Agility 2018 Hands-on Lab Guide

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1

Class 1: SAML Federation with F5

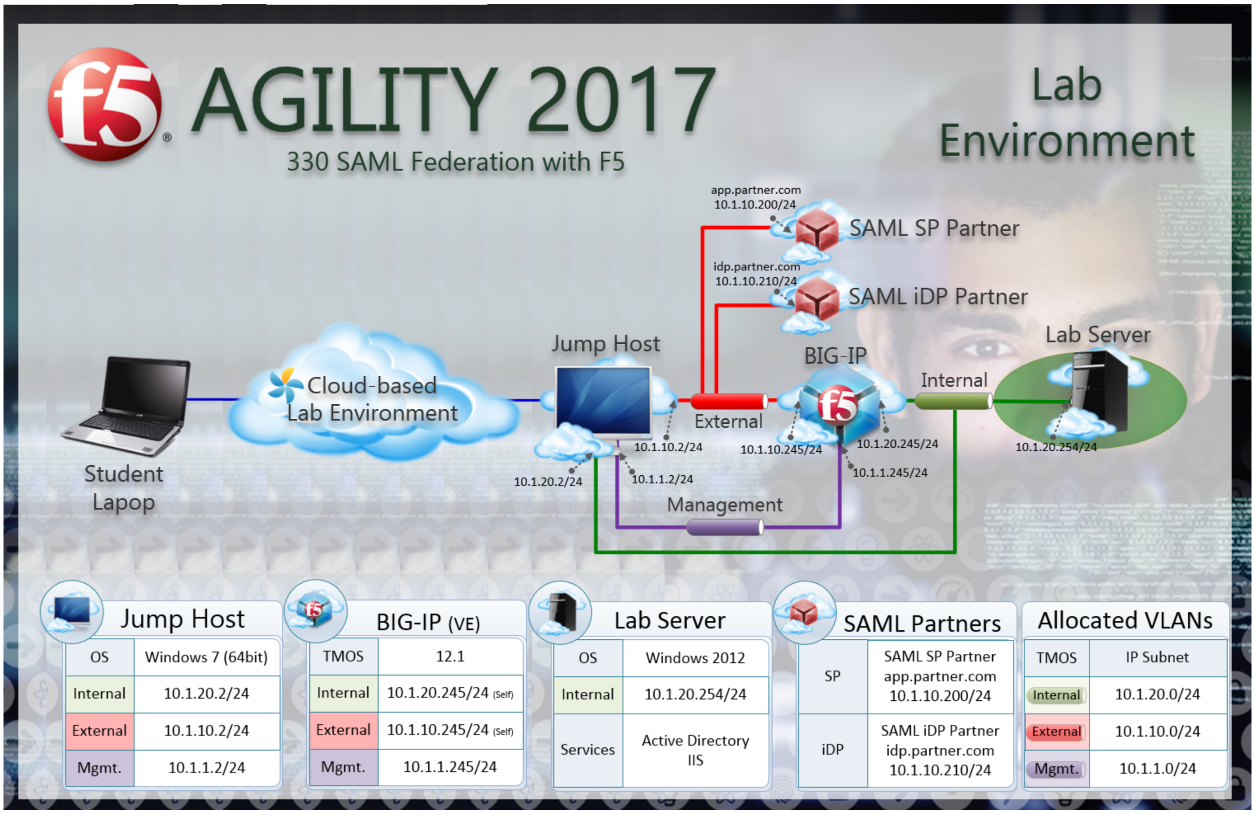
1.1 Getting Started

1.1.1 Lab Network Setup

In the interest of focusing as much time as possible configuring and performing lab tasks, we have provided some resources and basic setup ahead of time. These are:

- Cloud-based lab environment complete with Jump Host, Virtual BIG-IP and Lab Server
- Duplicate Lab environments for each student for improved collaboration
- The Virtual BIG-IP has been pre-licensed and provisioned with Access Policy Manager (APM)
- Pre-staged configurations to speed up lab time, reducing repetitive tasks to focus on key learning elements.

If you wish to replicate these labs in your environment you will need to perform these steps accordingly. Additional lab resources are provided as illustrated in the diagram below:



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Lab Environment

Jump Host

OS	Windows 7 (64bit)
Internal	10.1.20.2/24
External	10.1.10.2/24
Mgmt.	10.1.1.2/24

BIG-IP (VE)

TMOS	12.1
Internal	10.1.20.245/24 (Self)
External	10.1.10.245/24 (Self)
Mgmt.	10.1.1.245/24

Lab Server

OS	Windows 2012
Internal	10.1.20.254/24
Services	Active Directory IIS

SAML Partners

SP	SAML SP Partner app.partner.com 10.1.10.200/24
iDP	SAML iDP Partner idp.partner.com 10.1.10.210/24

Allocated VLANs

TMOS	IP Subnet
Internal	10.1.20.0/24
External	10.1.10.0/24
Mgmt.	10.1.1.0/24

1.1.2 Timing for labs

The time it takes to perform each lab varies and is mostly dependent on accurately completing steps. This can never be accurately predicted but we strived to provide an estimate based on several people, each having a different level of experience. Below is an estimate of how long it will take for each lab:

Lab Description	Time Allocated
LAB I (SAML Service Provider (SP))	25 minutes
LAB II (SAML Identity Provider (IDP))	25 minutes
LAB III (Kerberos to SAML)	25 minutes
LAB IV (SAAS Federation IAPP)	25 minutes

1.1.3 Authentication – Credentials

The following credentials will be utilized throughout this Lab guide.

Credential Use	User ID	Password
BIG-IP Configuration Utility (GUI)	admin	admin
BIG-IP CLI Access (SSH)	root	default
Jump Host Access	f5demo\user	Agility1
All User authentication for Labs/Tasks	user	Agility1

1.1.4 Utilized Browsers

The preferred browsers for this lab are Firefox and Internet Explorer. Shortcut links have been provided to speed access to targeted resources and assist you in your tasks. Except where noted, either browser can be used for all lab tasks.

1.1.5 General Notes

As noted previously, environment staging has been done to speed up lab time, reducing repetitive tasks to focus on key learning elements. Where possible steps that have been optimized have been called out with links and references provided in the *Additional Information* section for additional clarification. The intention being that the lab guide truly serves as a resource guide for all your future federation deployments.

1.2 Lab 1: SAML Service Provider (SP) Lab

The purpose of this lab is to configure and test a SAML Service Provider. Students will configure the various aspects of a SAML Service Provider, import and bind to a SAML Identity Provider and test SP?Initiated SAML Federation.

Objective:

- Gain an understanding of SAML Service Provider(SP) configurations and its component parts
- Gain an understanding of the access flow for SP-Initiated SAML

Lab Requirements:

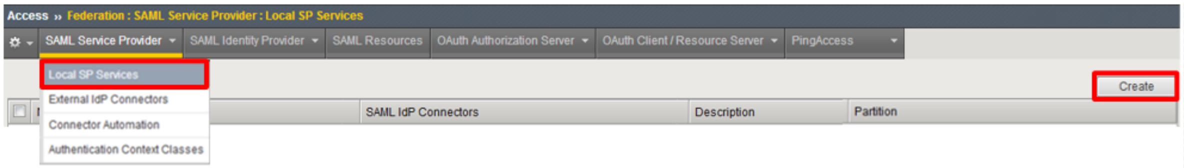
- All Lab requirements will be noted in$f$ the tasks that follow

Estimated completion time: 25 minutes

1.2.1 TASK 1 ? Configure the SAML Service Provider (SP)

SP Service

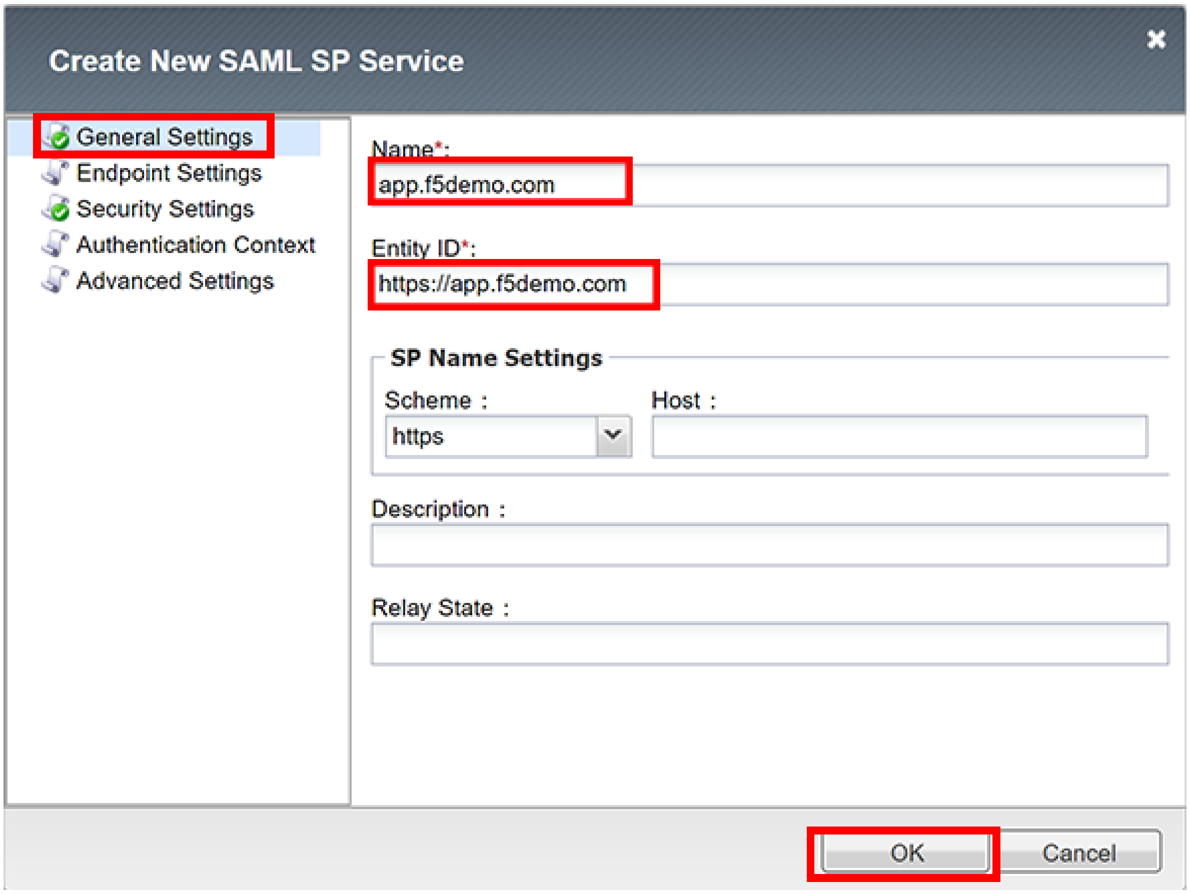
1. Begin by selecting: **Access -> Federation -> SAML Service Provider -> Local SP Services**
2. Click the **Create** button (far right)



3. In the **Create New SAML SP Service** dialog box click **General Settings** in the left navigation pane and key in the following as shown:

Name:	`app.f5demo.com`
Entity ID:	`https://app.f5demo.com`

4. Click **OK** on the dialogue box



Name*: app.f5demo.com

Entity ID*: https://app.f5demo.com

Scheme : https

Host :

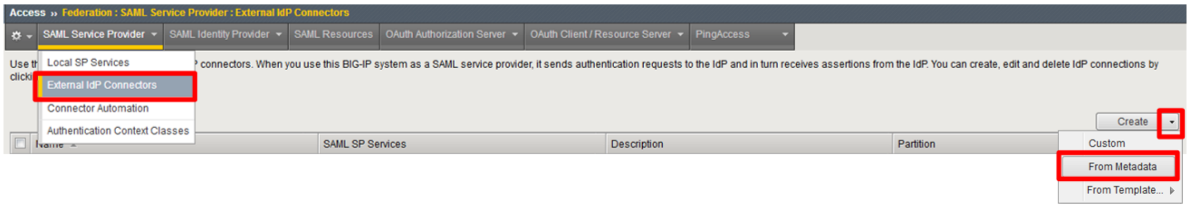
Description :

Relay State :

Note: The yellow box on Host will disappear when the Entity ID is entered.

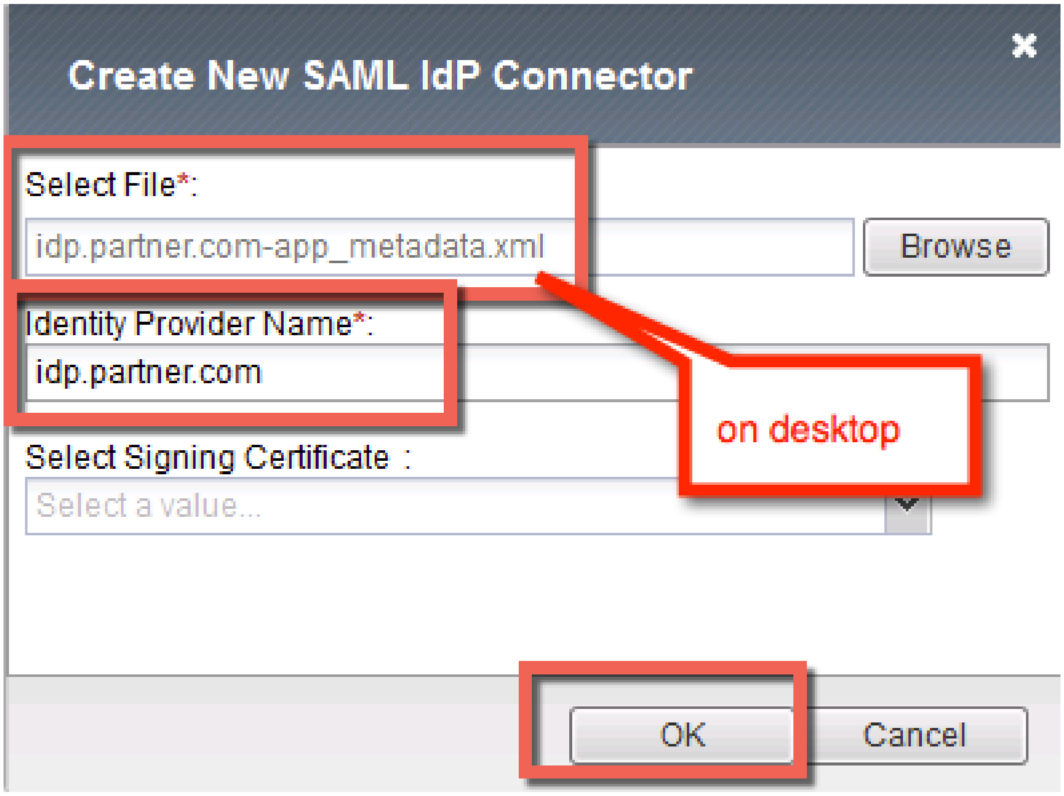
IdP Connector

1. Click on **Access ?> Federation ?> SAML Service Provider ?> External IdP Connectors** *or* click on the **SAML Service Provider** tab in the horizontal navigation menu and select **External IdP Connectors**
2. Click specifically on the **Down Arrow** next to the **Create** button (far right)
3. Select **From Metadata** from the drop down menu



Use th … connectors. When you use this BIG-IP system as a SAML service provider, it sends authentication requests to the IdP and in turn receives assertions from the IdP. You can create, edit and delete IdP connections by clicki…

4. In the **Create New SAML IdP Connector** dialogue box, click **Browse** and select the **idp.partner.com?app_metadata.xml** file from the Desktop of your jump host.
5. In the **Identity Provider Name** field enter *idp.partner.com*:
6. Click **OK** on the dialog box



Create New SAML IdP Connector

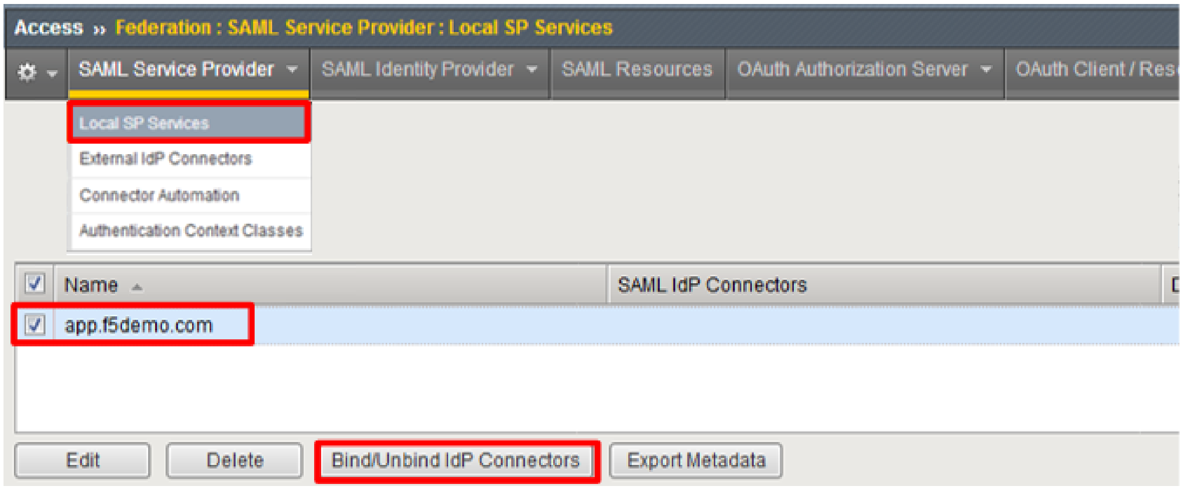
Select File*: idp.partner.com-app_metadata.xml

Identity Provider Name*: idp.partner.com

Select Signing Certificate : Select a value...

Note: The idp.partner.com-app_metadata.xml was created previously. Oftentimes, IdP providers will have a metadata file representing their IdP service. This can be imported to save object creation time as it has been done in this lab

7. Click on the **Local SP Services** from the **SAML Service Providers** tab in the horizontal navigation menu
8. Click the **checkbox** next to the previously created *app.f5demo.com* and click **Bind/Unbind IdP Connectors** at the bottom of the GUI



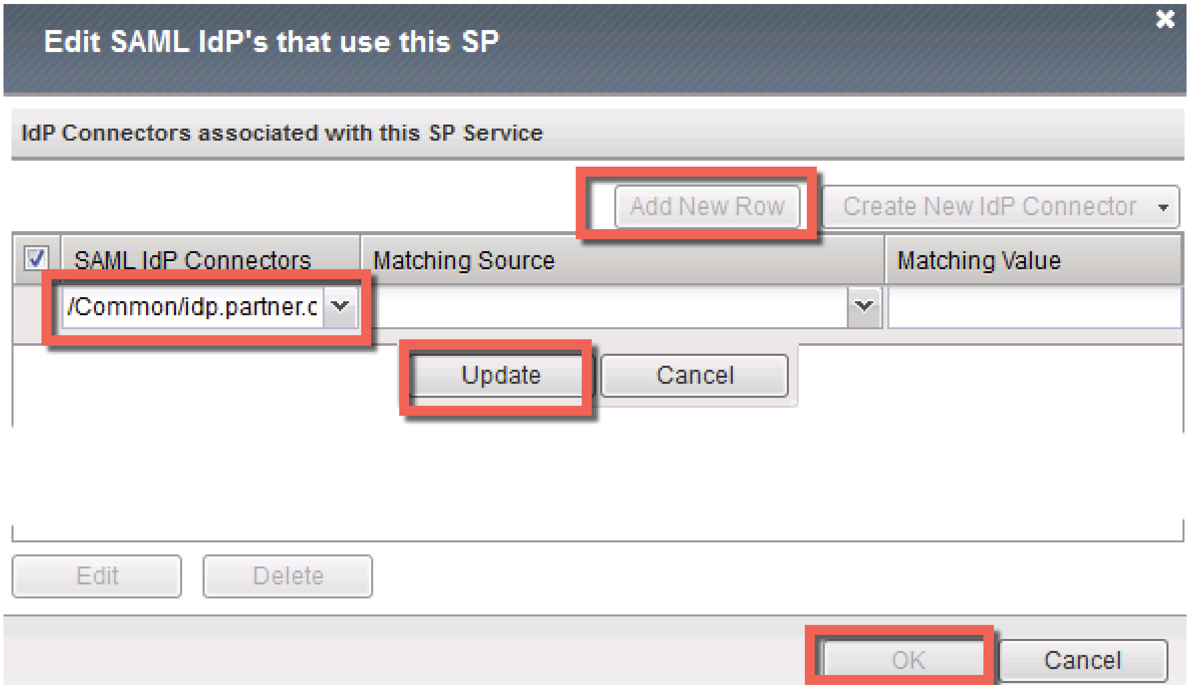
Access » Federation : SAML Service Provider : Local SP Services

☑ Name	SAML IdP Connectors
☑ app.f5demo.com	

9. **In the Edit SAML IdP's that use this SP dialogue box, click the Add New Row** button
10. In the added row, click the **Down Arrow** under **SAML IdP Connectors** and select the */Com-*

mon/idp.partner/com SAML IdP Connector previously created

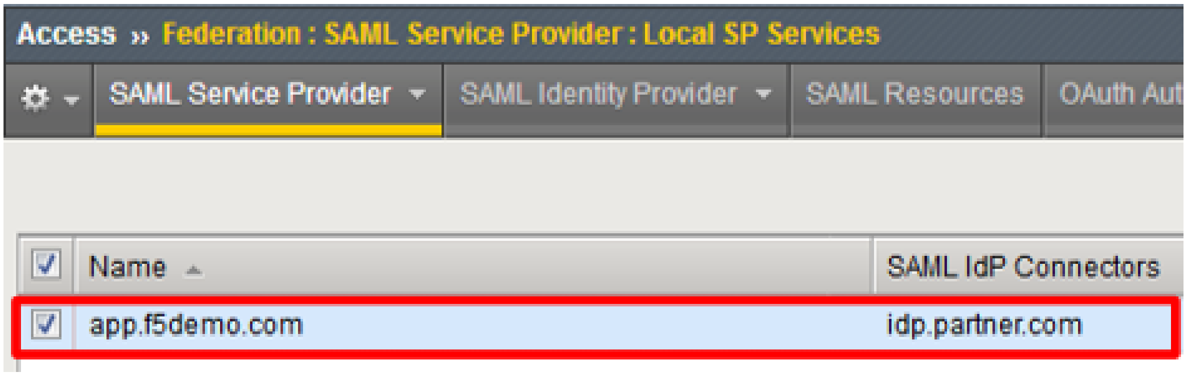
11. Click the **Update** button and the **OK** button at the bottom of the dialog box



SAML IdP Connectors: /Common/idp.partner.c

12. Under the **Access ?> Federation ?> SAML Service Provider ?> Local SP Services** menu you should now see the following (as shown):

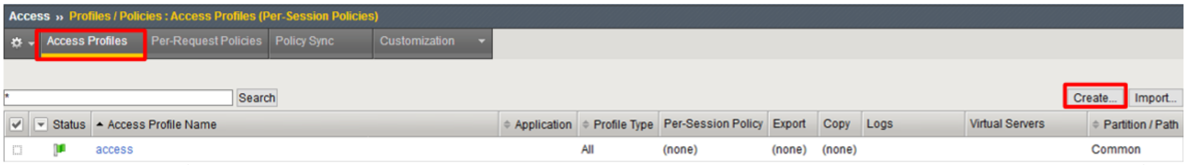
Name:	`app.f5demo.com`
SAML IdP Connectors:	`idp.partner.com`



☑	Name	SAML IdP Connectors
☑	app.f5demo.com	idp.partner.com

1.2.2 TASK 2 ? Configure the SAML SP Access Policy

1. Begin by selecting **Access ?> Profiles/Policies ?> Access Profiles (Per?Session Policies)**
2. Click the **Create** button (far right)



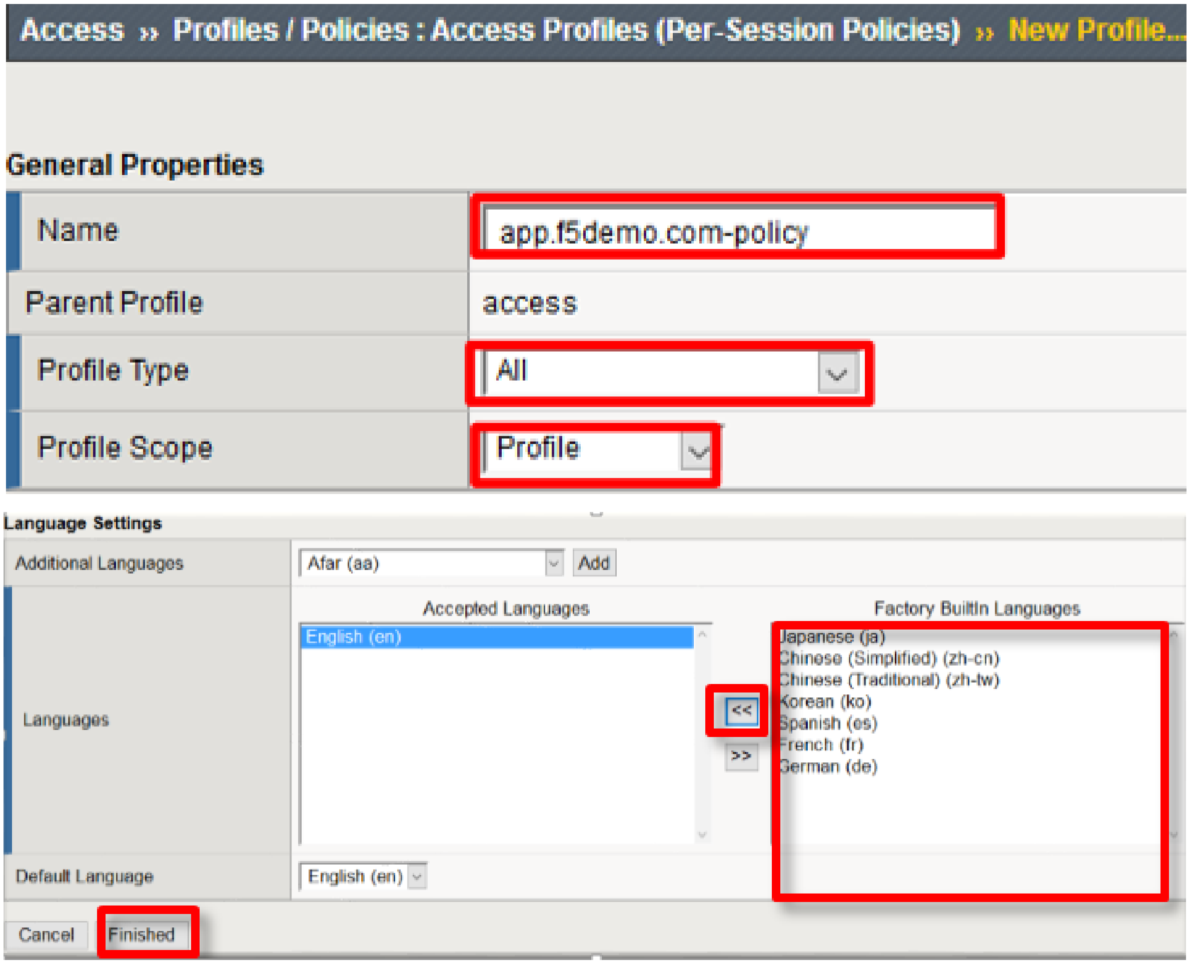
Access » Profiles / Policies : Access Profiles (Per-Session Policies)

☑	Status	Access Profile Name	Application	Profile Type	Per-Session Policy	Export	Copy	Logs	Virtual Servers	Partition / Path
□		access		All	(none)	(none)	(none)			Common

3. In the **New Profile** window, key in the following:

Name:	`app.f5demo.com?policy`
Profile Type:	`All` (from drop down)
Profile Scope:	`Profile` (default)

4. Scroll to the bottom of the **New Profile** window to the **Language Settings**
5. Select *English* from the **Factory Built?in Languages** on the right, and click the **Double Arrow (<<)**, then click the **Finished** button.



Access » Profiles / Policies : Access Profiles (Per-Session Policies) » New Profile...

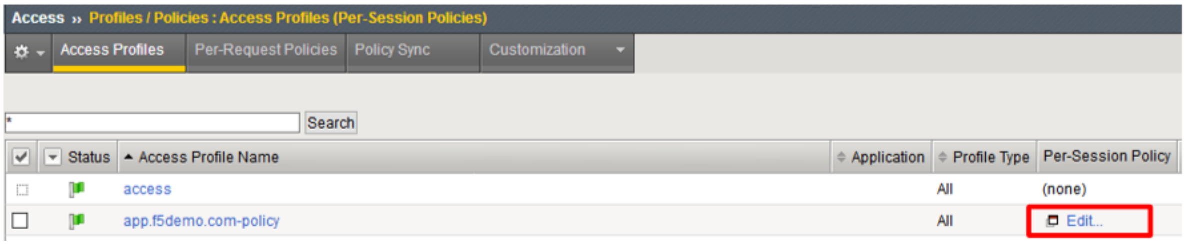
General Properties

Name	app.f5demo.com-policy
Parent Profile	access
Profile Type	All
Profile Scope	Profile

Language Settings

Additional Languages	Afar (aa)
Languages	Accepted Languages: English (en) Factory BuiltIn Languages: Japanese (ja), Chinese (Simplified) (zh-cn), Chinese (Traditional) (zh-tw), Korean (ko), Spanish (es), French (fr), German (de)
Default Language	English (en)

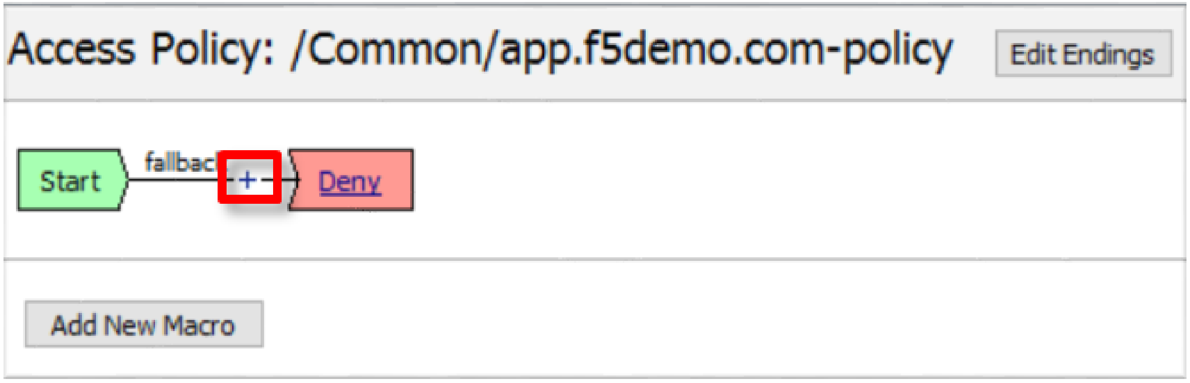
6. From the **Access ?> Profiles/Policies ?> Access Profiles (Per?Session Policies)** screen, click the **Edit** link on the previously created `app.f5demo.com?policy` line



Access » Profiles / Policies : Access Profiles (Per-Session Policies)

☑	Status	Access Profile Name	Application	Profile Type	Per-Session Policy
□		access		All	(none)
□		app.f5demo.com-policy		All	Edit...

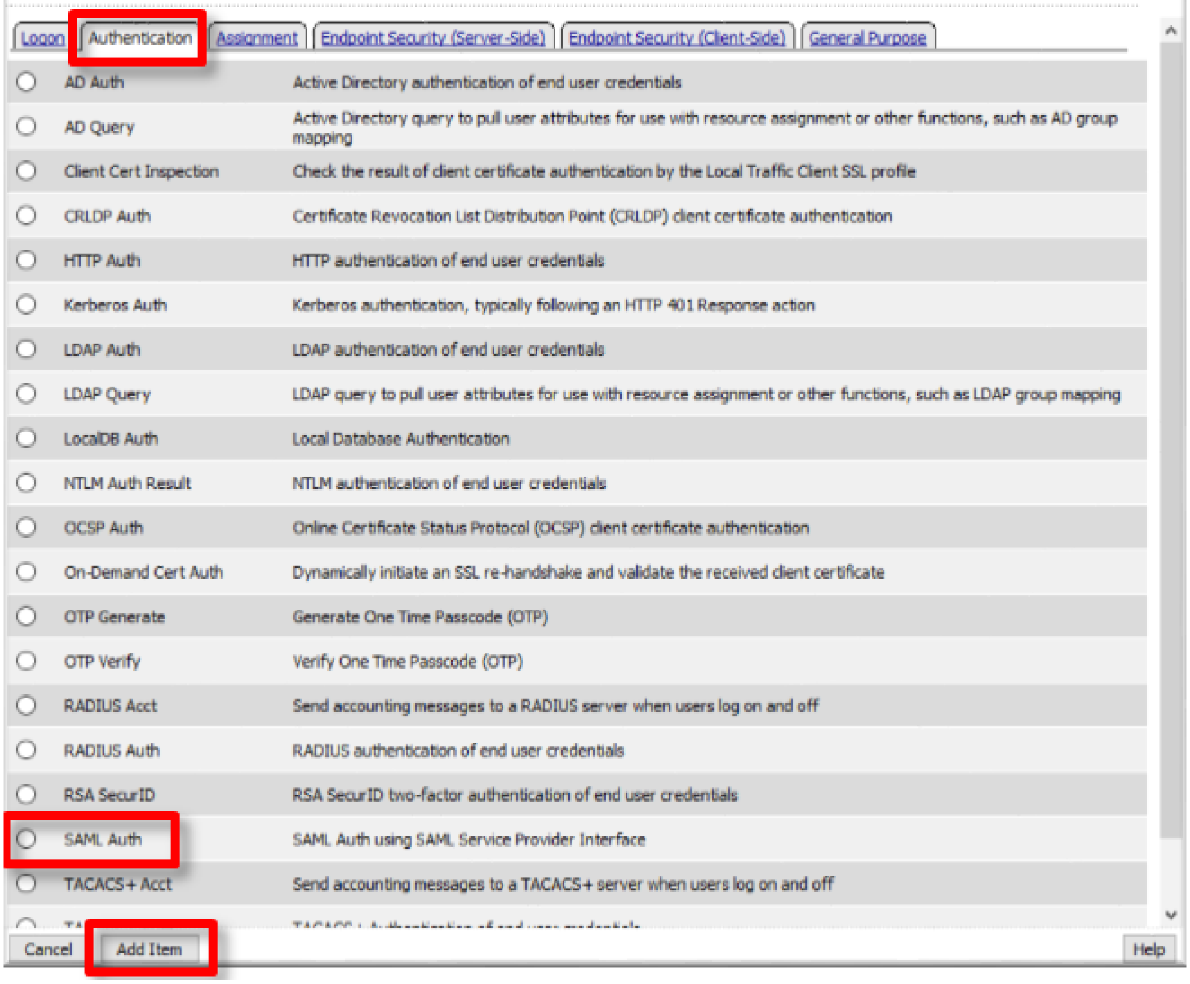
7. In the Visual Policy Editor window for `/Common/app.f5demo.com?policy`, click the **Plus (+) Sign** between **Start** and **Deny**



Access Policy: /Common/app.f5demo.com-policy

8. In the pop?up dialog box, select the **Authentication** tab and then click the **Radio Button** next to **SAML Auth**

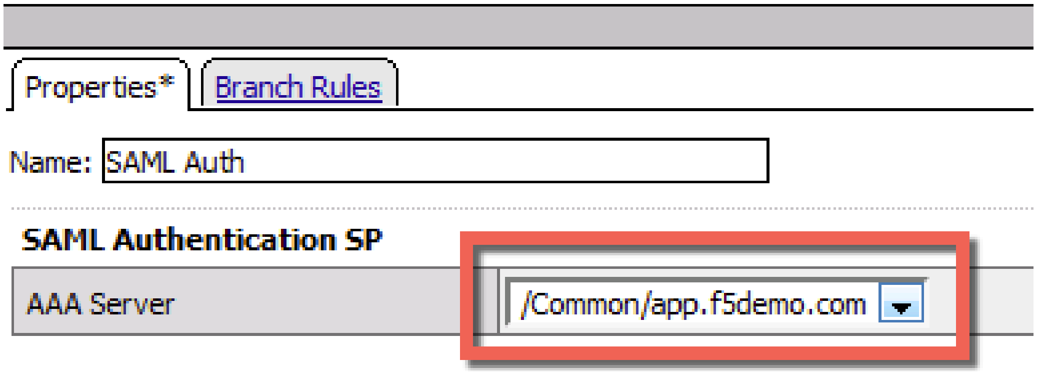
9. Once selected, click the **Add Item** button


Logon
Authentication
Assignment
Endpoint Security (Server-Side)
Endpoint Security (Client-Side)
General Purpose
Cancel
Add Item
Help

○	AD Auth	Active Directory authentication of end user credentials
○	AD Query	Active Directory query to pull user attributes for use with resource assignment or other functions, such as AD group mapping
○	Client Cert Inspection	Check the result of client certificate authentication by the Local Traffic Client SSL profile
○	CRLDP Auth	Certificate Revocation List Distribution Point (CRLDP) client certificate authentication
○	HTTP Auth	HTTP authentication of end user credentials
○	Kerberos Auth	Kerberos authentication, typically following an HTTP 401 Response action
○	LDAP Auth	LDAP authentication of end user credentials
○	LDAP Query	LDAP query to pull user attributes for use with resource assignment or other functions, such as LDAP group mapping
○	LocalDB Auth	Local Database Authentication
○	NTLM Auth Result	NTLM authentication of end user credentials
○	OCSP Auth	Online Certificate Status Protocol (OCSP) client certificate authentication
○	On-Demand Cert Auth	Dynamically initiate an SSL re-handshake and validate the received client certificate
○	OTP Generate	Generate One Time Passcode (OTP)
○	OTP Verify	Verify One Time Passcode (OTP)
○	RADIUS Acct	Send accounting messages to a RADIUS server when users log on and off
○	RADIUS Auth	RADIUS authentication of end user credentials
○	RSA SecurID	RSA SecurID two-factor authentication of end user credentials
○	SAML Auth	SAML Auth using SAML Service Provider Interface
○	TACACS+ Acct	Send accounting messages to a TACACS+ server when users log on and off
○	TA	TACACS+ Authentication of end user credentials

10. In the **SAML Auth** configuration window, select `/Common/app.f5demo.com` from the **AAA Server** drop down menu

11. Click the **Save** button at the bottom of the window

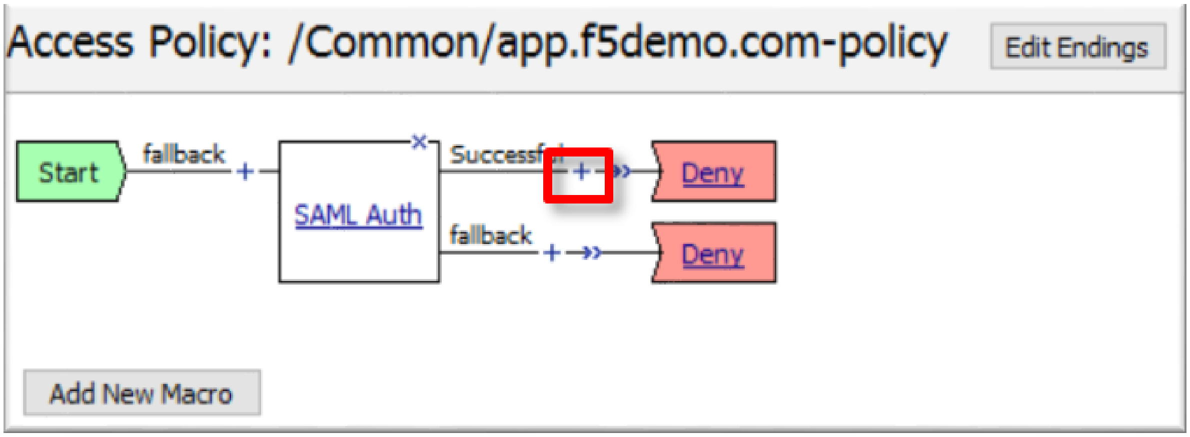


Name: SAML Auth

SAML Authentication SP

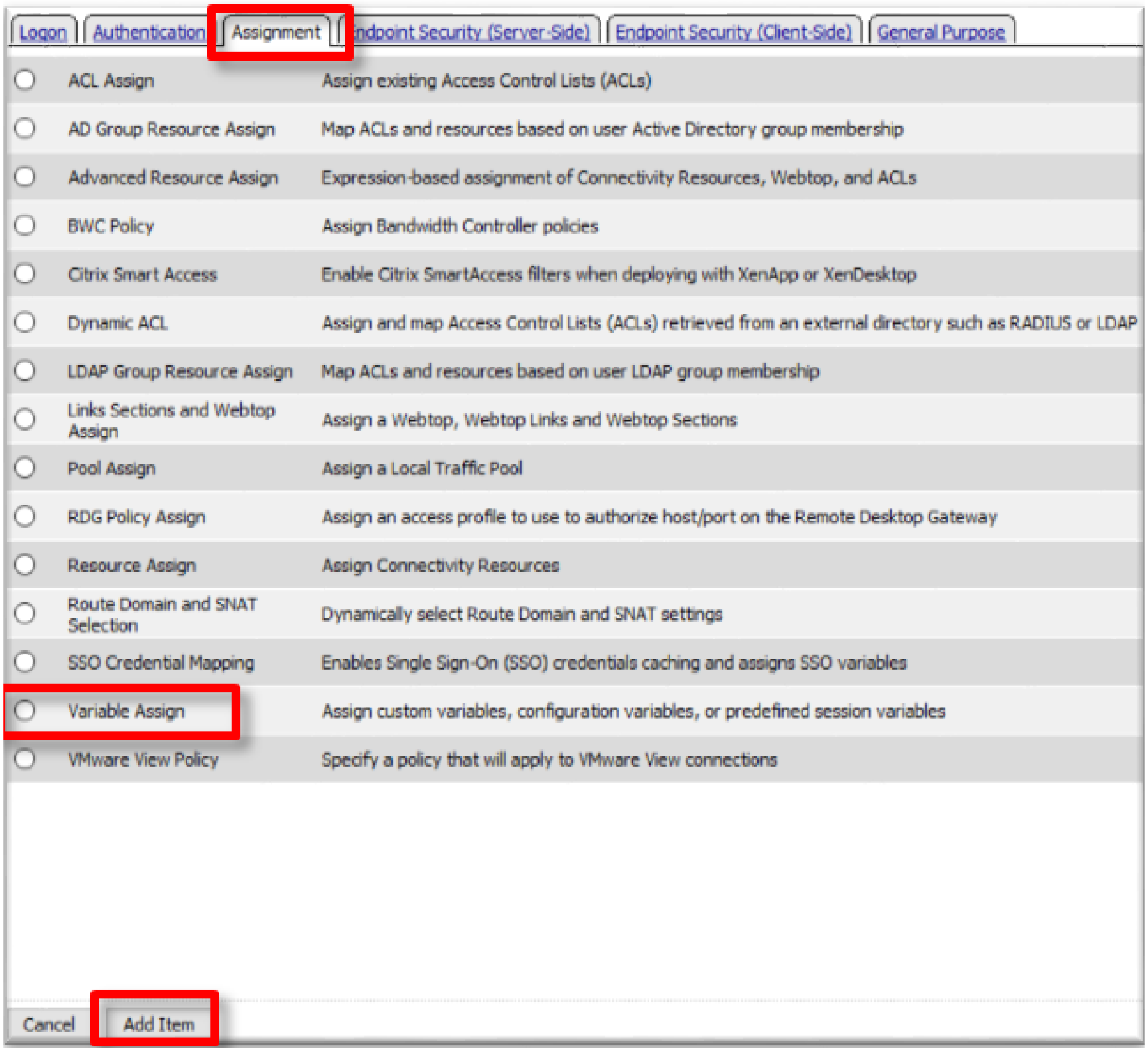
AAA Server: /Common/app.f5demo.com

12. In the **Visual Policy Editor** window for `/Common/app.f5demo.com?policy`, click the **Plus (+) Sign** on the **Successful** branch following **SAML Auth**



13. In the pop-up dialog box, select the **Assignment** tab, and then click the **Radio Button** next to **Variable Assign**

14. Once selected, click the **Add Item** buton


Logon
Authentication
Assignment
Endpoint Security (Server-Side)
Endpoint Security (Client-Side)
General Purpose
Cancel
Add Item

○	ACL Assign	Assign existing Access Control Lists (ACLs)
○	AD Group Resource Assign	Map ACLs and resources based on user Active Directory group membership
○	Advanced Resource Assign	Expression-based assignment of Connectivity Resources, Webtop, and ACLs
○	BWC Policy	Assign Bandwidth Controller policies
○	Citrix Smart Access	Enable Citrix SmartAccess filters when deploying with XenApp or XenDesktop
○	Dynamic ACL	Assign and map Access Control Lists (ACLs) retrieved from an external directory such as RADIUS or LDAP
○	LDAP Group Resource Assign	Map ACLs and resources based on user LDAP group membership
○	Links Sections and Webtop Assign	Assign a Webtop, Webtop Links and Webtop Sections
○	Pool Assign	Assign a Local Traffic Pool
○	RDG Policy Assign	Assign an access profile to use to authorize host/port on the Remote Desktop Gateway
○	Resource Assign	Assign Connectivity Resources
○	Route Domain and SNAT Selection	Dynamically select Route Domain and SNAT settings
○	SSO Credential Mapping	Enables Single Sign-On (SSO) credentials caching and assigns SSO variables
○	Variable Assign	Assign custom variables, configuration variables, or predefined session variables
○	VMware View Policy	Specify a policy that will apply to VMware View connections

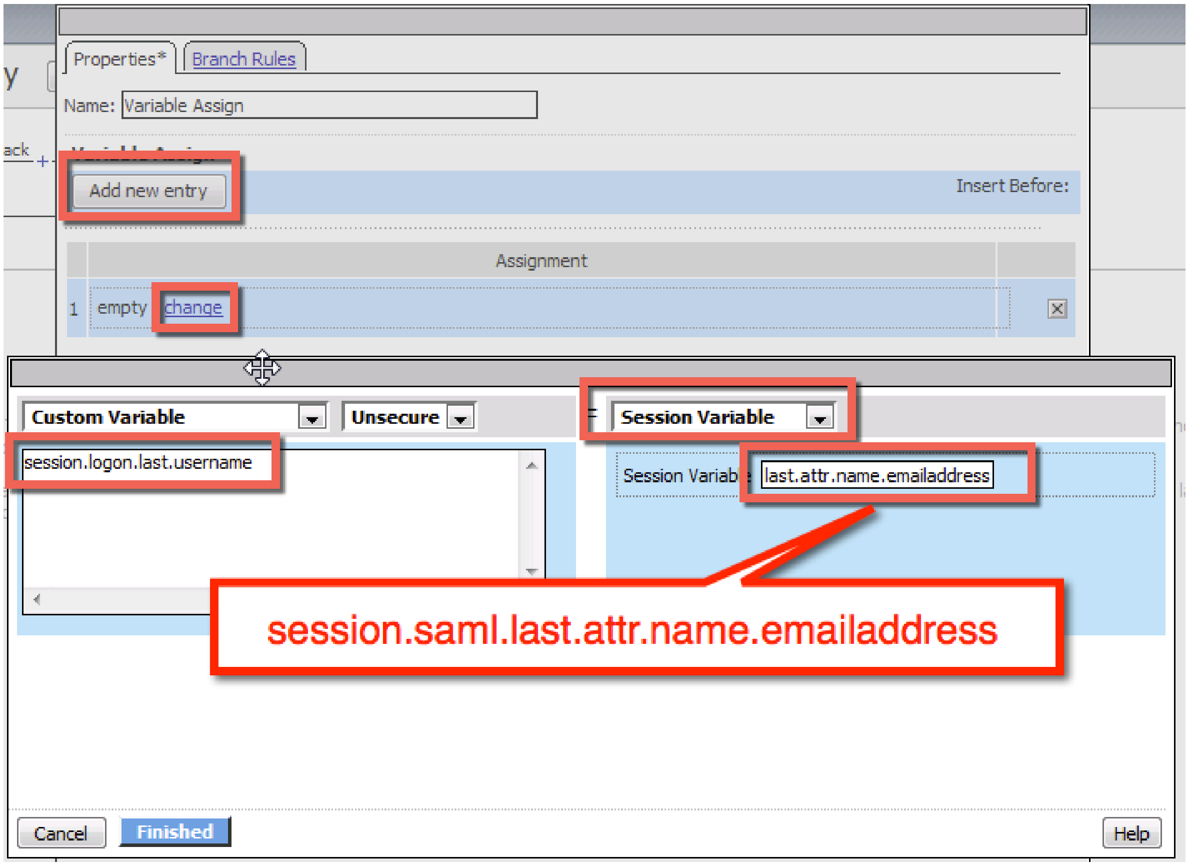
15. In the **Variable Assign** configuration window, click the **Add New Entry** button

16. Under the new **Assignment** row, click the **Change** link
17. In the pop?up window, configure the following:

Left Pane	
Variable Type:	`Custom Variable`
Security:	`Unsecure`
Value:	`session.logon.last.username`

Right Pane	
Variable Type:	`Session Variable`
Session Variable:	`session.saml.last.attr.name.emailaddress`

18. Click the **Finished** button at the bottom of the configuration window
19. Click the **Save** button at the bottom of the **Variable Assign** dialog window



Name: Variable Assign

1 empty change

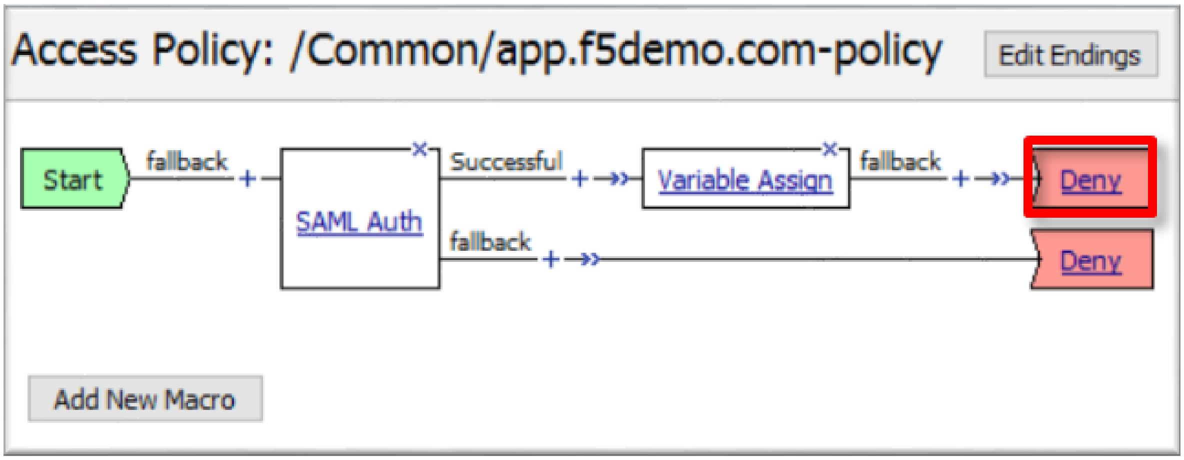
Custom Variable | Unsecure = Session Variable

session.logon.last.username

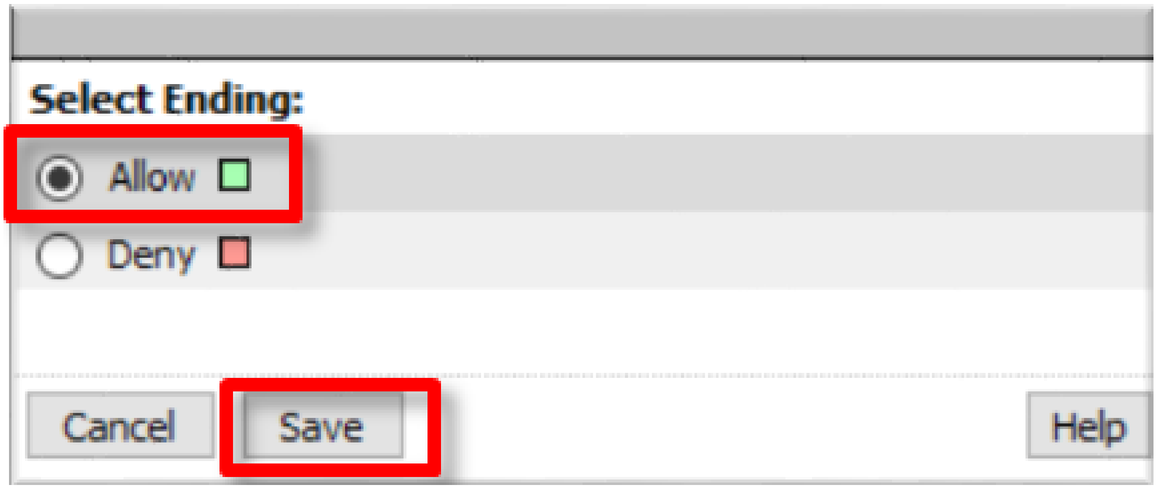
Session Variab last.attr.name.emailaddress

session.saml.last.attr.name.emailaddress

20. In the **Visual Policy Editor** select the **Deny** ending along the **fallback** branch following the **Variable Assign**



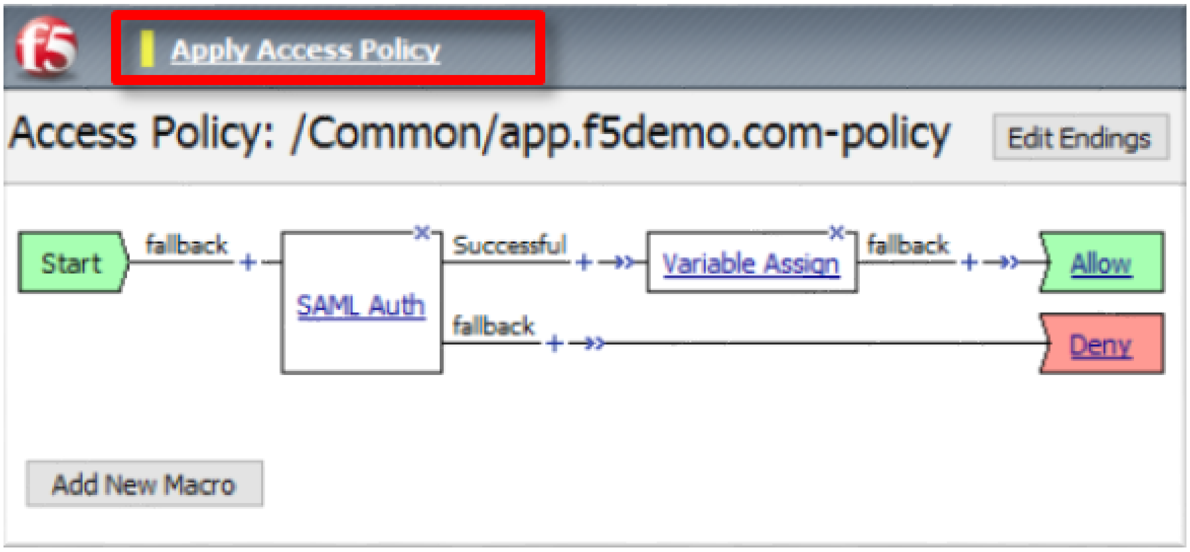
21. From the **Select Ending** dialog box, select the **Allow** button and then click **Save**


Select Ending:

● Allow 🟩

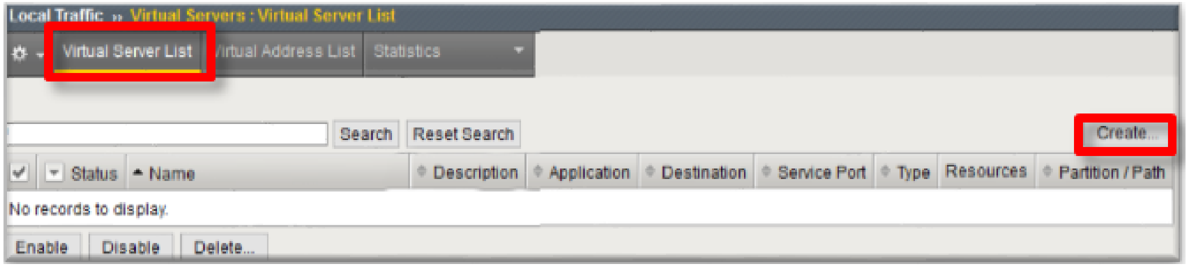
○ Deny 🟥

22. In the **Visual Policy Editor** click **Apply Access Policy** (top left) and close the **Visual Policy Editor**



1.2.3 TASK 3 ? Create the SP Virtual Server & Apply the SP Access Policy

1. Begin by selecting **Local Traffic -> Virtual Servers**
2. Click the **Create** button (far right)



3. In the **New Virtual Server** window, key in the following as shown:

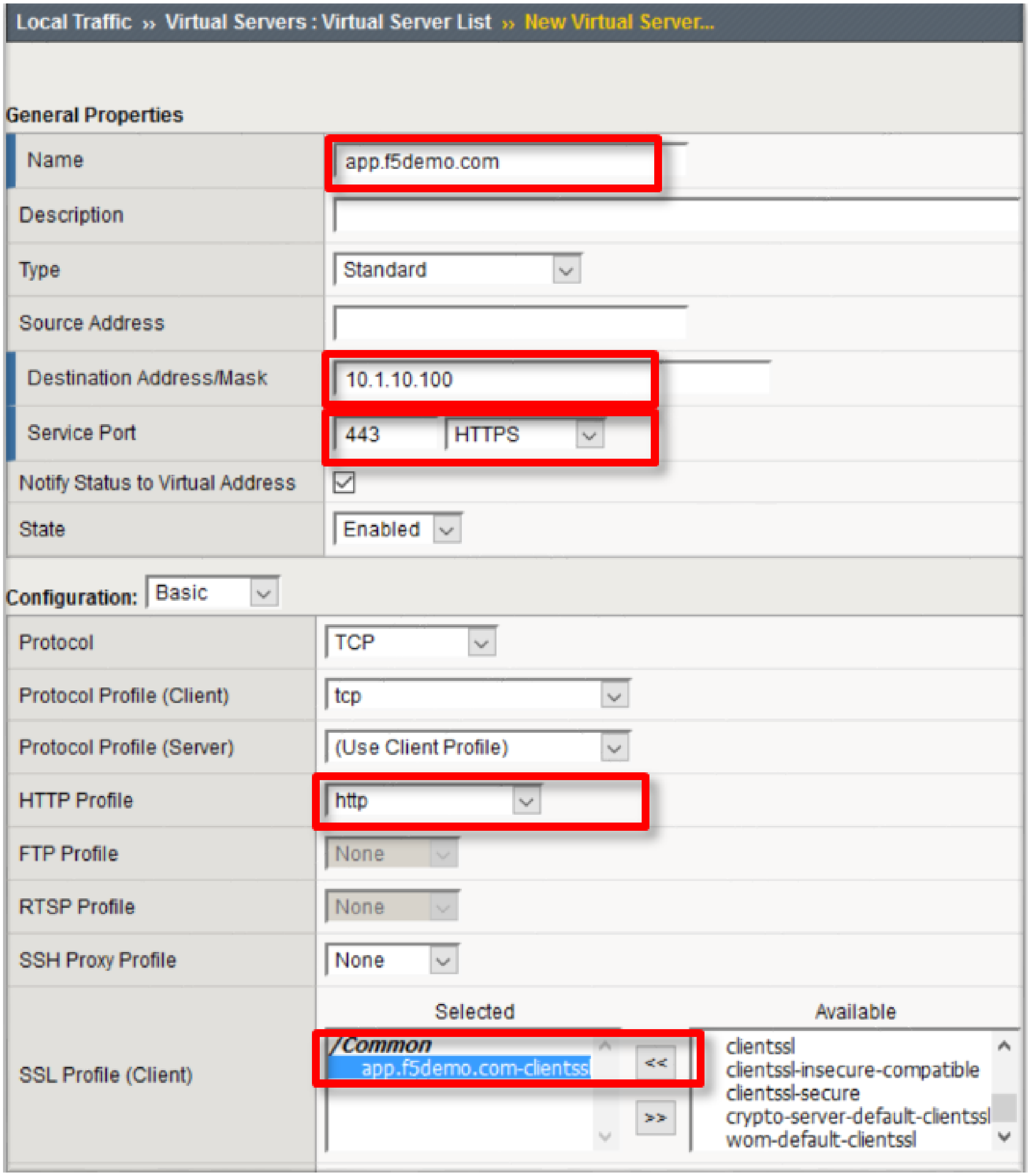
General Properties	
Name:	`app.f5demo.com`
Destination Address/Mask:	`10.1.10.100`
Service Port:	`443`

Configuration	
HTTP Profile:	`http` (drop down)
SSL Profile (Client)	`app.f5demo.com?clientssl`

Access Policy	
Access Profile:	`app.f5demo.com?policy`

Resources	
iRules:	`application?irule`

4. Scroll to the bottom of the configuration window and click **Finished**



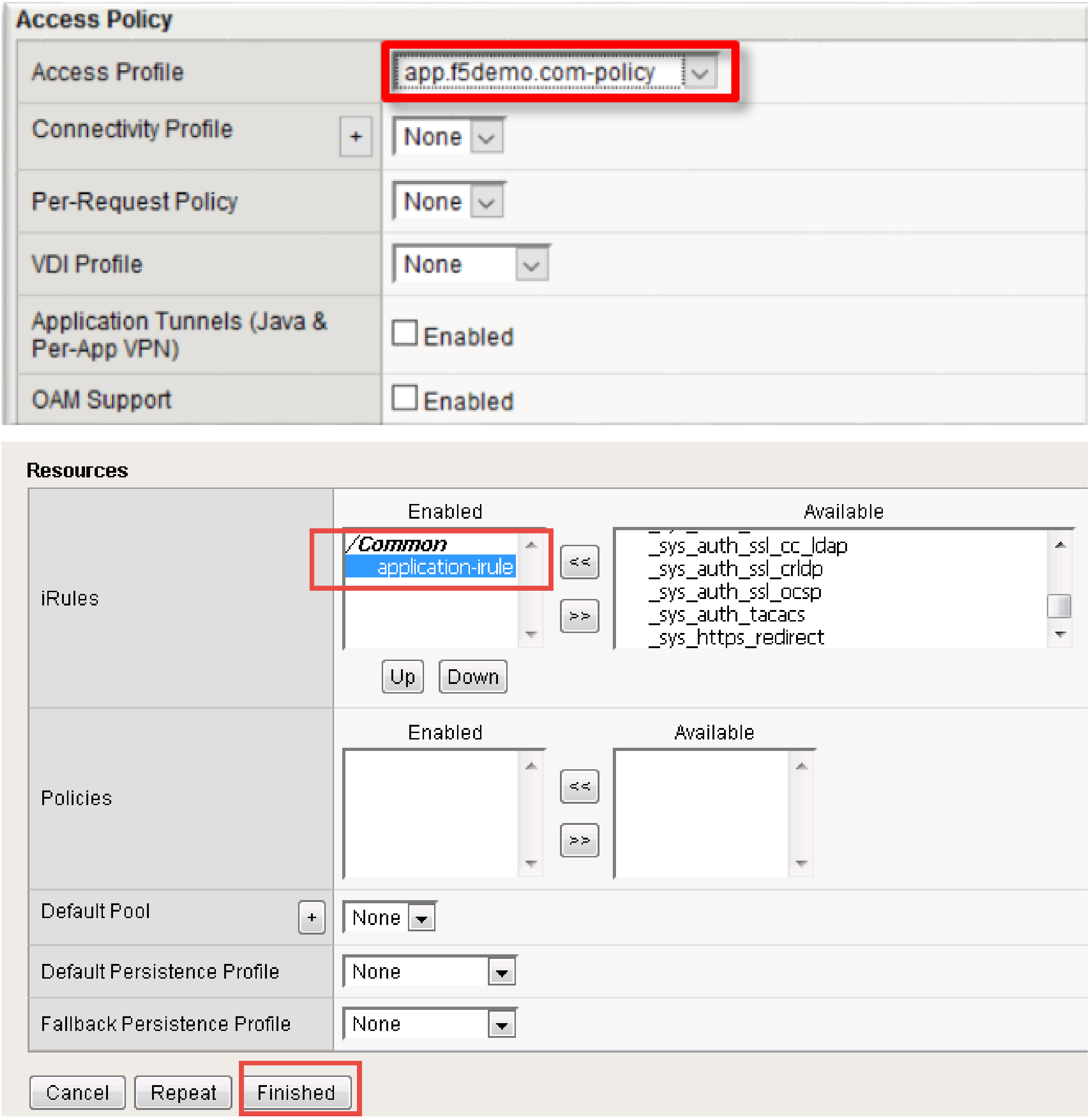
Local Traffic » Virtual Servers : Virtual Server List » New Virtual Server...

General Properties

Name	app.f5demo.com
Description	
Type	Standard
Source Address	
Destination Address/Mask	10.1.10.100
Service Port	443 HTTPS
Notify Status to Virtual Address	☑
State	Enabled

Configuration: Basic

Protocol	TCP
Protocol Profile (Client)	tcp
Protocol Profile (Server)	(Use Client Profile)
HTTP Profile	http
FTP Profile	None
RTSP Profile	None
SSH Proxy Profile	None
SSL Profile (Client)	Selected: /Common app.f5demo.com-clientssl Available: clientssl clientssl-insecure-compatible clientssl-secure crypto-server-default-clientssl wom-default-clientssl



Access Policy

Access Profile	app.f5demo.com-policy
Connectivity Profile +	None
Per-Request Policy	None
VDI Profile	None
Application Tunnels (Java & Per-App VPN)	□ Enabled
OAM Support	□ Enabled

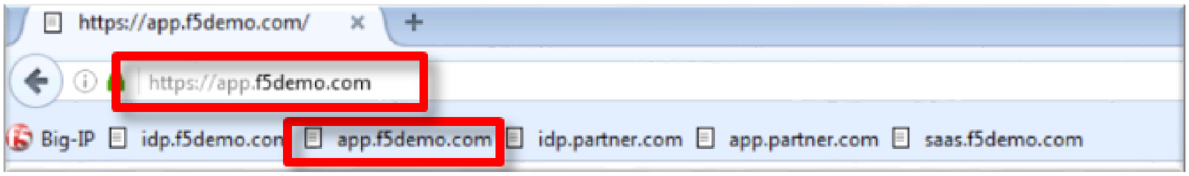
Resources

iRules	Enabled: /Common application-irule Available: _sys_auth_ssl_cc_ldap _sys_auth_ssl_crldp _sys_auth_ssl_ocsp _sys_auth_tacacs _sys_https_redirect
Policies	Enabled: Available:
Default Pool +	None
Default Persistence Profile	None
Fallback Persistence Profile	None

Note: The iRule is being added in order to simulate an application server to validate successful access.

1.2.4 TASK 4 ? Test the SAML SP

1. Using your browser from the jump host, navigate to the SAML SP you just configured at `https://app.f5demo.com` (or click the provided bookmark)



2. Did you successfuly redirect to the IdP?
3. Log in to the IdP. Were you successfully authenticated?

Note: Use the credentials provided in the Authentication section at the beginning of this guide (user/Agility1)

---

4. After successful authentication, were you returned to the SAML SP?
5. Were you successfully authenticated to the app in the SAML SP?
6. Review your Active Sessions **(Access ?> Overview ?> Active Sessions)**
7. Review your Access Report Logs **(Access ?> Overview ?> Access Reports)**

1.3 Lab 2: SAML Identity Provider (IdP) Lab

The purpose of this lab is to configure and test a SAML Identity Provider. Students will configure the various aspect of a SAML Identity Provider, import and bind to a SAML Service Provider and test IdP-Initiated SAML Federation.

Objective:

- Gain an understanding of SAML Identity Provider(IdP) configurations and its component parts
- Gain an understanding of the access flow for IdP-Initiated SAML

Lab Requirements:

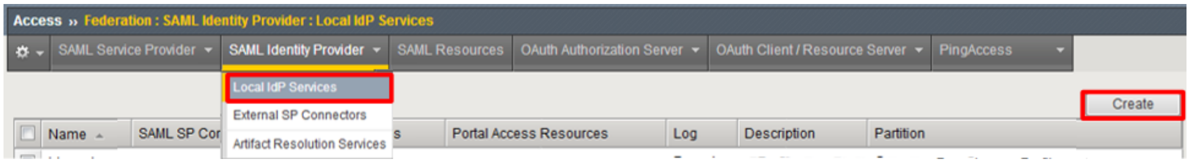
- All Lab requirements will be noted in the tasks that follow

Estimated completion time: 25 minutes

1.3.1 TASK 1 ? Configure the SAML Identity Provider (IdP)

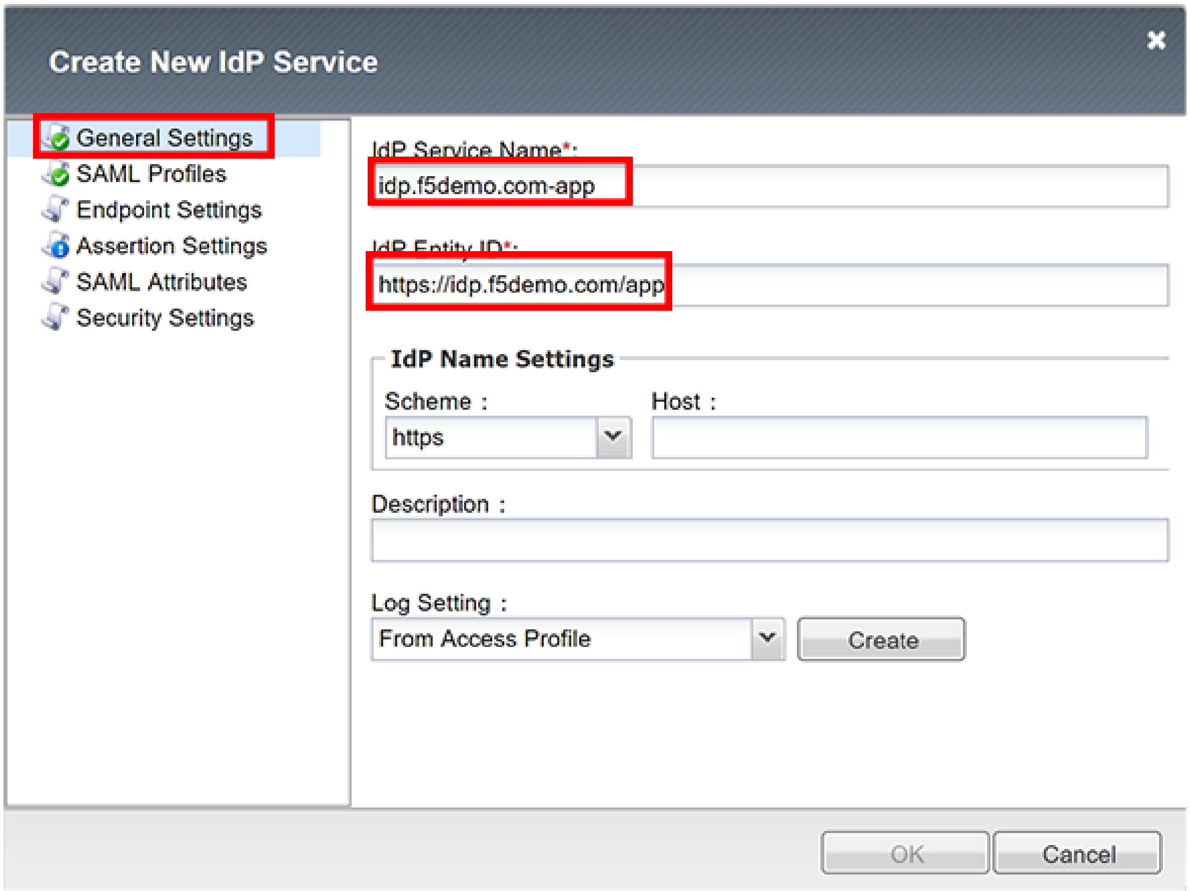
IdP Service

1. Begin by selecting: **Access ?> Federation ?> SAML Identity Provider ?> Local IdP Services**
2. Click the **Create** button (far right)



3. In the **Create New SAML IdP Service** dialog box, click **General Settngs** in the left navigation pane and key in the following:

IdP Service Name:	`idp.f5demo.com?app`
IdP Entity ID:	`https://idp.f5demo.com/app`



IdP Service Name*: idp.f5demo.com-app

IdP Entity ID*: https://idp.f5demo.com/app

IdP Name Settings

Scheme : https

Host :

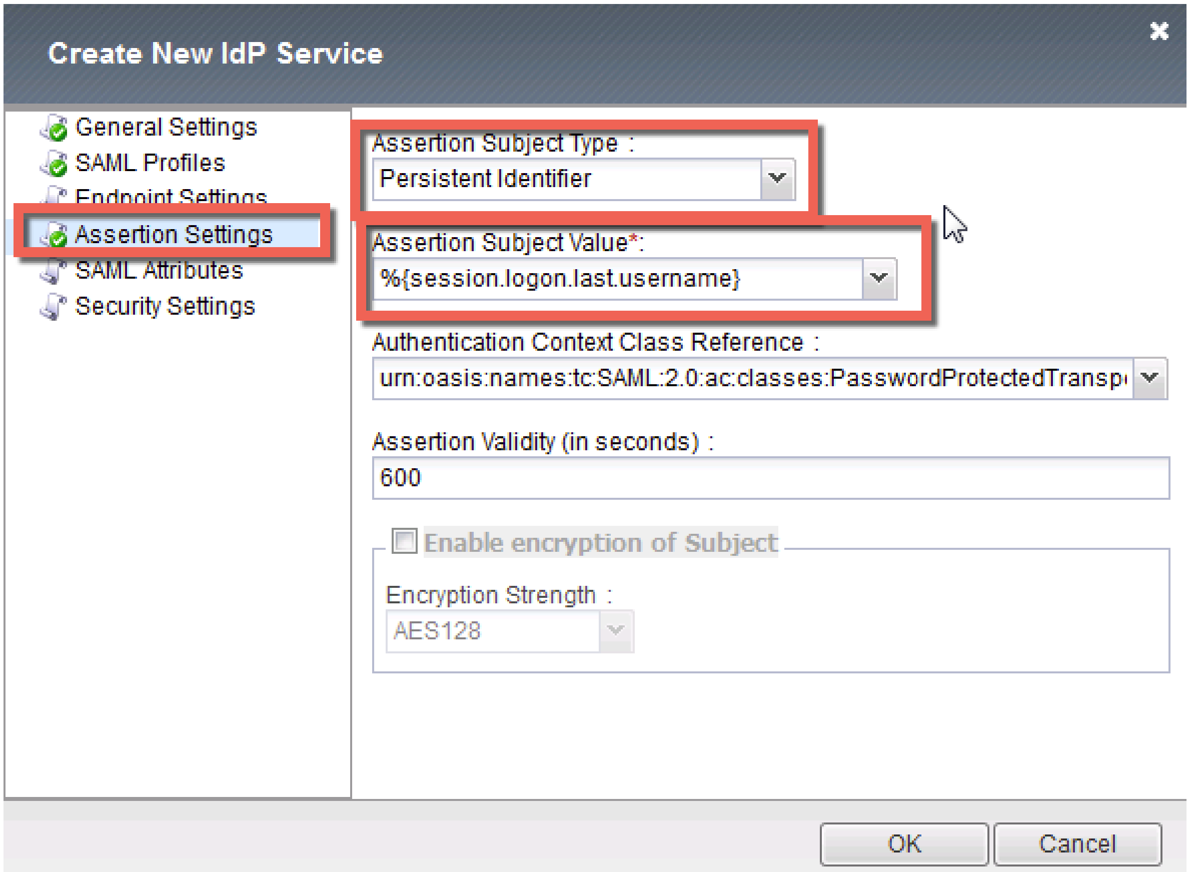
Description :

Log Setting : From Access Profile

Note: The yellow box on “Host” will disappear when the Entity ID is entered

4. In the **Create New SAML IdP Service** dialog box, click **Assertion Settings** in the left navigation pane and key in the following:

Assertion Subject Type:	`Persistent Identifier` (drop down)
Assertion Subject Value:	`%{session.logon.last.username}` (drop down)



Assertion Subject Type : Persistent Identifier

Assertion Subject Value*: %{session.logon.last.username}

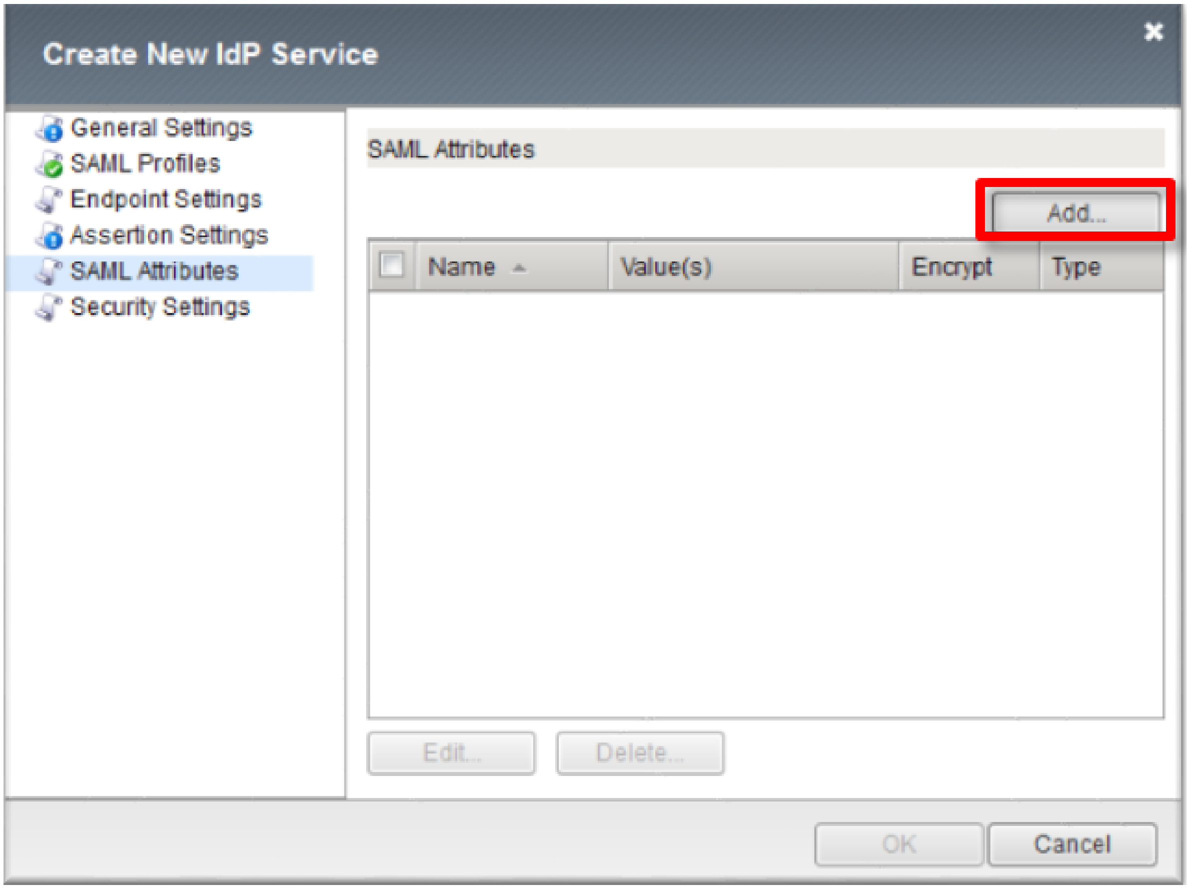
Authentication Context Class Reference : urn:oasis:names:tc:SAML:2.0:ac:classes:PasswordProtectedTransp

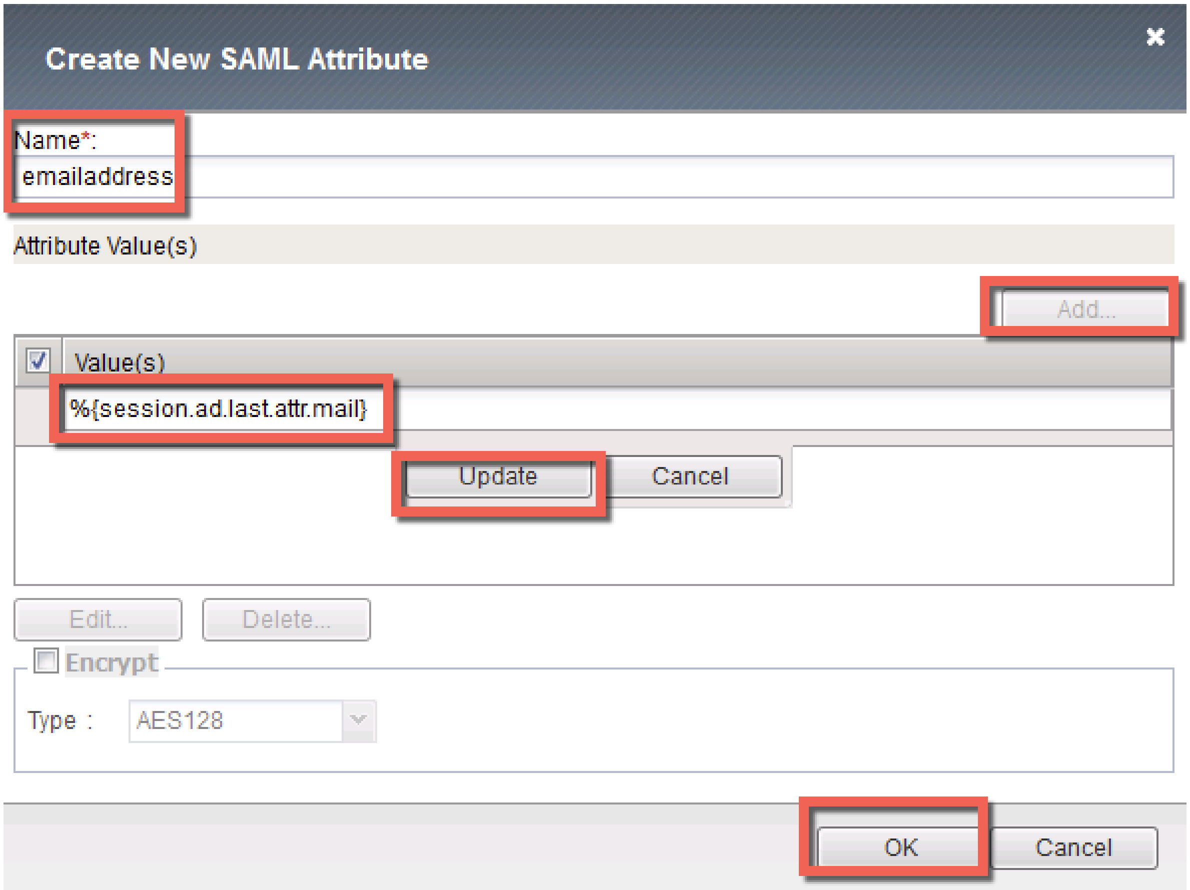
Assertion Validity (in seconds) : 600

☐ Enable encryption of Subject

Encryption Strength : AES128

5. In the **Create New SAML IdP Service** dialog box, click **SAML Attributes** in the left navigation pane and click the **Add** button as shown
6. In the **Name** field in the resulting pop-up window, enter the following: `emailaddress`
7. Under **Attribute Values**, click the **Add** button
8. In the **Values** line, enter the following: `%{session.ad.last.attr.mail}`
9. Click the **Update** button
10. Click the **OK** button


Create New IdP Service
General Settings
SAML Profiles
Endpoint Settings
Assertion Settings
SAML Attributes
Security Settings
SAML Attributes
Add...
Name
Value(s)
Encrypt
Type
Edit...
Delete...
OK
Cancel



Name*: emailaddress

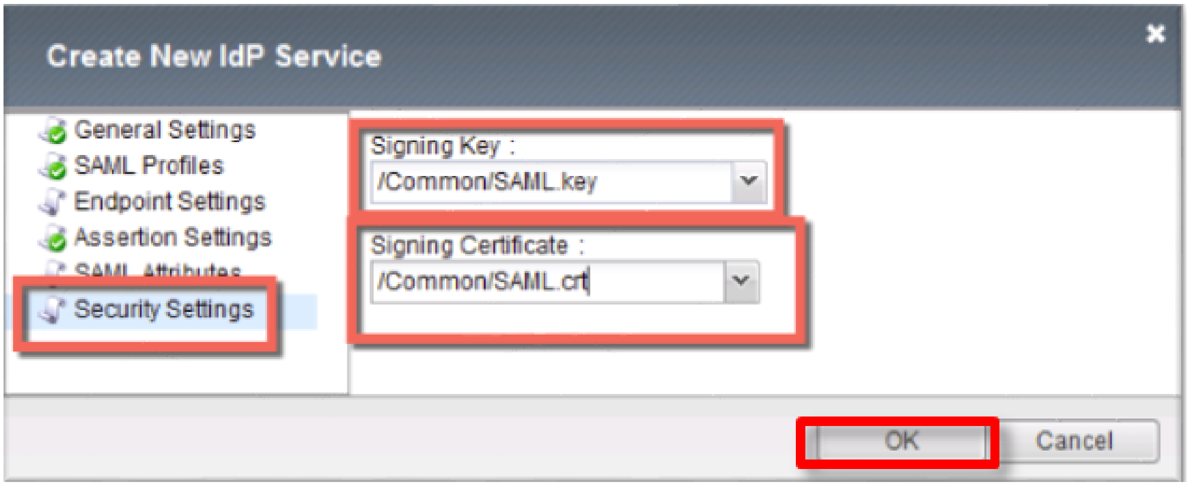
Value(s): %{session.ad.last.attr.mail}

11. In the **Create New SAML IdP Service** dialog box, click **Security Settings** in the left navigation pane and key in the following:

Signing Key:	`/Common/SAML.key` (drop down)
Signing Certificate:	`/Common/SAML.crt` (drop down)

Note: The certificate and key were previously imported

12. Click **OK** to complete the creation of the IdP service

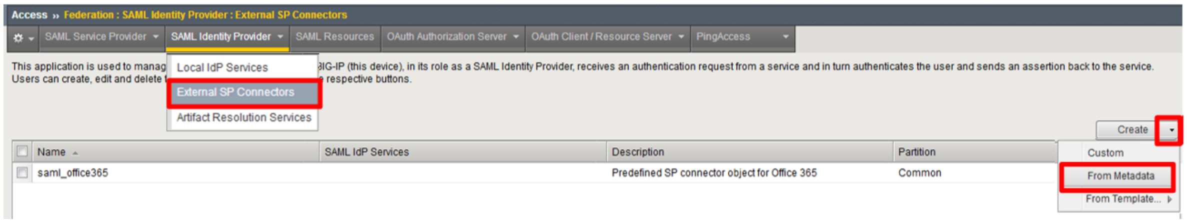


Signing Key : /Common/SAML.key

Signing Certificate : /Common/SAML.crt

SP Connector

1. Click on **External SP Connectors** (under the **SAML Identity Provider** tab) in the horizontal navigation menu
2. Click specifically on the **Down Arrow** next to the **Create** button (far right)
3. Select **From Metadata** from the drop down menu

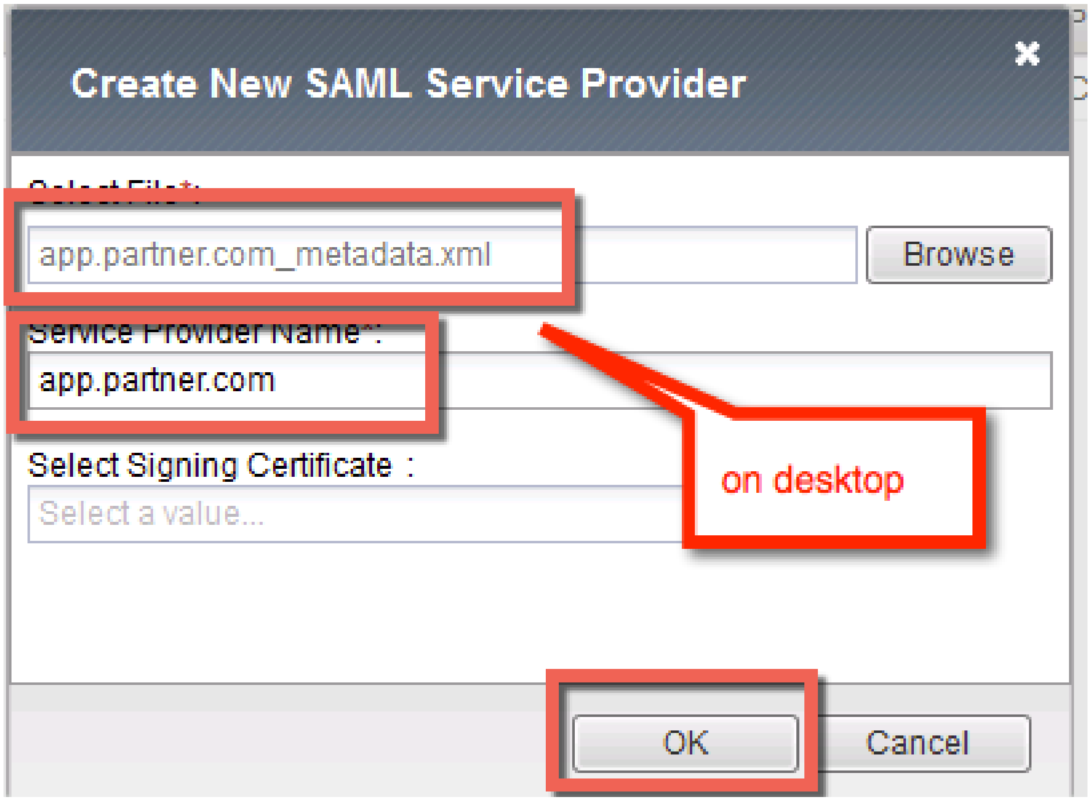


Access » Federation : SAML Identity Provider : External SP Connectors
SAML Service Provider
SAML Identity Provider
SAML Resources
OAuth Authorization Server
OAuth Client / Resource Server
PingAccess
Local IdP Services
External SP Connectors
Artifact Resolution Services
Create
Custom
From Metadata
From Template...

This application is used to manag BIG-IP (this device), in its role as a SAML Identity Provider, receives an authentication request from a service and in turn authenticates the user and sends an assertion back to the service. Users can create, edit and delete respective buttons.

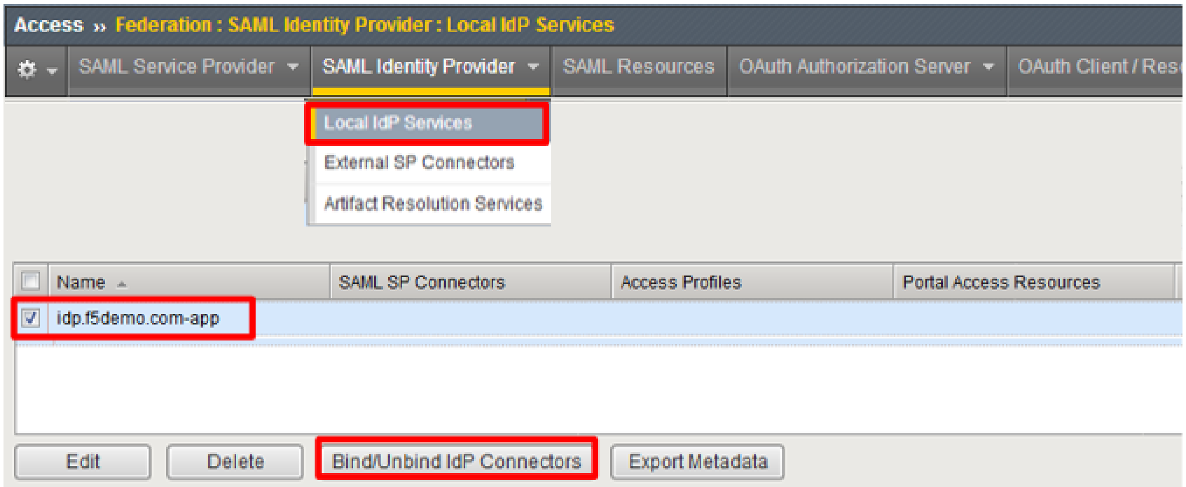
Name	SAML IdP Services	Description	Partition
saml_office365		Predefined SP connector object for Office 365	Common

4. In the **Create New SAML Service Provider** dialogue box, click **Browse** and select the *app.partner.com_metadata.xml* file from the Desktop of your jump host
5. In the **Service Provider Name** field, enter the following: `app.partner.com`
6. Click **OK** on the dialog box



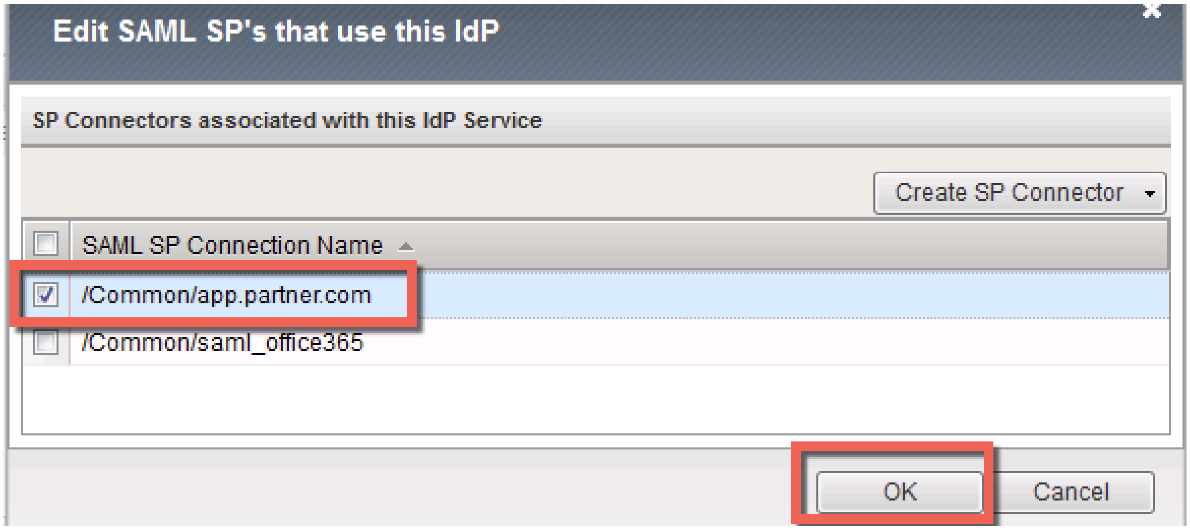
Note: The app.partner.com_metadata.xml file was created previously. Oftentimes SP providers will have a metadata file representing their SP service. This can be imported to save object creation time as has been done in this lab.

7. Click on **Local IdP Services** (under the **SAML Identity Provider** tab) in the horizontal navigation menu
8. Select the **Checkbox** next to the previously created `idp.f5demo.com` and click the **Bind/Unbind SP Connectors** button at the bottom of the GUI



9. In the **Edit SAML SP's that use this IdP** dialog, select the `/Common/app.partner.com` SAML SP Connection Name created previously

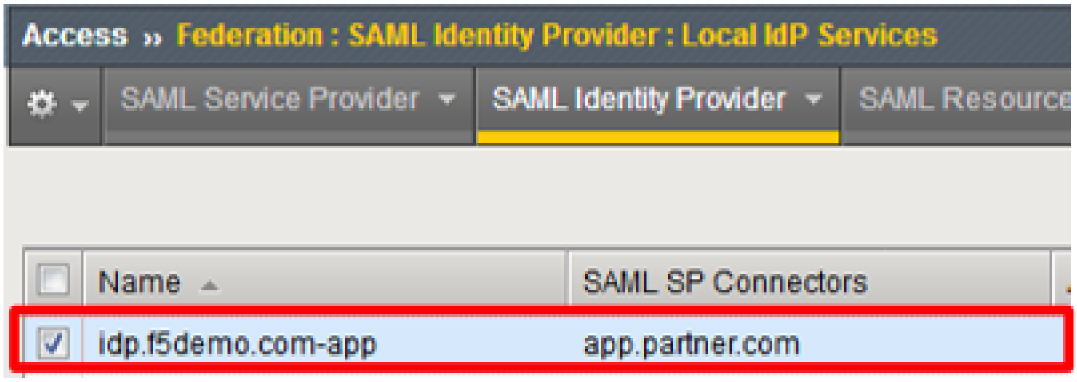
10. Click the **OK** button at the bottom of the dialog box



Edit SAML SP's that use this IdP
SP Connectors associated with this IdP Service
Create SP Connector
SAML SP Connection Name
☑ /Common/app.partner.com
□ /Common/saml_office365
OK
Cancel

11. Under the **Access ?> Federation ?> SAML Identity Provider ?> Local IdP Services** menu you should now see the following (as shown):

Name:	`idp.f5demo.com-app`
SAML SP Connectors:	`app.partner.com`



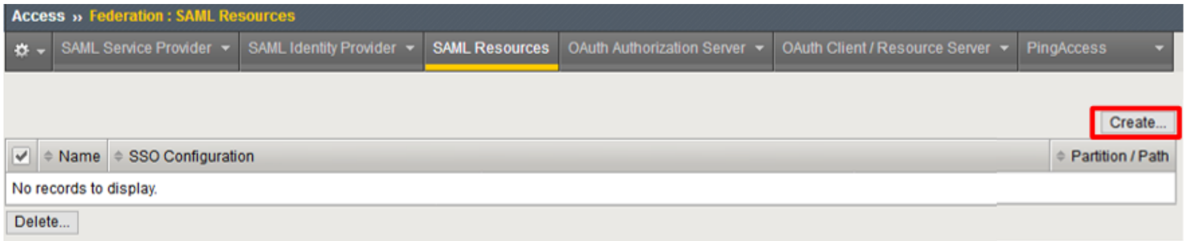
1.3.2 TASK 2 ? Create SAML Resource, Webtop, and SAML IdP Access Policy

SAML Resource

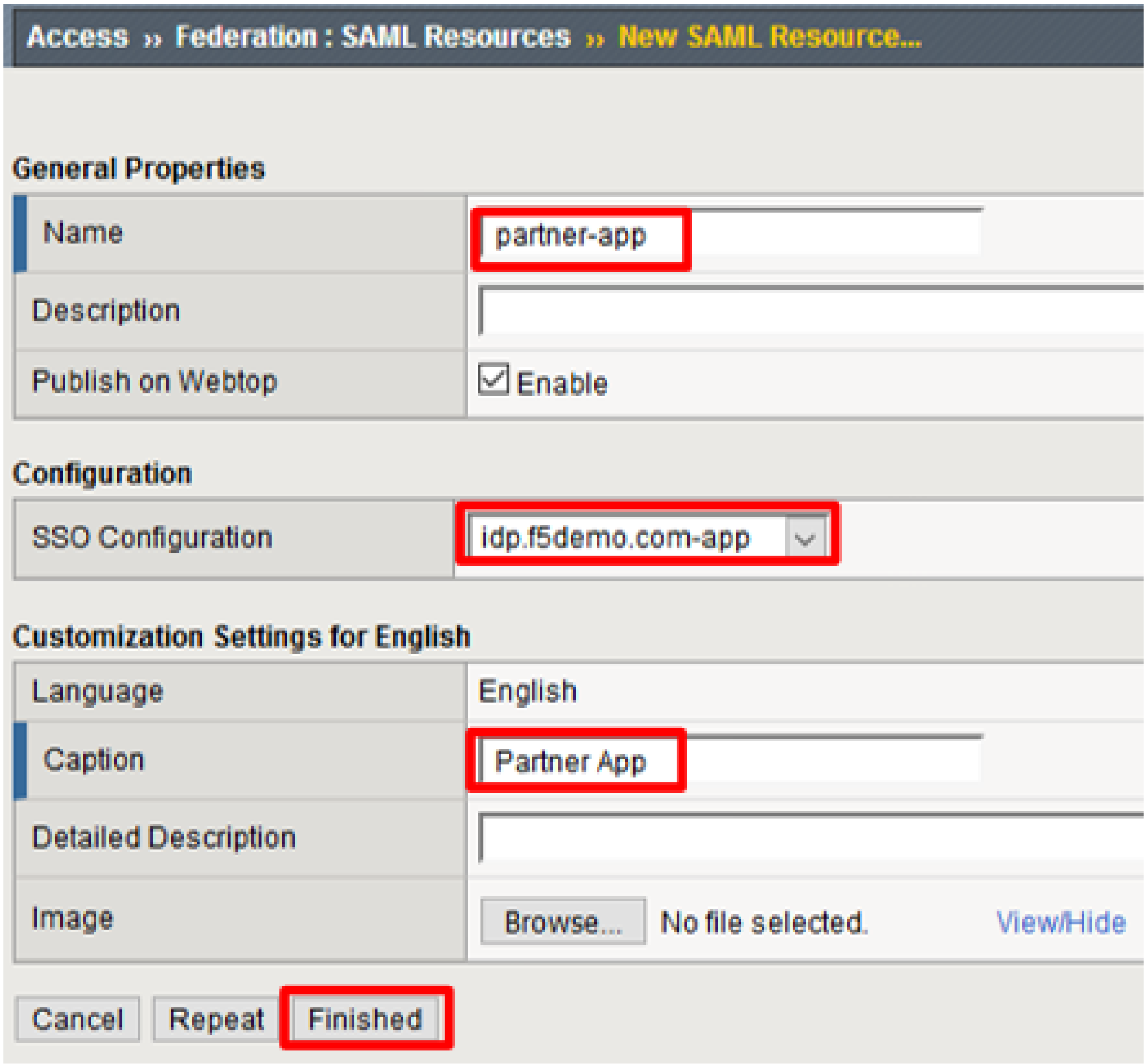
1. Begin by selecting **Access ?> Federation ?> SAML Resources**
2. Click the **Create** button (far right)
3. In the **New SAML Resource** window, enter the following values:

Name:	`partner?app`
SSO Configuration:	`idp.f5demo.com?app`
Caption:	`Partner App`

4. Click **Finished** at the bottom of the configuration window


Access » Federation : SAML Resources
SAML Service Provider
SAML Identity Provider
SAML Resources
OAuth Authorization Server
OAuth Client / Resource Server
PingAccess
Create...
Delete...

☑	Name	SSO Configuration	Partition / Path
No records to display.			



General Properties

Name	partner-app
Description	
Publish on Webtop	☑ Enable

Configuration

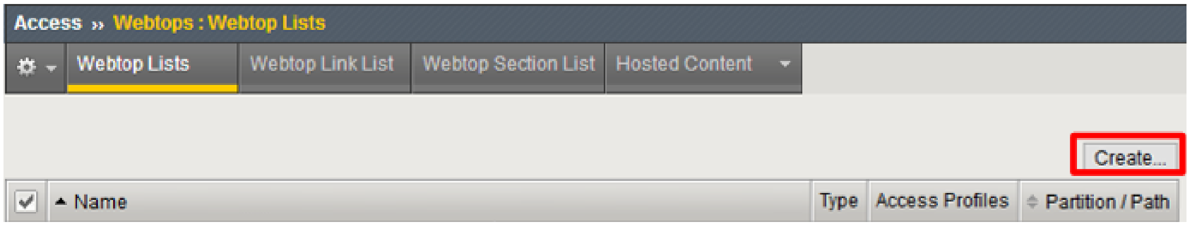
SSO Configuration	idp.f5demo.com-app

Customization Settings for English

Language	English
Caption	Partner App
Detailed Description	
Image	No file selected.

Webtop

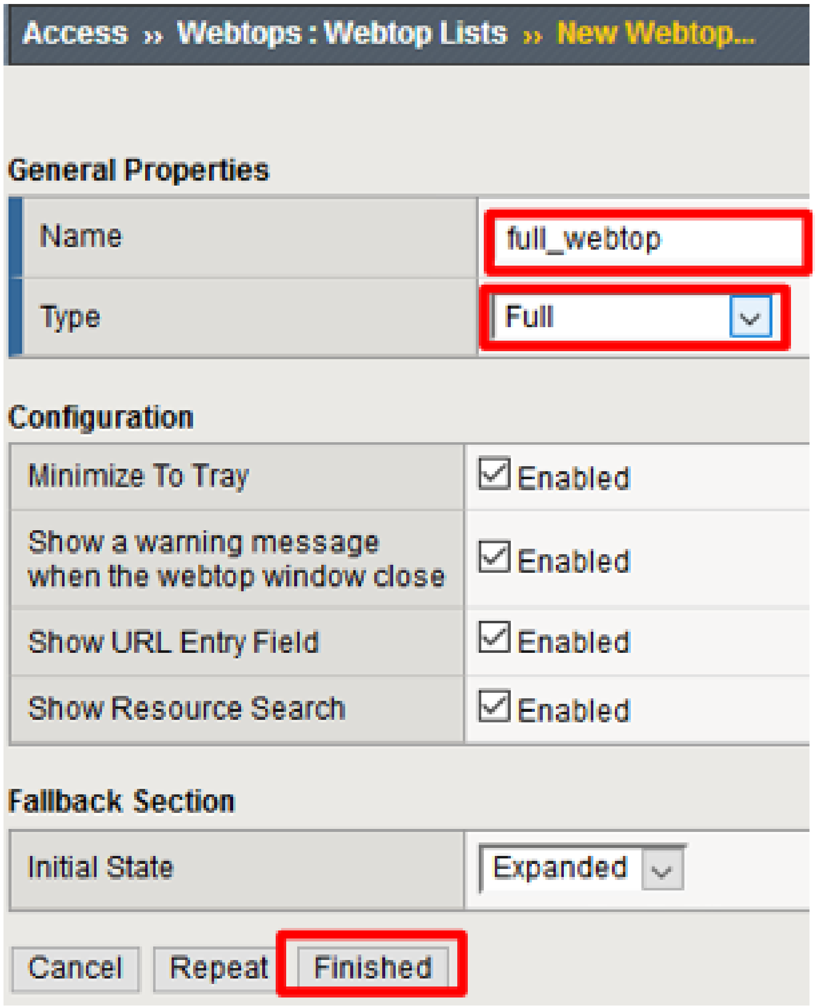
1. Select **Access ?> Webtops ?> Webtop List**
2. Click the **Create** button (far right)



3. In the resulting window, enter the following values:

Name:	`full_webtop`
Type:	`Full` (drop down)

4. Click **Finished** at the bottom of the GUI



General Properties

Name	full_webtop
Type	Full

Configuration

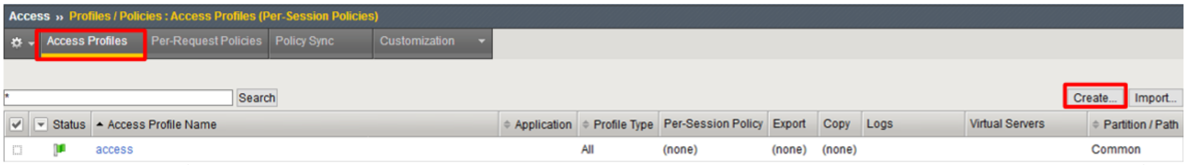
Minimize To Tray	☑ Enabled
Show a warning message when the webtop window close	☑ Enabled
Show URL Entry Field	☑ Enabled
Show Resource Search	☑ Enabled

Fallback Section

Initial State	Expanded

SAML IdP Access Policy

1. Select **Access ?> Profiles/Policies ?> Access Profiles (Per-Session Policies)**
2. Click the **Create** button (far right)

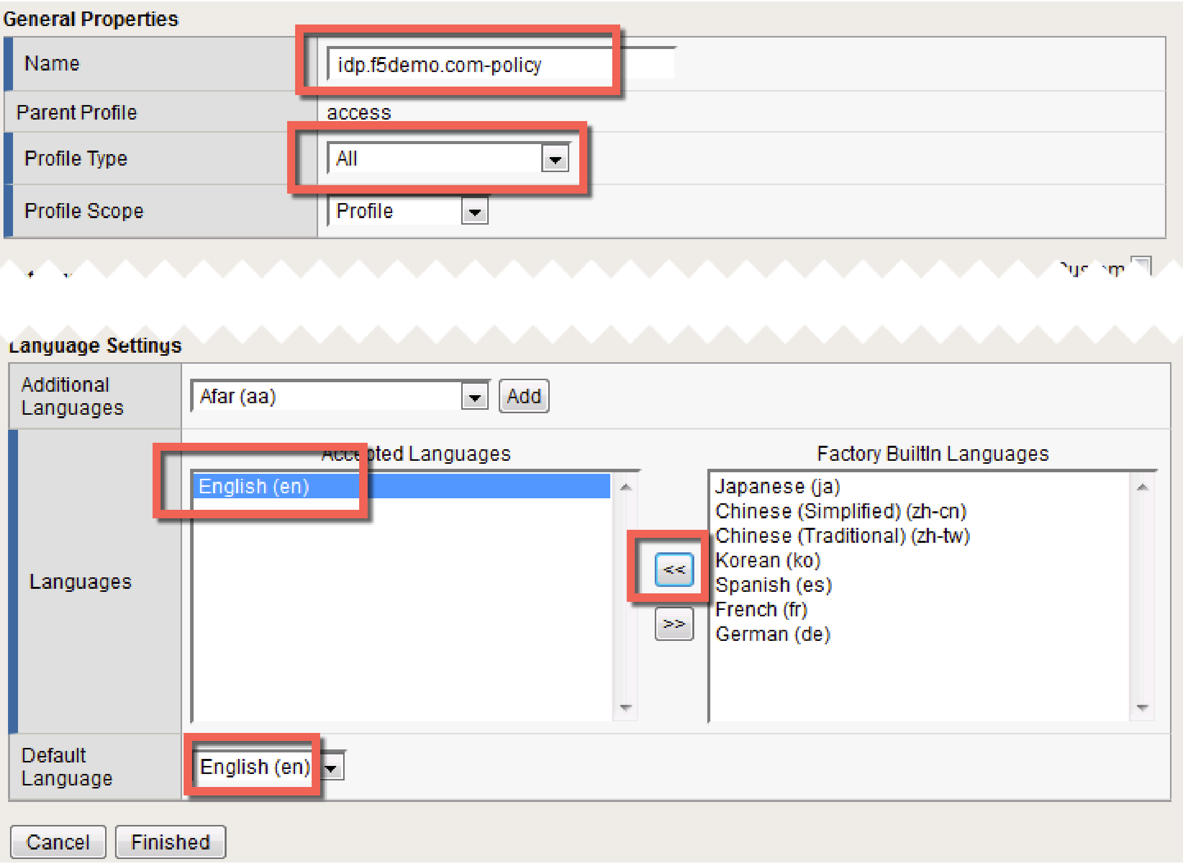


Status	Access Profile Name	Application	Profile Type	Per-Session Policy	Export	Copy	Logs	Virtual Servers	Partition / Path
	access		All	(none)	(none)	(none)			Common

3. In the **New Profile** window, enter the following information:

Name:	`idp.f5demo.com?policy`
Profile Type:	`All` (drop down)
Profile Scope:	`Profile` (default)

4. Scroll to the bottom of the **New Profile** window to the **Language Settings** section
5. Select *English* from the **Factory Built?in Languages** menu on the right and click the **Double Arrow (<<)**, then click the **Finished** button.
6. The **Default Language** should be automatically set



Name: idp.f5demo.com-policy

Parent Profile: access

Profile Type: All

Profile Scope: Profile

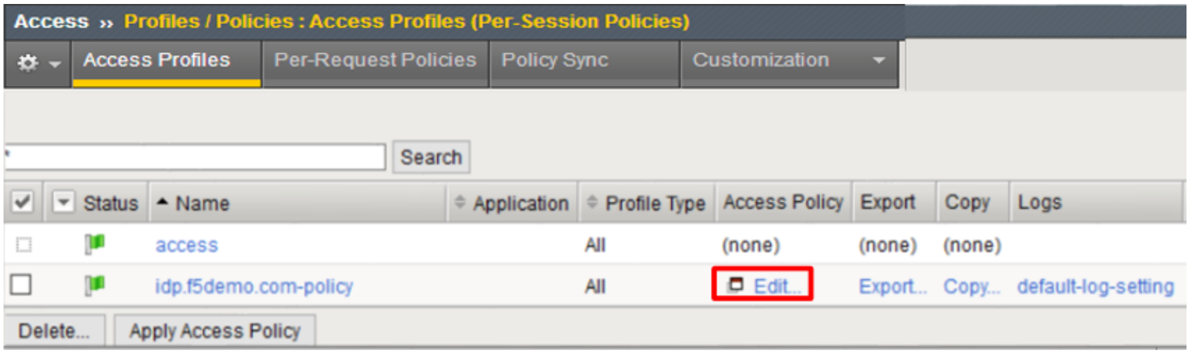
Additional Languages: Afar (aa)

Languages:

Accepted Languages	Factory BuiltIn Languages
English (en)	Japanese (ja) Chinese (Simplified) (zh-cn) Chinese (Traditional) (zh-tw) Korean (ko) Spanish (es) French (fr) German (de)

Default Language: English (en)

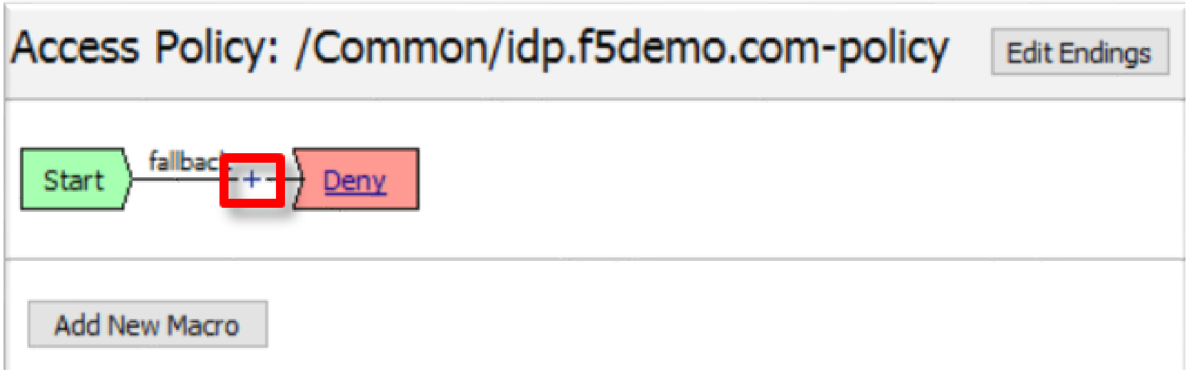
7. From the **Access ?> Profiles/Policies ?> Access Profiles (Per-Session Policies) screen**, click the **Edit** link on the previously created `idp.f5demo.com?policy` line



Access ›› Profiles / Policies : Access Profiles (Per-Session Policies)

☑	Status	Name	Application	Profile Type	Access Policy	Export	Copy	Logs
□	🟩	access		All	(none)	(none)	(none)	
□	🟩	idp.f5demo.com-policy		All	Edit...	Export...	Copy...	default-log-setting

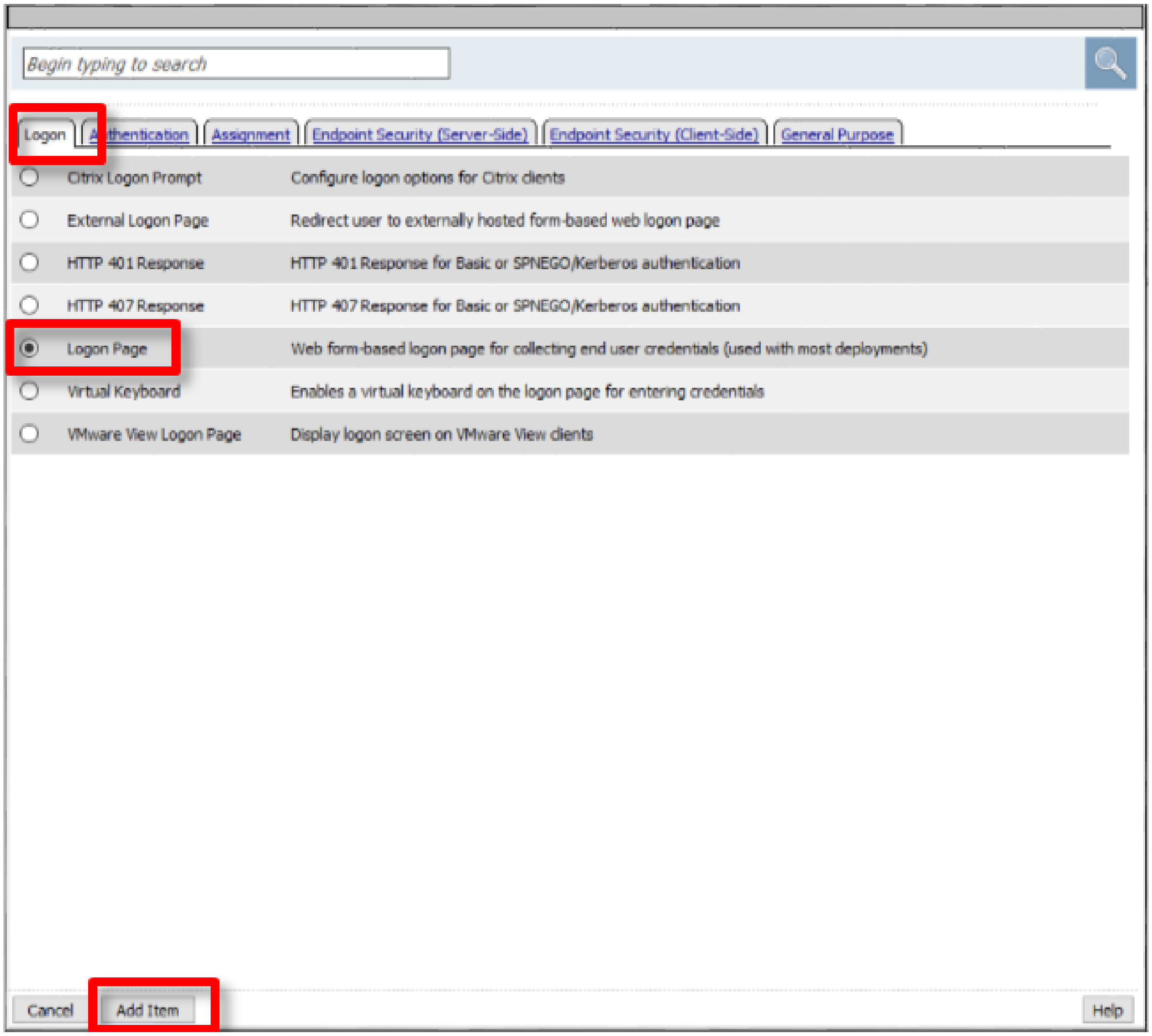
8. In the **Visual Policy Editor** window for `/Common/idp.f5demo.com?policy`, click the **Plus (+) Sign** between **Start** and **Deny**



Access Policy: /Common/idp.f5demo.com-policy

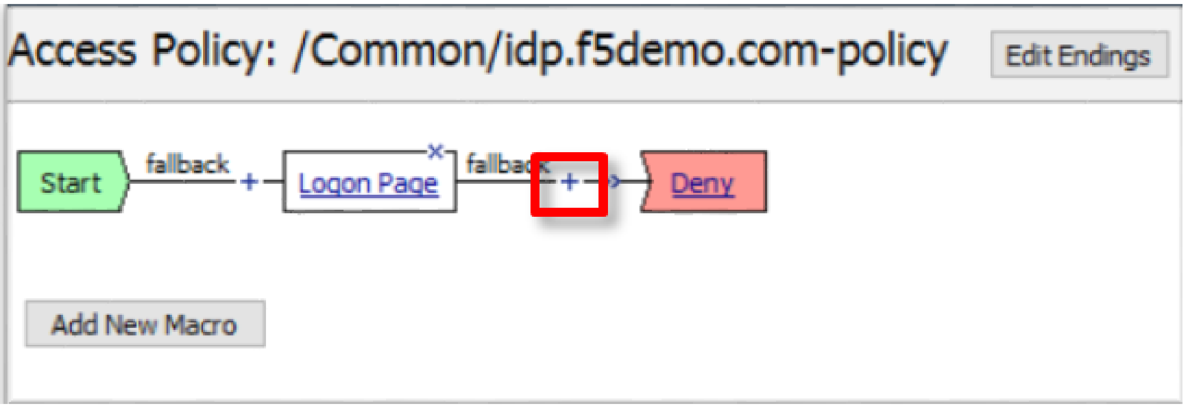
9. In the pop-up dialog box, select the **Logon** tab and then select the **Radio** next to **Logon Page**, and click the **Add Item** button

10. Click **Save** in the resulting Logon Page dialog box

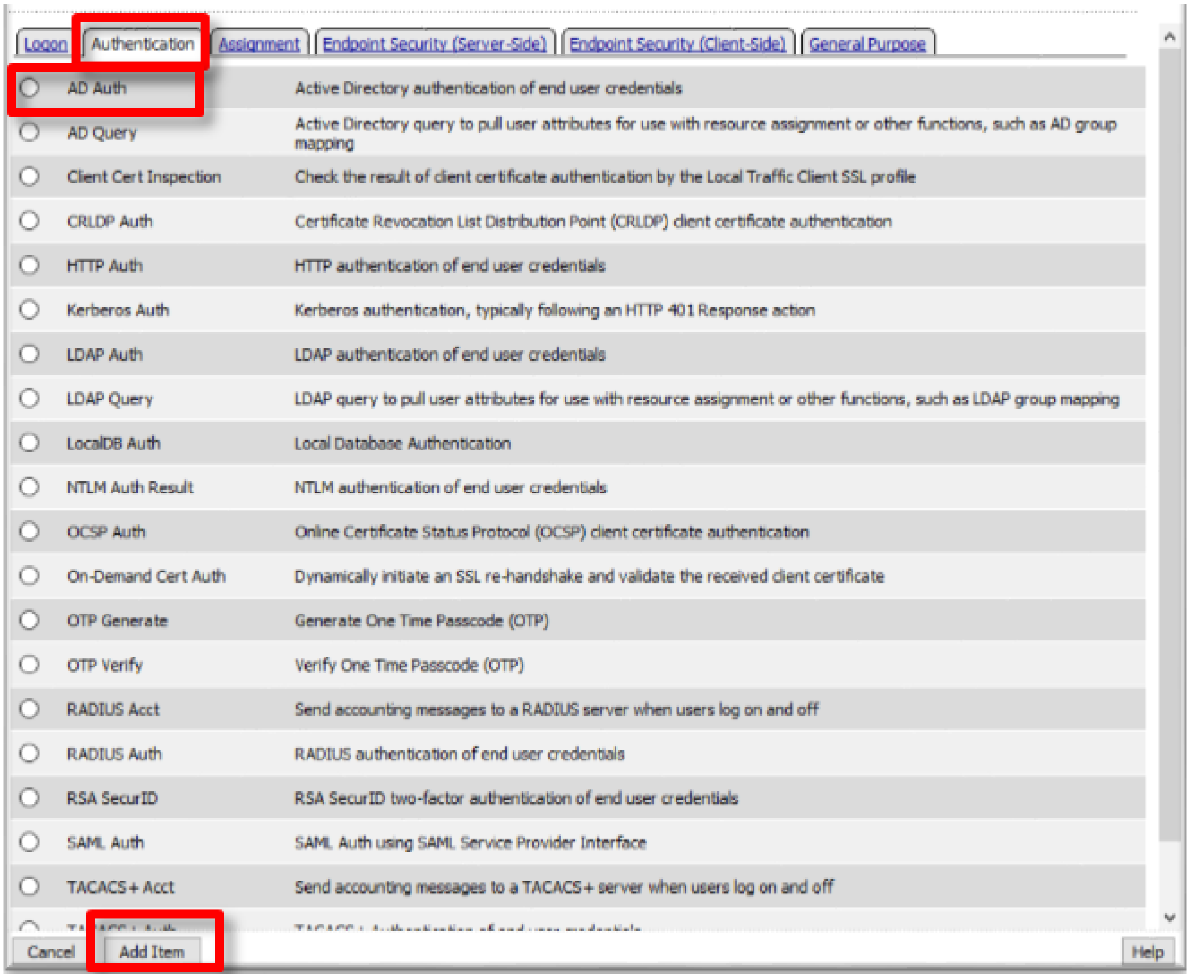


○	Citrix Logon Prompt	Configure logon options for Citrix clients
○	External Logon Page	Redirect user to externally hosted form-based web logon page
○	HTTP 401 Response	HTTP 401 Response for Basic or SPNEGO/Kerberos authentication
○	HTTP 407 Response	HTTP 407 Response for Basic or SPNEGO/Kerberos authentication
●	Logon Page	Web form-based logon page for collecting end user credentials (used with most deployments)
○	Virtual Keyboard	Enables a virtual keyboard on the logon page for entering credentials
○	VMware View Logon Page	Display logon screen on VMware View clients

11. In the **Visual Policy Editor** window for `/Common/idp.f5demo.com?policy`, click the **Plus (+) Sign** between **Logon Page** and **Deny**



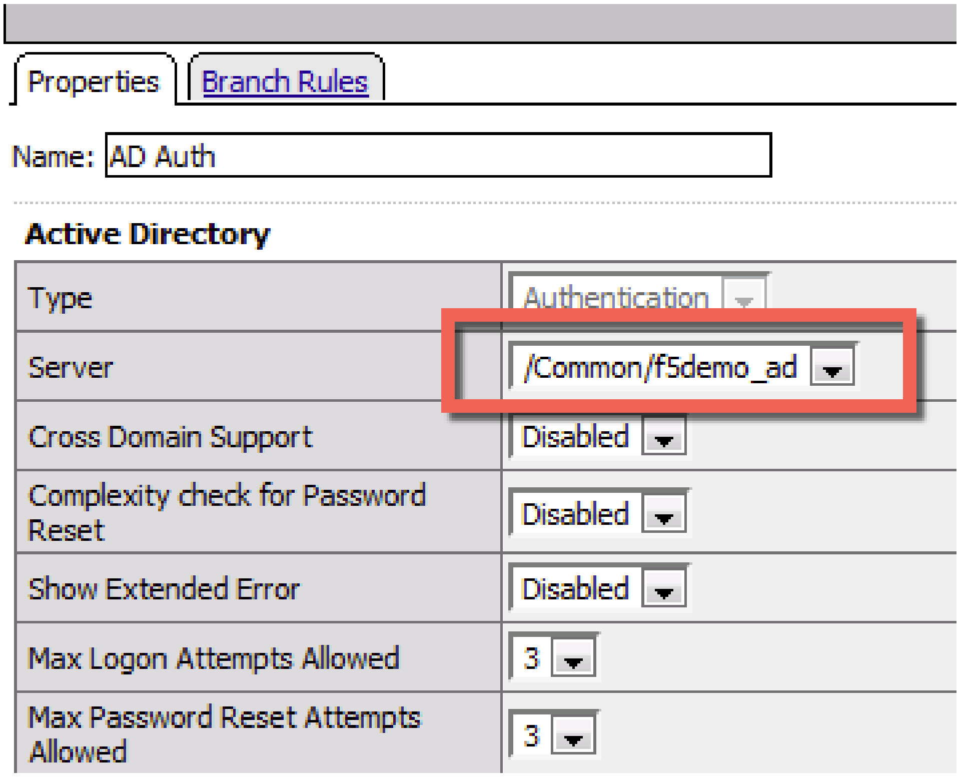
12. In the pop-up dialog box, select the **Authentication** tab and then select the **Radio** next to **AD Auth**, and click the **Add Item** button


Logon
Authentication
Assignment
Endpoint Security (Server-Side)
Endpoint Security (Client-Side)
General Purpose
Cancel
Add Item
Help

○	AD Auth	Active Directory authentication of end user credentials
○	AD Query	Active Directory query to pull user attributes for use with resource assignment or other functions, such as AD group mapping
○	Client Cert Inspection	Check the result of client certificate authentication by the Local Traffic Client SSL profile
○	CRLDP Auth	Certificate Revocation List Distribution Point (CRLDP) client certificate authentication
○	HTTP Auth	HTTP authentication of end user credentials
○	Kerberos Auth	Kerberos authentication, typically following an HTTP 401 Response action
○	LDAP Auth	LDAP authentication of end user credentials
○	LDAP Query	LDAP query to pull user attributes for use with resource assignment or other functions, such as LDAP group mapping
○	LocalDB Auth	Local Database Authentication
○	NTLM Auth Result	NTLM authentication of end user credentials
○	OCSP Auth	Online Certificate Status Protocol (OCSP) client certificate authentication
○	On-Demand Cert Auth	Dynamically initiate an SSL re-handshake and validate the received client certificate
○	OTP Generate	Generate One Time Passcode (OTP)
○	OTP Verify	Verify One Time Passcode (OTP)
○	RADIUS Acct	Send accounting messages to a RADIUS server when users log on and off
○	RADIUS Auth	RADIUS authentication of end user credentials
○	RSA SecurID	RSA SecurID two-factor authentication of end user credentials
○	SAML Auth	SAML Auth using SAML Service Provider Interface
○	TACACS+ Acct	Send accounting messages to a TACACS+ server when users log on and off
○	TACACS+ Auth	TACACS+ Authentication of end user credentials

13. In the resulting **AD Auth** pop-up window, select `/Common/f5demo_ad` from the **Server** drop down menu

14. Click **Save** at the bottom of the window

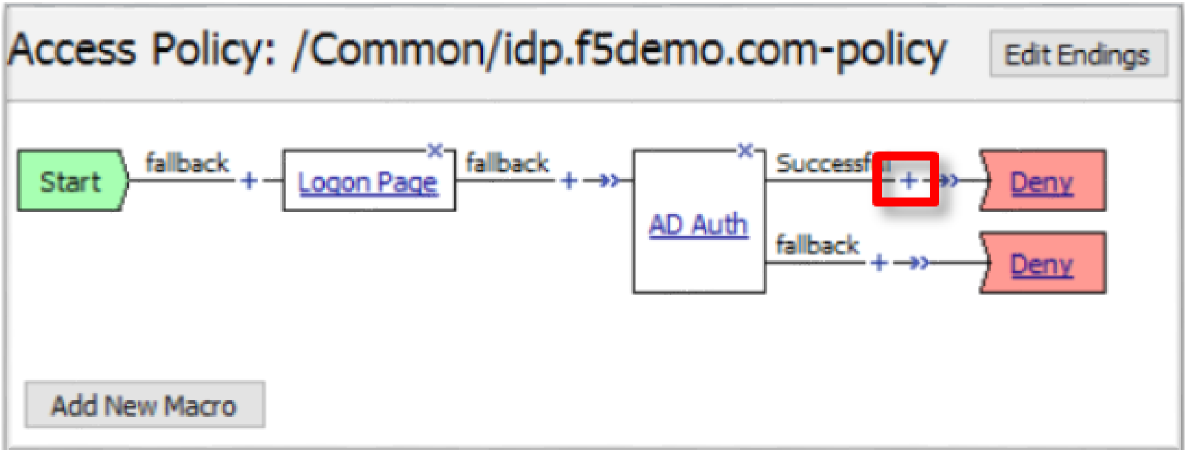


Name: AD Auth

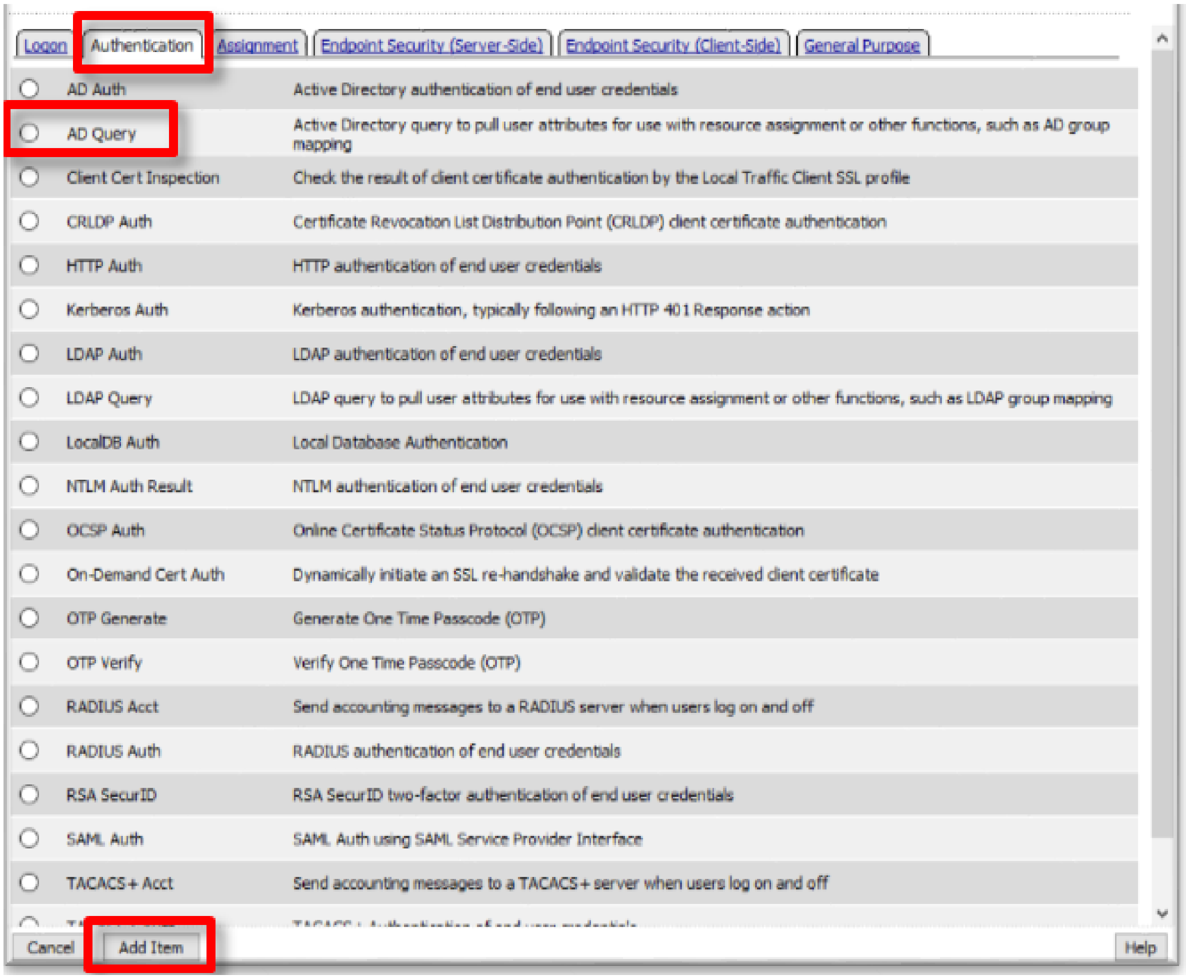
Active Directory

Type	Authentication
Server	/Common/f5demo_ad
Cross Domain Support	Disabled
Complexity check for Password Reset	Disabled
Show Extended Error	Disabled
Max Logon Attempts Allowed	3
Max Password Reset Attempts Allowed	3

15. In the **Visual Policy Editor** window for `/Common/idp.f5demo.com?policy`, click the **Plus (+) Sign** on the successful branch between **AD Auth** and **Deny**

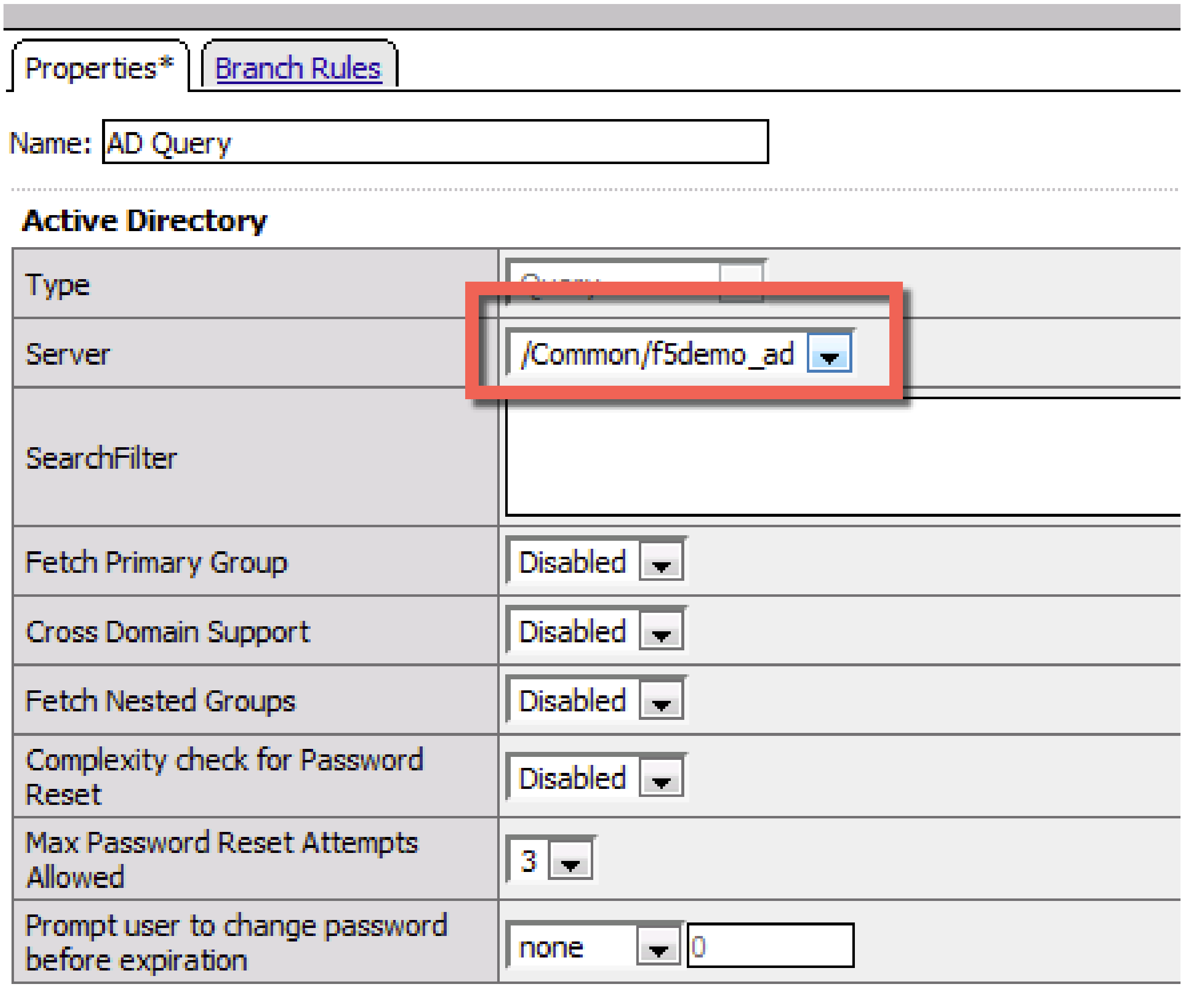


16. In the pop-up dialog box, select the **Authentication** tab and then select the **Radio** next to **AD Query**, and click the **Add Item** button


Logon
Authentication
Assignment
Endpoint Security (Server-Side)
Endpoint Security (Client-Side)
General Purpose
Cancel
Add Item
Help

○	AD Auth	Active Directory authentication of end user credentials
○	AD Query	Active Directory query to pull user attributes for use with resource assignment or other functions, such as AD group mapping
○	Client Cert Inspection	Check the result of client certificate authentication by the Local Traffic Client SSL profile
○	CRLDP Auth	Certificate Revocation List Distribution Point (CRLDP) client certificate authentication
○	HTTP Auth	HTTP authentication of end user credentials
○	Kerberos Auth	Kerberos authentication, typically following an HTTP 401 Response action
○	LDAP Auth	LDAP authentication of end user credentials
○	LDAP Query	LDAP query to pull user attributes for use with resource assignment or other functions, such as LDAP group mapping
○	LocalDB Auth	Local Database Authentication
○	NTLM Auth Result	NTLM authentication of end user credentials
○	OCSP Auth	Online Certificate Status Protocol (OCSP) client certificate authentication
○	On-Demand Cert Auth	Dynamically initiate an SSL re-handshake and validate the received client certificate
○	OTP Generate	Generate One Time Passcode (OTP)
○	OTP Verify	Verify One Time Passcode (OTP)
○	RADIUS Acct	Send accounting messages to a RADIUS server when users log on and off
○	RADIUS Auth	RADIUS authentication of end user credentials
○	RSA SecurID	RSA SecurID two-factor authentication of end user credentials
○	SAML Auth	SAML Auth using SAML Service Provider Interface
○	TACACS+ Acct	Send accounting messages to a TACACS+ server when users log on and off

17. In the resulting **AD Query** pop-up window, select `/Common/f5demo_ad` from the **Server** drop down menu



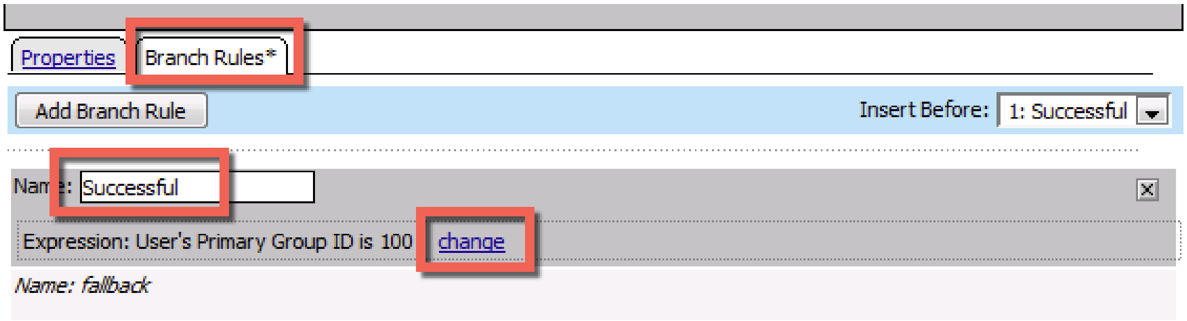
Properties* | Branch Rules

Name: AD Query

Active Directory

Type	Query
Server	/Common/f5demo_ad
SearchFilter	
Fetch Primary Group	Disabled
Cross Domain Support	Disabled
Fetch Nested Groups	Disabled
Complexity check for Password Reset	Disabled
Max Password Reset Attempts Allowed	3
Prompt user to change password before expiration	none 0

18. In the **AD Query** pop?up window, select the **Branch Rules** tab
19. Change the **Name** of the branch to *Successful*.
20. Click the **Change** link next to the **Expression**



Properties | Branch Rules*

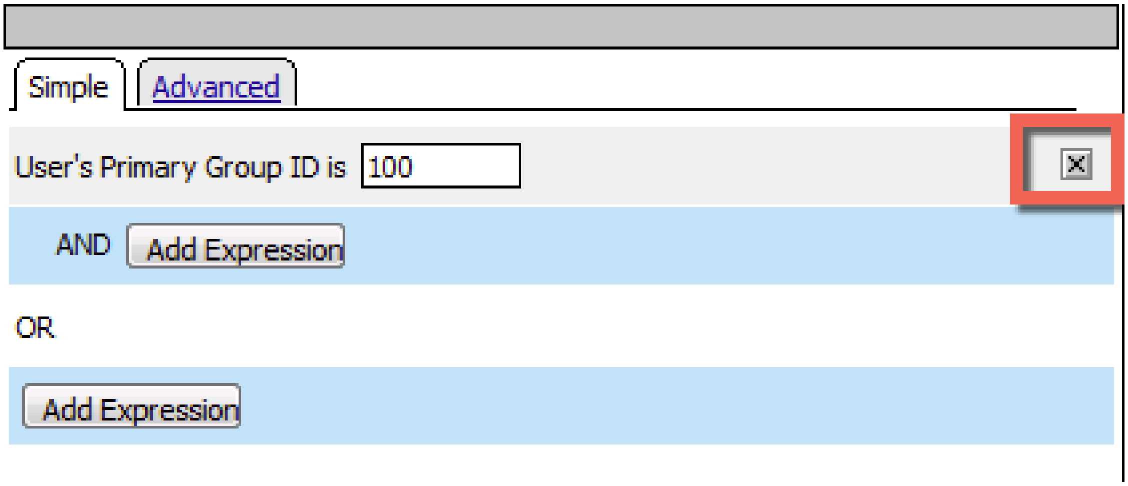
Add Branch Rule   Insert Before: 1: Successful

Name: Successful

Expression: User's Primary Group ID is 100 change

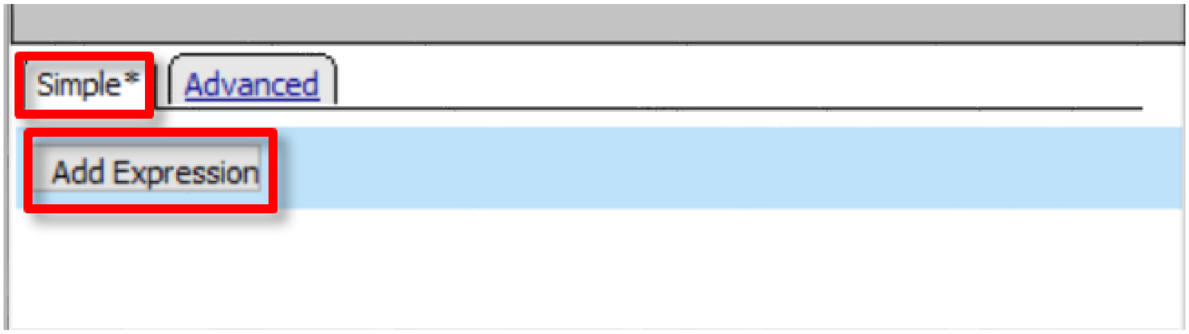
Name: fallback

21. In the resulting pop-up window, delete the existing expression by clicking the **X** as shown



User's Primary Group ID is 100

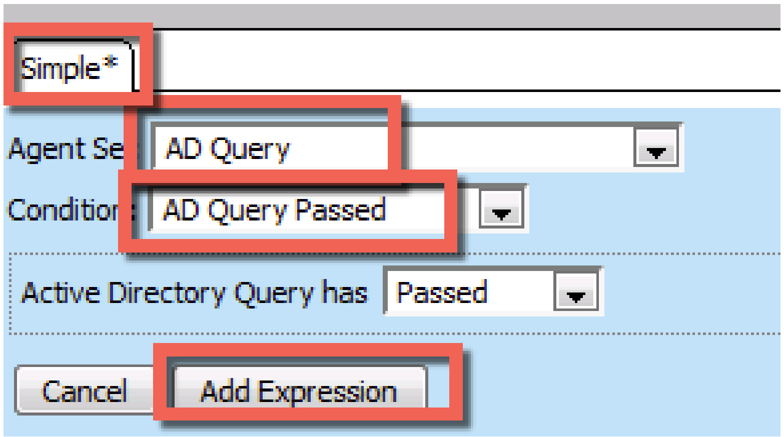
22. Create a new **Simple** expression by clicking the **Add Expression** button



23. In the resulting menu, select the following from the drop down menus:

Agent Sel:	AD Query
Condition:	AD Query Passed

24. Click the **Add Expression** Button

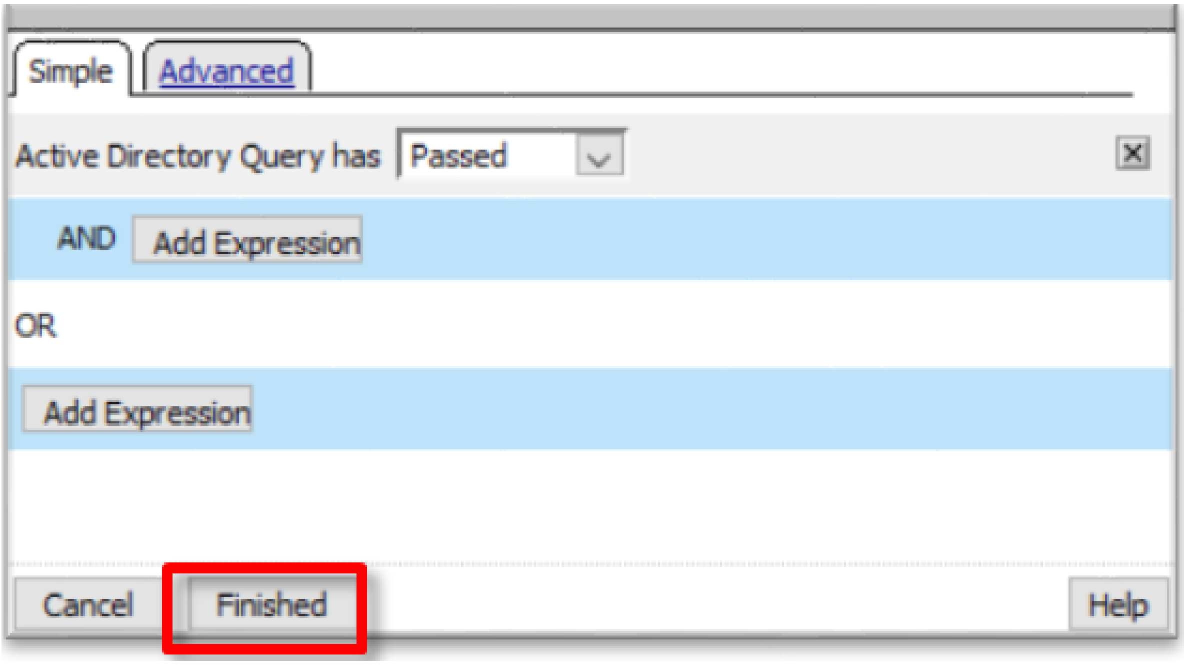


Agent Se AD Query

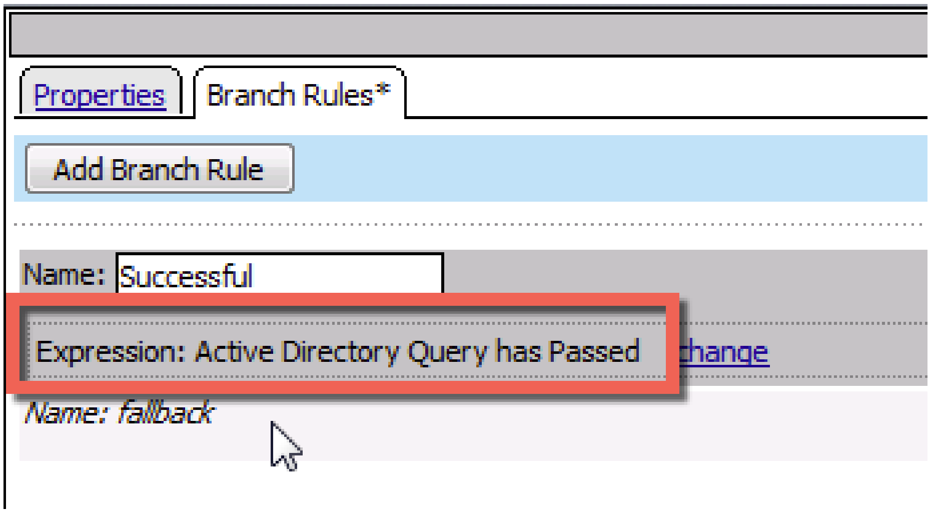
Conditior AD Query Passed

Active Directory Query has Passed

25. Click the **Finished** button to complete the expression



Active Directory Query has Passed

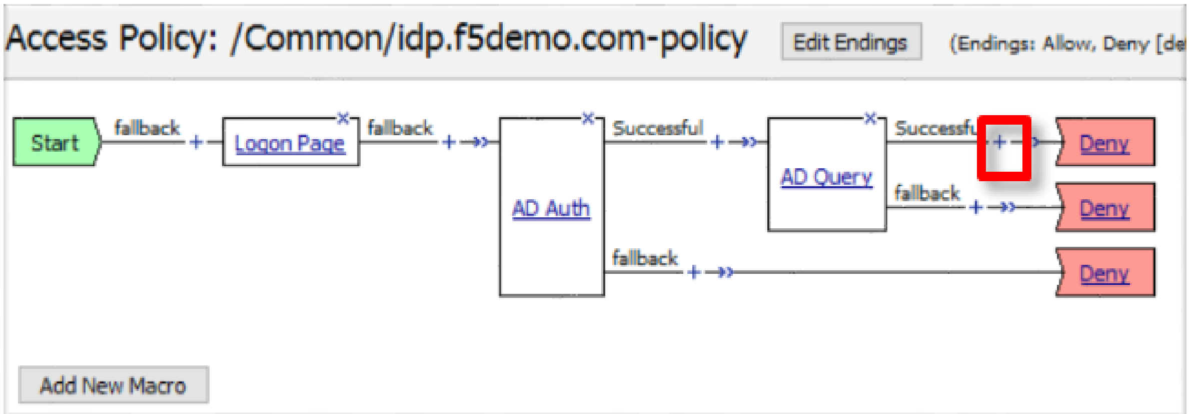


Name: Successful

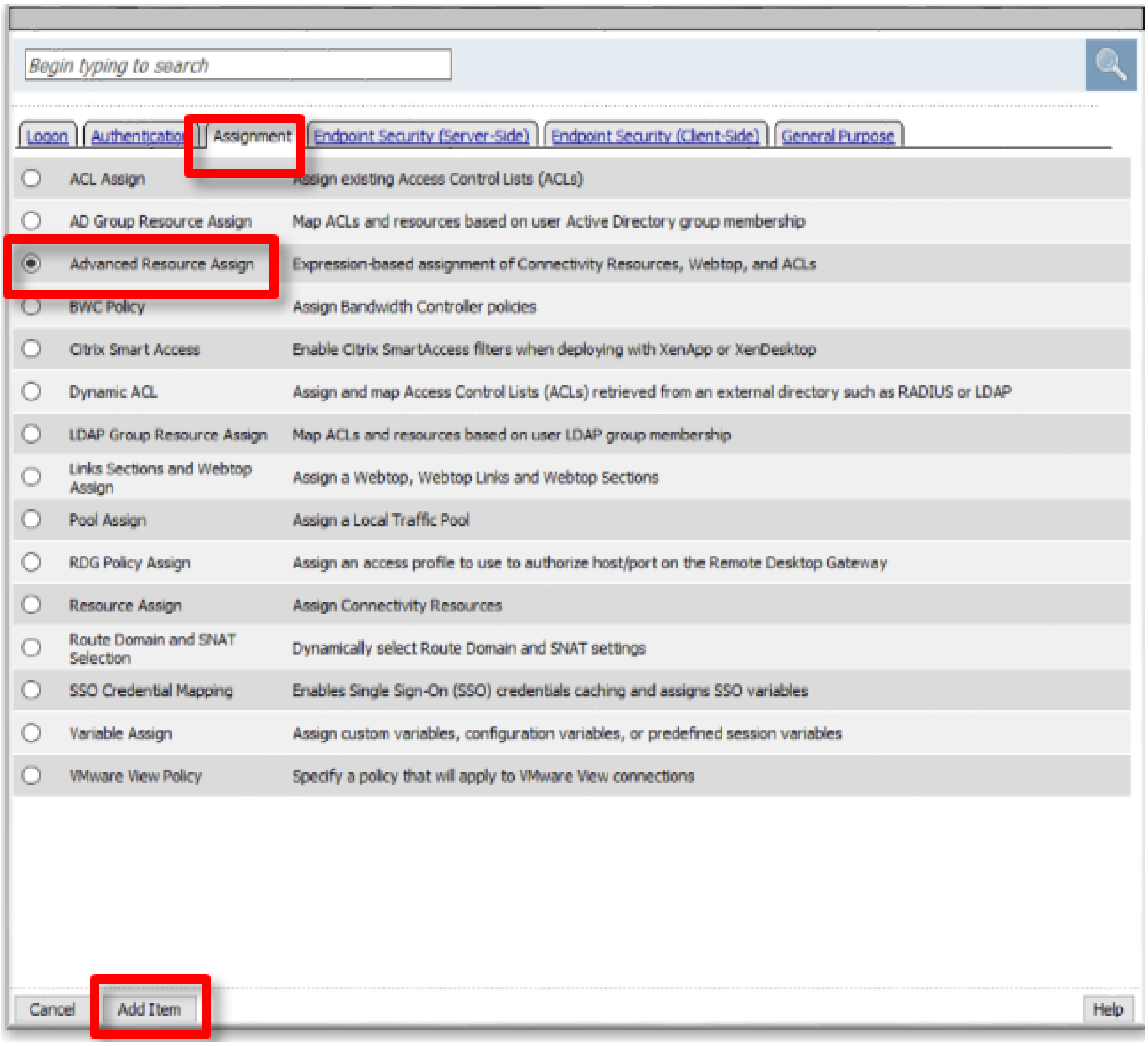
Expression: Active Directory Query has Passed

Name: fallback

26. Click the **Save** button to complete the **AD Query**
27. In the **Visual Policy Editor** window for `/Common/idp.f5demo.com?policy`, click the **Plus (+) Sign** on the successful branch between **AD Query** and **Deny**



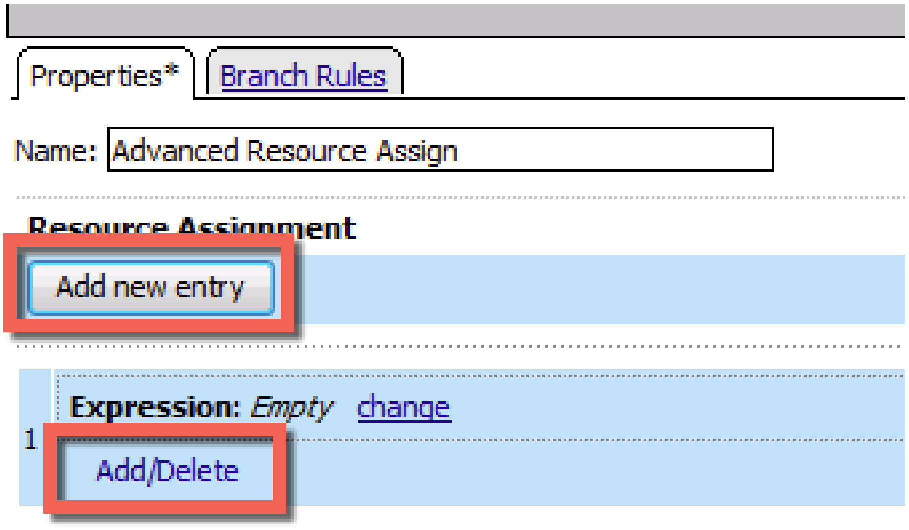
28. In the pop-up dialog box, select the **Assignment** tab and then select the **Radio** next to **Advanced Resource Assign**, and click the **Add Item** button



○	ACL Assign	Assign existing Access Control Lists (ACLs)
○	AD Group Resource Assign	Map ACLs and resources based on user Active Directory group membership
●	Advanced Resource Assign	Expression-based assignment of Connectivity Resources, Webtop, and ACLs
○	BWC Policy	Assign Bandwidth Controller policies
○	Citrix Smart Access	Enable Citrix SmartAccess filters when deploying with XenApp or XenDesktop
○	Dynamic ACL	Assign and map Access Control Lists (ACLs) retrieved from an external directory such as RADIUS or LDAP
○	LDAP Group Resource Assign	Map ACLs and resources based on user LDAP group membership
○	Links Sections and Webtop Assign	Assign a Webtop, Webtop Links and Webtop Sections
○	Pool Assign	Assign a Local Traffic Pool
○	RDG Policy Assign	Assign an access profile to use to authorize host/port on the Remote Desktop Gateway
○	Resource Assign	Assign Connectivity Resources
○	Route Domain and SNAT Selection	Dynamically select Route Domain and SNAT settings
○	SSO Credential Mapping	Enables Single Sign-On (SSO) credentials caching and assigns SSO variables
○	Variable Assign	Assign custom variables, configuration variables, or predefined session variables
○	VMware View Policy	Specify a policy that will apply to VMware View connections

29. In the resulting **Advanced Resource Assign** pop-up window, click the **Add New Entry** button

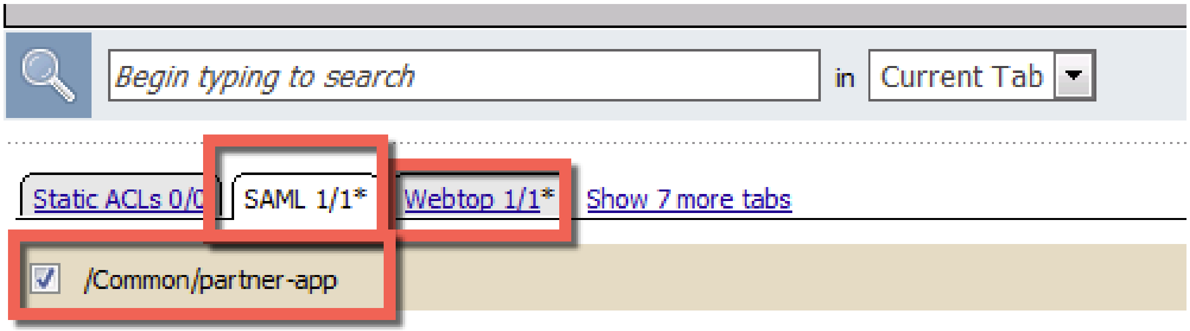
30. In the new Resource Assignment entry, click the **Add/Delete** link



Name: Advanced Resource Assign

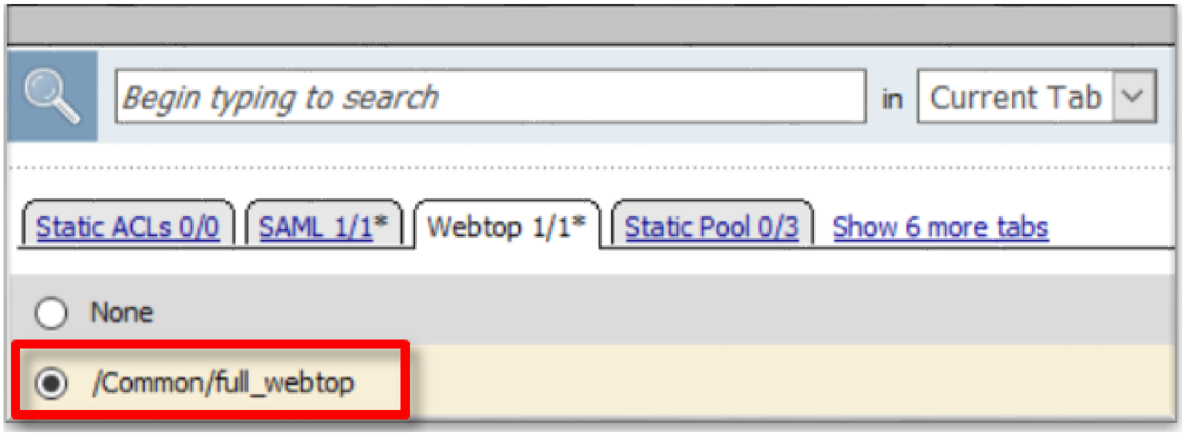
1 Expression: *Empty*

31. In the resulting pop-up window, click the **SAML** tab, and select the **Checkbox** next to `/Common/partner-app`



☑ /Common/partner-app

32. Click the **Webtop** tab, and select the **Checkbox** next to `/Common/full_webtop`



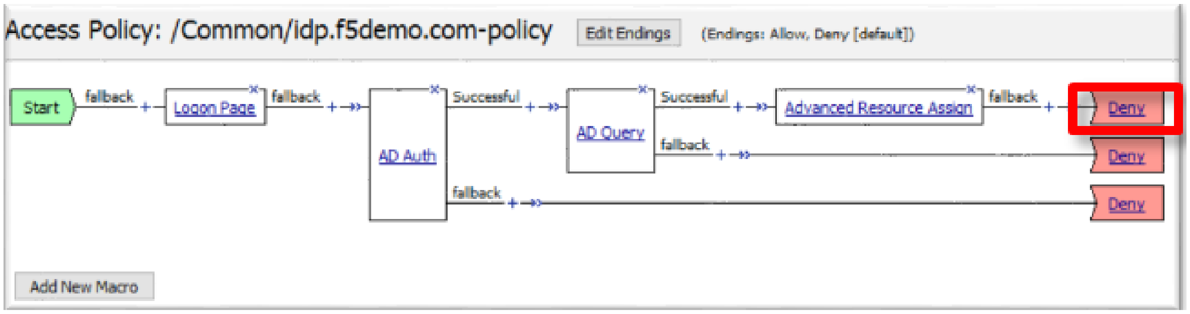
○ None

● /Common/full_webtop

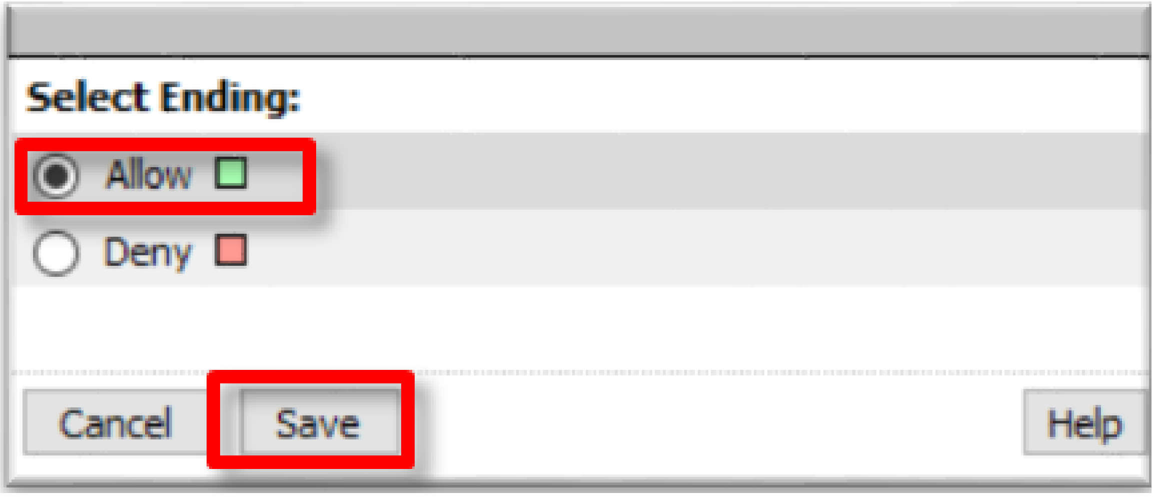
33. Click the **Update** button at the bottom of the window to complete the Resource Assignment entry

34. Click the **Save** button at the bottom of the **Advanced Resource Assign** window

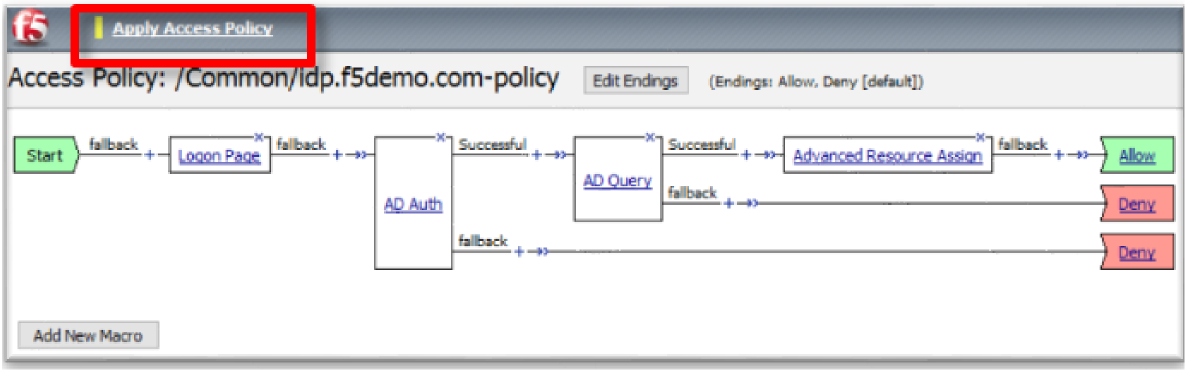
35. In the **Visual Policy Editor**, select the **Deny** ending on the fallback branch following **Advanced Resource Assign**



36. In the **Select Ending** dialog box, selet the **Allow** radio button and then click **Save**

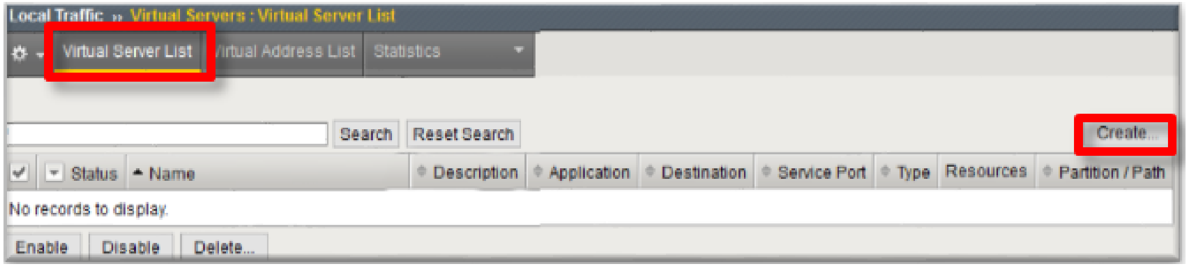


37. In the **Visual Policy Editor**, click **Apply Access Policy** (top left), and close the **Visual Policy Editor**



1.3.3 TASK 3 - Create the IdP Virtual Server and Apply the IdP Access Policy

1. Begin by selecting **Local Traffic ?> Virtual Servers**
2. Click the **Create** button (far right)



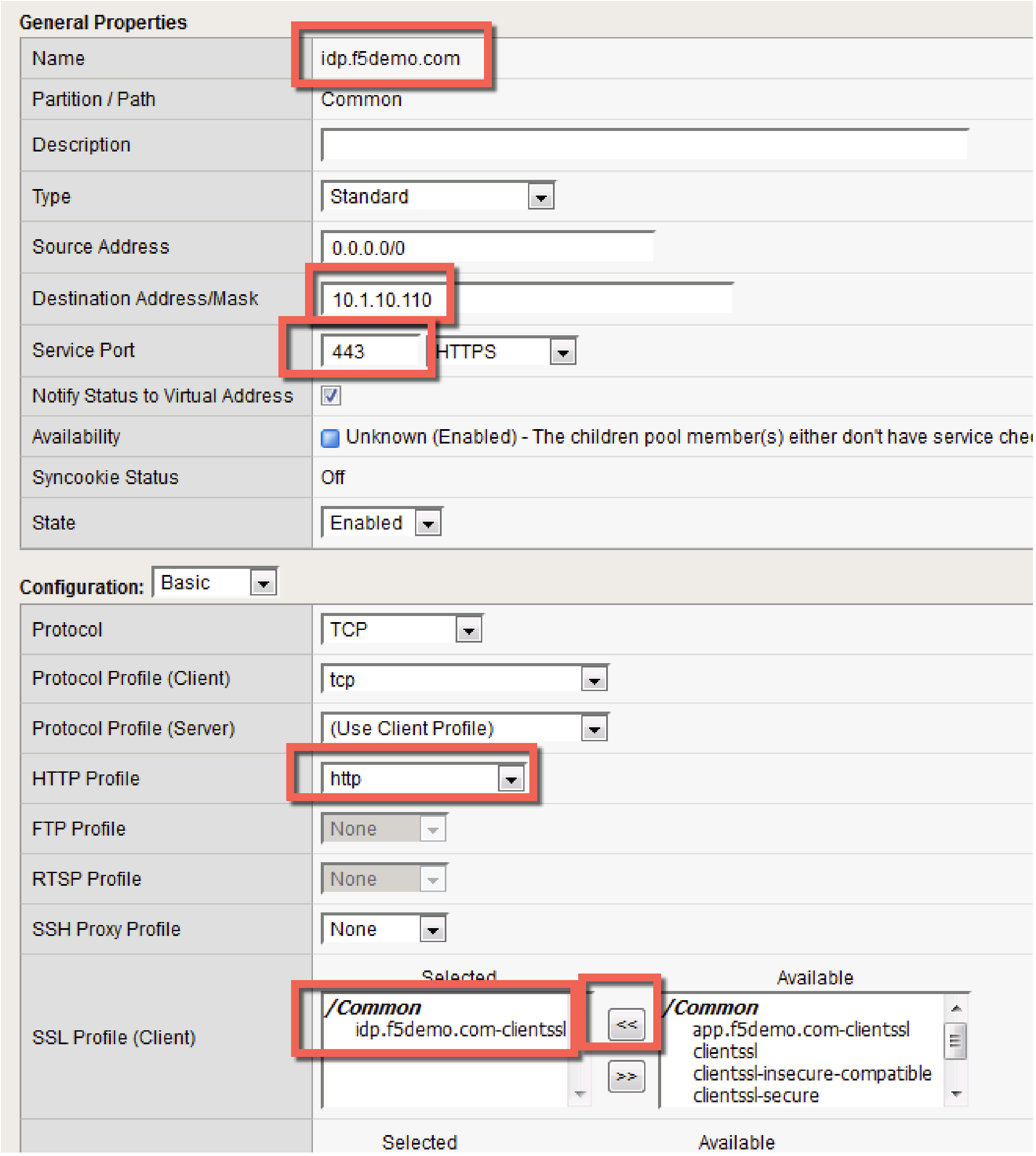
No records to display.

3. In the **New Virtual Server** window, enter the following information:

General Properties	
Name:	`idp.f5demo.com`
Destination Address/Mask:	`10.1.10.110`
Service Port:	`443`

Configuration	
HTTP Profile:	`http` (drop down)
SSL Profile (Client)	`idp.f5demo.com?clientssl`

Access Policy	
Access Profile:	`idp.f5demo.com?policy`

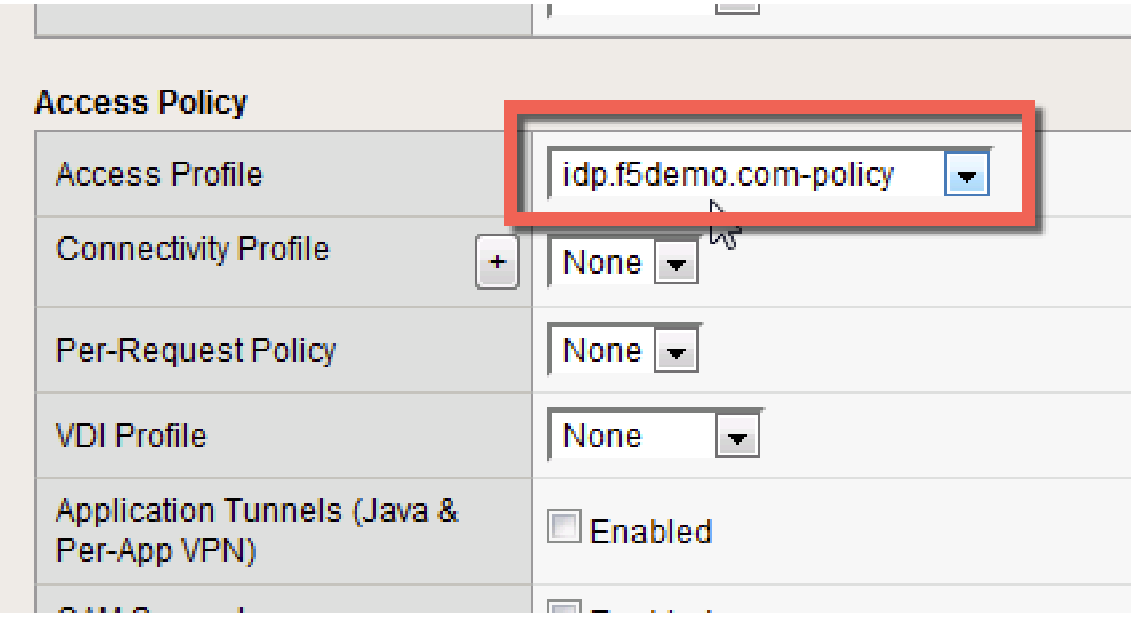


General Properties

Name	idp.f5demo.com
Partition / Path	Common
Description	
Type	Standard
Source Address	0.0.0.0/0
Destination Address/Mask	10.1.10.110
Service Port	443 HTTPS
Notify Status to Virtual Address	☑
Availability	Unknown (Enabled) - The children pool member(s) either don't have service che
Syncookie Status	Off
State	Enabled

Configuration: Basic

Protocol	TCP
Protocol Profile (Client)	tcp
Protocol Profile (Server)	(Use Client Profile)
HTTP Profile	http
FTP Profile	None
RTSP Profile	None
SSH Proxy Profile	None
SSL Profile (Client)	Selected: */Common* idp.f5demo.com-clientssl Available: */Common* app.f5demo.com-clientssl, clientssl, clientssl-insecure-compatible, clientssl-secure



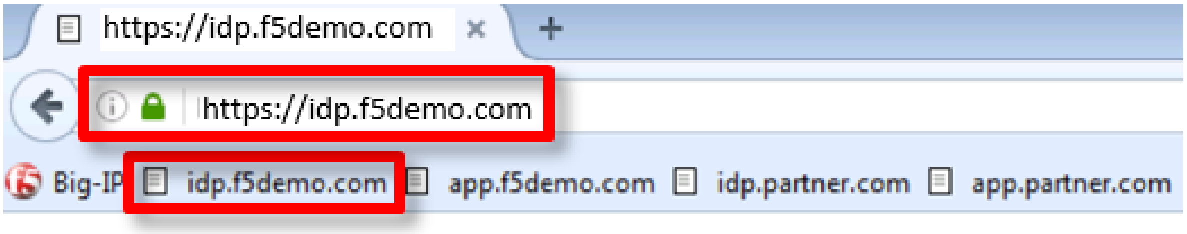
Access Policy

Access Profile	idp.f5demo.com-policy
Connectivity Profile	None
Per-Request Policy	None
VDI Profile	None
Application Tunnels (Java & Per-App VPN)	□ Enabled

4. Scroll to the bottom of the configuration window and click **Finished**

1.3.4 TASK 4 - Test the SAML IdP

1. Using your browser from the jump host, navigate to the SAML IdP you just configured at `https://idp.f5demo.com` (or click the provided bookmark)



https://idp.f5demo.com

2. Log in to the IdP. Were you successfully authenticated? Did you see the webtop with the SP application?

Note: Use the credentials provided in the Authentication section at the beginning of this guide (user/Agility1)

3. Click on the Partner App icon. Were you successfully authenticated (via SAML) to the SP?
4. Review your Active Sessions **(Access ?> Overview ?> Active Sessions)**
5. Review your Access Report Logs **(Access ?> Overview ?> Access Reports)**

1.4 Lab 3: Kerberos to SAML Lab

The purpose of this lab is to deploy and test a Kerberos to SAML configuration. Students will modify a previous built Access Policy and create a seamless access experience from Kerberos to SAML for connecting users. This lab will leverage the work performed previously in Lab 2. Archive files are available for the completed Lab 2.

Objective:

- Gain an understanding of the Kerberos to SAML relationship its component parts.
- Develop an awareness of the different deployment models that Kerberos to SAML authentication opens up

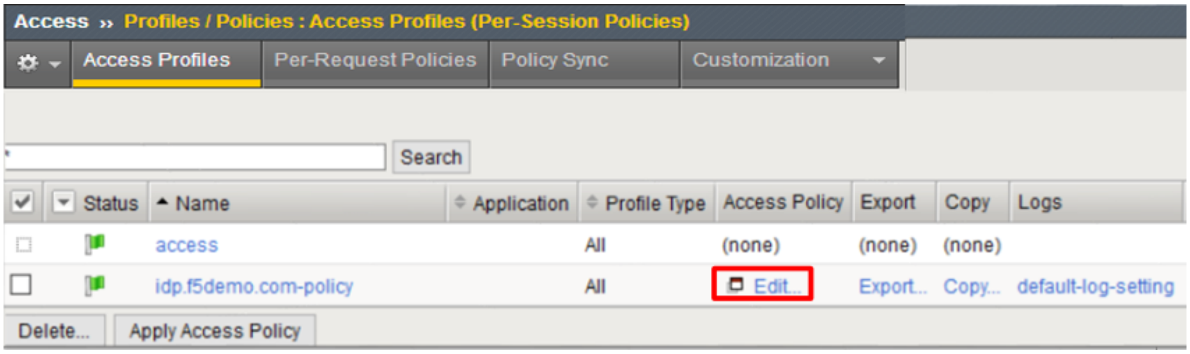
Lab Requirements:

- All Lab requirements will be noted in the tasks that follow

Estimated completion time: 25 minutes

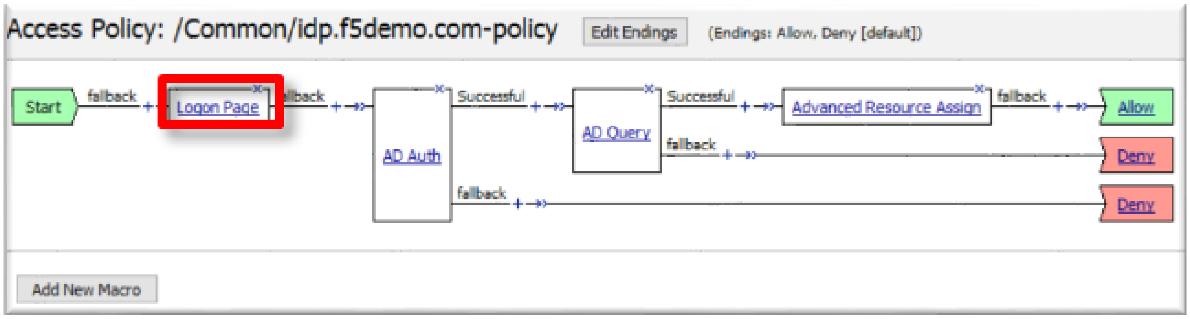
1.4.1 TASK 1 – Modify the SAML Identity Provider (IdP) Access Policy

1. Using the existing Access Policy from Lab 2, navigate to **Access ?> Profiles/Policies ?> Access Profiles (Per-Session Policies)**, and click the **Edit** link next to the previously created *idp.f5demo.com-policy*



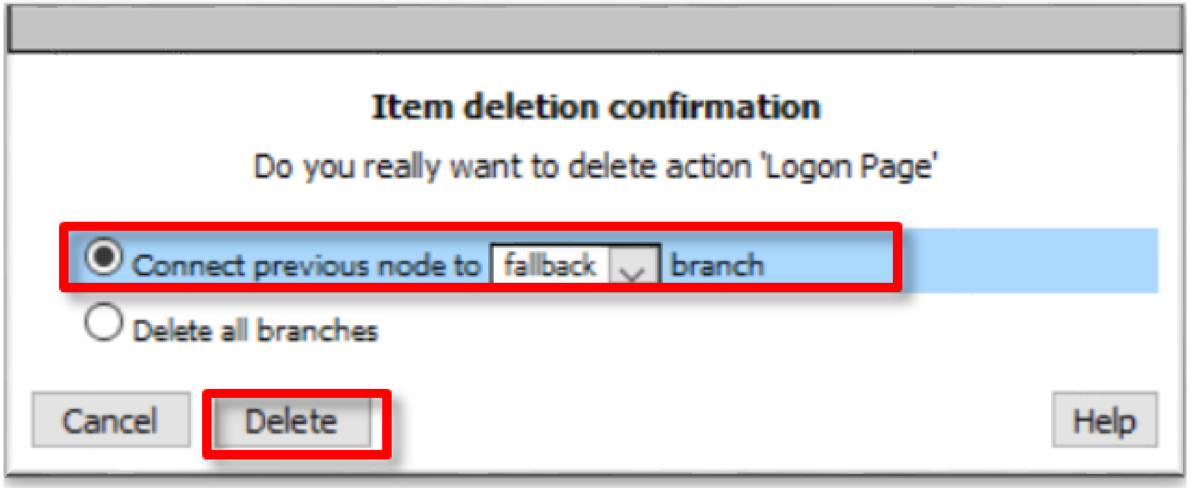
☑	Status	Name	Application	Profile Type	Access Policy	Export	Copy	Logs
□		access		All	(none)	(none)	(none)	
□		idp.f5demo.com-policy		All	Edit...	Export...	Copy...	default-log-setting

2. Delete the **Logon Page** object by clicking on the **X** as shown


Access Policy: /Common/idp.f5demo.com-policy

(Endings: Allow, Deny [default])

3. In the resulting **Item Deletion Confirmation** dialog, ensure that the previous node is connect to the **fallback** branch, and click the **Delete** button



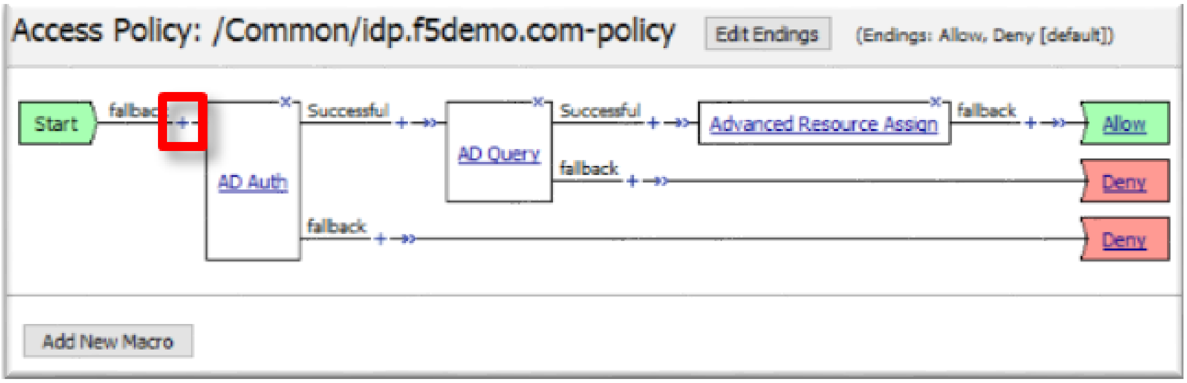
Item deletion confirmation

Do you really want to delete action 'Logon Page'

● Connect previous node to fallback branch

○ Delete all branches

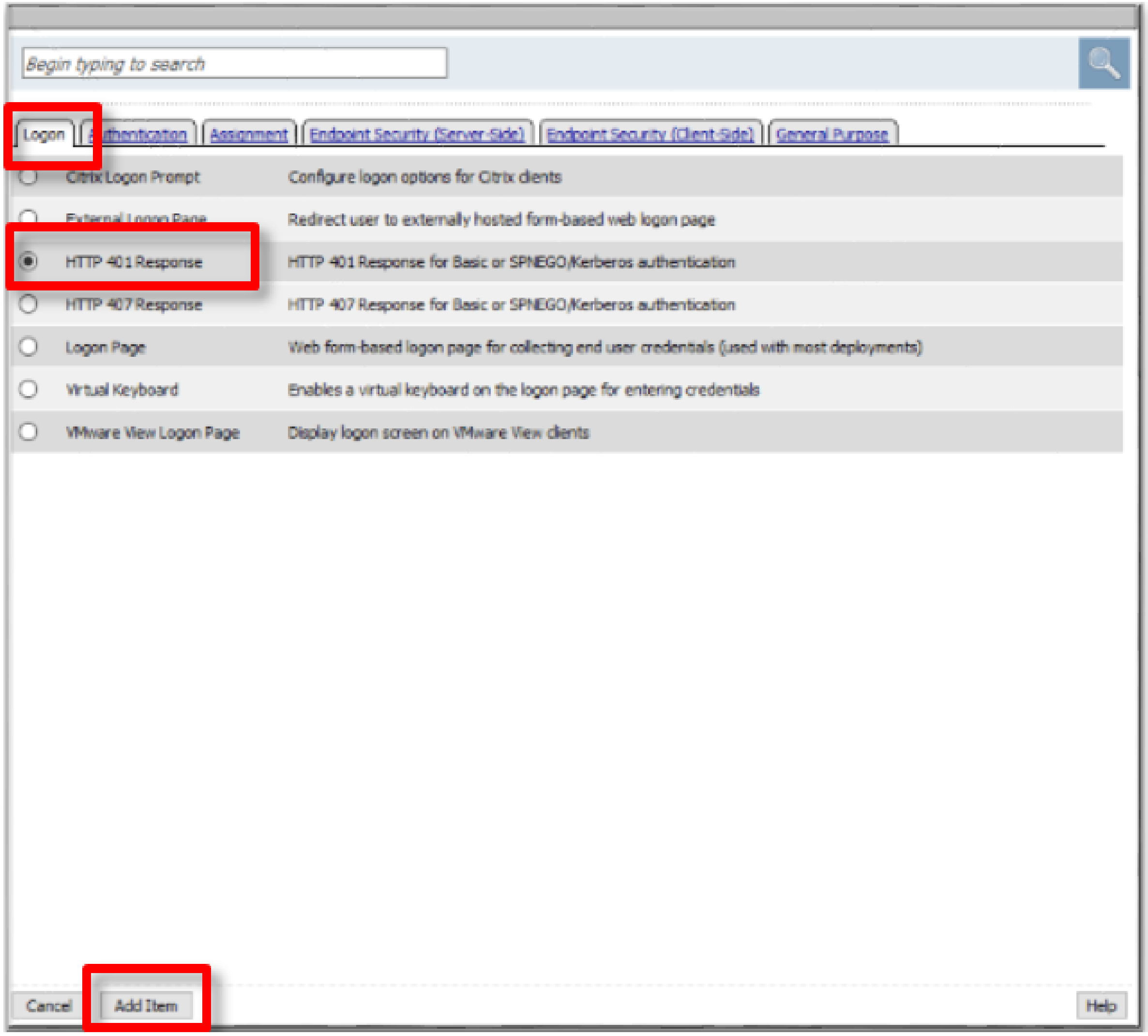
4. In the **Visual Policy Editor** window for `/Common/idp.f5demo.com?policy`, click the **Plus (+) Sign** between **Start** and **AD Auth**



Access Policy: /Common/idp.f5demo.com-policy

(Endings: Allow, Deny [default])

5. In the pop-up dialog box, select the **Logon** tab and then select the **Radio** next to **HTTP 401 Response**, and click the **Add Item** button

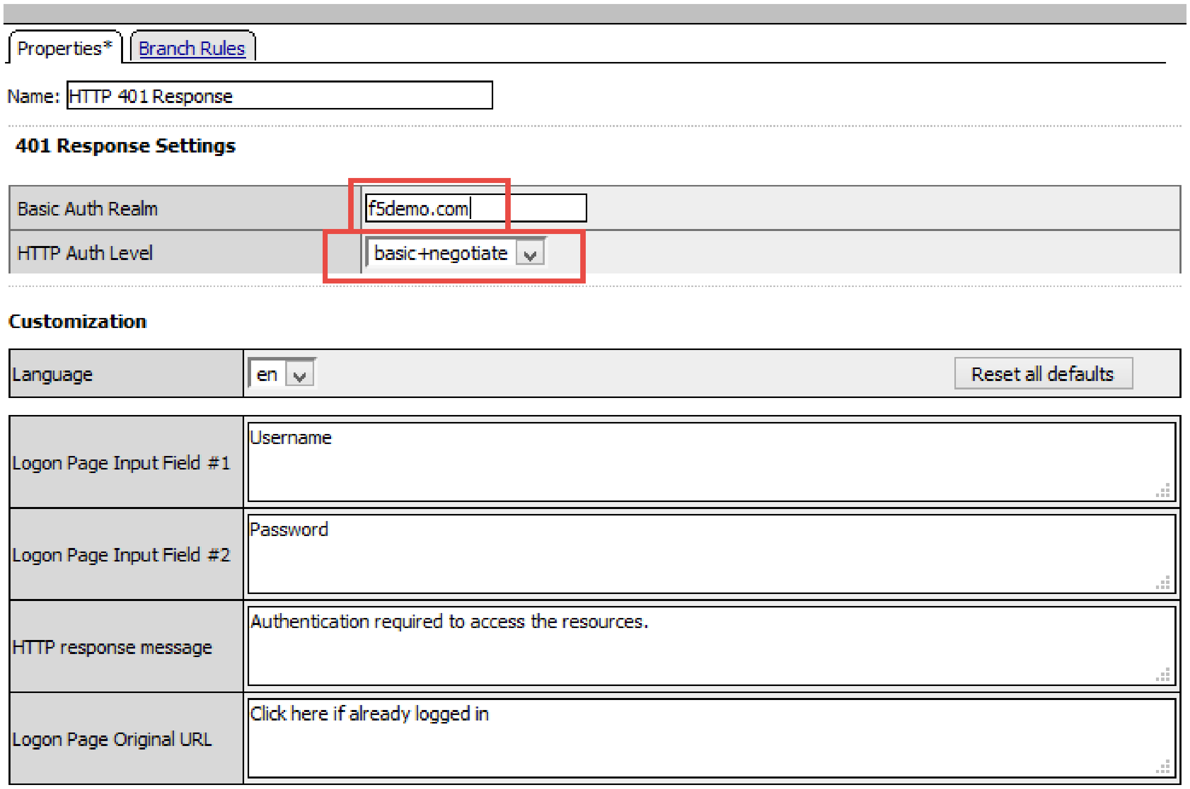


○	Citrix Logon Prompt	Configure logon options for Citrix clients
○	External Logon Page	Redirect user to externally hosted form-based web logon page
●	HTTP 401 Response	HTTP 401 Response for Basic or SPNEGO/Kerberos authentication
○	HTTP 407 Response	HTTP 407 Response for Basic or SPNEGO/Kerberos authentication
○	Logon Page	Web form-based logon page for collecting end user credentials (used with most deployments)
○	Virtual Keyboard	Enables a virtual keyboard on the logon page for entering credentials
○	VMware View Logon Page	Display logon screen on VMware View clients

6. In the **HTTP 401 Response** dialog box, enter the following information:

Basic Auth Realm:	`f5demo.com`
HTTP Auth Level:	`basic+negotiate` (drop down)

7. Click the **Save** button at the bottom of the dialog box



Name: HTTP 401 Response

401 Response Settings

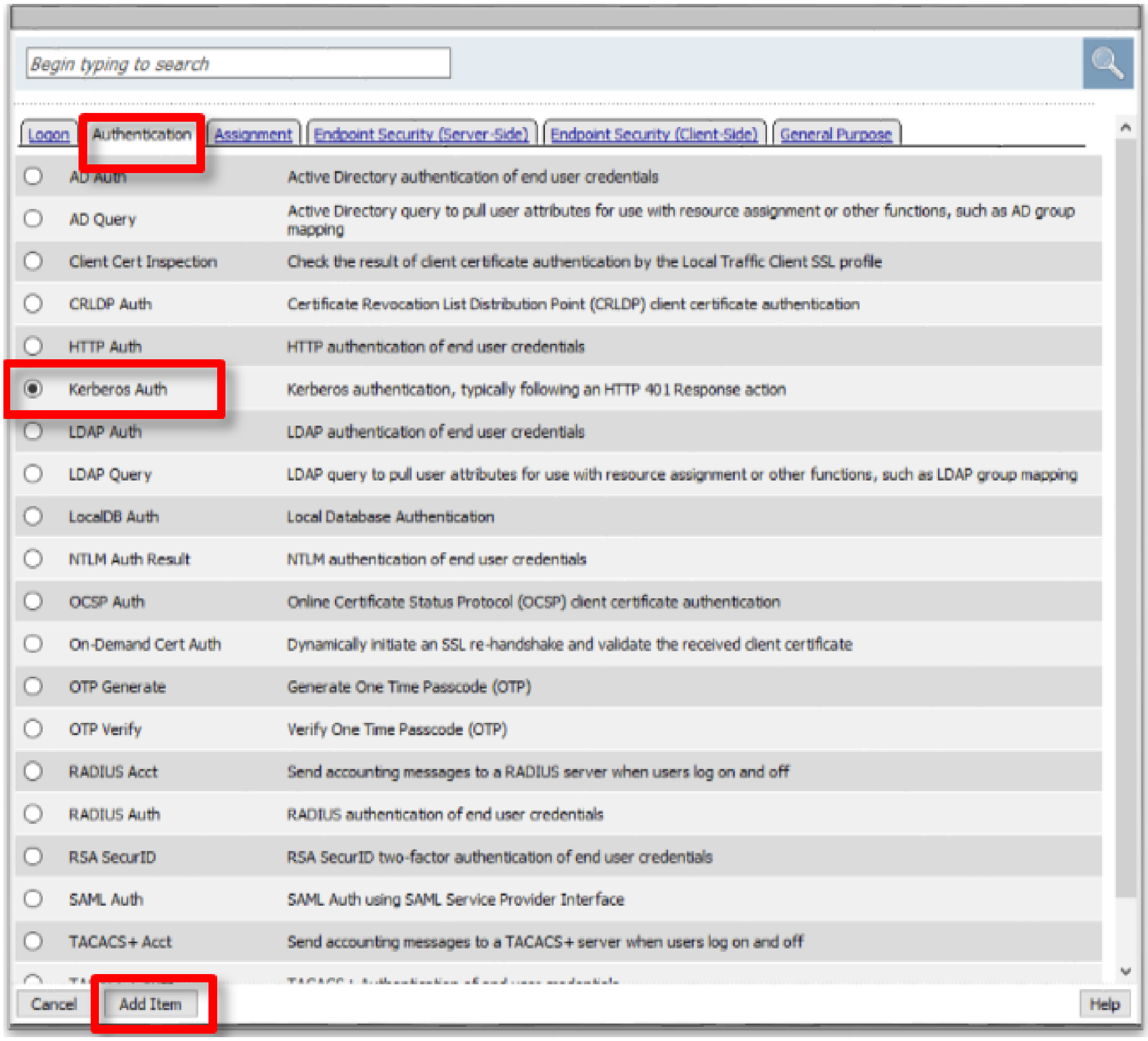
Basic Auth Realm	f5demo.com
HTTP Auth Level	basic+negotiate

Customization

Language	en
Logon Page Input Field #1	Username
Logon Page Input Field #2	Password
HTTP response message	Authentication required to access the resources.
Logon Page Original URL	Click here if already logged in

8. In the **Visual Policy Editor** window for `/Common/idp.f5demo.com?policy`, click the **Plus (+) Sign** on the **Negotiate** branch between **HTTP 401 Response** and **Deny**

9. In the pop-up dialog box, select the **Authentication** tab and then select the **Radio** next to **Kerberos Auth**, and click the **Add Item** button

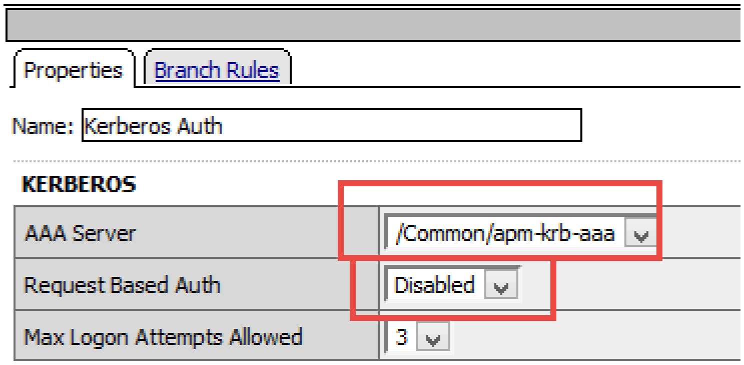


○	AD Auth	Active Directory authentication of end user credentials
○	AD Query	Active Directory query to pull user attributes for use with resource assignment or other functions, such as AD group mapping
○	Client Cert Inspection	Check the result of client certificate authentication by the Local Traffic Client SSL profile
○	CRLDP Auth	Certificate Revocation List Distribution Point (CRLDP) client certificate authentication
○	HTTP Auth	HTTP authentication of end user credentials
●	Kerberos Auth	Kerberos authentication, typically following an HTTP 401 Response action
○	LDAP Auth	LDAP authentication of end user credentials
○	LDAP Query	LDAP query to pull user attributes for use with resource assignment or other functions, such as LDAP group mapping
○	LocalDB Auth	Local Database Authentication
○	NTLM Auth Result	NTLM authentication of end user credentials
○	OCSP Auth	Online Certificate Status Protocol (OCSP) client certificate authentication
○	On-Demand Cert Auth	Dynamically initiate an SSL re-handshake and validate the received client certificate
○	OTP Generate	Generate One Time Passcode (OTP)
○	OTP Verify	Verify One Time Passcode (OTP)
○	RADIUS Acct	Send accounting messages to a RADIUS server when users log on and off
○	RADIUS Auth	RADIUS authentication of end user credentials
○	RSA SecurID	RSA SecurID two-factor authentication of end user credentials
○	SAML Auth	SAML Auth using SAML Service Provider Interface
○	TACACS+ Acct	Send accounting messages to a TACACS+ server when users log on and off
○	TACACS+ Auth	TACACS+ Authentication of end user credentials

10. In the **Kerberos Auth** dialog box, enter the following information:

AAA Server:	`/Common/apm-krb-aaa` (drop down)
Request Based Auth:	`Disabled` (drop down)

11. Click the **Save** button at the bottom of the dialog box



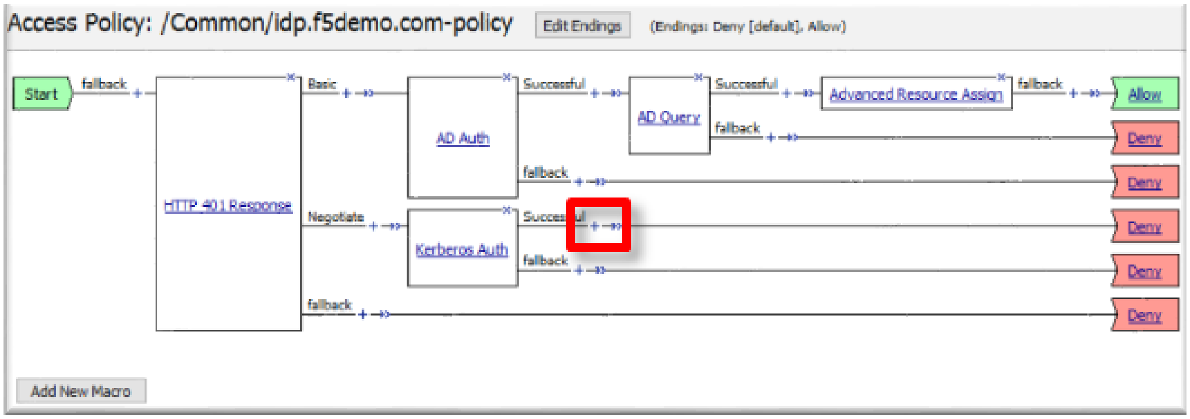
Name: Kerberos Auth

KERBEROS

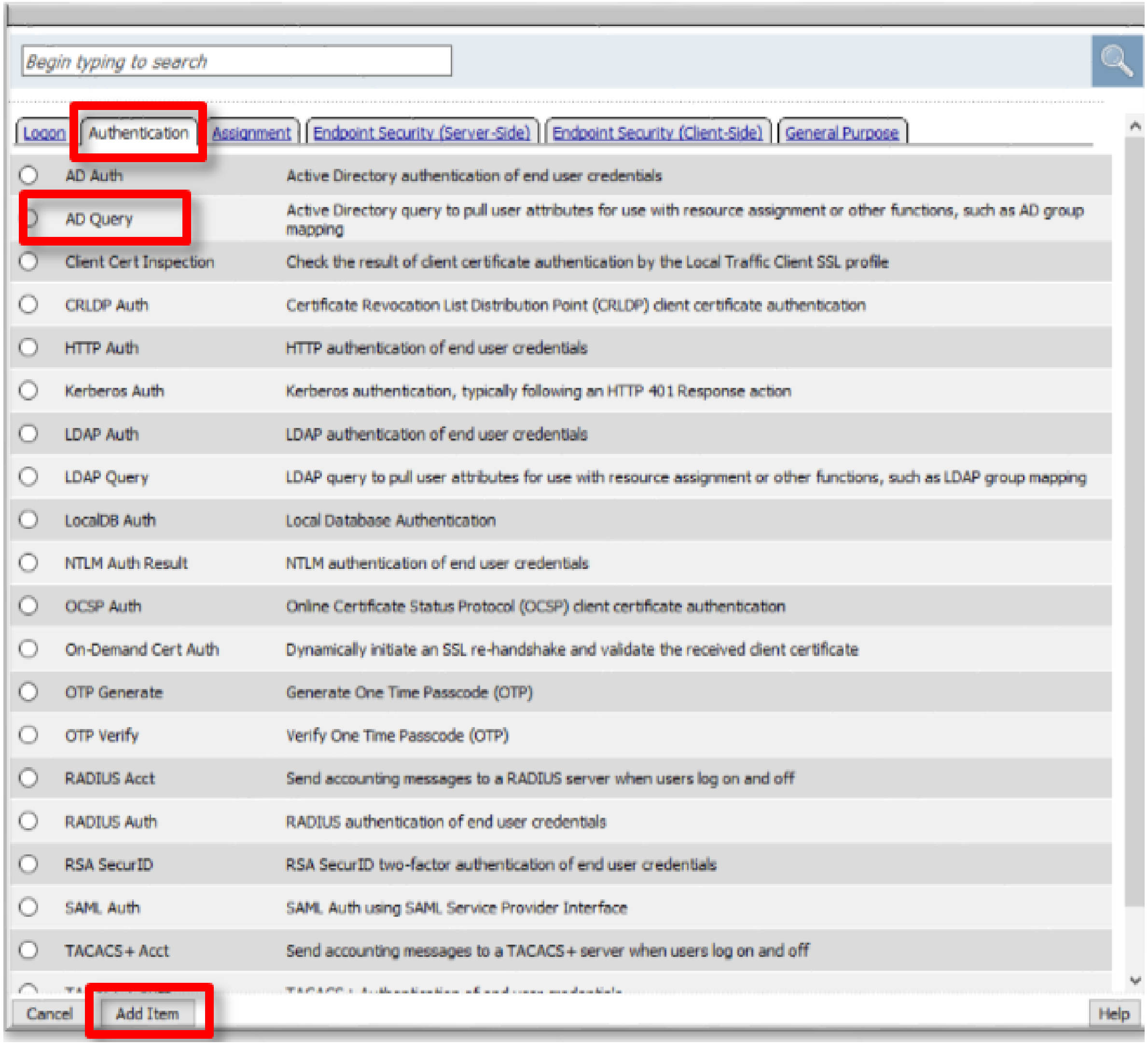
AAA Server	/Common/apm-krb-aaa
Request Based Auth	Disabled
Max Logon Attempts Allowed	3

Note: The *apm-krb-aaa* object was pre-created for you in this lab. More details on the configuration of Kerberos AAA are included in the Learn More section at the end of this guide.

