

# F5 BIG-IP

# LTM

## Lab Manual

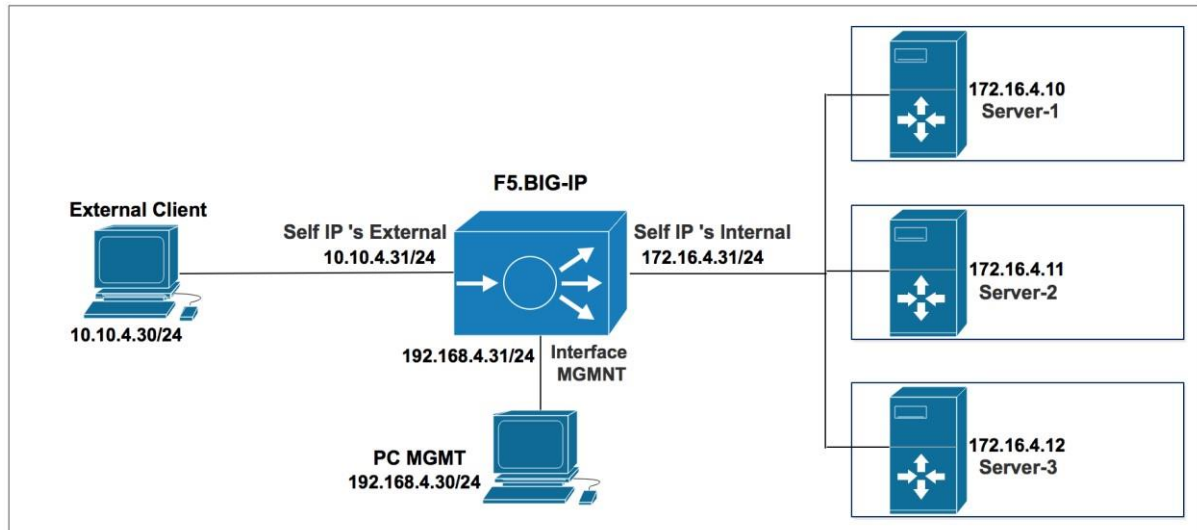


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# Lab Topology



**Note:** I am using Cisco Routers as HTTP HTTPS and SSH Server

# Lab 1: F5 BIG-IP Installation

## Step 1

Log in to the CLI using the default user account. Use root as username and default as password.

```
BIG-IP 11.3.0 Build 39.0
Kernel 2.6.32-220.el6.f5.x86_64 on an x86_64
localhost login: root
Password:
Last login: Thu Apr 20 13:00:54 on tty1

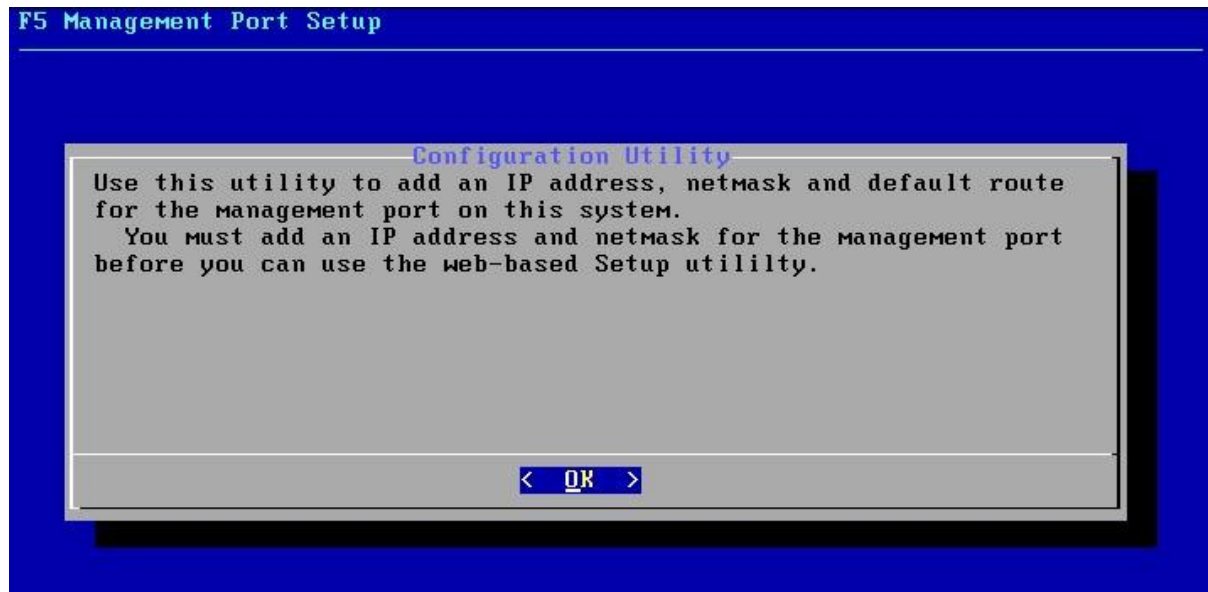
[root@localhost:NO LICENSE] config #
[root@localhost:NO LICENSE] config # _
```