12. In the **Visual Policy Editor** window for `/Common/idp.f5demo.com?policy`, click the **Plus (+) Sign** on the **Successful** branch between **Kerberos Auth** and **Deny**



13. In the pop-up dialog box, select the **Authentication** tab and then select the **Radio** next to **AD Query**, and click the **Add Item** button



○	AD Auth	Active Directory authentication of end user credentials
○	AD Query	Active Directory query to pull user attributes for use with resource assignment or other functions, such as AD group mapping
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○	Kerberos Auth	Kerberos authentication, typically following an HTTP 401 Response action
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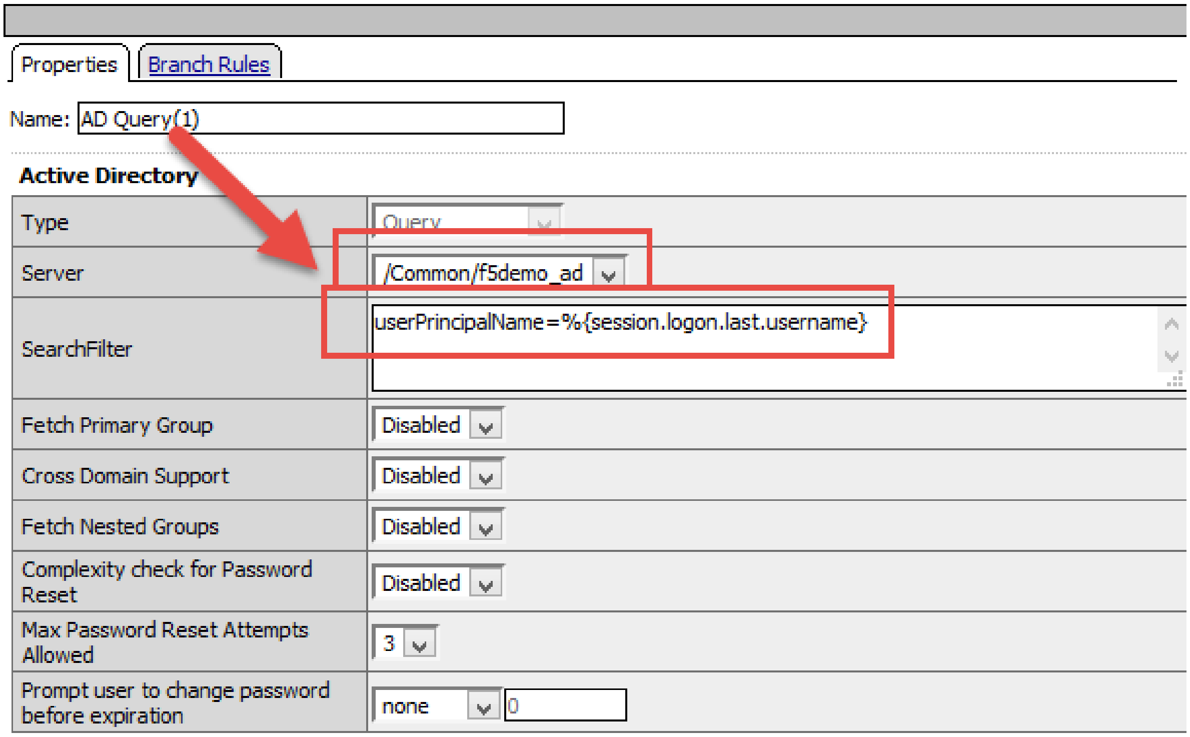
○	LDAP Query	LDAP query to pull user attributes for use with resource assignment or other functions, such as LDAP group mapping
○	LocalDB Auth	Local Database Authentication
○	NTLM Auth Result	NTLM authentication of end user credentials
○	OCSP Auth	Online Certificate Status Protocol (OCSP) client certificate authentication
○	On-Demand Cert Auth	Dynamically initiate an SSL re-handshake and validate the received client certificate
○	OTP Generate	Generate One Time Passcode (OTP)
○	OTP Verify	Verify One Time Passcode (OTP)
○	RADIUS Acct	Send accounting messages to a RADIUS server when users log on and off
○	RADIUS Auth	RADIUS authentication of end user credentials
○	RSA SecurID	RSA SecurID two-factor authentication of end user credentials
○	SAML Auth	SAML Auth using SAML Service Provider Interface
○	TACACS+ Acct	Send accounting messages to a TACACS+ server when users log on and off

14. In the resulting **AD Query(1)** pop-up window, select `/Commmon/f5demo_ad` from the **Server** drop down menu

15. In the **SearchFilter** field, enter the following value: `userPrincipalName=%{session.logon.last.username}`

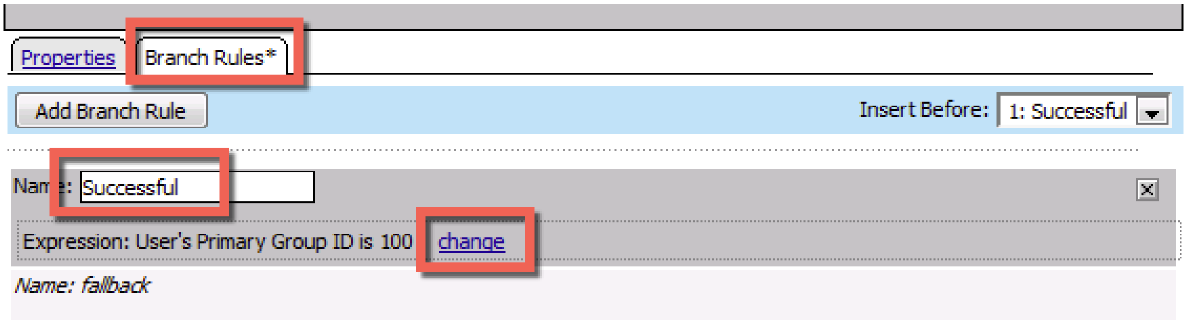


Name: AD Query(1)

Active Directory

Type	Query
Server	/Common/f5demo_ad
SearchFilter	userPrincipalName=%{session.logon.last.username}
Fetch Primary Group	Disabled
Cross Domain Support	Disabled
Fetch Nested Groups	Disabled
Complexity check for Password Reset	Disabled
Max Password Reset Attempts Allowed	3
Prompt user to change password before expiration	none 0

16. In the **AD Query(1)** window, click the **Branch Rules** tab
17. Change the **Name** of the branch to *Successful*.
18. Click the **Change** link next to the **Expression**

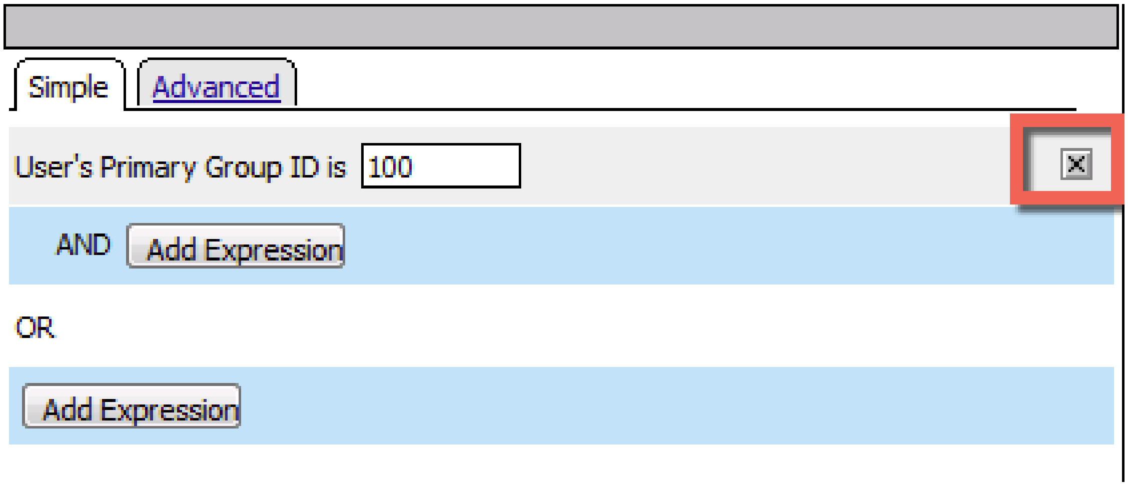


Name: Successful

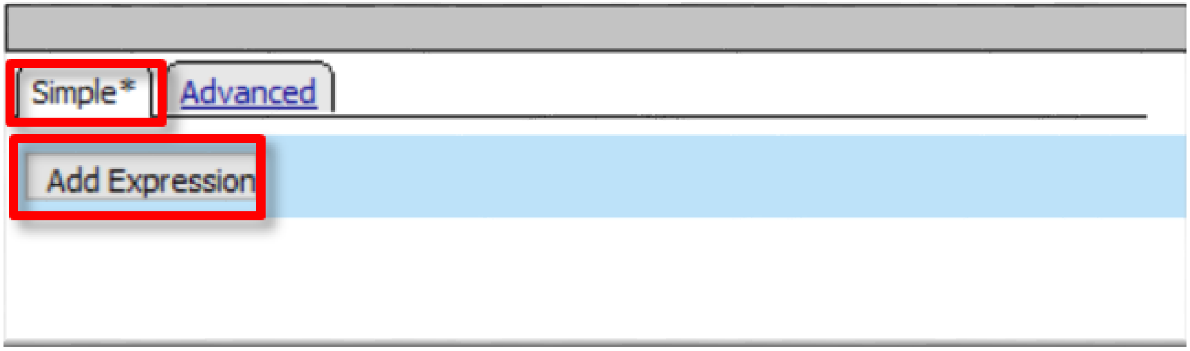
Expression: User's Primary Group ID is 100

Name: fallback

19. In the resulting pop-up window, delete the existing expression by clicking the **X** as shown



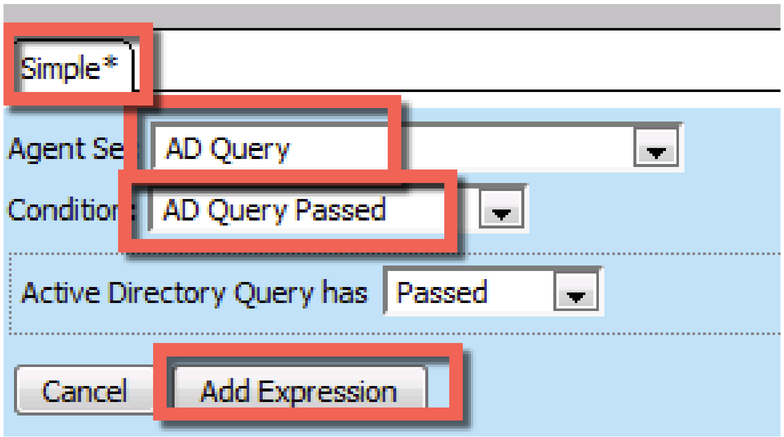
20. Create a new **Simple** expression by clicking the **Add Expression** button



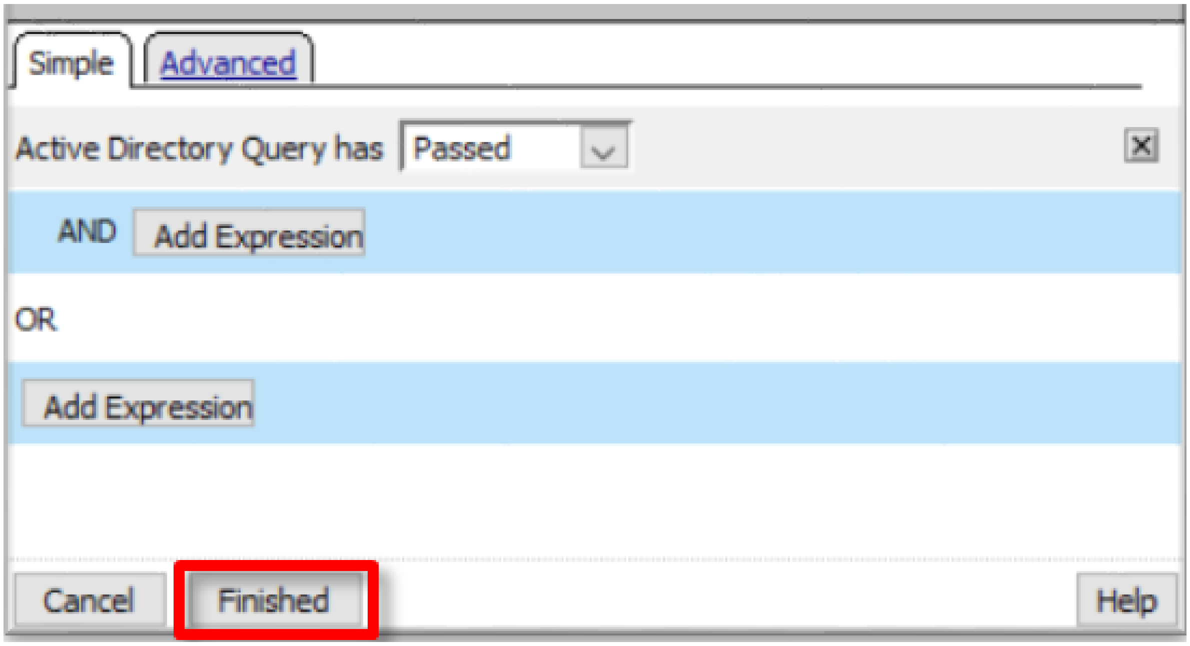
21. In the resulting menu, select the following from the drop down menus:

Agent Sel:	`AD Query`
Condition:	`AD Query Passed`

22. Click the **Add Expression** Button

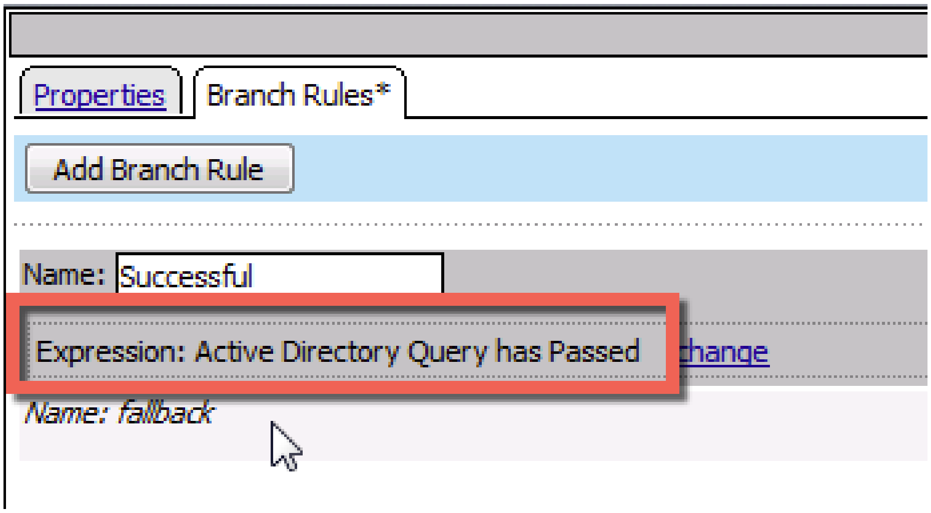


23. Click the **Finished** button to complete the expression



Active Directory Query has Passed

24. Click the **Save** button to complete the **AD Query**



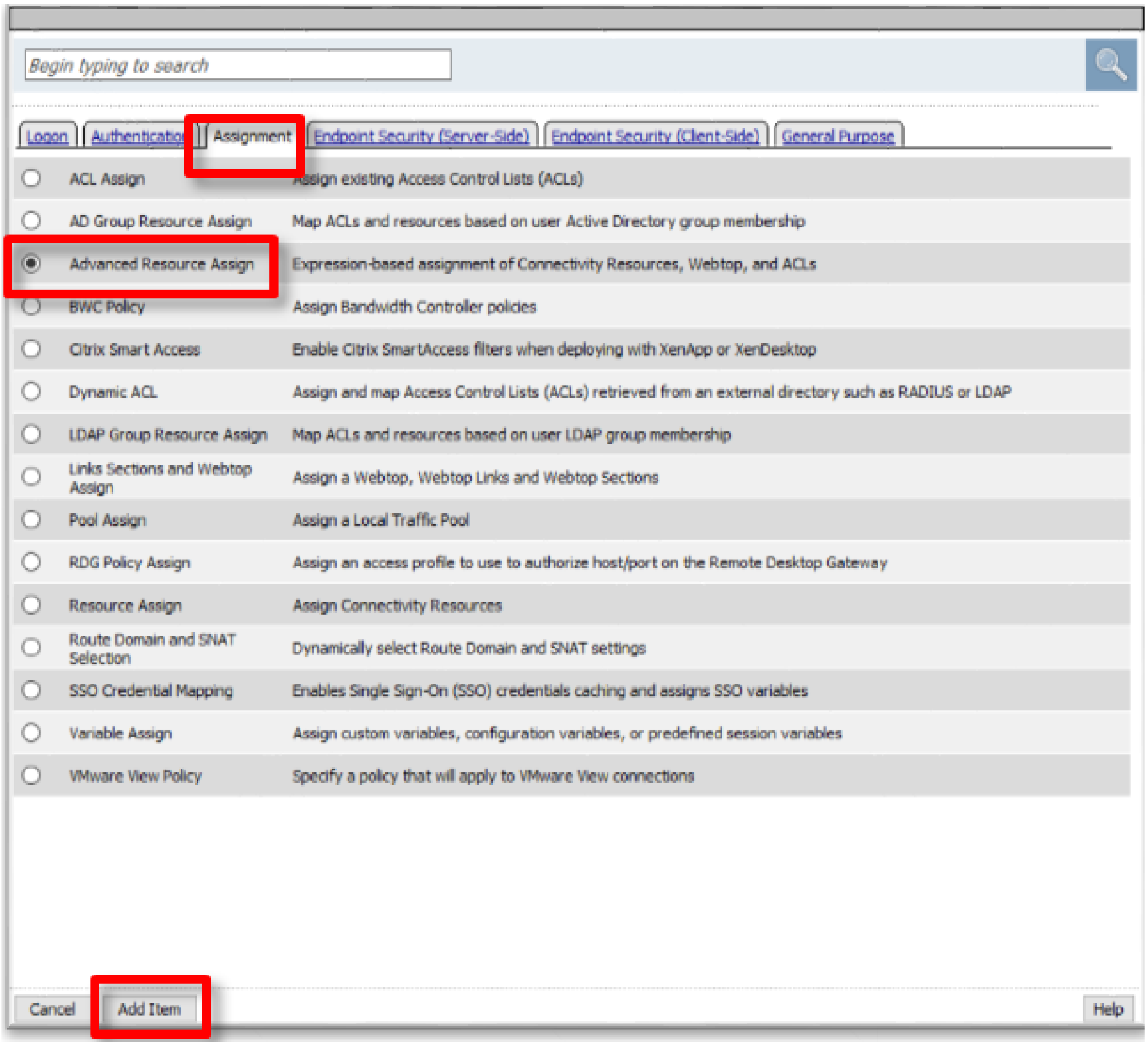
Name: Successful

Expression: Active Directory Query has Passed

Name: fallback

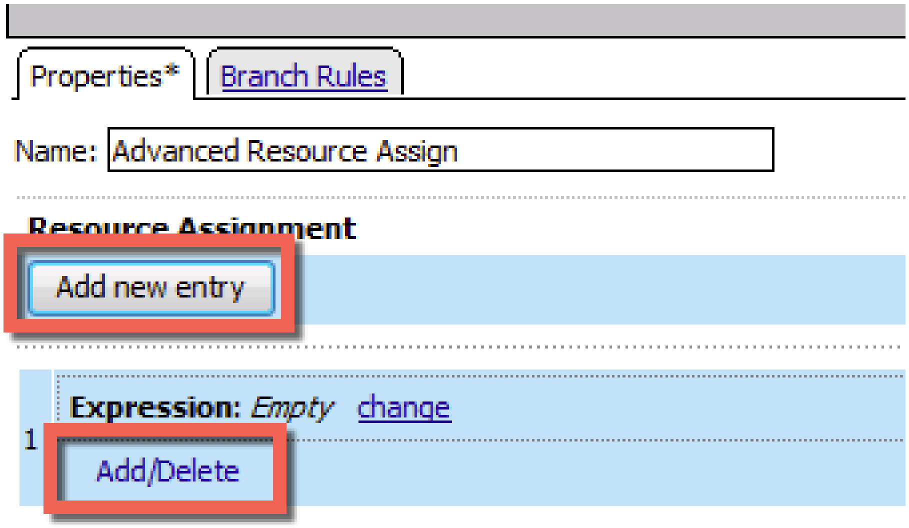
25. In the **Visual Policy Editor** window for `/Common/idp.f5demo.com?policy`, click the **Plus (+) Sign** on the **Successful** branch between **AD Query(1)** and **Deny**

26. In the pop-up dialog box, select the **Assignment** tab and then select the **Radio** next to **Advanced Resource Assign**, and click the **Add Item** button



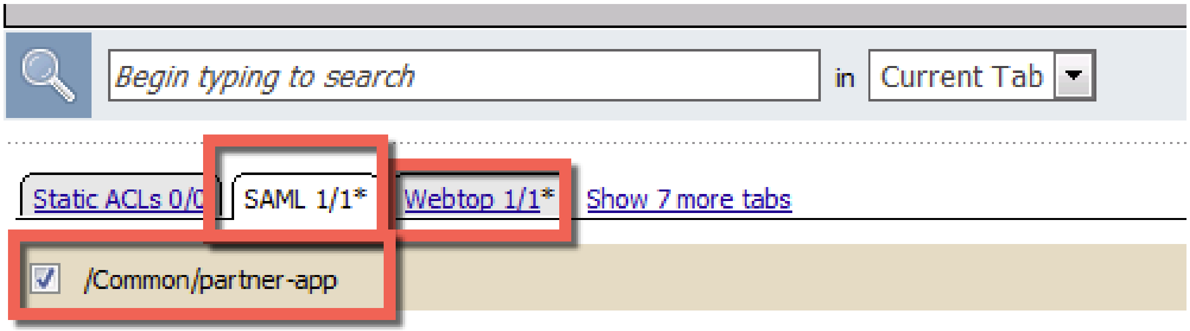
○	ACL Assign	Assign existing Access Control Lists (ACLs)
○	AD Group Resource Assign	Map ACLs and resources based on user Active Directory group membership
●	Advanced Resource Assign	Expression-based assignment of Connectivity Resources, Webtop, and ACLs
○	BWC Policy	Assign Bandwidth Controller policies
○	Citrix Smart Access	Enable Citrix SmartAccess filters when deploying with XenApp or XenDesktop
○	Dynamic ACL	Assign and map Access Control Lists (ACLs) retrieved from an external directory such as RADIUS or LDAP
○	LDAP Group Resource Assign	Map ACLs and resources based on user LDAP group membership
○	Links Sections and Webtop Assign	Assign a Webtop, Webtop Links and Webtop Sections
○	Pool Assign	Assign a Local Traffic Pool
○	RDG Policy Assign	Assign an access profile to use to authorize host/port on the Remote Desktop Gateway
○	Resource Assign	Assign Connectivity Resources
○	Route Domain and SNAT Selection	Dynamically select Route Domain and SNAT settings
○	SSO Credential Mapping	Enables Single Sign-On (SSO) credentials caching and assigns SSO variables
○	Variable Assign	Assign custom variables, configuration variables, or predefined session variables
○	VMware View Policy	Specify a policy that will apply to VMware View connections

27. In the resulting **Advanced Resource Assign(1)** pop-up window, click the **Add New Entry** button
28. In the new Resource Assignment entry, click the **Add/Delete** link



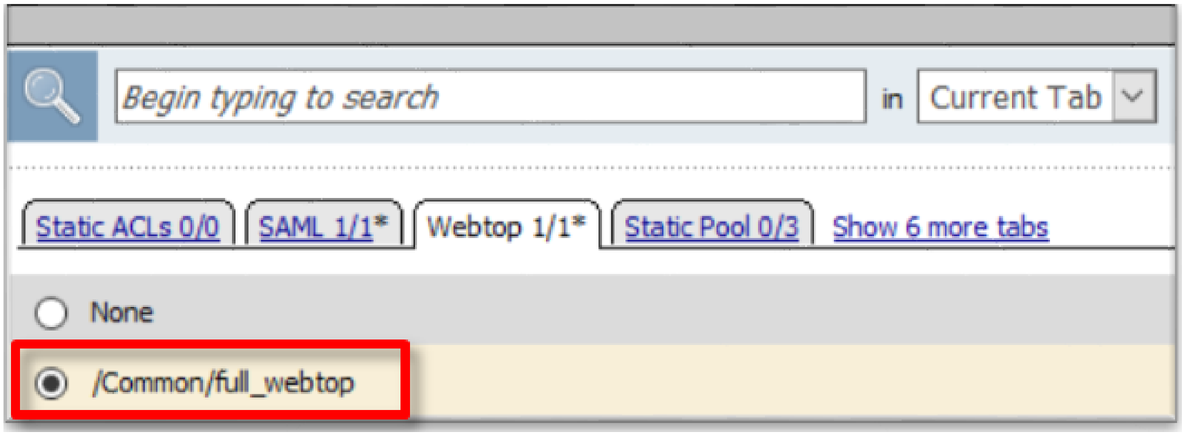
Name: Advanced Resource Assign

29. In the resulting pop-up window, click the **SAML** tab, and select the **Checkbox** next to */Common/partner-app*



☑ /Common/partner-app

30. Click the **Webtop** tab, and select the **Checkbox** next to `/Common/full_webtop`

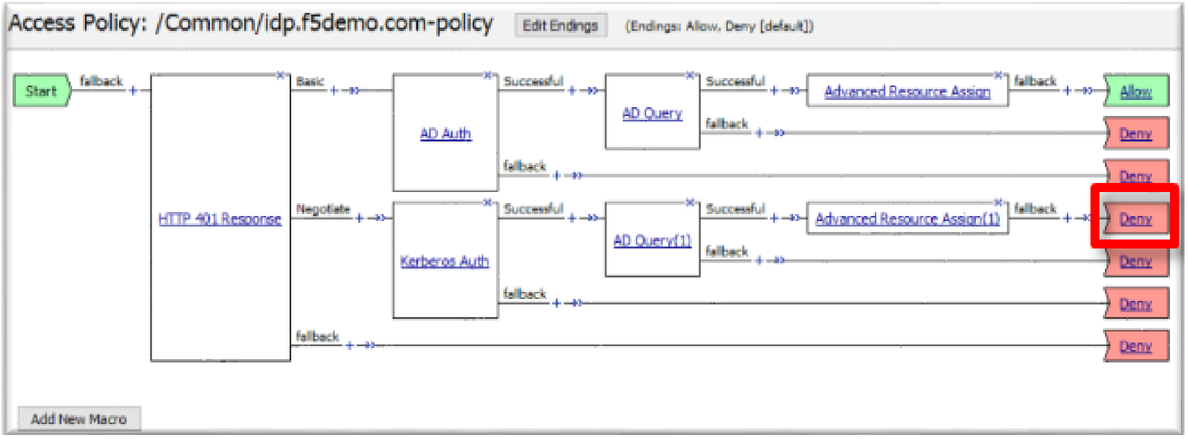


○ None

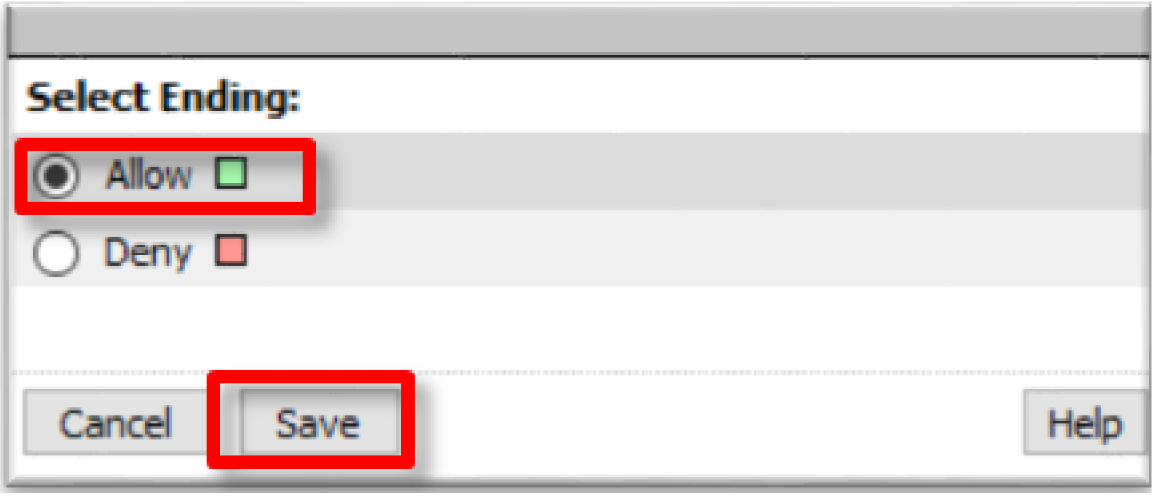
● /Common/full_webtop

31. Click the **Update** button at the bottom of the window to complete the Resource Assignment entry
32. Click the **Save** button at the bottom of the **Advanced Resource Assign(1)** window

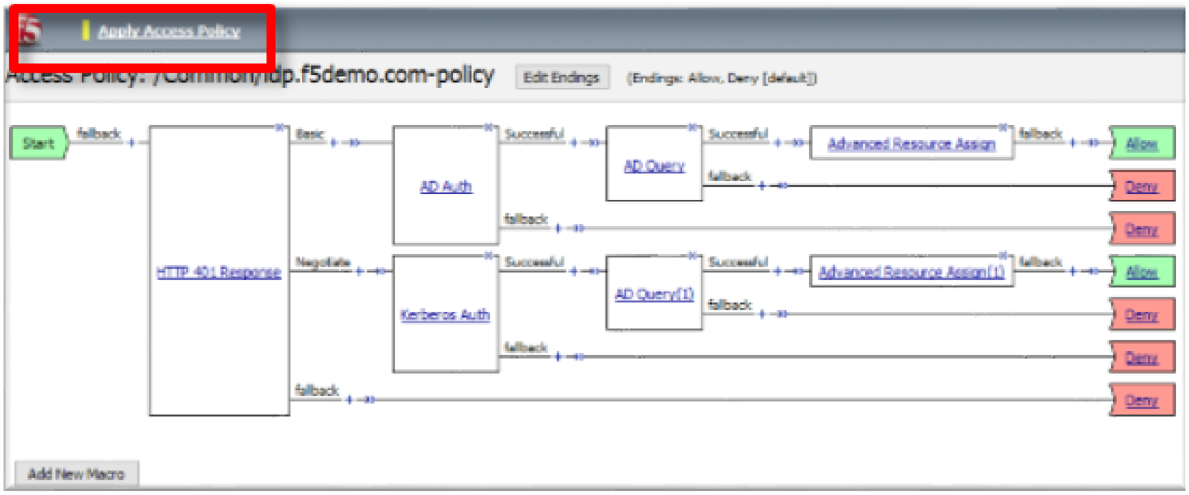
33. In the **Visual Policy Editor**, select the **Deny** ending on the fallback branch following **Advanced Resource Assign**



34. In the **Select Ending** dialog box, selet the **Allow** radio button and then click **Save**



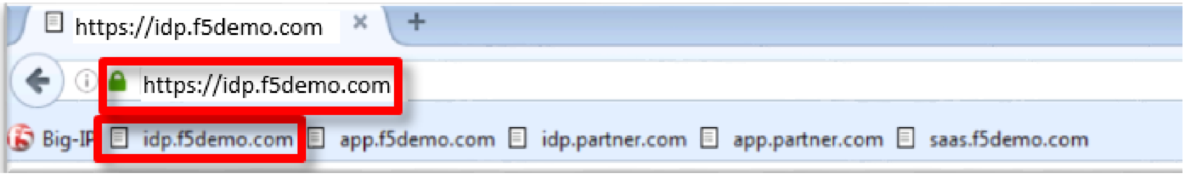
35. In the **Visual Policy Editor**, click **Apply Access Policy** (top left), and close the **Visual Policy Editor**



1.4.2 TASK 2 - Test the Kerberos to SAML Configuration

Note: In the following Lab Task it is recommended that you use Microsoft Internet Explorer. While other browsers also support Kerberos (if configured), for the purposes of this Lab Microsoft Internet Explorer has been configured and will be used.

1. Using Internet Explorer from the jump host, navigate to the SAML IdP you previously configured at *https://idp.f5demo.com* (or click the provided bookmark)

2. Were you prompted for credentials? Were you successfully authenticated? Did you see the webtop with the SP application?
3. Click on the Partner App icon. Were you successfully authenticated (via SAML) to the SP?
4. Review your Active Sessions **(Access ?> Overview ?> Active Sessions)**
5. Review your Access Report Logs **(Access ?> Overview ?> Access Reports)**

1.5 Lab 4: [Optional] SaaS Federation iApp Lab

The purpose of this lab is to familiarize the Student with the new SaaS Federation iApp. Students will use the iApp to create a federation relationship with a commonly used SaaS provider. This lab will leverage the work performed previously in Lab 3. Archive files are available for the completed Lab 3.

Objective:

- Gain an understanding of the new SaaS Federation iApp and its features.
- Deploy a working SaaS federation using the iApp to a commonly used SaaS provider

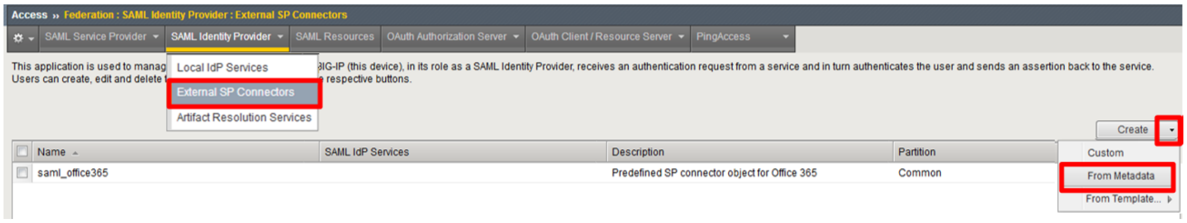
Lab Requirements:

- All lab requirements will be noted in the tasks that follow

Estimated completion time: 25 minutes

1.5.1 TASK 1 – Create a new SaaS SAML Service Provider (SP)

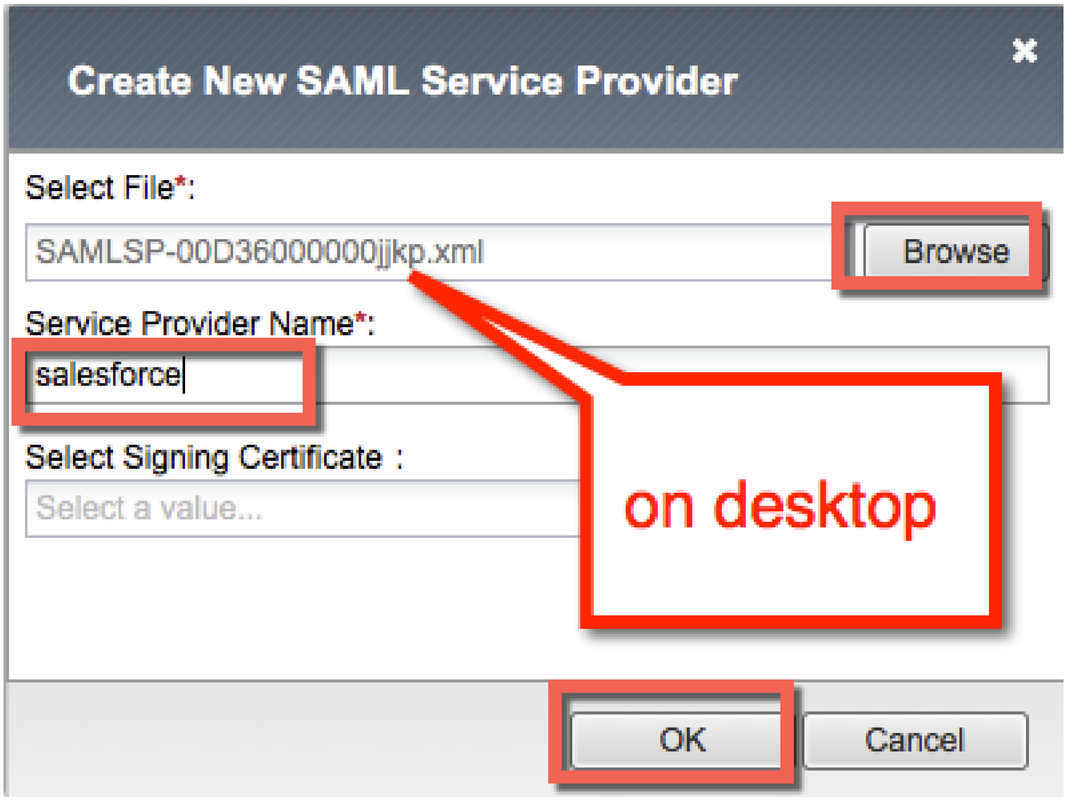
1. Navigate to **Access ?> Federation ?> SAML Identity Provider ?> External SP Connectors**
2. Click specifically on the **Down Arrow** next to the **Create** button (far right)
3. Select **From Metadata** from the drop down menu


Access » Federation : SAML Identity Provider : External SP Connectors

This application is used to manag BIG-IP (this device), in its role as a SAML Identity Provider, receives an authentication request from a service and in turn authenticates the user and sends an assertion back to the service. Users can create, edit and delete t e respective buttons.

□	Name	SAML IdP Services	Description	Partition
□	saml_office365		Predefined SP connector object for Office 365	Common

4. In the **Create New SAML Service Provider** dialogue box, click **Browse** and select the `SAMLSP-00D36000000jjkp.xml` file from the Desktop of your jump host
5. In the **Service Provider Name** field, enter: `salesforce`
6. Click **OK** on the dialog box


Create New SAML Service Provider

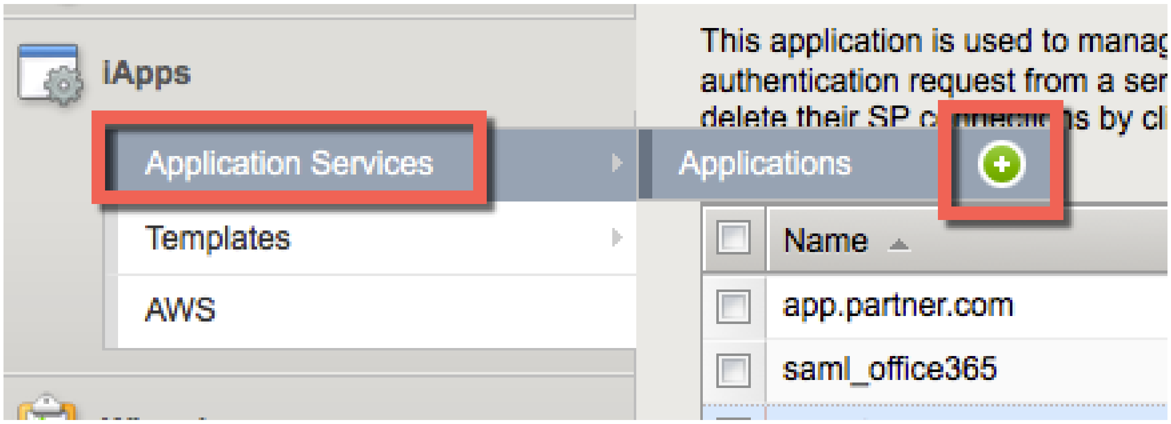
Select File*: SAMLSP-00D36000000jjkp.xml

Service Provider Name*: salesforce

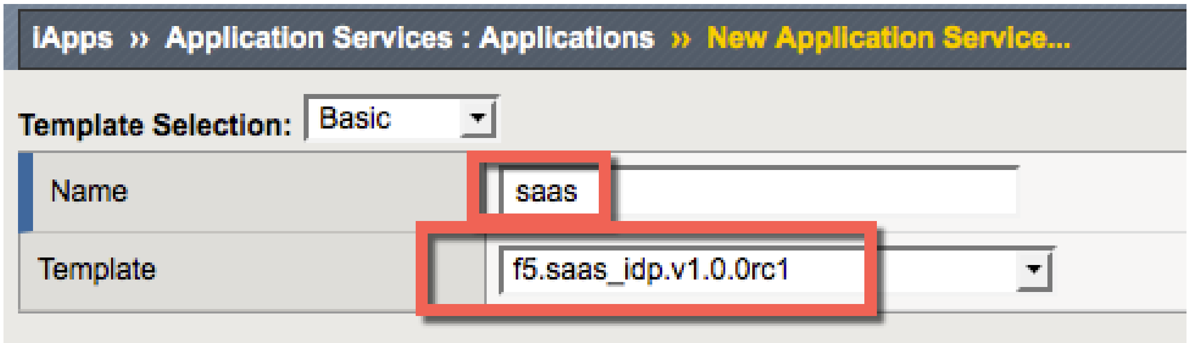
Select Signing Certificate : Select a value...

1.5.2 TASK 2 - Deploy the SaaS Federation iApp

1. Navigate to **iApps ?> Application Services -> Applications** and click on the **Plus (+) Sign** as shown


iApps
Application Services
Templates
AWS
Applications
Name
app.partner.com
saml_office365
This application is used to manag
authentication request from a ser
delete their SP c   s by cl

2. In the resulting **New Application Service** window, enter *saas* as the *Name*
3. Select `f5.saas_idp.v1.0.rc1` from the **Template** drop down menu


iApps » Application Services : Applications » New Application Service...

Template Selection: Basic

Name: saas

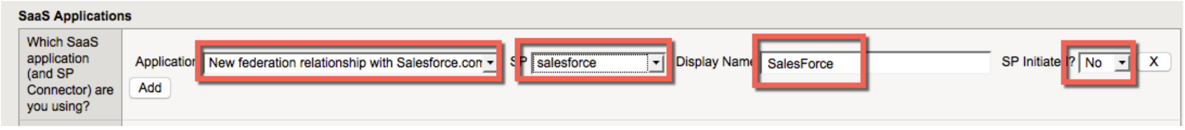
Template: f5.saas_idp.v1.0.0rc1

Note: The iApp template has already been downloaded and imported for this lab. You can download the latest iApp templates from https://downloads.f5.com/

---

4. Configure the iApp template as follows:

SaaS Applications	
Application:	`New federation relationship with salesforce.com`
SP:	`salesforce`
Display Name:	`SalesForce`
SP Initiated:	`No`



Which SaaS application (and SP Connector) are you using?

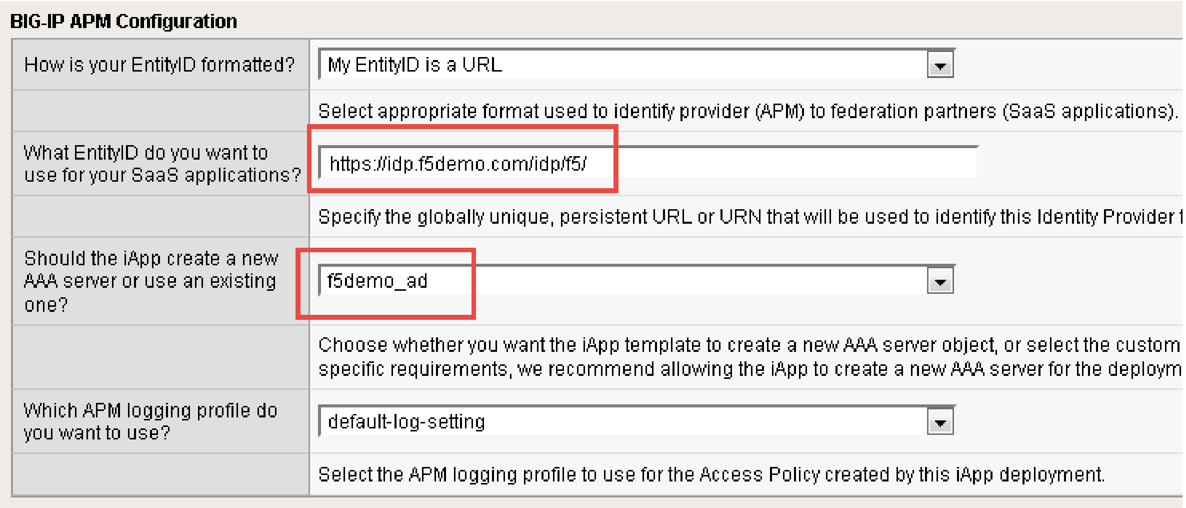
Application: New federation relationship with Salesforce.com

SP: salesforce

Display Name: SalesForce

SP Initiated? No

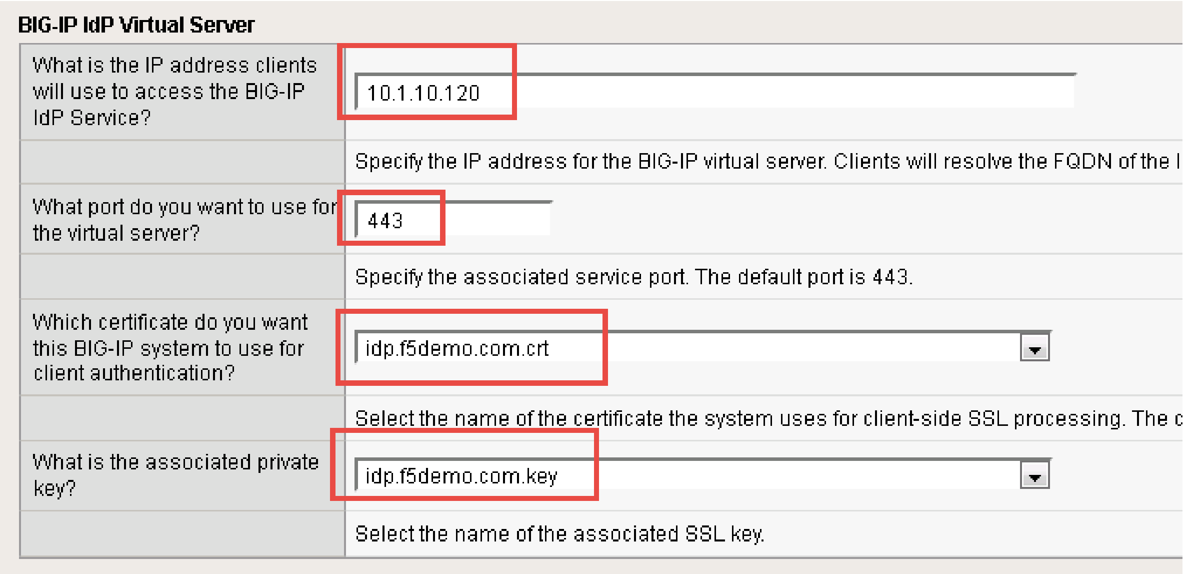
BIG-IP APM Configuration	
What EntityID do you want to use for your SaaS applications?	`https://idp.f5demo.com/idp/f5/`
Should the iApp create a new AAA server or use an existing one?	`f5demo_ad`



BIG-IP APM Configuration

How is your EntityID formatted?	My EntityID is a URL
	Select appropriate format used to identify provider (APM) to federation partners (SaaS applications).
What EntityID do you want to use for your SaaS applications?	https://idp.f5demo.com/idp/f5/
	Specify the globally unique, persistent URL or URN that will be used to identify this Identity Provider t
Should the iApp create a new AAA server or use an existing one?	f5demo_ad
	Choose whether you want the iApp template to create a new AAA server object, or select the custom specific requirements, we recommend allowing the iApp to create a new AAA server for the deploym
Which APM logging profile do you want to use?	default-log-setting
	Select the APM logging profile to use for the Access Policy created by this iApp deployment.

BIG-IP Virtual Server	
What is the IP address clients will use to access the BIG-IP IdP Service?	`10.1.10.120`
What port do you want to use for the virtual server?	`443`
Which certificate do you want this BIG-IP system to use for client authentication?	`idp.f5demo.com.crt`
What is the associated private key?	`idp.f5demo.com.key`

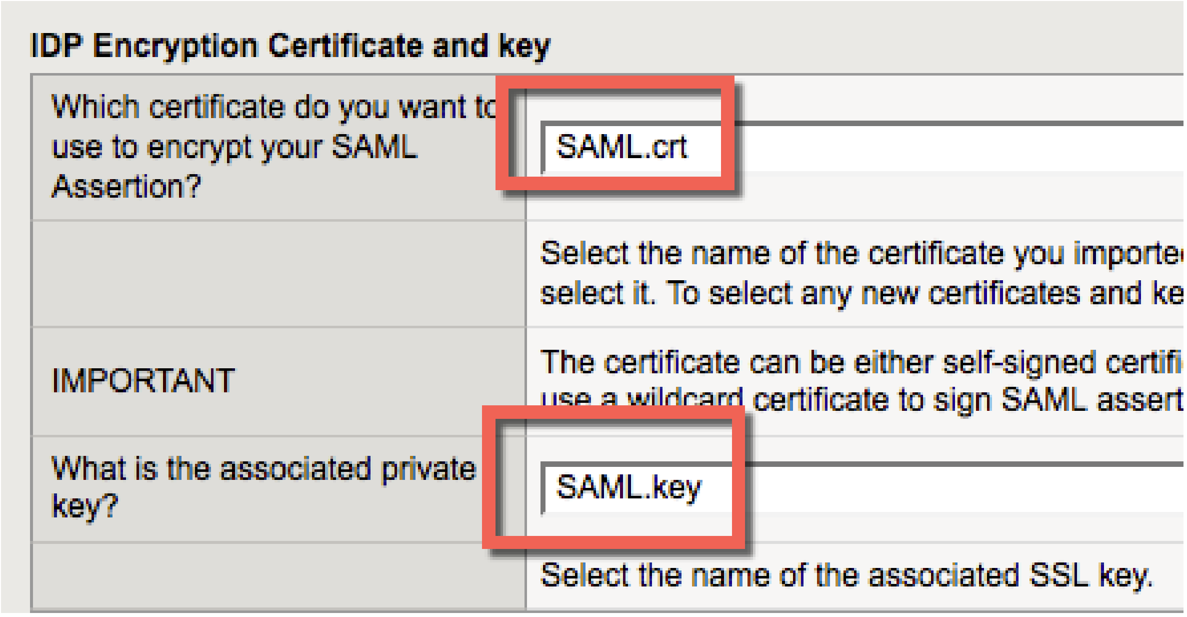


BIG-IP IdP Virtual Server

What is the IP address clients will use to access the BIG-IP IdP Service?	10.1.10.120
	Specify the IP address for the BIG-IP virtual server. Clients will resolve the FQDN of the I
What port do you want to use for the virtual server?	443
	Specify the associated service port. The default port is 443.
Which certificate do you want this BIG-IP system to use for client authentication?	idp.f5demo.com.crt
	Select the name of the certificate the system uses for client-side SSL processing. The c
What is the associated private key?	idp.f5demo.com.key
	Select the name of the associated SSL key.

Note: We are deploying the iApp on a different IP so that you can see how everything is built out; however, this IdP will not work, as the `idp.f5demo.com` FQDN resolves to another IP. We are going to use the iApp to create the SAML resource that we will assign to our existing access policy from Lab 3.

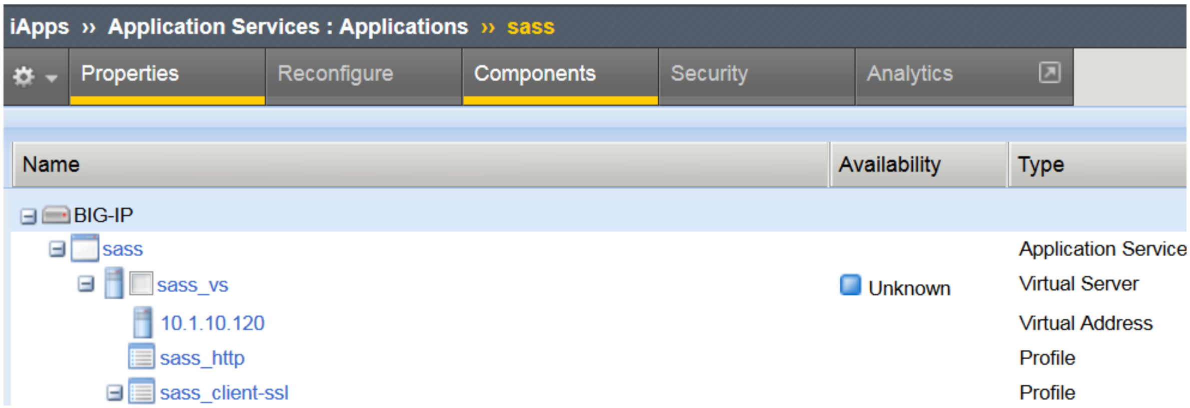
IdP Encryption Certificate and Key	
Which certificate do you want to use to encrypt your SAML Assertion?	`SAML.crt`
What is the associated private key?	`SAML.key`



IDP Encryption Certificate and key

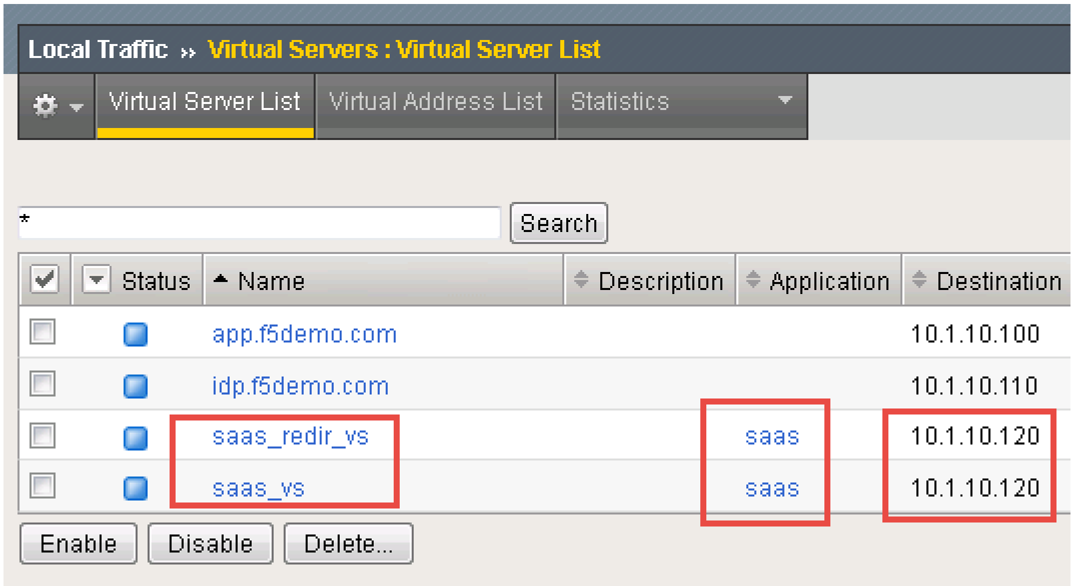
Which certificate do you want to use to encrypt your SAML Assertion?	SAML.crt
	Select the name of the certificate you importe select it. To select any new certificates and ke
IMPORTANT	The certificate can be either self-signed certifi use a wildcard certificate to sign SAML assert
What is the associated private key?	SAML.key
	Select the name of the associated SSL key.

5. Scroll to the bottom of the configuration template and click **Finished**
6. Once deployed, you can review the built out SaaS Federation iApp at **iApps ?> Application Services ?> Applications ?> saas**



Name	Availability	Type
BIG-IP		
sass		Application Service
sass_vs	Unknown	Virtual Server
10.1.10.120		Virtual Address
sass_http		Profile
sass_client-ssl		Profile

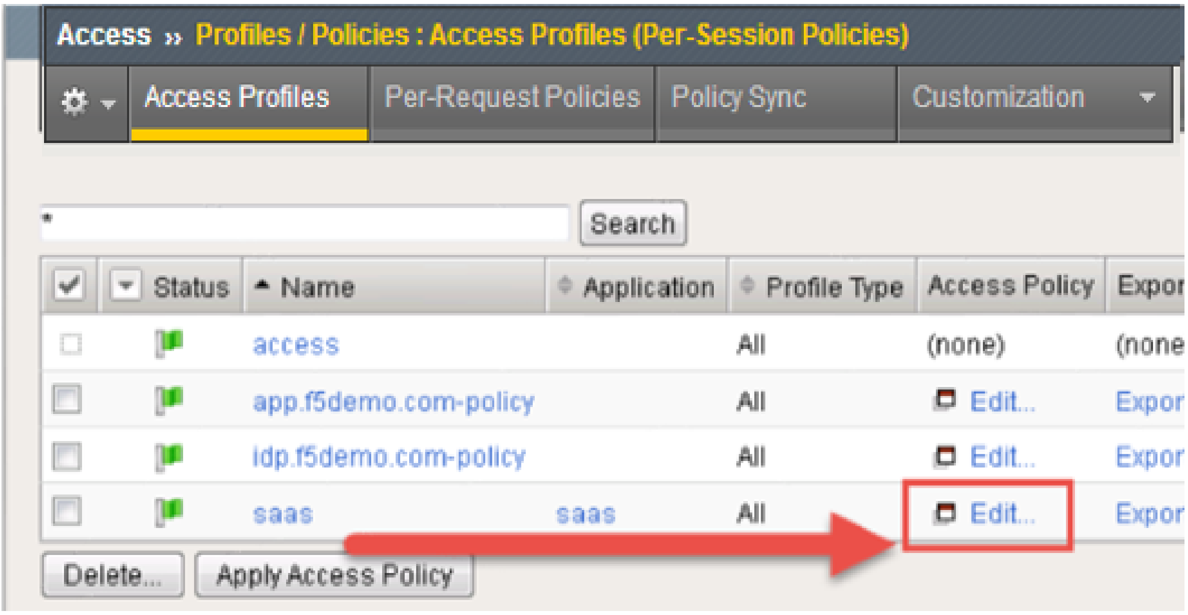
7. Review the new virtual servers created by the iApp at **Local Traffic ?> Virtual Server ?> Virtual Server List**



Local Traffic ›› Virtual Servers : Virtual Server List

☑	Status	Name	Description	Application	Destination
□	🟦	app.f5demo.com			10.1.10.100
□	🟦	idp.f5demo.com			10.1.10.110
□	🟦	saas_redir_vs		saas	10.1.10.120
□	🟦	saas_vs		saas	10.1.10.120

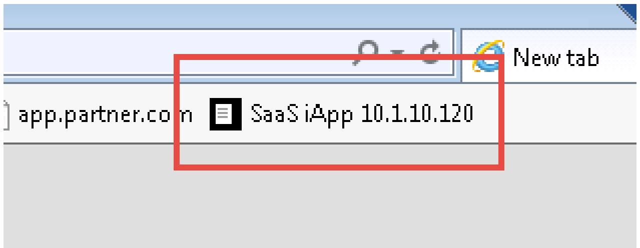
8. Review the new Access Policy built by the iApp at **Access ?> Profiles/Policies ?> Access Profiles (Per-Session Policies)** and select the **Edit** link next to the *saas* Access Policy



Access ›› Profiles / Policies : Access Profiles (Per-Session Policies)

☑	Status	Name	Application	Profile Type	Access Policy	Expor
□		access		All	(none)	(none
□		app.f5demo.com-policy		All	Edit...	Expor
□		idp.f5demo.com-policy		All	Edit...	Expor
□		saas	saas	All	Edit...	Expor

9. Test the SaaS iApp by clicking on the bookmark in your browser.



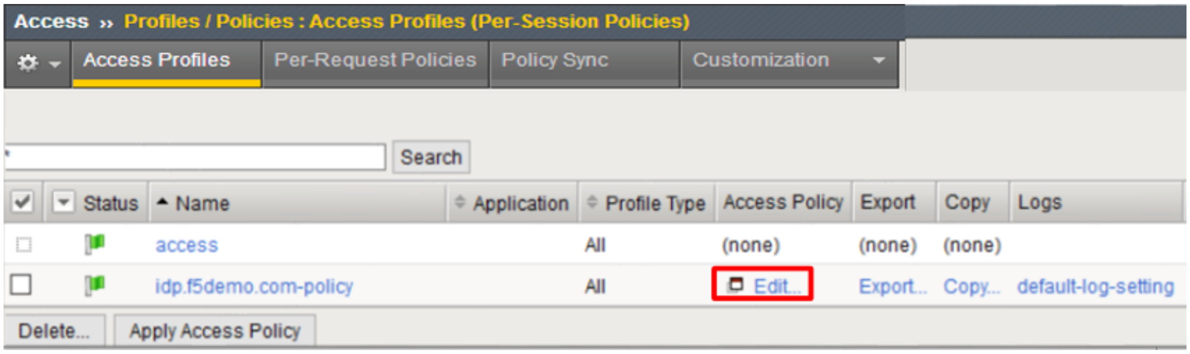
Note: Navigating to the virtual server by IP will produce a certificate warning. This is expected. Click through the warning to see the resulting page.

1.5.3 TASK 3 - Modify the SAML IdP Access Policy

The previous task, Task 2, was to provide you an understanding of how the SaaS Federation iApp can automatically build a configuration for you.

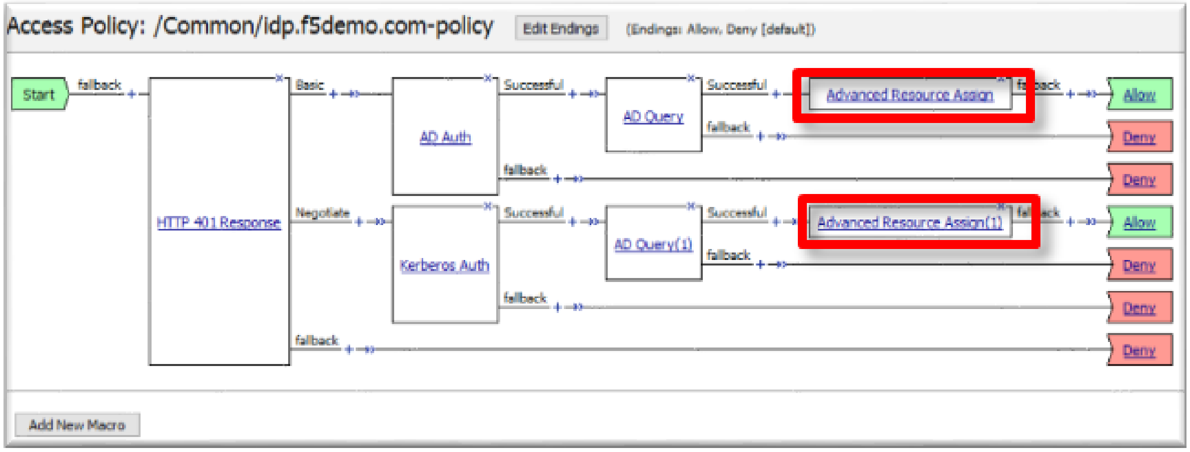
In this task we will be modifying the existing Webtop from prior labs to add the SaaS SalesForce application. The purpose of the task is so you can see the F5Demo App and SalesForce in the same Webtop.

1. Using the same Access Policy from Lab 3, navigate to **Access ?> Profiles/Policies ?> Access Profiles (Per-Session Policies)** and click the **Edit** link next to the previously created `idp.f5demo.com-policy`

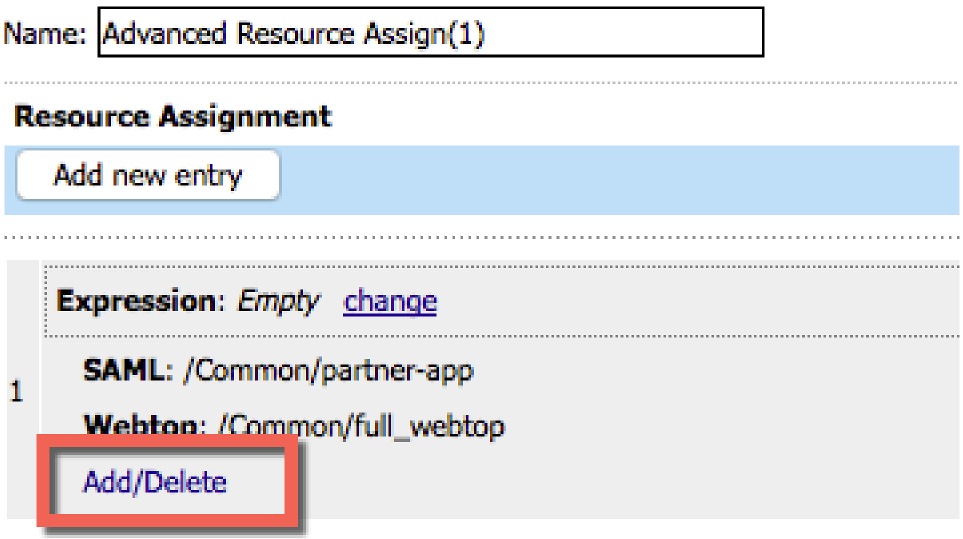


☑	Status	Name	Application	Profile Type	Access Policy	Export	Copy	Logs
□		access		All	(none)	(none)	(none)	
□		idp.f5demo.com-policy		All	Edit...	Export...	Copy...	default-log-setting

2. In the **Visual Policy Editor** window for `/Common/idp.f5demo.com?policy`, click the **Advanced Resource Assign** object.



3. Click the **Add/Delete** link on the Resource Assignment item



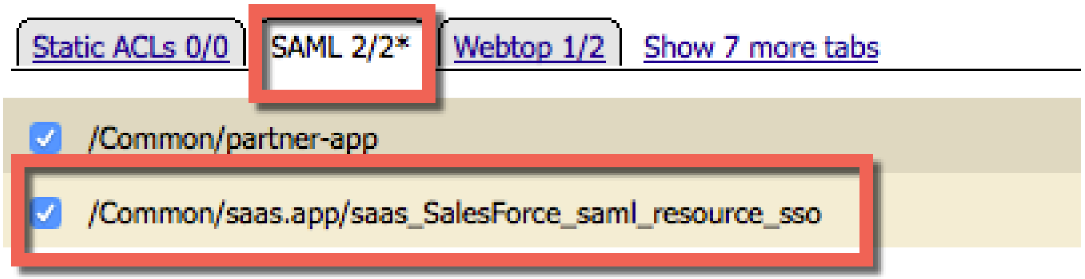
Name: Advanced Resource Assign(1)

1 Expression: *Empty*

SAML: /Common/partner-app

Webtop: /Common/full_webtop

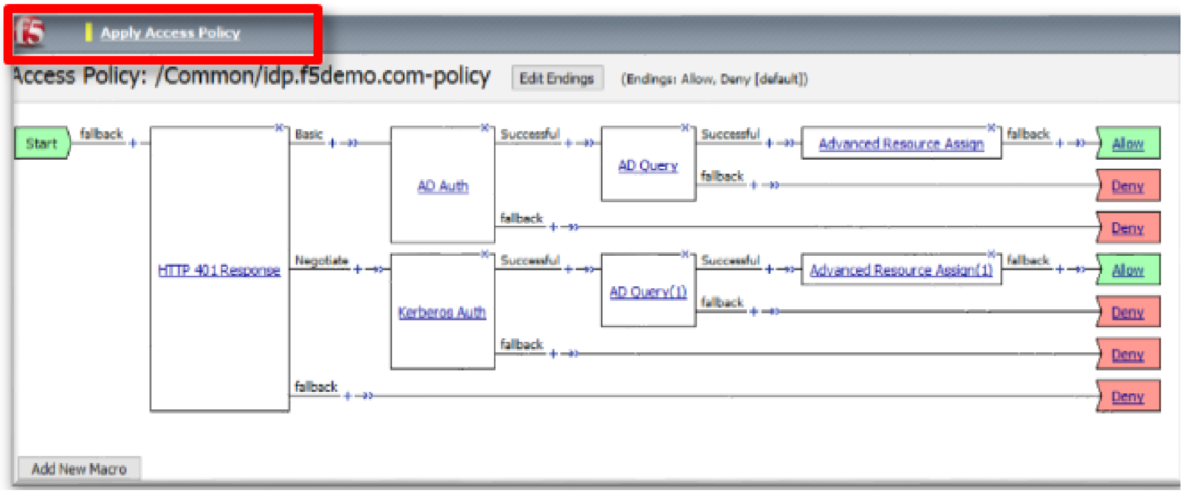
4. Click the **SAML** tab, and select the checkbox next to `/Common/saas.app/saas_SalesForce_saml_resource_sso`



☑ /Common/partner-app

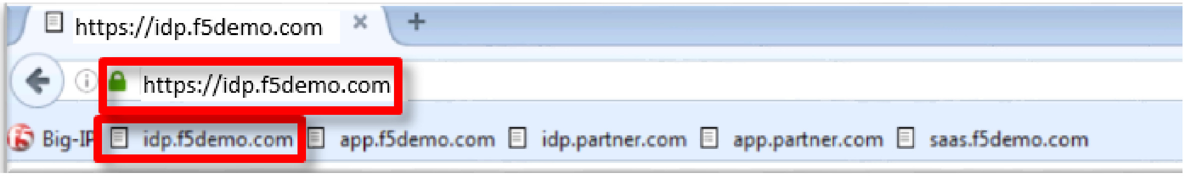
☑ /Common/saas.app/saas_SalesForce_saml_resource_sso

5. Click the **Update** button at the bottom of the window to complete the Resource Assignment entry
6. Click the **Save** button at the bottom of the **Advanced Resource Assign** window
7. Repeat steps 2 - 6 with the **Advanced Resource Assign (1)** object
8. In the **Visual Policy Editor**, click **Apply Access Policy** (top left), and close the **Visual Policy Editor**



1.5.4 TASK 4 - Test the SaaS Federation Application

1. Using your browser from the jump host, navigate to the SAML IdP previously configured at `https://idp.f5demo.com` (or click the provided bookmark)



2. Were you prompted for credentials? Were you successfully authenticated? Did you see the webtop with the new SaaS SP application?
3. Click on the SalesForce icon. Were you successfully authenticated (via SAML) to the SP?
4. Review your Active Sessions **(Access ?> Overview ?> Active Sessions)**
5. Review your Access Report Logs **(Access ?> Overview ?> Access Reports)**

1.6 Conclusion

Thank you for your participation in the 301 Access Policy Manager (APM) Federation Lab. This Lab Guide has highlighted several notable features of SAML Federation. It does not attempt to review all F5 APM Federation features and configurations but serves as an introduction to allow the student to further explore the BIG-IP platform and Access Policy Manager (APM), its functions & features.

1.6.1 Learn More

The following are additional resources included for reference and assistance with this lab guide and other APM tasks.

Links & Guides

- **Access Policy Manager (APM) Operations Guide:** https://support.f5.com/content/kb/en-us/products/big-ip_apm/manuals/product/f5-apm-operations-guide/_jcr_content/pdfAttach/download/file.res/f5-apm-operations-guide.pdf
- **Access Policy Manager (APM) Authentication & Single Sign on Concepts:** https://support.f5.com/kb/en-us/products/big-ip_apm/manuals/product/apm-authentication-sso-13-0-0.html
- **SAML:**
  - **Introduction:** https://support.f5.com/kb/en-us/products/big-ip_apm/manuals/product/apm-authentication-sso-13-0-0/28.html#guid-28f26377-6e10-42c9-883a-3ac65eab9092
  - **F5 SAML IdP (Identity Provider with Portal):** https://support.f5.com/kb/en-us/products/big-ip_apm/manuals/product/apm-authentication-sso-13-0-0/29.html#guid-42e93e4b-e4fc-4c3d-ae53-910641d5755c
  - **F5 SAML IdP (Identity Provider without Portal):** https://support.f5.com/kb/en-us/products/big-ip_apm/manuals/product/apm-authentication-sso-13-0-0/30.html#guid-39ffed07-65f2-40b8-85ae-c80073cc4e82
  - **F5 SAML SP (Service Provider):** https://support.f5.com/kb/en-us/products/big-ip_apm/manuals/product/apm-authentication-sso-13-0-0/31.html#guid-be2cf224-727e-4a0f-aa68-676fdedba37b
  - **F5 Federation iApp (Includes o365):** https://www.f5.com/pdf/deployment-guides/saml-idp-saas-dg.pdf
  - **F5 o365 Deployment Guide:** https://www.f5.com/pdf/deployment-guides/microsoft-office-365-idp-dg.pdf
- **Kerberos**
  - **Kerberos AAA Object**: (*See Reference section below*)
  - **Kerberos Constrained Delegation:** http://www.f5.com/pdf/deployment-guides/kerberos-constrained-delegation-dg.pdf
- **Two-factor Integrations/Guides** (**Not a complete list**)
  - **RSA Integration:** https://support.f5.com/kb/en-us/products/big-ip_apm/manuals/product/apm-authentication-single-sign-on-12-1-0/6.html#conceptid
  - **DUO Security:**
    - https://duo.com/docs/f5bigip
    - https://duo.com/docs/f5bigip-alt
  - **SafeNet MobilePass:** http://www.safenet-inc.com/resources/integration-guide/data-protection/SafeNet_Authentication_Service/SafeNet_Authentication_Service__RADIUS_Authentication_on_F5_BIG-IP_APM_Integration_Guide
  - **Google Authenticator:** https://devcentral.f5.com/articles/two-factor-authentication-with-google-authenticator-an
- **Access Policy Manager (APM) Deployment Guides:**
  - **F5 Deployment Guide for Microsoft Exchange 2010/2013:** https://f5.com/solutions/deployment-guides/microsoft-exchange-server-2010-and-2013-big-ip-v11
  - **F5 Deployment Guide for Microsoft Exchange 2016:** https://f5.com/solutions/deployment-guides/microsoft-exchange-server-2016-big-ip-v11-v12-ltm-apm-afm

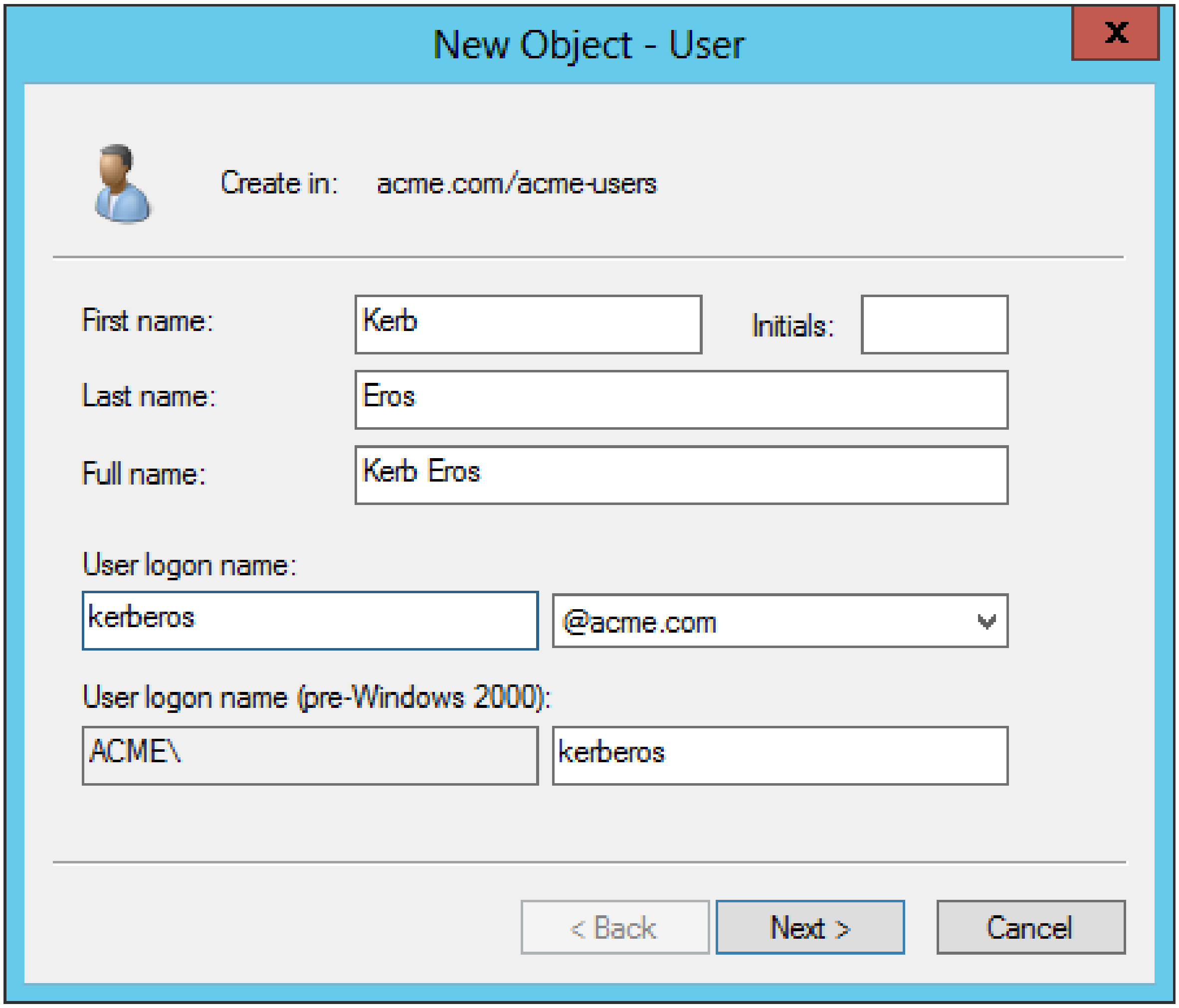
- **F5 Deployment Guide for Microsoft SharePoint 2010/2013:** https://f5.com/solutions/deployment-guides/microsoft-sharepoint-2010-and-2013-new-supported-iapp-big-ip-v114-ltm-apm-asm-aam
- **F5 Deployment Guide for Microsoft SharePoint 2016:** https://f5.com/solutions/deployment-guides/microsoft-sharepoint-2016-big-ip-v114-v12-ltm-apm-asm-afm-aam
- **F5 Deployment Guide for Citrix XenApp/XenDesktop:** https://f5.com/solutions/deployment-guides/citrix-xenapp-or-xendesktop-release-candidate-big
- **F5 Deployment Guide for VMWare Horizon View:** https://f5.com/solutions/deployment-guides/vmware-horizon-view-52-53-60-62-70-release-candidate-iapp-big-ip-v11-v12-ltm-apm-afm?tag=VMware
- **F5 Deployment Guide for Microsoft Remote Desktop Gateway Services:** https://f5.com/solutions/deployment-guides/microsoft-remote-desktop-gateway-services-big-ip-v114-ltm-afm-apm
- **F5 Deployment Guide for Active Directory Federated Services:** https://f5.com/solutions/deployment-guides/microsoft-active-directory-federation-services-big-ip-v11-ltm-apm

1.6.2 Reference: Kerberos AAA Object

The following is an example of the AAA Server object used in **Lab 3: Kerberos to SAML Lab** (the /**Common/apm-krb-aaa** used in Task 1).

AD User and Keytab

1. Create a new user in Active Directory
2. In this example, the User Logon Name *kerberos* has been created



New Object - User

Create in: acme.com/acme-users

First name: Kerb

Initials:

Last name: Eros

Full name: Kerb Eros

User logon name:

kerberos @acme.com

User logon name (pre-Windows 2000):

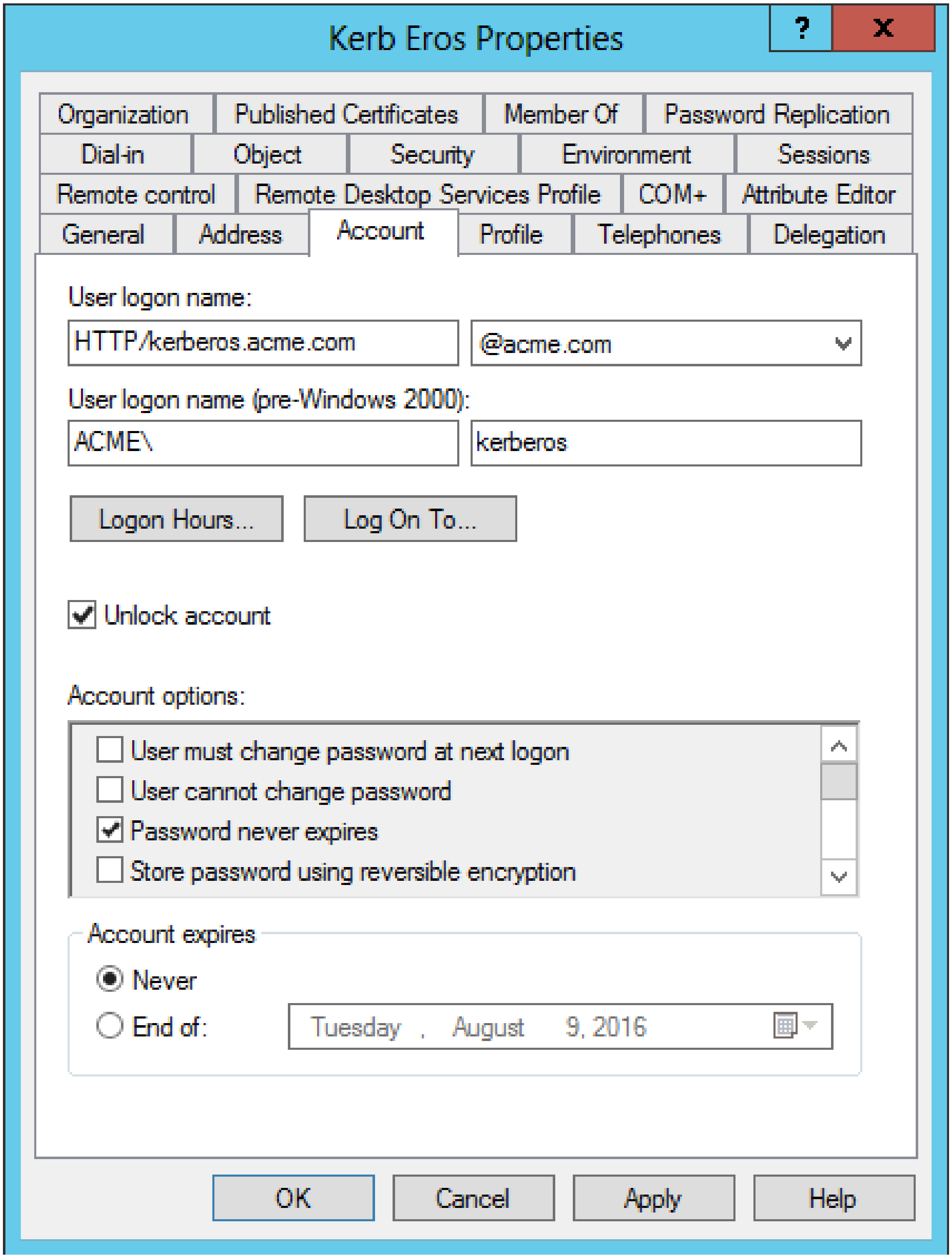
ACME\ kerberos

3. From the Windows command line, run the KTPASS command to generate a keytab file for the previously created user object

```
ktpass /princ HTTP/kerberos.acme.com@ACME.COM /mapuser acme\kerberos /
ptype KRB5_NT_PRINCIPAL /pass password /out c:\file.keytab
```

FQDN of virtual server:	`kerberos.acme.com`
AD Domain (UPN format):	`@ACME.COM`
Username:	`acme\kerberos`
Password:	`password`

4. Review the changes to the AD User object



User logon name: HTTP/kerberos.acme.com @acme.com

User logon name (pre-Windows 2000): ACME\ kerberos

☑ Unlock account

Account options:

☐ User must change password at next logon
☐ User cannot change password
☑ Password never expires
☐ Store password using reversible encryption

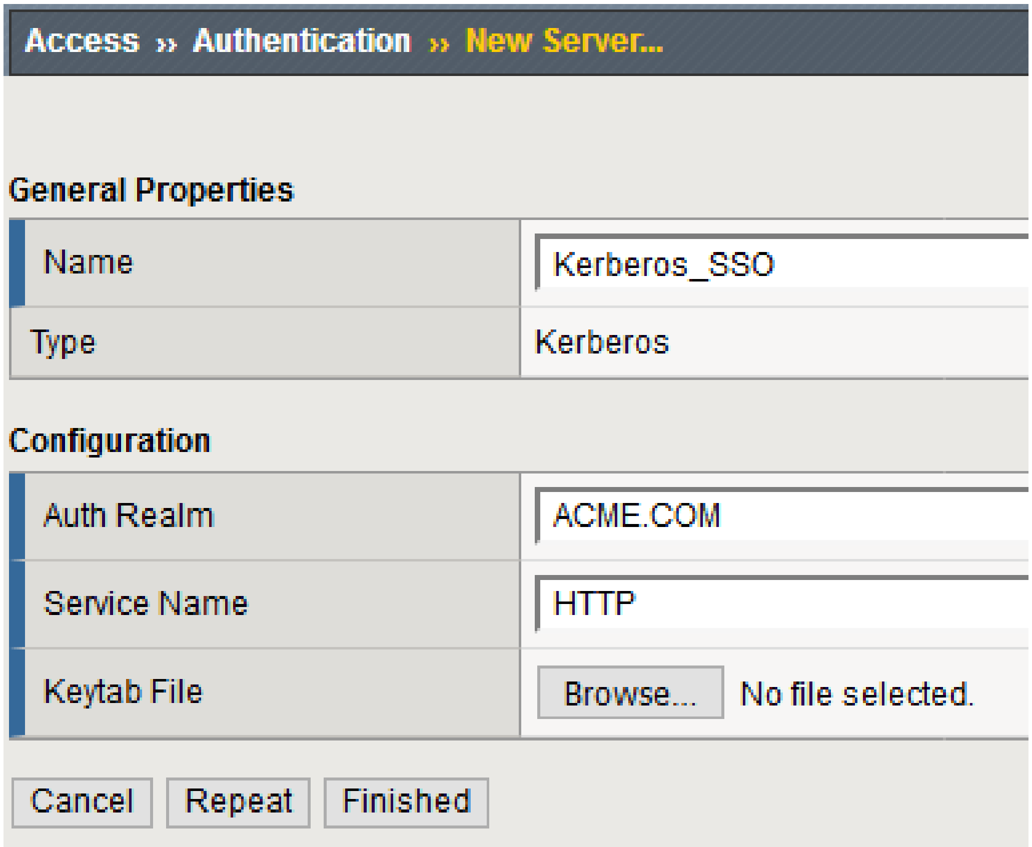
Account expires

● Never
○ End of: Tuesday , August 9, 2016

Kerberos AAA Object

1. Create the AAA object by navigating to **Access ?> Authentication -> Kerberos**
2. Specify a **Name**

3. Specify the **Auth Realm** (Ad Domain)
4. Specify a **Service Name** (This should be *HTTP* for http/https services)
5. Browse to locate the **Keytab File**
6. Click **Finished** to complete creation of the AAA object



Access » Authentication » New Server...

General Properties

Name	Kerberos_SSO
Type	Kerberos

Configuration

Auth Realm	ACME.COM
Service Name	HTTP
Keytab File	Browse... No file selected.

7. Review the AAA server configuration at **Access ?> Authentication**

2

Class 2: OAuth Federation with F5

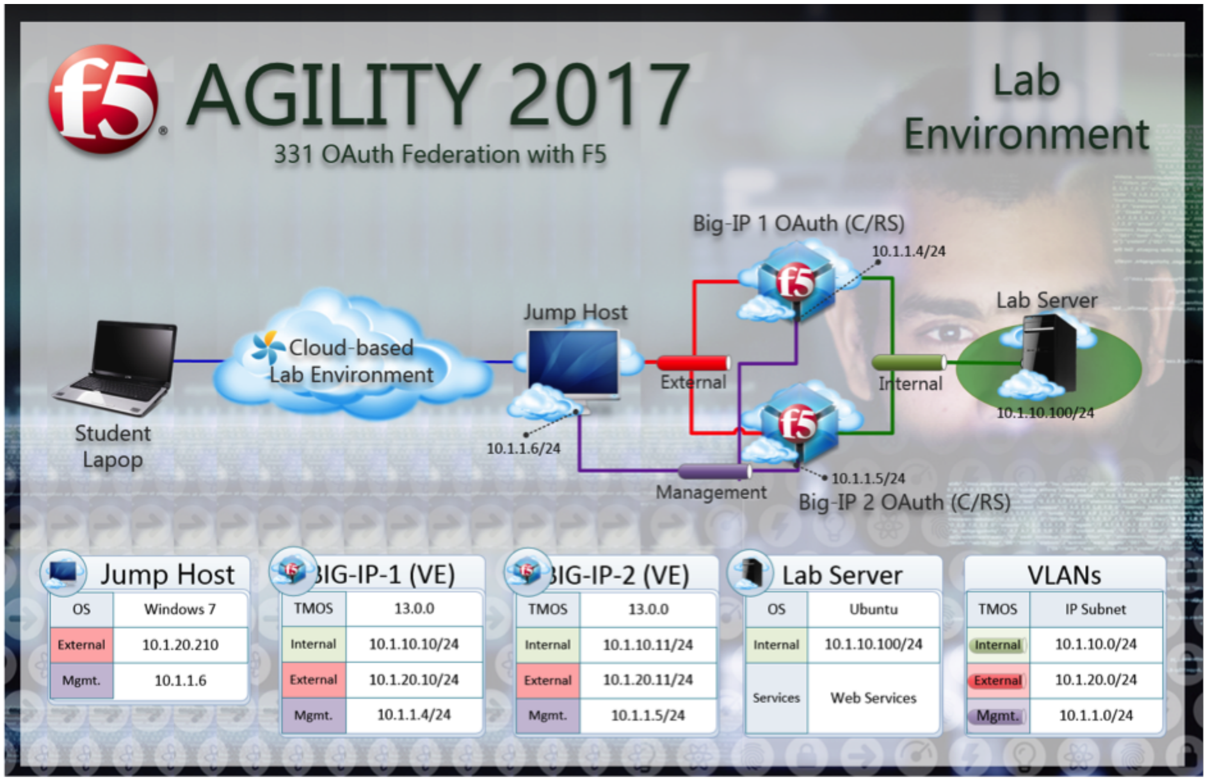
2.1 Lab Environment

All lab prep is already completed if you are working in the UDF or Ravello blueprint. The following information will be critical for operating your lab. Additional information can be found in the ***Learn More*** section of this guide for setting up your own lab.

Lab Credentials

Host/Resource	Username	Password
Windows Jump Host	user	user
Big-IP 1, Big-IP 2 GUI (Browser Access)	admin	admin
Big-IP 1, Big-IP 2 CLI (SSH Access)	root	default

Lab Network & Resource Design



AGILITY 2017

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Lab Environment

Jump Host

OS	Windows 7
External	10.1.20.210
Mgmt.	10.1.1.6

BIG-IP-1 (VE)

TMOS	13.0.0
Internal	10.1.10.10/24
External	10.1.20.10/24
Mgmt.	10.1.1.4/24

BIG-IP-2 (VE)

TMOS	13.0.0
Internal	10.1.10.11/24
External	10.1.20.11/24
Mgmt.	10.1.1.5/24

Lab Server

OS	Ubuntu
Internal	10.1.10.100/24
Services	Web Services

VLANs

TMOS	IP Subnet
Internal	10.1.10.0/24
External	10.1.20.0/24
Mgmt.	10.1.1.0/24

2.2 Lab 1: Social Login Lab

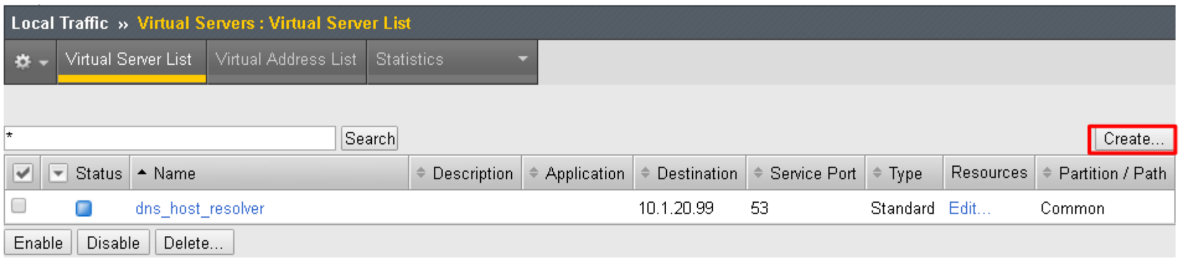
Note: The entire module covering Social Login is performed on BIG-IP 1 (OAuth C/RS)

2.2.1 Purpose

This module will teach you how to configure a Big-IP as a client and resource server enabling you to integrate with social login providers like Facebook, Google, and LinkedIn to provide access to a web application. You will inject the identity provided by the social network into a header that the backend application can use to identify the user.

2.2.2 Task 1: Setup Virtual Server

1. Go to **Local Traffic -> Virtual Servers -> Create**

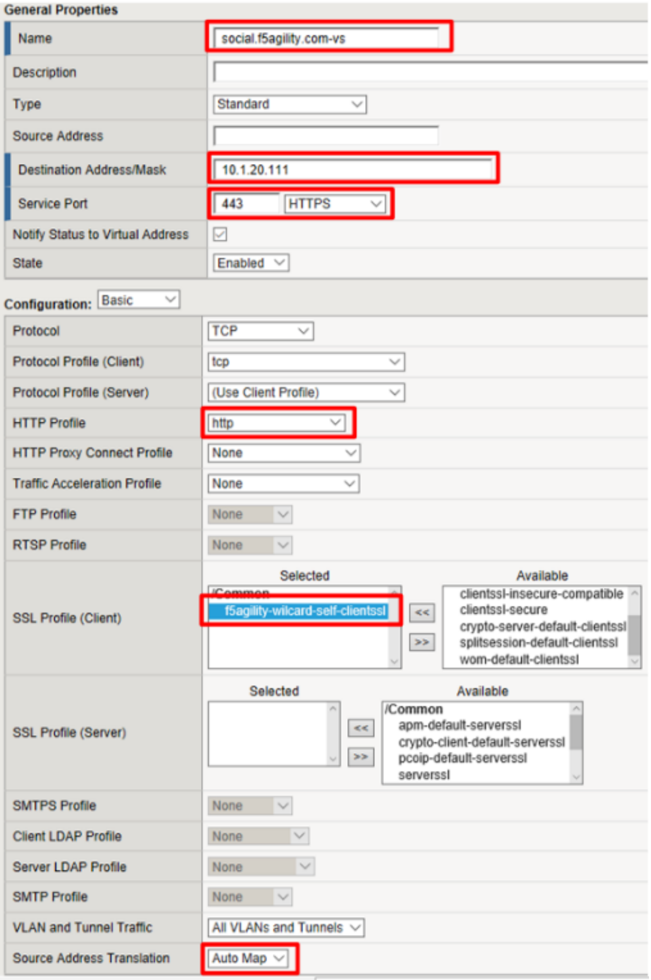


Local Traffic » Virtual Servers : Virtual Server List

☑	Status	Name	Description	Application	Destination	Service Port	Type	Resources	Partition / Path
□	■	dns_host_resolver			10.1.20.99	53	Standard	Edit...	Common

2. Enter the following values *(leave others default)*

   - **Name:** `social.f5agility.com-vs`
   - **Destination Address:** `10.1.20.111`
   - **Service Port:** `443`
   - **HTTP Profile:** `http`
   - **SSL Profile (Client):** `f5agility-wildcard-self-clientssl`
   - **Source Address Translation:** `Auto Map`



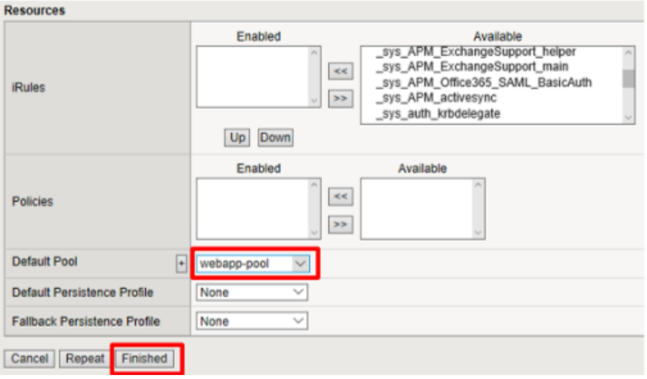
General Properties

Name	social.f5agility.com-vs
Description	
Type	Standard
Source Address	
Destination Address/Mask	10.1.20.111
Service Port	443 HTTPS
Notify Status to Virtual Address	☑
State	Enabled

Configuration: Basic

Protocol	TCP
Protocol Profile (Client)	tcp
Protocol Profile (Server)	(Use Client Profile)
HTTP Profile	http
HTTP Proxy Connect Profile	None
Traffic Acceleration Profile	None
FTP Profile	None
RTSP Profile	None
SSL Profile (Client)	Selected: /Common f5agility-wilcard-self-clientssl Available: clientssl-insecure-compatible clientssl-secure crypto-server-default-clientssl splitsession-default-clientssl wom-default-clientssl
SSL Profile (Server)	Selected: Available: /Common apm-default-serverssl crypto-client-default-serverssl pcoip-default-serverssl serverssl
SMTPS Profile	None
Client LDAP Profile	None
Server LDAP Profile	None
SMTP Profile	None
VLAN and Tunnel Traffic	All VLANs and Tunnels
Source Address Translation	Auto Map

3. Select webapp-pool from the Default Pool drop down and then click **Finished**

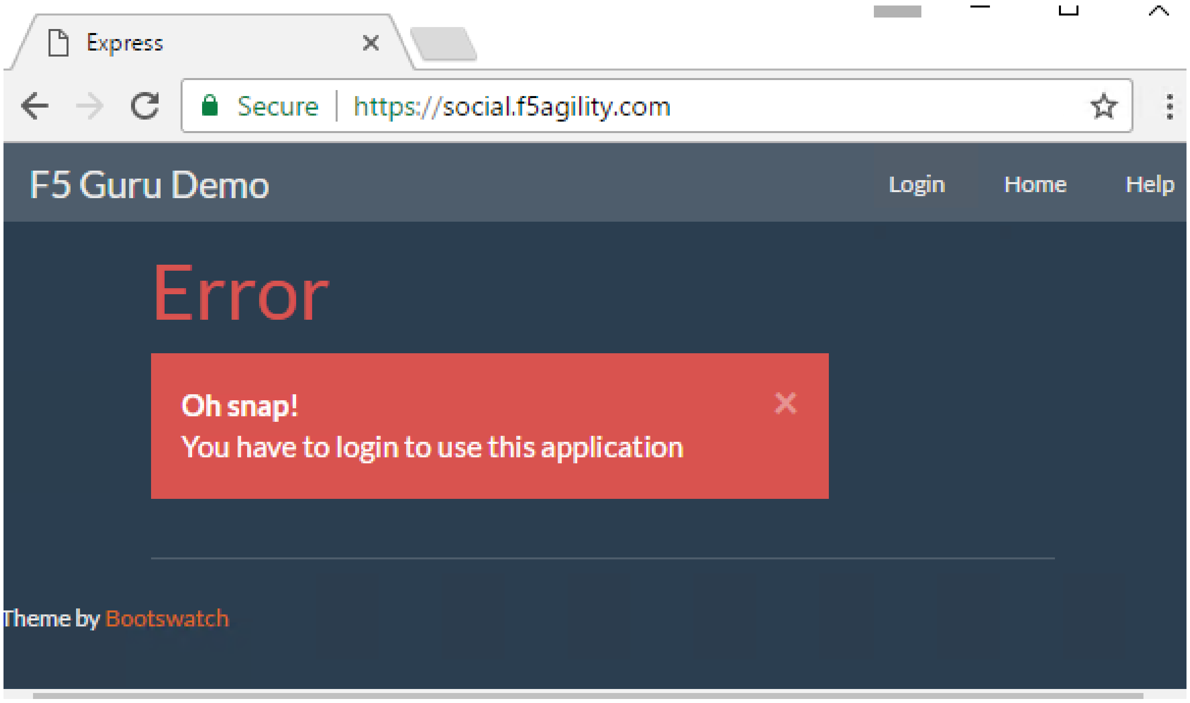


Resources

iRules	Enabled: Available: _sys_APM_ExchangeSupport_helper, _sys_APM_ExchangeSupport_main, _sys_APM_Office365_SAML_BasicAuth, _sys_APM_activesync, _sys_auth_krbdelegate
Policies	Enabled: Available:
Default Pool	webapp-pool
Default Persistence Profile	None
Fallback Persistence Profile	None

4. Test access to `https://social.f5agility.com` from the jump host's browser.

   You should be able to see the backend application, but it will give you an error indicating you have not logged in because it requires a header to be inserted to identify the user.



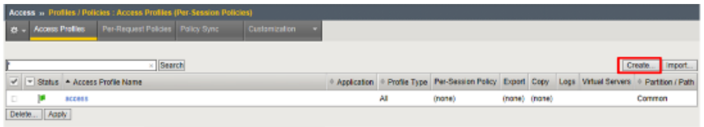
Error

Oh snap!
You have to login to use this application

Theme by Bootswatch

2.2.3 Task 2: Setup APM Profile

1. Go to **Access -> Profiles / Policies -> Access Profiles (Per Session Policies) -> Create**

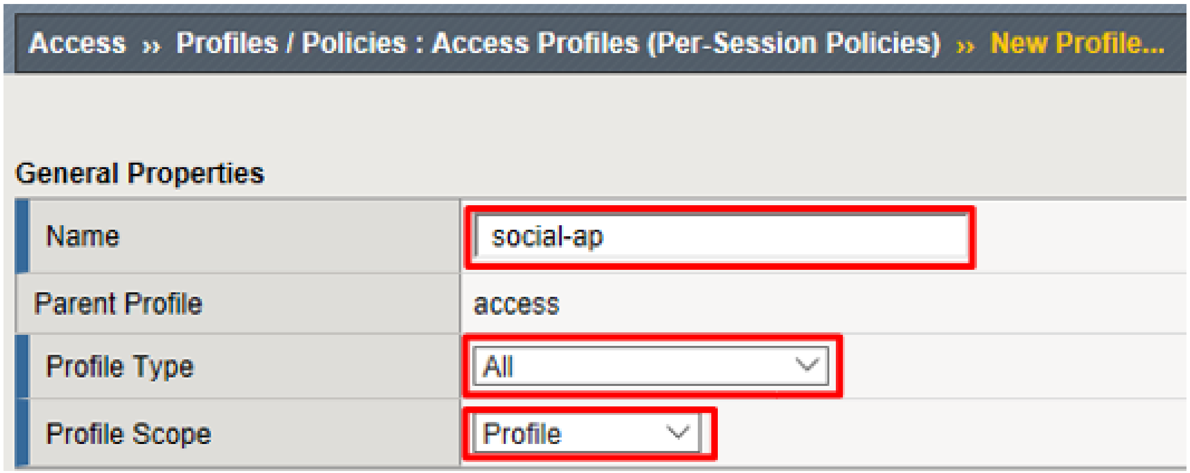


Status	Access Profile Name	Application	Profile Type	Per-Session Policy	Export	Copy	Logs	Virtual Servers	Partition / Path
	access		All	(none)	(none)	(none)			Common

2. Enter the following values (leave others default) then click **Finished**

   - **Name:** `social-ap`
   - **Profile Type:** `All`
   - **Profile Scope:** `Profile`

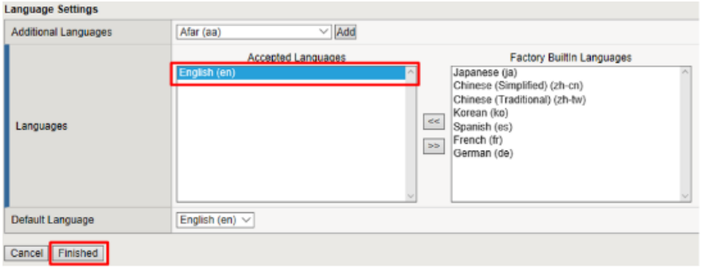
- **Languages:** English



Access » Profiles / Policies : Access Profiles (Per-Session Policies) » New Profile...

General Properties

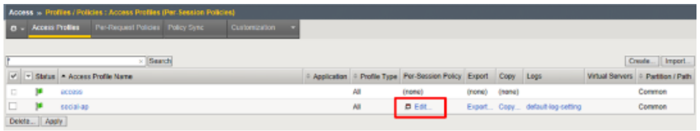
Name	social-ap
Parent Profile	access
Profile Type	All
Profile Scope	Profile



Language Settings

Additional Languages	Afar (aa) Add
Languages	Accepted Languages: English (en) Factory Builtin Languages: Japanese (ja), Chinese (Simplified) (zh-cn), Chinese (Traditional) (zh-tw), Korean (ko), Spanish (es), French (fr), German (de)
Default Language	English (en)

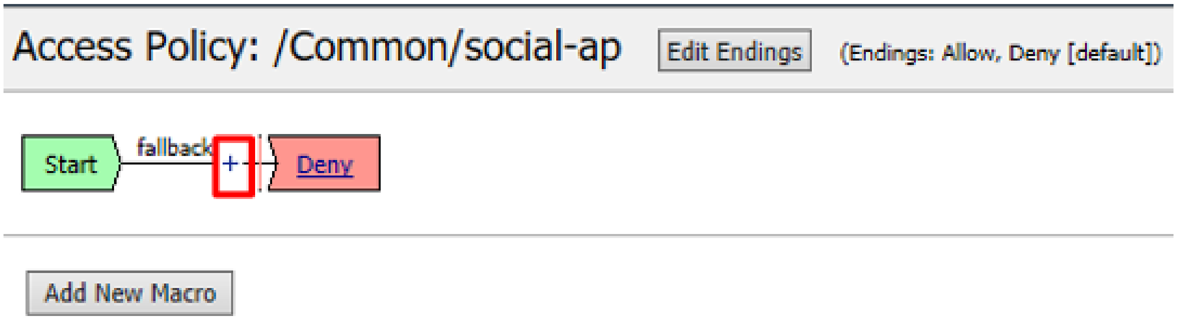
3. Click **Edit** for social-ap, a new browser tab will open



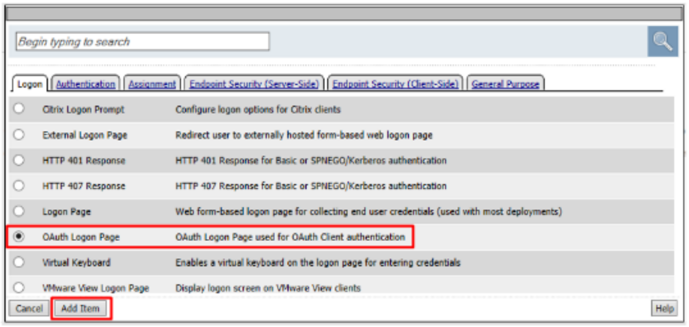
Access » Profiles / Policies : Access Profiles (Per-Session Policies)

Status	Access Profile Name	Application	Profile Type	Per-Session Policy	Export	Copy	Logs	Virtual Servers	Partition / Path
	access		All	(none)	(none)	(none)			Common
	social-ap		All	Edit...	Export...	Copy...	default-log-setting		Common

4. Click the **+** between **Start** and **Deny**, select **OAuth Logon Page** from the **Logon** tab, click **Add Item**



Access Policy: /Common/social-ap



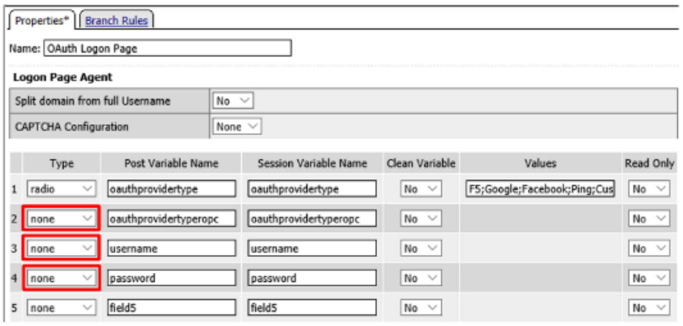
Begin typing to search

Logon | Authentication | Assignment | Endpoint Security (Server-Side) | Endpoint Security (Client-Side) | General Purpose

○	Citrix Logon Prompt	Configure logon options for Citrix clients
○	External Logon Page	Redirect user to externally hosted form-based web logon page
○	HTTP 401 Response	HTTP 401 Response for Basic or SPNEGO/Kerberos authentication
○	HTTP 407 Response	HTTP 407 Response for Basic or SPNEGO/Kerberos authentication
○	Logon Page	Web form-based logon page for collecting end user credentials (used with most deployments)
●	OAuth Logon Page	OAuth Logon Page used for OAuth Client authentication
○	Virtual Keyboard	Enables a virtual keyboard on the logon page for entering credentials
○	VMware View Logon Page	Display logon screen on VMware View clients

Cancel | Add Item | Help

5. Set the **Type** on **Lines 2, 3, and 4** to none



Properties* | Branch Rules

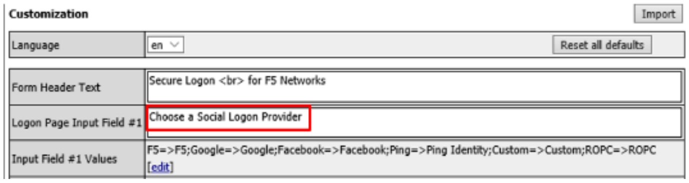
Name: OAuth Logon Page

Logon Page Agent

Split domain from full Username	No
CAPTCHA Configuration	None

	Type	Post Variable Name	Session Variable Name	Clean Variable	Values	Read Only
1	radio	oauthprovidertype	oauthprovidertype	No	F5;Google;Facebook;Ping;Cus	No
2	none	oauthprovidertypeeropc	oauthprovidertypeeropc	No		No
3	none	username	username	No		No
4	none	password	password	No		No
5	none	field5	field5	No		No

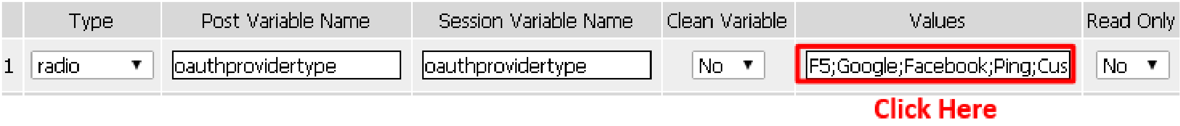
6. Change the **Logon Page, Input Field #1** to “Choose a Social Logon Provider”



Customization Import

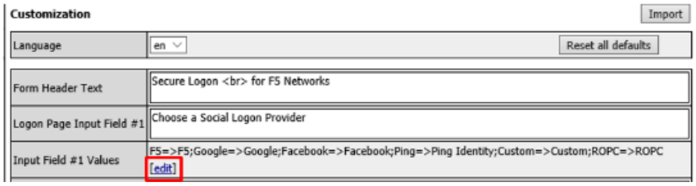
Language	en Reset all defaults
Form Header Text	Secure Logon for F5 Networks
Logon Page Input Field #1	Choose a Social Logon Provider
Input Field #1 Values	F5=>F5;Google=>Google;Facebook=>Facebook;Ping=>Ping Identity;Custom=>Custom;ROPC=>ROPC [edit]

7. Click the **Values** column for **Line 1**, a new window will open.



	Type	Post Variable Name	Session Variable Name	Clean Variable	Values	Read Only
1	radio	oauthprovidertype	oauthprovidertype	No	F5;Google;Facebook;Ping;Cus	No

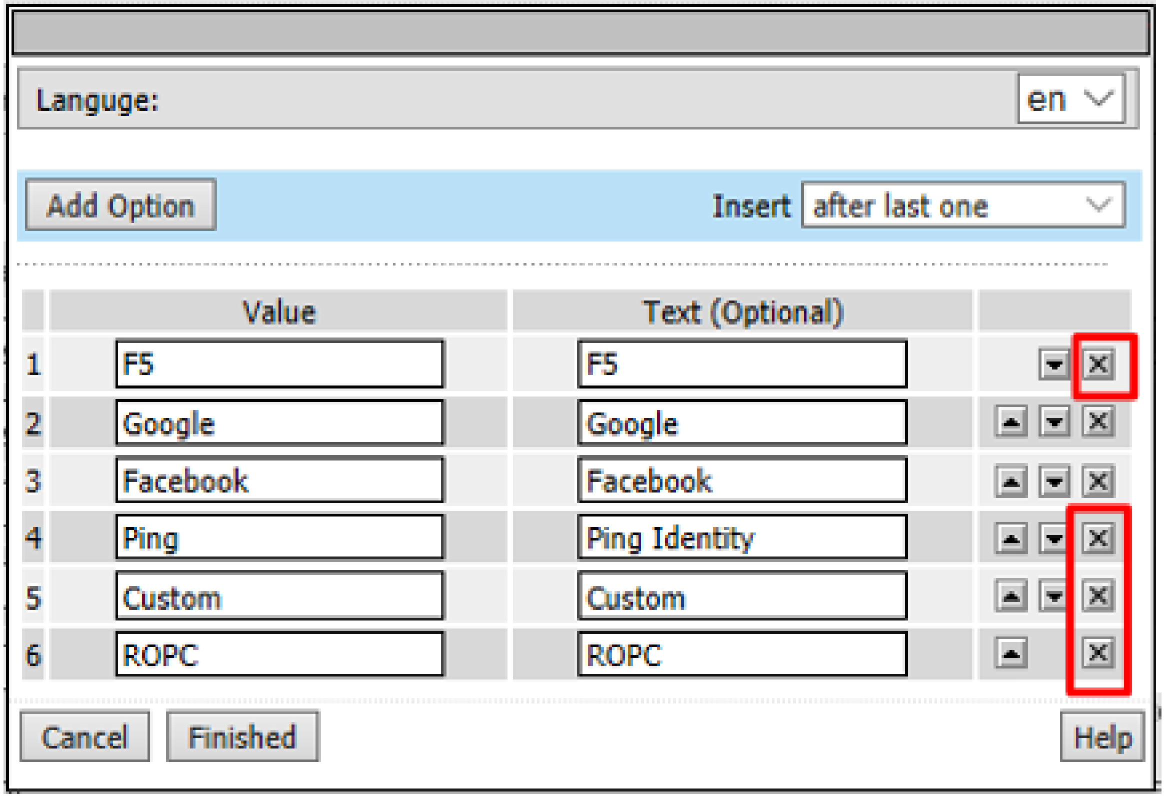
Alternatively, you may click **[Edit]** on the **Input Field #1 Values** line. Either item will bring you to the next menu.



Customization Import

Language	en Reset all defaults
Form Header Text	Secure Logon for F5 Networks
Logon Page Input Field #1	Choose a Social Logon Provider
Input Field #1 Values	F5=>F5;Google=>Google;Facebook=>Facebook;Ping=>Ping Identity;Custom=>Custom;ROPC=>ROPC [edit]

8. Click the **X** to remove **F5, Ping, Custom, and ROPC**

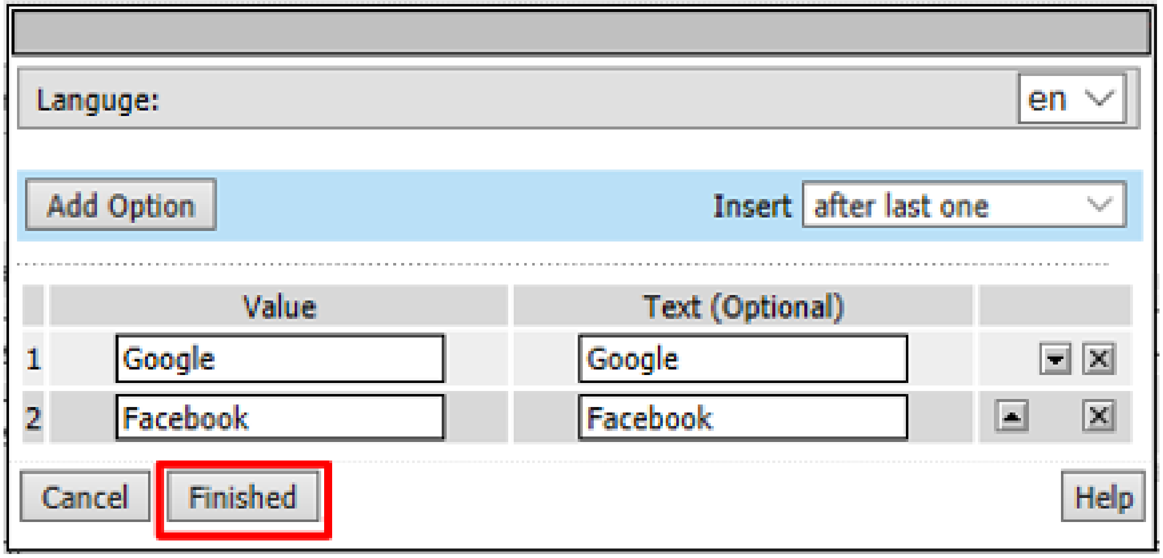


Languge: en

Add Option Insert after last one

	Value	Text (Optional)
1	F5	F5
2	Google	Google
3	Facebook	Facebook
4	Ping	Ping Identity
5	Custom	Custom
6	ROPC	ROPC

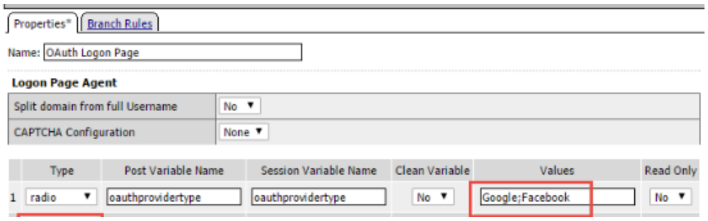
9. Click **Finished**



Languge: en

Add Option Insert after last one

	Value	Text (Optional)
1	Google	Google
2	Facebook	Facebook



Name: OAuth Logon Page

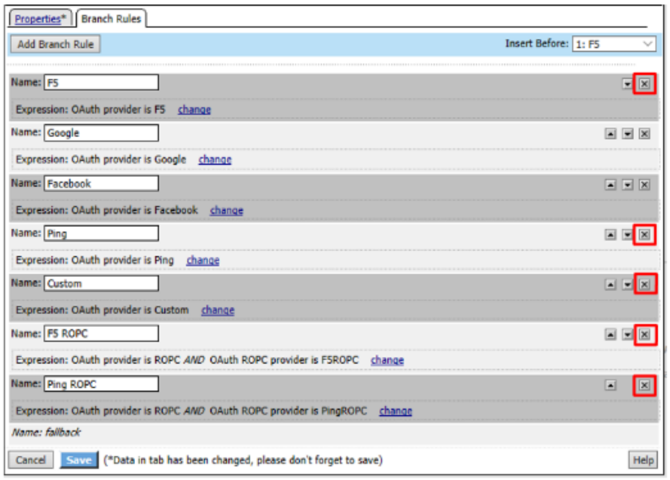
Logon Page Agent

Split domain from full Username	No
CAPTCHA Configuration	None

	Type	Post Variable Name	Session Variable Name	Clean Variable	Values	Read Only
1	radio	oauthprovidertype	oauthprovidertype	No	Google;Facebook	No

Note: The resulting screen is shown

10. **Go to the Branch Rules tab and click the X to remove F5, Ping**, **Custom**, **F5 ROPC**, and **Ping ROPC**



Properties* | Branch Rules

Add Branch Rule — Insert Before: 1: F5

Name: F5
Expression: OAuth provider is F5 change

Name: Google
Expression: OAuth provider is Google change

Name: Facebook
Expression: OAuth provider is Facebook change

Name: Ping
Expression: OAuth provider is Ping change

Name: Custom
Expression: OAuth provider is Custom change

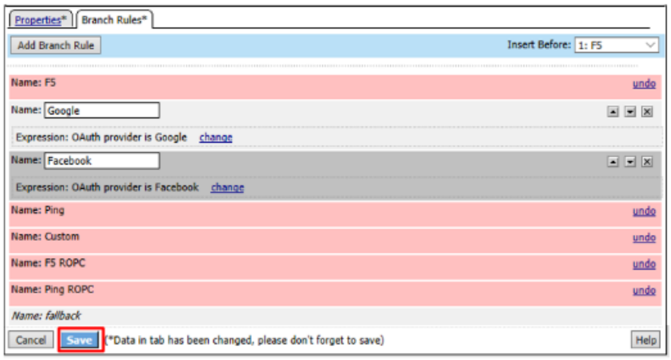
Name: F5 ROPC
Expression: OAuth provider is ROPC *AND* OAuth ROPC provider is F5ROPC change

Name: Ping ROPC
Expression: OAuth provider is ROPC *AND* OAuth ROPC provider is PingROPC change

Name: fallback

Cancel | Save | (*Data in tab has been changed, please don't forget to save) | Help

11. Click **Save**



Properties* | Branch Rules*

Add Branch Rule — Insert Before: 1: F5

Name: F5 undo

Name: Google
Expression: OAuth provider is Google change

Name: Facebook
Expression: OAuth provider is Facebook change

Name: Ping undo

Name: Custom undo

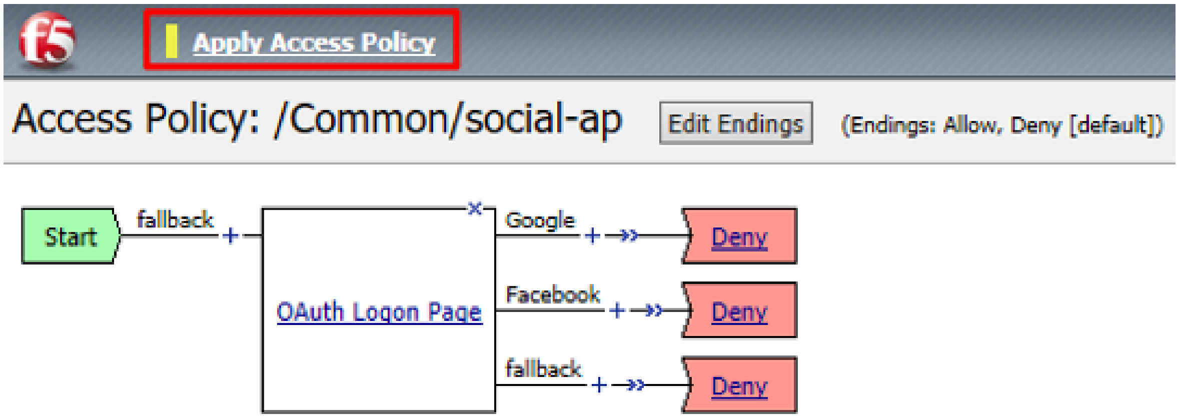
Name: F5 ROPC undo

Name: Ping ROPC undo

Name: fallback

Cancel | Save | (*Data in tab has been changed, please don't forget to save) | Help

12. Click **Apply Access Policy** in the top left and then close the browser tab

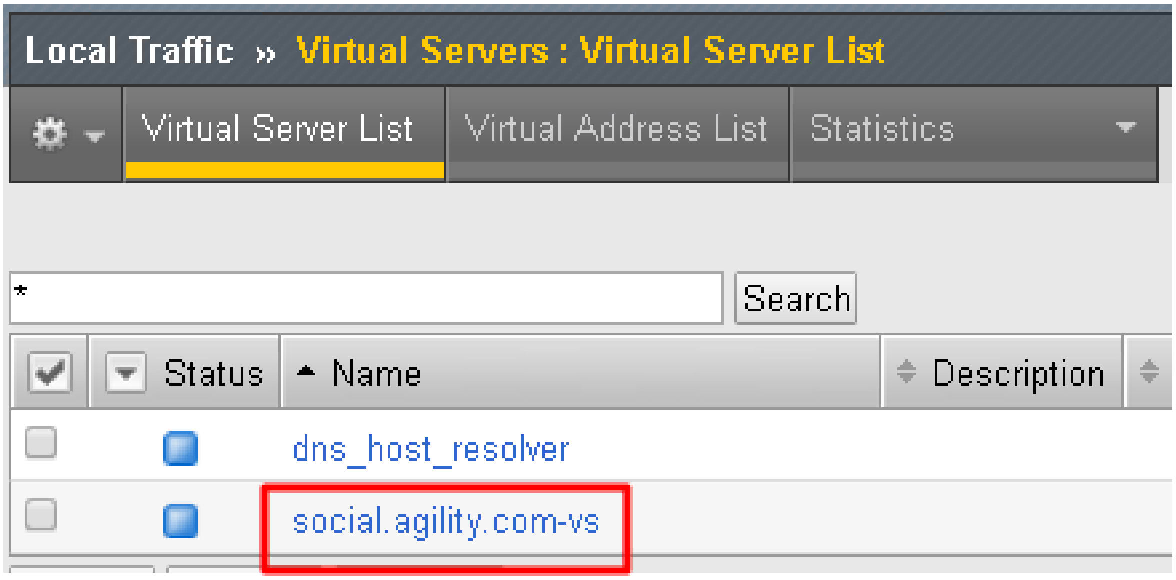


Apply Access Policy

Access Policy: /Common/social-ap | Edit Endings | (Endings: Allow, Deny [default])

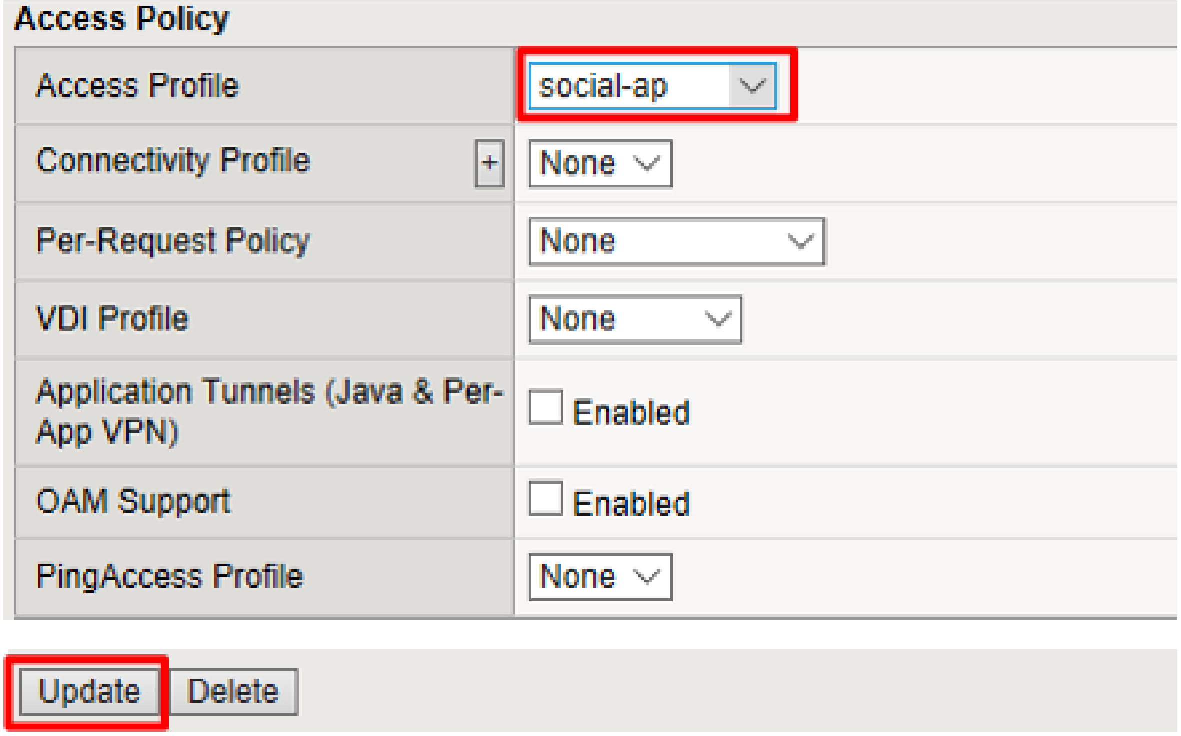
2.2.4 Task 3: Add the Access Policy to the Virtual Server

1. Go to **Local Traffic -> Virtual Servers -> social.f5agility.com-vs**



☑	Status	Name	Description
□	🟦	dns_host_resolver	
□	🟦	social.agility.com-vs	

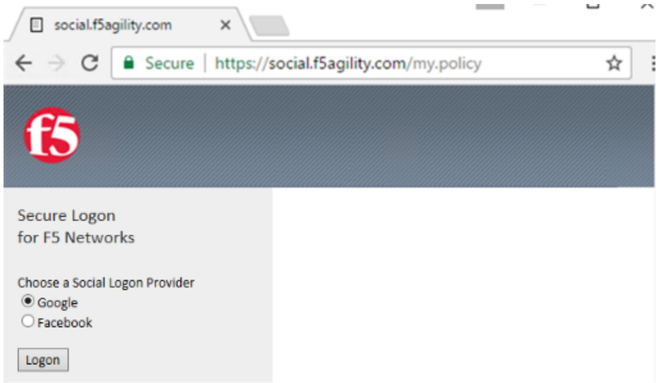
2. Modify the **Access Profile** setting from none to social-ap and click **Update**



Access Policy

Access Profile	social-ap
Connectivity Profile	None
Per-Request Policy	None
VDI Profile	None
Application Tunnels (Java & Per-App VPN)	□ Enabled
OAM Support	□ Enabled
PingAccess Profile	None

3. Test access to https://social.f5agility.com from the jump host again, you should now see a logon page requiring you to select your authentication provider. Any attempt to authenticate will fail since we have only deny endings.



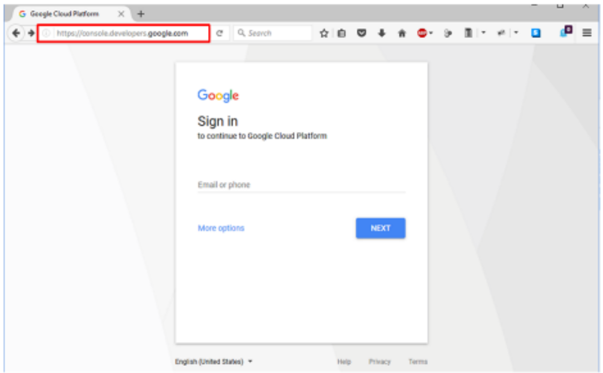
Secure Logon
for F5 Networks

Choose a Social Logon Provider
● Google
○ Facebook

2.2.5 Task 4: Google (Built-In Provider)

Setup a Google Project

1. Login at https://console.developers.google.com

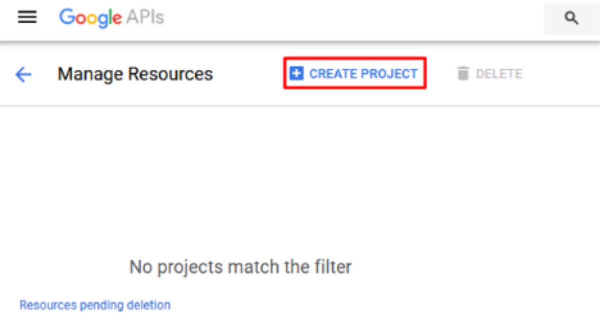


Sign in
to continue to Google Cloud Platform

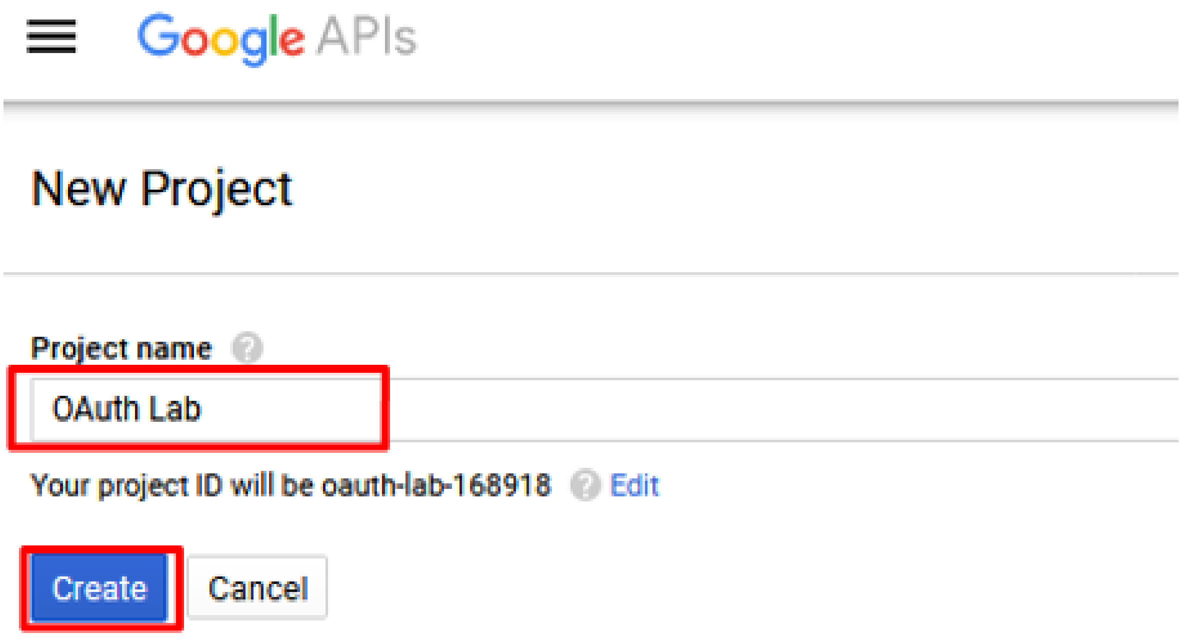
Email or phone

Note: This portion of the exercise requires a Google Account. You may use an existing one or create one for the purposes of this lab

2. Click **Create Project** and give it a name like “OAuth Lab” and click **Create**



No projects match the filter



Project name: OAuth Lab

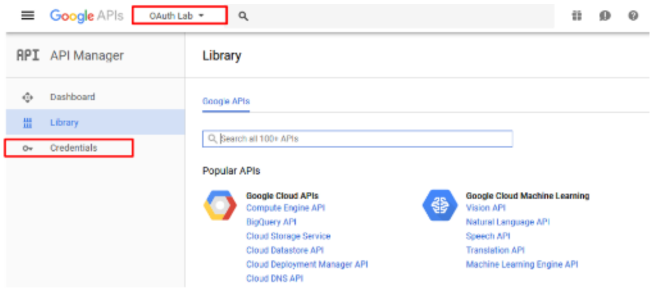
Your project ID will be oauth-lab-168918 Edit

Note: You may have existing projects so the menus may be slightly different.

Note: You may have to click on Google+ API under Social APIs

---

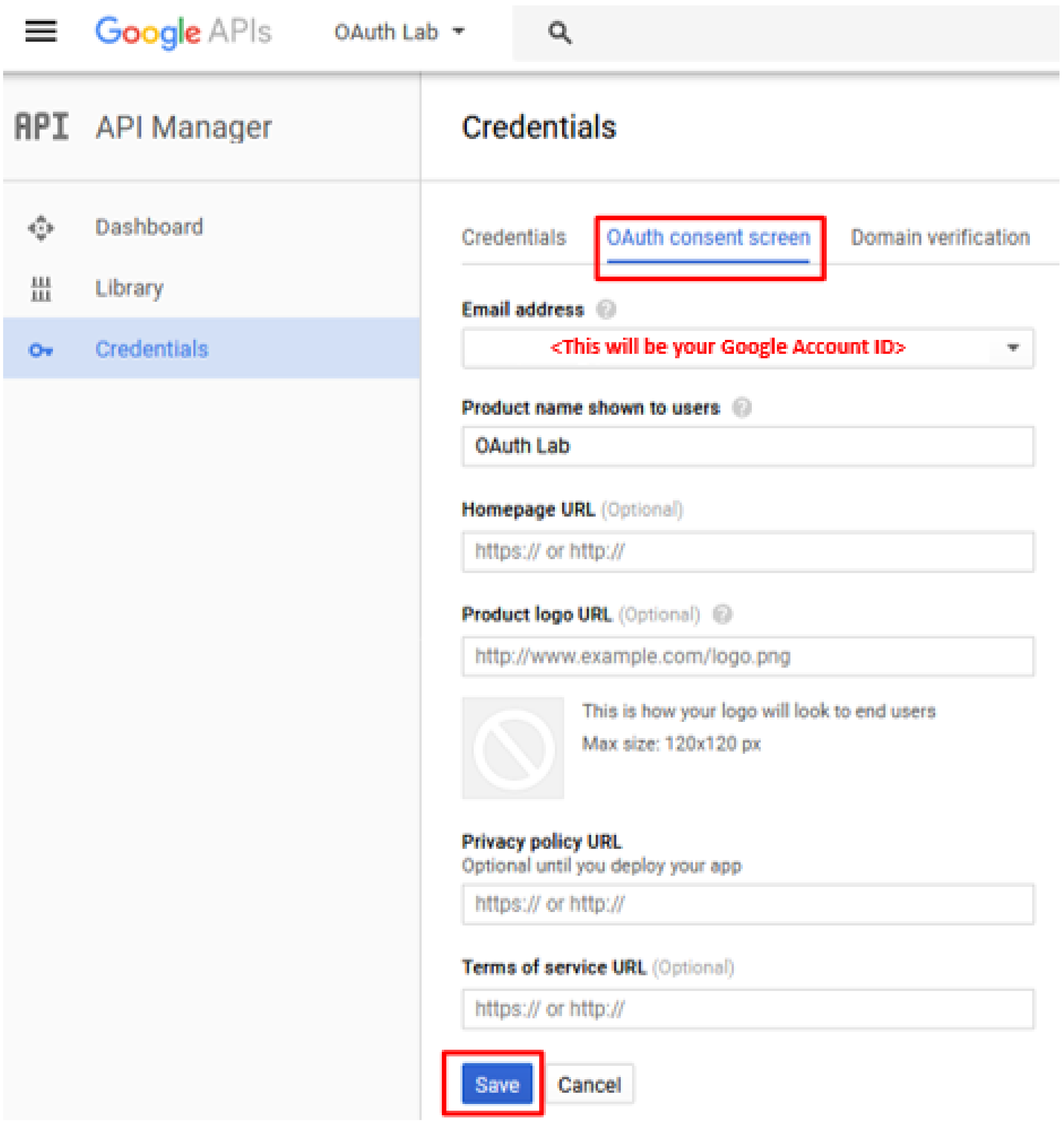
3. Go to the **Credentials** section on the left side.



Note: You may have navigate to your OAuth Lab project depending on your browser or prior work in Google Developer

---

4. Click **OAuth Consent Screen** tab, fill out the product name with “OAuth Lab”, then click save



Email address

<This will be your Google Account ID>

Product name shown to users

OAuth Lab

Homepage URL (Optional)

https:// or http://

Product logo URL (Optional)

http://www.example.com/logo.png

This is how your logo will look to end users

Max size: 120x120 px

Privacy policy URL

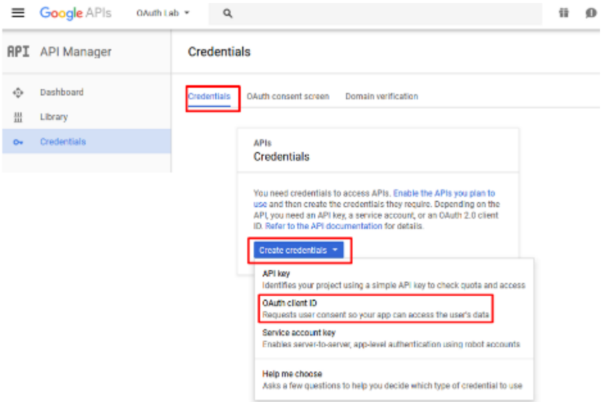
Optional until you deploy your app

https:// or http://

Terms of service URL (Optional)

https:// or http://

5. Go to the **Credentials** tab (if you are not taken there), click **Create Credentials** and select **OAuth Client ID**



You need credentials to access APIs. Enable the APIs you plan to use and then create the credentials they require. Depending on the API, you need an API key, a service account, or an OAuth 2.0 client ID. Refer to the API documentation for details.

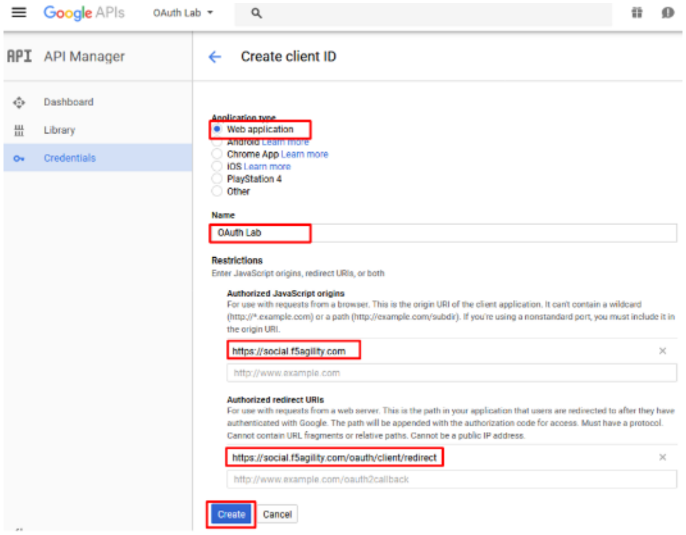
API key – Identifies your project using a simple API key to check quota and access

OAuth client ID – Requests user consent so your app can access the user's data

Service account key – Enables server-to-server, app-level authentication using robot accounts

Help me choose – Asks a few questions to help you decide which type of credential to use

6. Under the **Create Client ID** screen, select and enter the following values and click **Create**
   - **Application Type:** `Web Application`
   - **Name:** `OAuth Lab`
   - **Authorized Javascript Origins:** `https://social.f5agility.com`
   - **Authorized Redirect URIs:** `https://social.f5agility.com/oauth/client/redirect`



Application type

● Web application
○ Android Learn more
○ Chrome App Learn more
○ iOS Learn more
○ PlayStation 4
○ Other

Name: OAuth Lab

Restrictions

Enter JavaScript origins, redirect URIs, or both

Authorized JavaScript origins

For use with requests from a browser. This is the origin URI of the client application. It can't contain a wildcard (http://*.example.com) or a path (http://example.com/subdir). If you're using a nonstandard port, you must include it in the origin URI.

https://social.f5agility.com

http://www.example.com

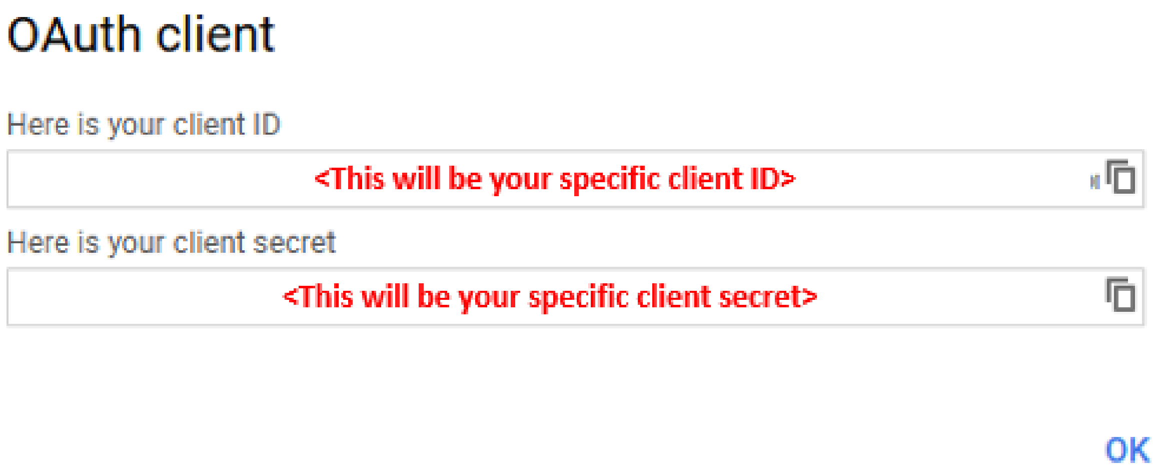
Authorized redirect URIs

For use with requests from a web server. This is the path in your application that users are redirected to after they have authenticated with Google. The path will be appended with the authorization code for access. Must have a protocol. Cannot contain URL fragments or relative paths. Cannot be a public IP address.

https://social.f5agility.com/oauth/client/redirect

http://www.example.com/oauth2callback

7. Copy the **Client ID** and **Client Secret** to notepad, or you can get it by clicking on the **OAuth Lab Credentials** section later if needed. You will need these when you setup Access Policy Manager (APM).



OAuth client

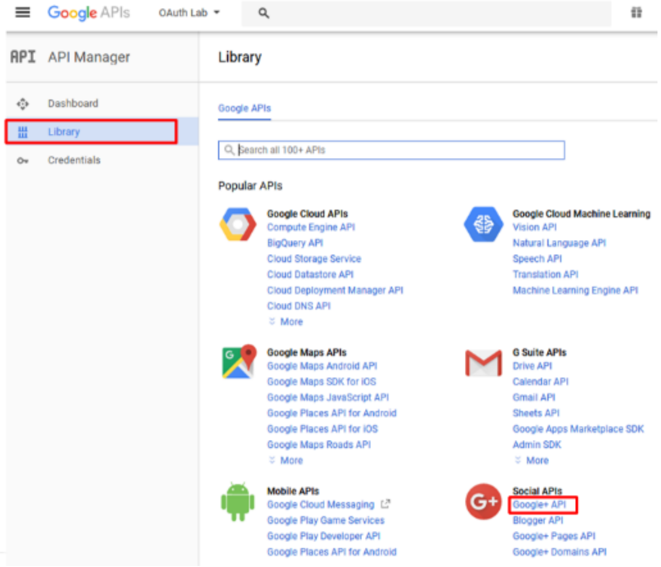
Here is your client ID

<This will be your specific client ID>

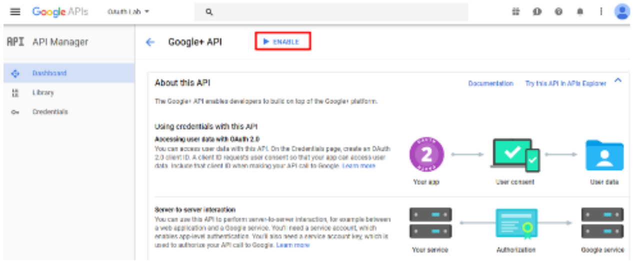
Here is your client secret

<This will be your specific client secret>

8. Click **Library** in the left-hand navigation section, then select **Google+ API** under **Social APIs** or search for it



9. Click **Enable** and wait for it to complete, you will now be able to view reporting on usage here



About this API

The Google+ API enables developers to build on top of the Google+ platform.

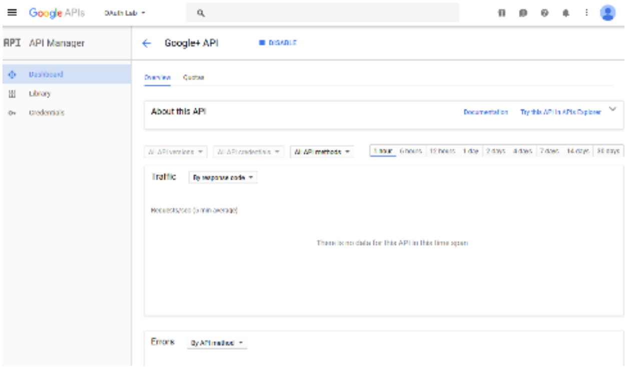
Using credentials with this API

Accessing user data with OAuth 2.0

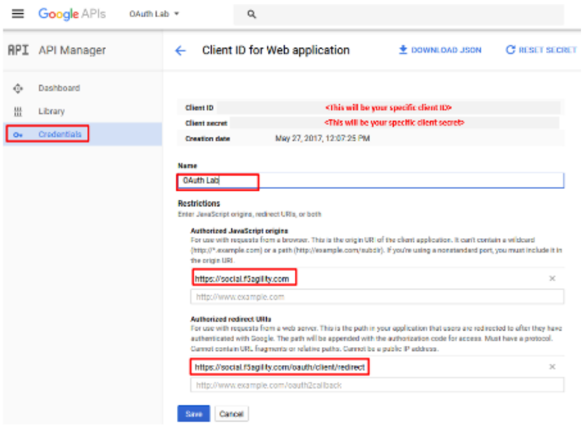
You can access user data with this API. On the Credentials page, create an OAuth 2.0 client ID. A client ID requests user consent so that your app can access user data. Include that client ID when making your API call to Google. Learn more

Server to server interaction

You can use this API to perform server-to-server interaction, for example between a web application and a Google service. You'll need a service account, which enables app-level authentication. You'll also need a service account key, which is used to authorize your API call to Google. Learn more



10. For Reference: This is a screenshot of the completed Google project:



Client ID <This will be your specific client ID>

Client secret <This will be your specific client secret>

Creation date May 27, 2017, 12:07:25 PM

Name: OAuth Lab

Restrictions

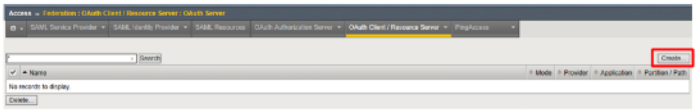
Enter JavaScript origins, redirect URIs, or both

Authorized JavaScript origins: https://social.f5agility.com

Authorized redirect URIs: https://social.f5agility.com/oauth/client/redirect

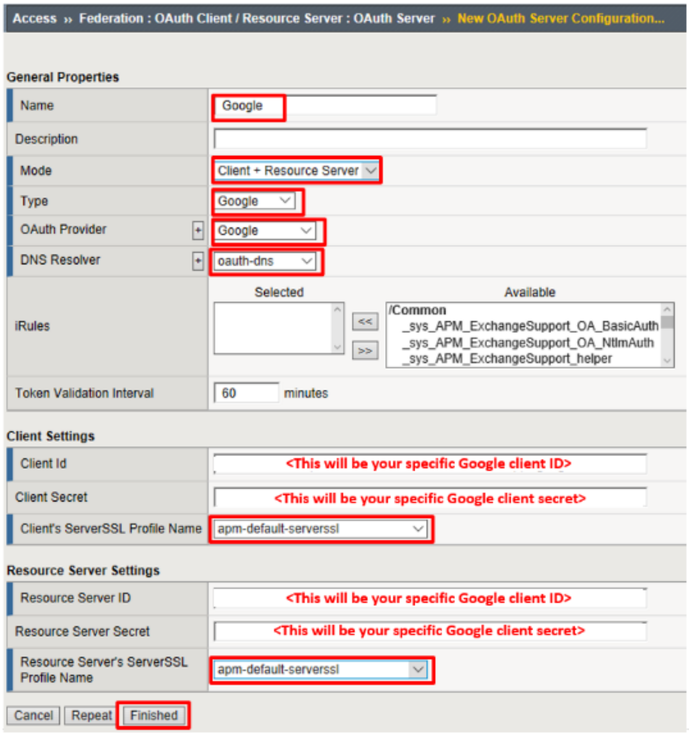
Configure Access Policy Manager (APM) to authenticate with Google

1. Configure the **OAuth Server** Object: Go to **Access -> Federation -> OAuth Client / Resource Server -> OAuth Server** and click **Create**



2. Enter the values as shown below for the **OAuth Server** and click **Finished**
   - **Name:** Google
   - **Mode:** `Client + Resource Server`
   - **Type:** `Google`
   - **OAuth Provider:** `Google`
   - **DNS Resolver:** `oauth-dns *(configured for you)*`
   - **Client ID:** `<Client ID from Google>`
   - **Client Secret:** `<Client Secret from Google>`
   - **Client's ServerSSL Profile Name:** `apm-default-serverssl`
   - **Resource Server ID:** `<Client ID from Google>`
   - **Resource Server Secret:** `<Client Secret from Google>`

- **Resource Server's ServerSSL Profile Name:** `apm-default-serverssl`



Access » Federation : OAuth Client / Resource Server : OAuth Server » New OAuth Server Configuration...

General Properties

Name	Google
Description	
Mode	Client + Resource Server
Type	Google
OAuth Provider	Google
DNS Resolver	oauth-dns
iRules	Selected: Available: /Common _sys_APM_ExchangeSupport_OA_BasicAuth _sys_APM_ExchangeSupport_OA_NtlmAuth _sys_APM_ExchangeSupport_helper
Token Validation Interval	60 minutes

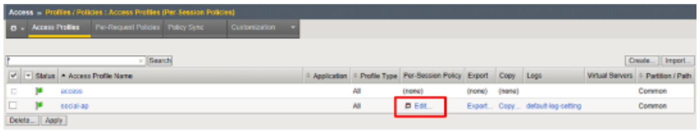
Client Settings

Client Id	<This will be your specific Google client ID>
Client Secret	<This will be your specific Google client secret>
Client's ServerSSL Profile Name	apm-default-serverssl

Resource Server Settings

Resource Server ID	<This will be your specific Google client ID>
Resource Server Secret	<This will be your specific Google client secret>
Resource Server's ServerSSL Profile Name	apm-default-serverssl

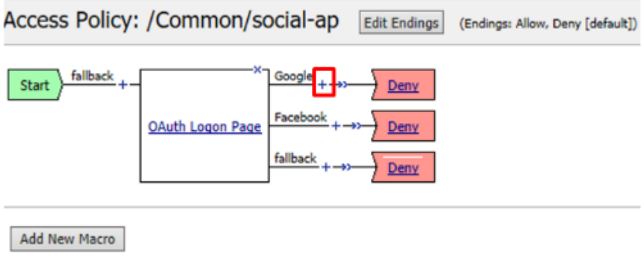
3. Configure the VPE for Google: Go to **Access -> Profiles** / **Policies -> Access Profiles (Per Session Policies)** and click **Edit** on `social-ap`, a new browser tab will open



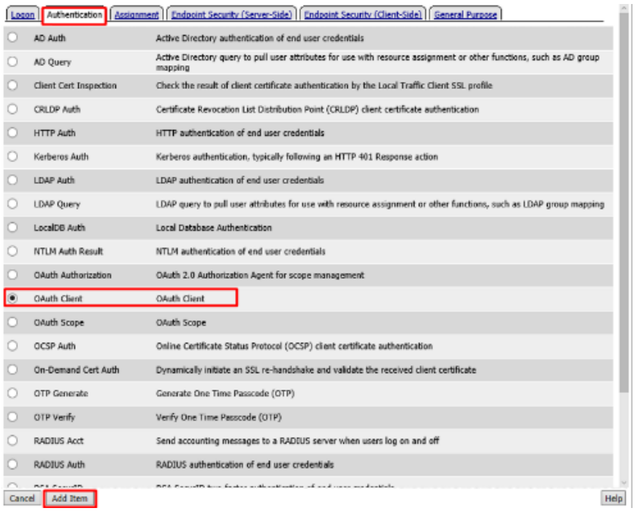
Access » Profiles / Policies : Access Profiles (Per-Session Policies)

Status	Access Profile Name	Application	Profile Type	Per-Session Policy	Export	Copy	Logs	Virtual Servers	Partition / Path
	access		All	(none)	(none)	(none)			Common
	social-ap		All	Edit...	Export...	Copy...	default-log-setting		Common

4. Click the + on the **Google** provider's branch after the **OAuth Logon Page**



5. Select **OAuth Client** from the **Authentication** tab and click **Add Item**

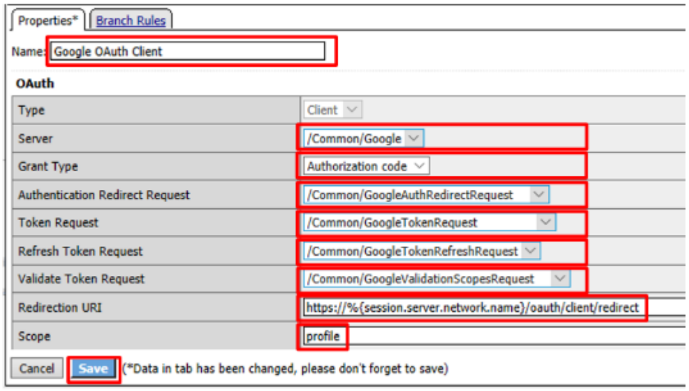


Logon | Authentication | Assignment | Endpoint Security (Server-Side) | Endpoint Security (Client-Side) | General Purpose

○	AD Auth	Active Directory authentication of end user credentials
○	AD Query	Active Directory query to pull user attributes for use with resource assignment or other functions, such as AD group mapping
○	Client Cert Inspection	Check the result of client certificate authentication by the Local Traffic Client SSL profile
○	CRLDP Auth	Certificate Revocation List Distribution Point (CRLDP) client certificate authentication
○	HTTP Auth	HTTP authentication of end user credentials
○	Kerberos Auth	Kerberos authentication, typically following an HTTP 401 Response action
○	LDAP Auth	LDAP authentication of end user credentials
○	LDAP Query	LDAP query to pull user attributes for use with resource assignment or other functions, such as LDAP group mapping
○	LocalDB Auth	Local Database Authentication
○	NTLM Auth Result	NTLM authentication of end user credentials
○	OAuth Authorization	OAuth 2.0 Authorization Agent for scope management
●	OAuth Client	OAuth Client
○	OAuth Scope	OAuth Scope
○	OCSP Auth	Online Certificate Status Protocol (OCSP) client certificate authentication
○	On-Demand Cert Auth	Dynamically initiate an SSL re-handshake and validate the received client certificate
○	OTP Generate	Generate One Time Passcode (OTP)
○	OTP Verify	Verify One Time Passcode (OTP)
○	RADIUS Acct	Send accounting messages to a RADIUS server when users log on and off
○	RADIUS Auth	RADIUS authentication of end user credentials

6. Enter the following in the **OAuth Client** input screen and click **Save**

   - **Name:** `Google OAuth Client`
   - **Server:** `/Common/Google`
   - **Grant Type:** `Authorization Code`
   - **Authentication Redirect Request:** `/Common/GoogleAuthRedirectRequest`
   - **Token Request:** `/Common/GoogleTokenRequest`
   - **Refresh Token Request:** `/Common/GoogleTokenRefreshRequest`
   - **Validate Token Request:** `/Common/GoogleValidationScopesRequest`
   - **Redirection URI:** `https://%{session.server.network.name}/oauth/client/redirect`
   - **Scope:** `profile`



Properties* | Branch Rules

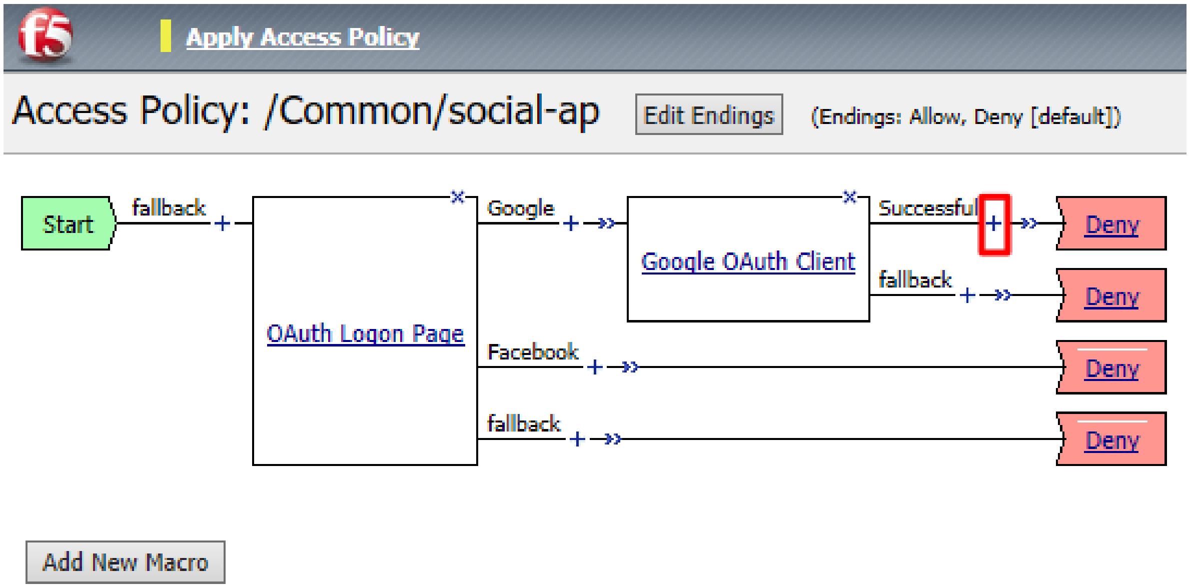
Name: Google OAuth Client

OAuth

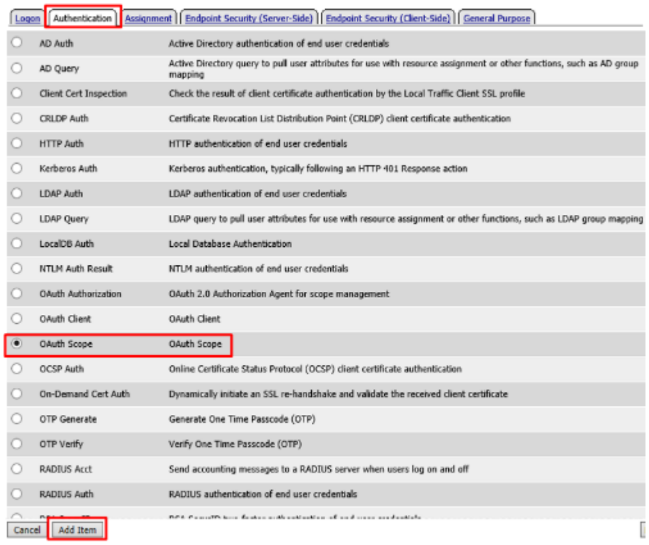
Type	Client
Server	/Common/Google
Grant Type	Authorization code
Authentication Redirect Request	/Common/GoogleAuthRedirectRequest
Token Request	/Common/GoogleTokenRequest
Refresh Token Request	/Common/GoogleTokenRefreshRequest
Validate Token Request	/Common/GoogleValidationScopesRequest
Redirection URI	https://%{session.server.network.name}/oauth/client/redirect
Scope	profile

(*Data in tab has been changed, please don't forget to save)

7. Click **+** on the **Successful** branch after the **Google OAuth Client**



8. Select **OAuth Scope** from the **Authentication** tab, and click **Add Item**


Logon
Authentication
Assignment
Endpoint Security (Server-Side)
Endpoint Security (Client-Side)
General Purpose

○	AD Auth	Active Directory authentication of end user credentials
○	AD Query	Active Directory query to pull user attributes for use with resource assignment or other functions, such as AD group mapping
○	Client Cert Inspection	Check the result of client certificate authentication by the Local Traffic Client SSL profile
○	CRLDP Auth	Certificate Revocation List Distribution Point (CRLDP) client certificate authentication
○	HTTP Auth	HTTP authentication of end user credentials
○	Kerberos Auth	Kerberos authentication, typically following an HTTP 401 Response action
○	LDAP Auth	LDAP authentication of end user credentials
○	LDAP Query	LDAP query to pull user attributes for use with resource assignment or other functions, such as LDAP group mapping
○	LocalDB Auth	Local Database Authentication
○	NTLM Auth Result	NTLM authentication of end user credentials
○	OAuth Authorization	OAuth 2.0 Authorization Agent for scope management
○	OAuth Client	OAuth Client
●	OAuth Scope	OAuth Scope
○	OCSP Auth	Online Certificate Status Protocol (OCSP) client certificate authentication
○	On-Demand Cert Auth	Dynamically initiate an SSL re-handshake and validate the received client certificate
○	OTP Generate	Generate One Time Passcode (OTP)
○	OTP Verify	Verify One Time Passcode (OTP)
○	RADIUS Acct	Send accounting messages to a RADIUS server when users log on and off
○	RADIUS Auth	RADIUS authentication of end user credentials

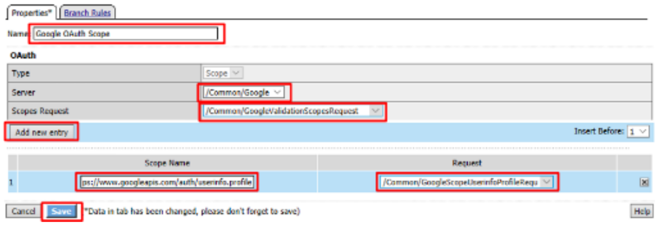
9. Enter the following on the **OAuth Scope** input screen and click **Save**

   - **Name:** `Google OAuth Scope`
   - **Server:** `/Common/Google`
   - **Scopes Request:** `/Common/GoogleValidationScopesRequest`

- Click **Add New Entry**

  – **Scope Name:** `https://www.googleapis.com/auth/userinfo.profile`

  – **Request:** `/Common/GoogleScopeUserInfoProfileRequest`



Properties* | Branch Rules

Name: Google OAuth Scope

OAuth

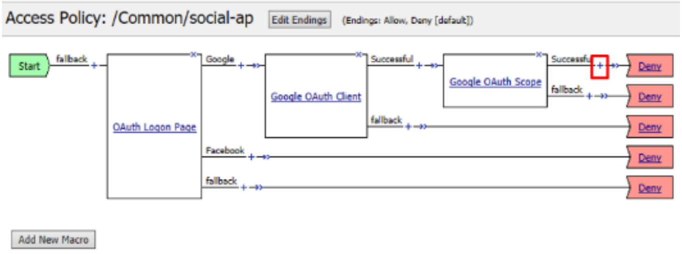
Type	Scope
Server	/Common/Google
Scopes Request	/Common/GoogleValidationScopesRequest

Add new entry — Insert Before: 1

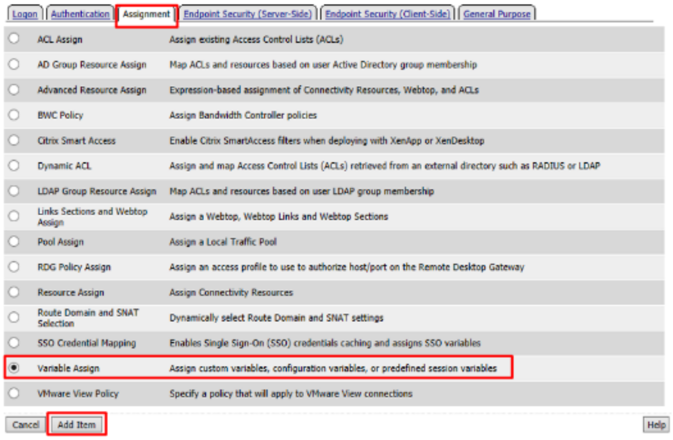
	Scope Name	Request	
1	ps://www.googleapis.com/auth/userinfo.profile	/Common/GoogleScopeUserinfoProfileRequ	☒

Cancel | Save | *Data in tab has been changed, please don't forget to save) | Help

1. **Click the + on the Successful branch after the Google OAuth Scope** object



2. **Select Variable Assign from the Assignment tab, and click Add Item**

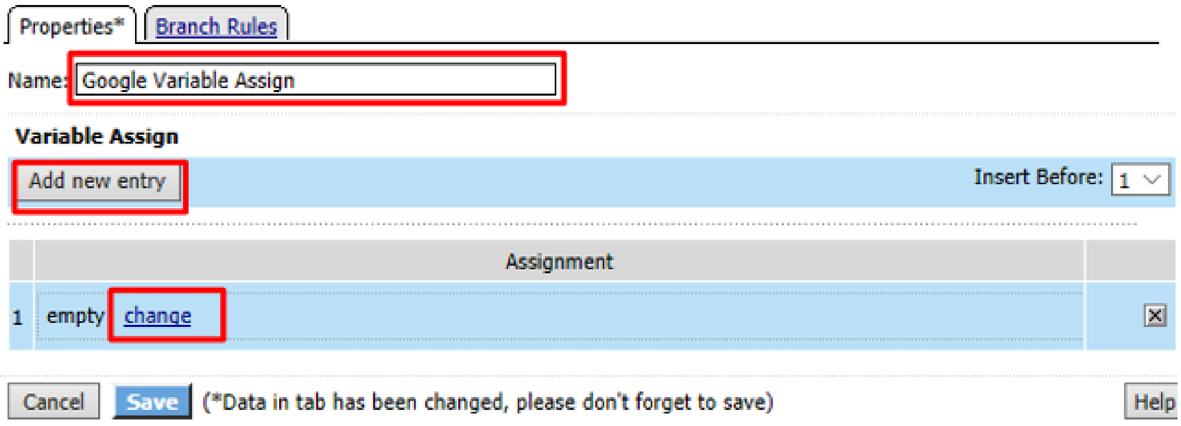


Logon | Authentication | Assignment | Endpoint Security (Server-Side) | Endpoint Security (Client-Side) | General Purpose

○	ACL Assign	Assign existing Access Control Lists (ACLs)
○	AD Group Resource Assign	Map ACLs and resources based on user Active Directory group membership
○	Advanced Resource Assign	Expression-based assignment of Connectivity Resources, Webtop, and ACLs
○	BWC Policy	Assign Bandwidth Controller policies
○	Citrix Smart Access	Enable Citrix SmartAccess filters when deploying with XenApp or XenDesktop
○	Dynamic ACL	Assign and map Access Control Lists (ACLs) retrieved from an external directory such as RADIUS or LDAP
○	LDAP Group Resource Assign	Map ACLs and resources based on user LDAP group membership
○	Links Sections and Webtop Assign	Assign a Webtop, Webtop Links and Webtop Sections
○	Pool Assign	Assign a Local Traffic Pool
○	RDG Policy Assign	Assign an access profile to use to authorize host/port on the Remote Desktop Gateway
○	Resource Assign	Assign Connectivity Resources
○	Route Domain and SNAT Selection	Dynamically select Route Domain and SNAT settings
○	SSO Credential Mapping	Enables Single Sign-On (SSO) credentials caching and assigns SSO variables
●	Variable Assign	Assign custom variables, configuration variables, or predefined session variables
○	VMware View Policy	Specify a policy that will apply to VMware View connections

Cancel | Add Item | Help

3. Name it Google Variable Assign and click **Add New Entry** then **change**



Properties* | Branch Rules

Name: Google Variable Assign

Variable Assign

Add new entry — Insert Before: 1

	Assignment	
1	empty change	☒

Cancel | Save | (*Data in tab has been changed, please don't forget to save) | Help

4. Enter the following values and click **Finished**

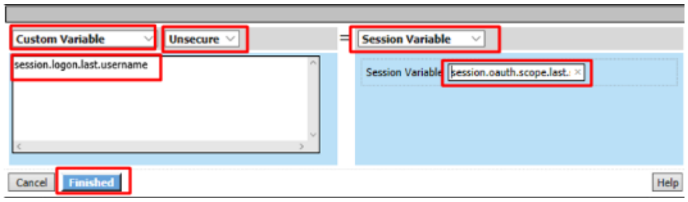
   Left Side:

   - **Type:** `Custom Variable`

- **Security:** `Unsecure`
- **Value:** `session.logon.last.username`

Right Side:

- **Type:** `Session Variable`
- **Session Variable:** `session.oauth.scope.last.scope_data.userinfo.profile.displayName`

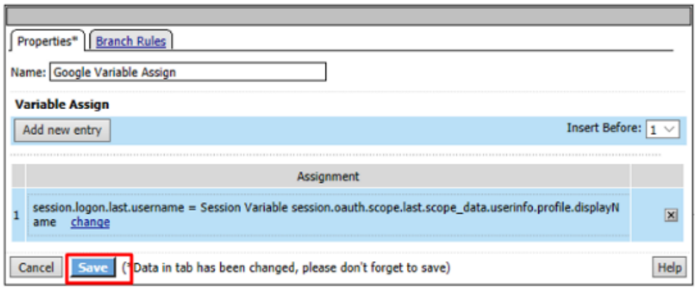


Custom Variable | Unsecure = Session Variable

session.logon.last.username

Session Variable: session.oauth.scope.last.

5. Review the **Google Variable Assign** object and click **Save**



Name: Google Variable Assign

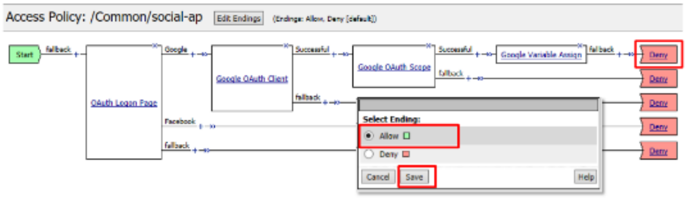
Variable Assign

Insert Before: 1

	Assignment
1	session.logon.last.username = Session Variable session.oauth.scope.last.scope_data.userinfo.profile.displayName change

(*Data in tab has been changed, please don't forget to save)

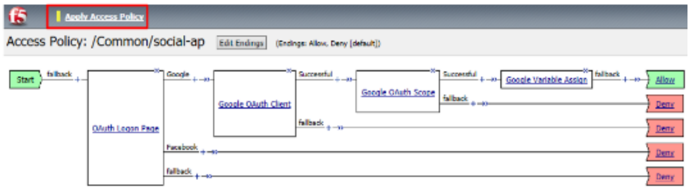
6. Click **Deny** on the **Fallback** branch after the **Google Variable Assign** object, select **Allow** in the pop up window and click **Save**



Access Policy: /Common/social-ap (Endings: Allow, Deny [default])

Select Ending:
● Allow
○ Deny

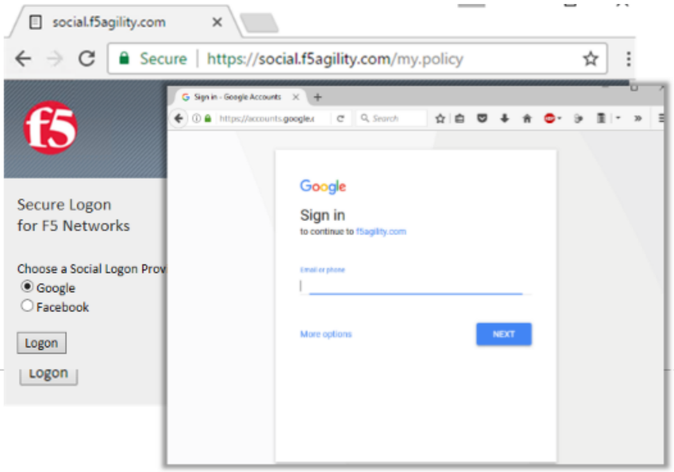
7. Click **Apply Access Policy** in the top left and then close the tab



Access Policy: /Common/social-ap (Endings: Allow, Deny [default])

Test Configuration

1. Test by opening Chrome in the jump host and browsing to `https://social.f5agility.com`, select the provider and attempt logon.



Note: You are able to login and reach the app now, but SSO to the app has not been setup so you get an application error.

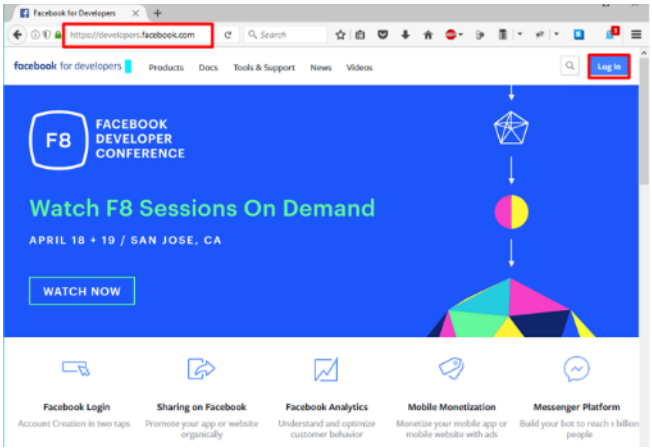
Note: You may also be prompted for additional security measures as you are logging in from a new location.

2.2.6 Task 5: Facebook (Built-In Provider)

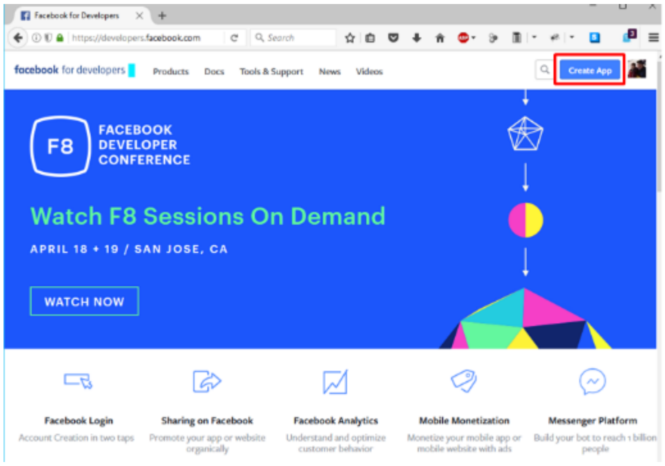
Setup a Facebook Project

1. Go to https://developers.facebook.com and *Login*

Note: This portion of the exercise requires a Facebook Account. You may use an existing one or create one for the purposes of this lab


Facebook for Developers
https://developers.facebook.com
facebook for developers
Products
Docs
Tools & Support
News
Videos
Log In
F8
FACEBOOK
DEVELOPER
CONFERENCE
Watch F8 Sessions On Demand
APRIL 18 + 19 / SAN JOSE, CA
WATCH NOW
Facebook Login
Account Creation in two taps
Sharing on Facebook
Promote your app or website organically
Facebook Analytics
Understand and optimize customer behavior
Mobile Monetization
Monetize your mobile app or mobile website with ads
Messenger Platform
Build your bot to reach 1 billion people

2. If prompted click, **Get Started** and accept the **Developer Policy.** Otherwise, click **Create App**


Facebook for Developers
https://developers.facebook.com
Search
facebook for developers
Products
Docs
Tools & Support
News
Videos
Create App
F8
FACEBOOK DEVELOPER CONFERENCE
Watch F8 Sessions On Demand
APRIL 18 + 19 / SAN JOSE, CA
WATCH NOW
Facebook Login
Account Creation in two taps
Sharing on Facebook
Promote your app or website organically
Facebook Analytics
Understand and optimize customer behavior
Mobile Monetization
Monetize your mobile app or mobile website with ads
Messenger Platform
Build your bot to reach 1 billion people

3. Click **Create App** and name (**Display Name**) your app (Or click the top left project drop down and create a new app, then name it). Then click **Create App ID**.

Note: For example the **Display Name** given here was "OAuth Lab". You may also be prompted with a security captcha

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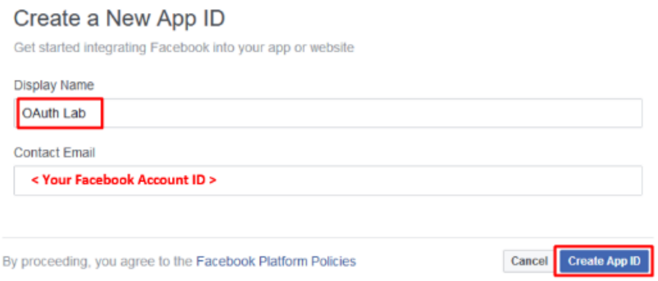


Create a New App ID

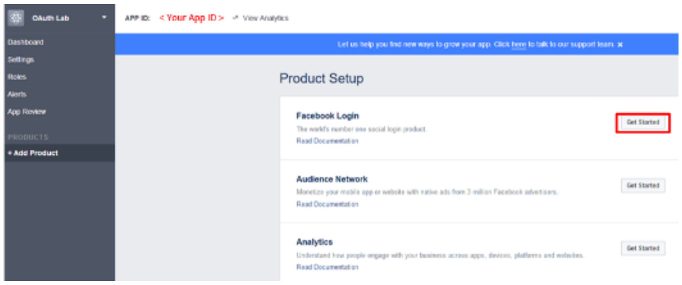
Get started integrating Facebook into your app or website

Display Name: OAuth Lab

Contact Email: < Your Facebook Account ID >

By proceeding, you agree to the Facebook Platform Policies

4. Click **Get Started** in the **Facebook Login** section (*Or click + Add Product and then Get Started for Facebook*)



APP ID: < Your App ID >

Let us help you find new ways to grow your app. Click here to talk to our support team.

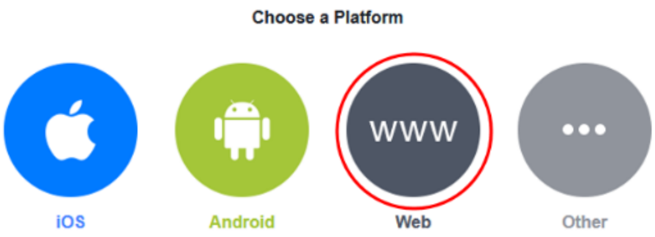
Product Setup

Facebook Login — The world's number one social login product.

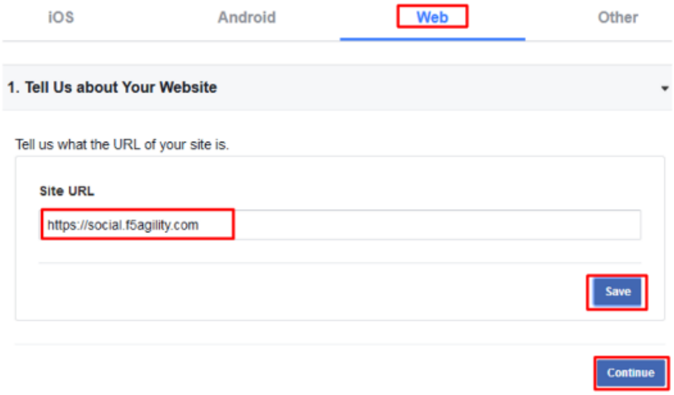
Audience Network — Monetize your mobile app or website with native ads from 3 million Facebook advertisers.

Analytics — Understand how people engage with your business across apps, devices, platforms and websites.

5. From the *"Choose a Platform"* screen click on **WWW (Web)**



6. In the *“Tell Us about Your Website”* prompt, enter `https://social.f5agility.com` for the **Site URL** and click **Save** then click **Continue**



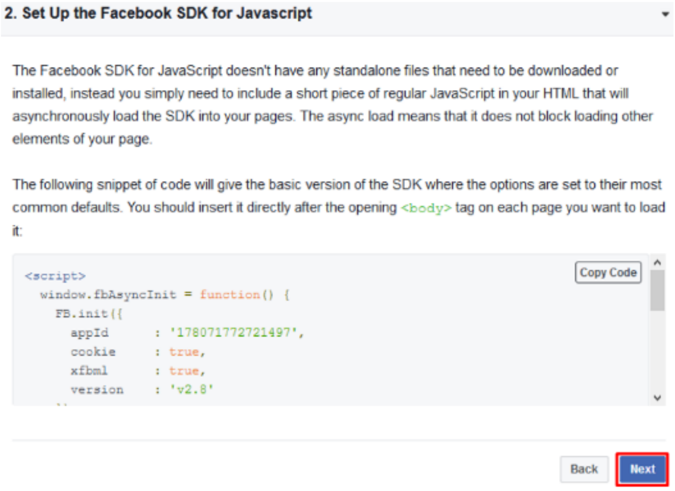
1. Tell Us about Your Website

Tell us what the URL of your site is.

Site URL

https://social.f5agility.com

7. Click **Next** on the *“Set Up the Facebook SDK for Javascript”* screen



2. Set Up the Facebook SDK for Javascript

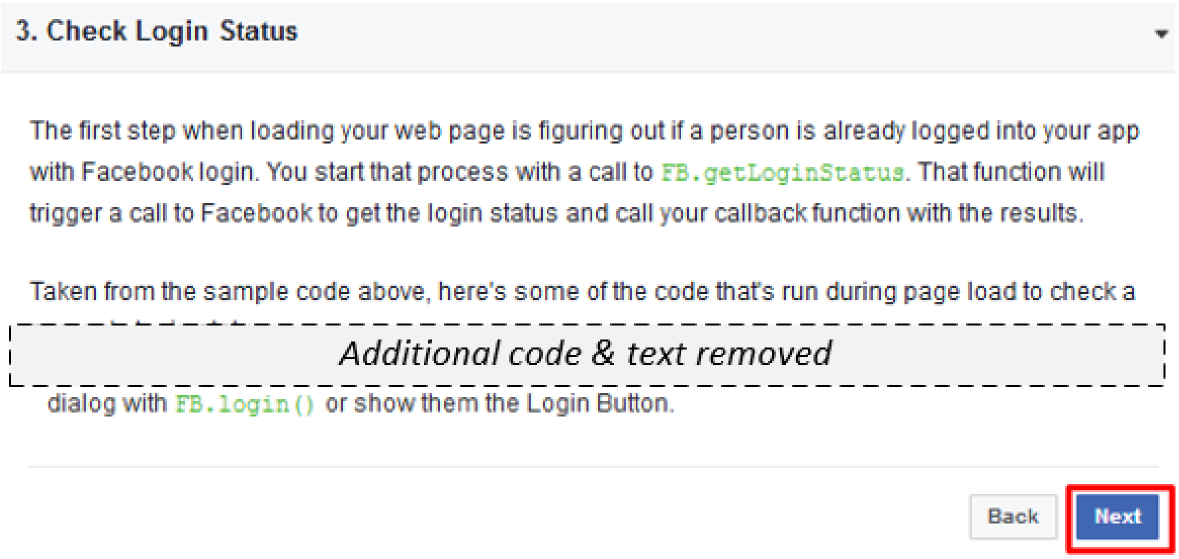
The Facebook SDK for JavaScript doesn't have any standalone files that need to be downloaded or installed, instead you simply need to include a short piece of regular JavaScript in your HTML that will asynchronously load the SDK into your pages. The async load means that it does not block loading other elements of your page.

The following snippet of code will give the basic version of the SDK where the options are set to their most common defaults. You should insert it directly after the opening <body> tag on each page you want to load it:

```
<script>
  window.fbAsyncInit = function() {
    FB.init({
      appId      : '178071772721497',
      cookie     : true,
      xfbml      : true,
      version    : 'v2.8'
```

8. Click **Next** on the *“Check Login Status”* screen

Note: Additional screen content removed.



3. Check Login Status

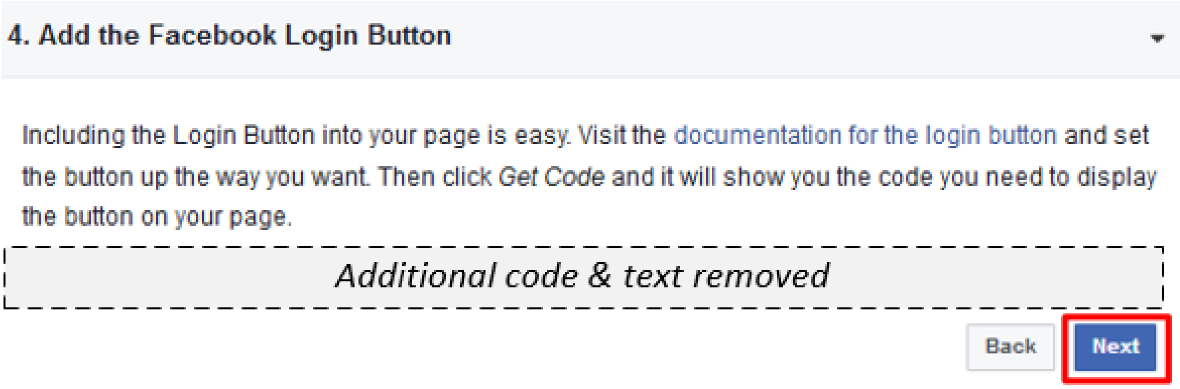
The first step when loading your web page is figuring out if a person is already logged into your app with Facebook login. You start that process with a call to `FB.getLoginStatus`. That function will trigger a call to Facebook to get the login status and call your callback function with the results.

Taken from the sample code above, here's some of the code that's run during page load to check a

Additional code & text removed

dialog with `FB.login()` or show them the Login Button.

9. Click **Next** on the *"Add the Facebook Login Button"* screen

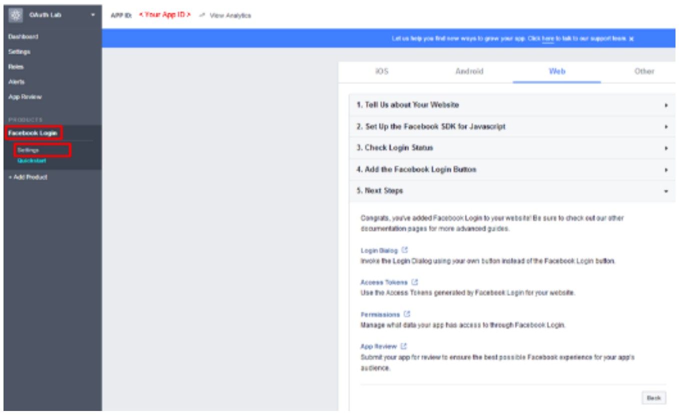


4. Add the Facebook Login Button

Including the Login Button into your page is easy. Visit the documentation for the login button and set the button up the way you want. Then click *Get Code* and it will show you the code you need to display the button on your page.

Additional code & text removed

10. Click **Facebook Login** on the left side bar and then click **Settings**



OAuth Lab
APP ID: < Your App ID >
View Analytics
Let us help you find new ways to grow your app. Click here to talk to our support team.
Dashboard
Settings
Roles
Alerts
App Review
PRODUCTS
Facebook Login
Settings
Quickstart
+ Add Product
iOS
Android
Web
Other
1. Tell Us about Your Website
2. Set Up the Facebook SDK for Javascript
3. Check Login Status
4. Add the Facebook Login Button
5. Next Steps

Congrats, you've added Facebook Login to your website! Be sure to check out our other documentation pages for more advanced guides.

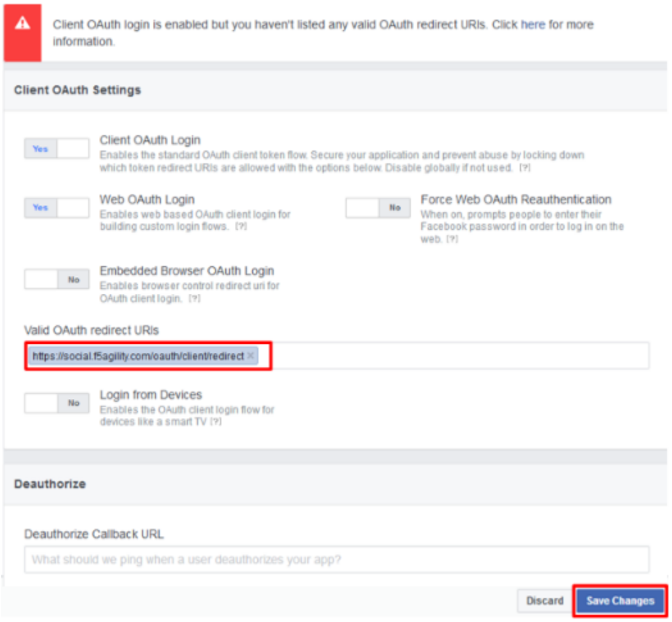
Login Dialog
Invoke the Login Dialog using your own button instead of the Facebook Login button.

Access Tokens
Use the Access Tokens generated by Facebook Login for your website.

Permissions
Manage what data your app has access to through Facebook Login.

App Review
Submit your app for review to ensure the best possible Facebook experience for your app's audience.

11. For the **Client OAuth Settings** screen in the **Valid OAuth redirect URIs** enter `https://social.f5agility.com/oauth/client/redirect` and then click enter to create it, then **Save Changes**



Client OAuth login is enabled but you haven't listed any valid OAuth redirect URIs. Click here for more information.

Client OAuth Settings

Yes — Client OAuth Login: Enables the standard OAuth client token flow. Secure your application and prevent abuse by locking down which token redirect URIs are allowed with the options below. Disable globally if not used. [?]

Yes — Web OAuth Login: Enables web based OAuth client login for building custom login flows. [?]

No Force Web OAuth Reauthentication When on, prompts people to enter their Facebook password in order to log in on the web. [?]

No — Embedded Browser OAuth Login: Enables browser control redirect uri for OAuth client login. [?]

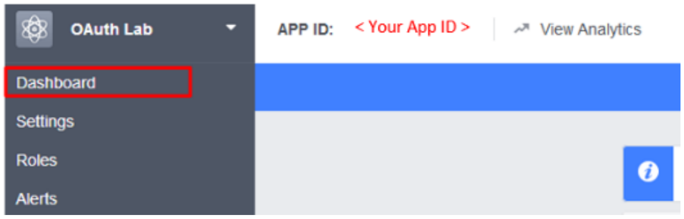
Valid OAuth redirect URIs: https://social.f5agility.com/oauth/client/redirect

No — Login from Devices: Enables the OAuth client login flow for devices like a smart TV [?]

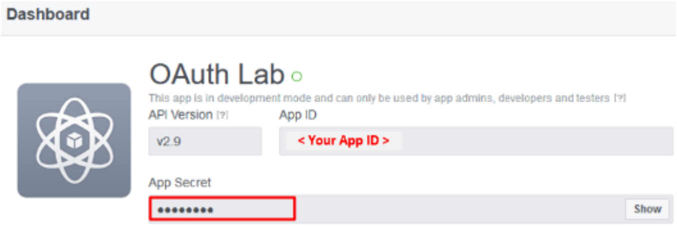
Deauthorize

Deauthorize Callback URL: What should we ping when a user deauthorizes your app?

12. Click **Dashboard** in the left navigation bar



13. Here you can retrieve your **App ID** and **App Secret** for use in Access Policy Manager (APM).



Dashboard

OAuth Lab

This app is in development mode and can only be used by app admins, developers and testers [?]

API Version [?]: v2.9

App ID: < Your App ID >

App Secret: ●●●●●●●● Show

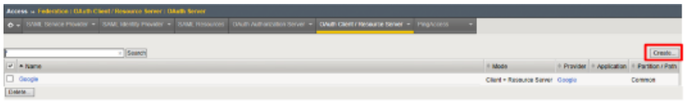
Screenshot of completed Facebook project

Note: If you want Facebook Auth to work for users other than the developer you will need to publish the project

---

Configure Access Policy Manager (APM) to authenticate with Facebook

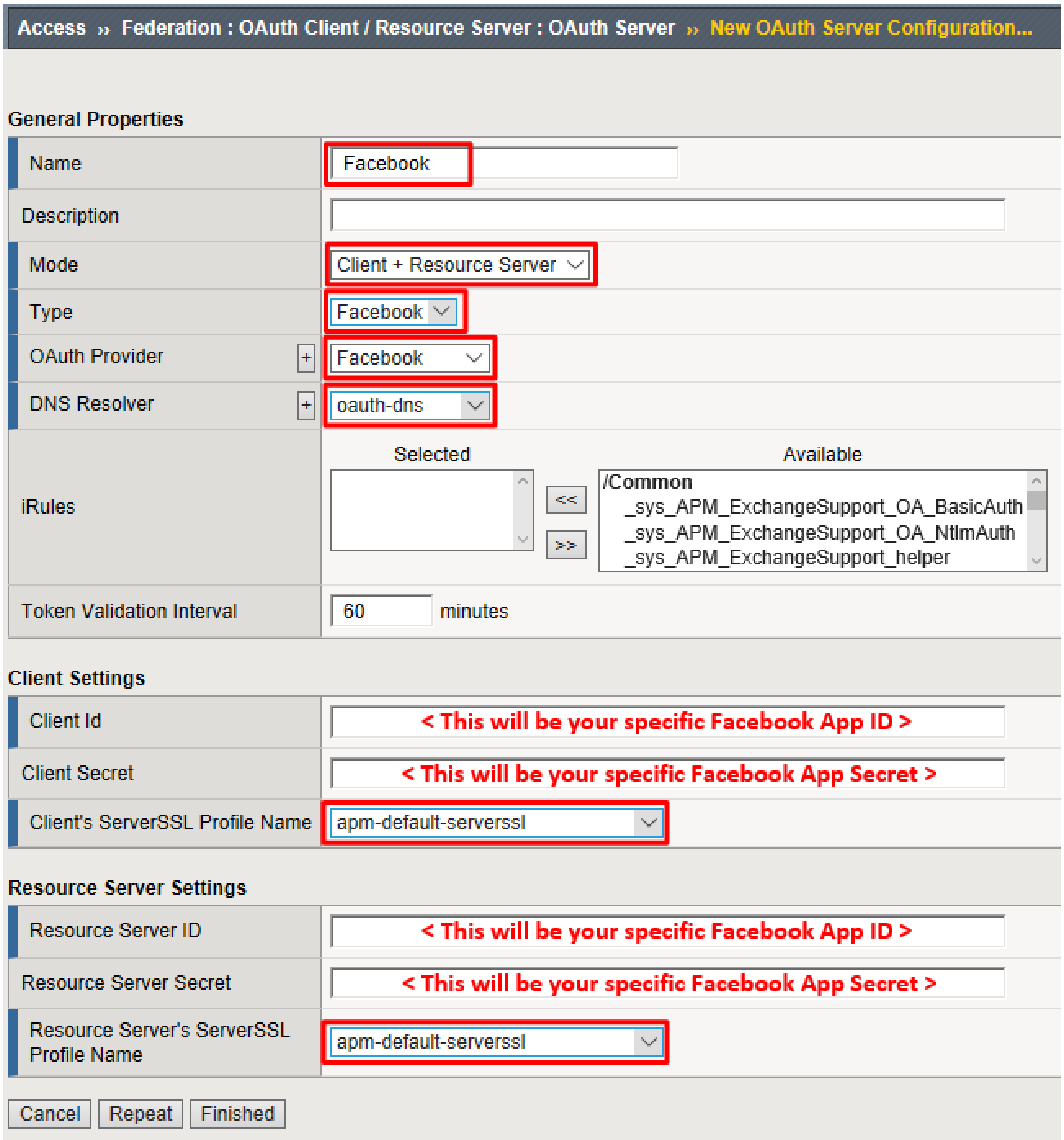
1. Configure the **OAuth Server** Object: Go to **Access -> Federation -> OAuth Client / Resource Server -> OAuth Server** and click **Create**



Access » Federation : OAuth Client / Resource Server : OAuth Server
SAML Service Provider
SAML Identity Provider
SAML Resources
OAuth Authorization Server
OAuth Client / Resource Server
PingAccess
Search
Create...
Delete...

	Name	Mode	Provider	Application	Partition / Path
□	Google	Client + Resource Server	Google		Common

2. Enter the values as shown below for the **OAuth Server** and click **Finished**
   - **Name:** `Facebook`
   - **Mode:** `Client + Resource Server`
   - **Type:** `Facebook`
   - **OAuth Provider:** `Facebook`
   - **DNS Resolver:** `oauth-dns` *(configured for you)*
   - **Client ID:** `<App ID from Facebook>`
   - **Client Secret:** `<App Secret from Facebook>`
   - **Client's ServerSSL Profile Name:** `apm-default-serverssl`
   - **Resource Server ID:** " App ID from Facebook>"
   - **Resource Server Secret:** `<App Secret from Facebook>`
   - **Resource Server's ServerSSL Profile Name:** `apm-default-serverssl`



Access » Federation : OAuth Client / Resource Server : OAuth Server » New OAuth Server Configuration...

General Properties

Name	Facebook
Description	
Mode	Client + Resource Server
Type	Facebook
OAuth Provider	Facebook
DNS Resolver	oauth-dns
iRules	Selected: Available: /Common _sys_APM_ExchangeSupport_OA_BasicAuth _sys_APM_ExchangeSupport_OA_NtlmAuth _sys_APM_ExchangeSupport_helper
Token Validation Interval	60 minutes

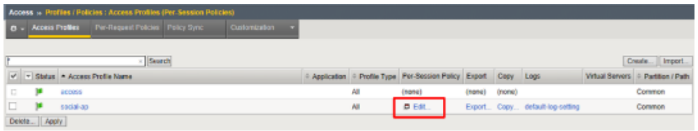
Client Settings

Client Id	< This will be your specific Facebook App ID >
Client Secret	< This will be your specific Facebook App Secret >
Client's ServerSSL Profile Name	apm-default-serverssl

Resource Server Settings

Resource Server ID	< This will be your specific Facebook App ID >
Resource Server Secret	< This will be your specific Facebook App Secret >
Resource Server's ServerSSL Profile Name	apm-default-serverssl

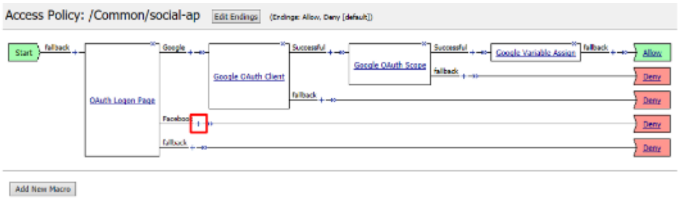
3. Configure the VPE for Facebook: Go to **Access -> Profiles** / **Policies -> Access Profiles (Per Session Policies)** and click **Edit** on `social-ap`, a new browser tab will open



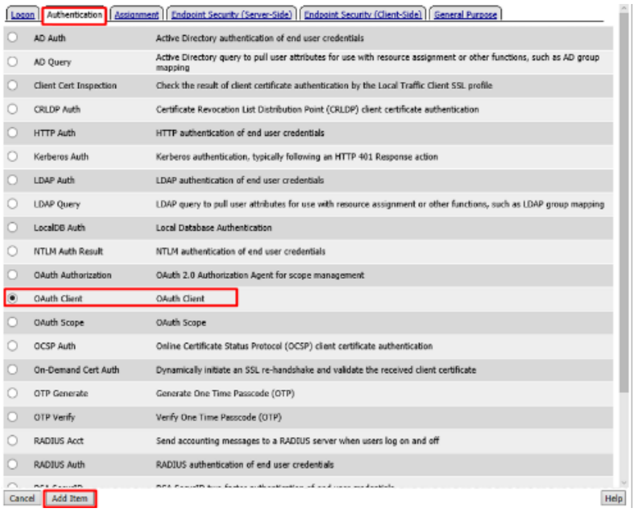
Access » Profiles / Policies : Access Profiles (Per-Session Policies)

Status	Access Profile Name	Application	Profile Type	Per-Session Policy	Export	Copy	Logs	Virtual Servers	Partition / Path
	access		All	(none)	(none)	(none)			Common
	social-ap		All	Edit...	Export...	Copy...	default-log-setting		Common

4. Click the + on the **Facebook** provider's branch after the **OAuth Logon Page**



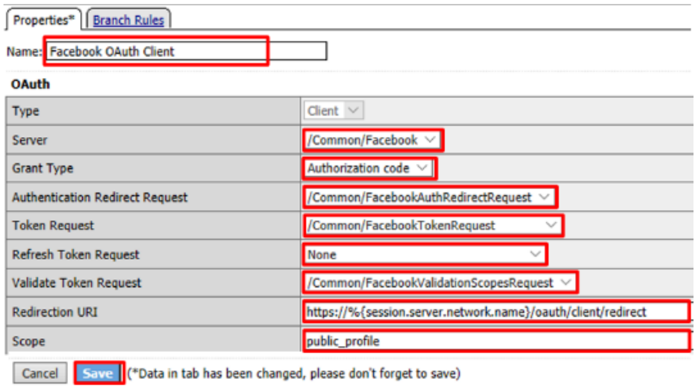
5. Select **OAuth Client** from the **Authentication** tab and click **Add Item**


Logon
Authentication
Assignment
Endpoint Security (Server-Side)
Endpoint Security (Client-Side)
General Purpose

○	AD Auth	Active Directory authentication of end user credentials
○	AD Query	Active Directory query to pull user attributes for use with resource assignment or other functions, such as AD group mapping
○	Client Cert Inspection	Check the result of client certificate authentication by the Local Traffic Client SSL profile
○	CRLDP Auth	Certificate Revocation List Distribution Point (CRLDP) client certificate authentication
○	HTTP Auth	HTTP authentication of end user credentials
○	Kerberos Auth	Kerberos authentication, typically following an HTTP 401 Response action
○	LDAP Auth	LDAP authentication of end user credentials
○	LDAP Query	LDAP query to pull user attributes for use with resource assignment or other functions, such as LDAP group mapping
○	LocalDB Auth	Local Database Authentication
○	NTLM Auth Result	NTLM authentication of end user credentials
○	OAuth Authorization	OAuth 2.0 Authorization Agent for scope management
●	OAuth Client	OAuth Client
○	OAuth Scope	OAuth Scope
○	OCSP Auth	Online Certificate Status Protocol (OCSP) client certificate authentication
○	On-Demand Cert Auth	Dynamically initiate an SSL re-handshake and validate the received client certificate
○	OTP Generate	Generate One Time Passcode (OTP)
○	OTP Verify	Verify One Time Passcode (OTP)
○	RADIUS Acct	Send accounting messages to a RADIUS server when users log on and off
○	RADIUS Auth	RADIUS authentication of end user credentials
○	RSA SecurID	RSA SecurID two-factor authentication of end user credentials

6. Enter the following in the **OAuth Client** input screen and click **Save**

- **Name:** `Facebook OAuth Client`
- **Server:** `/Common/Facebook`
- **Grant Type:** `Authorization Code`
- **Authentication Redirect Request:** `/Common/FacebookAuthRedirectRequest`
- **Token Request:** `/Common/FacebookTokenRequest`
- **Refresh Token Request:** `None`
- **Validate Token Request:** " /Common/FacebookValidationScopesRequest"
- **Redirection URI:** `https://%{session.server.network.name}/oauth/client/redirect`
- **Scope:** `public_profile` *(Note underscore)*



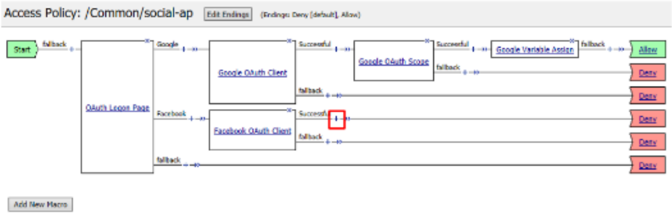
Name: Facebook OAuth Client

OAuth

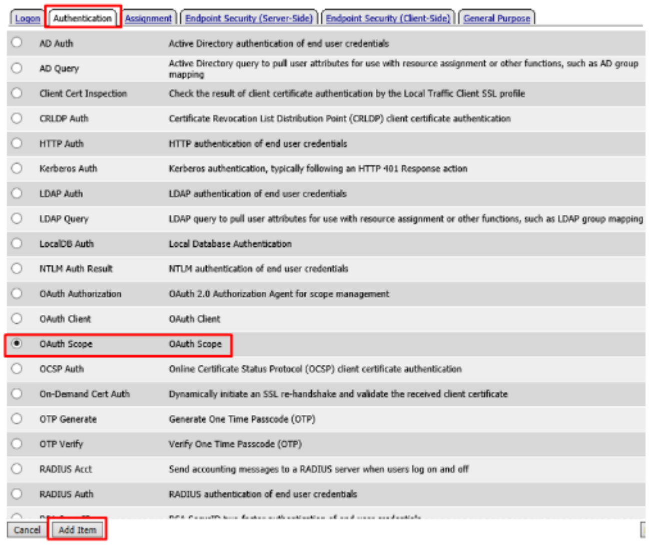
Type	Client
Server	/Common/Facebook
Grant Type	Authorization code
Authentication Redirect Request	/Common/FacebookAuthRedirectRequest
Token Request	/Common/FacebookTokenRequest
Refresh Token Request	None
Validate Token Request	/Common/FacebookValidationScopesRequest
Redirection URI	https://%{session.server.network.name}/oauth/client/redirect
Scope	public_profile

(*Data in tab has been changed, please don't forget to save)

7. Click **+** on the **Successful** branch after the **Facebook OAuth Client**



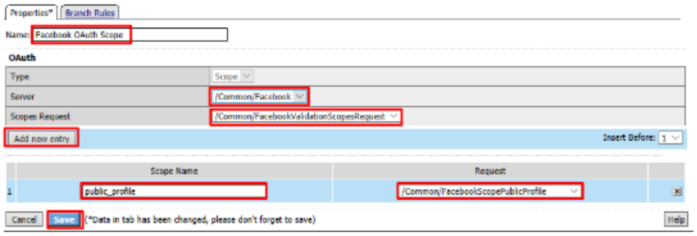
8. Select **OAuth Scope** from the **Authentication** tab, and click **Add Item**


Logon
Authentication
Assignment
Endpoint Security (Server-Side)
Endpoint Security (Client-Side)
General Purpose

○	AD Auth	Active Directory authentication of end user credentials
○	AD Query	Active Directory query to pull user attributes for use with resource assignment or other functions, such as AD group mapping
○	Client Cert Inspection	Check the result of client certificate authentication by the Local Traffic Client SSL profile
○	CRLDP Auth	Certificate Revocation List Distribution Point (CRLDP) client certificate authentication
○	HTTP Auth	HTTP authentication of end user credentials
○	Kerberos Auth	Kerberos authentication, typically following an HTTP 401 Response action
○	LDAP Auth	LDAP authentication of end user credentials
○	LDAP Query	LDAP query to pull user attributes for use with resource assignment or other functions, such as LDAP group mapping
○	LocalDB Auth	Local Database Authentication
○	NTLM Auth Result	NTLM authentication of end user credentials
○	OAuth Authorization	OAuth 2.0 Authorization Agent for scope management
○	OAuth Client	OAuth Client
●	OAuth Scope	OAuth Scope
○	OCSP Auth	Online Certificate Status Protocol (OCSP) client certificate authentication
○	On-Demand Cert Auth	Dynamically initiate an SSL re-handshake and validate the received client certificate
○	OTP Generate	Generate One Time Passcode (OTP)
○	OTP Verify	Verify One Time Passcode (OTP)
○	RADIUS Acct	Send accounting messages to a RADIUS server when users log on and off
○	RADIUS Auth	RADIUS authentication of end user credentials

9. Enter the following on the **OAuth Scope** input screen and click **Save**

- **Name:** `Facebook OAuth Scope`
- **Server:** `/Common/Facebook`
- **Scopes Request:** `/Common/FacebookValidationScopesRequest`
- Click **Add New Entry**
- **Scope Name:** `public_profile`
- **Request:** `/Common/FacebookScopePublicProfile`



Name: Facebook OAuth Scope

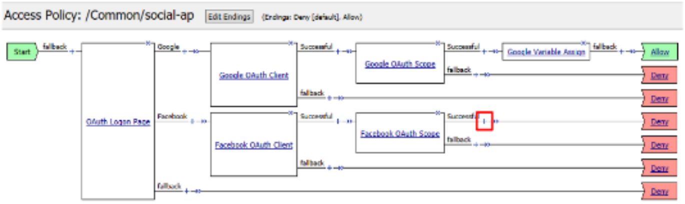
OAuth

Type	Scope
Server	/Common/Facebook
Scopes Request	/Common/FacebookValidationScopesRequest

	Scope Name	Request
1	public_profile	/Common/FacebookScopePublicProfile

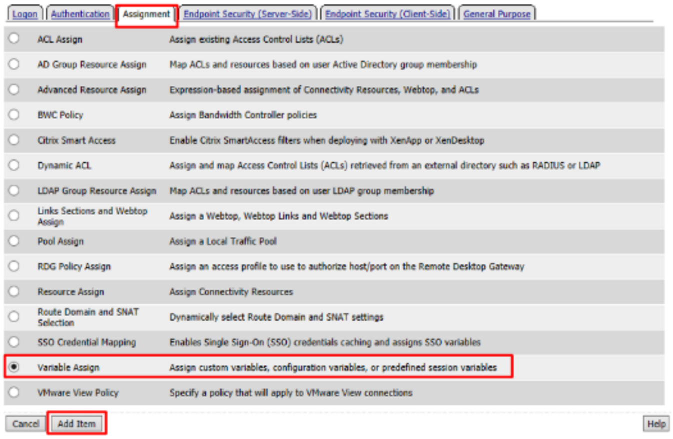
(*Data in tab has been changed, please don't forget to save)

10. Click the **+** on the **Successful** branch after the **Facebook OAuth Scope** object



Access Policy: /Common/social-ap

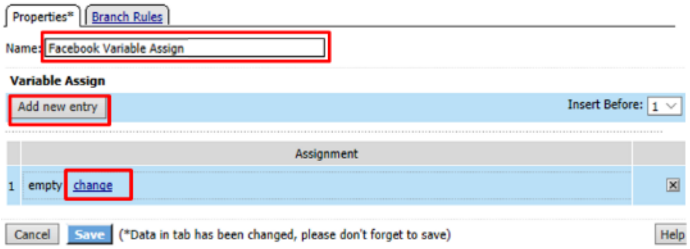
11. Select **Variable Assign** from the **Assignment** tab, and click **Add Item**



Logon
Authentication
Assignment
Endpoint Security (Server-Side)
Endpoint Security (Client-Side)
General Purpose

○	ACL Assign	Assign existing Access Control Lists (ACLs)
○	AD Group Resource Assign	Map ACLs and resources based on user Active Directory group membership
○	Advanced Resource Assign	Expression-based assignment of Connectivity Resources, Webtop, and ACLs
○	BWC Policy	Assign Bandwidth Controller policies
○	Citrix Smart Access	Enable Citrix SmartAccess filters when deploying with XenApp or XenDesktop
○	Dynamic ACL	Assign and map Access Control Lists (ACLs) retrieved from an external directory such as RADIUS or LDAP
○	LDAP Group Resource Assign	Map ACLs and resources based on user LDAP group membership
○	Links Sections and Webtop Assign	Assign a Webtop, Webtop Links and Webtop Sections
○	Pool Assign	Assign a Local Traffic Pool
○	RDG Policy Assign	Assign an access profile to use to authorize host/port on the Remote Desktop Gateway
○	Resource Assign	Assign Connectivity Resources
○	Route Domain and SNAT Selection	Dynamically select Route Domain and SNAT settings
○	SSO Credential Mapping	Enables Single Sign-On (SSO) credentials caching and assigns SSO variables
●	Variable Assign	Assign custom variables, configuration variables, or predefined session variables
○	VMware View Policy	Specify a policy that will apply to VMware View connections

12. Name it Facebook Variable Assign and click **Add New Entry** then **change**



Name: Facebook Variable Assign

Variable Assign

Insert Before: 1

	Assignment	
1	empty change	☒

(*Data in tab has been changed, please don't forget to save)

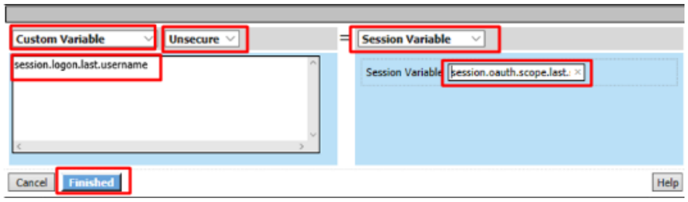
13. Enter the following values and click **Finished**

Left Side:

- **Type:** `Custom Variable`
- **Security:** `Unsecure`
- **Value:** `session.logon.last.username`

Right Side:

- **Type:** `Session Variable`
- **Session Variable:** `session.oauth.scope.last.scope_data.public_profile.name`

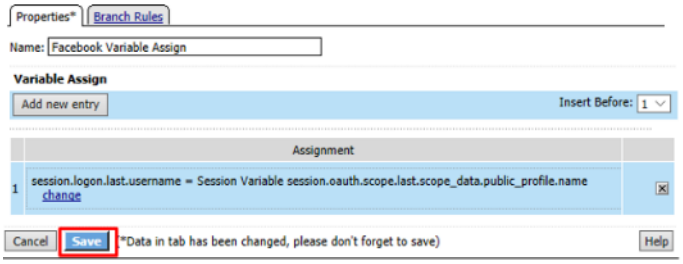


Custom Variable | Unsecure = Session Variable

session.logon.last.username

Session Variable session.oauth.scope.last.

14. Review the **Facebook Variable Assign** object and click **Save**

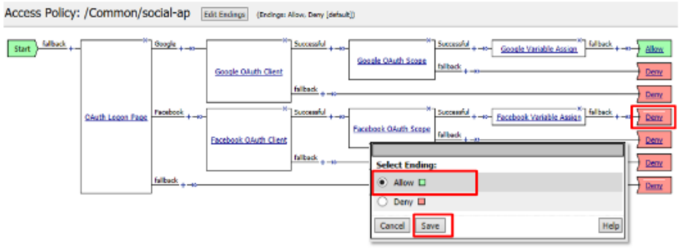


Name: Facebook Variable Assign

Variable Assign

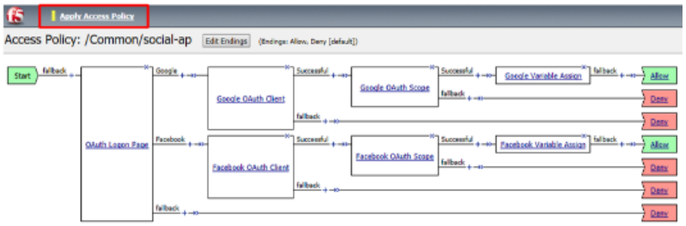
	Assignment
1	session.logon.last.username = Session Variable session.oauth.scope.last.scope_data.public_profile.name change

15. Click **Deny** on the **Fallback** branch after the **Facebook Variable Assign** object, select **Allow** in the pop up window and click **Save**



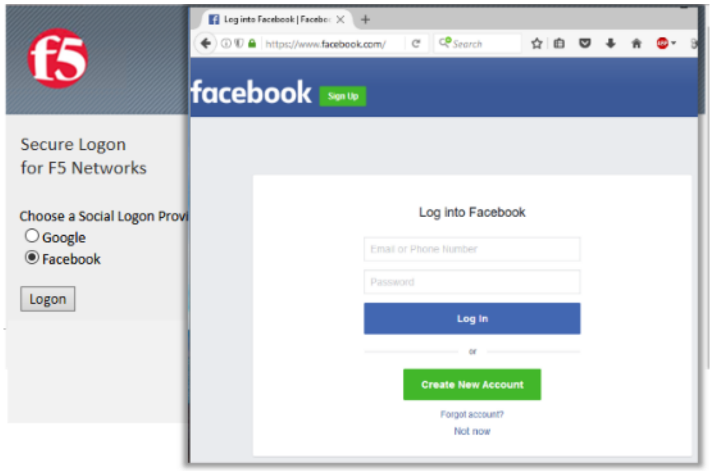
Select Ending:
● Allow
○ Deny

16. Click **Apply Access Policy** in the top left and then close the tab



2.2.7 Test Configuration

1. Test by opening Chrome in the jump host and browsing to `https://social.f5agility.com`, select the provider and attempt logon.



Secure Logon
for F5 Networks

Choose a Social Logon Provi
○ Google
● Facebook

Logon

Log into Facebook

Email or Phone Number

Password

Log In

or

Create New Account

Forgot account?

Not now

Note: You are able to login and reach the app now, but SSO to the app has not been setup so you get an application error.

Note: You may also be prompted for additional security measures as you are logging in from a new location

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Note: You may need to start a Chrome New Incognito Window so no session data carries over.

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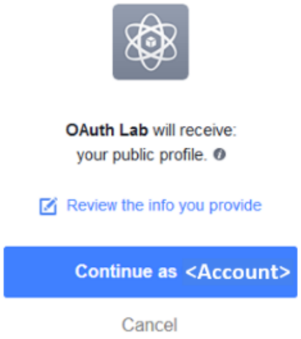
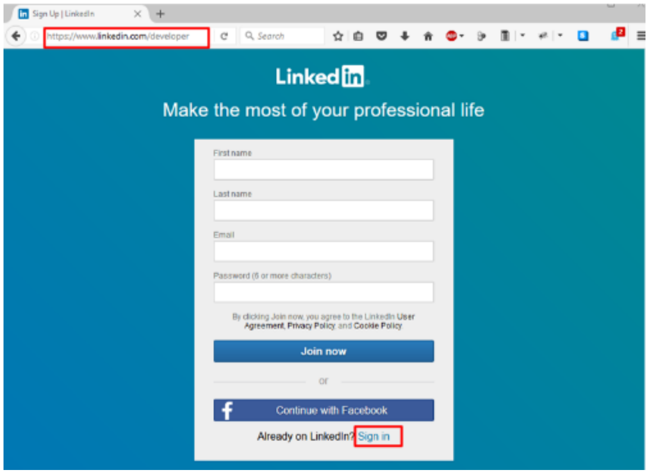
2. You should be prompted to authorize your request. Click **Continue as <Account>** (Where <Account> is your Facebook Profile name)



OAuth Lab will receive:
your public profile.

2.2.8 Task 6: LinkedIn (Custom Provider)

1. Login at `https://www.linkedin.com/secure/developer`



Make the most of your professional life

First name

Last name

Email

Password (6 or more characters)

By clicking Join now, you agree to the LinkedIn User Agreement, Privacy Policy, and Cookie Policy.

Already on LinkedIn? Sign in

Note: This portion of the exercise requires a LinkedIn Account. You may use an existing one or create one for the purposes of this lab*

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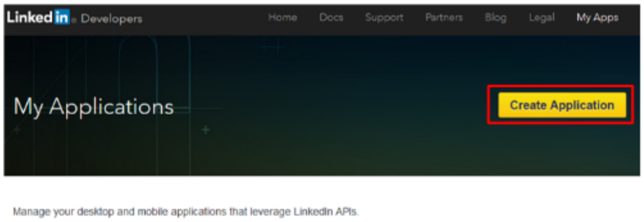
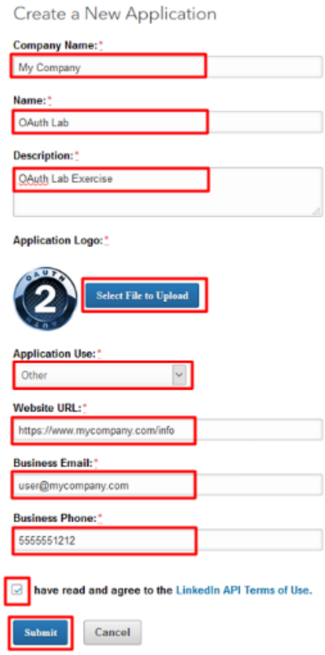
2. Click **Create Application**



My Applications

Manage your desktop and mobile applications that leverage LinkedIn APIs.

3. In the **Create a New Application** screen fill in the required values and click **Submit**



Create a New Application

Company Name:* My Company

Name:* OAuth Lab

Description:* OAuth Lab Exercise

Application Logo:*

Application Use:* Other

Website URL:* https://www.mycompany.com/info

Business Email:* user@mycompany.com

Business Phone:* 5555551212

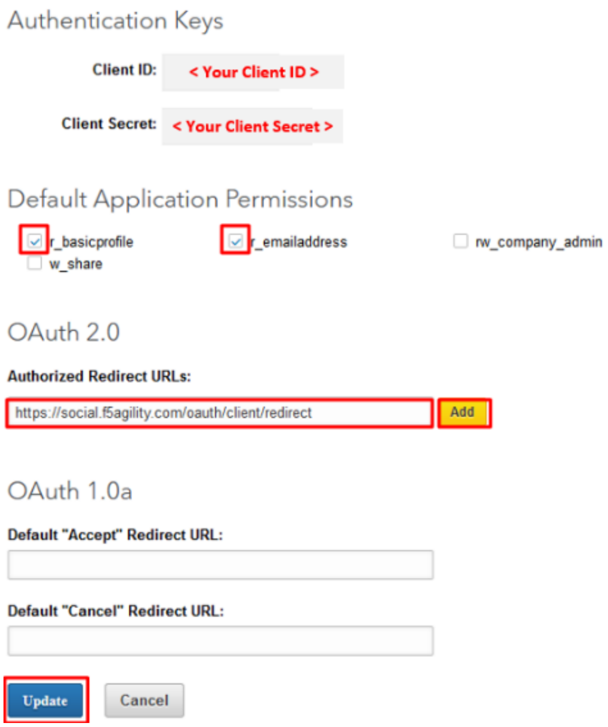
☑ have read and agree to the LinkedIn API Terms of Use.

Note: Generic values have been shown. You may use the values you deem appropriate

Note: An Application logo has been provided on your desktop 'OAuth2.png'

4. In the *"Authentication Keys"* screen, check the boxes for `r_basicprofile` and `r_emailaddress`. In the **Authorized Redirect URLs**, enter `https://social.f5agility.com/oauth/client/redirect`

5. Click **Add**. Finally, click **Update** at the bottom of the screen.



Authentication Keys

Client ID: < Your Client ID >

Client Secret: < Your Client Secret >

Default Application Permissions

☑ r_basicprofile ☑ r_emailaddress □ rw_company_admin
□ w_share

OAuth 2.0

Authorized Redirect URLs:

https://social.f5agility.com/oauth/client/redirect

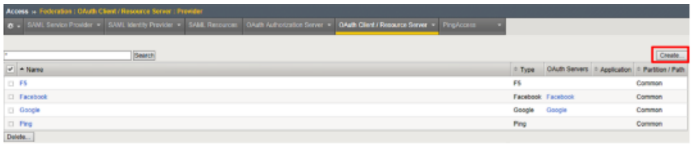
OAuth 1.0a

Default "Accept" Redirect URL:

Default "Cancel" Redirect URL:

Configure Access Policy Manager (APM) to authenticate with LinkedIn

1. Configure the **OAuth Server** Object: Go to **Access -> Federation -> OAuth Client / Resource Server -> Provider** and click **Create**

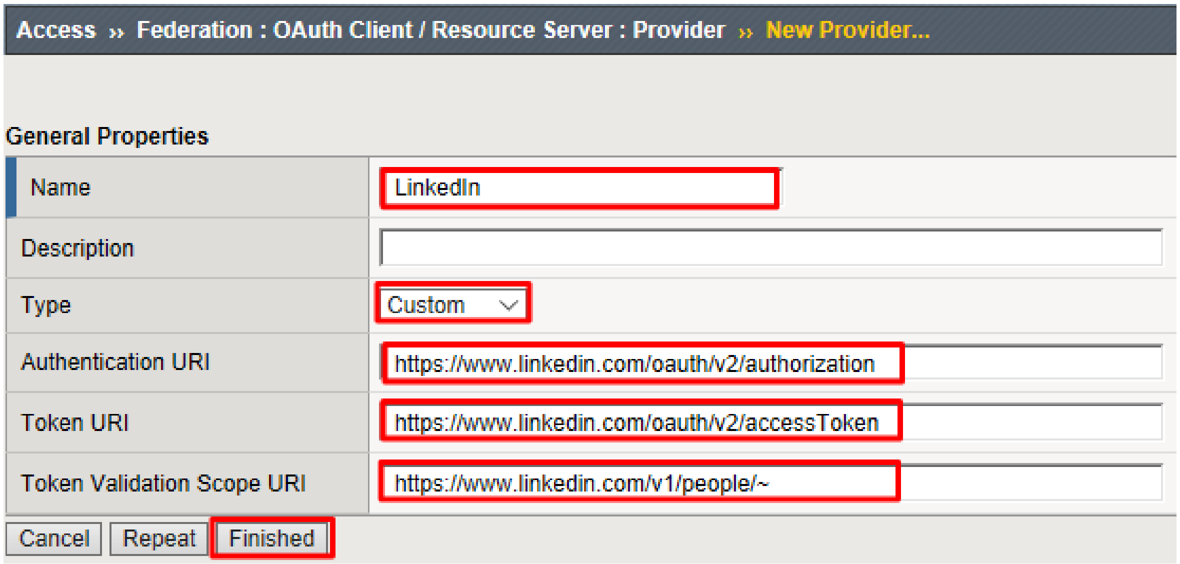
   Access » Federation : OAuth Client / Resource Server : Provider

Name	Type	OAuth Servers	Application	Partition / Path
F5	F5			Common
Facebook	Facebook	Facebook		Common
Google	Google	Google		Common
Ping	Ping			Common

   Note: You are creating a "Provider"

2. Enter the values as shown below for the **OAuth Provider** and click **Finished**

   - **Name:** `LinkedIn`
   - **Type:** `Custom`
   - **Authentication URI:** `https://www.linkedin.com/oauth/v2/authorization`
   - **Token URI:** `https://www.linkedin.com/oauth/v2/accessToken`
   - **Token Validation Scope URI:** `https://www.linkedin.com/v1/people/~`

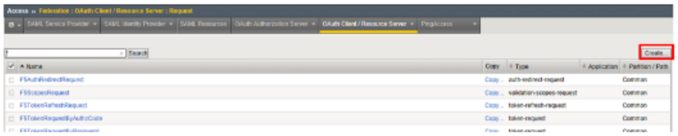


Access ›› Federation : OAuth Client / Resource Server : Provider ›› New Provider...

General Properties

Name	LinkedIn
Description	
Type	Custom
Authentication URI	https://www.linkedin.com/oauth/v2/authorization
Token URI	https://www.linkedin.com/oauth/v2/accessToken
Token Validation Scope URI	https://www.linkedin.com/v1/people/~

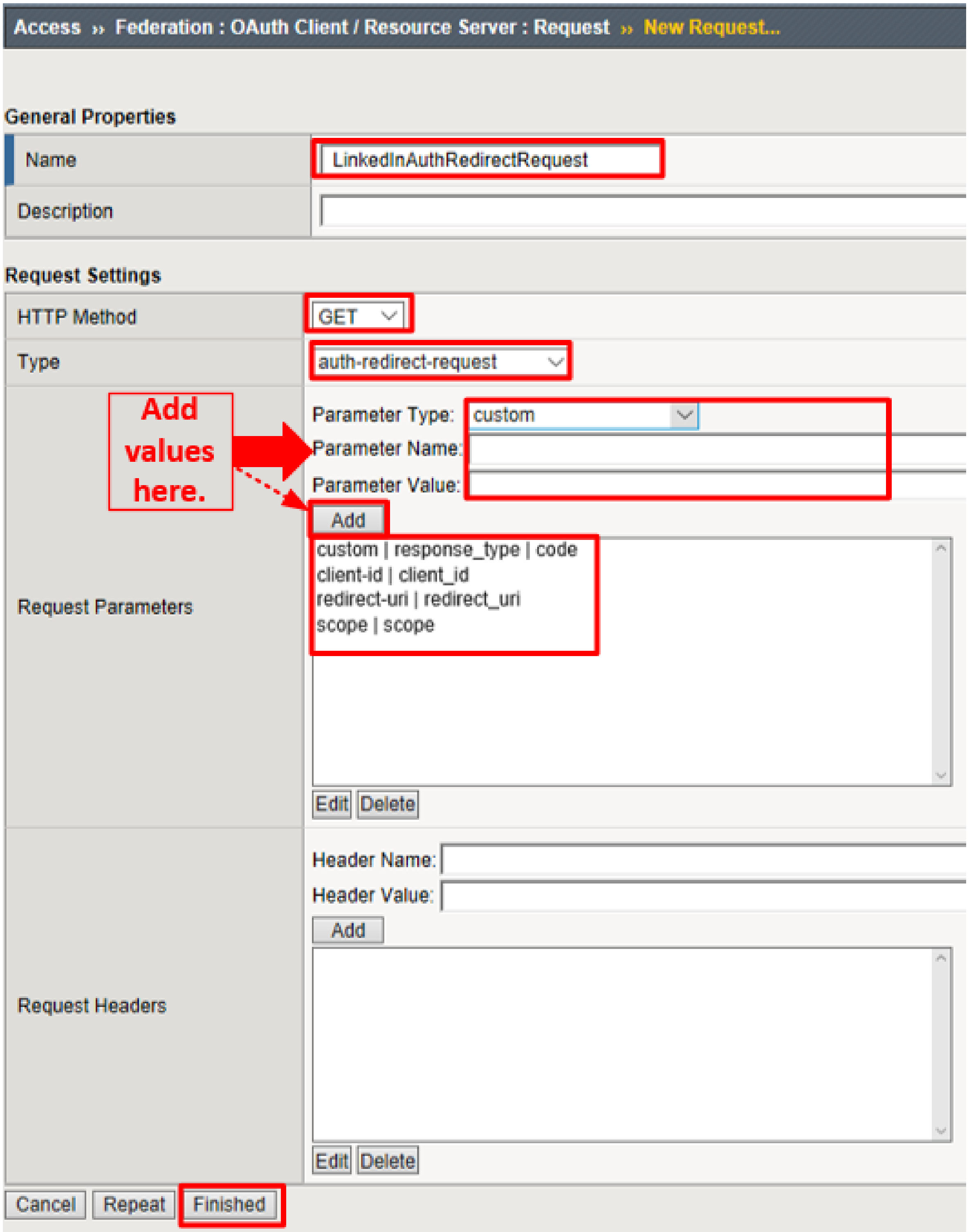
3. Configure the **OAuth Redirect Request** Profile Object: Go to **Access -> Federation -> OAuth Client / Resource Server -> Request** and click **Create**



Access ›› Federation : OAuth Client / Resource Server : Request

Name	Copy	Type	Application	Partition / Path
FSAuthRedirectRequest	Copy...	auth-redirect-request		Common
FSScopesRequest	Copy...	validation-scopes-request		Common
FSTokenRefreshRequest	Copy...	token-refresh-request		Common
FSTokenRequestByAuthzCode	Copy...	token-request		Common
FSTokenRequestByPassword	Copy...	token-request		Common

4. Enter the values as shown for the **OAuth Request** and click **Finished**
   - **Name:** `LinkedInAuthRedirectRequest`
   - **HTTP Method:** `GET`
   - **Type:** `auth-redirect-request`



Access » Federation : OAuth Client / Resource Server : Request » New Request...

General Properties

Name	LinkedInAuthRedirectRequest
Description	

Request Settings

HTTP Method	GET
Type	auth-redirect-request

Request Parameters

Parameter Type: custom
Parameter Name:
Parameter Value:

```
custom | response_type | code
client-id | client_id
redirect-uri | redirect_uri
scope | scope
```

Request Headers

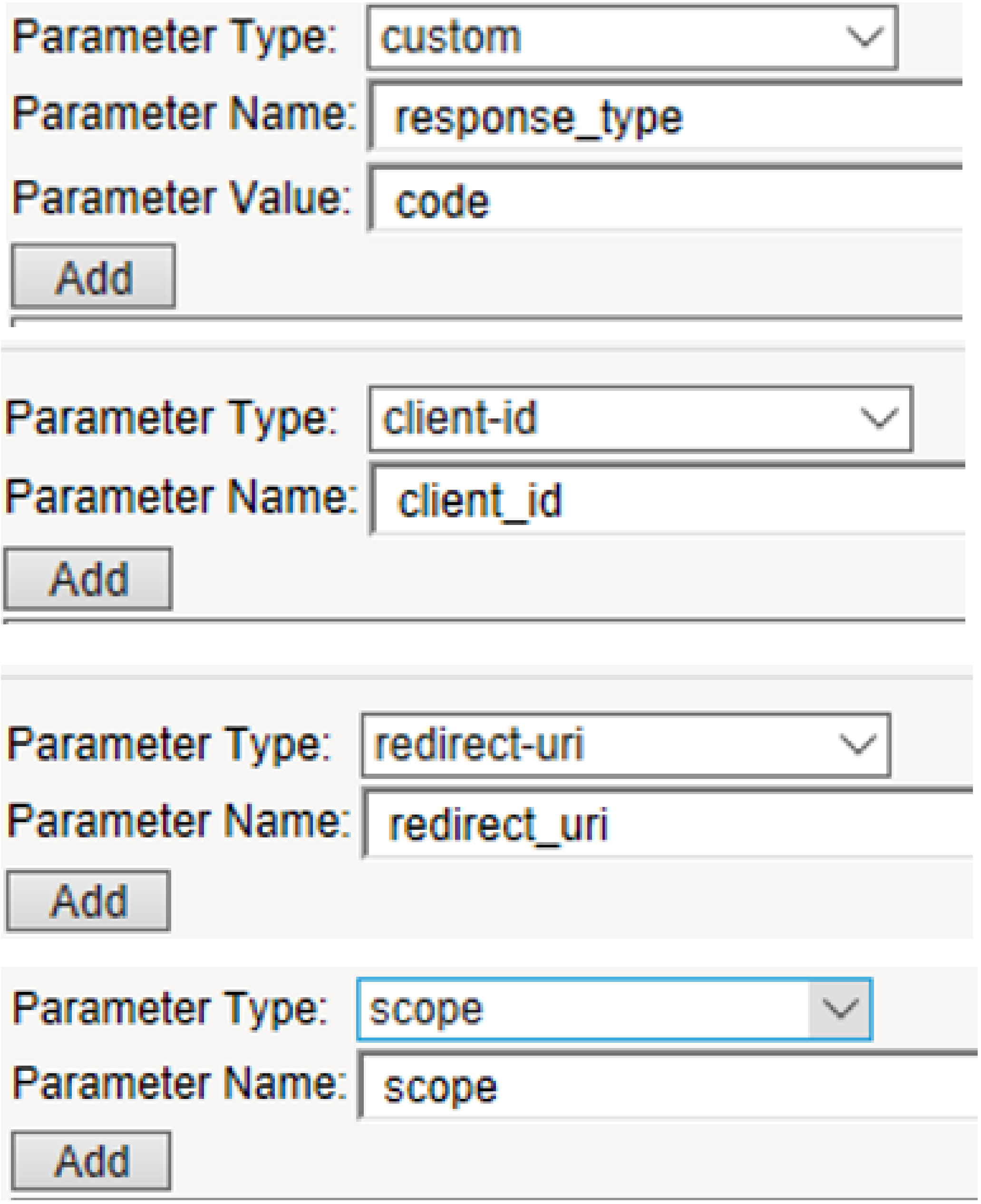
Header Name:
Header Value:

5. Add the following request parameters and click **Add** after entering the values for each:

   - **Parameter Type:** `custom`
   - **Parameter Name:** `response_type`
   - **Parameter Value:** `code`

- **Parameter Type:** `client-id`
- **Parameter Name:** `client_id`
- **Parameter Type:** `redirect-uri`
- **Parameter Name:** `redirect_uri`
- **Parameter Type:** `scope`
- **Parameter Name:** `scope`

Note: LinkedIn requires a state parameter, but we already insert it by default.



Parameter Type: custom
Parameter Name: response_type
Parameter Value: code

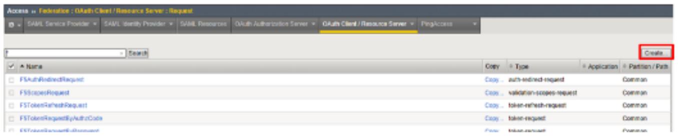
Parameter Type: client-id
Parameter Name: client_id

Parameter Type: redirect-uri
Parameter Name: redirect_uri

Parameter Type: scope
Parameter Name: scope

6. Configure the **OAuth Token Request** Profile Object: Go to **Access -> Federation -> OAuth Client** /

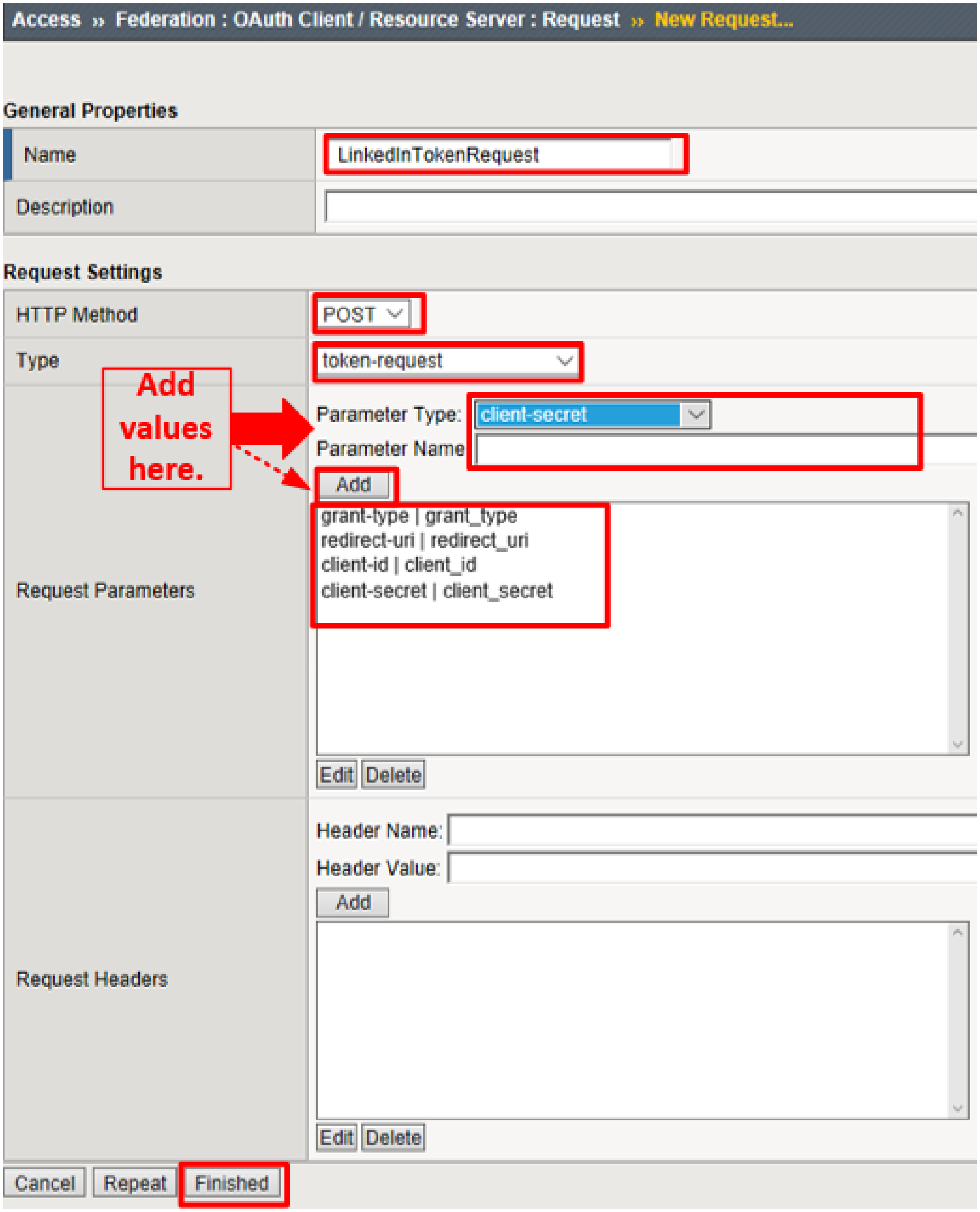
Resource Server -> Request and click **Create**


Access » Federation : OAuth Client / Resource Server : Request
SAML Service Provider
SAML Identity Provider
SAML Resources
OAuth Authorization Server
OAuth Client / Resource Server
PingAccess
Search
Create...

Name	Copy	Type	Application	Partition / Path
F5AuthRedirectRequest	Copy...	auth-redirect-request		Common
F5ScopesRequest	Copy...	validation-scopes-request		Common
F5TokenRefreshRequest	Copy...	token-refresh-request		Common
F5TokenRequestByAuthzCode	Copy...	token-request		Common
F5TokenRequestByPassword	Copy...	token-request		Common

7. Enter the values as shown for the **OAuth Request** and click **Finished**

   - **Name:** `LinkedInTokenRequest`
   - **HTTP Method:** `POST`
   - **Type:** `token-request`



Access » Federation : OAuth Client / Resource Server : Request » New Request...

General Properties

Name: LinkedInTokenRequest

Description:

Request Settings

HTTP Method: POST

Type: token-request

Request Parameters

Parameter Type: client-secret

Parameter Name:

grant-type | grant_type
redirect-uri | redirect_uri
client-id | client_id
client-secret | client_secret

Request Headers

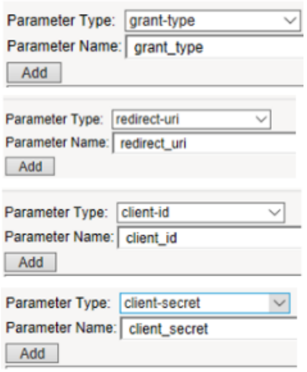
Header Name:

Header Value:

8. Add the following request parameters and click **Add** after entering the values for each:

   - **Parameter Type:** `grant-type`
   - **Parameter Name:** `grant_type`
   - **Parameter Type:** `redirect-uri`
   - **Parameter Name:** `redirect_uri`

- **Parameter Type:** `client-id`
- **Parameter Name:** `client_id`
- **Parameter Type:** `client-secret`
- **Parameter Name:** `client_secret`



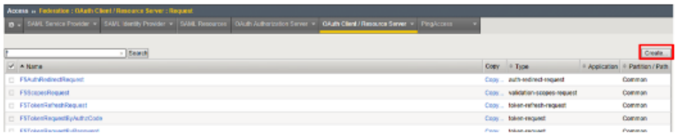
Parameter Type: grant-type
Parameter Name: grant_type

Parameter Type: redirect-uri
Parameter Name: redirect_uri

Parameter Type: client-id
Parameter Name: client_id

Parameter Type: client-secret
Parameter Name: client_secret

9. Configure the **OAuth Validation Scopes Request** Profile Object: Go to **Access -> Federation -> OAuth Client / Resource Server -> Request** and click **Create**

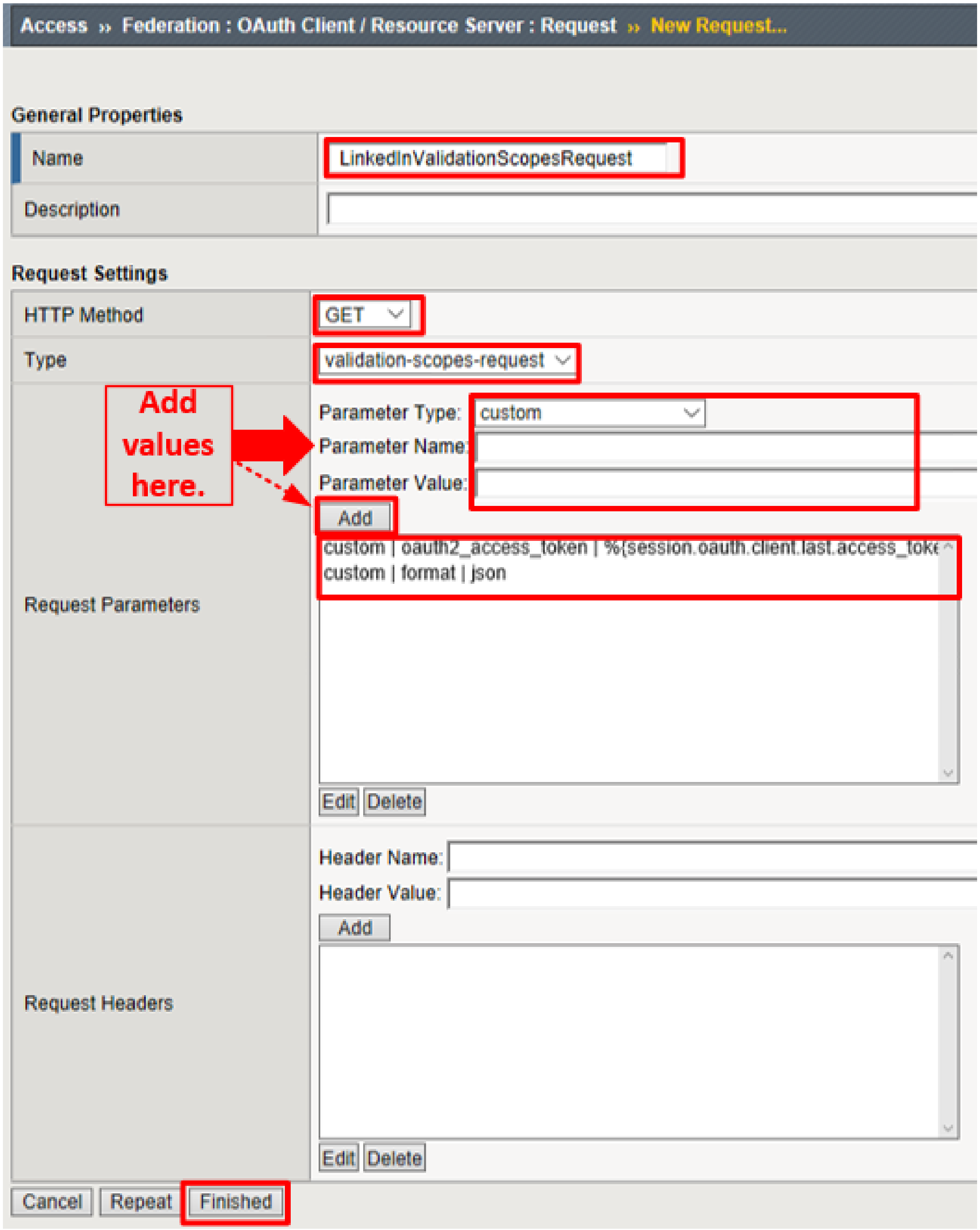


Access » Federation : OAuth Client / Resource Server : Request
SAML Service Provider
SAML Identity Provider
SAML Resources
OAuth Authorization Server
OAuth Client / Resource Server
PingAccess
Search
Create...

Name	Copy	Type	Application	Partition / Path
FSAuthRedirectRequest	Copy...	auth-redirect-request		Common
FSScopesRequest	Copy...	validation-scopes-request		Common
FSTokenRefreshRequest	Copy...	token-refresh-request		Common
FSTokenRequestByAuthzCode	Copy...	token-request		Common
FSTokenRequestByPassword	Copy...	token-request		Common

10. Enter the values as shown for the **OAuth Request** and click **Finished**

    - **Name:** `LinkedInValidationScopesRequest`
    - **HTTP Method:** `GET`
    - **Type:** `validation-scopes-request`



Access » Federation : OAuth Client / Resource Server : Request » New Request...

General Properties

Name: LinkedInValidationScopesRequest

Description:

Request Settings

HTTP Method: GET

Type: validation-scopes-request

Request Parameters

Parameter Type: custom

Parameter Name:

Parameter Value:

```
custom | oauth2_access_token | %{session.oauth.client.last.access_toke
custom | format | json
```

Request Headers

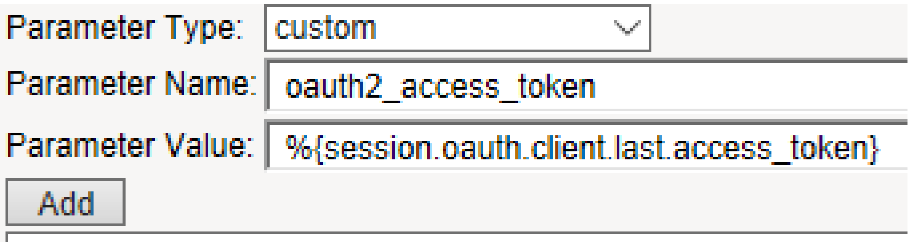
Header Name:

Header Value:

11. Add the following request parameters and click **Add** after entering the values for each:

    - **Parameter Type:** `custom`
    - **Parameter Name:** `oauth2_access_token`
    - **Parameter Value:** `%{session.oauth.client.last.access_token}`
    - **Parameter Type:** `custom`

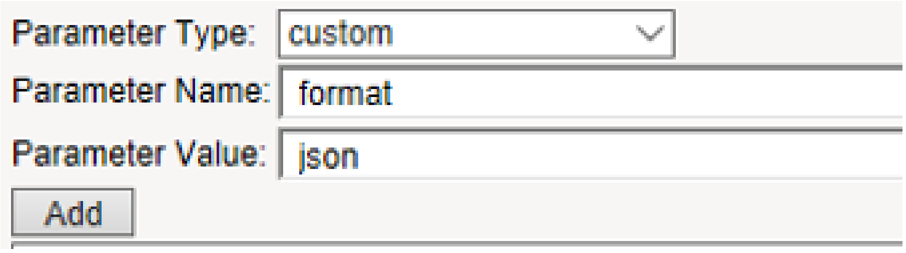
- **Parameter Name:** `format`
- **Parameter Value:** `json`



Parameter Type: custom

Parameter Name: oauth2_access_token

Parameter Value: %{session.oauth.client.last.access_token}

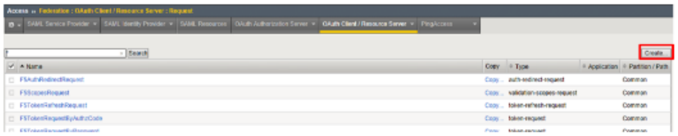


Parameter Type: custom

Parameter Name: format

Parameter Value: json

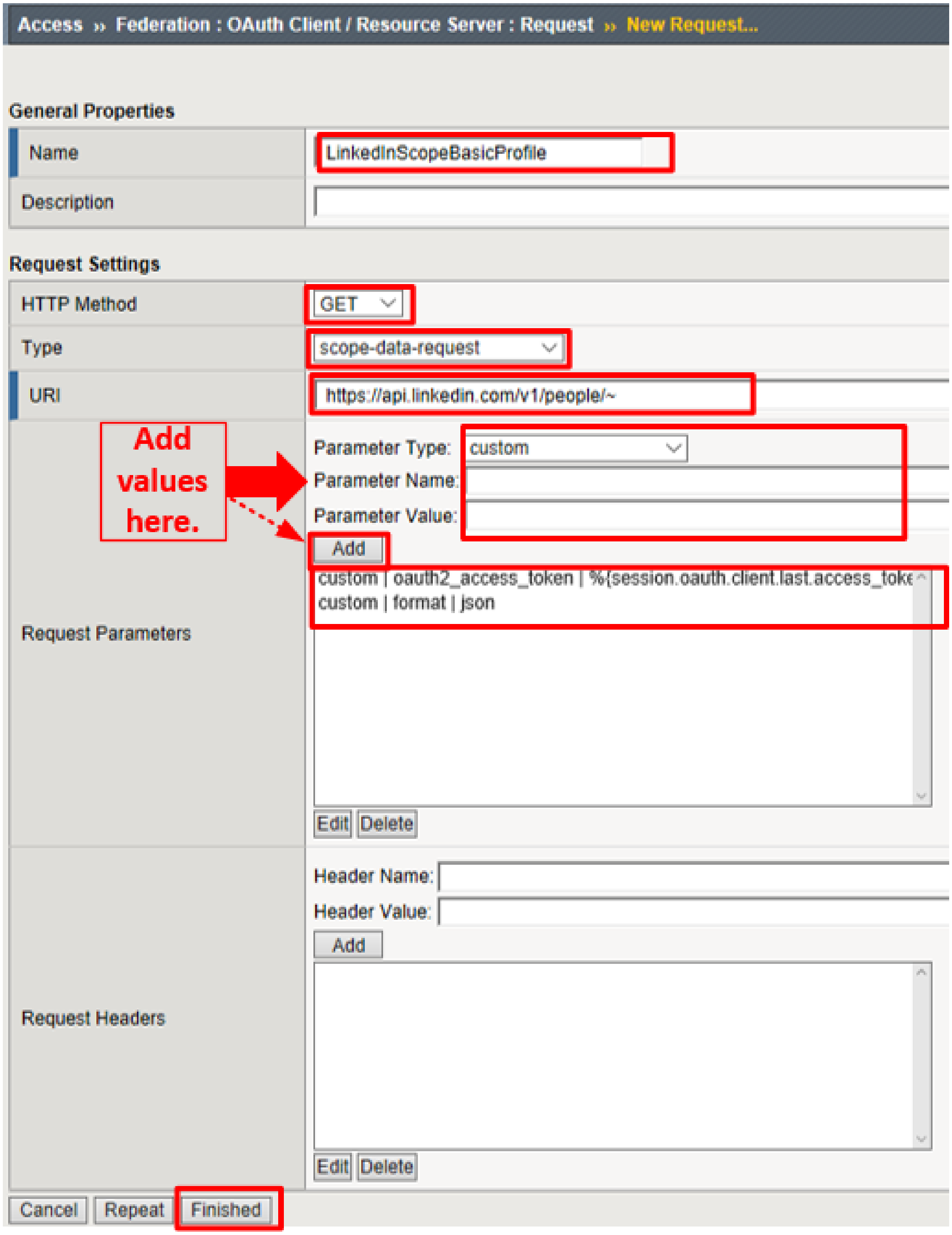
12. Configure the **OAuth Scope Data Request** Profile Object: Go to **Access -> Federation -> OAuth Client / Resource Server -> Request** and click **Create**



Access » Federation : OAuth Client / Resource Server : Request
SAML Service Provider
SAML Identity Provider
SAML Resources
OAuth Authorization Server
OAuth Client / Resource Server
PingAccess
Search
Create...

☑	▲ Name	Copy	◆ Type	◆ Application	◆ Partition / Path
□	FSAuthRedirectRequest	Copy...	auth-redirect-request		Common
□	FSScopesRequest	Copy...	validation-scopes-request		Common
□	FSTokenRefreshRequest	Copy...	token-refresh-request		Common
□	FSTokenRequestByAuthzCode	Copy...	token-request		Common
□	[illegible]	Copy...	token-request		Common

13. Enter the values as shown for the **OAuth Request** and click **Finished**
    - **Name:** `LinkedInScopeBasicProfile`
    - **HTTP Method:** `GET`
    - **URI:** `https://api.linkedin.com/v1/people/~`
    - **Type:** `scope-data-request`



Access » Federation : OAuth Client / Resource Server : Request » New Request...

General Properties

Name	LinkedInScopeBasicProfile
Description	

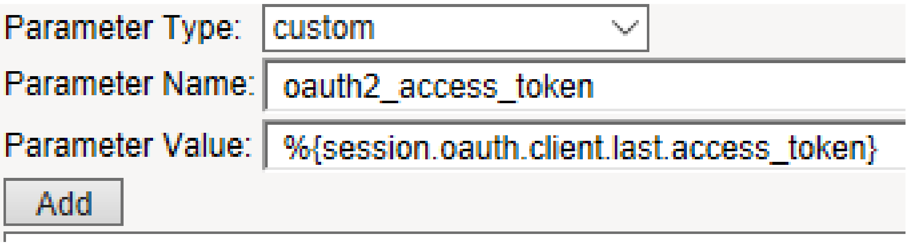
Request Settings

HTTP Method	GET
Type	scope-data-request
URI	https://api.linkedin.com/v1/people/~
Request Parameters	Parameter Type: custom Parameter Name: Parameter Value: custom | oauth2_access_token | %{session.oauth.client.last.access_toke custom | format | json
Request Headers	Header Name: Header Value:

14. Add the following request parameters and click **Add** after entering the values for each:

    - **Parameter Type:** `custom`
    - **Parameter Name:** “ oauth2_access_token“
    - **Parameter Value:** `%{session.oauth.client.last.access_token}`

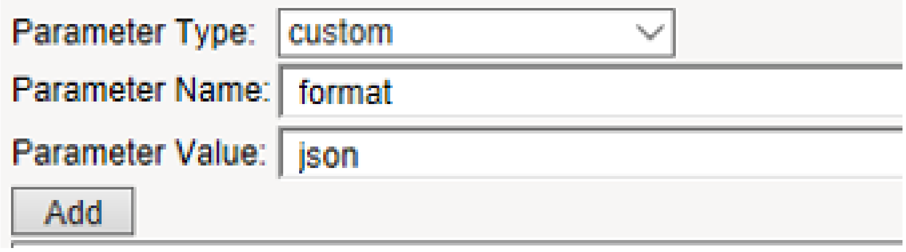
- **Parameter Type:** `custom`
- **Parameter Name:** `format`
- **Parameter Value:** `json`



Parameter Type: custom

Parameter Name: oauth2_access_token

Parameter Value: %{session.oauth.client.last.access_token}

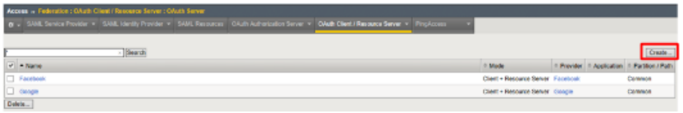


Parameter Type: custom

Parameter Name: format

Parameter Value: json

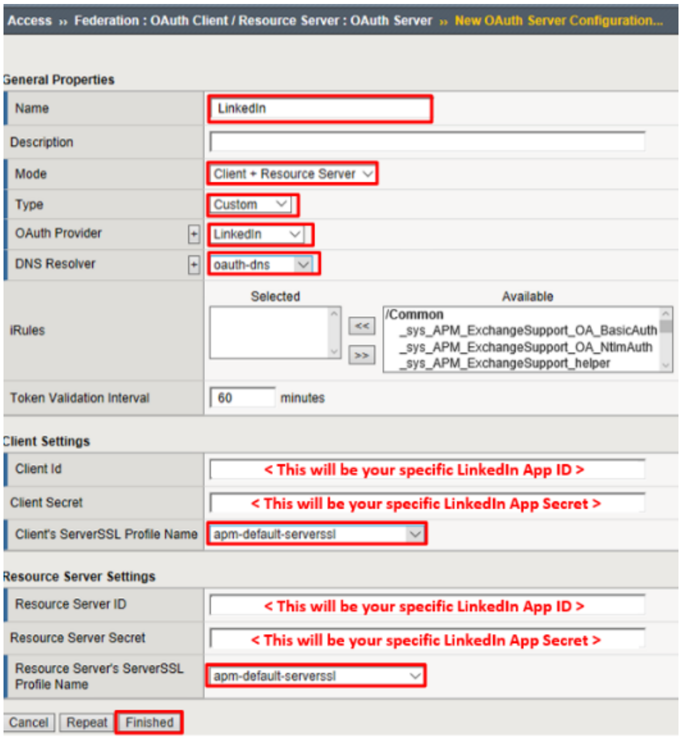
15. Configure the **OAuth Server** Object: Go to **Access -> Federation -> OAuth Client / Resource Server -> OAuth Server** and click **Create**



Access » Federation : OAuth Client / Resource Server : OAuth Server
SAML Service Provider
SAML Identity Provider
SAML Resources
OAuth Authorization Server
OAuth Client / Resource Server
PingAccess
Search
Create...
Delete...

☑	Name	Mode	Provider	Application	Partition / Path
□	Facebook	Client + Resource Server	Facebook		Common
□	Google	Client + Resource Server	Google		Common

16. Enter the values as shown below for the **OAuth Server** and click **Finished**
    - **Name:** `LinkedIn`
    - **Mode:** `Client + Resource Server`
    - **Type:** `Custom`
    - **OAuth Provider:** `LinkedIn`
    - **DNS Resolver:** `oauth-dns *(configured for you)*`
    - **Client ID:** `<App ID from LinkedIn>`
    - **Client Secret:** `<App Secret from LinkedIn >`
    - **Client's ServerSSL Profile Name:** `apm-default-serverssl`
    - **Resource Server ID:** `<App ID from LinkedIn >`
    - **Resource Server Secret:** `<App Secret from LinkedIn >`
    - **Resource Server's ServerSSL Profile Name:** `apm-default-serverssl`



Access » Federation : OAuth Client / Resource Server : OAuth Server » New OAuth Server Configuration...

General Properties

Name	LinkedIn
Description	
Mode	Client + Resource Server
Type	Custom
OAuth Provider	LinkedIn
DNS Resolver	oauth-dns
iRules	Selected: Available: /Common _sys_APM_ExchangeSupport_OA_BasicAuth _sys_APM_ExchangeSupport_OA_NtlmAuth _sys_APM_ExchangeSupport_helper
Token Validation Interval	60 minutes

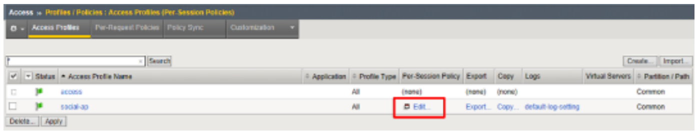
Client Settings

Client Id	< This will be your specific LinkedIn App ID >
Client Secret	< This will be your specific LinkedIn App Secret >
Client's ServerSSL Profile Name	apm-default-serverssl

Resource Server Settings

Resource Server ID	< This will be your specific LinkedIn App ID >
Resource Server Secret	< This will be your specific LinkedIn App Secret >
Resource Server's ServerSSL Profile Name	apm-default-serverssl

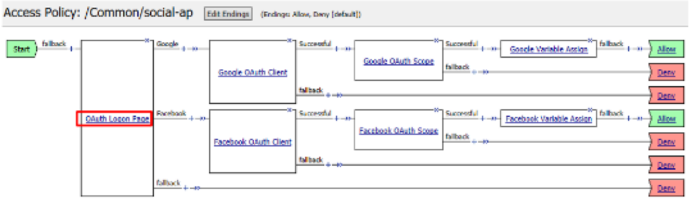
17. Configure the VPE for LinkedIn: Go to **Access -> Profiles / Policies -> Access Profiles (Per Session Policies)** and click **Edit** on `social-ap`, a new browser tab will open



Access » Profiles / Policies : Access Profiles (Per-Session Policies)

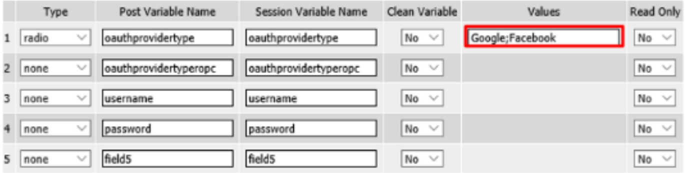
	Status	Access Profile Name	Application	Profile Type	Per-Session Policy	Export	Copy	Logs	Virtual Servers	Partition / Path
□		access		All	(none)	(none)	(none)			Common
□		social-ap		All	Edit...	Export...	Copy...	default-log-setting		Common

18. Click on the link **OAuth Logon Page** as shown



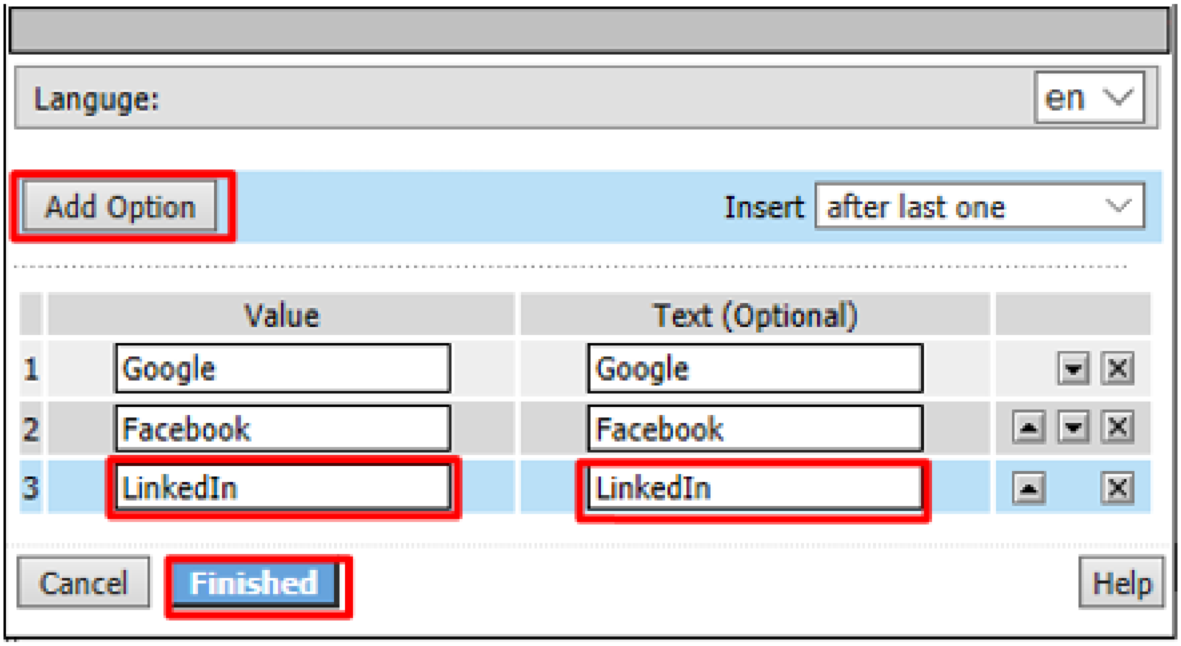
Access Policy: /Common/social-ap

19. Click on the **Values** area of **Line #1** as shown. A pop-up window will appear



	Type	Post Variable Name	Session Variable Name	Clean Variable	Values	Read Only
1	radio	oauthprovidertype	oauthprovidertype	No	Google;Facebook	No
2	none	oauthprovidertyperopc	oauthprovidertyperopc	No		No
3	none	username	username	No		No
4	none	password	password	No		No
5	none	field5	field5	No		No

20. Click **Add Option**. In the new **Line 3**, type LinkedIn in both the **Value** and **Text (Optional)** fields and click **Finished**



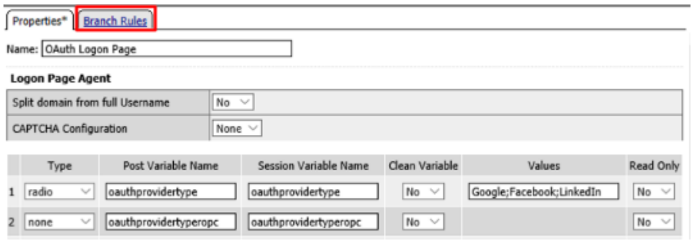
Langúge: en

Add Option   Insert after last one

	Value	Text (Optional)
1	Google	Google
2	Facebook	Facebook
3	LinkedIn	LinkedIn

Cancel   Finished   Help

21. Click on the **Branch Rules** tab of the **OAuth Logon Page** screen



Properties* | Branch Rules

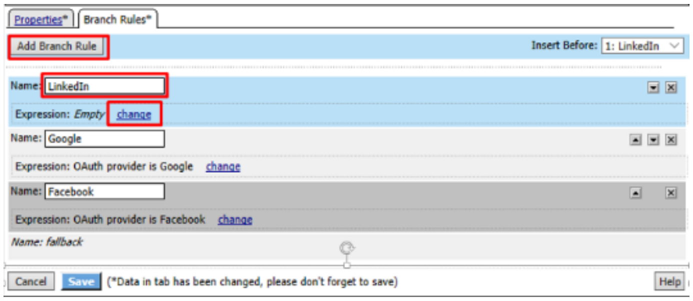
Name: OAuth Logon Page

Logon Page Agent

Split domain from full Username	No
CAPTCHA Configuration	None

	Type	Post Variable Name	Session Variable Name	Clean Variable	Values	Read Only
1	radio	oauthprovidertype	oauthprovidertype	No	Google;Facebook;LinkedIn	No
2	none	oauthprovidertyperopc	oauthprovidertyperopc	No		No

22. Click **Add Branch Rule**. In the resulting new line enter LinkedIn for the **Name** field and click the **Change** link on the **Expression** line



Properties* | Branch Rules*

Add Branch Rule   Insert Before: 1: LinkedIn

Name: LinkedIn

Expression: *Empty* change

Name: Google

Expression: OAuth provider is Google change

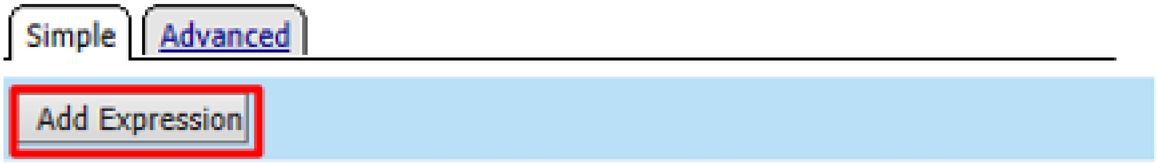
Name: Facebook

Expression: OAuth provider is Facebook change

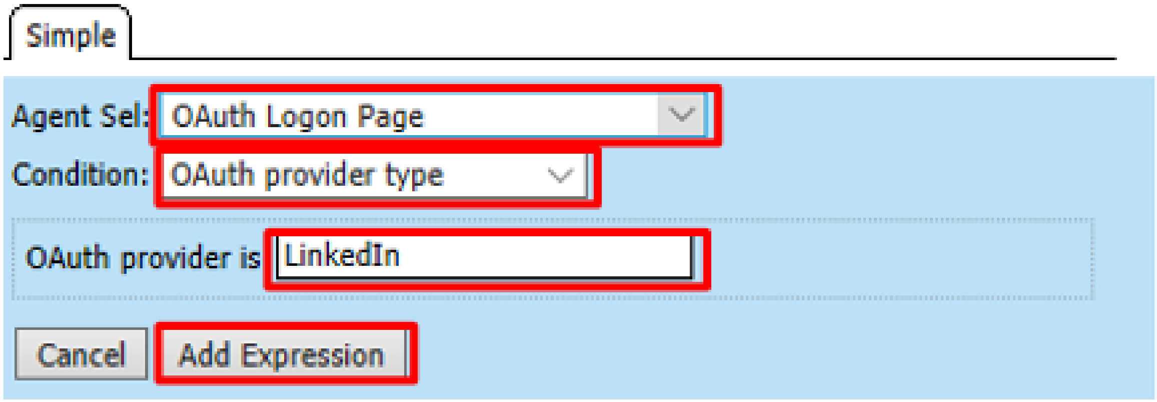
Name: fallback

Cancel   Save   (*Data in tab has been changed, please don't forget to save)   Help

23. Click **Add Expression** on the **Simple** tab



24. Select OAuth Logon Page in the **Agent Sel:** drop down. Select OAuth provider type from the **Condition** drop down. In the **OAuth provider** field enter LinkedIn and then click **Add Expression**

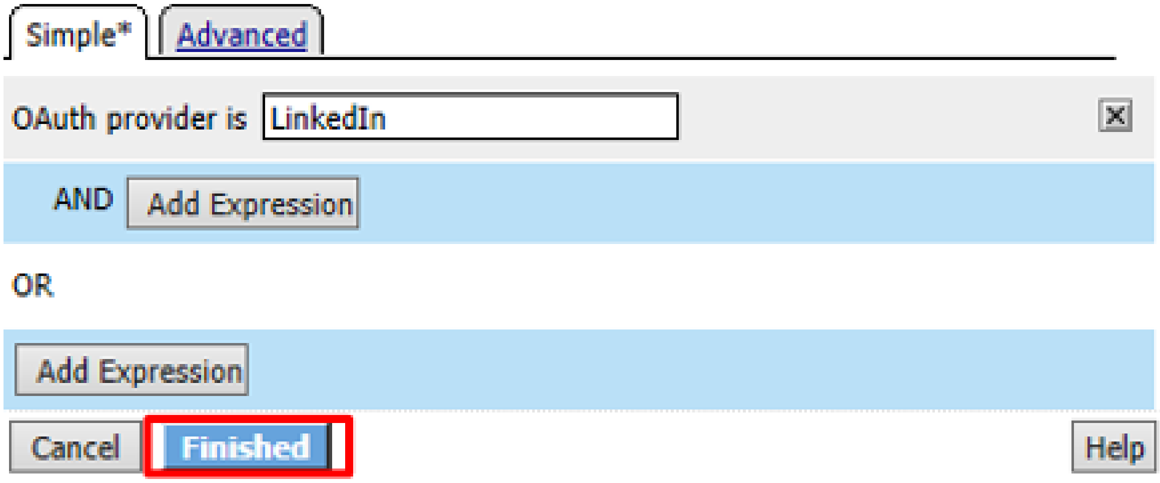


Agent Sel: OAuth Logon Page

Condition: OAuth provider type

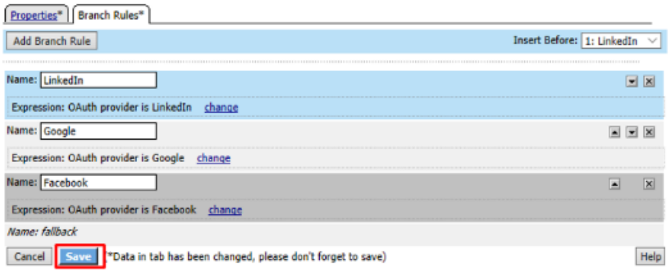
OAuth provider is LinkedIn

25. Click **Finished** on the **Simple** Expression tab



OAuth provider is LinkedIn

26. Click **Save** on the completed **Branch Rules** tab



Insert Before: 1: LinkedIn

Name: LinkedIn

Expression: OAuth provider is LinkedIn change

Name: Google

Expression: OAuth provider is Google change

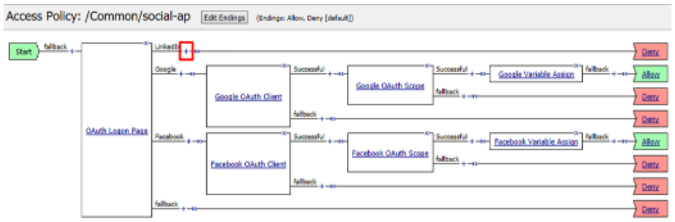
Name: Facebook

Expression: OAuth provider is Facebook change

Name: fallback

(*Data in tab has been changed, please don't forget to save)

27. Click the + on the **LinkedIn** provider's branch after the **OAuth Logon Page**

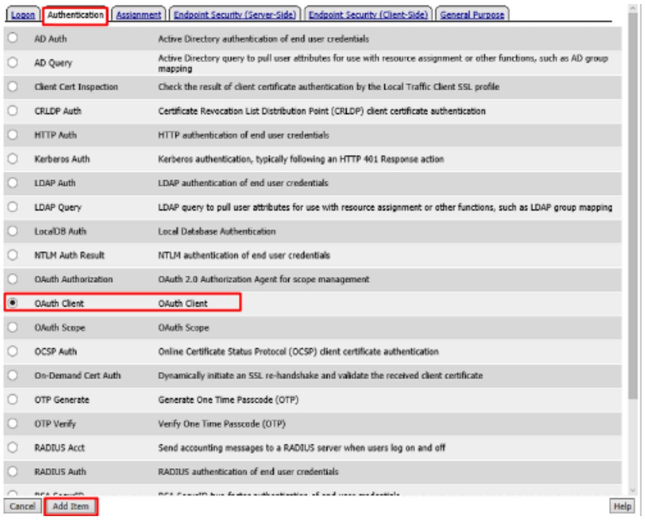


Access Policy: /Common/social-ap

Note: If not still in the VPE: Go to **Access -> Profiles / Policies -> Access Profiles (Per Session**

Policies). Click **Edit** on **social-ap**, a new browser tab will open*

28. Select **OAuth Client** from the **Authentication** tab and click **Add Item**

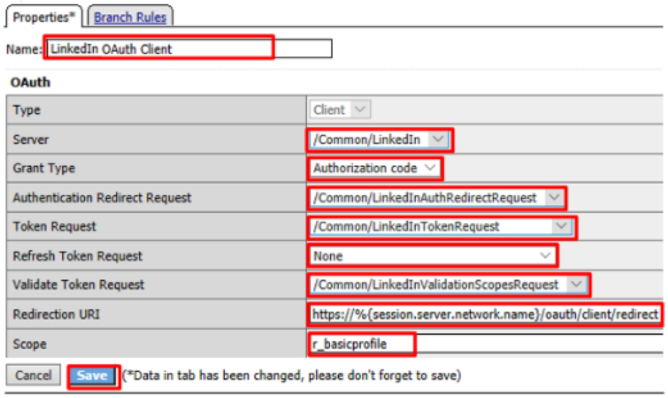


Logon
Authentication
Assignment
Endpoint Security (Server-Side)
Endpoint Security (Client-Side)
General Purpose

○	AD Auth	Active Directory authentication of end user credentials
○	AD Query	Active Directory query to pull user attributes for use with resource assignment or other functions, such as AD group mapping
○	Client Cert Inspection	Check the result of client certificate authentication by the Local Traffic Client SSL profile
○	CRLDP Auth	Certificate Revocation List Distribution Point (CRLDP) client certificate authentication
○	HTTP Auth	HTTP authentication of end user credentials
○	Kerberos Auth	Kerberos authentication, typically following an HTTP 401 Response action
○	LDAP Auth	LDAP authentication of end user credentials
○	LDAP Query	LDAP query to pull user attributes for use with resource assignment or other functions, such as LDAP group mapping
○	LocalDB Auth	Local Database Authentication
○	NTLM Auth Result	NTLM authentication of end user credentials
○	OAuth Authorization	OAuth 2.0 Authorization Agent for scope management
●	OAuth Client	OAuth Client
○	OAuth Scope	OAuth Scope
○	OCSP Auth	Online Certificate Status Protocol (OCSP) client certificate authentication
○	On-Demand Cert Auth	Dynamically initiate an SSL re-handshake and validate the received client certificate
○	OTP Generate	Generate One Time Passcode (OTP)
○	OTP Verify	Verify One Time Passcode (OTP)
○	RADIUS Acct	Send accounting messages to a RADIUS server when users log on and off
○	RADIUS Auth	RADIUS authentication of end user credentials
○	RSA SecurID	RSA SecurID two-factor authentication of end user credentials

29. Enter the following in the **OAuth Client** input screen and click **Save**

- **Name:** `LinkedIn OAuth Client`
- **Server:** `/Common/LinkedIn`
- **Grant Type:** `Authorization Code`
- **Authentication Redirect Request:** `/Common/LinkedInAuthRedirectRequest`
- **Token Request:** `/Common/LinkedInTokenRequest`
- **Refresh Token Request:** `None`
- **Validate Token Request:** `/Common/LinkedInValidationScopesRequest`
- **Redirection URI:** `https://%{session.server.network.name}/oauth/client/redirect`
- **Scope:** `r_basicprofile *(Note underscore)*`



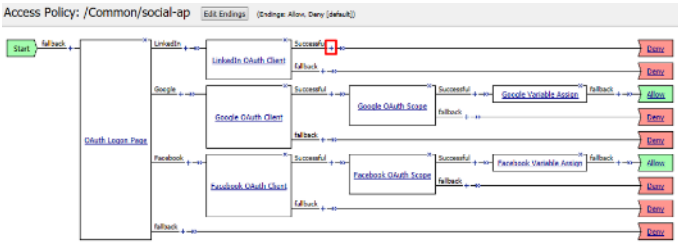
Name: LinkedIn OAuth Client

OAuth

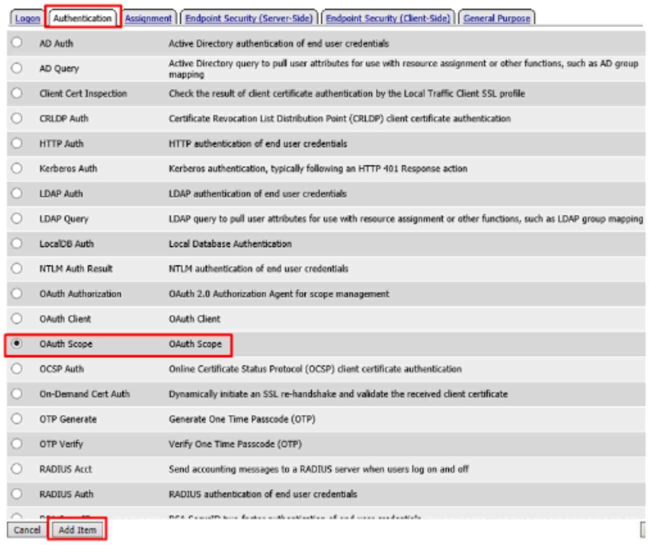
Type	Client
Server	/Common/LinkedIn
Grant Type	Authorization code
Authentication Redirect Request	/Common/LinkedInAuthRedirectRequest
Token Request	/Common/LinkedInTokenRequest
Refresh Token Request	None
Validate Token Request	/Common/LinkedInValidationScopesRequest
Redirection URI	https://%{session.server.network.name}/oauth/client/redirect
Scope	r_basicprofile

(*Data in tab has been changed, please don't forget to save)

30. Click **+** on the **Successful** branch after the **LinkedIn OAuth Client**



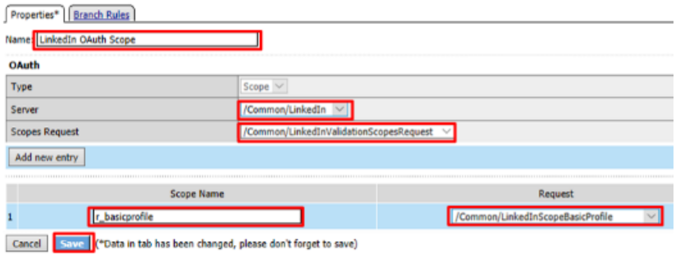
31. Select **OAuth Scope** from the **Authentication** tab, and click **Add Item**


Logon
Authentication
Assignment
Endpoint Security (Server-Side)
Endpoint Security (Client-Side)
General Purpose

○	AD Auth	Active Directory authentication of end user credentials
○	AD Query	Active Directory query to pull user attributes for use with resource assignment or other functions, such as AD group mapping
○	Client Cert Inspection	Check the result of client certificate authentication by the Local Traffic Client SSL profile
○	CRLDP Auth	Certificate Revocation List Distribution Point (CRLDP) client certificate authentication
○	HTTP Auth	HTTP authentication of end user credentials
○	Kerberos Auth	Kerberos authentication, typically following an HTTP 401 Response action
○	LDAP Auth	LDAP authentication of end user credentials
○	LDAP Query	LDAP query to pull user attributes for use with resource assignment or other functions, such as LDAP group mapping
○	LocalDB Auth	Local Database Authentication
○	NTLM Auth Result	NTLM authentication of end user credentials
○	OAuth Authorization	OAuth 2.0 Authorization Agent for scope management
○	OAuth Client	OAuth Client
●	OAuth Scope	OAuth Scope
○	OCSP Auth	Online Certificate Status Protocol (OCSP) client certificate authentication
○	On-Demand Cert Auth	Dynamically initiate an SSL re-handshake and validate the received client certificate
○	OTP Generate	Generate One Time Passcode (OTP)
○	OTP Verify	Verify One Time Passcode (OTP)
○	RADIUS Acct	Send accounting messages to a RADIUS server when users log on and off
○	RADIUS Auth	RADIUS authentication of end user credentials
○	RSA SecurID	RSA SecurID two-factor authentication of end user credentials

32. Enter the following on the **OAuth Scope** input screen and click **Save**

- **Name:** `LinkedIn OAuth Scope`
- **Server:** `/Common/LinkedIn`
- **Scopes Request:** `/Common/LinkedInValidationScopesRequest`
- Click **Add New Entry**
- **Scope Name:** `r_basicprofile`
- **Request:** `/Common/LinkedInScopeBasicProfile`



Name: LinkedIn OAuth Scope

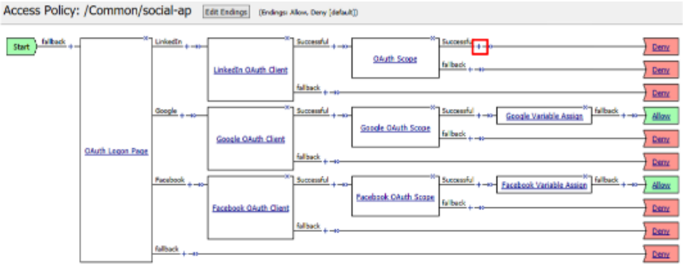
OAuth

Type	Scope
Server	/Common/LinkedIn
Scopes Request	/Common/LinkedInValidationScopesRequest

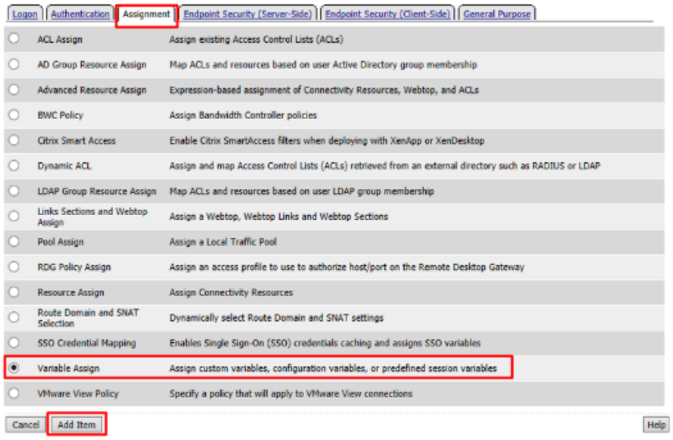
	Scope Name	Request
1	r_basicprofile	/Common/LinkedInScopeBasicProfile

(*Data in tab has been changed, please don't forget to save)

33. Click the **+** on the **Successful** branch after the **LinkedIn OAuth Scope** object



34. Select **Variable Assign** from the **Assignment** tab, and click **Add Item**

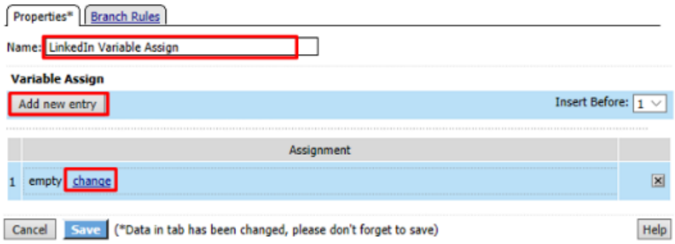


Logon | Authentication | Assignment | Endpoint Security (Server-Side) | Endpoint Security (Client-Side) | General Purpose

○	ACL Assign	Assign existing Access Control Lists (ACLs)
○	AD Group Resource Assign	Map ACLs and resources based on user Active Directory group membership
○	Advanced Resource Assign	Expression-based assignment of Connectivity Resources, Webtop, and ACLs
○	BWC Policy	Assign Bandwidth Controller policies
○	Citrix Smart Access	Enable Citrix SmartAccess filters when deploying with XenApp or XenDesktop
○	Dynamic ACL	Assign and map Access Control Lists (ACLs) retrieved from an external directory such as RADIUS or LDAP
○	LDAP Group Resource Assign	Map ACLs and resources based on user LDAP group membership
○	Links Sections and Webtop Assign	Assign a Webtop, Webtop Links and Webtop Sections
○	Pool Assign	Assign a Local Traffic Pool
○	RDG Policy Assign	Assign an access profile to use to authorize host/port on the Remote Desktop Gateway
○	Resource Assign	Assign Connectivity Resources
○	Route Domain and SNAT Selection	Dynamically select Route Domain and SNAT settings
○	SSO Credential Mapping	Enables Single Sign-On (SSO) credentials caching and assigns SSO variables
●	Variable Assign	Assign custom variables, configuration variables, or predefined session variables
○	VMware View Policy	Specify a policy that will apply to VMware View connections

Cancel | Add Item | Help

35. Name it LinkedIn Variable Assign and click **Add New Entry** then **change**



Properties* | Branch Rules

Name: LinkedIn Variable Assign

Variable Assign

Add new entry | Insert Before: 1

	Assignment	
1	empty change	☒

Cancel | Save | (*Data in tab has been changed, please don't forget to save) | Help

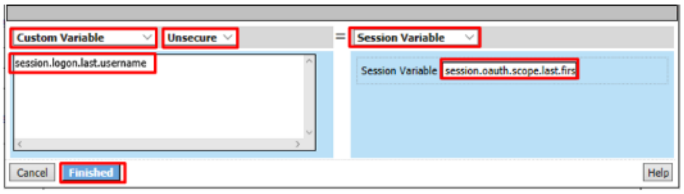
36. Enter the following values and click **Finished**

Left Side:

- **Type:** `Custom Variable`
- **Security:** `Unsecure`
- **Value:** `session.logon.last.username`

Right Side:

- **Type:** `Session Variable`
- **Session Variable:** `session.oauth.scope.last.firstName`



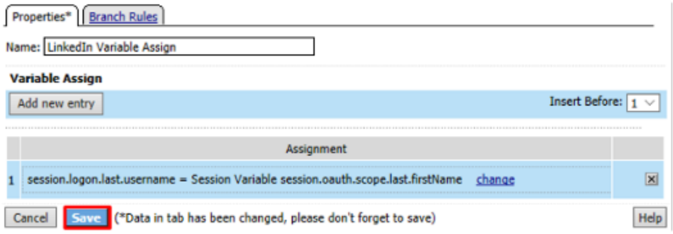
Custom Variable | Unsecure = Session Variable

session.logon.last.username

Session Variable: session.oauth.scope.last.firs

Cancel | Finished | Help

37. Review the **LinkedIn Variable Assign** object and click **Save**



Properties* | Branch Rules

Name: LinkedIn Variable Assign

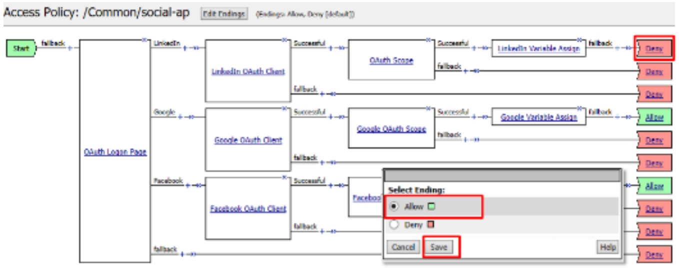
Variable Assign

Add new entry — Insert Before: 1

	Assignment	
1	session.logon.last.username = Session Variable session.oauth.scope.last.firstName change	☒

Cancel Save (*Data in tab has been changed, please don't forget to save) Help

38. Click **Deny** on the **Fallback** branch after the **LinkedIn Variable Assign** object, select **Allow** in the pop up window and click **Save**

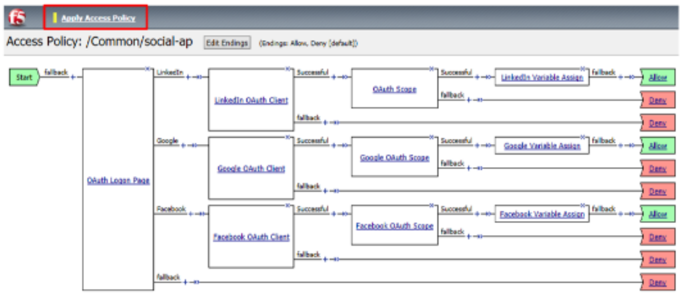


Select Ending:

● Allow
○ Deny

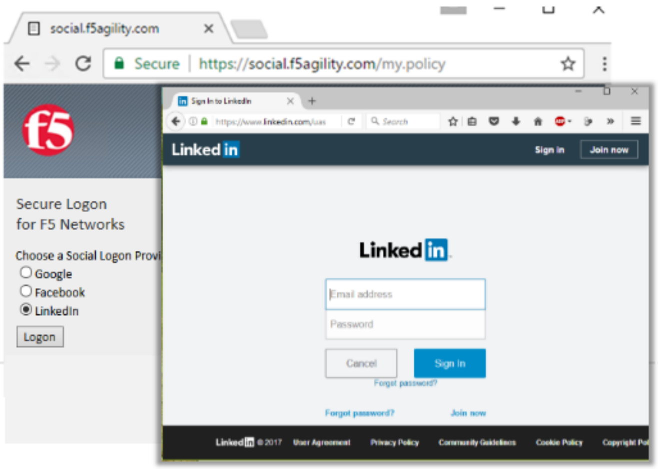
Cancel Save Help

39. Click **Apply Access Policy** in the top left and then close the tab



Test Configuration

1. Test by opening Chrome in the jump host and browsing to `https://social.f5agility.com`, select the provider and attempt logon.



social.f5agility.com

Secure | https://social.f5agility.com/my.policy

Secure Logon
for F5 Networks

Choose a Social Logon Provi

○ Google
○ Facebook
● LinkedIn

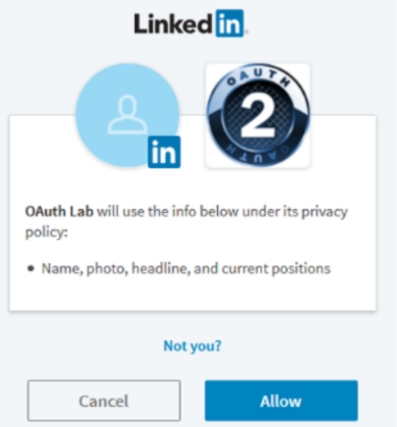
Logon

Note: You are able to login and reach the app now, but SSO to the app has not been setup so you get an application error.

Note: You may also be prompted for additional security measures as you are logging in from a new location.

Note: You may need to start a Chrome New Incognito Window so no session data carries over.

2. You will be prompted to authorize your request. Click **Allow.**



OAuth Lab will use the info below under its privacy policy:

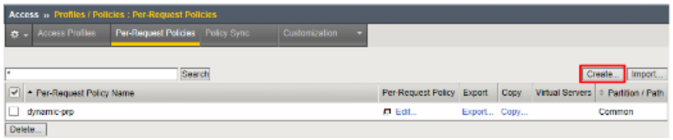
- Name, photo, headline, and current positions

2.2.9 Task 7: Add Header Insertion for SSO to the App

In this task you will create a policy that runs on every request. It will insert a header into the serverside HTTP Requests that contains the username. The application will use this to identify who the user is, providing Single Sign On (SSO).

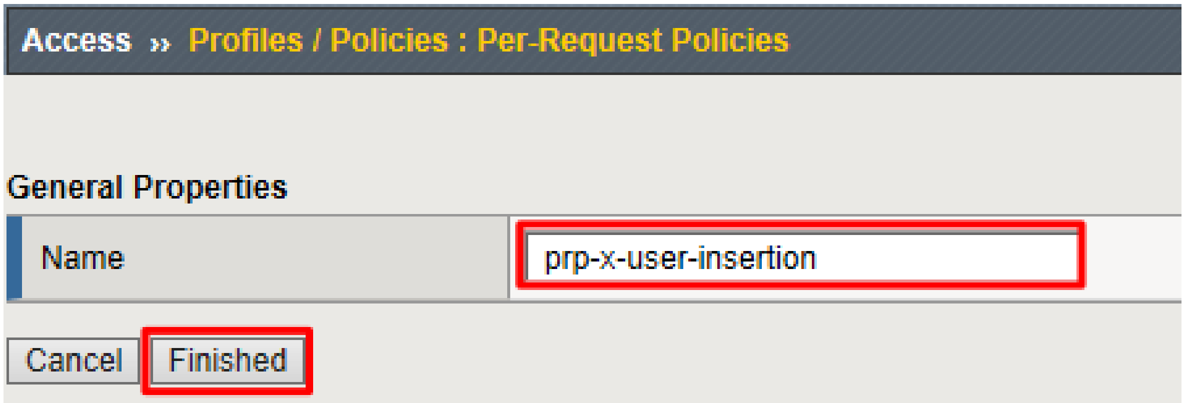
Configure the Per Request Policy

1. Go to **Access** -> **Profiles/Policies** -> **Per Request Policies** and click **Create**



☑	Per-Request Policy Name	Per-Request Policy	Export	Copy	Virtual Servers	Partition / Path
□	dynamic-prp	Edit...	Export...	Copy...		Common

2. Enter prp-x-user-insertion the Name field and click **Finished**

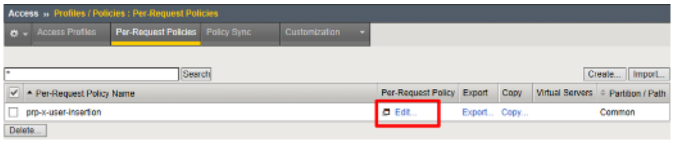


Access » Profiles / Policies : Per-Request Policies

General Properties

Name: prp-x-user-insertion

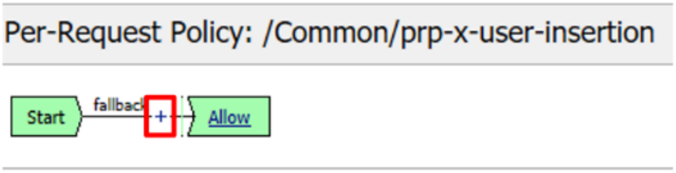
3. Click **Edit** on the **prp-x-user-insertion policy** line



Access » Profiles / Policies : Per-Request Policies

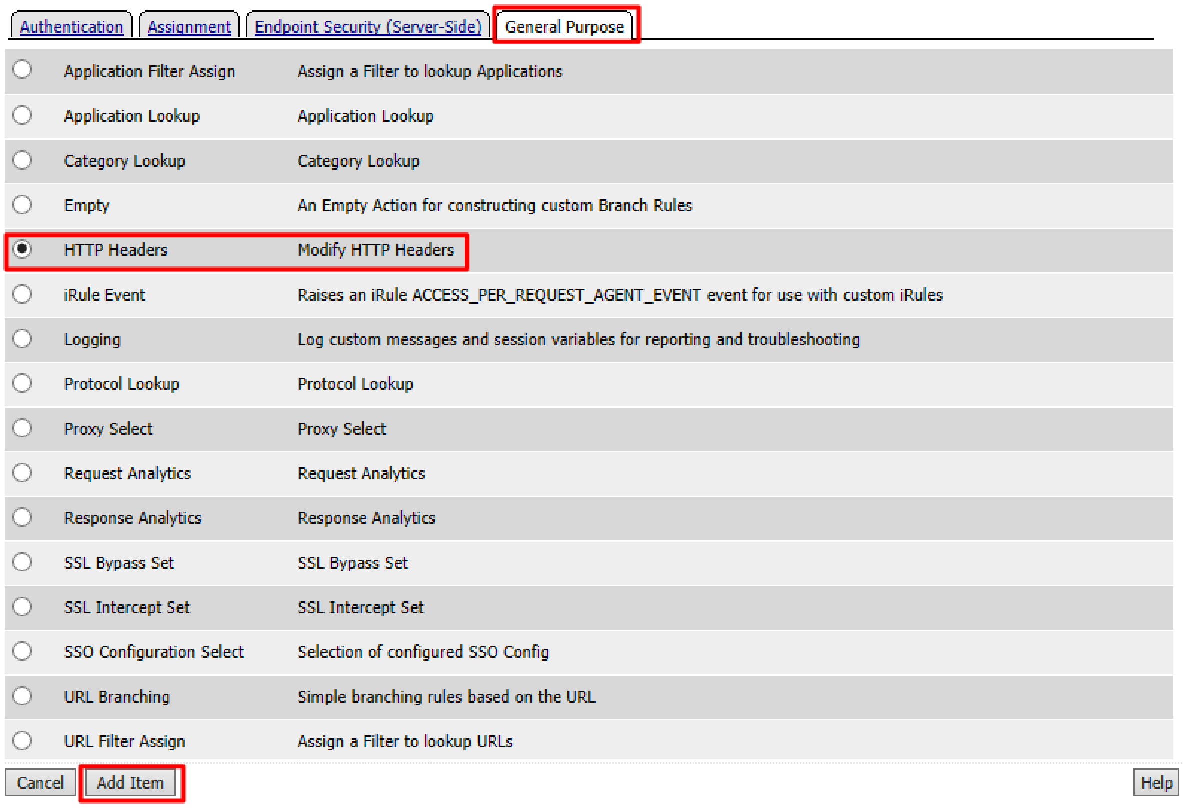
☑	▲ Per-Request Policy Name	Per-Request Policy	Export	Copy	Virtual Servers	⇕ Partition / Path
□	prp-x-user-insertion	Edit...	Export...	Copy...		Common

4. Click the **+** symbol between **Start** and **Allow**



Per-Request Policy: /Common/prp-x-user-insertion

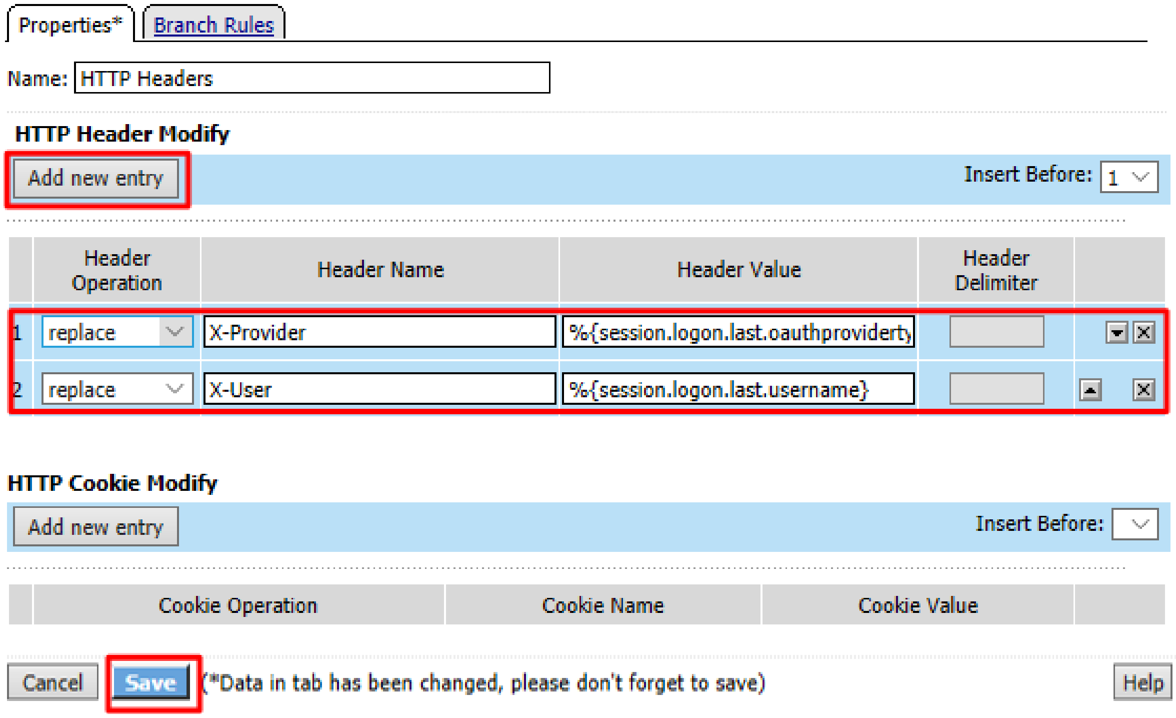
5. Under the **General Purpose** tab select **HTTP Headers** and click **Add Item**



○	Application Filter Assign	Assign a Filter to lookup Applications
○	Application Lookup	Application Lookup
○	Category Lookup	Category Lookup
○	Empty	An Empty Action for constructing custom Branch Rules
●	HTTP Headers	Modify HTTP Headers
○	iRule Event	Raises an iRule ACCESS_PER_REQUEST_AGENT_EVENT event for use with custom iRules
○	Logging	Log custom messages and session variables for reporting and troubleshooting
○	Protocol Lookup	Protocol Lookup
○	Proxy Select	Proxy Select
○	Request Analytics	Request Analytics
○	Response Analytics	Response Analytics
○	SSL Bypass Set	SSL Bypass Set
○	SSL Intercept Set	SSL Intercept Set
○	SSO Configuration Select	Selection of configured SSO Config
○	URL Branching	Simple branching rules based on the URL
○	URL Filter Assign	Assign a Filter to lookup URLs

6. Under the HTTP Header Modify section, click Add New Entry to add the following two headers and then click Save

   - **Header Operation:** `replace`
   - **Header Name:** `X-User`
   - **Header Value:** `%{session.logon.last.username}`
   - **Header Operation:** `replace`
   - **Header Name:** `X-Provider`
   - **Header Value:** `%{session.logon.last.oauthprovidertype}`



Name: HTTP Headers

HTTP Header Modify

	Header Operation	Header Name	Header Value	Header Delimiter	
1	replace	X-Provider	%{session.logon.last.oauthproviderty		
2	replace	X-User	%{session.logon.last.username}		

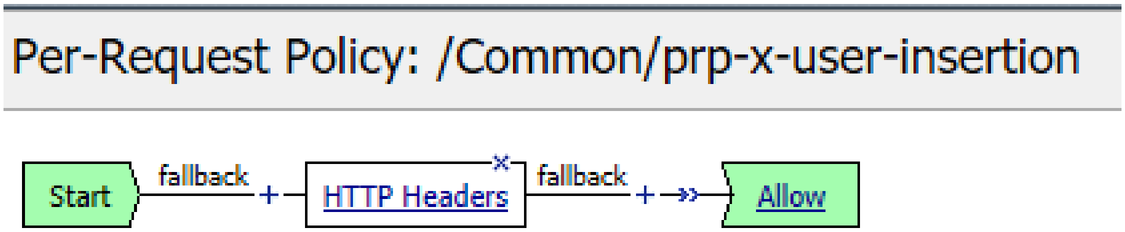
HTTP Cookie Modify

	Cookie Operation	Cookie Name	Cookie Value	

(*Data in tab has been changed, please don't forget to save)

Note: Replace instead of Insert has been selected for Header Operation to improve security. A malicious user might insert their own X-User header. As using Insert would simply add another header. Using Replace will add a header if it does not exist, or replace one if it does.

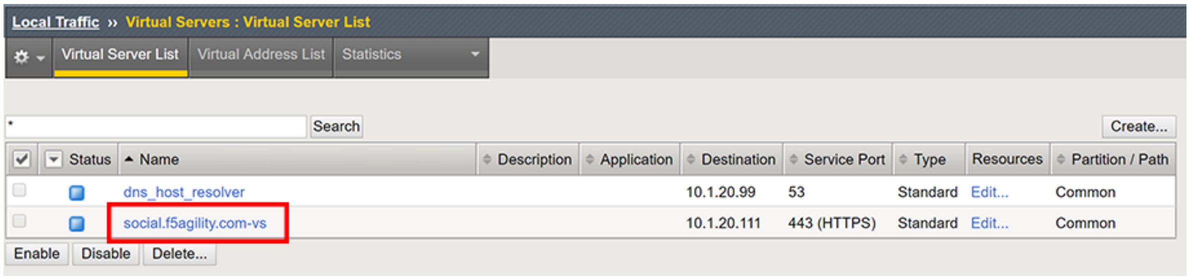
You do not need to Apply Policy on per request policies. You may simply close the browser tab



Per-Request Policy: /Common/prp-x-user-insertion

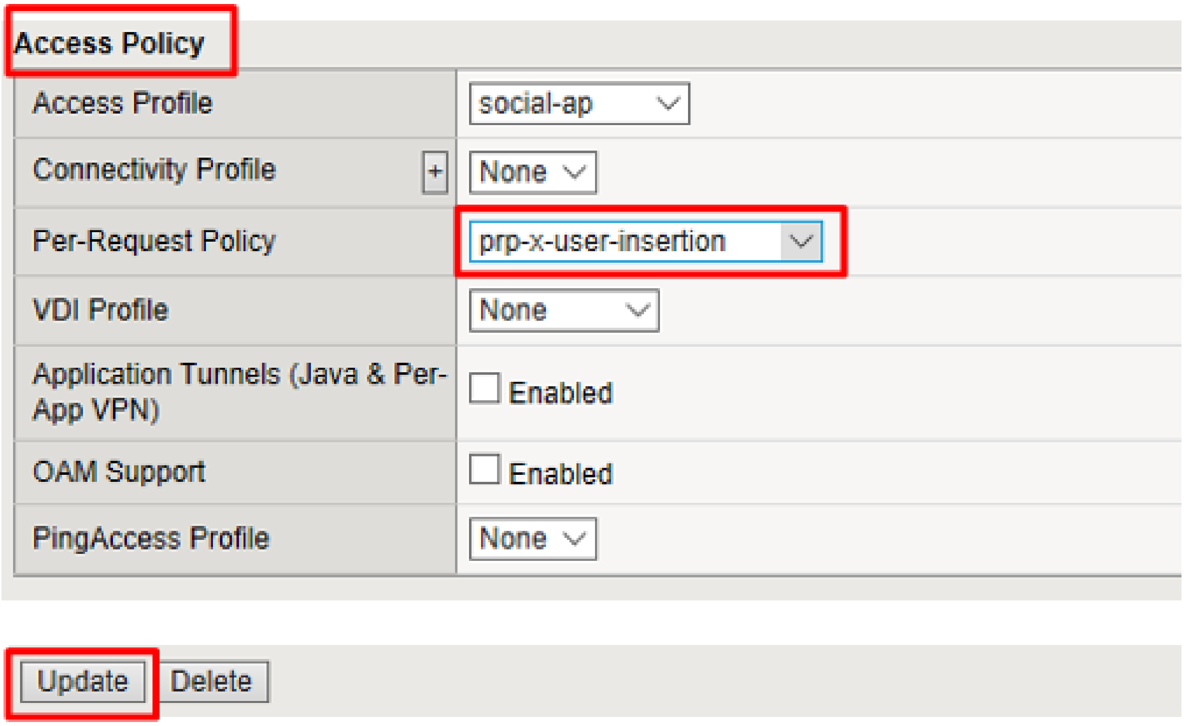
Add the Per Request Policy to the Virtual Server

1. Go to **Local Traffic -> Virtual Servers** and click on `social.f5agility.com-vs`



☑	Status	Name	Description	Application	Destination	Service Port	Type	Resources	Partition / Path
□		dns_host_resolver			10.1.20.99	53	Standard	Edit...	Common
□		social.f5agility.com-vs			10.1.20.111	443 (HTTPS)	Standard	Edit...	Common

2. Scroll to the **Access Policy** section of the Virtual Server and select `prp-x-user-insertion` from the **Per-Request Policy** drop down. Scroll to the bottom of the page and click **Update**

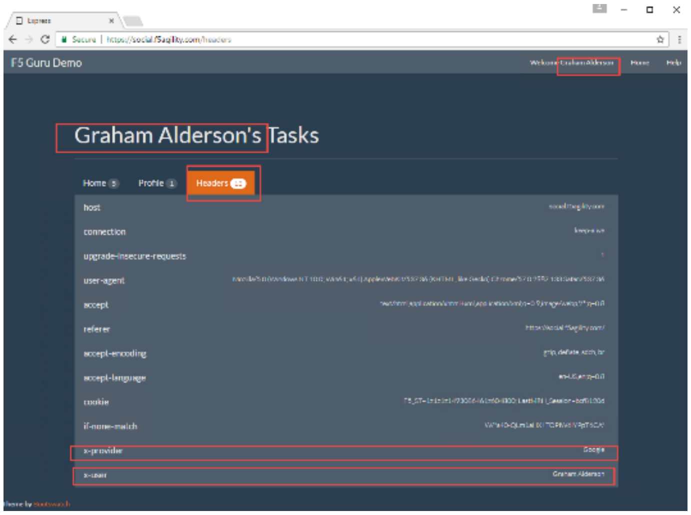


Access Policy

Access Profile	social-ap
Connectivity Profile	None
Per-Request Policy	prp-x-user-insertion
VDI Profile	None
Application Tunnels (Java & Per-App VPN)	□ Enabled
OAM Support	□ Enabled
PingAccess Profile	None

Test Configuration

1. Go to https://social.f5agility.com in your browser and logon using one of the social logon providers. This time you should see your name appear in the top right corner. You can also click “Headers” in the webapp and look at the headers presented to the client. You will see x-user present here with your name as the value. You’ll also see the x-provider header you inserted indicating where the data is coming from.



Graham Alderson's Tasks

host	social.f5agility.com
connection	keep-alive
upgrade-insecure-requests	1
user-agent	Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/57.0.2987.133 Safari/537.36
accept	text/html,application/xhtml+xml,application/xml;q=0.9,image/webp,*/*;q=0.8
referer	https://social.f5agility.com/
accept-encoding	gzip, deflate, sdch, br
accept-language	en-US,en;q=0.8
cookie	[illegible]
if-none-match	[illegible]
x-provider	Google
x-user	Graham Alderson

2.3 Lab 2: API Protection

2.3.1 Purpose

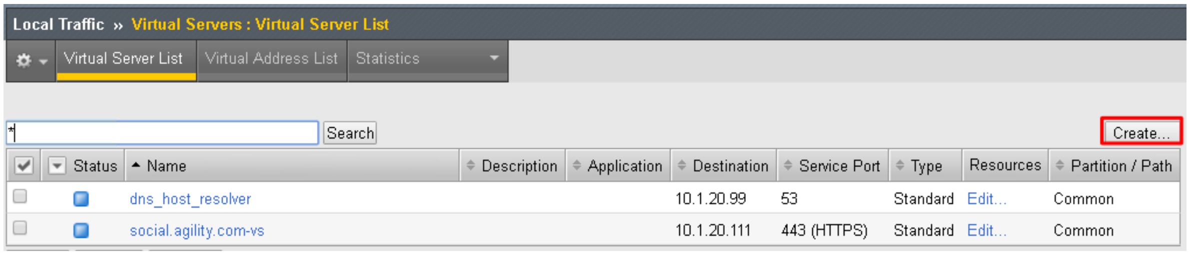
This section will teach you how to configure a Big-IP (#1) as a Resource Server protecting an API with OAuth and another Big-IP (#2) as the Authorization Server providing the OAuth tokens.

2.3.2 Task 1: Setup Virtual Server for the API

Note: This task is performed on Big-IP #1 (RS)

Create the Virtual Server

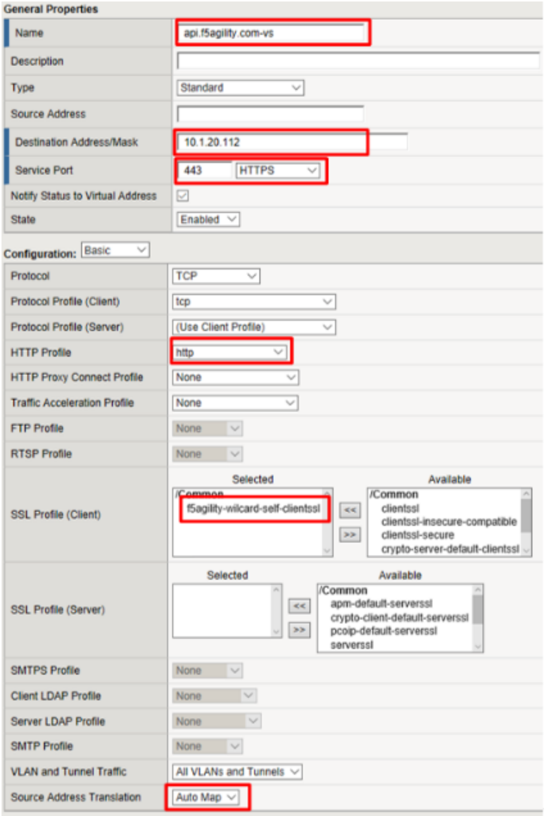
1. Go to **Local Traffic -> Virtual Servers** and click on **Create**



☑	Status	Name	Description	Application	Destination	Service Port	Type	Resources	Partition / Path
□	■	dns_host_resolver			10.1.20.99	53	Standard	Edit...	Common
□	■	social.agility.com-vs			10.1.20.111	443 (HTTPS)	Standard	Edit...	Common

2. Enter the following values *(leave others default)* then scroll down to **Resources**

   - **Name:** `api.f5agility.com-vs`
   - **Destination Address:** `10.1.20.112`
   - **Service Port:** `443`
   - **HTTP Profile:** `http`
   - **SSL Profile (Client):** `f5agility-wildcard-self-clientssl`
   - **Source Address Translation:** `Auto Map`



General Properties

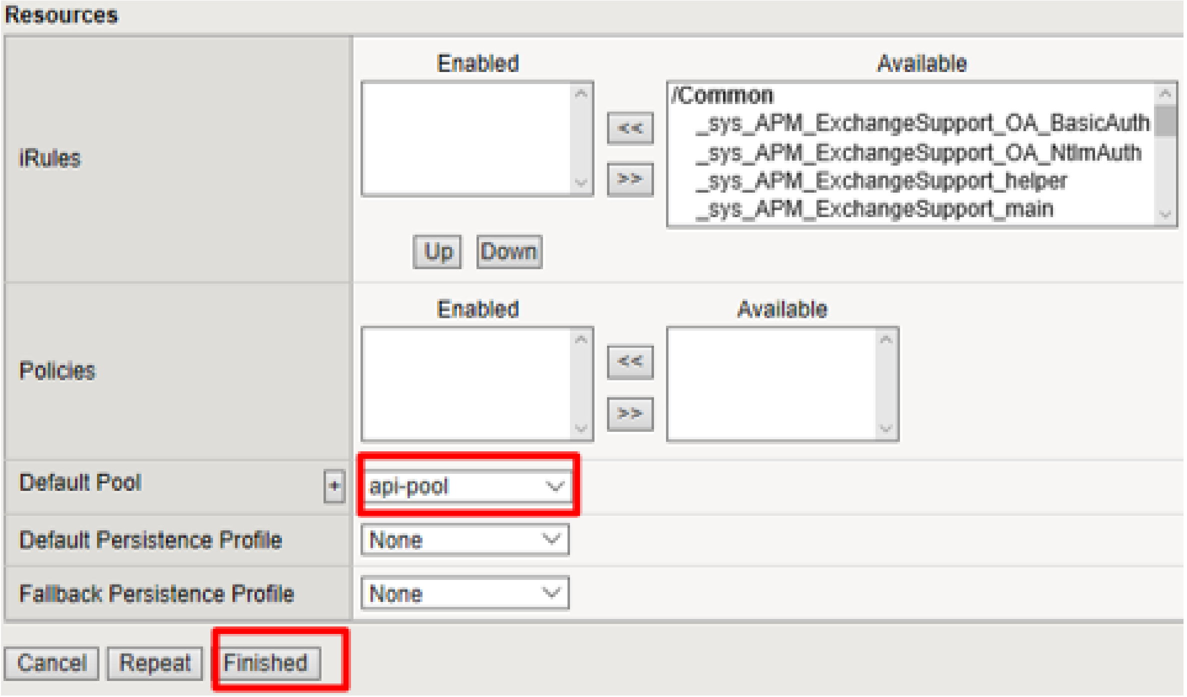
Name	api.f5agility.com-vs
Description	
Type	Standard
Source Address	
Destination Address/Mask	10.1.20.112
Service Port	443 HTTPS
Notify Status to Virtual Address	☑
State	Enabled

Configuration: Basic

Protocol	TCP
Protocol Profile (Client)	tcp
Protocol Profile (Server)	(Use Client Profile)
HTTP Profile	http
HTTP Proxy Connect Profile	None
Traffic Acceleration Profile	None
FTP Profile	None
RTSP Profile	None
SSL Profile (Client)	Selected: /Common f5agility-wilcard-self-clientssl Available: /Common clientssl clientssl-insecure-compatible clientssl-secure crypto-server-default-clientssl
SSL Profile (Server)	Selected: Available: /Common apm-default-serverssl crypto-client-default-serverssl pcoip-default-serverssl serverssl
SMTPS Profile	None
Client LDAP Profile	None
Server LDAP Profile	None
SMTP Profile	None
VLAN and Tunnel Traffic	All VLANs and Tunnels
Source Address Translation	Auto Map

3. In the **Resources** section, select following value *(leave others default)* then click **Finished**

   Default Pool: `api-pool`



Resources

iRules	Enabled: Available: /Common _sys_APM_ExchangeSupport_OA_BasicAuth _sys_APM_ExchangeSupport_OA_NtlmAuth _sys_APM_ExchangeSupport_helper _sys_APM_ExchangeSupport_main
Policies	Enabled: Available:
Default Pool	api-pool
Default Persistence Profile	None
Fallback Persistence Profile	None

Test Configuration

1. On the Jump Host, launch **Postman** from the desktop icon

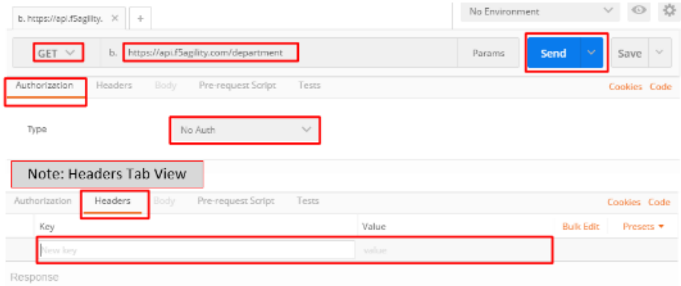
2. The request should be prefilled with the settings below. If not change as needed or select **TEST API Call** from the **API Collection** and click **Send**

   Method: `GET`

   Target: `https://api.f5agility.com/department`

   Authorization: `No Auth`

   Headers: (none should be set)

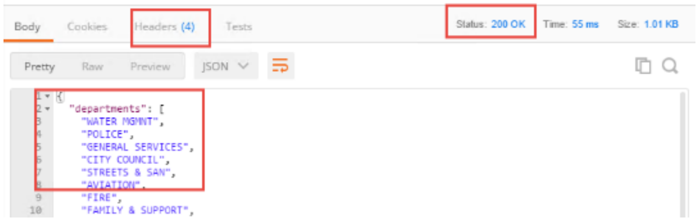
   

   GET https://api.f5agility.com/department

   Type: No Auth

   Note: Headers Tab View

3. You should receive a 200 OK, 4 headers and the body should contain a list of departments.

   Status: 200 OK Time: 55 ms Size: 1.01 KB

   ```
   {
     "departments": [
       "WATER MGMNT",
       "POLICE",
       "GENERAL SERVICES",
       "CITY COUNCIL",
       "STREETS & SAN",
       "AVIATION",
       "FIRE",
       "FAMILY & SUPPORT",
   ```

   Note: This request is working because we have not yet provided any protection for the API.*

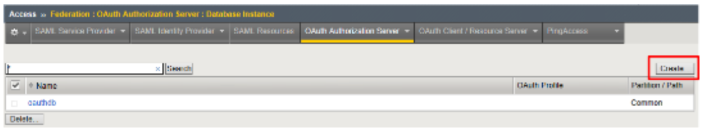
   Note: If you get "Could not get any response" then Postman's settings may be set to verify SSL Certificates (default). Click **File -> Settings** and turn `SSL Certificate Verification` to **Off**.*

2.3.3 Task 2: Authorization Server

Note: This task is performed on Big-IP #2 (AS)

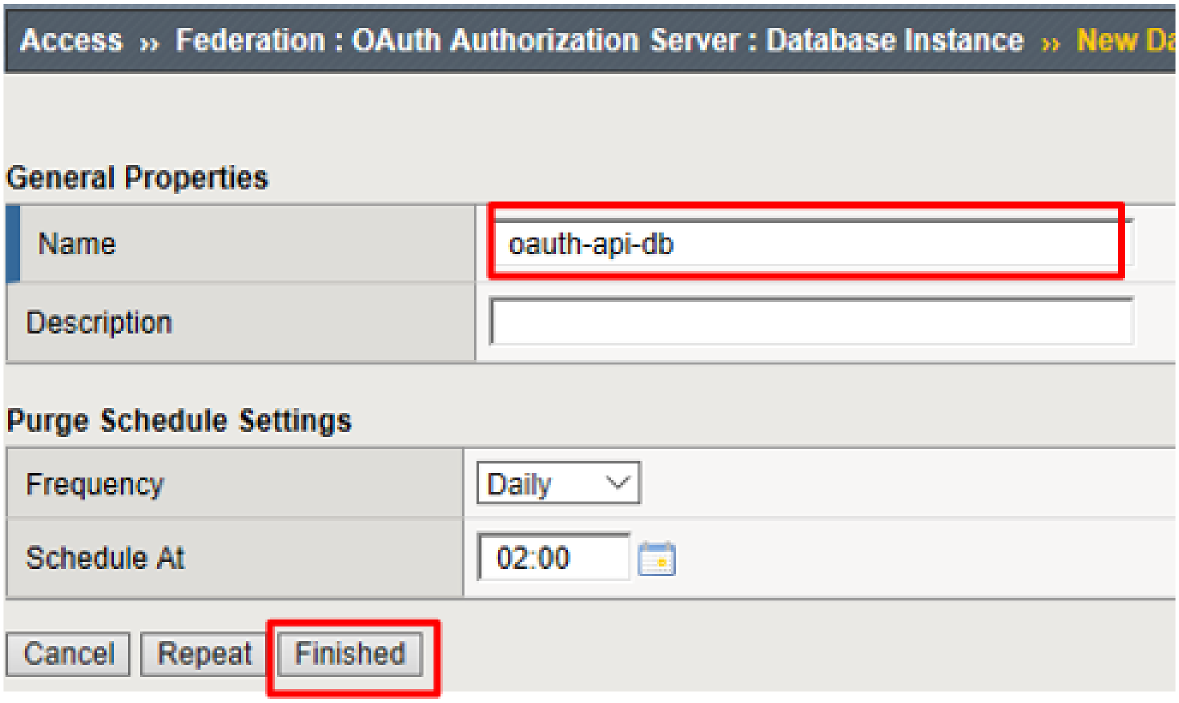
Configure the Database Instance

1. Go to **Access -> Federation -> OAuth Authorization Server -> Database Instance** and click **Create**


Access » Federation : OAuth Authorization Server : Database Instance
SAML Service Provider
SAML Identity Provider
SAML Resources
OAuth Authorization Server
OAuth Client / Resource Server
PingAccess
Search
Create
Delete...

☑	Name	OAuth Profile	Partition / Path
□	oauthdb		Common

2. Enter oauth-api-db for the **Name** field and click **Finished**.


Access » Federation : OAuth Authorization Server : Database Instance » New Da
General Properties
Purge Schedule Settings
Cancel
Repeat
Finished

Name: oauth-api-db

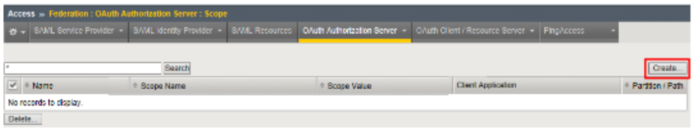
Description:

Frequency: Daily

Schedule At: 02:00

Configure the Scope

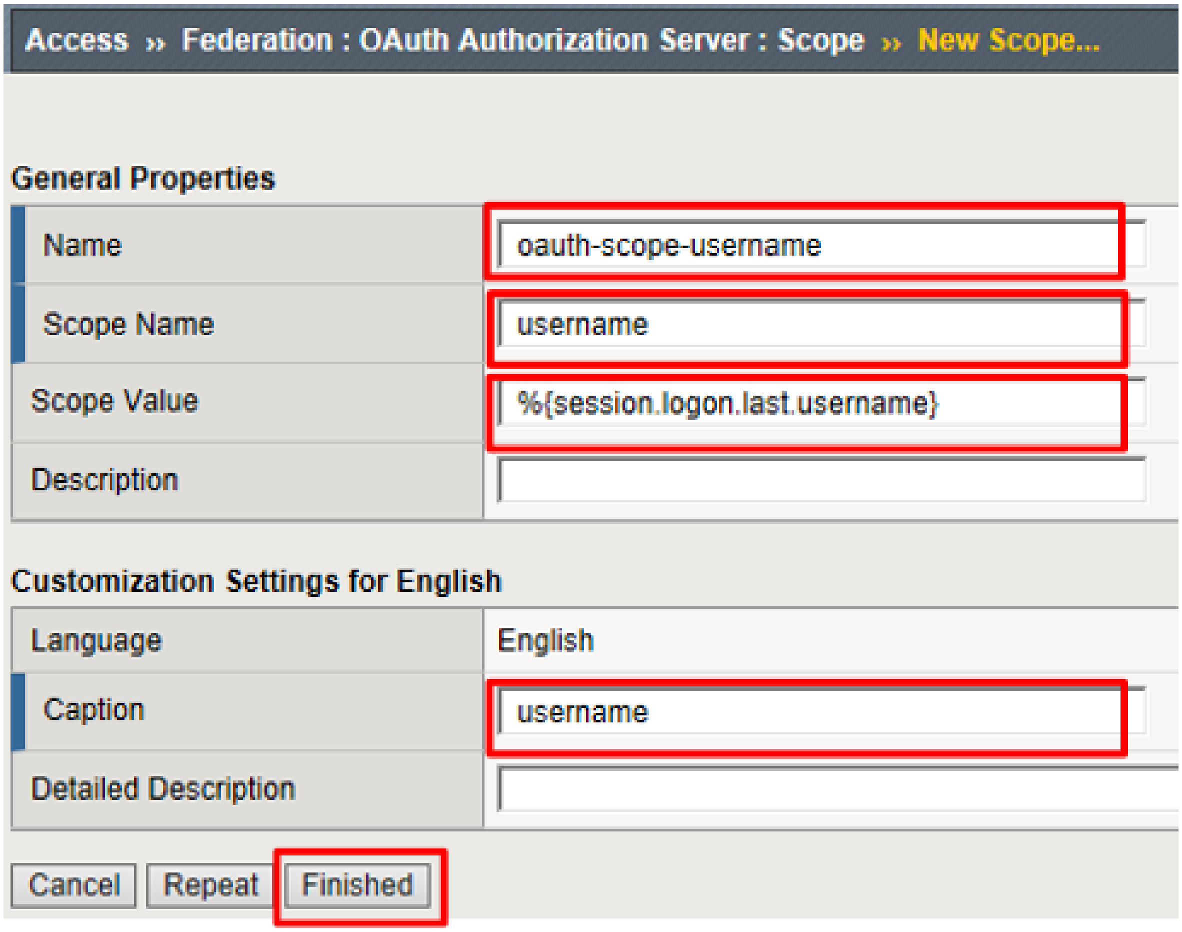
1. Go to **Access** -> Federation -> **OAuth Authorization Server -> Scope** and click **Create**


Access » Federation : OAuth Authorization Server : Scope
SAML Service Provider
SAML Identity Provider
SAML Resources
OAuth Authorization Server
OAuth Client / Resource Server
PingAccess
Search
Create...
Delete...

☑	Name	Scope Name	Scope Value	Client Application	Partition / Path
No records to display.					

2. Enter the following values and and click **Finished**.

   - **Name:** `oauth-scope-username`
   - **Scope Name:** `username`
   - **Scope Value:** `%{session.logon.last.username}`
   - **Caption:** `username`



Access » Federation : OAuth Authorization Server : Scope » New Scope...

General Properties

Name	oauth-scope-username
Scope Name	username
Scope Value	%{session.logon.last.username}
Description	

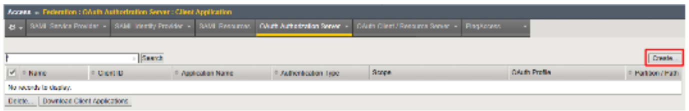
Customization Settings for English

Language	English
Caption	username
Detailed Description	

Note: This scope is requested by the Resource Server and the information here is provided back. You can hardcode a value or use a variable as we have here. So if the scope username is requested, we will supply back the username that was used to login at the Authorization Server (AS).*

Configure the Client Application

1. Go to **Access** -> Federation -> **OAuth Authorization Server -> Client Application** and click **Create**



Access » Federation : OAuth Authorization Server : Client Application

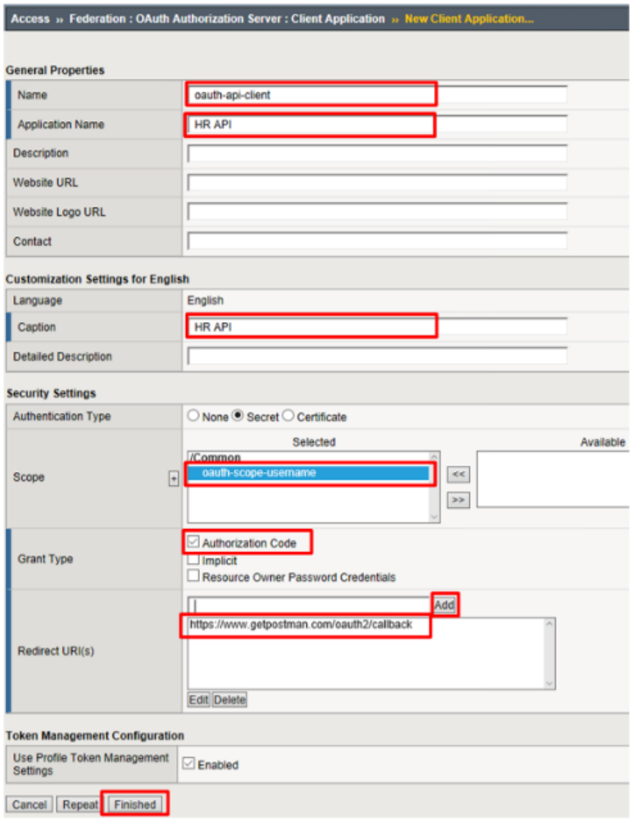
Name	Client ID	Application Name	Authentication Type	Scope	OAuth Profile	Partition / Path
No records to display.						

2. Enter the following values and click **Finished**.

   - **Name:** `oauth-api-client`
   - **Application Name:** `HR API`
   - **Caption:** `HR API`
   - **Authentication Type:** `Secret`
   - **Scope:** `oauth-scope-username`
   - **Grant Type:** `Authorization Code`

- **Redirect URI(s):** `https://www.getpostman.com/oauth2/callback`

Remember to click Add



Access » Federation : OAuth Authorization Server : Client Application » New Client Application...

General Properties

Name	oauth-api-client
Application Name	HR API
Description	
Website URL	
Website Logo URL	
Contact	

Customization Settings for English

Language	English
Caption	HR API
Detailed Description	

Security Settings

Authentication Type	○ None ● Secret ○ Certificate
Scope	Selected: /Common oauth-scope-username Available:
Grant Type	☑ Authorization Code ☐ Implicit ☐ Resource Owner Password Credentials
Redirect URI(s)	Add https://www.getpostman.com/oauth2/callback Edit Delete

Token Management Configuration

Use Profile Token Management Settings	☑ Enabled

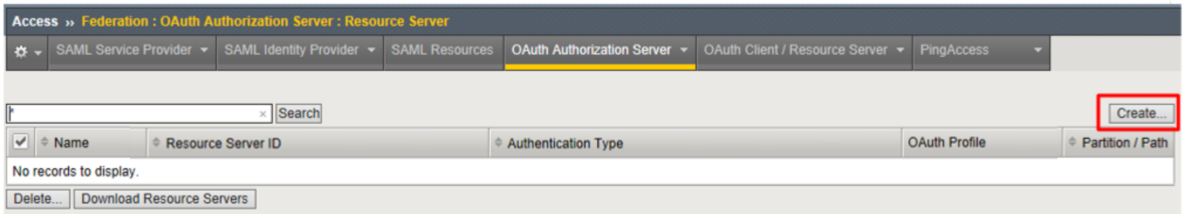
Cancel Repeat Finished

Note: The Redirect URI above is a special URI for the Postman client you'll be using. This would normally be a specific URI to your client

---

Configure the Resource Server

1. Go to **Access -> Federation -> OAuth Authorization Server -> Resource Server** and click **Create**



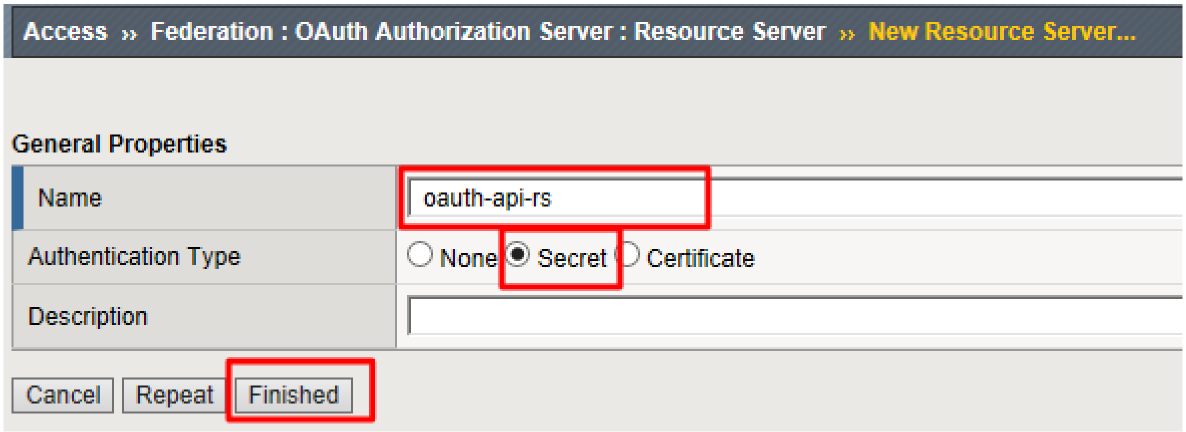
Access » Federation : OAuth Authorization Server : Resource Server

☑	Name	Resource Server ID	Authentication Type	OAuth Profile	Partition / Path
No records to display.					

Delete... Download Resource Servers

2. Enter the following values and click **Finished**.

   - **Name:** `oauth-api-rs`
   - **Application Type:** `Secret`



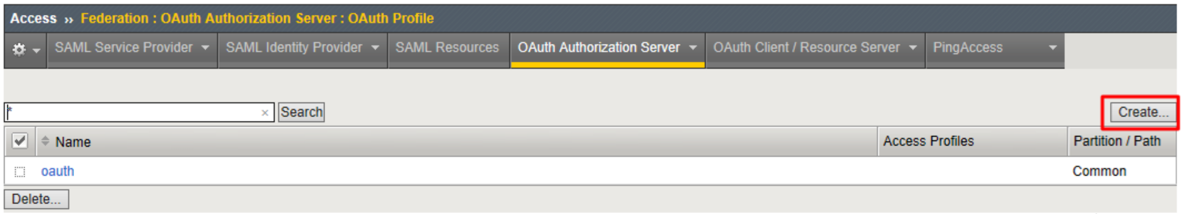
Access » Federation : OAuth Authorization Server : Resource Server » New Resource Server...

General Properties

Name	oauth-api-rs
Authentication Type	○ None ● Secret ○ Certificate
Description	

Configure the OAuth Profile

1. Go to **Access -> Federation -> OAuth Authorization Server -> OAuth Profile** and click **Create**

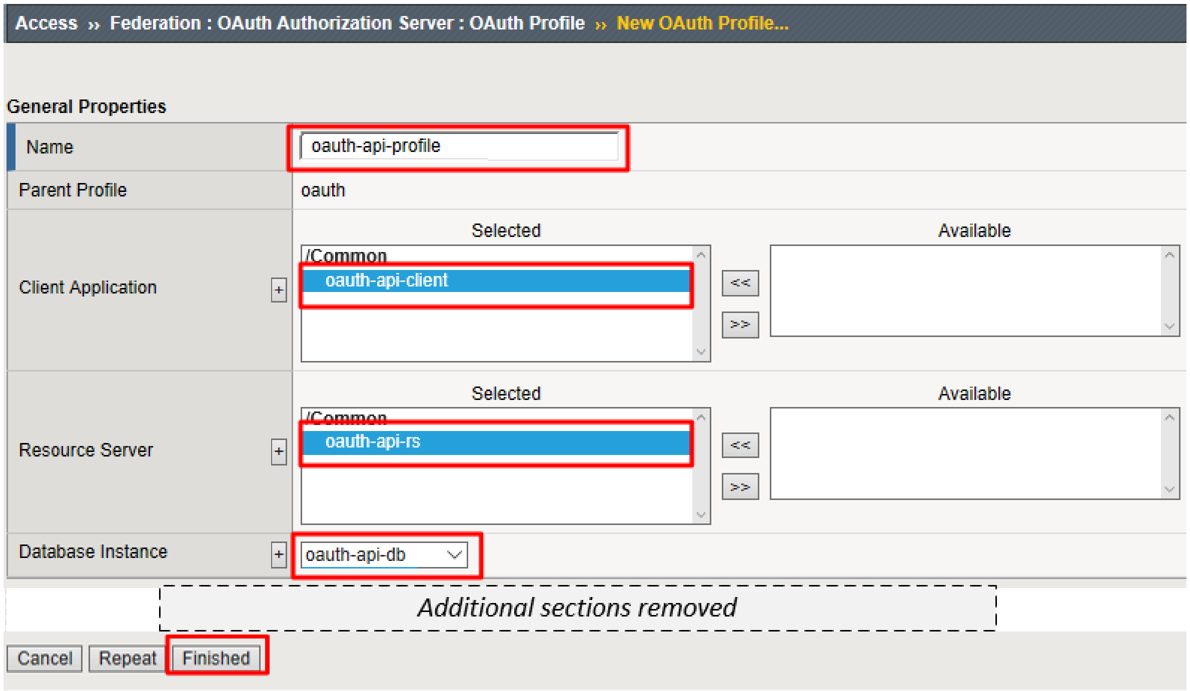


Access » Federation : OAuth Authorization Server : OAuth Profile

☑ Name	Access Profiles	Partition / Path
□ oauth		Common

2. Enter the following values and click **Finished**.

   - **Name:** `oauth-api-profile`
   - **Client Application:** `oauth-api-client`
   - **Resource Server:** `oauth-api-rs`
   - **Database Instance:** `oauth-api-db`



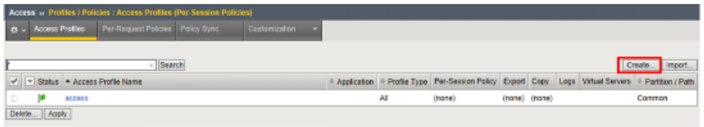
Access ›› Federation : OAuth Authorization Server : OAuth Profile ›› New OAuth Profile...

General Properties

Name	oauth-api-profile
Parent Profile	oauth
Client Application	Selected: /Common oauth-api-client
Resource Server	Selected: /Common oauth-api-rs
Database Instance	oauth-api-db

Configure the APM Per Session Policy

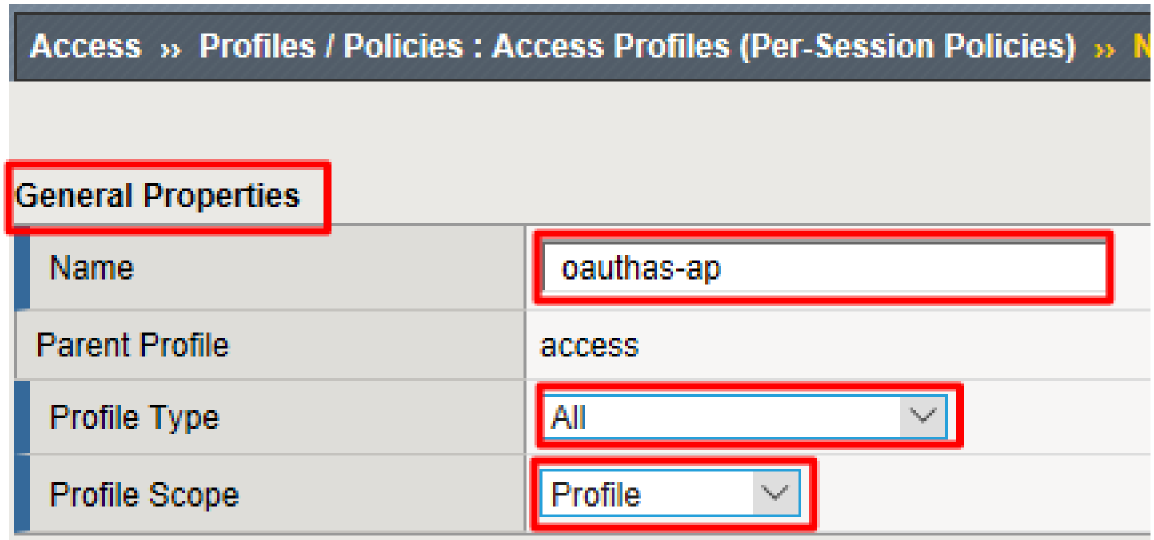
1. Go to **Access -> Profiles/Policies -> Access Profiles (Per Session Policies)** and click **Create**



Access ›› Profiles / Policies : Access Profiles (Per-Session Policies)

Status	Access Profile Name	Application	Profile Type	Per-Session Policy	Export	Copy	Logs	Virtual Servers	Partition / Path
	access		All	(none)	(none)	(none)			Common

2. In the **General Properties** section enter the following values
   - **Name:** `oauthas-ap`
   - **Profile Type:** `All`
   - **Profile Scope:** `Profile`



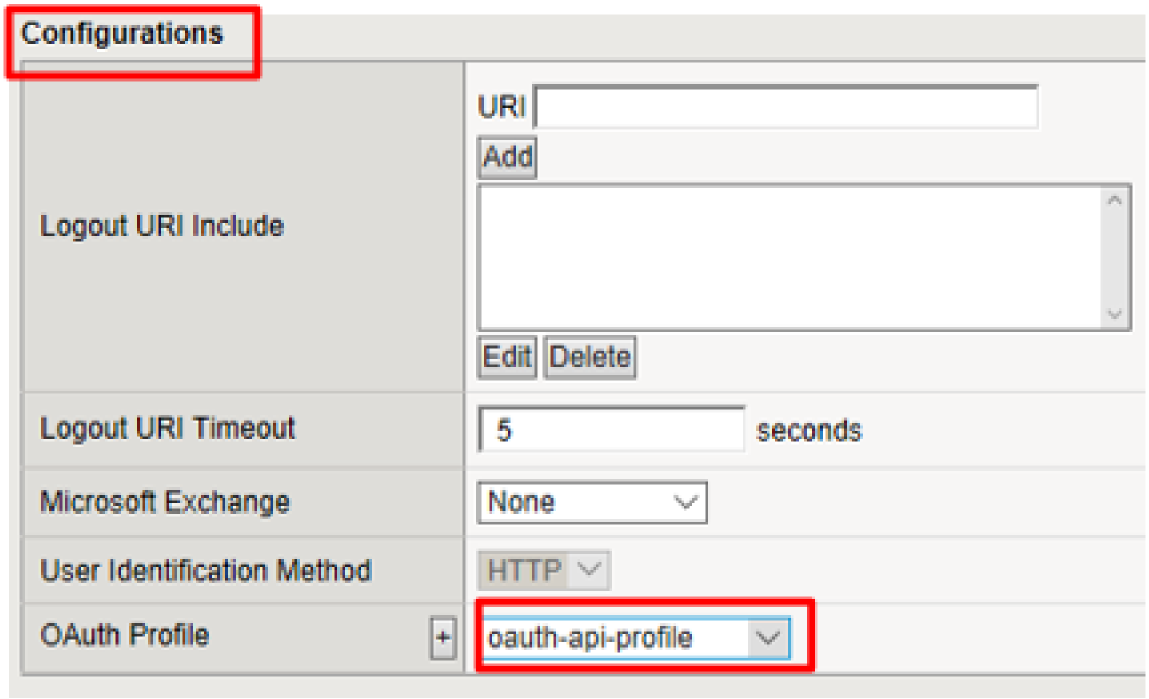
Access » Profiles / Policies : Access Profiles (Per-Session Policies) » N

General Properties

Name	oauthas-ap
Parent Profile	access
Profile Type	All
Profile Scope	Profile

3. In the **Configurations** section select the following value from the **OAuth Profile** drop down menu.

   - **OAuth Profile:** `oauth-api-profile`

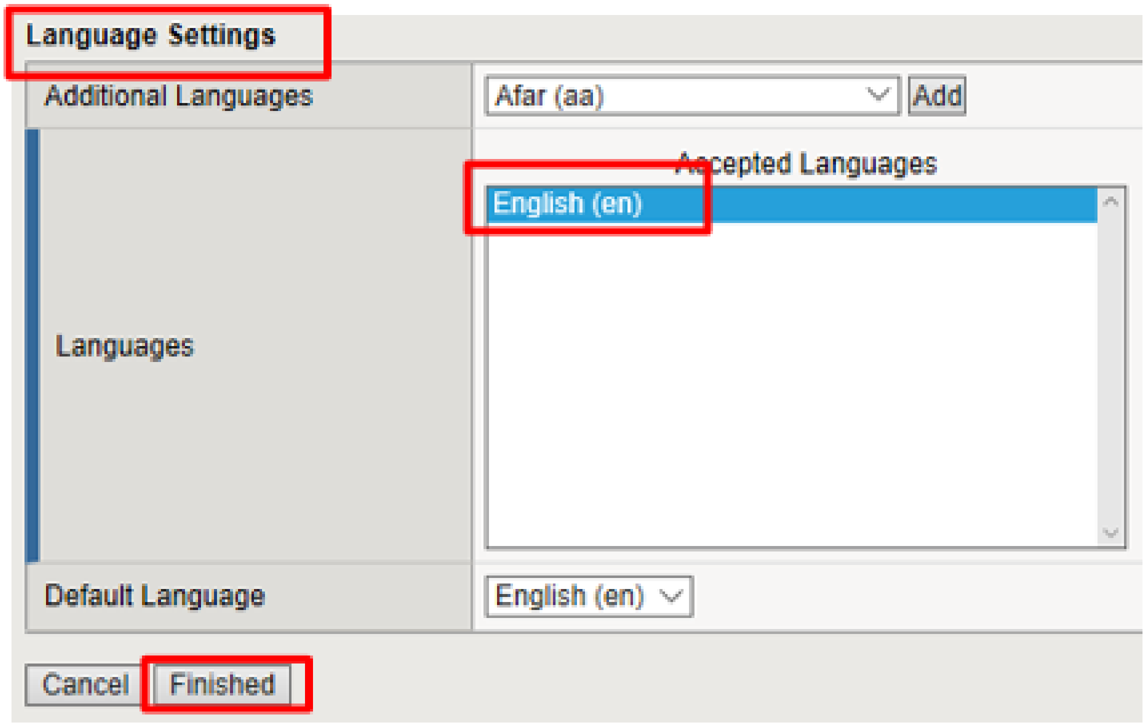


Configurations

Logout URI Include	URI Add Edit Delete
Logout URI Timeout	5 seconds
Microsoft Exchange	None
User Identification Method	HTTP
OAuth Profile +	oauth-api-profile

4. In the **Language Settings** section enter the following value and then click **Finished**.

   - **Languages:** `English`

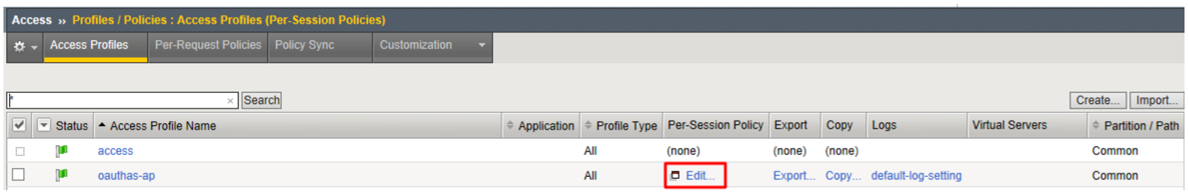


Language Settings

Additional Languages	Afar (aa) Add
Languages	Accepted Languages English (en)
Default Language	English (en)

Cancel Finished

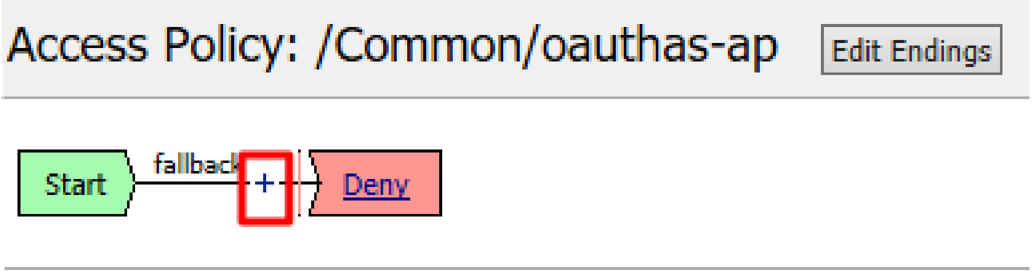
5. Click **Edit** on the **oauthas-ap** policy, a new browser tab will open.



Access » Profiles / Policies : Access Profiles (Per-Session Policies)

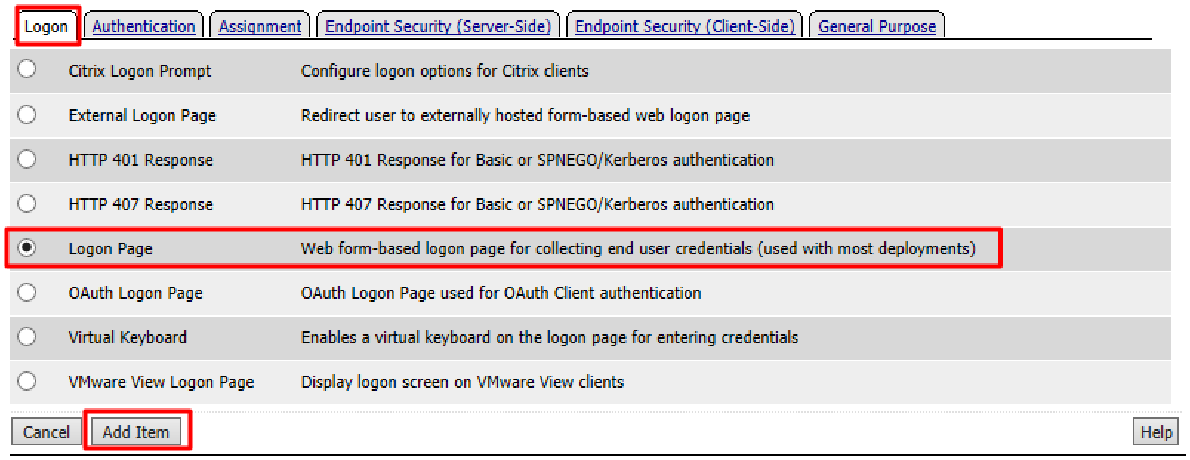
☑	Status	Access Profile Name	Application	Profile Type	Per-Session Policy	Export	Copy	Logs	Virtual Servers	Partition / Path
□		access		All	(none)	(none)	(none)			Common
□		oauthas-ap		All	Edit...	Export...	Copy...	default-log-setting		Common

6. Click the **+** between **Start** and **Deny**



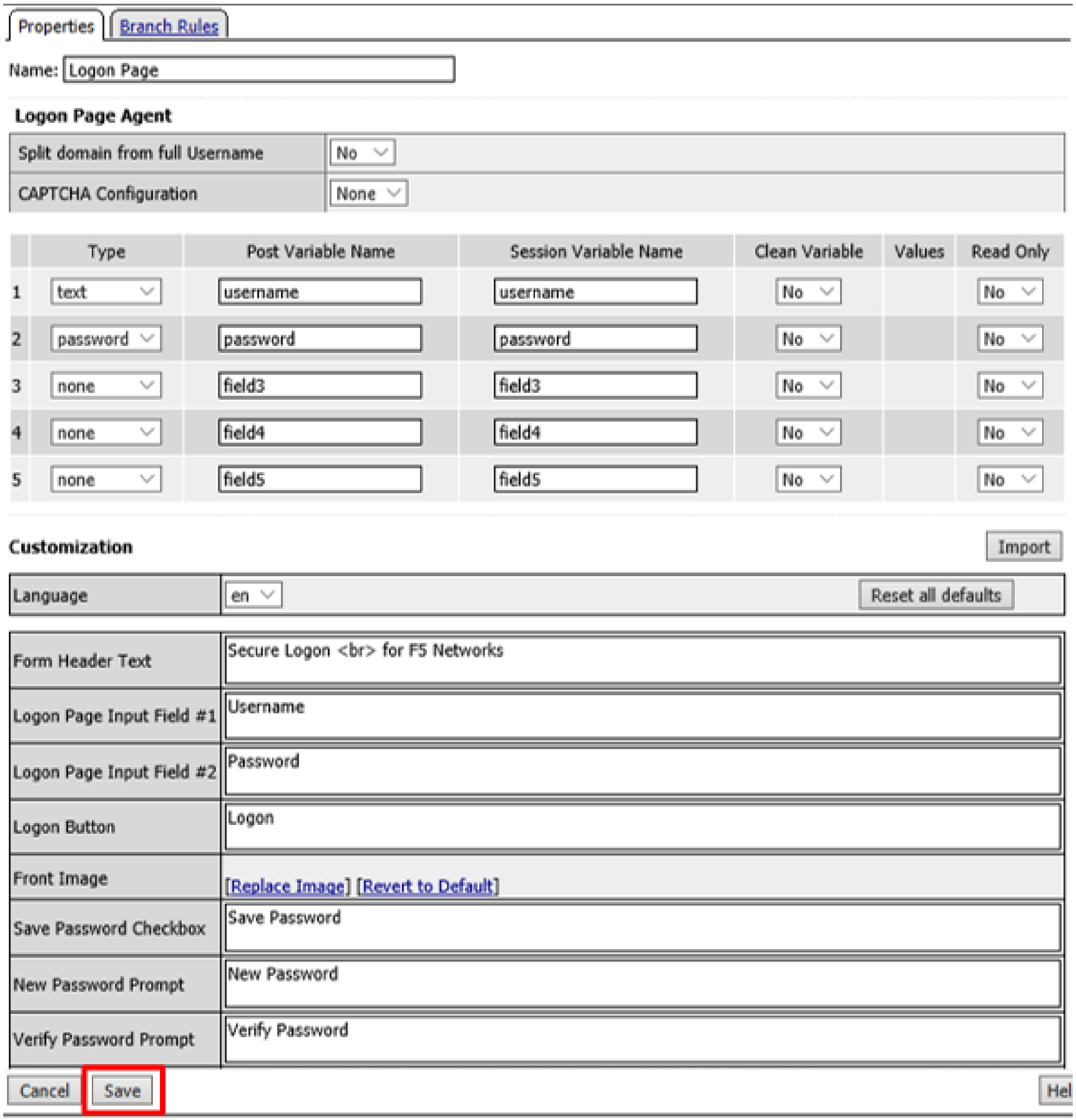
Access Policy: /Common/oauthas-ap

7. Select **Logon Page** from the **Logon** tab, and click **Add Item**


Logon
Authentication
Assignment
Endpoint Security (Server-Side)
Endpoint Security (Client-Side)
General Purpose
Cancel
Add Item
Help

○	Citrix Logon Prompt	Configure logon options for Citrix clients
○	External Logon Page	Redirect user to externally hosted form-based web logon page
○	HTTP 401 Response	HTTP 401 Response for Basic or SPNEGO/Kerberos authentication
○	HTTP 407 Response	HTTP 407 Response for Basic or SPNEGO/Kerberos authentication
●	Logon Page	Web form-based logon page for collecting end user credentials (used with most deployments)
○	OAuth Logon Page	OAuth Logon Page used for OAuth Client authentication
○	Virtual Keyboard	Enables a virtual keyboard on the logon page for entering credentials
○	VMware View Logon Page	Display logon screen on VMware View clients

8. Accept the defaults on the **Logon Page** and click **Save**



Name: Logon Page

Logon Page Agent

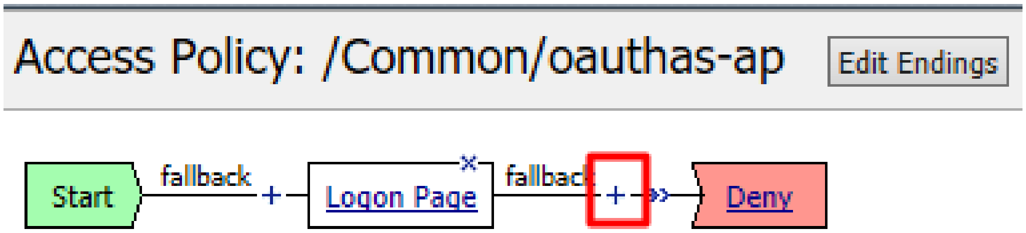
Split domain from full Username	No
CAPTCHA Configuration	None

	Type	Post Variable Name	Session Variable Name	Clean Variable	Values	Read Only
1	text	username	username	No		No
2	password	password	password	No		No
3	none	field3	field3	No		No
4	none	field4	field4	No		No
5	none	field5	field5	No		No

Customization

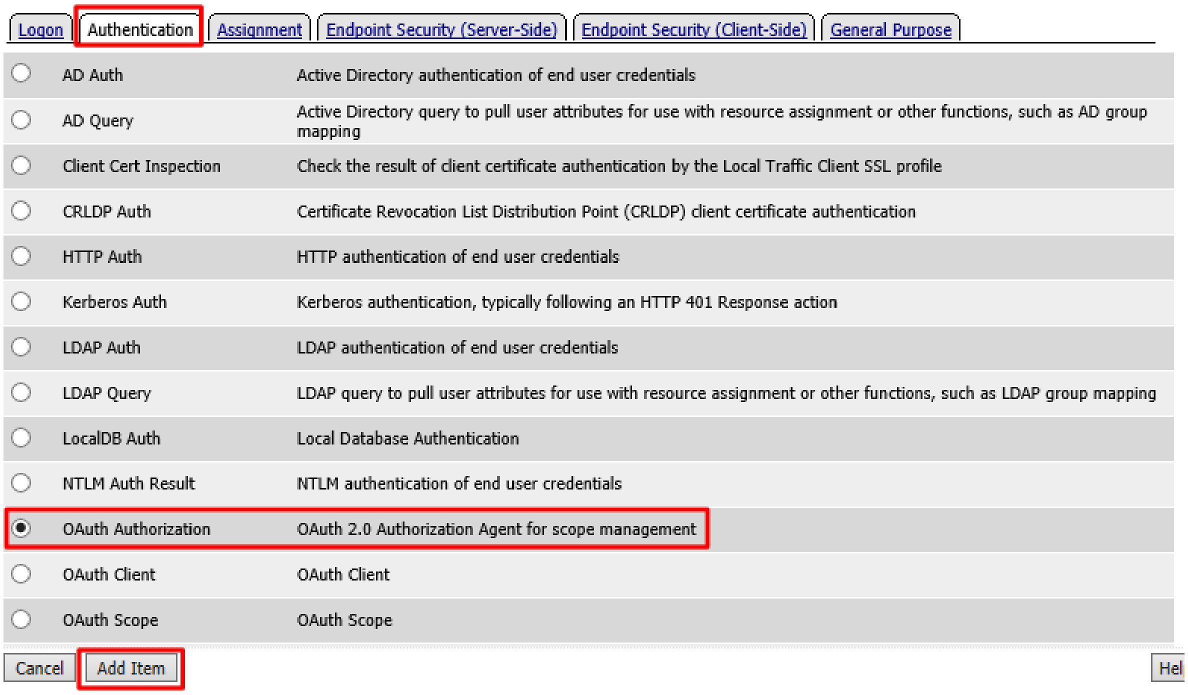
Language	en
Form Header Text	Secure Logon for F5 Networks
Logon Page Input Field #1	Username
Logon Page Input Field #2	Password
Logon Button	Logon
Front Image	[Replace Image] [Revert to Default]
Save Password Checkbox	Save Password
New Password Prompt	New Password
Verify Password Prompt	Verify Password

9. Click the **+** between **Logon Page** and **Deny**



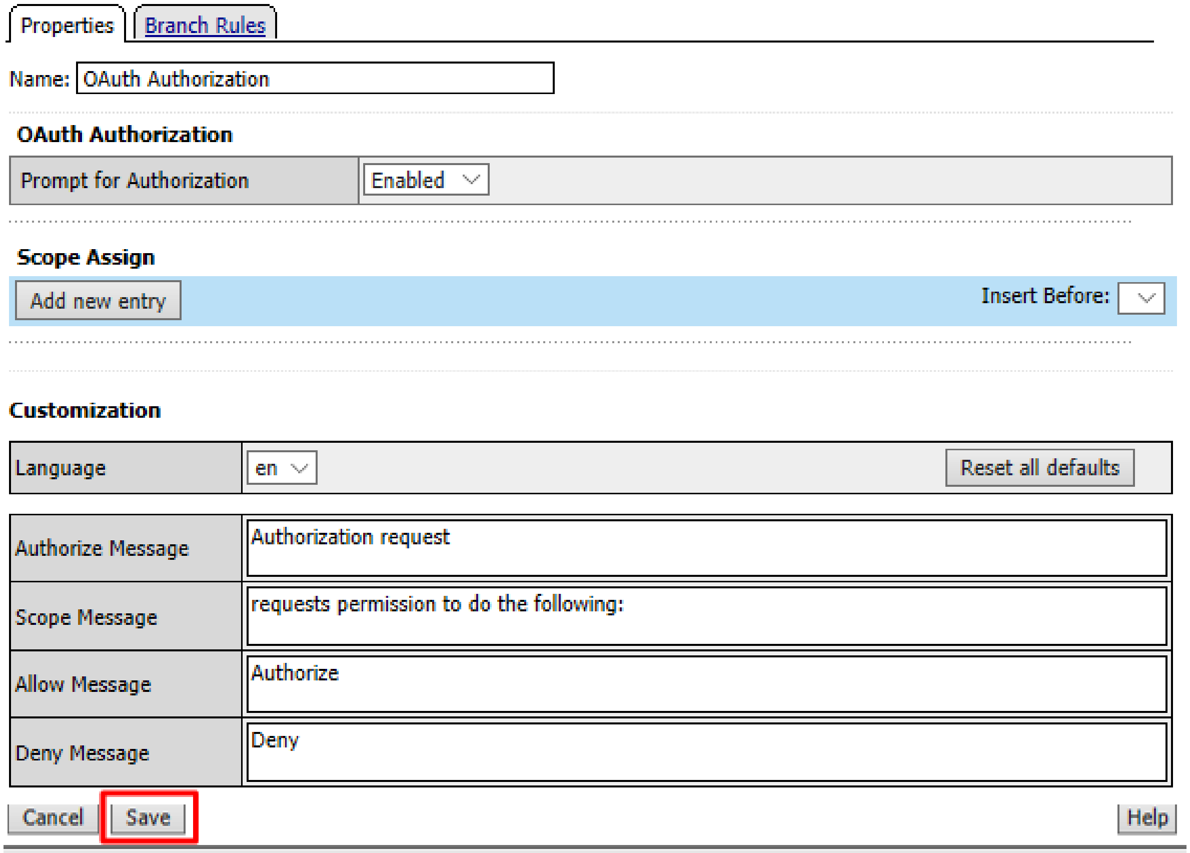
Access Policy: /Common/oauthas-ap

10. Select **OAuth Authorization** from the **Authentication** tab and click **Add Item**


Logon
Authentication
Assignment
Endpoint Security (Server-Side)
Endpoint Security (Client-Side)
General Purpose

○	AD Auth	Active Directory authentication of end user credentials
○	AD Query	Active Directory query to pull user attributes for use with resource assignment or other functions, such as AD group mapping
○	Client Cert Inspection	Check the result of client certificate authentication by the Local Traffic Client SSL profile
○	CRLDP Auth	Certificate Revocation List Distribution Point (CRLDP) client certificate authentication
○	HTTP Auth	HTTP authentication of end user credentials
○	Kerberos Auth	Kerberos authentication, typically following an HTTP 401 Response action
○	LDAP Auth	LDAP authentication of end user credentials
○	LDAP Query	LDAP query to pull user attributes for use with resource assignment or other functions, such as LDAP group mapping
○	LocalDB Auth	Local Database Authentication
○	NTLM Auth Result	NTLM authentication of end user credentials
●	OAuth Authorization	OAuth 2.0 Authorization Agent for scope management
○	OAuth Client	OAuth Client
○	OAuth Scope	OAuth Scope

11. Accept the defaults for the **OAuth Authorization** and click **Save**



Name: OAuth Authorization

OAuth Authorization

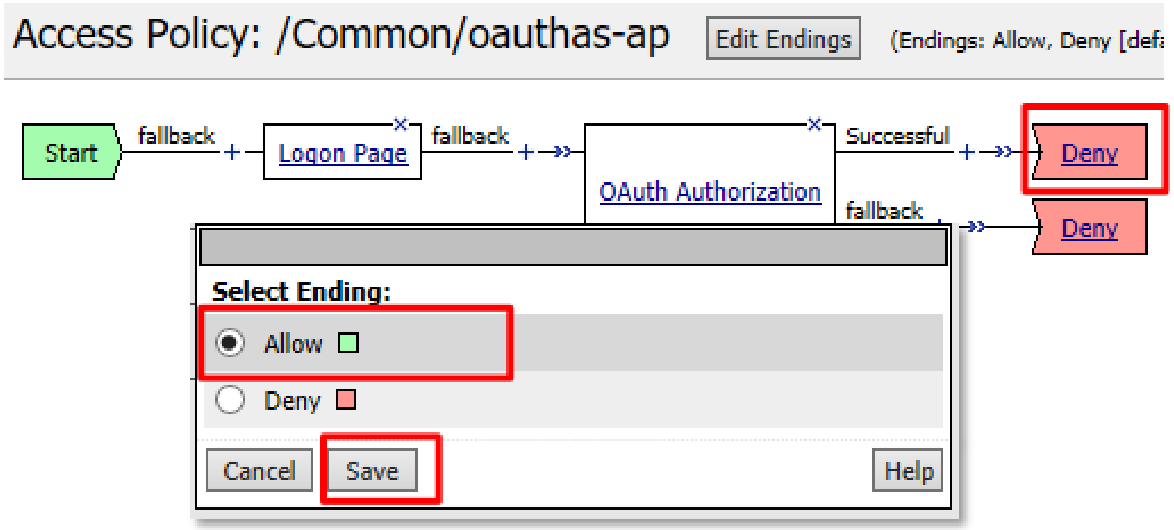
Prompt for Authorization	Enabled

Scope Assign

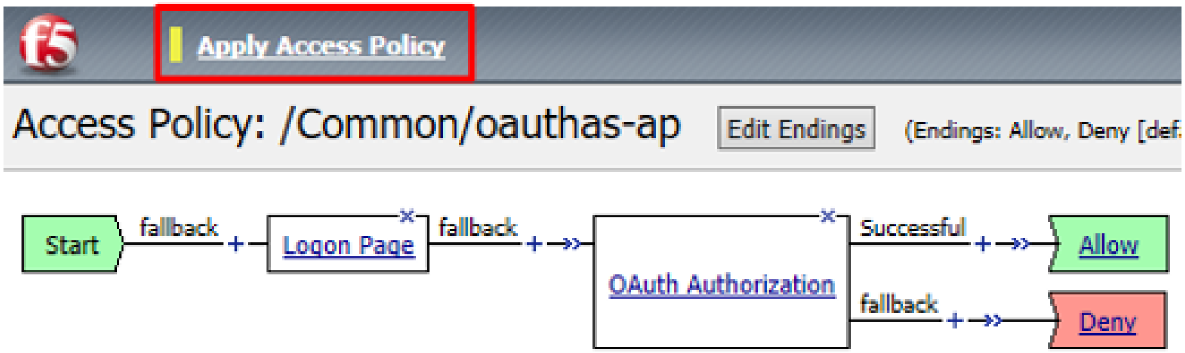
Customization

Language	en
Authorize Message	Authorization request
Scope Message	requests permission to do the following:
Allow Message	Authorize
Deny Message	Deny

12. Click **Deny** on the **Successful** branch after the **OAuth Authorization** object, select **Allow**, click **Save**



13. Click **Apply Access Policy** in the top left and then close the tab

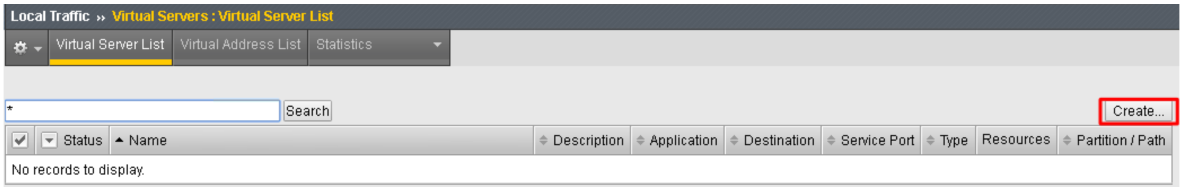


Note: We are not validating the credentials entered on the Logon Page, so you can enter anything you want. In a production deployment you would most likely include some process for validating credentials such as an LDAP Auth or AD Auth object, or perhaps limiting access by IP or client certificate

Note: This policy might also set some variables that get used as scope values. Thus, you could determine what the scope values are by utilizing the policy here.*

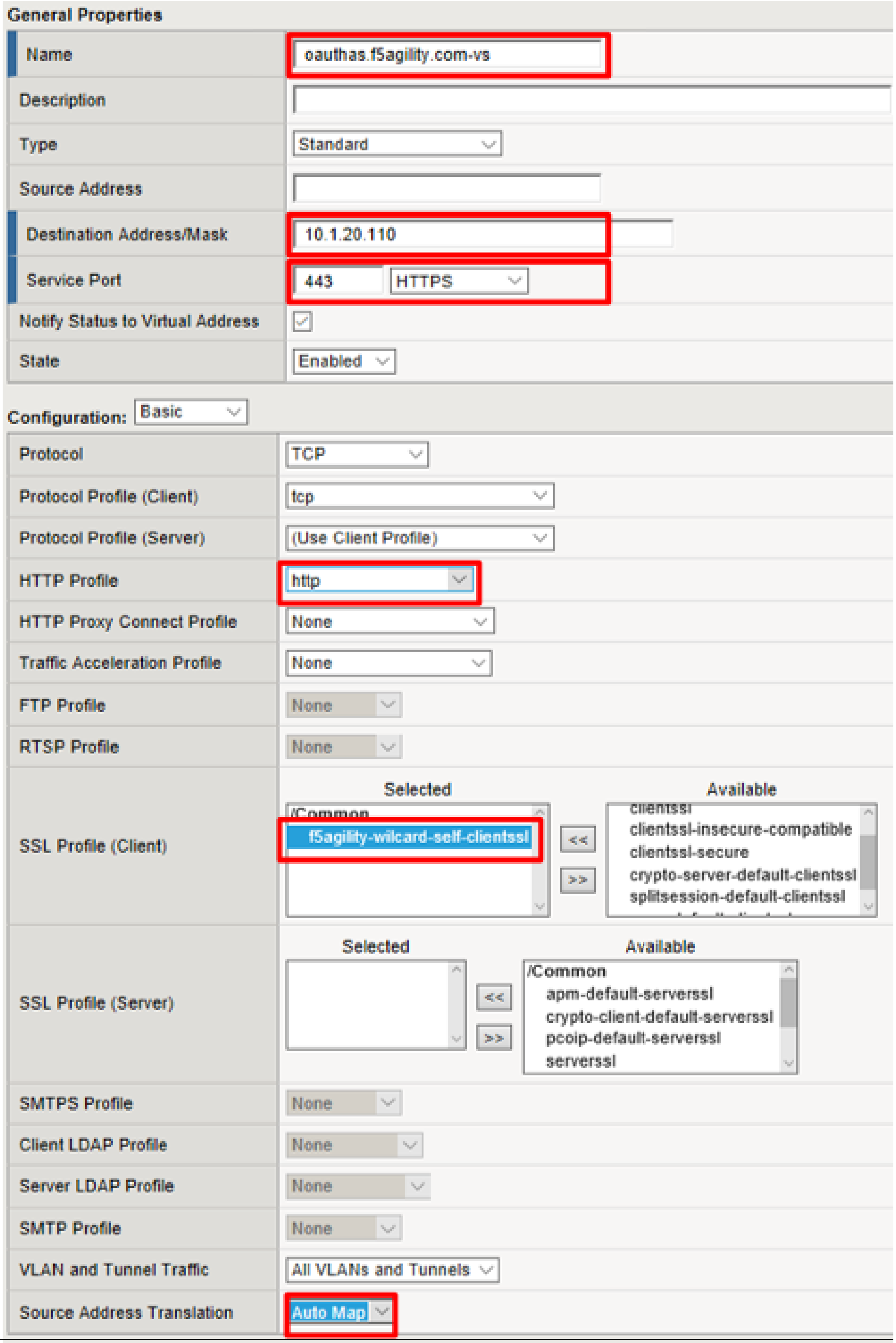
Create the Authorization Virtual Server

1. Go to **Local Traffic -> Virtual Servers** and click **Create**



2. Enter the following values for the Authorization Server Virtual Server

   - **Name:** `oauthas.f5agility.com-vs`
   - **Destination Address:** `10.1.20.110`
   - **Service Port:** `443`
   - **HTTP Profile:** `http`
   - **SSL Profile (Client):** `f5agility-wildcard-self-clientssl`
   - **Source Address Translation:** `Auto Map`



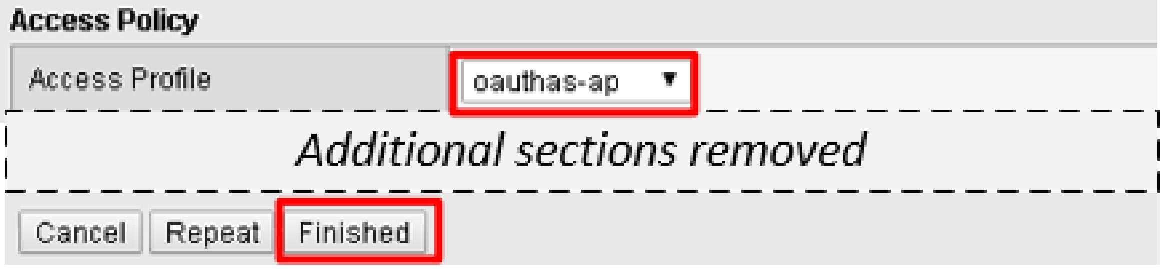
General Properties

Name	oauthas.f5agility.com-vs
Description	
Type	Standard
Source Address	
Destination Address/Mask	10.1.20.110
Service Port	443 HTTPS
Notify Status to Virtual Address	☑
State	Enabled

Configuration: Basic

Protocol	TCP
Protocol Profile (Client)	tcp
Protocol Profile (Server)	(Use Client Profile)
HTTP Profile	http
HTTP Proxy Connect Profile	None
Traffic Acceleration Profile	None
FTP Profile	None
RTSP Profile	None
SSL Profile (Client)	Selected: /Common f5agility-wilcard-self-clientssl Available: clientssl clientssl-insecure-compatible clientssl-secure crypto-server-default-clientssl splitsession-default-clientssl
SSL Profile (Server)	Selected: Available: /Common apm-default-serverssl crypto-client-default-serverssl pcoip-default-serverssl serverssl
SMTPS Profile	None
Client LDAP Profile	None
Server LDAP Profile	None
SMTP Profile	None
VLAN and Tunnel Traffic	All VLANs and Tunnels
Source Address Translation	Auto Map

3. Scroll to the **Access Policy** section, select oauthas-ap from the **Access Profile** drop down menu and then click **Finished** at the bottom of the screen.



Access Policy

Access Profile: oauthas-ap

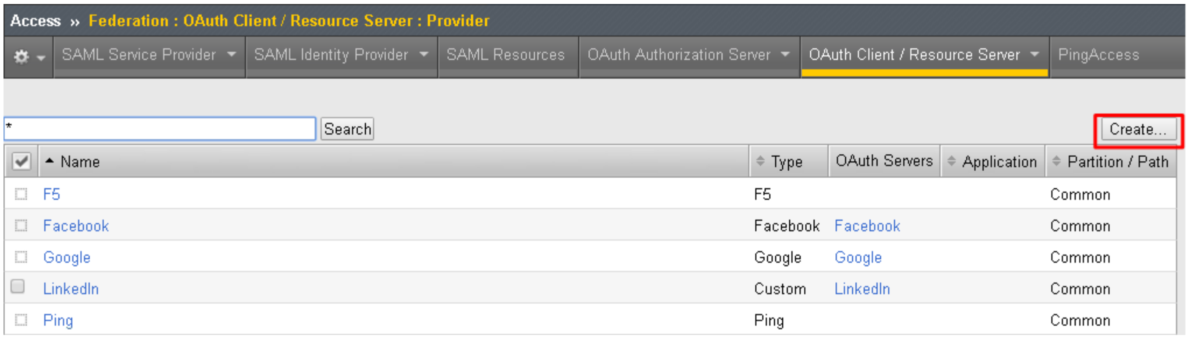
Additional sections removed

2.3.4 Task 3: Resource Server

Note: This task is performed on Big-IP #1 (RS)

Configure the OAuth Provider

1. Go to **Access -> Federation -> OAuth Client/Resource Server -> Provider** and click **Create**

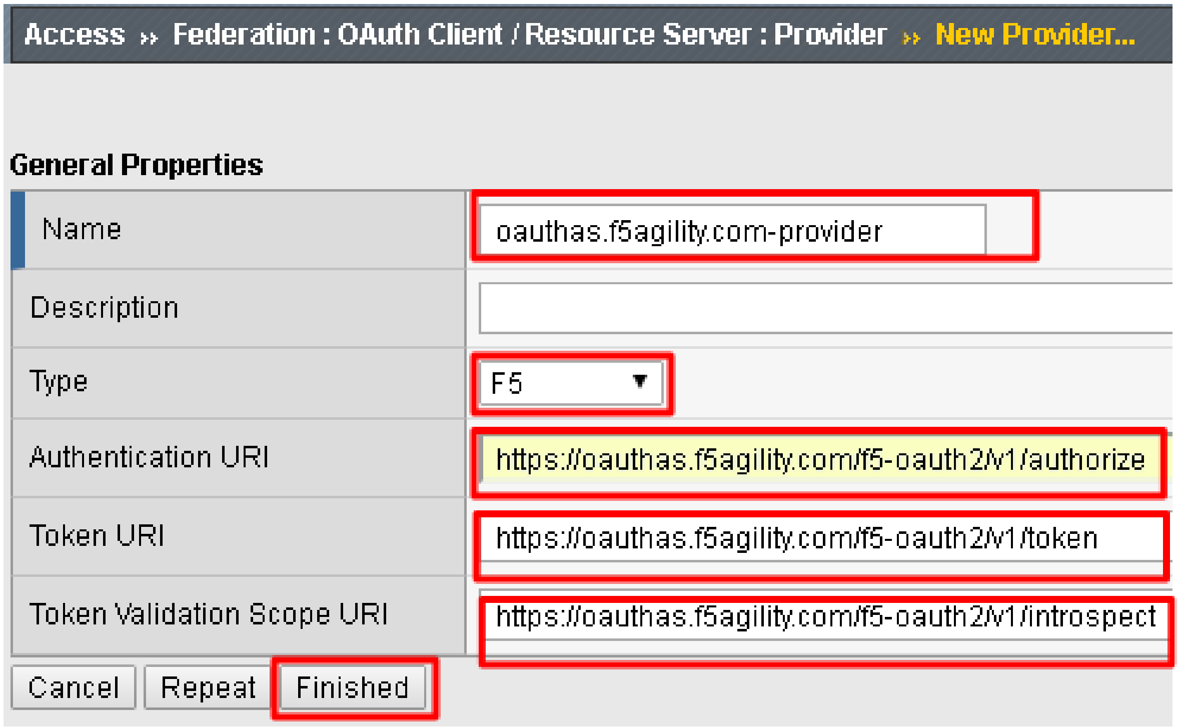


Access » Federation : OAuth Client / Resource Server : Provider

☑	Name	Type	OAuth Servers	Application	Partition / Path
□	F5	F5			Common
□	Facebook	Facebook	Facebook		Common
□	Google	Google	Google		Common
□	LinkedIn	Custom	LinkedIn		Common
□	Ping	Ping			Common

2. Enter the following values for the Authorization Server Virtual Server and then click **Finished**

- **Name:** `oauthas.f5agility.com-provider`
- **Type:** `F5`
- **Authentication URI:** `https://oauthas.f5agility.com/f5-oauth2/v1/authorize`
- **Token URI:** `https://oauthas.f5agility.com/f5-oauth2/v1/token`
- **Token Validation Scope:** `https://oauthas.f5agility.com/f5-oauth2/v1/introspect`



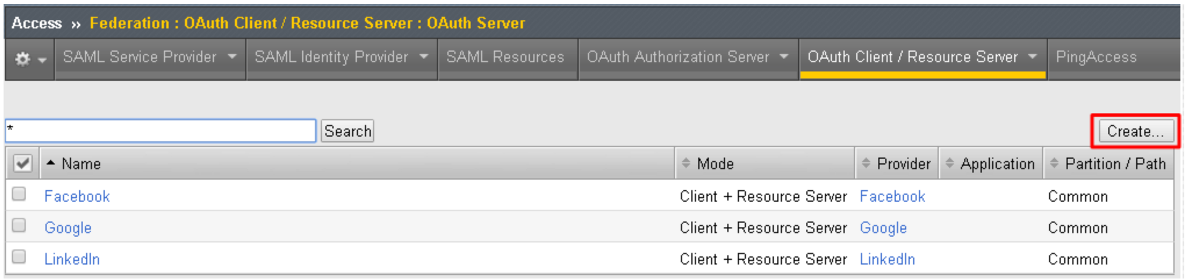
Access » Federation : OAuth Client / Resource Server : Provider » New Provider...

General Properties

Name	oauthas.f5agility.com-provider
Description	
Type	F5
Authentication URI	https://oauthas.f5agility.com/f5-oauth2/v1/authorize
Token URI	https://oauthas.f5agility.com/f5-oauth2/v1/token
Token Validation Scope URI	https://oauthas.f5agility.com/f5-oauth2/v1/introspect

Configure the OAuth Server

1. Go to **Access** -> Federation -> **OAuth Client/Resource Server -> OAuth Server** and click **Create**

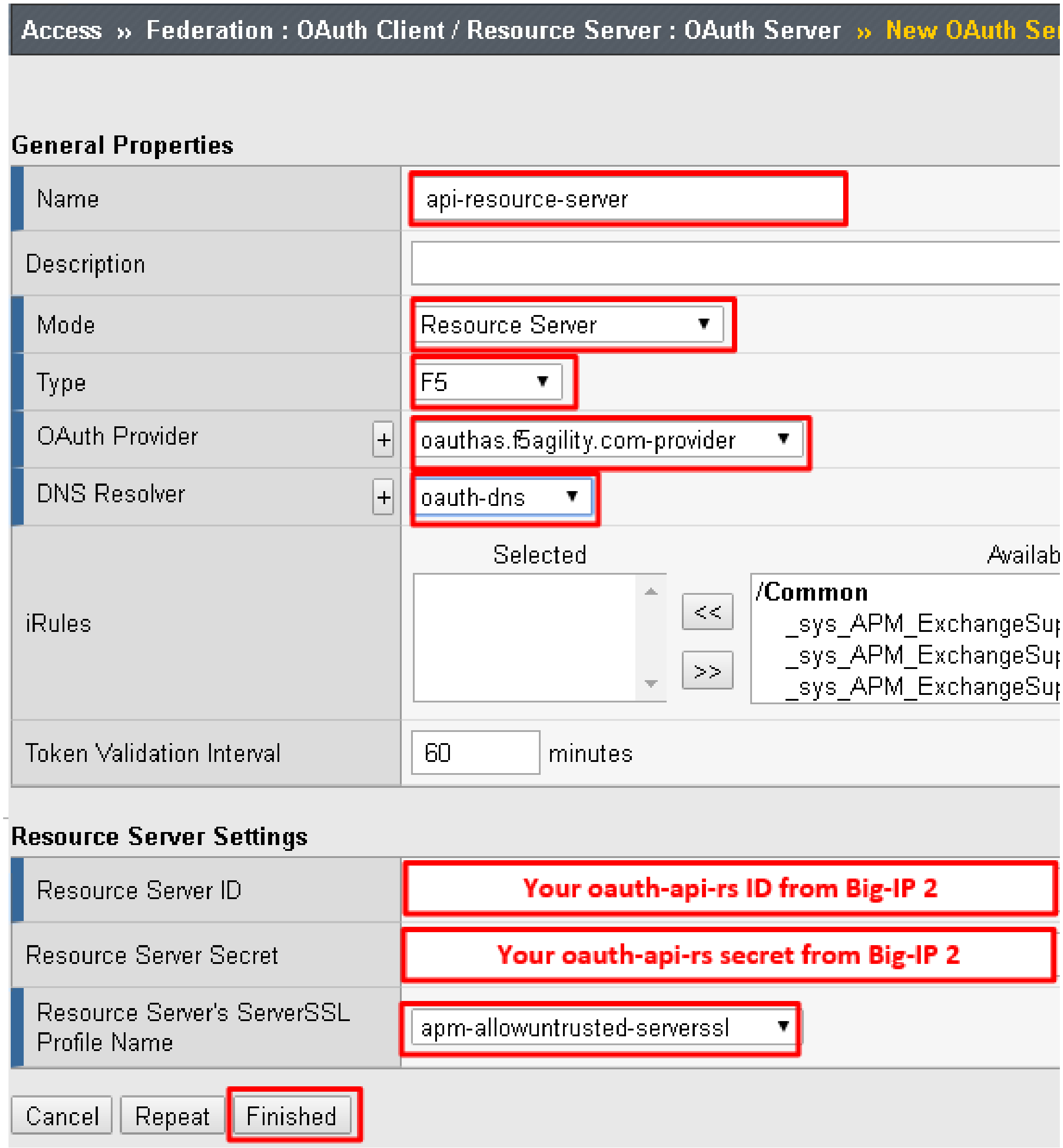


Access » Federation : OAuth Client / Resource Server : OAuth Server

☑ Name	Mode	Provider	Application	Partition / Path
□ Facebook	Client + Resource Server	Facebook		Common
□ Google	Client + Resource Server	Google		Common
□ LinkedIn	Client + Resource Server	LinkedIn		Common

2. Enter the following values for the Authorization Server Virtual Server and then click **Finished**

   - **Name:** `api-resource-server`
   - **Mode:** `Resource Server`
   - **Type:** `F5`
   - **OAuth Provider:** `oauthas.f5agility.com-provider`
   - **DNS Resolver:** `oauth-dns`
   - **Resource Server ID:** (see step 5) *<Get this from Big-IP 2 -> Access -> Federation -> OAuth Authorization Server -> Resource Server -> oauth-api-rs>*
   - **Resource Server Secret:** (see step 5) *<Get this from Big-IP 2 -> Access -> Federation -> OAuth Authorization Server -> Resource Server -> oauth-api-rs>*
   - **Resource Server's Server SSL Profile Name:** apm-allowuntrusted-serverssl



Access » Federation : OAuth Client / Resource Server : OAuth Server » New OAuth Se

General Properties

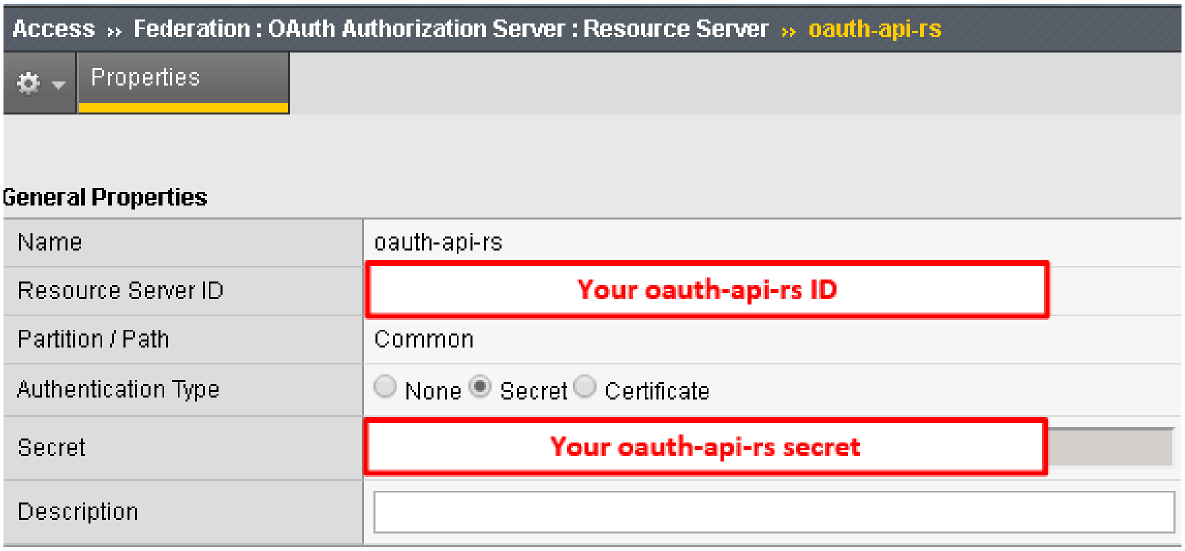
Name	api-resource-server
Description	
Mode	Resource Server
Type	F5
OAuth Provider	oauthas.f5agility.com-provider
DNS Resolver	oauth-dns
iRules	Selected: Availab: /Common _sys_APM_ExchangeSu _sys_APM_ExchangeSu _sys_APM_ExchangeSu
Token Validation Interval	60 minutes

Resource Server Settings

Resource Server ID	Your oauth-api-rs ID from Big-IP 2
Resource Server Secret	Your oauth-api-rs secret from Big-IP 2
Resource Server's ServerSSL Profile Name	apm-allowuntrusted-serverssl

Note: We are using a custom serverssl profile to allow negotiation with an untrusted certificate. This is needed because our Authorization Server is using a self-signed certificate. In production for proper security you should leverage a trusted certificate (most likely publicly signed) and the apm-default-serverssl profile (or other as appropriate)*

3. The values for step 4 above can be obtained by accessing Big-IP 2 and navigating to **Access -> Federation -> OAuth Authorization Server -> Resource Server -> oauth-api-rs** as shown.

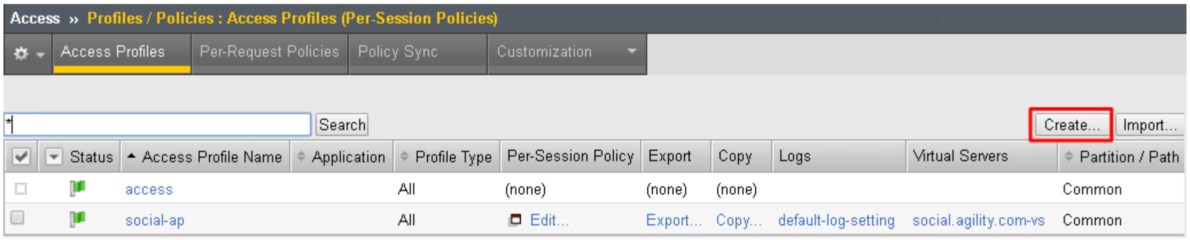


Access » Federation : OAuth Authorization Server : Resource Server » oauth-api-rs

General Properties

Name	oauth-api-rs
Resource Server ID	Your oauth-api-rs ID
Partition / Path	Common
Authentication Type	○ None ● Secret ○ Certificate
Secret	Your oauth-api-rs secret
Description	

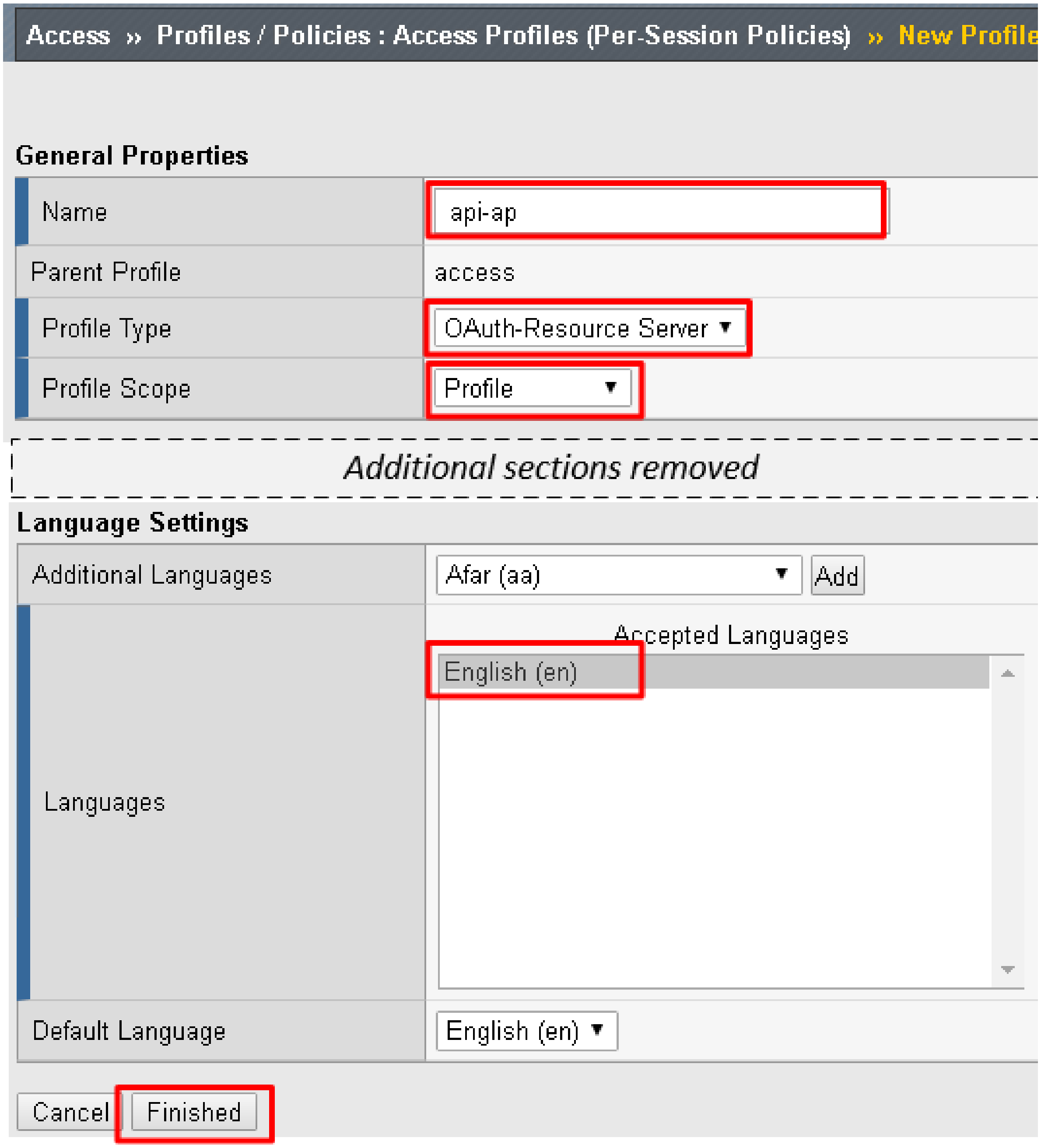
4. To configure the **APM Per Session Policy** go to **Access -> Profiles** / **Policies -> Access Profiles (Per Session Policies)** and then click **Create**



Access » Profiles / Policies : Access Profiles (Per-Session Policies)

☑	Status	Access Profile Name	Application	Profile Type	Per-Session Policy	Export	Copy	Logs	Virtual Servers	Partition / Path
□		access		All	(none)	(none)	(none)			Common
□		social-ap		All	Edit...	Export...	Copy...	default-log-setting	social.agility.com-vs	Common

5. Enter the following values and then click **Finished**



Access » Profiles / Policies : Access Profiles (Per-Session Policies) » New Profile

General Properties

Name: api-ap

Parent Profile: access

Profile Type: OAuth-Resource Server

Profile Scope: Profile

Additional sections removed

Language Settings

Additional Languages: Afar (aa)

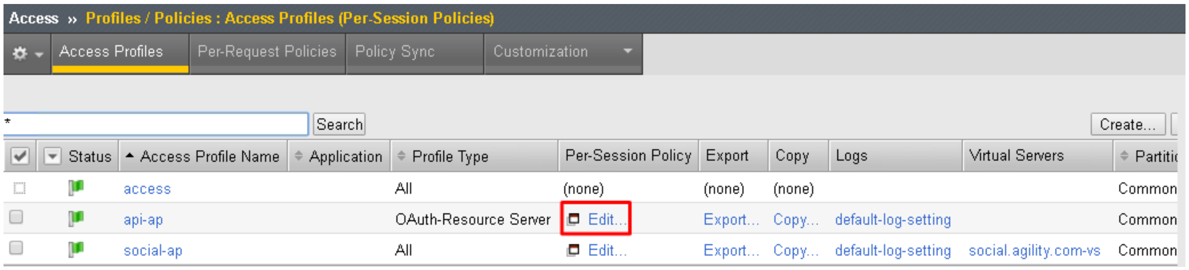
Languages: Accepted Languages: English (en)

Default Language: English (en)

- **Name:** `api-ap`
- **Profile Type:** `OAuth-Resource-Server`
- **Profile Scope:** `Profile`
- **Languages:** `English`

Note: User Identification Method is set to OAuth Token and you cannot change it for this profile type.

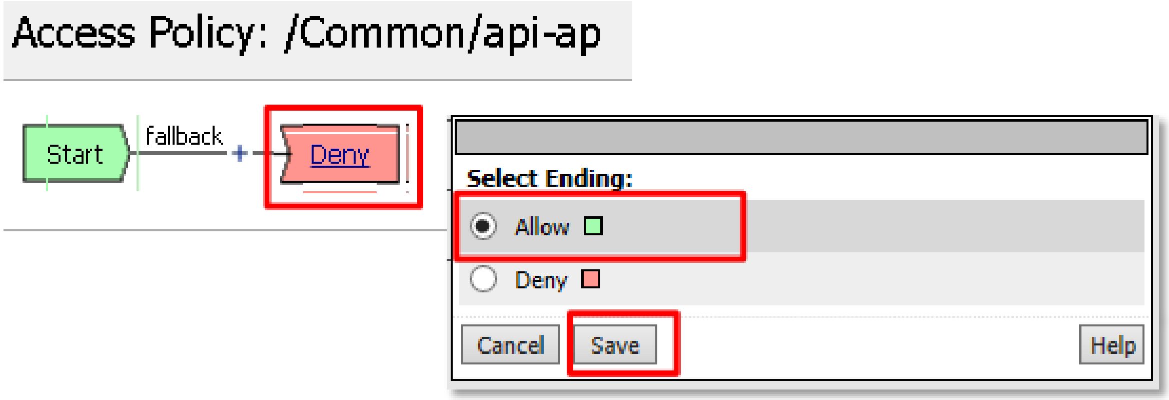
6. Click **Edit** on the new api-ap policy and a new window will open



Access » Profiles / Policies : Access Profiles (Per-Session Policies)

☑	Status	Access Profile Name	Application	Profile Type	Per-Session Policy	Export	Copy	Logs	Virtual Servers	Partiti
□	🟩	access		All	(none)	(none)	(none)			Common
□	🟩	api-ap		OAuth-Resource Server	Edit...	Export...	Copy...	default-log-setting		Common
□	🟩	social-ap		All	Edit...	Export...	Copy...	default-log-setting	social.agility.com-vs	Common

7. Click **Deny** on the fallback branch after **Start**, select **Allow** and click **Save**



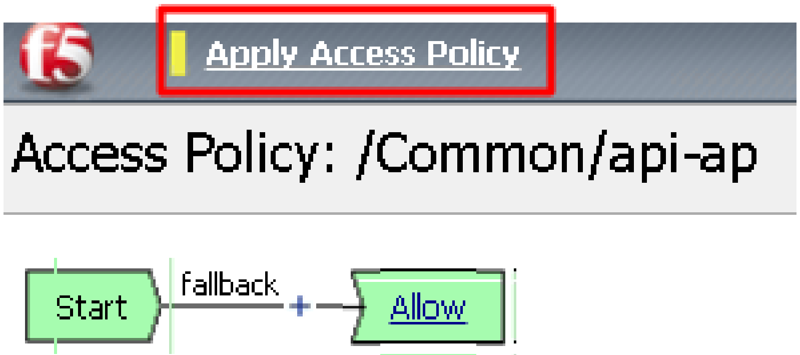
Access Policy: /Common/api-ap

Select Ending:

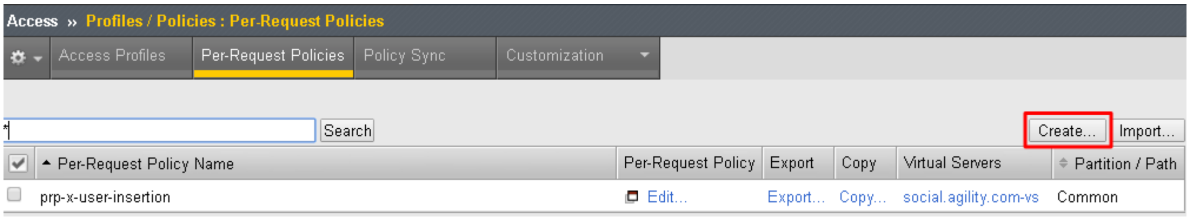
● Allow 🟩

○ Deny 🟥

8. Click **Apply Access Policy** in the top left and then close the tab



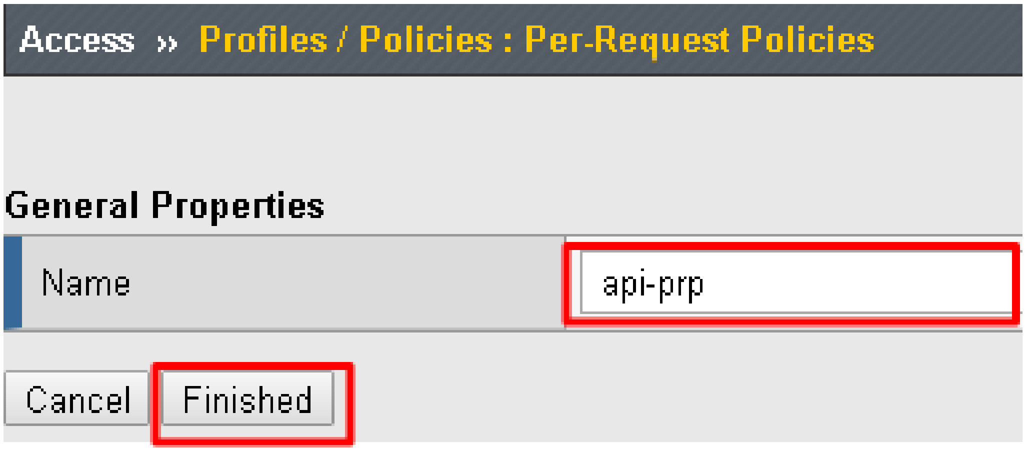
9. To configure the **APM Per Request Policy** go to **Access -> Profiles** / **Policies -> Per Request Policies** and then click **Create**



Access » Profiles / Policies : Per-Request Policies

☑	Per-Request Policy Name	Per-Request Policy	Export	Copy	Virtual Servers	Partition / Path
□	prp-x-user-insertion	Edit...	Export...	Copy...	social.agility.com-vs	Common

10. Enter api-prp for the **Name** and click **Finished**

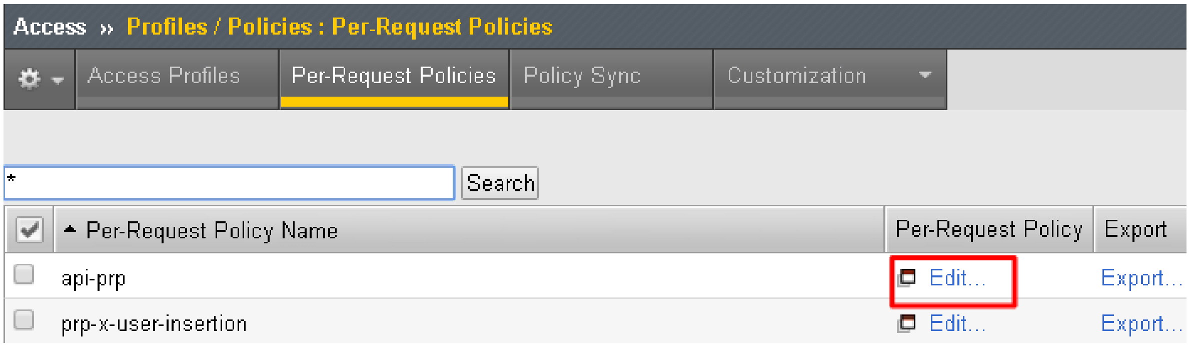


Access » Profiles / Policies : Per-Request Policies

General Properties

Name	api-prp

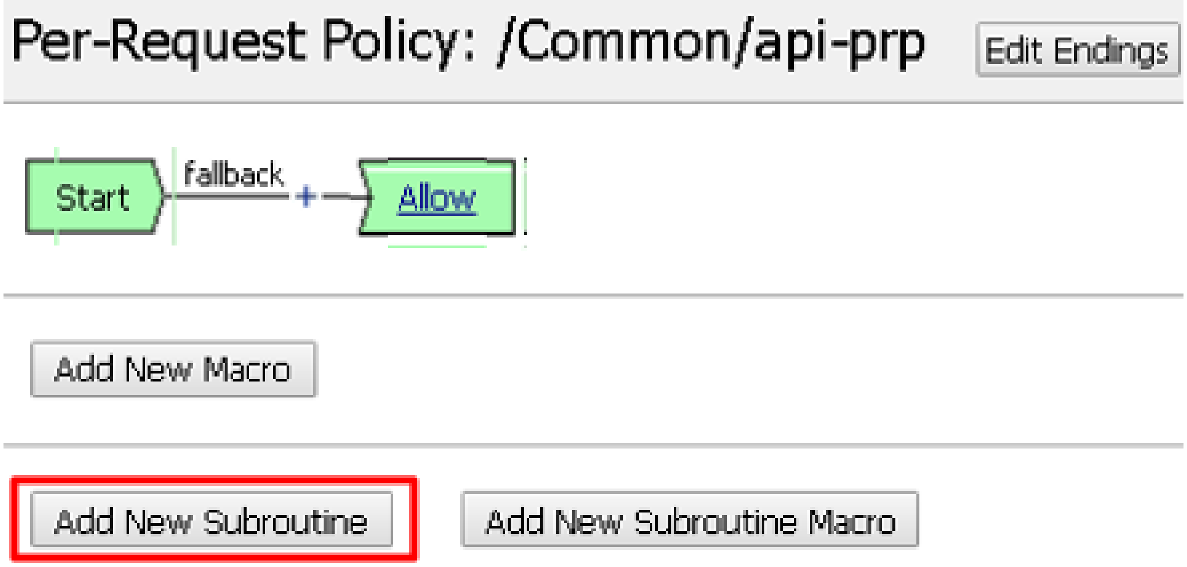
11. Click **Edit** on the **api-prp** policy and a new window will appear



Access » Profiles / Policies : Per-Request Policies

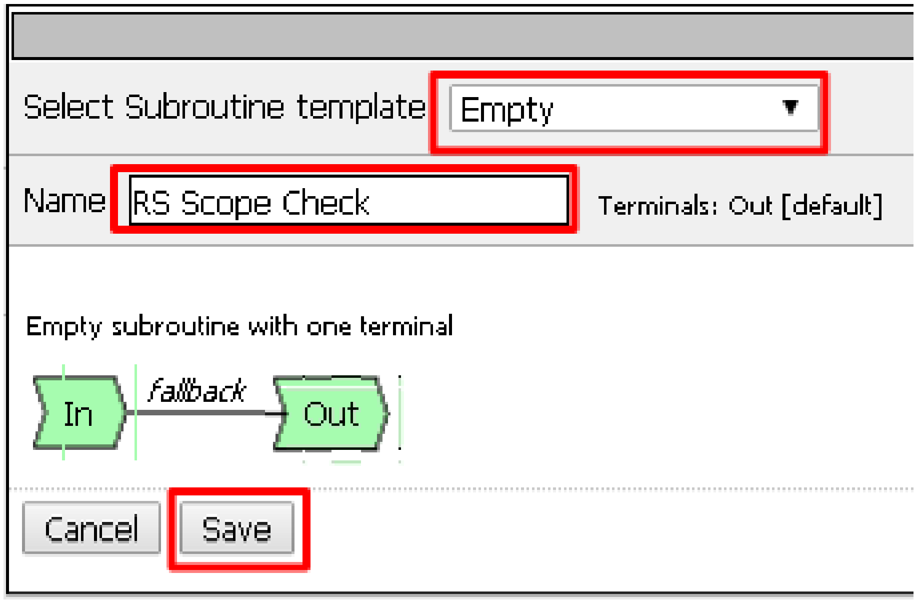
☑	▲ Per-Request Policy Name	Per-Request Policy	Export
□	api-prp	Edit...	Export...
□	prp-x-user-insertion	Edit...	Export...

12. Click **Add New Subroutine**



Per-Request Policy: /Common/api-prp

13. Leave the `Select Subroutine template` as Empty. Enter RS Scope Check for the **Name** and then click **Save**



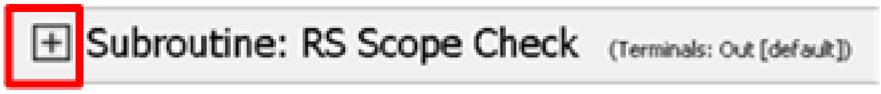
Select Subroutine template: Empty

Name: RS Scope Check

Terminals: Out [default]

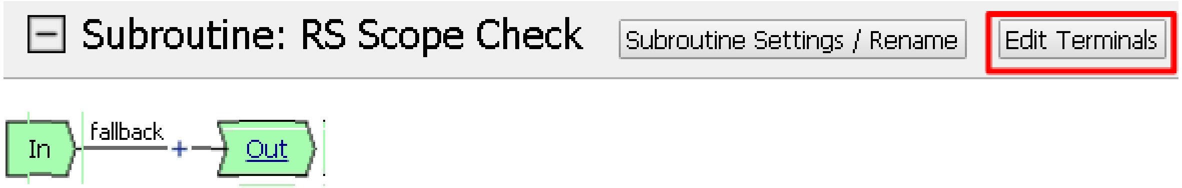
Empty subroutine with one terminal

14. Click the **+** next to the **RS Scope Check**



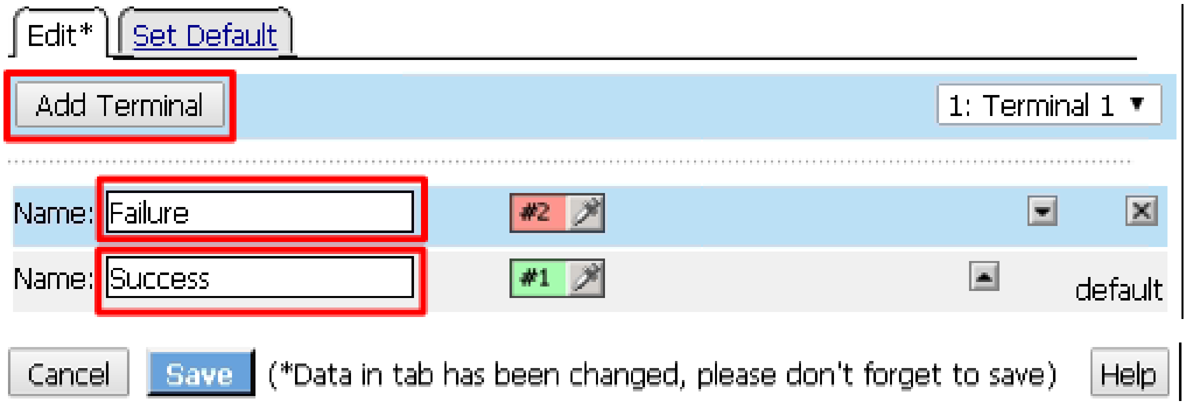
Subroutine: RS Scope Check (Terminals: Out [default])

15. Click Edit Terminals on the RS Scope Check Subroutine



Subroutine: RS Scope Check

16. First, rename **Out** to Success, then click **Add Terminal** and name it Failure

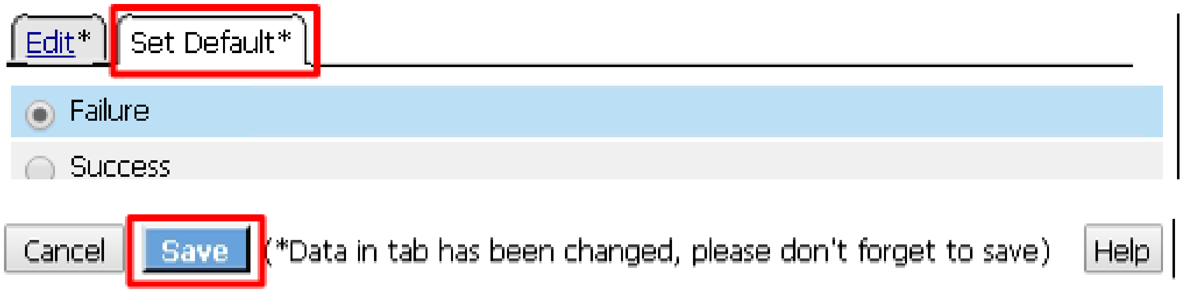


Name: Failure #2

Name: Success #1 default

(*Data in tab has been changed, please don't forget to save)

17. Go to the **Set Default** tab and select **Failure** then click Save

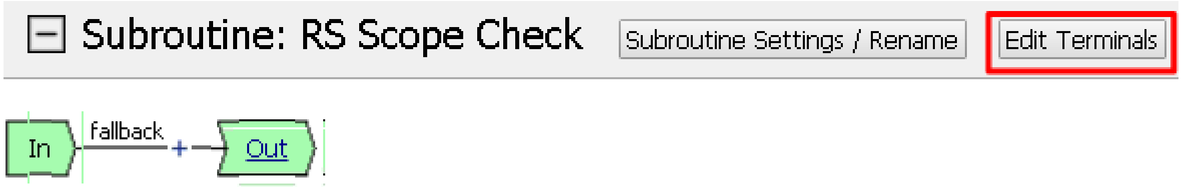


● Failure

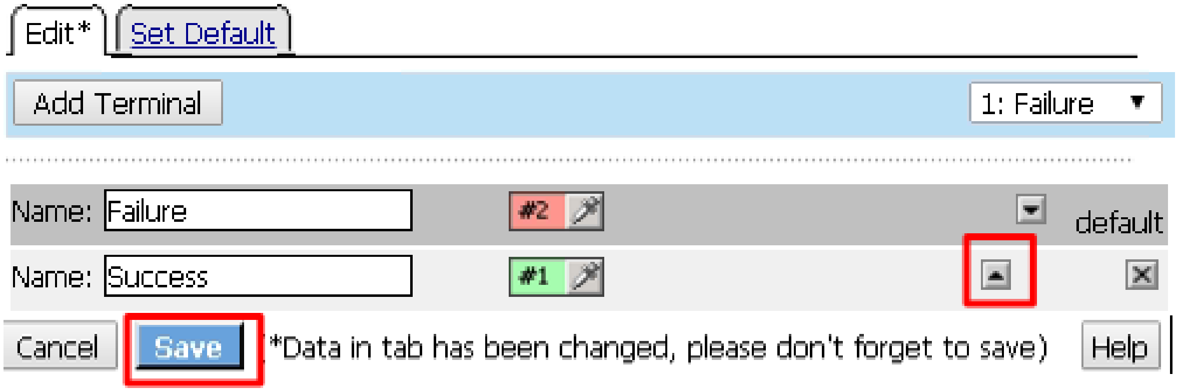
○ Success

(*Data in tab has been changed, please don't forget to save)

18. Click **Edit Terminals** again *(it will ignore the order settings if you do this in one step without saving in between)*



19. Move **Success** to the top using the up arrow on the right side then click **Save**



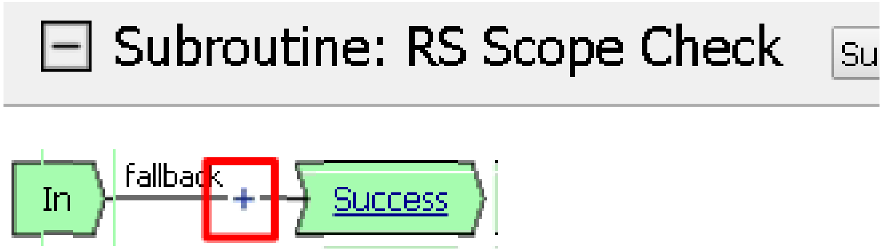
1: Failure ▼

Name: Failure #2

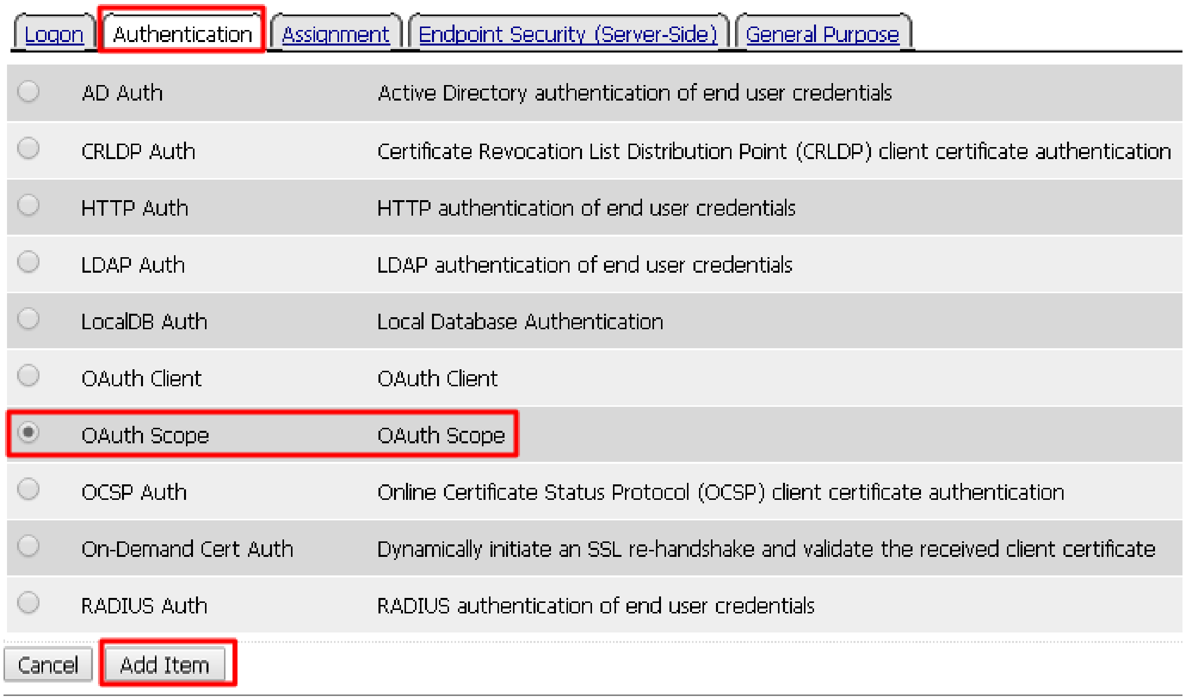
Name: Success #1

*Data in tab has been changed, please don't forget to save)

20. Click the **+** between **In** and **Success**, a new window will appear

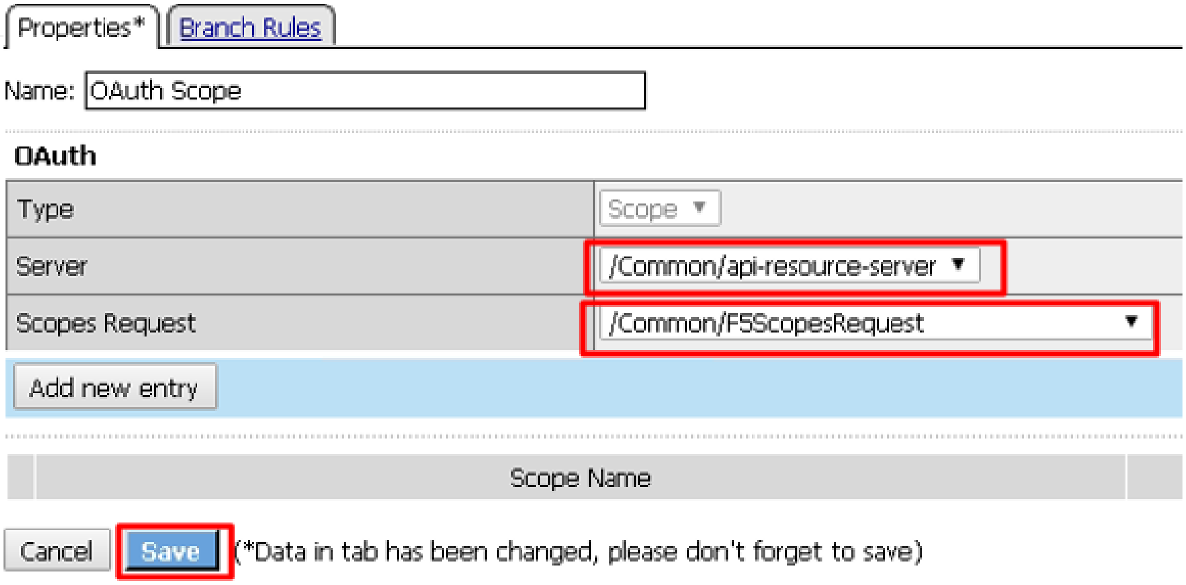


21. Select **OAuth Scope** from the **Authentication** tab and click **Add Item**



○	AD Auth	Active Directory authentication of end user credentials
○	CRLDP Auth	Certificate Revocation List Distribution Point (CRLDP) client certificate authentication
○	HTTP Auth	HTTP authentication of end user credentials
○	LDAP Auth	LDAP authentication of end user credentials
○	LocalDB Auth	Local Database Authentication
○	OAuth Client	OAuth Client
●	OAuth Scope	OAuth Scope
○	OCSP Auth	Online Certificate Status Protocol (OCSP) client certificate authentication
○	On-Demand Cert Auth	Dynamically initiate an SSL re-handshake and validate the received client certificate
○	RADIUS Auth	RADIUS authentication of end user credentials

22. Enter the following values and then click **Save**
    - **Server:** `/Common/api-resource-server`
    - **Scopes Request:** /Common/F5ScopesRequest



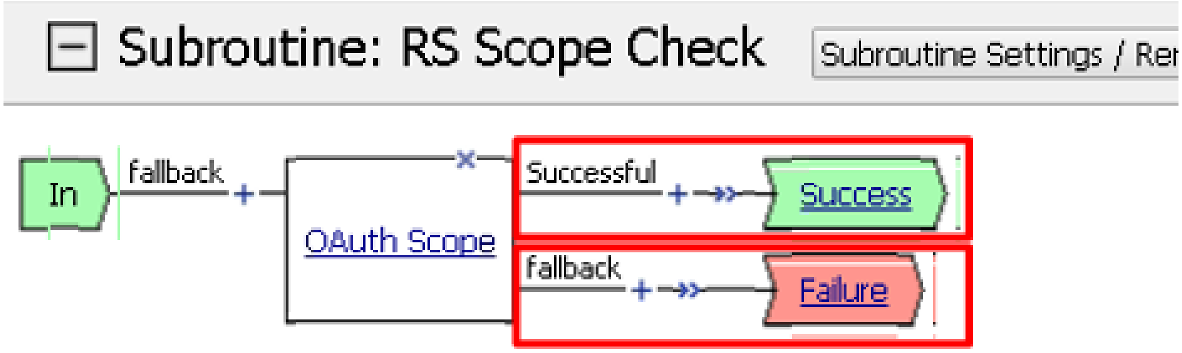
Name: OAuth Scope

OAuth

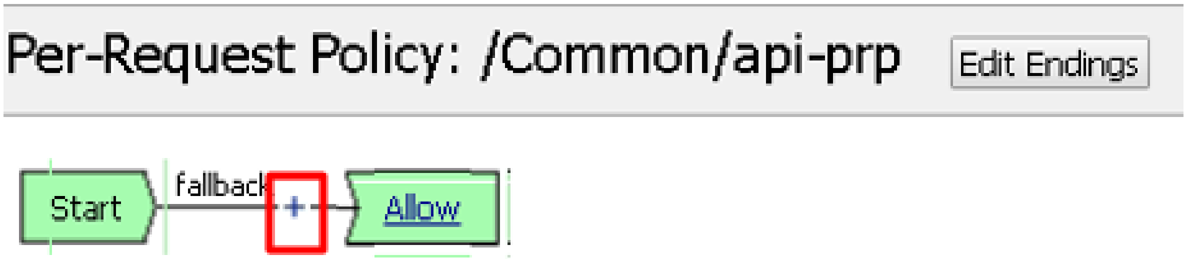
Type	Scope
Server	/Common/api-resource-server
Scopes Request	/Common/F5ScopesRequest

(*Data in tab has been changed, please don't forget to save)

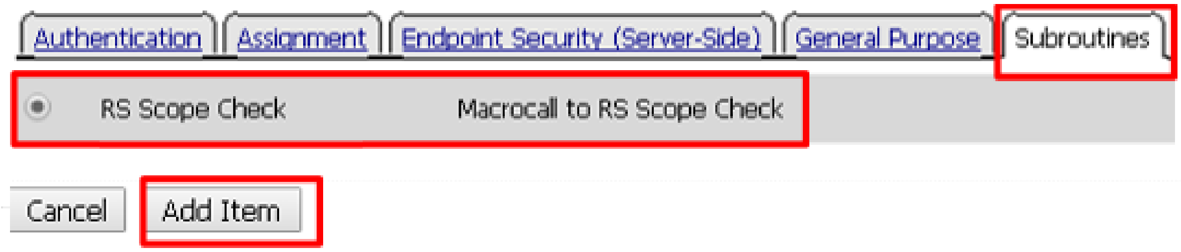
23. Verify that the **Successful** branch terminates in **Success** and the **Fallback** branch terminates in **Failure**



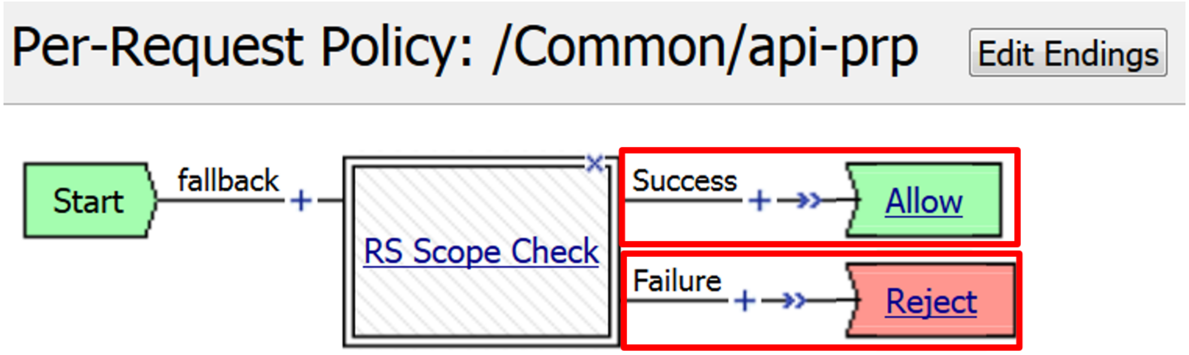
24. In the main policy, click **+** between the **Start** and **Allow**



25. Select **RS Scope Check** from the **Subroutines** tab and click **Add Item**

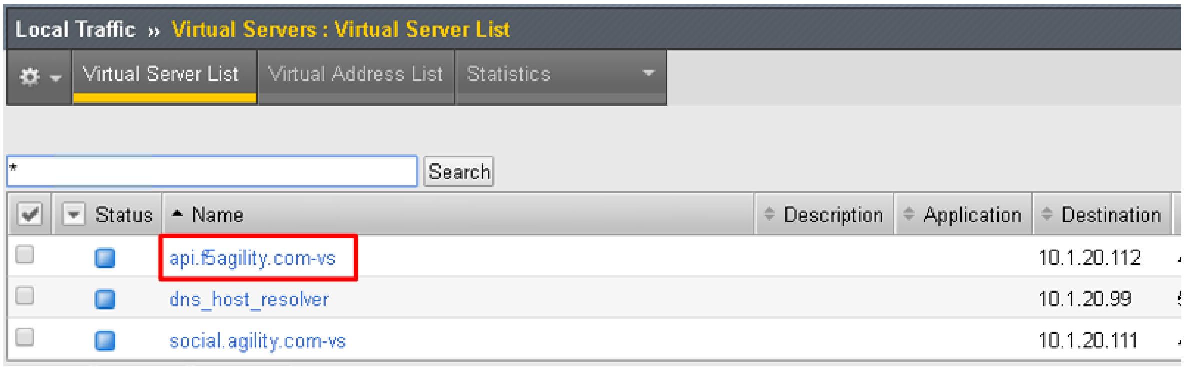


26. Verify that the Success branch terminates in Allow and the Fallback branch terminates in Reject



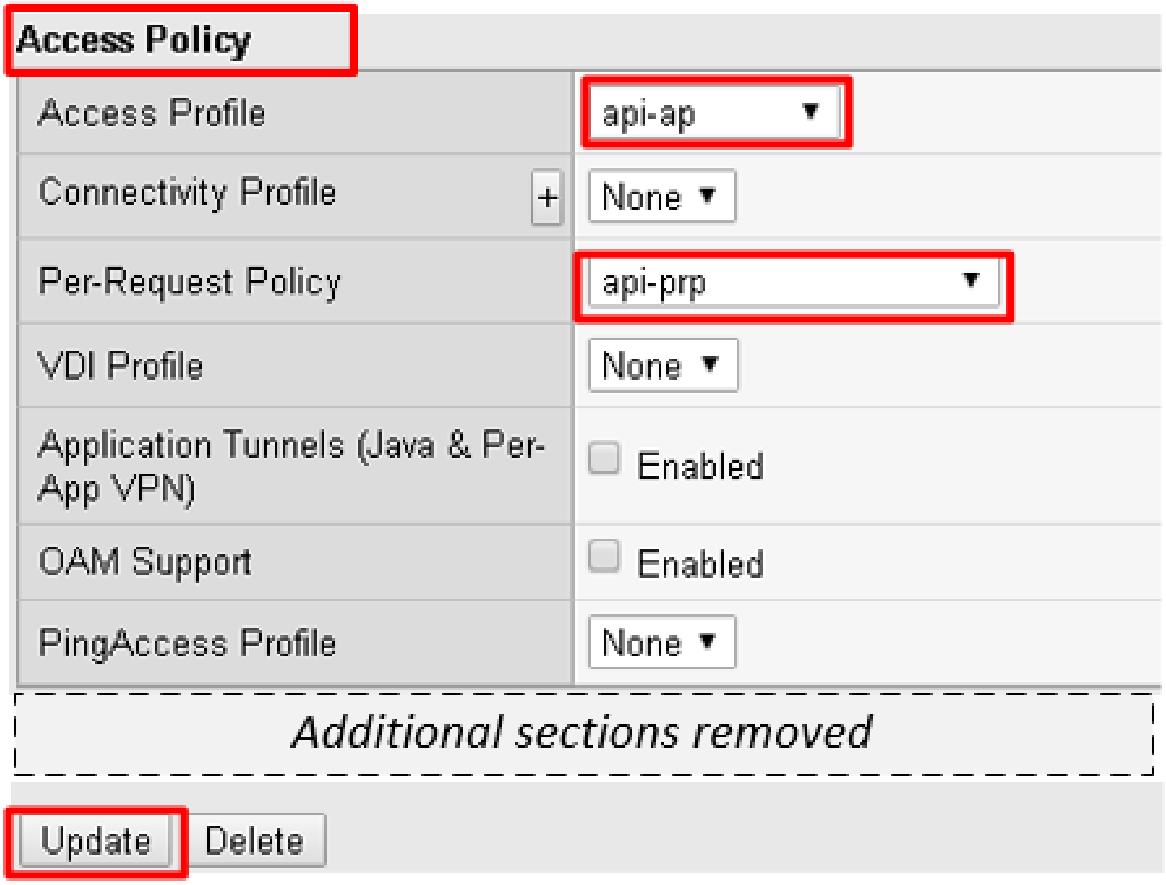
Note: You do not need to "Apply Policy " on Per Request Policies*

27. To add the APM Policies to the API Virtual Server, go to **Local Traffic -> Virtual Servers** and click on **api.f5agility.com-vs**



	Status	Name	Description	Application	Destination
□		api.f5agility.com-vs			10.1.20.112
□		dns_host_resolver			10.1.20.99
□		social.agility.com-vs			10.1.20.111

28. Scroll down to the **Access Policy** section. Change **Access Profile** from **None** to api-ap



Access Policy

Access Profile	api-ap
Connectivity Profile	None
Per-Request Policy	api-prp
VDI Profile	None
Application Tunnels (Java & Per-App VPN)	□ Enabled
OAM Support	□ Enabled
PingAccess Profile	None

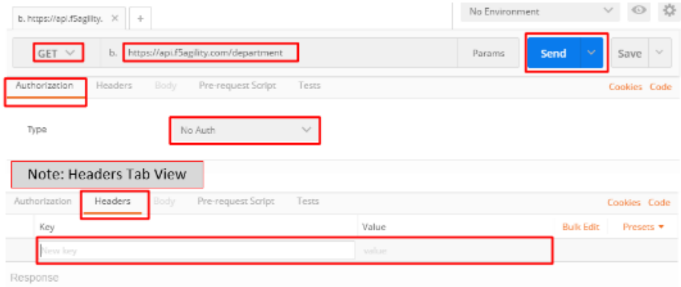
Additional sections removed

29. Change **Per-Request Policy** from **None** to api-prp and then click **Update**

2.3.5 Task 3: Verify

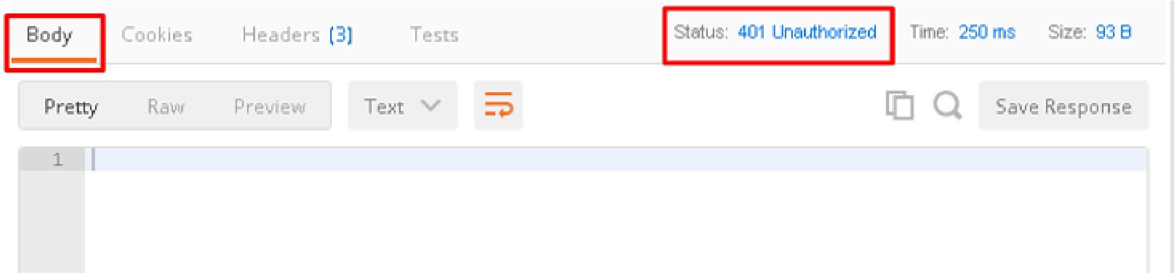
1. On the Jump Host, launch **Postman** from the desktop icon

2. The request should be prefilled with the settings below (same as earlier). If not change as needed or select **TEST API Call** from the **API Collection** and click **Send**

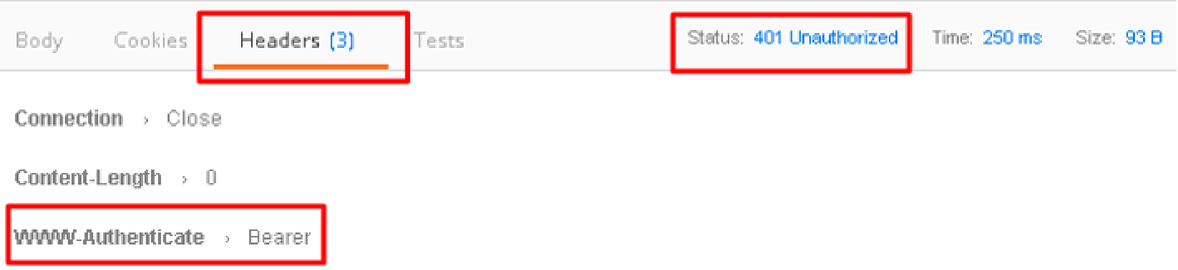


   - **Method:** `GET`
   - **Target:** `https://api.f5agility.com/department`
   - **Authorization:** `No Auth`
   - **Headers:** `(none should be set)`

3. You should receive a `401 Unauthorized` and **3 headers**, including `WWW-Authenticate: Bearer`. The body will be empty.

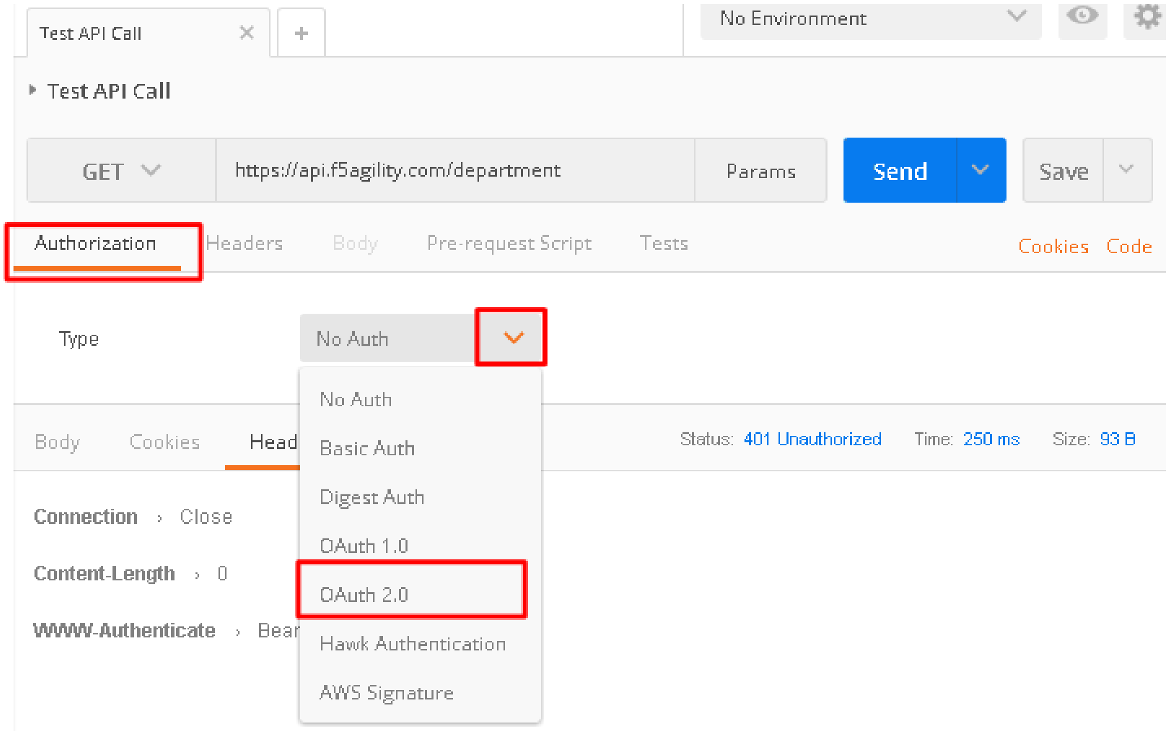


Note: Your API call failed because you are not providing an OAuth token. Both tabs shown

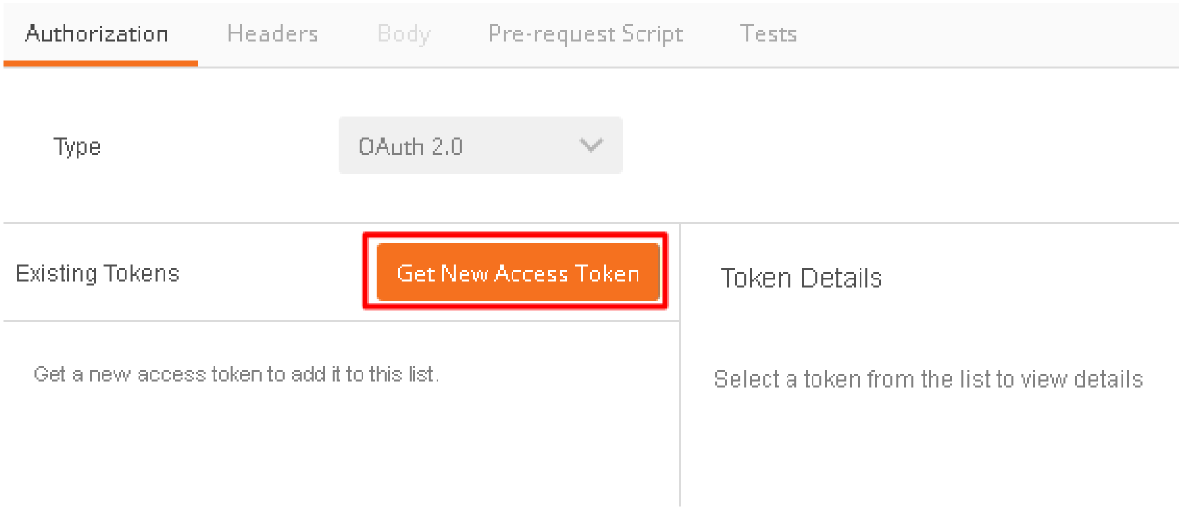


```
Connection › Close
Content-Length › 0
WWW-Authenticate › Bearer
```

4. Click the **Authorization** tab and change the **Type** from **No Auth** to OAuth 2.0



5. If present, select any existing tokens on the left side and delete them on the right side. Click **Get New Access Token**



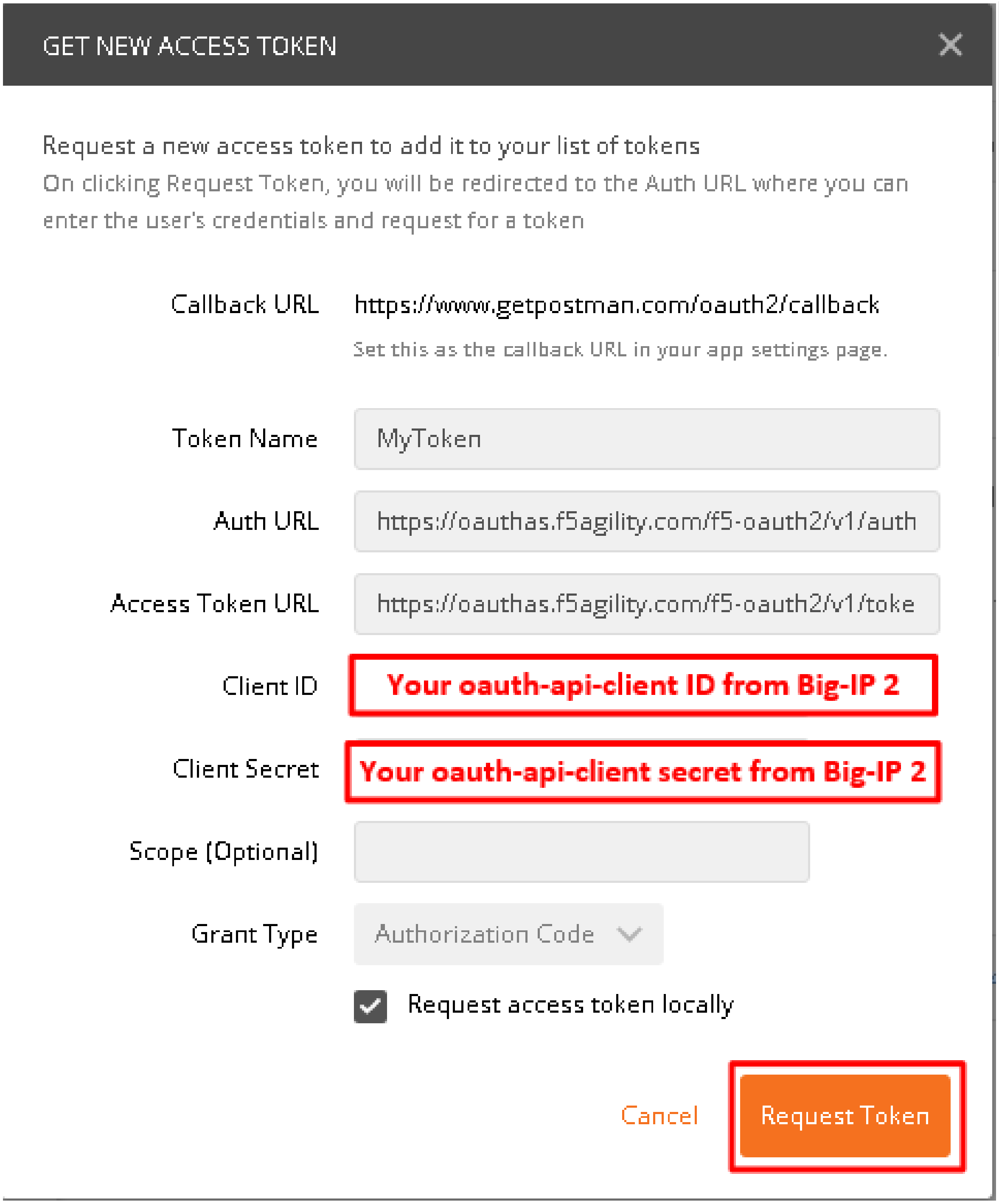
6. In the **Get New Access Token** window, if the values do not match then adjust as needed, and click **Request Token**

   - **Token Name:** <Anything is fine here>

Note: If you're doing this lab on your own machine and using self signed certificates you must add the certs to the trusted store on your computer. If you've just done this, you must close Postman and reopen. You also need to go to File -> Settings in Postman and turn SSL certificate validation to off.

   - **Auth URL:** `https://oauthas.f5agility.com/f5-oauth2/v1/authorize`

- **Access Token URL:** `https://oauthas.f5agility.com/f5-oauth2/v1/token`
- **Client ID:** <Get this from Big-IP 2 -> Access -> Federation -> OAuth Authorization Server -> Client Application -> oauth-api-client>
- **Client Secret:** <Get this from Big-IP 2 -> Access -> Federation -> OAuth Authorization Server -> Client Application -> oauth-api-client>
- **Scope:**
- **Grant Type:** `Authorization Code`
- **Request access token locally:** `checked`



GET NEW ACCESS TOKEN

Request a new access token to add it to your list of tokens
On clicking Request Token, you will be redirected to the Auth URL where you can enter the user's credentials and request for a token

Callback URL https://www.getpostman.com/oauth2/callback
Set this as the callback URL in your app settings page.

Token Name MyToken

Auth URL https://oauthas.f5agility.com/f5-oauth2/v1/auth

Access Token URL https://oauthas.f5agility.com/f5-oauth2/v1/toke

Client ID **Your oauth-api-client ID from Big-IP 2**

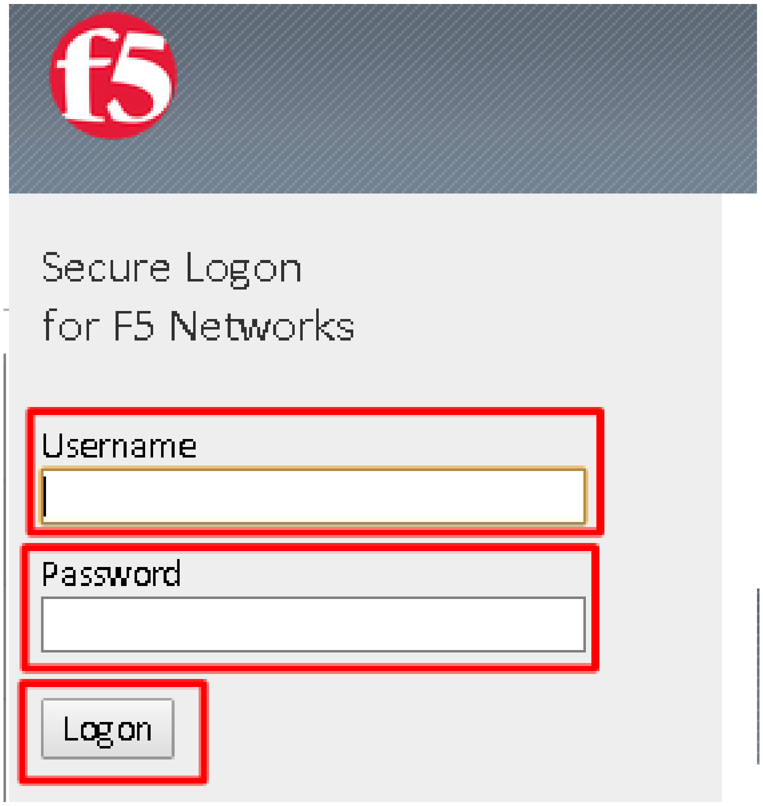
Client Secret **Your oauth-api-client secret from Big-IP 2**

Scope (Optional)

Grant Type Authorization Code

☑ Request access token locally

7. Logon with any credentials, such as user/password

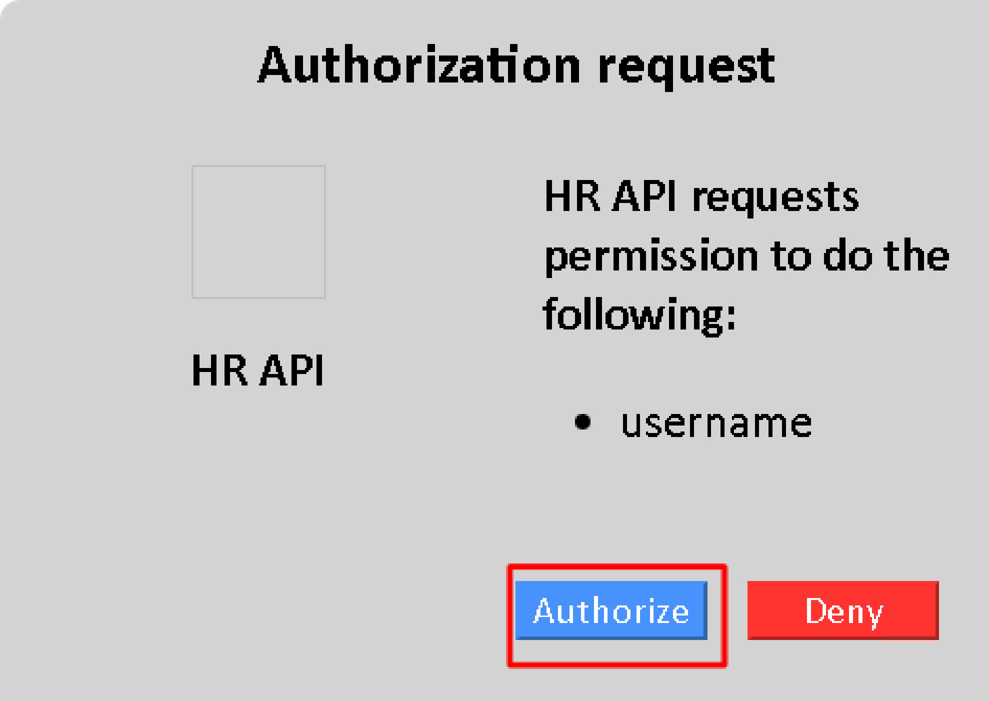


Secure Logon
for F5 Networks

Username

Password

8. Authorize the HR API by clicking **Authorize**



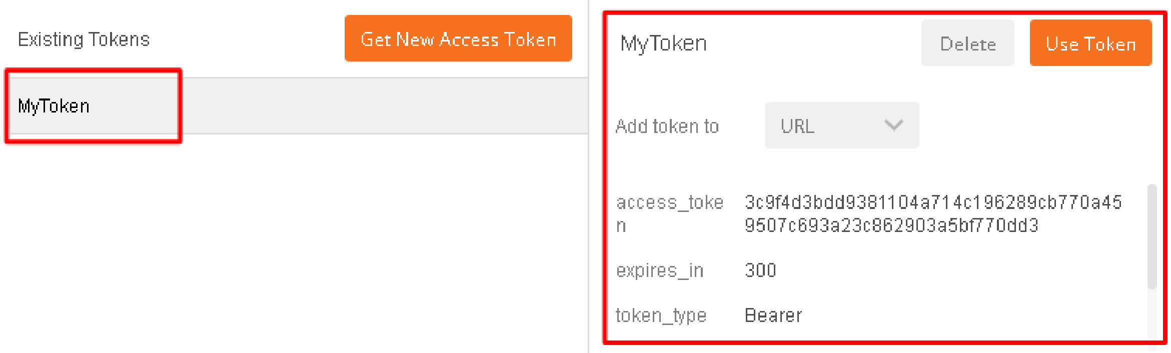
Authorization request

HR API

HR API requests permission to do the following:

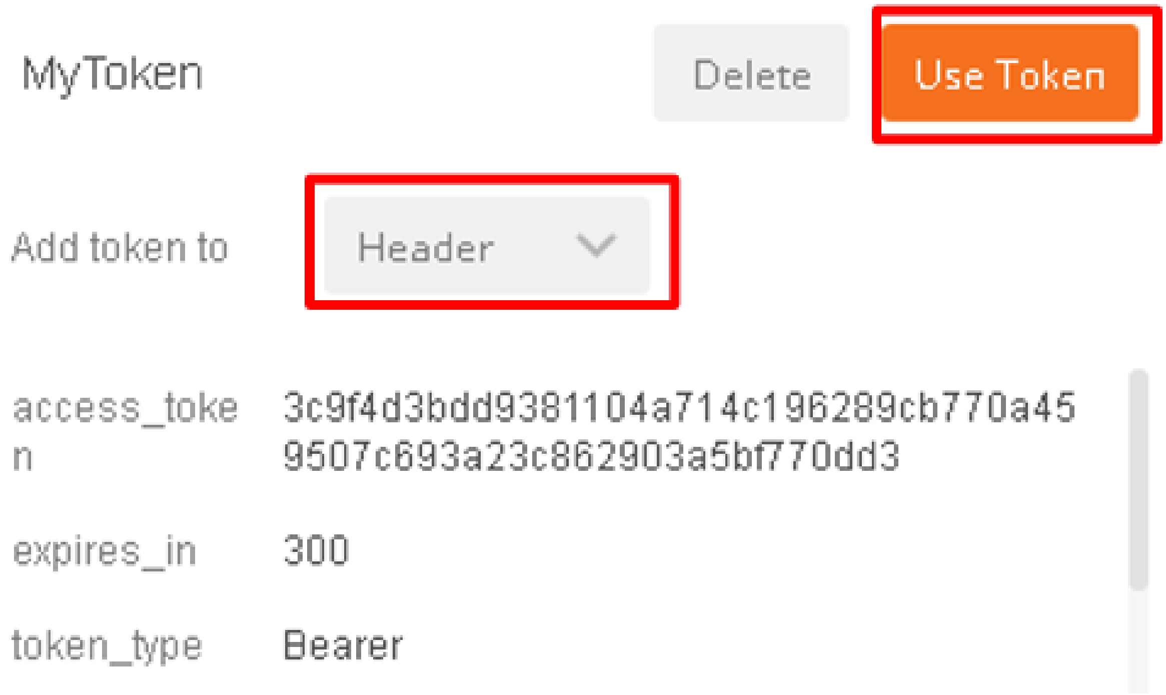
- username

9. You now have received an OAuth Token. Click the **name of your token** under **Existing Tokens** (left) and your token will appear on the right



Add token to	URL
access_token	3c9f4d3bdd9381104a714c196289cb770a459507c693a23c862903a5bf770dd3
expires_in	300
token_type	Bearer

10. Change the **Add token to** drop down to Header and the click **Use Token**. You will note that the **Header** tab (in the section tabs just above) now has one header in the **Header** tab which contains your **Authorization Header** of type **Bearer** with a string value.



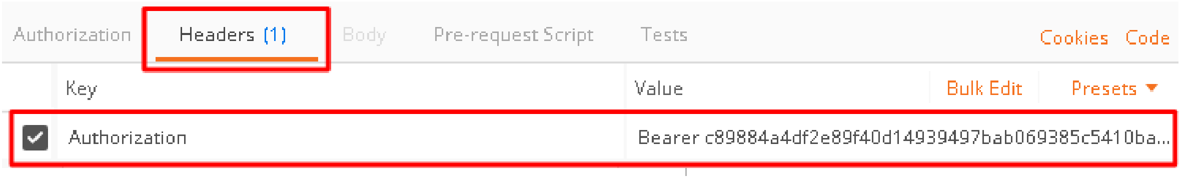
Add token to: Header

access_token: 3c9f4d3bdd9381104a714c196289cb770a459507c693a23c862903a5bf770dd3

expires_in: 300

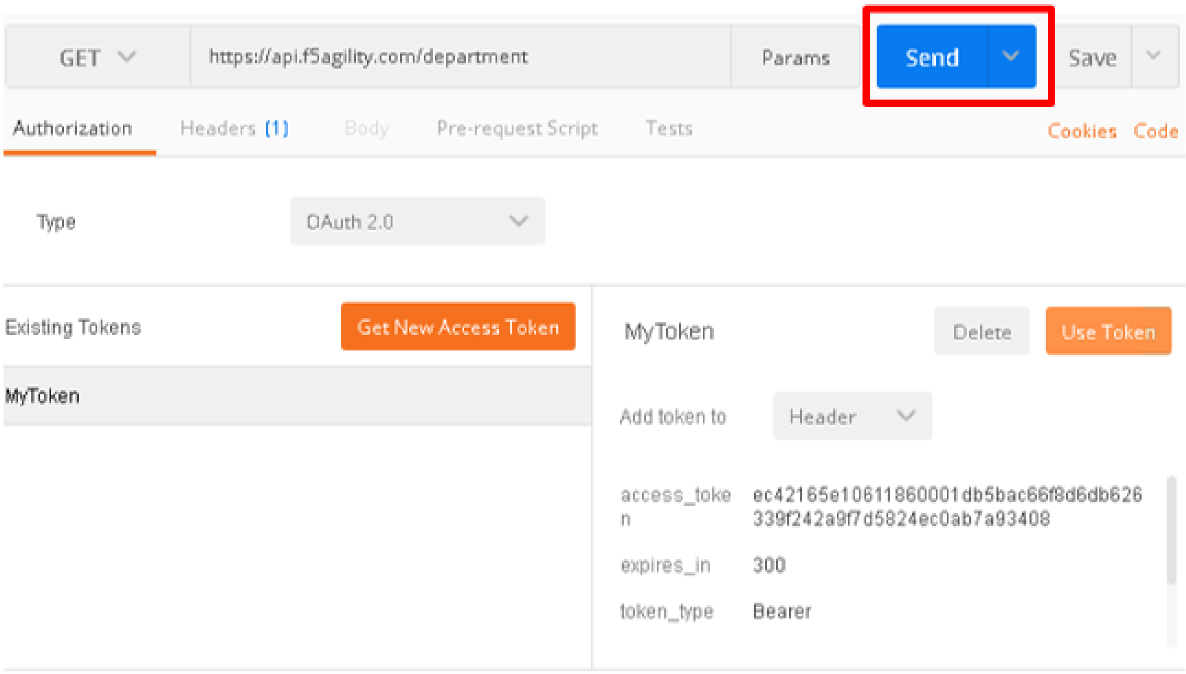
token_type: Bearer

The Header tab data is shown in the screenshot



	Key	Value
☑	Authorization	Bearer c89884a4df2e89f40d14939497bab069385c5410ba...

11. Click **Send** at the top of the Postman screen



GET https://api.f5agility.com/department

Type: OAuth 2.0

MyToken

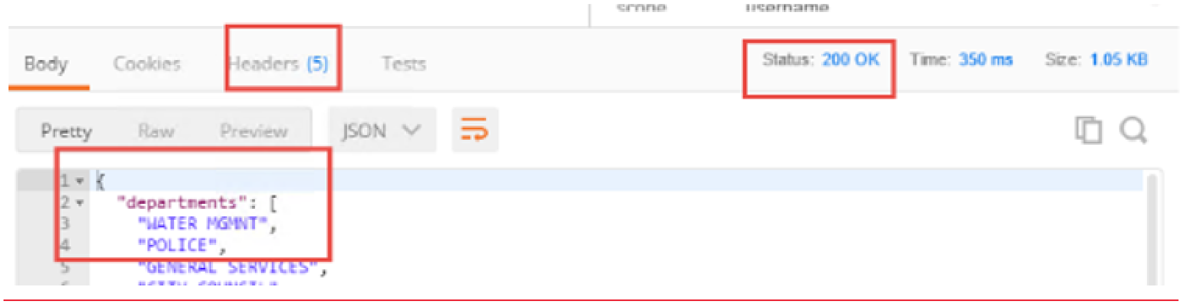
Add token to: Header

access_token: ec42165e10611860001db5bac66f8d6db626339f242a9f7d5824ec0ab7a93408

expires_in: 300

token_type: Bearer

12. You should receive a **200 OK**, **5 headers** and the **body** should contain a list of departments



Status: 200 OK Time: 350 ms Size: 1.05 KB

```
{
  "departments": [
    "WATER MGMNT",
    "POLICE",
    "GENERAL SERVICES",
```

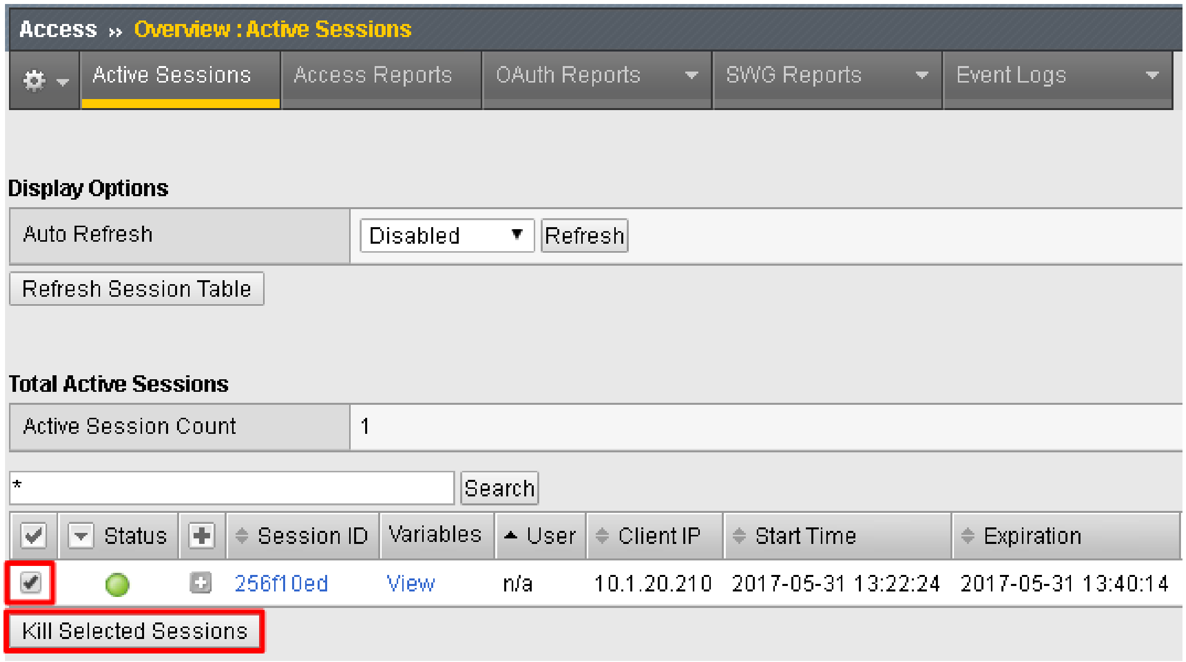
Note: This time the request was successful because you presented a valid OAuth token to the resource server (the Big-IP), so it allowed the traffic to the API server on the backend.

2.3.6 Task 4: Testing Session and Token States

Note: Parts of this task are performed on both Big-IP devices. Check each step to make sure you are working on the correct device.

Invalidate the Session

1. Go to **Big-IP 1 (OAuth C/RS) -> Access -> Overview -> Active Sessions**. Select the existing sessions and click **Kill Selected Sessions**, then confirm by clicking **Delete**



Display Options

Auto Refresh	Disabled ▾ Refresh

Refresh Session Table

Total Active Sessions

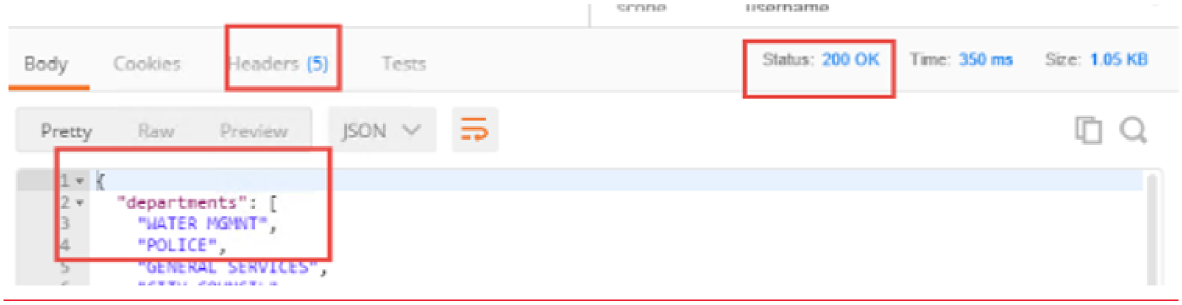
Active Session Count	1

* Search

☑	Status		Session ID	Variables	User	Client IP	Start Time	Expiration
☑	●		256f10ed	View	n/a	10.1.20.210	2017-05-31 13:22:24	2017-05-31 13:40:14

Kill Selected Sessions

2. Go back to **Postman** and click **Send** with your current OAuth token still inserted into the header. You should still receive a 200 OK, 5 headers and the body should contain a list of departments.



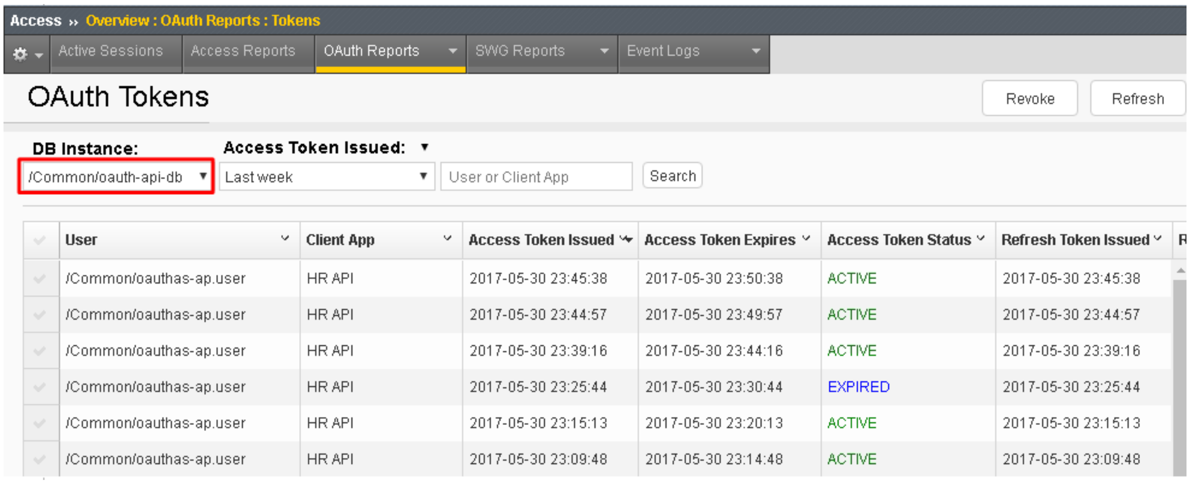
Status: 200 OK Time: 350 ms Size: 1.05 KB

```
{
  "departments": [
    "WATER MGMNT",
    "POLICE",
    "GENERAL SERVICES",
```

Note: You were still able to reach the API because you were able to establish a new session with your existing valid token*.

Invalidate both the Current Session and Token

1. Go Big-IP 2 (OAuth AS) -> **Access -> Overview -> OAuth Reports -> Tokens**. Change the **DB Instance** to oauth-api-db.



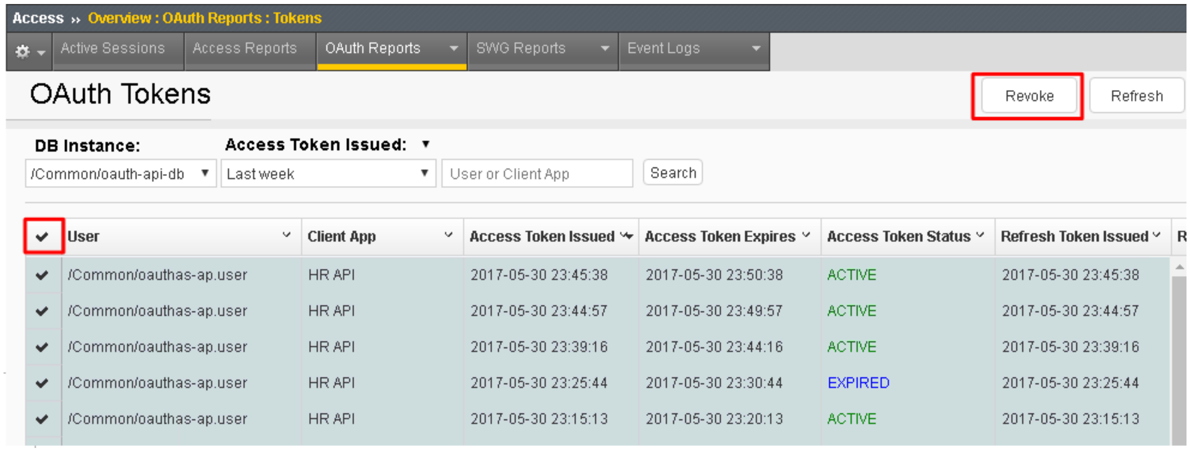
DB Instance: /Common/oauth-api-db

Access Token Issued: Last week

User or Client App

✓	User	Client App	Access Token Issued	Access Token Expires	Access Token Status	Refresh Token Issued	R
✓	/Common/oauthas-ap.user	HR API	2017-05-30 23:45:38	2017-05-30 23:50:38	ACTIVE	2017-05-30 23:45:38	
✓	/Common/oauthas-ap.user	HR API	2017-05-30 23:44:57	2017-05-30 23:49:57	ACTIVE	2017-05-30 23:44:57	
✓	/Common/oauthas-ap.user	HR API	2017-05-30 23:39:16	2017-05-30 23:44:16	ACTIVE	2017-05-30 23:39:16	
✓	/Common/oauthas-ap.user	HR API	2017-05-30 23:25:44	2017-05-30 23:30:44	EXPIRED	2017-05-30 23:25:44	
✓	/Common/oauthas-ap.user	HR API	2017-05-30 23:15:13	2017-05-30 23:20:13	ACTIVE	2017-05-30 23:15:13	
✓	/Common/oauthas-ap.user	HR API	2017-05-30 23:09:48	2017-05-30 23:14:48	ACTIVE	2017-05-30 23:09:48	

2. Select all tokens, click **Checkbox** left in title bar and the click **Revoke** in the top right



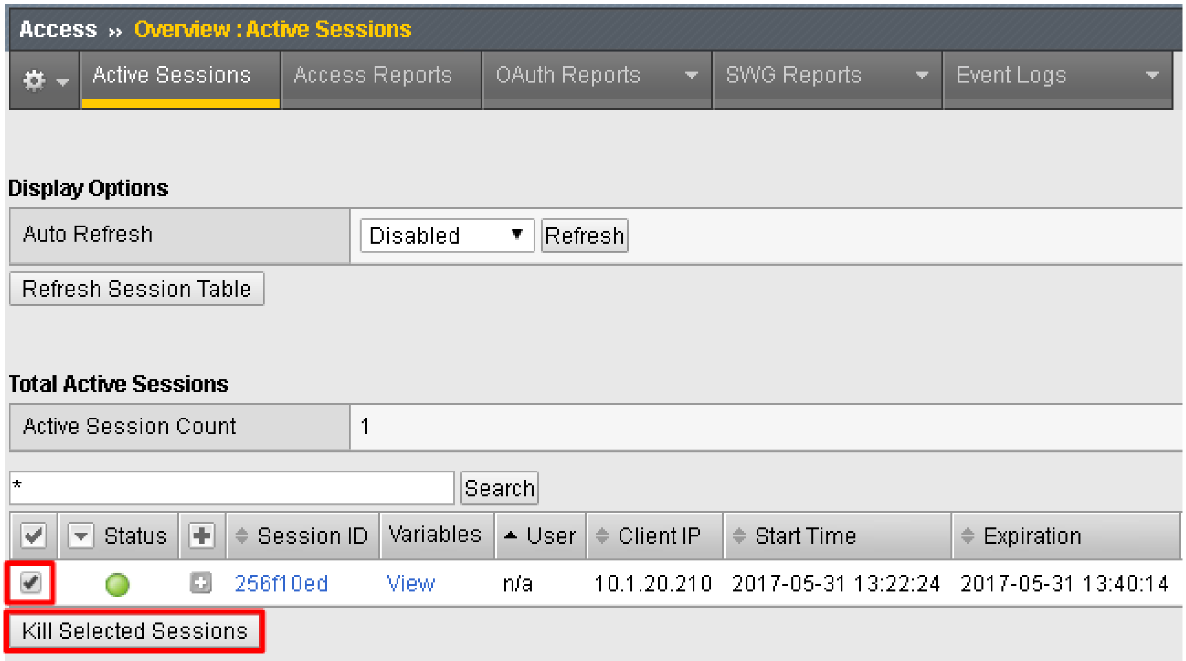
DB Instance: /Common/oauth-api-db

Access Token Issued: Last week

User or Client App

✓	User	Client App	Access Token Issued	Access Token Expires	Access Token Status	Refresh Token Issued	R
✓	/Common/oauthas-ap.user	HR API	2017-05-30 23:45:38	2017-05-30 23:50:38	ACTIVE	2017-05-30 23:45:38	
✓	/Common/oauthas-ap.user	HR API	2017-05-30 23:44:57	2017-05-30 23:49:57	ACTIVE	2017-05-30 23:44:57	
✓	/Common/oauthas-ap.user	HR API	2017-05-30 23:39:16	2017-05-30 23:44:16	ACTIVE	2017-05-30 23:39:16	
✓	/Common/oauthas-ap.user	HR API	2017-05-30 23:25:44	2017-05-30 23:30:44	EXPIRED	2017-05-30 23:25:44	
✓	/Common/oauthas-ap.user	HR API	2017-05-30 23:15:13	2017-05-30 23:20:13	ACTIVE	2017-05-30 23:15:13	

3. Go to **Big-IP 1 (OAuth C/RS) -> Access -> Overview -> Active Sessions**. Select the existing sessions and click **Kill Selected Sessions**, then confirm by clicking **Delete**



Display Options

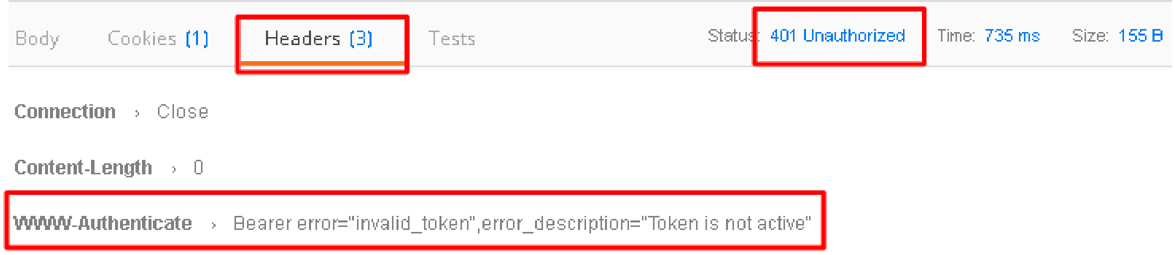
Auto Refresh	Disabled

Total Active Sessions

Active Session Count	1

☑	Status		Session ID	Variables	User	Client IP	Start Time	Expiration
☑	●	⊞	256f10ed	View	n/a	10.1.20.210	2017-05-31 13:22:24	2017-05-31 13:40:14

4. Go back to **Postman** and click Send with your *current OAuth token still inserted* into the header. You should receive a `401 Unauthorized`, **3 headers**, no body, and the `WWW-Authenticate` header will provide an error description indicating the token is not active.



Status: 401 Unauthorized Time: 735 ms Size: 155 B

Connection	Close
Content-Length	0
WWW-Authenticate	Bearer error="invalid_token",error_description="Token is not active"

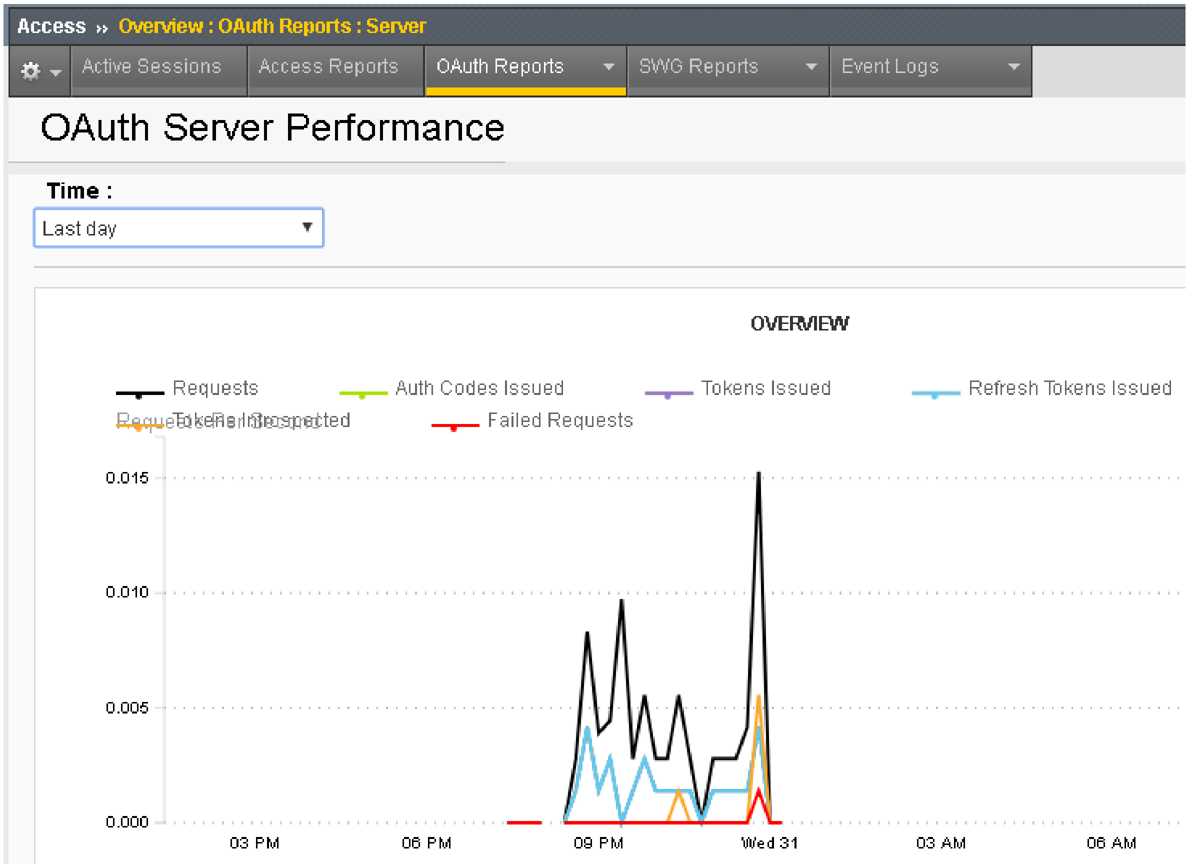
Note: You can remove the header, delete the token, and start over getting a new token and it will work once again.*

Note: This time you were no longer able to reach the API because you no longer had a valid token to establish your new session with. Getting a new token will resolve the issue.

2.4 Lab 3: Reporting and Session Management

2.4.1 Task 1: Big-IP as Authorization Server (Big-IP 2)

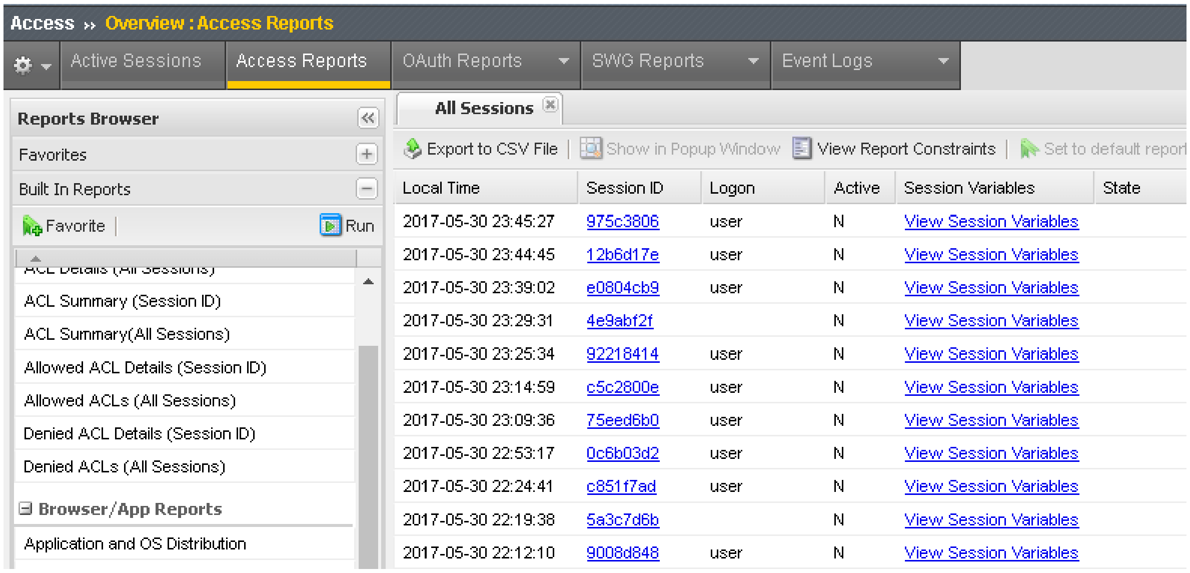
1. You can see reporting on OAuth traffic at **Access -> Overview -> OAuth Reports -> Server**



OAuth Server Performance

Time : Last day

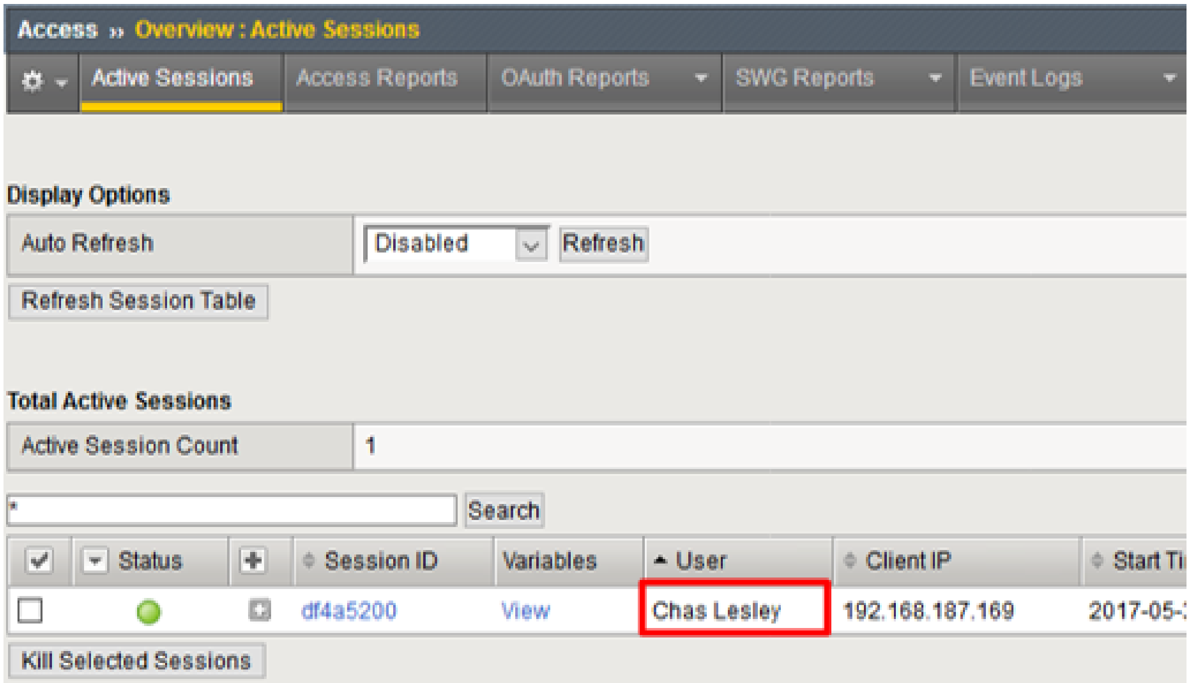
2. You can see the session logs by going to **Access**-> **Overview**-> **Active Sessions** and click on the active session, or for past sessions under **Access -> Overview -> Access Reports -> All Sessions Report** *(it runs by default and asks for a time period)*



Local Time	Session ID	Logon	Active	Session Variables	State
2017-05-30 23:45:27	975c3806	user	N	View Session Variables	
2017-05-30 23:44:45	12b6d17e	user	N	View Session Variables	
2017-05-30 23:39:02	e0804cb9	user	N	View Session Variables	
2017-05-30 23:29:31	4e9abf2f		N	View Session Variables	
2017-05-30 23:25:34	92218414	user	N	View Session Variables	
2017-05-30 23:14:59	c5c2800e	user	N	View Session Variables	
2017-05-30 23:09:36	75eed6b0	user	N	View Session Variables	
2017-05-30 22:53:17	0c6b03d2	user	N	View Session Variables	
2017-05-30 22:24:41	c851f7ad	user	N	View Session Variables	
2017-05-30 22:19:38	5a3c7d6b		N	View Session Variables	
2017-05-30 22:12:10	9008d848	user	N	View Session Variables	

2.4.2 Task 2: Big-IP as Client / Resource Server (Big-IP 1)

1. After logging in Go to **Access -> Overview -> Active Sessions** and note that the “User” field is populated with the name from your social account *(from social account labs)*. This happens because we took the relevant variable from the OAuth response and put it into the variable *session.logon.last.username*.



Display Options

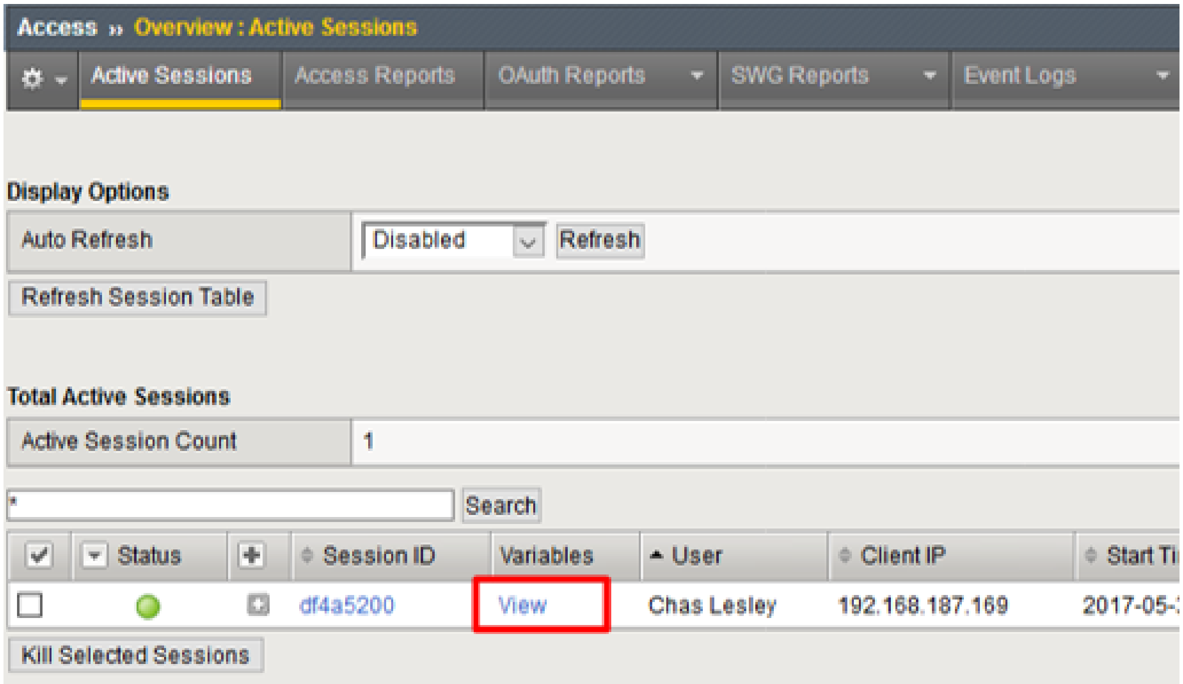
Auto Refresh	Disabled

Total Active Sessions

Active Session Count	1

☑	Status	+	Session ID	Variables	User	Client IP	Start Ti
□	●	+	df4a5200	View	Chas Lesley	192.168.187.169	2017-05-

2. There are more session variables retrieved from the provider you can examine. To see them click on **View** under **Variables** for the session. Search for variables that start with “session.oauth.scope.last”. The scope will determine what the Authorization Server returns to you.



Display Options

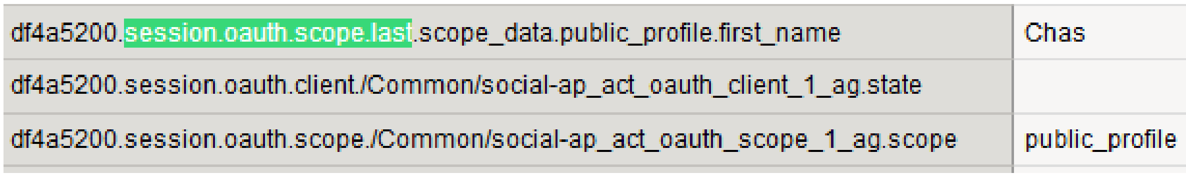
Auto Refresh	Disabled

Total Active Sessions

Active Session Count	1

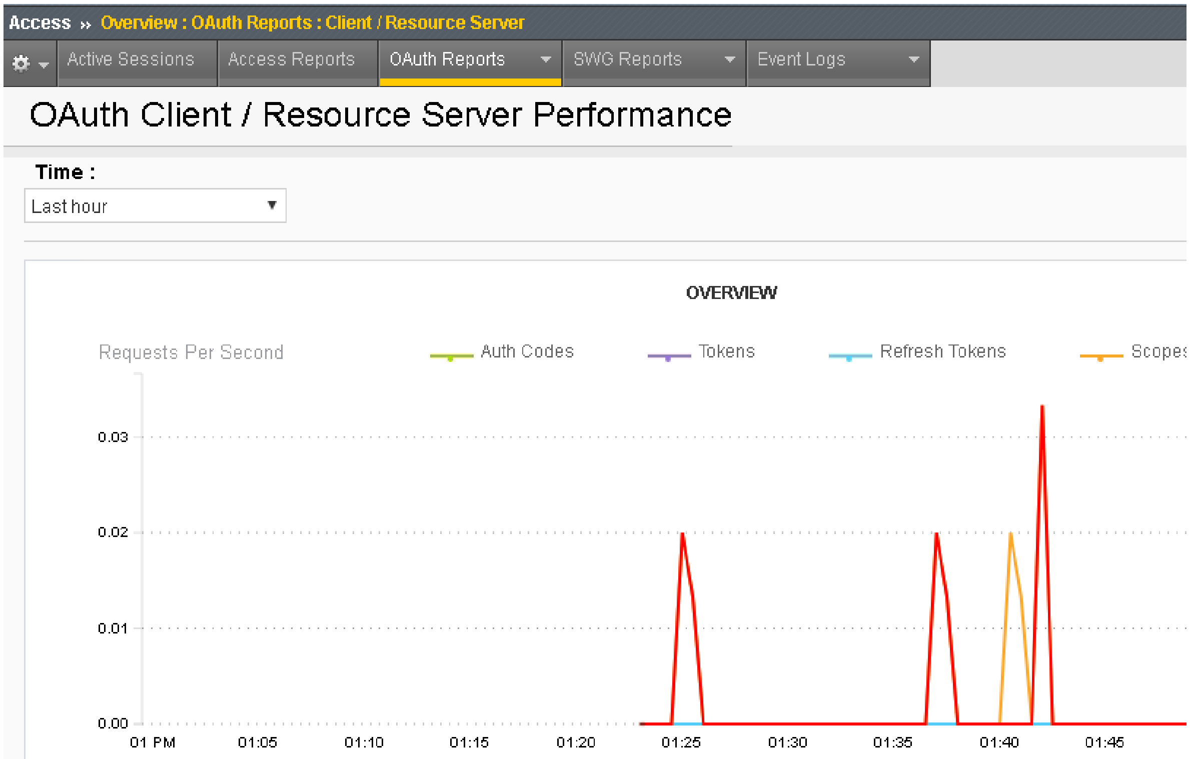
☑	Status	+	Session ID	Variables	User	Client IP	Start Ti
□	●	+	df4a5200	View	Chas Lesley	192.168.187.169	2017-05-

Note: You can terminate this session if desired at the Active Sessions screen*

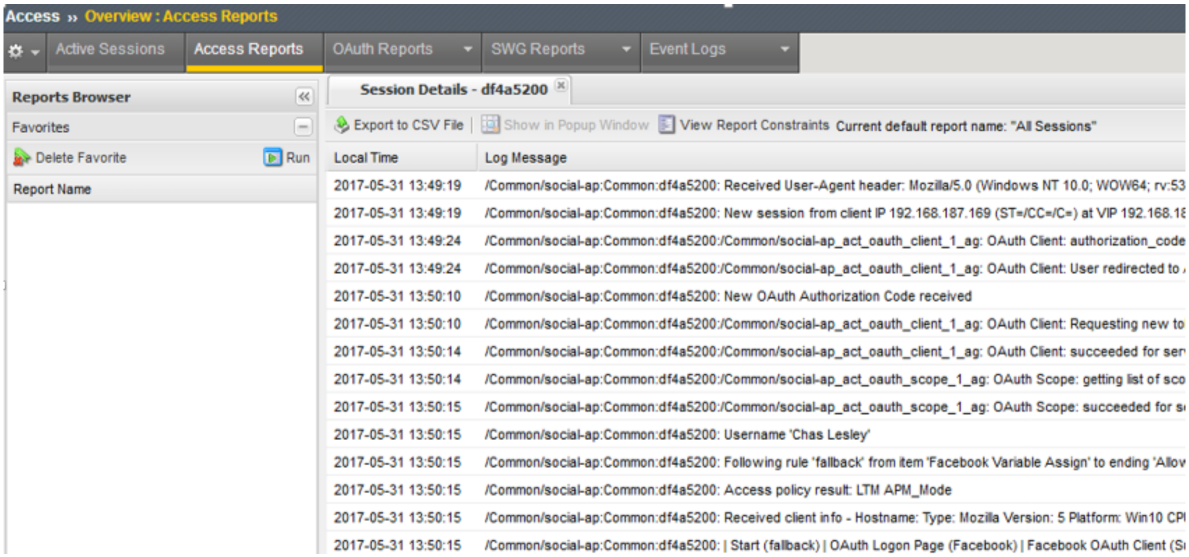


df4a5200.session.oauth.scope.last.scope_data.public_profile.first_name	Chas
df4a5200.session.oauth.client./Common/social-ap_act_oauth_client_1_ag.state	
df4a5200.session.oauth.scope./Common/social-ap_act_oauth_scope_1_ag.scope	public_profile

3. You can see reporting on OAuth traffic at **Access -> Overview -> OAuth Reports -> Client** / **Resource Server**



4. You can see the session logs by going to **Access**-> **Overview**-> **Active Sessions** and click on the active session, or for past sessions under **Access -> Overview -> Access Reports -> All Sessions Report** *(it runs by default and asks for a time period)*



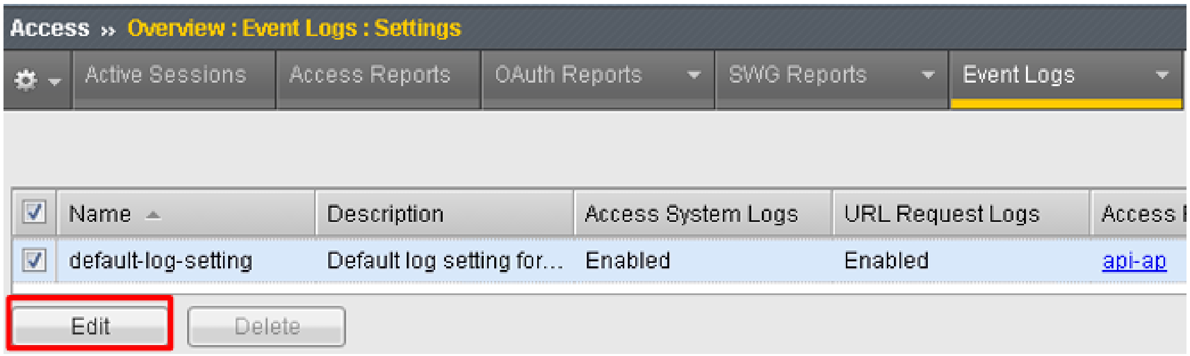
Current default report name: "All Sessions"

```
Local Time            Log Message
2017-05-31 13:49:19   /Common/social-ap:Common:df4a5200: Received User-Agent header: Mozilla/5.0 (Windows NT 10.0; WOW64; rv:53
2017-05-31 13:49:19   /Common/social-ap:Common:df4a5200: New session from client IP 192.168.187.169 (ST=/CC=/C=) at VIP 192.168.18
2017-05-31 13:49:24   /Common/social-ap:Common:df4a5200:/Common/social-ap_act_oauth_client_1_ag: OAuth Client: authorization_code
2017-05-31 13:49:24   /Common/social-ap:Common:df4a5200:/Common/social-ap_act_oauth_client_1_ag: OAuth Client: User redirected to
2017-05-31 13:50:10   /Common/social-ap:Common:df4a5200: New OAuth Authorization Code received
2017-05-31 13:50:10   /Common/social-ap:Common:df4a5200:/Common/social-ap_act_oauth_client_1_ag: OAuth Client: Requesting new to
2017-05-31 13:50:14   /Common/social-ap:Common:df4a5200:/Common/social-ap_act_oauth_client_1_ag: OAuth Client: succeeded for ser
2017-05-31 13:50:14   /Common/social-ap:Common:df4a5200:/Common/social-ap_act_oauth_scope_1_ag: OAuth Scope: getting list of sco
2017-05-31 13:50:15   /Common/social-ap:Common:df4a5200:/Common/social-ap_act_oauth_scope_1_ag: OAuth Scope: succeeded for s
2017-05-31 13:50:15   /Common/social-ap:Common:df4a5200: Username 'Chas Lesley'
2017-05-31 13:50:15   /Common/social-ap:Common:df4a5200: Following rule 'fallback' from item 'Facebook Variable Assign' to ending 'Allov
2017-05-31 13:50:15   /Common/social-ap:Common:df4a5200: Access policy result: LTM APM_Mode
2017-05-31 13:50:15   /Common/social-ap:Common:df4a5200: Received client info - Hostname: Type: Mozilla Version: 5 Platform: Win10 CP
2017-05-31 13:50:15   /Common/social-ap:Common:df4a5200: | Start (fallback) | OAuth Logon Page (Facebook) | Facebook OAuth Client (S
```

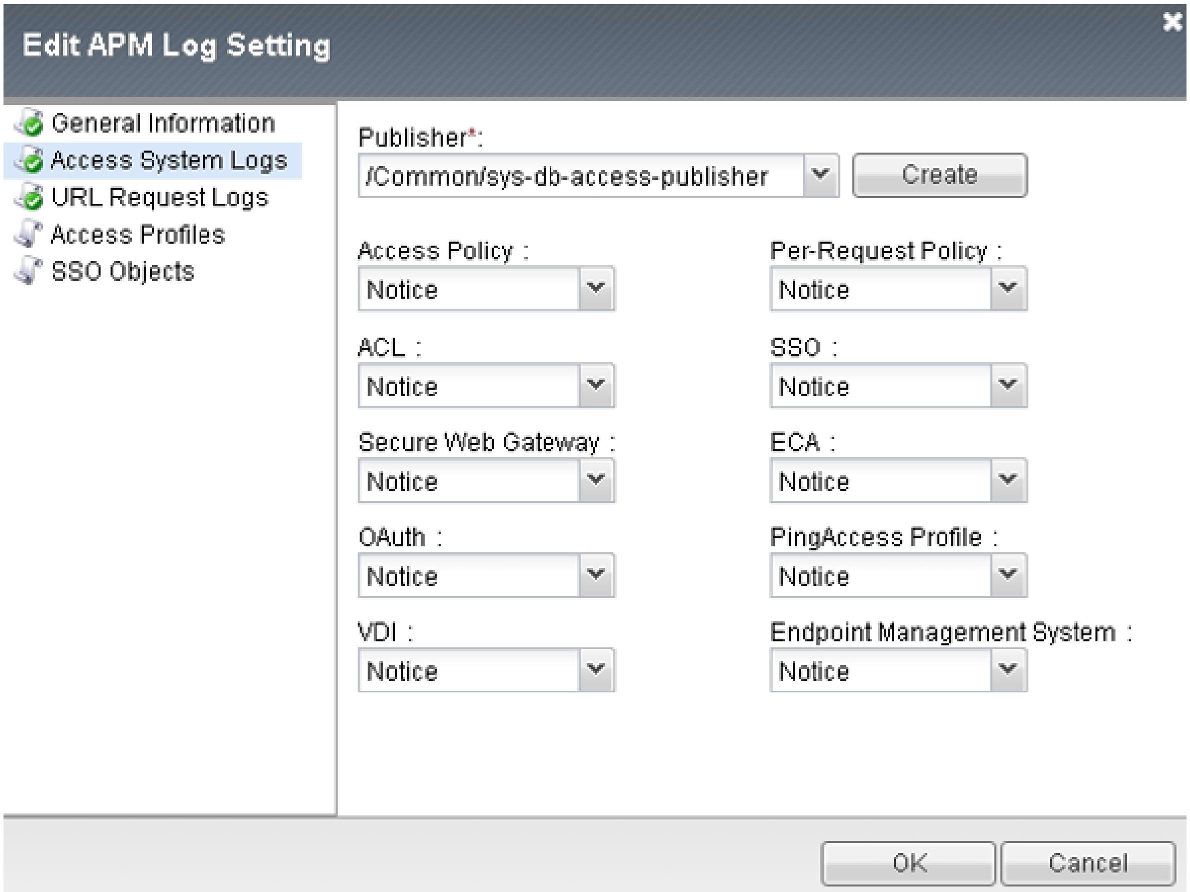
2.5 Lab 4: Troubleshooting

2.5.1 Task 1: Logging Levels

1. You can turn up the logging levels specific to OAuth at **Access -> Overview -> Event Logs -> Settings**. Often times *Informational* is enough to identify issues. It is recommended to start there before going to debug. In particular pay attention *session.oauth.client.last.errMsg* as it contains the errors the other side reported back to you.



☑	Name ▲	Description	Access System Logs	URL Request Logs	Access I
☑	default-log-setting	Default log setting for...	Enabled	Enabled	api-ap



Publisher*: /Common/sys-db-access-publisher

Access Policy : Notice

Per-Request Policy : Notice

ACL : Notice

SSO : Notice

Secure Web Gateway : Notice

ECA : Notice

OAuth : Notice

PingAccess Profile : Notice

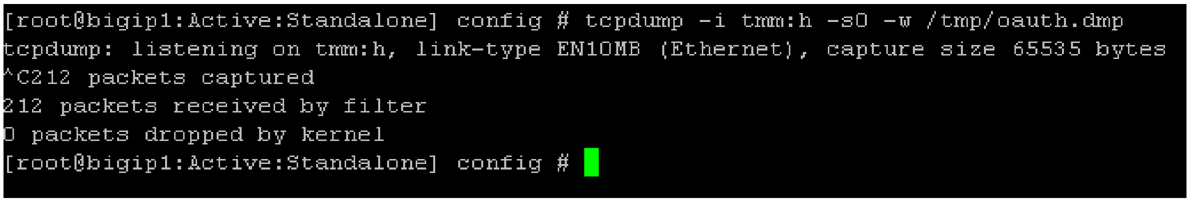
VDI : Notice

Endpoint Management System : Notice

2.5.2 Task 2: Traffic Captures

1. You can actually examine what Big-IP has sent out when acting as a client/resource server. First, capture the traffic on the tmm channel:

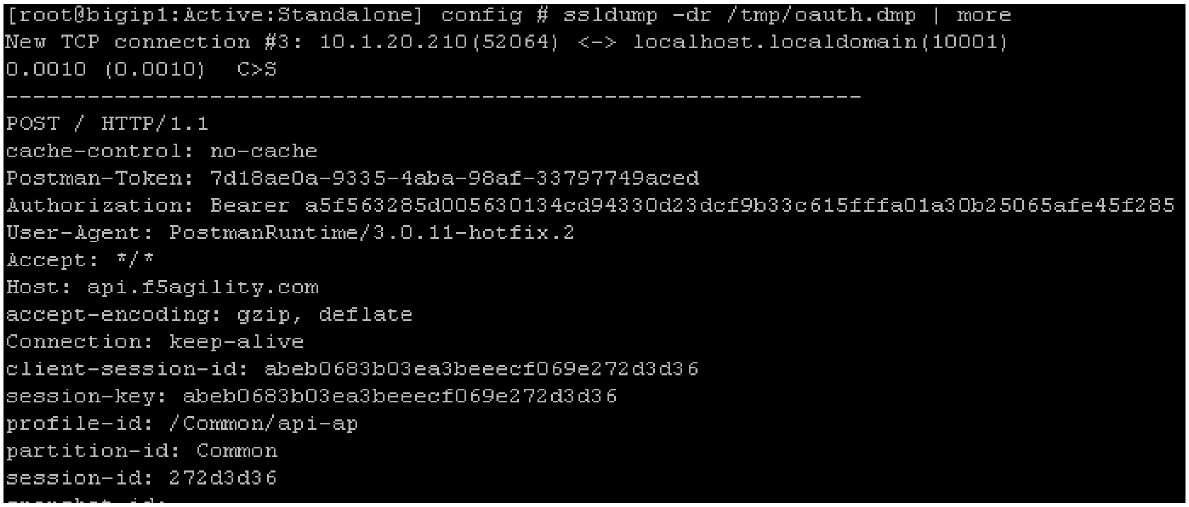
   ```
   tcpdump -i tmm:h -s0 -w /tmp/oauth.dmp
   ```

   ```
   [root@bigip1:Active:Standalone] config # tcpdump -i tmm:h -s0 -w /tmp/oauth.dmp
   tcpdump: listening on tmm:h, link-type EN10MB (Ethernet), capture size 65535 bytes
   ^C212 packets captured
   212 packets received by filter
   0 packets dropped by kernel
   [root@bigip1:Active:Standalone] config #
   ```

2. Then attempt your login using OAuth and ctrl-c the capture to end it. Now you need to ssldump the output:

   ```
   ssldump -dr /tmp/oauth.dmp | more
   ```



```
[root@bigip1:Active:Standalone] config # ssldump -dr /tmp/oauth.dmp | more
New TCP connection #3: 10.1.20.210(52064) <-> localhost.localdomain(10001)
0.0010 (0.0010)  C>S
---------------------------------------------------------------
POST / HTTP/1.1
cache-control: no-cache
Postman-Token: 7d18ae0a-9335-4aba-98af-33797749aced
Authorization: Bearer a5f563285d005630134cd94330d23dcf9b33c615fffa01a30b25065afe45f285
User-Agent: PostmanRuntime/3.0.11-hotfix.2
Accept: */*
Host: api.f5agility.com
accept-encoding: gzip, deflate
Connection: keep-alive
client-session-id: abeb0683b03ea3beeecf069e272d3d36
session-key: abeb0683b03ea3beeecf069e272d3d36
profile-id: /Common/api-ap
partition-id: Common
session-id: 272d3d36
```

Note: Your SSL Ciphers must support ssldump utility. Refer to the following link for further details https://support.f5.com/csp/article/K10209

2.5.3 Information: Logging at the Other Side

Sometimes the issue is not at your end and some providers have their own logging and reporting you can leverage. As an example, Google has a dashboard that reports errors.

2.5.4 Information: The Browser

Although a lot of the critical stuff is passed back and forth directly without your browser being involved, you can at least validate the browser portions of the transaction are good (e.g. are you passing all the values you should, example below for Google).

2.6 Conclusion

2.6.1 Learn More

Links & Information

- **Access Policy Manager (APM) Operations Guide:**

  https://support.f5.com/content/kb/en-us/products/big-ip_apm/manuals/product/f5-apm-operations-guide/_jcr_content/pdfAttach/download/file.res/f5-apm-operations-guide.pdf

- **Access Policy Manager (APM) Authentication & Single Sign On Concepts:**

  https://support.f5.com/kb/en-us/products/big-ip_apm/manuals/product/apm-authentication-sso-13-0-0.html

- **OAuth Overview:**

  https://support.f5.com/kb/en-us/products/big-ip_apm/manuals/product/apm-authentication-sso-13-0-0/35.html#guid-c1b617a7-07b5-4ad6-9b84-29d6ecd789b4

- **OAuth Client & Resource Server:**

  https://support.f5.com/kb/en-us/products/big-ip_apm/manuals/product/apm-authentication-sso-13-0-0/36.html#guid-c6db081e-e8ac-454b-84c8-02a1a282a888

- **OAuth Authorization Server:**

  https://support.f5.com/kb/en-us/products/big-ip_apm/manuals/product/apm-authentication-sso-13-0-0/37.html#guid-be8761c9-5e2f-4ad8-b829-871c7feb2a20

- Troubleshooting Tips

  - **OAuth Client & Resource Server:**

    https://support.f5.com/kb/en-us/products/big-ip_apm/manuals/product/apm-authentication-sso-13-0-0/36.html#guid-774384bc-cf63-469d-a589-1595d0ddfba2

  - **OAuth Authorization Server:**

    https://support.f5.com/kb/en-us/products/big-ip_apm/manuals/product/apm-authentication-sso-13-0-0/37.html#guid-8b97b512-ec2b-4bfb-a6aa-1af24842ee7a

2.6.2 Lab Reproduction

If you are building your own, here is some important information about the environment not covered in the lab. This lab environment requires two Big-IPs. One will act as an OAuth Client and Resource (Client/RS) Server. The other will act as an OAuth Authorization Server (AS). Both must be licensed and provisioned for Access Policy Manager (APM).

On the OAuth Client/RS Big-IP you will need backend pools for the two virtual servers, the lab expects a webapp behind the Social VS that accepts a header named x-user and reposts it back to the user. The lab expects an API behind the API VS that can respond with a list of departments to a request to /department. Also, a DNS Resolver must be configured on this Big-IP, in our case we don't have a local DNS server to respond for the names used, so we are also leveraging an iRule and VS to answer DNS requests for specific names. You will need a browser for testing the social module and Postman for testing the API module.

3

Class 3: SWG - Securing Outbound Internet Access

Welcome to the APM 231: SWG - Securing Outbound Internet Access lab. These lab exercises will instruct you on configuring F5 Secure Web Gateway (SWG) for typical use cases. This guide is intended to complement lecture material provided during the course and to serve as a reference guide when configuring SWG in your own environment. Expected time to complete: **3 hours**

3.1 Lab Environment

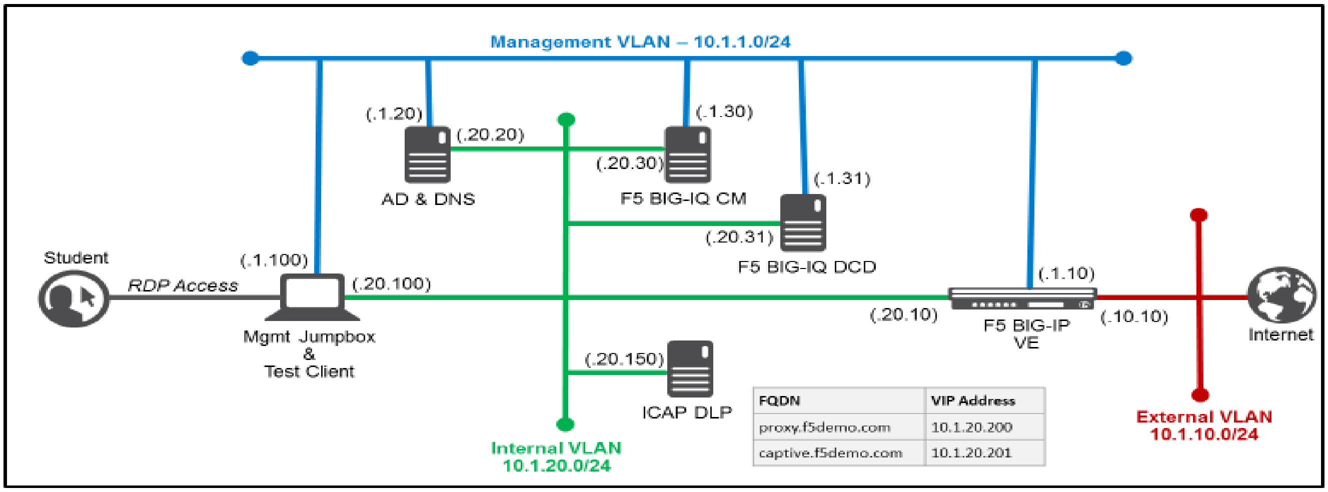
In the interest of time, the following components have been set up with basic configurations for you in a cloud-based virtual lab environment with:

- **Windows Jump Host – Provides remote access the virtual lab** environment via RDP (note: you will need to connect to it using your Remote Desktop Client for Windows/Mac). This will also be your test client.
- **BIG-IP Virtual Edition (VE) – Pre-licensed and provisioned for Access** Policy Manager (APM) and Secure Web Gateway (SWG)
- BIG-IQ Centralized Management (CM) VE – BIG-IQ console
- BIG-IQ Data Collection Device (DCD) VE – BIG-IQ logging node
- Windows Server – Active Directory and DNS services
- DLP Server – ICAP mode

Each student's lab environment is independent.

3.1.1 Lab Environment Diagram

The following diagram illustrates the lab environment's network configuration and will be useful if you wish to replicate these exercises in your personal lab environment:



FQDN	VIP Address
proxy.f5demo.com	10.1.20.200
captive.f5demo.com	10.1.20.201

3.1.2 Timing for Labs

The time it takes to perform each lab varies and is mostly dependent on accurately completing steps. Below is an estimate of how long it will take for each lab:

Lab Timing

Lab name (Description)	Time Allocated
Use Case: Enterprise Web Filtering	
Lab 1: SWG iApp - Explicit Proxy for HTTP and HTTPS	30 minutes
Lab 2: URL Category-based Decryption Bypass	25 minutes
Lab 3: Explicit Proxy Authentication - NTLM	25 minutes
Use Case: Access Reporting	
Lab 4: SWG Reporting with BIG-IQ	15 minutes
Use Case: Guest Access Web Filtering	
Lab 5: SWG iApp – Transparent Proxy for HTTP and HTTPS	15 minutes
Lab 6: Captive Portal Authentication	25 minutes
Use Case: SSL Visibility	
Lab 7: SSL Visibility for DLP (ICAP)	15 minutes

3.1.3 General Notes

Provisioning Secure Web Gateway (SWG) requires Access Policy Manager (APM to also be provisioned.

When working with iApp templates for the first time, you should change the BIG-IP Configuration Utility's default "**Idle Time Before Automatic Logout**" setting to a larger value. This has already been done for you in the lab environment to save time.

3.1.4 Accessing the Lab Environment

To access the lab environment, you will require a web browser and Remote Desktop Protocol (RDP) client software. The web browser will be used to access the Lab Training Portal. The RDP client will be used to connect to the Jump Host, where you will be able to access the BIG-IP management interfaces using HTTPS and SSH. You will also be using the Jump Host as a test client.

You class instructor will provide additional lab access details.

1. **Establish an RDP connection to your Jump Host and login with the** following credentials:

- User: JUMPBOX\external_user
- Password: password

1. Use Firefox to access the BIG-IP GUI (https://10.1.1.10).
2. **Login into the BIG-IP Configuration Utility with the following** credentials:

- User: admin
- Password: admin

3.2 Lab 1: SWG iApp – Explicit Proxy for HTTP and HTTPS

In this lab exercise, you will learn how to automate and simplify a deployment of SWG using an iApp template.

Estimated completion time: 30 minutes

Objectives:

- Create an Explicit Proxy configuration by deploying the SWG iApp template
- Test web browsing behavior

Lab Requirements:

- BIG-IP with SWG licensed
- BIG-IP must have access to the public Internet
- BIG-IP must have access to a DNS server that can resolve queries for public Internet web site names
- The latest iApp for SWG can be downloaded from **https://downloads.f5.com/** (browse to BIG-IP **iApp Templates**) Note: The iApp has already been downloaded and imported for you.

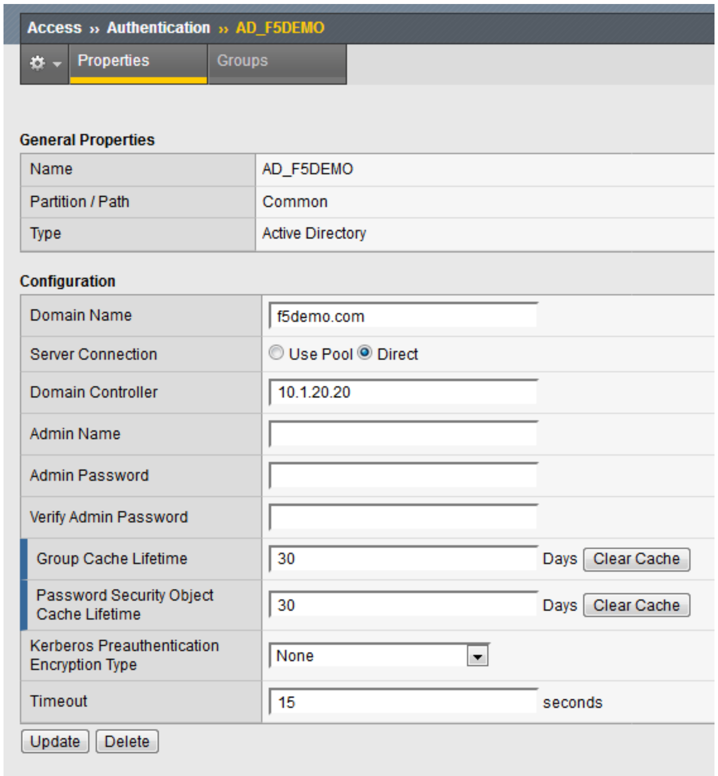
Before you can deploy the SWG iApp template, you must have the following objects configured:

- AD AAA server
- SWG-Explicit Access Policy
- Custom URL Filter
- Per-Request Access Policy

3.2.1 Task 1 – Create an "SWG-Explicit" Access Policy for Authentication

Create an AD AAA Server

- Create an AD AAA server by selecting **Access** >> **Authentication** >> **Active Directory** and clicking on **Create. . .**
- Change the Name to **AD_F5DEMO**
- Change the Domain Name to **f5demo.com**
- Change Server Connection to **Direct**
- Change the Domain Controller to **10.1.20.20**
- Click **Finished**



General Properties

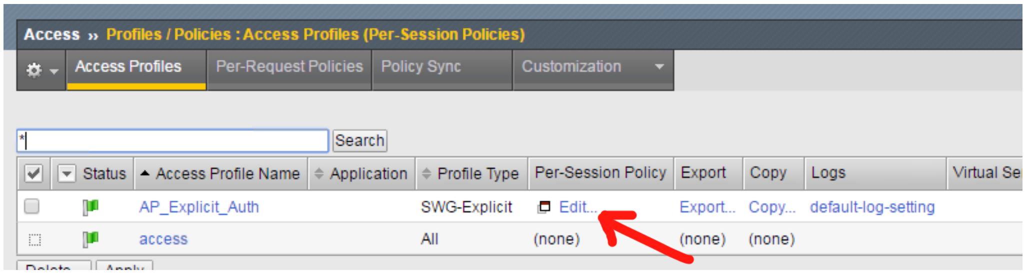
Name	AD_F5DEMO
Partition / Path	Common
Type	Active Directory

Configuration

Domain Name	f5demo.com
Server Connection	○ Use Pool ● Direct
Domain Controller	10.1.20.20
Admin Name	
Admin Password	
Verify Admin Password	
Group Cache Lifetime	30 Days Clear Cache
Password Security Object Cache Lifetime	30 Days Clear Cache
Kerberos Preauthentication Encryption Type	None
Timeout	15 seconds

Create a Per-Session Access Policy

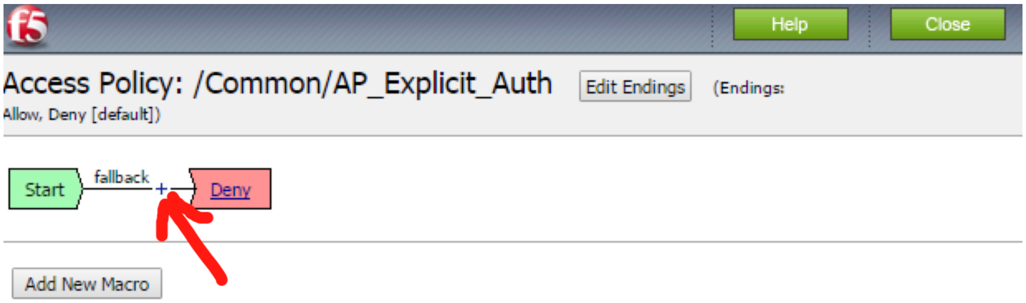
- Browse to **Access** >> **Profiles** / **Policies** >> **Access Profiles (Per-Session Policies)** and click **Create. . .** *
- Name the profile **AP_Explicit_Auth**
- Change the **Profile Type** to **SWG-Explicit**
- Add **English** to the **Accepted Languages** list
- Accept all other default settings and click **Finished**
- Click on the **Edit. . .** link for the appropriate Access Policy created above



Access » Profiles / Policies : Access Profiles (Per-Session Policies)

☑	Status	Access Profile Name	Application	Profile Type	Per-Session Policy	Export	Copy	Logs	Virtual Se
□		AP_Explicit_Auth		SWG-Explicit	Edit...	Export...	Copy...	default-log-setting	
□		access		All	(none)	(none)	(none)		

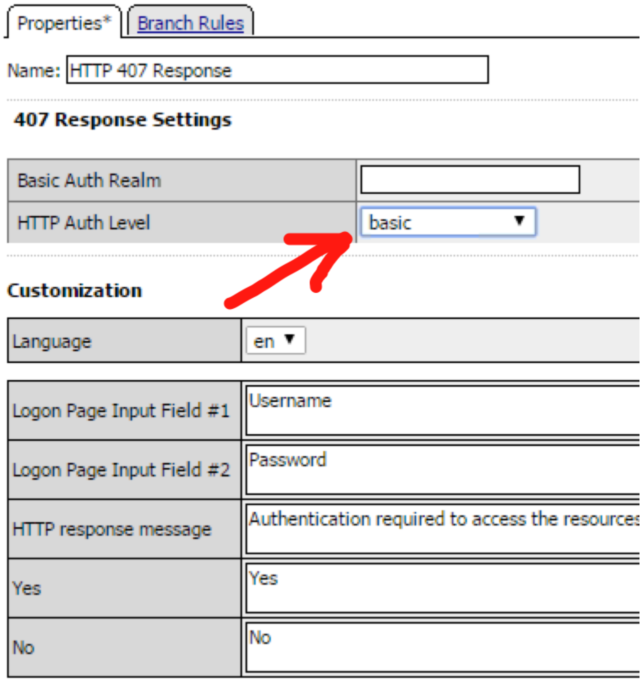
- Select the **+** between Start and Deny and **Add** an **HTTP 407 Response** object



Access Policy: /Common/AP_Explicit_Auth

(Endings: Allow, Deny [default])

- Change the **HTTP Auth Level** to **basic**



Name: HTTP 407 Response

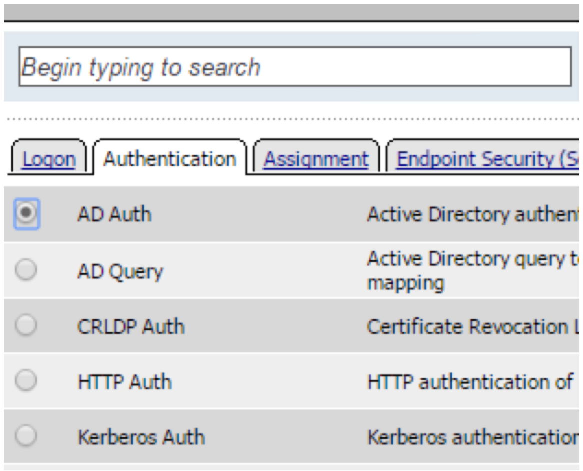
407 Response Settings

Basic Auth Realm	
HTTP Auth Level	basic

Customization

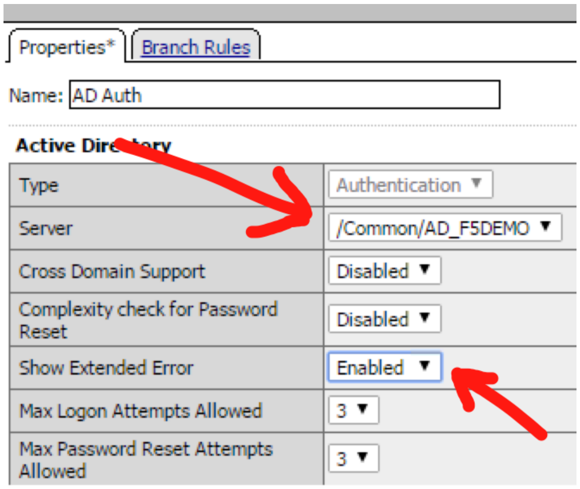
Language	en
Logon Page Input Field #1	Username
Logon Page Input Field #2	Password
HTTP response message	Authentication required to access the resources
Yes	Yes
No	No

- Click **Save**
- On the **Basic** branch of the **HTTP 407** Object, **Add** an **AD Auth** Object



●	AD Auth	Active Directory authen
○	AD Query	Active Directory query t mapping
○	CRLDP Auth	Certificate Revocation L
○	HTTP Auth	HTTP authentication of
○	Kerberos Auth	Kerberos authenticatior

- Change the **Server** to /**Common**/**AD_F5DEMO** and change **Show Extended Error** to **Enabled**

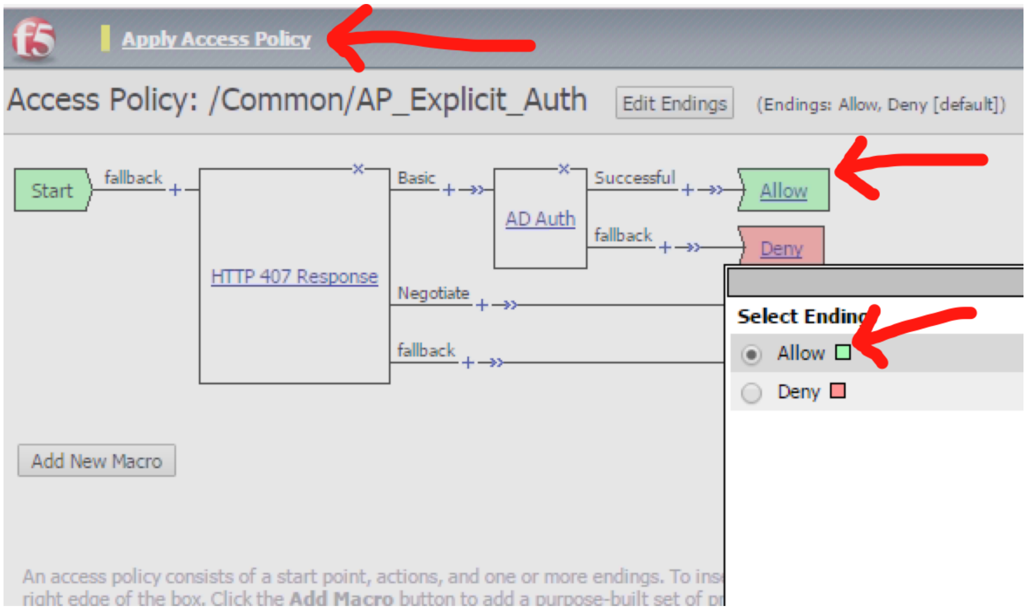


Name: AD Auth

Active Directory

Type	Authentication ▼
Server	/Common/AD_F5DEMO ▼
Cross Domain Support	Disabled ▼
Complexity check for Password Reset	Disabled ▼
Show Extended Error	Enabled ▼
Max Logon Attempts Allowed	3 ▼
Max Password Reset Attempts Allowed	3 ▼

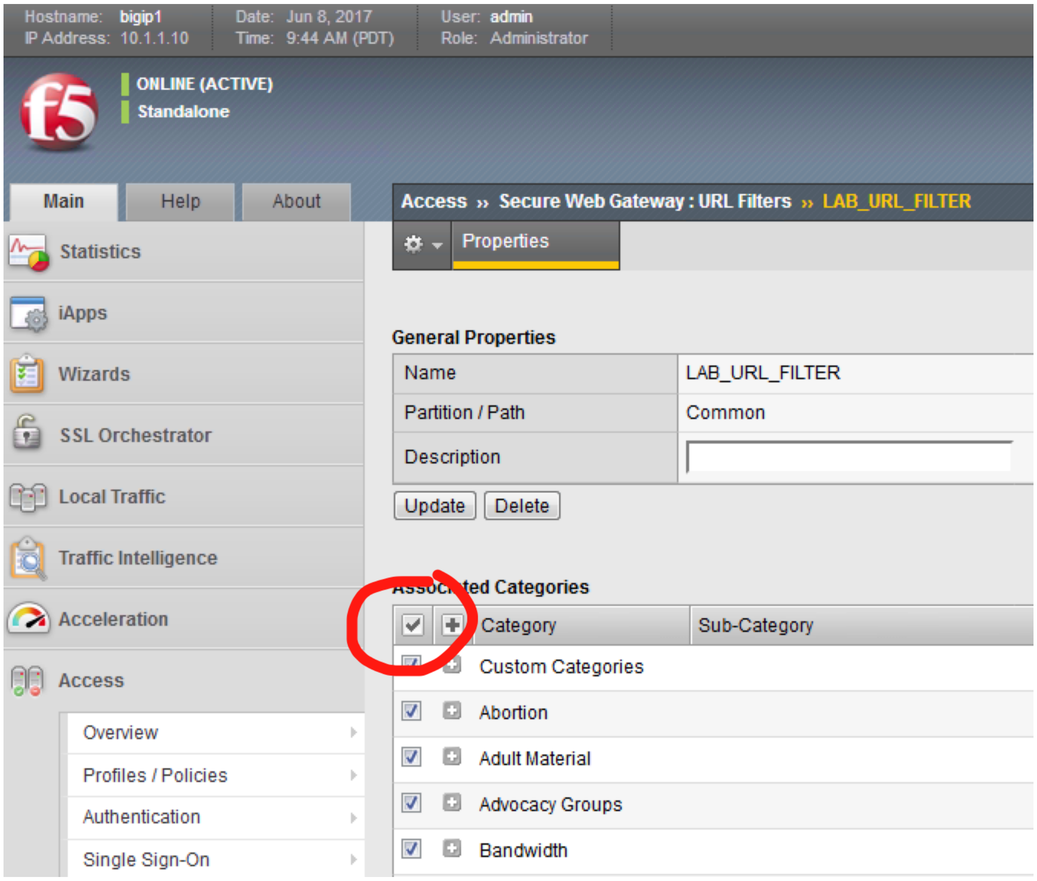
- Click **Save**
- On the **Successful** branch of the **AD Auth** Object, click on the **Deny** Ending and change it to **Allow**
- Click **Save**
- Click on the **Apply Access Policy** link



An access policy consists of a start point, actions, and one or more endings. To ins
right edge of the box. Click the **Add Macro** button to add a purpose-built set of pr

3.2.2 Task 2 – Create a custom URL Filter

- Browse to **Access >> Secure Web Gateway >> URL Filters** and click **Create. . .**
- Name your filter **LAB_URL_FILTER** and click **Finished**
- Click on the first check box to select all categories



Hostname: bigip1
IP Address: 10.1.1.10
Date: Jun 8, 2017
Time: 9:44 AM (PDT)
User: admin
Role: Administrator

ONLINE (ACTIVE)
Standalone

Access » Secure Web Gateway : URL Filters » LAB_URL_FILTER

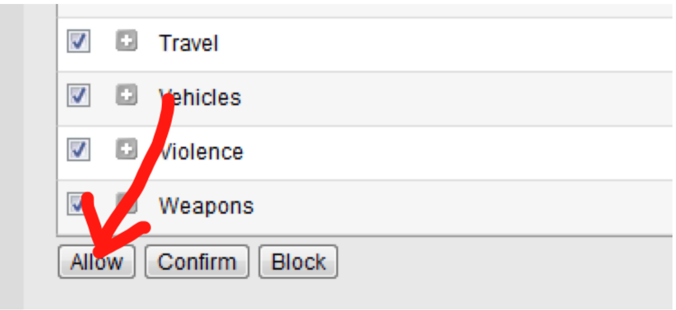
General Properties

Name	LAB_URL_FILTER
Partition / Path	Common
Description	

Associated Categories

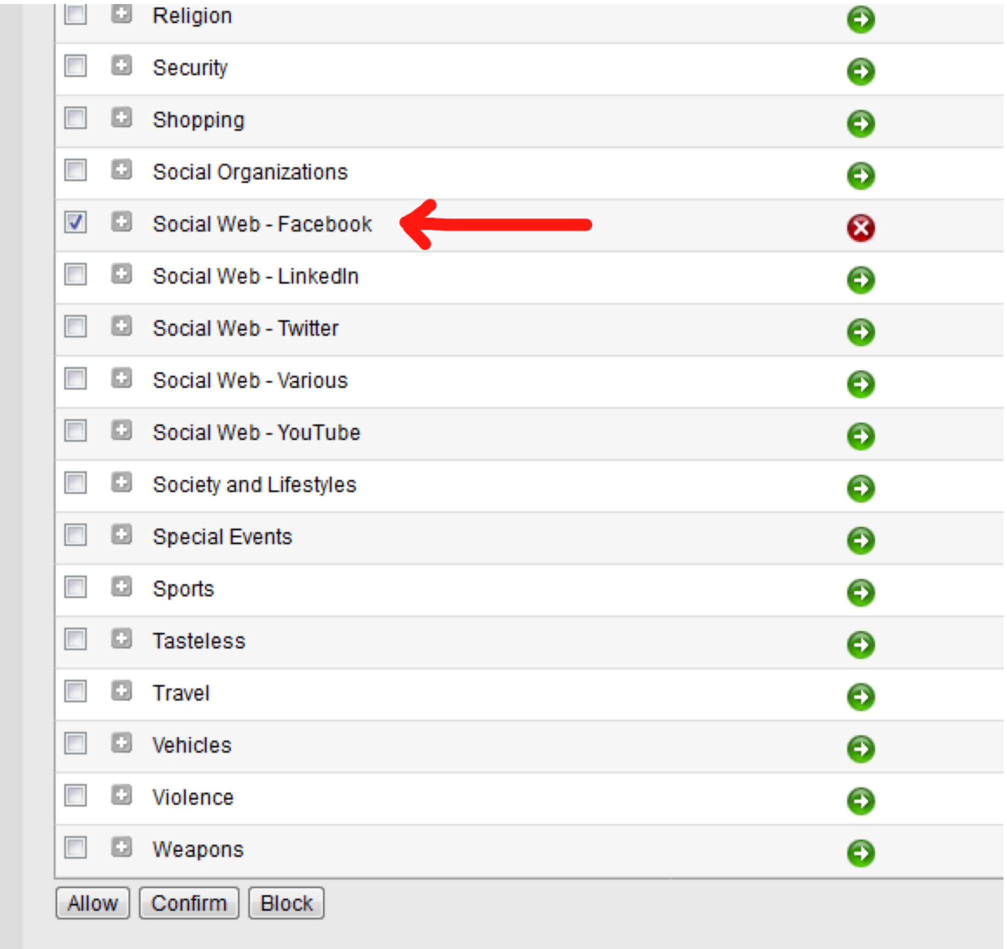
☑	Category	Sub-Category
☑	Custom Categories	
☑	Abortion	
☑	Adult Material	
☑	Advocacy Groups	
☑	Bandwidth	

- Click **Allow** at the bottom of the page



☑	Travel
☑	Vehicles
☑	Violence
☑	Weapons

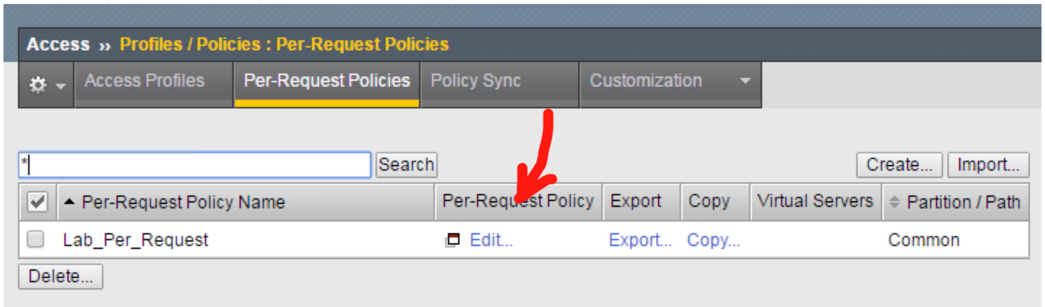
- Click the check box to select **Social Web – Facebook** and then click **Block** (for this lab, our URL filter will only block Facebook)



□	Religion	➔
□	Security	➔
□	Shopping	➔
□	Social Organizations	➔
☑	Social Web - Facebook	✖
□	Social Web - LinkedIn	➔
□	Social Web - Twitter	➔
□	Social Web - Various	➔
□	Social Web - YouTube	➔
□	Society and Lifestyles	➔
□	Special Events	➔
□	Sports	➔
□	Tasteless	➔
□	Travel	➔
□	Vehicles	➔
□	Violence	➔
□	Weapons	➔

3.2.3 Task 3 – Create a "Per-Request" Access Policy

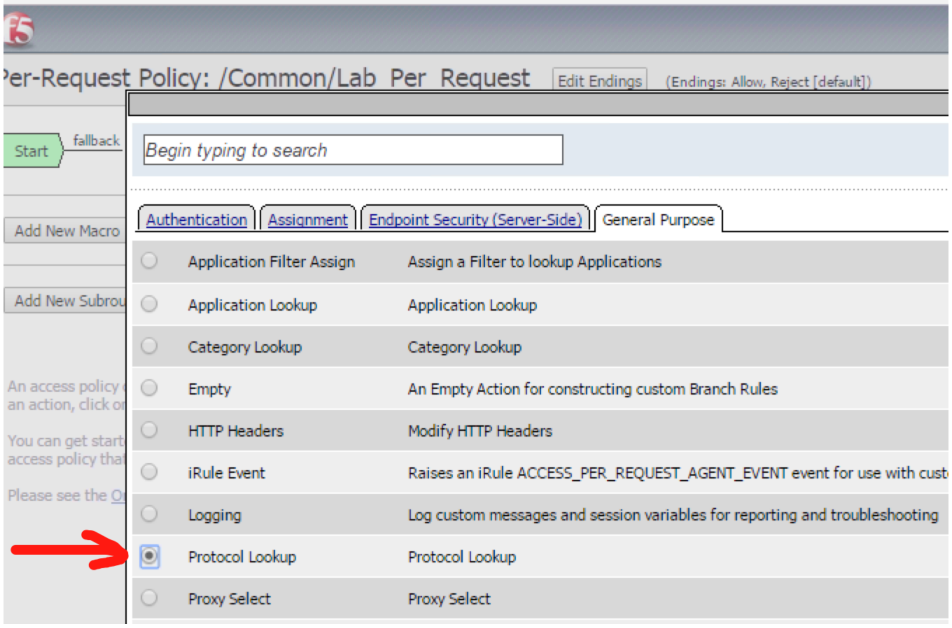
- Browse to **Access** >> **Profiles** / **Policies** >> **Per-Request Policies** and click **Create. . .**
- Name your policy **Lab_Per_Request**
- Click **Finished**
- Click on the **Edit. . .** link for the appropriate Per-Request Policy created above, then go back to the VPE tab in your browser



Access » Profiles / Policies : Per-Request Policies

☑	Per-Request Policy Name	Per-Request Policy	Export	Copy	Virtual Servers	Partition / Path
□	Lab_Per_Request	Edit...	Export...	Copy...		Common

- Click on the **+** symbol between **Start** and **Allow**
- Go to the **General Purpose** tab and add a **Protocol Lookup** object



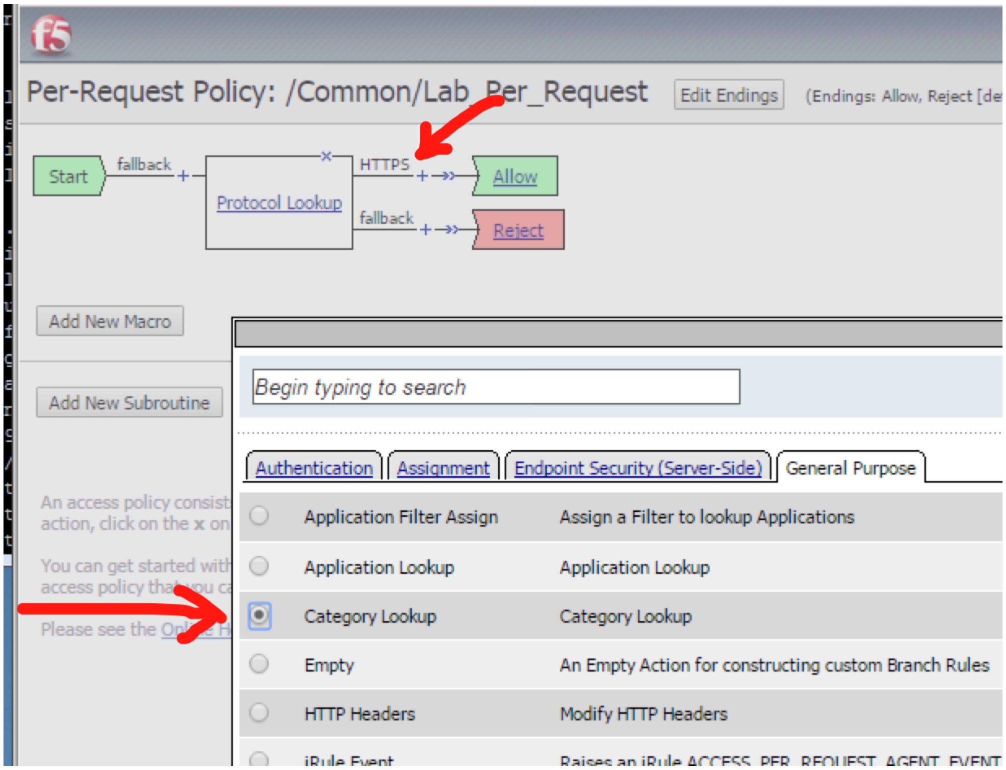
'er-Request Policy: /Common/Lab_Per_Request Edit Endings (Endings: Allow, Reject [default])

Begin typing to search

Authentication | Assignment | Endpoint Security (Server-Side) | General Purpose

○	Application Filter Assign	Assign a Filter to lookup Applications
○	Application Lookup	Application Lookup
○	Category Lookup	Category Lookup
○	Empty	An Empty Action for constructing custom Branch Rules
○	HTTP Headers	Modify HTTP Headers
○	iRule Event	Raises an iRule ACCESS_PER_REQUEST_AGENT_EVENT event for use with cust
○	Logging	Log custom messages and session variables for reporting and troubleshooting
●	Protocol Lookup	Protocol Lookup
○	Proxy Select	Proxy Select

- Click **Add Item**
- Click **Save**
- On the HTTPS branch, click the **+** and **Add** a **Category Lookup** object (**General Purpose** tab)



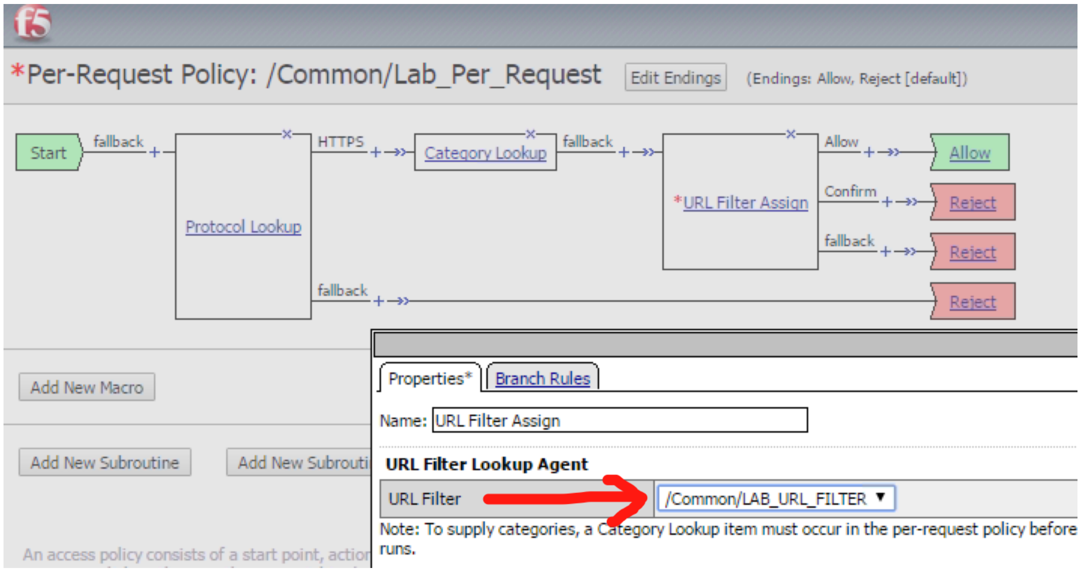
Per-Request Policy: /Common/Lab_Per_Request Edit Endings (Endings: Allow, Reject [de

Begin typing to search

Authentication | Assignment | Endpoint Security (Server-Side) | General Purpose

○	Application Filter Assign	Assign a Filter to lookup Applications
○	Application Lookup	Application Lookup
●	Category Lookup	Category Lookup
○	Empty	An Empty Action for constructing custom Branch Rules
○	HTTP Headers	Modify HTTP Headers
○	iRule Event	Raises an iRule ACCESS_PER_REQUEST_AGENT_EVENT

- Select **Use SNI in Client Hello** for **Categorization Input**
- Click **Save**
- After the Category Lookup, **Add** a **URL Filter Assign** Object (from the **General Purpose** tab) and choose URL Filter /**Common/LAB_URL_FILTER**



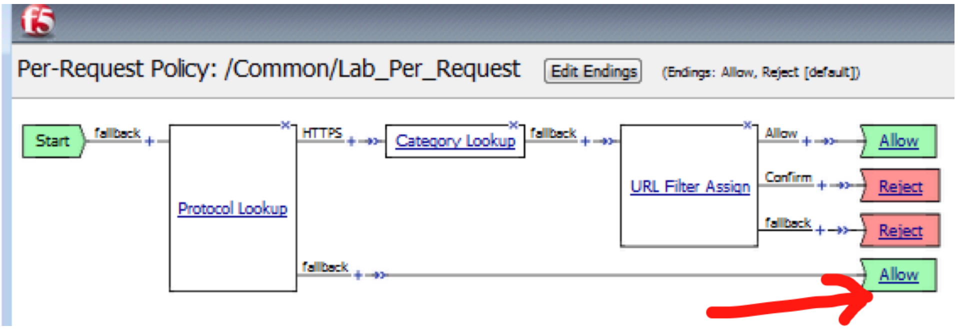
Name: URL Filter Assign

URL Filter Lookup Agent

URL Filter: /Common/LAB_URL_FILTER ▼

Note: To supply categories, a Category Lookup item must occur in the per-request policy before runs.

Important: Change the Ending of the **Allow** outcome on the "fallback" branch from "Reject" to **Allow**



3.2.4 Task 4 – Create Explicit Proxy Configuration using the SWG iApp

Import the SWG iApp template into the BIG-IP – Note: This has been done for you.

- In the BIG-IP Management UI, browse to **iApps >> Templates** and click **Import. . .**
- Click **Choose File** or **Browse. . .** and select the iApp file (at the time of writing the current version is 1.1.0rc4 (f5.secure_web_gateway.v1.1.0rc4.tmpl).
- Click **Open** and **Upload**

Create a SWG proxy configuration

- Browse to **iApps >> Application Services**
- Click **Create. . .**
- Change the name to **SWG**
- Change the Template to **f5.secure_web_gateway.v1.1.0rc4** (your version may be newer)

1. Answer the questions as follows:

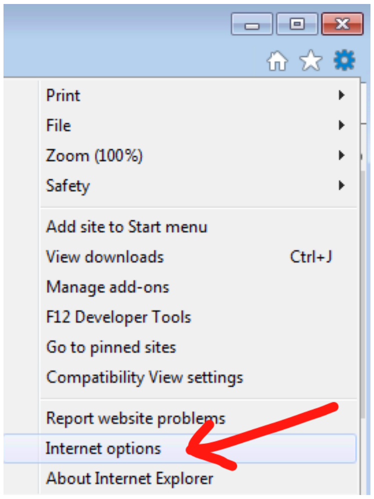
<table>
<tr><td colspan="2">Question | Answer</td></tr>
<tr><td colspan="2">Do you want to see inline help? | Yes, show inline help</td></tr>
<tr><td>Do you want to enable advanced options?</td><td>No, do not enable advanced options</td></tr>
<tr><td>Which type of SWG configuration do you want to deploy</td><td>Explicit Proxy</td></tr>
<tr><td>Do you want to use ICAP to forward requests for inspection by DLP servers?</td><td>No, do not use ICAP for DLP</td></tr>
<tr><td>What IP address and port do you want to use for the virtual server?</td><td>– IP Address: 10.1.20.200
– Port: 3128</td></tr>
<tr><td>What is the FQDN of this proxy?</td><td>proxy.f5demo.com. The local hosts file on your Jump Host has already been modified to resolve this FQDN to the correct IP address indicated above.</td></tr>
<tr><td>On which ports should the system accept HTTP traffic?</td><td>80</td></tr>
<tr><td>On which ports should the system accept HTTPS traffic?</td><td>443</td></tr>
<tr><td>Which SWG-Explicit Access Policy do you want to use?</td><td>AP_Explicit_Auth</td></tr>
<tr><td>Which Per-Request Access Policy do you want to use?</td><td>Lab_Per_Request</td></tr>
<tr><td>Do you want the system to forward all name requests?</td><td>Yes, forward all name requests</td></tr>
<tr><td>Which DNS servers do you want to use for forwarding?</td><td>– IP: 10.1.20.20
– Port: 53</td></tr>
<tr><td>Which SSL profile do you want to use for client-side connections?</td><td>Create a new Client SSL profile</td></tr>
<tr><td>Which Subordinate CA certificate do you want to use?</td><td>f5agility.crt</td></tr>
<tr><td>Which CA key do you want to use?</td><td>f5agility.key</td></tr>
<tr><td>Does the key require a password? If so, type it here</td><td>F5labs</td></tr>
<tr><td>Which SSL profile do you want to use for server-side connections?</td><td>Create a new Server SSL profile</td></tr>
</table>

2. Click **Finished** – you will see a large number of objects created for you on the **Components** tab.

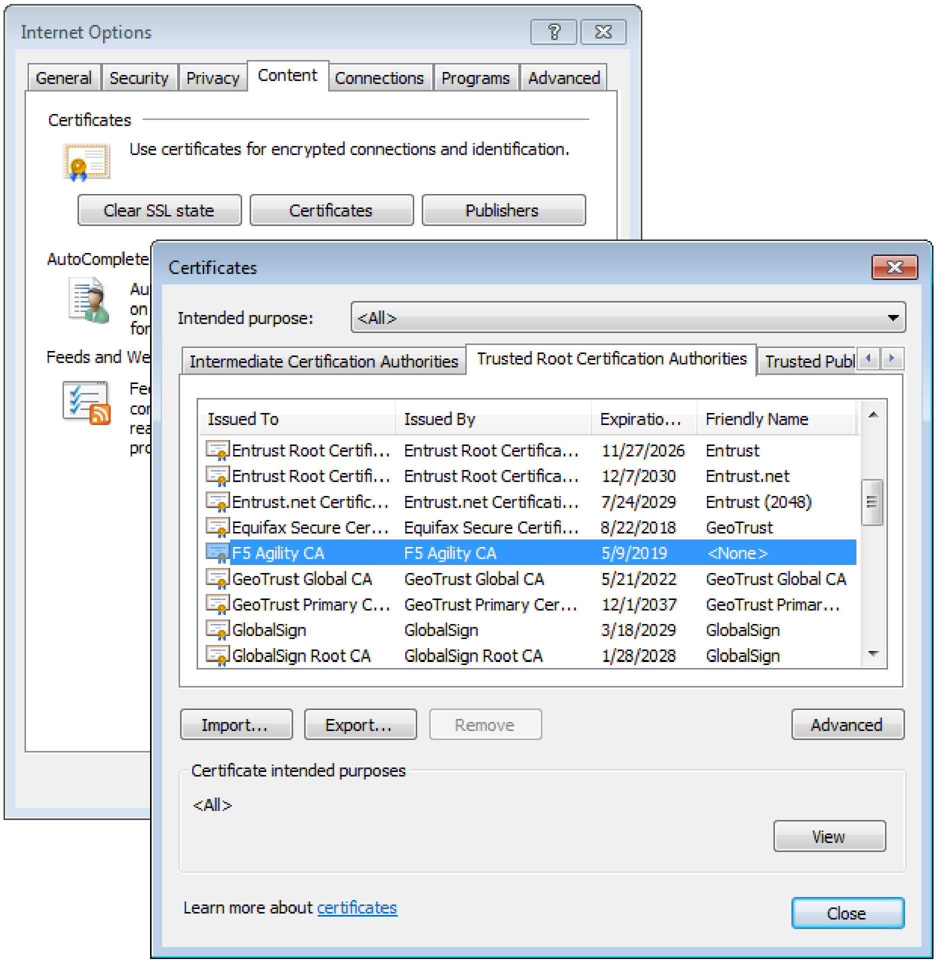
3.2.5 Task 5 – Verify that the “F5 Agility CA” certificate is trusted

A Windows Domain Group Policy was configured to deploy the CA certificate that SWG uses to forge new certificates (on behalf of the origin server) to domain-joined machines.

- Open Internet Explorer on your Jump Host client machine
- Click the gear icon or hit `Alt-X` and select **Internet options**



- Go to the **Content** tab and click **Certificates**
- Click on the **Trusted Root Certification Authorities** tab and scroll down. You should see the **F5 Agility CA** certificate in the list.



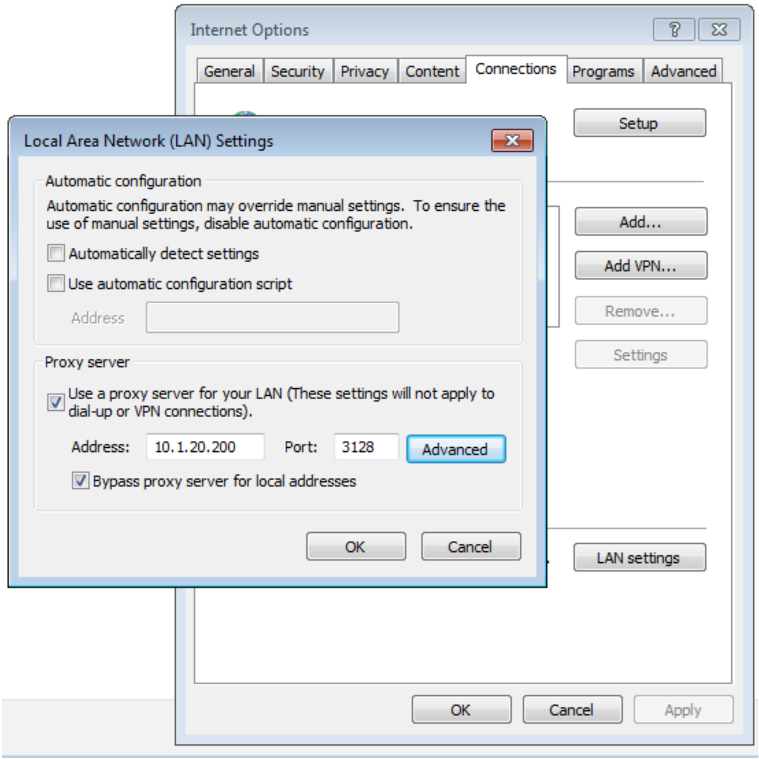
Issued To	Issued By	Expiratio...	Friendly Name
Entrust Root Certifi...	Entrust Root Certifica...	11/27/2026	Entrust
Entrust Root Certifi...	Entrust Root Certifica...	12/7/2030	Entrust.net
Entrust.net Certific...	Entrust.net Certificati...	7/24/2029	Entrust (2048)
Equifax Secure Cer...	Equifax Secure Certifi...	8/22/2018	GeoTrust
F5 Agility CA	F5 Agility CA	5/9/2019	<None>
GeoTrust Global CA	GeoTrust Global CA	5/21/2022	GeoTrust Global CA
GeoTrust Primary C...	GeoTrust Primary Cer...	12/1/2037	GeoTrust Primar...
GlobalSign	GlobalSign	3/18/2029	GlobalSign
GlobalSign Root CA	GlobalSign Root CA	1/28/2028	GlobalSign

- Double-click on the certificate to view its properties, then close this window and the Certificates window.

3.2.6 Task 6 – Testing

Configure your browser with a "Proxy Server"

- Go to the **Connections** tab and click **LAN settings**
- Enable the checkbox for **Use a proxy server for your LAN** and enter:
  - Address: **10.1.20.200**
  - Port: **3128**
- Click **OK** twice.



Local Area Network (LAN) Settings

Automatic configuration

Automatic configuration may override manual settings. To ensure the use of manual settings, disable automatic configuration.

☐ Automatically detect settings

☐ Use automatic configuration script

Address

Proxy server

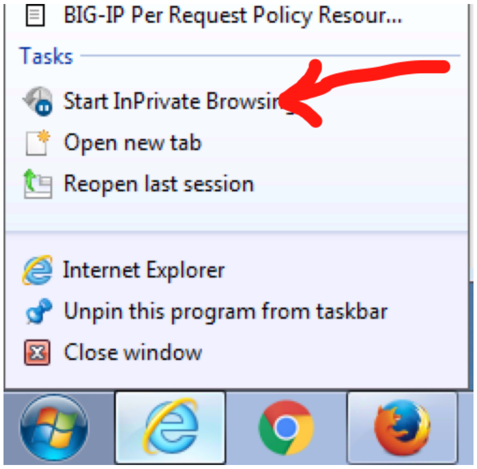
☑ Use a proxy server for your LAN (These settings will not apply to dial-up or VPN connections).

Address: 10.1.20.200 Port: 3128

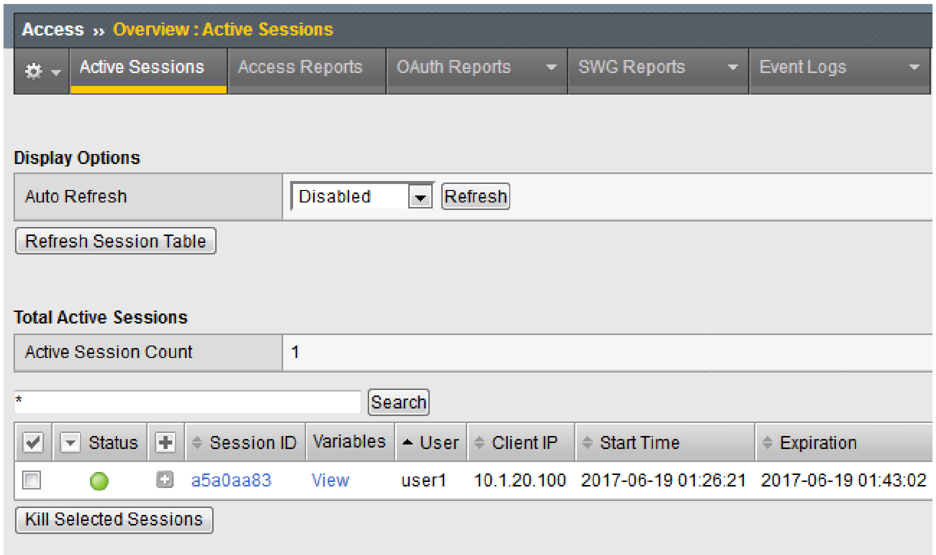
☑ Bypass proxy server for local addresses

Test 1:

- Open a new Internet Explorer "InPrivate" browser window on your Jump Host client machine
- Browse to **https://www.google.com**



- The browser should prompt you for authentication. Submit your credentials:
  - User: `user1`
  - Password: `AgilityRocks!`
- Verify defined user has an Access Session ID
- Browse to **Access** > **Overview** > **Active Sessions**



Display Options

Auto Refresh	Disabled

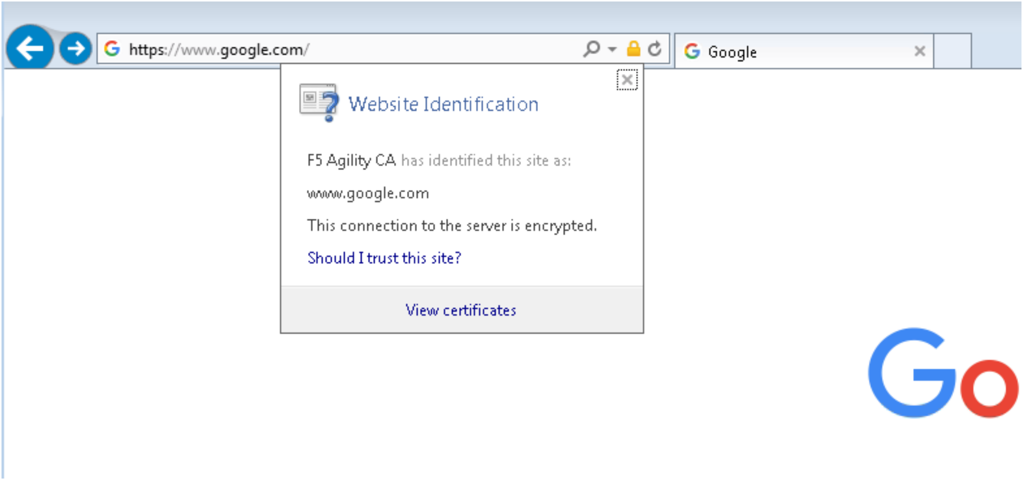
Total Active Sessions

Active Session Count	1

☑	Status	+	Session ID	Variables	User	Client IP	Start Time	Expiration
□	●	+	a5a0aa83	View	user1	10.1.20.100	2017-06-19 01:26:21	2017-06-19 01:43:02

Test 2:

- Using an InPrivate browser window from the client test machine, go to https://www.google.com and verify the SSL certificate is signed by the **F5 Agility CA** you configured in Lab 1



Website Identification

F5 Agility CA has identified this site as:

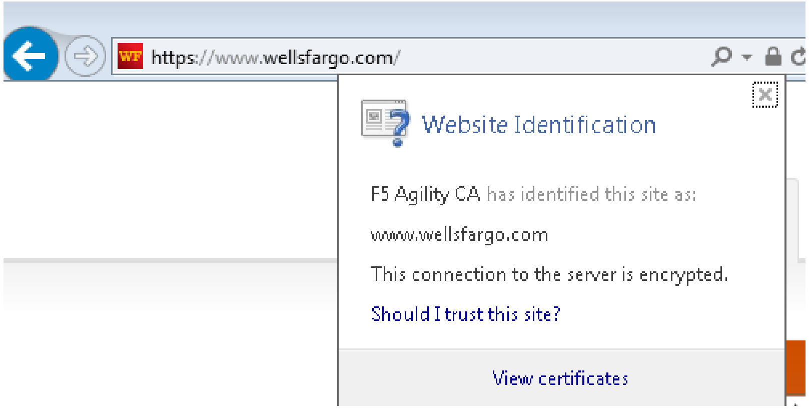
www.google.com

This connection to the server is encrypted.

Should I trust this site?

View certificates

- Using an InPrivate browser window from the client test machine, go to https://www.wellsfargo.com and examine the certificate to verify that it is signed by the same **F5 Agility CA** you configured in Lab 1



Website Identification

F5 Agility CA has identified this site as:

www.wellsfargo.com

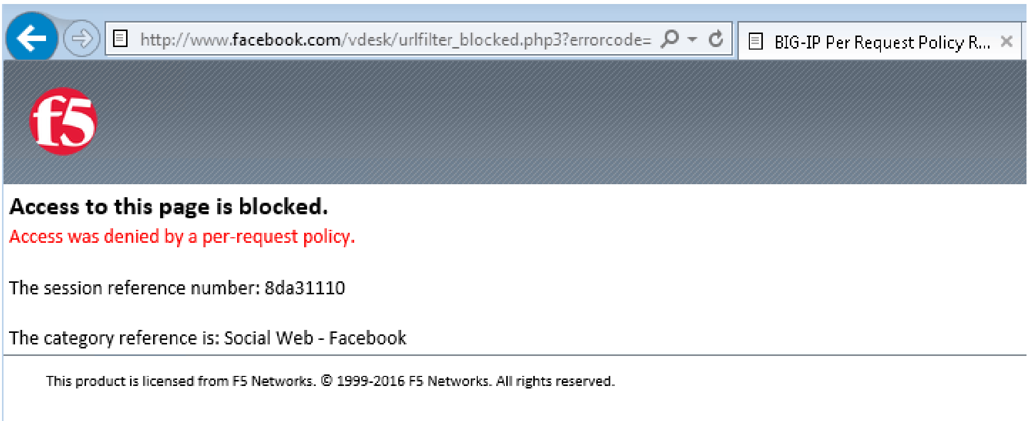
This connection to the server is encrypted.

Should I trust this site?

View certificates

Test 3:

- Using an InPrivate browser window from the client test machine, go to https://www.facebook.com and verify that you are instead delivered a SWG Block Page, in accordance to the URL Filter you configured above.


http://www.facebook.com/vdesk/urlfilter_blocked.php3?errorcode=
BIG-IP Per Request Policy R...
f5

Access to this page is blocked.

Access was denied by a per-request policy.

The session reference number: 8da31110

The category reference is: Social Web - Facebook

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3.3 Lab 2: URL Category-based Decryption Bypass

In this lab exercise, you will bypass SSL decryption based on requests to URLs categorized as financial services web sites.

Estimated completion time: 25 minutes

Objectives:

- Apply a new Per-Request Policy to bypass SSL decryption for specific URL categories
- Test web browsing behavior

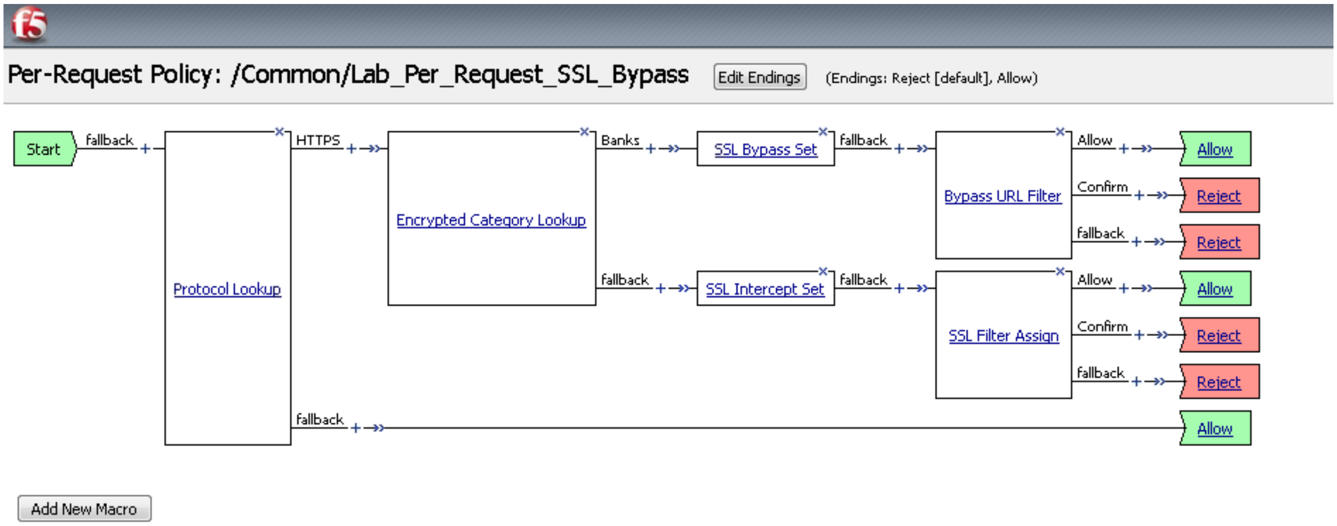
Lab Requirements:

- Lab 1 previously completed successfully (working SWG iApp deployment)

3.3.1 Task 1 – Copy and configure new Per-Request Policy

- Copy the **Lab_Per_Request** Per Request Policy by browsing to **Access Policy > Per-Request Policies** and click **Copy**
- Name the copy **Lab_Per_Request_SSL_Bypass**
- Edit the new Per-Request Policy by clicking **Edit**, then go to the VPE tab in your browser
- Modify the Encrypted Category Lookup object to include a branch for SSL Bypass:
- Click on the existing **Category Lookup** object
- On the **Properties** tab, change the name to **Encrypted Category Lookup**
- Click to access the **Branch Rules** tab
- Click **Add Branch Rule** and name it **Banks**
- Click **Change** to modify the Expression of this new Branch Rule
- Click **Add Expression**
- Change **Agent Sel**: to **Category Lookup**
- Change **Category is**: to **Financial Data and Services**
- Click **Add Expression**
- Click **Finished**
- Click **Save**
- Add an **SSL Bypass Set** object (from the General Purpose tab) on the **Banks** branch of the **Encrypted Category Lookup**
- Click **Save**
- Add an **SSL Intercept Set** object (from the General Purpose tab) on the “fallback” branch of the **Encrypted Category Lookup**
- Click **Save**
- Add a **URL Filter** object on the **SSL Bypass** Branch; select the **LAB_URL_FILTER URL** filter previously created in Lab1
- Click **Save**

- Change the **Allow** branch to an ending of **Allow**



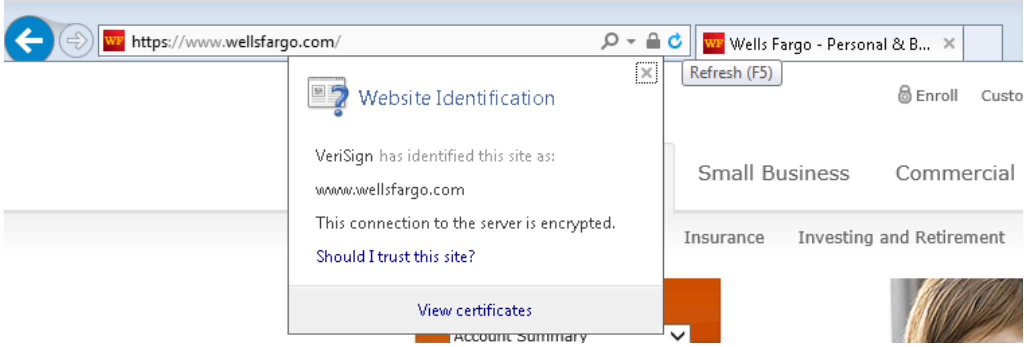
3.3.2 Task 2 – Reconfigure SWG iApp to assign New Per-Request Policy

- Browse to **iApps >> Application Services > Applications**”
- Click on **SWG**
- Click **Reconfigure**
- Find the section **Which Per-Request Access Policy do you want to use?**
- Change the per-request policy to **Lab_Per_Request_SSL_Bypass**
- Scroll to the bottom and click **finished**

3.3.3 Task 3 – Testing

Test 1:

- Open **Internet Explorer** on your Jump Host client machine
- Browse to **http://www.wellsfargo.com**
- The browser should prompt you for authentication. Submit your credentials.
- User: `user1`
- Password: `AgilityRocks!`
- Verify the site loads correctly and inspect the SSL certificate to confirm that it is originated from Wells Fargo and SSL Bypass was enabled


https://www.wellsfargo.com/
Wells Fargo - Personal & B...
Refresh (F5)
Website Identification
VeriSign has identified this site as:
www.wellsfargo.com
This connection to the server is encrypted.
Should I trust this site?
View certificates
Enroll
Custo
Small Business
Commercial
Insurance
Investing and Retirement
Account Summary

3.4 Lab 3: Explicit Proxy Authentication – NTLM

In this lab exercise, you will reconfigure authentication for seamless login of AD domain-joined client using NTLM.

Estimated completion time: 25 minutes

Objectives:

- Enable APM client-side NTLM authentication for the SWG explicit proxy
- Test web browsing behavior

Lab Requirements:

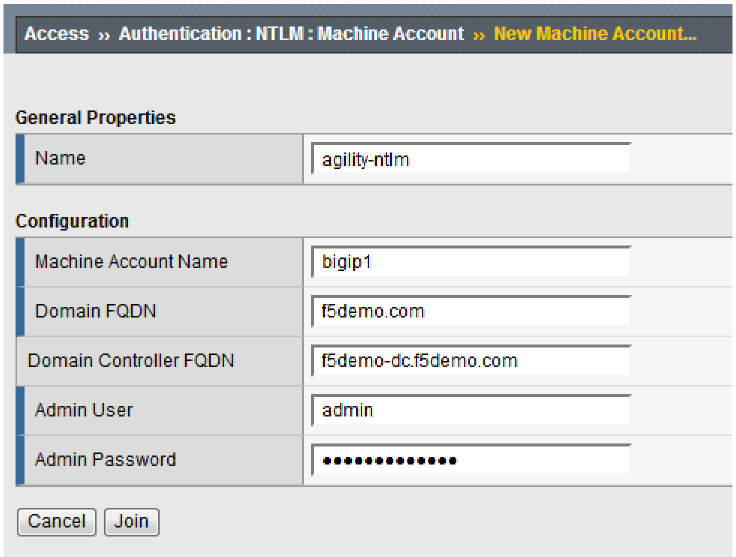
- Lab 1 previously completed successfully (working SWG iApp deployment)

3.4.1 Task 1 – Logout and log back in as domain user

- Logout of the windows remote desktop.
- Login as a domain user with the following credentials (**Switch User**/**Other User**):
  - Username : `F5DEMO\\user1`
  - Password: `AgilityRocks!`

3.4.2 Task 2 – Join BIG-IP to Domain

- Use Firefox to access the **BIG-IP** GUI (https://10.1.1.10, admin/admin)
- Browse to Access ›› Authentication : NTLM : Machine Account
- Click **Create**
- Fill out the fields as follows:
  - Name: `agility-ntlm`
  - Machine account: `bigip1`
  - Domain FQDN: `f5demo.com`
  - Domain controller FQDN: `f5demo-dc.f5demo.com`
  - Admin user: `admin`
  - Admin password: `AgilityRocks!`



Access ›› Authentication : NTLM : Machine Account ›› New Machine Account...

General Properties

Name	agility-ntlm

Configuration

Machine Account Name	bigip1
Domain FQDN	f5demo.com
Domain Controller FQDN	f5demo-dc.f5demo.com
Admin User	admin
Admin Password	•••••••••••••

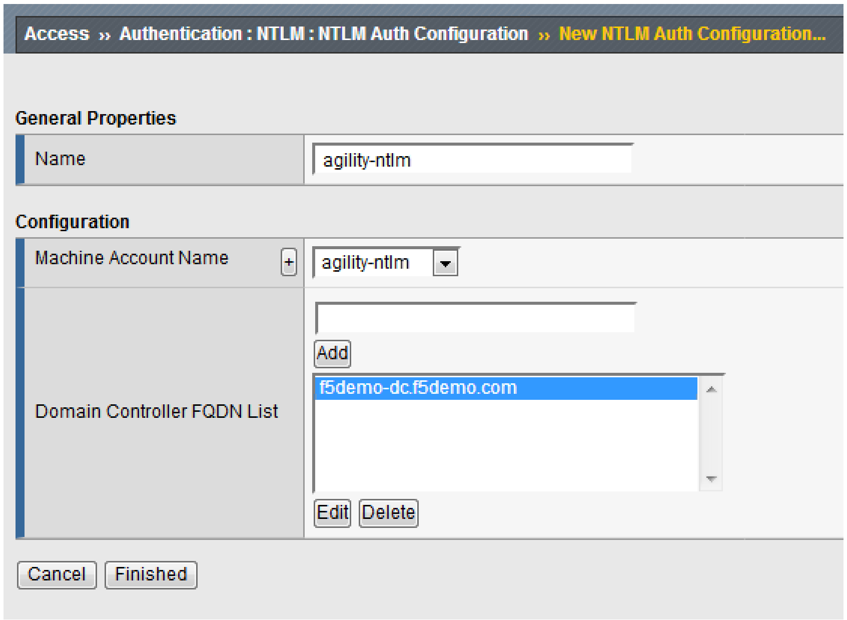
- Click **Join**
- Create a new NTLM Auth Configuration
- Browse to Access ›› Authentication : NTLM : NTLM Auth Configuration
- Click **Create**

  Name: `agility-ntlm`

  Machine Account Name: `agility-ntlm`

  Domain controller FQDN: `f5demo-dc.f5demo.com`

  Click **Add**



Access ›› Authentication : NTLM : NTLM Auth Configuration ›› New NTLM Auth Configuration...

General Properties

Name	agility-ntlm

Configuration

Machine Account Name	agility-ntlm
Domain Controller FQDN List	f5demo-dc.f5demo.com

- Click Finished

3.4.3 Task 3 – Create a new Access Policy

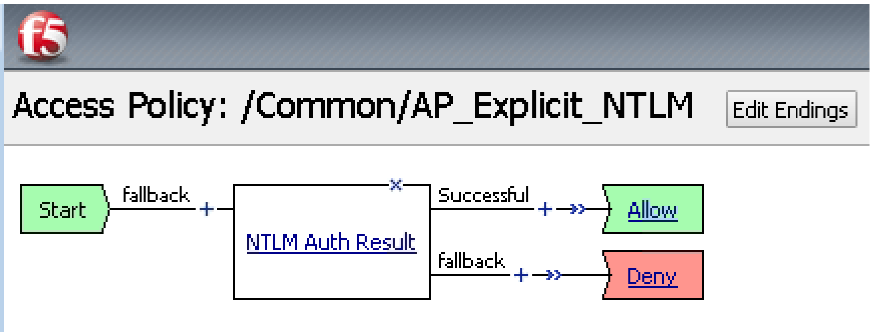
- Browse to **Access** >> **Profiles** / **Policies** >> **Access Profiles (Per-Session Policies)** and click **Create...**
- Name the profile **AP_Explicit_NTLM**
- Change the Profile Type to **SWG-Explicit**

Under Configurations:

Modify **User Identification Method** to **Credentials**

Modify **NTLM Auth Configuration** to **agility-ntlm**

- Add **English** to **Accepted Languages**
- Accept all other default settings and click **Finished**
- Click on the **Edit...** link for the appropriate Access Policy created above
- On the VPE browser tab, select the **+** between Start and Deny and **Add** a **NTLM Auth Result** object (from the Authentication tab)
- Click **Save**
- On the **Successful** branch of the **NTLM Auth Result** Object, click on the **Deny** Ending and change it to **Allow**
- Click **Save**
- Click **Apply Access Policy**



Access Policy: /Common/AP_Explicit_NTLM

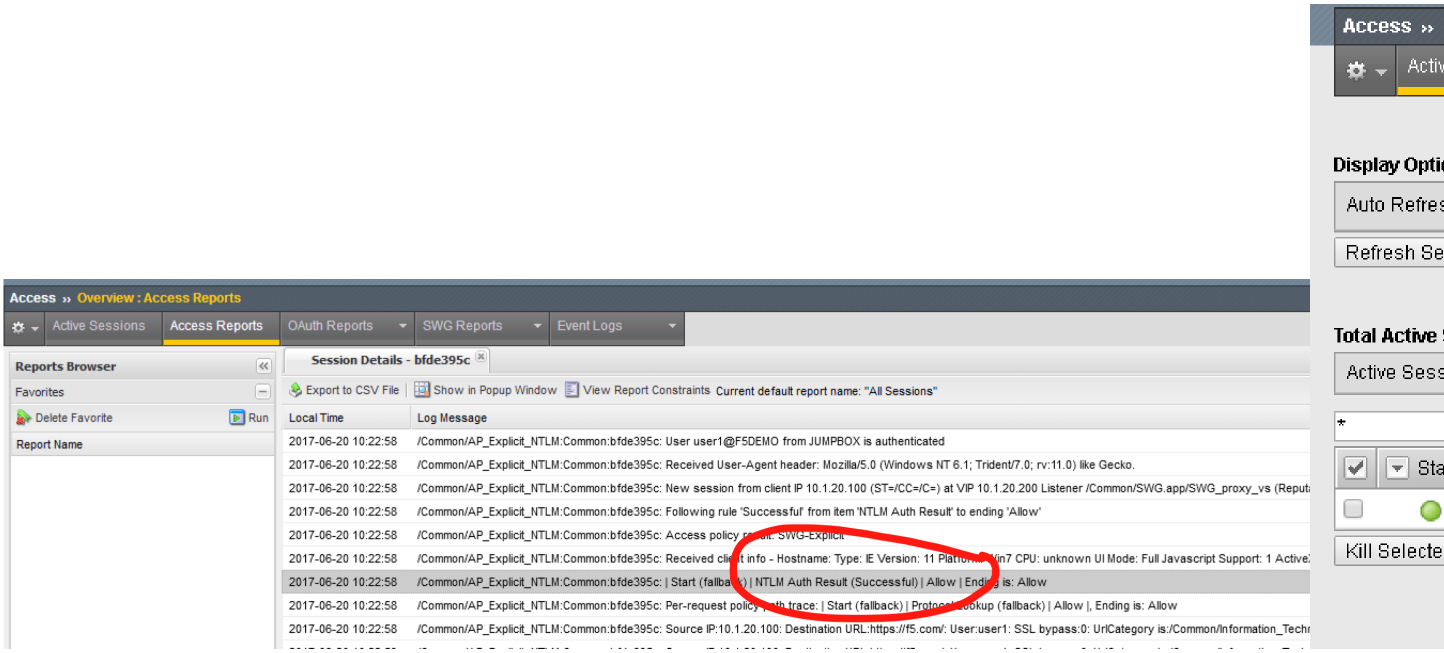
3.4.4 Task 4 – Reconfigure SWG iApp to apply NTLM Access Policy

- Browse to “iApps >> Application Services > Applications
- Click on **SWG**
- Click **Reconfigure**
- Find the section **Which SWG-Explicit Access Policy do you want to use?**
- Change the per-request policy to **AP_Explicit_NTLM**
- Browse to the bottom and click **Finished**

3.4.5 Task 5 – Testing

Before testing, close all browser sessions and kill all session in the GUI under **Access** > **Overview** > **Active Sessions**

- Open **Internet Explorer** on your Jump Host client machine
- Browse to https://www.f5.com. The browser should not prompt you for authentication since NTLM authentication is happening in the background (transparent to the user).
- Examine the user session details under **Access** > **Overview** > **Active Sessions**. Click on the session ID for details. You can see that NTLM authentication was performed.



Current default report name: "All Sessions"

```
Local Time           Log Message
2017-06-20 10:22:58  /Common/AP_Explicit_NTLM:Common:bfde395c: User user1@F5DEMO from JUMPBOX is authenticated
2017-06-20 10:22:58  /Common/AP_Explicit_NTLM:Common:bfde395c: Received User-Agent header: Mozilla/5.0 (Windows NT 6.1; Trident/7.0; rv:11.0) like Gecko.
2017-06-20 10:22:58  /Common/AP_Explicit_NTLM:Common:bfde395c: New session from client IP 10.1.20.100 (ST=/CC=/C=) at VIP 10.1.20.200 Listener /Common/SWG.app/SWG_proxy_vs (Reput
2017-06-20 10:22:58  /Common/AP_Explicit_NTLM:Common:bfde395c: Following rule 'Successful' from item 'NTLM Auth Result' to ending 'Allow'
2017-06-20 10:22:58  /Common/AP_Explicit_NTLM:Common:bfde395c: Access policy result: SWG-Explicit
2017-06-20 10:22:58  /Common/AP_Explicit_NTLM:Common:bfde395c: Received client info - Hostname: Type: IE Version: 11 Platform: Win7 CPU: unknown UI Mode: Full Javascript Support: 1 Active
2017-06-20 10:22:58  /Common/AP_Explicit_NTLM:Common:bfde395c: | Start (fallback) | NTLM Auth Result (Successful) | Allow | Ending is: Allow
2017-06-20 10:22:58  /Common/AP_Explicit_NTLM:Common:bfde395c: Per-request policy path trace: | Start (fallback) | Protocol Lookup (fallback) | Allow |, Ending is: Allow
2017-06-20 10:22:58  /Common/AP_Explicit_NTLM:Common:bfde395c: Source IP:10.1.20.100: Destination URL:https://f5.com/: User:user1: SSL bypass:0: UrlCategory is:/Common/Information_Techn
```

3.5 Lab 4: SWG Reporting with BIG-IQ

In this lab exercise, you will explore SWG Reporting with Big-IQ Access.

Estimated completion time: 15 minutes

Objectives:

- View SWG activity reports using BIG-IQ Access
- Test web browsing behavior

Lab Requirements:

- Lab 3 previously completed successfully (working SWG iApp deployment)

3.5.1 Task 1 – Generate New Web Browsing Traffic

- Open Internet Explorer on your Jump Host machine and browse to several web sites, including facebook.com and banking sites to generate reporting data for traffic that is allowed, decrypted, SSL bypassed, and blocked by SWG.

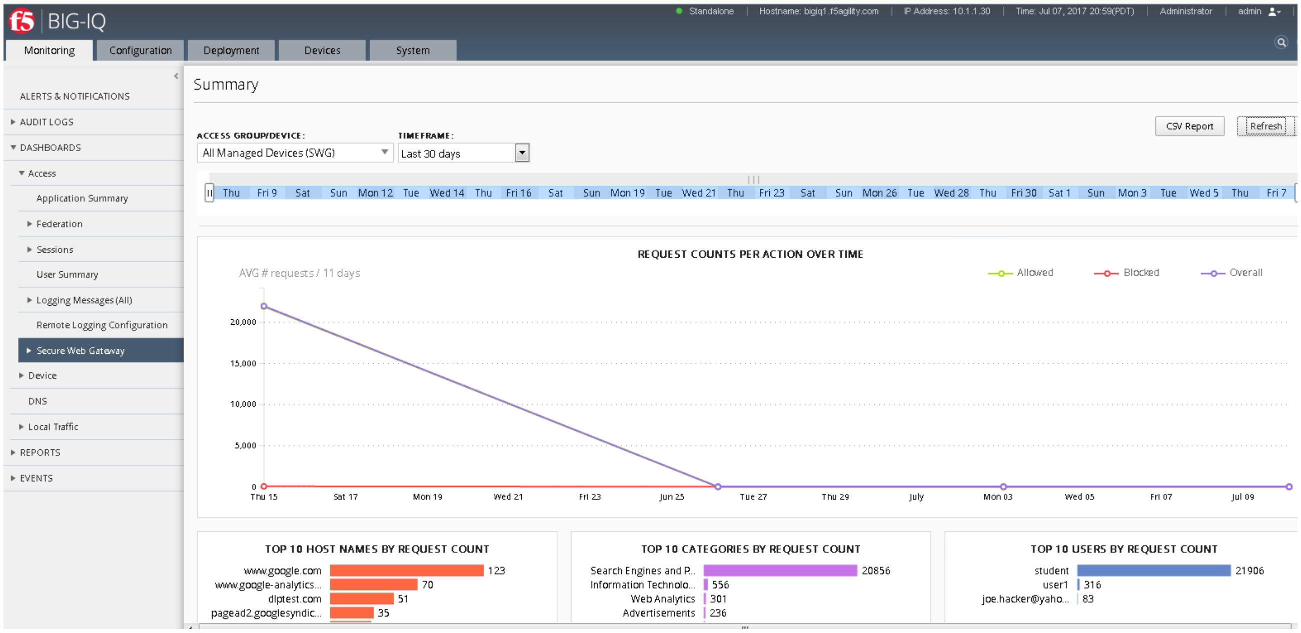
3.5.2 Task 2 – View SWG Reporting Data

- Using Firefox, browse to the BIG-IQ Management GUI **https://10.1.1.30**
- Login with the following credentials:

  Username: **admin**

  Password: **admin**

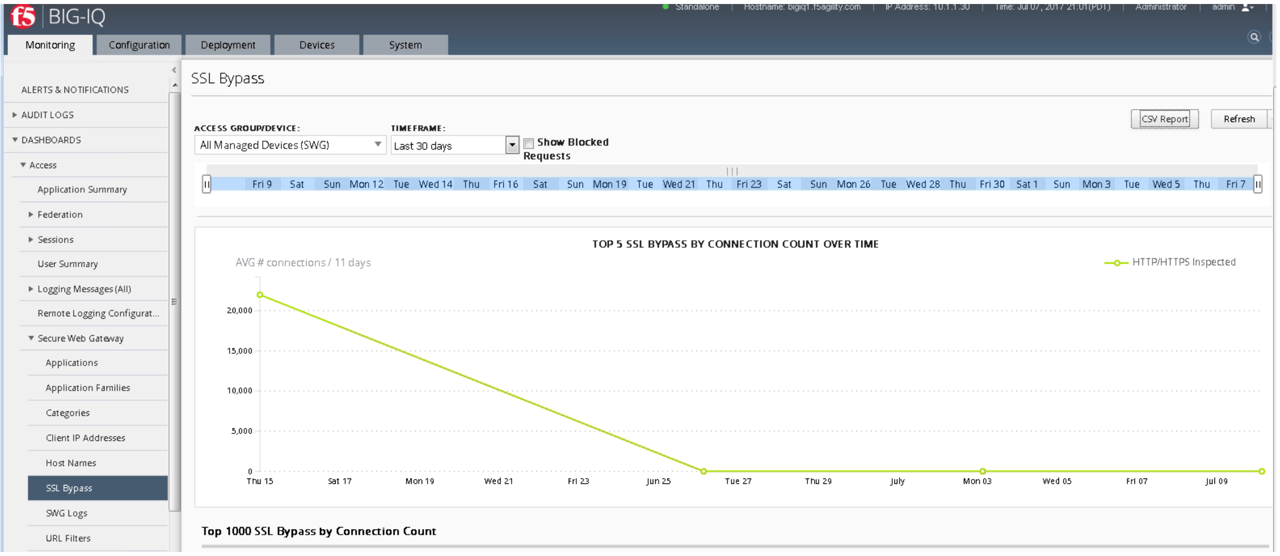
- Browse to **Monitoring** > **Dashboards** > **Access** > **Secure Web Gateway** > **Users** to see the activity by users
- Click on **Categories** to view category information,
- Adjust the time period to **30 days or less**


BIG-IQ
Standalone | Hostname: bigiq1.f5agility.com | IP Address: 10.1.1.30 | Time: Jul 07, 2017 20:59(PDT) | Administrator | admin
Monitoring
Configuration
Deployment
Devices
System
ALERTS & NOTIFICATIONS
AUDIT LOGS
DASHBOARDS
Access
Application Summary
Federation
Sessions
User Summary
Logging Messages (All)
Remote Logging Configuration
Secure Web Gateway
Device
DNS
Local Traffic
REPORTS
EVENTS
Summary
CSV Report
Refresh
Thu Fri 9 Sat Sun Mon 12 Tue Wed 14 Thu Fri 16 Sat Sun Mon 19 Tue Wed 21 Thu Fri 23 Sat Sun Mon 26 Tue Wed 28 Thu Fri 30 Sat 1 Sun Mon 3 Tue Wed 5 Thu Fri 7
REQUEST COUNTS PER ACTION OVER TIME
AVG # requests / 11 days
Allowed
Blocked
Overall
20,000
15,000
10,000
5,000
0
Thu 15 Sat 17 Mon 19 Wed 21 Fri 23 Jun 25 Tue 27 Thu 29 July Mon 03 Wed 05 Fri 07 Jul 09
TOP 10 HOST NAMES BY REQUEST COUNT
www.google.com 123
www.google-analytics... 70
dlptest.com 51
pagead2.googlesyndic... 35
TOP 10 CATEGORIES BY REQUEST COUNT
Search Engines and P... 20856
Information Technolo... 556
Web Analytics 301
Advertisements 236
TOP 10 USERS BY REQUEST COUNT
student 21906
user1 316
joe.hacker@yaho... 83

ACCESS GROUP/DEVICE: All Managed Devices (SWG)

TIMEFRAME: Last 30 days

- Click on **SSL Bypass** and view the breakdown between **HTTPS Inspected** and **Bypassed** Content

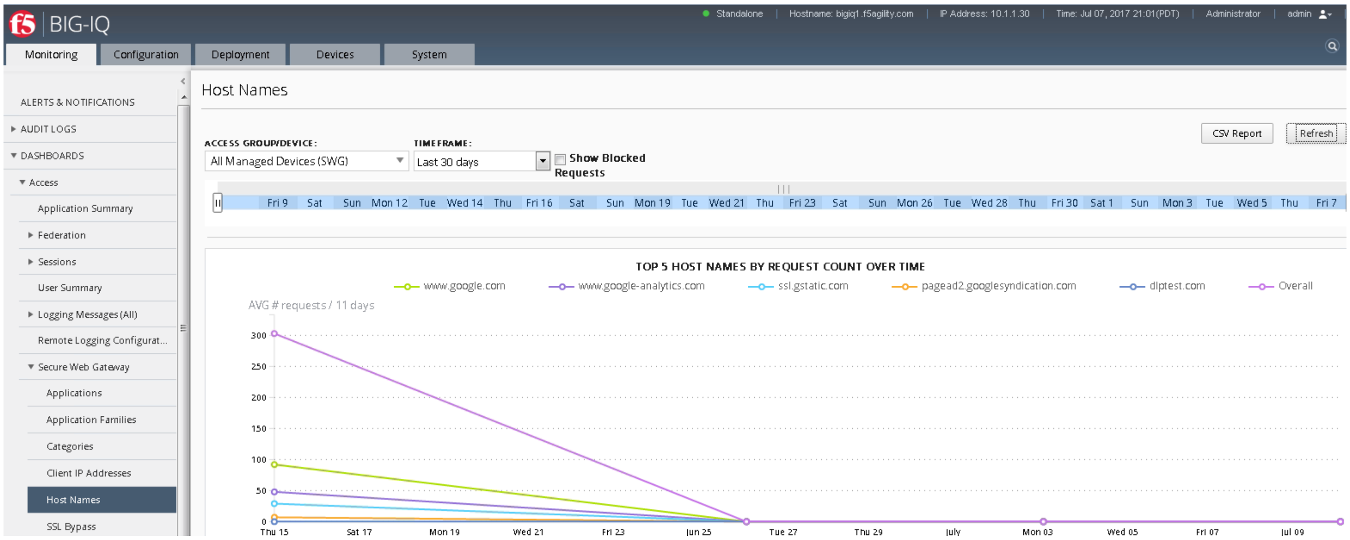

BIG-IQ
Standalone | Hostname: bigiq1.f5agility.com | IP Address: 10.1.1.30 | Time: Jul 07, 2017 21:01(PDT) | Administrator | admin
Monitoring
Configuration
Deployment
Devices
System
ALERTS & NOTIFICATIONS
AUDIT LOGS
DASHBOARDS
Access
Application Summary
Federation
Sessions
User Summary
Logging Messages (All)
Remote Logging Configurat...
Secure Web Gateway
Applications
Application Families
Categories
Client IP Addresses
Host Names
SSL Bypass
SWG Logs
URL Filters
SSL Bypass
CSV Report
Refresh
Fri 9 Sat Sun Mon 12 Tue Wed 14 Thu Fri 16 Sat Sun Mon 19 Tue Wed 21 Thu Fri 23 Sat Sun Mon 26 Tue Wed 28 Thu Fri 30 Sat 1 Sun Mon 3 Tue Wed 5 Thu Fri 7
TOP 5 SSL BYPASS BY CONNECTION COUNT OVER TIME
AVG # connections / 11 days
HTTP/HTTPS Inspected
20,000
15,000
10,000
5,000
0
Thu 15 Sat 17 Mon 19 Wed 21 Fri 23 Jun 25 Tue 27 Thu 29 July Mon 03 Wed 05 Fri 07 Jul 09
Top 1000 SSL Bypass by Connection Count

ACCESS GROUP/DEVICE: All Managed Devices (SWG)

TIMEFRAME: Last 30 days

□ Show Blocked Requests

- Click on **Host Name** to look at the hosts your users are accessing

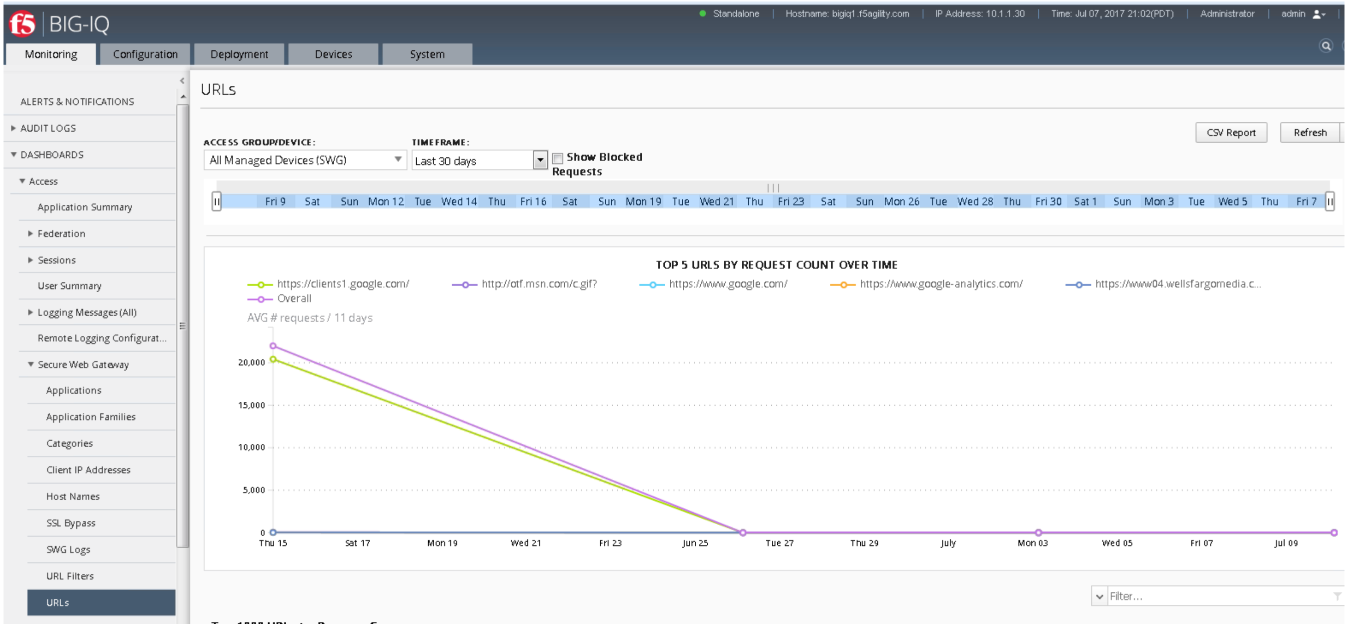


ACCESS GROUP/DEVICE: All Managed Devices (SWG)

TIMEFRAME: Last 30 days

☐ Show Blocked Requests

- Click on **URLs** to get detail on what URLs your users are accessing



ACCESS GROUP/DEVICE: All Managed Devices (SWG)

TIMEFRAME: Last 30 days

☐ Show Blocked Requests

3.6 Lab 5: SWG iApp - Transparent Proxy for HTTP and HTTPS

In this lab exercise, you will configure SWG in transparent proxy mode to support environments where clients do not leverage an explicit proxy. BIG-IP is deployed inline on the client's outbound path to the Internet to intercept the traffic.

Estimated completion time: 15 minutes

Objectives:

- Deploy SWG in transparent proxy mode
- Test web browsing behavior

Lab Requirements:

- Lab 1 previously completed successfully (working SWG iApp deployment)
- BIG-IP must be in path between the client workstation and the Internet (this has already been done for you in this lab)

3.6.1 Task 1 – Create a new Access Policy

- Use Firefox to access the BIG-IP GUI (https://10.1.1.10, admin/admin)
- Browse to **Access** >> **Profiles** / **Policies** >> **Access Profiles (Per-Session Policies)** and click **Create...**
- Name the profile **AP_Transparent**
- Change the Profile Type to **SWG-Transparent**
- Add **English** to **Accepted Languages**
- Accept all other default settings and click **Finished**
- Click on the **Edit...** link for the appropriate Access Policy created above
- Go to the VPE tab in your browser and on the **fallback** branch, click on the **Deny** Ending and change it to **Allow**
- Click **Save**
- Click **Apply Access Policy**

3.6.2 Task 2 – Reconfigure SWG iApp to apply Transparent Access Policy

- Browse to **iApps** >> **Application Services** > **Applications**
- Click on **SWG**
- Click **Reconfigure**
- Change **Configuration Type** to **Transparent Proxy**
- Find the section **Which SWG-Transparent Access Policy do you want to use?**
- Change **Access Policy** to **AP_Transparent**
- Find the section **Which Per-Request Access Policy do you want to use?**
- Change the **per-request policy** to **Lab_Per_Request**
- Set **Should the system translate client addresses** to **Yes...**
- Set **Which SNAT mode do you want to use** to **use SNAT Auto Map**
- Browse to the bottom and click **Finished**

3.6.3 Task 3 – Testing

- Open Internet Explorer on your Jump Host client machine
- Ensure Internet Explorer options are configured to ***not*** use an explicit proxy
- Browse to https://www.nhl.com. You should not be prompted for authentication.

3.7 Lab 6: Captive Portal Authentication

In this lab exercise, you will a captive portal to authenticate client connecting to the Internet through the SWG transparent proxy.

Estimated completion time: 25 minutes

Objectives:

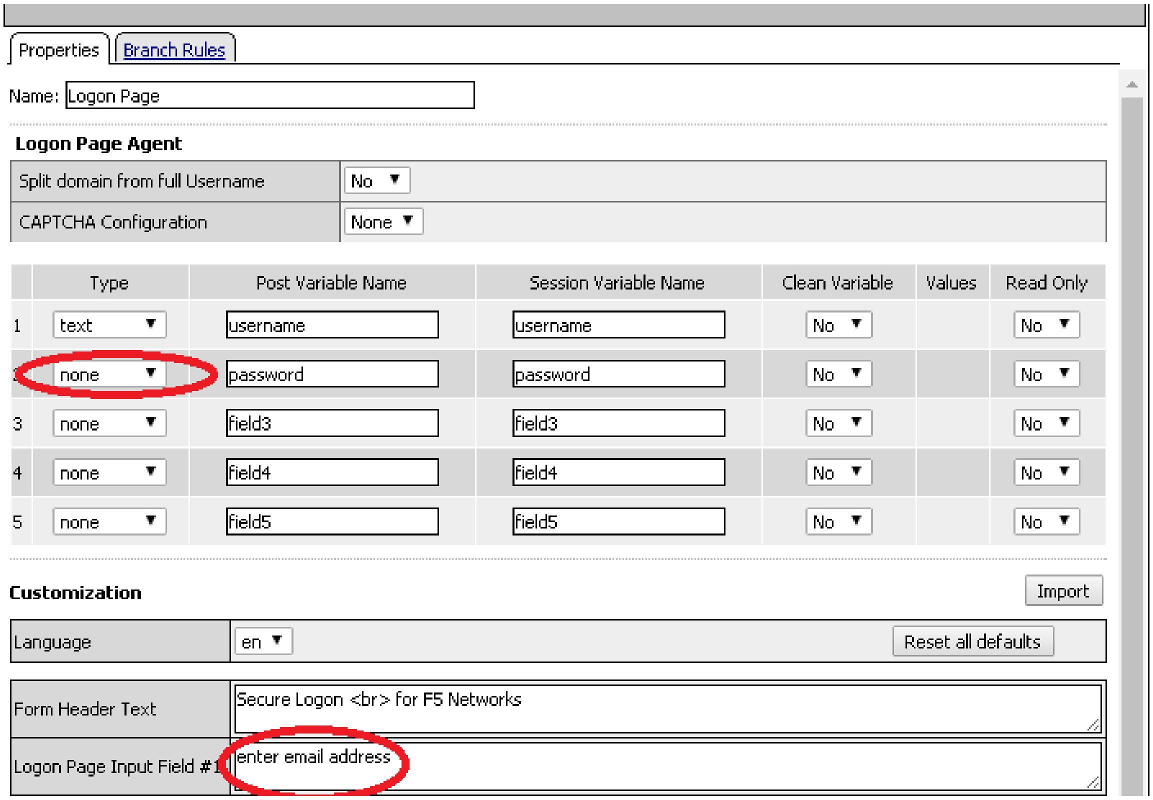
- Configure SWG with a Captive Portal to facilitate client authentication
- Test web browsing behavior

Lab Requirements:

- Lab 5 previously completed successfully (working SWG transparent proxy deployment)

3.7.1 Task 1 – Create a new Access Policy

- Use Firefox to access the BIG-IP GUI (https://10.1.1.10, admin/admin)
- Browse to **Access** >> **Profiles** / **Policies** >> **Access Profiles (Per-Session Policies)** and click **Create. . .**
- Name the profile **AP_Transparent_Captive_Portal**
- Change the Profile Type to **SWG-Transparent**
- Change Captive Portals to **Enabled**
- Set Primary Authentication URI to **https://captive.f5demo.com**
- Add **English** to **Accepted Languages**
- Accept all other default settings and click **Finished**
- Click on the **Edit. . .** link for the appropriate Access Policy created above
- On the VPE browser tab, select the **+** and **Add** a **Message Box** object (from the General Purpose tab)
- For the Message, enter: **Welcome to F5 Agility Guest Wifi Access. Please click the link to accept our terms and access the internet.**
- For the Link enter **Go**
- Click **Save**
- Select the **+** after the message box and **Add** a **Logon Page** object.
- Configure the **Logon Page** as shown below:



Name: Logon Page

Logon Page Agent

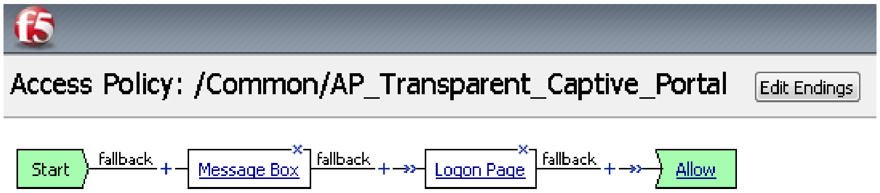
Split domain from full Username	No
CAPTCHA Configuration	None

	Type	Post Variable Name	Session Variable Name	Clean Variable	Values	Read Only
1	text	username	username	No		No
2	none	password	password	No		No
3	none	field3	field3	No		No
4	none	field4	field4	No		No
5	none	field5	field5	No		No

Customization

Language	en
Form Header Text	Secure Logon for F5 Networks
Logon Page Input Field #1	enter email address

- Click **Save**
- Click on the **Deny** ending and change it to **Allow**
- Click **Apply Access Policy**


Access Policy: /Common/AP_Transparent_Captive_Portal

3.7.2 Task 2 – Reconfigure SWG iApp to enable Transparent Capture Portal

- Browse to **iApps >> Application Services** > **Applications**
- Click on **SWG**
- Click **Reconfigure**
- Find the section **Which SWG-Transparent Access Policy do you want to use?**
- Select **AP_Transparent_Captive_Portal**
- Change **Configure the transparent proxy to relay to a Captive Portal** to **Yes, relay to a captive portal**
- Set the **Captive Portal Configuration** as follows:
  - IP Address: **10.1.20.201**

- Port: **443**
    - SSL Certificate: **captive.f5demo.com**
    - SSL Key: **captive.f5demo.com**
- Browse to the bottom and click **Finished**

3.7.3 Task 3 – Testing

- Open Internet Explorer on your Jump Host client machine
- Ensure Internet Explorer options are configured to *NOT* use an explicit proxy
- Browse to **https://www.nhl.com**
- You should be redirected to the capture portal page, prompted to accept the policy by clicking **Go**, then prompted to provide your email address before being allowed through.

3.8 Lab 7: SSL Visibility for DLP (ICAP)

In this lab exercise, you will send decrypted traffic to an ICAP-based Data Loss Prevention (DLP) service for inspection. The DLP will block HTTP POSTs (uploads) of certain content such as credit cards numbers and documents with Top Secret data classification labels.

Estimated completion time: 15 minutes

Objectives:

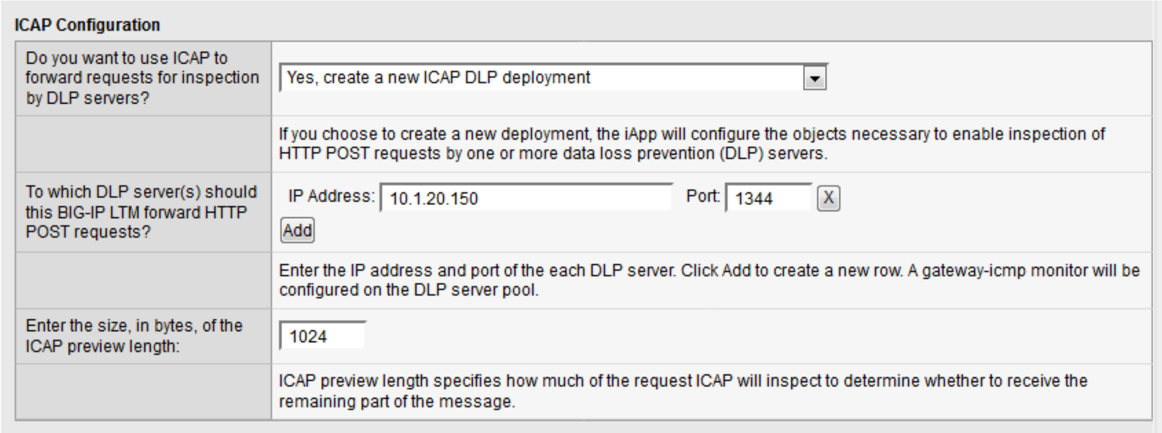
- Re-configure the SWG iApp to send unencrypted HTTP and decrypted HTTPS traffic to an ICAP (DLP) server
- Verify that the DLP service is able to see SWG proxy traffic and block if a policy violation occurs

Lab Requirements:

- Working SWG iApp deployment

3.8.1 Task 1 – Re-configure SWG iApp to enable ICAP inspection

- Browse to **iApps >> Application Services > Applications**
- Click on **SWG**
- Click **Reconfigure**
- Scroll down to the **ICAP Configuration** section
- Change the ICAP option to **Yes, create a new ICAP DLP deployment**
- Enter **10.1.20.150** as the IP address of the DLP server (the default port of **1344** is correct).



ICAP Configuration

Do you want to use ICAP to forward requests for inspection by DLP servers?	Yes, create a new ICAP DLP deployment
	If you choose to create a new deployment, the iApp will configure the objects necessary to enable inspection of HTTP POST requests by one or more data loss prevention (DLP) servers.
To which DLP server(s) should this BIG-IP LTM forward HTTP POST requests?	IP Address: 10.1.20.150 Port: 1344 X Add
	Enter the IP address and port of the each DLP server. Click Add to create a new row. A gateway-icmp monitor will be configured on the DLP server pool.
Enter the size, in bytes, of the ICAP preview length:	1024
	ICAP preview length specifies how much of the request ICAP will inspect to determine whether to receive the remaining part of the message.

- Browse to the bottom and click **Finished**

3.8.2 Task 2 – Testing

- Open Internet Explorer on your Jump Host client machine
- Browse to **http://dlptest.com**
- If you are prompted for authentication, login as `user1` with password `AgilityRocks!`
- Click on the **HTTP Post** link at the top of the page.
- Fill in the **Subject** and **Message** fields with some random text and then add a credit card numbers such as **4111 1111 1111 1111**.
- Click on the **Submit** button to see if the DLP service detects this. ***Hint:** You should receive a blocking page message.*
- Go back to the previous page try submitting again but with the words **top secret**. Again, you should receive a blocking page from the DLP service.
- Now, go back to the previous page and click on the **HTTPS Post** link at the top of the page.
- Perform the credit card number and **top secret** submissions again. You should again see the blocking pages since SWG is decrypting the HTTPS connection and sending the decrypted POST data to the DLP service for inspection.
- If you want to see the DLP policy violations, browse to **https://10.1.20.150/logs**. Log in as `mydlp` with password `mydlp`.

3.9 Conclusion

3.9.1 Learn More

Links & Information

- **Secure Web Gateway Services Product Info:**

  https://f5.com/products/big-ip/secure-web-gateway-services-swgs

- **SWG Reference Architecture:**

  https://f5.com/solutions/enterprise/reference-architectures/secure-web-gateway

4 Class 4: SAML Identity Provider (IdP) Lab

This lab covers the following topics:

- Configuring a SAML Identity Provider (IdP)
- Configuring Group-based Access Control

Expected time to complete: **2 hours**

To continue please review the information about the Lab Environment. Additionally, if you are new to the F5 BIG-IP Platform we've created an overview in the BIG-IP Basics section.

4.1 Lab Topology & Environments

All pre-built environments implement the Lab Topology shown below. Please review the topology first, then find the section matching the lab environment you are using for connection instructions.

Using Your Lab Environment

You will be using Ravello for this lab. We will be working with a Linux jumpbox, a BIG-IP Virtual Edition version 13.1, and a simulated SaaS application. We will be using the Linux desktop as our desktop for accessing the applications on the BIG-IP.

This diagram shows the topology of the network as it is currently configured:

The following table lists VLANS, IP Addresses and Credentials for all components:

Component	Management IP	VLAN/IP Address(es)	Credentials
Linux Jumphost	10.1.1.10	**External:** 10.1.10.10	`f5student/f5DEMOs4u`
BIG-IP VE v13.1	10.1.1.245	**External:** 10.1.10.245 **Internal:** 10.1.20.245	`admin/admin` `root/default`
SaaS Application	10.1.1.55	**Internal:** 10.1.20.55	

How to Access the Labs

You will receive instructions from your proctor on how to access the workstation in the lab. On this workstation, you will have the following applications:

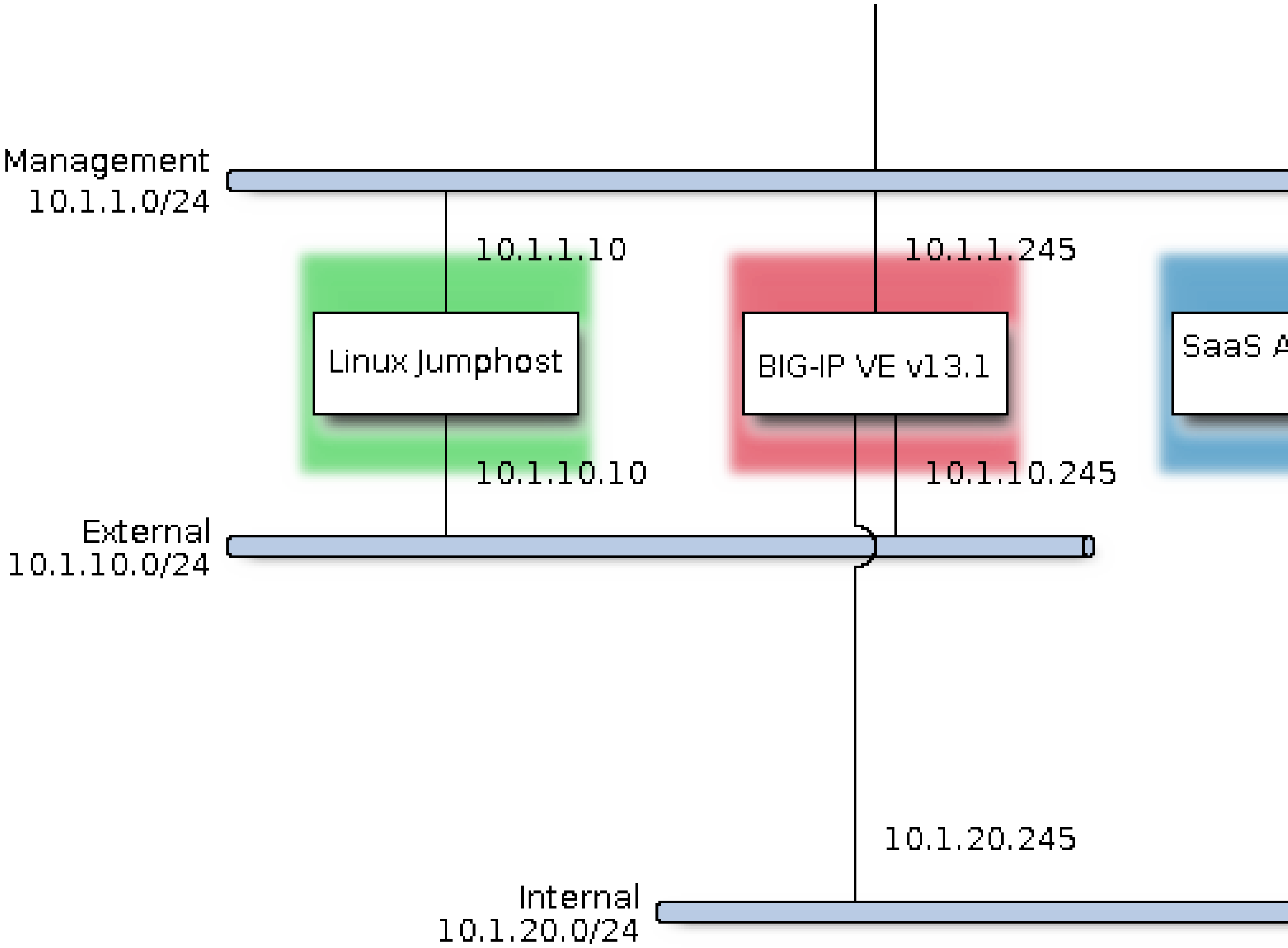


Fig. 4.1: Lab Topology

- Firefox Web Browser – For testing the applications we create and BIG-IP management access. Links are bookmarked just below the address bar.
- Putty SSH Client – For accessing the BASH and TMSH command line of the BIG-IP. The BIG-IP properties have been saved to the session labeled *BIG-IP*.

4.2 BIG-IP Basics (optional)

Just in case you're new to the F5 BIG-IP platform (or need a refresher) we've included some links and videos below that will help get you started.

4.2.1 What is BIG-IP

Source: https://devcentral.f5.com/articles/lightboard-lessons-what-is-big-ip-26793

4.2.2 BIG-IP Basic Nomenclature

Source: https://devcentral.f5.com/articles/lightboard-lessons-big-ip-basic-nomenclature-26144

4.2.3 F5 DevCentral BIG-IP Basics Articles

BIG-IP Basics Articles: https://devcentral.f5.com/articles?tag=devcentral+basics

4.2.4 Using F5 in Various Environments

- Public Cloud:
  - **AWS/Azure/GCP/etc.:** http://clouddocs.f5.com/cloud/public/v1/
- Private Cloud:
  - **OpenStack:** http://clouddocs.f5.com/cloud/openstack/
  - **VMware:** https://f5.com/solutions/technology-alliances/vmware
- Container Ecosystems:
  - **Cloud Foundry:** http://clouddocs.f5.com/containers/latest/cloudfoundry/
  - **Kubernetes:** http://clouddocs.f5.com/containers/latest/kubernetes
  - **Mesos Marathon:** http://clouddocs.f5.com/containers/latest/marathon
  - **RedHat OpenShift:** http://clouddocs.f5.com/containers/latest/openshift/

4.2.5 HA Proxy to BIG-IP Quick Start

If you're already familiar with HA Proxy, learning F5 BIG-IP is straightforward once you learn the associated F5 terminology.

Here is a list of common HA Proxy configuration terminology and its F5 equivalent:

HA Proxy	**F5 BIG-IP**
Frontend	Virtual Server (VIP)
Backend	Pool
Server	Member
mode http	HTTP Profile
default_backend	Default pool
use_backend	LTM policy
check port	Health monitor

4.2.6 NGINX to BIG-IP Quick Start

If you are already familiar with NGINX, learning F5 BIG-IP will be straightforward once you learn the F5 terminology.

NGINX administrators usually use multiple files and leverage the include command in their config to break down the config and make it easier to manage. F5 leverages *Profiles* which can be applied to a *Virtual Server*.

NGINX uses in-band (passive) health monitors which can be enabled on F5 through the creation of an *inband monitor*. BIG-IP also supports the use of active health monitors, which will poll the pool member periodically. Both can be used together for better monitoring of your services.

F5 BIG-IP supports control-plane and data-plane programmability with:

- Node.js through the use of iRulesLX, iControlLX and iAppsLX
- TCL through the use of iRules and iApp Templates

A lot of the manual configuration and scripting steps that are required with NGINX are supported more easily through various config parameters and profiles in BIG-IP. By leveraging the control-plane programmability features this class covers you can achieve full automation of your services with the BIG-IP platform.

F5 BIG-IP is designed to be a full proxy by default. In most cases there is no need to tune TCP & HTTP buffering like you would on NGINX (i.e. using `proxy_buffering`). This is because the default settings have been optimized and can adapt to most situations.

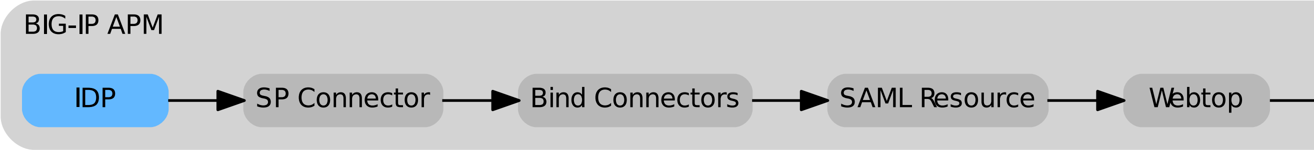
Here is a list of common NGINX configuration terminology and its F5 equivalent:

NGINX	**F5 BIG-IP**
listen	Virtual Server Port (VIP)
upstream	Pool
proxy_pass	Default Pool
server	Member
ssl_certificate	SSL Profile Option
return	LTM HTTP Policy Option
proxy_set_header X Forwarded For	HTTP Profile Option Insert X-Forwarded-For
proxy_set_header	LTM HTTP Policy Option
add_header	LTM HTTP Policy Option
location & proxy_pass	LTM HTTP Policy Option
Proxy Cache	Web Acceleration Policy

4.3 Module 1: SAML Identity Provider

In this lab we will learn the basics concepts required to use F5 Access Policy Manager as a SAML Identity Provider (IdP).

4.3.1 Lab 1.1: Create a SAML Identity Provider



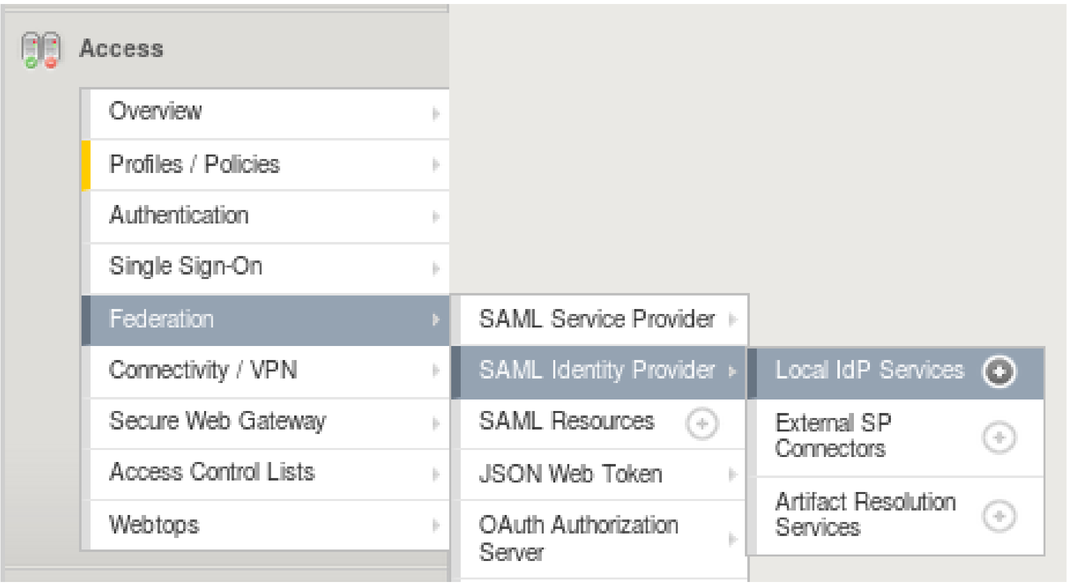
Task 1 - Create a Local IdP Service

In this lab we will create the local Identity Provider service. This service is responsbile for handling the authentication for the SaaS application.

Note: This guide may require you to Copy/Paste information from the guide to your jumphost. To make this easier you can open a copy of the guide by using the **Lab Guide** bookmark in Chrome.

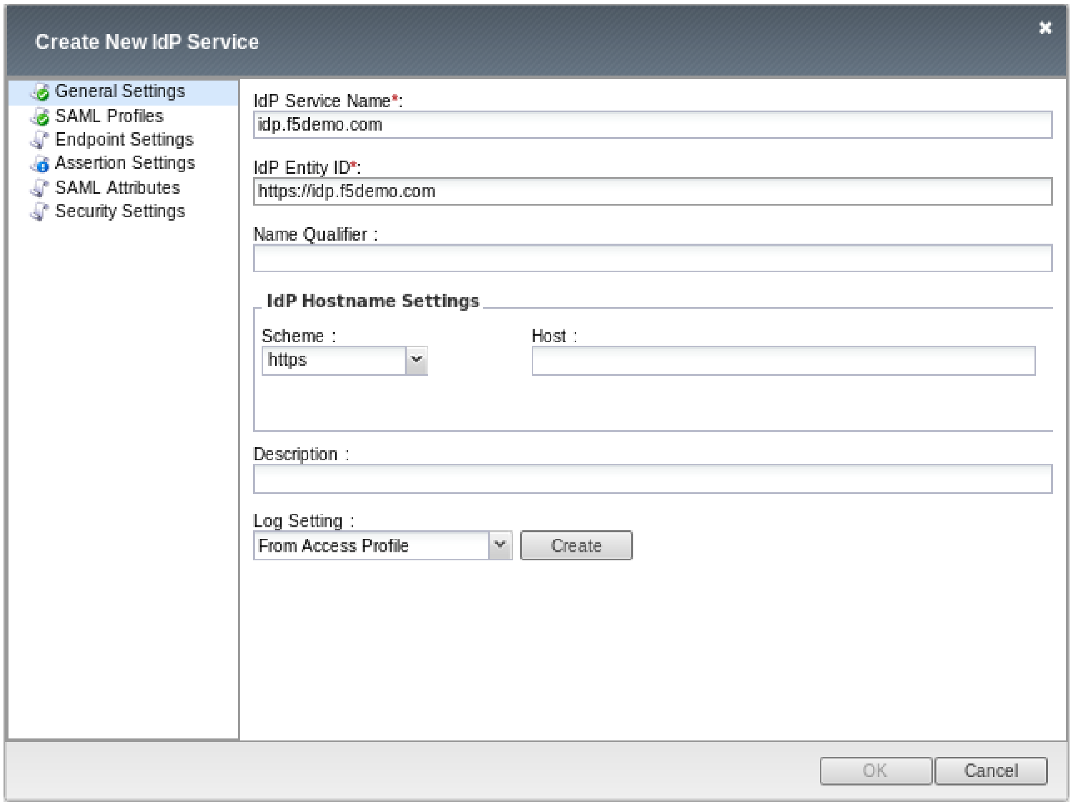
---

1. Navigate to *Access* → *Federation* → *SAML Identity Provider* → *Local IdP Services*
2. Click the + sign



3. Configure the *General Settings*:

Property	Value
IdP Service Name	idp.f5demo.com
IdP Entity Id	https://idp.f5demo.com



IdP Service Name*: idp.f5demo.com

IdP Entity ID*: https://idp.f5demo.com

Name Qualifier :

Scheme : https

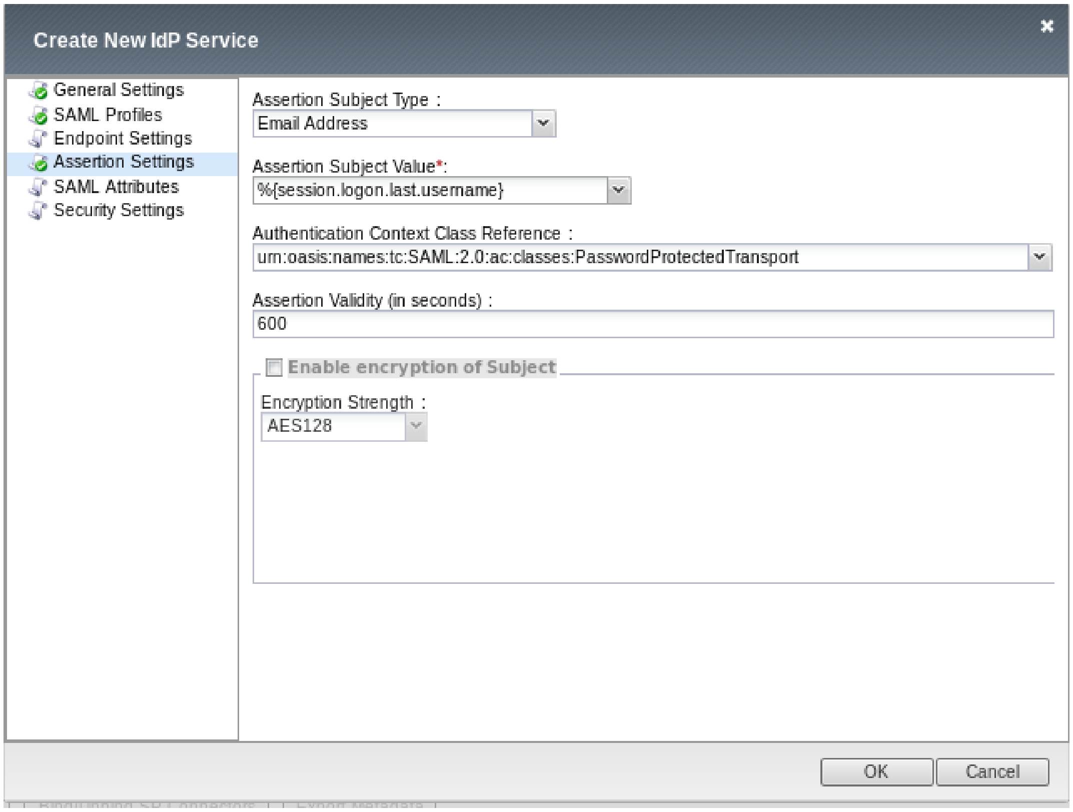
Host :

Description :

Log Setting : From Access Profile

4. Configure the *Assertiion Settings*:

Property	Value
Assertion Subject Value	%{session.logon.last.username}



Assertion Subject Type : Email Address

Assertion Subject Value*: %{session.logon.last.username}

Authentication Context Class Reference : urn:oasis:names:tc:SAML:2.0:ac:classes:PasswordProtectedTransport

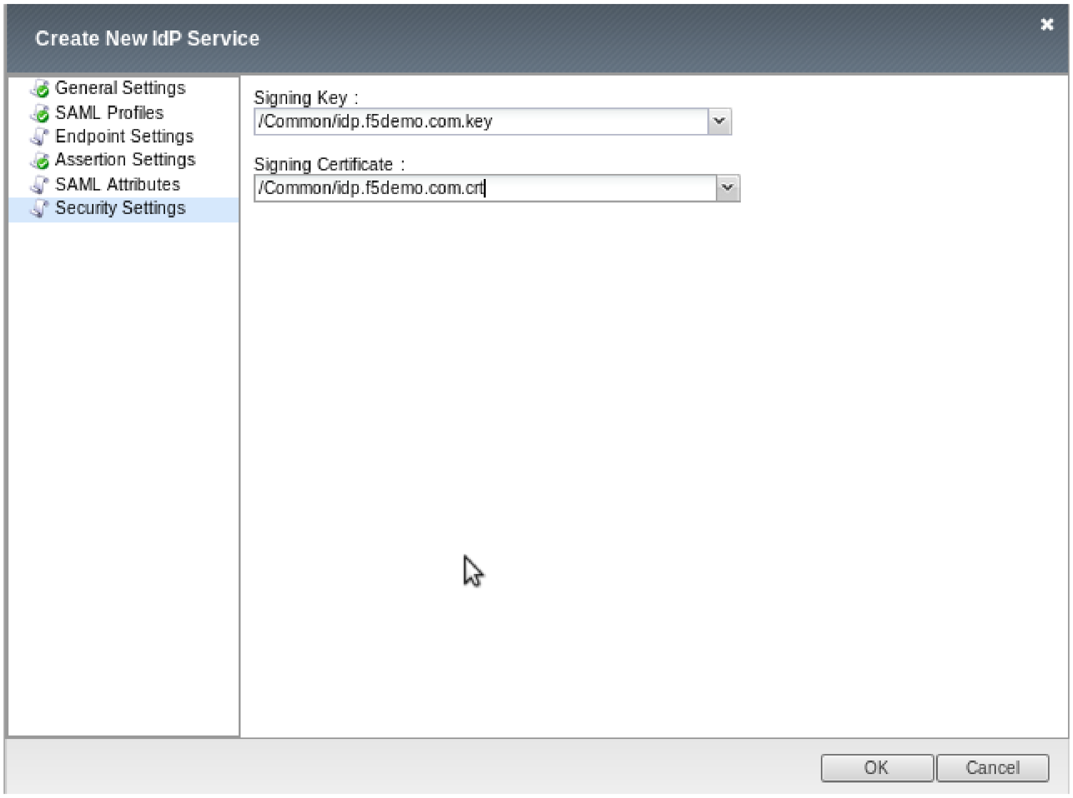
Assertion Validity (in seconds) : 600

□ Enable encryption of Subject

Encryption Strength : AES128

5. Configure the *Security Settings*:

Property	Value
Signing Key	idp.f5demo.com.key
Signing Certificate	idp.f5demo.com.crt

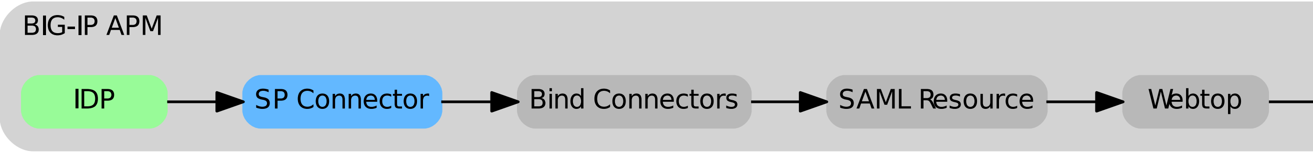


Signing Key : /Common/idp.f5demo.com.key

Signing Certificate : /Common/idp.f5demo.com.crt

6. Click the *OK* button.

4.3.2 Lab 1.2: Create an External SP Connector



Now that we have the Identity Provider configured, we need to configure the BIG-IP so it is aware of the Service Provider (the SaaS application). We do this by defining an External SP Connector using the metadata provided by the SaaS application, importing it into the BIG-IP, and setting the appropriate cryptographic controls.

Task 1 - Obtain the SAML Service Provider Metadata

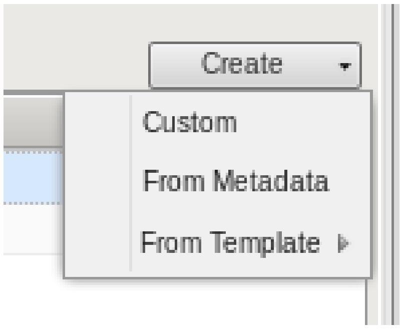
In a common deployment the metadata is provided by the application. This lab is no different, but the access method will vary. Follow the listed steps below to obtain the necessary XML file.

1. Open a browser and nagivate to https://app.f5demo.com/metadata.xml
2. Save the file as `app.f5demo.com.xml`

Task 2 - Create an External SP Connector

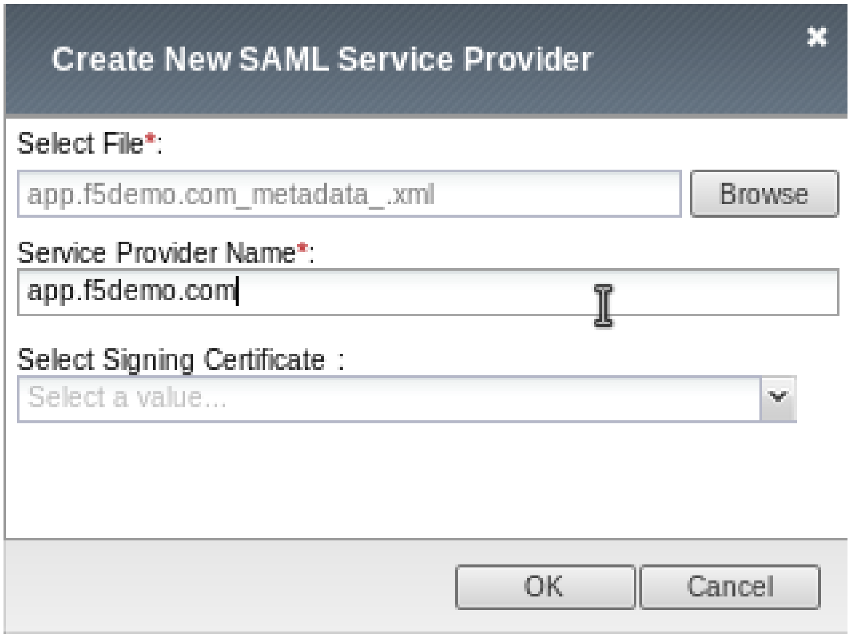
In this task we will create the External SP Connector object.

1. Navigate to *Access* → *Federation* → *SAML Identity Provider* → *External SP Connector*
2. Click on the triangle on the right side of the *Create* button and select *From Metadata*



3. Enter the following information:

Property	Value
Select File	app.f5demo.com.xml
Service Provider Name	app.f5demo.com



Create New SAML Service Provider

Select File*: app.f5demo.com_metadata_.xml

Service Provider Name*: app.f5demo.com

Select Signing Certificate : Select a value...

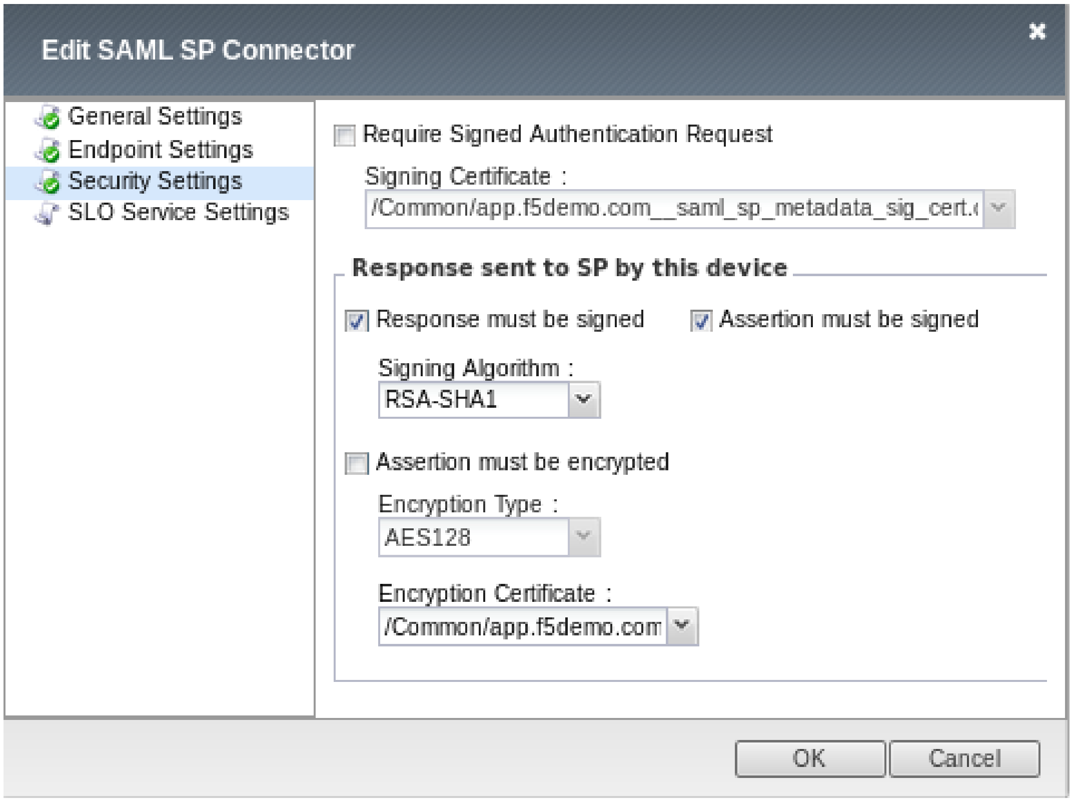
4. Click the *OK* button

Task 3 - Modify the SP Connector Settings

Finally, for security purposes, we'll configure the External SP Connector object to require that resposes are cryptographically signed. This prevents an attacker from manipulating the response and potentially gaining unauthorized access.

1. Click the checkbox next to *app.f5demo.com* and click the *Edit* button
2. Modify the following *Security Settings*:

Property	Value
Response must be signed	checked



Edit SAML SP Connector

- General Settings
- Endpoint Settings
- Security Settings
- SLO Service Settings

□ Require Signed Authentication Request

Signing Certificate : /Common/app.f5demo.com__saml_sp_metadata_sig_cert.

Response sent to SP by this device

☑ Response must be signed ☑ Assertion must be signed

Signing Algorithm : RSA-SHA1

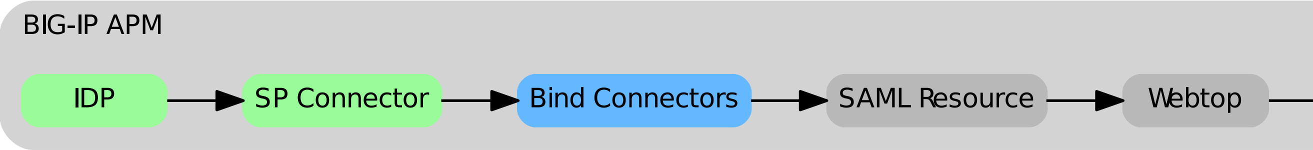
□ Assertion must be encrypted

Encryption Type : AES128

Encryption Certificate : /Common/app.f5demo.com

3. Click the *OK* button.

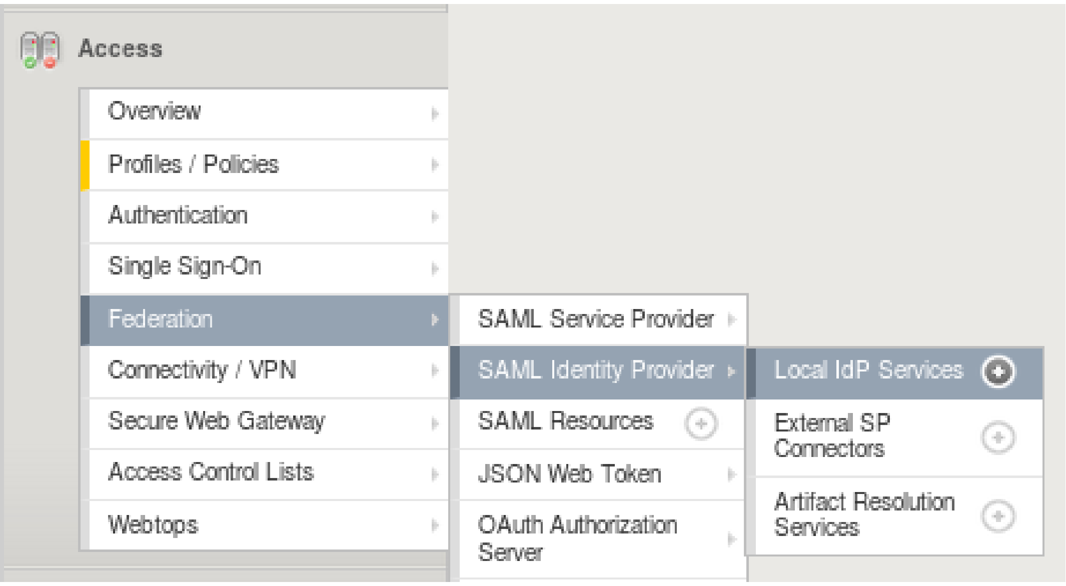
4.3.3 Lab 1.3: Bind SP Connectors



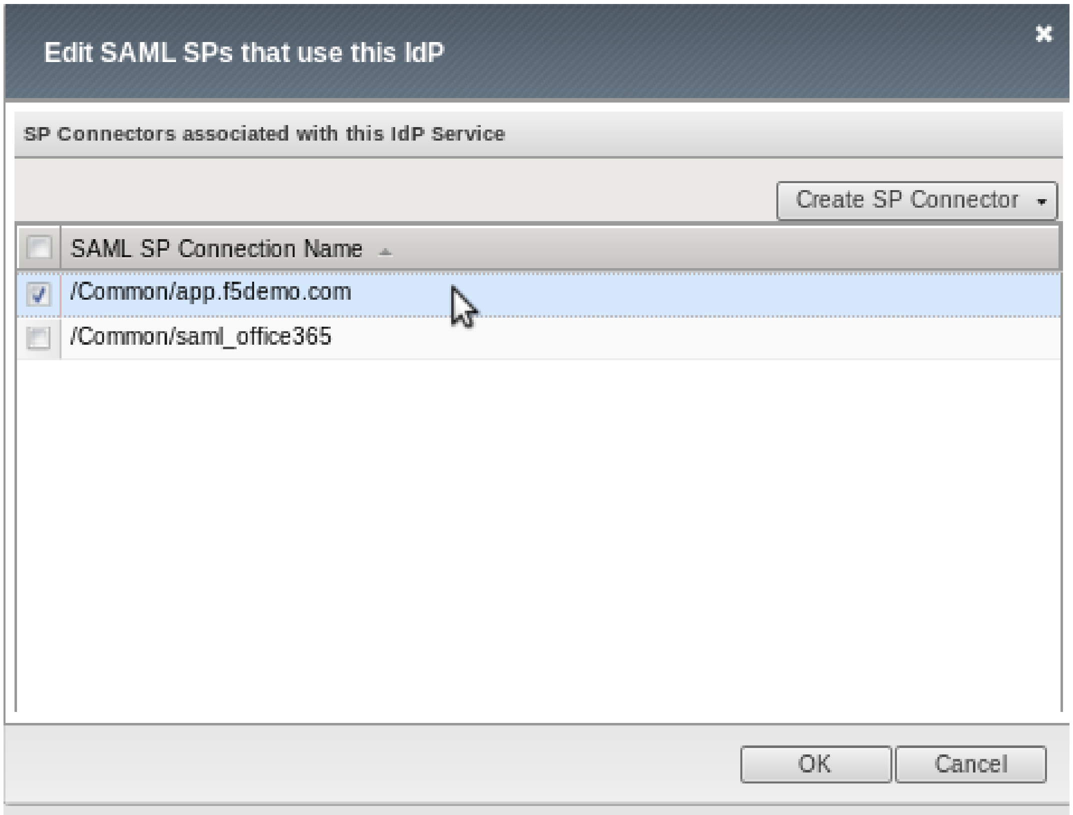
Once we have the Identity Provider and Service Provider objects configured, we need to link them together.

Task 1 - Bind the IdP and SP Connector

1. Navigate to *Access* → *Federation* → *SAML Identity Provider* → *Local IdP Services*



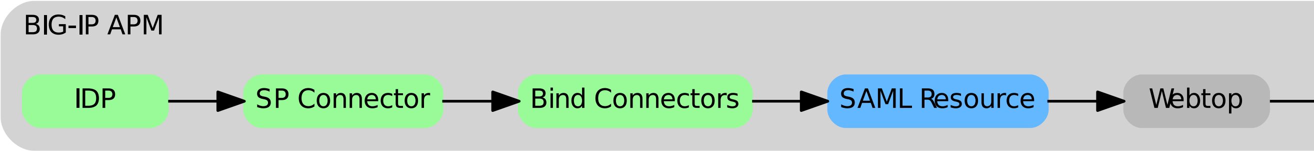
2. Check the radio button next to *idp.f5.demo.com*
3. Click on the *Bind/Unbind SP Connectors* button
4. Check the box next to */Common/app.f5demo.com*


Edit SAML SPs that use this IdP
SP Connectors associated with this IdP Service
Create SP Connector
OK
Cancel

☐	SAML SP Connection Name
☑	/Common/app.f5demo.com
☐	/Common/saml_office365

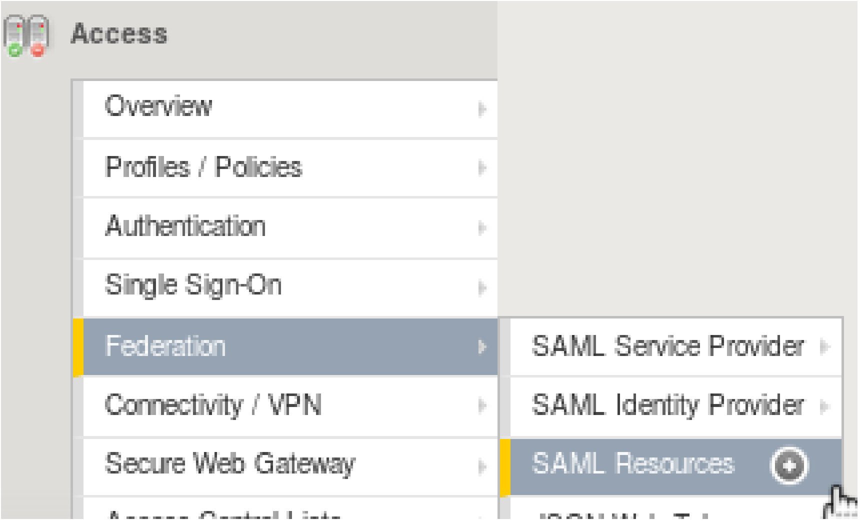
5. Click the *OK* button.

4.3.4 Lab 1.4: Create SAML Resource



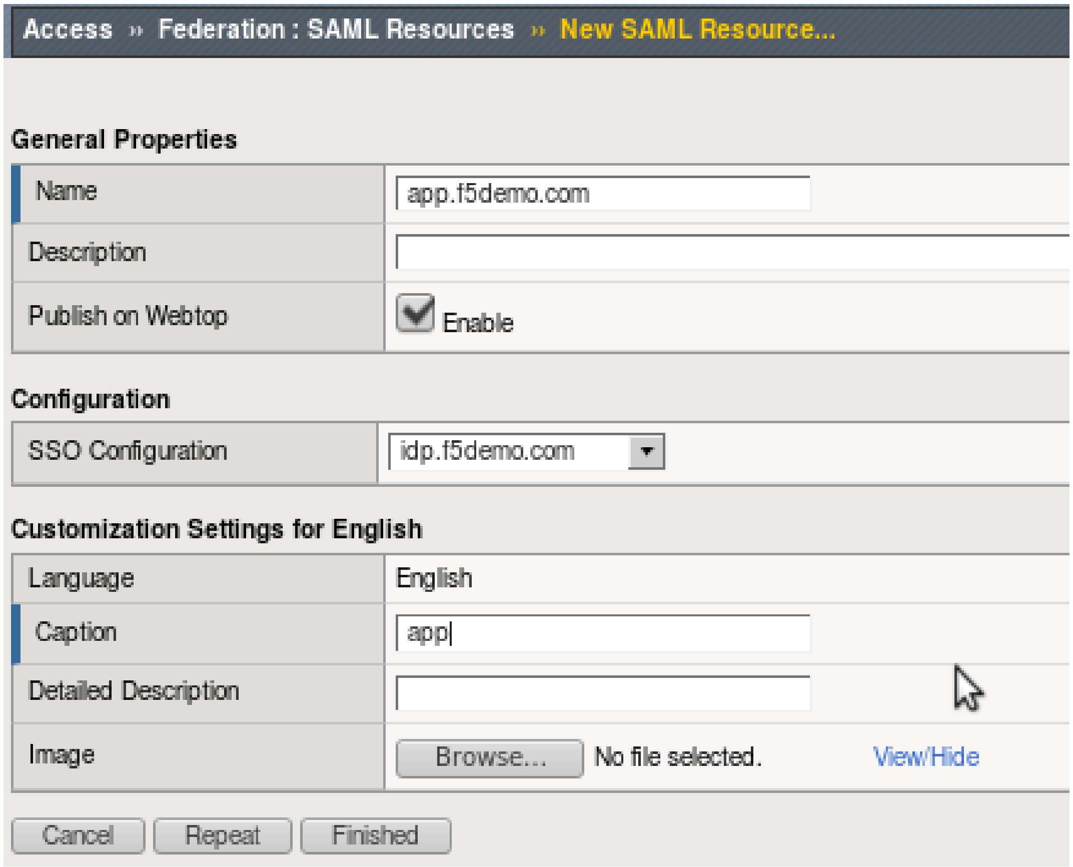
Task 1 - Create SAML Resource

1. Navigate to *Access* → *Federation* → *SAML Resource* and click the + sign



2. Configure the following settings:

Property	Value
Name	app.f5demo.com
SSO Configuration	idp.f5demo.com
Caption	app


Access » Federation : SAML Resources » New SAML Resource...

General Properties

Name	app.f5demo.com
Description	
Publish on Webtop	☑ Enable

Configuration

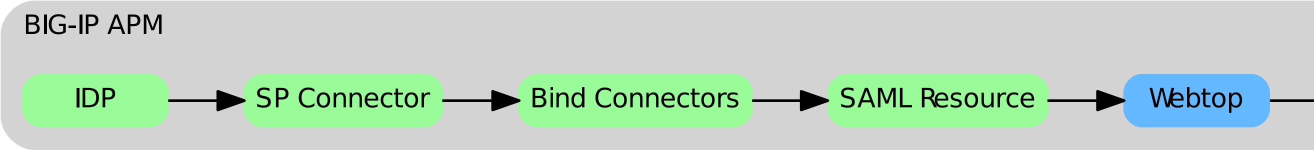
SSO Configuration	idp.f5demo.com

Customization Settings for English

Language	English
Caption	app
Detailed Description	
Image	Browse... No file selected. View/Hide

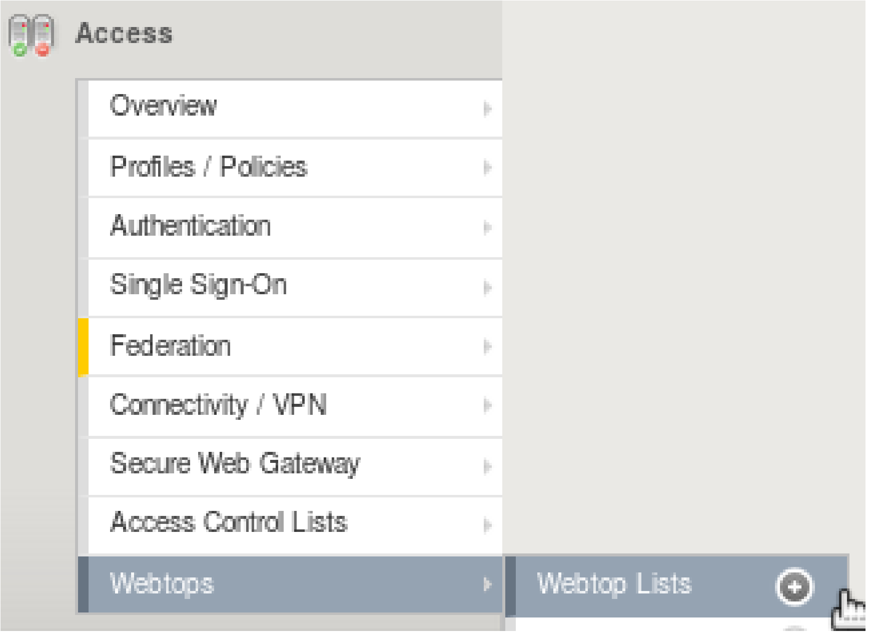
3. Click the *Finished* button.

4.3.5 Lab 1.5: Create a Webtop



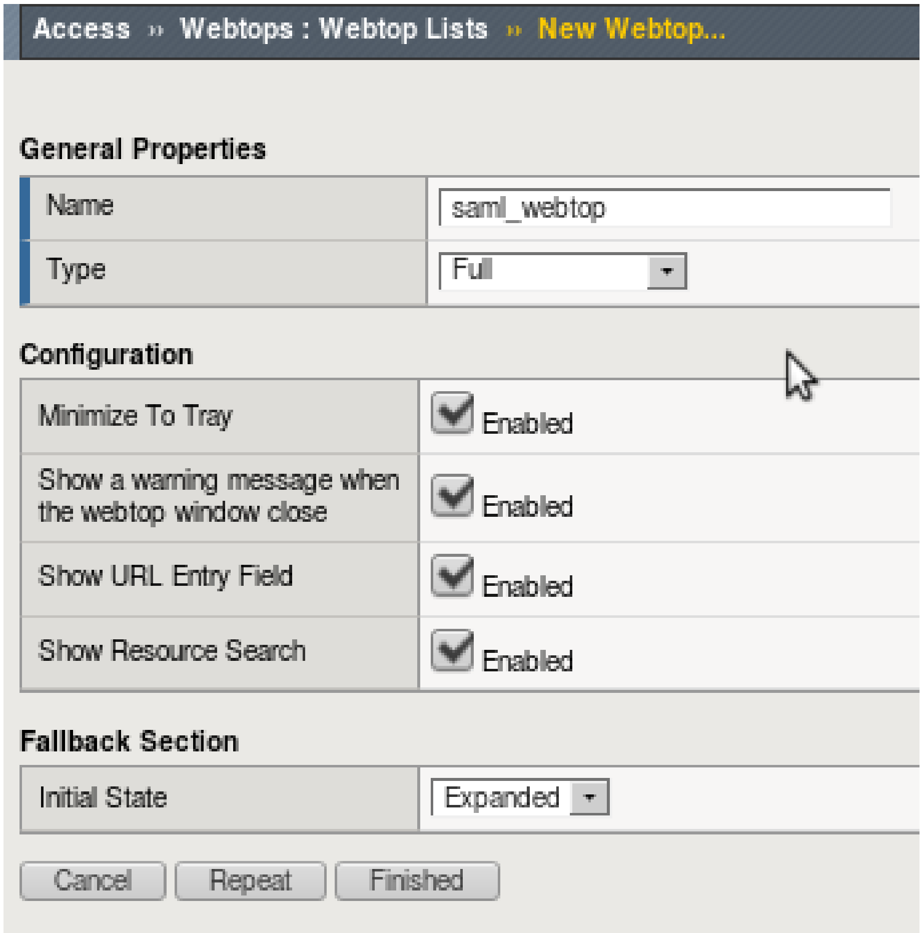
Task 1 - Create the SAML Webtop

1. Navigate to *Access* → *Webtops* → *Webtop Lists*
2. Click the + sign



3. Configure the following settings:

Property	Value
Name	saml_webtop
Type	full



Access » Webtops : Webtop Lists » New Webtop...

General Properties

Name	saml_webtop
Type	Full

Configuration

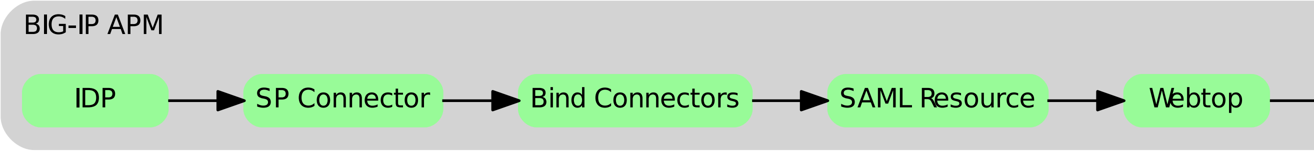
Minimize To Tray	☑ Enabled
Show a warning message when the webtop window close	☑ Enabled
Show URL Entry Field	☑ Enabled
Show Resource Search	☑ Enabled

Fallback Section

Initial State	Expanded

3. Click the *Finished* button.

4.3.6 Lab 1.6: Configure the Access Profile



The Access Profile defines the characteristics of how we authenticate and authorize a user using the BIG-IP platform. It controls things like what type logon page is presented to the user (if any at all), what language any dialog messages should be presented in, and – most importantly – the flow through which we limit access and assign resources.

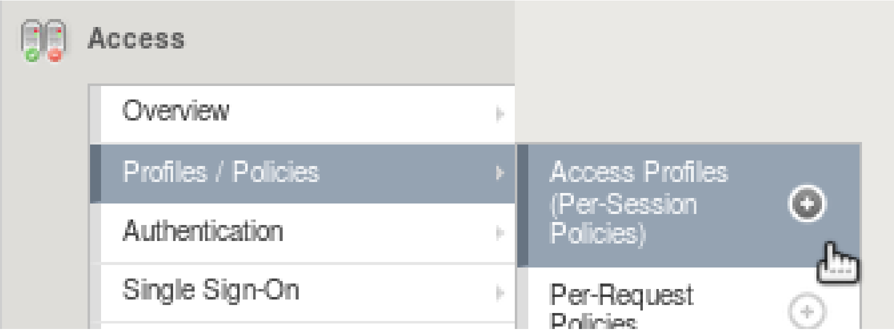
F5 BIG-IP Access Policy Manager supports two types of Access Policies:

1. Per-Session access policies
2. Per-Request access policies

The difference centers around how frequently a policy is evaluated, either once at time of initial logon or after every single HTTP request.

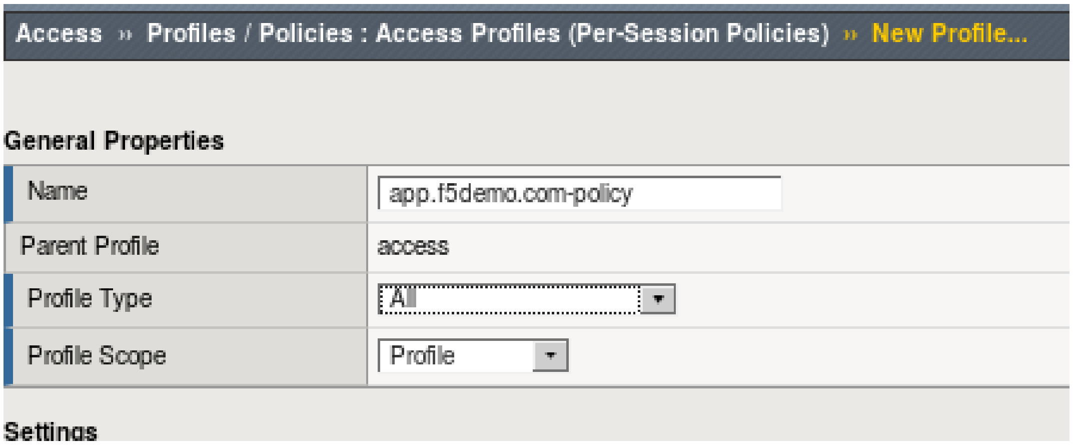
Task 1 - Create the Access Profile Object

1. Navigate to *Access* → *Profiles/Policies* → *Access Profiles (Per-Session Policies)*
2. Click the + sign



3. Configure the following settings:

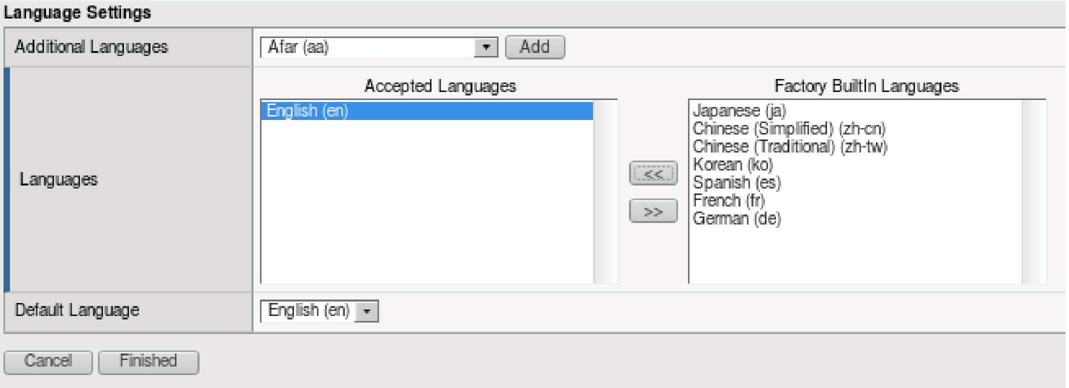
Property	Value
Name	idp.f5demo.com-policy
Profile Type	All
Languages	English (en)


Access » Profiles / Policies : Access Profiles (Per-Session Policies) » New Profile...

General Properties

Name	app.f5demo.com-policy
Parent Profile	access
Profile Type	All
Profile Scope	Profile

Settings



Language Settings

Additional Languages	Afar (aa) ▾ Add
Languages	Accepted Languages: English (en) << >> Factory BuiltIn Languages: Japanese (ja) Chinese (Simplified) (zh-cn) Chinese (Traditional) (zh-tw) Korean (ko) Spanish (es) French (fr) German (de)
Default Language	English (en) ▾

Cancel Finished

4. Click the *Finished* button.

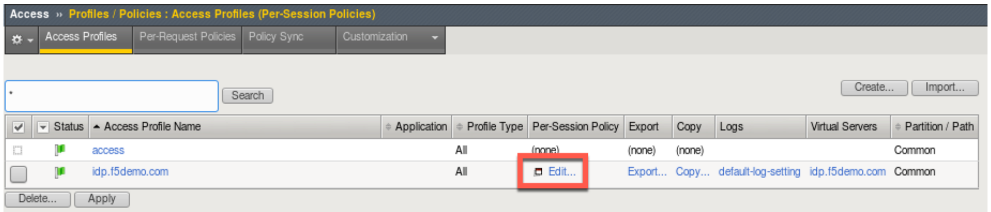
Task 2 - Configure the Access Policy Using the Visual Policy Editor

The Visual Policy Editor (VPE) is where the administrator configures the heart of the Access Policy. Using a flow chart methodology, it is easy to create robust policies without adding burdensome management overhead. Even significant policies can be easily read and understood.

1. **Open the Visual Policy Editor**

   (a) Navigate to *Access* → *Profiles/Policies* → *Access Profiles (Per-Session Policies)*

   (b) Click the *Edit. . .* link and the VPE will open in a new window

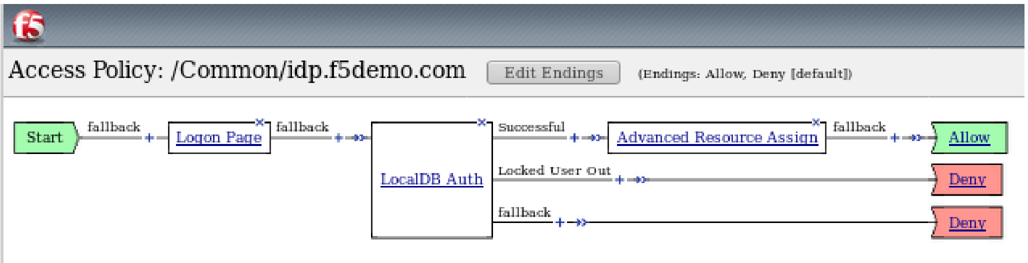


Access » Profiles / Policies : Access Profiles (Per-Session Policies)

☑	Status	Access Profile Name	Application	Profile Type	Per-Session Policy	Export	Copy	Logs	Virtual Servers	Partition / Path
□		access		All	(none)	(none)	(none)			Common
□		idp.f5demo.com		All	Edit...	Export...	Copy...	default-log-setting	idp.f5demo.com	Common

Delete... Apply

We'll build a policy like the one below:



Access Policy: /Common/idp.f5demo.com Edit Endings (Endings: Allow, Deny [default])

2. **Add a Logon Page**

   (a) Click on the + link after the *Start* node

   (b) Select the *Logon Page* tab and click the *Add Item* button

   (c) Use the default settings and click the *Save* button

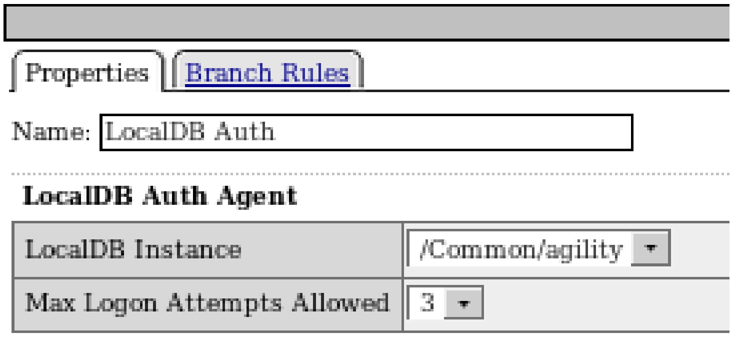
3. **Add an Authentication Mechanism**

   (a) Click on the + link after the *Logon Page* node

   (b) Select the *Authentication* tab and select *LocalDB Auth* then click the *Add Item* button

(c) Configure the following settings:

Property	Value
LocalDB Instance	/Common/agility



Name: LocalDB Auth

LocalDB Auth Agent

LocalDB Instance	/Common/agility
Max Logon Attempts Allowed	3

Note: The administrator can select from a variety of Authentication Mechanisms, including Active Directory and LDAP, among others. In this lab, the *LocalDB Auth* has been pre-configured.

(a) Click the *Save* button.

4. **Add Advanced Resource Assign**

   (a) Click on the + link on the successful branch after the *LocalDB Auth* node

   (b) Select the *Assignment* tab and select *Advanced Resource Assign* then click the *Add Item* button

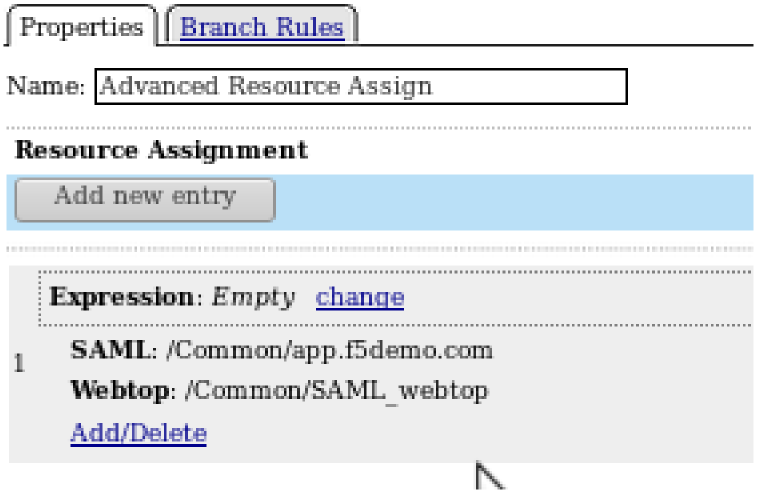
   (c) Click the *Add New Entry* button

   (d) Click the *Add/Delete* link

   (e) Select the *Webtop* tab and select the */Common/saml_webtop*

   (f) Select the *SAML* tab and select the */Common/app.f5demo.com*

   (g) Click the *Update* button, then click the *Save* button



Name: Advanced Resource Assign

Resource Assignment

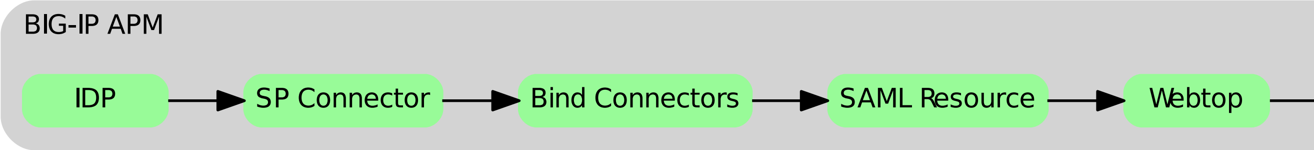
Expression: *Empty*

1 **SAML**: /Common/app.f5demo.com

Webtop: /Common/SAML_webtop

5. **Change the ending to Allow**
   (a) Click on the *Deny* ending after the *Advanced Resource Assign*
   (b) Select *Allow*
   (c) Click *Save*
6. **Apply Policy Changes**
   (a) Click the *Apply Access Policy* in top left next to the F5 red ball
   (b) Close browser tab

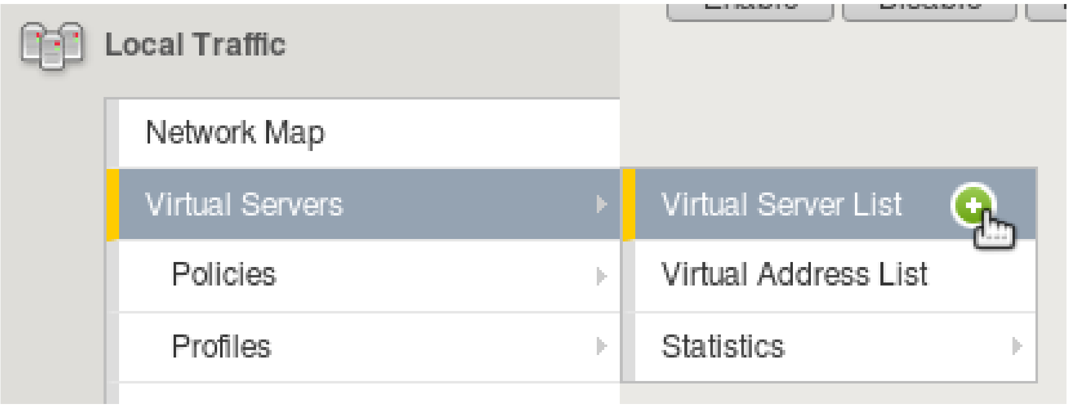
4.3.7 Lab 1.7: Create the Virtual Server



In order to access almost anything through an F5 BIG-IP, you must define a Virtual Server. The Virtual Server listens on the specified address and handles the requests either by making a load balancing decision or prompting for a logon (or both!).

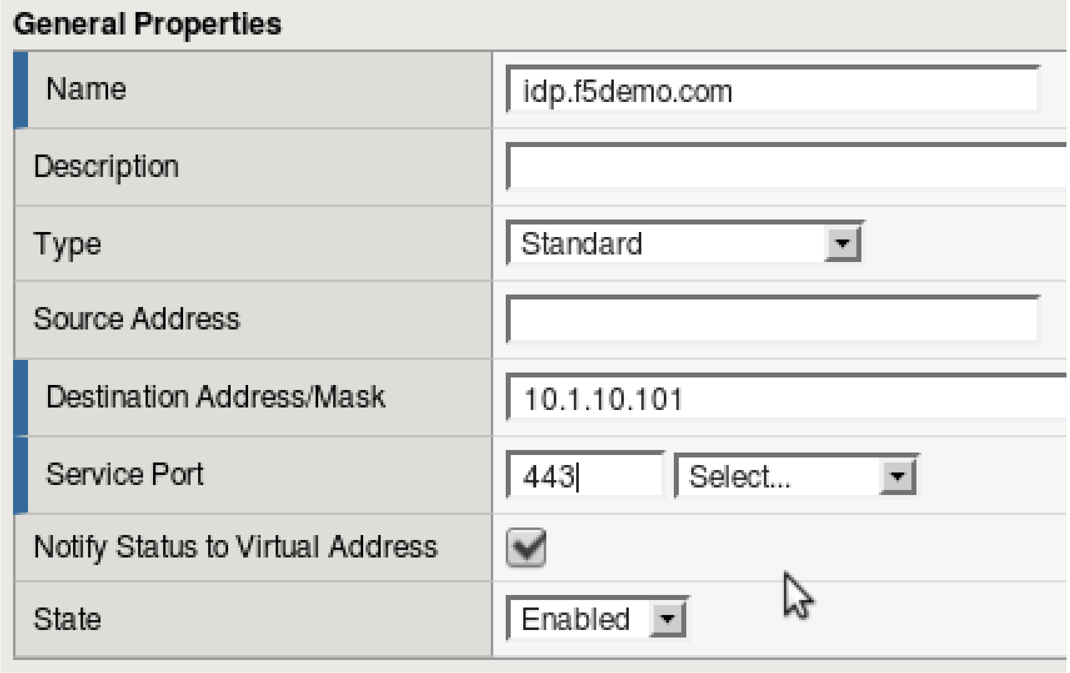
Task 1 - Create the Virtual Server

1. Navigate to *Local Traffic* → *Virtual Server List*
2. Click the + sign



2. Configure the *General Properties* settings:

General Properties	
Property	Value
Name	idp.f5demo.com
Destination Address/Mask	10.1.10.101
Service Port	443

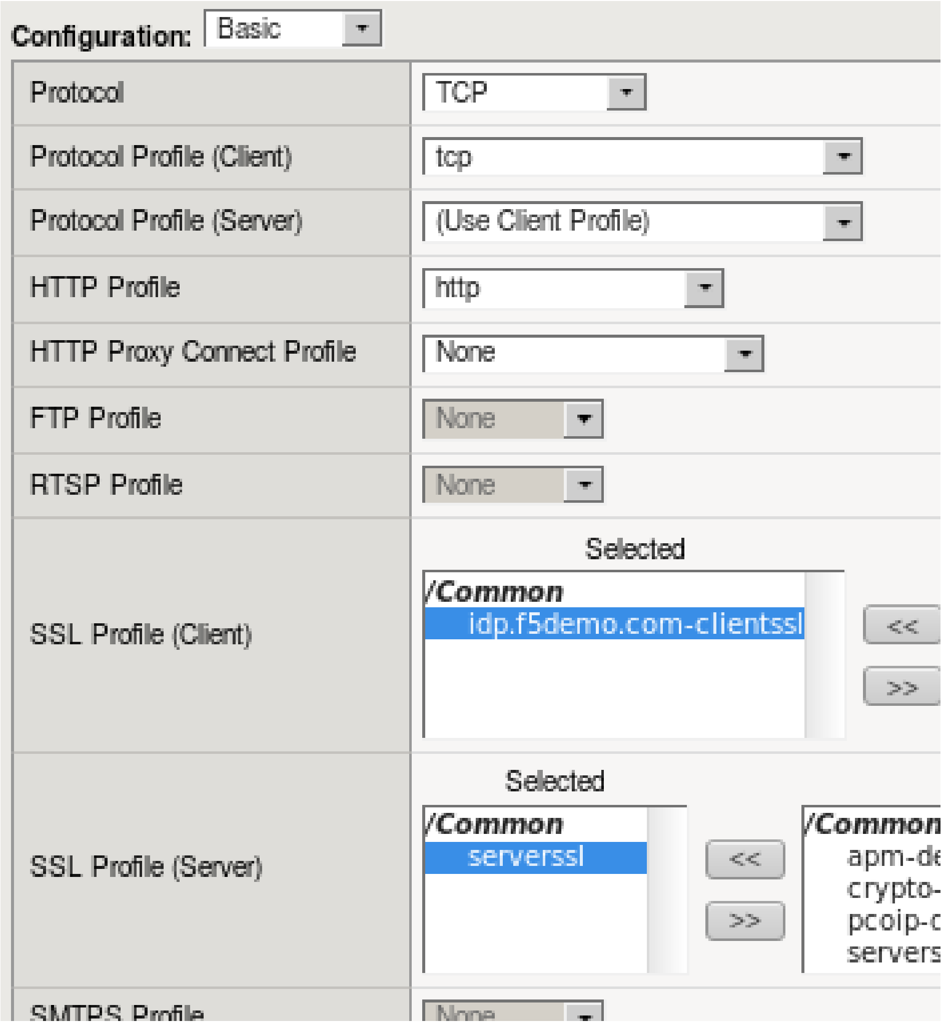


General Properties

Name	idp.f5demo.com
Description	
Type	Standard
Source Address	
Destination Address/Mask	10.1.10.101
Service Port	443 Select...
Notify Status to Virtual Address	☑
State	Enabled

3. Configure the *Configuration* settings:

Configuration	
Property	Value
HTTP Profile	http
SSL Profile (Client)	idp.f5demo.com-clientssl
SSL Profile (Server)	serverssl

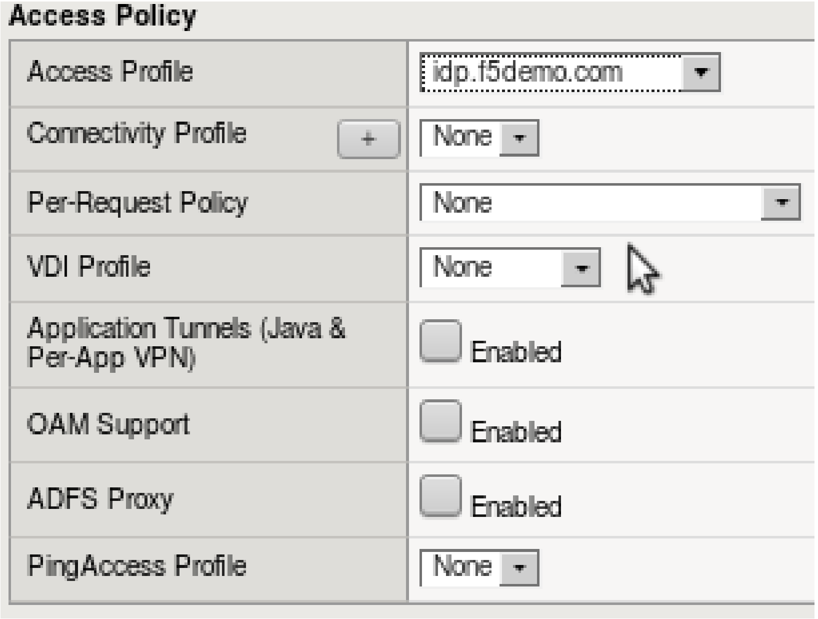


Configuration: Basic

Protocol	TCP
Protocol Profile (Client)	tcp
Protocol Profile (Server)	(Use Client Profile)
HTTP Profile	http
HTTP Proxy Connect Profile	None
FTP Profile	None
RTSP Profile	None
SSL Profile (Client)	Selected /Common idp.f5demo.com-clientssl
SSL Profile (Server)	Selected /Common serverssl
SMTPS Profile	None

4. Configure the *Access Policy* settings:

Access Policy	
Property	Value
Access Profile	idp.f5demo.com

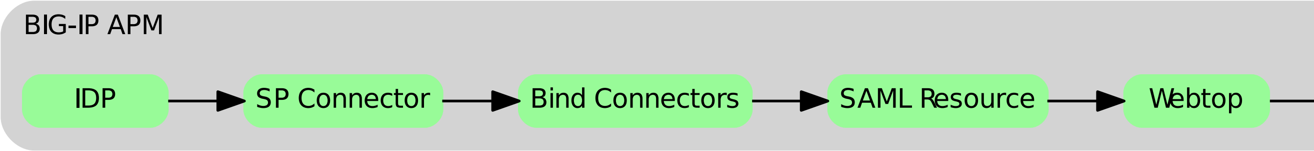


Access Policy

Access Profile	idp.f5demo.com
Connectivity Profile +	None
Per-Request Policy	None
VDI Profile	None
Application Tunnels (Java & Per-App VPN)	□ Enabled
OAM Support	□ Enabled
ADFS Proxy	□ Enabled
PingAccess Profile	None

5. Click the *Finished* button.

4.3.8 Lab 1.8: Test the SAML Configuration



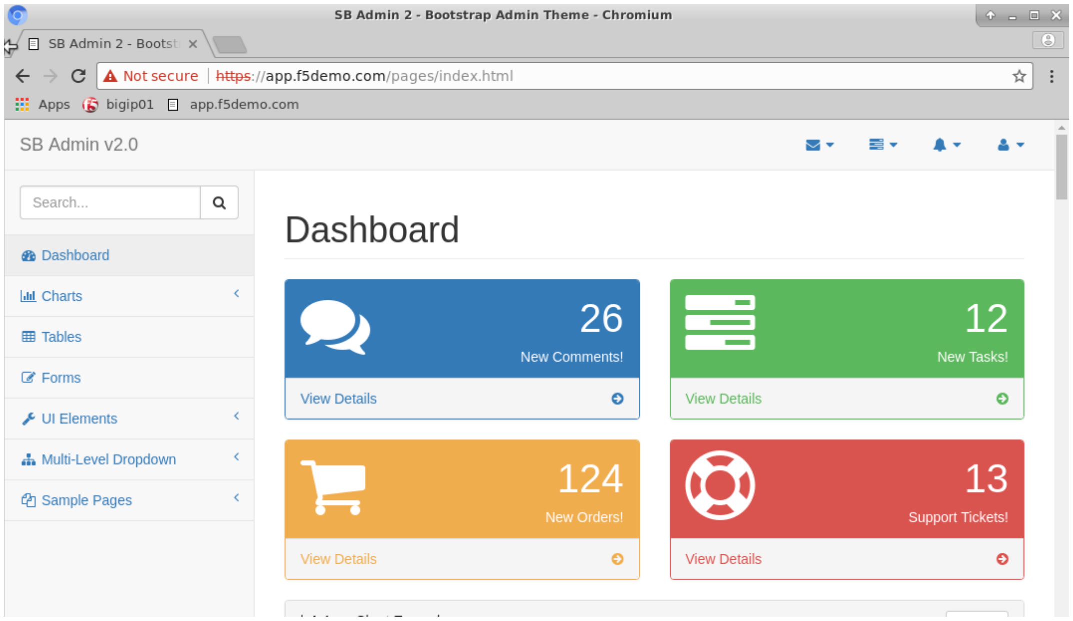
Now that we have all the pieces configured, the only thing left is to test and validate our setup to make sure it's working as expected.

Task 1 - Test SAML IdP

1. Open Chromium and navigate to https://app.f5demo.com
2. Notice how we've been redirected to the authentication page at https://. . .
3. Login with the test credentials below:

Username	Password
alice	agility

4. You should now see a demo application. If not, please step back through the configuration and make sure you did not mistype one of the settings



5. Close the Chromium browser

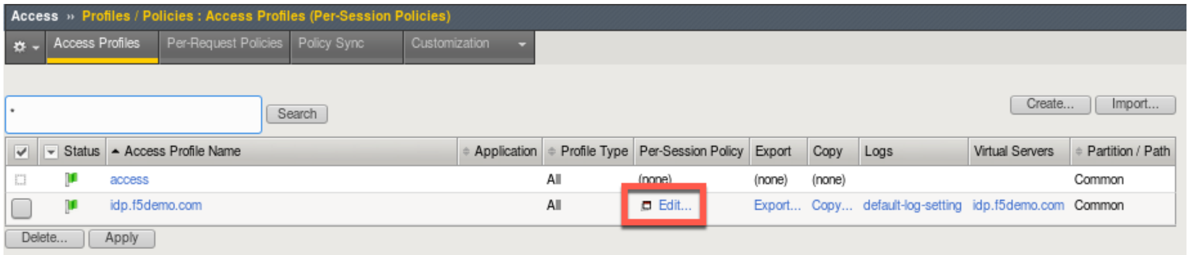
4.4 Module 2: Access Control

In this lab we will limit access to SaaS resources based on group membership.

4.4.1 Lab 2.1: Modify the Access Profile

Task 1 - Launching the Visual Policy Editor

1. Navigate to *Access* → *Profiles/Policies* → *Access Profiles (Per-Session Policies)*
2. Click the *Edit...* link



☑	Status	Access Profile Name	Application	Profile Type	Per-Session Policy	Export	Copy	Logs	Virtual Servers	Partition / Path
□	🟩	access		All	(none)	(none)	(none)			Common
□	🟩	idp.f5demo.com		All	Edit...	Export...	Copy...	default-log-setting	idp.f5demo.com	Common

Task 2 - Add a LocalDB Query

1. Click on the + sign after *LocalDB Auth* on the *Successful* branch
2. In the search field type *local*
3. Select *Local Database* and click the *Add Item* button

4. Configure the following settings:

Property	Value
LocalDB Instance	/Common/Agility

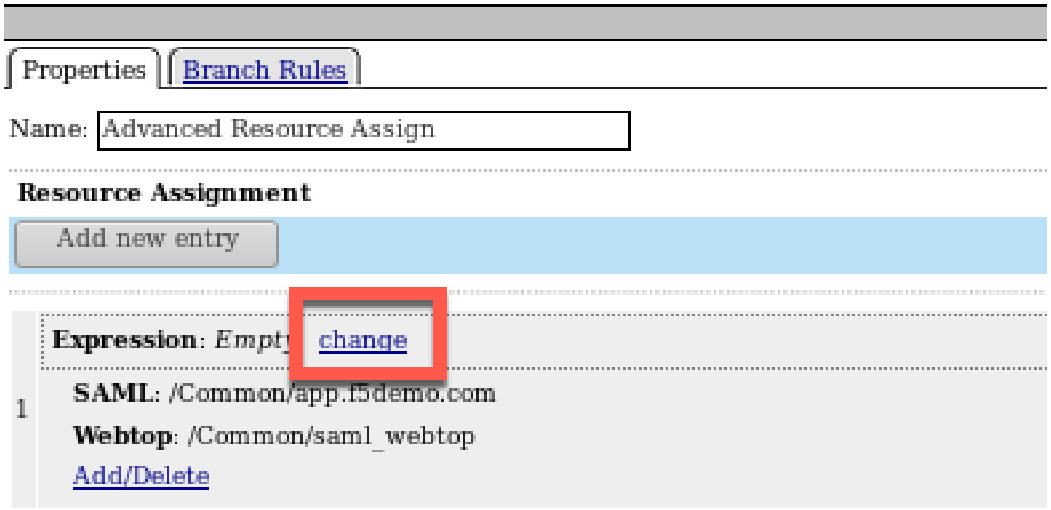
5. Click the *Add new entry button*
6. Configure the following settings:

Property	Value
Action	read
Destination	session.localdb.groups
Source	groups

7. Click the *Save* button

Task 3 - Modify the Advance Resource Assignment

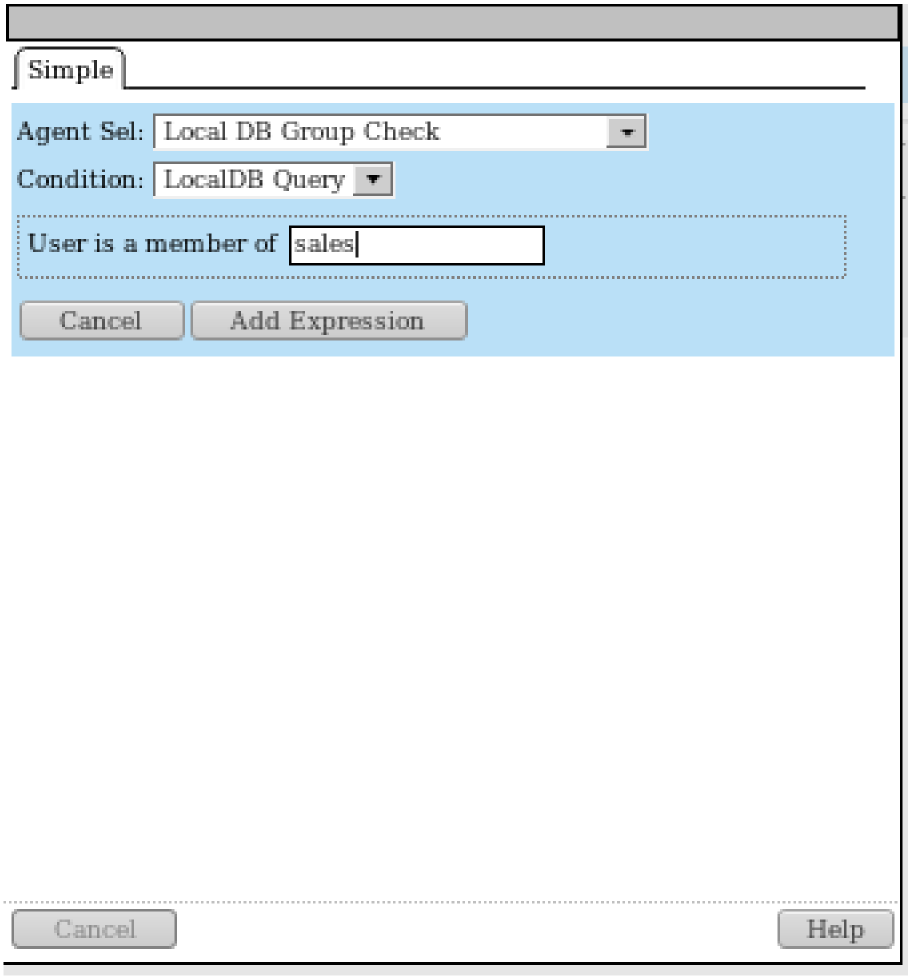
1. Click on *Advance Resource Assign*
2. Click on the *change* link



3. Click the *Add Expression* button
4. Configure the following settings:

Property	Value
Agent Sel	LocalDB Group Check
Condition	LocalDB Query
User is a member of	Sales

5. Click the *Add Expression* button



Agent Sel: Local DB Group Check

Condition: LocalDB Query

User is a member of sales

6. Click the *Finished* button
7. Click the *Save* button
8. Click the *Apply Access Policy* link in top left next to the F5 red ball

4.4.2 Lab 2.2: Test Access Control

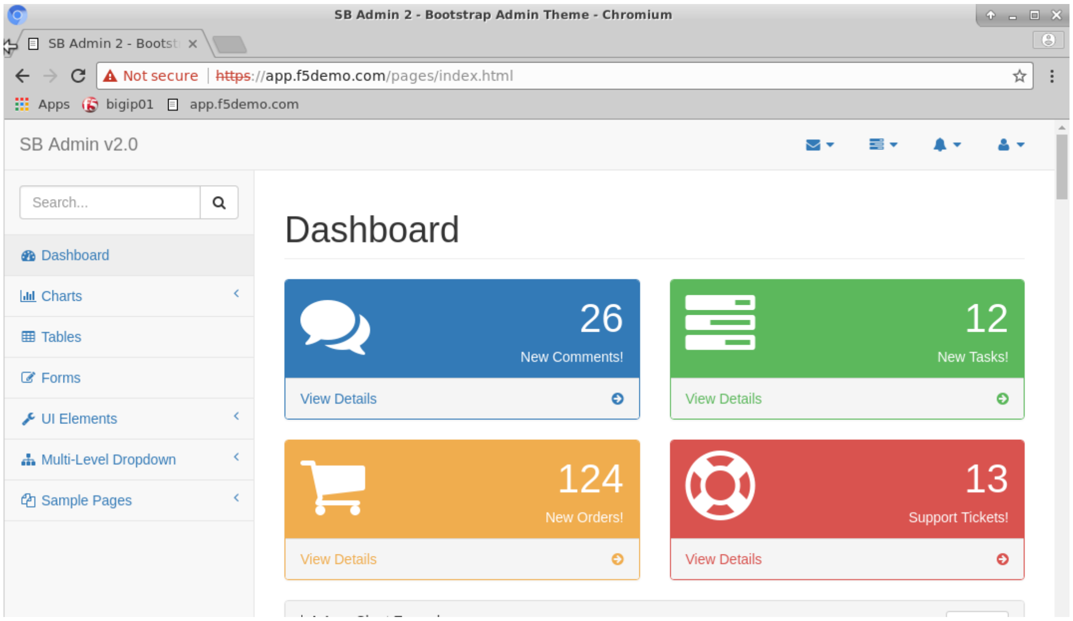
Now that you have your IdP configured we need to test it to make sure it is working as expected.

Task 1 - Test with an Authorized User

1. Open Chromium and navigate to https://app.f5demo.com
2. Login with the test credentials

Username	Password
alice	agility

3. You should now see a demo application.



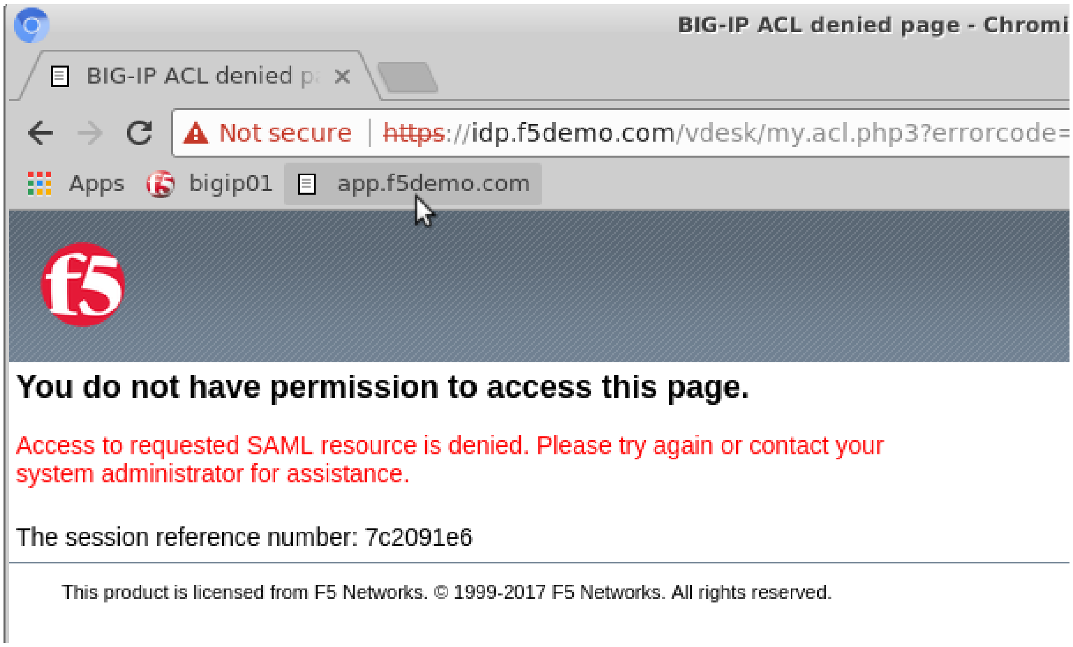
4. Click the user icon in the top right of the app and logout

Task 2 - Test with an Unauthorized User

1. Navigate to https://app.f5demo.com (you can click the bookmark)
2. Login with the test credentials

Username	Password
john	agility

3. You should now see an error page since John is not a member of the sales group


BIG-IP ACL denied page - Chromi
BIG-IP ACL denied p
Not secure
https://idp.f5demo.com/vdesk/my.acl.php3?errorcode=
Apps
bigip01
app.f5demo.com

You do not have permission to access this page.

Access to requested SAML resource is denied. Please try again or contact your system administrator for assistance.

The session reference number: 7c2091e6

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8. Close the Chromium browser

5 Class 5: AD FS Proxy Lab

This lab covers the following topics:

- Configuring AD FS Proxy Services on F5 BIG-IP

Expected time to complete: **2 hours**

To continue please review the information about the Lab Environment.

5.1 Getting Started

Please follow the instructions provided by the instructor to start your lab and access your jump host.

Note: All work for this lab can be performed exclusively from the Windows jumphost. No installation or interaction with your local system is required.

5.1.1 Lab Topology

The following components have been included in your lab environment:

- 1 x F5 BIG-IP VE (v13.1)
- 5 x Windows Server 2016

Lab Components

The following table lists VLANS, IP Addresses and Credentials for all components:

Component	VLAN/IP Address(es)	Credentials	Notes
BIGIP	- **Management:** 10.1.1.4 - **Internal:** 10.1.20.4 - **External:** 10.1.10.4 - **ADFS Proxy Virtual Server IP:** 10.1.10.100 - **ADFS Load Balancing Virtual Server IP:** 10.1.20.100	- `admin/admin` - `root/default`	Licensed with Best bundle, provisioned with LTM and APM. BIG-IP Version 13.1.
Client	- **Internal** 10.1.20.8	`user/user`	This is the client/jumphost used in the lab, it is domain joined. Windows Server 2016.
DC	- **Internal** 10.1.20.5	`admin/admin`	This is the domain controller and certificate authority. Windows Server 2016.
App	- **Internal** 10.1.20.10	`admin/admin`	Runs IIS with a claims app that is federated to ADFS. Windows Server 2016.
ADFS-1	- **Internal** 10.1.20.6	`admin/admin`	Primary ADFS farm node. Windows Server 2016.
ADFS-2	- **Internal** 10.1.20.7	`admin/admin`	Secondary ADFS farm node. Windows Server 2016.

5.2 Module: Connect and Validate Environment

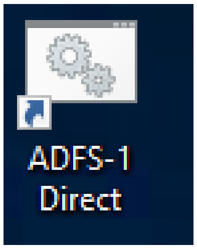
In this module you will validate that ADFS and the application that requests ADFS authentication are functioning without the BIG-IP in the traffic flow.

5.2.1 Open an RDP session to the client machine

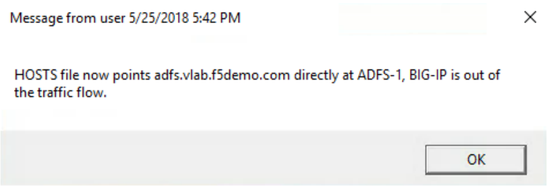
1. Open an RDP session to the client jumphost
2. Login with username: user and password: user

5.2.2 Change Client to Point at ADFS-1 Direct (BIG-IP not in traffic flow)

1. Double click the "ADFS-1 Direct" desktop shortcut



2. You should receive a notification that the HOSTS file now points adfs.vlab.f5demo.com directly at the ADFS-1 server.

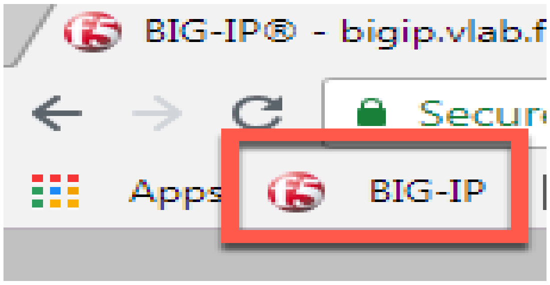


Message from user 5/25/2018 5:42 PM

HOSTS file now points adfs.vlab.f5demo.com directly at ADFS-1, BIG-IP is out of the traffic flow.

5.2.3 Open the BIG-IP Management Interface

1. Open Chrome
2. Click the BIG-IP shortcut

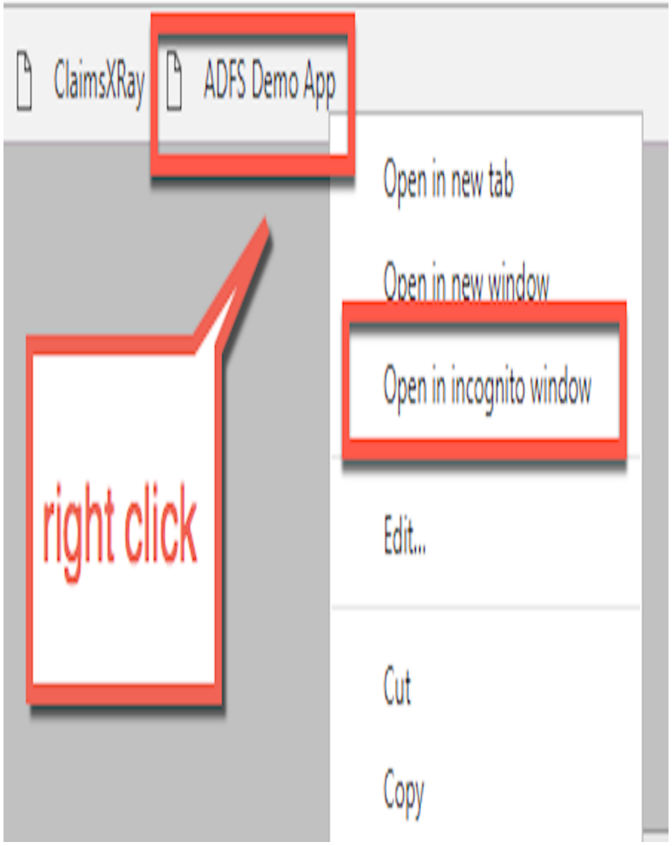


3. Login with username: admin and password: admin
4. Nothing needs to be done here now, you are only validating you can access the BIG-IP.

5.2.4 Verify ADFS and App are Functional

1. Close any open Chrome incognito windows
2. Open Chrome if not already open
3. Right click the “ADFS Demo App” shortcut and click “open in incognito window”

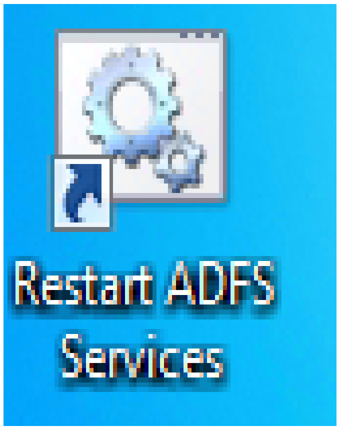
VERY IMPORTANT: For all testing in this lab, close all incognito windows first, then open a new one for your test. This will ensure you do not have issues related to cache or cookies.



4. You should see a set of claims displayed in the claims app at app.vlab.f5demo.com

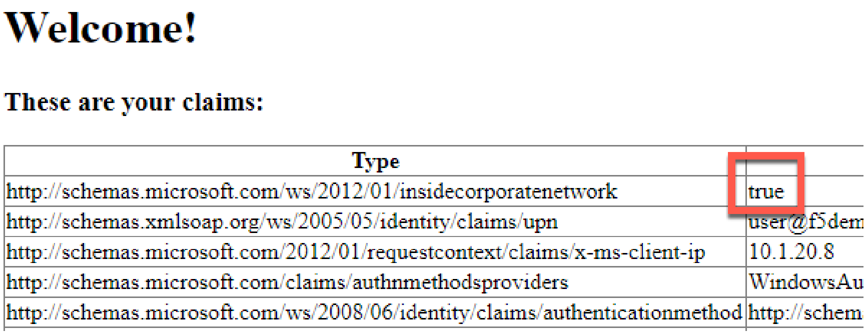
If the request failed and you do not see claims then the ADFS-1 Windows server may not have started correctly or

Option 1: You can restart services on the ADFS servers from your client with the shortcut on the desktop. This is the fastest option.



Option 2: You can restart the ADFS-1 and then ADFS-2 servers. This is much slower.

You should now see the following:



Welcome!

These are your claims:

Type	
http://schemas.microsoft.com/ws/2012/01/insidecorporatenetwork	true
http://schemas.xmlsoap.org/ws/2005/05/identity/claims/upn	user@f5dem
http://schemas.microsoft.com/2012/01/requestcontext/claims/x-ms-client-ip	10.1.20.8
http://schemas.microsoft.com/claims/authnmethodsproviders	WindowsAu
http://schemas.microsoft.com/ws/2008/06/identity/claims/authenticationmethod	http://schem

5. Note that ADFS identified the user as inside the corporate network because they did not go through an MS-ADFSPIP compliant proxy.
6. What happened:
   (a) You made a request to App
   (b) App redirected you to ADFS for authentication
   (c) ADFS authenticated you automatically with Windows Integrated Authentication with your domain joined computer
   (d) ADFS redirected you back to App with a WS-Fed assertion
   (e) App validated the assertion and displayed the claims it received from ADFS

You should close all browser windows in the client and repeat these steps to validate ADFS-2 using the desktop shortcut labeled "ADFS-2 Direct". If it fails, use the desktop shortcut to restart ADFS services as noted above.

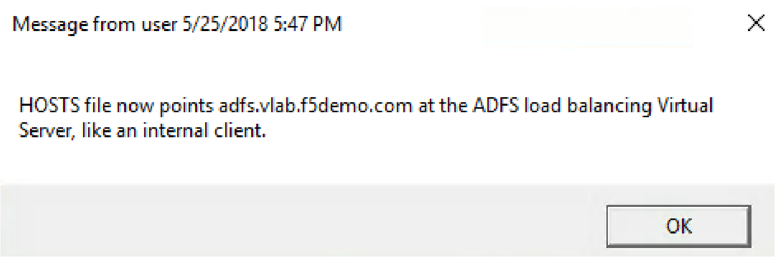
5.3 Module: Deploy ADFS Load Balancing Services

In this module you will deploy simple load balancing of ADFS for internal users. No proxy services are needed for internal users.

5.3.1 Change Client to Point at BIG-IP Load Balancing Virtual Server

1. Double click the BIG-IP ADFS Load Balancer desktop shortcut

2. You should see that the HOSTS file now points ADFS at the load balancing virtual server (which is not yet created)



Message from user 5/25/2018 5:47 PM

HOSTS file now points adfs.vlab.f5demo.com at the ADFS load balancing Virtual Server, like an internal client.

3. Close any open Chrome incognito windows
4. Open a new Chrome window if not already open.
5. Right click the "ADFS Demo App shortcut" and open a new incognito window
   (a) It should fail because you cannot access ADFS through the BIG-IP until you deploy the configuration.
   (b) If it is still working, you may need to close Chrome and/or retry the HOSTS file shortcut.

5.3.2 Deploy ADFS iApp for ADFS Load Balancing

1. Open the BIG-IP configuration interface
2. Open Local Traffic -> Virtual Servers and notice nothing is deployed
3. Open iApps -> Application Services -> Applications
4. Click Create

Accept all default values except for those listed below.

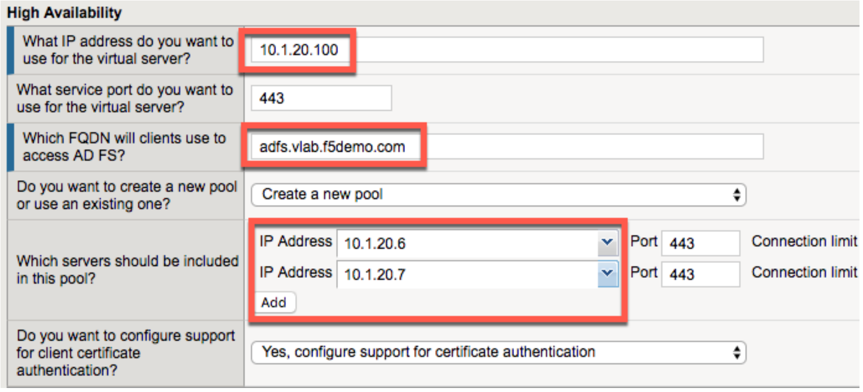
5. **Name**: **adfs-lb**
6. **Template**: **f5.microsoft_adfs.v1.2.0rc7**
7. **SSL Encryption**
   (a) **How should the BIG-IP system handle SSL traffic?**
      i. **Encrypted traffic is forwarded without decryption (SSL pass-through)**

SSL Pass-Through is chosen because Microsoft requires it for supported load balancing of ADFS. SSL Bridging breaks the connectivity between WAP servers and ADFS servers because client certificate authentication is required. You can use SSL Bridging if you will not point WAP servers at your deployment but following Microsoft's guidelines and using SSL Pass-Through is recommended.

8. **High Availability**
   (a) **What IP address do you want to use for the virtual server?**
      i. **10.1.20.100**

10.1.20.x is the internal network in this environment.

1. **Which FQDN will clients use to access AD FS?**
   (a) **adfs.vlab.f5demo.com**
2. **Which servers should be included in this pool?**
   (a) **10.1.20.6**
   (b) Click Add
   (c) **10.1.20.7**



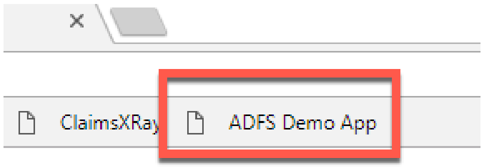
High Availability

What IP address do you want to use for the virtual server?	10.1.20.100
What service port do you want to use for the virtual server?	443
Which FQDN will clients use to access AD FS?	adfs.vlab.f5demo.com
Do you want to create a new pool or use an existing one?	Create a new pool
Which servers should be included in this pool?	IP Address 10.1.20.6 Port 443 Connection limit IP Address 10.1.20.7 Port 443 Connection limit Add
Do you want to configure support for client certificate authentication?	Yes, configure support for certificate authentication

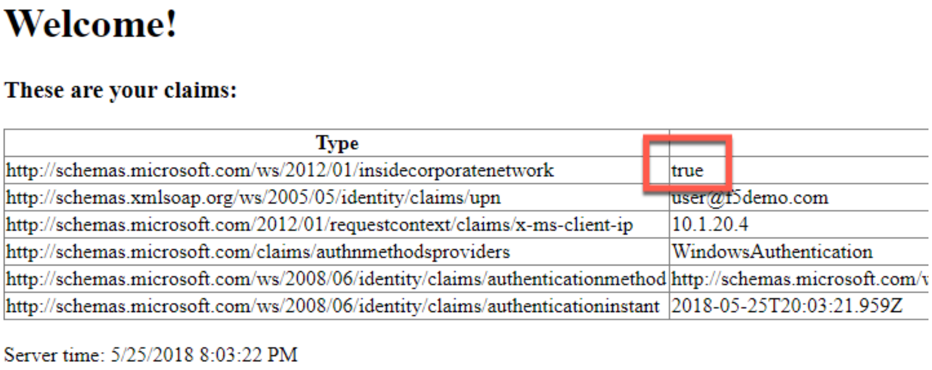
9. Click Finished

5.3.3 Test the ADFS Load Balancing Functionality

1. Close any open Chrome incognito windows
2. Open a new Chrome window if not already open
3. Right click the “ADFS Demo App” shortcut and open in an incognito window



4. You should see a set of claims displayed in the claims app at app.vlab.f5demo.com



Welcome!

These are your claims:

Type	
http://schemas.microsoft.com/ws/2012/01/insidecorporatenetwork	true
http://schemas.xmlsoap.org/ws/2005/05/identity/claims/upn	user@f5demo.com
http://schemas.microsoft.com/2012/01/requestcontext/claims/x-ms-client-ip	10.1.20.4
http://schemas.microsoft.com/claims/authnmethodsproviders	WindowsAuthentication
http://schemas.microsoft.com/ws/2008/06/identity/claims/authenticationmethod	http://schemas.microsoft.com/w
http://schemas.microsoft.com/ws/2008/06/identity/claims/authenticationinstant	2018-05-25T20:03:21.959Z

Server time: 5/25/2018 8:03:22 PM

1. Note that ADFS is still identifying the user as inside the corporate network because the user did not go through an MS-ADFSPIP compliant proxy solution.
2. What happened:
   (a) You made a request to App
   (b) App redirected you to ADFS for authentication
   (c) **The BIG-IP received the request and load balanced it to one of the ADFS servers (this is the only change from last time)**

   (d) ADFS authenticated you automatically with Windows Integrated Authentication with your domain joined computer
   (e) ADFS redirected you back to App with a WS-Fed assertion
   (f) App validated the assertion and displayed the claims it received from ADFS

5.3.4 Review the ADFS Load Balancing Configuration

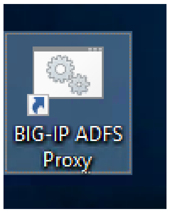
1. Go to Local Traffic -> Virtual Servers
2. Notice there are two deployed, one on port 443 and one on port 49443
   (a) 443 is for ADFS traffic
      i. Pool members use port 443
   (b) 49443 is for client certificate auth support
      i. Pool members use port 49443

5.4 Module: Deploy ADFS Proxy Services

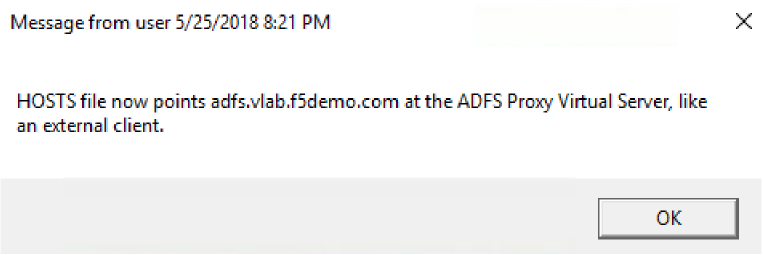
In this module you will deploy ADFS Proxy functionality. The BIG-IP will perform the same role in front of ADFS as a Web Application Proxy (WAP) server does, supporting the protocol MS-ADFSPIP.

5.4.1 Change Client to Point at BIG-IP ADFS Proxy Virtual Server

1. Double click the BIG-IP ADFS Load Balancer desktop shortcut



2. You should see that the HOSTS file now points ADFS at the load balancing virtual server (which is not yet created)


Message from user 5/25/2018 8:21 PM

HOSTS file now points adfs.vlab.f5demo.com at the ADFS Proxy Virtual Server, like an external client.

3. Close any open Chrome incognito windows
4. Open a new Chrome window if not already open
5. Right click the “ADFS Demo App” shortcut and open a new incognito window
   (a) It should fail because you cannot access ADFS through the BIG-IP until you deploy the configuration.

   (b) If it is still working, you may need to close Chrome and/or retry the HOSTS file shortcut.

5.4.2 Deploy ADFS iApp for ADFS Proxy (with MS-ADFSPIP support)

1. Open the BIG-IP configuration interface
2. Open iApps -> Application Services -> Applications
3. Click Create

Accept all default values except for those listed below.

4. **Name**: **adfs-proxy**
5. **Template**: **f5.microsoft_adfs.v1.2.0rc7**
6. **Access Policy Manager (BIG-IP APM)**
   (a) **Would you like to configure BIG-IP as an ADFS Proxy?**
      i. **Yes, configure BIG-IP as an ADFS Proxy**
   (b) **What is the account to be used for establishing proxy trust with ADFS?**
      i. **admin@f5demo.com**
   (c) **What is the password associated with that account?**
      i. **admin**

Establishing trust with ADFS requires username in UPN or domain\username format. This is true whether in the iApp or establishing trust manually.

7. **SSL Encryption**
   (a) **Which SSL certificate do you want to use?**
      i. **internal-vlab.f5demo.com.crt**
   (b) **Which SSL private key do you want to use?**
      i. **internal-vlab.f5demo.com.key**

Note that this time we are doing SSL Bridging. This is required for the ADFS Proxy. Client certificate authentication can still be performed because BIG-IP supports MS-ADFSPIP.

8. **High Availability**
   (a) **What IP address do you want to use for the virtual server?**
      i. **10.1.10.100**

   10.1.10.x is the external/DMZ network in this environment. Notice this is .10 not .20 this time.

1. **Which FQDN will clients use to access AD FS?**
   (a) **adfs.vlab.f5demo.com**
2. **Which servers should be included in this pool?**
   (a) **10.1.20.6**
   (b) Click Add
   (c) **10.1.20.7**
3. **What Trusted CA would you like to use to validate the client certificate chain presented during certificate authentication?**

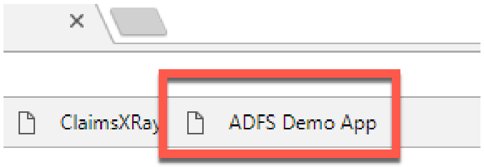
(a) **F5demo-DC-CA.crt**

This is the AD Certificates Services CA certificate for this environment that was used to issue the client certificates so that the client certificate auth can be verified. It was pre-imported for you.

9. Click Finished

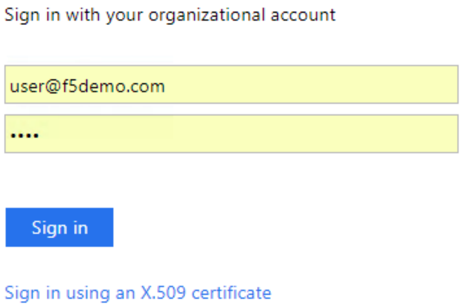
5.4.3 Test the ADFS Proxy Forms Authentication Functionality

1. Close any open Chrome incognito windows
2. Open a new Chrome window if not already open
3. Right click the "ADFS Demo App" shortcut and open a new incognito window



If you do not get the ADFS logon page noted below wait 60-120 seconds for the ADFS servers to sync and try again. If you are still getting the error you may have cache problems. Double check that you have closed all other incognito windows before trying this, and you can clear cache and cookies by performing ctrl+shift+del and selecting "all time".

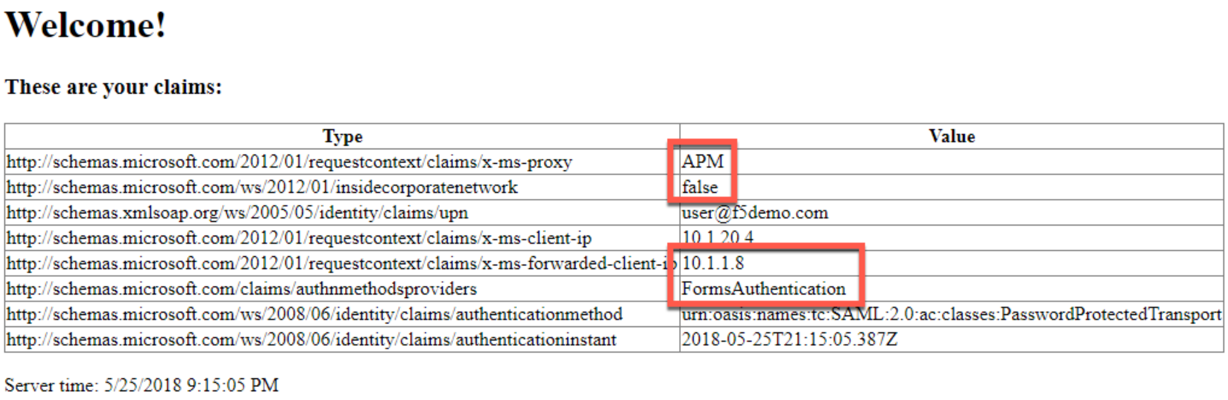
1. This time instead of automatically authenticating with Windows Integrated Authentication you are presented with a forms login page. This is because ADFS is configured to require Forms auth for external users.
   (a) Username: **user@f5demo.com**
   (b) Password: **user**
   (c) Click Sign In


Sign in with your organizational account

user@f5demo.com

••••

1. You should see a set of claims displayed in the claims app at app.vlab.f5demo.com



Welcome!

These are your claims:

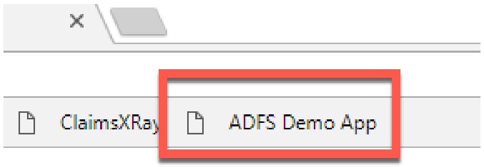
Type	Value
http://schemas.microsoft.com/2012/01/requestcontext/claims/x-ms-proxy	APM
http://schemas.microsoft.com/ws/2012/01/insidecorporatenetwork	false
http://schemas.xmlsoap.org/ws/2005/05/identity/claims/upn	user@f5demo.com
http://schemas.microsoft.com/2012/01/requestcontext/claims/x-ms-client-ip	10.1.20.4
http://schemas.microsoft.com/2012/01/requestcontext/claims/x-ms-forwarded-client-ip	10.1.1.8
http://schemas.microsoft.com/claims/authnmethodsproviders	FormsAuthentication
http://schemas.microsoft.com/ws/2008/06/identity/claims/authenticationmethod	urn:oasis:names:tc:SAML:2.0:ac:classes:PasswordProtectedTransport
http://schemas.microsoft.com/ws/2008/06/identity/claims/authenticationinstant	2018-05-25T21:15:05.387Z

Server time: 5/25/2018 9:15:05 PM

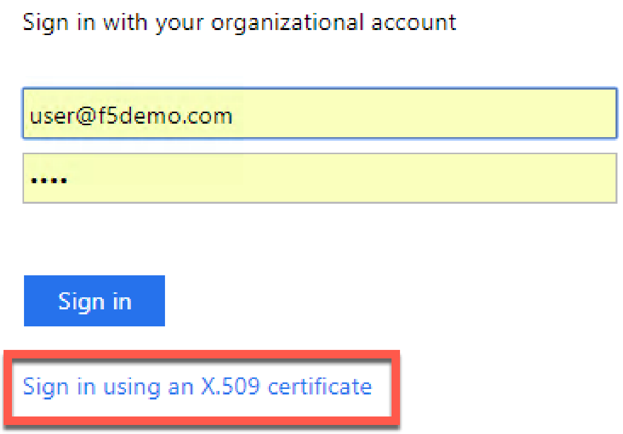
1. Note that ADFS now identifies the user as outside the corporate network, knows that APM acted as an ADFS Proxy, knows the user's true IP address, and that the user is now logging in with FormsAuthentication instead of WindowsAuthentication.
2. What happened:
   (a) You made a request to App
   (b) App redirected you to ADFS for authentication
   (c) **The BIG-IP received the request and load balanced it to one of the ADFS servers, as well as communicated data about the traffic using MS-ADFSPIP.**
   (d) **The ADFS server determined that you should be authenticated using the extranet policy and sent back a logon page which the BIG-IP forwarded on to you.**
   (e) **You submitted the forms and ADFS authenticated with your credentials**
   (f) ADFS redirected you back to App with a WS-Fed assertion
   (g) App validated the assertion and displayed the claims it received from ADFS

5.4.4 Test the ADFS Proxy Certificate Authentication Functionality

1. Close any open Chrome incognito windows
2. Open a new Chrome window if not already open
3. Right click the "ADFS Demo App" shortcut and open a new incognito window



1. Click **Sign in using an X.509 certificate**



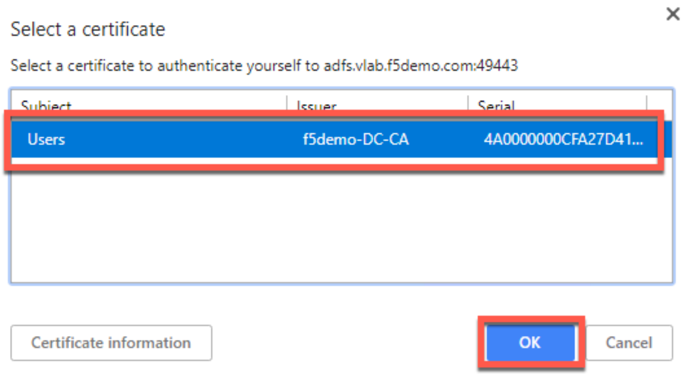
Sign in with your organizational account

user@f5demo.com

••••

1. Note that you can configure ADFS extranet authentication settings to perform certificate authentication automatically. The ADFS server in this lab is setup to allow both forms and certificate authentication.

1. The certificate is already selected, click OK.

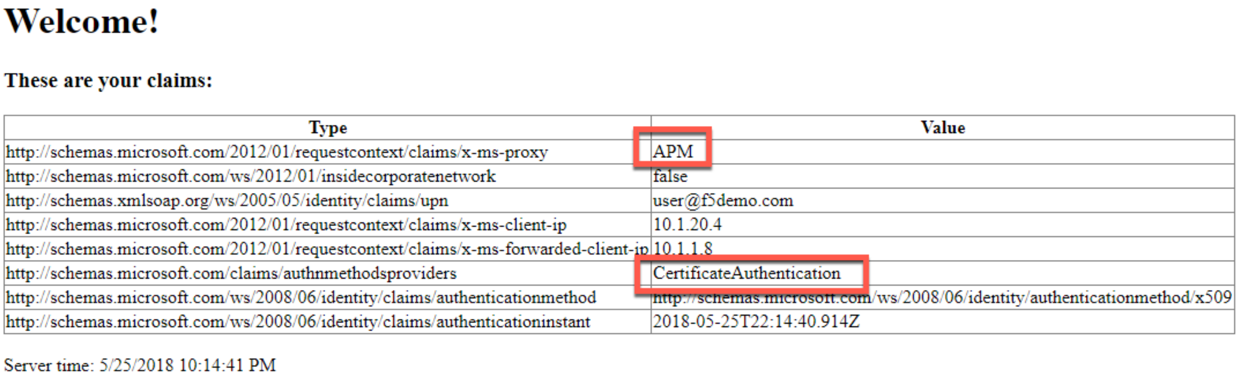


Select a certificate

Select a certificate to authenticate yourself to adfs.vlab.f5demo.com:49443

Subject	Issuer	Serial
Users	f5demo-DC-CA	4A0000000CFA27D41...

1. You should see a set of claims displayed in the claims app at app.vlab.f5demo.com



Welcome!

These are your claims:

Type	Value
http://schemas.microsoft.com/2012/01/requestcontext/claims/x-ms-proxy	APM
http://schemas.microsoft.com/ws/2012/01/insidecorporatenetwork	false
http://schemas.xmlsoap.org/ws/2005/05/identity/claims/upn	user@f5demo.com
http://schemas.microsoft.com/2012/01/requestcontext/claims/x-ms-client-ip	10.1.20.4
http://schemas.microsoft.com/2012/01/requestcontext/claims/x-ms-forwarded-client-ip	10.1.1.8
http://schemas.microsoft.com/claims/authnmethodsproviders	CertificateAuthentication
http://schemas.microsoft.com/ws/2008/06/identity/claims/authenticationmethod	http://schemas.microsoft.com/ws/2008/06/identity/authenticationmethod/x509
http://schemas.microsoft.com/ws/2008/06/identity/claims/authenticationinstant	2018-05-25T22:14:40.914Z

Server time: 5/25/2018 10:14:41 PM

1. Note that ADFS now ADFS has identified the authentication type as CertificateAuthentication

2. What happened:

   (a) You made a request to App

   (b) App redirected you to ADFS for authentication

   (c) **The BIG-IP received the request and load balanced it to one of the ADFS servers, as well as communicated data about the traffic using MS-ADFSPIP.**

(d) **The ADFS server determined that you should be authenticated using the extranet policy and sent back a logon page which the BIG-IP forwarded on to you.**

(e) **You selected the Certificate Authentication, which caused you to be redirected to port 49443 where the BIG-IP performed certificate authentication**

(f) **BIG-IP forwarded on details about your authentication using MS-ADFSPIP to the ADFS server**

(g) ADFS redirected you back to App with a WS-Fed assertion

(h) App validated the assertion and displayed the claims it received from ADFS

5.4.5 Review the ADFS Proxy Configuration

1. Go to Local Traffic -> Virtual Servers
2. Notice there are two adfs-proxy virtual servers deployed, one on port 443 and one on port 49443

   (a) 443 is for ADFS traffic

      i. Pool members use port 443

   (b) 49443 is for client certificate auth support

      i. Pool members use **port 443**

         A. **This is different from the load balancing only, which pointed to port 49443. This is because the certificate auth is not passing through, BIG-IP is performing the certificate auth, then sending the data along to ADFS using MS-ADFSPIP.**

   (a) Click on the virtual server **adfs-proxy_adfs_vs_443**

      i. Scroll down and examine the Access Policy -> ADFS Proxy configuration item

         A. Note that ADFS Proxy functionality is enabled and a trust is established. The BIG-IP will auto-renew this prior to expiration.

         B. Note that no Access Profile is deployed. You can add one if desired for additional security. The iApp is capable of deploying it, along with the required bypass iRule for some URLs like the metadata sharing URL.

   (b) Go to Local Traffic -> Profiles -> SSL -> Server and click **adfs-proxy_server-ssl**

      i. Note that a certificate and key are used on the server side. These are created as part of establishing the trust with the ADFS server as noted in the previous step and then automatically input here.

      ii. This is shared by both the 443 and the 49443 virtual servers because they need the same settings to communicate with ADFS.

   (c) Change configuration mode to advanced

      i. Note that the server name field contains adfs.vlab.f5demo.com. ADFS requires SNI and this is how you configure it on the serverssl profile.

   (d) Go to Local Traffic -> Profiles -> SSL -> Client and click **adfs-proxy_client-ssl-cert-auth**

      i. This is the SSL profile that provides certificate auth on the port 49443 virtual server.

      ii. Note that Client Certificate is set to required and the Trusted Certificate Authorities is set to f5demo-DC-CA.

iii. You could use Advertised Certified Authority here if you wanted the client to only display certificates generated by a specific CA. This could be your primary CA, or even a specific subordinate CA if you wanted to issue client certificate auth user certificates from a specific CA to reduce the number shown to the user.

5.5 Module: Additional Information and Troubleshooting Tips

It is possible to implement an APM profile in front of the ADFS server. The deployment guide covers requirements, or you can select to deploy an APM profile in the iApp and it will handle everything including the required selective APM bypass iRule and SSO into ADFS.

When logging in to the default APM logon page, you do not need to specify the domain like you do on the ADFS logon page, just typing "user" (the samAccountName) will be sufficient. You can customize the APM logon page to accept samAccountName, UPN, or domain\username if desired.

The service that handles the MS-ADFSPIP trust relationship is adfs_proxy. You can restart this service if needed with the following CLI command: bigstart restart adfs_proxy.

If you cannot establish trust, it could be because the primary ADFS server is offline. The primary ADFS server in the farm must be functioning or new WAPs/Proxies cannot establish trust.

Microsoft provides a service called ClaimsXRay at https://adfshelp.microsoft.com that is very useful for troubleshooting ADFS related issues. There is a shortcut to it on your Chrome browser. The shortcut is configured to populate the values for ClaimsXRay for this lab environment so that you do not need to enter them into the webpage manually. It will redirect to your ADFS environment, where you can authenticate, then send you to ClaimsXRay where you can examine the claims.

For more information on this solution, go here: https://devcentral.f5.com/articles/ad-fs-proxy-replacement-on-f5-big-ip-30191

For the deployment guide, go here: https://f5.com/solutions/deployment-guides/microsoft-active-directory-federation-services-big-ip-v11-ltm-apm

5.6 Conclusion

5.6.1 Learn More

Links & Information

- **Microsoft Active Directory Federation Services Deployment Guide:**

  https://f5.com/solutions/deployment-guides/microsoft-active-directory-federation-services-big-ip-v11-ltm-apm

- **DevCentral: ADFS Proxy Replacement on F5 BIG-IP:**

  https://devcentral.f5.com/articles/ad-fs-proxy-replacement-on-f5-big-ip-30191

6 Class 6: Federating Common Services

Welcome to the Common Federation lab at F5 Agility 2018

6.1 Welcome

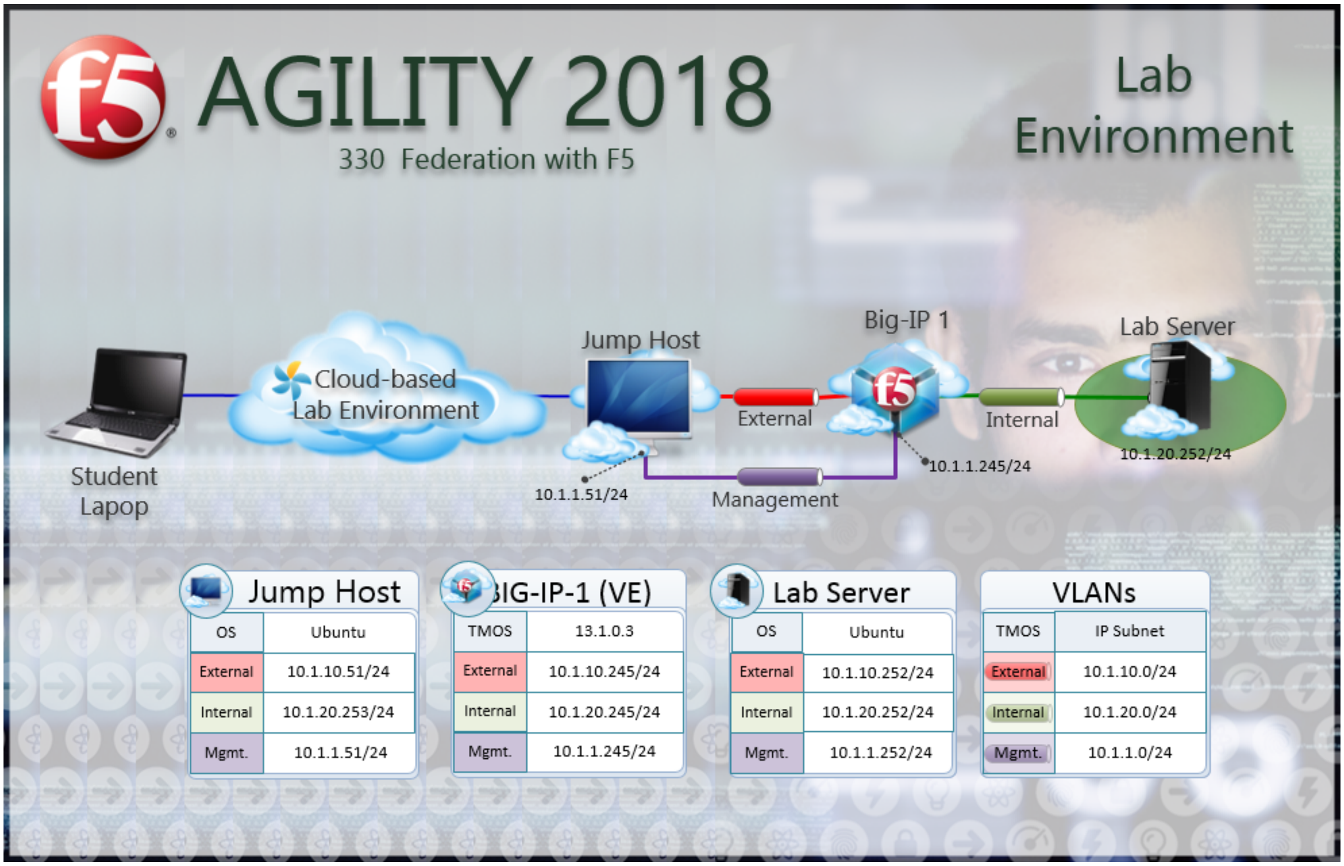
Welcome to the 330 Access Policy Manager (APM) Federation Hands-on Lab Guide. The following labs and exercises will instruct you on how to configure and troubleshoot federation use cases based on the experience of field engineers, support engineers and clients. This guide is intended to complement lecture material provided during the 330 course as well as a reference guide that can be referred to after the class as a basis for configuring federation relationships in your own environment.

6.1.1 Lab Network Setup

In the interest of focusing as much time as possible configuring and performing lab tasks, we have provided some resources and basic setup ahead of time. These are:

- Cloud-based lab environment complete with Jump Host, Virtual BIG-IP and Lab Server
- Duplicate Lab environments for each student for improved collaboration
- The Virtual BIG-IP has been pre-licensed and provisioned with Access Policy Manager (APM)
- Pre-staged configurations to speed up lab time, reducing repetitive tasks to focus on key learning elements.

If you wish to replicate these labs in your environment you will need to perform these steps accordingly. Additional lab resources are provided as illustrated in the diagram below:



AGILITY 2018

330 Federation with F5

Lab Environment

Jump Host

OS	Ubuntu
External	10.1.10.51/24
Internal	10.1.20.253/24
Mgmt.	10.1.1.51/24

BIG-IP-1 (VE)

TMOS	13.1.0.3
External	10.1.10.245/24
Internal	10.1.20.245/24
Mgmt.	10.1.1.245/24

Lab Server

OS	Ubuntu
External	10.1.10.252/24
Internal	10.1.20.252/24
Mgmt.	10.1.1.252/24

VLANs

TMOS	IP Subnet
External	10.1.10.0/24
Internal	10.1.20.0/24
Mgmt.	10.1.1.0/24

6.1.2 Timing for labs

The time it takes to perform each lab varies and is mostly dependent on accurately completing steps. This can never be accurately predicted but we strived to provide an estimate based on several people, each having a different level of experience. Below is an estimate of how long it will take for each lab:

Lab Description	Time Allocated
LAB 1 - SAML Service Provider (SP)	25 minutes
LAB 2 - SaaS SAML Identity Provider (IDP) (OKTA)	25 minutes
LAB 3 - oAuth & OpenID Connect (Google)	25 minutes
LAB 4 - oAuth and Azure AD Lab	25 minutes

6.1.3 Authentication – Credentials

The following credentials will be utilized throughout this Lab guide. All other credentials will be indicated at the time of use.

Credential Use	User ID	Password
BIG-IP Configuration Utility (GUI)	admin	admin
BIG-IP CLI Access (SSH)	root	default
Jump Host Access	f5student	f5DEMOs4u

6.1.4 Utilized Browsers

The preferred browser for this lab is Firefox. Shortcut links have been provided to speed access to targeted resources and assist you in your tasks. Except where noted, either browser can be used for all lab tasks.

6.1.5 General Notes

As noted previously, environment staging has been done to speed up lab time, reducing repetitive tasks to focus on key learning elements. Where possible steps that have been optimized have been called out with links and references provided in the *Additional Information* section for additional clarification. The intention being that the lab guide truly serves as a resource guide for all your future federation deployments.

6.1.6 Acknowledgements

This lab is built upon the work of prior F5 Agility's and the work of many individuals behind the scenes in addition the 2018 Agility Lab Team. Many thanks to the 2017 Agility Lab Team for the SAML & OAuth Federation Labs, Lucas Thompson for his OAuth/OIDC Lab and our lab testers Matt Harmon, Dave Lipowsky & Stu McMath.

6.1.7 Presented by

APM 330 Presented by: Steve Lyons, Chris Miller & Chas Lesley

6.2 Lab 1: SAML Service Provider (SP) Lab

The purpose of this lab is to configure and test a SAML Service Provider (SP). Students will configure the various aspects of a SAML Service Provider, import and bind to a SAML Identity Provider (IdP) and test SP-Initiated SAML Federation.

6.2.1 Objective:

- Gain an understanding of SAML Service Provider(SP) configurations and its component parts
- Gain an understanding of the access flow for SP-Initiated SAML

6.2.2 Lab Requirements:

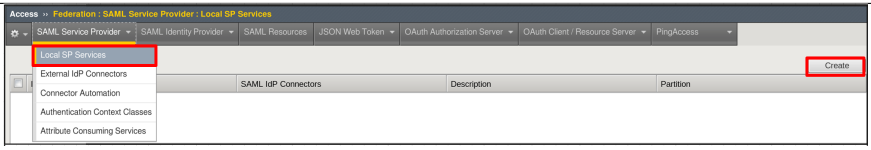
- All Lab requirements will be noted in the tasks that follow
- Estimated completion time: 25 minutes

6.2.3 Lab 1 Tasks:

TASK 1: Configure the SAML Service Provider (SP)

Refer to the instructions and screen shots below:

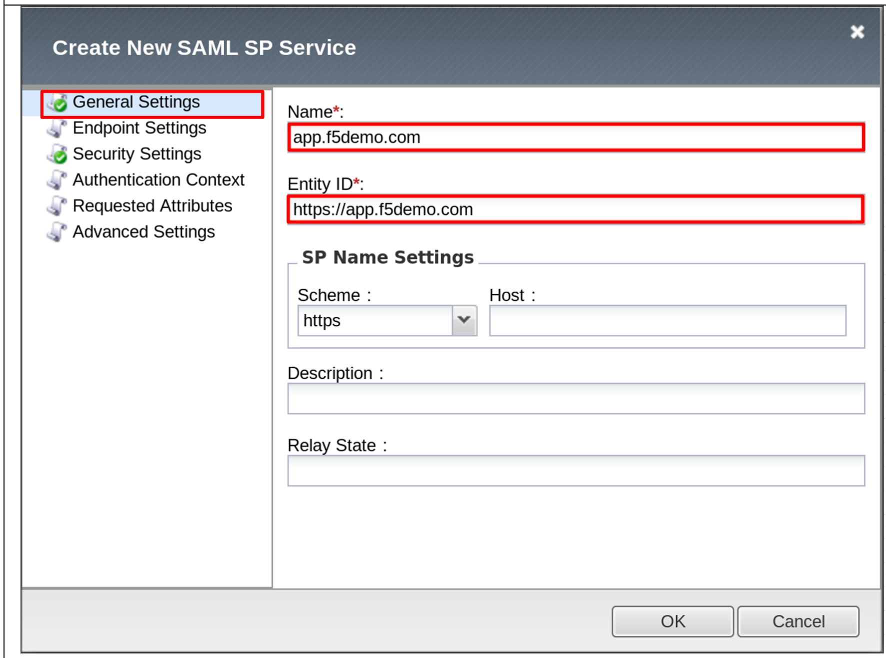
1. Login to your lab provided **Virtual Edition BIG-IP**
2. Begin by selecting: **Access -> Federation -> SAML Service Provider** -> **Local SP Services**
3. Click the **Create** button (far right)



Access ›› Federation : SAML Service Provider : Local SP Services

4. In the **Create New SAML SP Service** dialogue box click **General Settings** in the left navigation pane and key in the following as shown:
   - **Name**: **app.f5demo.com**
   - **Entity ID**: **https://app.f5demo.com**

   Note: The yellow box on Host will disappear when the Entity ID is entered.



Create New SAML SP Service

Name*: app.f5demo.com

Entity ID*: https://app.f5demo.com

SP Name Settings

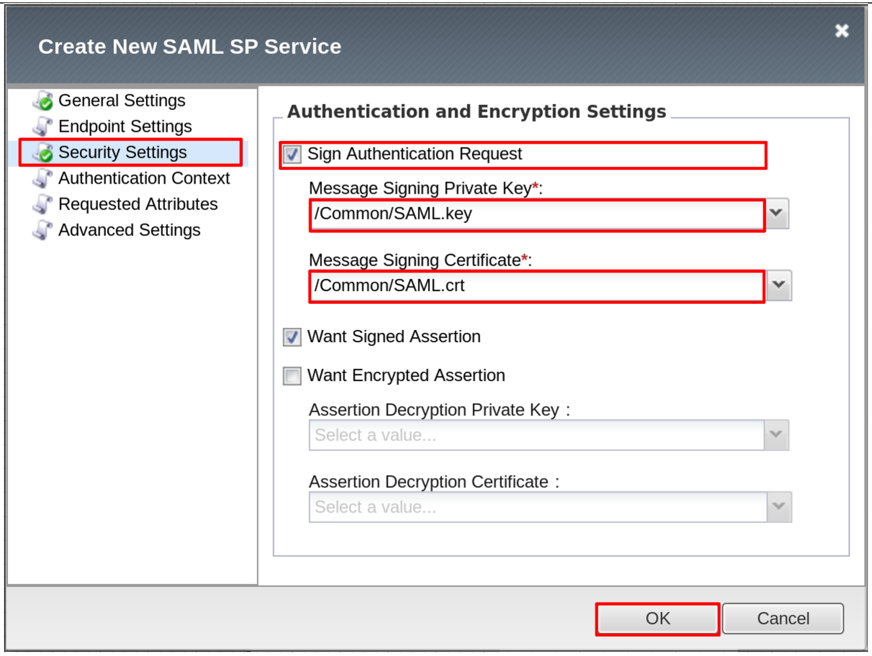
Scheme : https

Host :

Description :

Relay State :

5. Click on the **Security Settings** in the left navigation menu.
6. Check the **Sign Authentication Request** checkbox
7. Select /**Common/SAML.key** from drop down menu for the **Message Signing Private Key**
8. Select /**Common/SAML.crt** from drop down menu for the **Message Signing Certificate**
9. Click **OK** on the dialogue box



Create New SAML SP Service

Authentication and Encryption Settings

☑ Sign Authentication Request

Message Signing Private Key*: /Common/SAML.key

Message Signing Certificate*: /Common/SAML.crt

☑ Want Signed Assertion

□ Want Encrypted Assertion

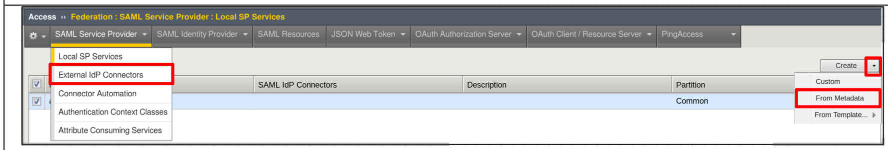
Assertion Decryption Private Key : Select a value...

Assertion Decryption Certificate : Select a value...

TASK 2: Configure the External SAML IdP Connector

Refer to the instructions and screen shots below:

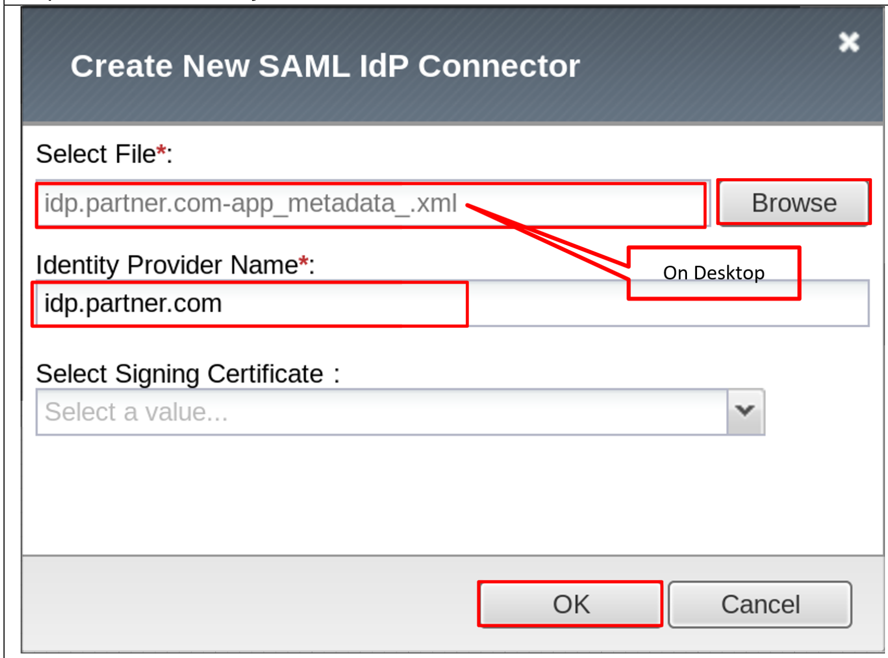
1. Click on the **Access** -> **Federation** -> **SAML Service Provider** -> **External IdP Connectors** or click on the **SAML Service Provider** tab in the horizontal navigation menu andselect **External IdP Connectors**.
2. Click specifically on the **Down Arrow** next to the **Create** button (far right)
3. Select **From Metadata** from the drop down menu



Access ›› Federation : SAML Service Provider : Local SP Services

4. In the **Create New SAML IdP Connector** dialogue box, click **Browse** and select the **idp.partner.com-app_metadata.xml** file from the Desktop of your jump host.
5. In the **Identity Provider Name** field enter the following: **idp.partner.com**
6. Click **OK** on the dialogue box.

Note: The idp.partner.com-app_metadata.xml was created previously. Oftentimes, iDP providers will have a metadata file representing their IdP service. This can be imported to save object creation time as it has been done in this lab



Create New SAML IdP Connector

Select File*: idp.partner.com-app_metadata_.xml

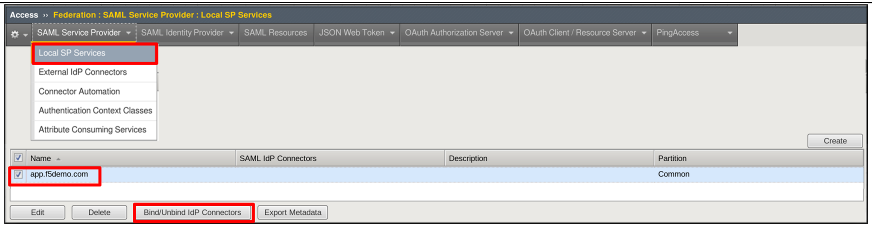
Identity Provider Name*: idp.partner.com

Select Signing Certificate : Select a value...

TASK: 3: Bind the External SAML IdP Connector to the SAML SP

Refer to the instructions and screen shots below:

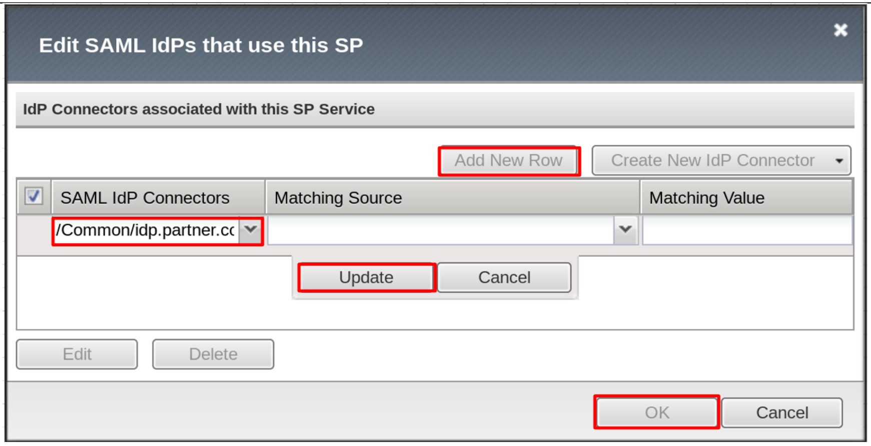
1. Click on the **Local SP Services** from the **SAML Service Provider** tab in the horizontal navigation menu.
2. Click the **Checkbox** next to the previously created **app.f5demo.com** and select **Bind/Unbind IdP Connectors** button at the bottom of the GUI.



Access ›› Federation : SAML Service Provider : Local SP Services

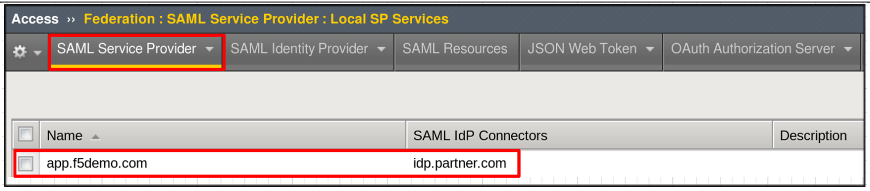
☑	Name ▲	SAML IdP Connectors	Description	Partition
☑	app.f5demo.com			Common

3. In the **Edit SAML IdP's that use this SP** dialogue box click the **Add New Row** button
4. In the added row click the **Down Arrow** under **SAML IdP Connectors** and select the **/Common/idp.partner.com** SAML IdP Connector previously created.
5. Click the **Update** button and the **OK** button at the bottom of the dialogue box.


Edit SAML IdPs that use this SP
IdP Connectors associated with this SP Service
Add New Row
Create New IdP Connector
Update
Cancel
Edit
Delete
OK
Cancel

☑	SAML IdP Connectors	Matching Source	Matching Value
	/Common/idp.partner.cc		

6. Under the **Access** -> **Federation** -> **SAML Service Provider** -> **Local SP Services** menu you should now see the following (as shown):
   - **Name**: **app.f5demo.com**
   - **SAML IdP Connectors**: **idp.partner.com**

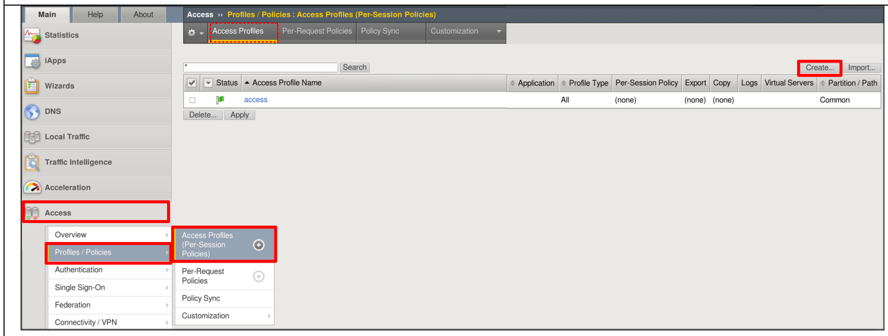

Access ›› Federation : SAML Service Provider : Local SP Services
SAML Service Provider
SAML Identity Provider
SAML Resources
JSON Web Token
OAuth Authorization Server

□	Name	SAML IdP Connectors	Description
□	app.f5demo.com	idp.partner.com	

TASK 4: Configure the SAML SP Access Policy

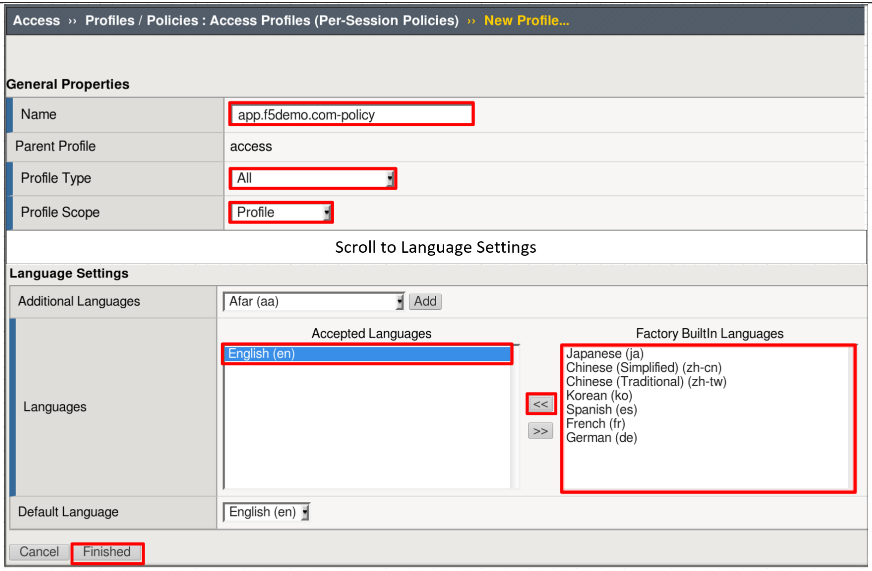
Refer to the instructions and screen shots below:

1. Begin by selecting: **Access** -> **Profiles/Policies** -> **Access Profiles (Per-Session Policies)**
2. Click the **Create** button (far right)



☑	Status	Access Profile Name	Application	Profile Type	Per-Session Policy	Export	Copy	Logs	Virtual Servers	Partition / Path
□		access		All	(none)	(none)	(none)			Common

3. In the **New Profile** window, key in the following as shown:
    - **Name**: **app.f5demo.com-policy**
    - **Profile Type**: **All** (from drop down)
    - **Profile Scope**: **Profile** (default)
4. Scroll to the bottom of the **New Profile** window to the **Language Settings**
5. Select **English** from the **Factory Built-in Languages** menu on the right and click the **Double Arrow (<<)**, then click the **Finished** button.



Access ›› Profiles / Policies : Access Profiles (Per-Session Policies) ›› New Profile...

General Properties

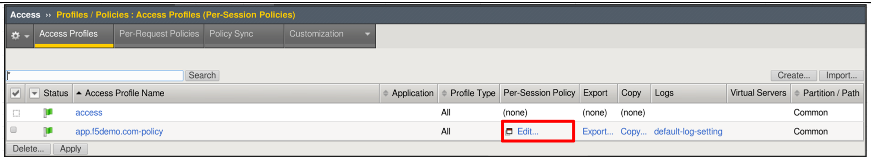
Name	app.f5demo.com-policy
Parent Profile	access
Profile Type	All
Profile Scope	Profile

Scroll to Language Settings

Language Settings

Additional Languages	Afar (aa) Add
Languages	Accepted Languages: English (en) Factory BuiltIn Languages: Japanese (ja), Chinese (Simplified) (zh-cn), Chinese (Traditional) (zh-tw), Korean (ko), Spanish (es), French (fr), German (de)
Default Language	English (en)

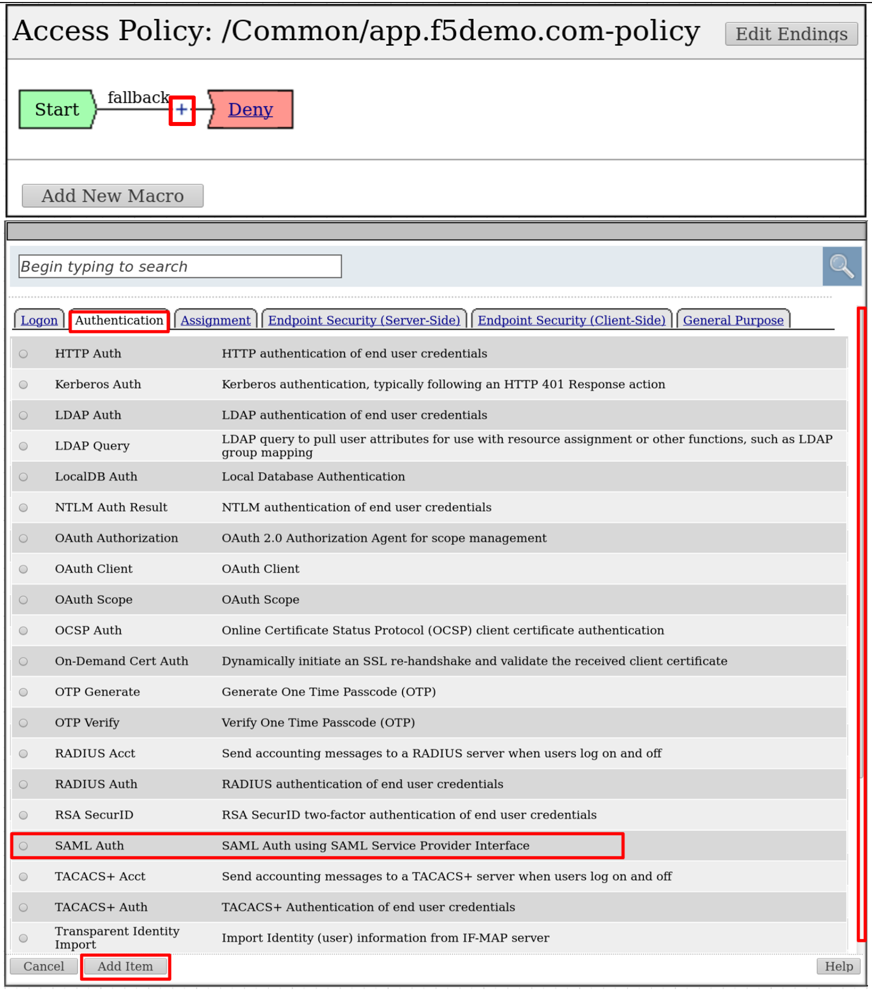
6. From the **Access** -> **Profiles/Policies** -> **Access Profiles (Per-Session Policies)**, click the **Edit** link on the previously created **app.f5demo.com-policy** line.



Access ›› Profiles / Policies : Access Profiles (Per-Session Policies)

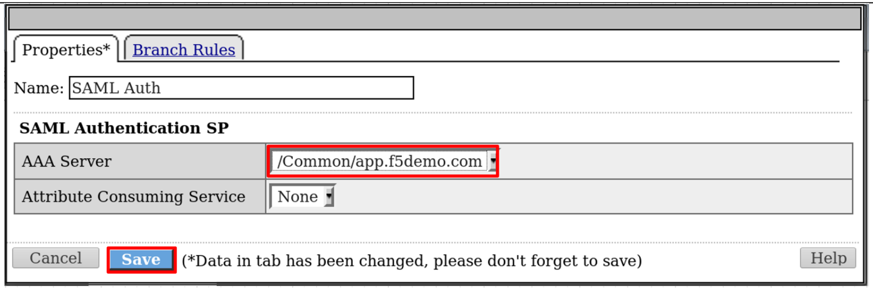
☑	Status	Access Profile Name	Application	Profile Type	Per-Session Policy	Export	Copy	Logs	Virtual Servers	Partition / Path
□		access		All	(none)	(none)	(none)			Common
□		app.f5demo.com-policy		All	Edit...	Export...	Copy...	default-log-setting		Common

7. In the **Visual Policy Editor** window for the **/Common/app.f5demo.com-policy**, click the **Plus (+) Sign** between **Start** and **Deny**.
8. In the pop-up dialogue box select the **Authentication** tab and then click the **Radio Button** next to **SAML Auth**. Once selected click the **Add Item** button.



○	HTTP Auth	HTTP authentication of end user credentials
○	Kerberos Auth	Kerberos authentication, typically following an HTTP 401 Response action
○	LDAP Auth	LDAP authentication of end user credentials
○	LDAP Query	LDAP query to pull user attributes for use with resource assignment or other functions, such as LDAP group mapping
○	LocalDB Auth	Local Database Authentication
○	NTLM Auth Result	NTLM authentication of end user credentials
○	OAuth Authorization	OAuth 2.0 Authorization Agent for scope management
○	OAuth Client	OAuth Client
○	OAuth Scope	OAuth Scope
○	OCSP Auth	Online Certificate Status Protocol (OCSP) client certificate authentication
○	On-Demand Cert Auth	Dynamically initiate an SSL re-handshake and validate the received client certificate
○	OTP Generate	Generate One Time Passcode (OTP)
○	OTP Verify	Verify One Time Passcode (OTP)
○	RADIUS Acct	Send accounting messages to a RADIUS server when users log on and off
○	RADIUS Auth	RADIUS authentication of end user credentials
○	RSA SecurID	RSA SecurID two-factor authentication of end user credentials
○	SAML Auth	SAML Auth using SAML Service Provider Interface
○	TACACS+ Acct	Send accounting messages to a TACACS+ server when users log on and off
○	TACACS+ Auth	TACACS+ Authentication of end user credentials
○	Transparent Identity Import	Import Identity (user) information from IF-MAP server

9. In the **SAML Auth** configuration window, select **/Common/app.f5demo.com** from the **SAML Authentication**, **AAA Server** drop down menu.
10. Click the **Save** button at the bottom of the configuration window.



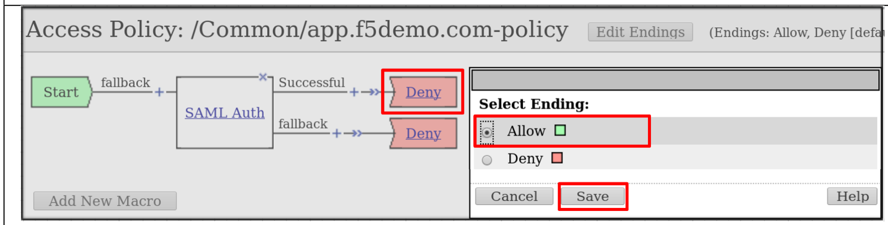
Name: SAML Auth

SAML Authentication SP

AAA Server	/Common/app.f5demo.com
Attribute Consuming Service	None

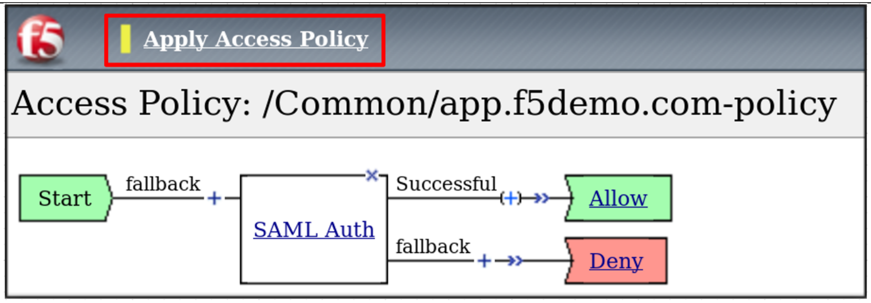
(*Data in tab has been changed, please don't forget to save)

11. In the **Visual Policy Editor** select the **Deny** along the **Successful** branch following the **SAML Auth**
12. From the **Select Ending** dialogue box select the **Allow Radio Button** and then click **Save**.



13. In the **Visual Policy Editor** click the **Apply Access Policy** (top left) and close the **Visual Policy Editor**.

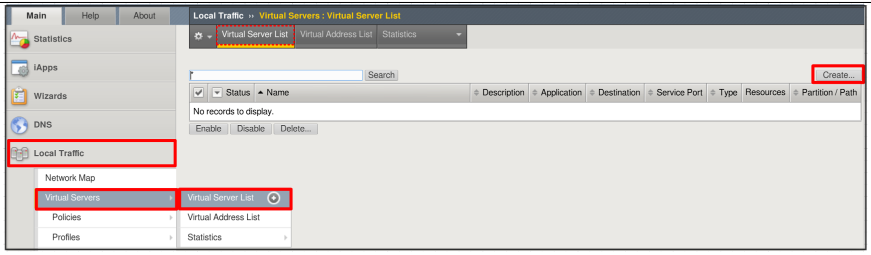
Note: Additional actions can be taken in the Per Session policy (Access Policy). The lab is simply completing authentication. Other access controls can be implemented based on the use case



TASK 5: Create the SP Virtual Server & Apply the SP Access Policy

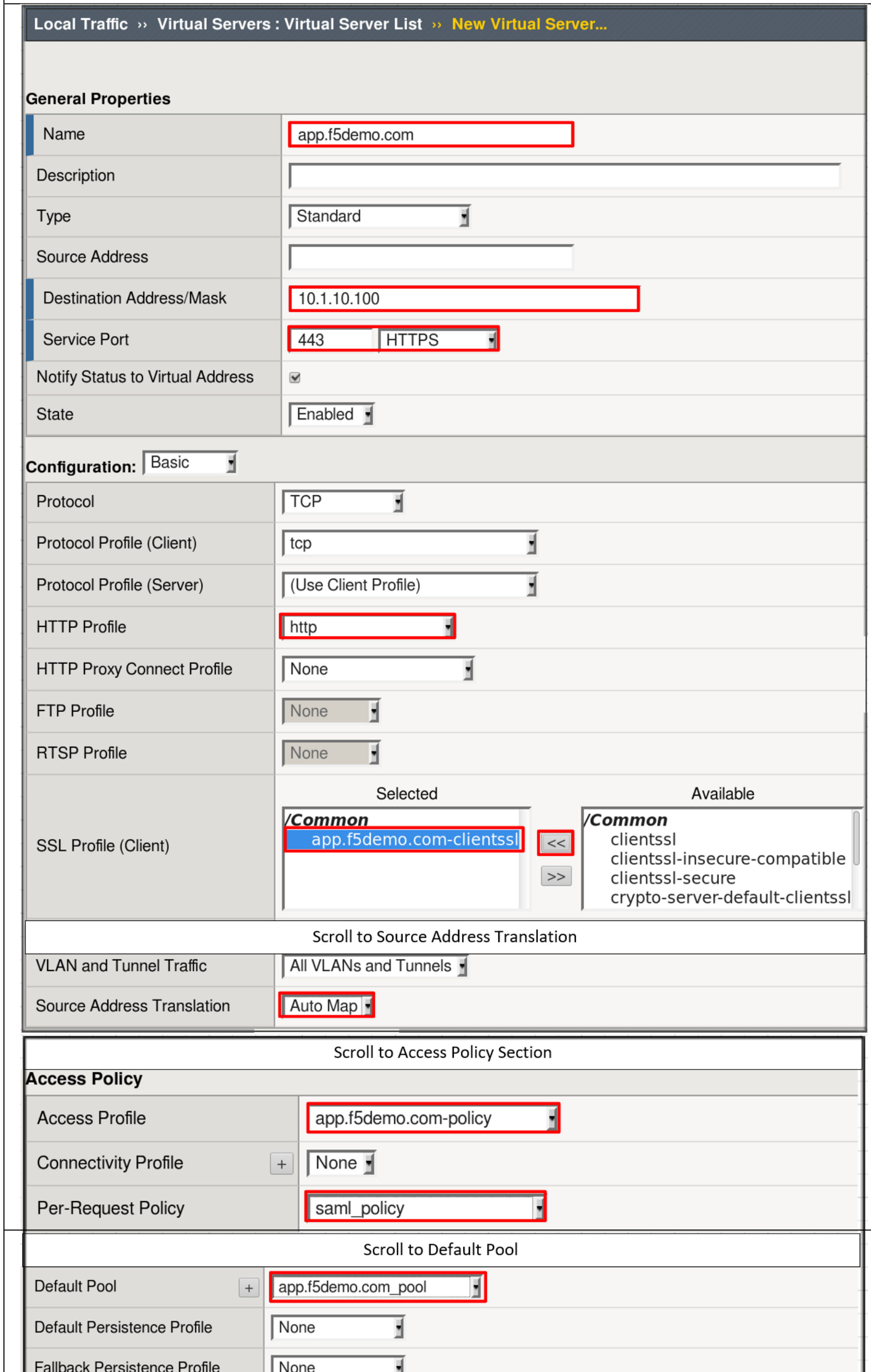
Refer to the instructions and screen shots below:

1. Begin by selecting: **Local Traffic** -> **Virtual Servers**
2. Click the **Create** button (far right)



3. In the **New Virtual Server** window, key in the following as shown:
   - **Name**: **app.f5demo.com**
   - **Destination Address/Mask**: **10.1.10.100**
   - **Service Port**: **443**
   - **HTTP Profile: http** (drop down)
   - **SSL Profile (client): app.f5demo.com-clientssl**
   - **Source Address Translation: Auto Map**
4. Scroll to the **Access Policy** section
   - **Access Profile**: **app.f5demo.com-policy**
   - **Per-Request Policy: saml_policy**
5. Scroll to the Resource section
   - **Default Pool**: **app.f5demo.com_pool**
6. Scroll to the bottom of the configuration window and click **Finished**

Note: The use of the Per-Request Policy is to provide header injection and other controls. These will be more utilized later in the lab.



Local Traffic ›› Virtual Servers : Virtual Server List ›› New Virtual Server...

General Properties

Name	app.f5demo.com
Description	
Type	Standard
Source Address	
Destination Address/Mask	10.1.10.100
Service Port	443 HTTPS
Notify Status to Virtual Address	☑
State	Enabled

Configuration: Basic

Protocol	TCP
Protocol Profile (Client)	tcp
Protocol Profile (Server)	(Use Client Profile)
HTTP Profile	http
HTTP Proxy Connect Profile	None
FTP Profile	None
RTSP Profile	None
SSL Profile (Client)	Selected: /Common app.f5demo.com-clientssl Available: /Common clientssl clientssl-insecure-compatible clientssl-secure crypto-server-default-clientssl

Scroll to Source Address Translation

VLAN and Tunnel Traffic	All VLANs and Tunnels
Source Address Translation	Auto Map

Scroll to Access Policy Section

Access Policy

Access Profile	app.f5demo.com-policy
Connectivity Profile	None
Per-Request Policy	saml_policy

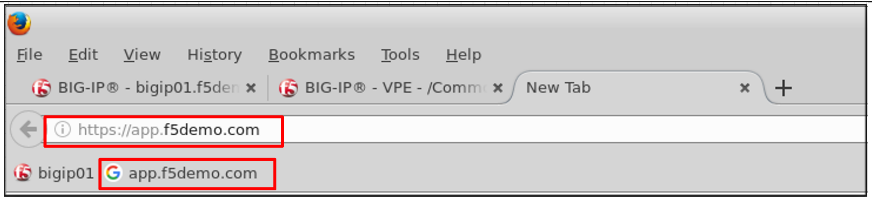
Scroll to Default Pool

Default Pool	app.f5demo.com_pool
Default Persistence Profile	None
Fallback Persistence Profile	None

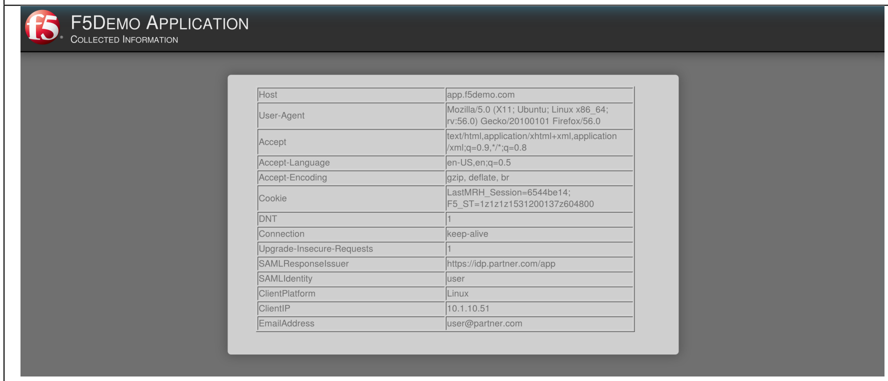
TASK 6: Test the SAML SP

Refer to the instructions and screen shots below:

1. Using your browser from the Jump Host click on the provided bookmark or navigate to https://app.f5demo.com . The SAML SP that you have just configured.



2. Did you successfully redirect to the IdP?
3. Login to the iDP, were you successfully authenticated? (use credentials provided in the Authentication Information section at the beginning of this guide)
   - **Username**: **user**
   - **Password**: **Agility1**
4. After successful authentication, were you returned to the SAML SP?
5. Were you successfully authenticated (SAML)?
6. Review your **Active Sessions** (**Access Overview** -> **Active Sessions**)
7. Review your Access Report Logs (**Access** -> **Overview Access Reports**)



Host	app.f5demo.com
User-Agent	Mozilla/5.0 (X11; Ubuntu; Linux x86_64; rv:56.0) Gecko/20100101 Firefox/56.0
Accept	text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
Accept-Language	en-US,en;q=0.5
Accept-Encoding	gzip, deflate, br

Cookie	LastMRH_Session=6544be14;
	F5_ST=1z1z1z1531200137z604800

DNT	1
Connection	keep-alive
Upgrade-Insecure-Requests	1
SAMLResponseIssuer	https://idp.partner.com/app
SAMLIdentity	user
ClientPlatform	Linux
ClientIP	10.1.10.51
EmailAddress	user@partner.com

6.3 Lab 2: IDaaS SAML Identity Provider (iDP) Lab (OKTA)

The purpose of this lab is to configure and test a IDaaS SAML Identity Provider. Students will configure a IDaaS based SAML Identity Provider (in this case OKTA) and import and bind to a SAML Service Provider and test IdP-Initiated and SP-Initiated SAML Federation.

6.3.1 Objective:

- Gain an understanding of integrating a IDaaS SAML Identity Provider(IdP)
- Gain an understanding of the access flow for IdP-Initiated SAML

6.3.2 Lab Requirements:

- All Lab requirements will be noted in the tasks that follow
- Estimated completion time: 25 minutes

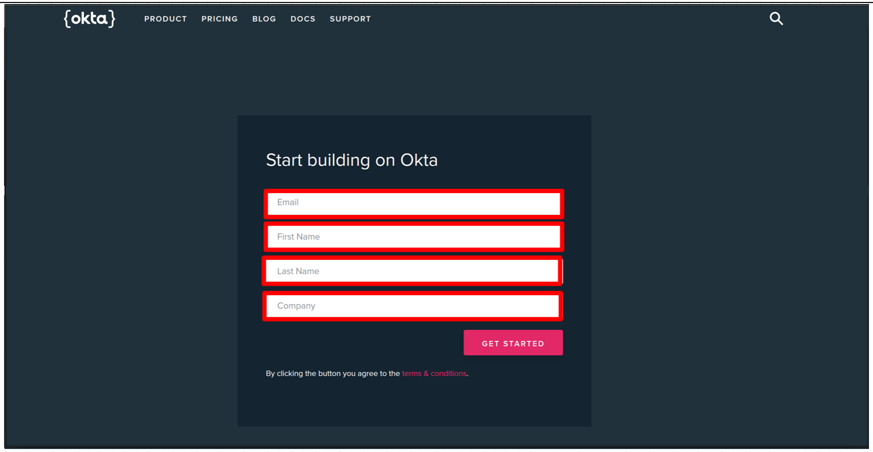
6.3.3 Lab 2 Tasks:

TASK 1: Sign Up for OKTA Developer Account

Refer to the instructions and screen shots below:

> *Note: The following steps provide instruction for setting up an OKTA developer account. If you already have one, you may elect to use that account. Understand, however, that the instructions below may need to be modified to match your environment.*

1. Sign Up for an OKTA developer account by navigating to: **https://developer.okta.com/signup/** and using a VALID email and click **Get Started**
2. Upon registration, you will be directed to a hyperlink (hostname) for your developer account. This link should be saved for future use.
3. Additional instructions will be sent to the email address provided during account setup.



Start building on Okta

Email

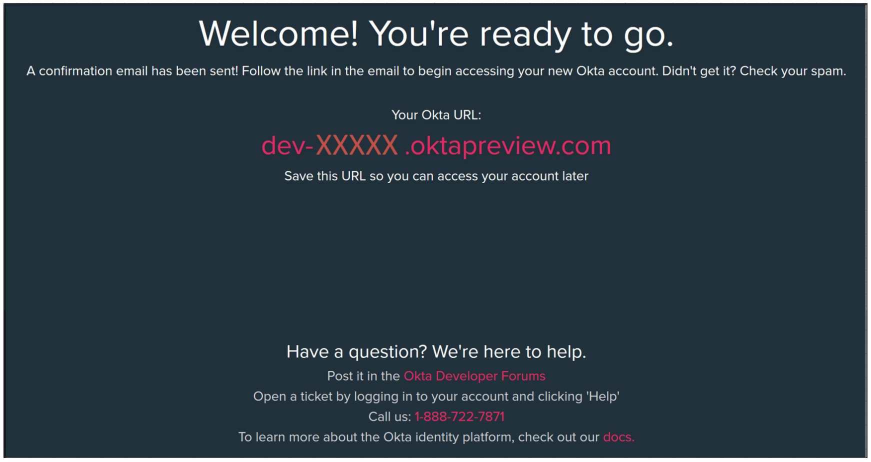
First Name

Last Name

Company

GET STARTED

By clicking the button you agree to the terms & conditions.



Welcome! You're ready to go.

A confirmation email has been sent! Follow the link in the email to begin accessing your new Okta account. Didn't get it? Check your spam.

Your Okta URL:

dev-XXXXX .oktapreview.com

Save this URL so you can access your account later

Have a question? We're here to help.

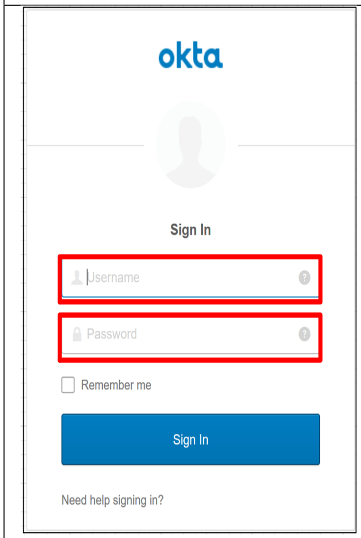
Post it in the Okta Developer Forums

Open a ticket by logging in to your account and clicking 'Help'

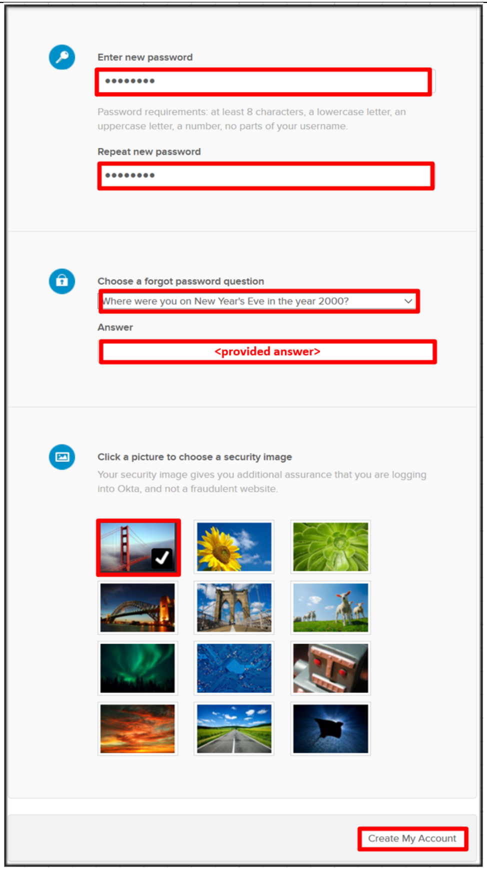
Call us: 1-888-722-7871

To learn more about the Okta identity platform, check out our docs.

4. Following the instructions received from the generated email, sign into the OKTA development environment with your provided, temporary password.



5. Enter a **New Password** and the **Repeat New Password**
6. Use the drop down to select a **Forgot Password Question** and provide the Answer
7. Click a **Security Image**
8. Click **Create My Account**



Enter new password

••••••••

Password requirements: at least 8 characters, a lowercase letter, an uppercase letter, a number, no parts of your username.

Repeat new password

••••••••

Choose a forgot password question

Where were you on New Year's Eve in the year 2000?

Answer

<provided answer>

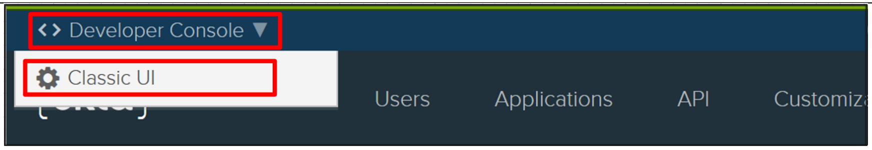
Click a picture to choose a security image

Your security image gives you additional assurance that you are logging into Okta, and not a fraudulent website.

TASK 2: OKTA Classic UI

Refer to the instructions and screen shots below:

1. For the purposes of the lab and SAML development, we will be using the OKTA Classic UI which provides access to SAML configurations. *(Note: At lab publication, the Developer Console did not have SAML resources.)*
2. In the top, left hand corner click the **<>** & select **Classic UI** from the drop down.



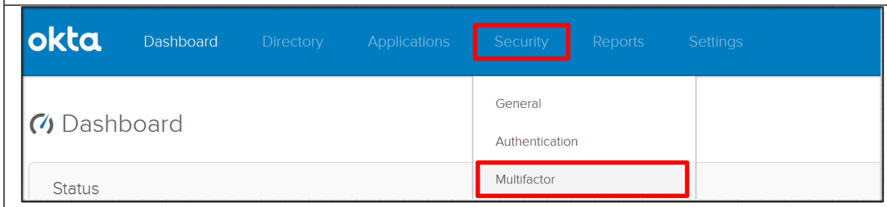
TASK 3: Enable OKTA Multi-Factor Authentication [OPTIONAL]

Refer to the instructions and screen shots below. This task will require a mobile app to enable a second factor.

[OPTIONAL]

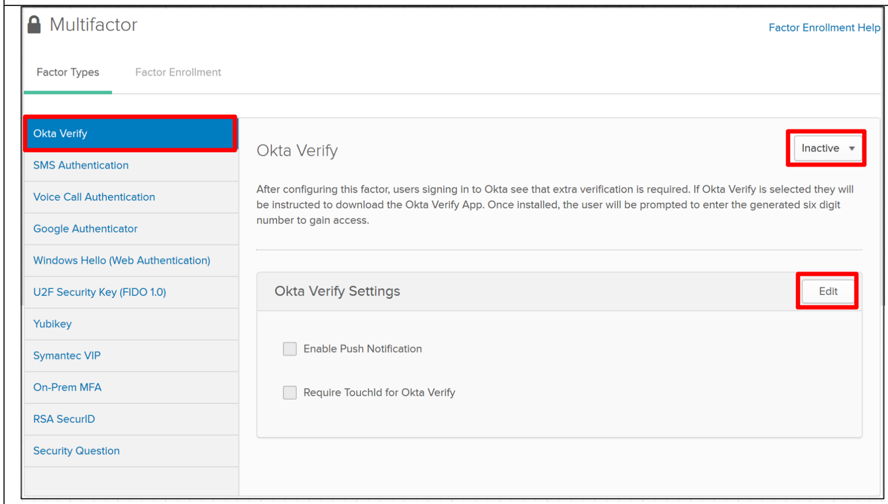
Note: Enabling MFA will require a Smart Device with the appropriate OKTA client for your OS
The step can be skipped if you prefer to just use UserID/Password

1. Click **Security** from the top navigation, then click **Multifactor**



[OPTIONAL]

2. Under **OKTA Verify**, change the dropdown from **Inactive** to **Active**
3. Click the **Edit** button next to ***OKTA Verify Settings**



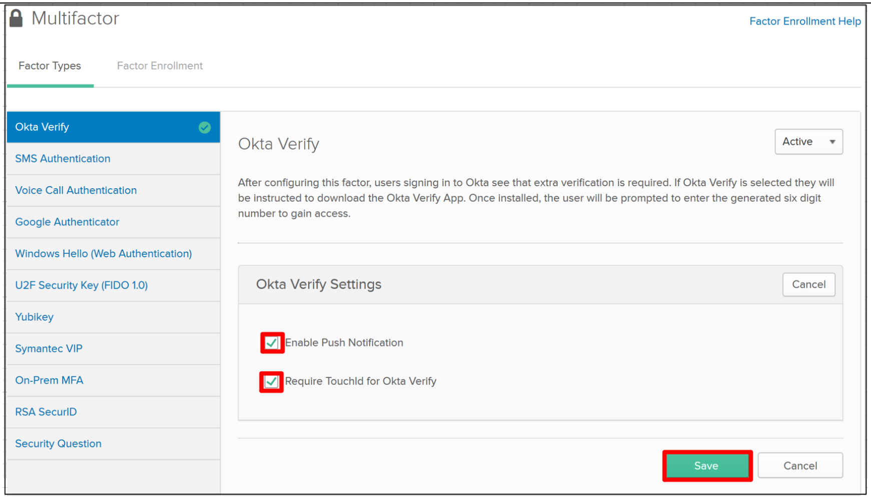
After configuring this factor, users signing in to Okta see that extra verification is required. If Okta Verify is selected they will be instructed to download the Okta Verify App. Once installed, the user will be prompted to enter the generated six digit number to gain access.

☐ Enable Push Notification

☐ Require TouchId for Okta Verify

[OPTIONAL]

4. Check **Enable Push Verification**
5. Check **Require TouchID for OKTA Verify** (optional)
6. Click **Save**



After configuring this factor, users signing in to Okta see that extra verification is required. If Okta Verify is selected they will be instructed to download the Okta Verify App. Once installed, the user will be prompted to enter the generated six digit number to gain access.

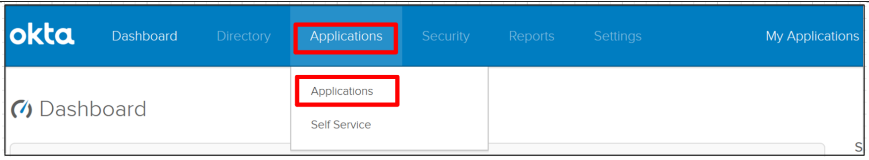
☑ Enable Push Notification

☑ Require TouchId for Okta Verify

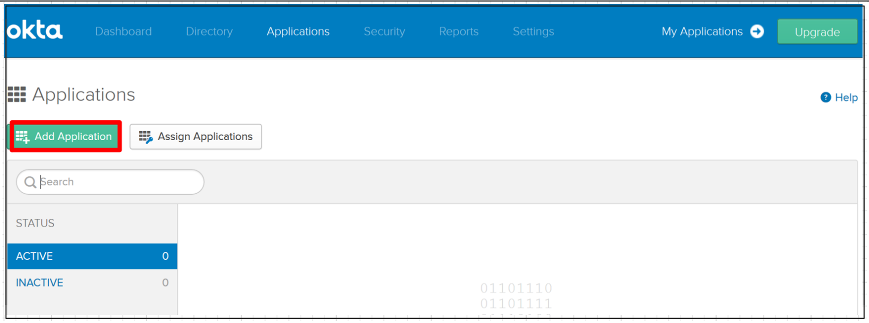
TASK 4: Build SAML Application - OKTA

Refer to the instructions and screen shots below:

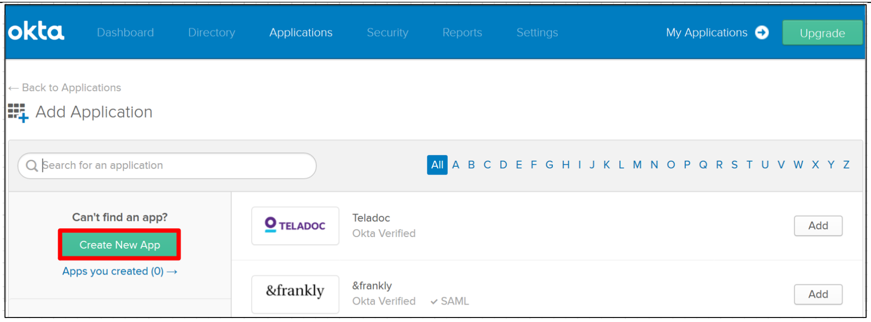
1. In the main menu, click **Applications**, and **Applications** from the dropdown in the top navigation.



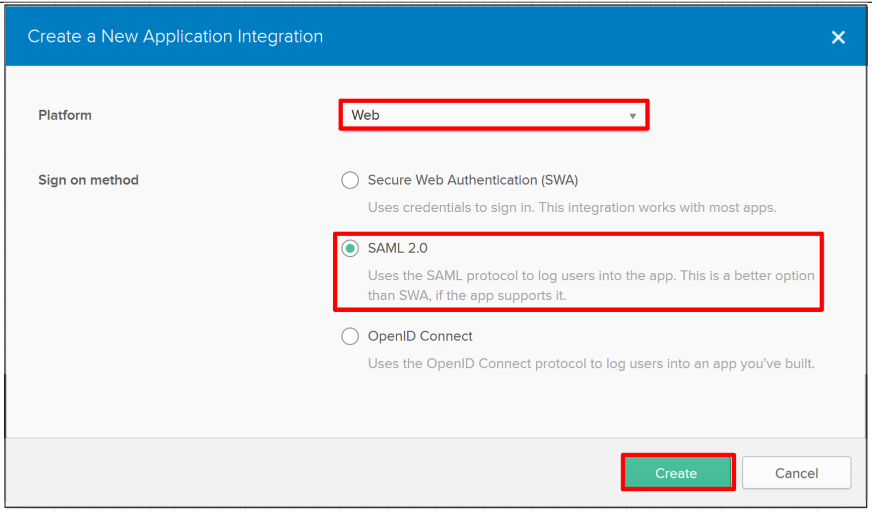
2. Click **Add Application** in the **Applications** dialogue window.



3. Click **Create New App** in the **Add Application Menu**



3. In the **Create a New Application Integration** dialogue box, select **Web** from the drop down for **Platform**.
4. Select the **SAML 2.0** radio button for **Sign on Method** and click **Create**.


Create a New Application Integration

Platform: Web

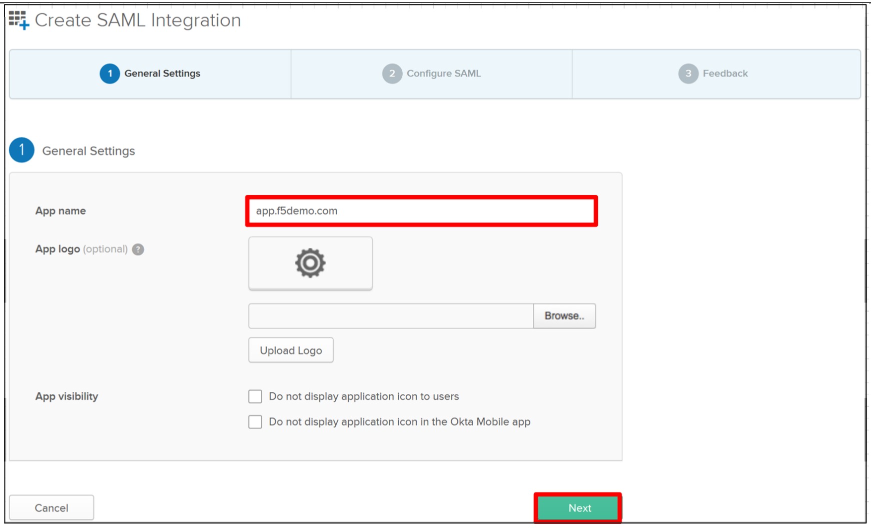
Sign on method

○ Secure Web Authentication (SWA)
Uses credentials to sign in. This integration works with most apps.

● SAML 2.0
Uses the SAML protocol to log users into the app. This is a better option than SWA, if the app supports it.

○ OpenID Connect
Uses the OpenID Connect protocol to log users into an app you've built.

5. In the **Create SAML Integration** screen, enter **app.f5demo.com** for the **App Name**.
6. Leave all other values as default and click **Next**.



Create SAML Integration

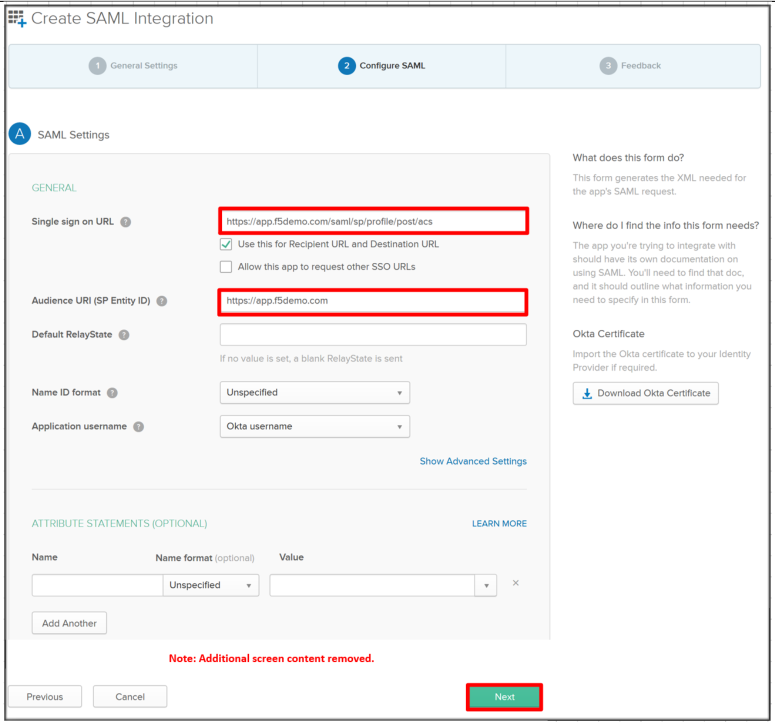
1 General Settings

App name: app.f5demo.com

App logo (optional)

App visibility
□ Do not display application icon to users
□ Do not display application icon in the Okta Mobile app

7. In the **Create SAML Integration** screen, enter the following values
8. In the **SAML Setting** section
   - **Single Sign on URL: https://app.f5demo.com/saml/sp/profile/post/acs**
   - **Audience URI (SP Entity ID): https://app.f5demo.com**
9. Leave all other values as default and click **Next**.



Create SAML Integration

A SAML Settings

GENERAL

Single sign on URL: https://app.f5demo.com/saml/sp/profile/post/acs
☑ Use this for Recipient URL and Destination URL
□ Allow this app to request other SSO URLs

Audience URI (SP Entity ID): https://app.f5demo.com

Default RelayState:
If no value is set, a blank RelayState is sent

Name ID format: Unspecified

Application username: Okta username

ATTRIBUTE STATEMENTS (OPTIONAL)

Name	Name format (optional)	Value
	Unspecified	

What does this form do?

This form generates the XML needed for the app's SAML request.

Where do I find the info this form needs?

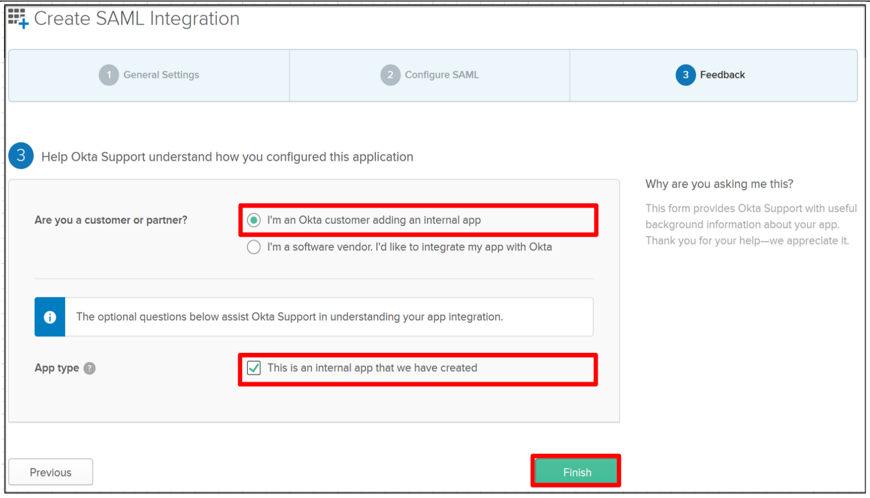
The app you're trying to integrate with should have its own documentation on using SAML. You'll need to find that doc, and it should outline what information you need to specify in this form.

Okta Certificate

Import the Okta certificate to your Identity Provider if required.

Note: Additional screen content removed.

10. In the **Create SAML Integration** screen, select the:
"I'm an OKTA customer adding an internal app" radio button for
Are you a customer or partner?
11. In the resulting expanded window, select:
"This is an internal app that we have created" for **App Type**
and click **Finish**.



Create SAML Integration

3 Help Okta Support understand how you configured this application

Are you a customer or partner?
● I'm an Okta customer adding an internal app
○ I'm a software vendor. I'd like to integrate my app with Okta

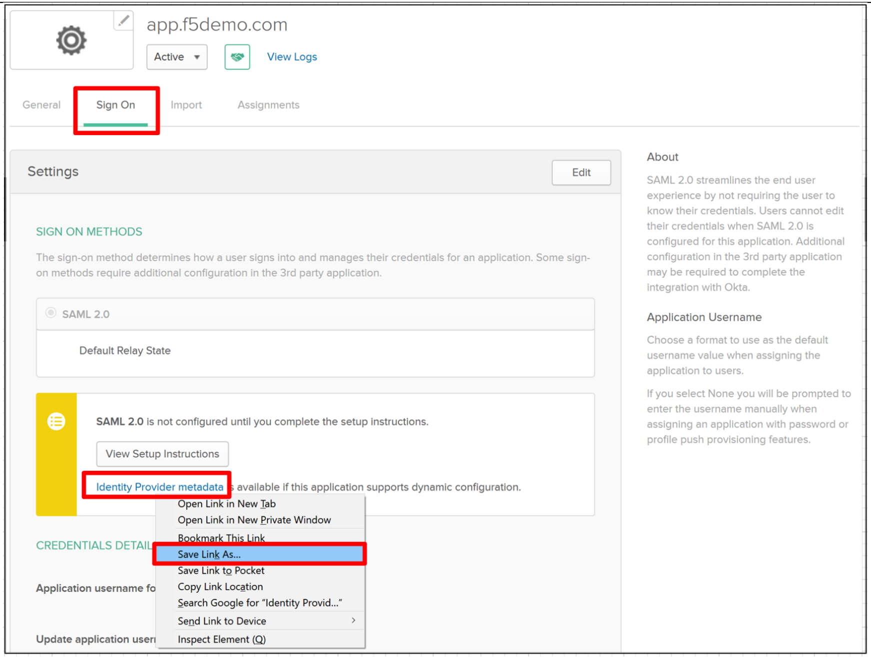
The optional questions below assist Okta Support in understanding your app integration.

App type ☑ This is an internal app that we have created

Why are you asking me this?

This form provides Okta Support with useful background information about your app. Thank you for your help—we appreciate it.

12. In the resulting application screen for **app.f5demo.com**, navigate to the **SAML 2.0 section**.
13. Right Click the **Identity Provider Metadata** hyperlink and click **Save Link As . . .**
14. Save the **metadata.xml** to your jumphost desktop. We will be using it in a later step in the Lab.



app.f5demo.com

Settings

SIGN ON METHODS

The sign-on method determines how a user signs into and manages their credentials for an application. Some sign-on methods require additional configuration in the 3rd party application.

○ SAML 2.0

Default Relay State

SAML 2.0 is not configured until you complete the setup instructions.

Identity Provider metadata is available if this application supports dynamic configuration.

CREDENTIALS DETAIL

Application username fo

Update application user

About

SAML 2.0 streamlines the end user experience by not requiring the user to know their credentials. Users cannot edit their credentials when SAML 2.0 is configured for this application. Additional configuration in the 3rd party application may be required to complete the integration with Okta.

Application Username

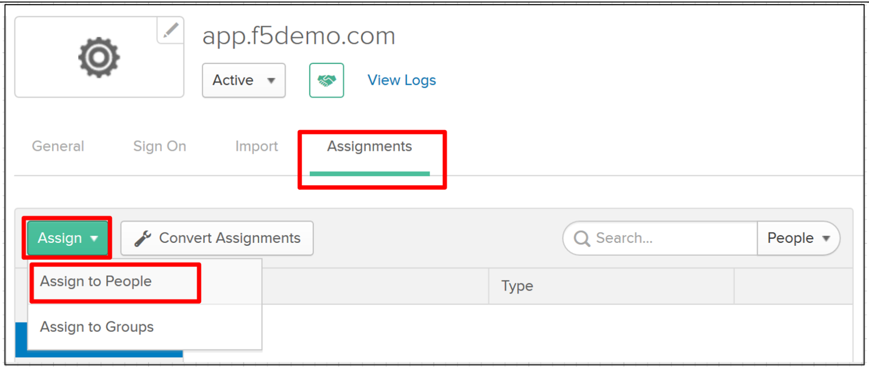
Choose a format to use as the default username value when assigning the application to users.

If you select None you will be prompted to enter the username manually when assigning an application with password or profile push provisioning features.

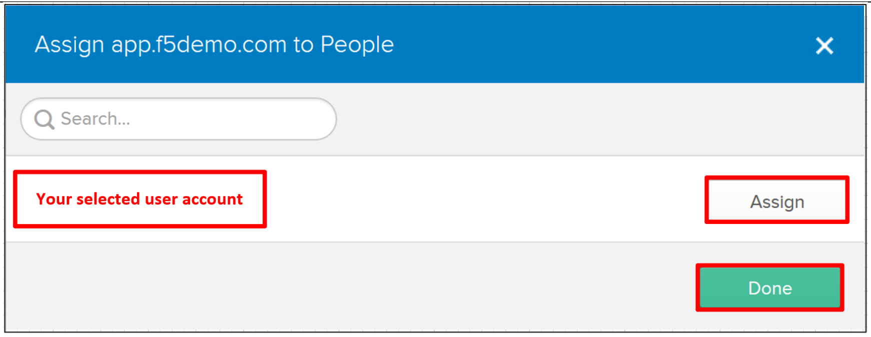
TASK 5: Add User to SAML Application

Refer to the instructions and screen shots below:

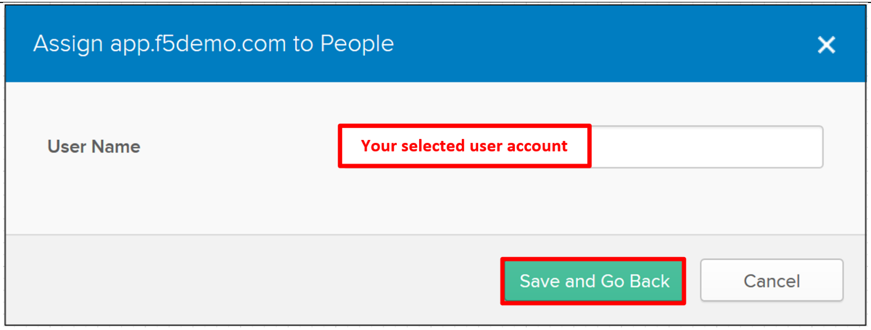
1. Within the **app.f5demo.com** application screen, Click **Assignments** then **Assign** and then **Assign to People** from the dropdown.



2. In the **Assign app.f5demo.com to People** dialogue box, select your **User ID**, click **Assign**, then **Done**.

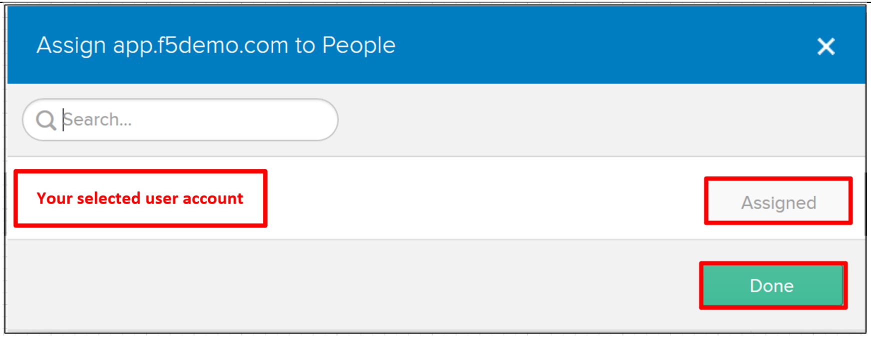


3. Click **Save and Go Back**.



User Name: Your selected user account

4. Click **Done**.

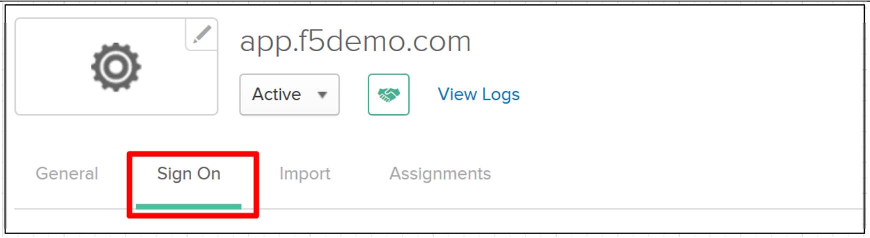


TASK 6: Add Multi-Factor Authentication Sign-On Policy [OPTIONAL]

Refer to the instructions and screen shots below. This section requires that **Task 3** be completed.

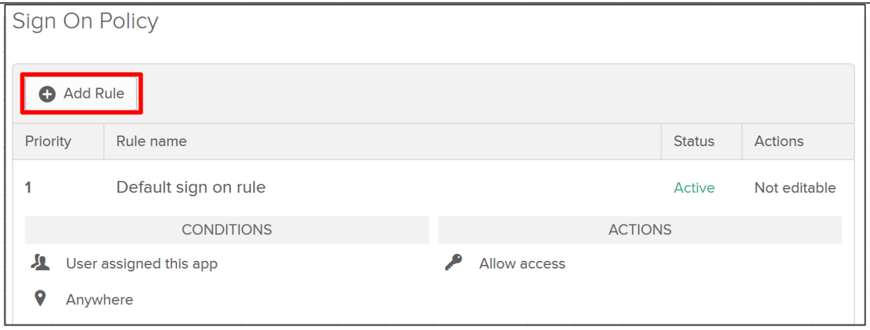
[OPTIONAL]

1. Within the **app.f5demo.com** application screen, Click **Sign On**



[OPTIONAL]

2. Scroll down to the **Sign On Policy** section and click **Add Rule**

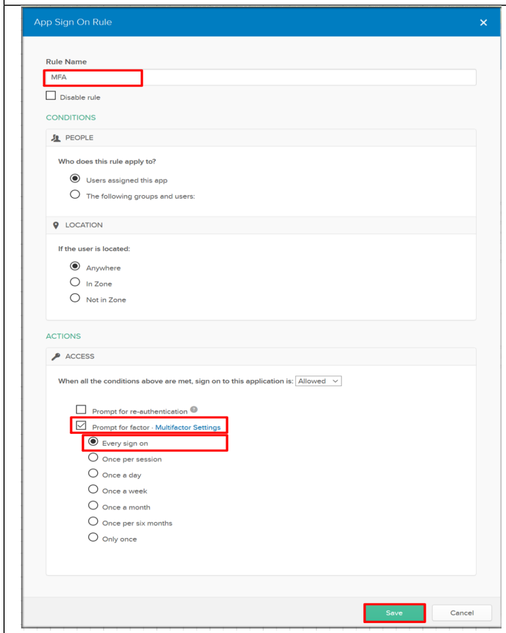

Sign On Policy

Priority	Rule name	Status	Actions
1	Default sign on rule	Active	Not editable

CONDITIONS	ACTIONS
User assigned this app	Allow access
Anywhere	

[OPTIONAL]

3. In the **Add Sign On Rule** dialogue box, enter **MFA** for the **Rule Name**.
4. Scroll down to the **Actions** section.
5. In the **Actions** section, under **Access**, check the box for **Prompt for factor**.
6. Ensure **Every Sign On** radio button is selected.
7. Click **Save**.



App Sign On Rule ×

Rule Name

MFA

☐ Disable rule

CONDITIONS

PEOPLE

Who does this rule apply to?

● Users assigned this app

○ The following groups and users:

LOCATION

If the user is located:

● Anywhere

○ In Zone

○ Not in Zone

ACTIONS

ACCESS

When all the conditions above are met, sign on to this application is: Allowed

☐ Prompt for re-authentication

☑ Prompt for factor · Multifactor Settings

● Every sign on

○ Once per session

○ Once a day

○ Once a week

○ Once a month

○ Once per six months

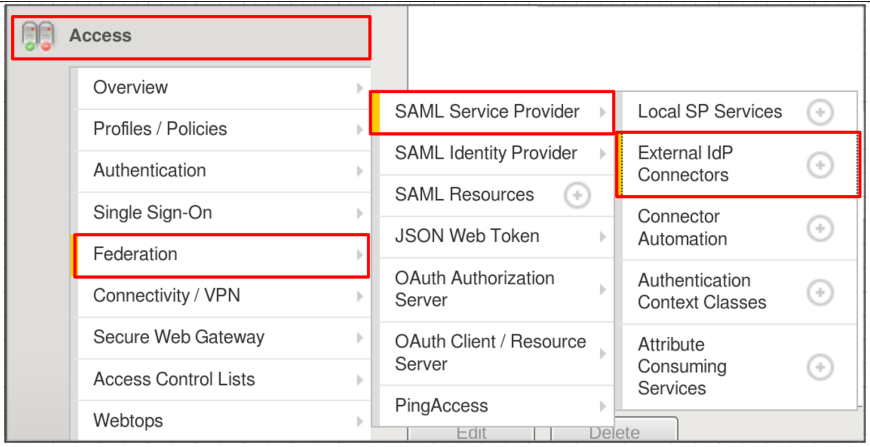
○ Only once

Save Cancel

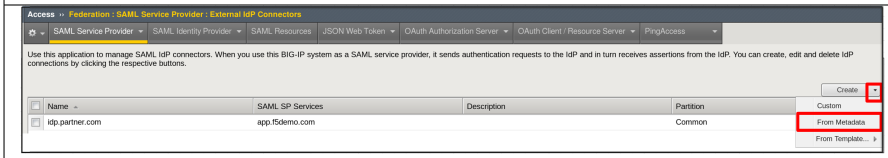
TASK 7: Create the External IDP Connector

Refer to the instructions and screen shots below:

1. Login to your lab provided **Virtual Edition BIG-IP**
2. Begin by selecting: **Access** -> **Federation** -> **SAML Service Provider** -> **External IdP Connectors**.



3. In the **External IdP Connectors** screen, click the **downward arrow** next to the word **Create** on the **Create** button (right side)
4. Select **From Metadata** from the drop down menu

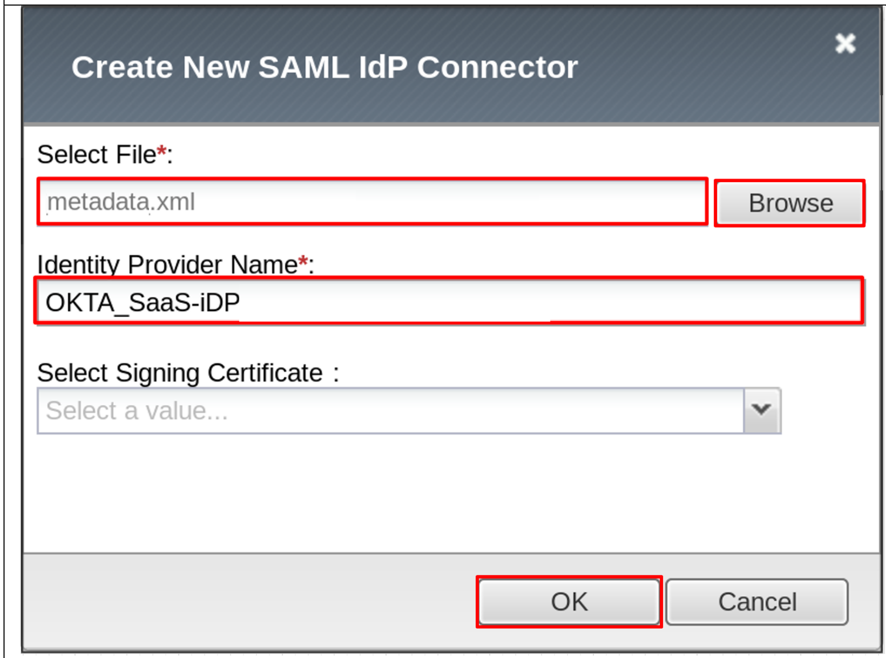


Access ›› Federation : SAML Service Provider : External IdP Connectors

Use this application to manage SAML IdP connectors. When you use this BIG-IP system as a SAML service provider, it sends authentication requests to the IdP and in turn receives assertions from the IdP. You can create, edit and delete IdP connections by clicking the respective buttons.

□	Name	SAML SP Services	Description	Partition
□	idp.partner.com	app.f5demo.com		Common

5. In the **Create New SAML IdP Connector** dialogue box, use the **Browse** button to select the **metadata.xml** from the desktop (created in Task 4).
6. Name the **Identity Provider Name**: **OKTA_SaaS-iDP**.
7. Click **OK**.



Create New SAML IdP Connector

Select File*: metadata.xml

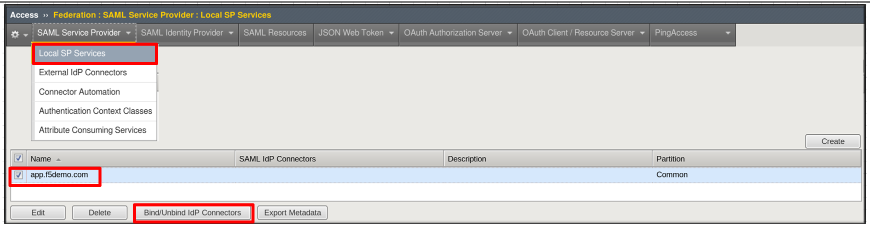
Identity Provider Name*: OKTA_SaaS-iDP

Select Signing Certificate : Select a value...

TASK 8: Change the SAML SP Binding

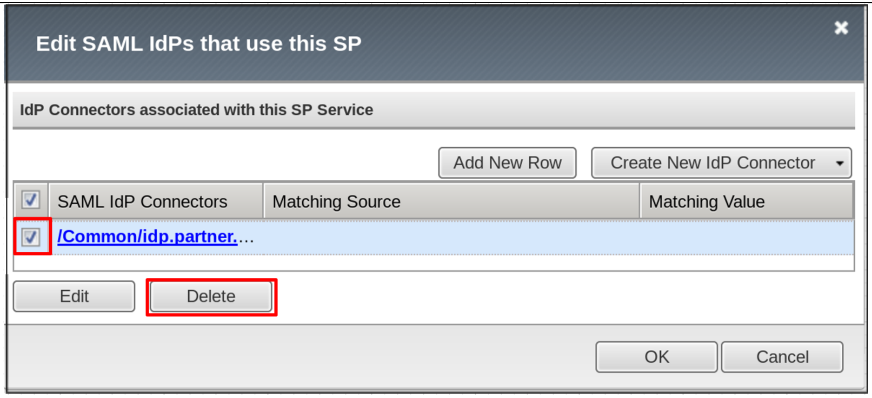
Refer to the instructions and screen shots below:

1. Begin by selecting: **Access** -> **Federation** -> **SAML Service Provider** -> **Local SP Services**
2. Select the checkbox next to **app.f5demo.com** and click **Bind\UnBind IdP Connectors**


Access ›› Federation : SAML Service Provider : Local SP Services
SAML Service Provider
SAML Identity Provider
SAML Resources
JSON Web Token
OAuth Authorization Server
OAuth Client / Resource Server
PingAccess
Local SP Services
External IdP Connectors
Connector Automation
Authentication Context Classes
Attribute Consuming Services
Create
Edit
Delete
Bind/Unbind IdP Connectors
Export Metadata

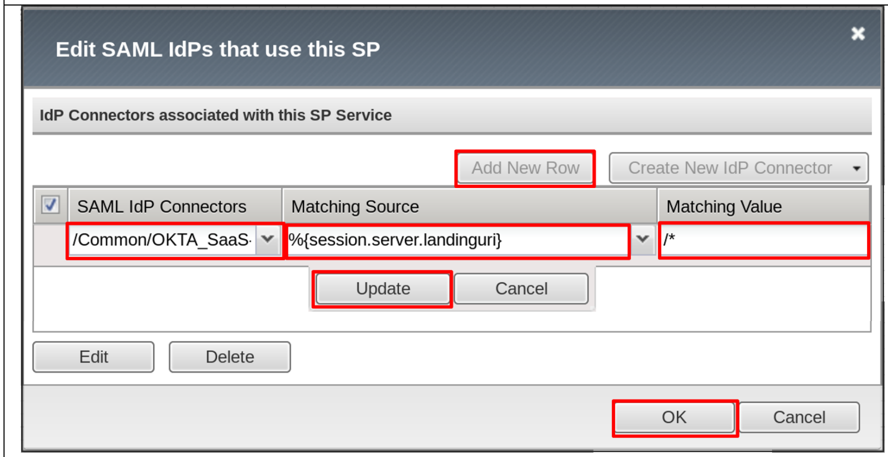
☑	Name	SAML IdP Connectors	Description	Partition
☑	app.f5demo.com			Common

3. Check the existing binding and click **Delete**.


Edit SAML IdPs that use this SP
IdP Connectors associated with this SP Service
Add New Row
Create New IdP Connector
Edit
Delete
OK
Cancel

☑	SAML IdP Connectors	Matching Source	Matching Value
☑	/Common/idp.partner.…		

4. Click **Add New Row** and use the following values
   - **SAML IdP Connectors: /Common/OKTA_SaaS-iDP**
   - **Matching Source: %{session.server.landinguri}**
   - **Matching Value:** /*
5. Click **Update** then **OK**.

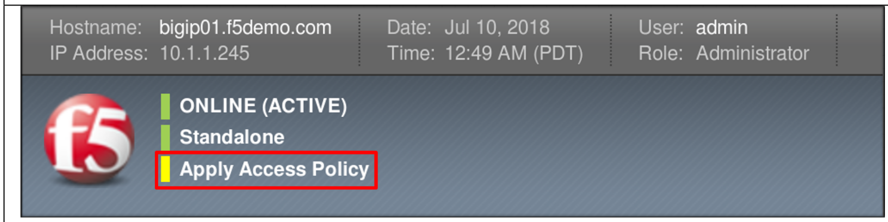

Edit SAML IdPs that use this SP
IdP Connectors associated with this SP Service
Add New Row
Create New IdP Connector
Update
Cancel
Edit
Delete
OK
Cancel

☑	SAML IdP Connectors	Matching Source	Matching Value
	/Common/OKTA_SaaS-	%{session.server.landinguri}	/*

TASK 9: Apply Access Policy Changes

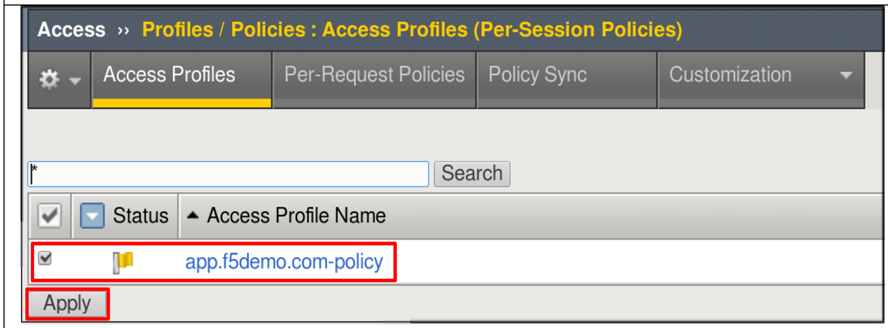
Refer to the instructions and screen shots below:

1. Click the **Apply Access Policy** link in the top left corner of the Admin GUI



Hostname: bigip01.f5demo.com
IP Address: 10.1.1.245
Date: Jul 10, 2018
Time: 12:49 AM (PDT)
User: admin
Role: Administrator

2. Ensure **app.f5demo.com-policy** is checked and click **Apply**



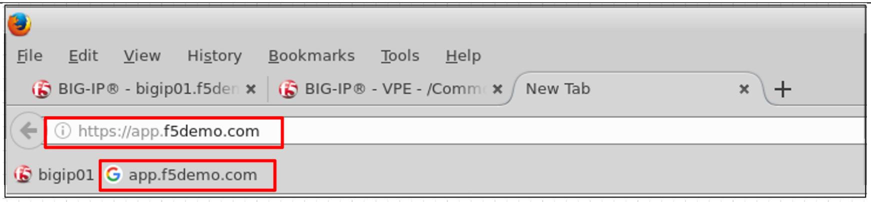
Access ›› Profiles / Policies : Access Profiles (Per-Session Policies)

☑	Status	Access Profile Name
☑		app.f5demo.com-policy

TASK 10 – Test Access to the app.f5demo.com application

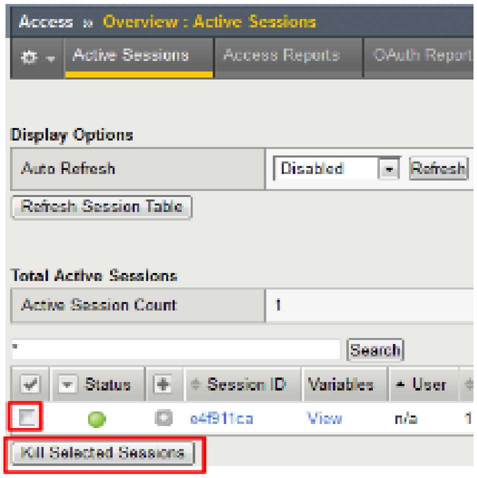
Refer to the instructions and screen shots below:

1. Using your browser from the Jump Host click on the provided bookmark or navigate to: https://app.f5demo.com



https://app.f5demo.com

10. Destroy your Active Session by nagivating to **Access Overview** -> **Active Sessions** Select the checkbox next to your session and click the **Kill Selected Session** button.

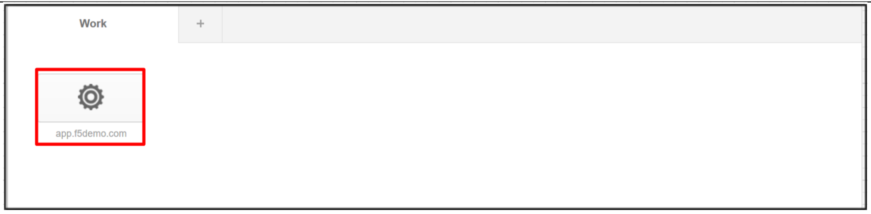


Auto Refresh: Disabled

Active Session Count: 1

□	Status	Session ID	Variables	User
□	●	e4f911ca	View	n/a

11. Close your browser and logon to your **https://dev-<Dev-ID>.oktapreview.com** account. Click on your **app.f5demo.com** application for IDP initiated Access.
12. After successful authentication, were you returned to the SAML SP?
13. Were you successfully authenticated (SAML)?
14. Review your **Active Sessions** (**Access Overview** -> **Active Sessions**).
15. Review your Access Report Logs (**Access Overview** -> **Access Reports**).



6.4 Lab 3: oAuth and OpenID Connect Lab (Google)

The purpose of this lab is to better understand the F5 use cases OAuth2 and OpenID Connect by deploying a lab based on a popular 3rd party login: Google. Google supports OpenID Connect with OAuth2 and JSON Web Tokens. This allows a user to securely log in, or to provide a secondary authentication factor to log in. Archive files are available for the completed Lab 2.

6.4.1 Objective:

- Gain a better understanding of the F5 use cases OAuth2 and OpenID Connect.
- Develop an awareness of the different deployment models that OAuth2, OpenID Connect and JSON Web Tokens (JWT) open up

6.4.2 Lab Requirements:

- All Lab requirements will be noted in the tasks that follow
- Estimated completion time: 25 minutes

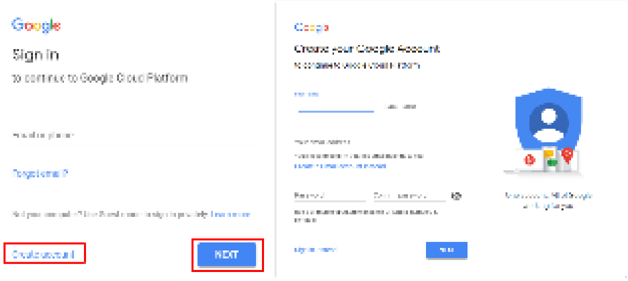
6.4.3 Lab 3 Tasks:

TASK 1: Setup Google's API Credentials

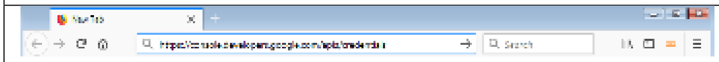
Refer to the instructions and screen shots below:

Note: If you do not have Google/gMail account, you will need to set one up. Navigate to:

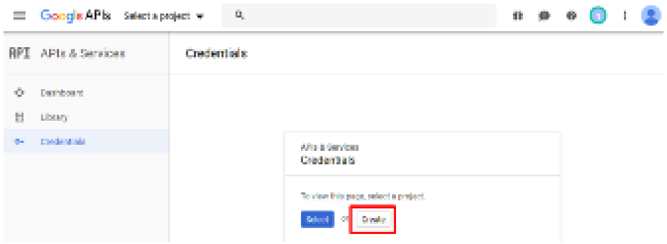
- https://console.developers.google.com/apis/credentials & follow the directions for setup.*


Google
Sign in
to continue to Google Cloud Platform
Create account
NEXT
Google
Create your Google Account

1. Navigate to https://console.developers.google.com/apis/credentials and log in with your developer account.



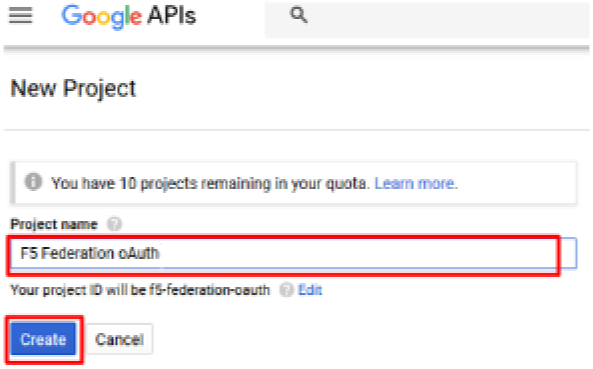
2. You will be redirected to the Google API's screen. If you are previously familiar with Google API's you can create a new Project.
3. If you have not been you will be prompted to create a New Project.
4. Click **Create** in the dialogue box provided.



To view this page, select a project.

5. In the **New Project** window, provide a **Project Name**. The suggested value is: **F5 Federation oAuth**

Note: If you have exceeded your project quota you may have to delete a project or create a new account



New Project

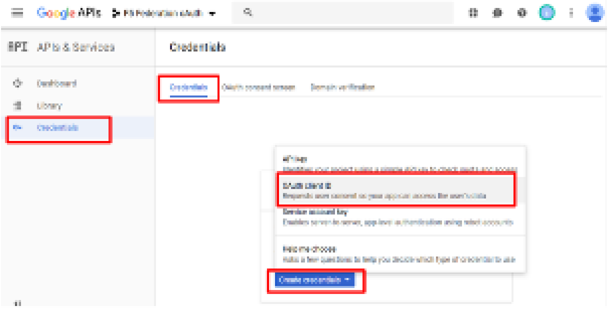
You have 10 projects remaining in your quota. Learn more.

Project name

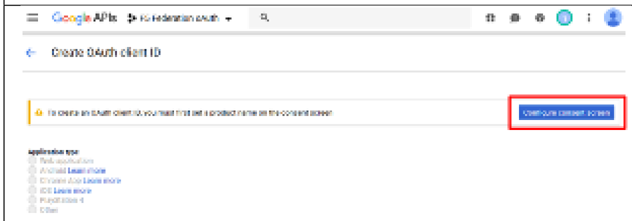
F5 Federation oAuth

Your project ID will be f5-federation-oauth Edit

6. In the next screen, select **OAuth Client ID** for the **Credentials** type and click **Create Credentials**

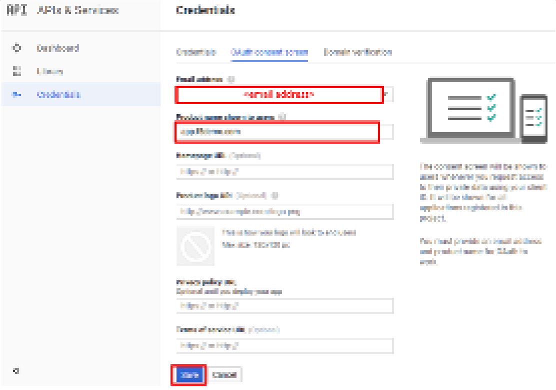


7. If you have not previously accepted a Consent Screen you may be prompted to do so. Click **Configure Consent Screen**.

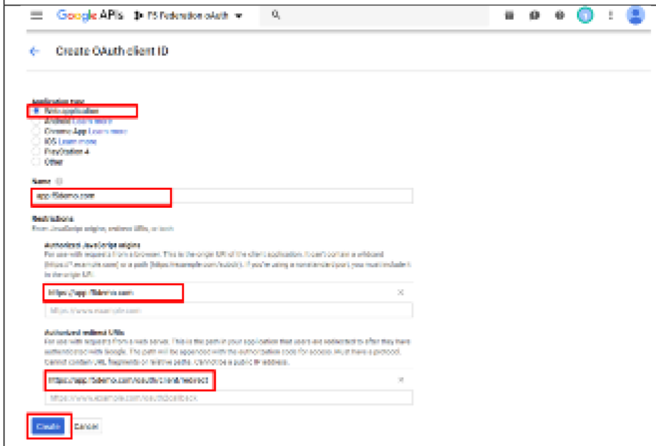


To create an OAuth client ID, you must first set a product name on the consent screen

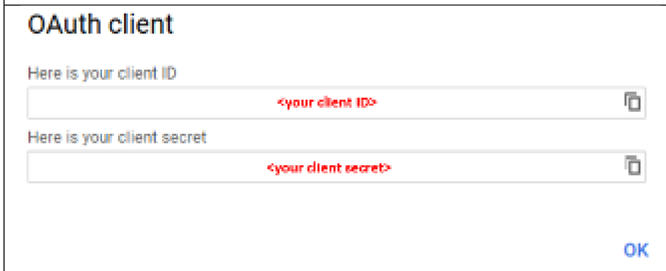
8. On the **OAuth Consent Screen** tab, enter the **email address** of your developer account (pre-populated) for the **Email Address**.
9. For the **Product Name Shown to Users** enter **app.f5demo.com**.
10. Click **Save**.



11. In the **Create OAuth Client ID*** screen select or enter the following values:
    - **Application Type: Web Application**
    - **Name**: **app.f5demo.com**
    - **Authorized JavaScript Engine: https://app.f5demo.com**
    - **Authorized Redirect URIs: https://app.f5demo.com/oauth/client/redirect**
12. Click **Create**.



13. In the **OAuth Client** pop-up window copy and paste your **Client ID** and **Client Secret** in Gedit text editor provided on your desktop.



OAuth client

Here is your client ID

<your client ID>

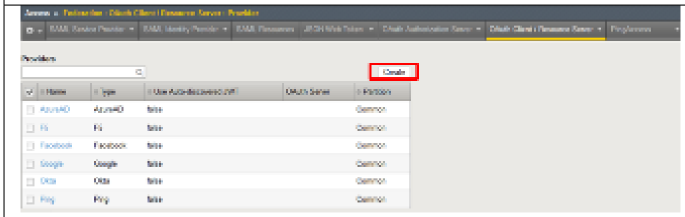
Here is your client secret

<your client secret>

TASK 2: Setup F5 OAuth Provider

Refer to the instructions and screen shots below:

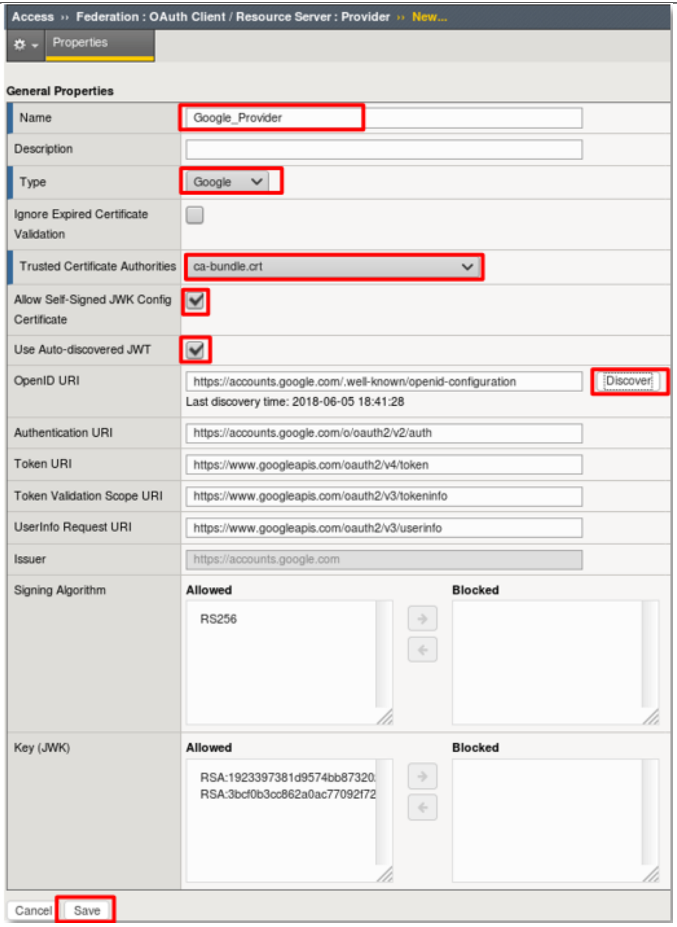
1. Create the **OAuth Provider** by navigating to **Access** -> **Federation** -> **OAuth Client/Resource Server** -> **Provider** and clicking **Create**.



Access » Federation : OAuth Client / Resource Server : Provider

Name	Type	Use Auto-discovered JWT	OAuth Server	Partition
AzureAD	AzureAD	false		Common
F5	F5	false		Common
Facebook	Facebook	false		Common
Google	Google	false		Common
Okta	Okta	false		Common
Ping	Ping	false		Common

2. Using the following values to complete the OAuth Provider
   - **Name: Google_Provider**
   - **Type: Google**
   - **Trusted Certificate Authorities: ca-bundle.crt**
   - **Allow Self-Signed JWK Config: checked**
   - **Use Auto-discovered JWT: checked**
3. Click **Discover**.
4. Accept all other defaults.
5. Click **Save**.



Access » Federation : OAuth Client / Resource Server : Provider » New...

Properties

General Properties

Name: Google_Provider

Description:

Type: Google

Ignore Expired Certificate Validation: □

Trusted Certificate Authorities: ca-bundle.crt

Allow Self-Signed JWK Config Certificate: ☑

Use Auto-discovered JWT: ☑

OpenID URI: https://accounts.google.com/.well-known/openid-configuration [Discover]
Last discovery time: 2018-06-05 18:41:28

Authentication URI: https://accounts.google.com/o/oauth2/v2/auth

Token URI: https://www.googleapis.com/oauth2/v4/token

Token Validation Scope URI: https://www.googleapis.com/oauth2/v3/tokeninfo

UserInfo Request URI: https://www.googleapis.com/oauth2/v3/userinfo

Issuer: https://accounts.google.com

Signing Algorithm: Allowed: RS256; Blocked:

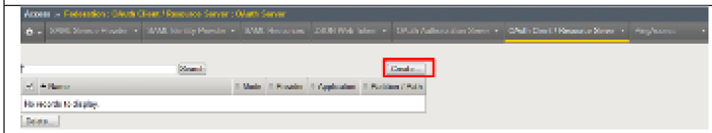
Key (JWK): Allowed: RSA:1923397381d9574bb87320; RSA:3bcf0b3cc862a0ac77092f72; Blocked:

Cancel | Save

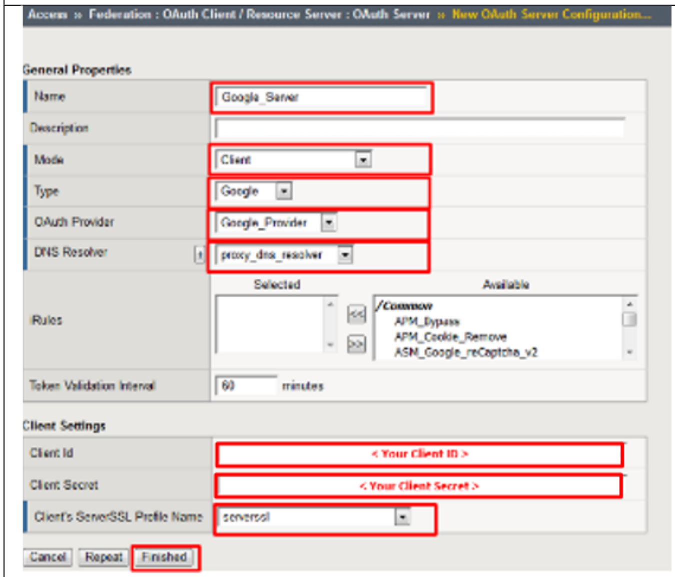
TASK 3: Setup F5 OAuth Server (Client)

Refer to the instructions and screen shots below:

1. Create the **OAuth Server (Client)** by navigating to **Access** -> **Federation** -> **OAuth Client/Resource Server** -> **OAuth Server** and clicking **Create**.



2. Using the following values to complete the OAuth Provider
   - **Name: Google_Server**
   - **Mode: Client**
   - **Type: Google**
   - **OAuth Provider: Google_Provider**
   - **DNS Resolver: proxy_dns_resolver**
   - **Client ID: <your client id>**
   - **Client Secret: <your client secret>**
   - **Client's Server SSL Profile Name: serverssl**
3. Click **Finished**.



Access » Federation : OAuth Client / Resource Server : OAuth Server » New OAuth Server Configuration...

General Properties

Name: Google_Server
Description:
Mode: Client
Type: Google
OAuth Provider: Google_Provider
DNS Resolver: proxy_dns_resolver
Rules: Selected / Available: /Common APM_Bypass, APM_Cookie_Remove, ASM_Google_reCaptcha_v2
Token Validation Interval: 60 minutes

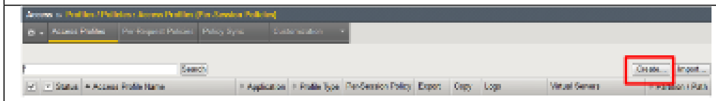
Client Settings

Client Id: < Your Client ID >
Client Secret: < Your Client Secret >
Client's ServerSSL Profile Name: serverssl

TASK 4: Setup F5 Per Session Policy (Access Policy)

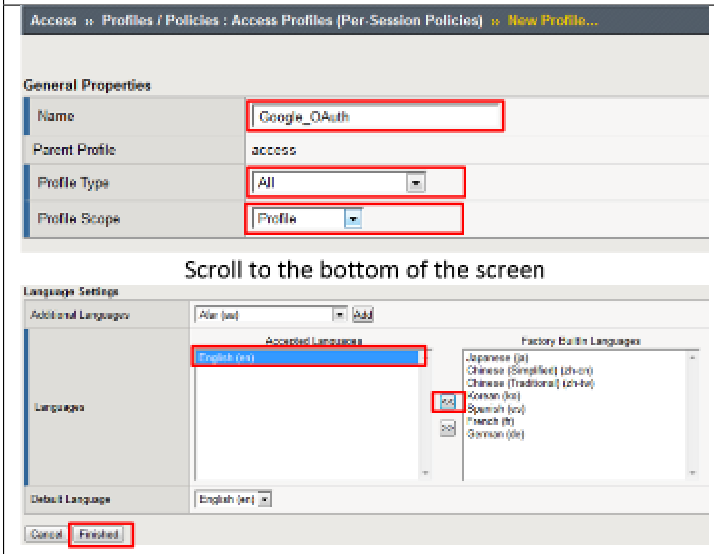
Refer to the instructions and screen shots below:

1. Create the **Per Session Policy** by navigating to **Access -> Profile/Policies** -> **Access Profiles (Per Session Policies)** and clicking **Create**.



Access » Profiles / Policies : Access Profiles (Per-Session Policies)

2. In the **New Profile** dialogue window enter the following values
   - **Name: Google_OAuth**
   - **Profile Type: All**
   - **Profile Scope: Profile**
   - **Language: English**
3. Click **Finished**.



Access » Profiles / Policies : Access Profiles (Per-Session Policies) » New Profile...

General Properties

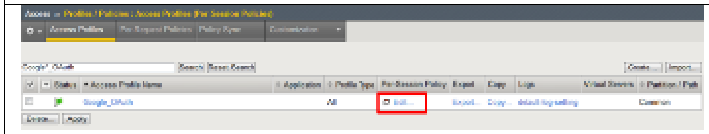
Name	Google_OAuth
Parent Profile	access
Profile Type	All
Profile Scope	Profile

Scroll to the bottom of the screen

Language Settings

Additional Languages	Afar (aa)
Languages	Accepted Languages: English (en) Factory Builtin Languages: Japanese (ja), Chinese (Simplified) (zh-cn), Chinese (Traditional) (zh-tw), Korean (ko), Spanish (es), French (fr), German (de)
Default Language	English (en)

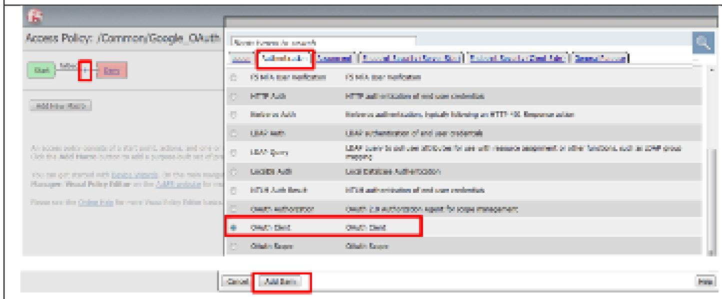
4. Click **Edit** link on for the **Google_OAuth** Access Policy.



Access » Profiles / Policies : Access Profiles (Per-Session Policies)

Status	Access Profile Name	Application	Profile Type	Per-Session Policy	Export	Copy	Logs	Virtual Servers	Partition / Path
	Google_OAuth		All	Edit...	Export...	Copy...	default-log-setting		Common

5. In the **Google_OAuth** Access Policy, click the "**+**" between **Start** & **Deny**
6. Click the **Authentication** tab in the events window.
7. Scroll down and click the radio button for **OAuth Client**.
8. Click **Add Item**.

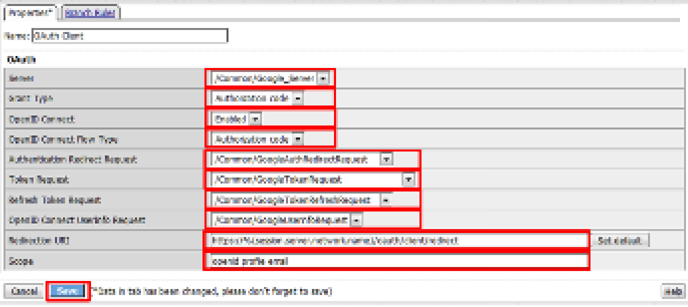


Access Policy: /Common/Google_OAuth

○	F5 MFA user notification	F5 MFA user notification
○	HTTP Auth	HTTP authentication of end user credentials
○	Kerberos Auth	Kerberos authentication, typically following an HTTP 401 Response action
○	LDAP Auth	LDAP authentication of end user credentials
○	LDAP Query	LDAP query to pull user attributes for use with resource assignment or other functions, such as LDAP group mapping
○	LocalDB Auth	Local Database Authentication
○	NTLM Auth Result	NTLM authentication of end user credentials
○	OAuth Authorization	OAuth 2.0 authorization agent for scope management
●	OAuth Client	OAuth Client
○	OAuth Scope	OAuth Scope

9. In the ***OAuth_Client*** window enter the following values as shown:
- **Server: /Common/Google_Server**
- **Grant Type: Authorization code**
- **OpenID Connect: Enabled**
- **OpenID Connect Flow Type: Authorization code**
- **Authentication Redirect Request: /Common/GoogleAuthRedirectRequest**
- **Token Request: /Common/GoogleTokenRequest**
- **Refresh Token Request: /Common/GoogleTokenRefreshRequest**
- **OpenID Connect UserInfo Request: /Common/GoogleUserinfoRequest**
- **Redirection URI: https://%{session.server.network.name}/oauth/client/redirect**
- **Scope: openid profile email**

10. Click **Save**.



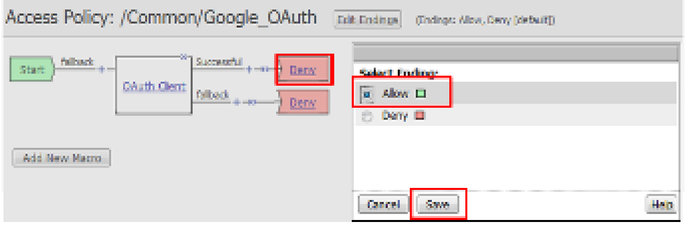
Name: OAuth Client

OAuth

Server	/Common/Google_Server
Grant Type	Authorization code
OpenID Connect	Enabled
OpenID Connect Flow Type	Authorization code
Authentication Redirect Request	/Common/GoogleAuthRedirectRequest
Token Request	/Common/GoogleTokenRequest
Refresh Token Request	/Common/GoogleTokenRefreshRequest
OpenID Connect UserInfo Request	/Common/GoogleUserinfoRequest
Redirection URI	https://%{session.server.network.name}/oauth/client/redirect
Scope	openid profile email

(*Data in tab has been changed, please don't forget to save)

11. Click on the **Deny** link, in the **Select Binding**, select the **Allow** radio button and click **Save**.



Access Policy: /Common/Google_OAuth

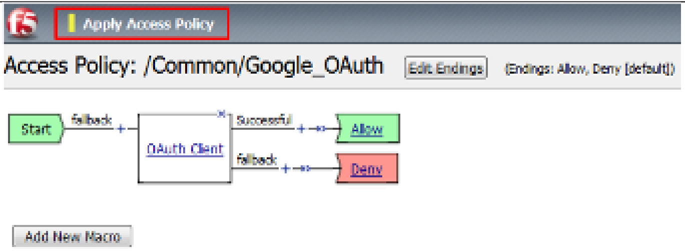
(Endings: Allow, Deny [default])

Select Ending:

● Allow
○ Deny

12. Click on the ***Apply Access Policy*** link in the top left-hand corner.

Note: Additional actions can be taken in the Per Session policy (Access Policy). The lab is simply completing authorization. Other access controls can be implemented based on the use case.



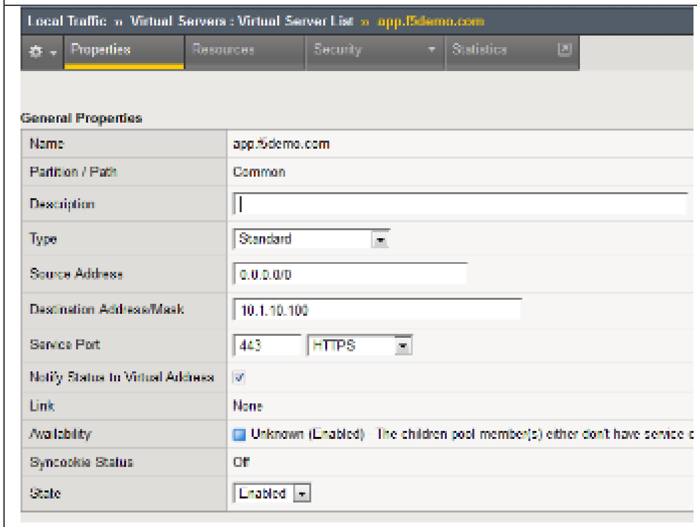
Access Policy: /Common/Google_OAuth

(Endings: Allow, Deny [default])

TASK 5: Associate Access Policy to Virtual Server

Refer to the instructions and screen shots below:

1. Navigate to **Local Traffic** -> **Virtual Servers** -> **Virtual Server List** and click on the **app.f5demo.com** Virtual Server link.
2. Scroll to the **Access Policy** section.

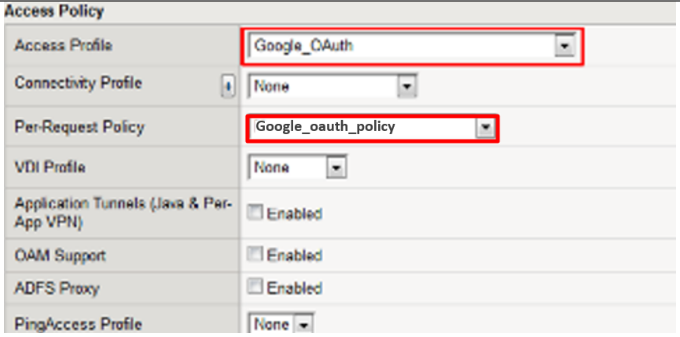


Local Traffic » Virtual Servers : Virtual Server List » app.f5demo.com

General Properties

Name	app.f5demo.com
Partition / Path	Common
Description	
Type	Standard
Source Address	0.0.0.0/0
Destination Address/Mask	10.1.10.100
Service Port	443 HTTPS
Notify Status to Virtual Address	☑
Link	None
Availability	Unknown (Enabled) - The children pool member(s) either don't have service c
Syncookie Status	Off
State	Enabled

3. Use the **Access Profile** drop down to change the **Access Profile** to **Google_OAuth**
4. Use the **Per-Request Policy** drop down to change the **Per-Request Policy** to **Google_oauth_policy**
5. Scroll to the bottom of the **Virtual Server** configuration and click **Update**



Access Policy

Access Profile	Google_OAuth
Connectivity Profile	None
Per-Request Policy	Google_oauth_policy
VDI Profile	None
Application Tunnels (Java & Per-App VPN)	□ Enabled
OAM Support	□ Enabled
ADFS Proxy	□ Enabled
PingAccess Profile	None

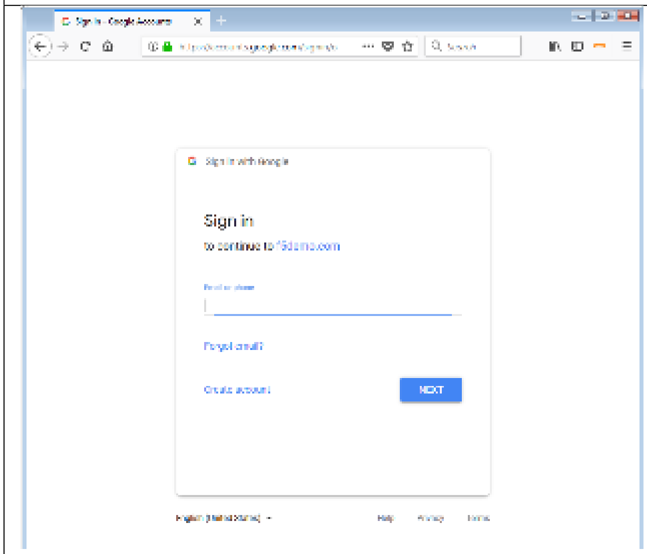
TASK 6: Test app.f5demo.com

Refer to the instructions and screen shots below:

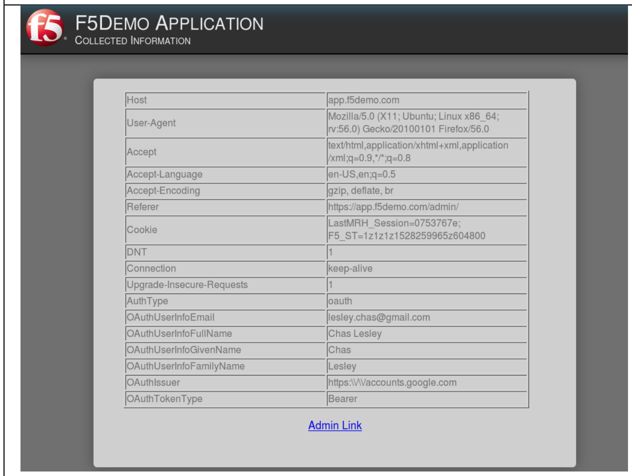
1. Navigate in your provided browser to **https://app.f5demo.com**

https://app.f5demo.com

2. Authenticate with the account you established your Google Developer account with.



3. Did you successfully redirect to the Google?
4. After successful authentication, were you returned to the app.f5demo.com?
5. Did you successfully pass your OAuth Token?



F5DEMO APPLICATION
COLLECTED INFORMATION

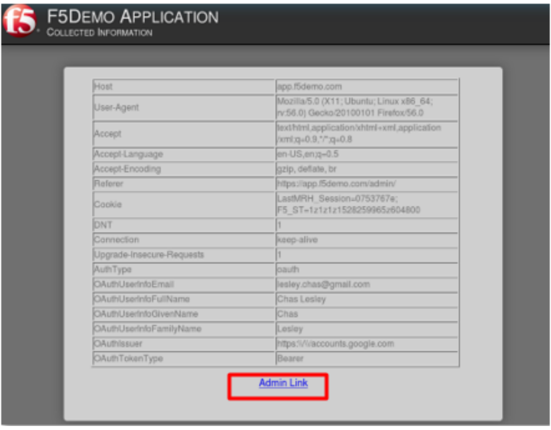
Host	app.f5demo.com
User-Agent	Mozilla/5.0 (X11; Ubuntu; Linux x86_64; rv:56.0) Gecko/20100101 Firefox/56.0
Accept	text/html,application/xhtml+xml,application /xml;q=0.9,*/*;q=0.8
Accept-Language	en-US,en;q=0.5
Accept-Encoding	gzip, deflate, br
Referer	https://app.f5demo.com/admin/
Cookie	LastMRH_Session=0753767e; F5_ST=1z1z1z1528259965z604800
DNT	1
Connection	keep-alive
Upgrade-Insecure-Requests	1
AuthType	oauth
OAuthUserInfoEmail	lesley.chas@gmail.com
OAuthUserInfoFullName	Chas Lesley
OAuthUserInfoGivenName	Chas
OAuthUserInfoFamilyName	Lesley
OAuthIssuer	https:\/\/accounts.google.com
OAuthTokenType	Bearer

Admin Link

TASK 7: Per Request Policy Controls

Refer to the instructions and screen shots below:

1. In the application page for **https://app.f5demo.com** click the **Admin Link** shown



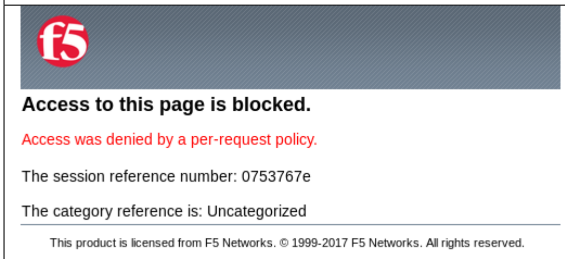
F5DEMO APPLICATION
COLLECTED INFORMATION

Host	app.f5demo.com
User-Agent	Mozilla/5.0 (X11; Ubuntu; Linux x86_64; rv:56.0) Gecko/20100101 Firefox/56.0
Accept	text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
Accept-Language	en-US,en;q=0.5
Accept-Encoding	gzip, deflate, br
Referer	https://app.f5demo.com/admin/

Cookie	LastMRH_Session=0753767e;
	F5_ST=1z1z1z1528259965z604800

DNT	1
Connection	keep-alive
Upgrade-Insecure-Requests	1
AuthType	oauth
OAuthUserInfoEmail	lesley.chas@gmail.com
OAuthUserInfoFullName	Chas Lesley
OAuthUserInfoGivenName	Chas
OAuthUserInfoFamilyName	Lesley
OAuthIssuer	https:\/\/accounts.google.com
OAuthTokenType	Bearer

2. You will receive an **Access to this page is blocked** (customizable) message with a reference. You have been blocked because you do not have access on a per request basis.
3. Press the **Back** button in your browser to return to **https://app.f5demo.com**.



Access to this page is blocked.

Access was denied by a per-request policy.

The session reference number: 0753767e

The category reference is: Uncategorized

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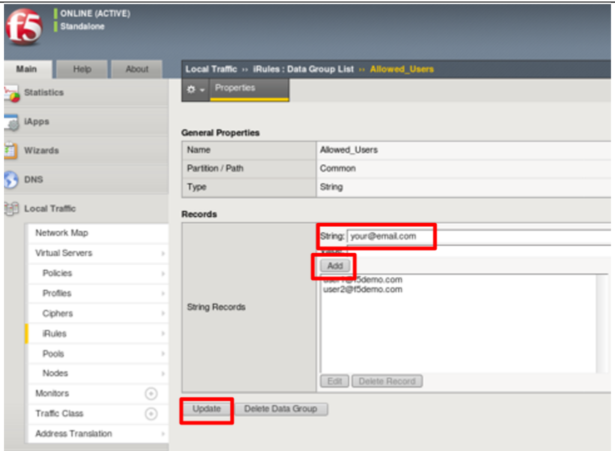
4. Navigate to **Local Traffic** -> **iRules** -> **Datagroup List** and click on the **Allowed_Users** datagroup.
5. Enter your **Google Account** used for this lab as the **String** value.
6. Click **Add** then Click **Update**.

Note: We are using a DataGroup control to minimize lab resources and steps. AD or LDAP Group memberships, Session variables, other user attributes and various other access control mechanisms can be used to achieve similar results.



General Properties

Name	Allowed_Users
Partition / Path	Common
Type	String

Records

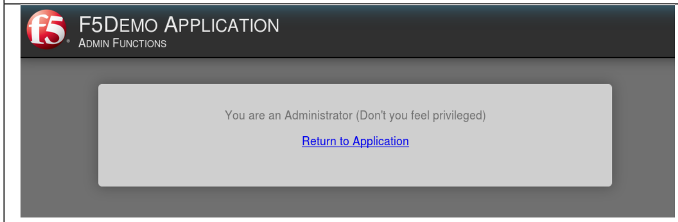
String Records

String: your@email.com

user1@f5demo.com
user2@f5demo.com

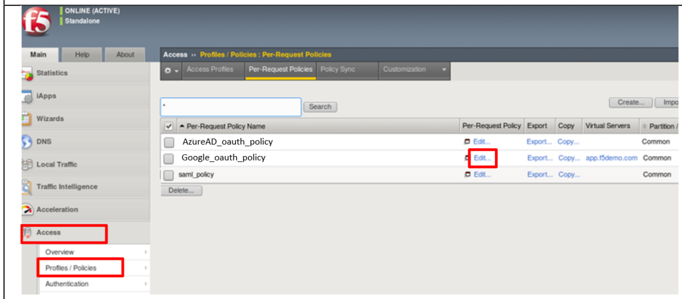
7. You should now be able to successfully to access the Admin Functions by clicking on the **Admin Link**.

Note: Per Request Policies are dynamic and do not require the same "Apply Policy" action as Per Session Policies.



You are an Administrator (Don't you feel privileged)

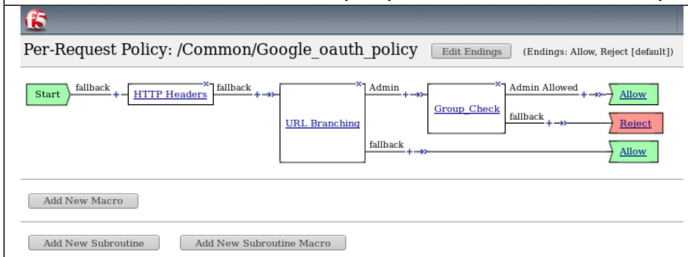
8. To review the Per Request Policy, navigate to **Access Profiles/Policies** -> **Per Request Policies** and click on the **Edit** link for the **Google_oauth_policy**.



☑	Per-Request Policy Name	Per-Request Policy	Export	Copy	Virtual Servers	Partition /
□	AzureAD_oauth_policy	Edit...	Export...	Copy...		Common
□	Google_oauth_policy	Edit...	Export...	Copy...	app.f5demo.com	Common
□	saml_policy	Edit...	Export...	Copy...		Common

9. The various Per-Request-Policy actions can be reviewed

Note: Other actions like Step-Up Auth controls can be performed in a Per-Request Policy.



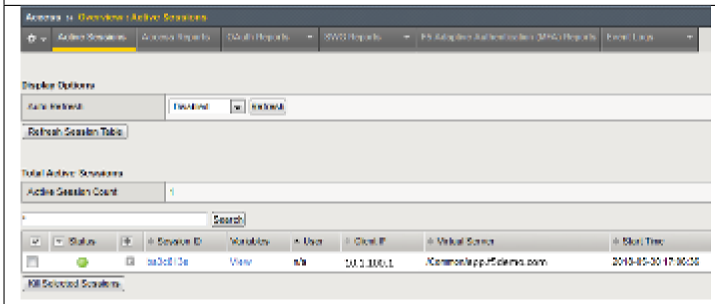
Per-Request Policy: /Common/Google_oauth_policy

Edit Endings (Endings: Allow, Reject [default])

TASK 8: Review OAuth Results

Refer to the instructions and screen shots below:

1. Review your Active Sessions (**Access** -> **Overview** -> **Active Sessions**).
2. You can review Session activity or session variable from this window or kill the selected Session.



Access » Overview : Active Sessions

Display Options

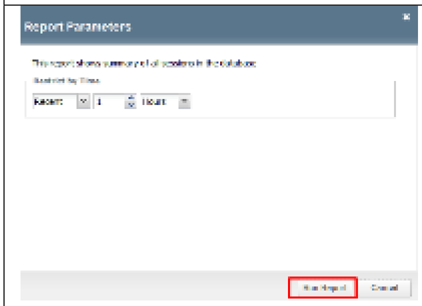
Auto Refresh: Disabled

Total Active Sessions

Active Session Count: 1

Status	Session ID	Variables	User	Client IP	Virtual Server	Start Time
●	ab3c813e	View	n/a	10.1.100.1	/Common/app.f5demo.com	2018-05-30 17:36:35

3. Review your Access Report Logs (**Access** -> **Overview** -> **Access Reports**).



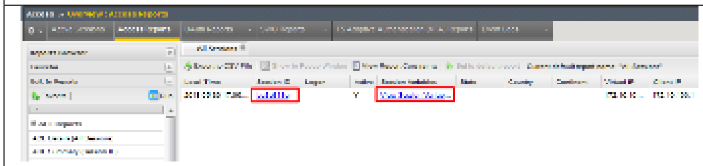
Report Parameters

This report shows summary of all sessions in the database.

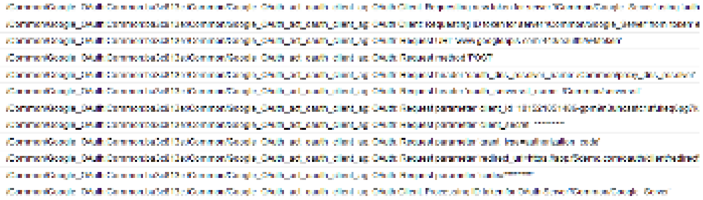
Restrict by Time

Recent 1 Hours

4. In the **Report Parameters window** click **Run Report**.

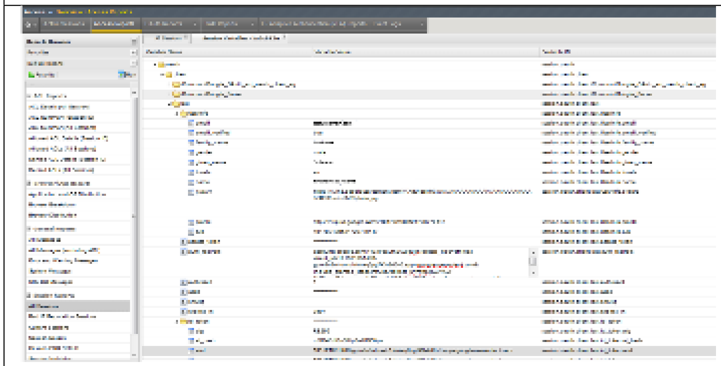


5. Look at the **SessionID** report by clicking the **Session ID** Link.

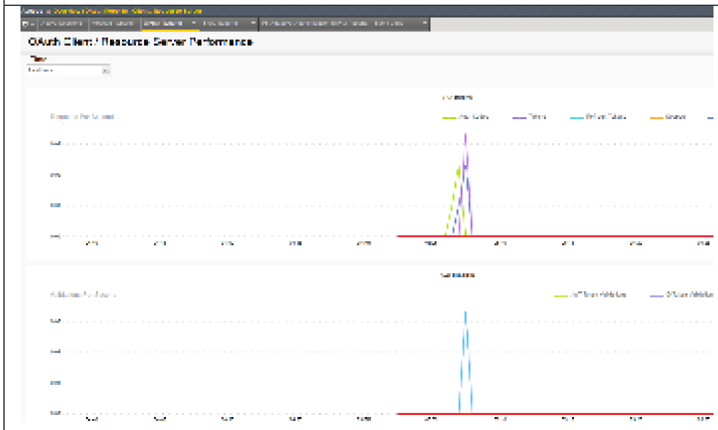


6. Look at the **Session Variables** report by clicking the **View Session Variables** link. Pay attention to the OAuth Variables.

Note: Any of these session variables can be used to perform further actions to improve security or constrain access with logic in the Per-Session or Per Request VPE policies or iRules/iRulesLX.



7. Review your Access Report Logs (**Access** -> **Overview** -> **OAuth Reports** -> **Client/Resource Server**).



6.5 Lab 4: oAuth and AzureAD Lab

The purpose of this lab is to familiarize the Student with the using APM in conjunction with Microsoft Azure AD. Microsoft Active Directory Domain Services is offered by Microsoft Azure as a cloud service. This can be used together with OpenID to log in to APM.

6.5.1 Objective:

- Gain an understanding of additional F5 OAuth features
- Deploy a working configuration using F5 APM and Microsoft Azure AD

6.5.2 Lab Requirements:

- All lab requirements will be noted in the tasks that follow
- Estimated completion time: 25 minutes

6.5.3 Lab 4 Tasks:

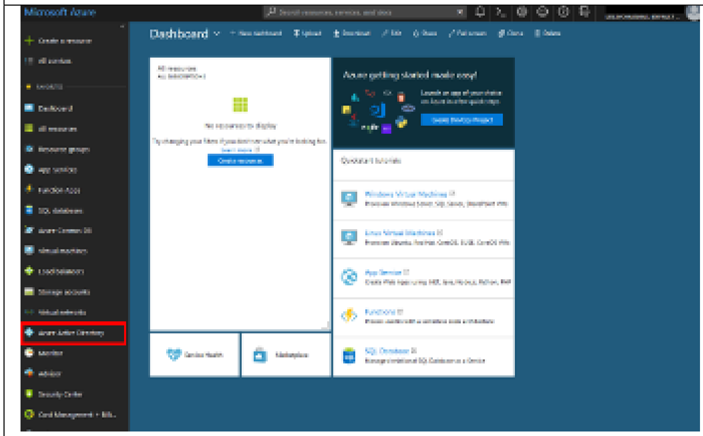
TASK 1: Create/Review New Application Registration

Refer to the instructions and screen shots below:

Note: The following steps in this task can just be "REVIEWED". As setting up a free Azure account requires the entry of billing information, setting up an account and performing the steps below is a [REVIEW] task. For those desiring to set up an account refer to the "APPENDIX: Setting up an Azure Development Account". For those with existing accounts these steps may be followed if desired. For all others, simply review the steps in Task1 and proceed to Task 2.

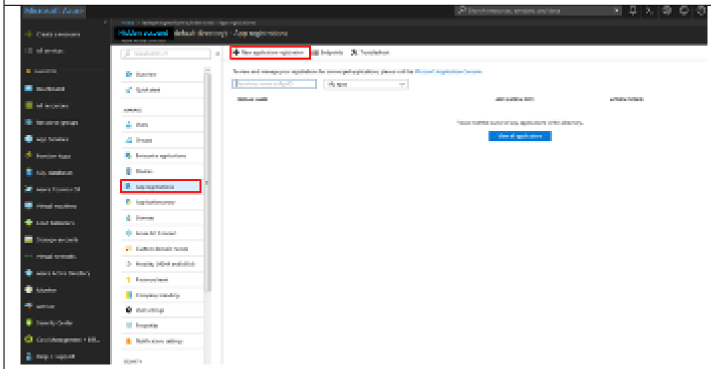
[REVIEW]

1. Log into the Microsoft Azure Dashboard and click **Azure Active Directory** in the left navigation menu.



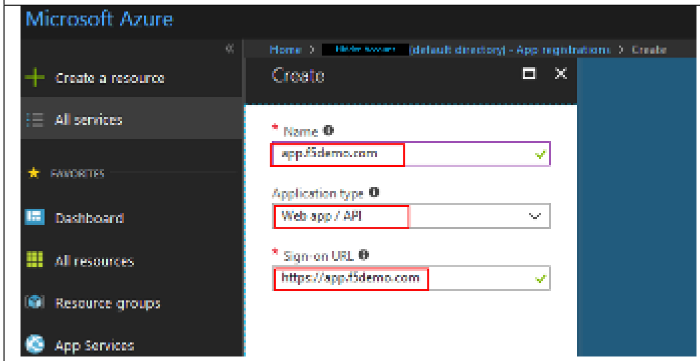
[REVIEW]

2. Click on **App Registration** on the resulting menu and then **New Application Registration** on the flyout menu.



[REVIEW]

3. In the pop menu for **Create App Registration**, enter the following values
   - **Name: app.f5demo.com**
   - **Application Type: Web App /API**
   - **Sign On URL: https://app.f5demo.com**
4. Click **Create**.



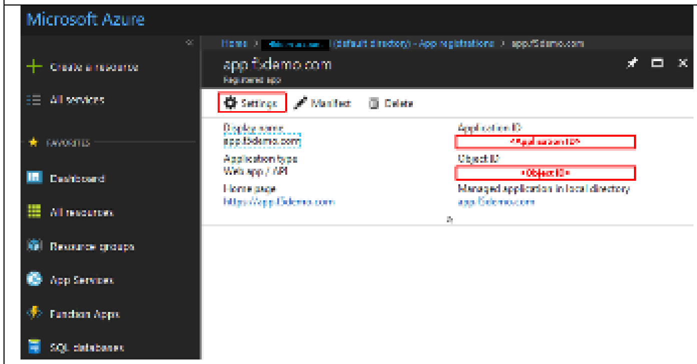
* Name: app.f5demo.com

Application type: Web app / API

* Sign-on URL: https://app.f5demo.com

[REVIEW]

5. In the resulting **app.f5demo.com Registered App** window, note & copy the **Application ID**. This will be used in a later setup step
6. Click **Settings**.



Display name: app.f5demo.com

Application type: Web app / API

Home page: https://app.f5demo.com

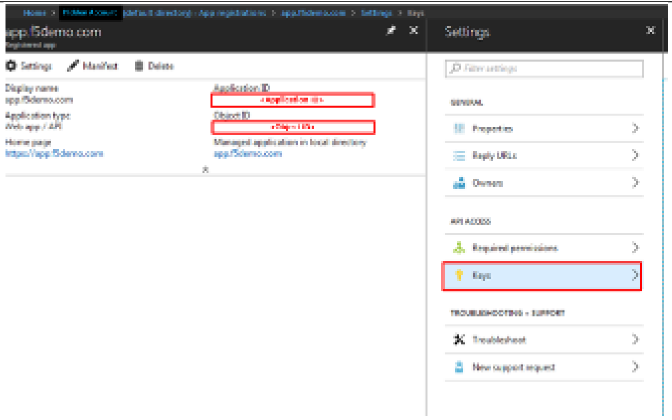
Application ID: <Application ID>

Object ID: <Object ID>

Managed application in local directory: app.f5demo.com

[REVIEW]

7. In the **Settings** flyout panel, click **Keys**



Display name: app.f5demo.com

Application type: Web app / API

Home page: https://app.f5demo.com

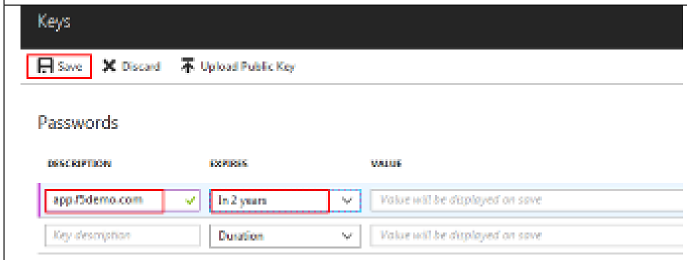
Application ID: <application id>

Object ID: <Object ID>

Managed application in local directory: app.f5demo.com

[REVIEW]

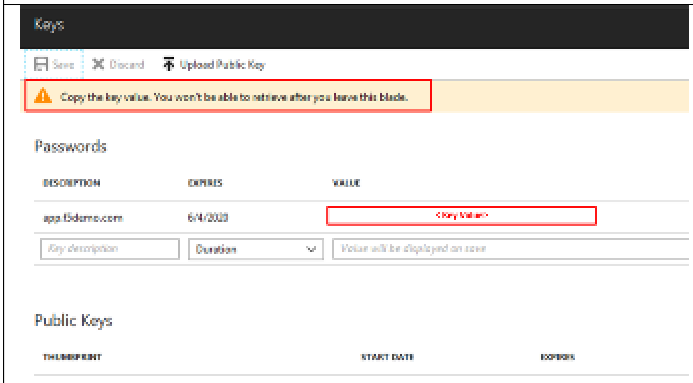
8. In the **Keys** flyout panel, enter the following values
   - **Description: app.f5demo.com**
   - **Expires: In 2 Years**
9. Click **Save**.



DESCRIPTION	EXPIRES	VALUE
app.f5demo.com	In 2 years	Value will be displayed on save
Key description	Duration	Value will be displayed on save

[REVIEW]

10. Note the message provided by Azure in the **Keys** panel.
11. Copy the ***Key Value*** for use in a later setup step.



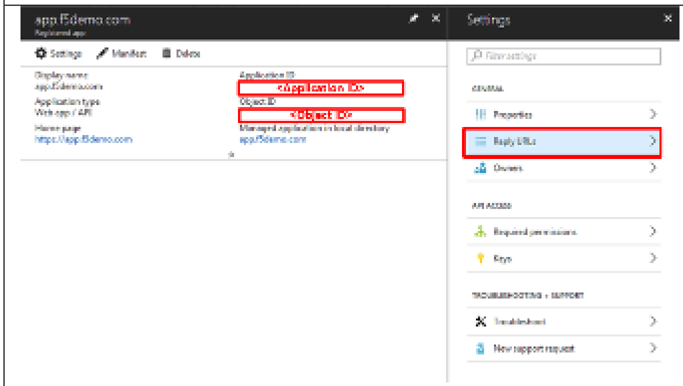
Copy the key value. You won't be able to retrieve after you leave this blade.

DESCRIPTION	EXPIRES	VALUE
app.f5demo.com	6/4/2020	<Key Value>
Key description	Duration	Value will be displayed on save

THUMBPRINT	START DATE	EXPIRES

[REVIEW]

12. In the **Settings** flyout panel, click **Reply URL**.



Display name
app.f5demo.com

Application type
Web app / API

Home page
https://app.f5demo.com

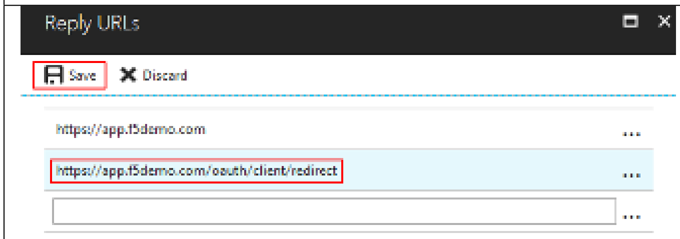
Application ID
<Application ID>

Object ID
<Object ID>

Managed application in local directory
app.f5demo.com

[REVIEW]

13. In the **Reply URL** flyout panel, enter **https://app.f5demo.com/oauth/client/redirect**
14. Click **Save**.

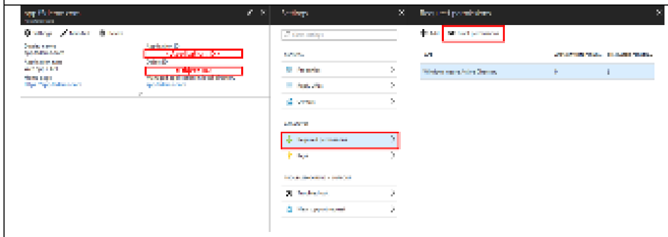


https://app.f5demo.com

https://app.f5demo.com/oauth/client/redirect

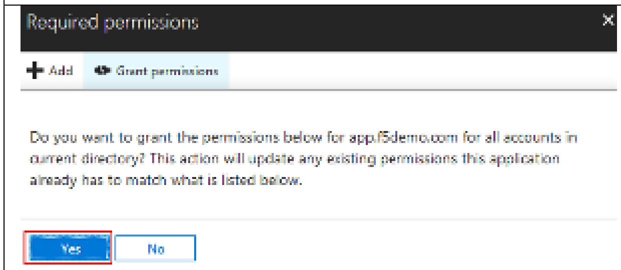
[REVIEW]

15. In the **Settings** flyout panel, click **Required Permissions**
16. In the **Required Permissions** flyout panel, click **Grant Permissions**



[REVIEW]

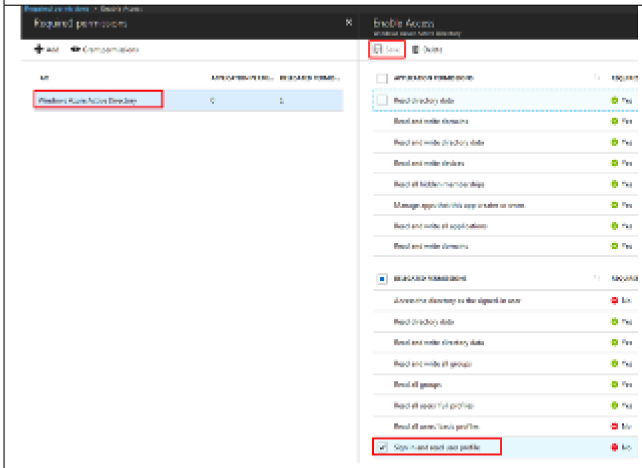
17. The following **Required Permissions** dialogue box may appear.
18. Click **Yes** to proceed.



Do you want to grant the permissions below for app.f5demo.com for all accounts in current directory? This action will update any existing permissions this application already has to match what is listed below.

[REVIEW]

19. In the **Required Permissions** flyout panel, click **Windows Azure Active Directory**.
20. In the **Enable Access** flyout panel, ensure the **Sign In and Read User Profile**. permission is checked.
21. Click **Save**.



API	APPLICATION PERMI...	DELEGATED PERMI...
Windows Azure Active Directory	0	1

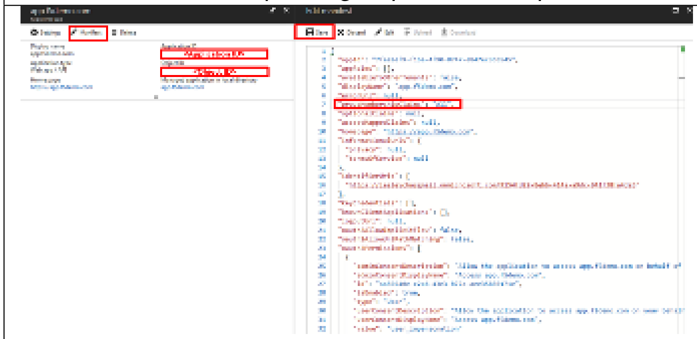
□ APPLICATION PERMISSIONS	REQUIRES
□ Read directory data	● Yes
Read and write domains	● Yes
Read and write directory data	● Yes
Read and write devices	● Yes
Read all hidden memberships	● Yes
Manage apps that this app creates or owns	● Yes
Read and write all applications	● Yes
Read and write domains	● Yes

■ DELEGATED PERMISSIONS	REQUIRES
Access the directory as the signed-in user	● No
Read directory data	● Yes
Read and write directory data	● Yes
Read and write all groups	● Yes
Read all groups	● Yes
Read all users' full profiles	● Yes
Read all users' basic profiles	● No
☑ Sign in and read user profile	● No

[REVIEW]

22. In the **Registered Application** panel, click **Manifest**.
23. In the **Edit Manifest** flyout panel, edit the **groupMembershipClaims** line (line 7) from **null** to **“All”** (note quotes are required).
24. Click **Save**.

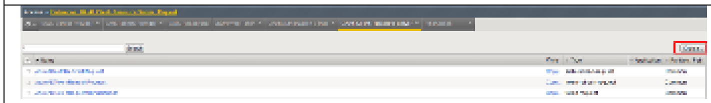
Note: You can also update groupMembershipClaims to be “SecurityGroup”.



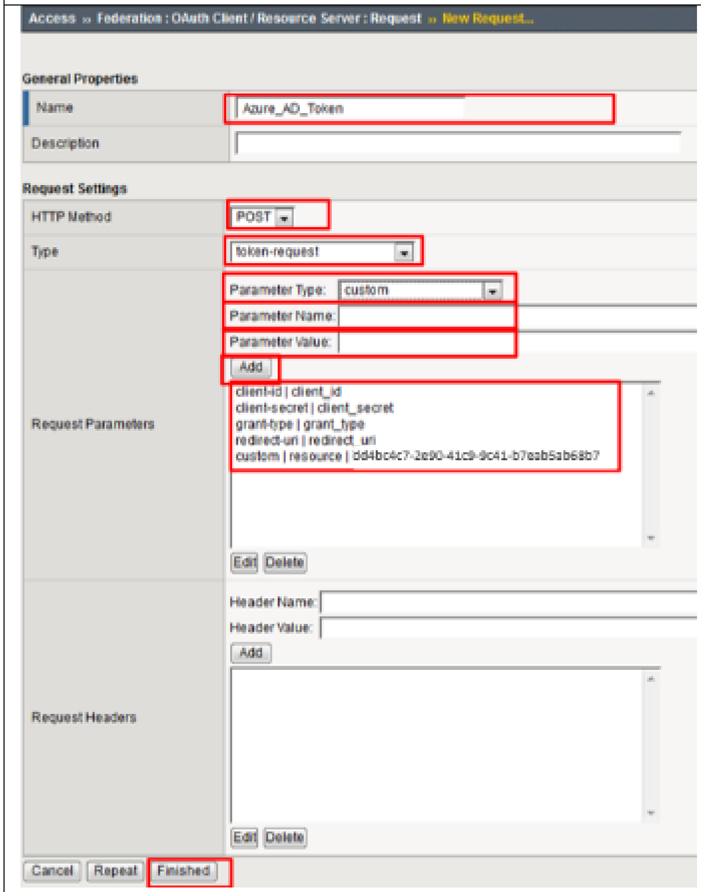
TASK 2: Create OAuth Request

Refer to the instructions and screen shots below:

1. Create the **OAuth Request** by navigating to **Access** -> **Federation** -> **OAuth Client/Resource Server** -> **Request** and clicking **Create**



2. Use the following values to create the Request
   - **Name: Azure_AD_Token**
   - **HTTP Method: POST**
   - **Type: token-request**
3. Create the following Request Parameters using the Parameter Type drop down:
   - **Parameter Type: client-id**
   - **Parameter Name: client_id** (notice _)
   - **Parameter Type: client-secret**
   - **Parameter Name: client_secret** (notice _)
   - **Parameter Type: grant-type**
   - **Parameter Name: grant_type** (notice _)
   - **Parameter Type: redirect-uri**
   - **Parameter Name: redirect_uri** (notice _)
   - **Parameter Type: custom**
   - **Parameter Name: resource**
   - **Parameter Value: dd4bc4c7-2e90-41c9-9c41-b7eab5ab68b7**
4. Click **Finished**.



Access » Federation : OAuth Client / Resource Server : Request » New Request...

General Properties

Name: Azure_AD_Token

Description:

Request Settings

HTTP Method: POST

Type: token-request

Request Parameters:

Parameter Type: custom

Parameter Name:

Parameter Value:

```
client-id | client_id
client-secret | client_secret
grant-type | grant_type
redirect-uri | redirect_uri
custom | resource | dd4bc4c7-2e90-41c9-9c41-b7eab5ab68b7
```

Request Headers:

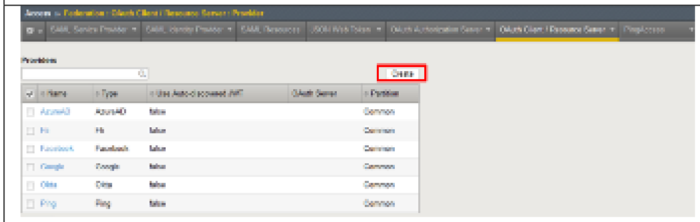
Header Name:

Header Value:

TASK 3: Create OAuth Provider

Refer to the instructions and screen shots below:

1. Create the **OAuth Provider** by navigating to **Access** -> **Federation** -> **OAuth Client/Resource Server** -> **Provider** and clicking **Create**.


Access » Federation : OAuth Client / Resource Server : Provider
SAML Service Provider
SAML Identity Provider
SAML Resources
JSON Web Token
OAuth Authorization Server
OAuth Client / Resource Server
PingAccess
Providers
Create

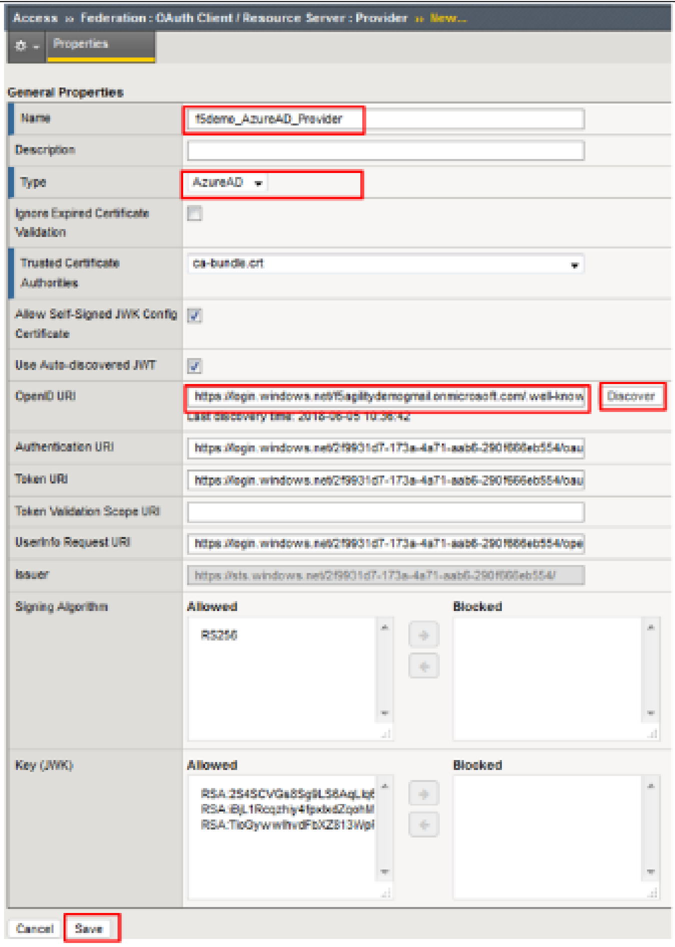
Name	Type	Use Auto-discovered JWT	OAuth Server	Partition
AzureAD	AzureAD	false		Common
F5	F5	false		Common
Facebook	Facebook	false		Common
Google	Google	false		Common
Okta	Okta	false		Common
Ping	Ping	false		Common

2. Use the following values to create the Request
   - **Name**: **f5demo_AzureAD_Provider**
   - **Type**: **AzureAD**
   - **OpenID URI:** (replace **_tennantID_** with the following tenantID **f5agilitydemogmail.onmicrosoft.com**)

Resulting URI should be as follows: https://login.windows.net/f5agilitydemogmail.onmicrosoft.com/.well-known/openid-configuration

3. Click **Discover**.
4. Click **Save**.

Note: if using another account you can find you TenantID by navigating to the "Azure Portal" and clicking "Azure Active Directory". The tenant ID is the "default directory" as shown. The full name of the TenantID will be your "TenantID.onmicrosoft.com"

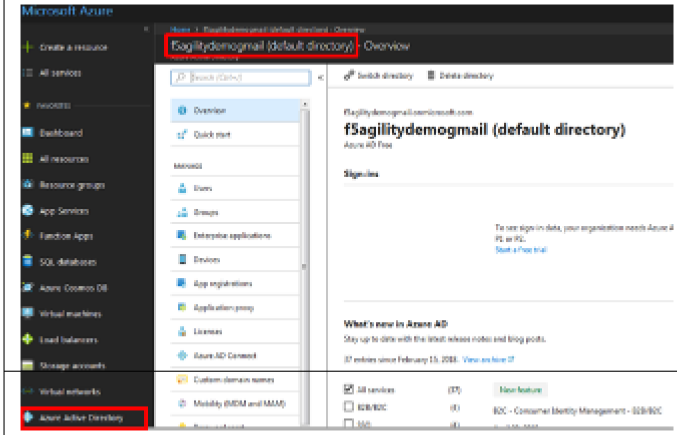


Access » Federation : OAuth Client / Resource Server : Provider » New...

Properties

General Properties

Name	f5demo_AzureAD_Provider
Description	
Type	AzureAD
Ignore Expired Certificate Validation	□
Trusted Certificate Authorities	ca-bundle.crt
Allow Self-Signed JWK Config Certificate	☑
Use Auto-discovered JWT	☑
OpenID URI	https://login.windows.net/f5agilitydemogmail.onmicrosoft.com/.well-know Last discovery time: 2018-06-05 10:36:42
Authentication URI	https://login.windows.net/2f9931d7-173a-4a71-aab6-290f666eb554/oau
Token URI	https://login.windows.net/2f9931d7-173a-4a71-aab6-290f666eb554/oau
Token Validation Scope URI	
UserInfo Request URI	https://login.windows.net/2f9931d7-173a-4a71-aab6-290f666eb554/ope
Issuer	https://sts.windows.net/2f9931d7-173a-4a71-aab6-290f666eb554/
Signing Algorithm	Allowed: RS256 Blocked:
Key (JWK)	Allowed: RSA:2545CVGs8Sg9LS8AqLbf RSA:iBjL1Rcqzhiy4fpxbdZqohM RSA:TioGywwlhvdFbXZ813Wpl Blocked:



f5agilitydemogmail (default directory) - Overview

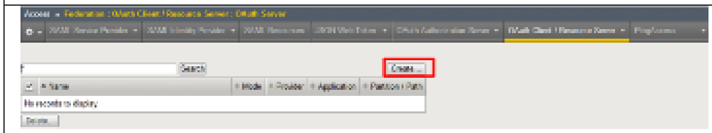
f5agilitydemogmail (default directory)

Azure AD Free

TASK 4: Create OAuth Server

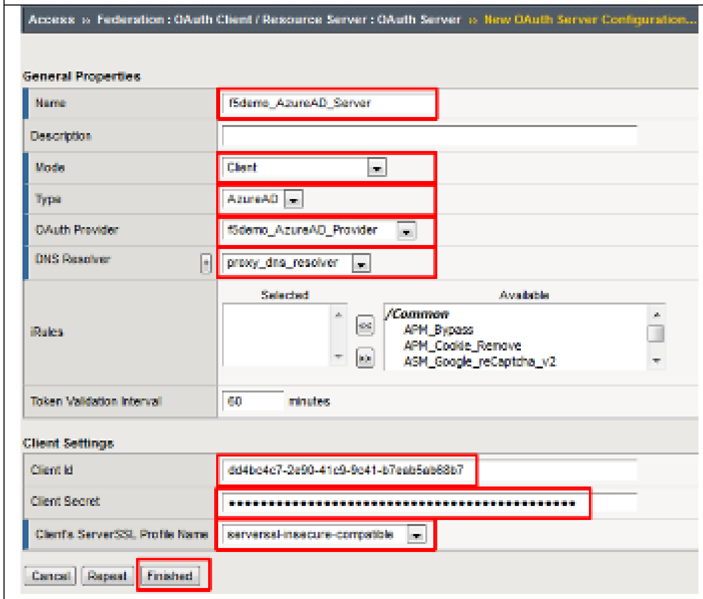
Refer to the instructions and screen shots below:

1. Create the **OAuth Server (Client)** by navigating to **Access** -> **Federation** -> **OAuth Client/Resource Server** -> **OAuth Server*** and clicking **Create**.



Access » Federation : OAuth Client / Resource Server : OAuth Server

2. Using the following values to complete the OAuth Provider
   - **Name: f5demo_AzureAD_Server**
   - **Mode: Client**
   - **Type: AzureAD**
   - **OAuth Provider: f5demo_AzureAD_Provider**
   - **DNS Resolver: proxy_dns_resolver**
   - **Client ID: dd4bc4c7-2e90-41c9-9c41-b7eab5ab68b7**
   - **Client Secret: YqHbzTosdBxdaGl9A/hXCs1ex1HWi+BTUSkgcfhbTwA=**
   - **Client's Server SSL Profile Name: serverssl-insecure-compatible**
3. Click **Finished**.



Access » Federation : OAuth Client / Resource Server : OAuth Server » New OAuth Server Configuration...

General Properties

Name	f5demo_AzureAD_Server
Description	
Mode	Client
Type	AzureAD
OAuth Provider	f5demo_AzureAD_Provider
DNS Resolver	proxy_dns_resolver
iRules	Selected: Available: /Common APM_Bypass APM_Cookie_Remove ASM_Google_reCaptcha_v2
Token Validation Interval	60 minutes

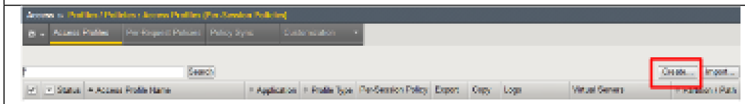
Client Settings

Client Id	dd4bc4c7-2e90-41c9-9c41-b7eab5ab68b7
Client Secret	••
Client's ServerSSL Profile Name	serverssl-insecure-compatible

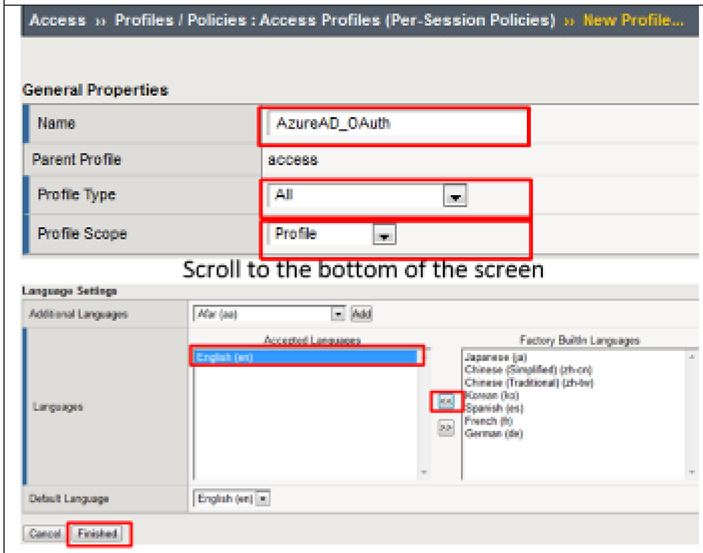
TASK 5: Setup F5 Per Session Policy (Access Policy)

Refer to the instructions and screen shots below:

1. Create the **Per Session Policy** by navigating to **Access** -> **Profile/Policies** -> **Access Profiles (Per Session Policies)** and clicking **Create**.



2. In the **New Profile** dialogue window enter the following values
   - **Name: AzureAD_OAuth**
   - **Profile Type: All**
   - **Profile Scope: Profile**
   - **Language: English**
3. Click **Finished**.


Access » Profiles / Policies : Access Profiles (Per-Session Policies) » New Profile...

General Properties

Name	AzureAD_OAuth
Parent Profile	access
Profile Type	All
Profile Scope	Profile

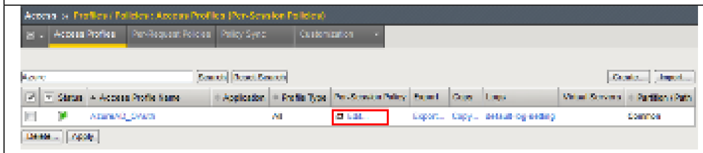
Scroll to the bottom of the screen

Language Settings

Additional Languages	Afar (aa)
Languages	Accepted Languages: English (en)
Default Language	English (en)

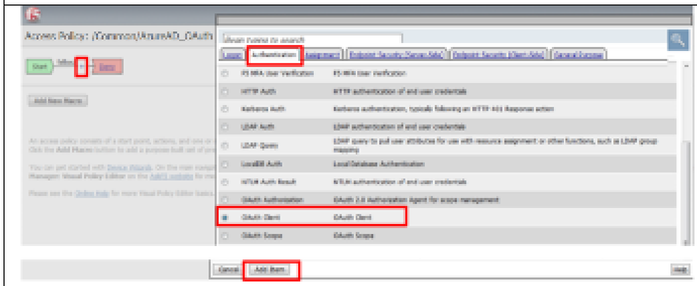
Add
Factory Builtin Languages
Japanese (ja)
Chinese (Simplified) (zh-cn)
Chinese (Traditional) (zh-tw)
Korean (ko)
Spanish (es)
French (fr)
German (de)
<<
>>
Cancel
Finished

4. Click **Edit** link on for the **AzureAD_OAuth** Access Policy

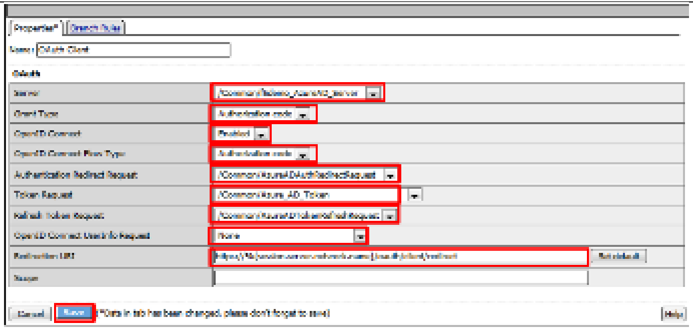


Status	Access Profile Name	Application	Profile Type	Per-Session Policy	Export	Copy	Logs	Virtual Servers	Partition / Path
	AzureAD_OAuth		All	Edit...	Export...	Copy...	default-log-setting		Common

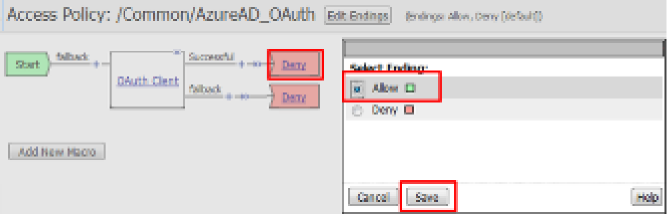
5. In the **AzureAD_OAuth** Access Policy, click the "**+**" between **Start** & **Deny**
6. Click the **Authentication** tab in the events window.
7. Scroll down and click the radio button for **OAuth Client**.
8. Click **Add Item**.



9. In the ***OAuth_Client*** window enter the following values as shown:
   - **Server: /Common/f5demo_AzureAD_Server**
   - **Grant Type: Authorization code**
   - **OpenID Connect: Enabled**
   - **OpenID Connect Flow Type: Authorization code**
   - **Authentication Redirect Request: /Common/AzureADAuthRedirectRequest**
   - **Token Request: /Common/Azure_AD_Token**
   - **Refresh Token Request: /Common/AzureADTokenRefreshRequest**
   - **OpenID Connect UserInfo Request: None**
   - **Redirection URI: https://%{session.server.network.name}/oauth/client/redirect**
10. Click **Save**.

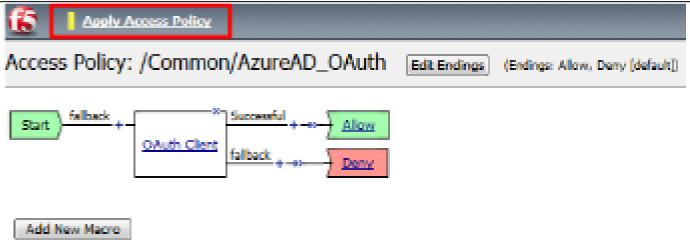


11. Click on the **Deny** link, in the **Select Binding**, select the **Allow** radio button and click **Save**.



12. Click on the **Apply Access Policy** link in the top left-hand corner.

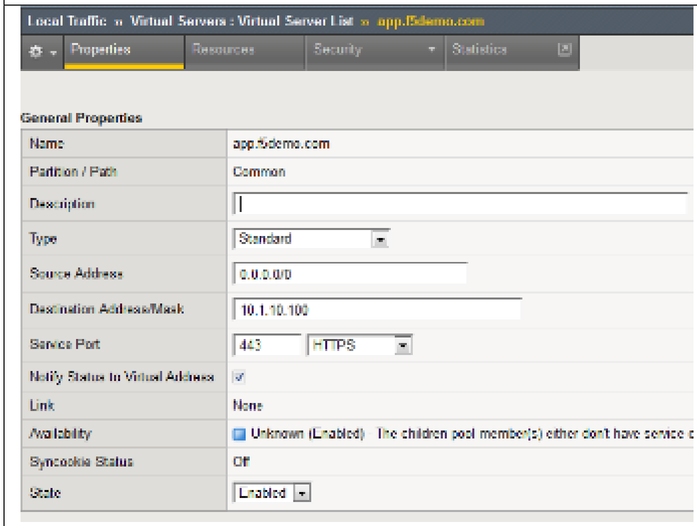
Note: Additional actions can be taken in the Per Session policy (Access Policy). The lab is simply completing authorization. Other access controls can be implemented based on the use case.



TASK 6: Associate Access Policy to Virtual Server

Refer to the instructions and screen shots below:

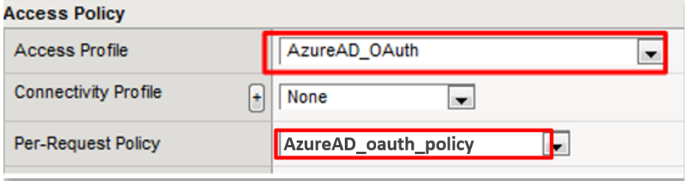
1. Navigate to **Local Traffic** -> **Virtual Servers** -> **Virtual Server List** and click on the **app.f5demo.com** Virtual Server link
2. Scroll to the **Access Policy** section.


Local Traffic » Virtual Servers : Virtual Server List » app.f5demo.com
Properties
Resources
Security
Statistics

General Properties

Name	app.f5demo.com
Partition / Path	Common
Description	
Type	Standard
Source Address	0.0.0.0/0
Destination Address/Mask	10.1.10.100
Service Port	443 HTTPS
Notify Status to Virtual Address	☑
Link	None
Availability	Unknown (Enabled) - The children pool member(s) either don't have service c
Syncookie Status	Off
State	Enabled

3. Use the **Access Profile** drop down to change the **Access Profile** to **AzureAD_OAuth**.
4. Use the **Per-Request Policy** drop down to change the **Per-Request Policy** to **AzureAD_oauth_policy**.
5. Scroll to the bottom of the **Virtual Server** configuration and click **Update**.



Access Policy

Access Profile	AzureAD_OAuth
Connectivity Profile	None
Per-Request Policy	AzureAD_oauth_policy

TASK 7: Test app.f5demo.com

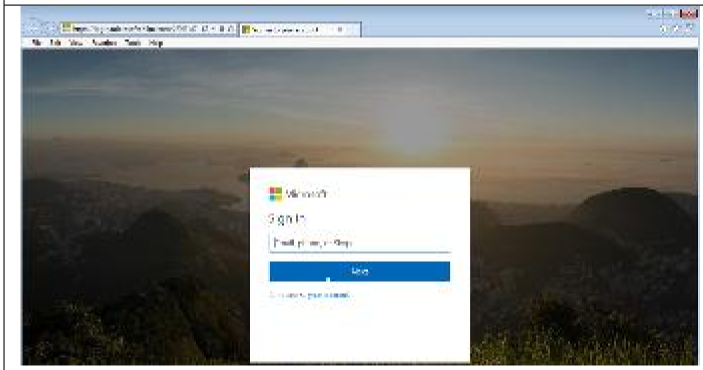
Refer to the instructions and screen shots below:

1. Navigate in your provided browser to **https://app.f5demo.com**

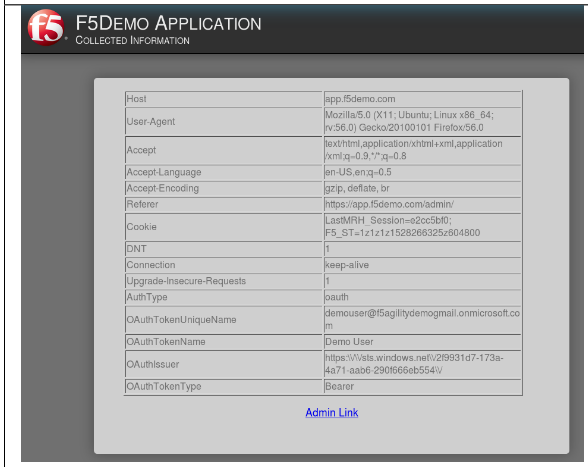
https://app.f5demo.com

2. Authenticate with the following AzureAD account:

- **Username: demouser@f5agilitydemogmail.onmicrosoft.com**
- **Password: f5d3m0u$3r**



3. Did you successfully redirect to the AzureAD?
4. After successful authentication, were you returned to the app.f5demo.com?
5. Did you successfully pass your OAuth Token?



F5DEMO APPLICATION
COLLECTED INFORMATION

Host	app.f5demo.com
User-Agent	Mozilla/5.0 (X11; Ubuntu; Linux x86_64; rv:56.0) Gecko/20100101 Firefox/56.0
Accept	text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
Accept-Language	en-US,en;q=0.5
Accept-Encoding	gzip, deflate, br
Referer	https://app.f5demo.com/admin/

Cookie	LastMRH_Session=e2cc5bf0;
	F5_ST=1z1z1z1528266325z604800

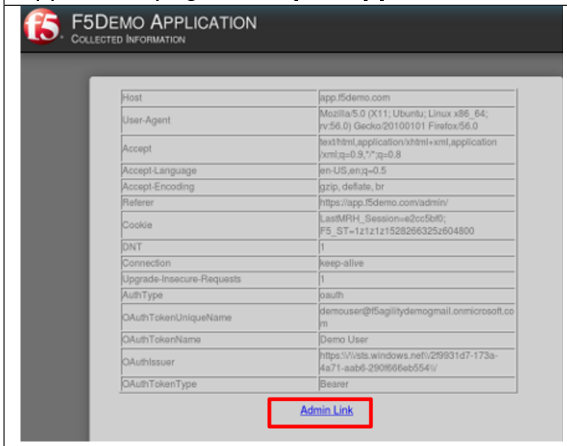
DNT	1
Connection	keep-alive
Upgrade-Insecure-Requests	1
AuthType	oauth
OAuthTokenUniqueName	demouser@f5agilitydemogmail.onmicrosoft.com
OAuthTokenName	Demo User
OAuthIssuer	https:\/\/sts.windows.net\/2f9931d7-173a-4a71-aab6-290f666eb554\/
OAuthTokenType	Bearer

Admin Link

TASK 8: Per Request Policy Controls

Refer to the instructions and screen shots below:

1. As in the prior lab, you can experiment with Per Request Policy controls. In the application page for **https://app.f5demo.com** click the **Admin Link** shown.



F5DEMO APPLICATION
COLLECTED INFORMATION

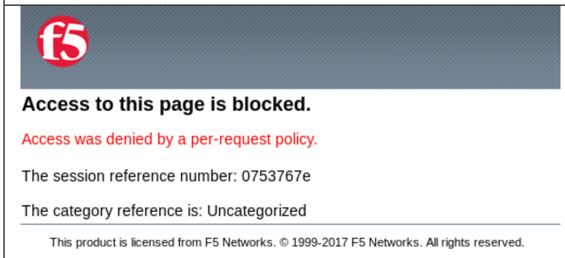
Host	app.f5demo.com
User-Agent	Mozilla/5.0 (X11; Ubuntu; Linux x86_64; rv:56.0) Gecko/20100101 Firefox/56.0
Accept	text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
Accept-Language	en-US,en;q=0.5
Accept-Encoding	gzip, deflate, br
Referer	https://app.f5demo.com/admin/

Cookie	LastMRH_Session=e2cc5bf0;
	F5_ST=1z1z1z1528266325z604800

DNT	1
Connection	keep-alive
Upgrade-Insecure-Requests	1
AuthType	oauth
OAuthTokenUniqueName	demouser@f5agilitydemogmail.onmicrosoft.com
OAuthTokenName	Demo User
OAuthIssuer	https:\/\/sts.windows.net\/2f9931d7-173a-4a71-aab6-290f666eb554\/
OAuthTokenType	Bearer

Admin Link

2. You will receive an **Access to this page is blocked** (customizable) message with a reference. You have been blocked because you do not have access on a per request basis.
3. Press the **Back** button in your browser to return to **https://app.f5demo.com**.



Access to this page is blocked.

Access was denied by a per-request policy.

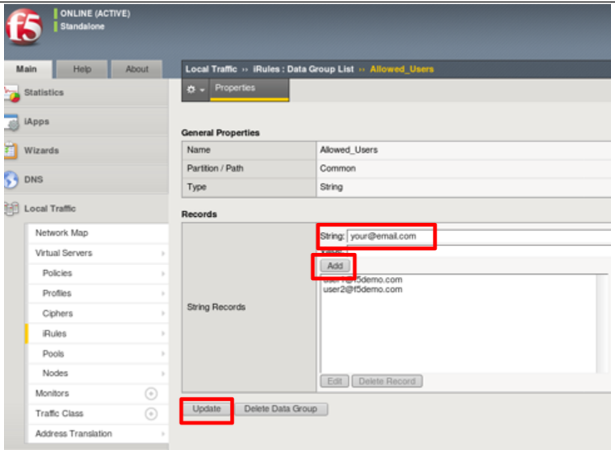
The session reference number: 0753767e

The category reference is: Uncategorized

This product is licensed from F5 Networks. © 1999-2017 F5 Networks. All rights reserved.

4. Navigate to **Local Traffic** -> **iRules** -> **Datagroup List** and click on the **Allowed_Users** datagroup.
5. Enter your **demouser@f5agilitydemogmail.onmicrosoft.com** used for this lab as the **String** value.
6. Click **Add** then Click **Update**.

Note: We are using a DataGroup control to minimize lab resources and steps. AD or LDAP Group memberships, Session variables, other user attributes and various other access control mechanisms can be used to achieve similar results.



General Properties

Name	Allowed_Users
Partition / Path	Common
Type	String

Records

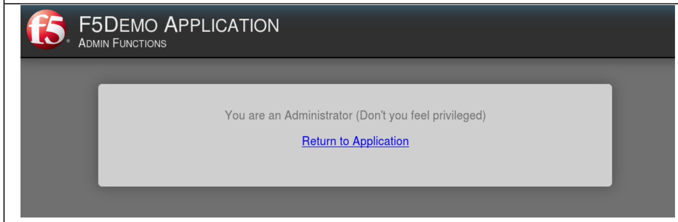
String Records

String: your@email.com

user2@f5demo.com

7. You should now be able to successfully to access the Admin Functions by clicking on the Admin Link.

Note: Per Request Policies are dynamic and do not require the same "Apply Policy" action as Per Session Policies.



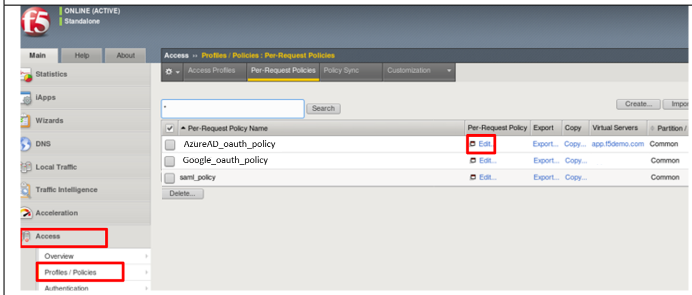
F5DEMO APPLICATION

ADMIN FUNCTIONS

You are an Administrator (Don't you feel privileged)

Return to Application

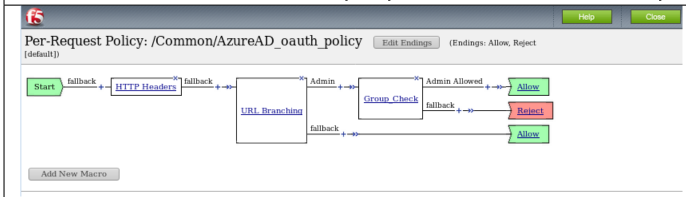
8. To review the Per Request Policy, navigate to ***Access** -> **Profiles**/**Policies** -> **Per Request Policies** and click on the Edit link for the **AzureAD_oauth_policy**.



☑	▲ Per-Request Policy Name	Per-Request Policy	Export	Copy	Virtual Servers	Partition /
□	AzureAD_oauth_policy	Edit...	Export...	Copy...	app.f5demo.com	Common
□	Google_oauth_policy	Edit...	Export...	Copy...		Common
□	saml_policy	Edit...	Export...	Copy...		Common

9. The various Per-Request-Policy actions can be reviewed.

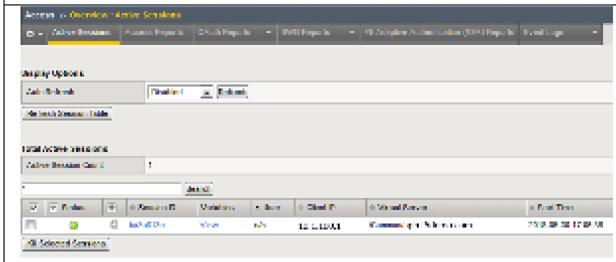
Note: Other actions like Step-Up Auth controls can be performed in a Per-Request Policy



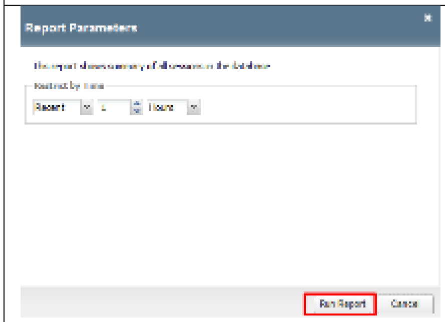
TASK 9: Review OAuth Results

Refer to the instructions and screen shots below:

1. Review your Active Sessions (**Access** -> **Overview** -> **Active Sessions**).
2. You can review Session activity or session variable from this window or kill the selected Session.

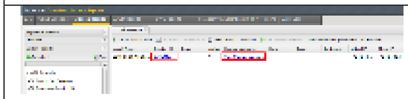


3. Review your Access Report Logs (**Access** -> **Overview** -> **Access Reports**).

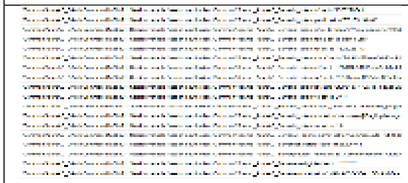


This report shows summary of all sessions in the database

4. In the **Report Parameters window** click **Run Report**.

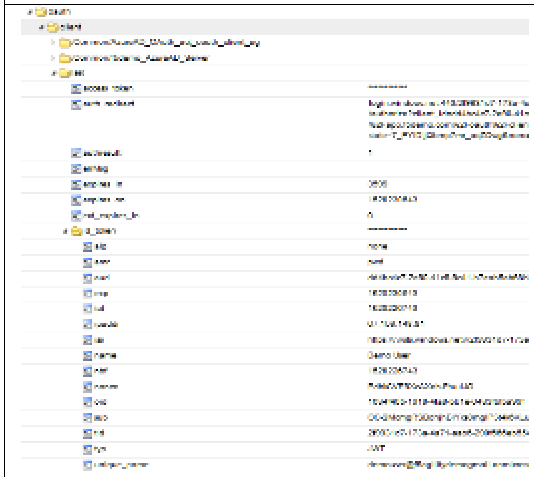


5. Look at the **SessionID** report by clicking the **Session ID** Link.

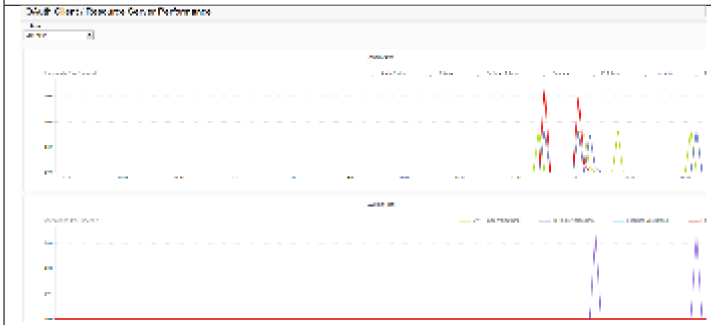


6. Look at the **Session Variables** report by clicking the **View Session Variables** link. Pay attention to the OAuth Variables.

Note: Any of these session variables can be used to perform further actions to improve security or constrain access with logic in the Per-Session or Per Request VPE policies or iRules/iRulesLX.



7. Review your Access Report Logs (**Access** -> **Overview** -> **OAuth Reports** -> **Client**/**Resource Server**).


OAuth Client / Resource Server Performance

6.6 Conclusion

Thank you for your participation in the 330 Access Policy Manager (APM) Federation Lab. This Lab Guide has highlighted several notable features of SAML Federation. It does not attempt to review all F5 APM Federation features and configurations but serves as an introduction to allow the student to further explore the BIG-IP platform and Access Policy Manager (APM), its functions & features.

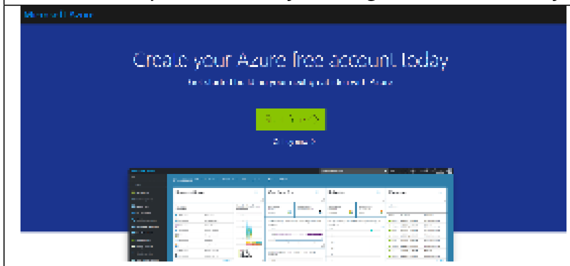
6.7 Appendix

6.7.1 Setting up an AzureAD Developer Account

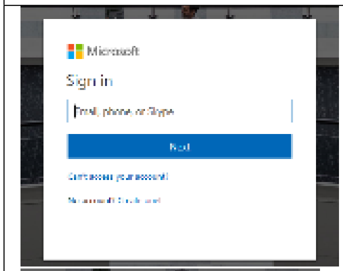
The following steps are for informational purposes only and maybe subject to change based on Microsoft.

1. Navigate to the following URL to begin the process then follow the prompts as shown https://azure.microsoft.com/en-us/free/
2. The following images show the general flow to setup a free developer account

Note: This process may change as dictated by Microsoft



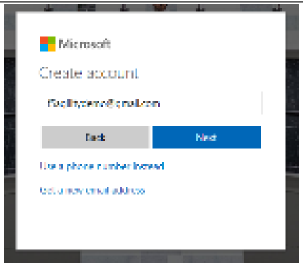
3. Initial Setup



Microsoft

Sign in

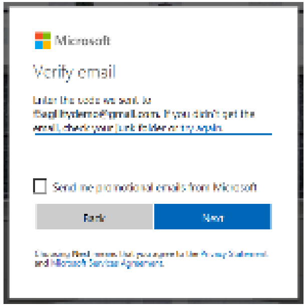
Email, phone, or Skype



Microsoft

Create account

tfsagilitydemo@gmail.com



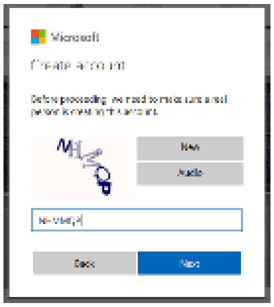
Microsoft

Verify email

Enter the code we sent to tfsagilitydemo@gmail.com. If you didn't get the email, check your junk folder or try again.

□ Send me promotional emails from Microsoft

Choosing Next means that you agree to the Privacy Statement and Microsoft Services Agreement.



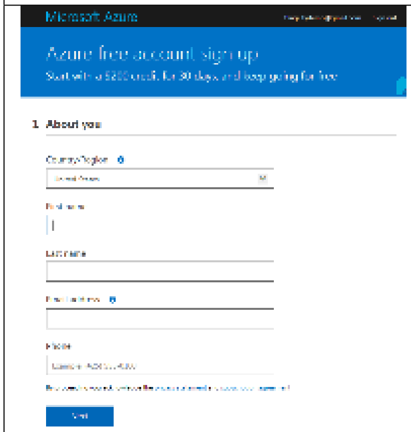
Microsoft

Create account

Before proceeding, we need to make sure a real person is creating this account.

[illegible]

4. About You



Azure free account sign up

Start with a $200 credit for 30 days, and keep going for free

1 About you

Country/Region
United States

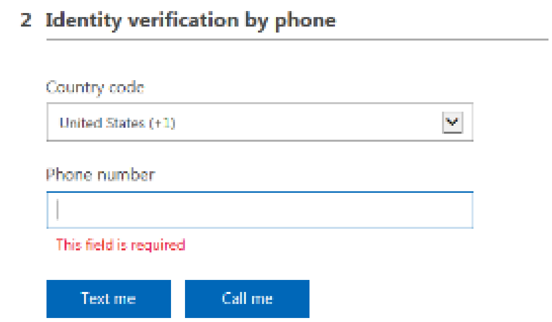
First name

Last name

Email address

Phone

5. Identity Verification by Phone



2 Identity verification by phone

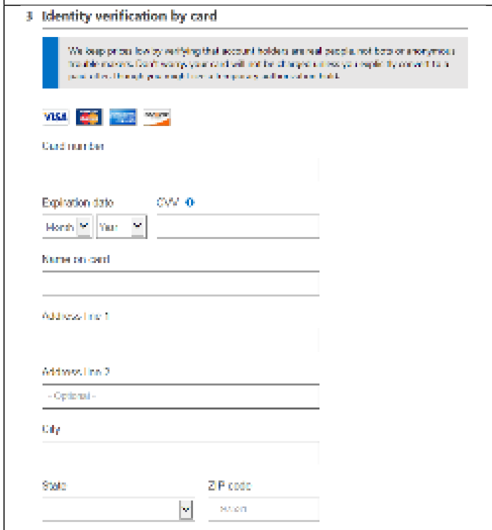
Country code

United States (+1)

Phone number

This field is required

6. Identity Verification by Card



3 Identity verification by card

We keep prices low by verifying that account holders are real people, not bots or anonymous trouble makers. Don't worry, your card will not be charged unless you explicitly convert to a paid offer, though you might see a temporary authorization hold.

Card number

Expiration date

CVV

Name on card

Address line 1

Address line 2

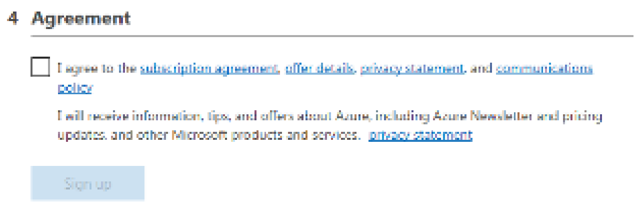
- Optional -

City

State

ZIP code

7. Agreement



4 Agreement

□ I agree to the subscription agreement, offer details, privacy statement, and communications policy

I will receive information, tips, and offers about Azure, including Azure Newsletter and pricing updates, and other Microsoft products and services. privacy statement

6.7.2 Links & Guides

The following are additional resources included for reference and assistance with this lab guide and other APM tasks.

- **Access Policy Manager (APM) Operations Guide:** https://support.f5.com/content/kb/en-us/products/big-ip_apm/manuals/product/f5-apm-operations-guide/_jcr_content/pdfAttach/download/file.res/f5-apm-operations-guide.pdf
- **Access Policy Manager (APM) Authentication & Single Sign on Concepts:** https://support.f5.com/kb/en-us/products/big-ip_apm/manuals/product/apm-authentication-sso-13-0-0.html
- **SAML:**
  - **Introduction:** https://support.f5.com/kb/en-us/products/big-ip_apm/manuals/product/apm-authentication-sso-13-0-0/28.html#guid-28f26377-6e10-42c9-883a-3ac65eab9092
  - **F5 SAML IdP (Identity Provider with Portal):** https://support.f5.com/kb/en-us/products/big-ip_apm/manuals/product/apm-authentication-sso-13-0-0/29.html#guid-42e93e4b-e4fc-4c3d-ae53-910641d5755c
  - **F5 SAML IdP (Identity Provider without Portal):** https://support.f5.com/kb/en-us/products/big-ip_apm/manuals/product/apm-authentication-sso-13-0-0/30.html#guid-39ffed07-65f2-40b8-85ae-c80073cc4e82
  - **F5 SAML SP (Service Provider):** https://support.f5.com/kb/en-us/products/big-ip_apm/manuals/product/apm-authentication-sso-13-0-0/31.html#guid-be2cf224-727e-4a0f-aa68-676fdedba37b
  - **F5 Federation iApp (Includes o365):** https://www.f5.com/pdf/deployment-guides/saml-idp-saas-dg.pdf
  - **F5 o365 Deployment Guide:** https://www.f5.com/pdf/deployment-guides/microsoft-office-365-idp-dg.pdf
- **OAuth**
  - **OAuth Overview:** https://support.f5.com/kb/en-us/products/big-ip_apm/manuals/product/apm-authentication-sso-13-0-0/35.html#guid-c1b617a7-07b5-4ad6-9b84-29d6ecd789b4
  - **OAuth Client & Resource Server:** https://support.f5.com/kb/en-us/products/big-ip_apm/manuals/product/apm-authentication-sso-13-0-0/36.html#guid-c6db081e-e8ac-454b-84c8-02a1a282a888
  - **OAuth Authorization Server:** https://support.f5.com/kb/en-us/products/big-ip_apm/manuals/product/apm-authentication-sso-13-0-0/37.html#guid-be8761c9-5e2f-4ad8-b829-871c7feb2a20
  - **Troubleshooting Tips**
    - **OAuth Client & Resource Server:** https://support.f5.com/kb/en-us/products/big-ip_apm/manuals/product/apm-authentication-sso-13-0-0/36.html#guid-774384bc-cf63-469d-a589-1595d0ddfba2
    - **OAuth Authorization Server:** https://support.f5.com/kb/en-us/products/big-ip_apm/manuals/product/apm-authentication-sso-13-0-0/37.html#guid-8b97b512-ec2b-4bfb-a6aa-1af24842ee7a
- **Kerberos**
  - **Kerberos AAA Object**: (*See Reference section below*)
  - **Kerberos Constrained Delegation:** http://www.f5.com/pdf/deployment-guides/kerberos-constrained-delegation-dg.pdf
- **Two-factor Integrations/Guides** (**Not a complete list**)
  - **RSA Integration:** https://support.f5.com/kb/en-us/products/big-ip_apm/manuals/product/apm-authentication-single-sign-on-12-1-0/6.html#conceptid

  - **DUO Security:**
    - https://duo.com/docs/f5bigip
    - https://duo.com/docs/f5bigip-alt
  - **SafeNet MobilePass:** http://www.safenet-inc.com/resources/integration-guide/data-protection/SafeNet_Authentication_Service/SafeNet_Authentication_Service__RADIUS_Authentication_on_F5_BIG-IP_APM_Integration_Guide
  - **Google Authenticator:** https://devcentral.f5.com/articles/two-factor-authentication-with-google-authenticator-an
- **Access Policy Manager (APM) Deployment Guides:**
  - **F5 Deployment Guide for Microsoft Exchange 2010/2013:** https://f5.com/solutions/deployment-guides/microsoft-exchange-server-2010-and-2013-big-ip-v11
  - **F5 Deployment Guide for Microsoft Exchange 2016:** https://f5.com/solutions/deployment-guides/microsoft-exchange-server-2016-big-ip-v11-v12-ltm-apm-afm
  - **F5 Deployment Guide for Microsoft SharePoint 2010/2013:** https://f5.com/solutions/deployment-guides/microsoft-sharepoint-2010-and-2013-new-supported-iapp-big-ip-v114-ltm-apm-asm-aam
  - **F5 Deployment Guide for Microsoft SharePoint 2016:** https://f5.com/solutions/deployment-guides/microsoft-sharepoint-2016-big-ip-v114-v12-ltm-apm-asm-afm-aam
  - **F5 Deployment Guide for Citrix XenApp/XenDesktop:** https://f5.com/solutions/deployment-guides/citrix-xenapp-or-xendesktop-release-candidate-big
  - **F5 Deployment Guide for VMWare Horizon View:** https://f5.com/solutions/deployment-guides/vmware-horizon-view-52-53-60-62-70-release-candidate-iapp-big-ip-v11-v12-ltm-apm-afm?tag=VMware
  - **F5 Deployment Guide for Microsoft Remote Desktop Gateway Services:** https://f5.com/solutions/deployment-guides/microsoft-remote-desktop-gateway-services-big-ip-v114-ltm-afm-apm
  - **F5 Deployment Guide for Active Directory Federated Services:** https://f5.com/solutions/deployment-guides/microsoft-active-directory-federation-services-big-ip-v11-ltm-apm

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7 Class 7: Introduction to Universal Access

Welcome to the **F5 Identity and Access Management Solutions** lab at F5 Agility 2018

The content contained here leverages a full DevOps CI/CD pipeline and is sourced from the GitHub repository at https://github.com/f5devcentral/f5-agility-labs-iam. Bugs and Requests for enhancements can be made by opening an Issue within the repository.

This class will cover APM concepts and will guide students through configuration steps for the following common use cases:

- Remote access VPN services
- Web portals (Webtops) for publishing internal applications
- Using different authentication protocols
- Single-Sign-On (SSO) functionality

7.1 Lab Information

7.1.1 Login instructions

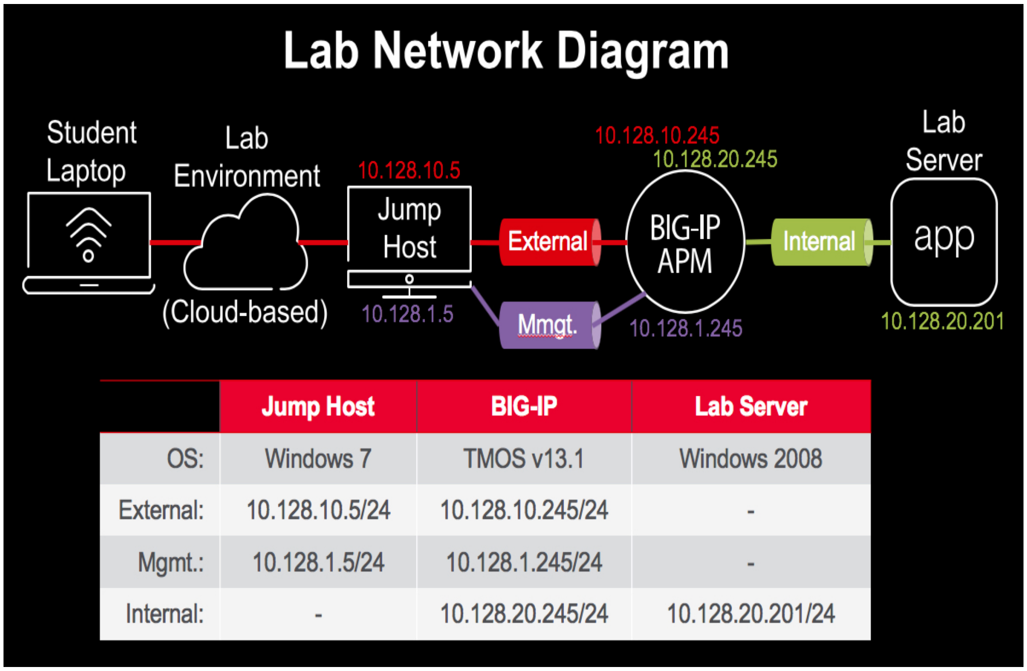
Please follow the instructions provided by the instructor to start your lab and access your jump host.

To access your dedicated student lab environment, you will require a web browser and Remote Desktop Protocol (RDP) client software. The web browser will be used to access the Lab Training Portal. The RDP client will be used to connect to the Jump Host, where you will be able to access the BIG-IP management interfaces (HTTPS, SSH).

1. Establish an RDP connection to your Jump Host and login with the following credentials:
   - User: **user**
   - Password: **Agility1**
2. Access the **BIG-IP** GUI **https://10.128.1.245** (you can double-click on the red “f5 Big-IP” shortcut icon on the Windows desktop).
3. Login into the BIG-IP Configuration Utility with the following credentials:
   - User: **admin**
   - Password: **admin**

Note: All work for this lab will be performed exclusively from the Windows jumphost. No installation or interaction with your local system is required.

7.1.2 Lab Topology



Lab Network Diagram

	Jump Host	BIG-IP	Lab Server
OS:	Windows 7	TMOS v13.1	Windows 2008
External:	10.128.10.5/24	10.128.10.245/24	-
Mgmt.:	10.128.1.5/24	10.128.1.245/24	-
Internal:	-	10.128.20.245/24	10.128.20.201/24

The following components have been included in your lab environment:

- 1 x F5 BIG-IP VE v13.1 (provisioned for Local Traffic Manager and Access Policy Manager)
- 1 x Windows Server running Active Directory and Web services
- 1 x Windows Jumphost

Note: The following entries have been added in the local hosts file of your Jumphost:

- 10.128.10.10 www.f5demo.com
- 10.128.10.11 myvpn.f5demo.com
- 10.128.20.200 www2.f5demo.com
- 10.128.10.11 webtop.f5demo.com
- 10.128.10.12 forms.f5demo.com
- 10.128.10.12 forms.f5demo.com
- 10.128.10.13 basic.f5demo.com
- 10.128.10.13 app1.f5demo.com
- 10.128.10.13 app2.f5demo.com
- 10.128.10.13 app3.f5demo.com
- 10.128.1.245 bigip1.f5demo.com

7.1.3 Lab Components

The following table lists VLANS, IP Addresses and Credentials for all components:

Component	VLAN/IP Address(es)	Credentials
BIG-IP	• **Management:** 10.128.1.245 • **Internal:** 10.128.20.245 • **External:** 10.128.10.245	`admin/admin`
Jumphost	• **Management:** 10.128.1.5 • **External:** 10.128.10.5	`user/Agility1`
Lab Server	• **Internal:** 10.128.20.201	`administrator/Agility2018`

7.1.4 Labs Timing/Duration

The time it takes to perform each lab varies and is mostly dependent on accurately completing steps. Below is an estimate of how long it will take for each lab:

Lab name (Description)	Time Allocated
Lab 1 - Deploy a simple reverse proxy service	10 minutes
Lab 2 – Create My First Policy	15 minutes
Lab 3 – Configuring a VPN Policy	20 minutes
Lab 4 – Configuring an APM Webtop	10 minutes
Lab 5 – FORMS Based Authentication	15 minutes
Lab 6 – BASIC Authentication	15 minutes
Lab 7 – Single-Sign-On Across Authentication Domains	20 minutes

7.2 Lab 1 – Deploy a simple reverse proxy service

This lab will teach you how to configure resources including Virtual Servers, Pools, and monitors that we will use as the foundation for subsequent labs.

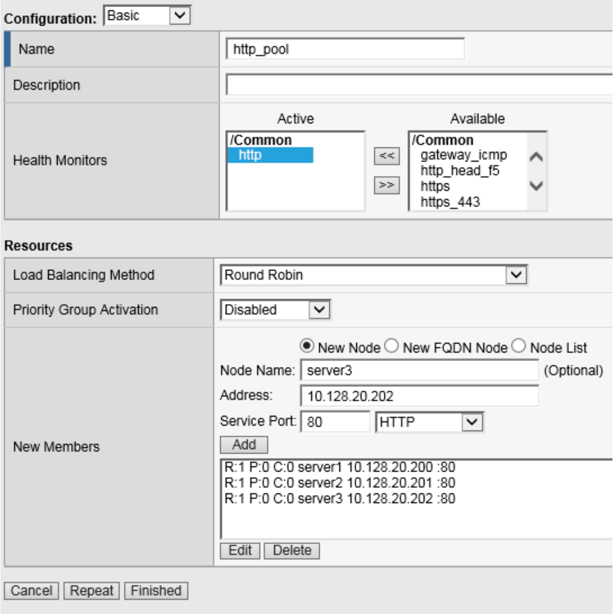
Note: Lab Requirements:

- BIG-IP with APM licensed and activated
- Web site up and running at 10.128.20.200:80, 10.128.20.201:80 and 10.128.20.202:80

7.2.1 Task – Create a pool

Follow these steps to complete this task:

1. Browse to **Local Traffic > Pools** and click the '**+**' next to **Pools List** to create a new pool.
2. Name the pool in "**http_pool**"
3. Assign the monitor "**http**" by selecting it and sliding it to the left.
4. **Add** the following "new node" members to the pool, then click **Finished**:
   - Node Name: **server1**, Address: **10.128.20.200**, Service Port **80**
   - Node Name: **server2**, Address: **10.128.20.201**, Service Port **80**
   - Node Name: **server3**, Address: **10.128.20.202**, Service Port **80**



Configuration: Basic

Name	http_pool
Description	
Health Monitors	Active: /Common http Available: /Common gateway_icmp http_head_f5 https https_443

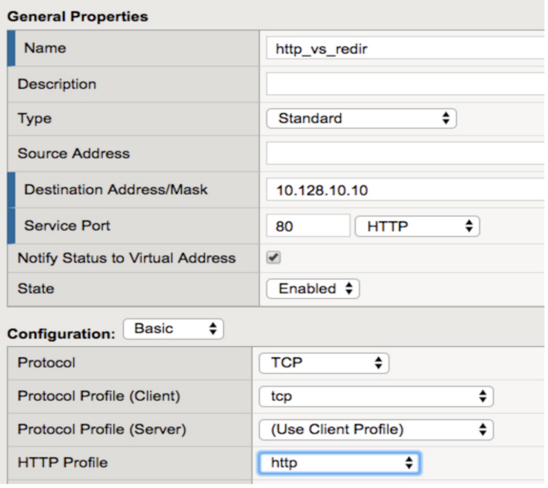
Resources

Load Balancing Method	Round Robin
Priority Group Activation	Disabled
New Members	● New Node ○ New FQDN Node ○ Node List Node Name: server3 (Optional) Address: 10.128.20.202 Service Port: 80 HTTP

```
R:1 P:0 C:0 server1 10.128.20.200 :80
R:1 P:0 C:0 server2 10.128.20.201 :80
R:1 P:0 C:0 server3 10.128.20.202 :80
```

7.2.2 Task - Create HTTP Virtual Server to redirect to HTTPS

1. Create a new Virtual Server by browsing to **Local Traffic** > **Virtual Servers** > **Virtual Server List** and click the '**+**' to create a new one.
2. Name the Virtual Server in the following format **http_vs_redir**. For "Destination Address/Mask", use **10.128.10.10"**. For "Service Port", use **80**.
3. For "HTTP Profile" choose the default http profile called **http**
4. Under iRules at the bottom of the screen, select the **sys_https_redirect** irule from the "Available" list and slide it over to the "Enabled" list and click **Finished**.

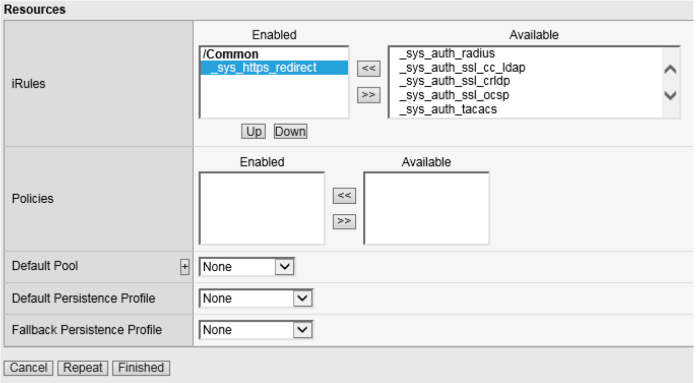


General Properties

Name	http_vs_redir
Description	
Type	Standard
Source Address	
Destination Address/Mask	10.128.10.10
Service Port	80 HTTP
Notify Status to Virtual Address	☑
State	Enabled

Configuration: Basic

Protocol	TCP
Protocol Profile (Client)	tcp
Protocol Profile (Server)	(Use Client Profile)
HTTP Profile	http

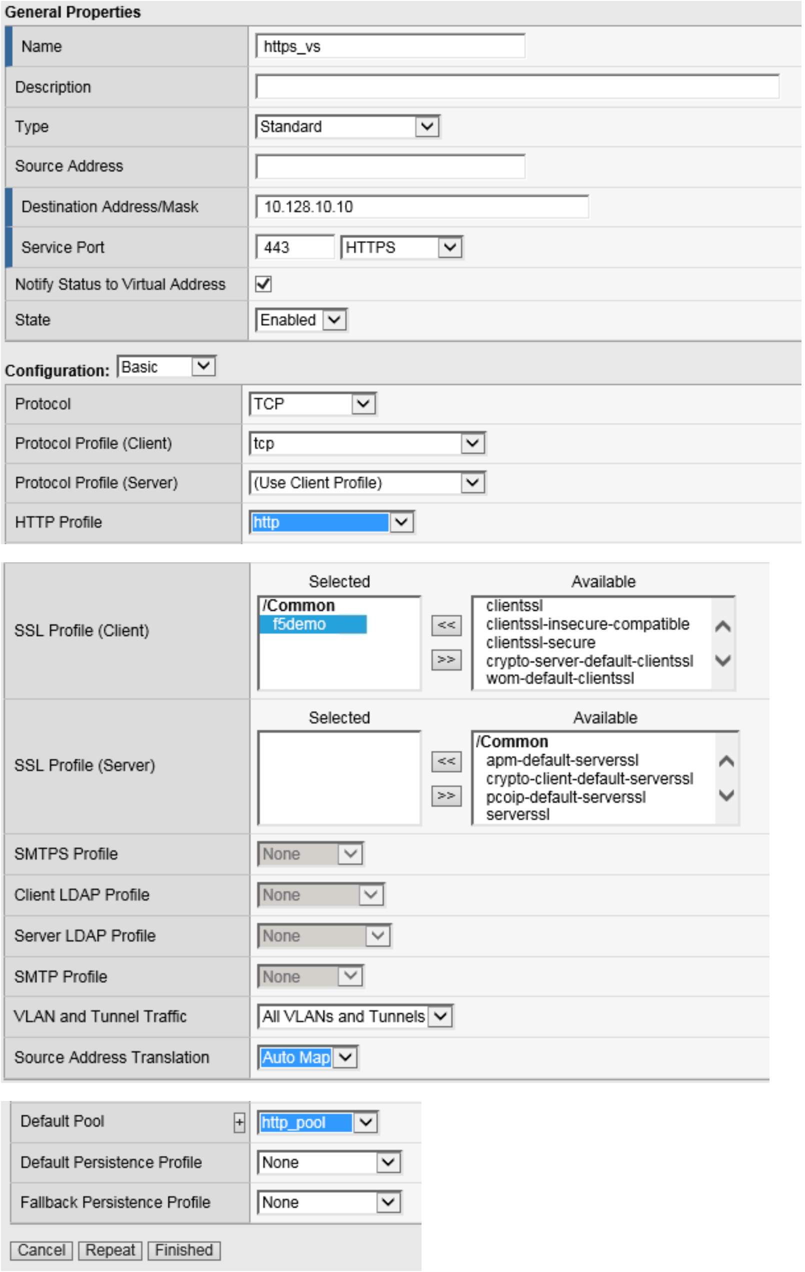


Resources

iRules	Enabled: /Common _sys_https_redirect Available: _sys_auth_radius _sys_auth_ssl_cc_ldap _sys_auth_ssl_crldp _sys_auth_ssl_ocsp _sys_auth_tacacs
Policies	Enabled: Available:
Default Pool	None
Default Persistence Profile	None
Fallback Persistence Profile	None

7.2.3 Task - Create HTTPS Virtual Server

1. Create a new Virtual Server by browsing to **Local Traffic** > **Virtual Servers** > **Virtual Server List** and click the '**+**' to create a new one.
2. Name the Virtual Server in the following format **https_vs** .
3. For "Destination Address/Mask", use **10.128.10.10**. For "Service Port", use **443**.
4. For "HTTP Profile", choose the default **http** profile
5. For "SSL Profile (Client)", choose the **f5demo**, slide it over to the "Selected" column
6. For "Source Address Translation", choose **Auto Map**
7. For "Default Pool", select the pool created earlier (**http_pool**) and click **Finished**.



General Properties

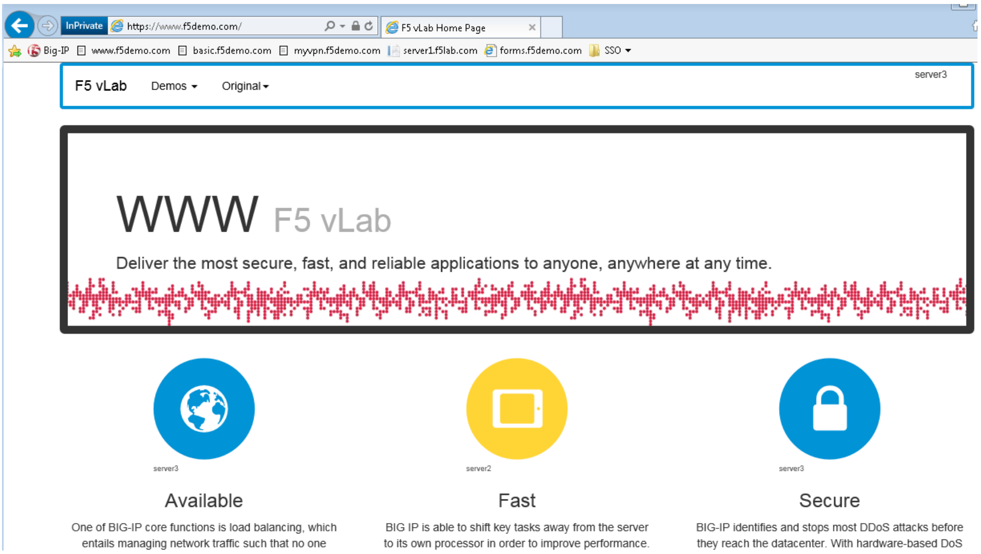
Name	https_vs
Description	
Type	Standard
Source Address	
Destination Address/Mask	10.128.10.10
Service Port	443 HTTPS
Notify Status to Virtual Address	☑
State	Enabled

Configuration: Basic

Protocol	TCP
Protocol Profile (Client)	tcp
Protocol Profile (Server)	(Use Client Profile)
HTTP Profile	http
SSL Profile (Client)	Selected: /Common f5demo Available: clientssl clientssl-insecure-compatible clientssl-secure crypto-server-default-clientssl wom-default-clientssl
SSL Profile (Server)	Selected: Available: /Common apm-default-serverssl crypto-client-default-serverssl pcoip-default-serverssl serverssl
SMTPS Profile	None
Client LDAP Profile	None
Server LDAP Profile	None
SMTP Profile	None
VLAN and Tunnel Traffic	All VLANs and Tunnels
Source Address Translation	Auto Map
Default Pool	http_pool
Default Persistence Profile	None
Fallback Persistence Profile	None

7.2.4 Task - Testing

You should now be able to browse to either Virtual Server (HTTP or HTTPs) and you should get the same page. Try: **http://www.f5demo.com** and **https://www.f5demo.com**



Deliver the most secure, fast, and reliable applications to anyone, anywhere at any time.

One of BIG-IP core functions is load balancing, which entails managing network traffic such that no one

BIG IP is able to shift key tasks away from the server to its own processor in order to improve performance.

BIG-IP identifies and stops most DDoS attacks before they reach the datacenter. With hardware-based DoS

7.3 Lab 2 – Create My First Policy

In this lab, we will use the resources configured in the previous lab and configure a simple Access Profile using the Visual Policy Editor (VPE) to perform user authentication.

Note: Lab Requirements:

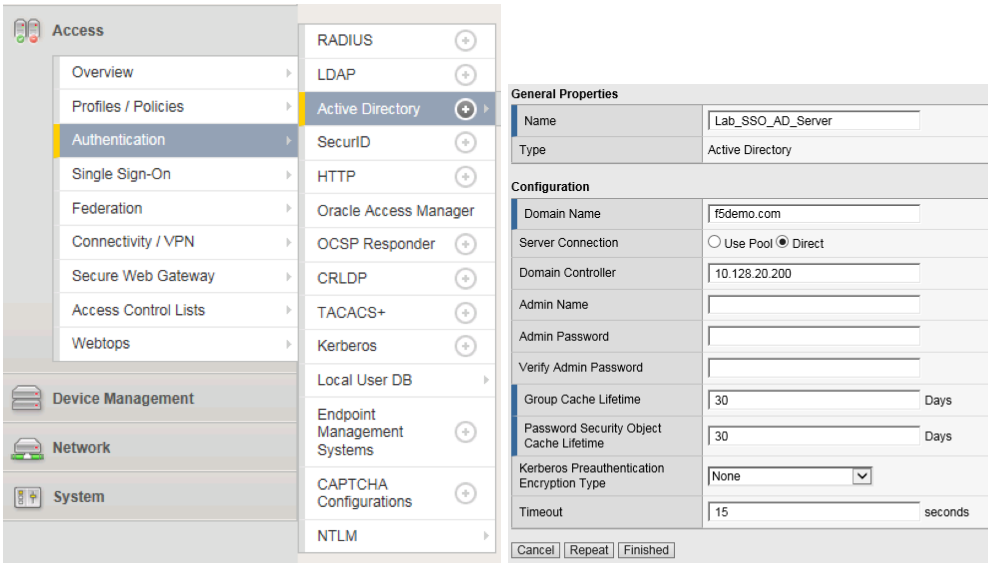
- Working HTTP and HTTPS Virtual Servers (from previous lab)

7.3.1 Task – Define an Authentication Server

Before we can create an access profile, we must create the necessary AAA server profile for our Active Directory.

Follow these steps to complete this task:

1. From the main screen, browse to **Access** > **Authentication** > **Active Directory**
2. Click **Create...** in the upper right-hand corner
3. Configure the new server profile as follows, then click **Finished**:
    - Name: **Lab_SSO_AD_Server**
    - Domain Name: **f5demo.com**
    - Server Connection: **Direct**
    - Domain Controller: **10.128.20.200**



General Properties

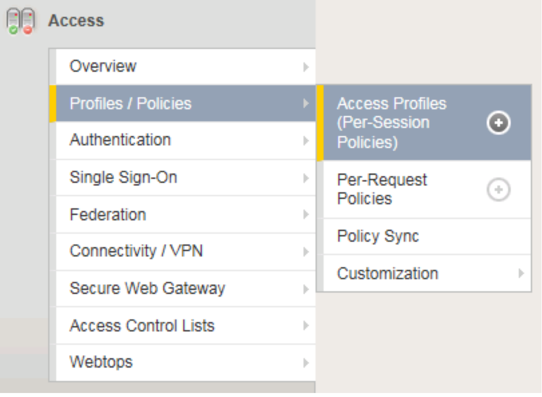
Name	Lab_SSO_AD_Server
Type	Active Directory

Configuration

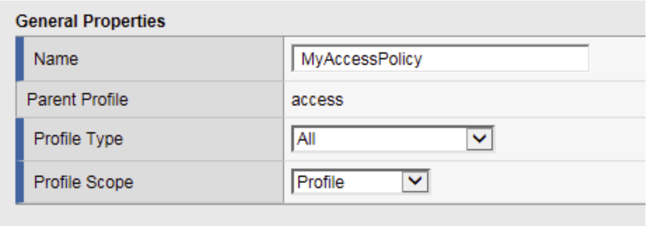
Domain Name	f5demo.com
Server Connection	○ Use Pool ● Direct
Domain Controller	10.128.20.200
Admin Name	
Admin Password	
Verify Admin Password	
Group Cache Lifetime	30 Days
Password Security Object Cache Lifetime	30 Days
Kerberos Preauthentication Encryption Type	None
Timeout	15 seconds

7.3.2 Task – Create a Simple Access Profile

1. Navigate to **Access** > **Profiles** / **Policies** > **Access Profiles (Per-Session Policies)**



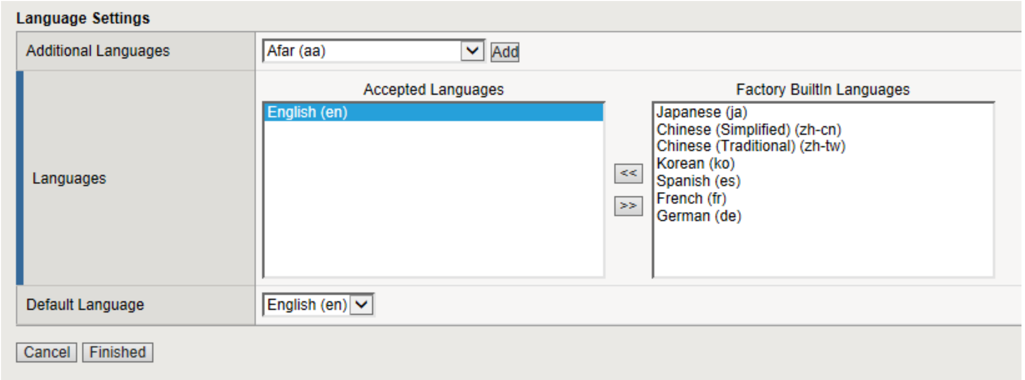
2. From the Access Profiles screen, click **Create. . .** in the upper right-hand corner
3. In the Name field, enter “**MyAccessPolicy**”, and for “Profile Type”, select the dropdown and choose **All**



General Properties

Name	MyAccessPolicy
Parent Profile	access
Profile Type	All
Profile Scope	Profile

4. Under “Language Settings”, choose **English** and click the “**<<**“ button to slide over to the “Accepted Languages” column.

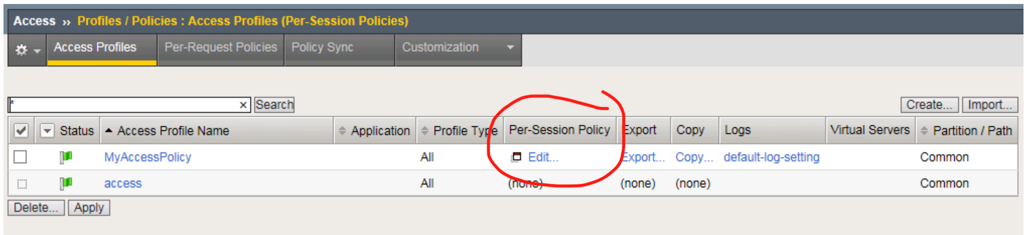


Language Settings

Additional Languages	Afar (aa) Add		
Languages	Accepted Languages English (en)	<< >>	Factory BuiltIn Languages Japanese (ja) Chinese (Simplified) (zh-cn) Chinese (Traditional) (zh-tw) Korean (ko) Spanish (es) French (fr) German (de)
Default Language	English (en)		

Cancel Finished

5. Click **Finished**, which will bring you back to the Access Profiles screen.
6. On the Access Profiles screen, click the **Edit** link under the Per-Session Policy column. The Visual Policy Editor (VPE) will open in a new tab.



Access » Profiles / Policies : Access Profiles (Per-Session Policies)

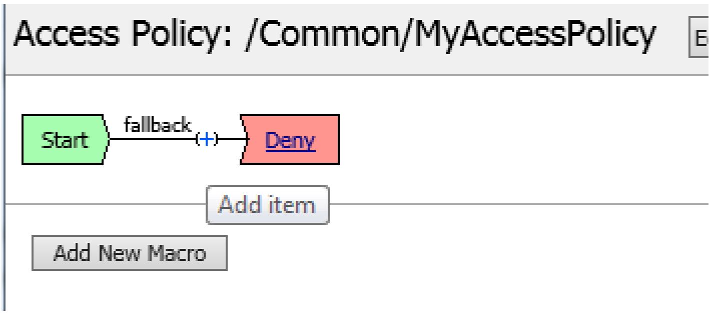
Access Profiles | Per-Request Policies | Policy Sync | Customization

Search | Create... | Import...

☑	Status	Access Profile Name	Application	Profile Type	Per-Session Policy	Export	Copy	Logs	Virtual Servers	Partition / Path
□	🟩	MyAccessPolicy		All	Edit...	Export...	Copy...	default-log-setting		Common
□	🟩	access		All	(none)	(none)	(none)			Common

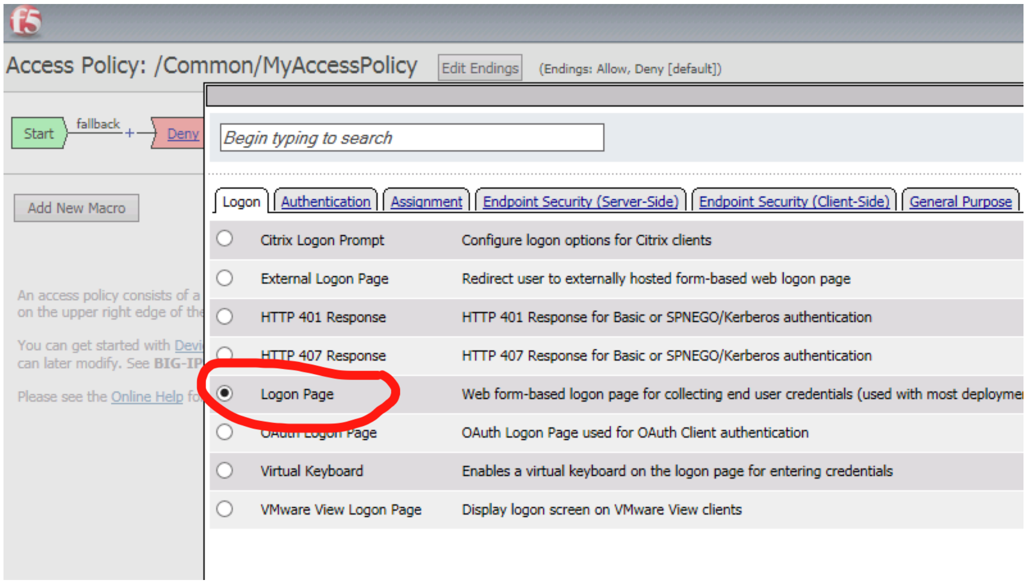
Delete... Apply

7. On the VPE page, click the ‘**+**’ icon on the “fallback” path, to the right of the **Start** object.



Access Policy: /Common/MyAccessPolicy

8. On the popup menu, choose the **Logon Page** radio button under the Logon tab.



Access Policy: /Common/MyAccessPolicy (Endings: Allow, Deny [default])

Start
fallback
Deny
Add New Macro

An access policy consists of a
on the upper right edge of the

You can get started with Devi
can later modify. See BIG-IP

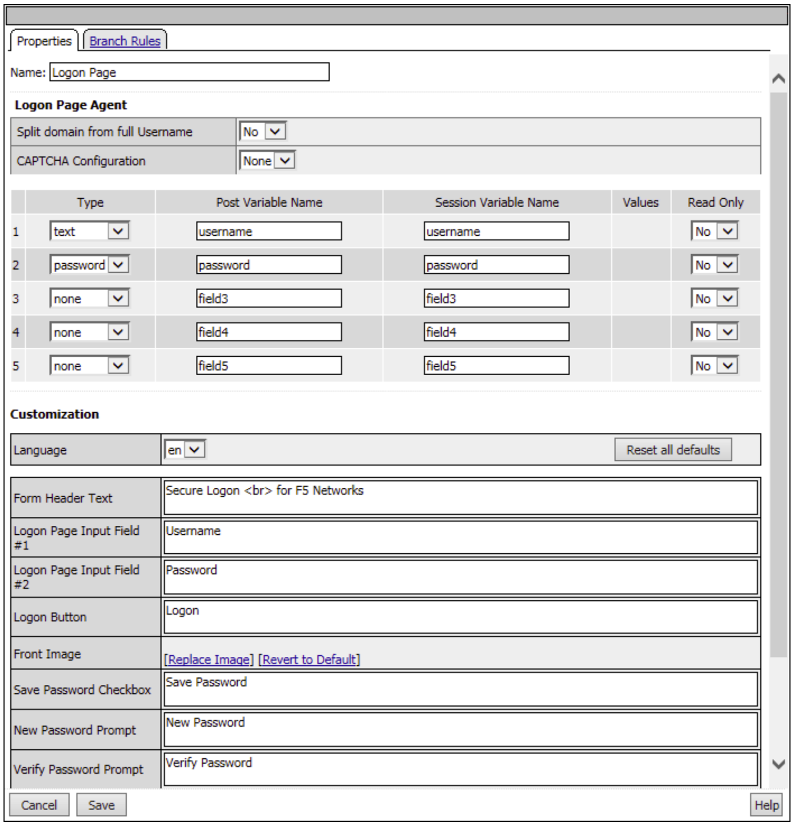
Please see the Online Help fo

Begin typing to search

Logon | Authentication | Assignment | Endpoint Security (Server-Side) | Endpoint Security (Client-Side) | General Purpose

○	Citrix Logon Prompt	Configure logon options for Citrix clients
○	External Logon Page	Redirect user to externally hosted form-based web logon page
○	HTTP 401 Response	HTTP 401 Response for Basic or SPNEGO/Kerberos authentication
○	HTTP 407 Response	HTTP 407 Response for Basic or SPNEGO/Kerberos authentication
●	Logon Page	Web form-based logon page for collecting end user credentials (used with most deployme
○	OAuth Logon Page	OAuth Logon Page used for OAuth Client authentication
○	Virtual Keyboard	Enables a virtual keyboard on the logon page for entering credentials
○	VMware View Logon Page	Display logon screen on VMware View clients

9. Click **Add Item**.



Name: Logon Page

Logon Page Agent

Split domain from full Username	No
CAPTCHA Configuration	None

	Type	Post Variable Name	Session Variable Name	Values	Read Only
1	text	username	username		No
2	password	password	password		No
3	none	field3	field3		No
4	none	field4	field4		No
5	none	field5	field5		No

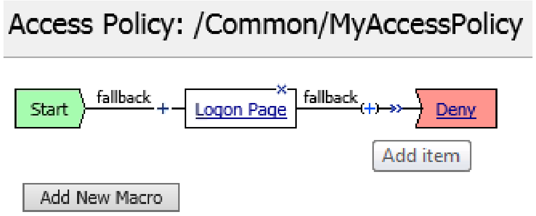
Customization

Language	en
Form Header Text	Secure Logon for F5 Networks
Logon Page Input Field #1	Username
Logon Page Input Field #2	Password
Logon Button	Logon
Front Image	[Replace Image] [Revert to Default]
Save Password Checkbox	Save Password
New Password Prompt	New Password
Verify Password Prompt	Verify Password

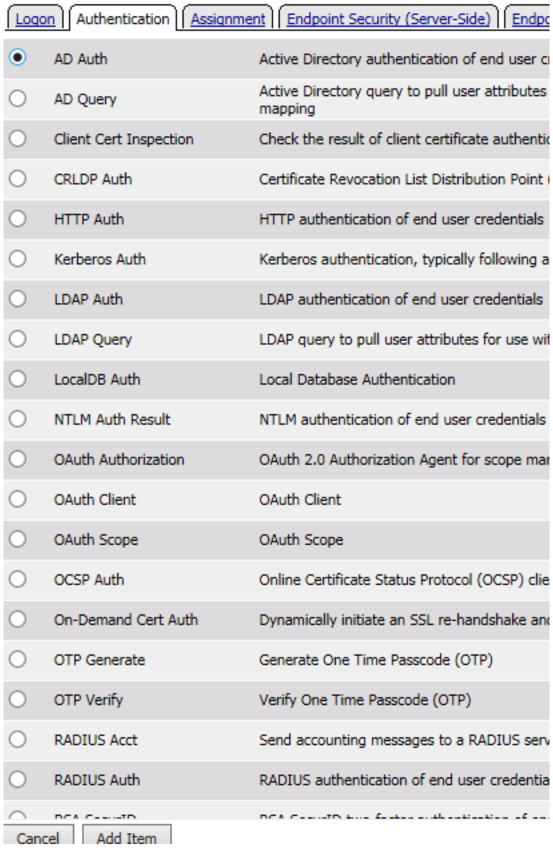
10. Accept the defaults and click **Save**.

    Now let's authenticate the client using the credentials to be provided via the "Logon Page" object.

11. Between the "Logon Page" and "Deny" objects, click the '**+**' icon.

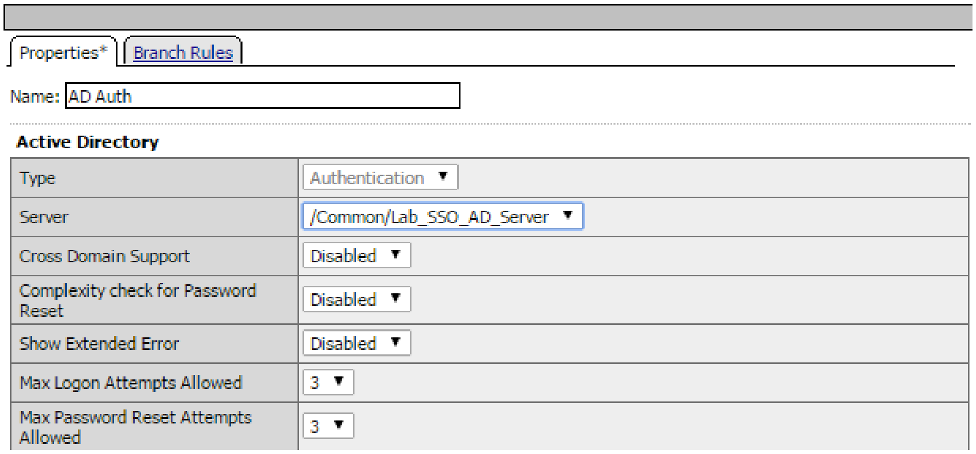


12. Select **AD Auth** found under the **Authentication** tab, and click the **Add Item** button.



●	AD Auth	Active Directory authentication of end user c
○	AD Query	Active Directory query to pull user attributes mapping
○	Client Cert Inspection	Check the result of client certificate authentic
○	CRLDP Auth	Certificate Revocation List Distribution Point (
○	HTTP Auth	HTTP authentication of end user credentials
○	Kerberos Auth	Kerberos authentication, typically following a
○	LDAP Auth	LDAP authentication of end user credentials
○	LDAP Query	LDAP query to pull user attributes for use wi
○	LocalDB Auth	Local Database Authentication
○	NTLM Auth Result	NTLM authentication of end user credentials
○	OAuth Authorization	OAuth 2.0 Authorization Agent for scope ma
○	OAuth Client	OAuth Client
○	OAuth Scope	OAuth Scope
○	OCSP Auth	Online Certificate Status Protocol (OCSP) clie
○	On-Demand Cert Auth	Dynamically initiate an SSL re-handshake an
○	OTP Generate	Generate One Time Passcode (OTP)
○	OTP Verify	Verify One Time Passcode (OTP)
○	RADIUS Acct	Send accounting messages to a RADIUS serv
○	RADIUS Auth	RADIUS authentication of end user credentia
○	RSA SecurID	RSA SecurID two-factor authentication of en

13. Accept the default for the **Name** and in the **Server** drop-down menu select the AD server created above: /**Common/LAB_SSO_AD_Server**, then click **Save**.

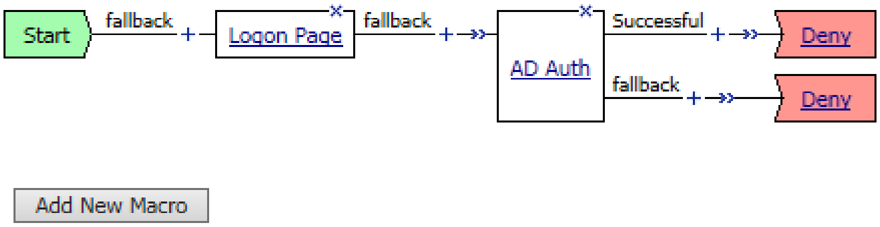


Name: AD Auth

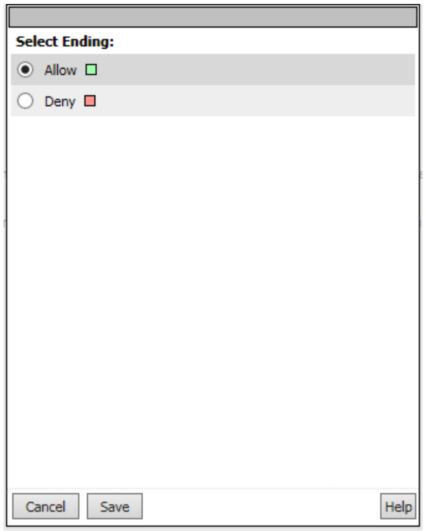
Active Directory

Type	Authentication ▼
Server	/Common/Lab_SSO_AD_Server ▼
Cross Domain Support	Disabled ▼
Complexity check for Password Reset	Disabled ▼
Show Extended Error	Disabled ▼
Max Logon Attempts Allowed	3 ▼
Max Password Reset Attempts Allowed	3 ▼

14. On the “Successful” branch between the **AD Auth** and **Deny** objects, click on the word **Deny** to change the ending.



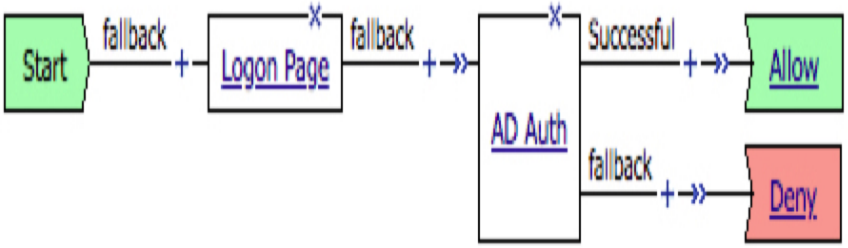
15. Change the “Successful” branch ending to **Allow**, then click **Save**.



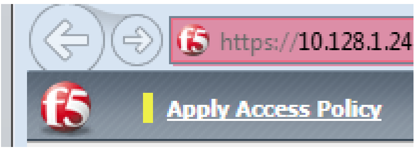
Select Ending:

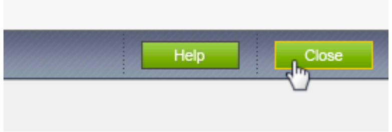
● Allow 🟩

○ Deny 🟥



16. In the upper left-hand corner of the screen, click on the **Apply Access Policy** link, then close the window using the **Close** button in the upper right-hand. Click **Yes** when asked “Do you want to close this tab?”.

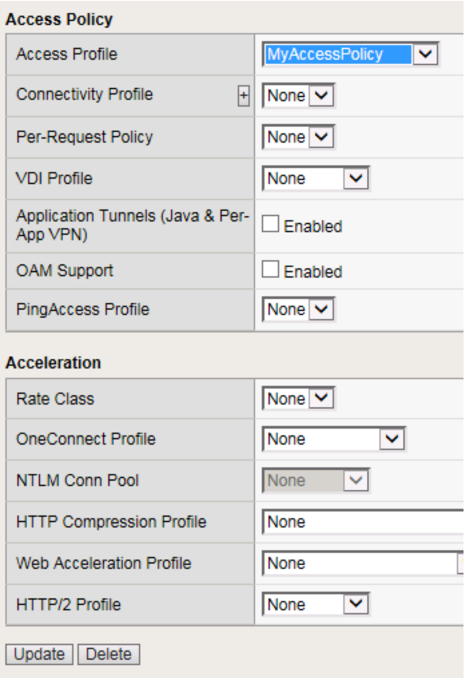




7.3.3 Task – Associate Access Policy to Virtual Servers

Now that we have created an access policy, we must apply it to the appropriate virtual server to be able to use it.

1. From the **Local Traffic** menu, navigate to the **Virtual Servers List** and click the name of the virtual server created previously: **https_vs**.
2. Scroll down to the “Access Policy” section, then for the “Access Profile” dropdown, select **MyAccessPolicy**.



Access Policy

Access Profile	MyAccessPolicy
Connectivity Profile	None
Per-Request Policy	None
VDI Profile	None
Application Tunnels (Java & Per-App VPN)	□ Enabled
OAM Support	□ Enabled
PingAccess Profile	None

Acceleration

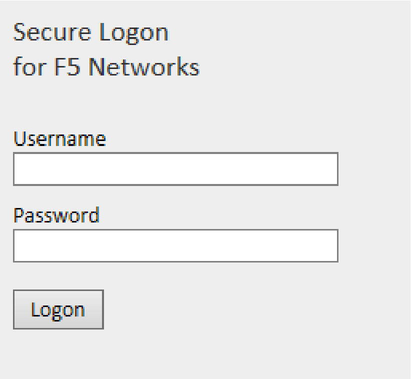
Rate Class	None
OneConnect Profile	None
NTLM Conn Pool	None
HTTP Compression Profile	None
Web Acceleration Profile	None
HTTP/2 Profile	None

3. Click **Update** at the bottom of the screen.

7.3.4 Task – Testing

Now you are ready to test.

1. Open a new browser window and open the URL for the virtual server that has the access policy applied: **https://www.f5demo.com**. You will be presented with a login window.



Secure Logon
for F5 Networks

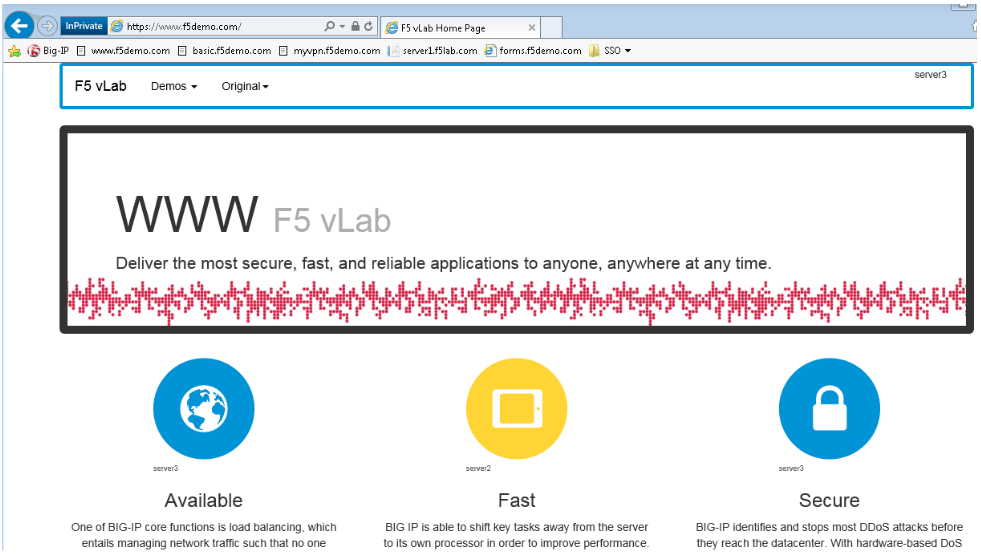
Username

Password

2. Enter the following credentials and click **Logon**:

   - Username: **user**
   - Password: **Agility1**

   You will see a screen similar to the following:



WWW F5 vLab

Deliver the most secure, fast, and reliable applications to anyone, anywhere at any time.

Available

One of BIG-IP core functions is load balancing, which entails managing network traffic such that no one

Fast

BIG IP is able to shift key tasks away from the server to its own processor in order to improve performance.

Secure

BIG-IP identifies and stops most DDoS attacks before they reach the datacenter. With hardware-based DoS

7.4 Lab 3 – Configuring a VPN Policy

In this lab, we will use the Device Wizard to configure a new SSL VPN service with the necessary Network Access Resources on APM.

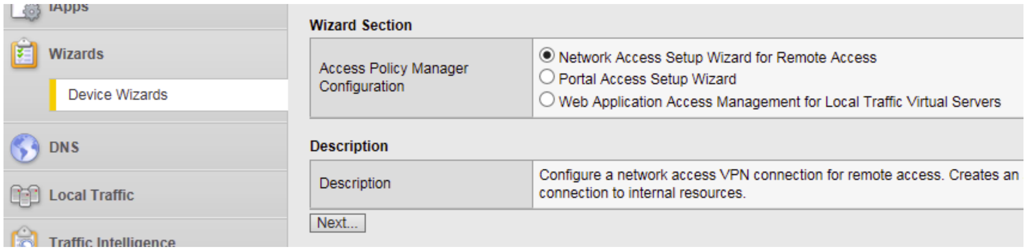
Note: Lab Requirements:

- BIG-IP with APM licensed and activated
- Server running AD and Web services
- Local Host file entries on the Jump Host

7.4.1 Task – Use the Wizard to create a new Remote Access service

The Wizard simplifies configuration tasks for specific use cases.

1. From the main menu on the left side of the screen, browse to the **Wizards > Device Wizards** and select the radio button for "**Network Access Setup Wizard for Remote Access**".



Wizard Section

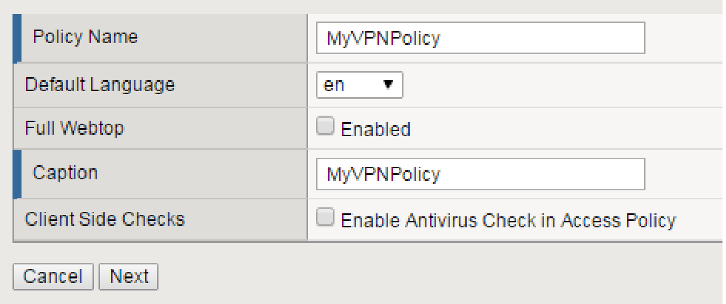
Access Policy Manager Configuration
● Network Access Setup Wizard for Remote Access
○ Portal Access Setup Wizard
○ Web Application Access Management for Local Traffic Virtual Servers

Description

Description: Configure a network access VPN connection for remote access. Creates an connection to internal resources.

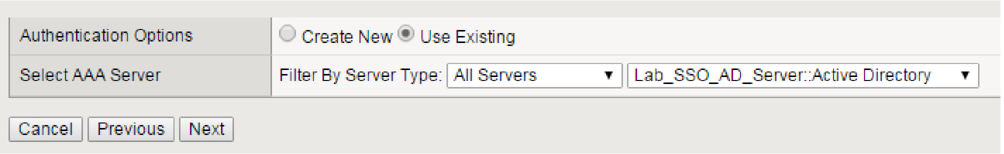
2. Click **Next**.

3. For the Policy Name field, enter **MyVPNPolicy**. This should auto populate the caption field. **Uncheck** the "**Enable Antivirus Check in Access Policy**" checkbox and click **Next**.



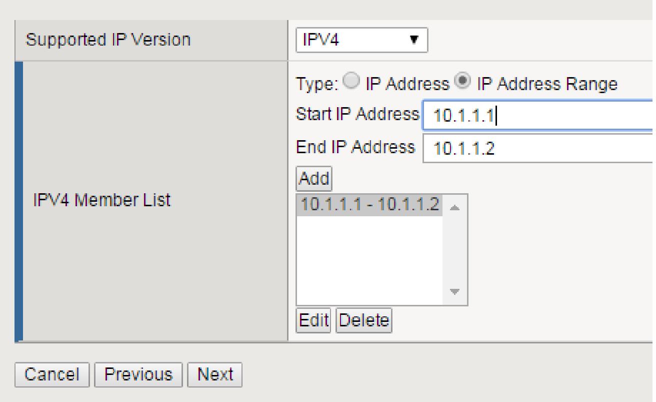
Policy Name	MyVPNPolicy
Default Language	en ▾
Full Webtop	☐ Enabled
Caption	MyVPNPolicy
Client Side Checks	☐ Enable Antivirus Check in Access Policy

4. From the Select Authentication screen, choose the “**Use Existing**” radio button, select the AAA server “**Lab_SSO_AD_Server::Active Directory**” configured previously in Lab 2 and click **Next**.



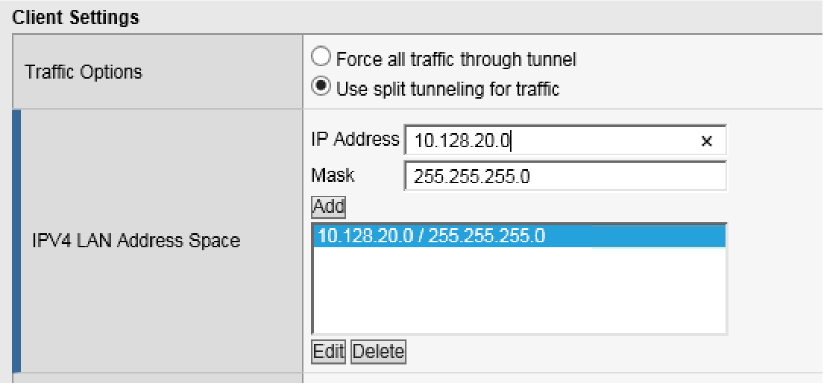
Authentication Options	○ Create New ● Use Existing
Select AAA Server	Filter By Server Type: All Servers ▾ Lab_SSO_AD_Server::Active Directory ▾

5. Assign an IP Address Range to be used for the VPN connection on the “Configure Lease Pool” page. Click the radio button for “**IP Address range**” and enter the range “**10.1.1.1-10.1.1.2**”, click **Add** and click **Next**.



Supported IP Version	IPV4 ▾
IPV4 Member List	Type: ○ IP Address ● IP Address Range Start IP Address 10.1.1.1 End IP Address 10.1.1.2 10.1.1.1 - 10.1.1.2

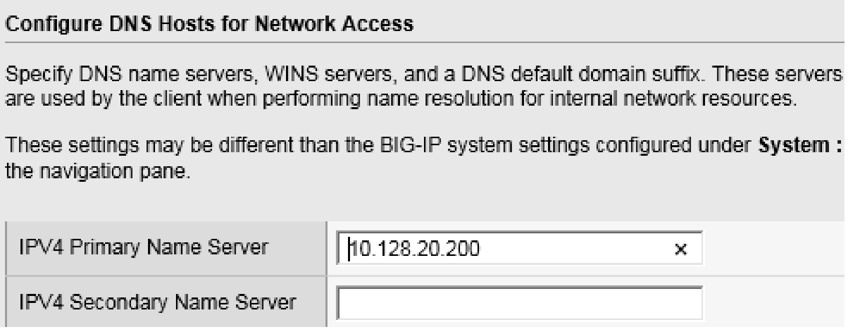
6. On the “Configure Network Access” page, select “**Use split tunneling for traffic**” and for “IPV4 Lan Space”, enter the network “**10.128.20.0**”, mask “**255.255.255.0”,** click **Add**, leave everything else default and click **Next**.



Client Settings

Traffic Options	○ Force all traffic through tunnel ● Use split tunneling for traffic
IPV4 LAN Address Space	IP Address 10.128.20.0 Mask 255.255.255.0 10.128.20.0 / 255.255.255.0

7. Accept the default on the “Configure DNS Hosts for Network Access” page and click **Next**.



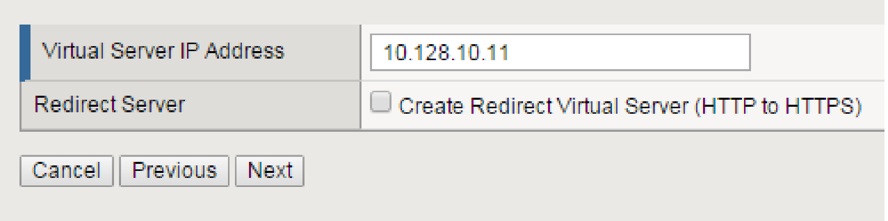
Configure DNS Hosts for Network Access

Specify DNS name servers, WINS servers, and a DNS default domain suffix. These servers are used by the client when performing name resolution for internal network resources.

These settings may be different than the BIG-IP system settings configured under **System :** the navigation pane.

IPV4 Primary Name Server	10.128.20.200
IPV4 Secondary Name Server	

8. On the "Virtual Server (HTTPS connection)" page, enter "**10.128.10.11**" for the IP address of the Virtual Server that users will connect to for access to the VPN. **Uncheck** the "**Create Redirect Virtual Server**" option and click **Next**.



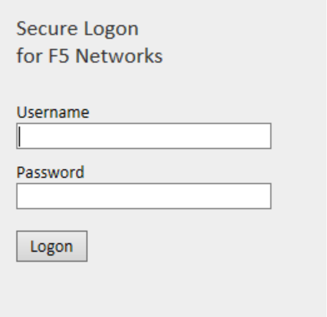
Virtual Server IP Address	10.128.10.11
Redirect Server	□ Create Redirect Virtual Server (HTTP to HTTPS)

9. Verify your settings on the Review page and click **Next** when satisfied.

10. The Setup Summary page will display a list of the configuration objects that the Wizard created for you. Click **Finished**.

7.4.2 Task – Testing

1. Open a web browser to the virtual server created in the above step by navigating to **https://myvpn.f5demo.com**. You will be presented with a Logon page similar to the one from the last lab. |



Secure Logon
for F5 Networks

Username

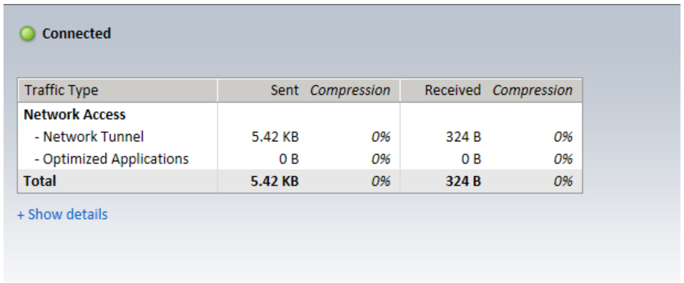
Password

2. Enter the following credentials:

   Username: **user**

   Password: **Agility1**

   This will initialize, authenticate and establish a new VPN connection to the Network Resource that was configured. You will be presented with a new page that shows the connection details.

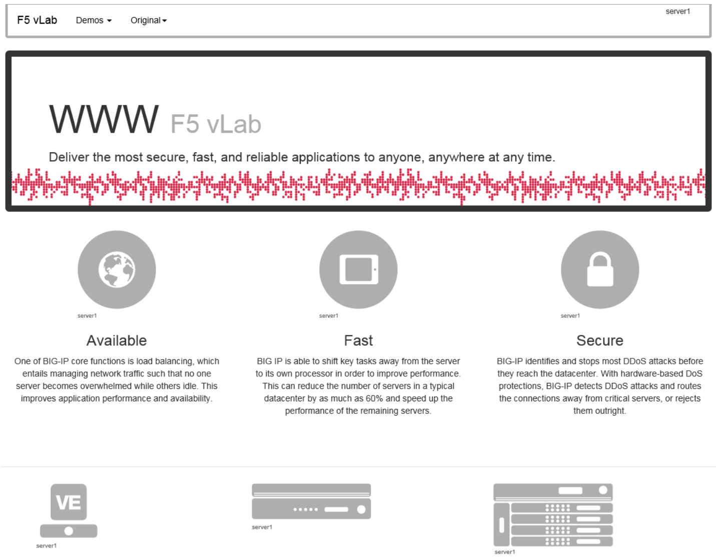


Connected

Traffic Type	Sent	Compression	Received	Compression
Network Access				
- Network Tunnel	5.42 KB	0%	324 B	0%
- Optimized Applications	0 B	0%	0 B	0%
Total	**5.42 KB**	0%	**324 B**	0%

+ Show details

3. Open a new browser tab and confirm that you are now connected to the internal network by browsing directly to the HTTP server used in the pool for the previous labs: **http://server1.f5demo.com**. You should see a page similar to the following:



WWW F5 vLab

Deliver the most secure, fast, and reliable applications to anyone, anywhere at any time.

Available

One of BIG-IP core functions is load balancing, which entails managing network traffic such that no one server becomes overwhelmed while others idle. This improves application performance and availability.

Fast

BIG IP is able to shift key tasks away from the server to its own processor in order to improve performance. This can reduce the number of servers in a typical datacenter by as much as 60% and speed up the performance of the remaining servers.

Secure

BIG-IP identifies and stops most DDoS attacks before they reach the datacenter. With hardware-based DoS protections, BIG-IP detects DDoS attacks and routes the connections away from critical servers, or rejects them outright.

4. Close the page then click **Logout** on the F5 VPN page to terminate your VPN connection and close the browser window.

7.5 Lab 4 – Configuring an APM Webtop

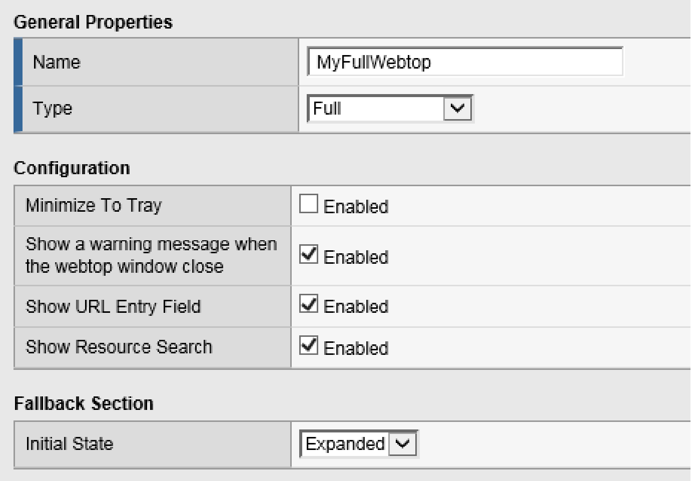
In this lab, we will add a Webtop resource to the Access Policy created in the previous lab.

Note: Lab Requirements:

- Working HTTPS Virtual Server created in Lab 1 with Access Policy created in Lab 2 (Lab 2 successfully completed).

7.5.1 Task – Create a Webtop resource

1. Expand the **Access** tab from the main menu on the left and navigate to **Webtops** > **Webtop Lists**.
2. Click **Create** to create a new Webtop called **MyFullWebtop**, select Type "**Full**", uncheck "**Minmize To Tray**" and click **Finished**.



General Properties

Name	MyFullWebtop
Type	Full

Configuration

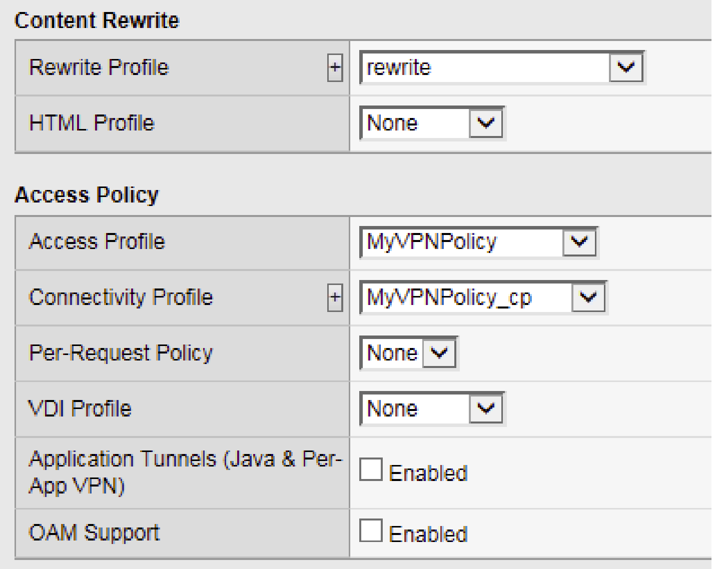
Minimize To Tray	□ Enabled
Show a warning message when the webtop window close	☑ Enabled
Show URL Entry Field	☑ Enabled
Show Resource Search	☑ Enabled

Fallback Section

Initial State	Expanded

7.5.2 Task – Enable "Content Rewrite" on the Virtual Server

1. Browse to **Local Traffic** > **Virtual Servers > Virtual Server List** and click on the name of your VPN Virtual Server called **MyVPNPolicy_vs**.
2. Scroll down to the "Content Rewrite" section, select "**rewrite**" for the "Rewrite Profile" field and click **Update**.



Content Rewrite

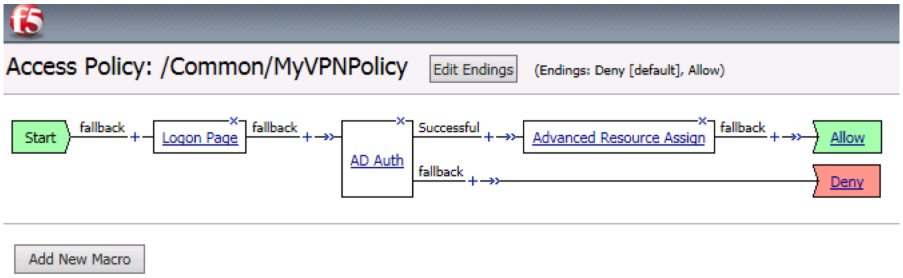
Rewrite Profile +	rewrite
HTML Profile	None

Access Policy

Access Profile	MyVPNPolicy
Connectivity Profile +	MyVPNPolicy_cp
Per-Request Policy	None
VDI Profile	None
Application Tunnels (Java & Per-App VPN)	□ Enabled
OAM Support	□ Enabled

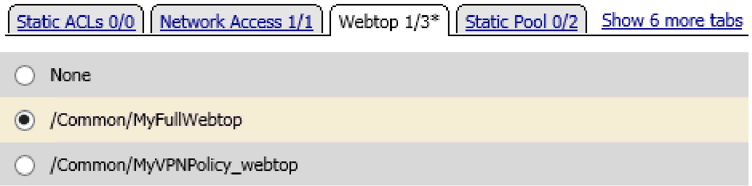
7.5.3 Task – Add Webtop resource to existing Access Policy

1. Browse to **Access** > **Profiles** / **Policies** > **Access Profiles (Per-Session Policies)**, click on **Edit** for **MyVPNPolicy**. A new tab should open to the Visual Policy Editor for **MyVPNPolicy**.



Access Policy: /Common/MyVPNPolicy Edit Endings (Endings: Deny [default], Allow)

2. Select the **Advanced Resource Assign** object.
3. Click **Add/Delete**.
4. Click on the **Webtop** tab, select the radio button for **MyFullWebtop**, then click the **Update** button at the bottom of the screen.



○ None

● /Common/MyFullWebtop

○ /Common/MyVPNPolicy_webtop

5. Click **Save**.
6. At the top left of the browser window, click on "**Apply Access Policy**", then close the tab.

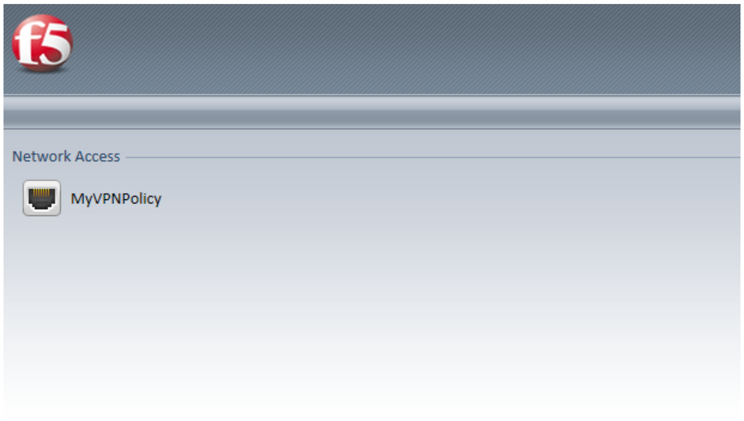
7.5.4 Task – Testing

1. Open a web browser to the virtual server created in the previous lab by navigating to **https://myvpn.f5demo.com**. You will be presented with a Logon page similar to the one from the last lab.
2. Enter the following credentials:

   Username: **user**

   Password: **Agility1**
3. Click **Logon**.

   This will open the APM Webtop landing page that shows the resources you are allowed to access. In this lab, we've only configured one resource: **Network Access**, but you can add as many as you want and they will appear on this Webtop page.



7.6 Lab 5 – FORMS Based Authentication

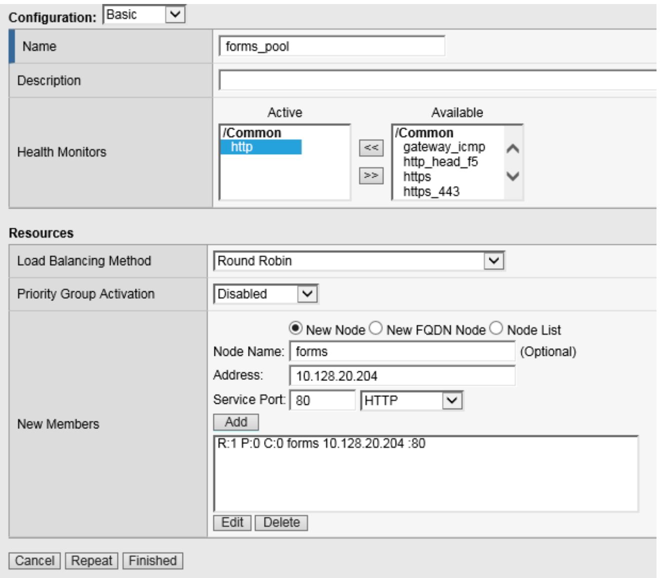
In this lab, we will show you how to configure APM to leverage SSO functionality with an application server that uses forms based authentication.

Note: Lab Requirements:

- BIG-IP with APM licensed and activated
- Server running AD and Web services
- Local Host file entries on the Jump Host

7.6.1 Task – Create a Pool

1. Browse to **Local Traffic** > **Pools** and click the '**+**' next to **Pools List** to create a new pool.
2. Name the pool "**forms_pool**"
3. Assign the monitor "**http**" by selecting the monitor and moving it to the left.
4. **Add** the following new member/node to the pool and click **Finished**:
   - Node Name: **forms**, Address: **10.128.20.204**, Service Port: **80**



Configuration: Basic

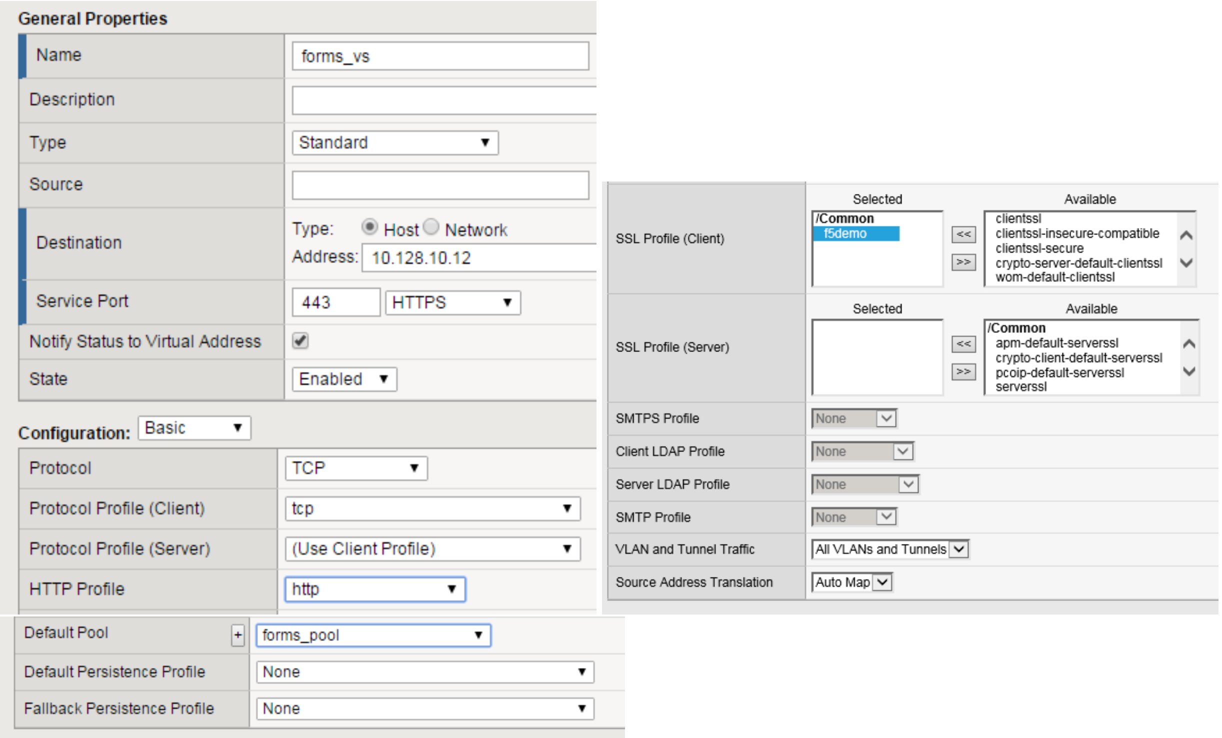
Name	forms_pool
Description	
Health Monitors	Active: /Common http Available: /Common gateway_icmp http_head_f5 https https_443

Resources

Load Balancing Method	Round Robin
Priority Group Activation	Disabled
New Members	● New Node ○ New FQDN Node ○ Node List Node Name: forms (Optional) Address: 10.128.20.204 Service Port: 80 HTTP R:1 P:0 C:0 forms 10.128.20.204 :80

7.6.2 Task – Create a Virtual Server

1. Browse to **Local Traffic > Virtual Servers** and click the '**+**' next to **Virtual Server List** to create a new one.
2. Use the following information to create the virtual server and leave the other settings at their default values, then click **Finished**:
   - Name the pool "**forms_vs**"
   - Destination Address/Mask: **10.128.10.12**
   - Service Port: **443**
   - HTTP Profile: **http**
   - SSL Profile (Client): **f5demo**
   - Source Address Translation: **Auto Map**
   - Default Pool: **forms_pool**



General Properties

Name	forms_vs
Description	
Type	Standard
Source	
Destination	Type: ● Host ○ Network Address: 10.128.10.12
Service Port	443 HTTPS
Notify Status to Virtual Address	☑
State	Enabled

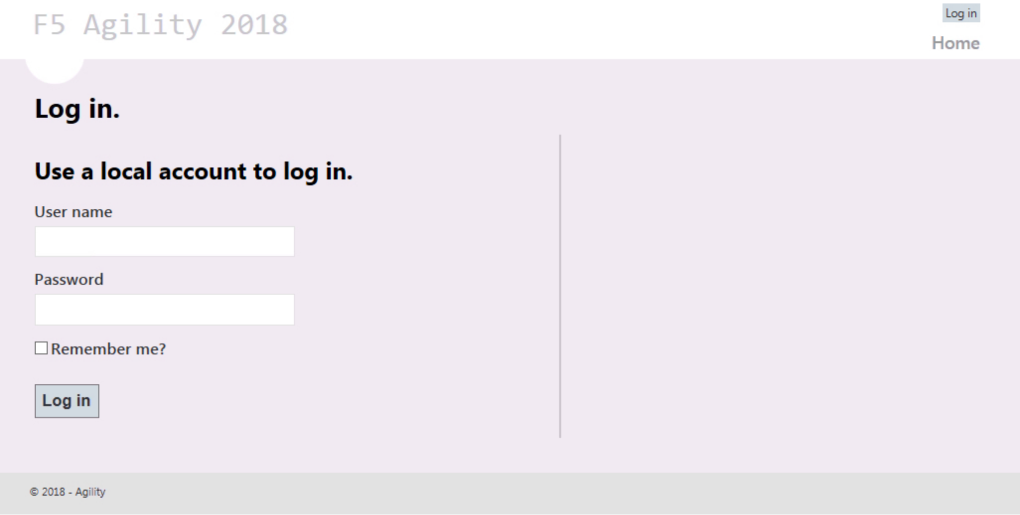
Configuration: Basic

Protocol	TCP
Protocol Profile (Client)	tcp
Protocol Profile (Server)	(Use Client Profile)
HTTP Profile	http
SSL Profile (Client)	Selected: /Common f5demo Available: clientssl clientssl-insecure-compatible clientssl-secure crypto-server-default-clientssl wom-default-clientssl
SSL Profile (Server)	Selected: Available: /Common apm-default-serverssl crypto-client-default-serverssl pcoip-default-serverssl serverssl
SMTPS Profile	None
Client LDAP Profile	None
Server LDAP Profile	None
SMTP Profile	None
VLAN and Tunnel Traffic	All VLANs and Tunnels
Source Address Translation	Auto Map
Default Pool	forms_pool
Default Persistence Profile	None
Fallback Persistence Profile	None

7.6.3 Task – Testing without APM

Observe the current behavior of the login page without authentication enforced by APM.

1. Open your web browser and go to **https://forms.f5demo.com**. You should see a page that looks as follows:



F5 Agility 2018

Log in.

Use a local account to log in.

User name

Password

□ Remember me?

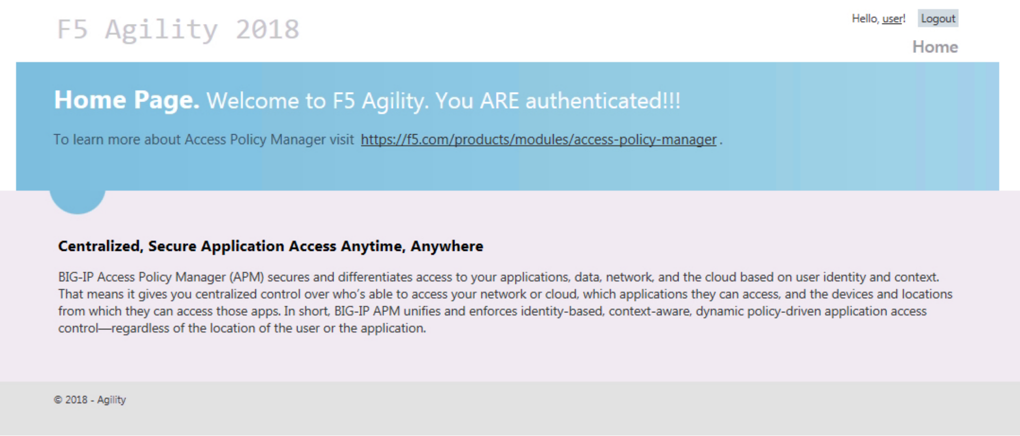
© 2018 - Agility

2. Log in with the following credentials:

   Username: **user**

   Password: **Agility1**

   Once successfully logged in you should see a web page similar to the following:



Home Page. Welcome to F5 Agility. You ARE authenticated!!!

To learn more about Access Policy Manager visit https://f5.com/products/modules/access-policy-manager .

Centralized, Secure Application Access Anytime, Anywhere

BIG-IP Access Policy Manager (APM) secures and differentiates access to your applications, data, network, and the cloud based on user identity and context. That means it gives you centralized control over who's able to access your network or cloud, which applications they can access, and the devices and locations from which they can access those apps. In short, BIG-IP APM unifies and enforces identity-based, context-aware, dynamic policy-driven application access control—regardless of the location of the user or the application.

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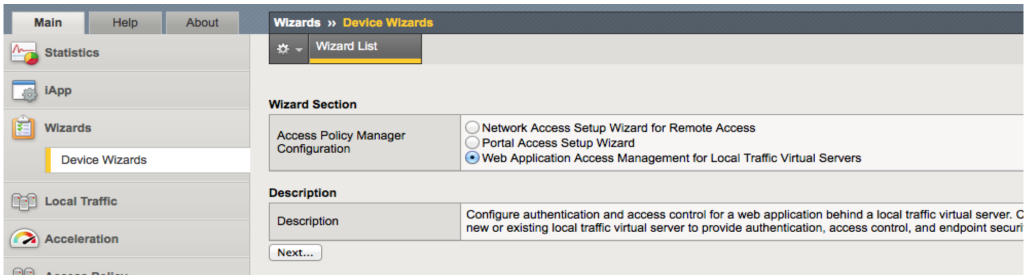
3. **Logout** using the link at the top right-hand corner of the page.

7.6.4 Task – Create Access Policy to use with Forms Based Authentication

1. Open the **Wizards > Device Wizards** page.
2. Select **Web Application Access Management for Local Traffic Virtual Servers**



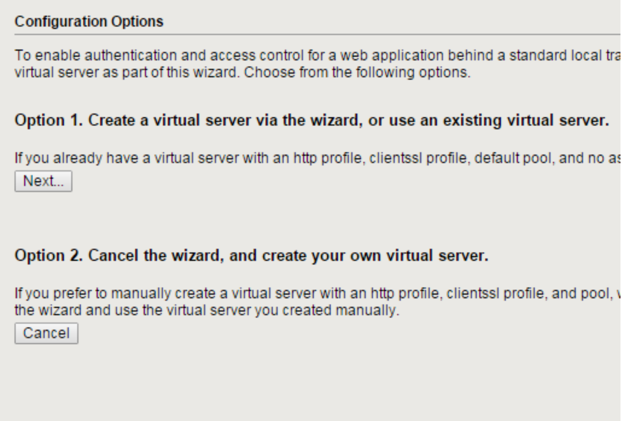
Wizard Section

Access Policy Manager Configuration
○ Network Access Setup Wizard for Remote Access
○ Portal Access Setup Wizard
● Web Application Access Management for Local Traffic Virtual Servers

Description

Description: Configure authentication and access control for a web application behind a local traffic virtual server. C new or existing local traffic virtual server to provide authentication, access control, and endpoint securi

3. Click **Next**
4. Click **Next** for Option 1 on the Configuration Options page



Configuration Options

To enable authentication and access control for a web application behind a standard local tra virtual server as part of this wizard. Choose from the following options.

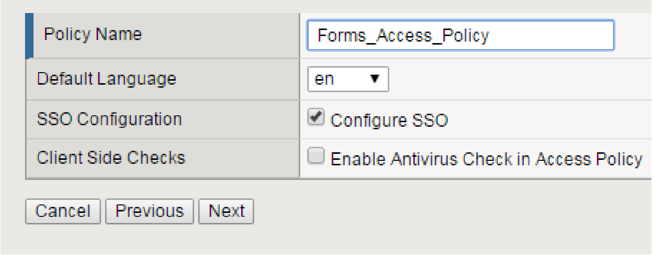
Option 1. Create a virtual server via the wizard, or use an existing virtual server.

If you already have a virtual server with an http profile, clientssl profile, default pool, and no as

Option 2. Cancel the wizard, and create your own virtual server.

If you prefer to manually create a virtual server with an http profile, clientssl profile, and pool, \ the wizard and use the virtual server you created manually.

5. Configure Basic Properties for the policy
   (a) For Policy Name enter **Forms_Access_Policy**
   (b) Uncheck **Enable Antivirus Check in Access Policy**



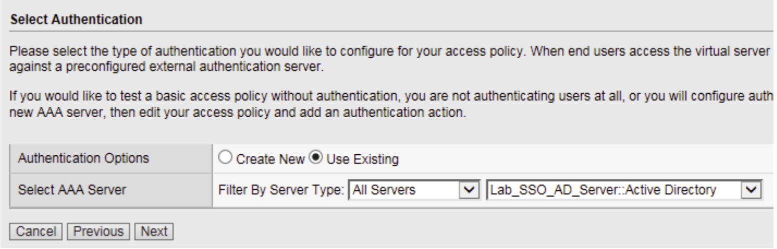
Policy Name	Forms_Access_Policy
Default Language	en ▼
SSO Configuration	☑ Configure SSO
Client Side Checks	□ Enable Antivirus Check in Access Policy

(c) Click **Next**

6. Configure the Authentication type used for this new policy

   (a) Select **Use Existing** for the Authentication Options

   (b) Select **Lab_SSO_AD_Server::Active Directory**



Select Authentication

Please select the type of authentication you would like to configure for your access policy. When end users access the virtual server against a preconfigured external authentication server.

If you would like to test a basic access policy without authentication, you are not authenticating users at all, or you will configure auth new AAA server, then edit your access policy and add an authentication action.

Authentication Options	○ Create New ● Use Existing
Select AAA Server	Filter By Server Type: All Servers ▼ Lab_SSO_AD_Server::Active Directory ▼

   (c) Click **Next**

7. Configure Single Sign On

   (a) Select “**Create New**” for “SSO Options”

   (b) Choose **Form Based** for the SSO Method

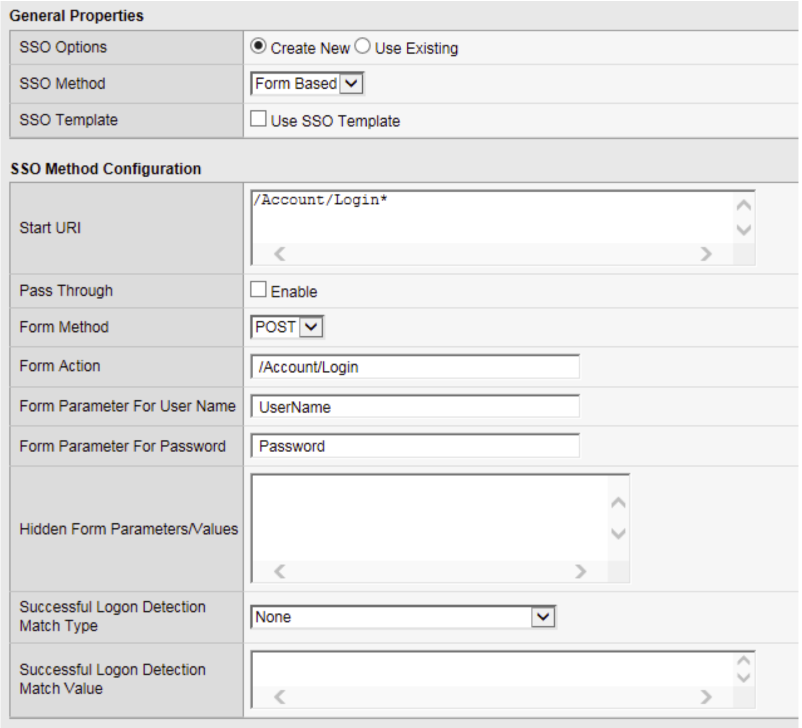
   (c) **Uncheck** the option for “Use SSO Template”

   (d) Enter /**Account**/**Login*** in the “Start URI” field

   (e) Enter /**Account**/**Login** in the “Form Action” field

   (f) Enter **UserName** in the “Form Parameter For User Name” field

   (g) Enter **Password** in the “Form Parameter For Password” field



General Properties

SSO Options	● Create New ○ Use Existing
SSO Method	Form Based
SSO Template	□ Use SSO Template

SSO Method Configuration

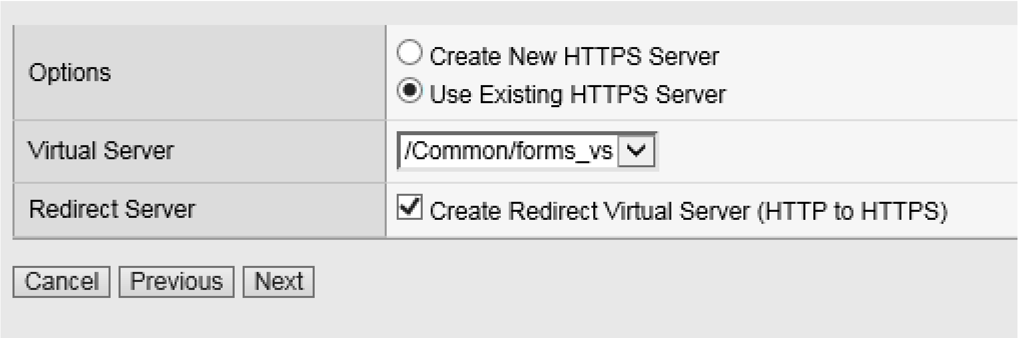
Start URI	/Account/Login*
Pass Through	□ Enable
Form Method	POST
Form Action	/Account/Login
Form Parameter For User Name	UserName
Form Parameter For Password	Password
Hidden Form Parameters/Values	
Successful Logon Detection Match Type	None
Successful Logon Detection Match Value	

   (h) Click **Next**

8. Configure Virtual Server

   (a) Select Use **Existing HTTPS Server**

   (b) Choose /**Common**/**forms_vs** for the Virtual Server



Options	○ Create New HTTPS Server ● Use Existing HTTPS Server
Virtual Server	/Common/forms_vs
Redirect Server	☑ Create Redirect Virtual Server (HTTP to HTTPS)

   (c) Click **Next**

9. Review configuration and click **Next**

10. Review the “Setup Summary”, which shows all (existing and new) objects associated with this new policy and click **Finished**.

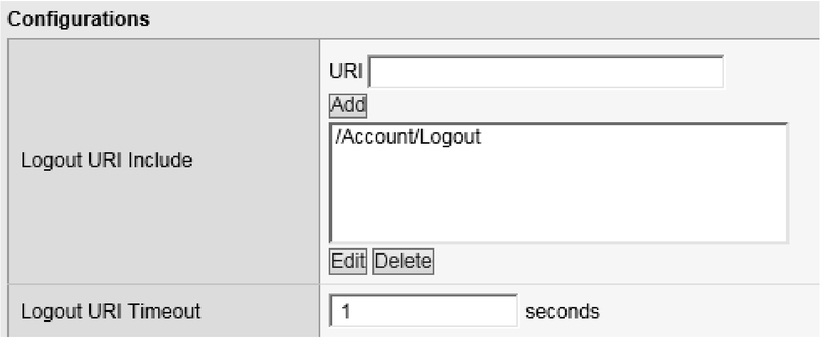
11. Add a logout URI Include to the new access policy

    (a) Open the **Access** > **Profiles** / **Policies** > **Access Profiles (Per-Session Policies)** page

    (b) Click on the name of the new policy **Forms_Access_Policy**

    (c) **Add** “/**Account**/**Logout**” to the “Logout URI Include” field

    (d) Change **Logout URI Timeout** to **1** second



Configurations

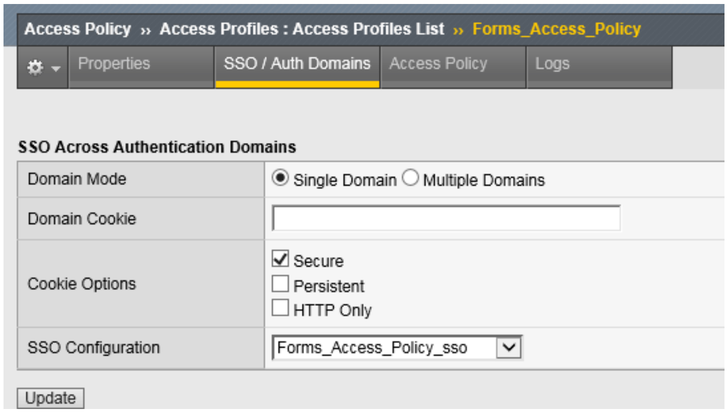
Logout URI Include	URI [ ] Add /Account/Logout Edit Delete
Logout URI Timeout	1 seconds

   (e) Click **Update**

12. Enable SSO

   (a) Click on the “SSO / Auth Domains” tab

   (b) For “SSO Configuration”, select **Forms_Access_Policy_sso**



Access Policy » Access Profiles : Access Profiles List » Forms_Access_Policy

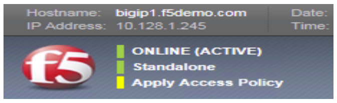
SSO Across Authentication Domains

Domain Mode	● Single Domain ○ Multiple Domains
Domain Cookie	
Cookie Options	☑ Secure □ Persistent □ HTTP Only
SSO Configuration	Forms_Access_Policy_sso

   (c) Click **Update**

7.6.5 Task – Applying Access Policy Changes

After you create or change an access policy, the link Apply Access Policy appears in yellow at the top left of the BIG-IP Configuration utility screen. You must click this link to activate the access policy for use in your configuration.

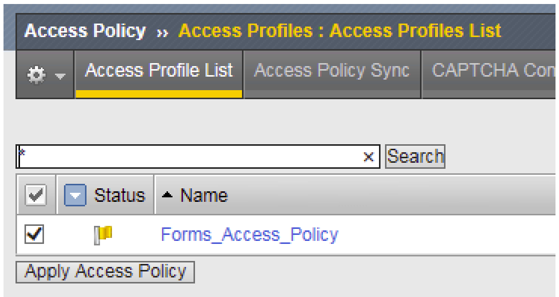


Hostname: bigip1.f5demo.com Date:
IP Address: 10.128.1.245 Time:

ONLINE (ACTIVE)
Standalone
Apply Access Policy

1. Click the **Apply Access Policy** link, which will bring you to the Apply Access Policy screen, with a list of access policies that have been changed.

2. Select the new Access Policy and click the **Apply** button (by default, all access policies that are new or changed are selected).



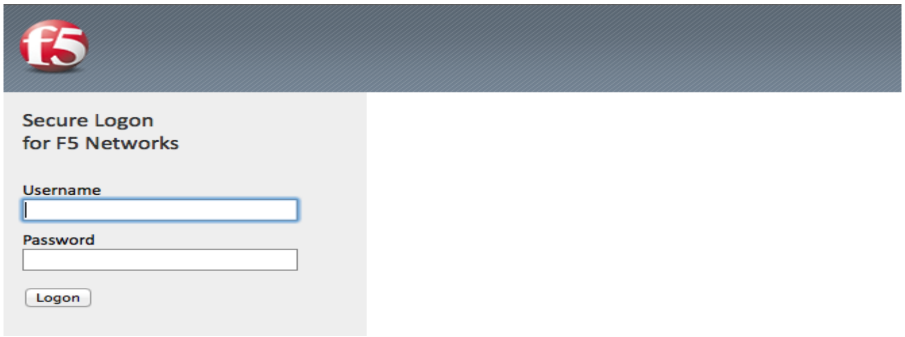
☑	Status	Name
☑		Forms_Access_Policy

After you apply the access policy, the Access Profiles list screen is displayed.

7.6.6 Task – Testing with APM Authentication

Observe the behavior of the login page now that authentication is enforced by APM.

1. Open your web browser and go back to **https://forms.f5demo.com**. You should see a page that looks like the following:

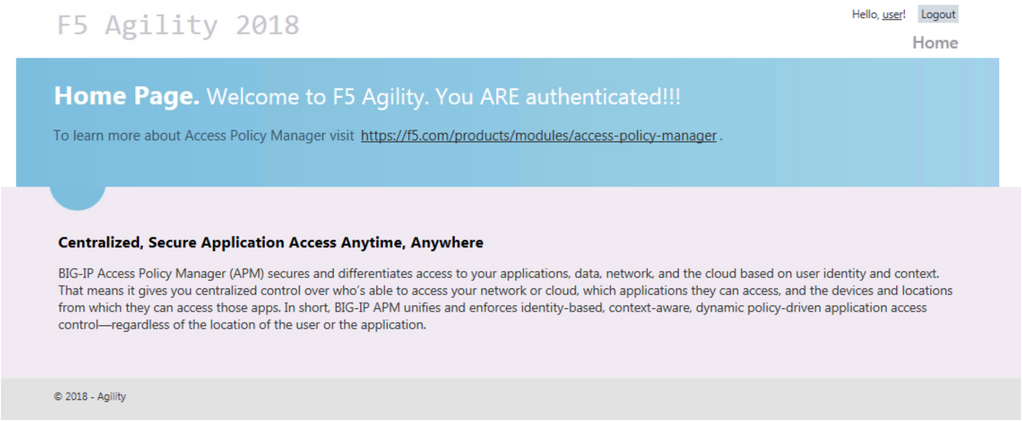


2. Logon with the following credentials:

   Username: **user**

   Password: **Agility1**

   Once successfully logged in you will see the same web page observed in task 2:



Home Page. Welcome to F5 Agility. You ARE authenticated!!!

To learn more about Access Policy Manager visit https://f5.com/products/modules/access-policy-manager .

Centralized, Secure Application Access Anytime, Anywhere

BIG-IP Access Policy Manager (APM) secures and differentiates access to your applications, data, network, and the cloud based on user identity and context. That means it gives you centralized control over who's able to access your network or cloud, which applications they can access, and the devices and locations from which they can access those apps. In short, BIG-IP APM unifies and enforces identity-based, context-aware, dynamic policy-driven application access control—regardless of the location of the user or the application.

© 2018 - Agility

7.6.7 Task – Testing Logout

Earlier in Task 3, Step 9, we defined a **Logout URI Include** for this Access Policy. This is a list of logoff URIs that the access profile searches for in order to terminate the Access Policy Manager session. The URI we used was /Account/Logout, and the default logout delay is 5 seconds, which was modified to 1 second.

1. Logout using the **Logout** link at the top right-hand corner of the page.
2. Wait 1 second
3. Click the Home link in the banner at the top of the page
4. You should be redirected back to the F5 logon page

7.7 Lab 6 – BASIC Authentication

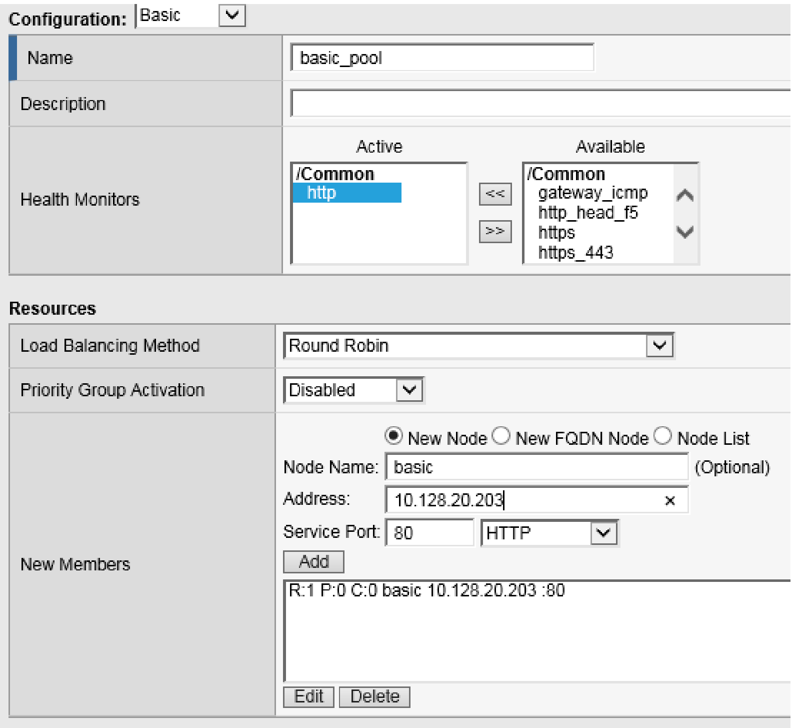
In this lab, we will show you how to configure basic authentication leveraging the SSO functionality of APM.

Note: Lab Requirements:

- BIG-IP with APM licensed and activated
- Server running AD and Web services
- Local Host file entries on the Jump Host

7.7.1 Task – Create a Pool

1. Browse to **Local Traffic > Pools** and click the '**+**' next to **Pools List** to create a new pool.
2. Name the pool "**basic_pool**"
3. Assign the monitor "**http**" by selecting the monitor and moving it to the left.
4. **Add** the following "New Member/Node" to the pool and click **Finished**:
    - Node Name: **basic**, Address: **10.128.20.203**, Service Port: **80**



Configuration: Basic

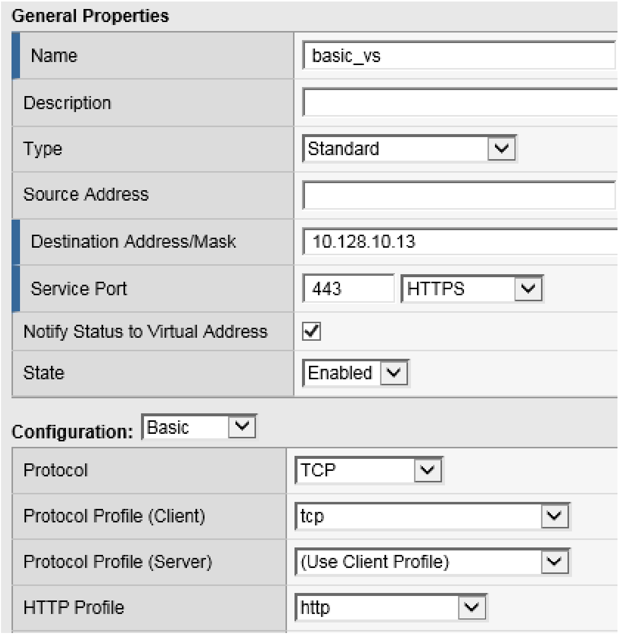
Name	basic_pool
Description	
Health Monitors	Active: /Common http Available: /Common gateway_icmp http_head_f5 https https_443

Resources

Load Balancing Method	Round Robin
Priority Group Activation	Disabled
New Members	● New Node ○ New FQDN Node ○ Node List Node Name: basic (Optional) Address: 10.128.20.203 Service Port: 80 HTTP Add R:1 P:0 C:0 basic 10.128.20.203 :80 Edit Delete

7.7.2 Task 2: Create a Virtual Server

1. Browse to **Local Traffic** > **Virtual Servers** and click the '**+**' next to **Virtual Server List** to create a new one.
2. Use the following information to create the virtual server and leave other settings as default, then click **Finished**:
   - Name the pool "**basic_vs**"
   - Destination Address: **10.128.10.13**
   - Service Port: **443**
   - HTTP Profile: **http**
   - SSL Profile (Client): **f5demo**
   - Source Address Translation: **Auto Map**
   - Default Pool: **basic_pool**

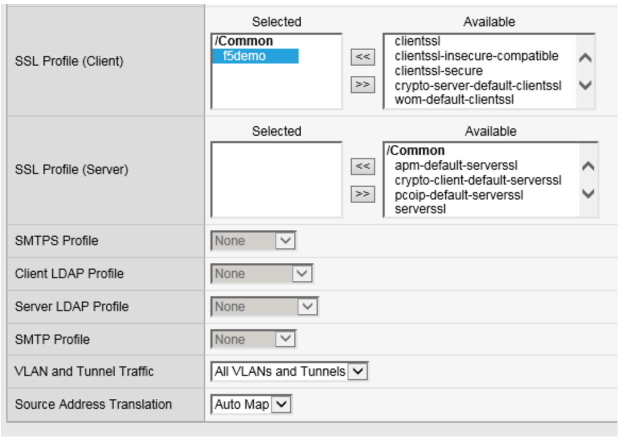


General Properties

Name	basic_vs
Description	
Type	Standard
Source Address	
Destination Address/Mask	10.128.10.13
Service Port	443 HTTPS
Notify Status to Virtual Address	☑
State	Enabled

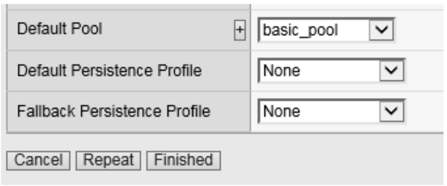
Configuration: Basic

Protocol	TCP
Protocol Profile (Client)	tcp
Protocol Profile (Server)	(Use Client Profile)
HTTP Profile	http



	Selected	Available
SSL Profile (Client)	/Common f5demo	clientssl clientssl-insecure-compatible clientssl-secure crypto-server-default-clientssl wom-default-clientssl
SSL Profile (Server)		/Common apm-default-serverssl crypto-client-default-serverssl pcoip-default-serverssl serverssl

SMTPS Profile	None
Client LDAP Profile	None
Server LDAP Profile	None
SMTP Profile	None
VLAN and Tunnel Traffic	All VLANs and Tunnels
Source Address Translation	Auto Map

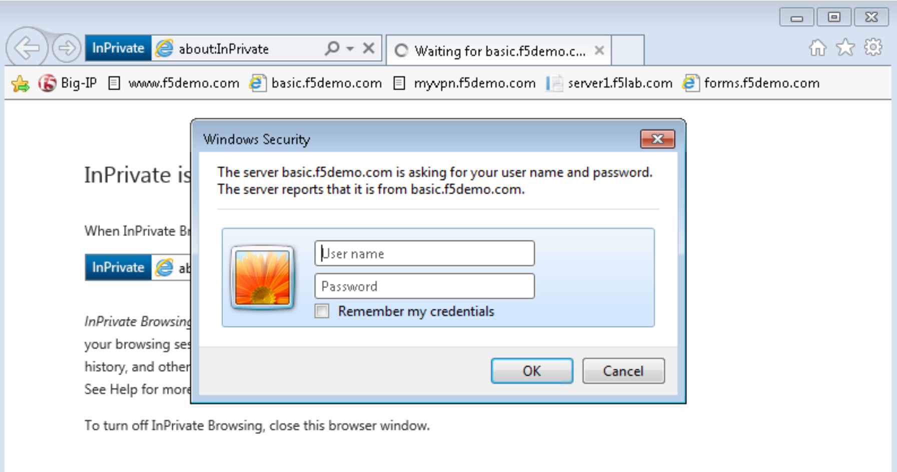


Default Pool	basic_pool
Default Persistence Profile	None
Fallback Persistence Profile	None

7.7.3 Task 3: Testing without APM

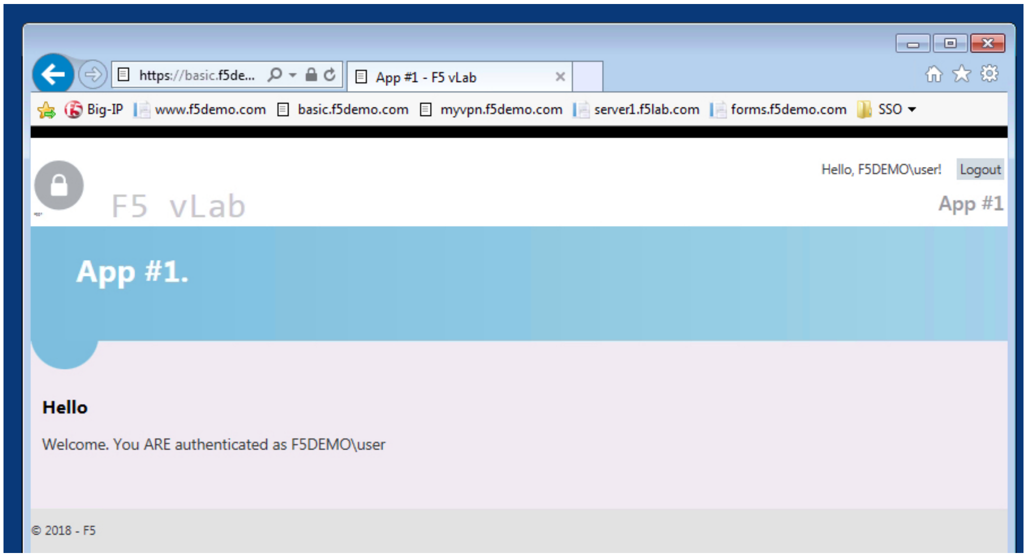
Observe the current behavior of the login page without APM authentication.

1. Open a private browsing window and go to **https://basic.f5demo.com**. You should receive a prompt that looks similar to the following screen shot:



The server basic.f5demo.com is asking for your user name and password. The server reports that it is from basic.f5demo.com.

2. Enter the following credentials:
   - Username: **user**
   - Password: **Agility1**
3. Once successfully logged in you will see a webpage similar to this one:



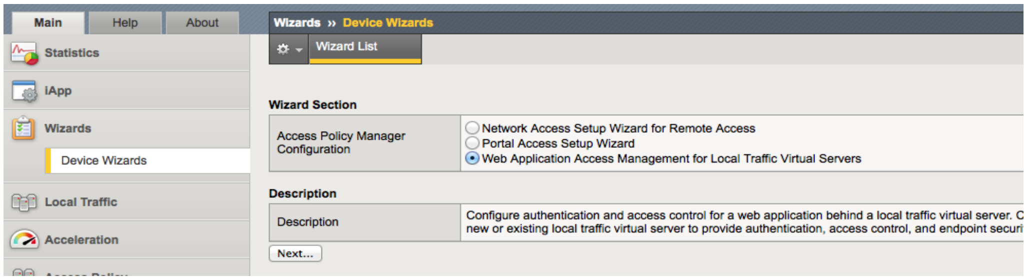
Hello

Welcome. You ARE authenticated as F5DEMO\user

4. Close the private browsing window.

7.7.4 Task 4: Create Access Policy to use with Basic Authentication

1. Open the **Wizards > Device Wizards** page.
   (a) Select **Web Application Access Management for Local Traffic Virtual Servers**



Wizard Section

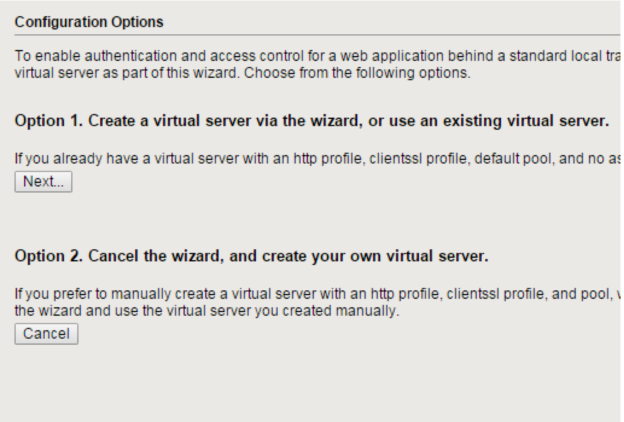
Access Policy Manager Configuration	○ Network Access Setup Wizard for Remote Access ○ Portal Access Setup Wizard ● Web Application Access Management for Local Traffic Virtual Servers

Description

Description	Configure authentication and access control for a web application behind a local traffic virtual server. C new or existing local traffic virtual server to provide authentication, access control, and endpoint securi

   (b) Click **Next**

2. Click **Next** for Option 1 on the Configuration Options page



Configuration Options

To enable authentication and access control for a web application behind a standard local tra virtual server as part of this wizard. Choose from the following options.

Option 1. Create a virtual server via the wizard, or use an existing virtual server.

If you already have a virtual server with an http profile, clientssl profile, default pool, and no as

Next...

Option 2. Cancel the wizard, and create your own virtual server.

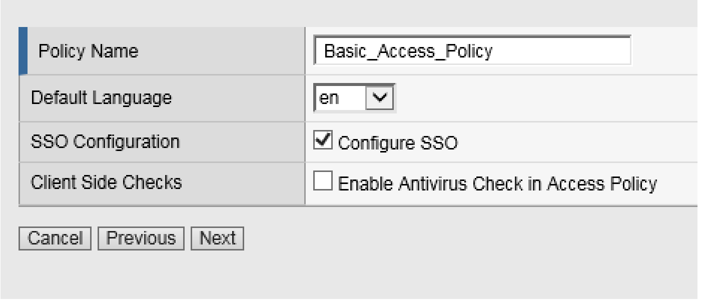
If you prefer to manually create a virtual server with an http profile, clientssl profile, and pool, v the wizard and use the virtual server you created manually.

Cancel

3. Configure Basic Properties for the policy

   (a) For Policy Name enter **Basic_Access_Policy**

   (b) **Uncheck** “Enable Antivirus Check in Access Policy”



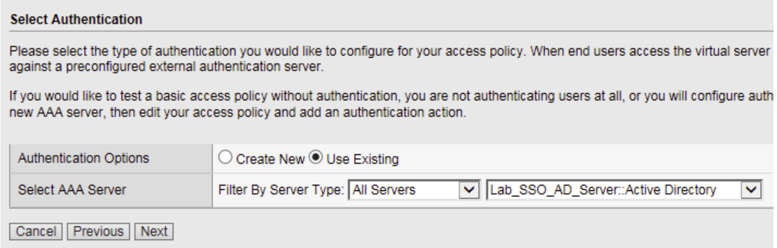
Policy Name	Basic_Access_Policy
Default Language	en
SSO Configuration	☑ Configure SSO
Client Side Checks	□ Enable Antivirus Check in Access Policy

   (c) Click **Next**

4. Configure Authentication type used for policy

   (a) Select **Use Existing** for the “Authentication Options”

   (b) Select **Lab_SSO_AD_Server::Active Directory**



Select Authentication

Please select the type of authentication you would like to configure for your access policy. When end users access the virtual server against a preconfigured external authentication server.

If you would like to test a basic access policy without authentication, you are not authenticating users at all, or you will configure auth new AAA server, then edit your access policy and add an authentication action.

Authentication Options	○ Create New ● Use Existing
Select AAA Server	Filter By Server Type: All Servers ⌵ Lab_SSO_AD_Server::Active Directory ⌵

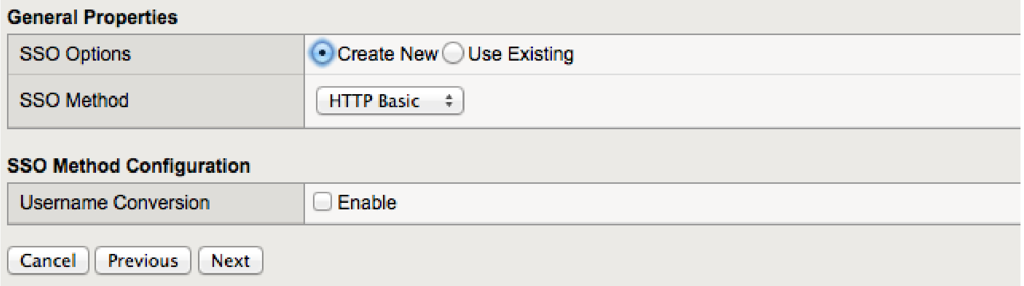
(c) Click **Next**

5. Configure SSO

   (a) Select **Create New** for the “SSO Options”

   (b) Choose **HTTP Basic**

   (c) Click **Next**



General Properties

SSO Options	● Create New ○ Use Existing
SSO Method	HTTP Basic

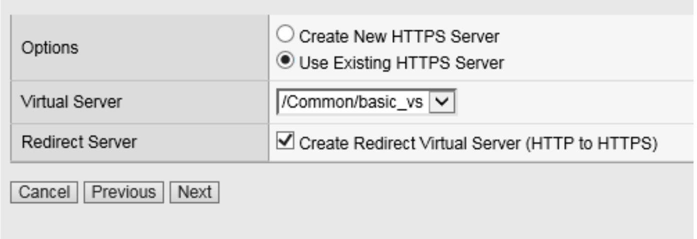
SSO Method Configuration

Username Conversion	□ Enable

6. Configure Virtual Server

   (a) Select Use **Existing HTTPS Server**

   (b) Choose /**Common**/**basic_vs** for the Virtual Server**



Options	○ Create New HTTPS Server ● Use Existing HTTPS Server
Virtual Server	/Common/basic_vs ⌵
Redirect Server	☑ Create Redirect Virtual Server (HTTP to HTTPS)

   (c) Click **Next**

7. Review configuration and click **Next**

8. Review the “Setup Summary”, which shows all (existing and new) objects associated with this new policy.

9. Click **Finished**

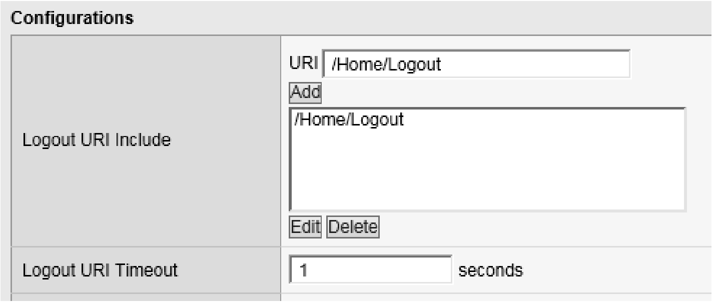
10. Add a logout URI Include to the new access policy

    (a) Open the **Access** > **Profiles** / **Policies** > **Access Profiles (Per-Session Policies)** page

    (b) Click on the name of the new policy **Basic_Access_Policy**

    (c) **Add** “/**Home**/**Logout**” to “Logout URI Include”

    (d) Change **Logout URI Timeout** to **1** second



Logout URI Include: URI /Home/Logout

/Home/Logout

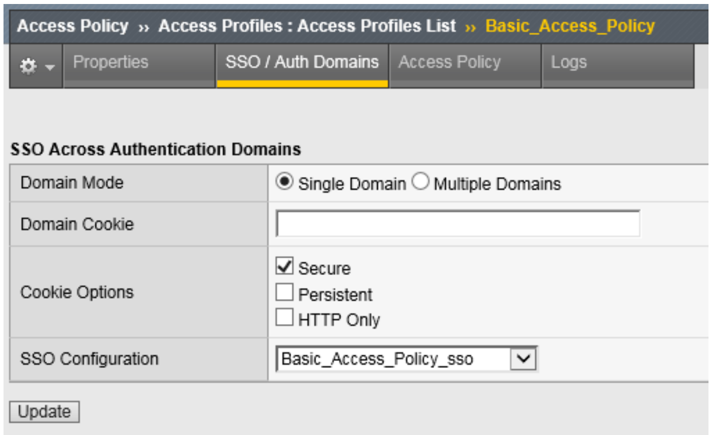
Logout URI Timeout: 1 seconds

(e) Click **Update**

11. Enable the SSO Configuration

    (a) Click on the **SSO** / **Auth Domains** tab

    (b) For **SSO Configuration**, select **Basic_Access_Policy_sso**


Access Policy » Access Profiles : Access Profiles List » Basic_Access_Policy
Properties
SSO / Auth Domains
Access Policy
Logs
SSO Across Authentication Domains
Update

Domain Mode: ● Single Domain ○ Multiple Domains

Domain Cookie:

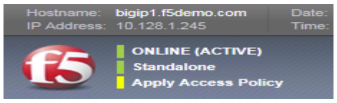
Cookie Options: ☑ Secure □ Persistent □ HTTP Only

SSO Configuration: Basic_Access_Policy_sso

    (c) Click **Update**

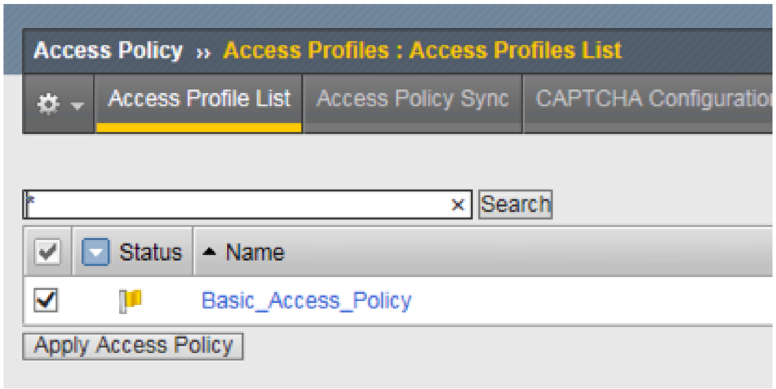
7.7.5 Task 5: Applying Access Policy

After you create or change an access policy, the link Apply Access Policy appears in yellow at the top left of the BIG-IP Configuration utility screen. You must click this link to activate the access policy for use in your configuration.



Hostname: bigip1.f5demo.com
IP Address: 10.128.1.245
Date:
Time:
ONLINE (ACTIVE)
Standalone

1. Click the **Apply Access Policy** link, which will bring you to the Apply Access Policy screen, with a list of access policies that have been changed.
2. Select the Access Policy and click the **Apply** button (by default, all access policies that are new or changed are selected).

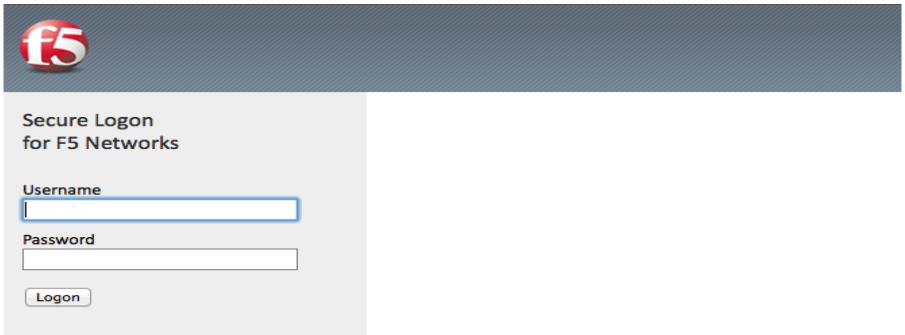


After you apply the access policy, the Access Profiles list screen is displayed.

7.7.6 Task 6: Testing with APM Authentication

Observe the behavior of the login page with authentication enforced by APM.

1. Open a private browsing window and go to **https://basic.f5demo.com**. You should see a page that looks like the following:

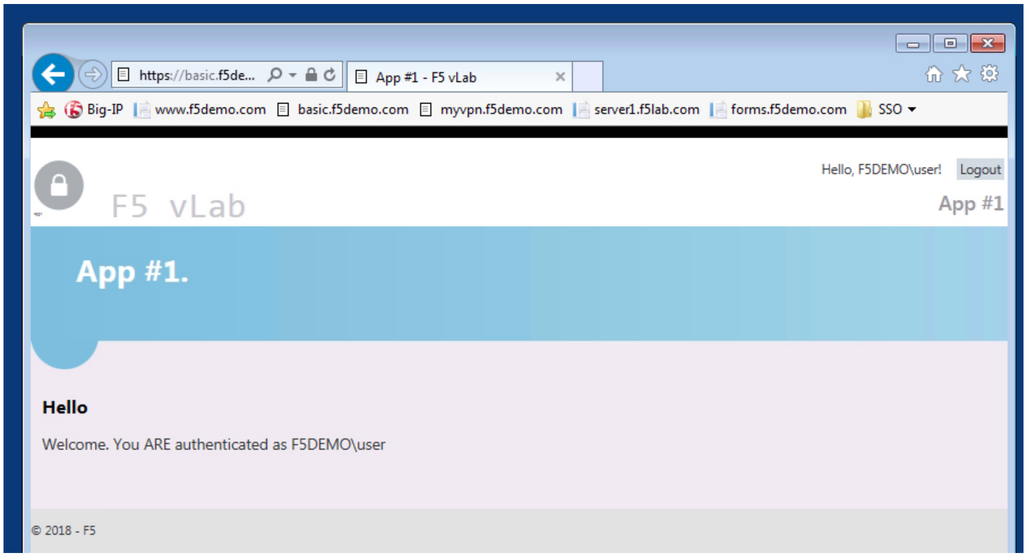


2. Logon with the following credentials:

   Username: **user**

   Password: **Agility1**

   Once successfully logged in you will see the same web page observed in task 3:



Hello, F5DEMO\user!

App #1.

Hello

Welcome. You ARE authenticated as F5DEMO\user

© 2018 - F5

7.7.7 Task 7: Testing Logout

Earlier in Task 3, Step 9, we defined a **Logout URI Include** for this Access Policy. This is a list of logoff URIs that the access profile searches for in order to terminate the Access Policy Manager session. The URI we used was /Home/Logout, and the default logout delay is 5 seconds which was modified to 1 second.

1. Click the **Logout** link located at the top right of the web pagee
2. Wait 1 second
3. Click the "**App #1**" link in the banner at the top of the page
4. You should be redirected back to the F5 logon page

7.8 Lab 7 – Single-Sign-On Across Authentication Domains

In this lab, we will show you how to provide SSO across multiple applications. Normally APM will require authentication each time an application is accessed. By using a Domain Cookie it is possible to re-use an existing APM session to access multiple applications.

Note: Lab Requirements:

- Previous Labs 5 and 6 successfully completed

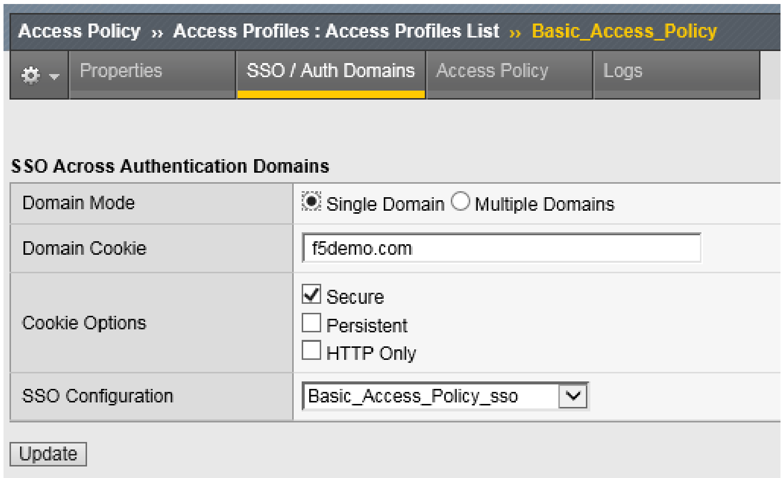
7.8.1 Task – Verify Authentication Required for different applications

1. Open a Private web browser or clear your browser cache and go to the Virtual Server used earlier **https://basic.f5demo.com**
2. You should be able to logon with the following credentials:
   - Username: **user**
   - Password: **Agility1**

3. Once successfully logged in, you will be presented with the same information page you observed earlier from basic.f5demo.com “App #1”.
4. Now go to **https://app2.f5demo.com** you should be prompted to logon again.
5. You should be able to logon with the following credentials:
   - Username: **user**
   - Password: **Agility1**
6. Once successfully logged in, you will be presented with information about “App #2”.
7. Logout and close the browser window.

7.8.2 Task - Specify Domain Cookie

1. Open the **Access** > **Profiles** / **Policies** > **Access Profiles (Per-Session Policies)** page
2. Click on the name of the policy **Basic_Access_Policy**
3. Click on the **SSO** / **Auth Domains** tab
4. Enter **f5demo.com** to **Domain Cookie**


Access Policy » Access Profiles : Access Profiles List » Basic_Access_Policy
Properties
SSO / Auth Domains
Access Policy
Logs
Update

SSO Across Authentication Domains

Domain Mode	● Single Domain ○ Multiple Domains
Domain Cookie	f5demo.com
Cookie Options	☑ Secure □ Persistent □ HTTP Only
SSO Configuration	Basic_Access_Policy_sso

5. Click **Update**
6. Don’t forget to click on **Apply Access Policy** to put your changes in effect!

7.8.3 Task - Testing Authentication across domains

1. Open a Private web browser or clear your browser cache and go to the Virtual Server used earlier **https://basic.f5demo.com**
2. You should be able to logon with - Username: **user** - Password: **Agility1**
3. Once successfully logged in, you will be presented with the same information page you observed earlier.
4. Now go to **https://app2.f5demo.com**. You should not be prompted to logon again!

7.8.4 Task 4 (Bonus) - Authentication across domains & virtual servers

Repeat the previous steps, but for Forms_Access_Policy instead of Basic_Access_Policy.

Are you prompted for authentication when going from **https://forms.f5demo.com** to **https://basic.f5demo.com**?

Try changing the value for "Profile Scope" for **Basic_Access_Policy** and **Forms_Access_Policy** from Profile to **Global**

> ***Troubleshooting tips:**
>
> Did you forget to **Apply Access Policy** ?
>
> Verify the Domain Cookie configured on the SSO page. . . for both policies?

8 Class 8: Troubleshooting Universal Access

Welcome to the Troubleshooting Universal Access Lab. These lab exercises will instruct you on how to configure and troubleshoot common Access Policy Manager (APM) issues as experienced by field engineers, support engineers and customers. This guide is intended to complement lecture material provided during the course as well as a reference guide that can be referred to after the class as a basis for troubleshooting APM in your own environment.

Expected time to complete: **4 hours**

8.1 Getting Started

8.1.1 Timing for Labs

The time it takes to perform each lab varies and is mostly dependent on accurately completing steps. This can never be accurately predicted but we strived to derive an estimate among several people each having a different level of experience. Below is an estimate of how long it will take for each lab:

LAB Timing

LAB Name (Description)	Time Allocated
LAB 1: APM Troubleshooting Lab Object Prep (GUI) *Do EITHER Lab 1 OR Lab 2 (not both)*	20 minutes
LAB 2: APM Troubleshooting Lab Object Prep (TMSH) *Do EITHER Lab 1 OR Lab 2 (not both)*	20 minutes
LAB 3: General Troubleshooting	5 minutes
LAB 4: Visual Policy Editor (VPE) and Session Variables	20 minutes
LAB 5: Command Line Tools	25 minutes

8.1.2 General Notes

Provisioning Access Policy Manager (APM) is not required for basic Access Policy uses cases although this has been provisioned for you ahead of time. This was done to save time as provisioning often requires services to restart which takes away valuable lecture/lab time.

8.1.3 How to use this Guide

For each section, follow the instruction of the class moderator on when to begin. Carefully read and implement each item step by step.

Archives have been provided for each completed section and can be loaded if necessary at the beginning of each section for prior labs. You can install the UCS archive by using the **tmsh no-license** option. For the command syntax, refer to the following example:

```
tmsh load sys ucs [ucs file name] no-license
```

8.2 Lab Environment

8.2.1 Accessing the Lab Environment

To access the lab environment, you will require a web browser and Remote Desktop Protocol (RDP) client software. The web browser will be used to access the Lab Training Portal. The RDP client will be used to connect to the Jump Host, where you will be able to access the BIG-IP management interfaces (HTTPS, SSH).

Your class instructor will provide additional lab access details.

8.2.2 Lab Network Setup

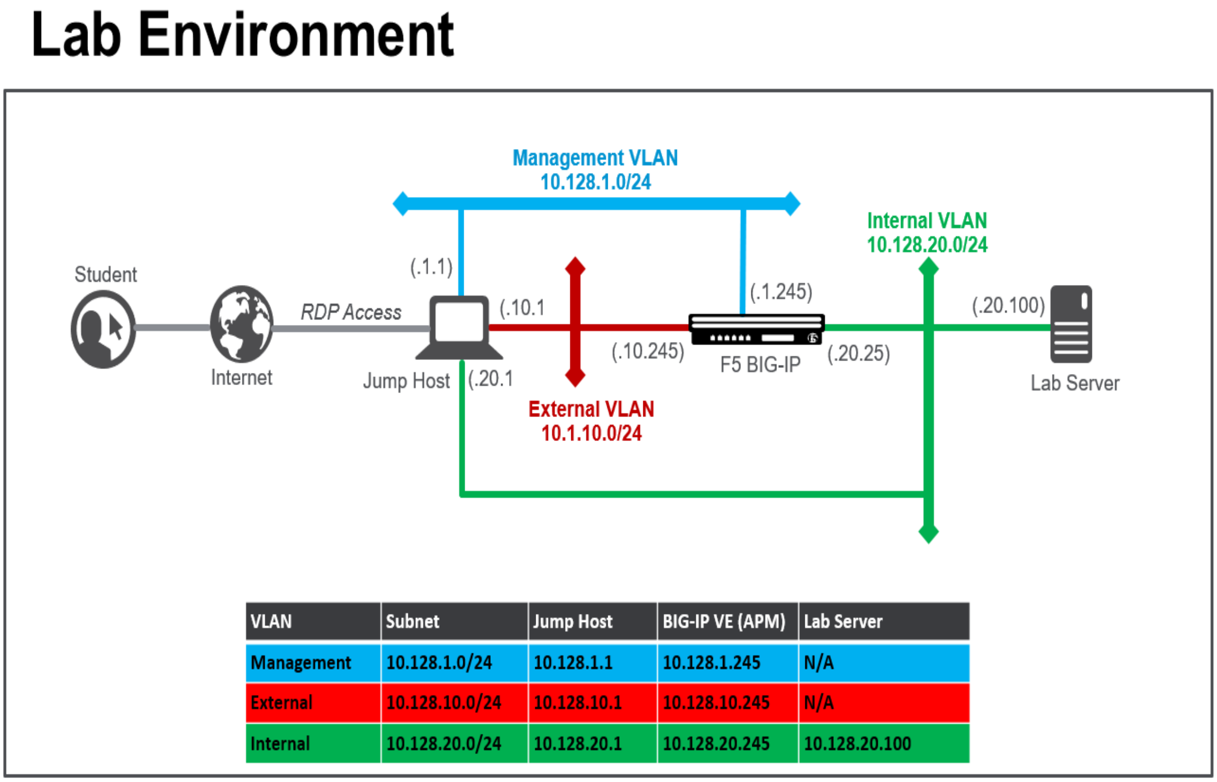
In the interest of focusing as much time as possible configuring and troubleshooting APM, we have provided some resources and basic setup ahead of time. These are:

- Cloud-based lab environment complete with Jump Host, Virtual BIG-IP (VE) and Lab Server
- Duplicate Lab environments for each student for improved collaboration
- Virtual BIG-IP has been pre-licensed and provisioned for Access Policy Manager (APM)

Note: All work for this lab will be performed exclusively from the Windows jump host. No installation or interaction with your local system is required.

If you wish to replicate these lab exercises in your own lab environment, you will need to perform these steps accordingly. Additional lab resources are provided as illustrated in the diagram below:

8.2.3 LAB Environment Diagram



VLAN	Subnet	Jump Host	BIG-IP VE (APM)	Lab Server
Management	10.128.1.0/24	10.128.1.1	10.128.1.245	N/A
External	10.128.10.0/24	10.128.10.1	10.128.10.245	N/A
Internal	10.128.20.0/24	10.128.20.1	10.128.20.245	10.128.20.100

8.2.4 Lab Components

The following components have been included in your lab environment:

- 1 x Windows Jump Host
- 1 x F5 BIG-IP VE (v13.1)
- 1 x Windows Lab Server (AD/DNS/App)

The following table lists VLANS, IP Addresses and Credentials for all components:

Component	VLAN/IP Address(es)	Credentials
Jump Host	• **Management:** 10.128.1.1 • **Internal:** 10.128.20.1 • **External:** 10.128.10.1	`agility/Agility1`
BIG-IP VE	• **Management:** 10.128.1.245 • **Internal:** 10.118.20.245 • **External:** 10.118.10.245	`admin/admin`
Lab Server	• **Internal:** 10.128.20.100	`none`

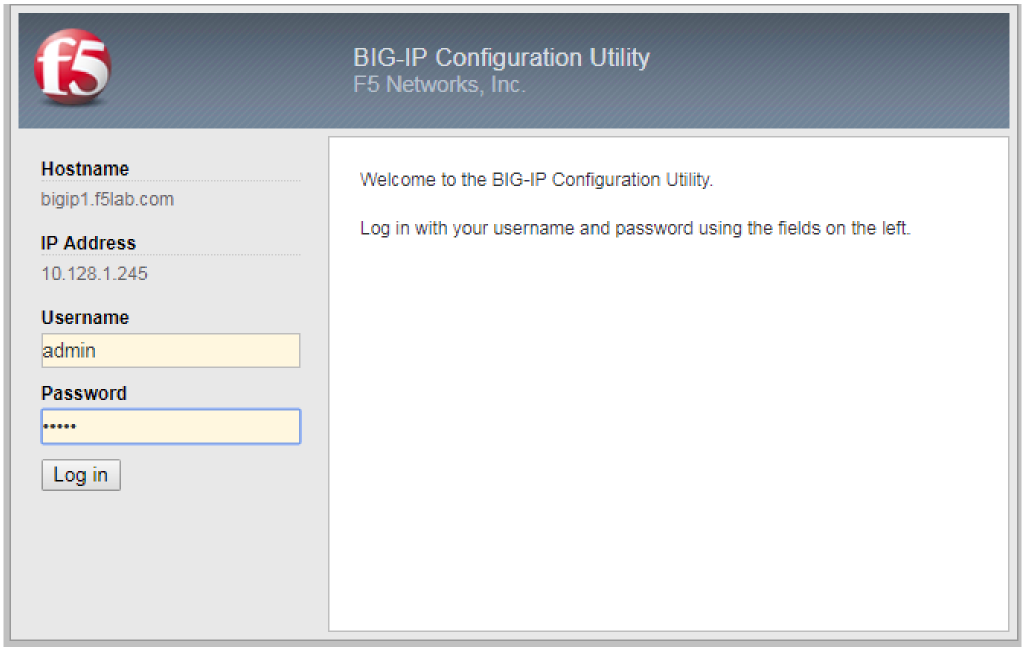
8.3 Lab 1: APM Troubleshooting Lab Object Preparation (GUI)

Note: You only need to perform EITHER Lab 1 OR Lab 2. They accomplish the same goal, but using different methods. Lab 2 gets the Lab Preparation using TMSH

The purpose of this lab is to preconfigure some objects that will be used throughout the other labs. These objects are as follows:

- Domain Name Services (DNS) Resolver
- Network Time Protocol (NTP) Server
- Access Policy (APM) AAA Server – Active Directory
- Access Policy (APM) SSO Configuration – NTLMv1
- Access Policy (APM) Access Profile
- Local Traffic (LTM) Pool and Member
- Local Traffic (LTM) Virtual Server

8.3.1 Connect to the Lab



BIG-IP Configuration Utility
F5 Networks, Inc.

Hostname
bigip1.f5lab.com

IP Address
10.128.1.245

Username
admin

Password
•••••

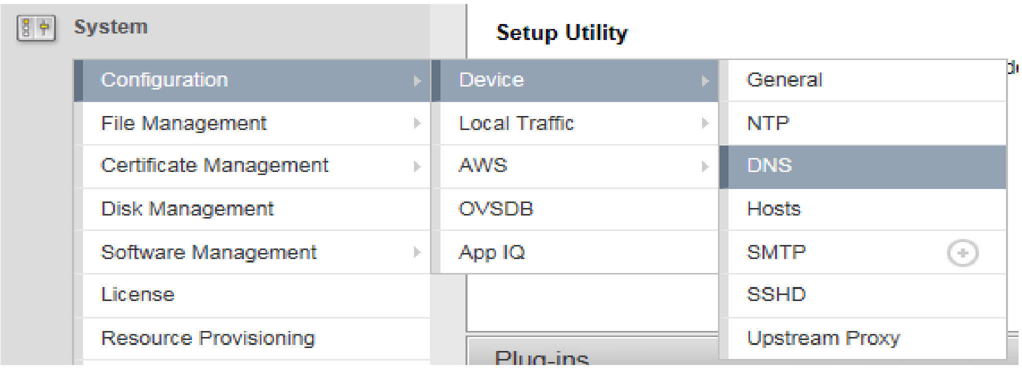
Welcome to the BIG-IP Configuration Utility.

Log in with your username and password using the fields on the left.

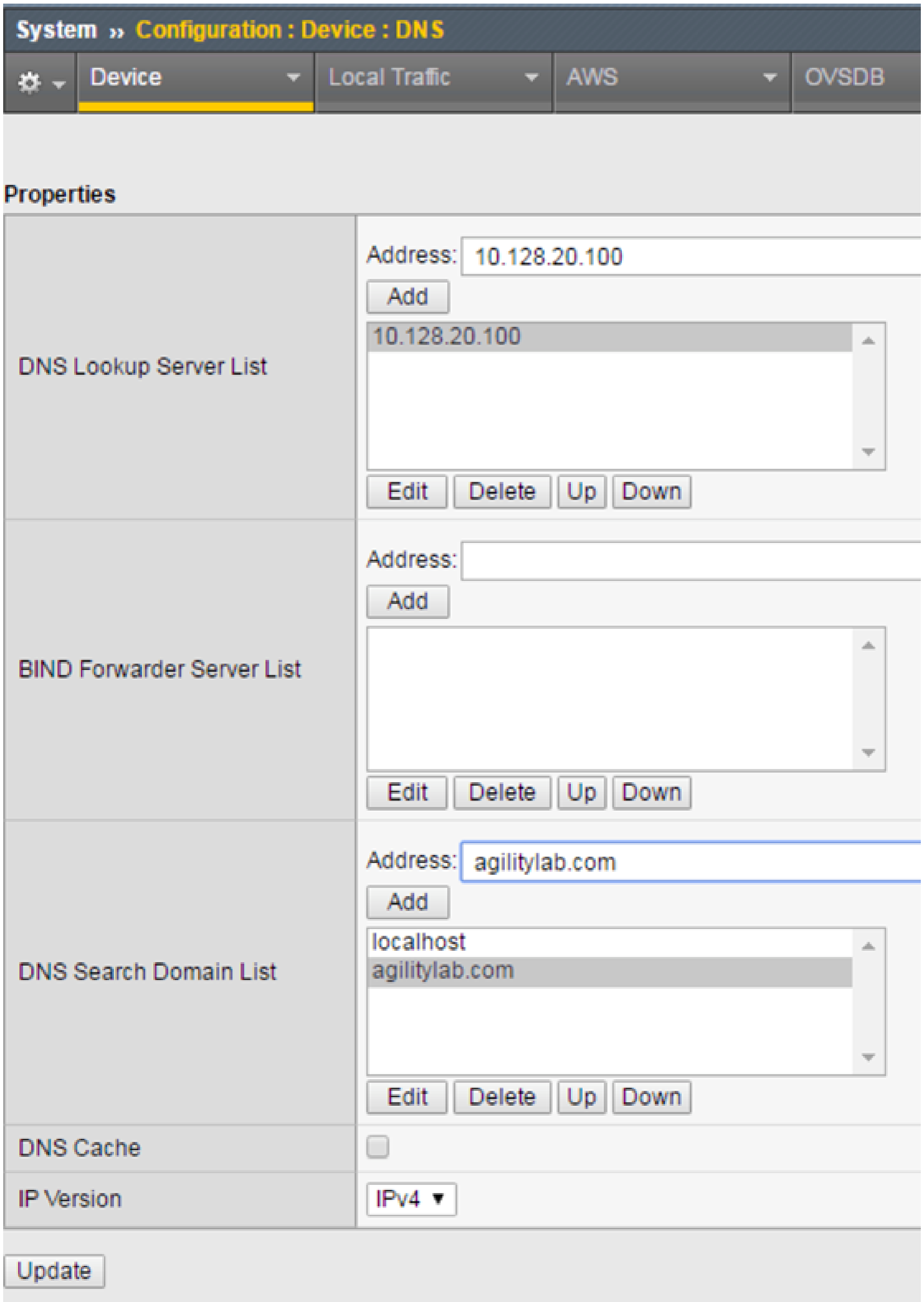
1. Establish an RDP connection to your Jump Host and double-click on the **BIG-IP** Chrome shortcut on the Windows desktop.
   - User: agility
   - Password: Agility1
2. Ignore the certificate warning.
3. Login into the BIG-IP Configuration Utility with the desktop icon (or Favorite link in Chrome) with the following credentials:

- User: **admin**
- Password: **admin**

8.3.2 DNS Resolver for System Configuration



1. Create a DNS entry by selecting: System->Configuration->Device->DNS

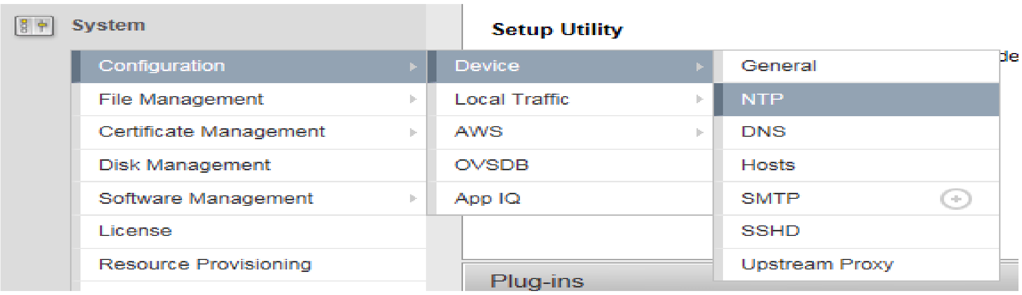


Properties

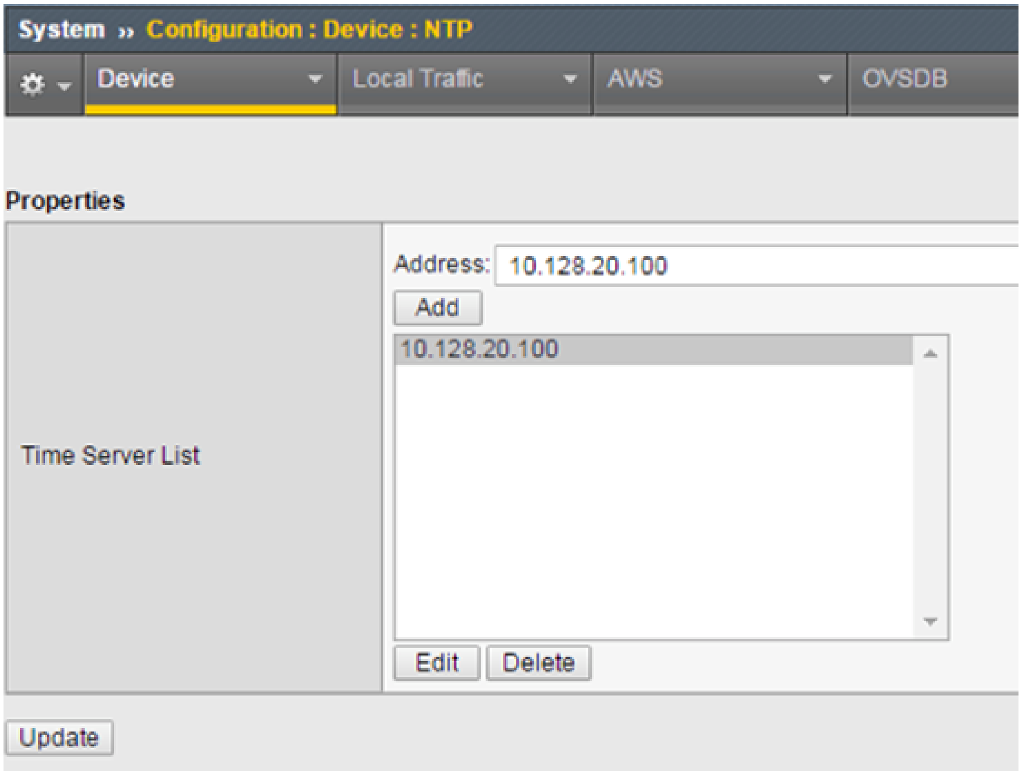
DNS Lookup Server List	Address: 10.128.20.100 10.128.20.100
BIND Forwarder Server List	Address:
DNS Search Domain List	Address: agilitylab.com localhost agilitylab.com
DNS Cache	□
IP Version	IPv4 ▼

2. In the Properties Section for DNS Lookup Server List, enter **10.128.20.100** in the Address field and click the **ADD** button.
3. Scroll down to the DNS Search Domain List section and enter **agilitylab.com** in the Address field and click the **ADD** button.
4. Click the **UPDATE** button at the bottom of the page to save the changes you just made.

8.3.3 NTP Server for System Configuration



1. Create a NTP entry by selecting: System ? Configuration ? Device ? NTP



Time Server List

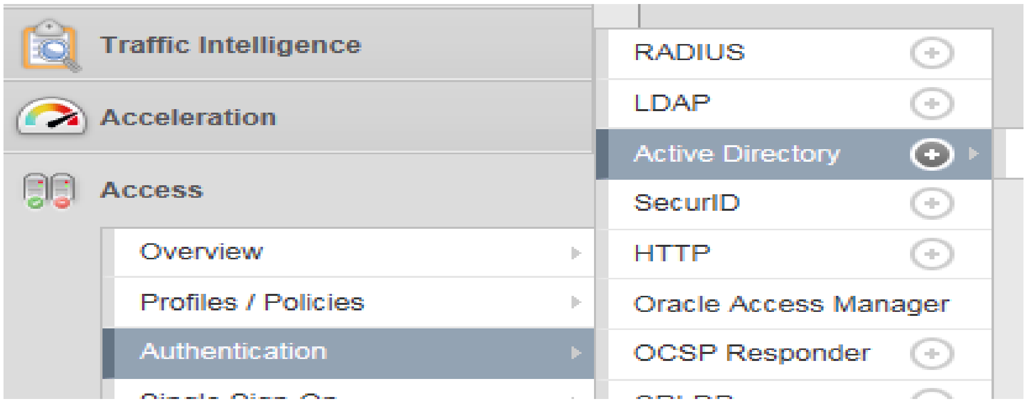
Address: 10.128.20.100

10.128.20.100

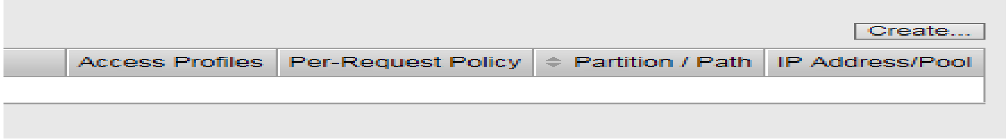
2. In the Properties Section for Time Server List, enter **10.128.20.100** in the Address field and click the **ADD** button.

3. Click the **UPDATE** button at the bottom of the page to save the changes you just made.

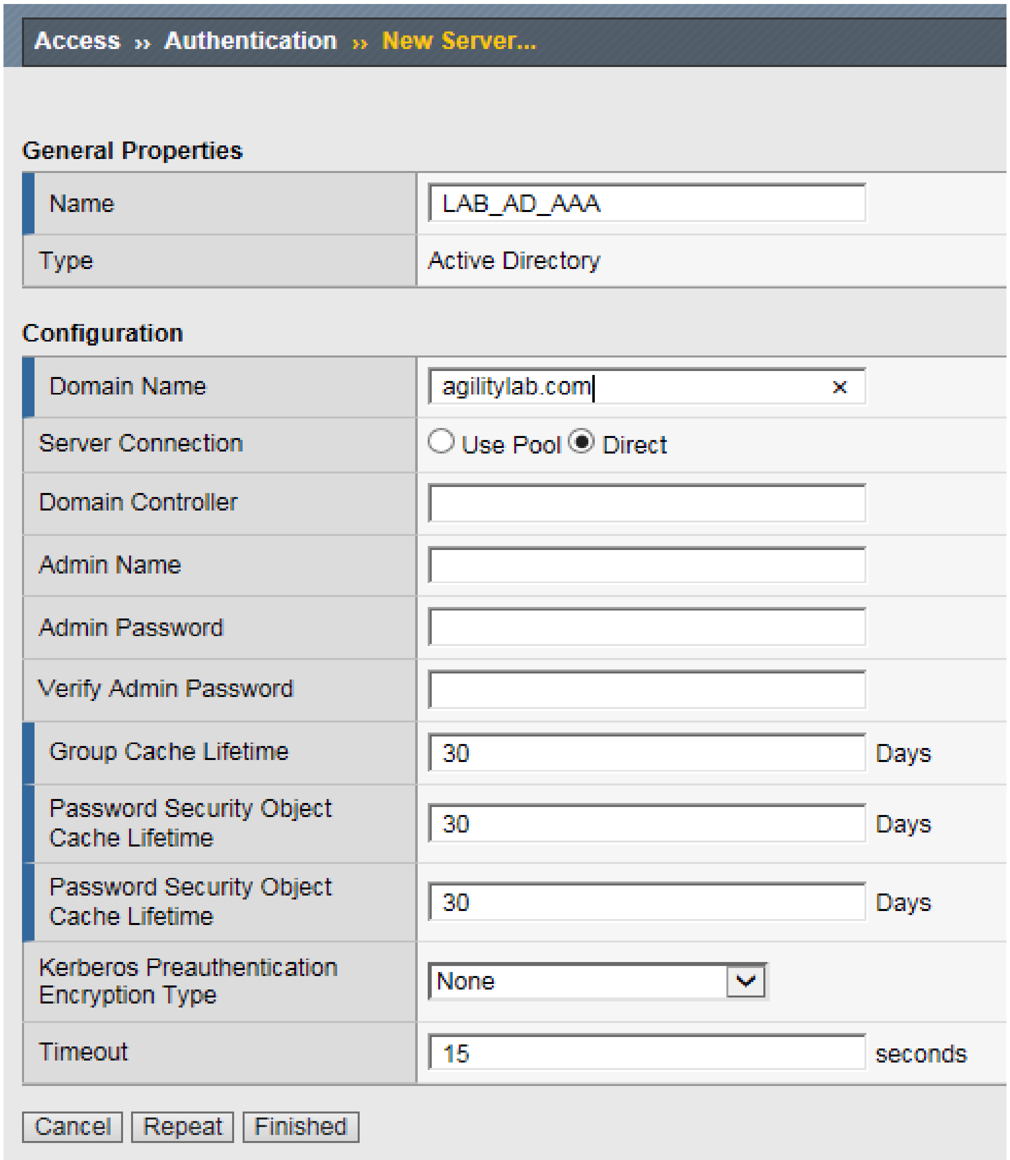
8.3.4 Access Policy (APM) AAA Server – Active Directory Object Creation



1. Create a new AAA Server Object of type Active Directory by selecting: Access ? Authentication ? Active Directory



2. Click the **CREATE** button on right side of page.



Access ›› Authentication ›› New Server...

General Properties

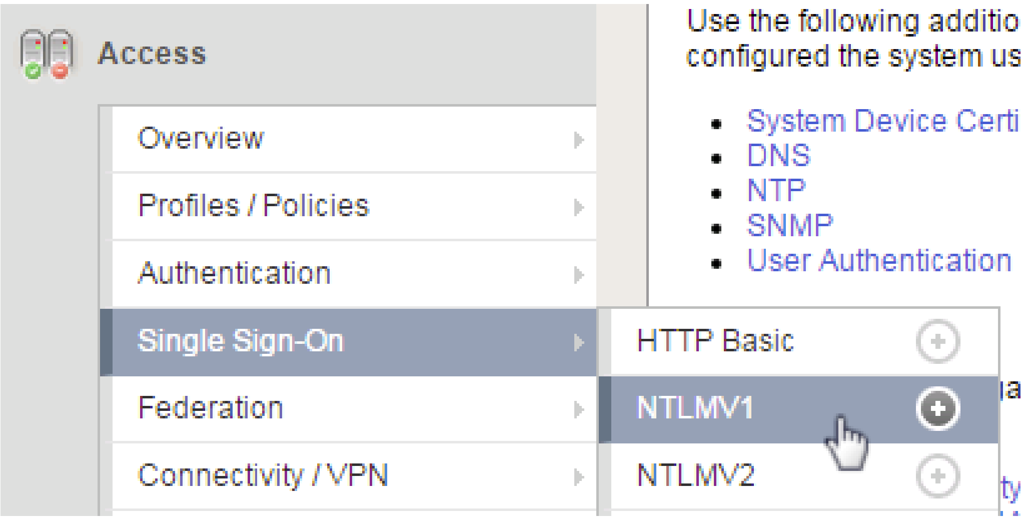
Name	LAB_AD_AAA
Type	Active Directory

Configuration

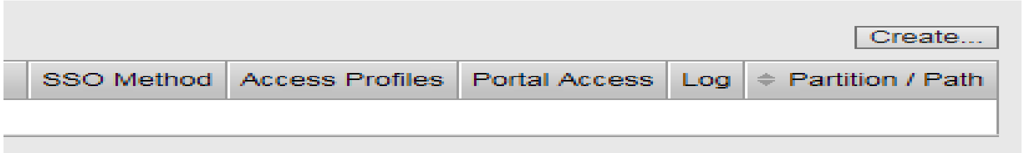
Domain Name	agilitylab.com
Server Connection	○ Use Pool ● Direct
Domain Controller	
Admin Name	
Admin Password	
Verify Admin Password	
Group Cache Lifetime	30 Days
Password Security Object Cache Lifetime	30 Days
Password Security Object Cache Lifetime	30 Days
Kerberos Preauthentication Encryption Type	None
Timeout	15 seconds

3. Under General Properties type **LAB_AD_AAA** in the name field.
4. In the Configuration Section, Click the radio button option next to **Direct** in the Server Connection row.
5. In the Domain Name field enter **agilitylab.com**
6. Leave the Domain Controller, Admin Name and Admin Password fields blank for now.
7. Click the **FINISHED** button at the bottom of the page to save your changes.

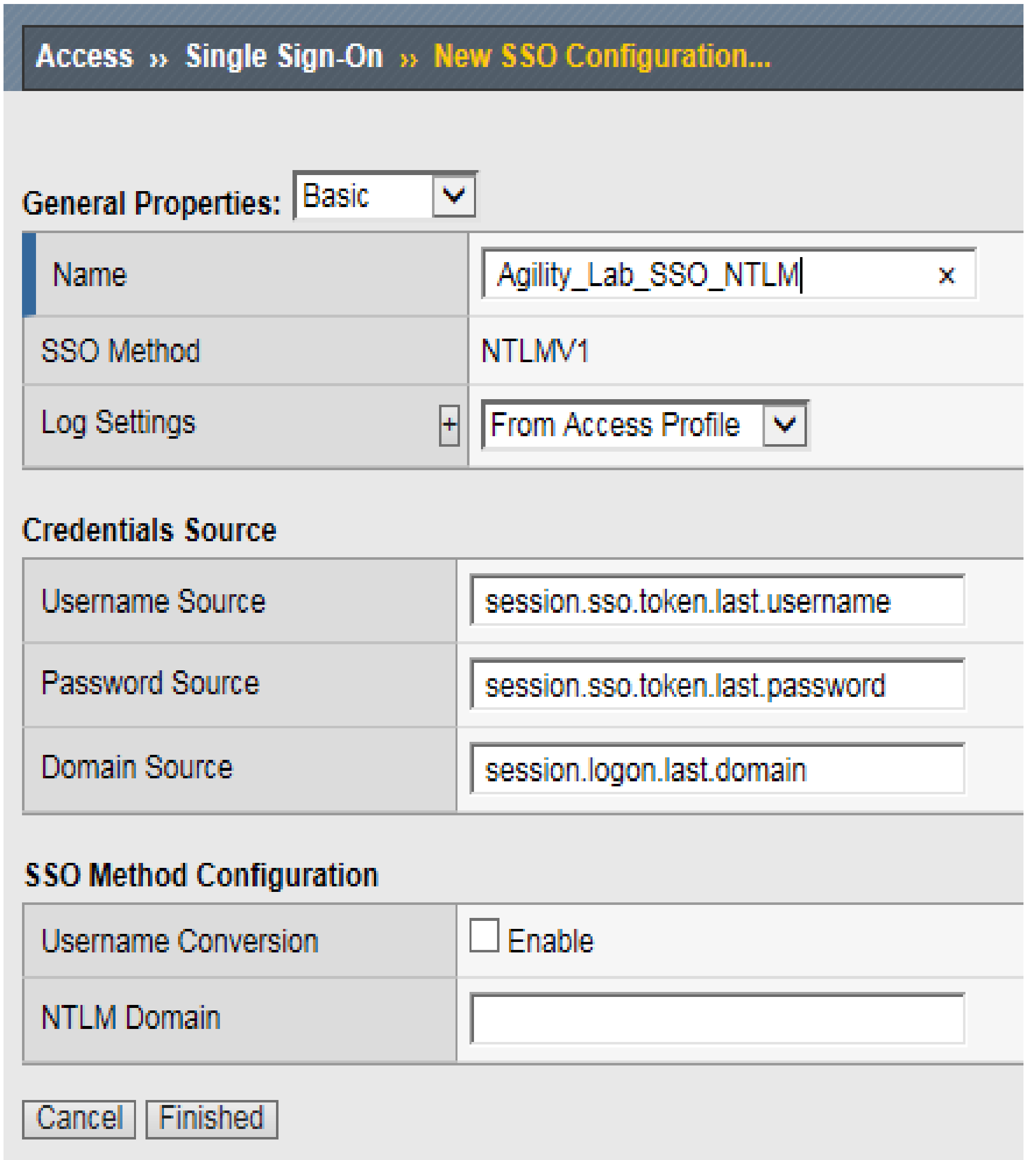
8.3.5 Access Policy (APM) SSO Configuration – NTLMv1



1. Create a new SSO Configuration Object of type NTLM by selecting: Access ? Single Sign-On ? NTLMV1



2. Click the **CREATE** button on the right side of the page.



General Properties: Basic

Name	Agility_Lab_SSO_NTLM
SSO Method	NTLMV1
Log Settings	From Access Profile

Credentials Source

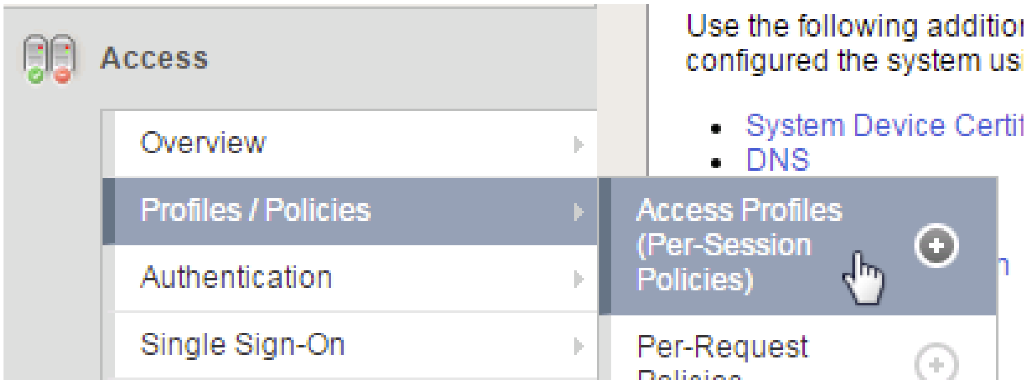
Username Source	session.sso.token.last.username
Password Source	session.sso.token.last.password
Domain Source	session.logon.last.domain

SSO Method Configuration

Username Conversion	□ Enable
NTLM Domain	

3. In the Name field enter **Agility_Lab_SSO_NTLM**
4. Click the **FINISHED** button at the bottom.

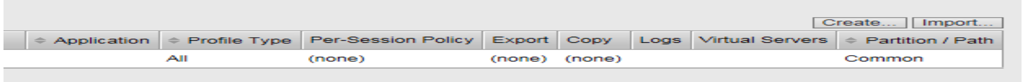
8.3.6 Access Policy (APM) Access Profile Creation



Use the following additio
configured the system us

- System Device Certi
- DNS

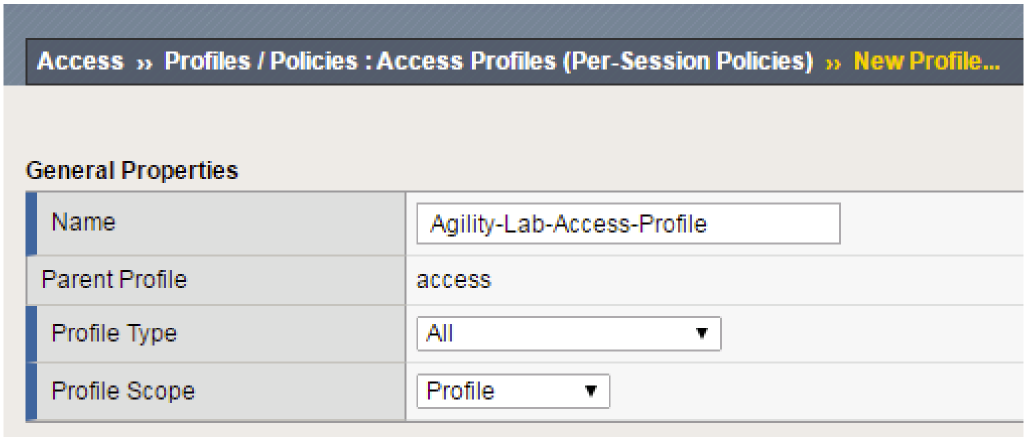
1. Create a new APM Profile Object of type ALL by selecting: Access ? Profiles/Policies ? Access Profiles (Per-Session Policies)



Create... Import...

	Application	Profile Type	Per-Session Policy	Export	Copy	Logs	Virtual Servers	Partition / Path
		All	(none)	(none)	(none)			Common

2. Click the **CREATE** button on the right side of the page.



Access » Profiles / Policies : Access Profiles (Per-Session Policies) » New Profile...

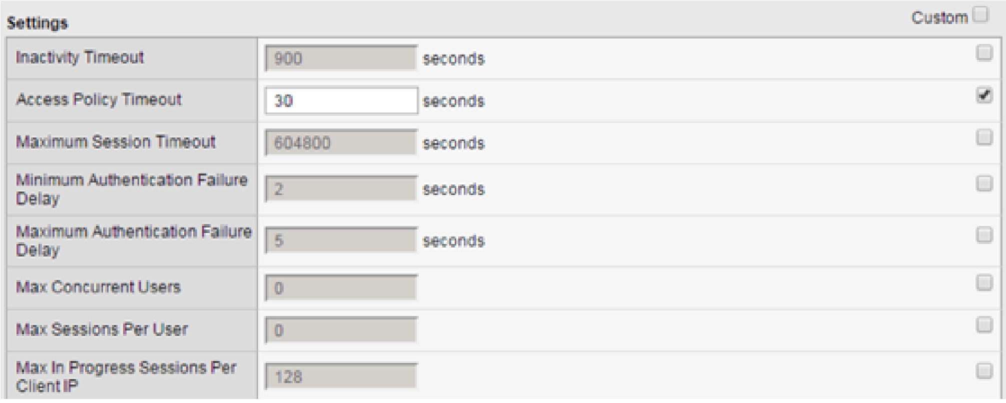
General Properties

Name	Agility-Lab-Access-Profile
Parent Profile	access
Profile Type	All ▼
Profile Scope	Profile ▼

3. In the Name field enter, **Agility-Lab-Access-Profile**

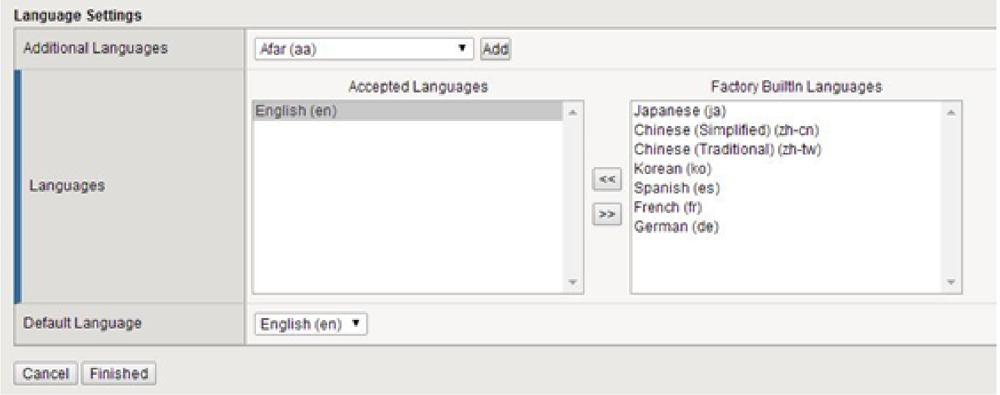
4. In the Profile Type drop down list select **All**

5. **In the Profile Scope drop down list select Profile**



Settings			Custom □
Inactivity Timeout	900	seconds	□
Access Policy Timeout	30	seconds	☑
Maximum Session Timeout	604800	seconds	□
Minimum Authentication Failure Delay	2	seconds	□
Maximum Authentication Failure Delay	5	seconds	□
Max Concurrent Users	0		□
Max Sessions Per User	0		□
Max In Progress Sessions Per Client IP	128		□

6. In the Settings section click the checkbox to the right of Access Policy Timeout and change the value from 300, to **30**, seconds.



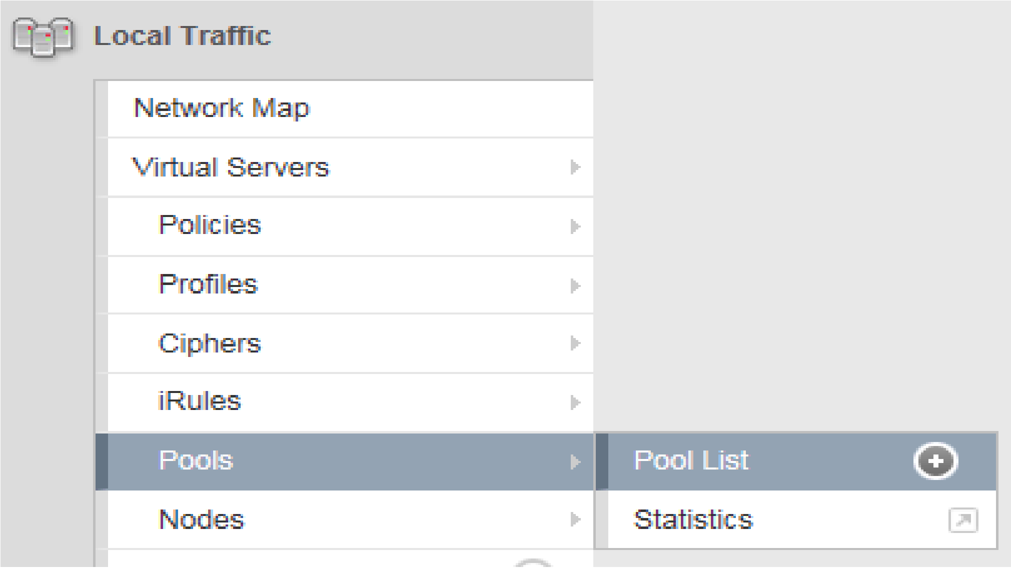
Language Settings

Additional Languages	Afar (aa) ▾ Add
Languages	Accepted Languages: English (en) Factory Builtin Languages: Japanese (ja), Chinese (Simplified) (zh-cn), Chinese (Traditional) (zh-tw), Korean (ko), Spanish (es), French (fr), German (de)
Default Language	English (en) ▾

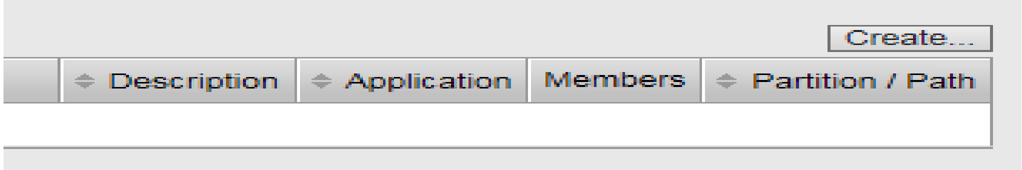
7. Scroll the bottom of the page and in the Language Settings section, click to highlight **English** in the Factory Builtin Languages box, then click the left **<<** arrows to move it to the left box labeled Accepted Languages.

8. Click the **FINISHED** button at the bottom of the page to save your changes.

8.3.7 Local Traffic (LTM) Pool and Member Creation

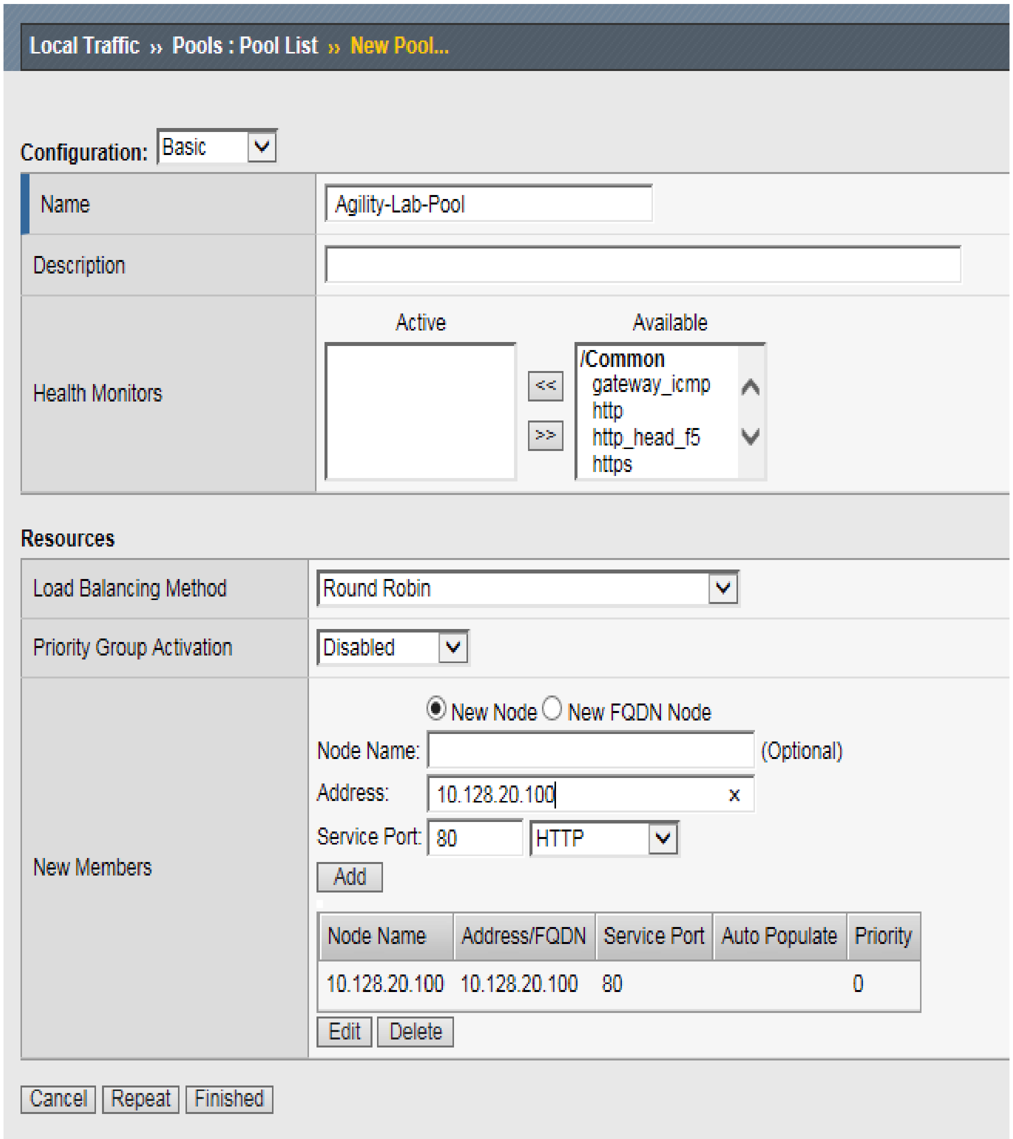


1. Create a new LTM Pool and Member by selecting Local Traffic ? Pools? Pools List



	⇕ Description	⇕ Application	Members	⇕ Partition / Path

2. Click the **CREATE** button on the right side of the page.



Local Traffic » Pools : Pool List » New Pool...

Configuration: Basic

Name: Agility-Lab-Pool

Description:

Health Monitors: Active | Available: /Common gateway_icmp, http, http_head_f5, https

Resources

Load Balancing Method: Round Robin

Priority Group Activation: Disabled

New Members: ● New Node ○ New FQDN Node

Node Name: (Optional)

Address: 10.128.20.100

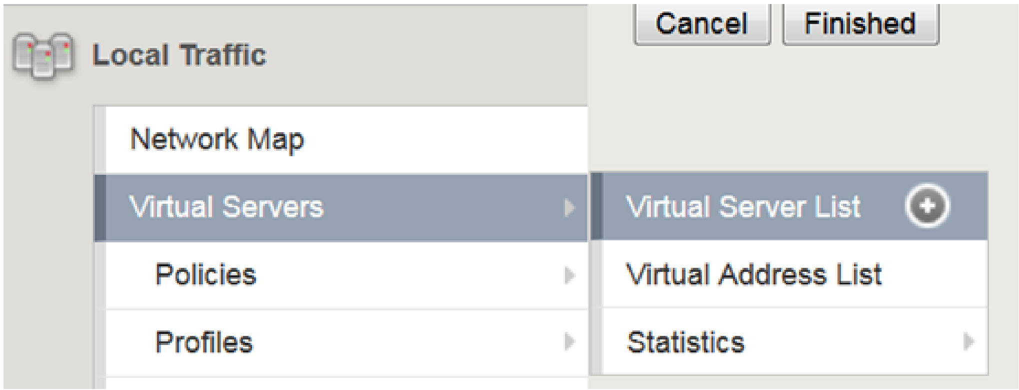
Service Port: 80 HTTP

Node Name	Address/FQDN	Service Port	Auto Populate	Priority
10.128.20.100	10.128.20.100	80		0

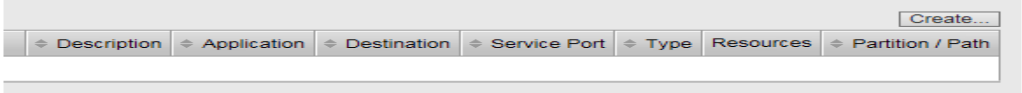
3. In the Name field enter **Agility-Lab-Pool**
4. In the Resources section, in the New Members area, enter **10.128.20.100** in the Address field.
5. In the Service Port field, enter **80**, or select **HTTP** from the drop-down menu.
6. Click the **ADD** button
7. Click the **FINISHED** button at the bottom to save your changes.

8.3.8 Local Traffic (LTM) Virtual Server Creation

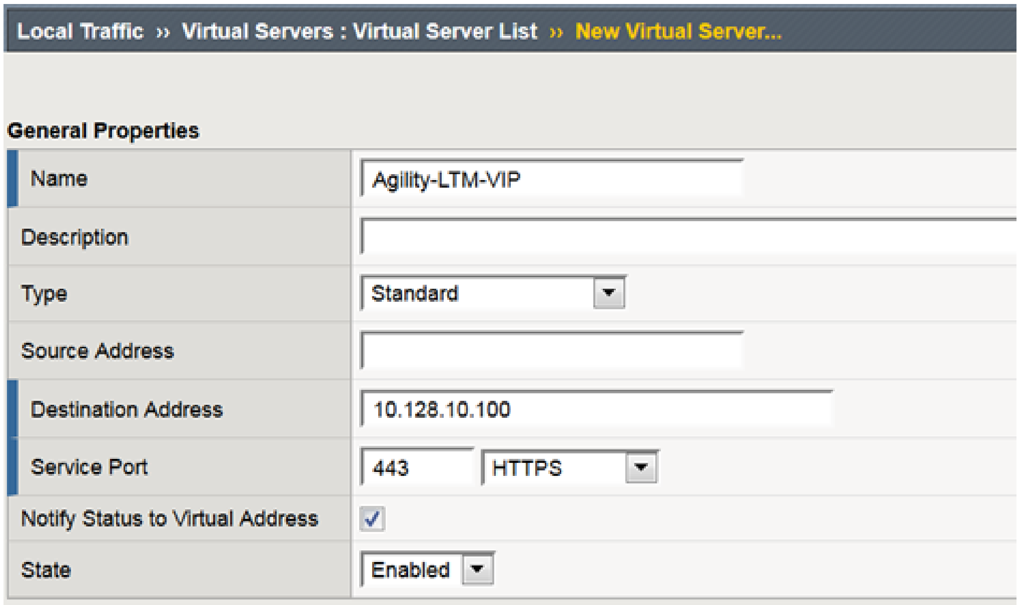
This lab will walk you through creating the Virtual Server we will use during the course of the lab. This Virtual Server will be used to associate Access Policies which will be evaluated when authenticating users.



1. Create an new Virtual Server by selecting Local Traffic ? Virtual Servers ? Virtual Server List



2. Click the **CREATE** button on the right side of the page.

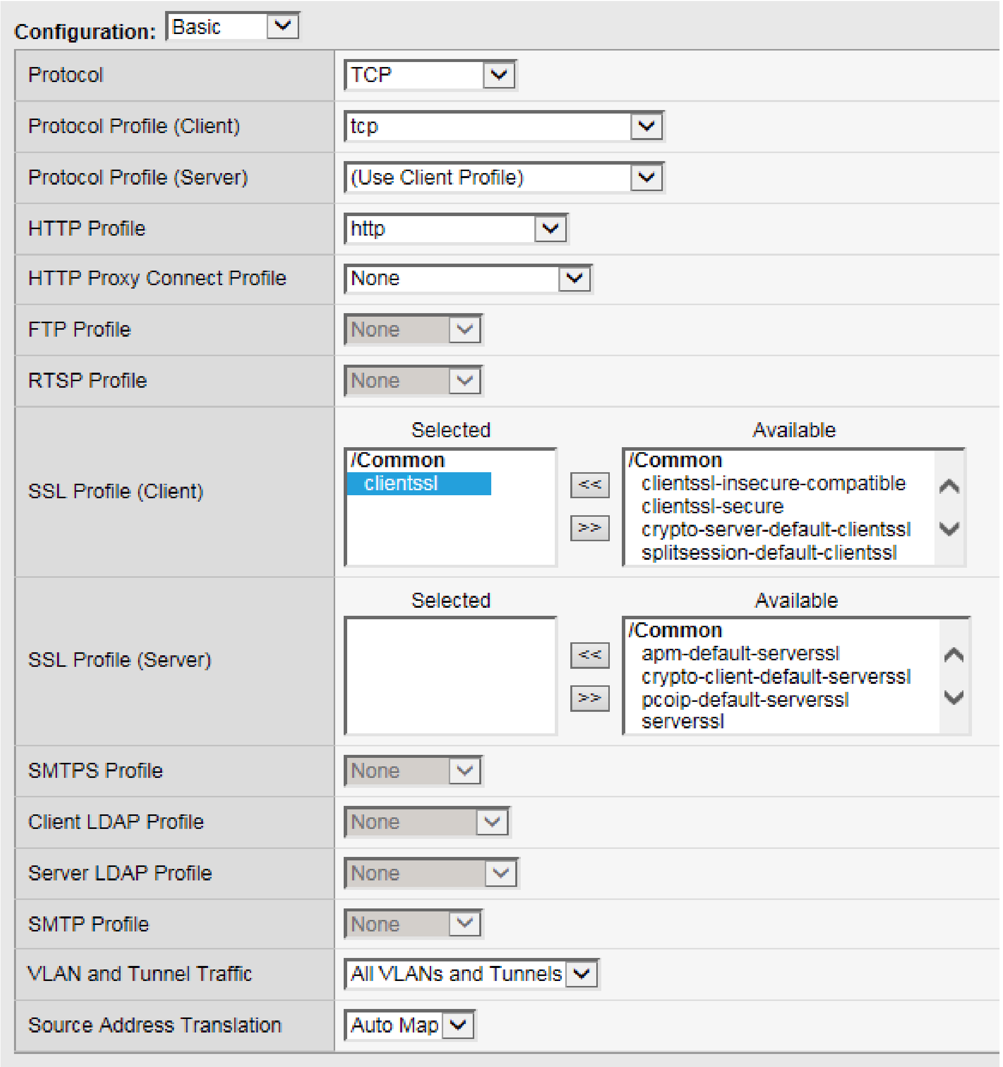


Local Traffic ›› Virtual Servers : Virtual Server List ›› New Virtual Server...

General Properties

Name	Agility-LTM-VIP
Description	
Type	Standard
Source Address	
Destination Address	10.128.10.100
Service Port	443 HTTPS
Notify Status to Virtual Address	☑
State	Enabled

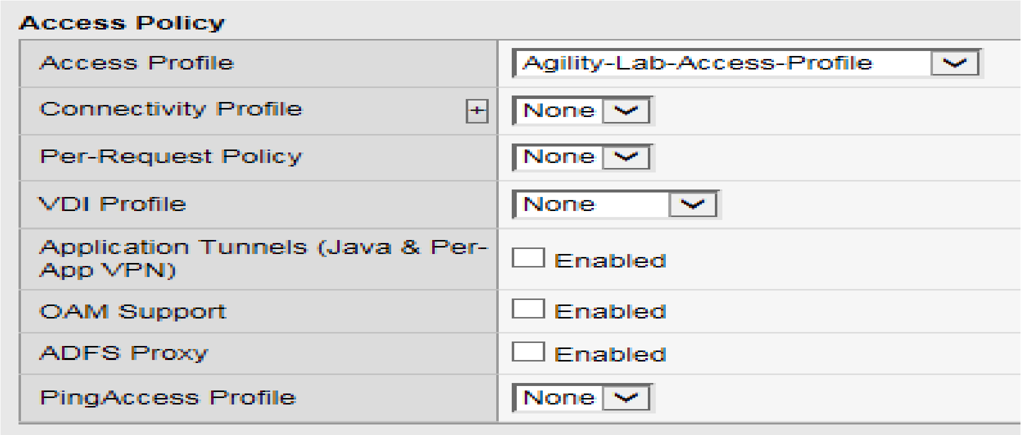
3. Under the General Properties section, in the Name field enter **Agility-LTM-VIP**
4. In the Destination Address field enter **10.128.10.100**
5. In the Service Port fields enter **443**, or select **HTTPS** from the drop-down menu



Configuration: Basic

Protocol	TCP
Protocol Profile (Client)	tcp
Protocol Profile (Server)	(Use Client Profile)
HTTP Profile	http
HTTP Proxy Connect Profile	None
FTP Profile	None
RTSP Profile	None
SSL Profile (Client)	Selected: /Common clientssl Available: /Common clientssl-insecure-compatible clientssl-secure crypto-server-default-clientssl splitsession-default-clientssl
SSL Profile (Server)	Selected: Available: /Common apm-default-serverssl crypto-client-default-serverssl pcoip-default-serverssl serverssl
SMTPS Profile	None
Client LDAP Profile	None
Server LDAP Profile	None
SMTP Profile	None
VLAN and Tunnel Traffic	All VLANs and Tunnels
Source Address Translation	Auto Map

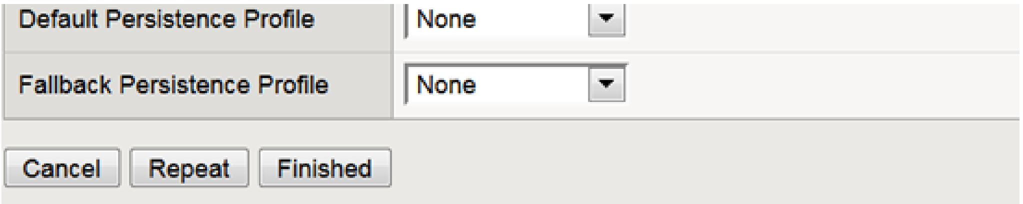
6. Under the Configuration section, in the HTTP Profile field use the drop-down menu to select **http**
7. In the SSL Profile (Client) field select **clientssl** from the Available profiles then use the **<<** left arrows to move it to the Selected box.
8. Ensure VLAN and Tunnel Traffic is set to **All VLANs and Tunnels**
9. In the Source Address Translation field select **Auto Map** from the drop-down menu.



Access Policy

Access Profile	Agility-Lab-Access-Profile
Connectivity Profile	None
Per-Request Policy	None
VDI Profile	None
Application Tunnels (Java & Per-App VPN)	☐ Enabled
OAM Support	☐ Enabled
ADFS Proxy	☐ Enabled
PingAccess Profile	None

10. Scroll down to the Access Profile section, select **Agility-Lab-Access-Profile** from the drop-down menu.



Default Persistence Profile	None
Fallback Persistence Profile	None

11. Click the **FINISHED** button to save your changes.

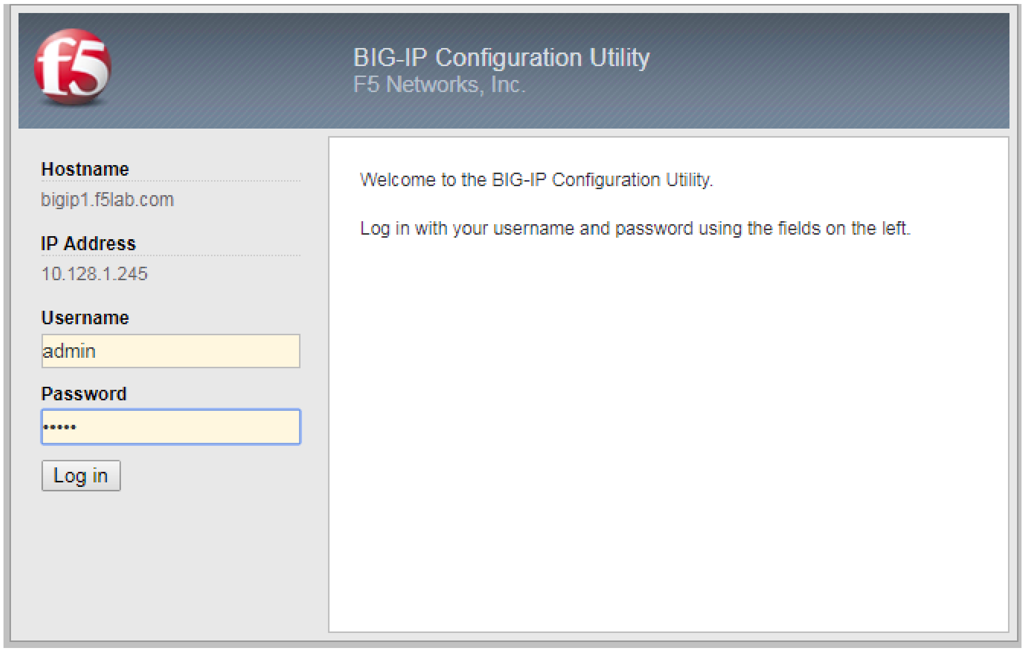
8.4 Lab 2: APM Troubleshooting Lab Object Preparation (TMSH)

Note: You only need to perform one of Lab 1, 2, or 3. They accomplish the same thing only in different ways. Lab 2 gets the Lab Preparation using TMSH

The purpose of this lab is to preconfigure some objects that will be used throughout the other labs. These objects are as follows:

- Domain Name Services (DNS) Resolver
- Network Time Protocol (NTP) Server
- Access Policy (APM) AAA Server – Active Directory
- Access Policy (APM) SSO Configuration – NTLMv1
- Access Policy (APM) Access Profile
- Local Traffic (LTM) Pool and Member
- Local Traffic (LTM) Virtual Server

8.4.1 Connect to the Lab via SSH



BIG-IP Configuration Utility
F5 Networks, Inc.

Hostname
bigip1.f5lab.com

IP Address
10.128.1.245

Username
admin

Password
•••••

Welcome to the BIG-IP Configuration Utility.

Log in with your username and password using the fields on the left.

1. Establish an RDP connection to your Jump Host and double-click on the **BIG-IP** Chrome shortcut on the Windows desktop. - User: agility - Password: Agility1
2. Ignore the certificate warning.
3. Login into the BIG-IP via SSH using putty and the following credentials: - User: root - Password: default
4. Log in to tmsh by typing the following command: **tmsh**

8.4.2 DNS Resolver for System Configuration (TMSH)

1. To add a name server to your /etc/resolv.conf file, use the following command syntax, replacing <IP addresses> with your IP addresses:

   modify sys dns name-servers add { <IP addresses> }

2. To add domains to your search list use the following command replacing <domains> with the domain you wish to add:

   modify sys dns search add { <domains> }

3. Configure as follows:

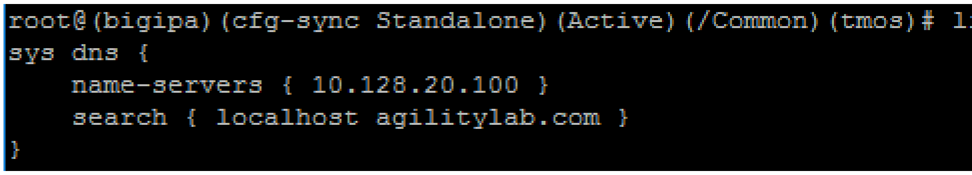
   modify sys dns name-servers add { 10.128.20.100 }

   modify sys dns search add { agilitylab.com }

   save sys config

4. To verify, use the following command: **list sys dns**

You should see the following reply:



```
root@(bigipa)(cfg-sync Standalone)(Active)(/Common)(tmos)# li
sys dns {
    name-servers { 10.128.20.100 }
    search { localhost agilitylab.com }
}
```

8.4.3 NTP Server for System Configuration (TMSH)

1. To configure one or more NTP servers for the BIG-IP system, use the following command syntax:

   modify sys ntp servers add {hostname hostname. . . .}

2. Configure as follows:

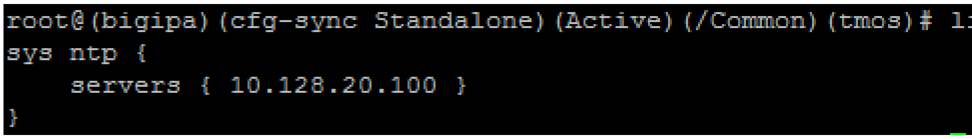
   modify sys ntp servers add { 10.128.20.100 }

   save sys config

3. To verify, use the following command:

   list sys ntp

   You snould see the following reply:



```
root@(bigipa)(cfg-sync Standalone)(Active)(/Common)(tmos)# li
sys ntp {
    servers { 10.128.20.100 }
}
```

8.4.4 Access Policy (APM) AAA Server – Active Directory Object Creation (TMSH)

1. To configure an Active Directory AAA Server object, use the following command syntax:

   create apm aaa active-directory <name> domain <domain-name> use-pool <disabled>

2. Configure as follows:

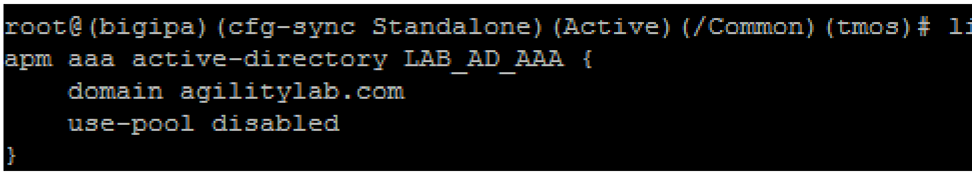
   create apm aaa active-directory LAB_AD_AAA domain agilitylab.com use-pool disabled

   save sys config

3. To verify, use the following command:

   list apm aaa

   You should see the following reply:



```
root@(bigipa)(cfg-sync Standalone)(Active)(/Common)(tmos)# li
apm aaa active-directory LAB_AD_AAA {
    domain agilitylab.com
    use-pool disabled
}
```

8.4.5 Access Policy (APM) SSO Configuration – NTLMv1 (TMSH)

1. To configure an NTLMv1 SSO profile, use the following command syntax:

   create apm sso ntlmv1 <profile_name>

2. Configure as follows:

   create apm sso ntlmv1 Agility_Lab_SSO_NTLM

```
save sys config
```

3. To verify, use the command:

```
list apm sso
```

8.4.6 Access Policy (APM) Access Profile Creation (see GUI steps)

Note: In order to gain familiarity with the Visual Policy Editor, please follow the GUI method of Access Policy creation: https://ua230-troubleshooting-2018-dev.readthedocs.io/en/latest/class4/module1/module1.html#access-policy-apm-access-profile-creation

8.4.7 Local Traffic (LTM) Pool and Member Creation (TMSH)

1. To configure a LTM Pool and Pool members, use the following command syntax:

```
create ltm pool <pool-name> members add { <IP-addr>:<service-port> }
```

2. Configure as follows:

```
create ltm pool Agility-Lab-Pool members add { 10.128.20.100:80 }
save sys config
```

3. To verify, use the following command:

```
list ltm pool
```

8.4.8 Local Traffic (LTM) Virtual Server Creation (TMSH)

1. To configure a virtual server, use the following command syntax:

```
create ltm virtual Agility-LTM-VIP { destination 10.128.10.100:443 profiles add { clientssl http Agility-Lab-Access-Profile } vlans default source-address-translation { type automap } }
```

2. Configure as follows:

```
create ltm virtual Agility-LTM-VIP { destination 10.128.10.100:443 profiles add { clientssl http Agility-Lab-Access-Profile } vlans default source-address-translation { type automap } }
save sys config
```

3. To verify, use the following command:

```
list ltm virtual
```

8.5 Lab 3: General Troubleshooting

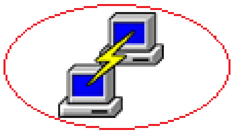
In this lab exercise, you will learn where to look and what to look at when an Access Policy is not successfully allowing access or not performing as intended.

8.5.1 Questions to ask yourself (LAB3)

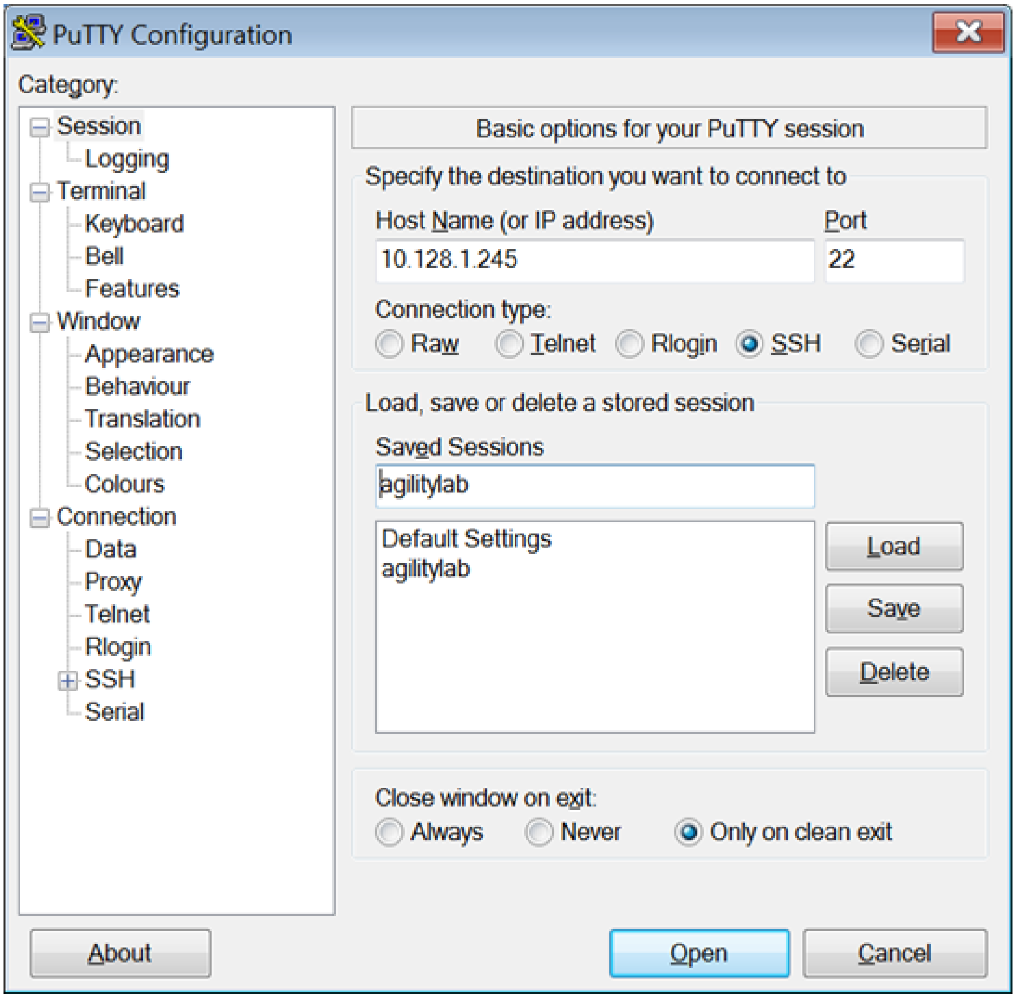
1. Do we have proper Network Connectivity?
2. Are there any Upstream/Downstream Firewall Rules preventing APM to be reachable or to reach destination targets it requires to access?
3. Do we have DNS setup properly?
4. Do we have NTP setup properly?
5. Are we receiving any Warnings or Error messages when we logon?
6. Are there any missing dependencies?
7. Time to check on our Sessions under Manage Session Menu
   (a) What can we see from the Manage Session Menu?
   (b) If we click the Session ID link what more information is available?
   (c) Is Authentication Successful or is it Failing?
   (d) Is the user receiving the proper ENDING ALLOW from the Policy?
8. Time to Review the Reports information for the Session in question
   (a) What information is available from the ALL SESSIONS REPORT?
   (b) Can we review the Session Variables for the user's session from the ALL SESSION REPORT? If YES then Why however If NO then WHY?
9. Can the BIG-IP TMOS Resolve the AAA server by Hostname and by Hostname.Domain?
   (a) Is the AAA reachable over the network, no Firewalls blocking communication from BIGIP Self-IP?

8.5.2 Verify DNS is setup from the CLI of the BIG-IP

Perform the following steps to verify DNS is correctly configured:



1. Click on the PuTTY (SSH client) to access the BIG-IP CLI



Specify the destination you want to connect to

Host Name (or IP address): 10.128.1.245

Port: 22

Connection type: ○ Raw ○ Telnet ○ Rlogin ● SSH ○ Serial

Load, save or delete a stored session

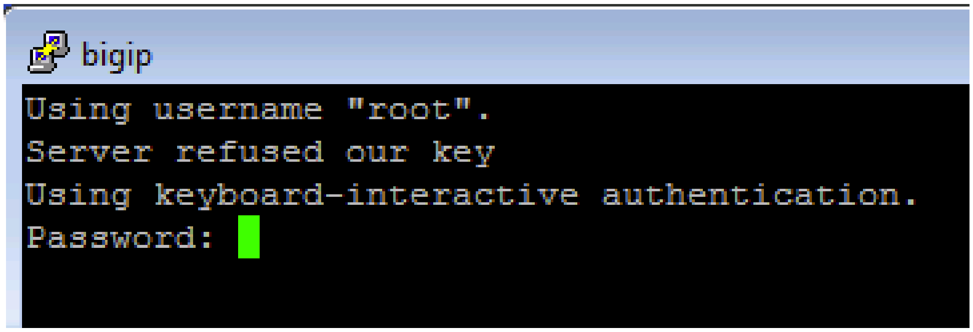
Saved Sessions: agilitylab

Default Settings
agilitylab

Close window on exit: ○ Always ○ Never ● Only on clean exit

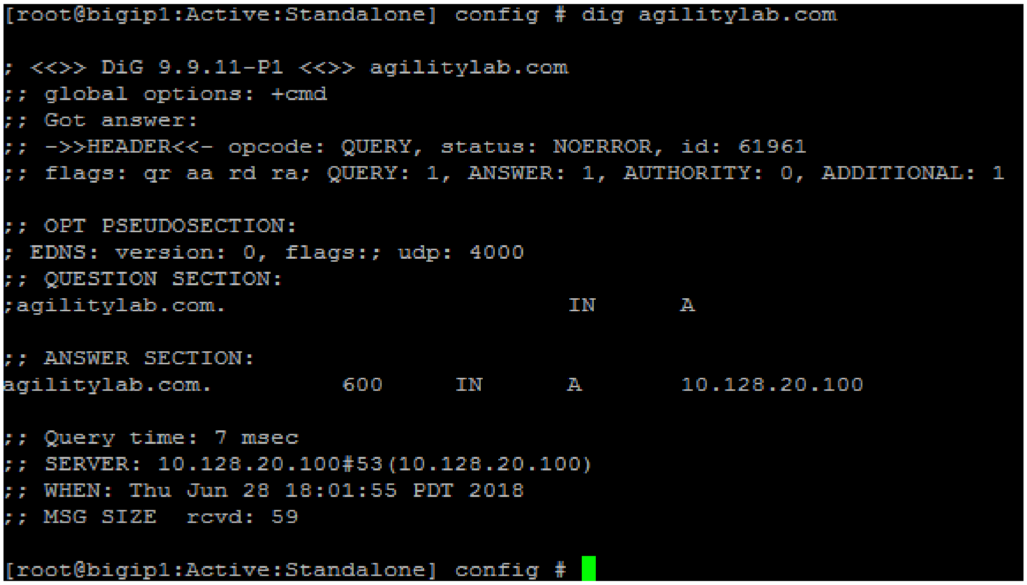
2. Click on the **agilitylab** Saved Session and click Load
3. The click on **OPEN**

Alternatively, you can simply double-click on the **agilitylab** Saved Session to open the session



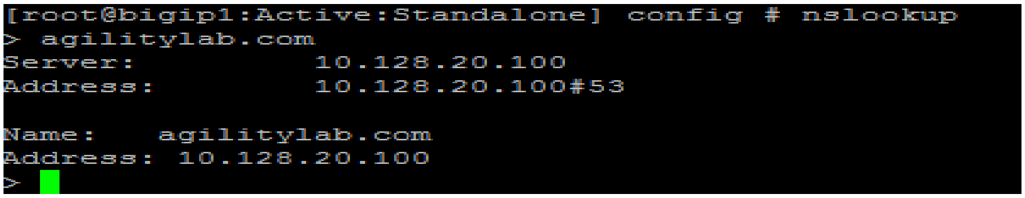
```
Using username "root".
Server refused our key
Using keyboard-interactive authentication.
Password:
```

4. Logon as **root** with password **default** if necessary (you should logon automatically)



```
[root@bigip1:Active:Standalone] config # dig agilitylab.com

; <<>> DiG 9.9.11-P1 <<>> agilitylab.com
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 61961
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 0, ADDITIONAL: 1

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 4000
;; QUESTION SECTION:
;agilitylab.com.                        IN      A

;; ANSWER SECTION:
agilitylab.com.         600     IN      A       10.128.20.100

;; Query time: 7 msec
;; SERVER: 10.128.20.100#53(10.128.20.100)
;; WHEN: Thu Jun 28 18:01:55 PDT 2018
;; MSG SIZE  rcvd: 59

[root@bigip1:Active:Standalone] config #
```

5. From the CLI type **dig agilitylab.com** and then press enter
6. The following results should be reviewed and verified.
7. If DNS is properly configured you should receive the returned IP address of **10.128.20.100**

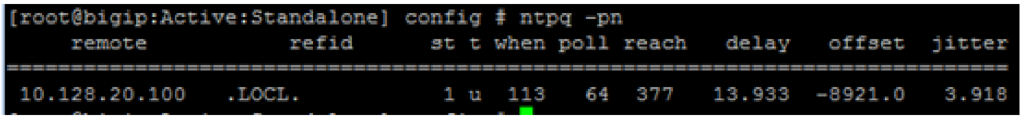


```
[root@bigip1:Active:Standalone] config # nslookup
> agilitylab.com
Server:         10.128.20.100
Address:        10.128.20.100#53

Name:   agilitylab.com
Address: 10.128.20.100
>
```

8. From the CLI type **nslookup** and then press enter.
9. Type **agilitylab.com** and then press enter
10. The following results should be reviewed and verified.
11. If DNS is properly configured you should receive the returned IP address of **10.128.20.100**
12. Exit nslookup by typing **exit**

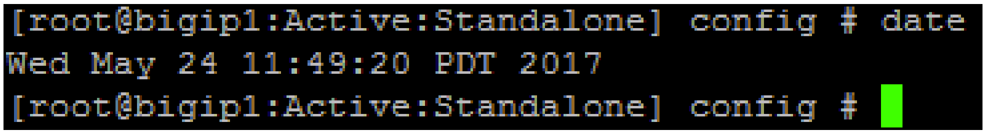
8.5.3 Verify NTP is setup from the CLI of the BIGIP

Perform the following steps to verify NTP is correctly configured:



```
[root@bigip:Active:Standalone] config # ntpq -pn
     remote           refid      st t when poll reach   delay   offset  jitter
==============================================================================
 10.128.20.100   .LOCL.           1 u  113   64  377   13.933  -8921.0   3.918
```

1. From the CLI (via PuTTy –SSH Client) . . . . type **ntpq –pn** and then press enter.
2. The following results should be reviewed.



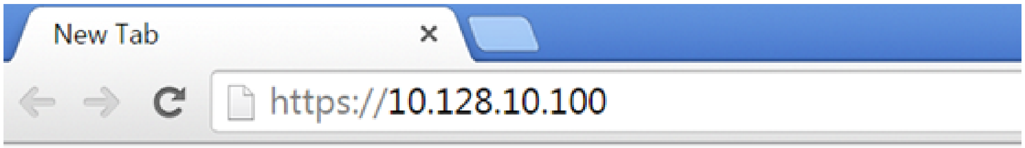
```
[root@bigip1:Active:Standalone] config # date
Wed May 24 11:49:20 PDT 2017
[root@bigip1:Active:Standalone] config #
```

3. If time is out of sync by too much of an offset you can update the local time using the following command:
   date MMDDhhmmYYYY

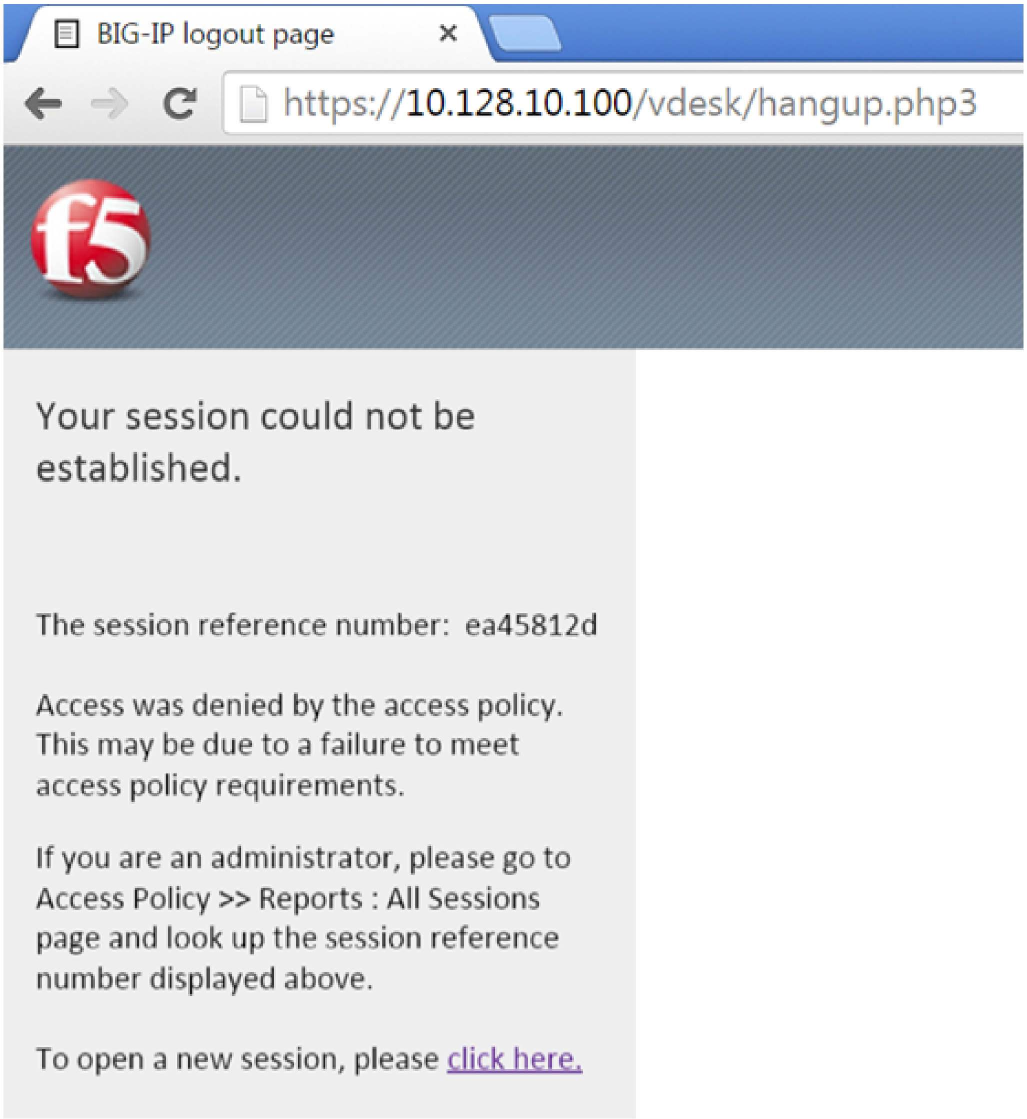
8.5.4 Manage Sessions within the Access Policy Manager menu

We use the Manage Sessions menu to view general status of currently logged in sessions, view their progress through a policy, and to kill sessions when needed.

STEP 1



1. Open a USER session to APM through a new browser window by navigating to your first Virtual Server IP Address created in LAB I (**10.128.10.100**)



Your session could not be established.

The session reference number: ea45812d

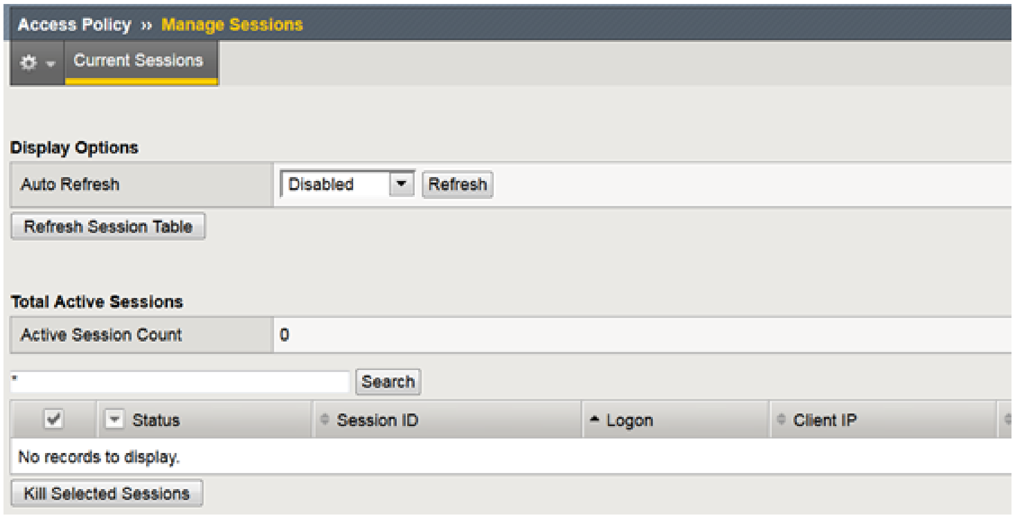
Access was denied by the access policy. This may be due to a failure to meet access policy requirements.

If you are an administrator, please go to Access Policy >> Reports : All Sessions page and look up the session reference number displayed above.

To open a new session, please click here.

2. Did you receive an error message? If so, take note of the Session Reference Number

TEST 1



Access Policy » Manage Sessions

Current Sessions

Display Options

Auto Refresh	Disabled ▾ Refresh

Refresh Session Table

Total Active Sessions

Active Session Count	0

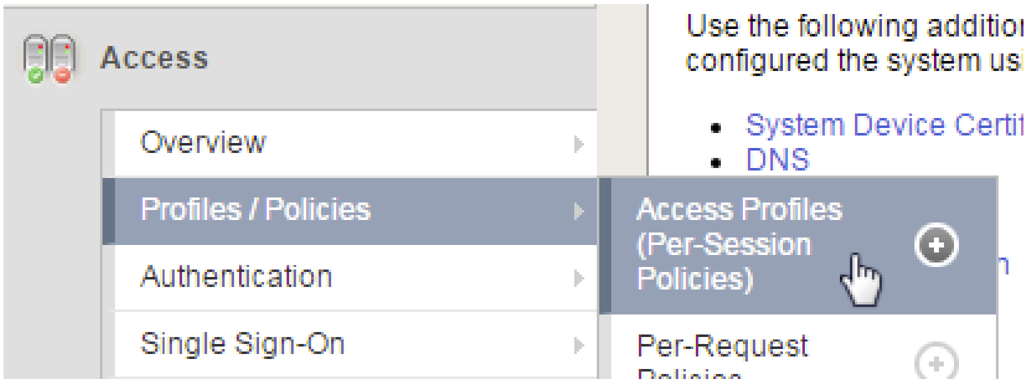
* Search

☑	Status	Session ID	Logon	Client IP
No records to display.				

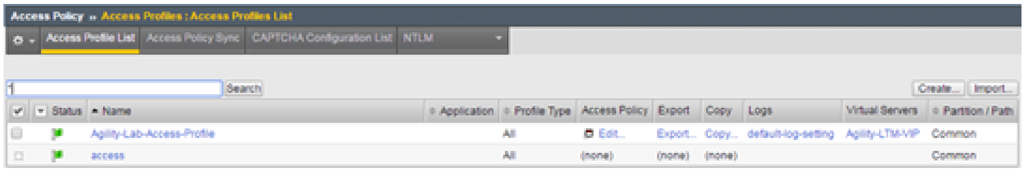
Kill Selected Sessions

1. In the browser window, you are using to manage the BIG-IP, navigate to Access ? Overview > Active Sessions menu.
2. Review the Manage Sessions screen, is there an Active Session? If not then why?

STEP 2



1. Now open the APM Visual Policy Editor (VPE) for the policy created/loaded in LAB I by navigating to Access ? Profiles/Policies -> Access Profiles (Per-Session Policies) menu.



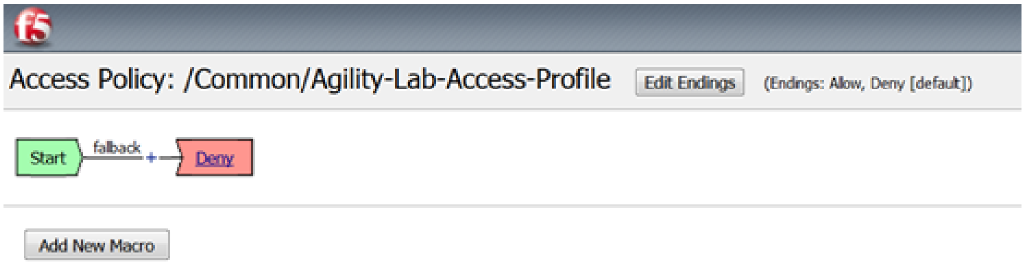
Access Policy » Access Profiles : Access Profiles List

Access Profile List | Access Policy Sync | CAPTCHA Configuration List | NTLM

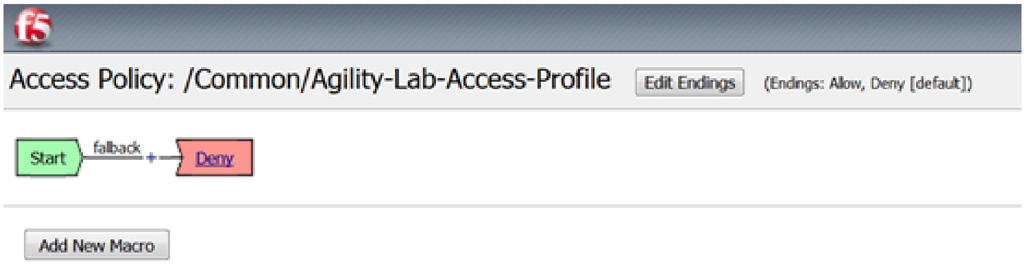
Search Create... Import...

☑	Status	Name	Application	Profile Type	Access Policy	Export	Copy	Logs	Virtual Servers	Partition / Path
□		Agility-Lab-Access-Profile		All	Edit...	Export...	Copy...	default-log-setting	Agility-LTM-VIP	Common
□		access		All	(none)	(none)	(none)			Common

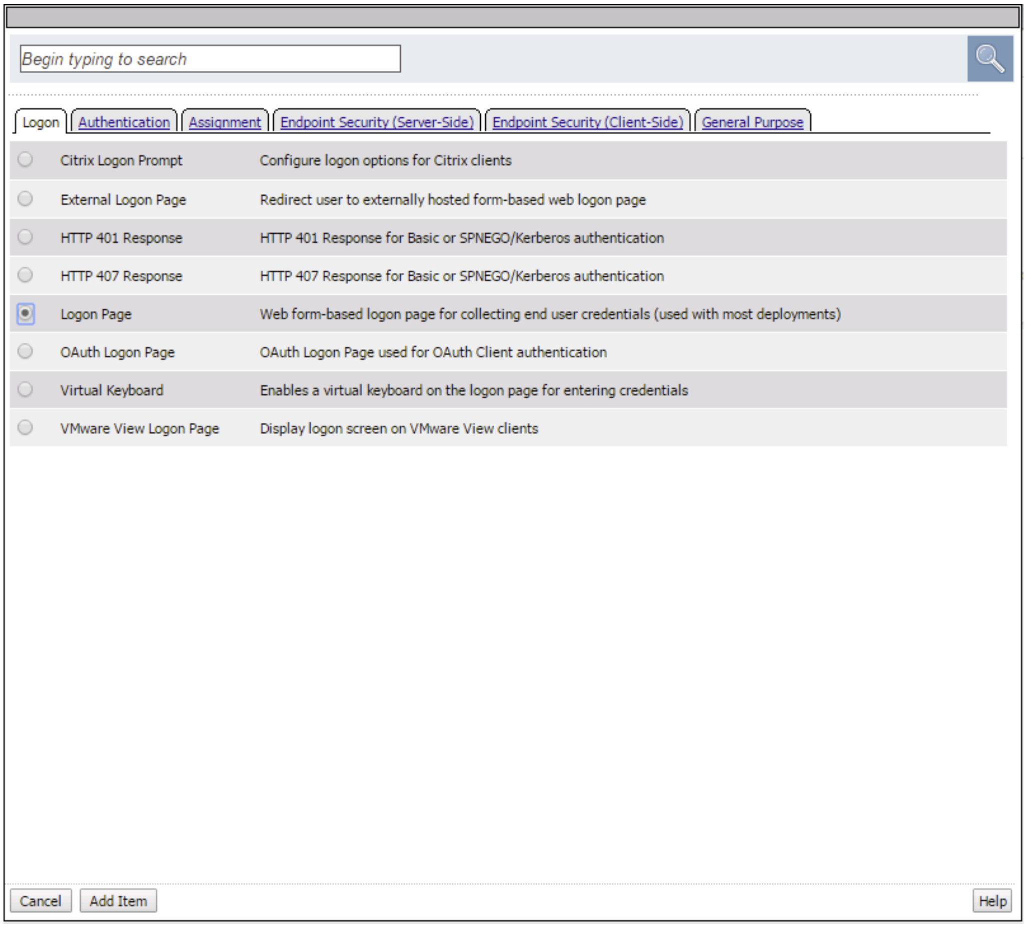
2. Then click the Edit link in the row that has the name of your Access Profile you are working with currently. (**Agility-Lab-Access-Profile**)


Access Policy: /Common/Agility-Lab-Access-Profile
Edit Endings
(Endings: Allow, Deny [default])
Start
fallback
Deny
Add New Macro

3. This will either launch a new browser or new tab depending on your browsers settings to display the APM Visual Policy Editor (VPE). The first policy we created was never edited to add any additional tasks that would instruct APM on what Actions it would need to take/enforce throughout a Policy Execution for the user's Session. So we will now adjust the policy and retest to see if we receive some new results.

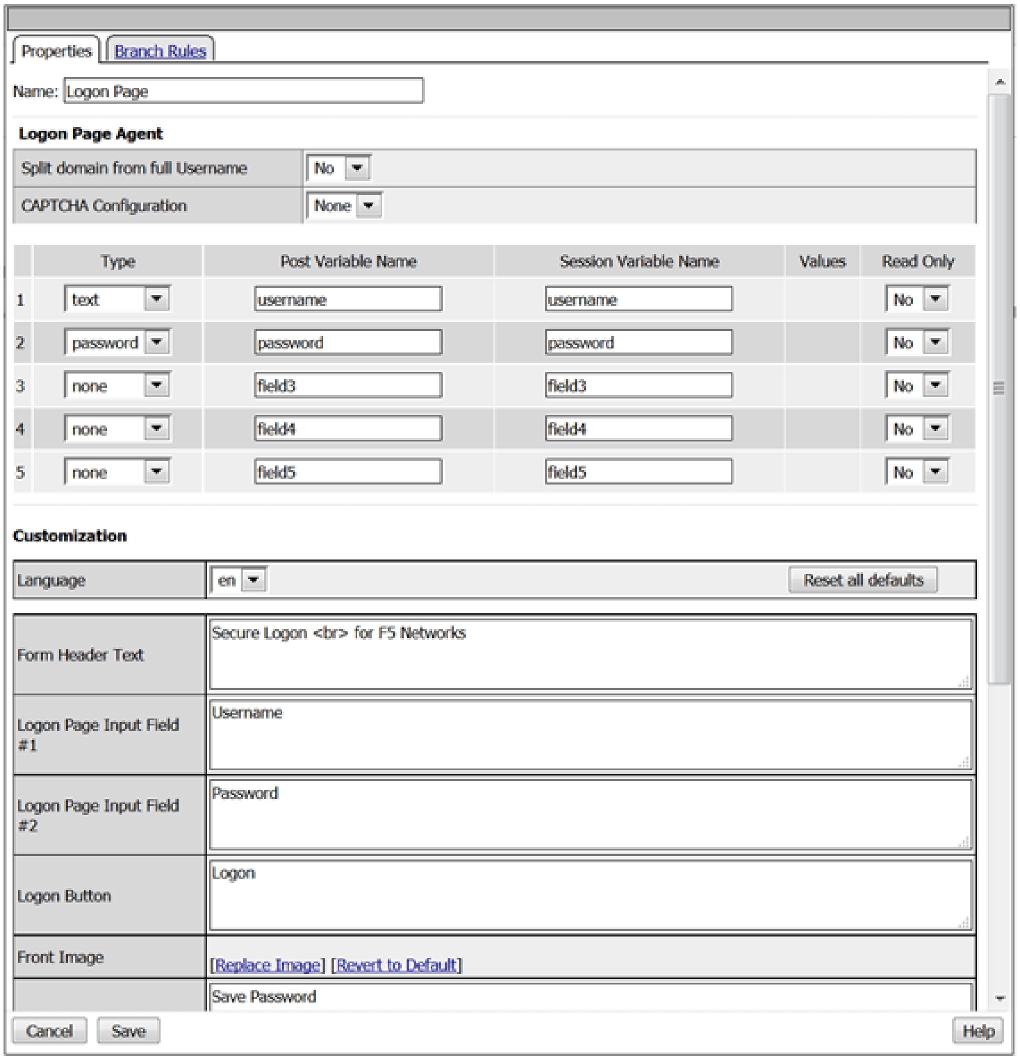

Access Policy: /Common/Agility-Lab-Access-Profile
Edit Endings
(Endings: Allow, Deny [default])
Start
fallback
Deny
Add New Macro

4. Click on the **+** symbol between the Start and ending Deny objects.



○	Citrix Logon Prompt	Configure logon options for Citrix clients
○	External Logon Page	Redirect user to externally hosted form-based web logon page
○	HTTP 401 Response	HTTP 401 Response for Basic or SPNEGO/Kerberos authentication
○	HTTP 407 Response	HTTP 407 Response for Basic or SPNEGO/Kerberos authentication
●	Logon Page	Web form-based logon page for collecting end user credentials (used with most deployments)
○	OAuth Logon Page	OAuth Logon Page used for OAuth Client authentication
○	Virtual Keyboard	Enables a virtual keyboard on the logon page for entering credentials
○	VMware View Logon Page	Display logon screen on VMware View clients

5. This will pop up the Actions window where we can select from several Actions we wish to associate with our policy. On the Logon tab select the **Logon Page** radio button and then click the **ADD ITEM** button at the bottom of the page.



Name: Logon Page

Logon Page Agent

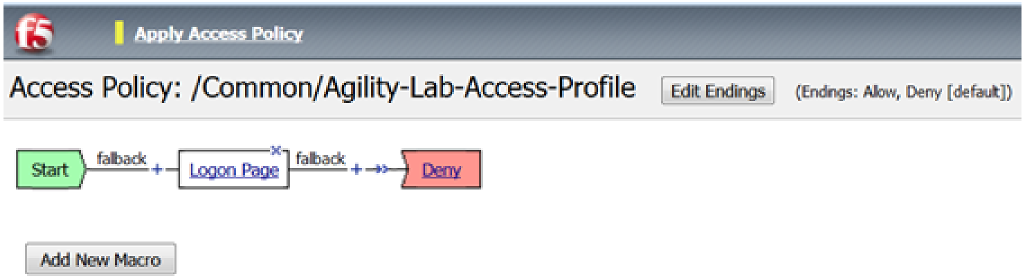
Split domain from full Username	No
CAPTCHA Configuration	None

	Type	Post Variable Name	Session Variable Name	Values	Read Only
1	text	username	username		No
2	password	password	password		No
3	none	field3	field3		No
4	none	field4	field4		No
5	none	field5	field5		No

Customization

Language	en
Form Header Text	Secure Logon for F5 Networks
Logon Page Input Field #1	Username
Logon Page Input Field #2	Password
Logon Button	Logon
Front Image	[Replace Image] [Revert to Default]
	Save Password

6. Click the **SAVE** button on the Logon Page properties window.

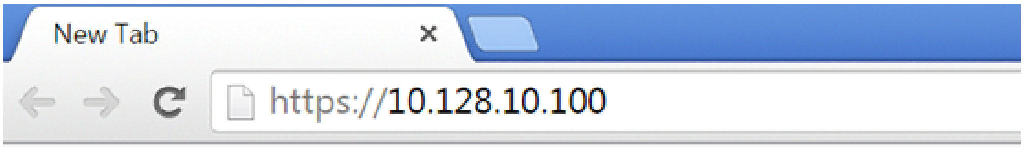


Access Policy: /Common/Agility-Lab-Access-Profile

(Endings: Allow, Deny [default])

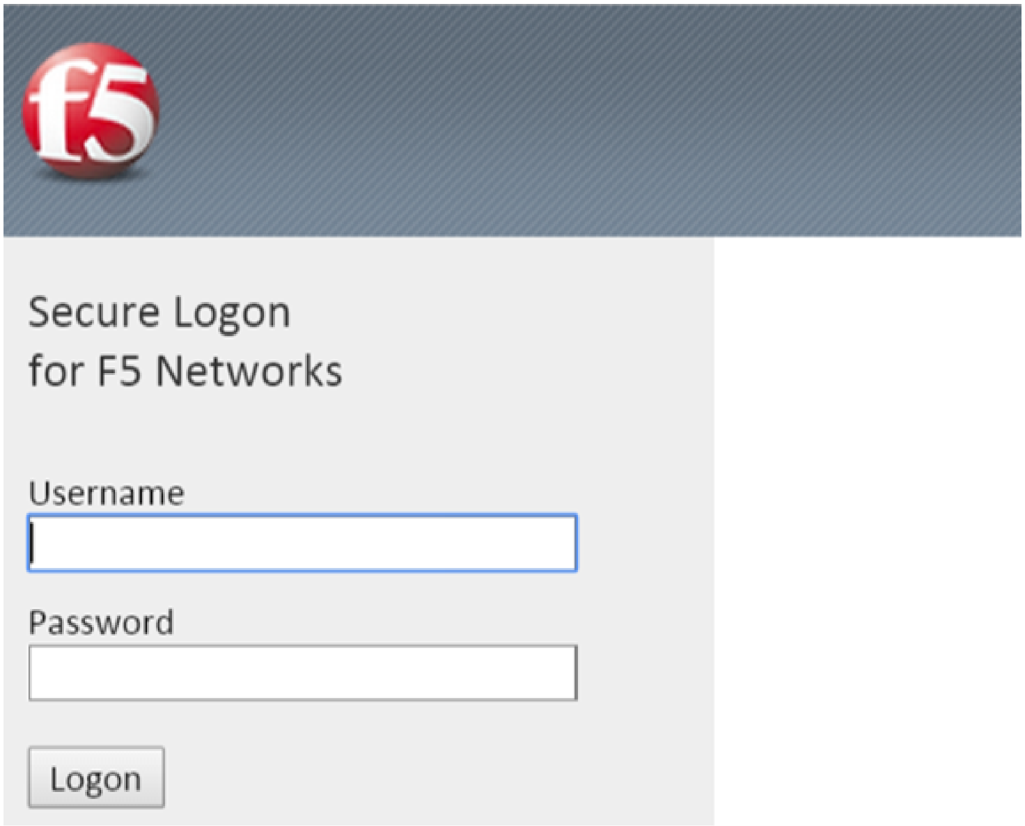
7. Then click the **Apply Access Policy** link on the top left of the page.

TEST 2



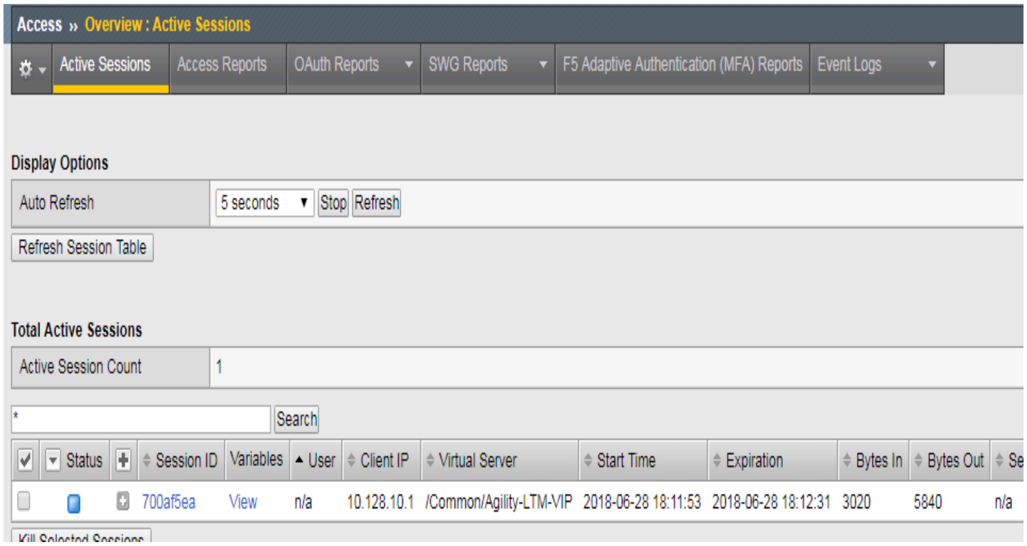
https://10.128.10.100

1. Restart your session to APM. (**https://10.128.10.100**)



Secure Logon
for F5 Networks

2. Did you receive and error this time? Or did you receive a Logon Page?



Display Options

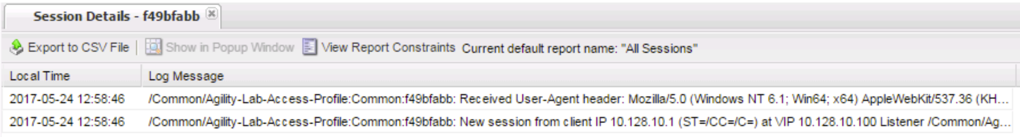
Auto Refresh	5 seconds Stop Refresh

Total Active Sessions

Active Session Count	1

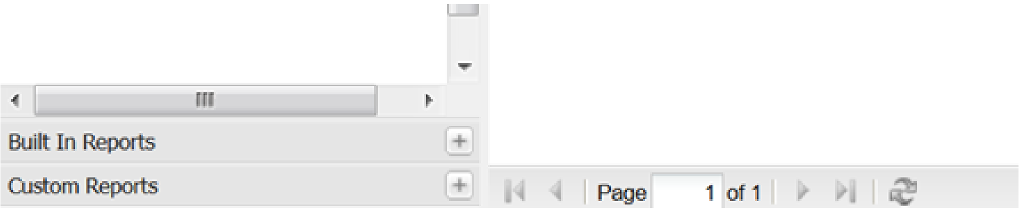
☑	Status	+	Session ID	Variables	User	Client IP	Virtual Server	Start Time	Expiration	Bytes In	Bytes Out	Se
□	■	+	700af5ea	View	n/a	10.128.10.1	/Common/Agility-LTM-VIP	2018-06-28 18:11:53	2018-06-28 18:12:31	3020	5840	n/a

3. Open your browser or tab for managing APM and open the Active Sessions menu again.
4. Is there now an Active Session displayed on the page? If you were already on this page you may need to click the Refresh Session Table button.
5. What does the Status Icon look like? Is it a Green Circle or a Blue Square?
6. Is your username displayed in the Logon column?
7. Click on the Session ID for your session, this will open up a Session Details window.

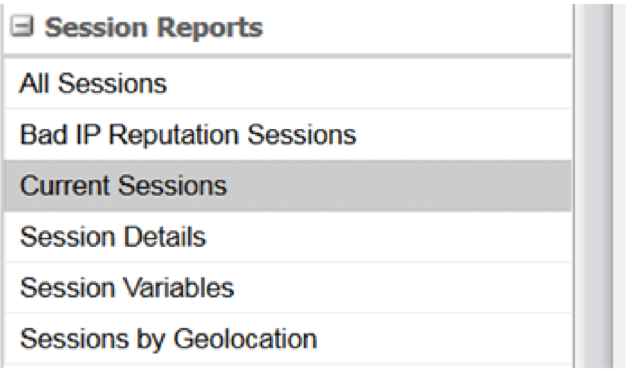

Session Details - f49bfabb
Export to CSV File
Show in Popup Window
View Report Constraints
Current default report name: "All Sessions"

Local Time	Log Message
2017-05-24 12:58:46	/Common/Agility-Lab-Access-Profile:Common:f49bfabb: Received User-Agent header: Mozilla/5.0 (Windows NT 6.1; Win64; x64) AppleWebKit/537.36 (KH...
2017-05-24 12:58:46	/Common/Agility-Lab-Access-Profile:Common:f49bfabb: New session from client IP 10.128.10.1 (ST=/CC=/C=) at VIP 10.128.10.100 Listener /Common/Ag...

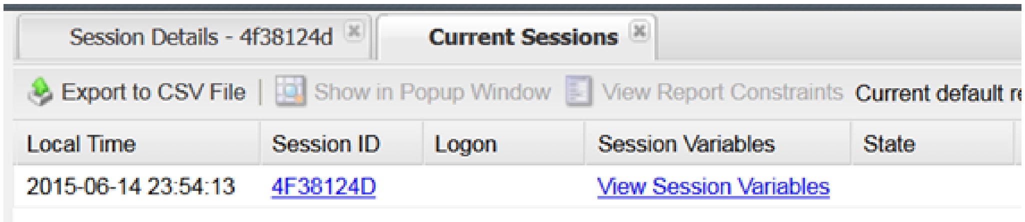
8. In the Session Details window, we can see some information about the session up to the point that the policy has executed so far.



9. Further down there is a reports section titled **Built-In Reports**, click that to open the list of built in reports.



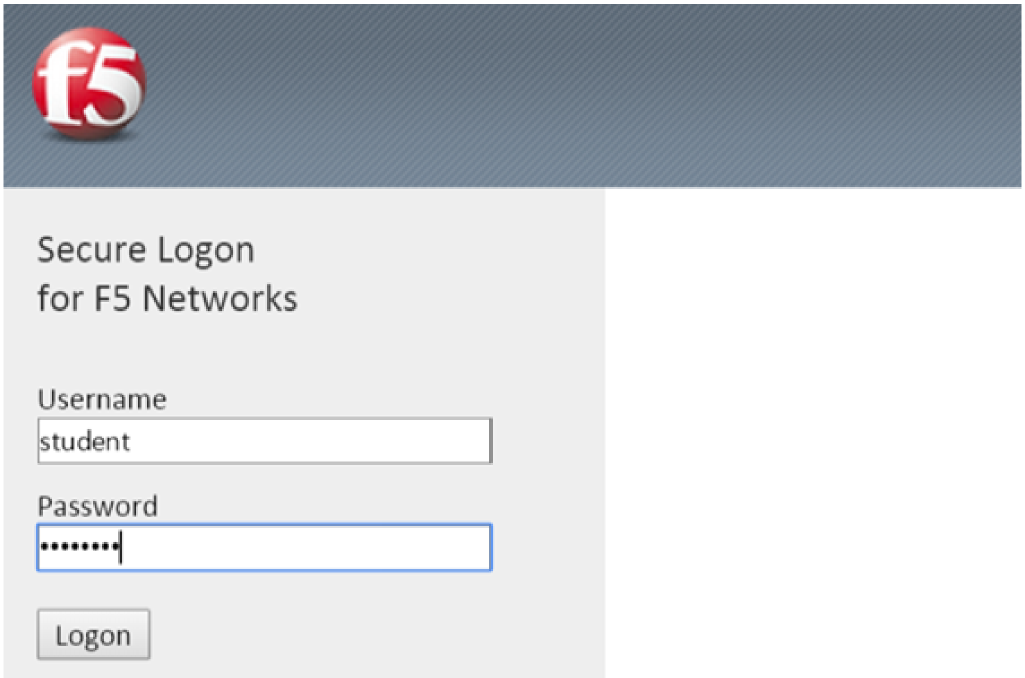
10. Scroll down to see the list of **Session Reports** and click the **Current Sessions** line and select **Run Report** from the pop up window.



Local Time	Session ID	Logon	Session Variables	State
2015-06-14 23:54:13	4F38124D		View Session Variables	

11. Do you see your Session ID displayed in the list of current sessions? If not then why?

TEST 3

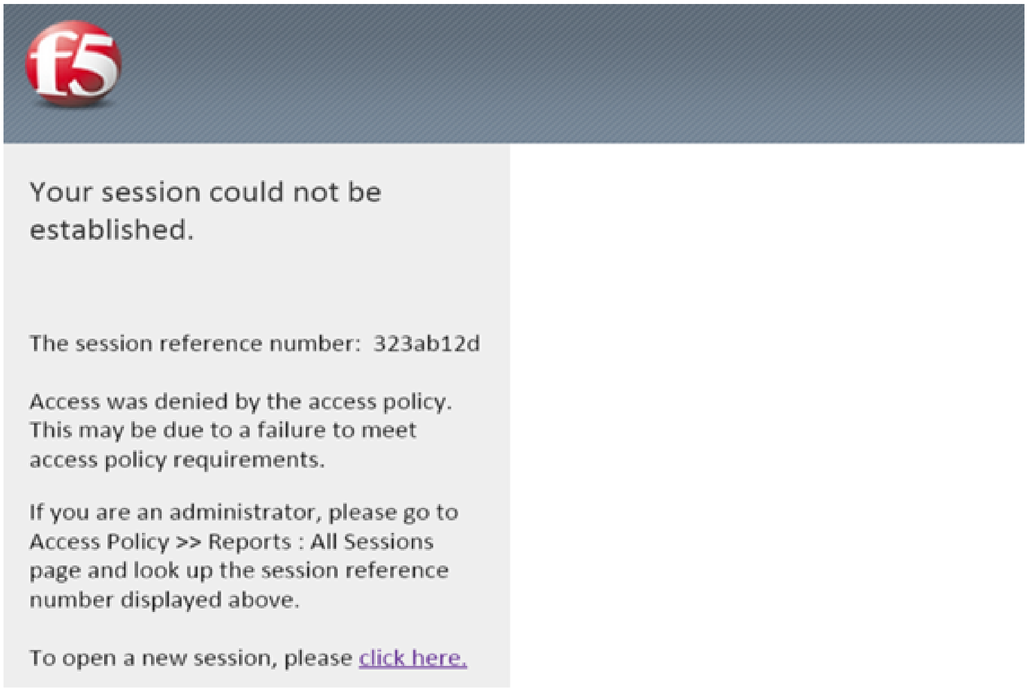


Secure Logon
for F5 Networks

Username: student

Password: ••••••••

1. Return to the browser or tab you are using for access to **https://10.128.10.100**. Restart a new session if necessary.
2. Next logon to the APM Logon page with:
   - Username: **student**
   - Password: **password**



Your session could not be established.

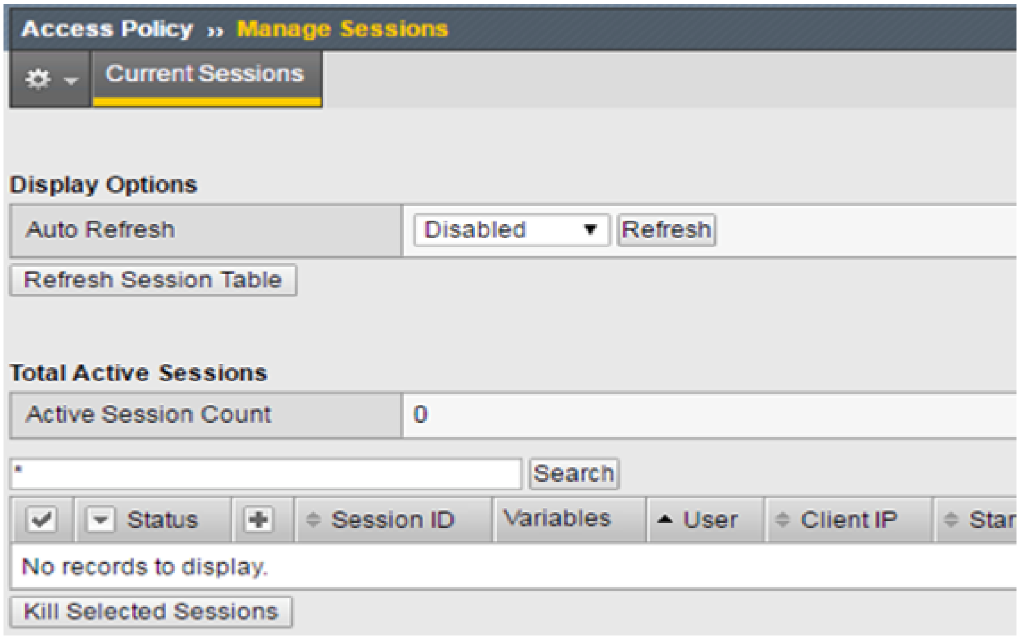
The session reference number: 323ab12d

Access was denied by the access policy. This may be due to a failure to meet access policy requirements.

If you are an administrator, please go to Access Policy >> Reports : All Sessions page and look up the session reference number displayed above.

To open a new session, please click here.

3. Did you receive and error after logging on? If so note the Session Reference Number.



Access Policy ›› Manage Sessions

Current Sessions

Display Options

Auto Refresh	Disabled ▾ Refresh

Refresh Session Table

Total Active Sessions

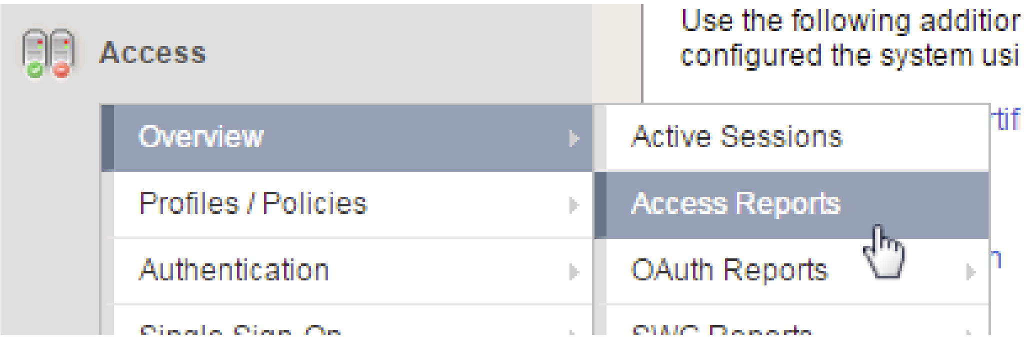
Active Session Count	0

* Search

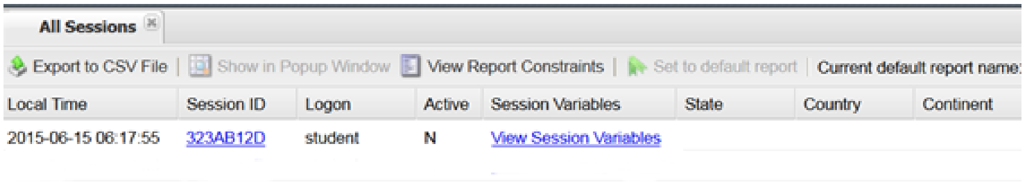
☑	Status	✚	Session ID	Variables	▲ User	Client IP	Star
No records to display.							

Kill Selected Sessions

4. Review the Manage Sessions menu, is your session listed?



5. Navigate to Access -> Overview ? Access Reports. When prompted Click Run Report.

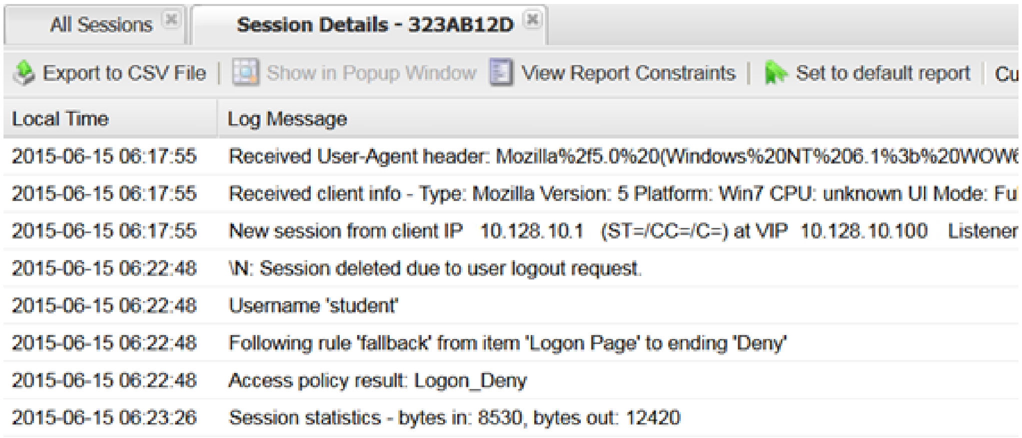


All Sessions

Export to CSV File | Show in Popup Window | View Report Constraints | Set to default report | Current default report name:

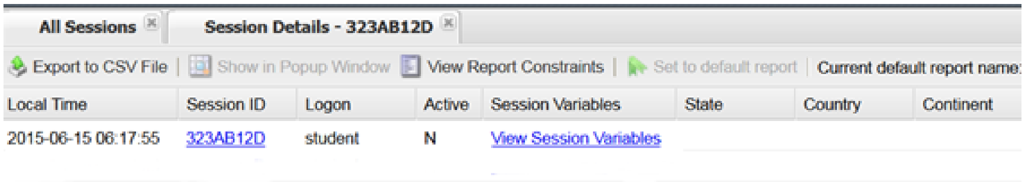
Local Time	Session ID	Logon	Active	Session Variables	State	Country	Continent
2015-06-15 06:17:55	323AB12D	student	N	View Session Variables			

6. Do you see your Session ID listed in the list of All Sessions? Is the username listed in the Logon column?



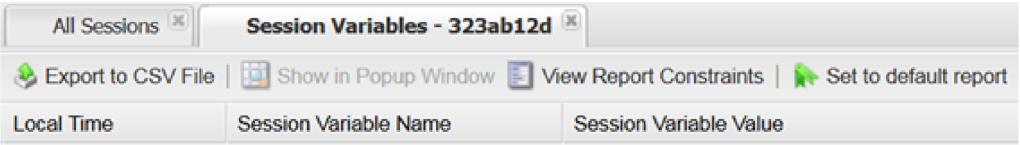
Local Time	Log Message
2015-06-15 06:17:55	Received User-Agent header: Mozilla%2f5.0%20(Windows%20NT%206.1%3b%20WOW6
2015-06-15 06:17:55	Received client info - Type: Mozilla Version: 5 Platform: Win7 CPU: unknown UI Mode: Fu
2015-06-15 06:17:55	New session from client IP 10.128.10.1 (ST=/CC=/C=) at VIP 10.128.10.100 Listener
2015-06-15 06:22:48	\N: Session deleted due to user logout request.
2015-06-15 06:22:48	Username 'student'
2015-06-15 06:22:48	Following rule 'fallback' from item 'Logon Page' to ending 'Deny'
2015-06-15 06:22:48	Access policy result: Logon_Deny
2015-06-15 06:23:26	Session statistics - bytes in: 8530, bytes out: 12420

7. Click the Session ID to open the Session Details window.
8. Do you now see more information in this Sessions Details compared to the previous one we reviewed?
9. Is the username listed in the details?
10. In the Session Details screen we can see some important troubleshooting information, for example just below the username row we see a line that states that the Policy followed a path or branch called Fallback out of the Logon Page object to an Ending "Deny" thus the Access Policy Result was Logon_Deny.



Local Time	Session ID	Logon	Active	Session Variables	State	Country	Continent
2015-06-15 06:17:55	323AB12D	student	N	View Session Variables			

11. Now click back on the All Sessions tab at the top.
12. In the row for this session look to the right of the Logon column. You will see the next column states that the session is not Active. Now click the View Session Variables link in the next column.



Local Time	Session Variable Name	Session Variable Value

13. Do you see a lot of information recorded for Session Variables for this session? If not, then why?

8.6 Lab 4: Visual Policy Editor (VPE) & Session Variables

This lab will go a little deeper into understanding the Visual Policy Editor and Session Variables.

8.6.1 Questions to ask yourself (LAB4)

- Does the VPE Flow look correct?

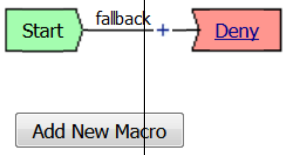
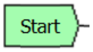
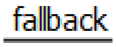
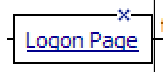
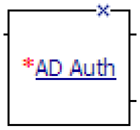
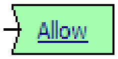
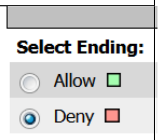
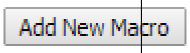
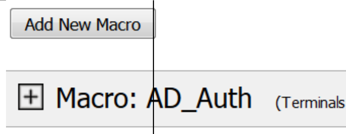
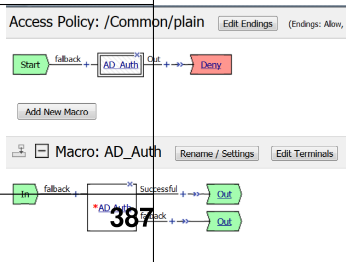
- Does the VPE have the proper ENDING assigned to the appropriate BRANCH?
- Are your connection attempts following the intended VPE BRANCH/PATH during your test?
  - How could you alter the VPE to allow for better trouble shooting or pausing of a policy execution and termination?
- How can I pause the Policy Execution or Termination to review the session variable in Reports?
- What are VPE Actions?
- Are the Correct Session Variables being sent to the AAA Object?
- How can we GET or SET Session Variables in the VPE?
- How could I preserve the originally requested URI from the Client to pass to the internal server after APM authentication has complete?

8.6.2 Visual Policy Editor (VPE) Workflow, Actions, Branches, Endings

The Visual Policy Editor (VPE) is a screen on which to configure an access policy using visual elements. We have used it a few times already throughout our previous labs. This is meant to both review and explain in a bit more detail what the available Visual Policy Editor conventions are.

This table provides a visual dictionary for the Visual Policy Editor (VPE).

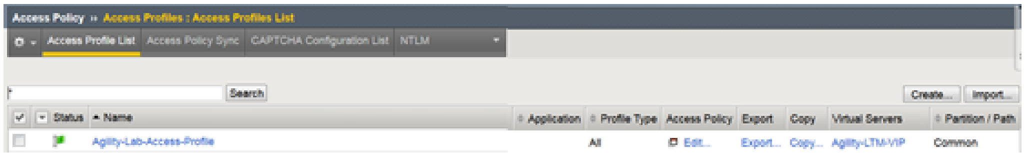
Visual Policy Editor (VPE) Visual Dictionary

Element type	Description	Visual element
Initial Access Policy	When an access profile is created, usually an initial access policy is also created.	
Start	Every access profile contains a start.	
Branch	A branch connects an action to another action or to an ending.	
Add an action	Clicking this icon causes a screen to open with available actions for selection.	
Action	Clicking the name of an action, such as Logon Page, opens a screen with properties and rules for the action. Clicking the x deletes the action from the access policy.	
Action that requires some configuration	The red asterisk indicates that some properties must be configured. Clicking the name opens a screen with properties for the action.	
Ending	Each branch has an ending: Allow or Deny.	
Configure ending	Clicking the name of an ending opens a popup screen.	Select Ending: ○ Allow 🟩 ● Deny 🟥
Add a macro for use in the access policy	Opens a screen for macro template selection. After addition, the macro is available for configuration and for use as an action item.	
Macro added for use	Added macros display under the access policy. Clicking the plus (+) sign expands the macro for configuration of the actions in it.	
		 Access Policy: /Common/plain Edit Endings (Endings: Allow, Start fallback AD Auth Out Deny Add New Macro Macro: AD_Auth Rename / Settings Edit Terminals In fallback *AD Auth Successful Out Out
Macrocall in an Access Policy	Clicking the *Macrocall* name expands the *Macro* in the area below the *Access Policy.*	

8.6.3 Pausing the APM Policy Execution for Troubleshooting – The Message Box

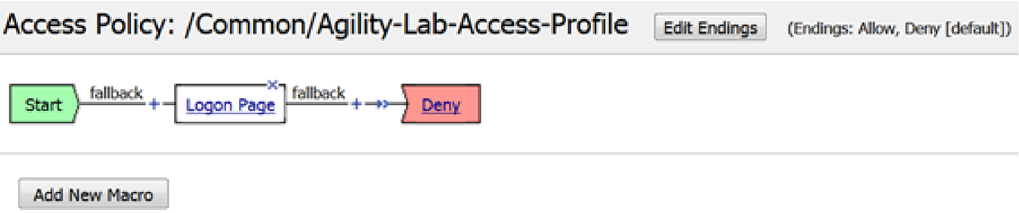
Now that we have reviewed/refreshed our memory on VPE conventions lets edit our policy we were previously working on to add some more actions. This section we show a great tool for troubleshooting a policy that may have been reaching an ENDING DENY and closing the APM session too rapidly for proper inspection during the troubleshooting phase.

STEP 1

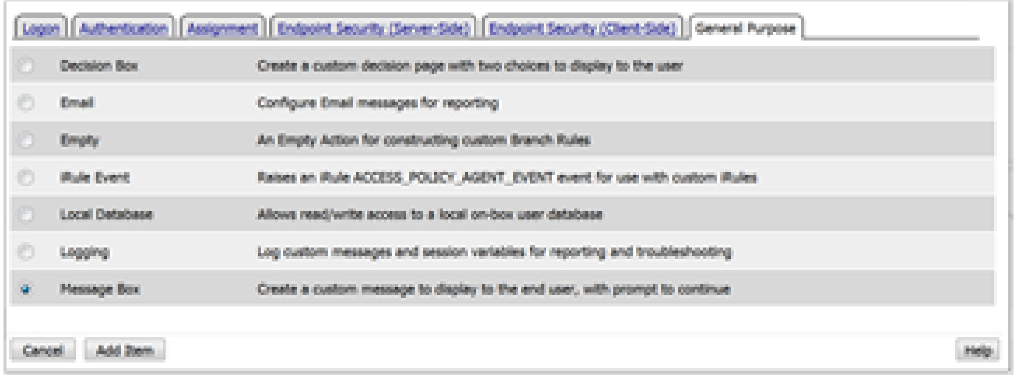

Access Policy » Access Profiles : Access Profiles List
Access Profile List
Access Policy Sync
CAPTCHA Configuration List
NTLM
Search
Create...
Import...

☑	Status	Name	Application	Profile Type	Access Policy	Export	Copy	Virtual Servers	Partition / Path
□	🟩	Agility-Lab-Access-Profile		All	Edit...	Export...	Copy...	Agility-LTM-VIP	Common

1. Navigate to Access ? Access Profiles ? Profiles/Policies -> Access Profiles (Per-Sessions Policies). Click Edit next to **Agility-Lab-Access-Profile** to open the Visual Policy Editor (VPE).

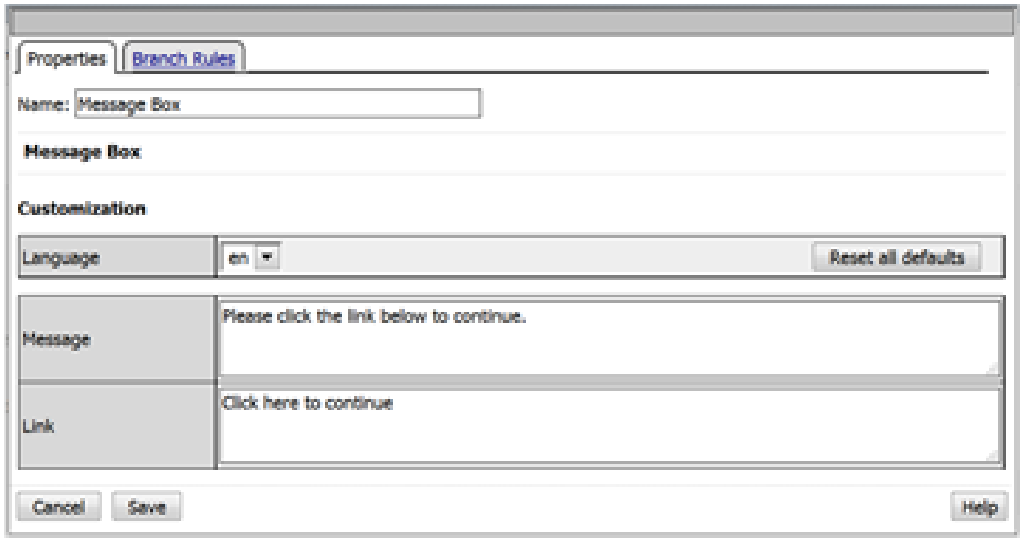

Access Policy: /Common/Agility-Lab-Access-Profile
Edit Endings
(Endings: Allow, Deny [default])
Start
fallback
Logon Page
fallback
Deny
Add New Macro

2. After the Logon Page object, on the fallback branch, click the **+** symbol to open the Actions window.


Logon
Authentication
Assignment
Endpoint Security (Server-Side)
Endpoint Security (Client-Side)
General Purpose
Cancel
Add Item
Help

○	Decision Box	Create a custom decision page with two choices to display to the user
○	Email	Configure Email messages for reporting
○	Empty	An Empty Action for constructing custom Branch Rules
○	iRule Event	Raises an iRule ACCESS_POLICY_AGENT_EVENT event for use with custom iRules
○	Local Database	Allows read/write access to a local on-box user database
○	Logging	Log custom messages and session variables for reporting and troubleshooting
●	Message Box	Create a custom message to display to the end user, with prompt to continue

3. Click on the **General Purpose** tab and then click the radio button next to **Message Box** and click the **ADD ITEM** button at the bottom of the page.



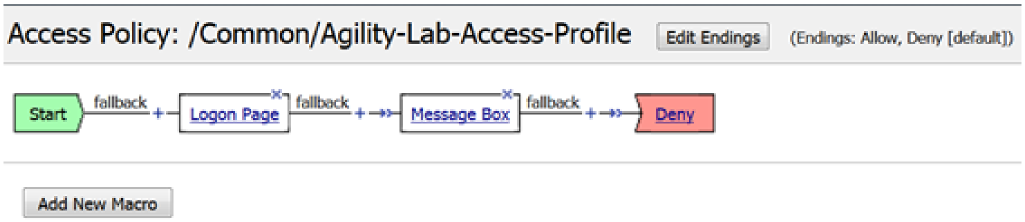
Name: Message Box

Message Box

Customization

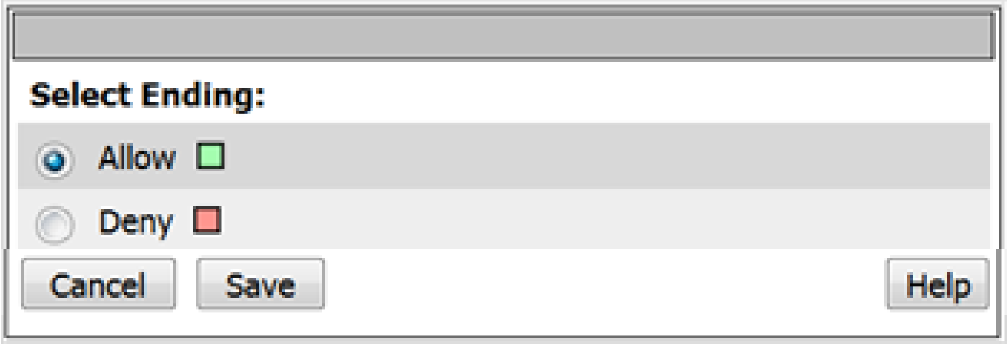
Language	en
Message	Please click the link below to continue.
Link	Click here to continue

4. Click the **SAVE** button on the next window


Access Policy: /Common/Agility-Lab-Access-Profile

(Endings: Allow, Deny [default])

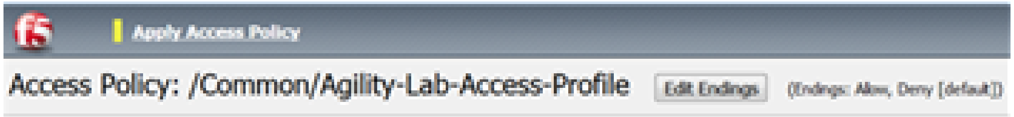
5. Now client the ending Deny.


Select Ending:

● Allow 🟩

○ Deny 🟥

6. In the pop-up window change it to Allow and click the **SAVE** button.

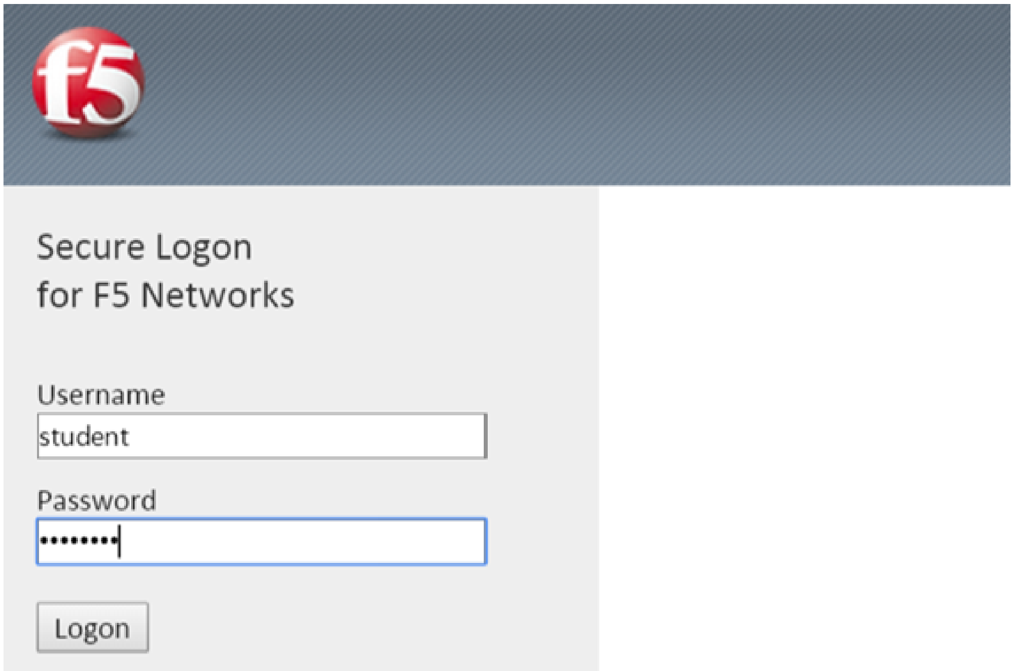


Access Policy: /Common/Agility-Lab-Access-Profile

(Endings: Allow, Deny [default])

7. Then click the Apply Access Policy link at the top left.

TEST 1



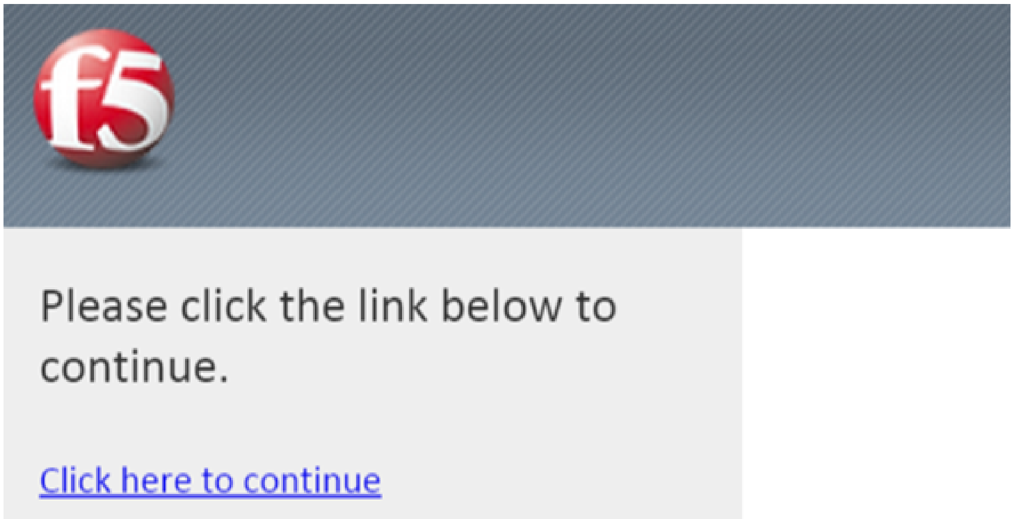
Secure Logon
for F5 Networks

Username
student

Password
••••••••

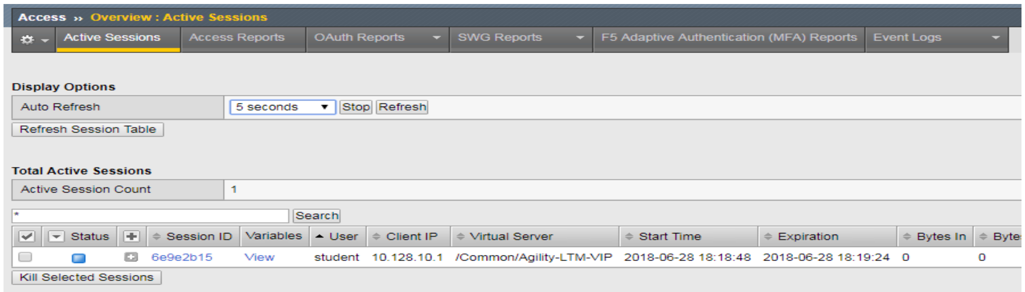
1. Return to the browser or tab you are using for access to **https://10.128.10.100**. Restart a new session if necessary.

- Username: **student**
- Password: **password**



Please click the link below to continue.

2. Did we receive an error this time after the logon page?
3. Did the Message Box display?


Access » Overview : Active Sessions
Active Sessions
Access Reports
OAuth Reports
SWG Reports
F5 Adaptive Authentication (MFA) Reports
Event Logs

Display Options

Auto Refresh: 5 seconds ▾ [Stop] [Refresh]

[Refresh Session Table]

Total Active Sessions

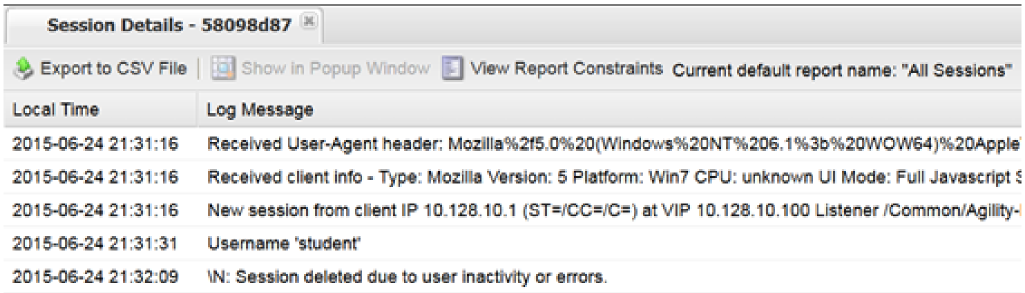
Active Session Count: 1

* [Search]

☑	Status	⊞	Session ID	Variables	User	Client IP	Virtual Server	Start Time	Expiration	Bytes In	Byte
□	🟦	⊞	6e9e2b15	View	student	10.128.10.1	/Common/Agility-LTM-VIP	2018-06-28 18:18:48	2018-06-28 18:19:24	0	0

[Kill Selected Sessions]

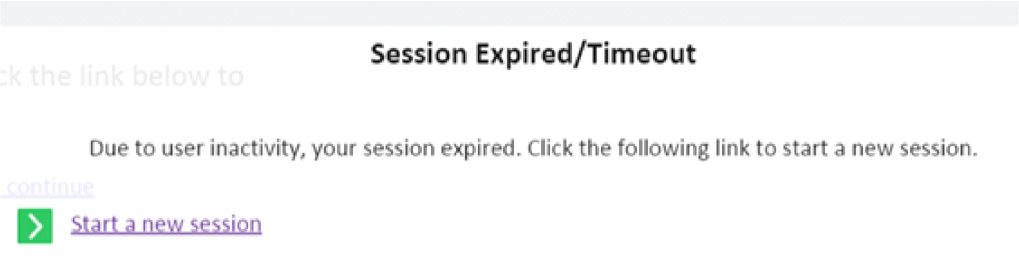
4. Keep the message box display there and move to the other browser to review the Manage Sessions menu.
5. Does the Manage Sessions menu show the Username this time?
6. Is the Status showing a Blue Square or Green Circle? Why?


Session Details - 58098d87

Current default report name: "All Sessions"

Local Time	Log Message
2015-06-24 21:31:16	Received User-Agent header: Mozilla%2f5.0%20(Windows%20NT%206.1%3b%20WOW64)%20Apple
2015-06-24 21:31:16	Received client info - Type: Mozilla Version: 5 Platform: Win7 CPU: unknown UI Mode: Full Javascript S
2015-06-24 21:31:16	New session from client IP 10.128.10.1 (ST=/CC=/C=) at VIP 10.128.10.100 Listener /Common/Agility-
2015-06-24 21:31:31	Username 'student'
2015-06-24 21:32:09	\N: Session deleted due to user inactivity or errors.

7. Click the session ID to review the details for any new messages.
8. If things worked correctly you should see a message in the details stating, “Session deleted due to user inactivity or errors”

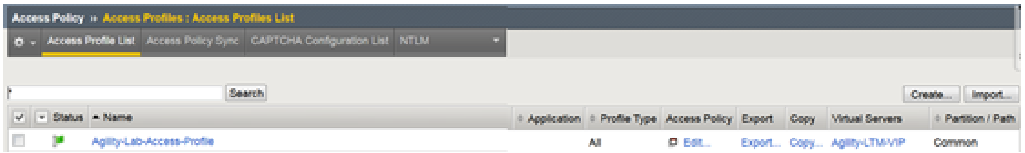

Session Expired/Timeout

Due to user inactivity, your session expired. Click the following link to start a new session.

Start a new session

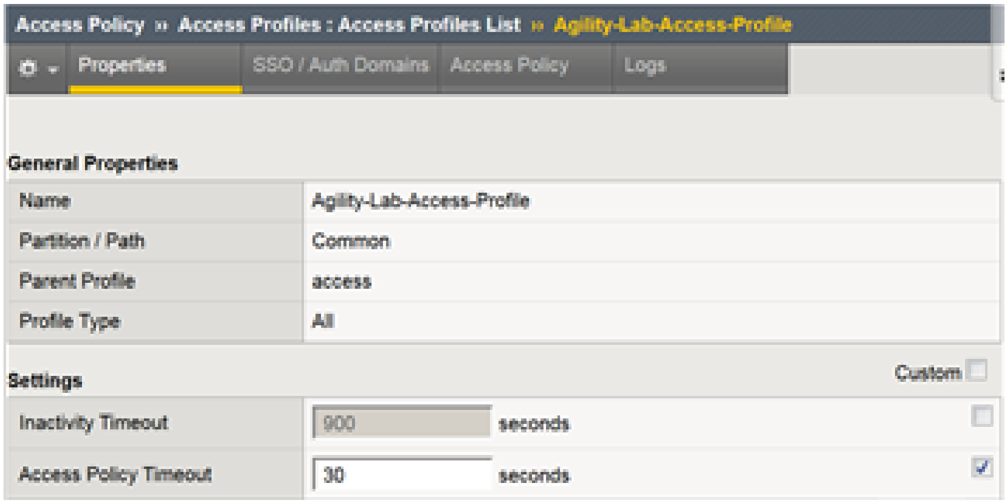
9. If you look back at the other browser window you should notice a Session Expired/Timeout message is being displayed.

STEP 2


Access Policy » Access Profiles : Access Profiles List
Access Profile List
Access Policy Sync
CAPTCHA Configuration List
NTLM
Search
Create...
Import...

☑	Status	Name	Application	Profile Type	Access Policy	Export	Copy	Virtual Servers	Partition / Path
□	🟩	Agility-Lab-Access-Profile		All	Edit...	Export...	Copy...	Agility-LTM-VIP	Common

1. Navigate back to Access ? Profiles/Policies ? Access Profiles (Per-Session Policies). Click on **Agility-Lab-Access-Profile**



Access Policy » Access Profiles : Access Profiles List » Agility-Lab-Access-Profile
Properties
SSO / Auth Domains
Access Policy
Logs

General Properties

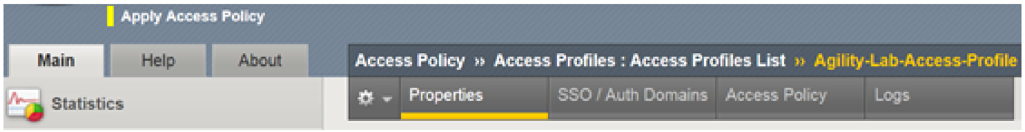
Name	Agility-Lab-Access-Profile
Partition / Path	Common
Parent Profile	access
Profile Type	All

Settings

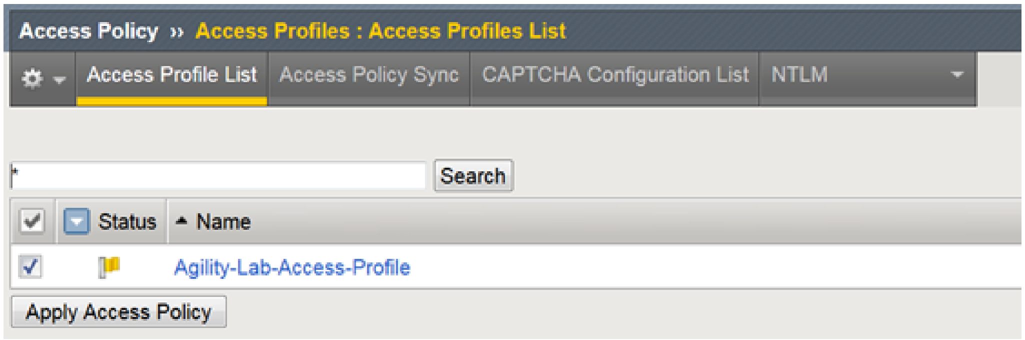
		Custom □
Inactivity Timeout	900 seconds	□
Access Policy Timeout	30 seconds	☑

2. Access Policy Timeout from 30 seconds back to **300** seconds by removing the check from the custom column.

3. Click the **UPDATE** button at the bottom of the page.



4. Click Apply Access Policy link at the top left of the page.

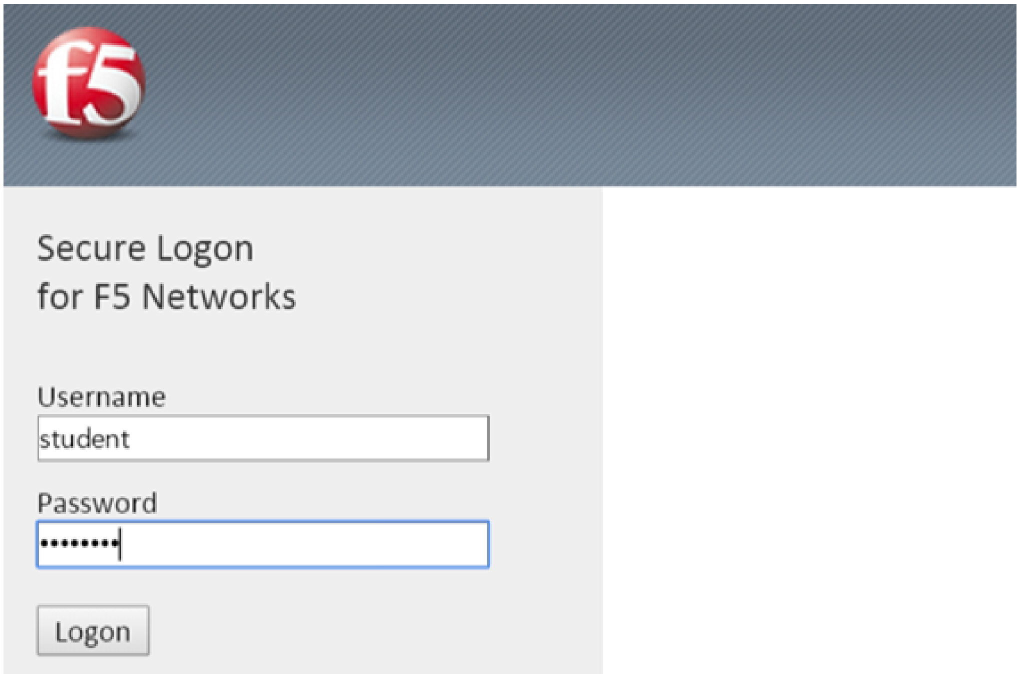


Access Policy » Access Profiles : Access Profiles List
Access Profile List
Access Policy Sync
CAPTCHA Configuration List
NTLM
Search
Apply Access Policy

☑	Status	Name
☑		Agility-Lab-Access-Profile

5. Finalize the update by confirming the box is checked next to the profile and clicking **APPLY ACESS POLICY**

TEST 2

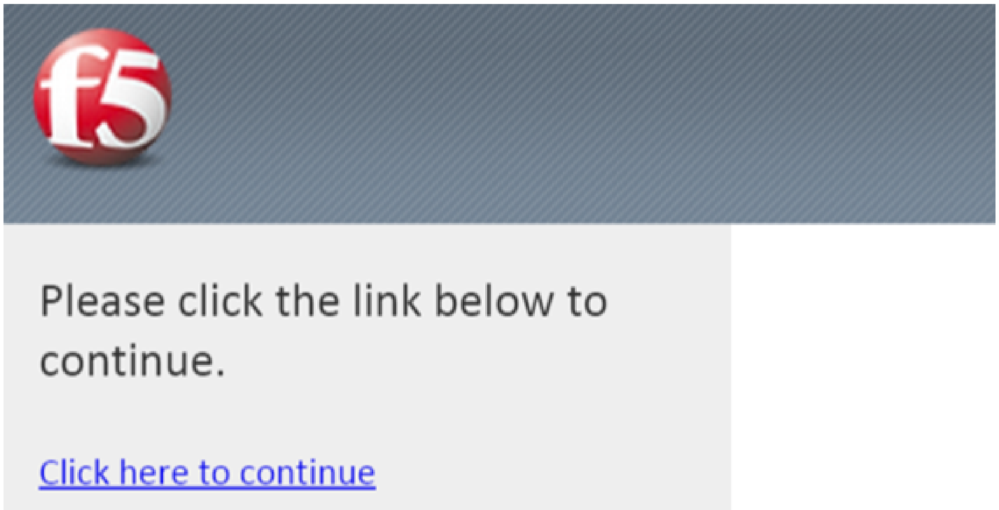


Secure Logon
for F5 Networks

Username: student

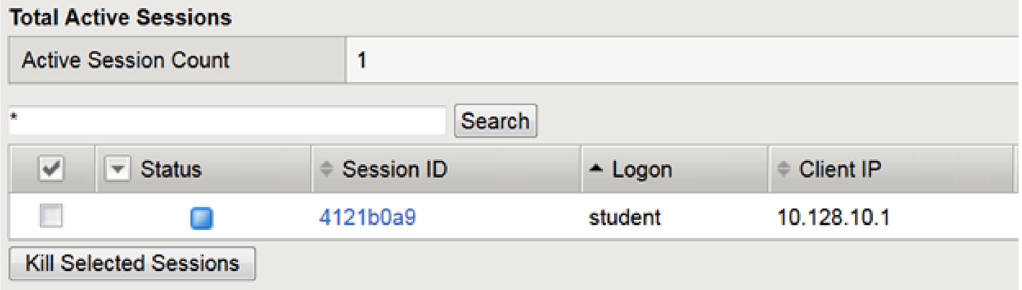
Password: ••••••••

1. Now go back and restart the user session and logon.



Please click the link below to continue.

2. **Do NOT** click the message box link “Click here to continue”
3. Leave the message box message displayed for the time.



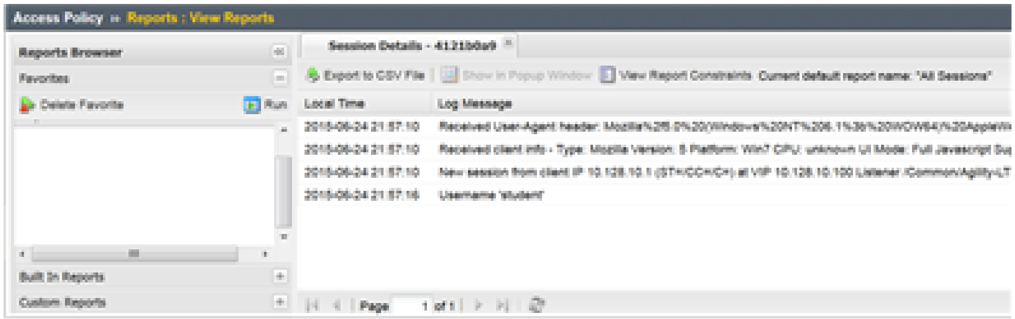
Total Active Sessions

Active Session Count	1

☑	Status	Session ID	Logon	Client IP
☐	🟦	4121b0a9	student	10.128.10.1

4. Go to the other browser/tab and open the Manage Sessions menu.

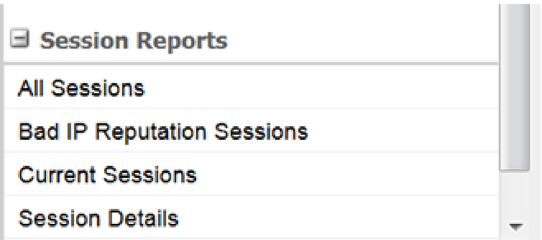
5. Your session should be there but the Status icon should still be a Blue Square.
6. Click on your Session ID



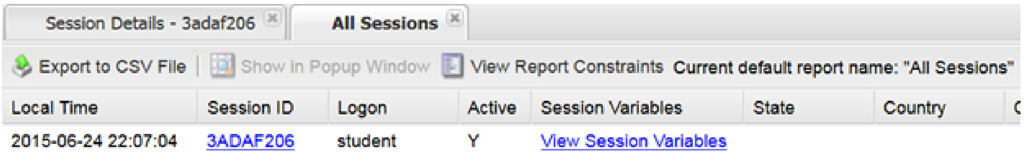
Current default report name: "All Sessions"

Local Time	Log Message
2015-06-24 21:57:10	Received User-Agent header: Mozilla%2f5.0%20(Windows%20NT%206.1%3b%20WOW64)%20AppleWe
2015-06-24 21:57:10	Received client info - Type: Mozilla Version: 5 Platform: Win7 CPU: unknown UI Mode: Full Javascript Su
2015-06-24 21:57:10	New session from client IP 10.128.10.1 (ST=/CC=/C=) at VIP 10.128.10.100 Listener /Common/Agility-LT
2015-06-24 21:57:16	Username 'student'

7. Click Built-in Reports



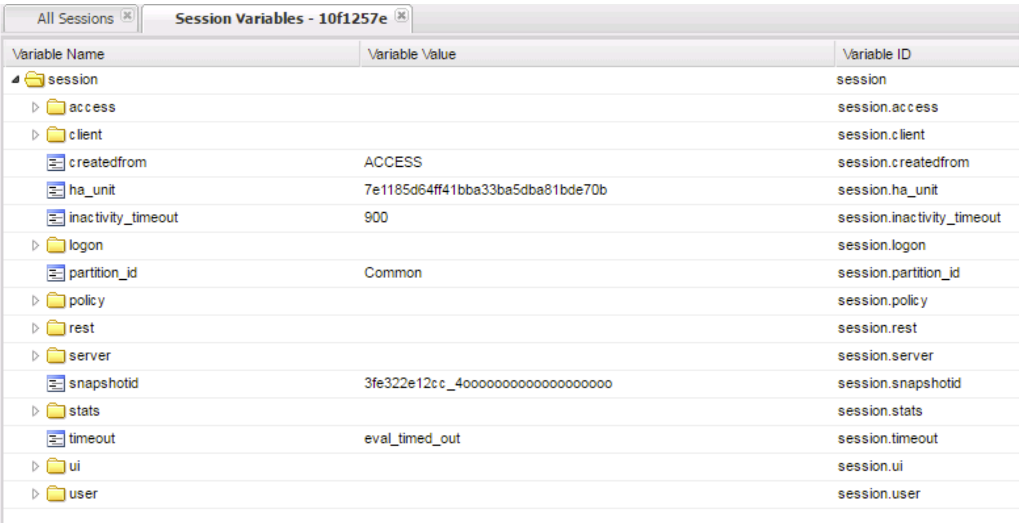
8. Click on All Sessions report, then choose Run Report on the pop-up menu.



Current default report name: "All Sessions"

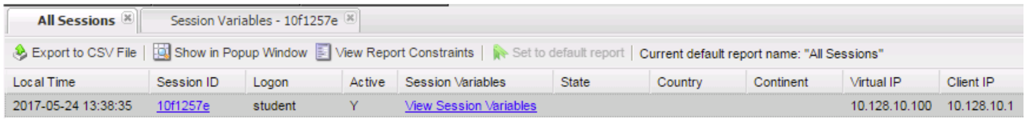
Local Time	Session ID	Logon	Active	Session Variables	State	Country	C
2015-06-24 22:07:04	3ADAF206	student	Y	View Session Variables			

9. Click the Session Variables for your current session.



Variable Name	Variable Value	Variable ID
session		session
access		session.access
client		session.client
createdfrom	ACCESS	session.createdfrom
ha_unit	7e1185d64ff41bba33ba5dba81bde70b	session.ha_unit
inactivity_timeout	900	session.inactivity_timeout
logon		session.logon
partition_id	Common	session.partition_id
policy		session.policy
rest		session.rest
server		session.server
snapshotid	3fe322e12cc_4oooooooooooooooooo	session.snapshotid
stats		session.stats
timeout	eval_timed_out	session.timeout
ui		session.ui
user		session.user

10. Do you now have Session Variables being displayed for this session? If so why?

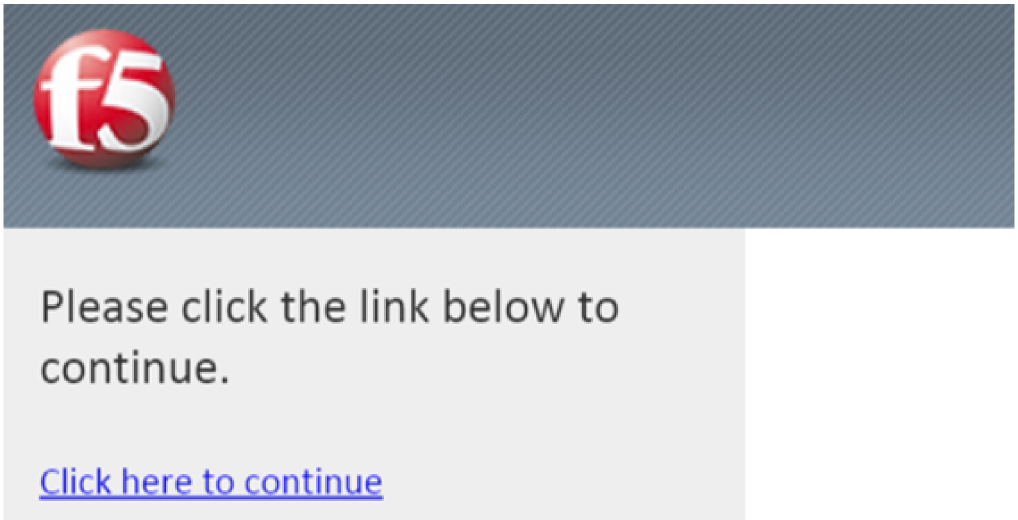


Current default report name: "All Sessions"

Local Time	Session ID	Logon	Active	Session Variables	State	Country	Continent	Virtual IP	Client IP
2017-05-24 13:38:35	10f1257e	student	Y	View Session Variables				10.128.10.100	10.128.10.1

11. Click the All Sessions tab and look at the column labeled Active. Does it show a Y or N in the column?

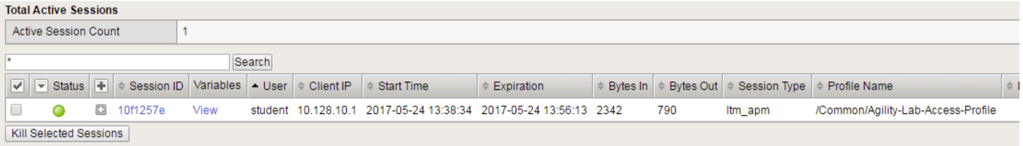
Note that session variables will only be displayed for Active sessions. Since you placed a message box in the VPE to pause policy execution the session is seen as active. This provides you the ability to now review Session Variables that APM has collected up to this point in the policies execution.



Please click the link below to continue.

12. Now in the user browser click the link in the Message Box.

If it timed out then restart and this time click through the message box link.

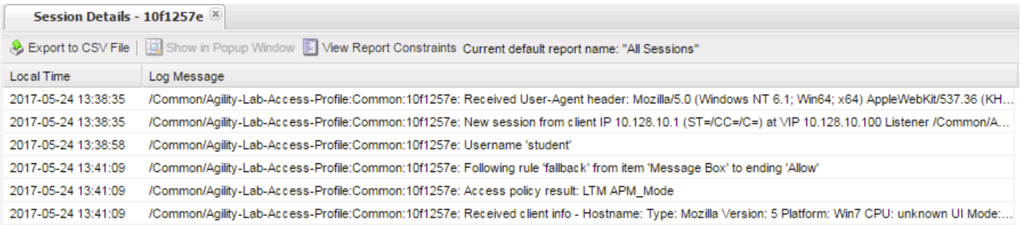


Total Active Sessions

Active Session Count	1

☑	Status	⊞	Session ID	Variables	User	Client IP	Start Time	Expiration	Bytes In	Bytes Out	Session Type	Profile Name
☐	●	⊞	10f1257e	View	student	10.128.10.1	2017-05-24 13:38:34	2017-05-24 13:56:13	2342	790	ltm_apm	/Common/Agility-Lab-Access-Profile

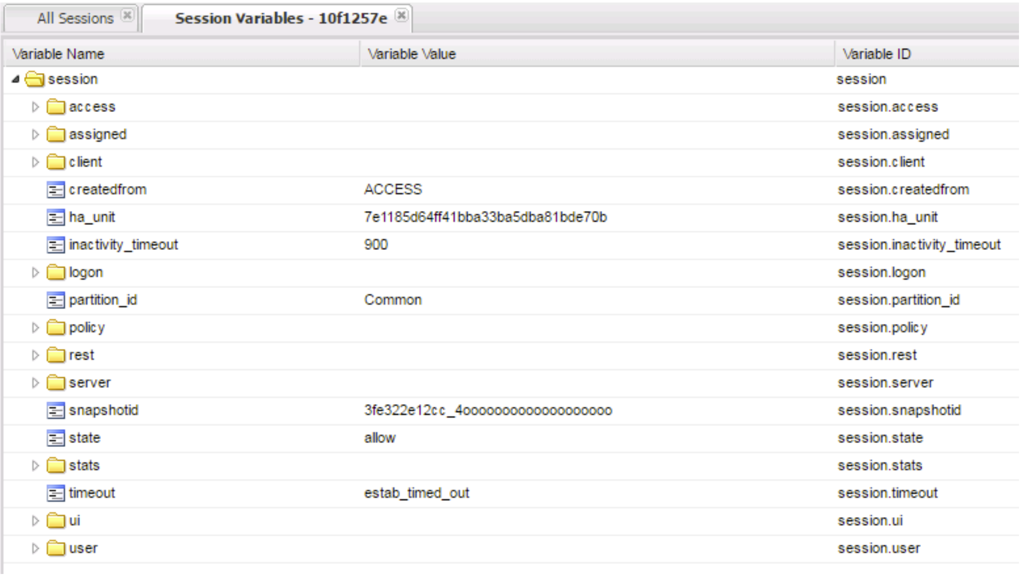
13. Now review the Active Sessions menu and note what icon is shown in the status column. Green Circle finally? Success!!



Current default report name: "All Sessions"

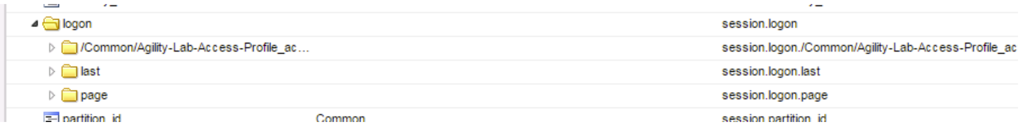
Local Time	Log Message
2017-05-24 13:38:35	/Common/Agility-Lab-Access-Profile:Common:10f1257e: Received User-Agent header: Mozilla/5.0 (Windows NT 6.1; Win64; x64) AppleWebKit/537.36 (KH...
2017-05-24 13:38:35	/Common/Agility-Lab-Access-Profile:Common:10f1257e: New session from client IP 10.128.10.1 (ST=/CC=/C=) at VIP 10.128.10.100 Listener /Common/A...
2017-05-24 13:38:58	/Common/Agility-Lab-Access-Profile:Common:10f1257e: Username 'student'
2017-05-24 13:41:09	/Common/Agility-Lab-Access-Profile:Common:10f1257e: Following rule 'fallback' from item 'Message Box' to ending 'Allow'
2017-05-24 13:41:09	/Common/Agility-Lab-Access-Profile:Common:10f1257e: Access policy result: LTM APM_Mode
2017-05-24 13:41:09	/Common/Agility-Lab-Access-Profile:Common:10f1257e: Received client info - Hostname: Type: Mozilla Version: 5 Platform: Win7 CPU: unknown UI Mode:...

14. If you now click the Session ID you will see that the Policy has reached an ending Allow thus the Access Policy Result is now showing we have been granted LTM+APM_Mode access.



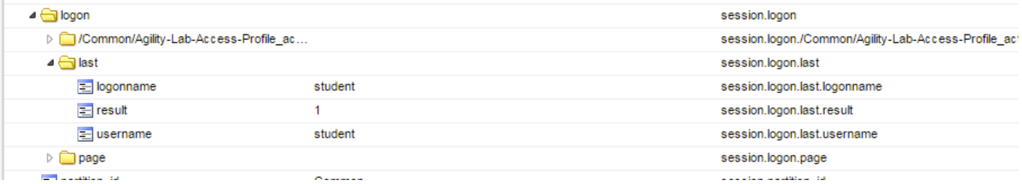
Variable Name	Variable Value	Variable ID
session		session
access		session.access
assigned		session.assigned
client		session.client
createdfrom	ACCESS	session.createdfrom
ha_unit	7e1185d64ff41bba33ba5dba81bde70b	session.ha_unit
inactivity_timeout	900	session.inactivity_timeout
logon		session.logon
partition_id	Common	session.partition_id
policy		session.policy
rest		session.rest
server		session.server
snapshotid	3fe322e12cc_4oooooooooooooooooooo	session.snapshotid
state	allow	session.state
stats		session.stats
timeout	estab_timed_out	session.timeout
ui		session.ui
user		session.user

15. Now open the All Sessions report once more to review the Session Variables collected.



logon		session.logon
/Common/Agility-Lab-Access-Profile_ac…		session.logon./Common/Agility-Lab-Access-Profile_ac
last		session.logon.last
page		session.logon.page
partition_id	Common	session.partition_id

16. Click the logon folder in the Session Variables page that opens for your session.



logon		session.logon
/Common/Agility-Lab-Access-Profile_ac…		session.logon./Common/Agility-Lab-Access-Profile_ac
last		session.logon.last
logonname	student	session.logon.last.logonname
result	1	session.logon.last.result
username	student	session.logon.last.username
page		session.logon.page

17. Click the folder icon named *last* to expand its contents.

Notice on the left column labeled Variable Name above and to the right the next column is Variable Value and the third column is Variable ID. If you look at the Variable Name of username you will see to the right its value is recorded as student as you entered it in the logon page. The next column displays APM's matching session Variable ID for this information. You will see that the naming convention follows the session hierarchy starting with session. then the first folder logon. then the next folder last. then finally the Variable Name of Username.

We will use some session variables in the next lab to GET and SET information for the users session.

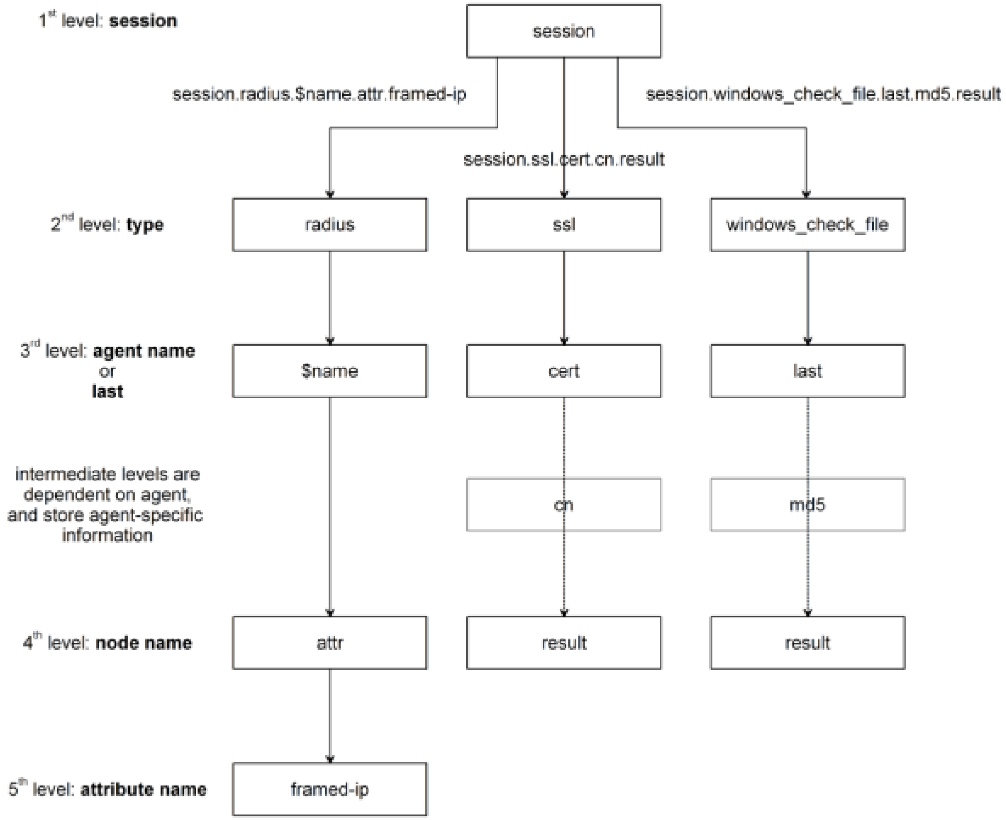
8.6.4 Session Variables – Setting and Retrieving (Some Quick Information)

This section will provide some guidance on how to both retrieve and set session variables within a policy for a user's session. Session Variables are very useful in many areas of policy execution. They can be used to assist in areas like authentication or single sign-on or assigning resource items for users based on information APM can collect from the backend AAA server and its associated directory.

Currently cached session Variables are available in APM Reports for review by an administrator. Additional available variables can always be found in the APM Configuration Guides. What is really nice is that APM is not limited to only having awareness of Session Variable it collects from the user session establishment or from the AAA server, administrators can actually create or set their own custom session variables for use within a policy. This means that an administrator could create new session variables via the VPE's Variable Assign action or session variables could even be set from an iRule attached to a virtual server. This means that information that the LTM VIP can see or be gathered via an iRule could then be set as a session variable that could then be retrieved and used within the VPE.

About Session Variable Names

The name of a session variable consists of multiple hierarchical nodes that are separated by periods (.):

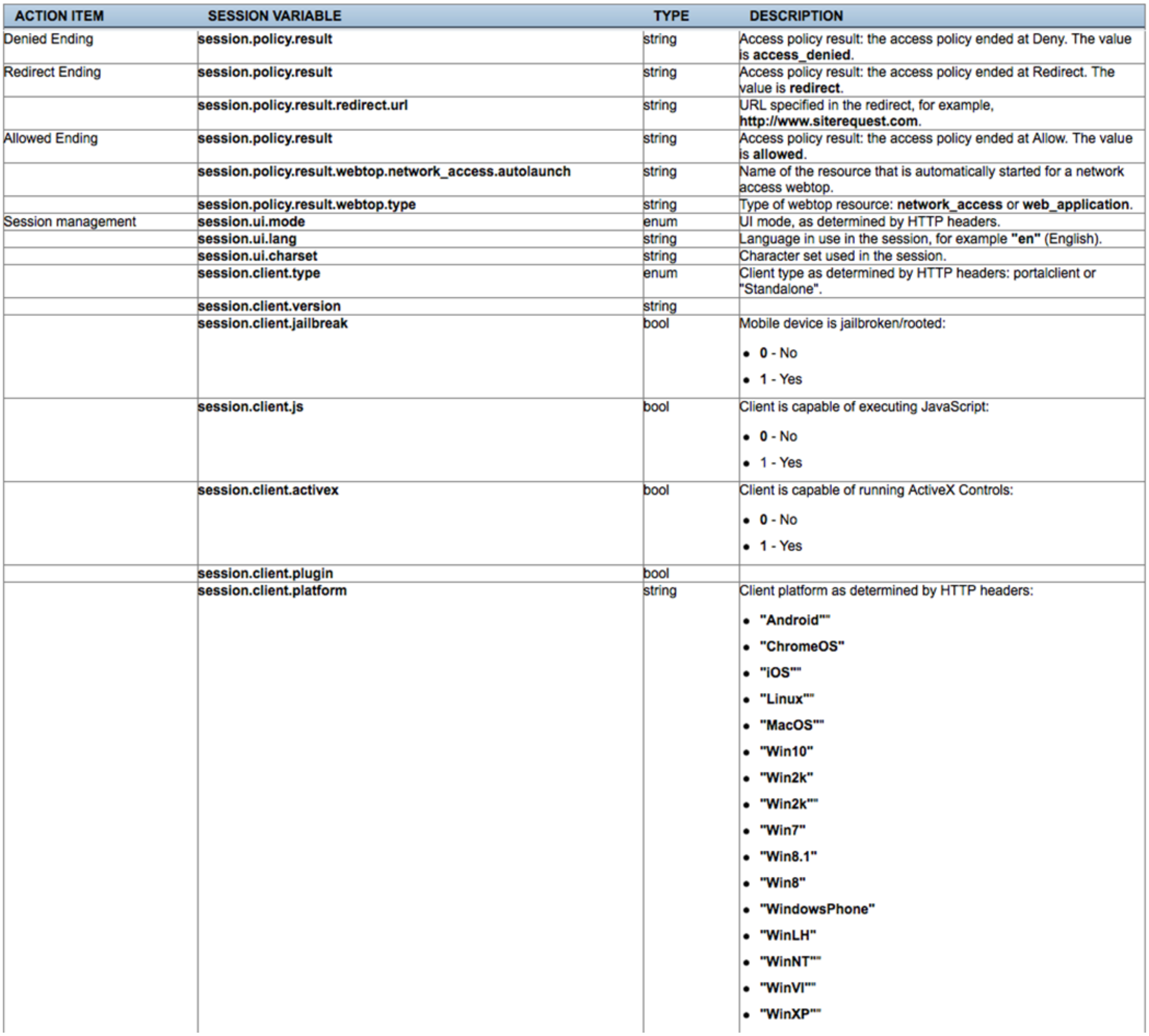


1st level: session
session
session.radius.$name.attr.framed-ip
session.windows_check_file.last.md5.result
session.ssl.cert.cn.result
2nd level: type
radius
ssl
windows_check_file
3rd level: agent name or last
$name
cert
last
intermediate levels are dependent on agent, and store agent-specific information
cn
md5
4th level: node name
attr
result
result
5th level: attribute name
framed-ip

Session Variable Reference

APM Session Variable references are provided in APM documentation. Current release information can be found at the following link: https://support.f5.com/kb/en-us/products/big-ip_apm/manuals/product/apm-visual-policy-editor-13-0-0/5.html

Partial Session Variable list



ACTION ITEM	SESSION VARIABLE	TYPE	DESCRIPTION
Denied Ending	**session.policy.result**	string	Access policy result: the access policy ended at Deny. The value is **access_denied**.
Redirect Ending	**session.policy.result**	string	Access policy result: the access policy ended at Redirect. The value is **redirect**.
	session.policy.result.redirect.url	string	URL specified in the redirect, for example, **http://www.siterequest.com**.
Allowed Ending	**session.policy.result**	string	Access policy result: the access policy ended at Allow. The value is **allowed**.
	session.policy.result.webtop.network_access.autolaunch	string	Name of the resource that is automatically started for a network access webtop.
	session.policy.result.webtop.type	string	Type of webtop resource: **network_access** or **web_application**.
Session management	**session.ui.mode**	enum	UI mode, as determined by HTTP headers.
	session.ui.lang	string	Language in use in the session, for example **"en"** (English).
	session.ui.charset	string	Character set used in the session.
	session.client.type	enum	Client type as determined by HTTP headers: portalclient or "Standalone".
	session.client.version	string	
	session.client.jailbreak	bool	Mobile device is jailbroken/rooted: • **0** - No • **1** - Yes
	session.client.js	bool	Client is capable of executing JavaScript: • **0** - No • 1 - Yes
	session.client.activex	bool	Client is capable of running ActiveX Controls: • **0** - No • 1 - Yes
	session.client.plugin	bool	
	session.client.platform	string	Client platform as determined by HTTP headers: • **"Android""** • **"ChromeOS"** • **"iOS""** • **"Linux""** • **"MacOS""** • **"Win10"** • **"Win2k"** • **"Win2k""** • **"Win7"** • **"Win8.1"** • **"Win8"** • **"WindowsPhone"** • **"WinLH"** • **"WinNT""** • **"WinVI""** • **"WinXP""**

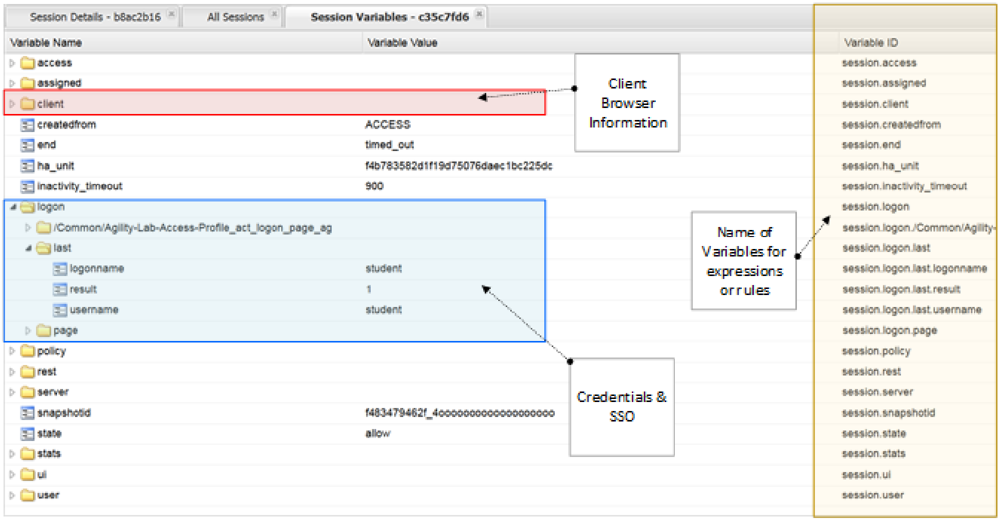
Session Variable Categorization

While these are not formal categories, Session Variables fall under three general categories:

Category	Examples
Variables returned by Access Policy actions	• Active Directory query results • Antivirus Check results • Windows Info and Registry check results
Special purpose user variables	• Lease Pools • Client IP assigned to a client session • Username and Password
Network access resource variables and attributes	• Split tunneling • DNS Settings • Compression, etc.

Active Session Variables

Below is a short breakdown of information gathered and cached during an Active session. Additional information can be gathered from the results of End Point checks when they are put into a policy. These would display as folders like check_av or check_fw if the actions were added to the policy



Variable Name	Variable Value	Variable ID
access		session.access
assigned		session.assigned
client		session.client
createdfrom	ACCESS	session.createdfrom
end	timed_out	session.end
ha_unit	f4b783582d1f19d75076daec1bc225dc	session.ha_unit
inactivity_timeout	900	session.inactivity_timeout
logon		session.logon
/Common/Agility-Lab-Access-Profile_act_logon_page_ag		session.logon./Common/Agility-
last		session.logon.last
logonname	student	session.logon.last.logonname
result	1	session.logon.last.result
username	student	session.logon.last.username
page		session.logon.page
policy		session.policy
rest		session.rest
server		session.server
snapshotid	f483479462f_4oooooooooooooooooooo	session.snapshotid
state	allow	session.state
stats		session.stats
ui		session.ui
user		session.user

Client Browser Information

Name of Variables for expressions or rules

Credentials & SSO

Session Variable Manipulation via TCL

Variables can be parsed, modified, manipulated, etc using TCL. Although the tables below are not an exhaustive reference for writing and using TCL expressions, it includes some common operators and syntax rules.

Standard Operators

You can use TCL standard operators with most BIG-IP® Access Policy Manager® rules. You can find a full list of these operators in the TCL online manual, at http://www.tcl.tk/man/tcl8.5/TclCmd/expr.htm. Standard operators include:

Operator	Description
- + ~ !	Unary minus, unary plus, bit-wise NOT, logical NOT. None of these operators may be applied to string operands, and bit-wise NOT may be applied only to integers.
**	Exponentiation. Valid for any numeric operands.
* / %	Multiply, divide, remainder. None of these operators may be applied to string operands, and remainder may be applied only to integers. The remainder will always have the same sign as the divisor and an absolute value smaller than the divisor.
+ -	Add and subtract. Valid for any numeric operands.
<< >>	Left and right shift. Valid for integer operands only. A right shift always propagates the sign bit.
< > <= >=	
	Boolean less than, greater than, less than or equal to, and greater than or equal to. Each operator produces 1 if the condition is true, 0 otherwise. These operators may be applied to strings as well as numeric operands, in which case string comparison is used.
== !=	Boolean equal to and not equal to. Each operator produces a zero/one result. Valid for all operand types.
eq ne	Boolean string equal to and string not equal to. Each operator produces a zero/one result. The operand types are interpreted only as strings.
in ni	List containment and negated list containment. Each operator produces a zero/one result and treats its first argument as a string and its second argument as a Tcl list. The in operator indicates whether the first argument is a member of the second argument list; the ni operator inverts the sense of the result.
&	Bit-wise AND. Valid for integer operands only.
^	Bit-wise exclusive OR. Valid for integer operands only.
|	Bit-wise OR. Valid for integer operands only.
&&	Logical AND. Produces a 1 result if both operands are non-zero, 0 otherwise. Valid for boolean and numeric (integers or floating-point) operands only.
||	Logical OR. Produces a 0 result if both operands are zero, 1 otherwise. Valid for boolean and numeric (integers or floating-point) operands only.
x?y:z	If-then-else, as in C. If x evaluates to non-zero, then the result is the value of y. Otherwise the result is the value of z. The x operand must have a boolean or numeric value.

Standard Operators

A rule operator compares two operands in an expression. In addition to using the TCL standard operators, you can use the operators listed below.

Operator	Description
contains	Tests if one string contains another string.
ends_with	Tests if one string ends with another string
equals	Tests if one string equals another string
matches	Tests if one string matches another string
matches_regex	Tests if one string matches a regular expression
starts_with	Tests if one string starts_with another string
switch	Evaluates one of several scripts, depending on a given value

Logical Operators

Logical operators are used to compare two values.

Operator	Description
and	Performs a logical and comparison between two values
not	Performs a logical not action on a value
or	Performs a logical or comparison between two values

Getting/Setting Session Variables

During the pre-logon sequence, using the Visual Policy Editor (VPE) you can get and set Session Variables. The following are some quick examples.

- To **set**/**modify** a variable: Variable Assign action
- To **get** a value the last username entered by a user, use expr or return:
  expr { [mcget {session.logon.last.username}]}

expr evaluates an expression, whereas **return** simply returns the result. For example, we have a two custom variables:

- session.custom.value1 = 3
- session.custom.value2 = 4

Using **expr** we can construct the following expression, this would return a value of 7 (i.e. the evaluation of 3+4):

> expr { "[mcget session.custom.value1] + [mcget session.custom.value2]" }.

Using **return** we can construct the following expression, this would return simply "3+4" as shown.

> return { "[mcget session.custom.value1] + [mcget session.custom.value2]" }

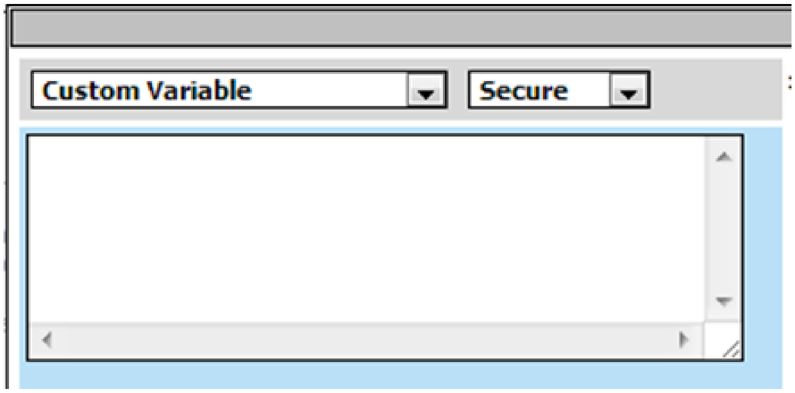
Using iRules

In all the "Access" events

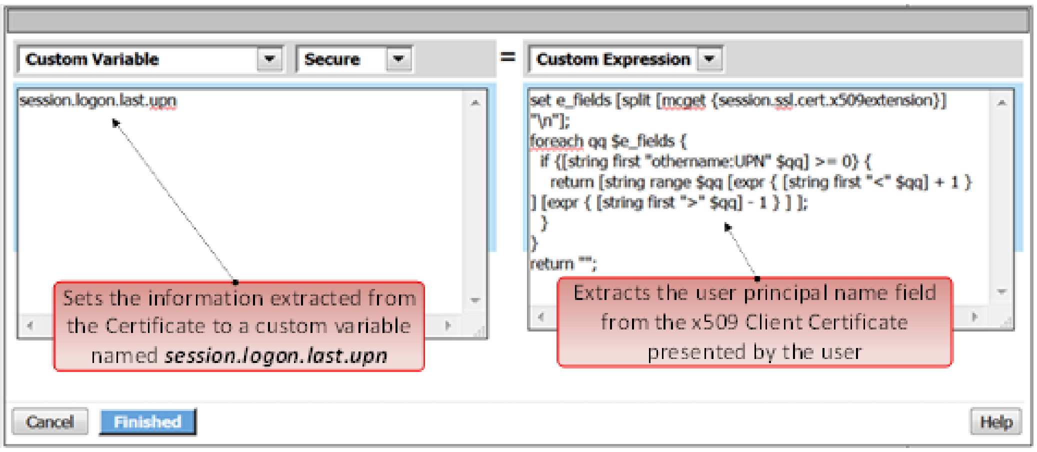
```
ACCESS::session data get/set "variable\_name" ["value"]
```

Set Secure Variables

You can also set Secure Variables. The value of a secure session variable is stored as encrypted in the session db. The value is not displayed as part of session report in UI, nor is it logged as part of logging agent. Secure variables require the -secure flag, both for mcget and access::session data get/set.



Review these two examples below. The first is a Variable Assign action that is SETTING the Session Variable ID of “session.logon.last.upn” with the information extracted from an x509 Client Certificate that was presented by the user’s computer/browser upon connection to the VIP.



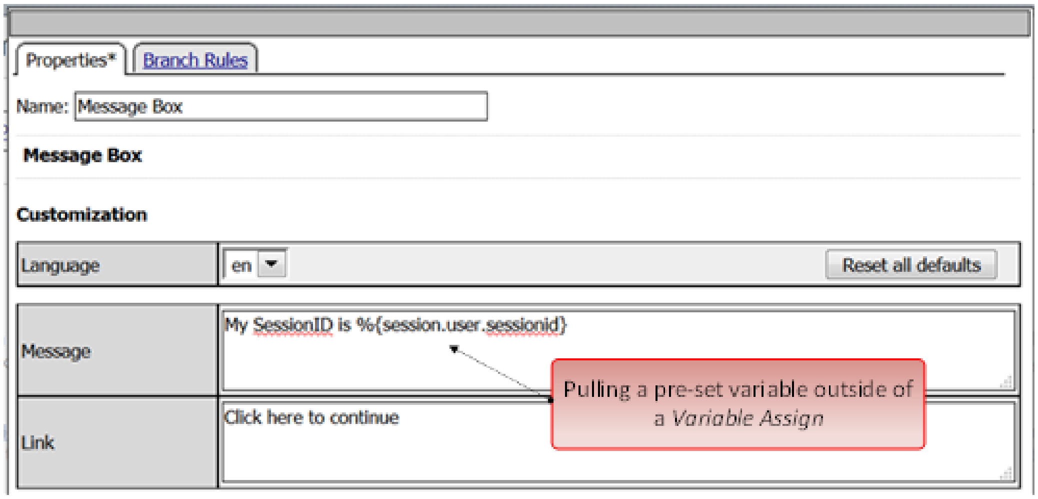
```
session.logon.last.upn
```

```
set e_fields [split [mcget {session.ssl.cert.x509extension}]
"\n"];
foreach qq $e_fields {
  if {[string first "othername:UPN" $qq] >= 0} {
    return [string range $qq [expr { [string first "<" $qq] + 1 }
] [expr { [string first ">" $qq] - 1 } ] ];
  }
}
return "";
```

Sets the information extracted from the Certificate to a custom variable named ***session.logon.last.upn***

Extracts the user principal name field from the x509 Client Certificate presented by the user

The second example show a message box displaying a Session Variable value by calling out the Session Variable ID in the Message Box for the user to see.



Name: Message Box

Language: en

Message: My SessionID is %{session.user.sessionid}

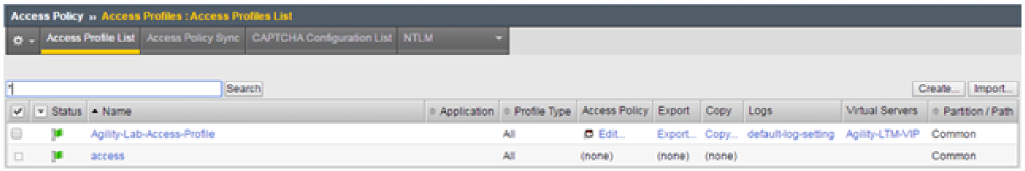
Link: Click here to continue

Pulling a pre-set variable outside of a *Variable Assign*

Session Variable Exercise

The following are some exercises to demonstrate how session variables can be utilized.

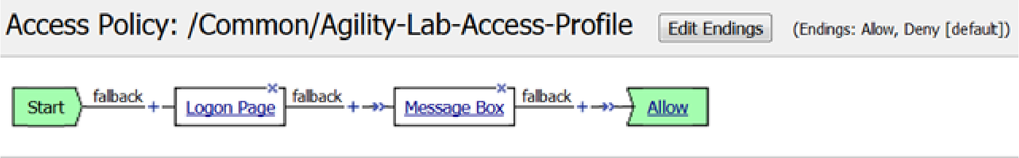
STEP 1



Access Policy » Access Profiles : Access Profiles List

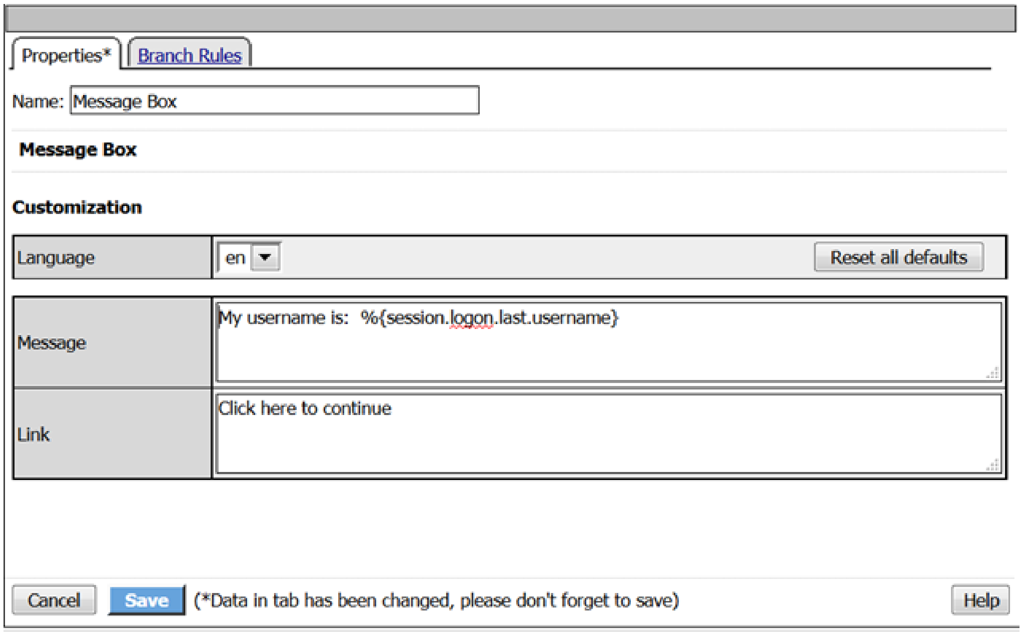
Status	Name	Application	Profile Type	Access Policy	Export	Copy	Logs	Virtual Servers	Partition / Path
	Agility-Lab-Access-Profile		All	Edit...	Export...	Copy...	default-log-setting	Agility-LTM-VIP	Common
	access		All	(none)	(none)	(none)			Common

1. Open the APM VPE for the **Agility-Lab-Access-Profile** Access Policy we have been working with.



Access Policy: /Common/Agility-Lab-Access-Profile

2. Edit the Message Box in the VPE.



Name: Message Box

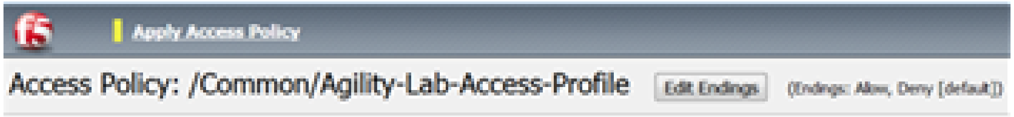
Message Box

Customization

Language	en
Message	My username is: %{session.logon.last.username}
Link	Click here to continue

(*Data in tab has been changed, please don't forget to save)

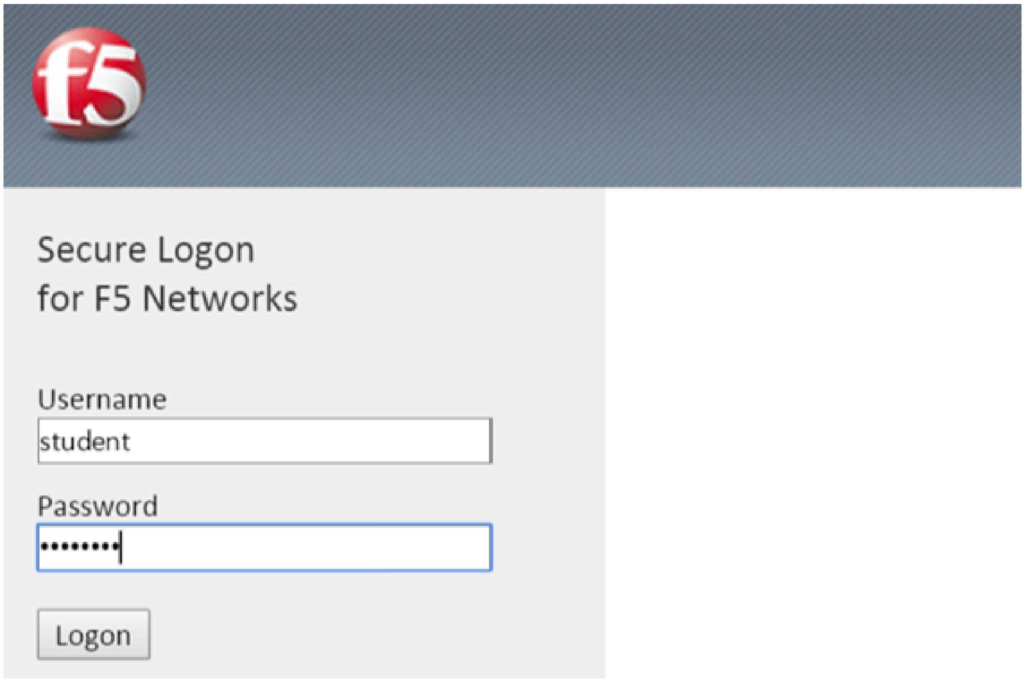
3. In the Message text box enter: **My username is: %{session.logon.last.username}** Then click the **Save** button



Access Policy: /Common/Agility-Lab-Access-Profile

4. Then click Apply Access Policy

TEST 1

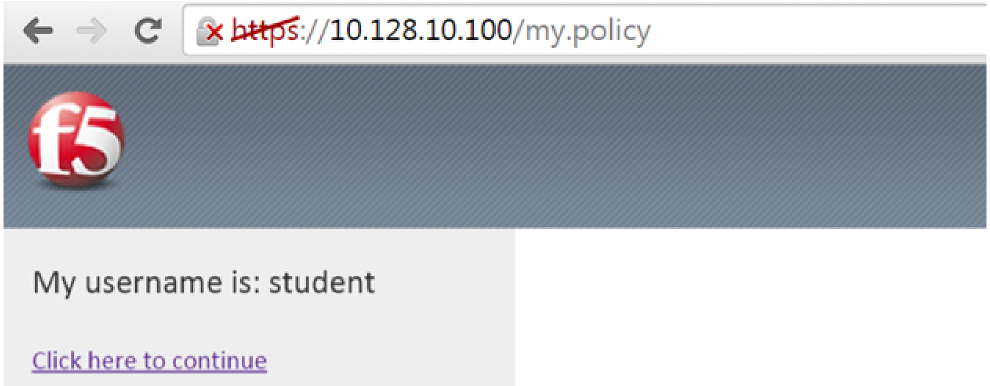


Secure Logon
for F5 Networks

Username: student

Password: ••••••••

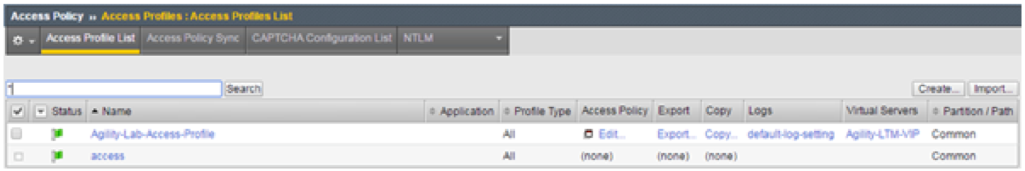
1. Now logon with the “student” username to the test site.



My username is: student

2. When the message box appears, you should see a message stating, “**My username is: student**”. Was it successful?

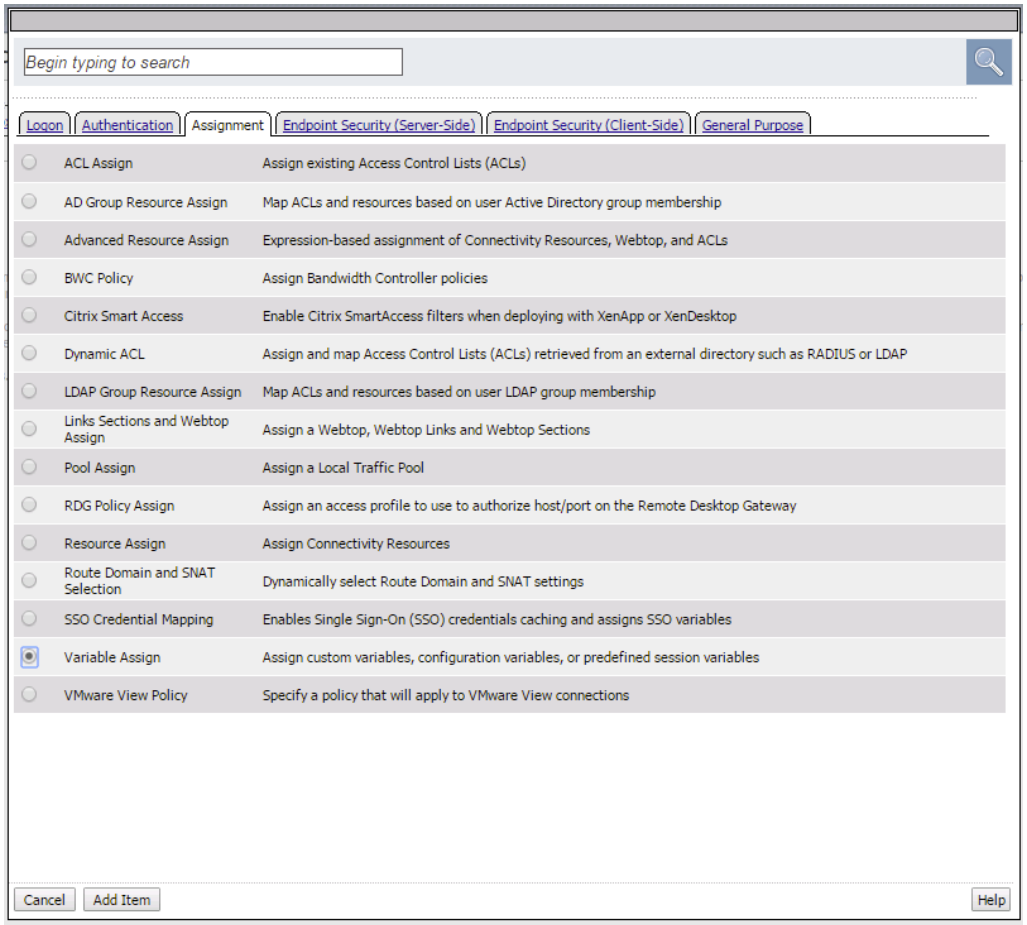
STEP 2



Access Policy » Access Profiles : Access Profiles List

☑	Status	Name	Application	Profile Type	Access Policy	Export	Copy	Logs	Virtual Servers	Partition / Path
□	🟩	Agility-Lab-Access-Profile		All	Edit...	Export...	Copy...	default-log-setting	Agility-LTM-VIP	Common
□	🟩	access		All	(none)	(none)	(none)			Common

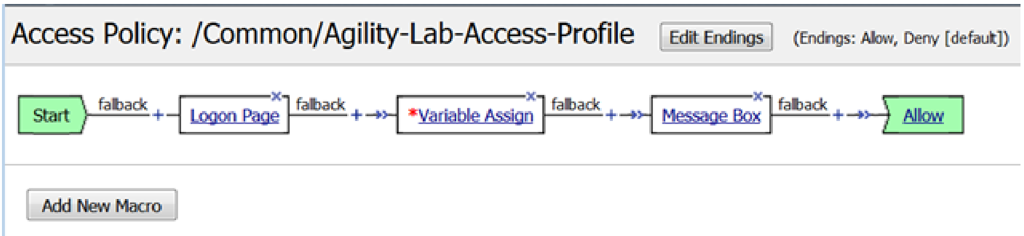
1. Go back into the VPE



Begin typing to search

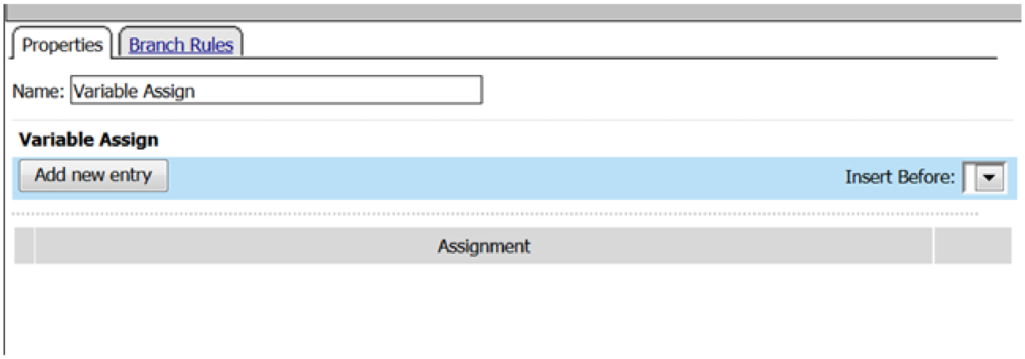
Logon
Authentication
Assignment
Endpoint Security (Server-Side)
Endpoint Security (Client-Side)
General Purpose

○	ACL Assign	Assign existing Access Control Lists (ACLs)
○	AD Group Resource Assign	Map ACLs and resources based on user Active Directory group membership
○	Advanced Resource Assign	Expression-based assignment of Connectivity Resources, Webtop, and ACLs
○	BWC Policy	Assign Bandwidth Controller policies
○	Citrix Smart Access	Enable Citrix SmartAccess filters when deploying with XenApp or XenDesktop
○	Dynamic ACL	Assign and map Access Control Lists (ACLs) retrieved from an external directory such as RADIUS or LDAP
○	LDAP Group Resource Assign	Map ACLs and resources based on user LDAP group membership
○	Links Sections and Webtop Assign	Assign a Webtop, Webtop Links and Webtop Sections
○	Pool Assign	Assign a Local Traffic Pool
○	RDG Policy Assign	Assign an access profile to use to authorize host/port on the Remote Desktop Gateway
○	Resource Assign	Assign Connectivity Resources
○	Route Domain and SNAT Selection	Dynamically select Route Domain and SNAT settings
○	SSO Credential Mapping	Enables Single Sign-On (SSO) credentials caching and assigns SSO variables
●	Variable Assign	Assign custom variables, configuration variables, or predefined session variables
○	VMware View Policy	Specify a policy that will apply to VMware View connections



Access Policy: /Common/Agility-Lab-Access-Profile

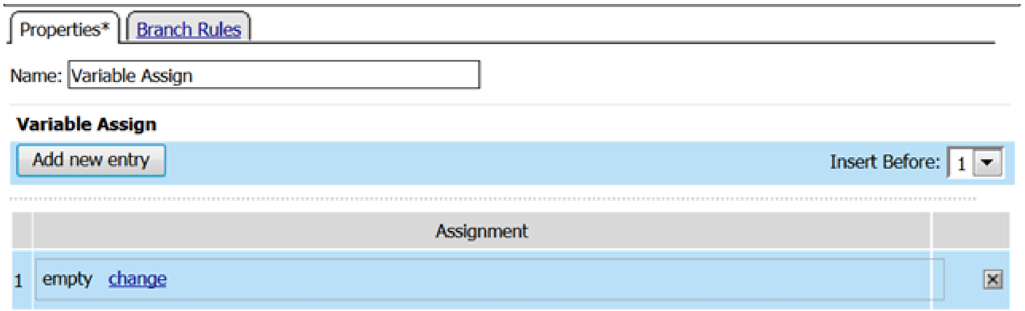
2. Add a Variable Assign action from the Assignment action tab and place it before the Message Box action.



Name: Variable Assign

Variable Assign

3. When the properties screen opens, click the **Add New Entry** button.



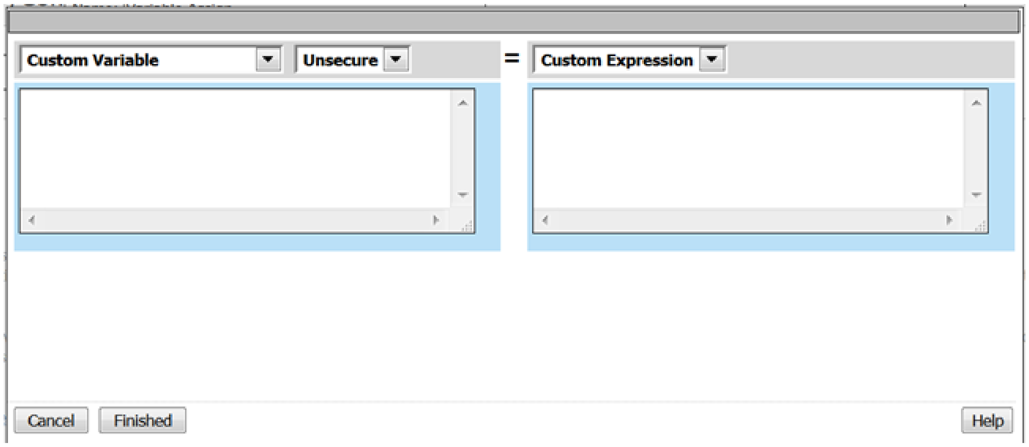
Name: Variable Assign

Variable Assign

Insert Before: 1

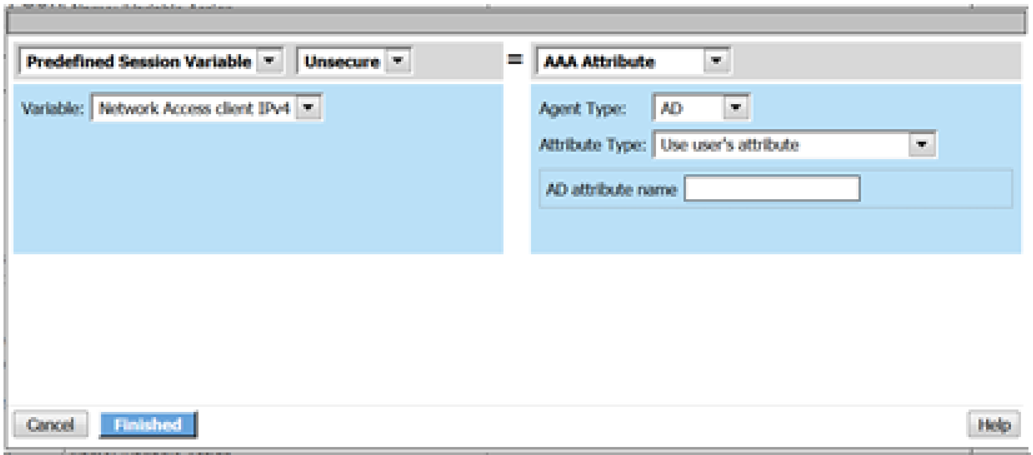
	Assignment	
1	empty change	☒

4. Then click the “Change” link.



Custom Variable | Unsecure = Custom Expression

5. A window will pop up with *Custom Variable* on the left and *Custom Expression* on the right. You will notice both boxes are currently empty.



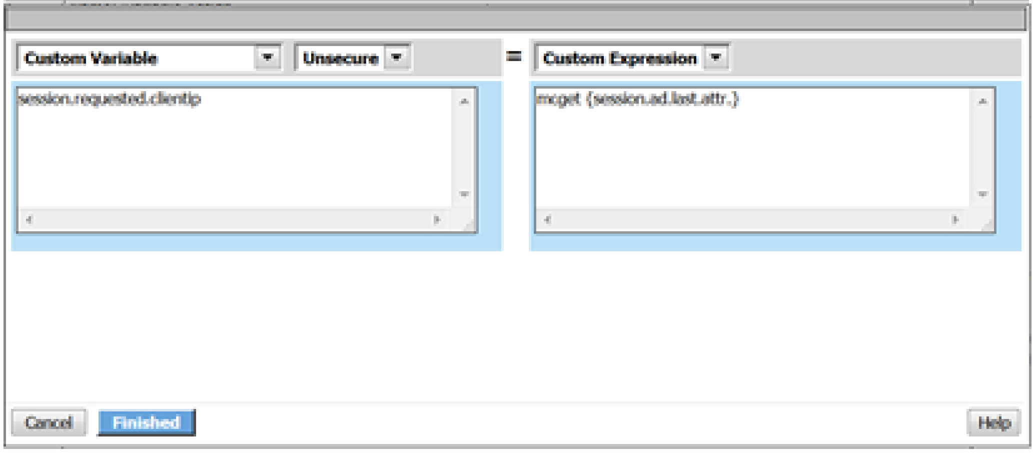
Predefined Session Variable | Unsecure = AAA Attribute

Variable: Network Access client IPv4

Agent Type: AD

Attribute Type: Use user's attribute

AD attribute name



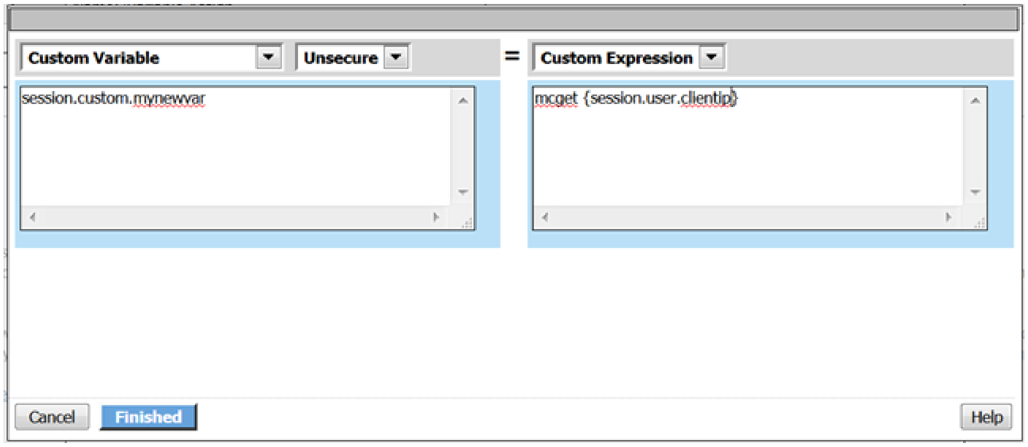
Custom Variable | Unsecure = Custom Expression

session.requested.clientip

mcget {session.ad.last.attr.}

6. Often you may forget how to start off with the variable name or the expression so a trick you can use to get you started is first select a pre-defined variable on the left side and a AAA attribute on the right side and then reselect custom variable and custom expression. This will populate each box with example data that you can now edit.

This is not a required step, just a tip!



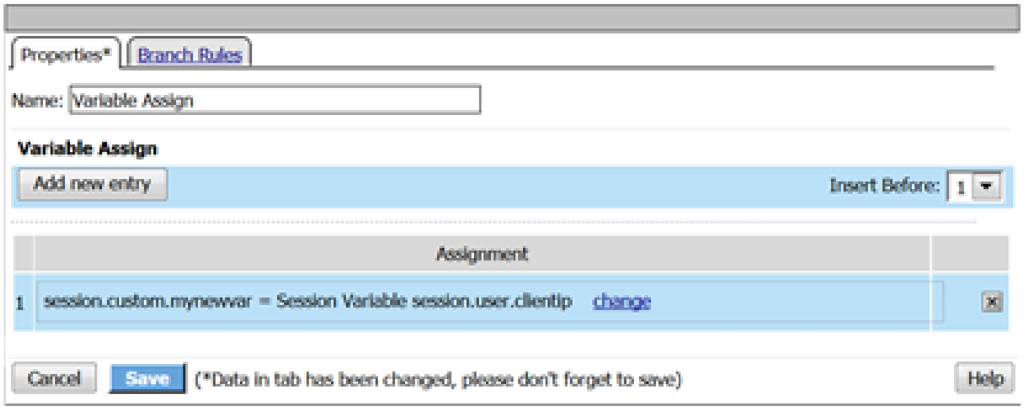
Custom Variable | Unsecure = Custom Expression

session.custom.mynewvar

mcget {session.user.clientip}

7. On the Custom Variable side type: **session.custom.mynewvar** (Be sure to make it lowercase). On the Custom Expression side type: **mcget {session.user.clientip}** (There is a space between mcget and the { bracket)

8. Click the **Finished** button.

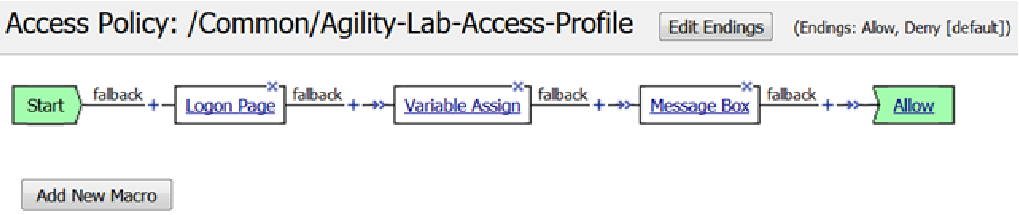


Name: Variable Assign

1 session.custom.mynewvar = Session Variable session.user.clientip

(*Data in tab has been changed, please don't forget to save)

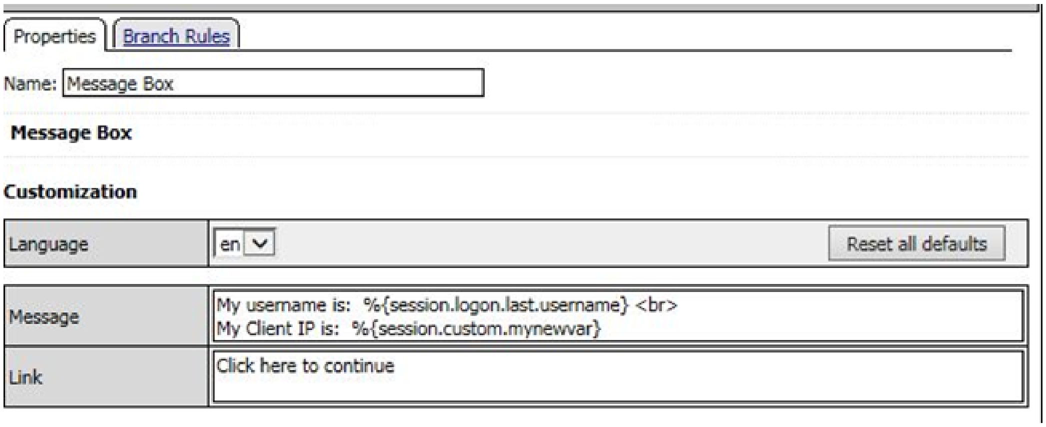
9. Click the **Save** button.



Access Policy: /Common/Agility-Lab-Access-Profile

(Endings: Allow, Deny [default])

10. Click on the Message Box.



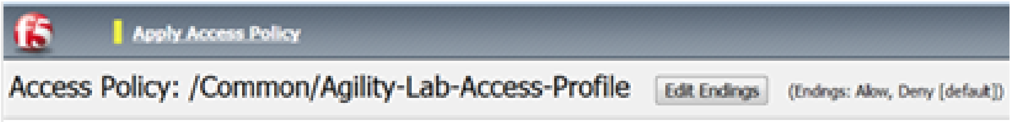
Name: Message Box

Language	en

Message	My username is: %{session.logon.last.username}
	
	My Client IP is: %{session.custom.mynewvar}

Link	Click here to continue

11. After the closing } bracket in the first line of the message section add a space and then type **<br>**
12. Then on the next line type, **My Client IP is: %{session.custom.mynewvar}**
13. Then click the **Save** button.

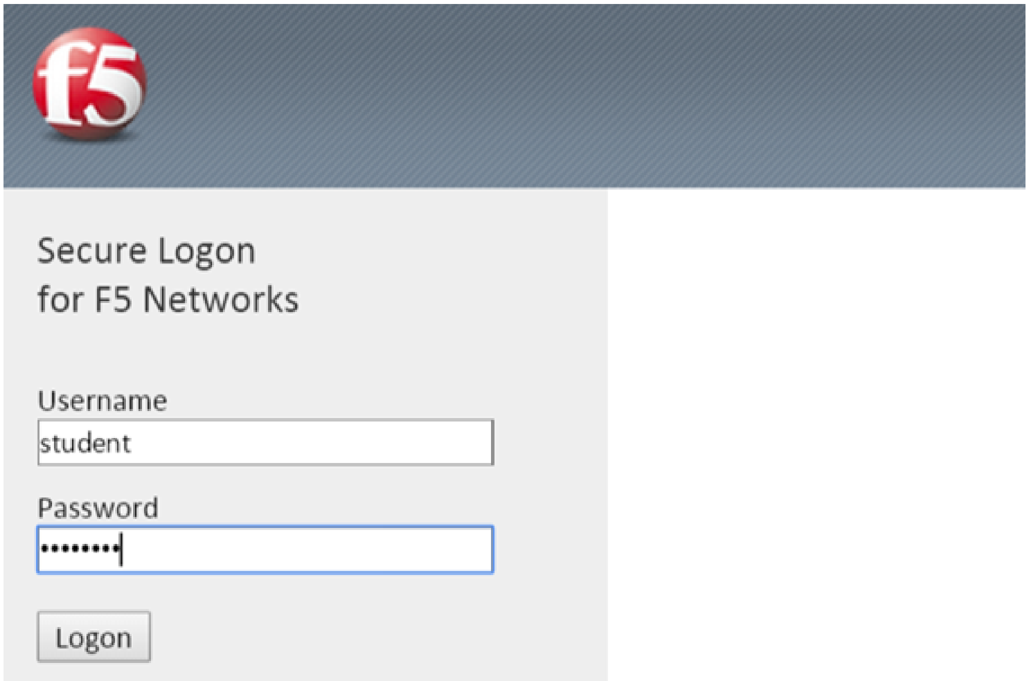


Access Policy: /Common/Agility-Lab-Access-Profile

(Endings: Allow, Deny [default])

14. Then click Apply Access Policy.

TEST 2

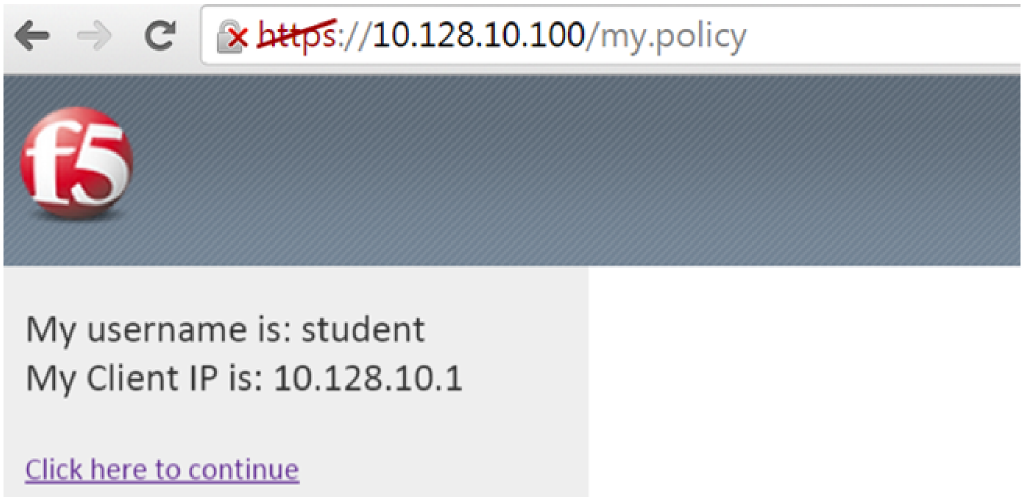


Secure Logon
for F5 Networks

Username
student

Password
••••••••

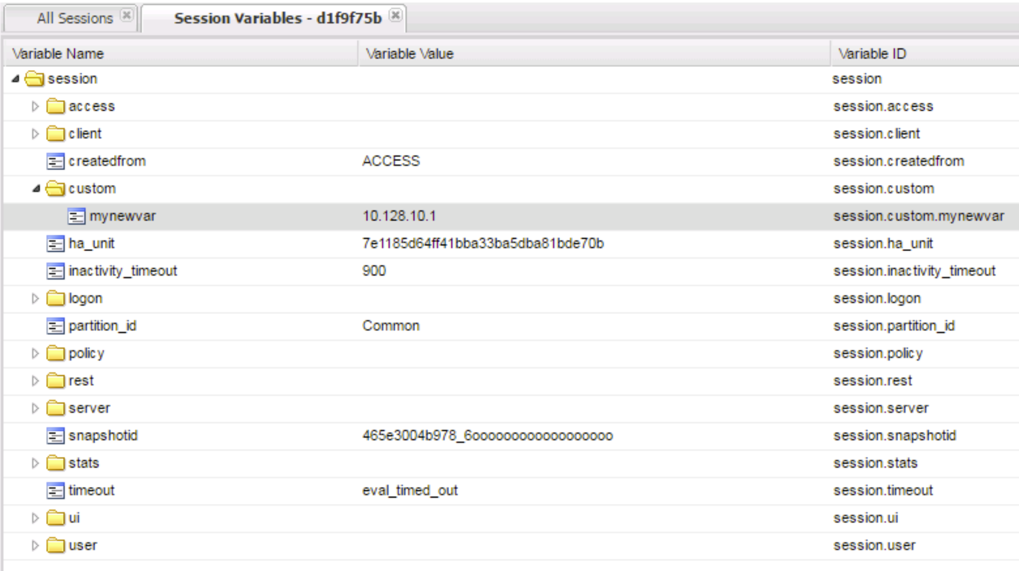
1. Now logon to the test site as a user again and review the message box text.



~~https~~://10.128.10.100/my.policy

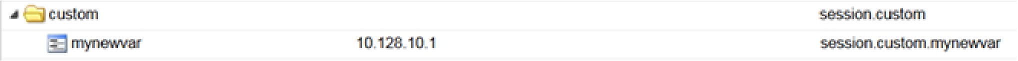
My username is: student
My Client IP is: 10.128.10.1

2. Does it display your client IP address?



Variable Name	Variable Value	Variable ID
session		session
access		session.access
client		session.client
createdfrom	ACCESS	session.createdfrom
custom		session.custom
mynewvar	10.128.10.1	session.custom.mynewvar
ha_unit	7e1185d64ff41bba33ba5dba81bde70b	session.ha_unit
inactivity_timeout	900	session.inactivity_timeout
logon		session.logon
partition_id	Common	session.partition_id
policy		session.policy
rest		session.rest
server		session.server
snapshotid	465e3004b978_6oooooooooooooooooo	session.snapshotid
stats		session.stats
timeout	eval_timed_out	session.timeout
ui		session.ui
user		session.user

3. Now run the All Sessions Report and review the View Session Variables for the active SessionID. (Access ??Overview ?Access Reports)
4. Notice the folder icon named custom and the corresponding Variable ID of session.custom. This was generated automatically during the Variable Assign action that you added to the policy. When you set the Custom Variable to session.custom.mynewvar APM used the next word after the session as the new container (custom) for variable (mynewvar).



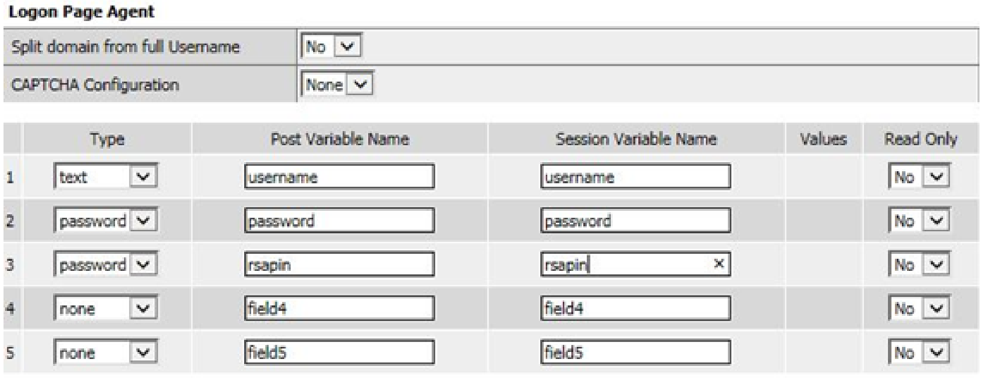
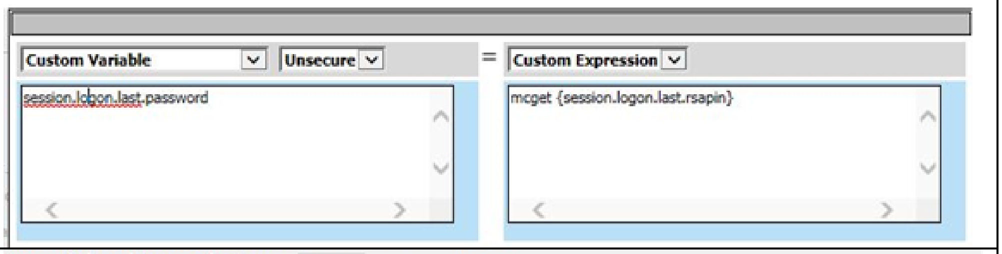
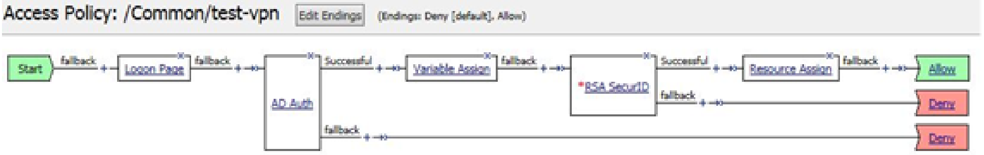
custom		session.custom
mynewvar	10.128.10.1	session.custom.mynewvar

5. If you expand custom folder you will notice a new Variable named mynewvar and in the next column you will see your client ip address and in the third column the variable id of session.custom.mynewvar

As you can see this could be expanded upon to be very useful. For example, maybe you are enabling two-factor authentication for both Active Directory and RSA Secure ID. Well the AAA server authentication Action objects expect to see a specific session variable name sent to them for so that they can correctly parse that data and verify against the AAA server. As an example both the AD Auth and the RSA Auth expect to see session.logon.last.password as the variable used to hold the password value. However, if you create a logon page with three input fields, one for username, a second for AD password and the third for the RSA Token/PIN then they must each have their own unique post and session variable name as they are configured in the Logon Page object.

This means that as the third variable for the RSA toke/pin is passed to APM no longer as session.logon.last.password because the AD Password field was already set to use that variable on the logon page. What do we do now?

Variable Assign to the rescue, take a look at this below example to fix this problem as it mimics what we just accomplished with the session.custom.mynewvar exercise. Consider the following screen shots.

Adding the name of the variable in *Logon Page* action	
Setting the custom variable	
A full view of the policy	

Logon Page Agent

Split domain from full Username	No
CAPTCHA Configuration	None

	Type	Post Variable Name	Session Variable Name	Values	Read Only
1	text	username	username		No
2	password	password	password		No
3	password	rsapin	rsapin		No
4	none	field4	field4		No
5	none	field5	field5		No

Custom Variable | Unsecure = Custom Expression

session.logon.last.password = mcget {session.logon.last.rsapin}

Access Policy: /Common/test-vpn Edit Endings (Endings: Deny [default], Allow)

8.7 Lab 5: Command Line Tools

This lab will show you how to make use of some of the Command Line Utilities for troubleshooting Access Policy Manager when dealing with Authentication issues that you could experience.

8.7.1 Questions to ask yourself (LAB5)

- What should I expect in the Logs with Default Settings?
- Can I review the APM configuration from TMSH?
- Can I review Session Data from the CLI?
- How can I test if the AAA server responds to Authentication Tests using CLI Tools?
- How can I test if the AAA server respond to Query Tests using CLI Tools?
- How can I change the Logging Level for more Verbose details?
- How can I use iRules for Troubleshooting Assistance?
- How can I use TCPDump for Troubleshooting Assistance?

8.7.2 What's Not Covered but we will discuss

- VDI Troubleshooting/Debug Logging
- SAML Troubleshooting Tools – SAML Tracer (Not CLI based)

8.7.3 Checking APM Logs

APM Logs by default show the same information you can get from the Manage Sessions menu, as well as APM module-specific information.

Access Policy Manager uses syslog-ng to log events. The syslog-ng utility is an enhanced version of the standard logging utility syslog.

The type of event messages available on the APM are:

Event Messages	File Location	Description
Access Policy Events	/var/log/apm	Access Policy event messages include logs pertinent to access policy, SSO, network access, and web applications. To view access policy events, on the navigation pane, expand System menu and click Logs.
Audit Logging	/var/log/audit	Audit event messages are those that the APM system logs as a result of changes made to its configuration.

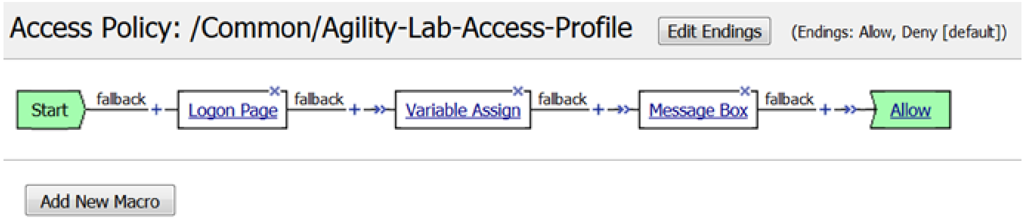
When setting up logging you can customize the logs by designating the minimum severity level or log level, that you want the system to report when a type of event occurs. The minimum log level indicates the minimum severity level at which the system logs that type of event.

Note: Files are rotated daily if their file size exceeds 10MB. Additionally, weekly rotations are enforced if the rotated log file is a week old, regardless whether or not the file exceeds the 10MB threshold.

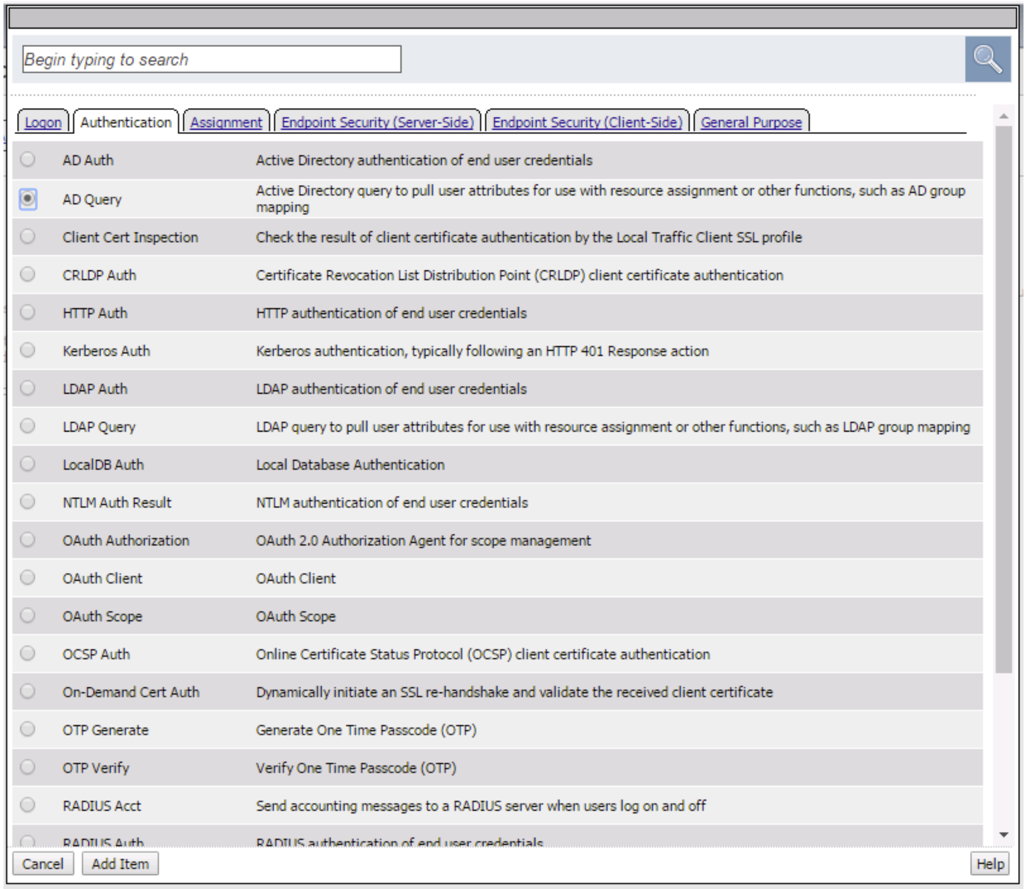
The **default** log level for the BIG-IP APM access policy log is **Notice**, which does ***not*** log Session Variables. Setting the access policy log level to **Informational** or **Debug** will cause the BIG-IP APM system to log Session Variables, but it will also add additional system overhead. If you need to log Session Variables on a production system, F5 recommends setting the access policy log level to Informational temporarily while performing troubleshooting or debugging.

We need to add some more actions to the APM Profile in the VPE we have been working with to go along with the next few lab tests.

STEP 1



1. Open the VPE and add a new AD Query action after the first Message Box action by selecting the **+** sign that follows.

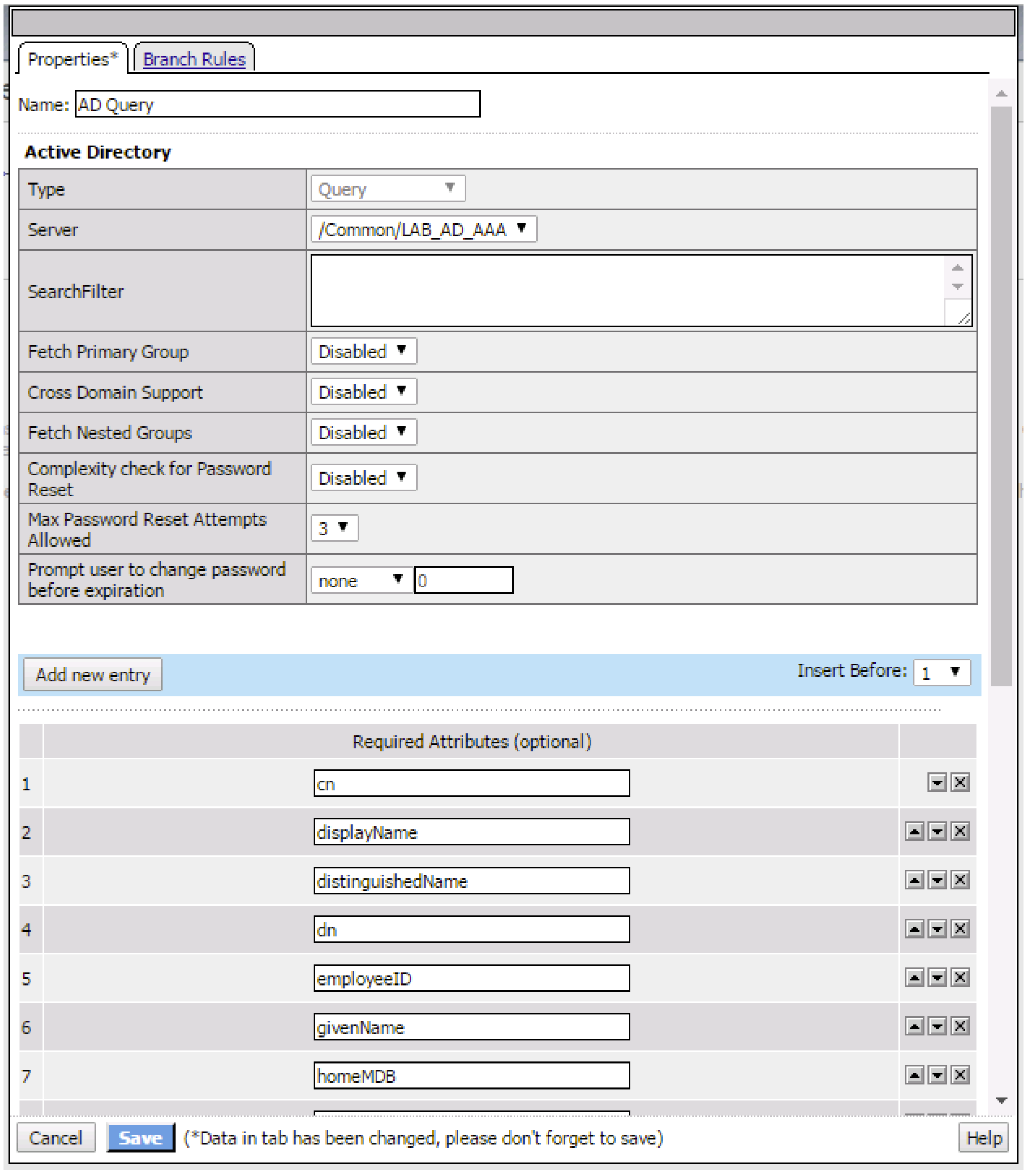


Begin typing to search

Logon | Authentication | Assignment | Endpoint Security (Server-Side) | Endpoint Security (Client-Side) | General Purpose

○	AD Auth	Active Directory authentication of end user credentials
●	AD Query	Active Directory query to pull user attributes for use with resource assignment or other functions, such as AD group mapping
○	Client Cert Inspection	Check the result of client certificate authentication by the Local Traffic Client SSL profile
○	CRLDP Auth	Certificate Revocation List Distribution Point (CRLDP) client certificate authentication
○	HTTP Auth	HTTP authentication of end user credentials
○	Kerberos Auth	Kerberos authentication, typically following an HTTP 401 Response action
○	LDAP Auth	LDAP authentication of end user credentials
○	LDAP Query	LDAP query to pull user attributes for use with resource assignment or other functions, such as LDAP group mapping
○	LocalDB Auth	Local Database Authentication
○	NTLM Auth Result	NTLM authentication of end user credentials
○	OAuth Authorization	OAuth 2.0 Authorization Agent for scope management
○	OAuth Client	OAuth Client
○	OAuth Scope	OAuth Scope
○	OCSP Auth	Online Certificate Status Protocol (OCSP) client certificate authentication
○	On-Demand Cert Auth	Dynamically initiate an SSL re-handshake and validate the received client certificate
○	OTP Generate	Generate One Time Passcode (OTP)
○	OTP Verify	Verify One Time Passcode (OTP)
○	RADIUS Acct	Send accounting messages to a RADIUS server when users log on and off
○	RADIUS Auth	RADIUS authentication of end user credentials

2. Navigate to the Authentication tab and select the AD Query radial and click **Add Item**.



Properties* | Branch Rules

Name: AD Query

Active Directory

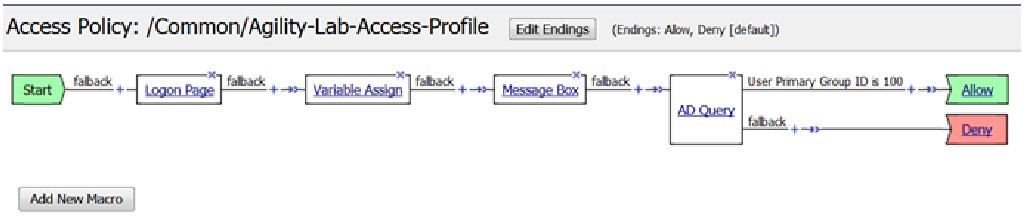
Type	Query
Server	/Common/LAB_AD_AAA
SearchFilter	
Fetch Primary Group	Disabled
Cross Domain Support	Disabled
Fetch Nested Groups	Disabled
Complexity check for Password Reset	Disabled
Max Password Reset Attempts Allowed	3
Prompt user to change password before expiration	none 0

Add new entry — Insert Before: 1

	Required Attributes (optional)
1	cn
2	displayName
3	distinguishedName
4	dn
5	employeeID
6	givenName
7	homeMDB

Cancel | Save | (*Data in tab has been changed, please don't forget to save) | Help

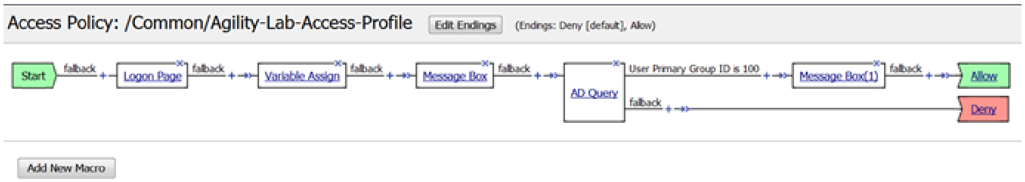
3. In the AD Query, use the drop-down dialog box on Server to select the /**Common/LAB_AD_AAA** server. Click the **Save** button.



Access Policy: /Common/Agility-Lab-Access-Profile Edit Endings (Endings: Allow, Deny [default])

4. On the top branch following the AD Query action, add another Message Box.

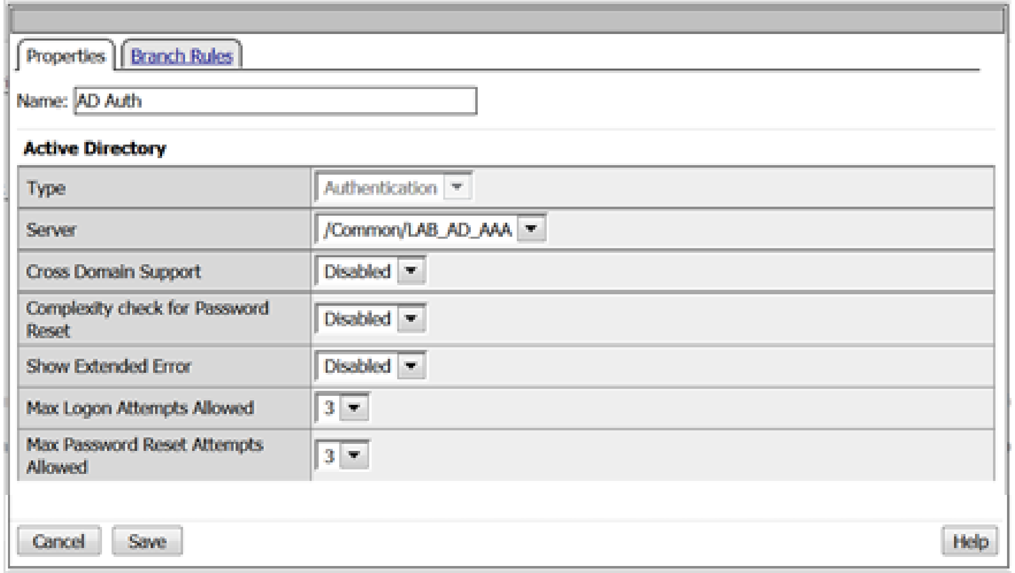
Hint: A Message Box can be added by clicking the **+** sign, navigating to the General Purpose tab and selecting Message Box



Access Policy: /Common/Agility-Lab-Access-Profile

5. After the second Message Box add the AD Auth action from the Authentication tab

Hint: An AD Auth action can be added by clicking the **+** sign, navigating to the Authentication tab and selecting AD Auth



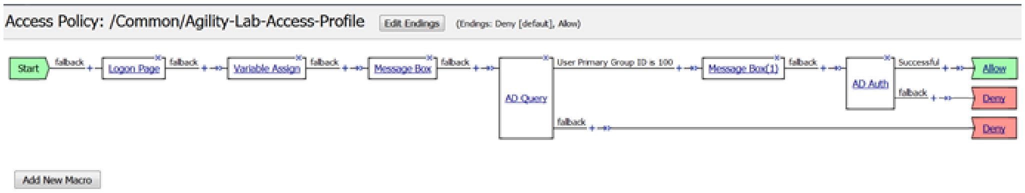
Name: AD Auth

Active Directory

Type	Authentication
Server	/Common/LAB_AD_AAA
Cross Domain Support	Disabled
Complexity check for Password Reset	Disabled
Show Extended Error	Disabled
Max Logon Attempts Allowed	3
Max Password Reset Attempts Allowed	3

6. In the AD Auth properties window use the server drop-down menu to select /**Common**/**LAB_AD_AAA** server.

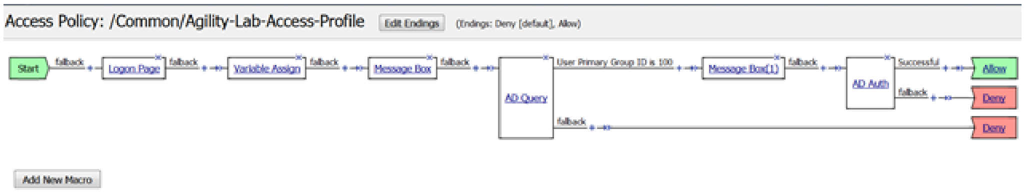
7. Click the **Save** button.



Access Policy: /Common/Agility-Lab-Access-Profile

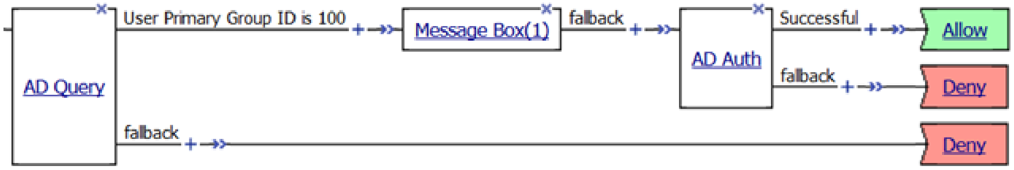
8. Your policy should now look like this

Notice that one the top branch to the AD Query object the line reads User Primary Group ID is 100 (See graphic in Step 8 above, just after AD Query). Maybe you do not want to query for that information and would prefer to delete that branch. You must be ***careful*** in what you select or do when deleting that branch when you have other actions following it in the policy or they could be deleted when you do not want them to be deleted. Here is a trick you can use to preserve the actions that follow the ad query when you need to delete a branch.

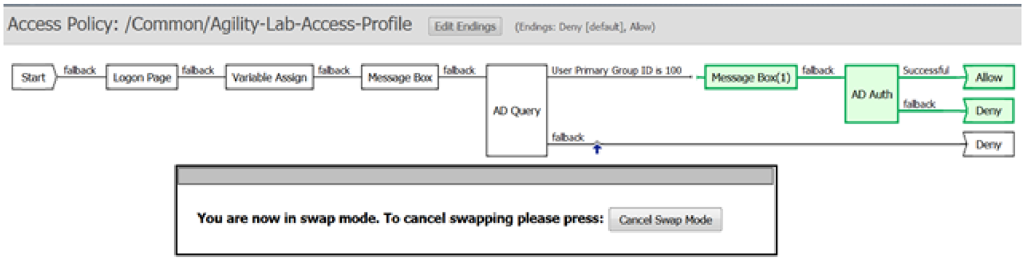


Access Policy: /Common/Agility-Lab-Access-Profile

9. Just before the second Message Box after the “User Primary Group ID is 100” and after the **+** symbol there is a double arrow symbol. This will allow us to swap portions of the policy that come after that **->>-** double arrow to another location in the VPE policy.



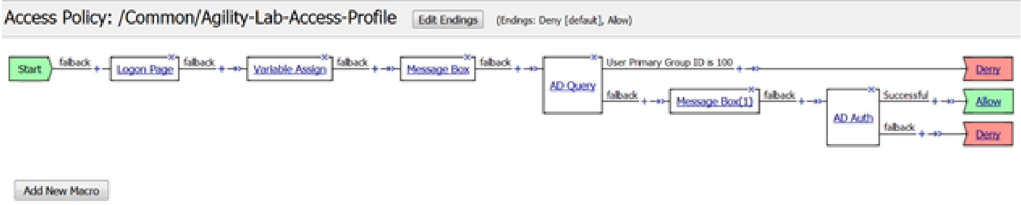
10. Click the **->>-** double arrow.



You are now in swap mode. To cancel swapping please press:

11. You will now notice a **vertical arrow** pointing to other locations in the VPE where this section highlighted in green can be swapped.

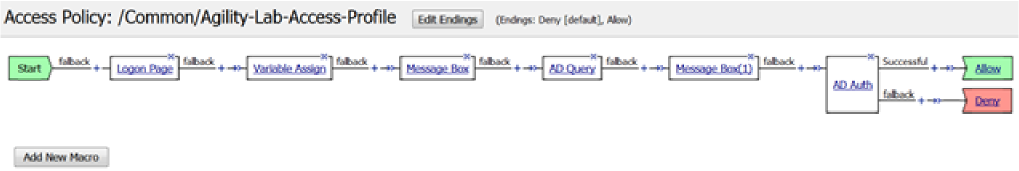
12. Click on the **Vertical Arrow**



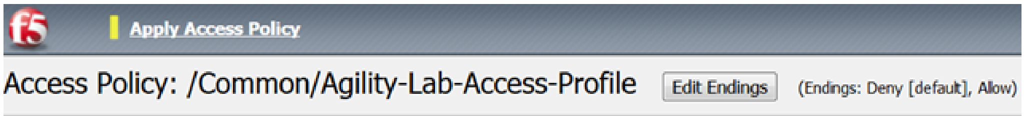
13. Now click the **AD Query** action in your policy and go to **Branch Rules** tab

14. Click the **X** to the right in the gray box for the Branch Rule

15. Click **Save** to save your settings



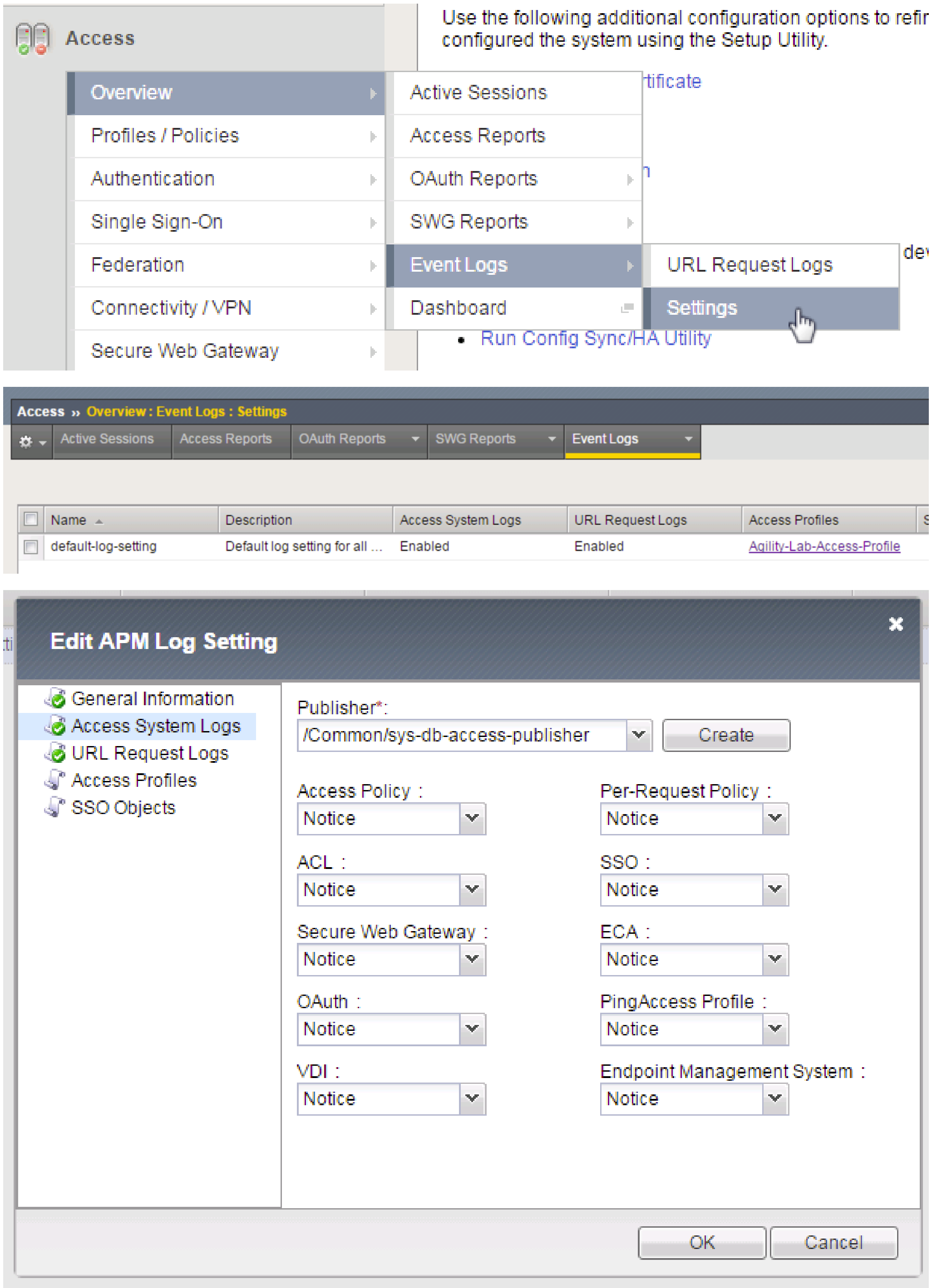
16. Your policy should now look like this. Now you can see how the Swap function can help with moving action objects throughout the VPE


Apply Access Policy
Access Policy: /Common/Agility-Lab-Access-Profile
Edit Endings
(Endings: Deny [default], Allow)

17. Click **Apply Access Policy** to save and implement or work

Now let’s see what can be seen in the logs when set at the default logging level of Notice.

TEST 1



Name	Description	Access System Logs	URL Request Logs	Access Profiles
default-log-setting	Default log setting for all ...	Enabled	Enabled	Agility-Lab-Access-Profile

Edit APM Log Setting

Publisher*: /Common/sys-db-access-publisher

Access Policy : Notice

Per-Request Policy : Notice

ACL : Notice

SSO : Notice

Secure Web Gateway : Notice

ECA : Notice

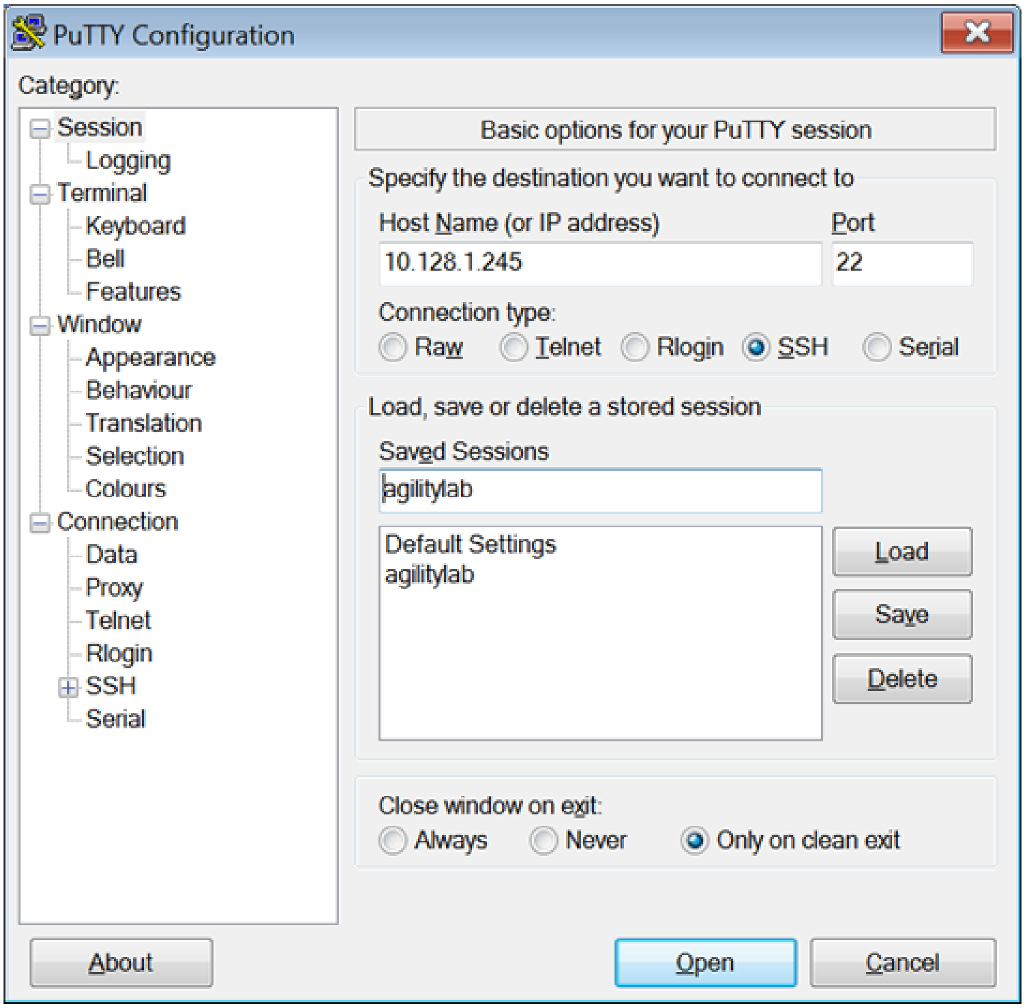
OAuth : Notice

PingAccess Profile : Notice

VDI : Notice

Endpoint Management System : Notice

1. Review the current Access Policy Logging (Access ? Overview ? Event Logs -> Settings)
2. Select **default-log-setting**, then Click Edit to view settings.
3. Select **Access System Logs**



Host Name (or IP address): 10.128.1.245

Port: 22

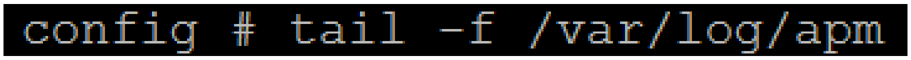
Connection type: ○ Raw ○ Telnet ○ Rlogin ● SSH ○ Serial

Saved Sessions: agilitylab

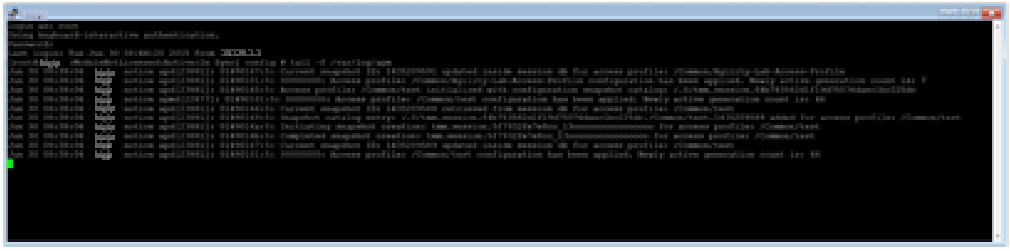
Default Settings
agilitylab

Close window on exit: ○ Always ○ Never ● Only on clean exit

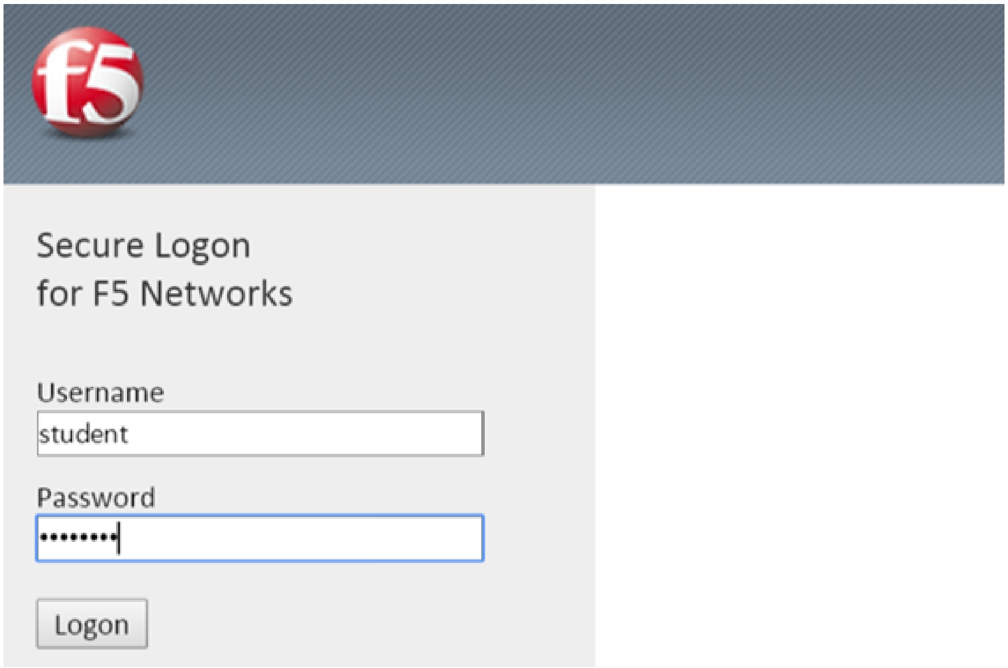
4. Logon to the BIGIP APM console using an SSH client (PuTTY from your desktop). Select **agilitylab** > **Load** > **Open**



```
config # tail -f /var/log/apm
```



5. Maximize your SSH window to reduce line wrapping when reviewing the logs from the CLI.
6. From the CLI prompt, type **tail –f /var/log/apm** and hit **Enter** so you can start see the logs being displayed

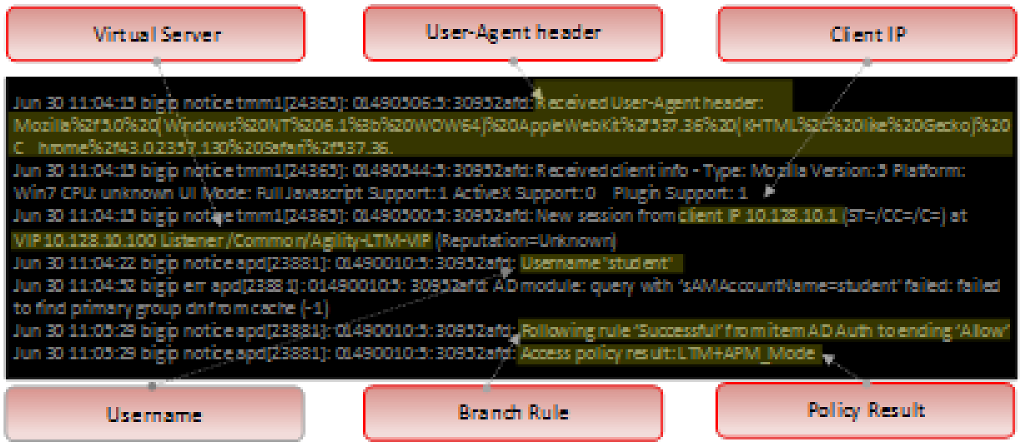


Secure Logon
for F5 Networks

Username
student

Password
••••••••

With the SSH console logging, open a browser and access the APM as the user **student**.



```
Jun 30 11:04:15 bigip notice tmm1[24363]: 01490506:5: 30952afd: Received User-Agent header:
Mozilla%2f5.0%20(Windows%20NT%206.1%3b%20WOW64)%20AppleWebKit%2f537.36%20(KHTML%2c%20like%20Gecko)%20
C  hrome%2f43.0.2357.130%20Safari%2f537.36.
Jun 30 11:04:15 bigip notice tmm1[24363]: 01490544:5: 30952afd: Received client info - Type: Mozilla Version: 5 Platform:
Win7 CPU: unknown UI Mode: Full Javascript Support: 1 ActiveX Support: 0   Plugin Support: 1
Jun 30 11:04:15 bigip notice tmm1[24363]: 01490500:5: 30952afd: New session from client IP 10.128.10.1 (ST=/CC=/C=) at
VIP 10.128.10.100 Listener /Common/Agility-LTM-VIP (Reputation=Unknown)
Jun 30 11:04:22 bigip notice apd[23881]: 01490010:5: 30952afd: Username 'student'
Jun 30 11:04:52 bigip err apd[23881]: 01490010:5: 30952afd: AD module: query with 'sAMAccountName=student' failed: failed
to find primary group dn from cache (-1)
Jun 30 11:05:29 bigip notice apd[23881]: 01490010:5: 30952afd: Following rule 'Successful' from item AD Auth to ending 'Allow'
Jun 30 11:05:29 bigip notice apd[23881]: 01490010:5: 30952afd: Access policy result: LTM+APM_Mode
```

7. Notice the logs being produced at the different stages of the users session as it first reaches the VIP, then when the user authenticates, receives message boxes or other policy actions, and then when the user reaches the policy result.

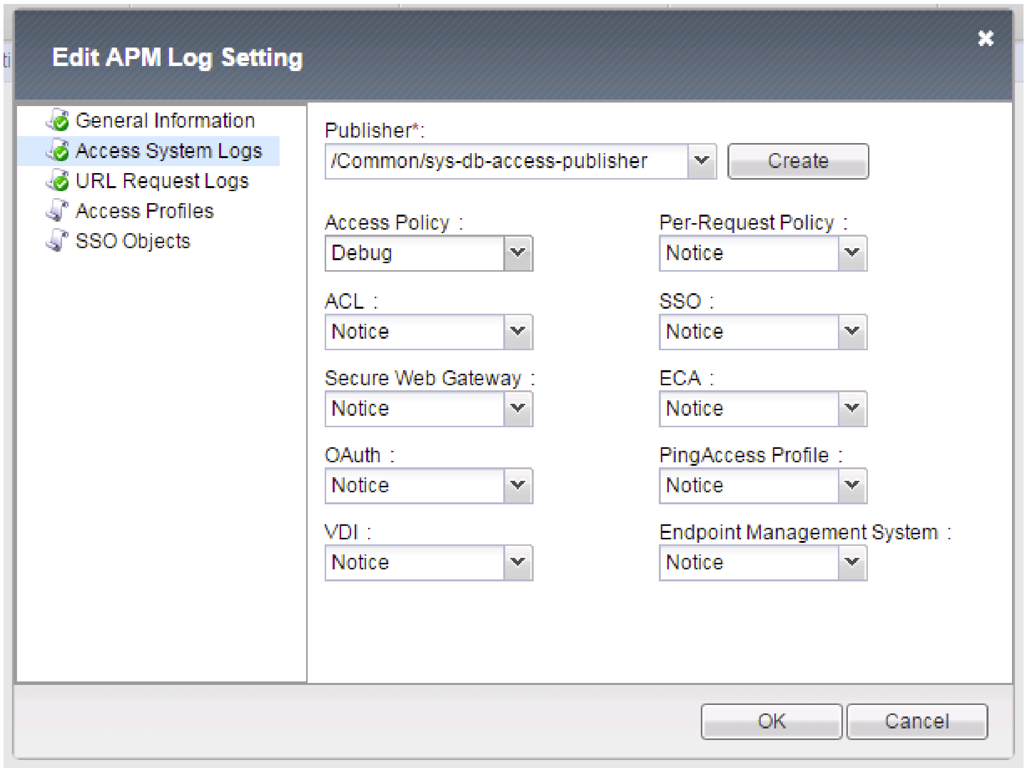
With the ***default logging*** level, there are no session variables being logged.

In the Next test we will turn up logging to Informational and restart the user session and then in the last test change logging level to Debug and notice the differences from Informational and Notice logging levels.

8.7.4 Turning up the heat on Logging

Now let's test more verbose logging. You can step up from Notice to Informational and then to Debug if you want to see the differences yourself. For the purpose of this test though I will jump straight to Debug. You can use the GUI to make the log level changes to Debug or you could use the Traffic Management Shell (TMSH) command from the CLI to adjust the logging.

STEP 1



Publisher*: /Common/sys-db-access-publisher

Access Policy : Debug

Per-Request Policy : Notice

ACL : Notice

SSO : Notice

Secure Web Gateway : Notice

ECA : Notice

OAuth : Notice

PingAccess Profile : Notice

VDI : Notice

Endpoint Management System : Notice

1. Change Access Policy log setting to Debug (Access -> Overview ? Event Logs ? Settings, select default-log-setting, then click Edit)

TIP: Make sure you change setting back to Notice when not troubleshooting. High levels of logging not only consume more disk space, but also consume other resources, such as CPU, when enabled.

TEST 2

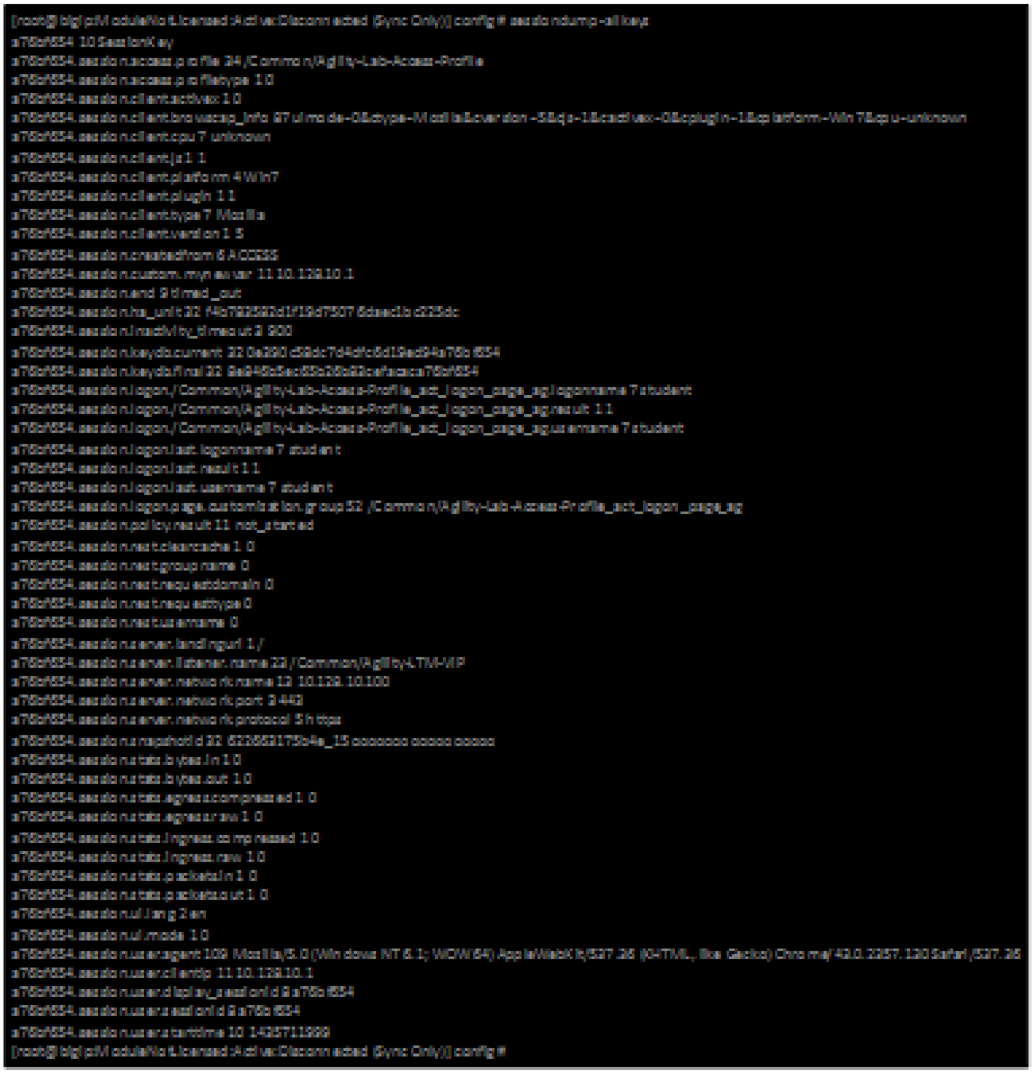
1. Once you have the logging level increased restart you user session with the browser to the APM VIP and walk through the policy message boxes and other actions taking note of the additional verbosity in the logs you see in the SSH terminal window.

For sake of saving space in this document we will not include the screen shots showing the Informational and Debug logging messages and allow you to experience that yourself during your tests.

8.7.5 SessionDump Command

SessionDump is a command line utility that shows sessions and their associated session variables (like GUI Reports)

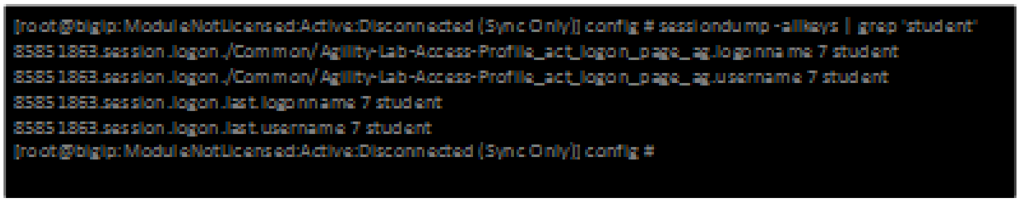
The sessiondump command has sever switches that can be used and you can further enhance your troubleshooting by additionally using other CLI utilities like grep to help filter the results to certain information. As you can see from the examples below, the first command simple provides all keys to be dumped for any/all user sessions while the second using grep allows you to filter the output to those associated with a given username. Refer to the screen shots below if you need additional detail.



```
[root@bigip:ModuleNotLicensed:Active:Disconnected (Sync Only)] config # sessiondump -allkeys
a76bf654 10 SessionKey
a76bf654.session.access.profile 34 /Common/Agility-Lab-Access-Profile
a76bf654.session.access.profiletype 1 0
a76bf654.session.client.activex 1 0
a76bf654.session.client.browscap_info 87 uimode=0&ctype=Mozilla&cversion=5&cjs=1&cactivex=0&cplugin=1&cplatform=Win7&cpu=unknown
a76bf654.session.client.cpu 7 unknown
a76bf654.session.client.js 1 1
a76bf654.session.client.platform 4 Win7
a76bf654.session.client.plugin 1 1
a76bf654.session.client.type 7 Mozilla
a76bf654.session.client.version 1 5
a76bf654.session.createdfrom 6 ACCESS
a76bf654.session.custom.mynewvar 11 10.128.10.1
a76bf654.session.end 9 timed_out
a76bf654.session.ha_unit 32 f4b792592d1f19d7507 6daed1bc225dc
a76bf654.session.inactivity_timeout 3 900
a76bf654.session.keydb.current 32 0e290c39dc7d4dfc6d19ed94a76bf654
a76bf654.session.keydb.final 32 8e948a5ec85b36b83cefacaca76bf654
a76bf654.session.logon./Common/Agility-Lab-Access-Profile_act_logon_page_ag.logonname 7 student
a76bf654.session.logon./Common/Agility-Lab-Access-Profile_act_logon_page_ag.result 1 1
a76bf654.session.logon./Common/Agility-Lab-Access-Profile_act_logon_page_ag.username 7 student
a76bf654.session.logon.last.logonname 7 student
a76bf654.session.logon.last.result 1 1
a76bf654.session.logon.last.username 7 student
a76bf654.session.logon.page.customization.group 52 /Common/Agility-Lab-Access-Profile_act_logon_page_ag
a76bf654.session.policy.result 11 not_started
a76bf654.session.rest.clearcache 1 0
a76bf654.session.rest.groupname 0
a76bf654.session.rest.requestdomain 0
a76bf654.session.rest.requesttype 0
a76bf654.session.rest.username 0
a76bf654.session.server.landinguri 1 /
a76bf654.session.server.listener.name 22 /Common/Agility-LTM-VIP
a76bf654.session.server.network.name 12 10.128.10.100
a76bf654.session.server.network.port 3 443
a76bf654.session.server.network.protocol 5 https
a76bf654.session.snapshotid 32 6226631755b4e_15 cccccccc cccccc cccccc
a76bf654.session.stats.bytes.in 1 0
a76bf654.session.stats.bytes.out 1 0
a76bf654.session.stats.egress.compressed 1 0
a76bf654.session.stats.egress.raw 1 0
a76bf654.session.stats.ingress.compressed 1 0
a76bf654.session.stats.ingress.raw 1 0
a76bf654.session.stats.packets.in 1 0
a76bf654.session.stats.packets.out 1 0
a76bf654.session.ui.lang 2 en
a76bf654.session.ui.mode 1 0
a76bf654.session.user.agent 109 Mozilla/5.0 (Windows NT 6.1; WOW64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/42.0.2257.130 Safari/537.36
a76bf654.session.user.clientip 11 10.128.10.1
a76bf654.session.user.display_sessionid 8 a76bf654
a76bf654.session.user.sessionid 8 a76bf654
a76bf654.session.user.starttime 10 1435711999
[root@bigip:ModuleNotLicensed:Active:Disconnected (Sync Only)] config #
```

This first example uses just the –allkeys switch.

sessiondump –allkeys

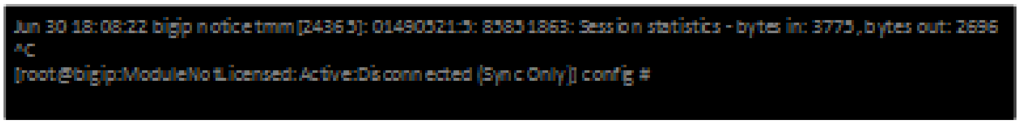


```
[root@bigip:ModuleNotLicensed:Active:Disconnected (Sync Only)] config # sessiondump -allkeys | grep 'student'
85851863.session.logon./Common/Agility-Lab-Access-Profile_act_logon_page_ag.logonname 7 student
85851863.session.logon./Common/Agility-Lab-Access-Profile_act_logon_page_ag.username 7 student
85851863.session.logon.last.logonname 7 student
85851863.session.logon.last.username 7 student
[root@bigip:ModuleNotLicensed:Active:Disconnected (Sync Only)] config #
```

This second example also uses the –allkeys switch. However, it also adds the |grep command to search for the “username”

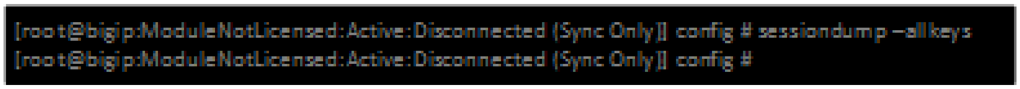
sessiondump -allkeys | grep ‘student’

STEP 1



```
Jun 30 18:08:22 bigip notice tmm[24365]: 01490521:5: 85851863: Session statistics - bytes in: 3775, bytes out: 2696
^C
[root@bigip:ModuleNotLicensed:Active:Disconnected (Sync Only)] config #
```

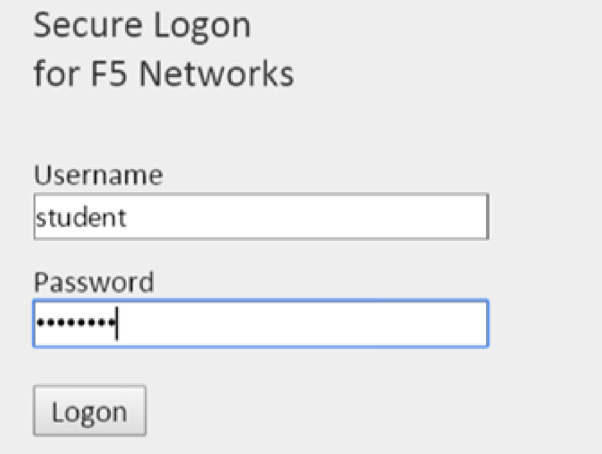
1. On the command line, if you still had the tail command showing logging then stop that now by typing **CTRL-C**



```
[root@bigip:ModuleNotLicensed:Active:Disconnected (Sync Only)] config # sessiondump –allkeys
[root@bigip:ModuleNotLicensed:Active:Disconnected (Sync Only)] config #
```

Remember back in previous labs we learned that Session Variables cannot be displayed in the Reports screens if the User Session is not in an ***Active*** state. Well that is the same with the CLI sessiondump utility. There must be active sessions through APM in order to dump details.

2. Once you are at the command prompt again try using the **sessiondump –allkeys** command first. Did you receive any data after running the command? If not, then why?

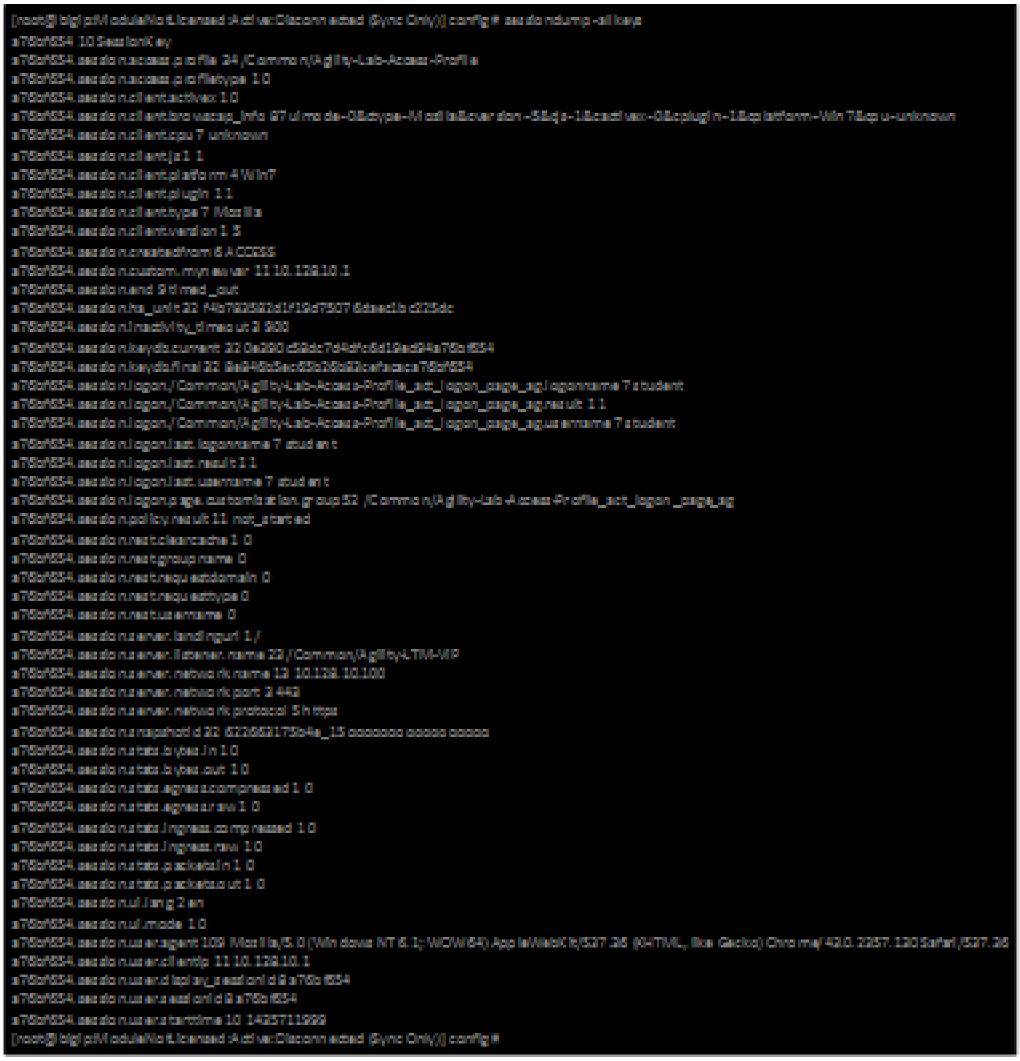


Secure Logon
for F5 Networks

Username
student

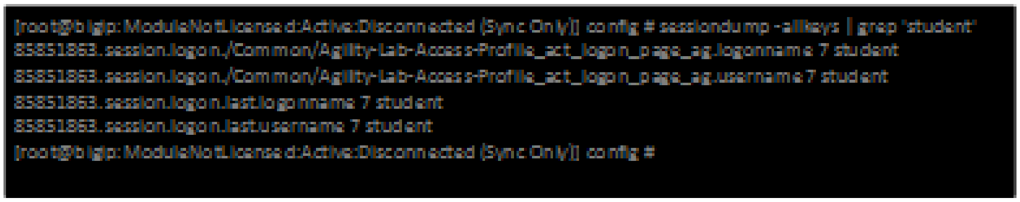
Password
••••••••

3. If all your previous sessions have expired then startup and new session as a user and logon to APM and click through the message boxes.



```
[root@bigip:ModuleNotLicensed:Active:Disconnected (Sync Only)] config # sessiondump -allkeys
a78bf654 10 SessionKey
a78bf654.session.access.profile 24 /Common/Agility-Lab-Access-Profile
a78bf654.session.access.profiletype 1 0
a78bf654.session.client.activex 1 0
a78bf654.session.client.browscap_info 87 uimode=0&ctype=Mozilla&cversion=5&cjs=1&cactivex=0&cplugin=1&cplatform=Win7&cpu=unknown
a78bf654.session.client.cpu 7 unknown
a78bf654.session.client.js 1 1
a78bf654.session.client.platform 4 Win7
a78bf654.session.client.plugin 1 1
a78bf654.session.client.type 7 Mozilla
a78bf654.session.client.version 1 5
a78bf654.session.createdfrom 6 ACCESS
a78bf654.session.custom.mynewvar 11 10.128.10.1
a78bf654.session.end 9 timed_out
a78bf654.session.ha_unit 32 f4b792592d1f19d75076daec1bc225dc
a78bf654.session.inactivity_timeout 3 900
a78bf654.session.keydb.current 32 0a390c59dc7d4dfc6d19ad94a78bf654
a78bf654.session.keydb.final 32 8e8469b5ec65b2b8d2cafacaca78bf654
a78bf654.session.logon./Common/Agility-Lab-Access-Profile_act_logon_page_ag.logonname 7 student
a78bf654.session.logon./Common/Agility-Lab-Access-Profile_act_logon_page_ag.result 1 1
a78bf654.session.logon./Common/Agility-Lab-Access-Profile_act_logon_page_ag.username 7 student
a78bf654.session.logon.last.logonname 7 student
a78bf654.session.logon.last.result 1 1
a78bf654.session.logon.last.username 7 student
a78bf654.session.logon.page.customization.group 52 /Common/Agility-Lab-Access-Profile_act_logon_page_ag
a78bf654.session.policy.result 11 not_started
a78bf654.session.rest.clearcache 1 0
a78bf654.session.rest.groupname 0
a78bf654.session.rest.requestdomain 0
a78bf654.session.rest.requesttype 0
a78bf654.session.rest.username 0
a78bf654.session.server.landinguri 1 /
a78bf654.session.server.listener.name 22 /Common/Agility-LTM-VIP
a78bf654.session.server.network.name 13 10.128.10.100
a78bf654.session.server.network.port 3 443
a78bf654.session.server.network.protocol 5 https
a78bf654.session.snapshotid 32 622663173b4e_15 0000000 00000 00000
a78bf654.session.stats.bytes.in 1 0
a78bf654.session.stats.bytes.out 1 0
a78bf654.session.stats.egress.compressed 1 0
a78bf654.session.stats.egress.raw 1 0
a78bf654.session.stats.ingress.compressed 1 0
a78bf654.session.stats.ingress.raw 1 0
a78bf654.session.stats.packets.in 1 0
a78bf654.session.stats.packets.out 1 0
a78bf654.session.ui.lang 2 en
a78bf654.session.ui.mode 1 0
a78bf654.session.user.agent 109 Mozilla/5.0 (Windows NT 6.1; WOW64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/43.0.2357.130 Safari/537.36
a78bf654.session.user.clientip 11 10.128.10.1
a78bf654.session.user.display_sessionid 8 a78bf654
a78bf654.session.user.sessionid 8 a78bf654
a78bf654.session.user.starttime 10 1435711999
[root@bigip:ModuleNotLicensed:Active:Disconnected (Sync Only)] config #
```

4. Now on the console type: **sessiondump –allkeys.** You should see a long list of information.

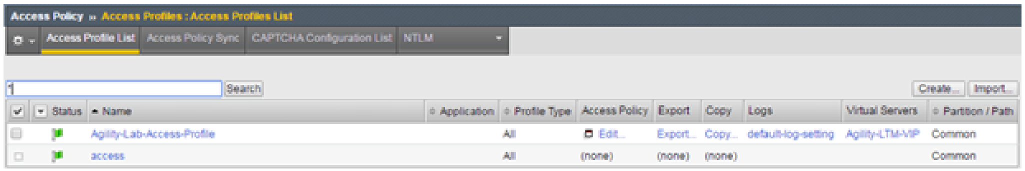


```
[root@bigip:ModuleNotLicensed:Active:Disconnected (Sync Only)] config # sessiondump -allkeys | grep 'student'
85851863.session.logon./Common/Agility-Lab-Access-Profile_act_logon_page_ag.logonname 7 student
85851863.session.logon./Common/Agility-Lab-Access-Profile_act_logon_page_ag.username 7 student
85851863.session.logon.last.logonname 7 student
85851863.session.logon.last.username 7 student
[root@bigip:ModuleNotLicensed:Active:Disconnected (Sync Only)] config #
```

Compare that with running: sessiondump –allkeys | grep student You should then only see the lines that had the username you specified in the command to be returned

Now let us have some fun with using this utility to help with SSO troubleshooting/validation.

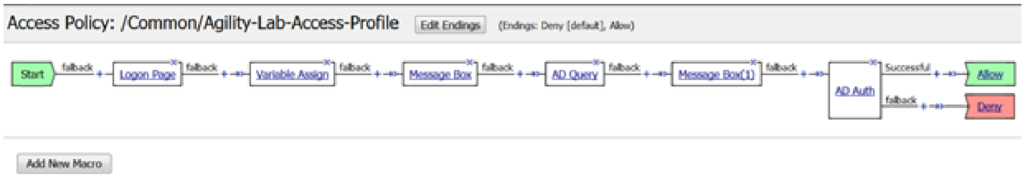
STEP 2



Access Policy » Access Profiles : Access Profiles List
⚙ ▾
Access Profile List
Access Policy Sync
CAPTCHA Configuration List
NTLM ▾
Search
Create...
Import...

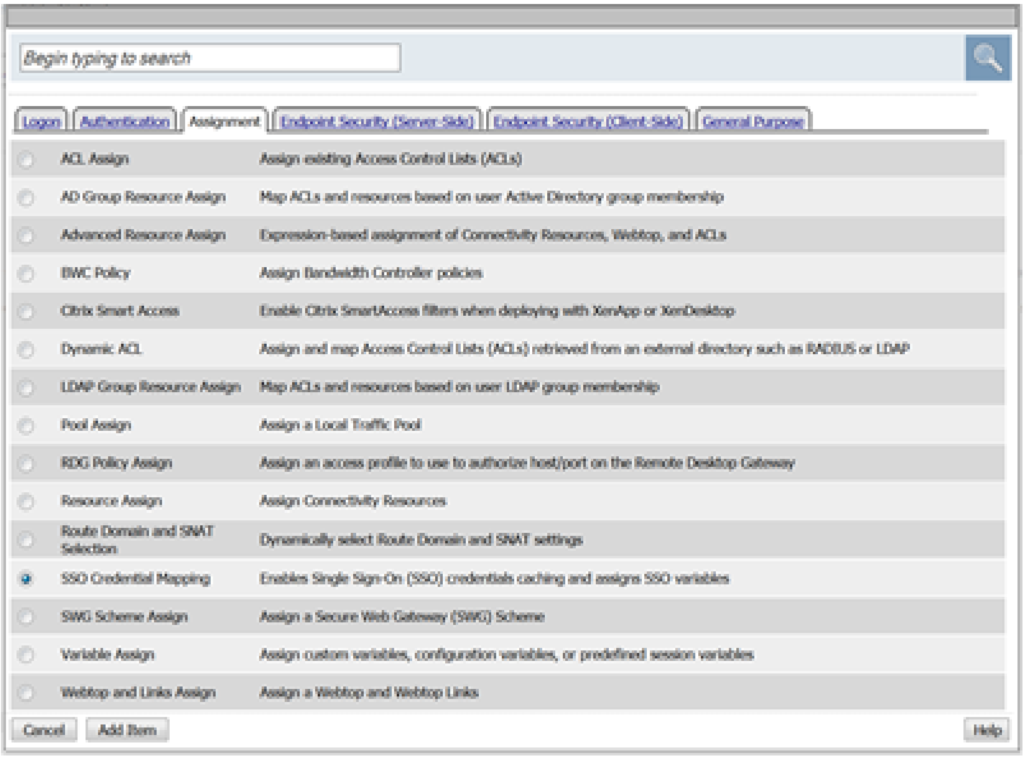
☑	Status	▲ Name	⇕ Application	⇕ Profile Type	Access Policy	Export	Copy	Logs	Virtual Servers	⇕ Partition / Path
□	🟩	Agility-Lab-Access-Profile		All	Edit...	Export...	Copy...	default-log-setting	Agility-LTM-VIP	Common
□	🟩	access		All	(none)	(none)	(none)			Common

1. Edit the VPE for the **Agility-Lab-Access-Profile** policy we have been working with.



Access Policy: /Common/Agility-Lab-Access-Profile Edit Endings (Endings: Deny [default], Allow)

2. Add two new actions to the policy after the AD Auth on the successful branch.

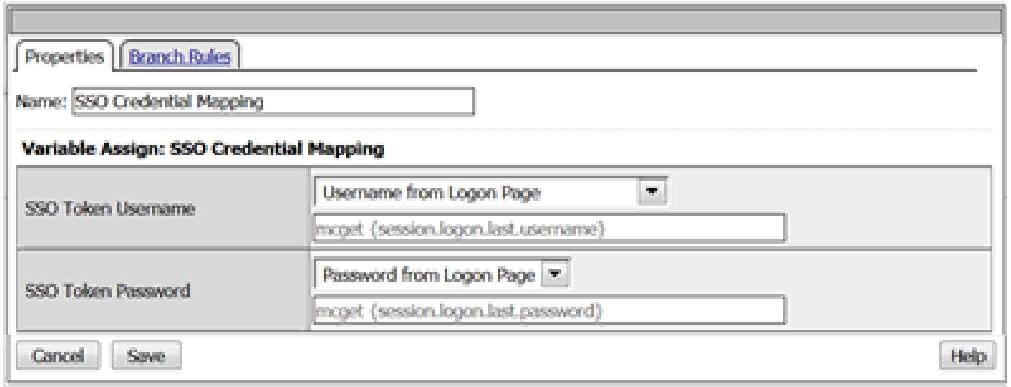


Begin typing to search

Logon
Authentication
Assignment
Endpoint Security (Server-Side)
Endpoint Security (Client-Side)
General Purpose

○	ACL Assign	Assign existing Access Control Lists (ACLs)
○	AD Group Resource Assign	Map ACLs and resources based on user Active Directory group membership
○	Advanced Resource Assign	Expression-based assignment of Connectivity Resources, Webtop, and ACLs
○	BWC Policy	Assign Bandwidth Controller policies
○	Citrix Smart Access	Enable Citrix SmartAccess filters when deploying with XenApp or XenDesktop
○	Dynamic ACL	Assign and map Access Control Lists (ACLs) retrieved from an external directory such as RADIUS or LDAP
○	LDAP Group Resource Assign	Map ACLs and resources based on user LDAP group membership
○	Pool Assign	Assign a Local Traffic Pool
○	RDG Policy Assign	Assign an access profile to use to authorize host/port on the Remote Desktop Gateway
○	Resource Assign	Assign Connectivity Resources
○	Route Domain and SNAT Selection	Dynamically select Route Domain and SNAT settings
●	SSO Credential Mapping	Enables Single Sign-On (SSO) credentials caching and assigns SSO variables
○	SWG Scheme Assign	Assign a Secure Web Gateway (SWG) Scheme
○	Variable Assign	Assign custom variables, configuration variables, or predefined session variables
○	Webtop and Links Assign	Assign a Webtop and Webtop Links

3. First after AD Auth add the SSO Credential Mapping action from the Assignment Tab. Click **Add Item**

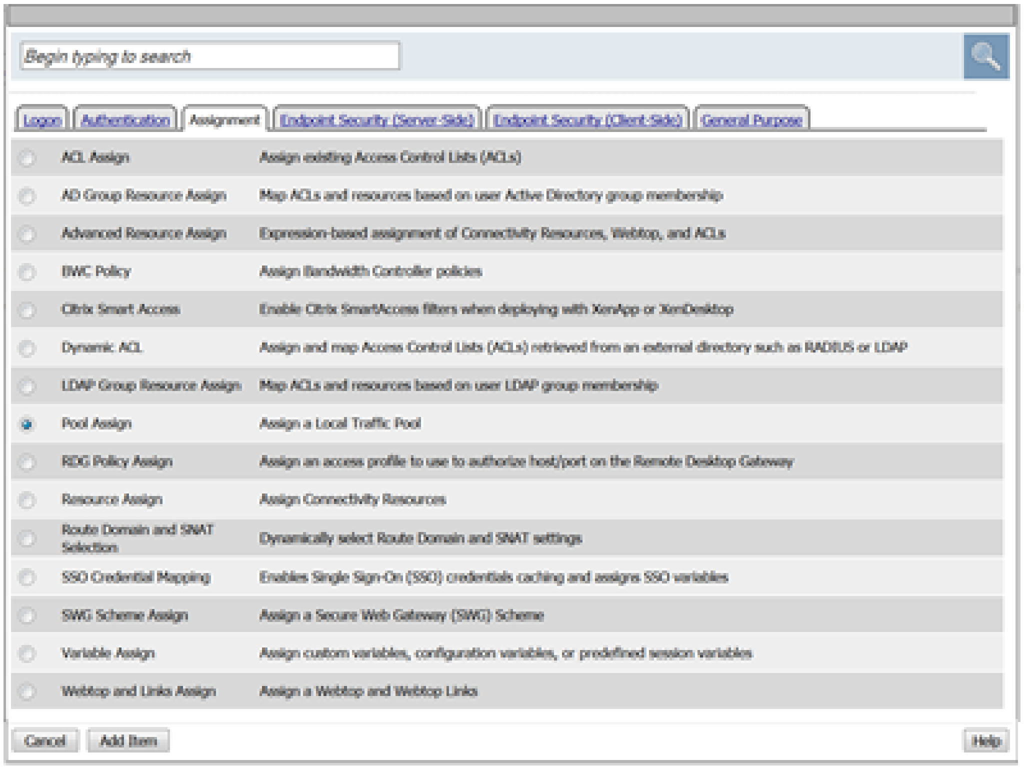


Name: SSO Credential Mapping

Variable Assign: SSO Credential Mapping

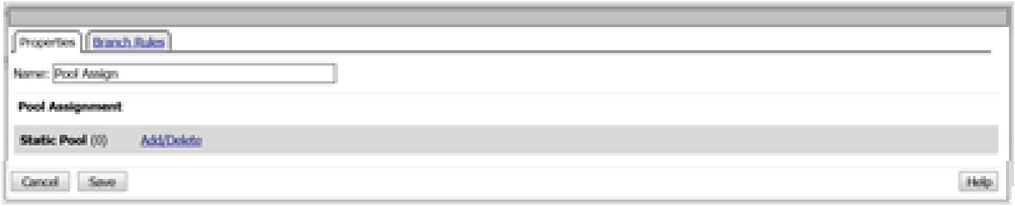
SSO Token Username	Username from Logon Page mcget {session.logon.last.username}
SSO Token Password	Password from Logon Page mcget {session.logon.last.password}

4. Keep the default settings and click **Save**.



○	ACL Assign	Assign existing Access Control Lists (ACLs)
○	AD Group Resource Assign	Map ACLs and resources based on user Active Directory group membership
○	Advanced Resource Assign	Expression-based assignment of Connectivity Resources, Webtop, and ACLs
○	BWC Policy	Assign Bandwidth Controller policies
○	Citrix Smart Access	Enable Citrix SmartAccess filters when deploying with XenApp or XenDesktop
○	Dynamic ACL	Assign and map Access Control Lists (ACLs) retrieved from an external directory such as RADIUS or LDAP
○	LDAP Group Resource Assign	Map ACLs and resources based on user LDAP group membership
●	Pool Assign	Assign a Local Traffic Pool
○	RDG Policy Assign	Assign an access profile to use to authorize host/port on the Remote Desktop Gateway
○	Resource Assign	Assign Connectivity Resources
○	Route Domain and SNAT Selection	Dynamically select Route Domain and SNAT settings
○	SSO Credential Mapping	Enables Single Sign-On (SSO) credentials caching and assigns SSO variables
○	SWG Scheme Assign	Assign a Secure Web Gateway (SWG) Scheme
○	Variable Assign	Assign custom variables, configuration variables, or predefined session variables
○	Webtop and Links Assign	Assign a Webtop and Webtop Links

5. Next add after the SSO Credential Mapping action add a Pool Assign action from the Assignment tab.

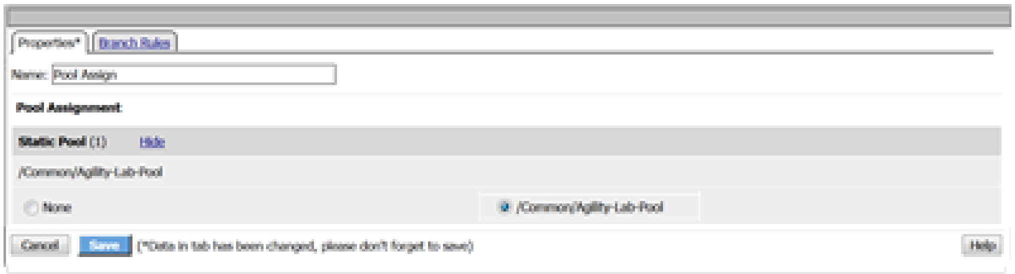


Name: Pool Assign

Pool Assignment

Static Pool (0) Add/Delete

6. In the next window click the **Add\Delete** link.



Name: Pool Assign

Pool Assignment

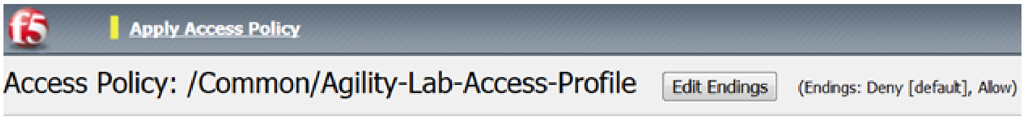
Static Pool (1) Hide

/Common/Agility-Lab-Pool

○ None ● /Common/Agility-Lab-Pool

(*Data in tab has been changed, please don't forget to save)

7. Then select the radio button for /**Common**/**Agility-Lab-Pool**. Now click the **Save** button.

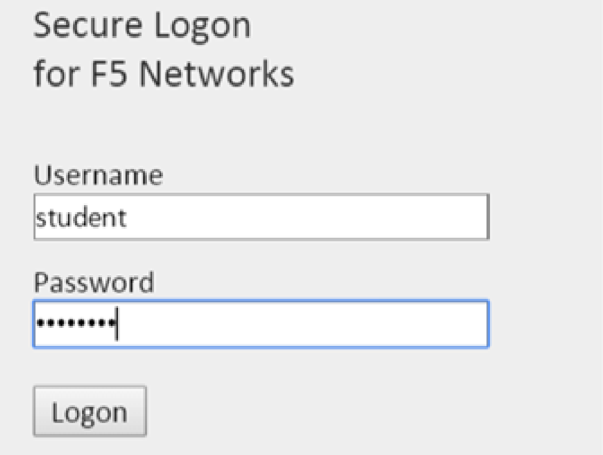


Access Policy: /Common/Agility-Lab-Access-Profile

(Endings: Deny [default], Allow)

8. Then click Apply Access Policy link on top left of page.

TEST 2

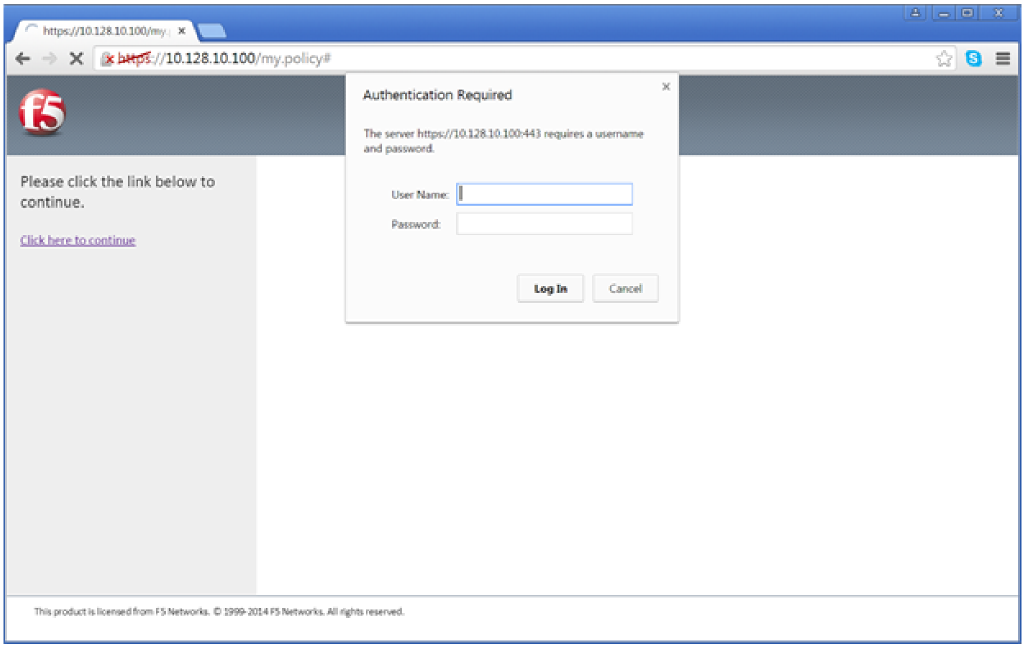


Secure Logon
for F5 Networks

Username: student

Password: ••••••••

1. Restart a new APM user session. Logon and follow through all the policy actions



Please click the link below to continue.

Click here to continue

Authentication Required

The server https://10.128.10.100:443 requires a username and password.

User Name:

Password:

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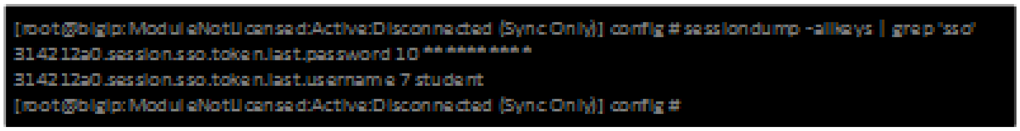
2. This time instead of seeing a browser error you should be getting prompted for authentication for a website which is the site being hosted on the pool member that we assigned to the policy. Why are we getting prompted for authentication though? Did we not add the SSO Credential Mapping to the policy as well?

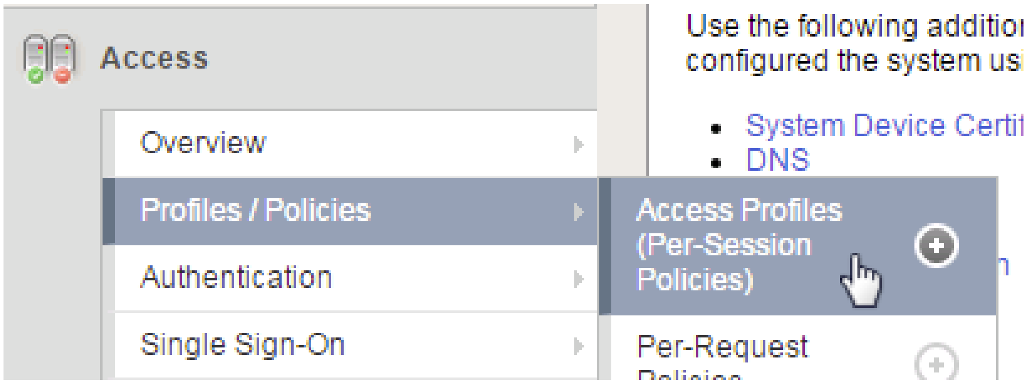


```
[root@bigip:ModuleNotLicensed:Active:Disconnected (Sync Only)] config # sessiondump -allkeys | grep 'sso'
314212a0.session.sso.token.last.password 10 **********
314212a0.session.sso.token.last.username 7 student
[root@bigip:ModuleNotLicensed:Active:Disconnected (Sync Only)] config #
```

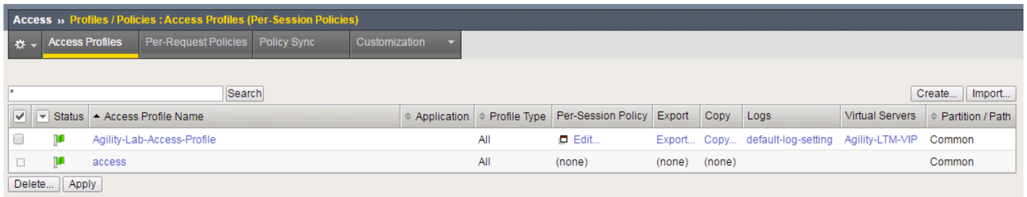
3. Let's use the following command at the console to check if we are getting credentials mapped to token variables properly: **sessiondump –allkeys | grep 'sso**' You should see two lines that show something like this following picture.

If you see the two lines with session.sso.token.last, then we know the credential mapping is happening and the username should be displayed accordingly. So what's missing?

STEP 3

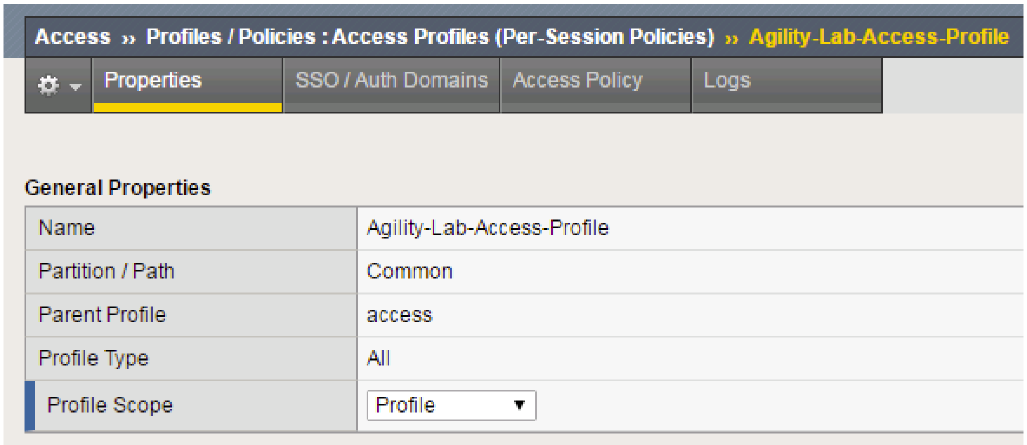


1. Next go to the Access Policy menu, click on Access -> Profiles/Policies -> Access Profiles (Per-Session Policies) .



☑	Status	Access Profile Name	Application	Profile Type	Per-Session Policy	Export	Copy	Logs	Virtual Servers	Partition / Path
□	🟩	Agility-Lab-Access-Profile		All	Edit...	Export...	Copy...	default-log-setting	Agility-LTM-VIP	Common
□	🟩	access		All	(none)	(none)	(none)			Common

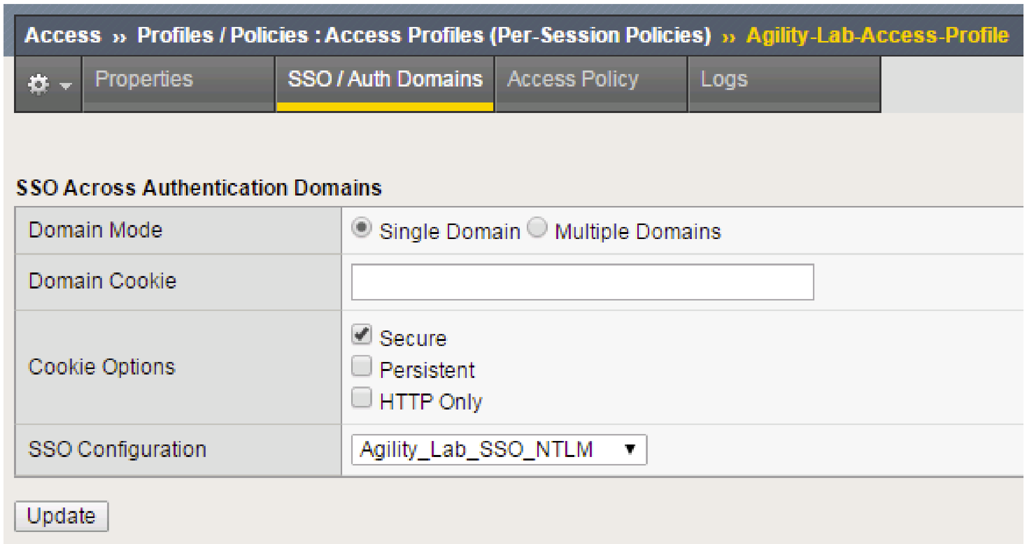
2. In the list of access profiles, click the NAME of your access profile, **Agility-LAB-Access-Profile**


Access » Profiles / Policies : Access Profiles (Per-Session Policies) » Agility-Lab-Access-Profile
Properties
SSO / Auth Domains
Access Policy
Logs

General Properties

Name	Agility-Lab-Access-Profile
Partition / Path	Common
Parent Profile	access
Profile Type	All
Profile Scope	Profile ▼

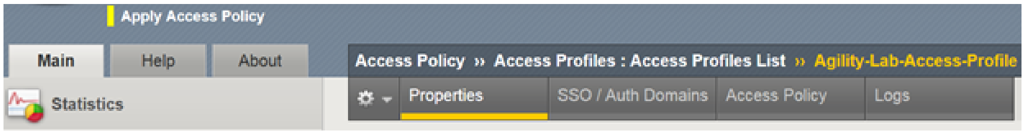
3. When this page opens, look at the top, there are four tabs, click the **SSO** / **Auth Domains** tab


Access » Profiles / Policies : Access Profiles (Per-Session Policies) » Agility-Lab-Access-Profile
Properties
SSO / Auth Domains
Access Policy
Logs

SSO Across Authentication Domains

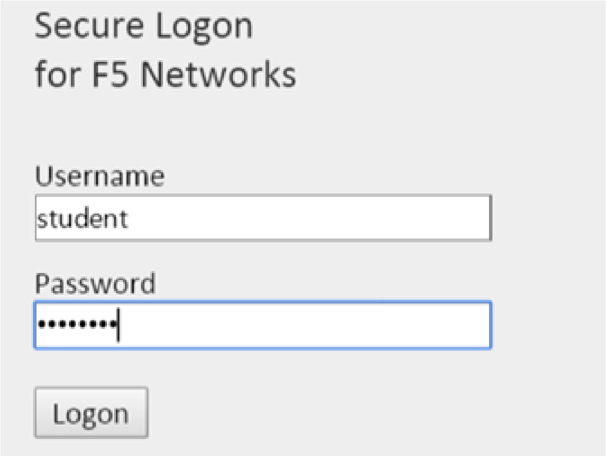
Domain Mode	● Single Domain ○ Multiple Domains
Domain Cookie	
Cookie Options	☑ Secure □ Persistent □ HTTP Only
SSO Configuration	Agility_Lab_SSO_NTLM ▼

4. On this page, use the drop down menu on the SSO Configuration row to select **Agility_Lab_SSO_NTLM**. Then click Update



5. Then click **Apply Access Policy** on the top left of the page and apply the policy on the next page.

TEST 3

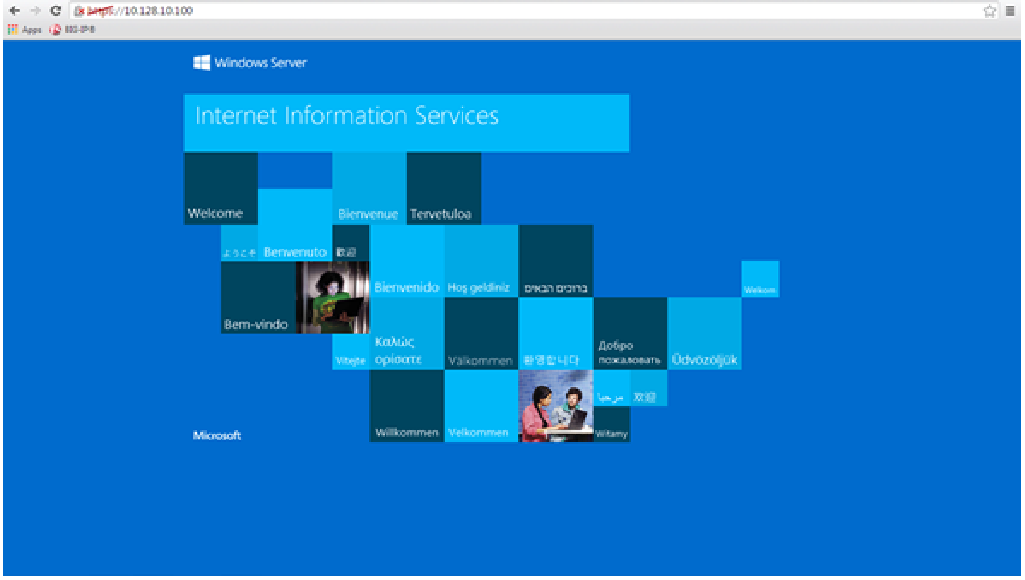


Username
student

Password
••••••••

1. Restart your user session again to the VIP and logon and click through the actions.

If necessary, you can kill your existing session by navigating to Access Policy ? Manage Sessions, then select the user/session and Click Kill Selected Sessions

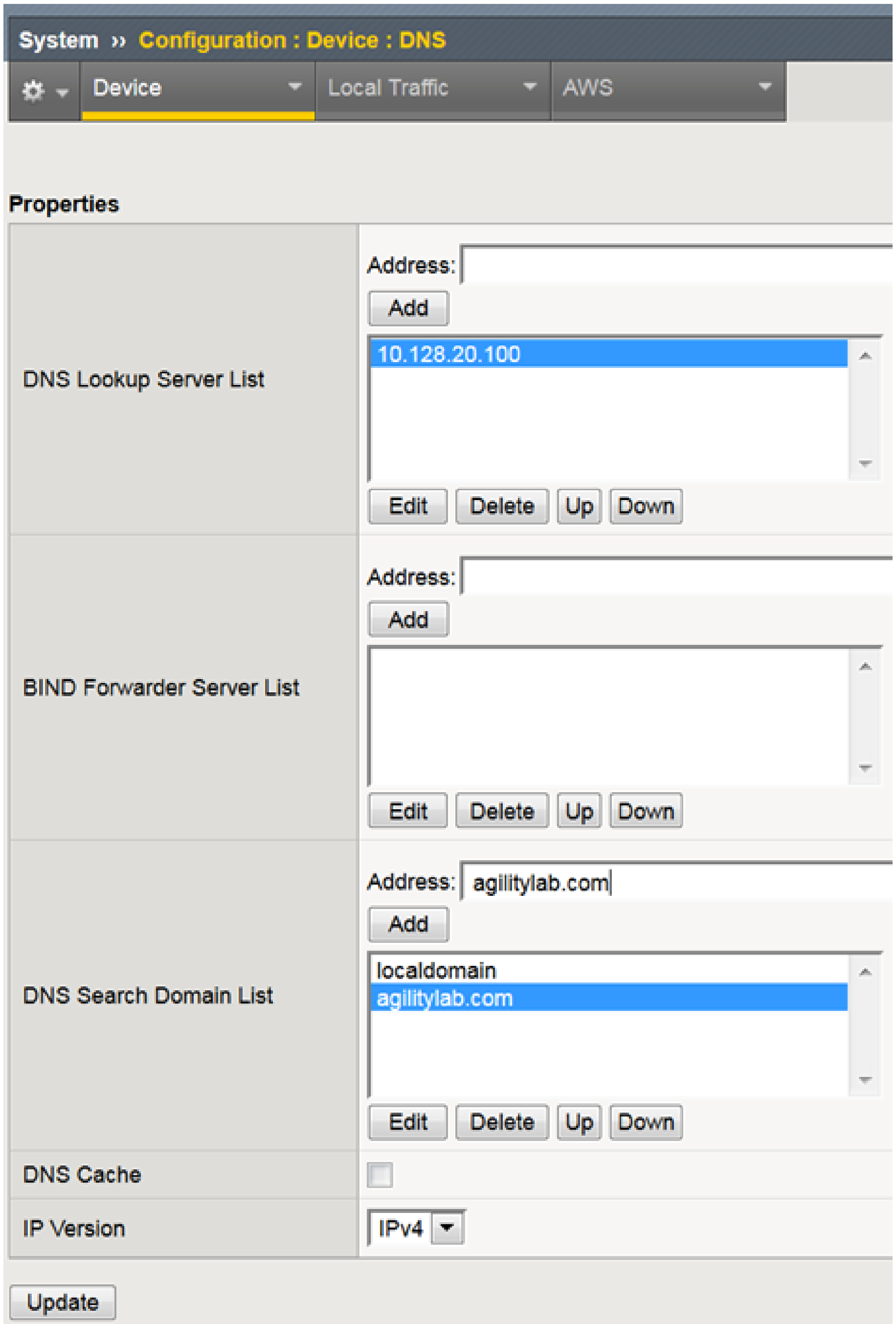


2. Now what do you see when the policy has completed? Are you seeing the web application without being prompted for an additional logon prompt from the application? If so, then you were successful.

8.7.6 ADTest Tool

In this section we will get familiar with anther CLI utility to assist in verifying proper authentication and query capabilities to an Active Directory domain. We need to prepare for this lab by making a quick change to the BIGIP's configuration.

STEP 1

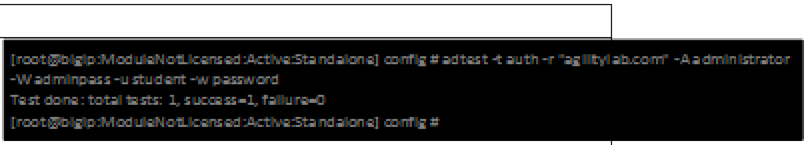
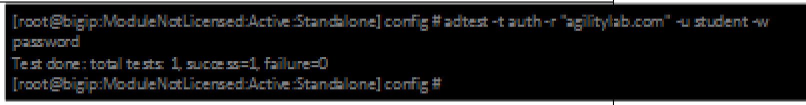
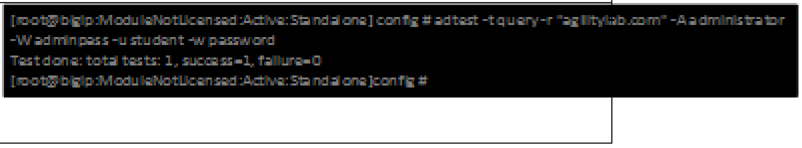


Properties

DNS Lookup Server List	Address: 10.128.20.100
BIND Forwarder Server List	Address:
DNS Search Domain List	Address: agilitylab.com localdomain agilitylab.com
DNS Cache	☐
IP Version	IPv4

1. Navigate to System > Configuration > Device ? DNS
2. Highlight **10.128.10.100** in the DNS Lookup Server List and click **Delete**.
3. Also highlight and **Delete** the DNS Search Domain List of **agilitylab.com**
4. Click the **Update** button.

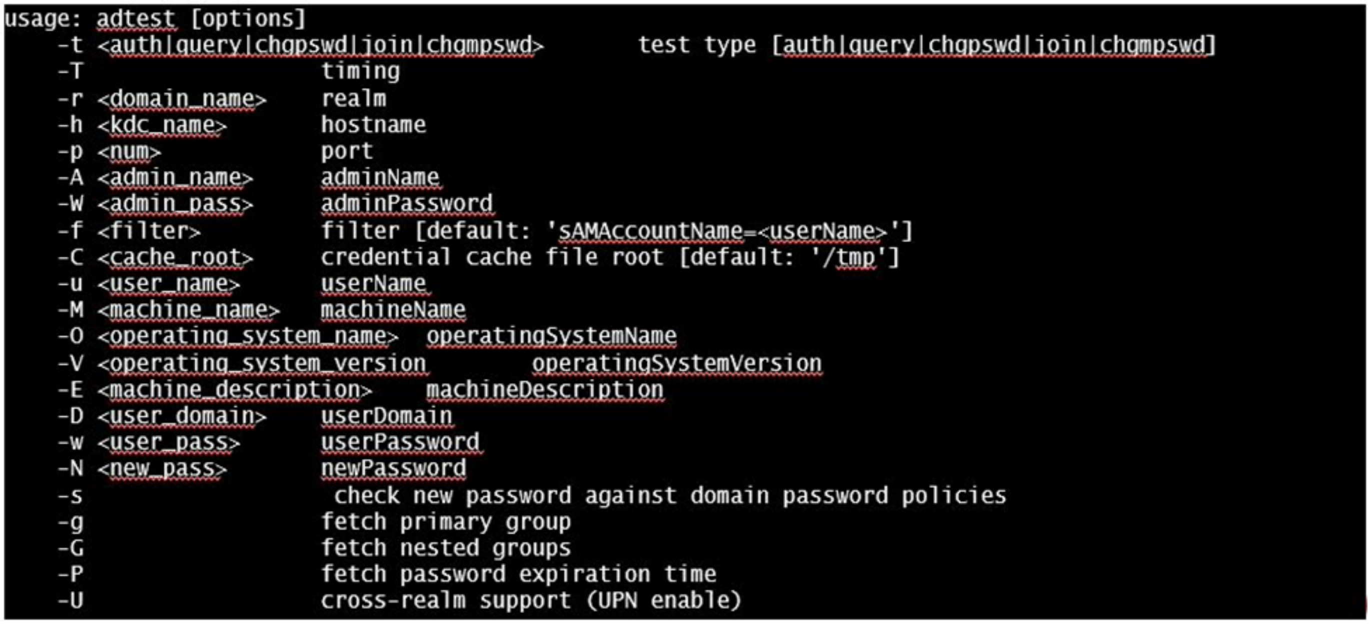
The **/usr/local/bin/adtest** utility is a test tool for APM's Active Directory Module

tYPICAL USAGE	
Auth Test with Administrative username & password (not necessary)	 [root@bigip:ModuleNotLicensed:Active:Standalone] config # adtest -t auth -r "agilitylab.com" -A administrator -W adminpass -u student -w password Test done : total tests: 1, success=1, failure=0 [root@bigip:ModuleNotLicensed:Active:Standalone] config #
Auth Test without just username and password	 [root@bigip:ModuleNotLicensed:Active:Standalone] config # adtest -t auth -r "agilitylab.com" -u student -w password Test done : total tests: 1, success=1, failure=0 [root@bigip:ModuleNotLicensed:Active:Standalone] config #
Query Test With Administrative username and password	 [root@bigip:ModuleNotLicensed:Active:Standalone] config # adtest -t query -r "agilitylab.com" -A administrator -W adminpass -u student -w password Test done: total tests: 1, success=1, failure=0 [root@bigip:ModuleNotLicensed:Active:Standalone]config #

The ADTest tool can help point out potential issues with a BIG-IP's configuration or interoperability issues on the server's side.

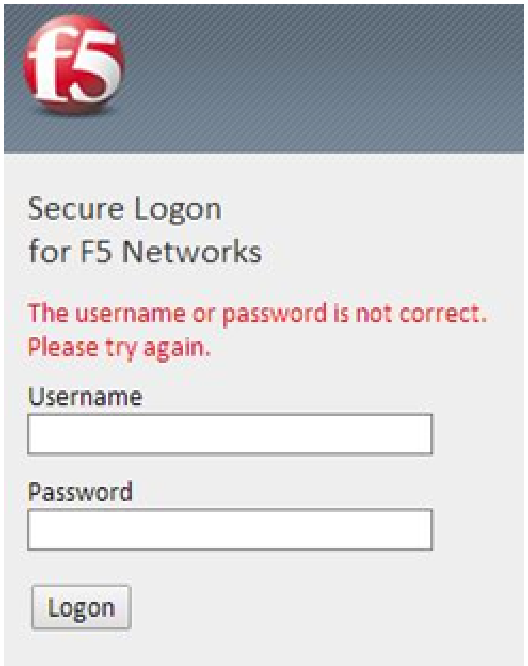
COMMON ERRORS	
ERROR: query with '(sAMAccountName=student)' failed in krb5_get_init_creds_password(): Preauthentication failed, principal name: administrator@agilitylab.com (-1765328360) **Test done: total tests: 1, success=0, failure=1**	The cause of this is simply failed administrative credentials while attempting a query
ERROR: query with '(sAMAccountName=student)' failed in ldap_sasl_interactive_bind_s(): Local error, SASL(-1): generic failure: GSSAPI Error: Unspecified GSS failure. Minor code may provide more information (Cannot find KDC for requested realm) (-2) **Test done: total tests: 1, success=0, failure=1**	The cause of this is typically failed DNS resolution

Refer to the screen shots below if you need additional information regarding the options of ADTest.



```
usage: adtest [options]
    -t <auth|query|chgpswd|join|chgmpswd>       test type [auth|query|chgpswd|join|chgmpswd]
    -T                        timing
    -r <domain_name>          realm
    -h <kdc_name>             hostname
    -p <num>                  port
    -A <admin_name>           adminName
    -W <admin_pass>           adminPassword
    -f <filter>               filter [default: 'sAMAccountName=<userName>']
    -C <cache_root>           credential cache file root [default: '/tmp']
    -u <user_name>            userName
    -M <machine_name>         machineName
    -O <operating_system_name>  operatingSystemName
    -V <operating_system_version        operatingSystemVersion
    -E <machine_description>    machineDescription
    -D <user_domain>          userDomain
    -w <user_pass>            userPassword
    -N <new_pass>             newPassword
    -s                         check new password against domain password policies
    -g                        fetch primary group
    -G                        fetch nested groups
    -P                        fetch password expiration time
    -U                        cross-realm support (UPN enable)
```

TEST 1



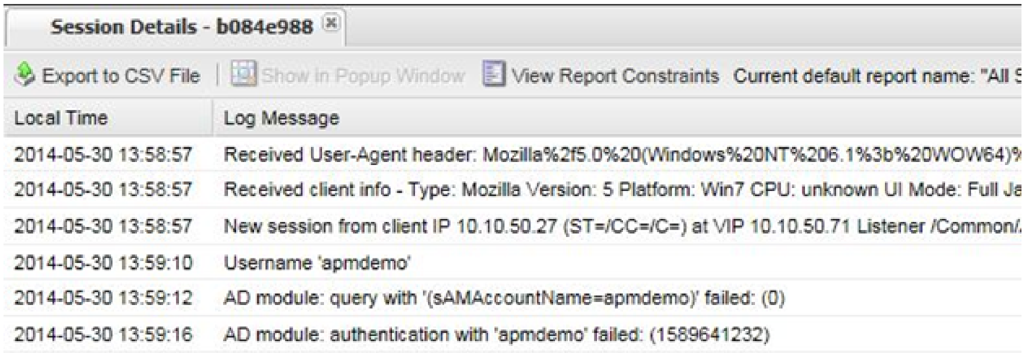
Secure Logon
for F5 Networks

The username or password is not correct.
Please try again.

Username

Password

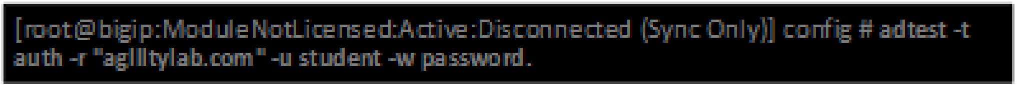
1. Try logging on to the VIP as a user again after removing the DNS entries. You will notice that your logon will likely fail and you will receive the following screen.



Current default report name: "All S

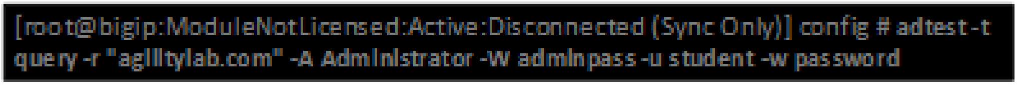
Local Time	Log Message
2014-05-30 13:58:57	Received User-Agent header: Mozilla%2f5.0%20(Windows%20NT%206.1%3b%20WOW64)%
2014-05-30 13:58:57	Received client info - Type: Mozilla Version: 5 Platform: Win7 CPU: unknown UI Mode: Full Ja
2014-05-30 13:58:57	New session from client IP 10.10.50.27 (ST=/CC=/C=) at VIP 10.10.50.71 Listener /Common/.
2014-05-30 13:59:10	Username 'apmdemo'
2014-05-30 13:59:12	AD module: query with '(sAMAccountName=apmdemo)' failed: (0)
2014-05-30 13:59:16	AD module: authentication with 'apmdemo' failed: (1589641232)

2. Review the session details for this logon session in reports or manage sessions. As we can see from the session details the AD Query is failing as well as AD Auth



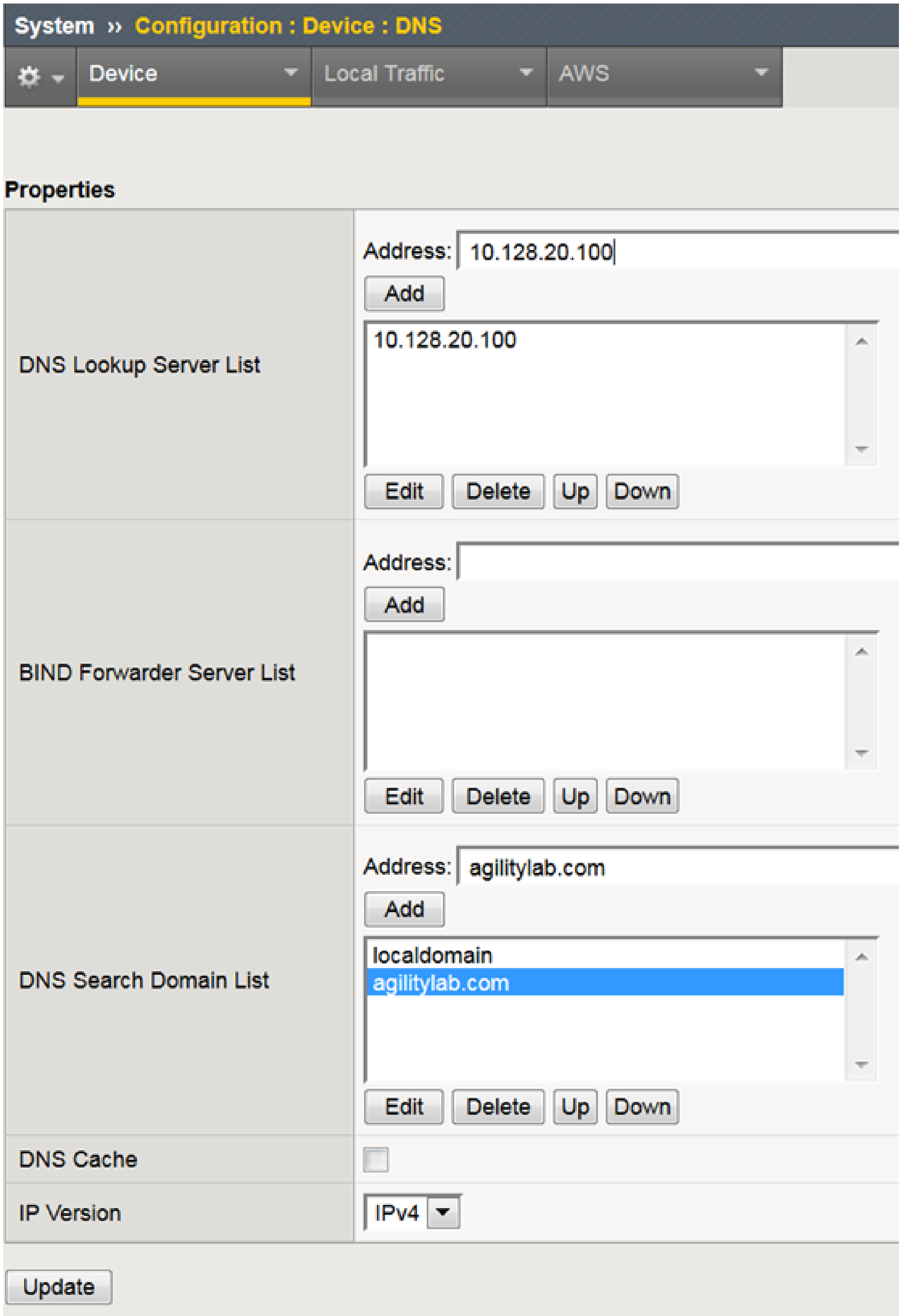
```
[root@bigip:ModuleNotLicensed:Active:Disconnected (Sync Only)] config # adtest -t
auth -r "agilitylab.com" -u student -w password.
```

3. Now we can test from the console. Open a console/ssh session. Using the following command let us first test authentication using the ADtest utility. **adtest -t auth -r “agilitylab.com” -u student -w password**. What result did you get with that test?



```
[root@bigip:ModuleNotLicensed:Active:Disconnected (Sync Only)] config # adtest -t
query -r "agilitylab.com" -A Administrator -W adminpass -u student -w password
```

4. Now let’s try a query test. **adtest -t query -r “agilitylab.com” -A Administrator -W adminpass -u student -w password**. What result was returned?



Properties

DNS Lookup Server List	Address: 10.128.20.100 10.128.20.100
BIND Forwarder Server List	Address:
DNS Search Domain List	Address: agilitylab.com localdomain agilitylab.com
DNS Cache	□
IP Version	IPv4

5. Go back to the DNS Settings section and re-add the DNS server IP and domain. Then re-test the Auth and Query using the ADtest utility.

8.7.7 iRules Logging Assistance

As many know one of the most useful features of F5 BIGIP TMOS is the flexibility provided by iRules.

With APM and iRules you can accomplish many things, in fact you can now use iRules to create APM sessions. We are not going to go over that here however for the purpose of how iRules can be used for troubleshooting we will provide some highlights.

Often you can run into problems wherein an application single sign-on is not being processed and completing as it should. What happens as a result of the initial setup not working im/_static/class4tely is that many people start second guessing what is happening as traffic passes from the clients browser, to the front client side of the BIGIP VIP, then what F5 VIP is actually able to SEE, next What does LTM see, APM see, what is being passed along the way at each stage of the transaction through the BIGIP, and of course what does the BIGIP APM then forward to the Backend Server Application and How does that Backend Server Application respond? Fortunately, iRules can be very beneficial in this process to collect and subsequently log specific data at each stage which greatly enhances the troubleshooting capabilities.

We all know that TCPDump can be your friend in capturing data to analyze however at times the application workflows between client f5 and server and encryption along the way can hamper what TCPDump could capture for analysis. Another issue with TCPDump is that is captures a lot of data that then needs to be analyzed. Granted TCPDump provides a filtering capability to weed through that extra data however when you compare it to using some targeted iRules to collect APM session variables and data to be output to logs it makes it easier to review the application flow more specific to the steps you are trying to validate.

By default, APM in the current code release automatically secures that variables that are entered into the logon page on APM. Furthermore, the password is hidden from the reports screen session variable view and hidden from the database. Yet there are times when the Admin of the APM may need to have access to the decrypted password to either verify that the correct information is being keyed by user, received by APM and sent from APM to servers. Fortunately, there is a way using an iRule to do just this for our troubleshooting purpose.

TEST 1

1. First open a console session to the BIGIP.
2. From the command prompt type: **tail –f /var/log/ltm**
3. Hit the enter key several times to move the text on the screen up to the top so you have a clear screen to start reviewing log data during this test.
4. Now open a browser and access the APM VIP and logon as a user.
5. When you reach the end of your APM policy take a look at the console session and note whether or not the logs provide any details about the username or password you just used to logon to APM.
6. Now in another browser open the APM Admin GUI.
7. Go to the reports screen and run the All Sessions Report.
8. Open the Session Variables link for the current session you have just started as the user.
9. Navigate down to the SSO folder and expand it.
10. Review the SSO Token Username and verify it displays the username you entered.
11. Review the SSO Token Password and verify it displays the password you entered. Or can you?
12. No, you cannot because it is obscured by default.

Next, we will implement an iRule to assist the Admin in verifying what password is being entered by the user.

An iRule has been created already and supplied for you so you won’t need to create it yourself you only need to apply it to the Virtual Server under the Resources Tab.

STEP 2

1. Open the properties for the Virtual Server.

2. Click the resources Tab.
3. In the iRules section, click the Manage button.
4. In the right-side box scroll down to find the iRule named **Agility-201-Troubleshooting**
5. Highlight the iRule and click the arrow button to move it to the left box.
6. Click the finished button.

TEST 2

1. Navigate to Manage Sessions and Kill all existing sessions.
2. In the console screen, hit the enter key several times to move any existing output up to the top of the window, then enter the following command **tail –F /var/log/ltm**
3. In the browser for user session testing, restart the session back to the APM VIP and logon with your username and password.
4. Click through to the end of the policy.
5. Now go back to the console session and review the log messages.
6. Do you see the username you entered in the logon page?
7. Do you see the password you entered in the logon page? If you answered yes then you were successful. Congratulations!

8.7.8 TCPDump Troubleshooting Assistance

Beginning in BIG-IP 11.2.0, you can use the "**p**" interface modifier with the "**p**" modifier to capture traffic with TMM information for a specific flow, and its related peer flow. The "**p**" modifier allows you to capture a specific traffic flow through the BIG-IP system from end to end, even when the configuration uses a Secure Network Address Translation (SNAT) or OneConnect. For example, the following command searches for traffic to or from client **10.128.10.100** on interface **0.0**:

```
tcpdump -ni 0.0:nnnp -s0 -c 100000 -w /var/tmp/capture.dmp host 10.128.10.100
```

Once **tcpdump** identifies a related flow, the flow is marked in TMM, and every subsequent packet in the flow (on both sides of the BIG-IP system) is written to the capture file.

8.8 Conclusion

In this lab, you learned how to use various tools including APM logs, ADTest, TCPDump to aid in troubleshooting common Access Policy Manager (APM) issues relating to Access Policy configuration, user authentication, and session variables.

8.8.1 Learn More

Links & Information

- **Identity & Access Management Labs**

  http://clouddocs.f5.com/training/community/iam/html/

- **BIG-IP APM 13.1.0 Knowledge Center**

  https://support.f5.com/csp/knowledge-center/software/BIG-IP?module=BIG-IP%20APM&version=13.1.0

- **Manual: F5 BIG-IP Access Policy Management Operations Guide**

  https://support.f5.com/kb/en-us/products/big-ip_apm/manuals/product/f5-apm-operations-guide.html

- **Manual: F5 BIG-IP Edge Client Operations Guide**

  https://support.f5.com/kb/en-us/products/big-ip_apm/manuals/product/f5-edge-client-operations-guide.html

- **K13595: Frequently used tools for troubleshooting BIG-IP APM and Edge Gateway issues (11.x)**

  https://support.f5.com/csp/article/K13595

- **K14184: Troubleshooting BIG-IP APM portal applications**

  https://support.f5.com/csp/article/K14184

- **K12444: Overview of the Client Troubleshooting Utility for Windows**

  https://support.f5.com/csp/article/K12444

- **K11898: Information required when opening a support case for BIG-IP APM**

  https://support.f5.com/csp/article/K11898

9

Class 9: Multi-Factor Auth for Cloud Applications

This lab will teach you how to configure APM environment in order to configure multi factor authentication (MFA) using F5 Adaptive Authentication, google authenticator(GA) and DUO. Also, you will be able to configure Single Sign On (SSO) for cloud apps (AWS, Salesforce).

This class covers the following topics:

- **Create a basic APM Policy**
- **Setup AWS Connector**
- **Setup Salesforce Connector**
- **Set up Google Authenticator (GA) as Second Auth Factor**
- **Set up DUO as Second Auth Factor**

Expected time to complete: **3 hours**

9.1 Getting Started

All lab prep is already completed if you are working in the Ravello blueprint. The following information will be critical for operating your lab. Additional information can be found in the Learn More section of this guide for setting up your own lab.

Please follow the instructions provided by the instructor to start your lab and access your jump box.

Note: All work for this lab will be performed exclusively from the Windows **Jumpbox**. No installation or interaction with your local system is required.

9.1.1 Lab Topology

The following components have been included in your lab environment:

- **1 x F5 BIG-IP VE_13** `(10.1.1.245)`
  - Provisioned with APM
- **1 x Windows 7** `(10.1.1.199)`

  - Jumpbox machine
  - Jumpbox user (external_user)
- **1 X Windows Server 2008** (10.1.1.245)
  - AAA server (Active Directory)
  - User (administrator)
- **1 X Windows 7 Internal** (10.1.1.198)
  - Internal server used to demo SSO to RDP servers
- **1 X Linux LAMP Webserver**
  - Internal Portal

Lab Components

The following credentials will be utilized throughout this Lab guide:

HOST/RESOURCE	USERNAME	PASSWORD
BIG-IP Configuration Utility (GUI)	admin	password
BIG-IP CLI Access (SSH)	root	password
Jumphost Access	external_user	password
Windows Server 2008 (AD) Access	administrator	password
Sales User	sales_user	sales
Sales Manager User	sales_manager	manager
Partner User	partner_user	partner

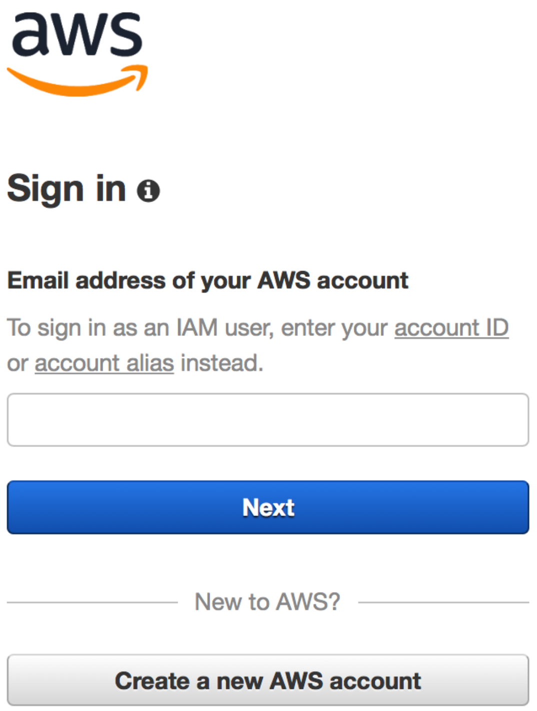
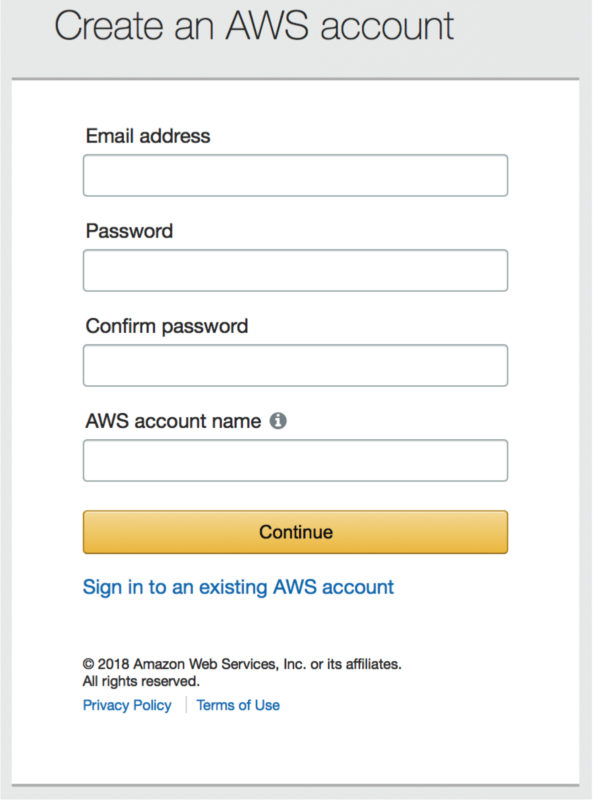
9.2 Pre-Work Activities

In this module you will create or download all the requirements to configure the **MFA for Cloud Apps Lab**

9.2.1 Lab – Pre-Work

Estimated completion time: **10 minutes**

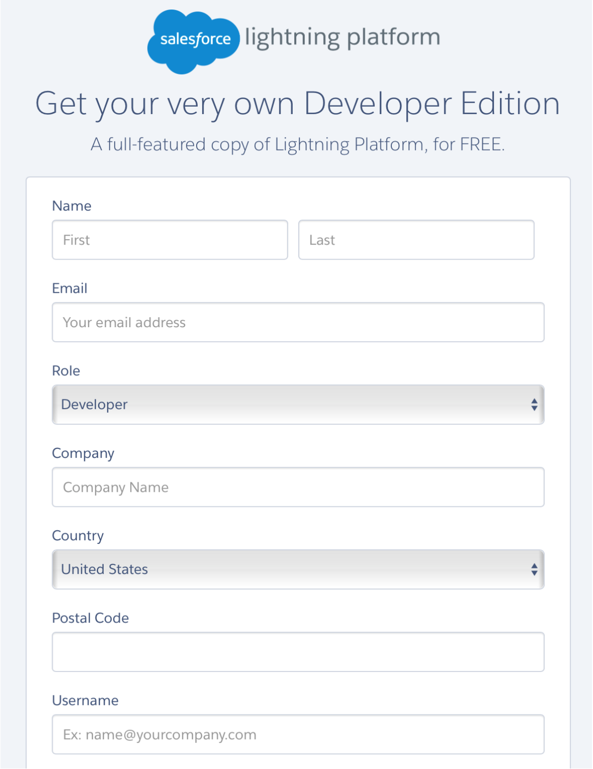
9.2.2 Task - Create AWS Account

1. Go to AWS page	https://console.aws.amazon.com/console/home
2. Click create new AWS account	 Sign in Email address of your AWS account To sign in as an IAM user, enter your account ID or account alias instead. Next New to AWS? Create a new AWS account
	 Create an AWS account Email address Password Confirm password AWS account name Continue Sign in to an existing AWS account © 2018 Amazon Web Services, Inc. or its affiliates. All rights reserved. Privacy Policy | Terms of Use
3. Complete all of the required fields.	

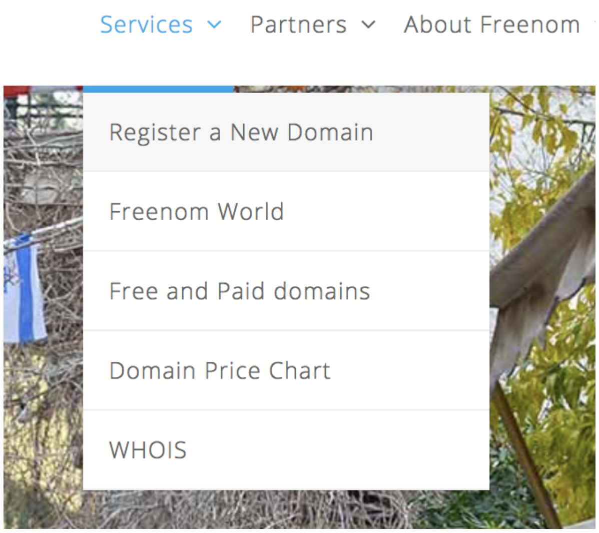
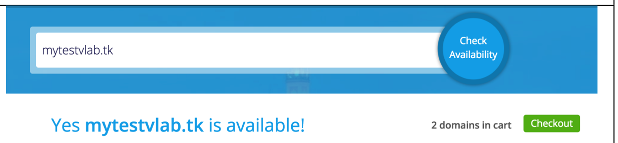
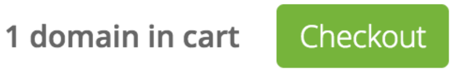
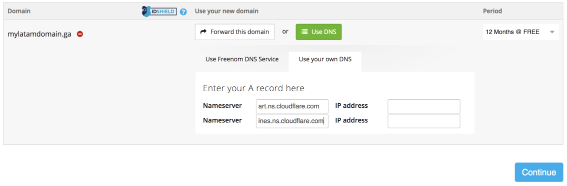
Note

Note: **Payment information** – Default Usage tier is **free for 1 year** with 750 hours a month compute (we will not be using any compute for this lab) and 5GB storage (`we will not be using any storage for this lab`).

9.2.3 Task - Create Salesforce Account

1. Go to Salesforce page	https://developer.salesforce.com/signup
2. Click create new Salesforce account	 salesforce lightning platform Get your very own Developer Edition A full-featured copy of Lightning Platform, for FREE. Name: First / Last Email: Your email address Role: Developer Company: Company Name Country: United States Postal Code: Username: Ex: name@yourcompany.com
3. Complete all of the required fields.	

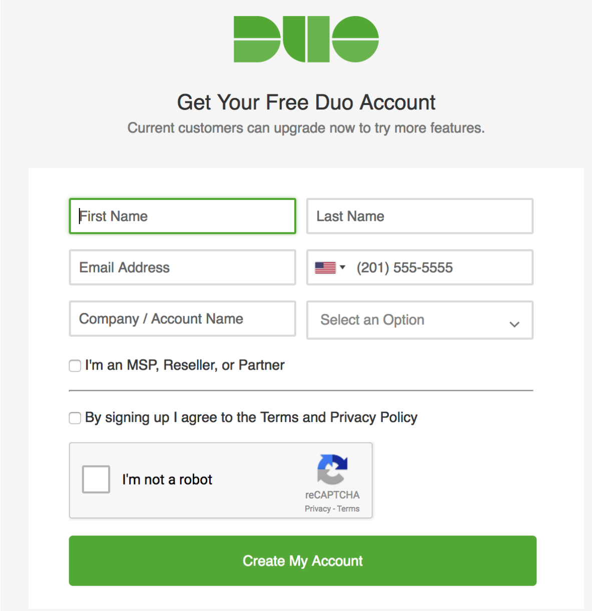
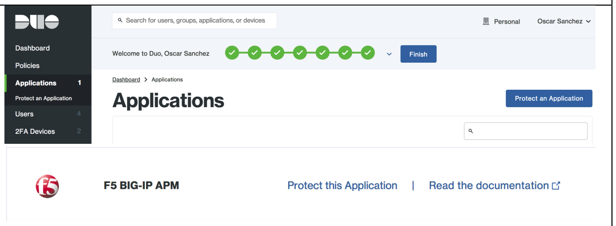
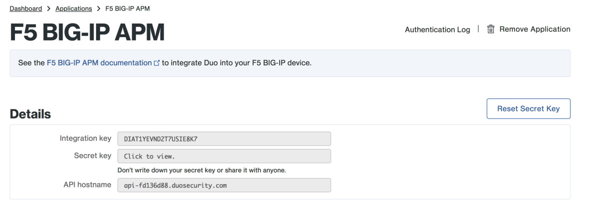
9.2.4 Task - Create (or use an existing) public domain

1. You can use **my.freenom** to create a new public domain	https://my.freenom.com
2. Go to **Services**, and then, **Register a New Domain**.	 Services Partners About Freenom Register a New Domain Freenom World Free and Paid domains Domain Price Chart WHOIS
3. Introduce your new domain **mytestvlab.tk** `(select your own)`, and check availability.	 mytestvlab.tk Yes **mytestvlab.tk** is available! 2 domains in cart
4. At the bottom, click **Checkout**	 1 domain in cart
5. Click in "**Use DNS**", and then "**Use your own DNS**" and introduce the hostnames : "**art.ns.cloudflare.com**" and " **ines.ns.cloudflare.com**". Select also a Period of 12 Months (`Free`)	 Domain: mylatamdomain.ga Use your new domain IDSHIELD Forward this domain or Use DNS Use Freenom DNS Service Use your own DNS Enter your A record here Nameserver: art.ns.cloudflare.com IP address: Nameserver: ines.ns.cloudflare.com IP address: Period: 12 Months @ FREE
6. Finish the configuration signing in or registering with a personal account	

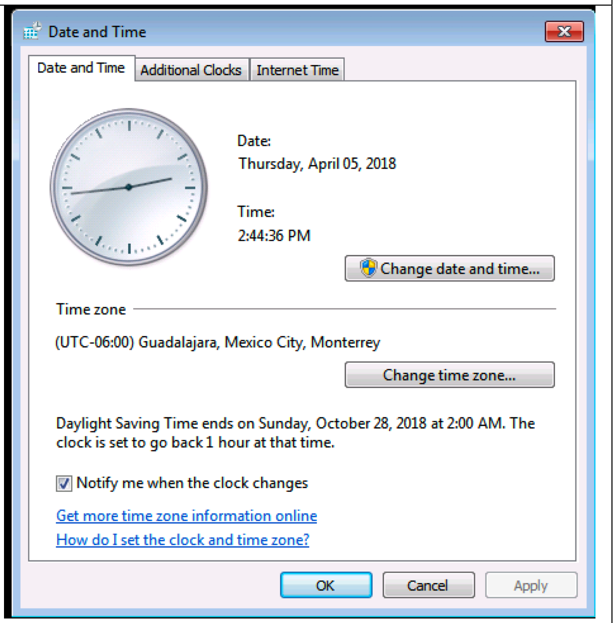
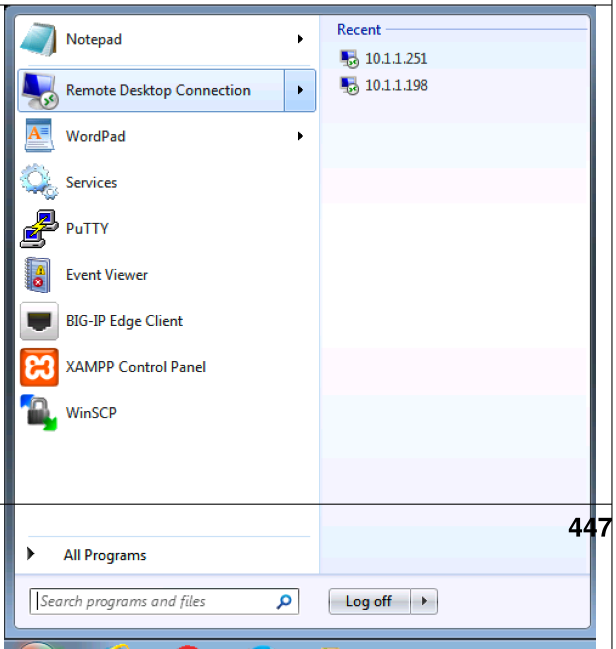
9.2.5 Task - Download Google Authenticator and DUO

1. Download **Google Authenticator** client to your smartphone.	1. Android (a) https://support.google.com/accounts/answer/1066447?co=GENIE.Platform%3DAndroid&hl=en 2. iOS (a) https://itunes.apple.com/us/app/google-authenticator/id388497605?mt=8
2. Download **DUO** client to your smartphone	1. iOS (a) https://itunes.apple.com/us/app/duo-mobile/id422663827?mt=8 2. Android (a) https://play.google.com/store/apps/details?id=com.duosecurity.duomobile&hl=en

9.2.6 Task - Create a DUO account

1. Sign up for a **DUO account**.	 Get Your Free Duo Account Current customers can upgrade now to try more features. First Name Last Name Email Address (201) 555-5555 Company / Account Name Select an Option □ I'm an MSP, Reseller, or Partner □ By signing up I agree to the Terms and Privacy Policy □ I'm not a robot reCAPTCHA Privacy - Terms Create My Account
2. Log in to the **Duo Admin Panel** and navigate to **Applications**, then click **Protect an Application** and locate **F5 BIG-IP APM** in the applications list.	 Search for users, groups, applications, or devices Personal Oscar Sanchez Dashboard Policies Applications 1 Protect an Application Users 4 2FA Devices 2 Welcome to Duo, Oscar Sanchez Finish Dashboard > Applications Applications Protect an Application F5 BIG-IP APM Protect this Application | Read the documentation
3. Click **Protect this Application** to get your `Integration Key`, `Secret Key`, and `API hostname`. We will use this information later.	 Dashboard > Applications > F5 BIG-IP APM F5 BIG-IP APM Authentication Log | Remove Application See the F5 BIG-IP APM documentation to integrate Duo into your F5 BIG-IP device. Details Reset Secret Key Integration key `DIAT1YEVND2T7USIE8K7` Secret key `Click to view.` Don't write down your secret key or share it with anyone. API hostname `api-fd136d88.duosecurity.com`

9.2.7 Task - Log in to Ravello

1. Go to the **URL** provided by the instructor and login using the `username` and `password` assigned to you.	http://tbctrainingportal-xxxxxxsrv.ravcloud.com 1. Username = `latam_studentXX` 2. Password = `f5DEMOs4u`
2. Search **LATAM_MFA_Cloud_Apps_Agility** environment, then click on the link and verify that the VMs are running.	
3. Connect to **Windows 7 External** VM. You can use either Console shortcut or a RDP client. Then verify **time settings** and modify if it is necessary.	 Date and Time Date: Thursday, April 05, 2018 Time: 2:44:36 PM Time zone: (UTC-06:00) Guadalajara, Mexico City, Monterrey Daylight Saving Time ends on Sunday, October 28, 2018 at 2:00 AM. The clock is set to go back 1 hour at that time. ☑ Notify me when the clock changes Get more time zone information online How do I set the clock and time zone? Date and Time Additional Clocks Internet Time Change date and time... Change time zone... OK Cancel Apply
	 Notepad Remote Desktop Connection WordPad Services PuTTY Event Viewer BIG-IP Edge Client XAMPP Control Panel WinSCP Recent 10.1.1.251 10.1.1.198 All Programs Search programs and files Log off

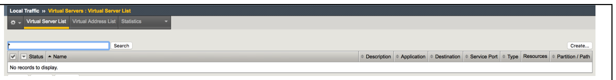
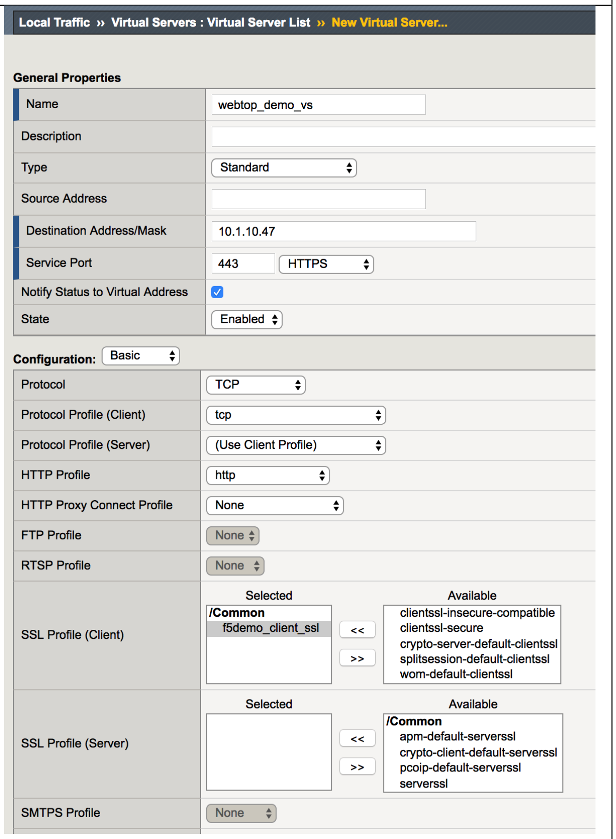
9.3 Lab 1: Create a basic APM Policy

In this module you will learn how to configure a basic APM Policy

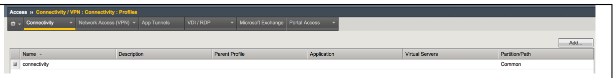
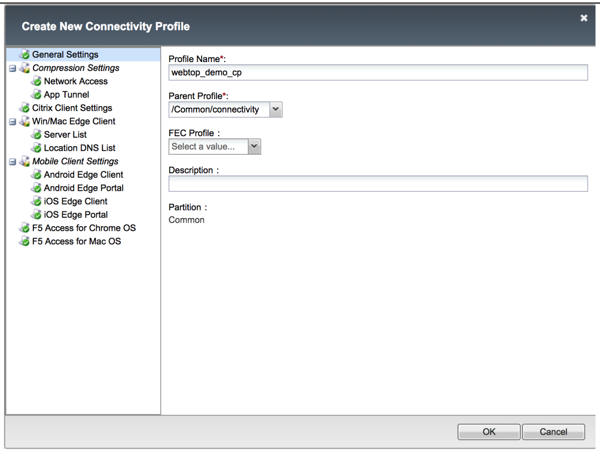
9.3.1 Lab – Create an APM Policy

This lab will teach you how to create a basic APM Policy using the GUI. Estimated completion time: **20 minutes**

9.3.2 Task - Setup Virtual Server

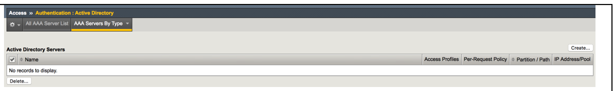
1. Go to **Local Traffic** -> **Virtual Servers** -> **Create**	 Local Traffic » Virtual Servers : Virtual Server List Status · Name · Description · Application · Destination · Service Port · Type · Resources · Partition / Path No records to display.
2. Enter the following values (leave others default) **Name:** `webtop_demo_vs` **Destination Address:** `10.1.10.47` **Service Port:** `443` **HTTP Profile:** `http` **SSL Profile (Client):** `f5demo_client_ssl` **Source Address Translation:** `Àutomap`	 Local Traffic » Virtual Servers : Virtual Server List » New Virtual Server... General Properties Name: webtop_demo_vs Description: Type: Standard Source Address: Destination Address/Mask: 10.1.10.47 Service Port: 443 HTTPS Notify Status to Virtual Address: ☑ State: Enabled Configuration: Basic Protocol: TCP Protocol Profile (Client): tcp Protocol Profile (Server): (Use Client Profile) HTTP Profile: http HTTP Proxy Connect Profile: None FTP Profile: None RTSP Profile: None SSL Profile (Client): Selected: /Common f5demo_client_ssl; Available: clientssl-insecure-compatible, clientssl-secure, crypto-server-default-clientssl, splitsession-default-clientssl, wom-default-clientssl SSL Profile (Server): Selected: ; Available: /Common apm-default-serverssl, crypto-client-default-serverssl, pcoip-default-serverssl, serverssl SMTPS Profile: None

9.3.3 Task - Create a Connectivity Profile

1. Go to **Access** -> **Connectivity/VPN** -> **Profiles** **-> Add**	 Access ›› Connectivity / VPN : Connectivity : Profiles Connectivity Network Access (VPN) App Tunnels VDI / RDP Microsoft Exchange Portal Access Add... Name Description Parent Profile Application Virtual Servers Partition/Path connectivity — Common
2. Enter the following values (leave others default) **Name:** `webtop_demo_cp` **Parent Profile:** `/Common/connectivity`	 Create New Connectivity Profile General Settings Compression Settings Network Access App Tunnel Citrix Client Settings Win/Mac Edge Client Server List Location DNS List Mobile Client Settings Android Edge Client Android Edge Portal iOS Edge Client iOS Edge Portal F5 Access for Chrome OS F5 Access for Mac OS OK Cancel Profile Name*: webtop_demo_cp Parent Profile*: /Common/connectivity FEC Profile : Select a value... Description : Partition : Common

9.3.4 Task - Create an AD Server as AAA

1. Go to **Access** -> **Authentication** -> **Active Directory** -> **Create**



Access » Authentication : Active Directory

⚙ | All AAA Server List | AAA Servers By Type

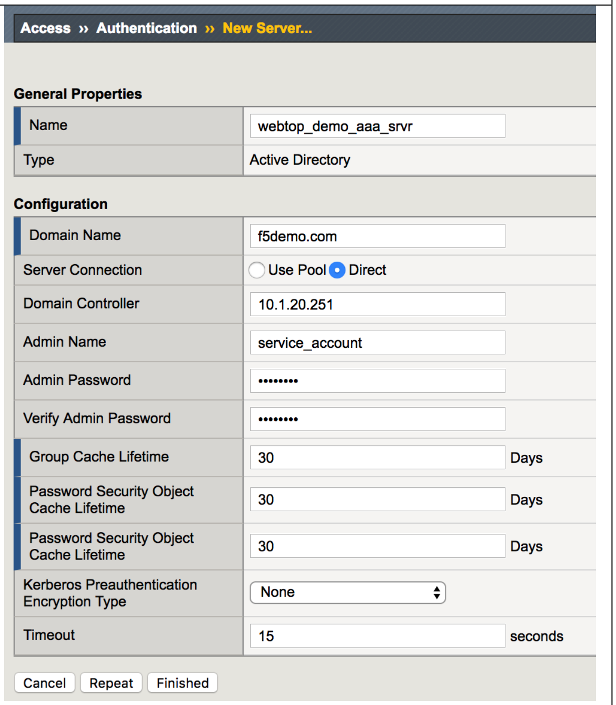
Active Directory Servers Create...

☑	Name	Access Profiles	Per-Request Policy	Partition / Path	IP Address/Pool
No records to display.					

Delete...

2. Enter the following values (leave others default)

   Name: `webtop_demo_aaa_srvr`
   Domain Name: `f5demo.com`
   Server Connection: `Direct`
   Domain Controller: `10.1.20.251`
   Admin Name: `service_account`
   Admin Password: `password`



Access » Authentication » New Server...

General Properties

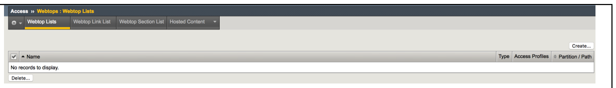
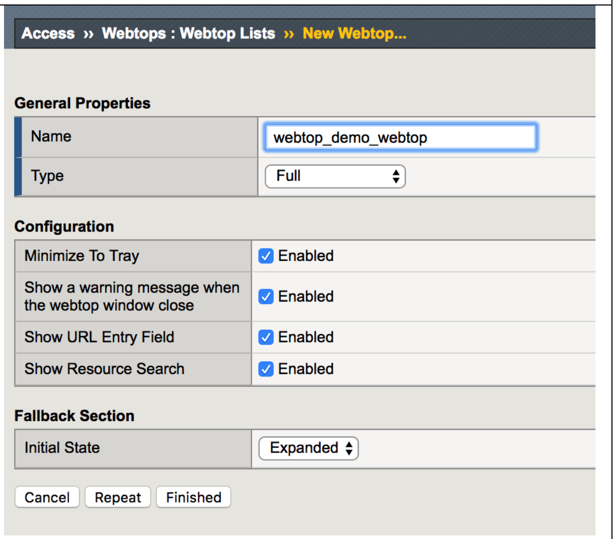
Name	webtop_demo_aaa_srvr
Type	Active Directory

Configuration

Domain Name	f5demo.com
Server Connection	○ Use Pool ● Direct
Domain Controller	10.1.20.251
Admin Name	service_account
Admin Password	••••••••
Verify Admin Password	••••••••
Group Cache Lifetime	30 Days
Password Security Object Cache Lifetime	30 Days
Password Security Object Cache Lifetime	30 Days
Kerberos Preauthentication Encryption Type	None
Timeout	15 seconds

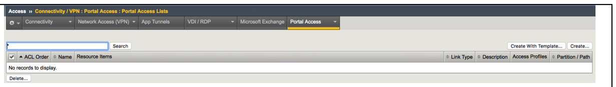
Cancel | Repeat | Finished

9.3.5 Task - Create a container (webtop)

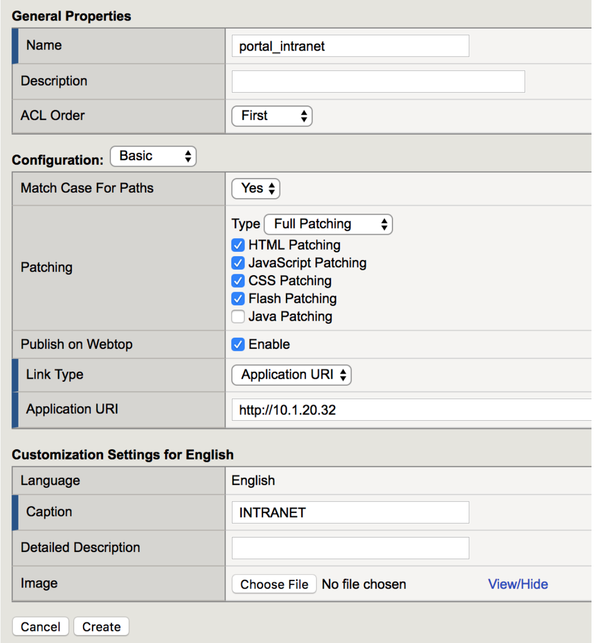
1. Go to **Access** -> **Webtop** -> **Webtop Lists** -> **Create**	 Access » Webtops : Webtop Lists Webtop Lists Webtop Link List Webtop Section List Hosted Content Create... Name Type Access Profiles Partition / Path Delete... No records to display.
2. Enter the following values (leave others default) **Name:** `webtop_demo_webtop` **Type:** `Full`	 Access » Webtops : Webtop Lists » New Webtop... **General Properties** Name: webtop_demo_webtop Type: Full **Configuration** Minimize To Tray: ☑ Enabled Show a warning message when the webtop window close: ☑ Enabled Show URL Entry Field: ☑ Enabled Show Resource Search: ☑ Enabled **Fallback Section** Initial State: Expanded Cancel Repeat Finished

9.3.6 Task - Create a Portal Access

1. Go to **Access** -> **Connectivity/VPN: Portal Access List** -> **Create**



2. Enter the following values (leave others default)
   Name: `portal_intranet`
   Link Type: `Application URI`
   Application URI: `http://10.1.20.32`
   Caption: `INTRANET`



General Properties

Name	portal_intranet
Description	
ACL Order	First

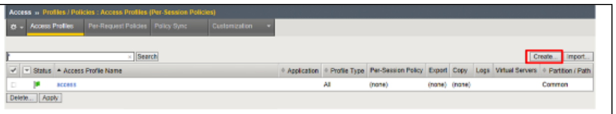
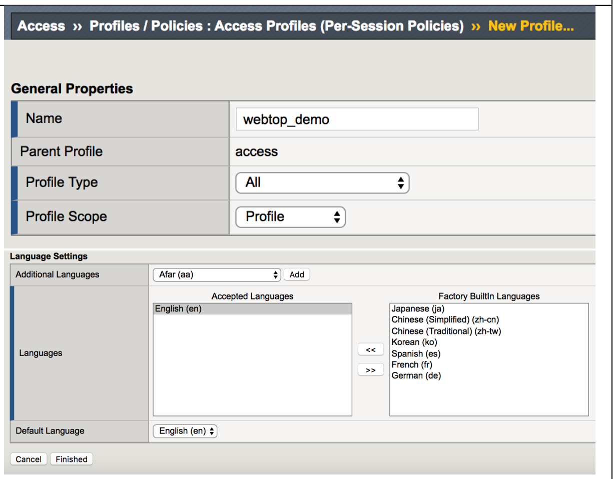
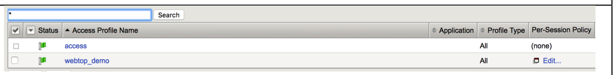
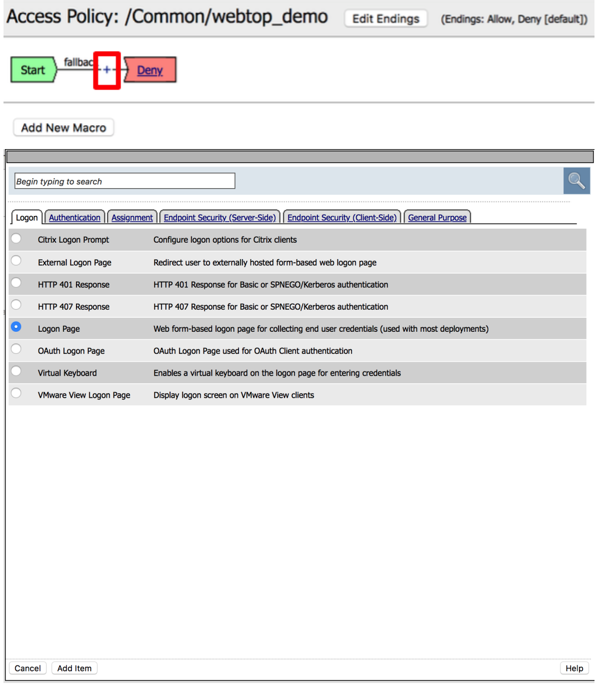
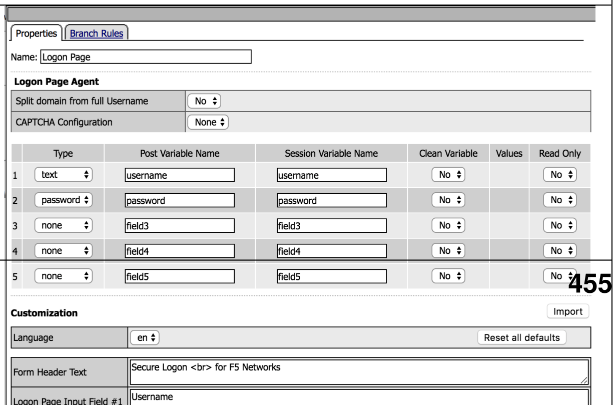
Configuration: Basic

Match Case For Paths	Yes
Patching	Type Full Patching ☑ HTML Patching ☑ JavaScript Patching ☑ CSS Patching ☑ Flash Patching ☐ Java Patching
Publish on Webtop	☑ Enable
Link Type	Application URI
Application URI	http://10.1.20.32

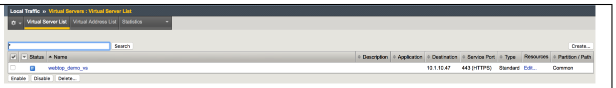
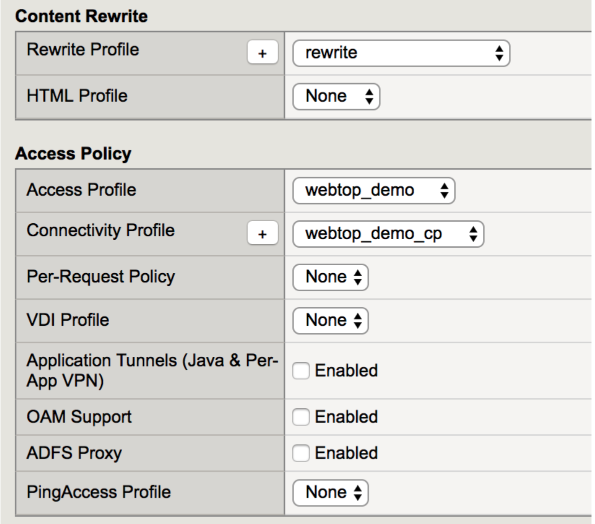
Customization Settings for English

Language	English
Caption	INTRANET
Detailed Description	
Image	Choose File No file chosen View/Hide

9.3.7 Task - Setup APM Profile

1. Go to **Access** -> **Profiles** / **Policies** -> **Access Profiles (Per Session Policies)** -> **Create**	 Access » Profiles / Policies : Access Profiles (Per-Session Policies) Access Profiles | Per-Request Policies | Policy Sync | Customization Search | Create... | Import... Status | Access Profile Name | Application | Profile Type | Per-Session Policy | Export | Copy | Logs | Virtual Servers | Partition / Path access | All | (none) | (none) | (none) | Common Delete... | Apply
2. Enter the following values (leave others default) then click **Finished** **Name:** `webtop_demo` **Profile Type:** `All` **Profile Scope:** `Profile` **Languages:** `English`	 Access » Profiles / Policies : Access Profiles (Per-Session Policies) » New Profile... General Properties Name: webtop_demo Parent Profile: access Profile Type: All Profile Scope: Profile Language Settings Additional Languages: Afar (aa) | Add Languages: Accepted Languages: English (en) Factory BuiltIn Languages: Japanese (ja), Chinese (Simplified) (zh-cn), Chinese (Traditional) (zh-tw), Korean (ko), Spanish (es), French (fr), German (de) Default Language: English (en) Cancel | Finished
3. Click **Edit** for **webtop_demo**, a new browser tab will open	 * | Search Status | Access Profile Name | Application | Profile Type | Per-Session Policy access | All | (none) webtop_demo | All | Edit...
4. Click the + between **Start** and **Deny**, select **Logon Page** from the **Logon** tab, click **Add Item**	 Access Policy: /Common/webtop_demo | Edit Endings | (Endings: Allow, Deny [default]) Start | fallback | + | Deny Add New Macro Begin typing to search Logon | Authentication | Assignment | Endpoint Security (Server-Side) | Endpoint Security (Client-Side) | General Purpose ○ Citrix Logon Prompt | Configure logon options for Citrix clients ○ External Logon Page | Redirect user to externally hosted form-based web logon page ○ HTTP 401 Response | HTTP 401 Response for Basic or SPNEGO/Kerberos authentication ○ HTTP 407 Response | HTTP 407 Response for Basic or SPNEGO/Kerberos authentication ● Logon Page | Web form-based logon page for collecting end user credentials (used with most deployments) ○ OAuth Logon Page | OAuth Logon Page used for OAuth Client authentication ○ Virtual Keyboard | Enables a virtual keyboard on the logon page for entering credentials ○ VMware View Logon Page | Display logon screen on VMware View clients Cancel | Add Item | Help
	 Properties | Branch Rules Name: Logon Page Logon Page Agent Split domain from full Username: No CAPTCHA Configuration: None Type | Post Variable Name | Session Variable Name | Clean Variable | Values | Read Only 1 | text | username | username | No | | No 2 | password | password | password | No | | No 3 | none | field3 | field3 | No | | No 4 | none | field4 | field4 | No | | No 5 | none | field5 | field5 | No | | No Customization | Import Language: en | Reset all defaults Form Header Text: Secure Logon for F5 Networks Logon Page Input Field #1: Username

9.3.8 Task - Add the Access Policy to the Virtual Server

1. Go to **Local Traffic** -> **Virtual Servers** -> **webtop__demo_vs**	 Local Traffic » Virtual Servers : Virtual Server List Virtual Server List · Virtual Address List · Statistics Search · Create... Status · Name · Description · Application · Destination · Service Port · Type · Resources · Partition / Path webtop_demo_vs · 10.1.10.47 · 443 (HTTPS) · Standard · Edit... · Common Enable · Disable · Delete...
2. Modify the **Rewrite Profile** setting to rewrite, **Access Profile** to `webtop_demo` and **Connectivity Profile** to `webtop_demo_cp`, then click **Update**	 **Content Rewrite** Rewrite Profile: rewrite HTML Profile: None **Access Policy** Access Profile: webtop_demo Connectivity Profile: webtop_demo_cp Per-Request Policy: None VDI Profile: None Application Tunnels (Java & Per-App VPN): □ Enabled OAM Support: □ Enabled ADFS Proxy: □ Enabled PingAccess Profile: None
3. Test access to `https://webtop.vlab.f5demo.com` (you can use the bookmark in Chrome) from the jump host, you should see a logon page. You can login with any user: • **sales_user** • **sales_manager** • **partner_user**	

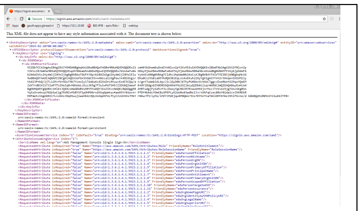
9.4 Lab 2: Setup an AWS Connector

In this module you will learn how to configure an AWS Connector

9.4.1 Lab – Setup AWS Connector

This lab will teach you how to create a SAML AWS connector. Estimated completion time: **30 minutes**

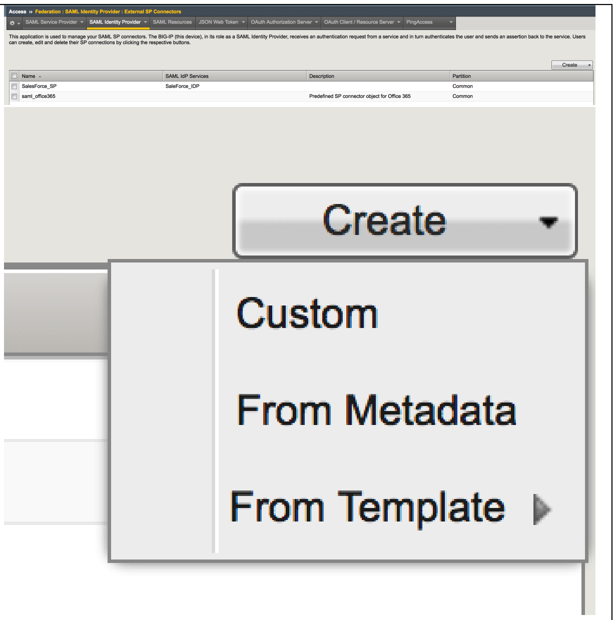
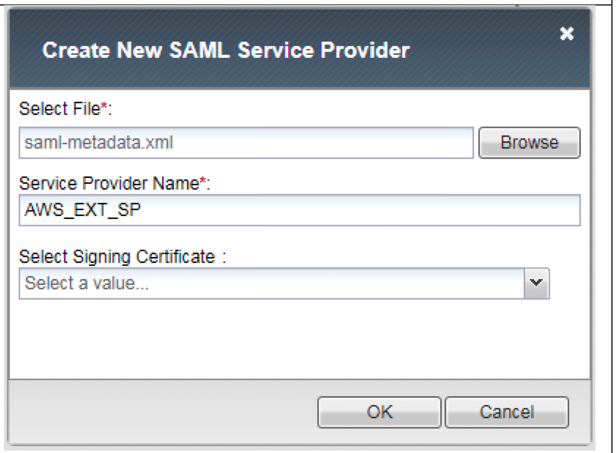
9.4.2 Task - Download AWS metadata

1. From the jumpbox machine (**Win7**) , open new window browser tab to `https://signin.aws.amazon.com/static/saml-metadata.xml` and **download** de xml file to the **Desktop**. This file will be used to create and AWS external SP Connector on the BIG-IP.	

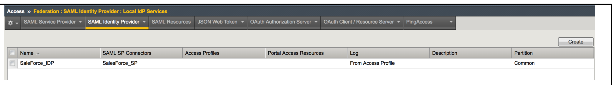
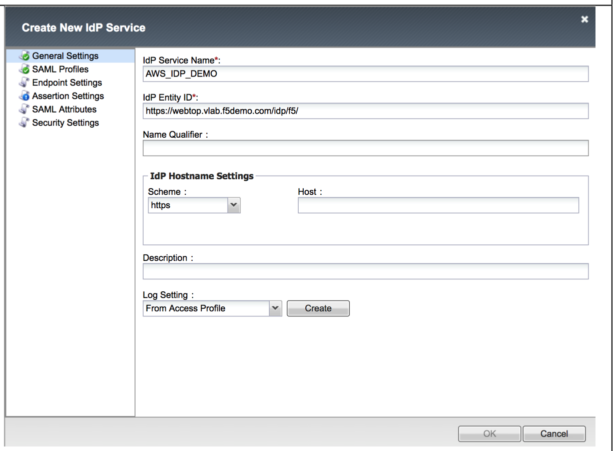
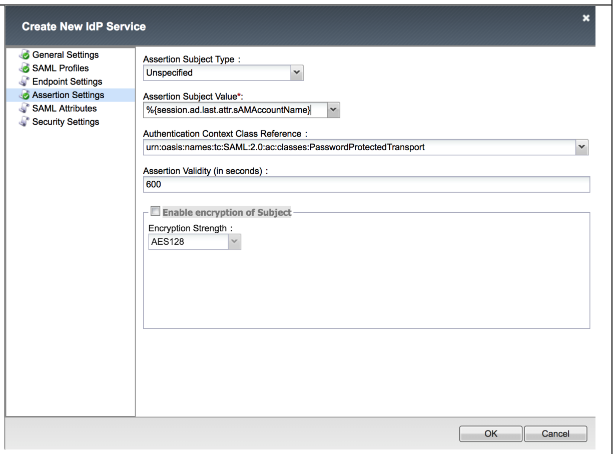
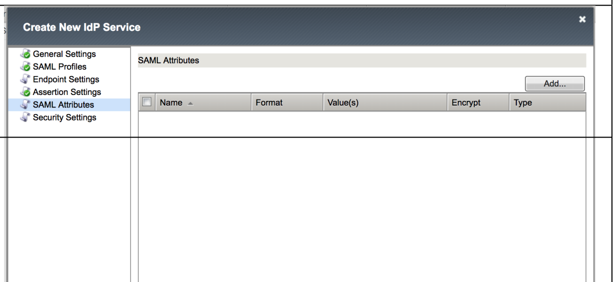
This XML file does not appear to have any style information associated with it. The document tree is shown below.

```
▼<EntityDescriptor xmlns="urn:oasis:names:tc:SAML:2.0:metadata" xmlns:saml="urn:oasis:names:tc:SAML:2.0:assertion" xmlns:ds="http://www.w3.org/2000/09/xmldsig#" entityID="urn:amazon:webservices"
 validUntil="2019-02-20T00:00:00Z">
 ▼<SPSSODescriptor protocolSupportEnumeration="urn:oasis:names:tc:SAML:2.0:protocol" WantAssertionsSigned="true">
  ▼<KeyDescriptor use="signing">
   ▼<ds:KeyInfo xmlns:ds="http://www.w3.org/2000/09/xmldsig#">
    ▼<ds:X509Data>
     ▼<ds:X509Certificate>
       [illegible]
      </ds:X509Certificate>
     </ds:X509Data>
    </ds:KeyInfo>
   </KeyDescriptor>
  ▼<NameIDFormat>
    urn:oasis:names:tc:SAML:2.0:nameid-format:transient
   </NameIDFormat>
  ▼<NameIDFormat>
    urn:oasis:names:tc:SAML:2.0:nameid-format:persistent
   </NameIDFormat>
   <AssertionConsumerService index="1" IsDefault="true" Binding="urn:oasis:names:tc:SAML:2.0:bindings:HTTP-POST" Location="https://signin.aws.amazon.com/saml"/>
  ▼<AttributeConsumingService index="1">
    <ServiceName xml:lang="en">AWS Management Console Single Sign-On</ServiceName>
    <RequestedAttribute isRequired="true" Name="https://aws.amazon.com/SAML/Attributes/Role" FriendlyName="RoleEntitlement"/>
    <RequestedAttribute isRequired="true" Name="https://aws.amazon.com/SAML/Attributes/RoleSessionName" FriendlyName="RoleSessionName"/>
    <RequestedAttribute isRequired="false" Name="urn:oid:1.3.6.1.4.1.5923.1.1.1.1" FriendlyName="eduPersonAffiliation"/>
    <RequestedAttribute isRequired="false" Name="urn:oid:1.3.6.1.4.1.5923.1.1.1.2" FriendlyName="eduPersonNickname"/>
    <RequestedAttribute isRequired="false" Name="urn:oid:1.3.6.1.4.1.5923.1.1.1.3" FriendlyName="eduPersonOrgDN"/>
    <RequestedAttribute isRequired="false" Name="urn:oid:1.3.6.1.4.1.5923.1.1.1.4" FriendlyName="eduPersonOrgUnitDN"/>
    <RequestedAttribute isRequired="false" Name="urn:oid:1.3.6.1.4.1.5923.1.1.1.5" FriendlyName="eduPersonPrimaryAffiliation"/>
    <RequestedAttribute isRequired="false" Name="urn:oid:1.3.6.1.4.1.5923.1.1.1.6" FriendlyName="eduPersonPrincipalName"/>
    <RequestedAttribute isRequired="false" Name="urn:oid:1.3.6.1.4.1.5923.1.1.1.7" FriendlyName="eduPersonEntitlement"/>
    <RequestedAttribute isRequired="false" Name="urn:oid:1.3.6.1.4.1.5923.1.1.1.8" FriendlyName="eduPersonPrimaryOrgUnitDN"/>
    <RequestedAttribute isRequired="false" Name="urn:oid:1.3.6.1.4.1.5923.1.1.1.9" FriendlyName="eduPersonScopedAffiliation"/>
    <RequestedAttribute isRequired="false" Name="urn:oid:1.3.6.1.4.1.5923.1.1.1.10" FriendlyName="eduPersonTargetedID"/>
    <RequestedAttribute isRequired="false" Name="urn:oid:1.3.6.1.4.1.5923.1.1.1.11" FriendlyName="eduPersonAssurance"/>
    <RequestedAttribute isRequired="false" Name="urn:oid:1.3.6.1.4.1.5923.1.2.1.2" FriendlyName="eduOrgHomePageURI"/>
    <RequestedAttribute isRequired="false" Name="urn:oid:1.3.6.1.4.1.5923.1.2.1.3" FriendlyName="eduOrgIdentityAuthNPolicyURI"/>
    <RequestedAttribute isRequired="false" Name="urn:oid:1.3.6.1.4.1.5923.1.2.1.4" FriendlyName="eduOrgLegalName"/>
    <RequestedAttribute isRequired="false" Name="urn:oid:1.3.6.1.4.1.5923.1.2.1.5" FriendlyName="eduOrgSuperiorURI"/>
```

9.4.3 Task - Create an external SP connector to AWS

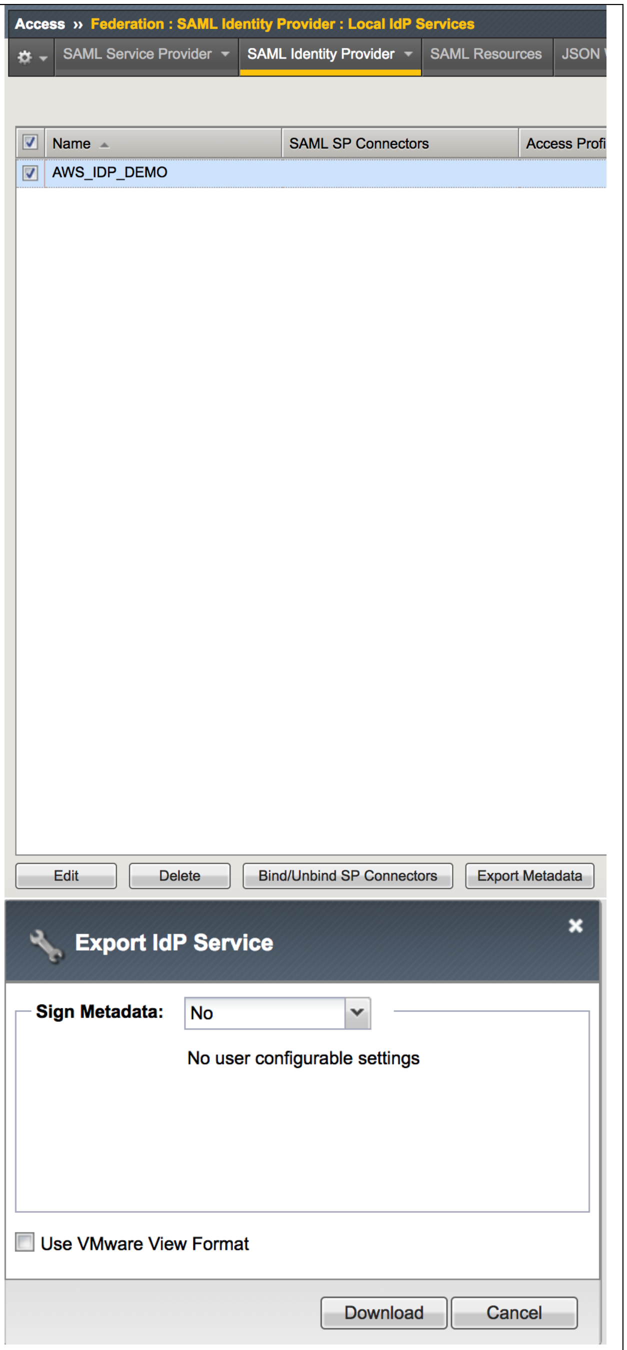
1. Logon onto BIG-IP, then go to **Access** -> **Federation: SAML Identity Provider** -> **External SP Connectors** -> **Create** -> **From Metadata**	 Access » Federation : SAML Identity Provider : External SP Connectors SAML Service Provider SAML Identity Provider SAML Resources JSON Web Token OAuth Authorization Server OAuth Client / Resource Server PingAccess This application is used to manage your SAML SP connectors. The BIG-IP (this device), in its role as a SAML Identity Provider, receives an authentication request from a service and in turn authenticates the user and sends an assertion back to the service. Users can create, edit and delete their SP connections by clicking the respective buttons. Name · SAML IdP Services · Description · Partition SalesForce_SP · SaleForce_IDP · · Common saml_office365 · · Predefined SP connector object for Office 365 · Common
2. Enter the following values (leave others default) then click **OK** **Select File:** `saml-metadata.xml` **Service Provider Name:** `AWS_EXT_SP`	 Create New SAML Service Provider Select File*: saml-metadata.xml Service Provider Name*: AWS_EXT_SP Select Signing Certificate : Select a value...

9.4.4 Task - Create a local IDP Service to AWS

1. Logon onto BIG-IP, then go to **Access** -> **Federation: SAML Identity Provider** -> **Local Idp Services** -> **Create**	 Access » Federation : SAML Identity Provider : Local IdP Services SAML Service Provider / SAML Identity Provider / SAML Resources / JSON Web Token / OAuth Authorization Server / OAuth Client / Resource Server / PingAccess Create □ Name / SAML SP Connectors / Access Profiles / Portal Access Resources / Log / Description / Partition □ SaleForce_IDP / SalesForce_SP / / / From Access Profile / / Common
2. Enter the following values (leave others default) on the **General Settings** **Idp Service Name:** `AWS_IDP_DEMO` **IdP Entity ID:** `https://webtop.vlab.f5demo.com/idp/f5/`	 Create New IdP Service General Settings / SAML Profiles / Endpoint Settings / Assertion Settings / SAML Attributes / Security Settings IdP Service Name*: AWS_IDP_DEMO IdP Entity ID*: https://webtop.vlab.f5demo.com/idp/f5/ Name Qualifier : IdP Hostname Settings Scheme : https Host : Description : Log Setting : From Access Profile Create OK Cancel
3. Enter the following values (leave others default) on the **Assertion Settings**. **Assertion Subject Type:** `Unspecified` **Assertion Subject Value:** `%{session.ad.last.attr.sAMAccountName}` **Authentication Context Class Reference:** `urn:oasis:names:tc:SAML:2.0:ac:classes:PasswordProtectedTransport`	 Create New IdP Service General Settings / SAML Profiles / Endpoint Settings / Assertion Settings / SAML Attributes / Security Settings Assertion Subject Type : Unspecified Assertion Subject Value*: %{session.ad.last.attr.sAMAccountName} Authentication Context Class Reference : urn:oasis:names:tc:SAML:2.0:ac:classes:PasswordProtectedTransport Assertion Validity (in seconds) : 600 □ Enable encryption of Subject Encryption Strength : AES128 OK Cancel
	 Create New IdP Service General Settings / SAML Profiles / Endpoint Settings / Assertion Settings / SAML Attributes / Security Settings SAML Attributes Add... □ Name / Format / Value(s) / Encrypt / Type

9.4.5 Task - Download IdP metadata from BIG-IP for AWS

1. Go to **Access** -> **Federation: SAML Identity Provider** -> **Local IdP Services**, select the `AWS_IDP_DEMO` object, then click **Export Metadata**. Leave the **Sign Metadata** to **No**, and then click **Download**.



Access » Federation : SAML Identity Provider : Local IdP Services

☑	Name	SAML SP Connectors	Access Profi
☑	AWS_IDP_DEMO		

Export IdP Service

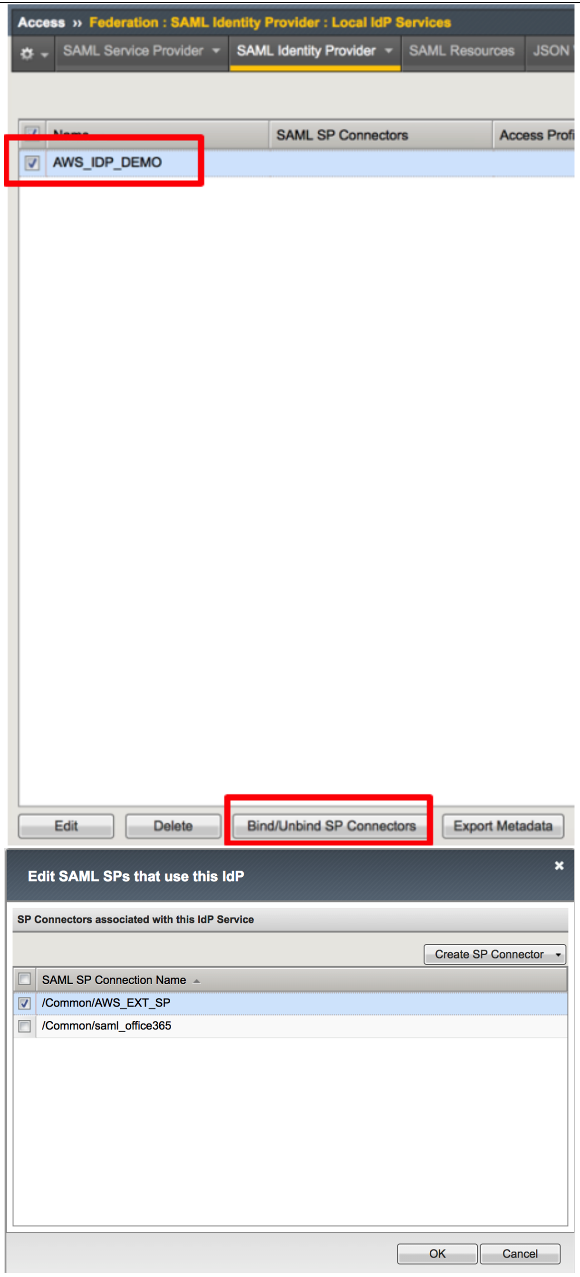
Sign Metadata: No

No user configurable settings

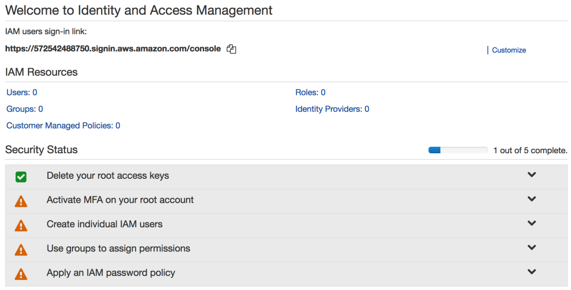
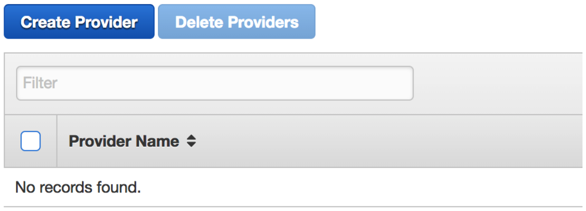
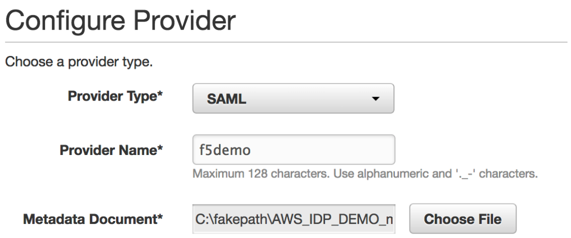
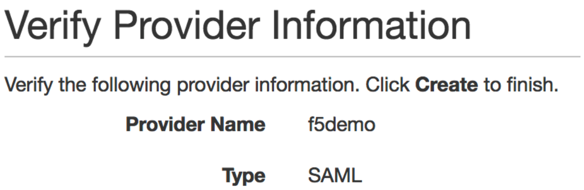
□ Use VMware View Format

9.4.6 Task - Bind IdP and SP Connector to AWS

1. Go to **Access** -> **Federation: SAML Identity Provider** -> **Local IdP Services**, select the `AWS_IDP_DEMO` object, then click **Bind/Unbind SP Connector**. Then select `/Common/AWS_EXT_SP` as SP connector and click **OK**.

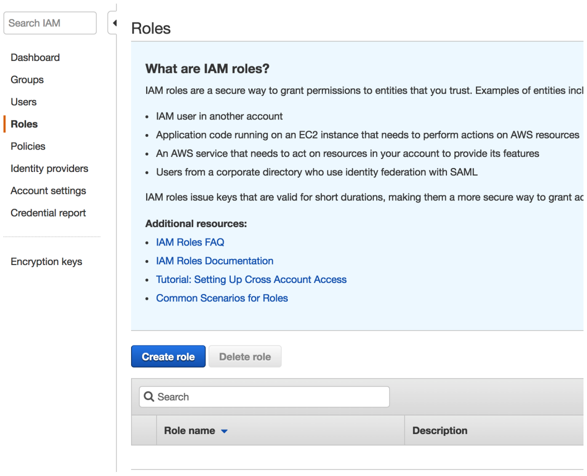


9.4.7 Task - Create an IdP provider in AWS

1. Sign in to the AWS Management Console and open the **IAM console** at `https://console.aws.amazon.com/iam/` then click **Identity Provider**	 Welcome to Identity and Access Management IAM users sign-in link: https://572542488750.signin.aws.amazon.com/console Customize IAM Resources Users: 0 Roles: 0 Groups: 0 Identity Providers: 0 Customer Managed Policies: 0 Security Status 1 out of 5 complete. ✓ Delete your root access keys ⚠ Activate MFA on your root account ⚠ Create individual IAM users ⚠ Use groups to assign permissions ⚠ Apply an IAM password policy
2. Click **Create Provider**	 Create Provider Delete Providers Filter □ Provider Name No records found.
3. Enter the following values (leave others default) on the **Configure Provider** tab, then click **Next Step** **Provider Type:** `SAML` **Provider Name:** `f5demo` **Metadata Document:** `PATH\\AWS_IDP_DEMO_metadata.xml` For the `metadata` document choose the file that you already downloaded.	 Configure Provider Choose a provider type. Provider Type* SAML Provider Name* f5demo Maximum 128 characters. Use alphanumeric and '._-' characters. Metadata Document* C:\fakepath\AWS_IDP_DEMO_n Choose File
4. `Verify the information` you have provided, and then click **Create**.	 Verify Provider Information Verify the following provider information. Click **Create** to finish. **Provider Name** f5demo **Type** SAML

9.4.8 Task - Create a new Role in AWS

1. In the left navigation pane, click **Roles**.



Search IAM

- Dashboard
- Groups
- Users
- **Roles**
- Policies
- Identity providers
- Account settings
- Credential report
- Encryption keys

Roles

What are IAM roles?

IAM roles are a secure way to grant permissions to entities that you trust. Examples of entities incl

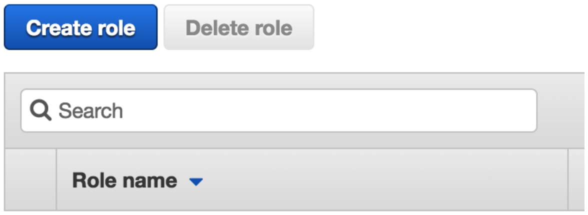
- IAM user in another account
- Application code running on an EC2 instance that needs to perform actions on AWS resources
- An AWS service that needs to act on resources in your account to provide its features
- Users from a corporate directory who use identity federation with SAML

IAM roles issue keys that are valid for short durations, making them a more secure way to grant ac

Additional resources:

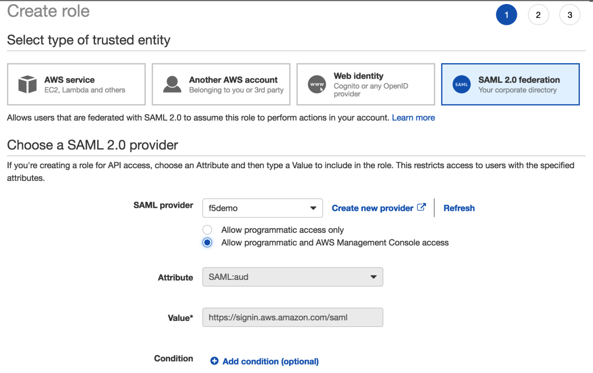
- IAM Roles FAQ
- IAM Roles Documentation
- Tutorial: Setting Up Cross Account Access
- Common Scenarios for Roles

2. Click **Create Role**



3. Enter the following values (leave others default) on the **Select type of trusted entity** tab, then click **Next: Permisions**

   Type of trusted entity: `SAML 2.0`
   SAML provider: `f5demo`
   Select: `Allow programmatic and AWS Management Console`
   Attribute: `SAML:aud`
   Value: `https://signing.aws.amazon.com/saml`



Create role

Select type of trusted entity

- **AWS service** EC2, Lambda and others
- **Another AWS account** Belonging to you or 3rd party
- **Web identity** Cognito or any OpenID provider
- **SAML 2.0 federation** Your corporate directory

Allows users that are federated with SAML 2.0 to assume this role to perform actions in your account. Learn more

Choose a SAML 2.0 provider

If you're creating a role for API access, choose an Attribute and then type a Value to include in the role. This restricts access to users with the specified attributes.

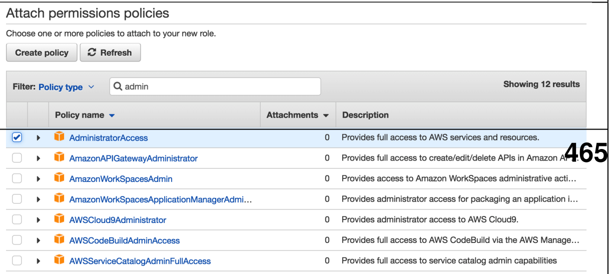
SAML provider f5demo

○ Allow programmatic access only
● Allow programmatic and AWS Management Console access

Attribute SAML:aud

Value* https://signin.aws.amazon.com/saml

Condition



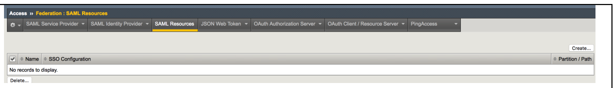
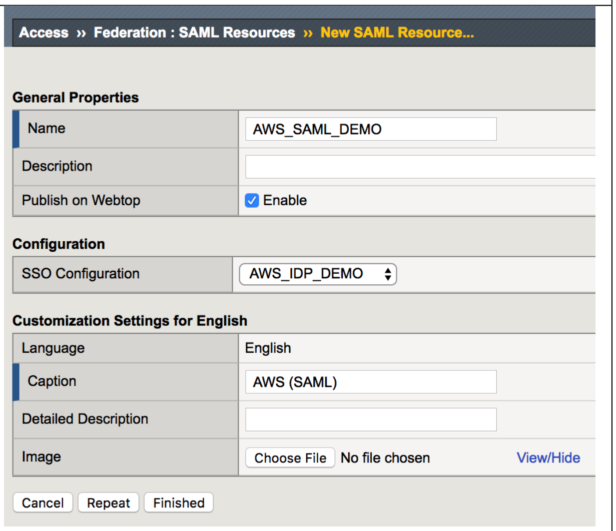
Attach permissions policies

Choose one or more policies to attach to your new role.

Filter: Policy type admin Showing 12 results

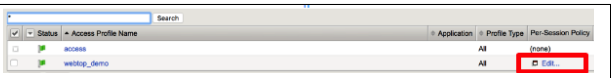
		Policy name	Attachments	Description
☑	▸	AdministratorAccess	0	Provides full access to AWS services and resources.
□	▸	AmazonAPIGatewayAdministrator	0	Provides full access to create/edit/delete APIs in Amazon A
□	▸	AmazonWorkSpacesAdmin	0	Provides access to Amazon WorkSpaces administrative acti…
□	▸	AmazonWorkSpacesApplicationManagerAdmi…	0	Provides administrator access for packaging an application i…
□	▸	AWSCloud9Administrator	0	Provides administrator access to AWS Cloud9.
□	▸	AWSCodeBuildAdminAccess	0	Provides full access to AWS CodeBuild via the AWS Manage…
□	▸	AWSServiceCatalogAdminFullAccess	0	Provides full access to service catalog admin capabilities

9.4.9 Task - Create a AWS SAML resource in BIG-IP

1. Go to **Access** -> **Federation: SAML Resources** -> **Create.**	 Access » Federation : SAML Resources SAML Service Provider SAML Identity Provider SAML Resources JSON Web Token OAuth Authorization Server OAuth Client / Resource Server PingAccess Create... Name SSO Configuration Partition / Path Delete... No records to display.
2. Enter the following values (leave others default) on the **New SAML Resource** tab, then click **Finished.** **Name:** `AWS_SAML_DEMO` **SSO Configuration:** `AWS_IDP_DEMO` **Caption:** `AWS (SAML)`	 Access » Federation : SAML Resources » New SAML Resource... **General Properties** Name: AWS_SAML_DEMO Description: Publish on Webtop: ☑ Enable **Configuration** SSO Configuration: AWS_IDP_DEMO **Customization Settings for English** Language: English Caption: AWS (SAML) Detailed Description: Image: Choose File No file chosen View/Hide Cancel Repeat Finished

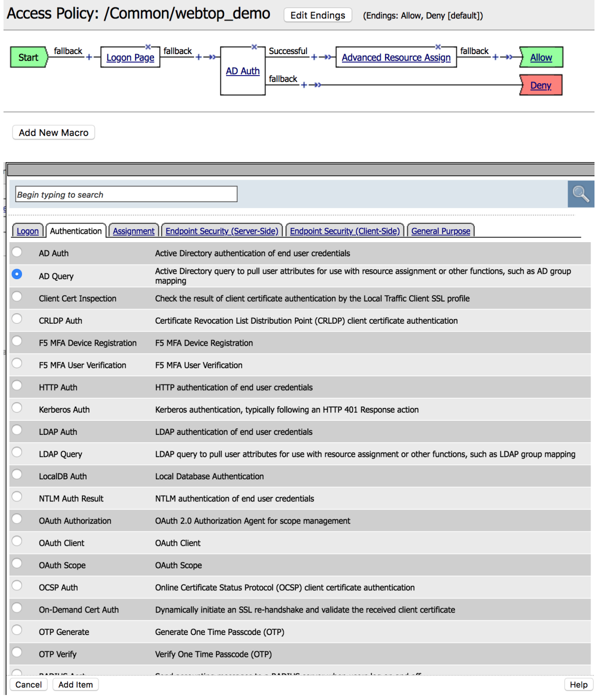
9.4.10 Task - Assign the AWS SAML resource

1. Go to **Access** -> **Profiles/Policies** -> **Access Profiles**, then click **Edit** for **webtop_demo**, a new browser tab will open



	Status	Access Profile Name	Application	Profile Type	Per-Session Policy
□		access		All	(none)
□		webtop_demo		All	Edit...

2. Click the + between **AD Auth** and **Advanced Resource Assign**, select **AD Query** from the **Authentication** tab, click **Add Item**

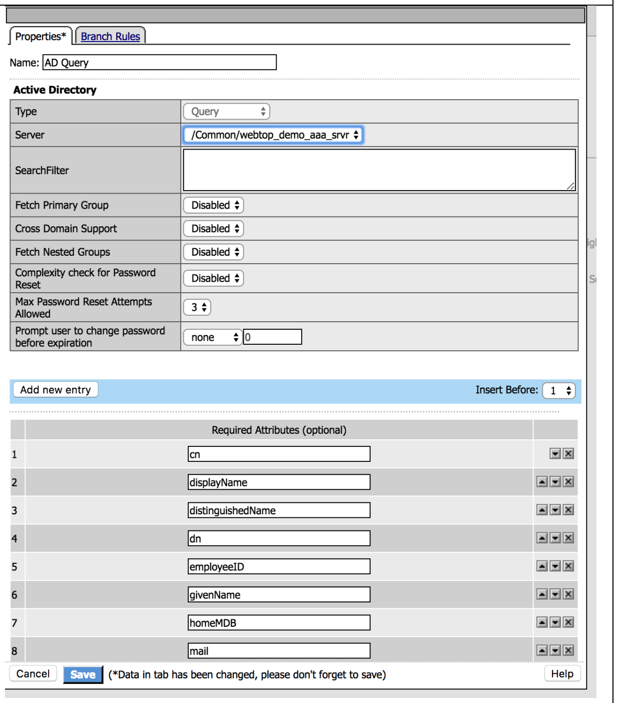


Access Policy: /Common/webtop_demo Edit Endings (Endings: Allow, Deny [default])

○	AD Auth	Active Directory authentication of end user credentials
●	AD Query	Active Directory query to pull user attributes for use with resource assignment or other functions, such as AD group mapping
○	Client Cert Inspection	Check the result of client certificate authentication by the Local Traffic Client SSL profile
○	CRLDP Auth	Certificate Revocation List Distribution Point (CRLDP) client certificate authentication
○	F5 MFA Device Registration	F5 MFA Device Registration
○	F5 MFA User Verification	F5 MFA User Verification
○	HTTP Auth	HTTP authentication of end user credentials
○	Kerberos Auth	Kerberos authentication, typically following an HTTP 401 Response action
○	LDAP Auth	LDAP authentication of end user credentials
○	LDAP Query	LDAP query to pull user attributes for use with resource assignment or other functions, such as LDAP group mapping
○	LocalDB Auth	Local Database Authentication
○	NTLM Auth Result	NTLM authentication of end user credentials
○	OAuth Authorization	OAuth 2.0 Authorization Agent for scope management
○	OAuth Client	OAuth Client
○	OAuth Scope	OAuth Scope
○	OCSP Auth	Online Certificate Status Protocol (OCSP) client certificate authentication
○	On-Demand Cert Auth	Dynamically initiate an SSL re-handshake and validate the received client certificate
○	OTP Generate	Generate One Time Passcode (OTP)
○	OTP Verify	Verify One Time Passcode (OTP)

3. Enter the following values (leave others default) then click **Save**

Server: `/Common/webtop_demo_aaa_srvr`



Name: AD Query

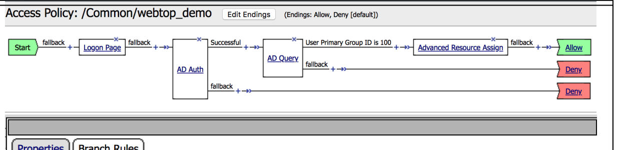
Active Directory

Type	Query
Server	/Common/webtop_demo_aaa_srvr
SearchFilter	
Fetch Primary Group	Disabled
Cross Domain Support	Disabled
Fetch Nested Groups	Disabled
Complexity check for Password Reset	Disabled
Max Password Reset Attempts Allowed	3
Prompt user to change password before expiration	none 0

	Required Attributes (optional)
1	cn
2	displayName
3	distinguishedName
4	dn
5	employeeID
6	givenName
7	homeMDB
8	mail

Cancel Save (*Data in tab has been changed, please don't forget to save) Help

4. Click on the **AD Query** object, a new window will open. Click on the **Branch Rules** tab



Access Policy: /Common/webtop_demo Edit Endings (Endings: Allow, Deny [default])

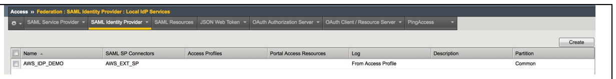
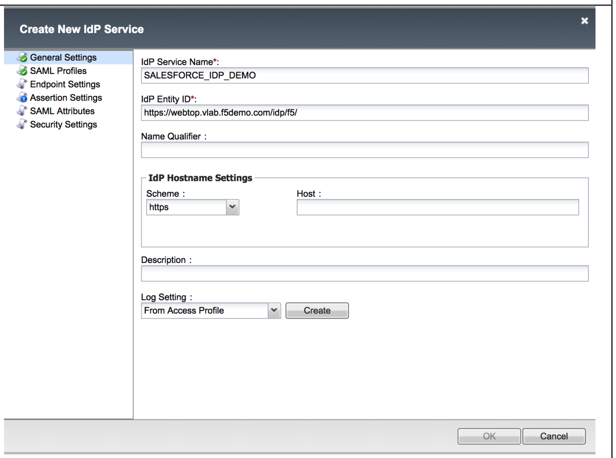
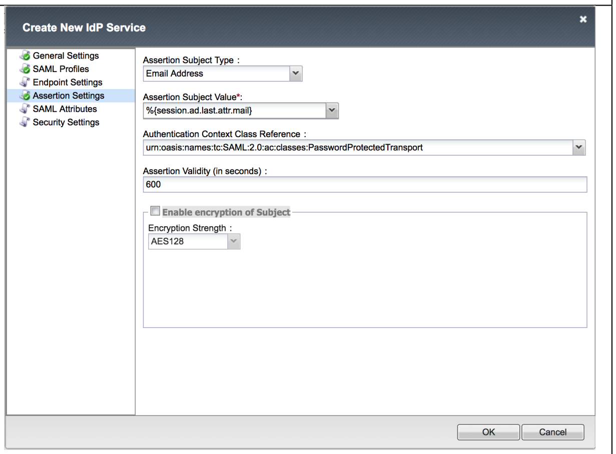
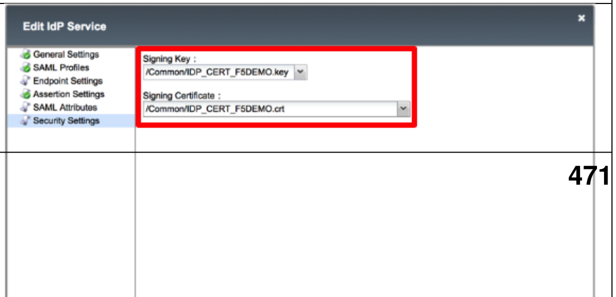
9.5 Lab 3: Setup a Salesforce Connector

In this module you will learn how to configure a Salesforce Connector.

9.5.1 Lab – Setup Salesforce Connector

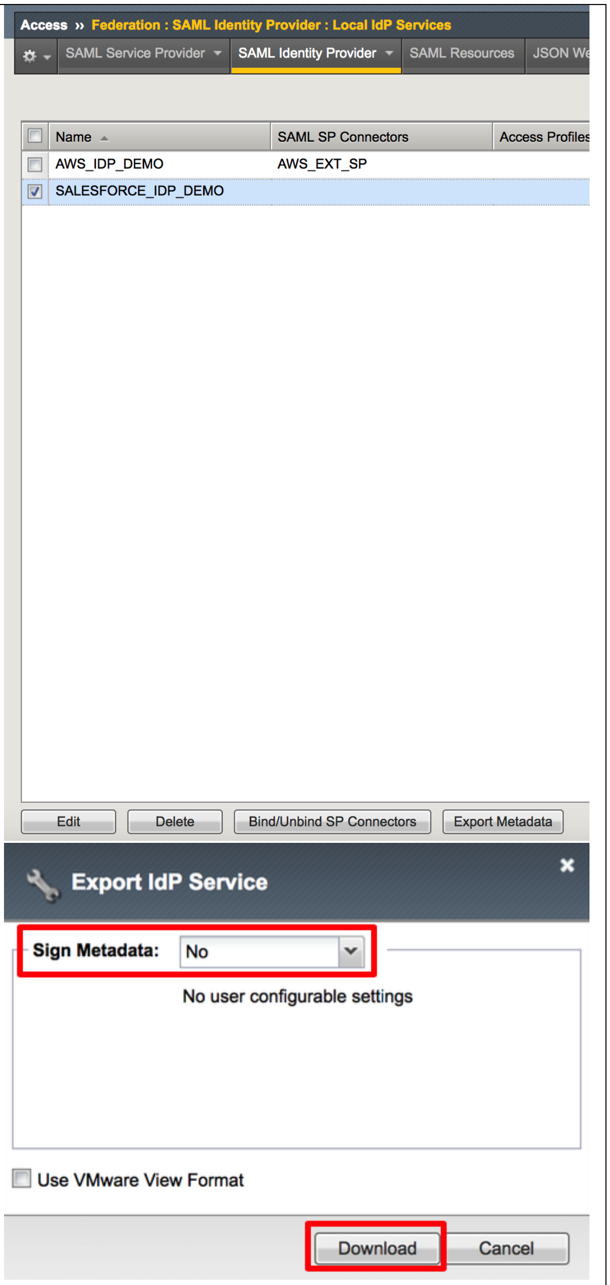
This lab will teach you how to create a SAML Salesforce connector. Estimated completion time: **30 minutes**

9.5.2 Task - Create a local IDP Service to Salesforce

1. Logon onto BIG-IP, then go to **Access** -> **Federation: SAML Identity Provider** -> **Local Idp Services** -> **Create**	 Access » Federation : SAML Identity Provider : Local IdP Services SAML Service Provider SAML Identity Provider SAML Resources JSON Web Token OAuth Authorization Server OAuth Client / Resource Server PingAccess Create Name: AWS_IDP_DEMO; SAML SP Connectors: AWS_EXT_SP; Access Profiles: ; Portal Access Resources: ; Log: From Access Profile; Description: ; Partition: Common
2. Enter the following values (leave others default) on the **General Settings** **Idp Service Name:** `SALESFORCE_IDP_DEMO` **IdP Entity ID:** `https://webtop.vlab.f5demo.com/idp/f5/`	 Create New IdP Service General Settings SAML Profiles Endpoint Settings Assertion Settings SAML Attributes Security Settings IdP Service Name*: SALESFORCE_IDP_DEMO IdP Entity ID*: https://webtop.vlab.f5demo.com/idp/f5/ Name Qualifier : IdP Hostname Settings Scheme : https Host : Description : Log Setting : From Access Profile
3. Enter the following values (leave others default) on the **Assertion Settings**. **Assertion Subject Type:** `Email Address` **Assertion Subject Value:** `%{session.ad.last.attr.mail}` **Authentication Context Class Reference:** `urn:oasis:names:tc:SAML:2.0:ac:classes:PasswordProtectedTransport`	 Create New IdP Service General Settings SAML Profiles Endpoint Settings Assertion Settings SAML Attributes Security Settings Assertion Subject Type : Email Address Assertion Subject Value*: %{session.ad.last.attr.mail} Authentication Context Class Reference : urn:oasis:names:tc:SAML:2.0:ac:classes:PasswordProtectedTransport Assertion Validity (in seconds) : 600 □ Enable encryption of Subject Encryption Strength : AES128
	 Edit IdP Service General Settings SAML Profiles Endpoint Settings Assertion Settings SAML Attributes Security Settings Signing Key : /Common/IDP_CERT_F5DEMO.key Signing Certificate : /Common/IDP_CERT_F5DEMO.crt

9.5.3 Task - Download IdP metadata from BIG-IP for Salesforce

1. Go to **Access** -> **Federation: SAML Identity Provider** -> **Local IdP Services**, select the **SALESFORCE_IDP_DEMO** object, then click **Export Metadata**. Leave the **Sign Metadata** to **No**, and then click **Download**.



□	Name	SAML SP Connectors	Access Profiles
□	AWS_IDP_DEMO	AWS_EXT_SP	
☑	SALESFORCE_IDP_DEMO		

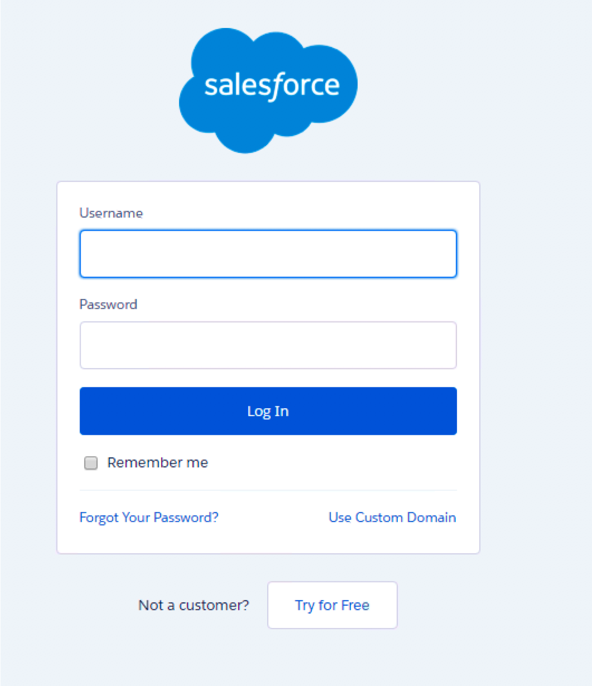
Sign Metadata: No

No user configurable settings

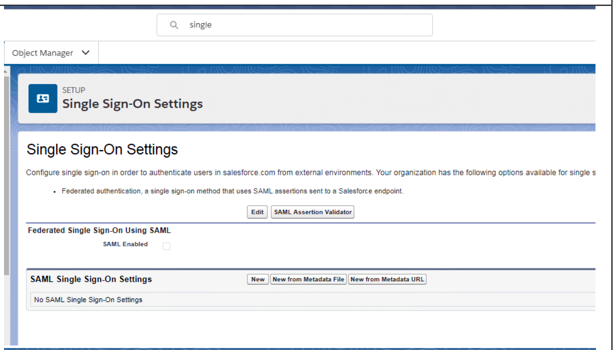
□ Use VMware View Format

9.5.4 Task - Create an IdP provider in Salesforce

1. Log in to Salesforce `https://login.salesforce.com`



2. In Quick Find search box, type **single**, and then click **Single Sign-On Settings.** After that click the **Edit** button and check the **SAML Enabled** box, and then click **Save**.



Single Sign-On Settings

Configure single sign-on in order to authenticate users in salesforce.com from external environments. Your organization has the following options available for single s

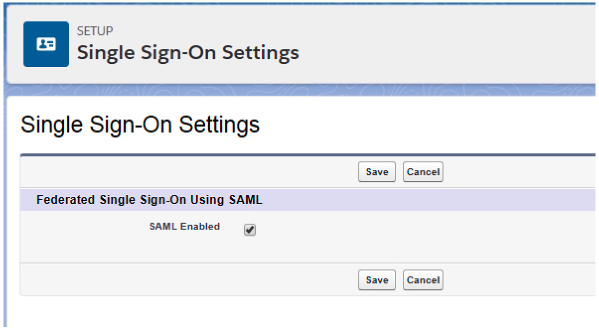
- Federated authentication, a single sign-on method that uses SAML assertions sent to a Salesforce endpoint.

Federated Single Sign-On Using SAML

SAML Enabled □

SAML Single Sign-On Settings

No SAML Single Sign-On Settings

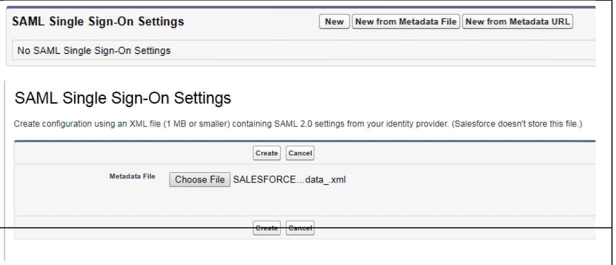


Single Sign-On Settings

Federated Single Sign-On Using SAML

SAML Enabled ☑

3. Click **New from Metadata file**.Then click **Choose File**, select `SALESFORCE_IDP_DEMO_metadata.xml` export file you downloaded from BIG-IP, and then click **Create.**

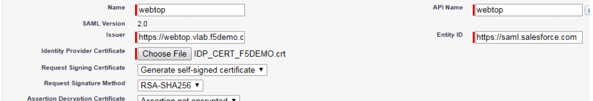

SAML Single Sign-On Settings

No SAML Single Sign-On Settings

SAML Single Sign-On Settings

Create configuration using an XML file (1 MB or smaller) containing SAML 2.0 settings from your identity provider. (Salesforce doesn't store this file.)

Metadata File: Choose File SALESFORCE...data_.xml


Name: webtop

API Name: webtop

SAML Version: 2.0

Issuer: https://webtop.vlab.f5demo.c

Entity ID: https://saml.salesforce.com

Identity Provider Certificate: Choose File IDP_CERT_F5DEMO.crt

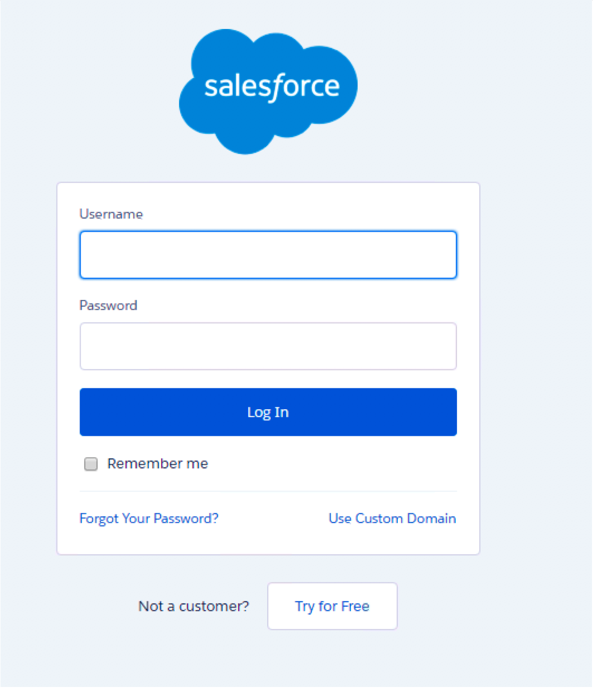
Request Signing Certificate: Generate self-signed certificate ▾

Request Signature Method: RSA-SHA256 ▾

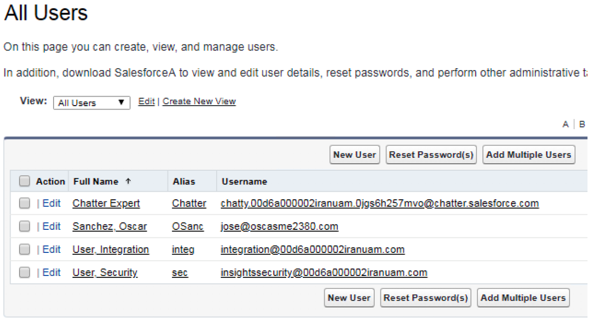
Assertion Decryption Certificate: Assertion not encrypted ▾

9.5.5 Task - Create a new user in Salesforce

1. Log in to Salesforce `https://login.salesforce.com`



2. Under Administration, click **Users** -> **Users** -> **New User.**



All Users

On this page you can create, view, and manage users.

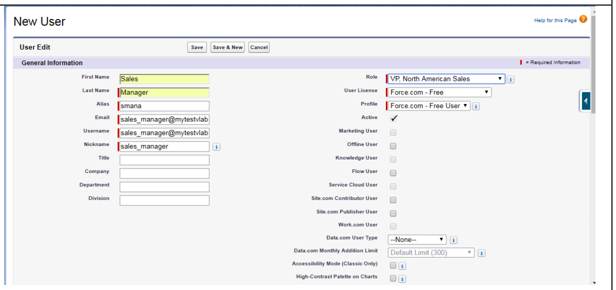
In addition, download SalesforceA to view and edit user details, reset passwords, and perform other administrative t

View: All Users ▾ Edit | Create New View

□ Action	Full Name ↑	Alias	Username
□ | Edit	Chatter Expert	Chatter	chatty.00d6a000002iranuam.0jgs6h257mvo@chatter.salesforce.com
□ | Edit	Sanchez, Oscar	OSanc	jose@oscasme2380.com
□ | Edit	User, Integration	integ	integration@00d6a000002iranuam.com
□ | Edit	User, Security	sec	insightssecurity@00d6a000002iranuam.com

3. Enter the following values (leave others default) on the **New User**.

   First Name: `Sales`
   Last Name: `Manager`
   E mail: `sales_manager@yourdomain`
   Username: `sales_manager@yourdomain`
   Nickname: `sales_manager`
   Role: `VP, North American Sales`
   User License: `Free`



New User

User Edit

General Information

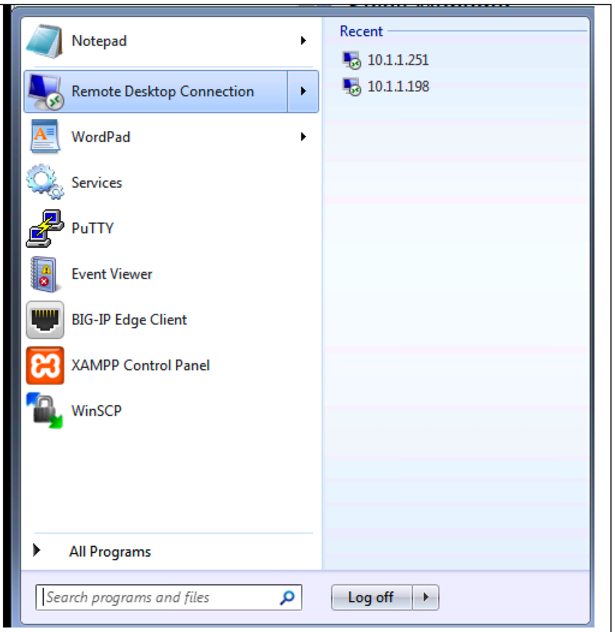
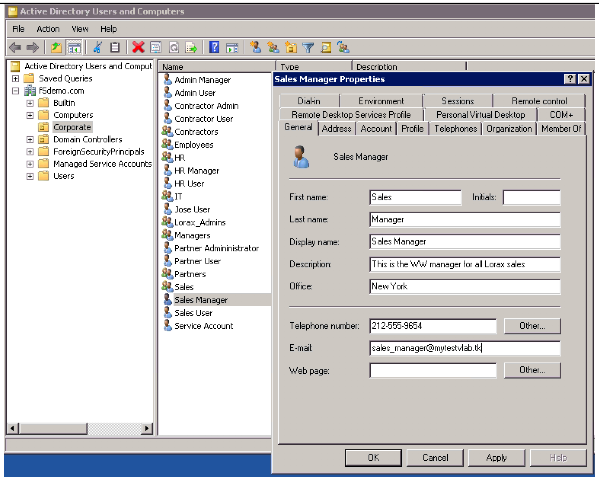
| = Required Information

First Name	Sales	Role	VP, North American Sales ▾
Last Name	Manager	User License	Force.com - Free ▾
Alias	smana	Profile	Force.com - Free User ▾
Email	sales_manager@mytestvlab	Active	✓
Username	sales_manager@mytestvlab	Marketing User	□
Nickname	sales_manager	Offline User	□
Title		Knowledge User	□
Company		Flow User	□
Department		Service Cloud User	□
Division		Site.com Contributor User	□
		Site.com Publisher User	□
		Work.com User	□
		Data.com User Type	--None-- ▾
		Data.com Monthly Addition Limit	Default Limit (300) ▾
		Accessibility Mode (Classic Only)	□
		High-Contrast Palette on Charts	□

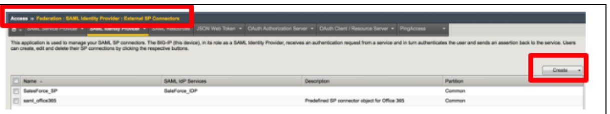
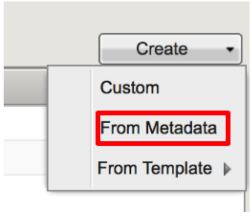
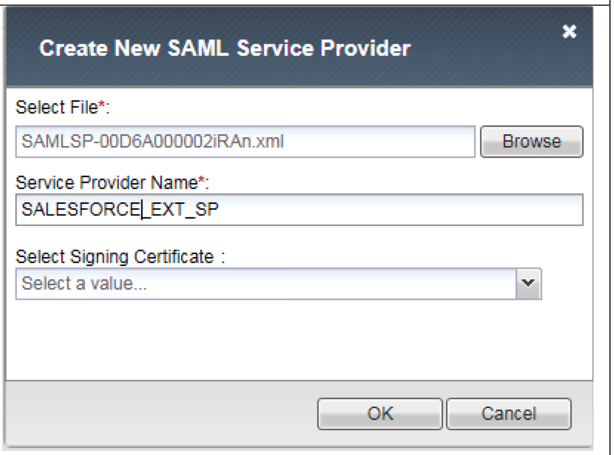
Repeat steps to the following users and change the **Role** as you want:

Sales User = `sales_user@yourdomain`
Partner User = `partner_user@yourdomain`

9.5.6 Task - Modify the users in Active Directory

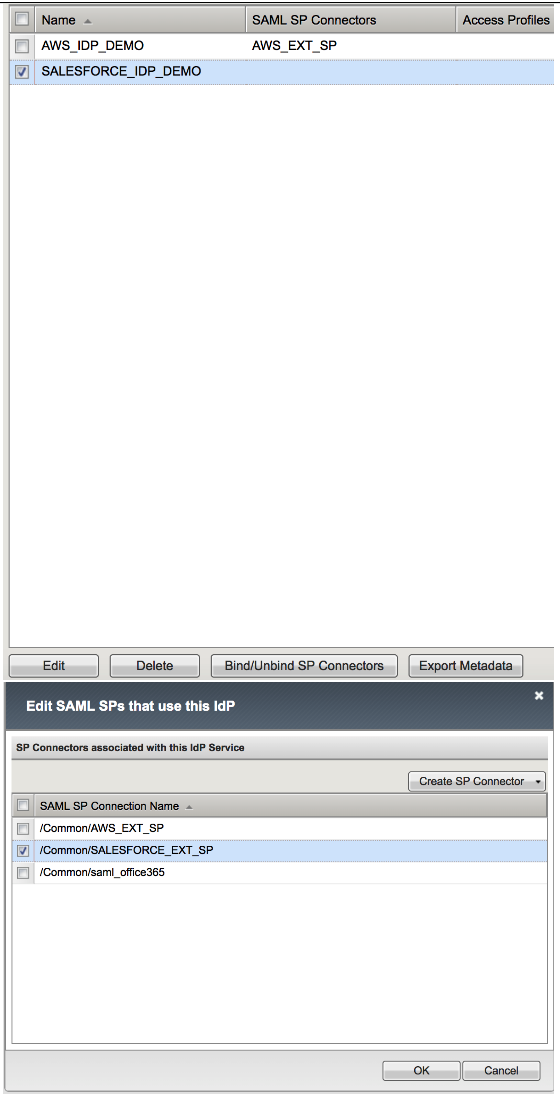
1. From the **Win 7** Jumpbox open a **Remote Desktop Connection** to Win 2008 server `10.1.1.251` Log in using **username:** `administrator` and **password:** `password`.	 Notepad Remote Desktop Connection WordPad Services PuTTY Event Viewer BIG-IP Edge Client XAMPP Control Panel WinSCP All Programs Search programs and files Log off Recent 10.1.1.251 10.1.1.198
2. Open the **Active Directory Users and Computers**console, then right-click on the **Sales Manager** user and then click **Properties**, modify the `E-mail` parameter according to the user that you already created at Salesforce. (`sales_manager@yourdomain`). Repeat steps to the following users: **Sales User** = `sales_user@yourdomain` **Partner User** = `partner_user@yourdomain`	 Sales Manager Properties First name: Sales Initials: Last name: Manager Display name: Sales Manager Description: This is the WW manager for all Lorax sales Office: New York Telephone number: 212-555-9654 E-mail: sales_manager@mytestvlab.tk Web page: Active Directory Users and Computers File Action View Help Active Directory Users and Comput Saved Queries f5demo.com Builtin Computers Corporate Domain Controllers ForeignSecurityPrincipals Managed Service Accounts Users Name Type Description Admin Manager Admin User Contractor Admin Contractor User Contractors Employees HR HR Manager HR User IT Jose User Lorax_Admins Managers Partner Admininistrator Partner User Partners Sales Sales Manager Sales User Service Account Dial-in Environment Sessions Remote control Remote Desktop Services Profile Personal Virtual Desktop COM+ General Address Account Profile Telephones Organization Member Of Sales Manager Other... Other... OK Cancel Apply Help

9.5.7 Task - Create an external SP connector to Salesforce

1. Logon onto BIG-IP, then go to **Access** -> **Federation: SAML Identity Provider** -> **External SP Connectors** -> **Create** -> **From Metadata**	 Access » Federation : SAML Identity Provider : External SP Connectors SAML Service Provider SAML Identity Provider SAML Resources JSON Web Token OAuth Authorization Server OAuth Client / Resource Server PingAccess This application is used to manage your SAML SP connectors. The BIG-IP (this device), in its role as a SAML Identity Provider, receives an authentication request from a service and in turn authenticates the user and sends an assertion back to the service. Users can create, edit and delete their SP connections by clicking the respective buttons. Name / SAML IdP Services / Description / Partition SalesForce_SP / SaleForce_IDP / / Common saml_office365 / / Predefined SP connector object for Office 365 / Common 
2. Enter the following values (leave others default) then click **OK** **Select File:** `SAMLSP-XXXX.xml` **Service Provider Name:** `SALESFORCE_EXT_SP` Use the `XML file` that you downloaded from **TASK 3**.	 Create New SAML Service Provider Select File*: SAMLSP-00D6A000002iRAn.xml Service Provider Name*: SALESFORCE_EXT_SP Select Signing Certificate : Select a value...

9.5.8 Task - Bind IdP and SP Connector to Salesforce

1. Go to **Access** -> **Federation: SAML Identity Provider** -> **Local IdP Services**, select the `SALESFORCE_IDP_DEMO` object, then click **Bind/Unbind SP Connector**. Then select `Common/SALESFORCE_EXT_SP` as SP connector, and click **OK**.



□	Name	SAML SP Connectors	Access Profiles
□	AWS_IDP_DEMO	AWS_EXT_SP	
☑	SALESFORCE_IDP_DEMO		

Edit SAML SPs that use this IdP

SP Connectors associated with this IdP Service

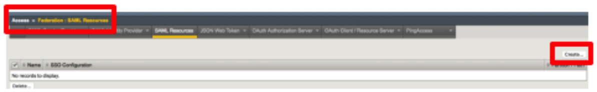
□	SAML SP Connection Name
□	/Common/AWS_EXT_SP
☑	/Common/SALESFORCE_EXT_SP
□	/Common/saml_office365

9.5.9 Task - Create a Salesforce SAML resource in BIG-IP

<table>
<tr>
<td>

1. Go to **Access** -> **Federation: SAML Resources** -> **Create.**

</td>
<td>

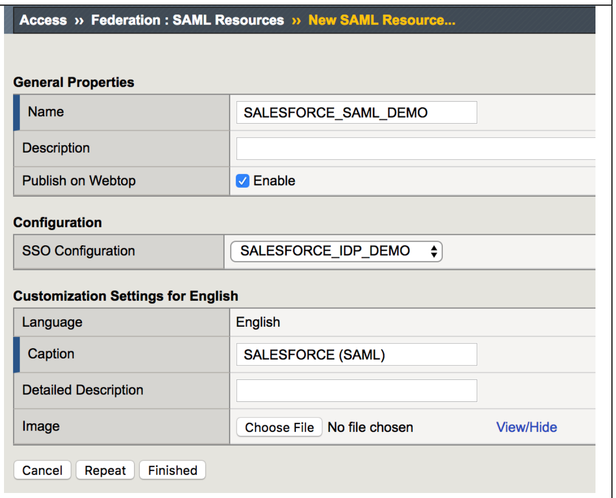


</td>
</tr>
<tr>
<td>

2. Enter the following values (leave others default) on the **New SAML Resource** tab, then click **Finished.**

Name: `SALESFORCE_SAML_DEMO`
SSO Configuration: `SALESFORCE_IDP_DEMO`
Caption: `SALESFORCE (SAML)`

</td>
<td>



Access » Federation : SAML Resources » New SAML Resource...

General Properties

Name	SALESFORCE_SAML_DEMO
Description	
Publish on Webtop	☑ Enable

Configuration

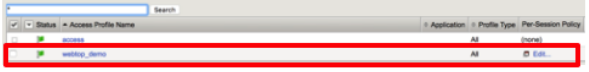
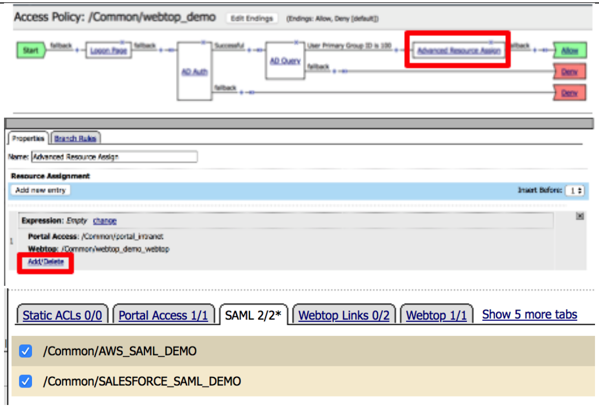
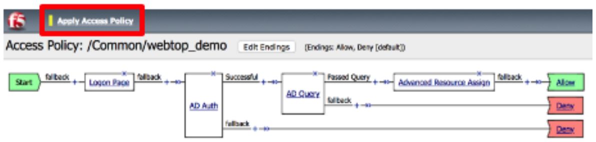
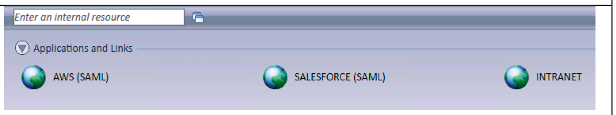
SSO Configuration	SALESFORCE_IDP_DEMO

Customization Settings for English

Language	English
Caption	SALESFORCE (SAML)
Detailed Description	
Image	Choose File No file chosen View/Hide

</td>
</tr>
</table>

9.5.10 Task - Assign the SALESFORCE SAML resource

1. Go to **Access** -> **Profiles/Policies** -> **Access Profiles**, then click **Edit** for `webtop_demo`, a new browser tab will open	 Search Status Access Profile Name Application Profile Type Per-Session Policy access All (none) webtop_demo All Edit...
2. Click on the **Advanced Resource Assign** object, a new window will open. Click **Add/Delete**, then choose `/Common/AWS_SAML_DEMO` and `/Common/SALESFORCE_SAML_DEMO` from the **SAML** tab and click **Update**, then **Save**.	 Access Policy: /Common/webtop_demo Name: Advanced Resource Assign Resource Assignment Expression: Empty change Portal Access: /Common/portal_intranet Webtop: /Common/webtop_demo_webtop Static ACLs 0/0 | Portal Access 1/1 | SAML 2/2* | Webtop Links 0/2 | Webtop 1/1 | Show 5 more tabs ☑ /Common/AWS_SAML_DEMO ☑ /Common/SALESFORCE_SAML_DEMO Edit Endings (Endings: Allow, Deny [default]) Start fallback Logon Page AD Auth Successful AD Query User Primary Group ID is 100 Advanced Resource Assign Allow Deny Deny Properties Branch Rules Add new entry Insert Before: 1 Add/Delete
3. Click **Apply Access Policy** in the top left and then close the browser tab	 Apply Access Policy Access Policy: /Common/webtop_demo Edit Endings (Endings: Allow, Deny [default]) Start fallback Logon Page AD Auth Successful AD Query Passed Query Advanced Resource Assign Allow Deny Deny
4. Go to `https://webtop.vlab.f5demo.com` from the jump host, You can login with any user: • **sales_user** • **sales_manager** • **partner_user** You should see two `SAML` resources **AWS** and **SALESFORCE**	 Enter an internal resource Applications and Links AWS (SAML) SALESFORCE (SAML) INTRANET
5. Click on the **AWS** and **SALESFORCE** links. You should be able to access **both** because of **SSO** (`SAML`).	

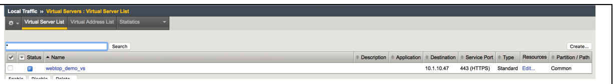
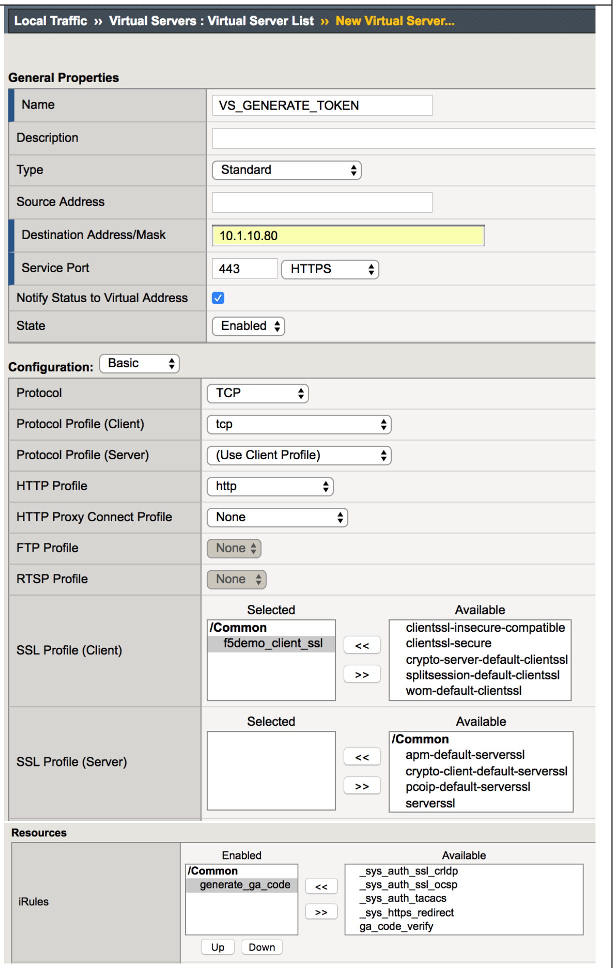
9.6 Lab 4: Set up Google Authenticator (GA)

In this module you will learn how to configure Google Authenticator as Second Auth Factor

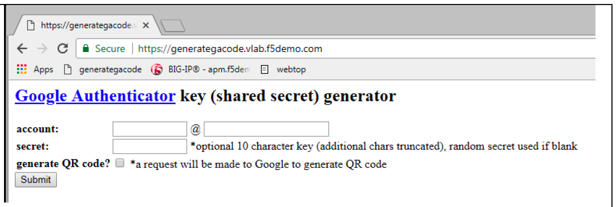
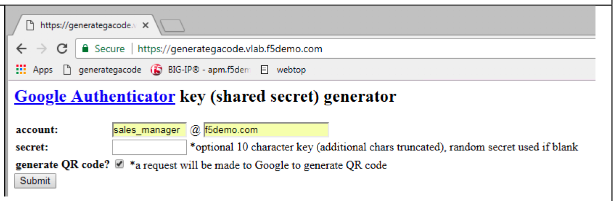
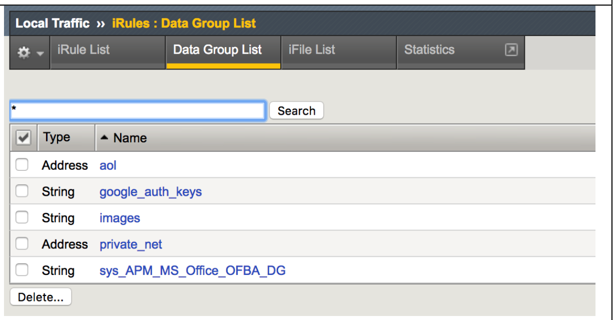
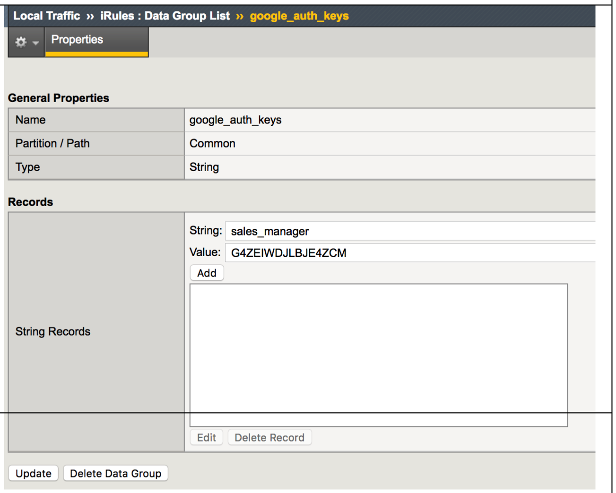
9.6.1 Lab – Set up Google Authenticator (GA)

This lab will teach you how to configure Google Authenticator as Second Auth Factor. Estimated completion time: **30 minutes**

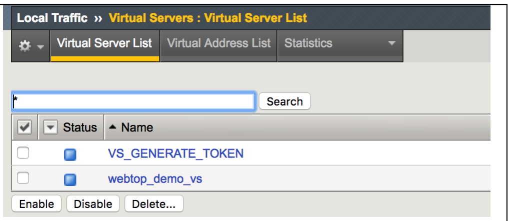
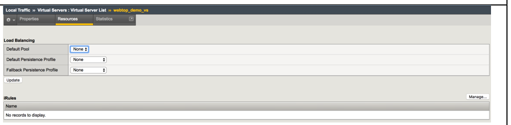
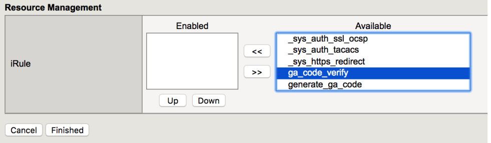
9.6.2 Task - Create the VS used to generate GA tokens

1. Log in to the BIG IP then go to **Local Traffic** -> **Virtual Servers** -> **Virtual Server List**. Click on **Create**.	 Local Traffic ›› Virtual Servers : Virtual Server List Status: webtop_demo_vs — Destination: 10.1.10.47 — Service Port: 443 (HTTPS) — Type: Standard — Resources: Edit... — Partition / Path: Common
2. Enter the following values (leave others default) and then **finished.** **Name:** `VS_GENERATE_TOKEN` **Destination Address:** `10.1.10.80` **Service Port:** `443` **HTTP Profile:** `http` **SSL Profile (Client):** `f5demo_client_ssl` **iRules:** `generate_ga_code`	 Local Traffic ›› Virtual Servers : Virtual Server List ›› New Virtual Server... General Properties Name: VS_GENERATE_TOKEN Description: Type: Standard Source Address: Destination Address/Mask: 10.1.10.80 Service Port: 443 HTTPS Notify Status to Virtual Address: ☑ State: Enabled Configuration: Basic Protocol: TCP Protocol Profile (Client): tcp Protocol Profile (Server): (Use Client Profile) HTTP Profile: http HTTP Proxy Connect Profile: None FTP Profile: None RTSP Profile: None SSL Profile (Client): Selected: /Common f5demo_client_ssl; Available: clientssl-insecure-compatible, clientssl-secure, crypto-server-default-clientssl, splitsession-default-clientssl, wom-default-clientssl SSL Profile (Server): Selected: (none); Available: /Common apm-default-serverssl, crypto-client-default-serverssl, pcoip-default-serverssl, serverssl Resources iRules: Enabled: /Common generate_ga_code; Available: _sys_auth_ssl_crldp, _sys_auth_ssl_ocsp, _sys_auth_tacacs, _sys_https_redirect, ga_code_verify

9.6.3 Task - Generate a token

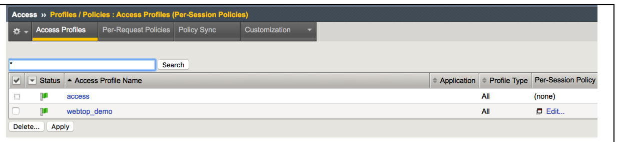
1. Open a **Chrome** browser and click on **generategacode bookmark.** You should see the **GA generator App**.	 Google Authenticator key (shared secret) generator account: @ secret: *optional 10 character key (additional chars truncated), random secret used if blank generate QR code? □ *a request will be made to Google to generate QR code Submit
2. Enter the **account:** `sales_manager` and **domain:** `f5demo.com`. Also **check** the **generate QR code**, and then click **Submit**	 Google Authenticator key (shared secret) generator account: sales_manager @ f5demo.com secret: *optional 10 character key (additional chars truncated), random secret used if blank generate QR code? ☑ *a request will be made to Google to generate QR code Submit
3. Open up your **Google Authenticator** app and touch the **"plus sign"**, select scan barcode and **scan** the **QR code**. Save the **secret**, we will need it soon.	 account: sales_manager@f5demo.comkey (secret): G4ZEIWDJLBJE4ZCM
4. Go to **Local Traffic** -> **iRules** -> **Data Group List** .Click on **google_auth_keys**.	 Local Traffic » iRules : Data Group List iRule List / Data Group List / iFile List / Statistics * Search ☑ Type ▲ Name □ Address aol □ String google_auth_keys □ String images □ Address private_net □ String sys_APM_MS_Office_OFBA_DG Delete...
5. Create a new record, using the info saved in **step 3**. Click **Add** and then **Update.** **String:** `sales_manager`	 Local Traffic » iRules : Data Group List » google_auth_keys Properties General Properties Name: google_auth_keys Partition / Path: Common Type: String Records String Records String: sales_manager Value: G4ZEIWDJLBJE4ZCM Add Edit / Delete Record Update / Delete Data Group

9.6.4 Task - Update the VS with the verification iRule

1. Go to **Local Traffic** -> **Virtual Servers** -> **Virtual Server List**, then find the Virtual Server **webtop_demo_vs** and **click on** it.	 Local Traffic » Virtual Servers : Virtual Server List Virtual Server List Virtual Address List Statistics Search Status Name VS_GENERATE_TOKEN webtop_demo_vs Enable Disable Delete...
2. In the following page, choose **Resources** and click on **manage** in the **iRules** section	 Local Traffic » Virtual Servers : Virtual Server List » webtop_demo_vs Properties Resources Statistics Load Balancing Update iRules Manage... NameDefault Pool: None Default Persistence Profile: None Fallback Persistence Profile: None No records to display.
3. Find the **ga_code_verify** irule in the right list and **click on the arrows** pointing left. The irule should now moved to the left side. Then Click **finished**.	 Resource Management iRule Enabled Available << >> _sys_auth_ssl_ocsp _sys_auth_tacacs _sys_https_redirect ga_code_verify generate_ga_code Up Down Cancel Finished

9.6.5 Task - Update the Access Policy

1. Go to **Access** -> **Profiles/Policies** -> **Access Profiles.** Find the **webtop_demo** policy and click on **Edit**.

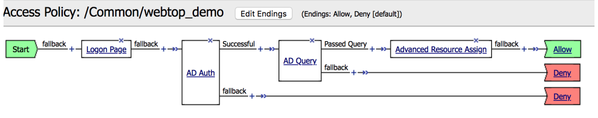


Access » Profiles / Policies : Access Profiles (Per-Session Policies)

* Search

☑	Status	Access Profile Name	Application	Profile Type	Per-Session Policy
□		access		All	(none)
□		webtop_demo		All	Edit...

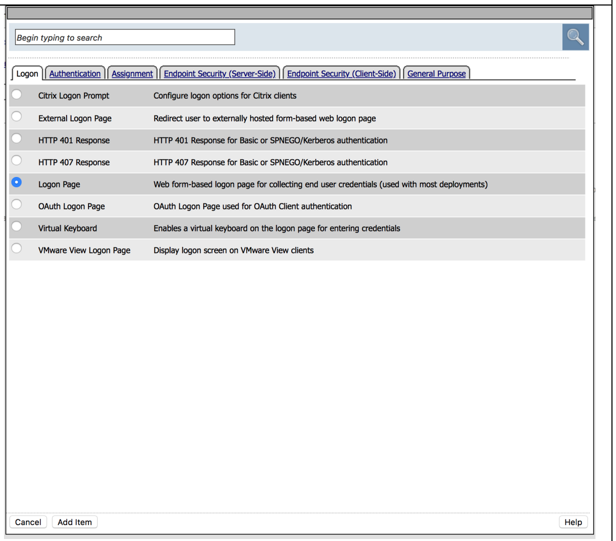
2. In the **VPE** (Visual Policy Editor), click the + between **AD Auth** and **AD Query.**



Access Policy: /Common/webtop_demo

(Endings: Allow, Deny [default])

3. In the **Logon tab**, choose **Logon Page** and then **Add Item**

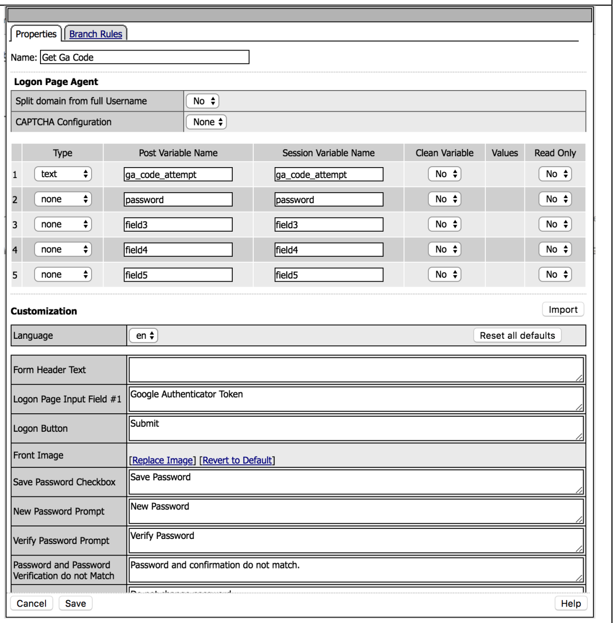


Begin typing to search

Logon
Authentication
Assignment
Endpoint Security (Server-Side)
Endpoint Security (Client-Side)
General Purpose

○	Citrix Logon Prompt	Configure logon options for Citrix clients
○	External Logon Page	Redirect user to externally hosted form-based web logon page
○	HTTP 401 Response	HTTP 401 Response for Basic or SPNEGO/Kerberos authentication
○	HTTP 407 Response	HTTP 407 Response for Basic or SPNEGO/Kerberos authentication
●	Logon Page	Web form-based logon page for collecting end user credentials (used with most deployments)
○	OAuth Logon Page	OAuth Logon Page used for OAuth Client authentication
○	Virtual Keyboard	Enables a virtual keyboard on the logon page for entering credentials
○	VMware View Logon Page	Display logon screen on VMware View clients

4. **Modify** the values according to the picture (leave others default) and then **Save.**



Name: Get Ga Code

Logon Page Agent

Split domain from full Username	No
CAPTCHA Configuration	None

	Type	Post Variable Name	Session Variable Name	Clean Variable	Values	Read Only
1	text	ga_code_attempt	ga_code_attempt	No		No
2	none	password	password	No		No
3	none	field3	field3	No		No
4	none	field4	field4	No		No
5	none	field5	field5	No		No

Customization

Language	en
Form Header Text	
Logon Page Input Field #1	Google Authenticator Token
Logon Button	Submit
Front Image	[Replace Image] [Revert to Default]
Save Password Checkbox	Save Password
New Password Prompt	New Password
Verify Password Prompt	Verify Password
Password and Password Verification do not Match	Password and confirmation do not match.

Name: `Get Ga Code`
Post Variabl:e `ga_code_attempt`
Session Variable: `ga_code_attempt`
Form Header Text: `Empty`
Logon Page Input Field: `Google`

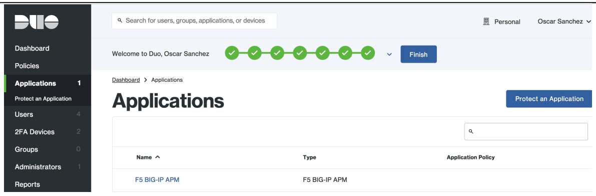
9.7 Lab 5: Set up DUO

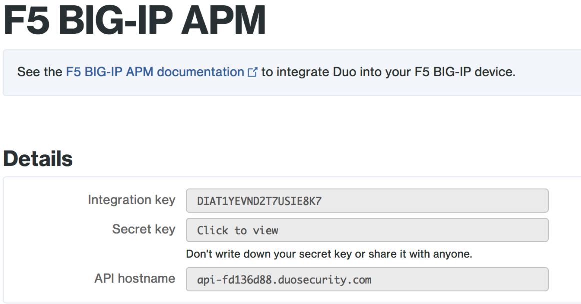
In this module you will learn how to configure DUO as Second Auth Factor.

9.7.1 Lab – Set up DUO as Second Auth Factor

This lab will teach you how to configure DUO as Second Auth Factor. Estimated completion time: **30 minutes**

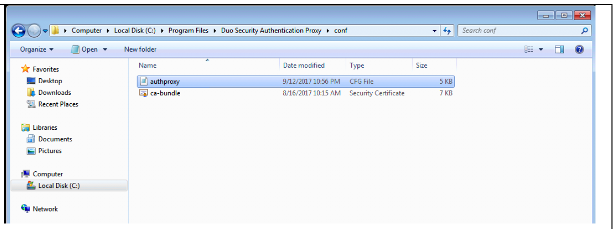
9.7.2 Task - Get the values from DUO Admin Panel

1. Log in to the **Duo Admin Panel** and navigate to **Applications**. Then click on `F5 BIG-IP APM`.	 Search for users, groups, applications, or devices Personal Oscar Sanchez Dashboard Policies Applications 1 Protect an Application Users 4 2FA Devices 2 Groups 0 Administrators 1 Reports Finish Protect an Application Welcome to Duo, Oscar Sanchez Dashboard > Applications Applications Name · Type · Application Policy F5 BIG-IP APM · F5 BIG-IP APM

2. **Copy** the values for:
`Integration key`
`Secret key`
`API hostname`
	
	F5 BIG-IP APM
	See the F5 BIG-IP APM documentation to integrate Duo into your F5 BIG-IP device.
	Details
	Integration key: DIAT1YEVND2T7USIE8K7
	Secret key: Click to view
	Don't write down your secret key or share it with anyone.
	API hostname: api-fd136d88.duosecurity.com

9.7.3 Task - Configure the Proxy for APM

1. In the **Win 7 External** open (`as administrator`) the file **C:Program Files-Duo Security Authentication Proxyconfauthproxy.cfg**

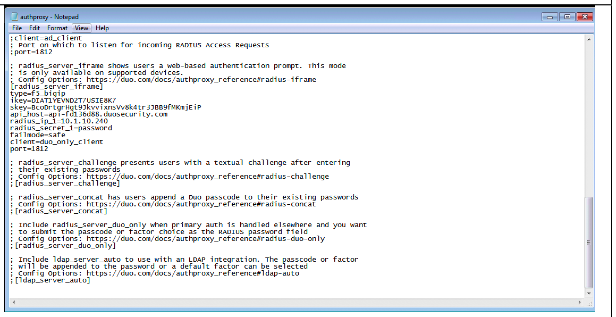


Computer ▸ Local Disk (C:) ▸ Program Files ▸ Duo Security Authentication Proxy ▸ conf

Name	Date modified	Type	Size
authproxy	9/12/2017 10:56 PM	CFG File	5 KB
ca-bundle	8/16/2017 10:15 AM	Security Certificate	7 KB

1. Search the section **[radius_server_iframe]** and modify the following values according to your **DUO account**

- `ikey`
- `skey`
- `api`

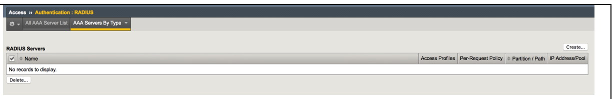


authproxy - Notepad

```
;client=ad_client
; Port on which to listen for incoming RADIUS Access Requests
;port=1812

; radius_server_iframe shows users a web-based authentication prompt. This mode
; is only available on supported devices.
; Config Options: https://duo.com/docs/authproxy_reference#radius-iframe
[radius_server_iframe]
type=f5_bigip
ikey=DIAT1YEVND2T7USIE8K7
skey=BcoDrtgrHgt9JkvvixnsVv8k4tr3JBB9fMKmjEiP
api_host=api-fd136d88.duosecurity.com
radius_ip_1=10.1.10.240
radius_secret_1=password
failmode=safe
client=duo_only_client
port=1812

; radius_server_challenge presents users with a textual challenge after entering
; their existing passwords
; Config Options: https://duo.com/docs/authproxy_reference#radius-challenge
;[radius_server_challenge]

; radius_server_concat has users append a Duo passcode to their existing passwords
; Config Options: https://duo.com/docs/authproxy_reference#radius-concat
;[radius_server_concat]

; Include radius_server_duo_only when primary auth is handled elsewhere and you want
; to submit the passcode or factor choice as the RADIUS password field
; Config Options: https://duo.com/docs/authproxy_reference#radius-duo-only
;[radius_server_duo_only]

; Include ldap_server_auto to use with an LDAP integration. The passcode or factor
; will be appended to the password or a default factor can be selected
; Config Options: https://duo.com/docs/authproxy_reference#ldap-auto
;[ldap_server_auto]
```

9.7.4 Task - Modify the Access Policy to include DUO

1. Go to **Access** -> **Authentication** -> **RADIUS** -> **Create.**



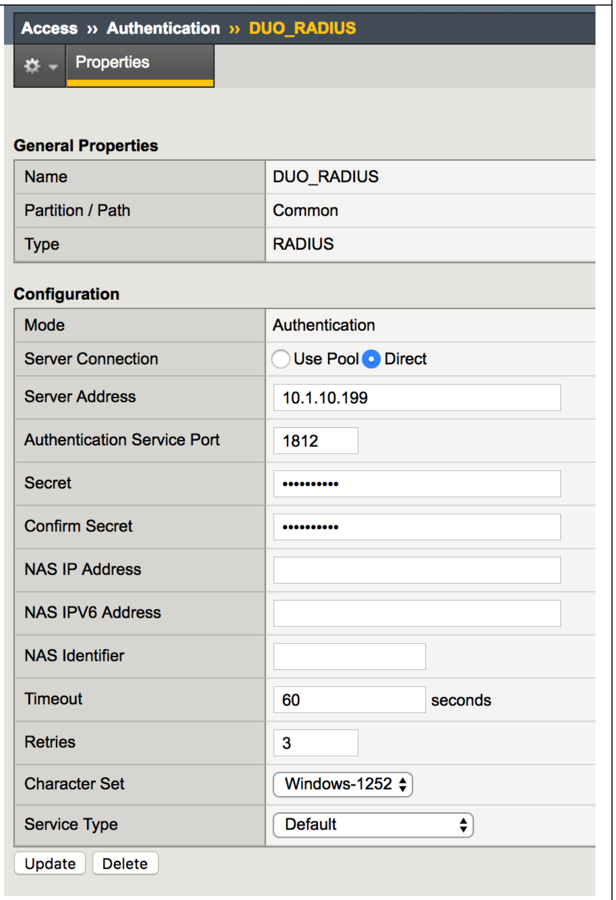
Access » Authentication : RADIUS

RADIUS Servers

☑	Name	Access Profiles	Per-Request Policy	Partition / Path	IP Address/Pool
No records to display.					

2. Create a new record, using the following info and then **Finished.**

Name: `DUO_RADIUS`
Mode: `Authentication`
Server Connection: `Direct`
Server Address: `10.1.10.199`
Authentication Service Port: `1812`
Secret: `password`
Confirm Secret: `password`
Timeout: `60`



Access » Authentication » DUO_RADIUS

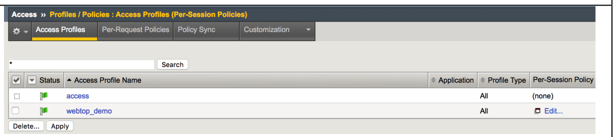
General Properties

Name	DUO_RADIUS
Partition / Path	Common
Type	RADIUS

Configuration

Mode	Authentication
Server Connection	○ Use Pool ● Direct
Server Address	10.1.10.199
Authentication Service Port	1812
Secret	••••••••••
Confirm Secret	••••••••••
NAS IP Address	
NAS IPV6 Address	
NAS Identifier	
Timeout	60 seconds
Retries	3
Character Set	Windows-1252
Service Type	Default

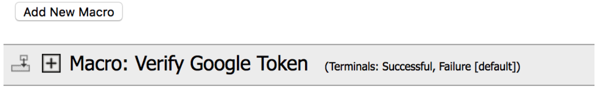
3. Go to **Access** -> **Profile** / **Policies** -> **Access Profile** then locate the **webtop_demo** profile and click **Edit.**



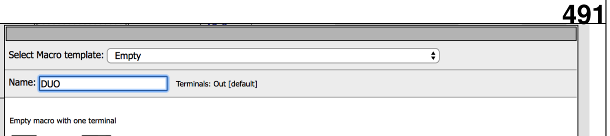
Access » Profiles / Policies : Access Profiles (Per-Session Policies)

☑	Status	Access Profile Name	Application	Profile Type	Per-Session Policy
□		access		All	(none)
□		webtop_demo		All	Edit...

4. Click on **Add New Macro**



Macro: Verify Google Token (Terminals: Successful, Failure [default])



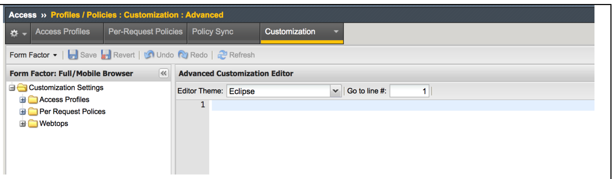
Select Macro template: Empty

Name: DUO Terminals: Out [default]

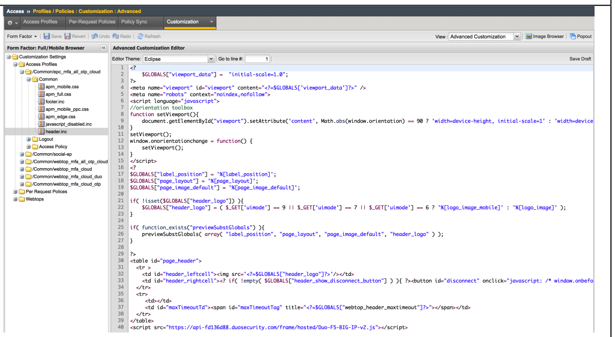
Empty macro with one terminal

9.7.5 Task - Configure the APM to use the DUO Service

1. Go to **Access** -> **Profiles** / **Policies** -> **Customization** -> **Advanced**

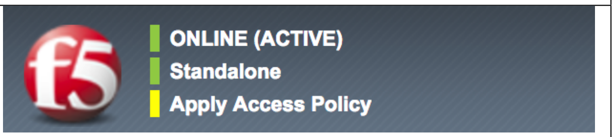


2. Navigate to **Access Profiles** -> **/Common/webtop_demo** -> **Common** -> **header.inc** and insert the line `<script src="https://api-XXXXXXXX.duosecurity.com/frame/hosted/Duo-F5-BIG-IP-v2.js"></script>` at the end of file and then **Save**.
NOTE: Use the `api URL` from your `DUO account`.

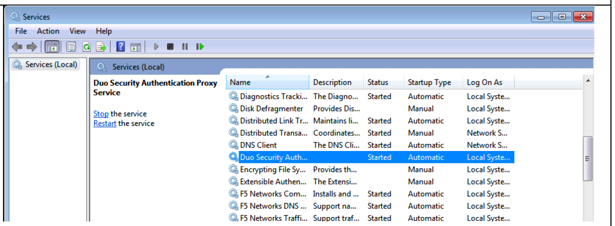


```
<?
    $GLOBALS["viewport_data"] =  "initial-scale=1.0";
?>
<meta name="viewport" id="viewport" content="<?=$GLOBALS['viewport_data']?>" />
<meta name="robots" context="noindex,nofollow">
<script language="javascript">
//orientation toolbox
function setViewport(){
    document.getElementById("viewport").setAttribute('content', Math.abs(window.orientation) == 90 ? 'width=device-height, initial-scale=1' : 'width=device
}
setViewport();
window.onorientationchange = function() {
    setViewport();
}
</script>
<?
$GLOBALS["label_position"] = '%[label_position]';
$GLOBALS["page_layout"] = '%[page_layout]';
$GLOBALS["page_image_default"] = '%[page_image_default]';

if( !isset($GLOBALS["header_logo"]) ){
    $GLOBALS["header_logo"] = ( $_GET['uimode'] == 9 || $_GET['uimode'] == 7 || $_GET['uimode'] == 6 ? '%[logo_image_mobile]' : '%[logo_image]' );
}

if( function_exists("previewSubstGlobals") ){
    previewSubstGlobals( array( "label_position", "page_layout", "page_image_default", "header_logo" ) );
}

?>
<table id="page_header">
  <tr >
    <td id="header_leftcell"><img src='<?=$GLOBALS["header_logo"]?>'/></td>
    <td id="header_rightcell"><? if( !empty( $GLOBALS["header_show_disconnect_button"] ) ){ ?><button id="disconnect" onclick="javascript: /* window.onbefo
  </tr>
  <tr>
     <td></td>
     <td id="maxTimeoutTd"><span id="maxTimeoutTag" title="<?=$GLOBALS["webtop_header_maxtimeout"]?>"></span></td>
  </tr>
</table>
<script src="https://api-fd136d88.duosecurity.com/frame/hosted/Duo-F5-BIG-IP-v2.js"></script>
```

3. Click on **Apply Access Policy**



4. Restart the Proxy DUO Service. Go to **Start** -> **Services** and then click `Restart`

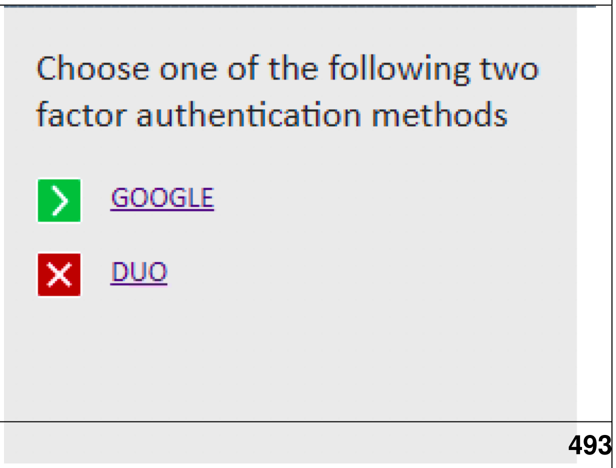


Duo Security Authentication Proxy Service

Stop the service
Restart the service

Name	Description	Status	Startup Type	Log On As
Diagnostics Tracki...	The Diagno...	Started	Automatic	Local Syste...
Disk Defragmenter	Provides Dis...		Manual	Local Syste...
Distributed Link Tr...	Maintains li...	Started	Automatic	Local Syste...
Distributed Transa...	Coordinates...	Started	Manual	Network S...
DNS Client	The DNS Cli...	Started	Automatic	Network S...
Duo Security Auth...		Started	Automatic	Local Syste...
Encrypting File Sy...	Provides th...		Manual	Local Syste...
Extensible Authen...	The Extensi...		Manual	Local Syste...
F5 Networks Com...	Installs and ...	Started	Automatic	Local Syste...
F5 Networks DNS ...	Support na...	Started	Automatic	Local Syste...
F5 Networks Traffi...	Support traf...	Started	Automatic	Local Syste...

5. Go to `https://webtop.vlab.f5demo.com`. You should see the **Google Authenticator** and **DUO** options to use as `Second Factor`. Try to log in with any user:


Choose one of the following two factor authentication methods

10

Class 10: Privileged User Access

Welcome to the Self Guided Priviledged User Access Hands-on Lab Guide. The following labs and exercises will instruct you on how to configure the IrulesLX Priviledged User Access Solution.

10.1 Lab Network Setup

In the interest of focusing as much time as possible configuring and performing lab tasks, we have provided some resources and basic setup ahead of time. These are:

- Cloud-based lab environment complete with Virtual BIG-IP.
- The Virtual BIG-IP has been pre-licensed and provisioned with Access Policy Manager (APM).
- Pre-staged configurations to speed up lab time, reducing repetitive tasks to focus on key learning elements.

If you wish to replicate these labs in your environment you will need to perform these steps accordingly.

Note: All work for this lab will be performed within the BIG-IP GUI and CLI. No installation or interaction with your local system is required.

10.1.1 Authentication – Credentials

The following credentials will be utilized throughout this Lab guide. All other credentials will be indicated at the time of use.

Credential Use	User ID	Password
BIG-IP Configuration Utility (GUI)	admin	4g1L17Y2018
BIG-IP CLI Access (SSH)	root	4g1L17Y2018

10.1.2 Utilized Browsers

The preferred browser for this lab is Firefox. Shortcut links have been provided to speed access to targeted resources and assist you in your tasks. Except where noted, either browser can be used for all lab tasks.

10.1.3 General Notes

As noted previously, environment staging has been done to speed up lab time, reducing repetitive tasks to focus on key learning elements. Where possible steps that have been optimized have been called out with links and references provided in the *Additional Information* section for additional clarification. The intention being that the lab guide truly serves as a resource guide for all your future federation deployments.

10.1.4 Acknowledgements

This lab is built upon the work of prior F5 Agility's and the work of many individuals behind the scenes in addition the 2018 Agility Lab Team. Many thanks to Michael Coleman and Bill Church.

10.1.5 Presented by

No Presenter, but written by Michael Coleman & stolen mostly from Bill Church.

10.2 Lab 1: WebSSH and APM

The Privileged User Authentication (PUA) solution is made up of three parts.

1. WebSSH2 Client Plugin
2. Ephemeral Authentication Plugin
3. Access Policy Manager (APM) policy configuration

10.2.1 Requirements

- BIG-IP with TMOS v13.1.0.2 or greater.
- 1-5 IP addresses for virtual servers (see Resource Table)

10.2.2 Prerequisites

BIG-IP with at least APM and iRules LX licensed and provisioned

The *build_pua.zip* or *build_pua_offline.zip* installation script found here:

> https://raw.githubusercontent.com/billchurch/f5-pua/master/build_pua.zip
>
> https://raw.githubusercontent.com/billchurch/f5-pua/master/build_pua_offline.zip

Note: These requirements, and prerequisites have all been provisioned ahead of time for you.

10.2.3 Installation Overview

The installation will consist of installing and testing (in order)

1. BIG-IP Preparation
2. Script download and execution

3. Customization of APM policy

10.2.4 Resource Table

Resource	Description	Value
WebSSH_proxy_vs_IP	Virtual server IP Address of WebSSH2 service.	10.1.10.240
APM_Portal_vs_IP	Virtual server IP Address of APM portal for authentication	10.1.10.240
RADIUS_proxy_vs_IP	Virtual server IP address of RADIUS proxy service	10.1.10.240
LDAP_proxy_vs_IP	Virtual server IP address of LDAP proxy service	10.1.10.240
LDAPS_proxy_vs_IP	Virtual server IP address of LDAPS proxy service	10.1.10.240
LDAP_server_IP	IP Address of site LDAP or AD server (required for LDAP use)	10.1.10.240
RADIUS_server_IP	IP Address of site RADIUS server (if RADIUS bypass is used)	10.1.10.240

10.2.5 Installation

This script will configure a reference implementation of the F5 Privileged User Authentication solution. The only requirements are a running and licensed system ("Active"), initial configuration complete (licensed, VLANs, self IPs), and preferably already provisioned for LTM+APM+ILX. The script will check for and can enable it for you if you wish.

You will be prompted for IP addresses for 5 services:

- WebSSH Proxy - This IP may be shared with other IPs on the BIG-IP system if the protocol/port (tcp/2222) do not conflict. This proxy is ultimately called by the APM web top. It's also important to note that SNAT may not be used on this virtual server. (webssh_proxy)
- RADIUS Proxy – This runs the RADIUS Ephemeral Authentication Service. This IP may be shared with other IPs on the BIG-IP system if the protocol/port (udp/1812) do not conflict. (radius_proxy)
- LDAP Proxy – This runs the LDAP Ephemeral Authentication Service. This IP may be shared with other IPs on the BIG-IP system if the protocol/port (tcp/389) do not conflict. (ldap_proxy)
- LDAPS Proxy – This runs the LDAPS (ssl) Ephemeral Authentication Service. This IP may be shared with other IPs on the BIG-IP system if the protocol/port (tcp/636) do not conflict. (ldaps_proxy)
- Web top – This runs the LDAP Ephemeral Authentication Service. This IP may be shared with other IPs on the BIG-IP system if the protocol/port (tcp/443) do not conflict. By default SNAT is disabled for this vs as the WebSSH proxy may not interoperate with SNAT. If you change this option be sure to institute some sort of selective disable option (iRule) when connecting to the webssh_proxy as a portal resource.

WebSSH, LDAPS, and web top will all be initially configured with a default client-ssl profile, after testing this should be changed to use a legitimate certificate.

A blank APM policy is created and attached to the web top vs "pua_webtop", this policy will need to be built out for the pua_webtop service to operate correctly.

Note: For this lab, the scripts have been preloaded to /tmp, and we will be using build_pua_offline.sh and using Offline Installation Method. The online instructions, in the event you wish to deploy in your own environment, can be located here: https://raw.githubusercontent.com/billchurch/f5-pua/master/docs/PUA%20Solution%20Install%20Guide.docx If the scripts do not appear in /tmp, they have also been copied to /root.

10.2.6 Offline Installation Method

This method utilizes the *build_pua_offline.sh/zip* method to install the PUA solutions from a closed network or a BIG-IP with limited or no Internet connectivity.

10.2.7 Run Installation Script

Note: This lab utilizes the Non-Interactive Install mode. A file called pua_config.sh may be placed in the same directory as build_pua.sh or build_pua_offline.sh to fully automate the install, or provide defaults for a "semi-automatic" deployment. See pua_config.sh as an example.

When started, build_pua.sh or build_pua_offline.sh both check for the existence of this file.

Additionally, most of the variables set in the top of pua_config.sh and pua_config_offline.sh may be overridden by this file.

1. Run /**tmp/build_pua_offline.sh** or /**root/build_pua_offline.sh**
2. Win.

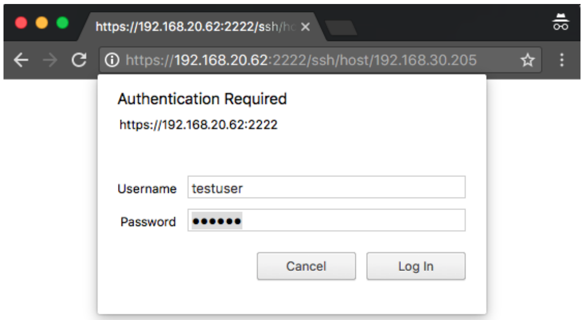
10.3 Validation

10.3.1 WebSSH2 Client

1. Open a web browser and DO NOT navigate to the first URL given by the script. The IP show in the script is internal and will not be accessible externally. Instead, you will have to use the IP from the Student Portal "Webtop" link.

example: https://{[}VS_IP{]}:2222/ssh/host/10.1.0.240

2. Enter the username **testuser** with any password and click login.



https://192.168.20.62:2222/ssh/hc

https://192.168.20.62:2222/ssh/host/192.168.30.205

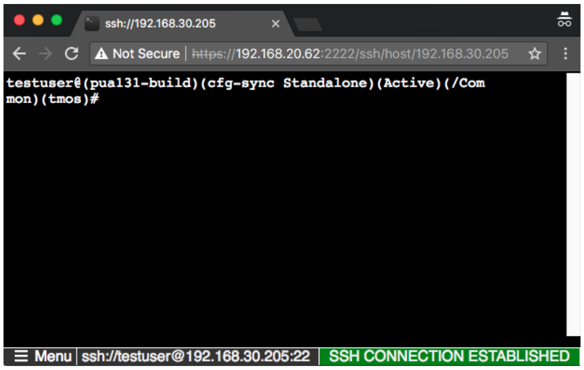
Authentication Required

https://192.168.20.62:2222

Username testuser

Password ••••••

3. You should be greeted with a tmsh prompt to the BIG-IP the script was installed on, logged in as the user ***testuser***.


ssh://192.168.30.205
Not Secure | https://192.168.20.62:2222/ssh/host/192.168.30.205
Menu | ssh://testuser@192.168.30.205:22
SSH CONNECTION ESTABLISHED

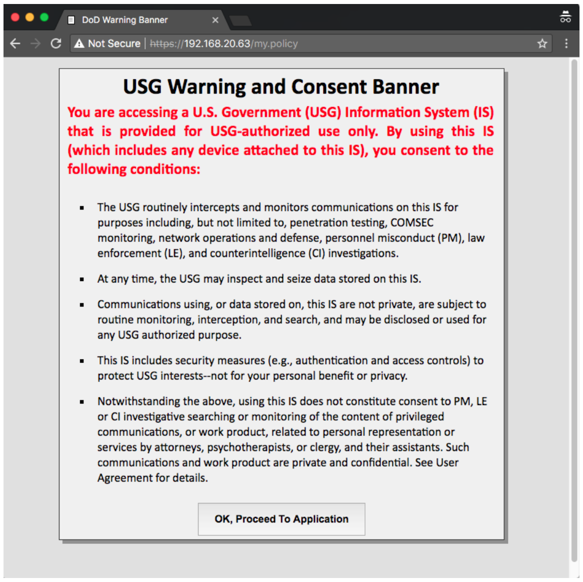
```
testuser@(pua131-build)(cfg-sync Standalone)(Active)(/Com
mon)(tmos)#
```

10.3.2 APM Policy and Portal Mode

1. Open a web browser and navigate to the second URL given by the script.

example: *https://[Public IP of Virtual Server]*

2. The sample USG Warning and Consent Banner should appear, click **OK**.

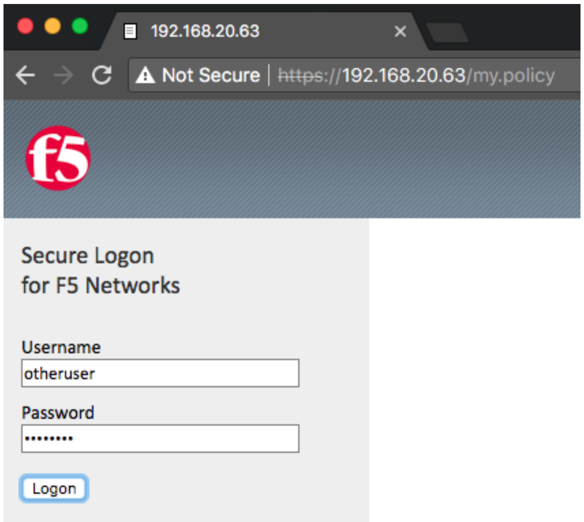

DoD Warning Banner
Not Secure | https://192.168.20.63/my.policy
OK, Proceed To Application

USG Warning and Consent Banner

You are accessing a U.S. Government (USG) Information System (IS) that is provided for USG-authorized use only. By using this IS (which includes any device attached to this IS), you consent to the following conditions:

- The USG routinely intercepts and monitors communications on this IS for purposes including, but not limited to, penetration testing, COMSEC monitoring, network operations and defense, personnel misconduct (PM), law enforcement (LE), and counterintelligence (CI) investigations.
- At any time, the USG may inspect and seize data stored on this IS.
- Communications using, or data stored on, this IS are not private, are subject to routine monitoring, interception, and search, and may be disclosed or used for any USG authorized purpose.
- This IS includes security measures (e.g., authentication and access controls) to protect USG interests--not for your personal benefit or privacy.
- Notwithstanding the above, using this IS does not constitute consent to PM, LE or CI investigative searching or monitoring of the content of privileged communications, or work product, related to personal representation or services by attorneys, psychotherapists, or clergy, and their assistants. Such communications and work product are private and confidential. See User Agreement for details.

3. Enter a random username other than *testuser* and any password. Click **Logon**.

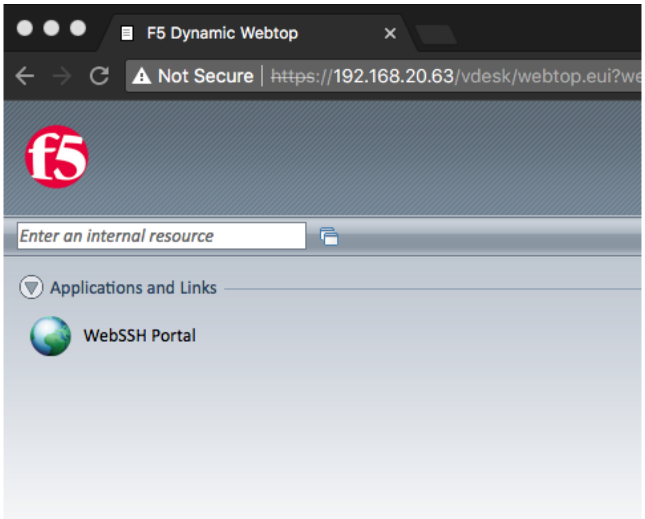


Secure Logon
for F5 Networks

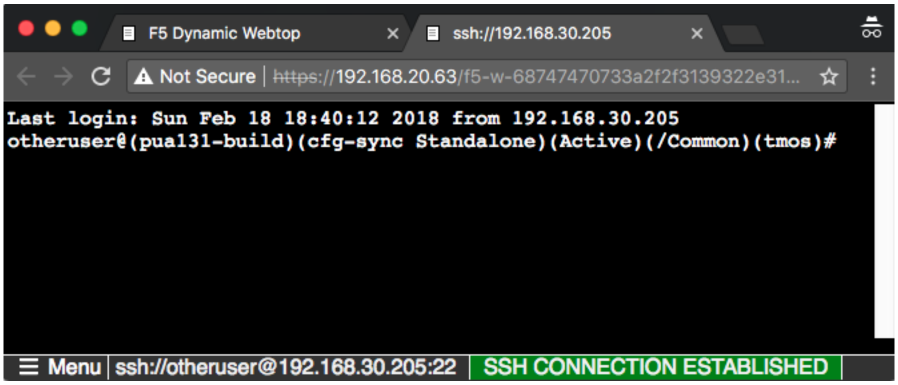
Username: otheruser

Password: ••••••••

4. You should be directed to the webtop, click the **WebSSH Portal** icon.


F5 Dynamic Webtop
Not Secure | https://192.168.20.63/vdesk/webtop.eui?we
Enter an internal resource
Applications and Links
WebSSH Portal

5. You should be presented with another WebSSH2 screen, logged into the BIG-IP the script was installed on as the user you provided in step 3.


F5 Dynamic Webtop
ssh://192.168.30.205
Not Secure | https://192.168.20.63/f5-w-68747470733a2f2f3139322e31...

```
Last login: Sun Feb 18 18:40:12 2018 from 192.168.30.205
otheruser@(pua131-build)(cfg-sync Standalone)(Active)(/Common)(tmos)#
```

☰ Menu | ssh://otheruser@192.168.30.205:22
SSH CONNECTION ESTABLISHED