## Step 2

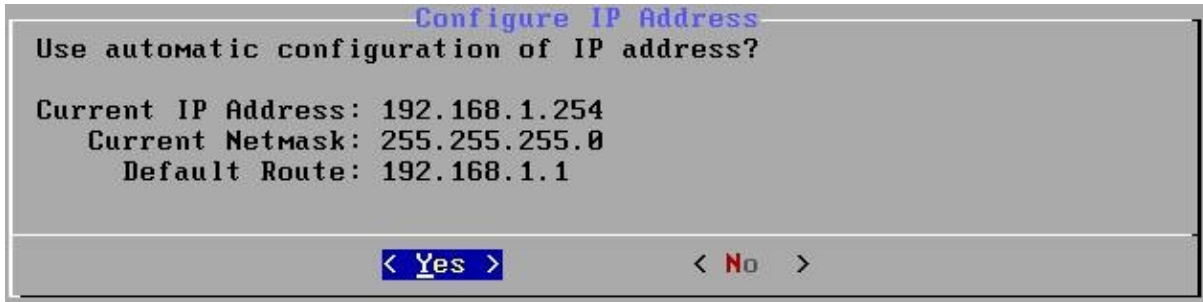
Issue the config command.

## Step 3

Once you get the prompt as shown below, click OK.

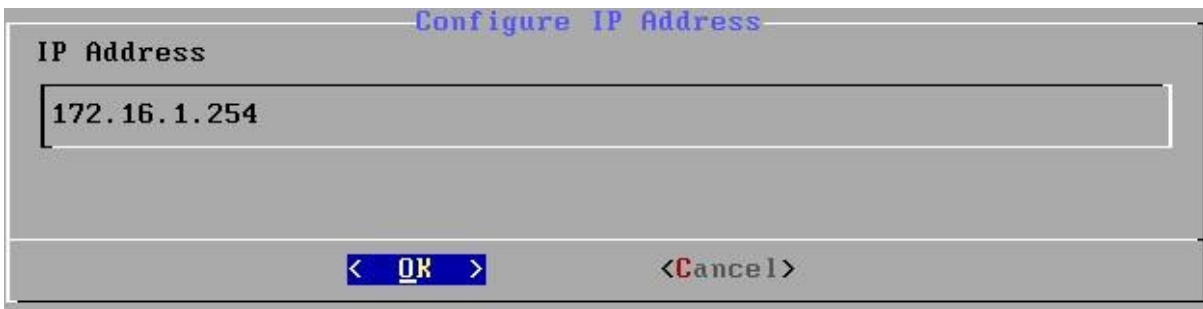


The next prompt will ask you if you want to use the automatic configuration, choose No.



**Step 4**

Enter desired IP address for the management interface and click OK.



**Step 5**

Enter desired subnet mask for the management interface and click OK.



**Step 6**

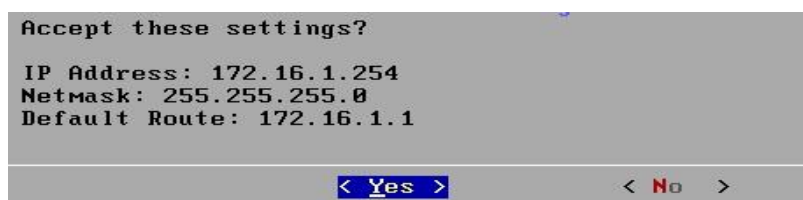
To access the BIG-IP from any network, configure a default gateway, click Yes.

You will be prompted to enter the IP address of the default gateway and click OK.



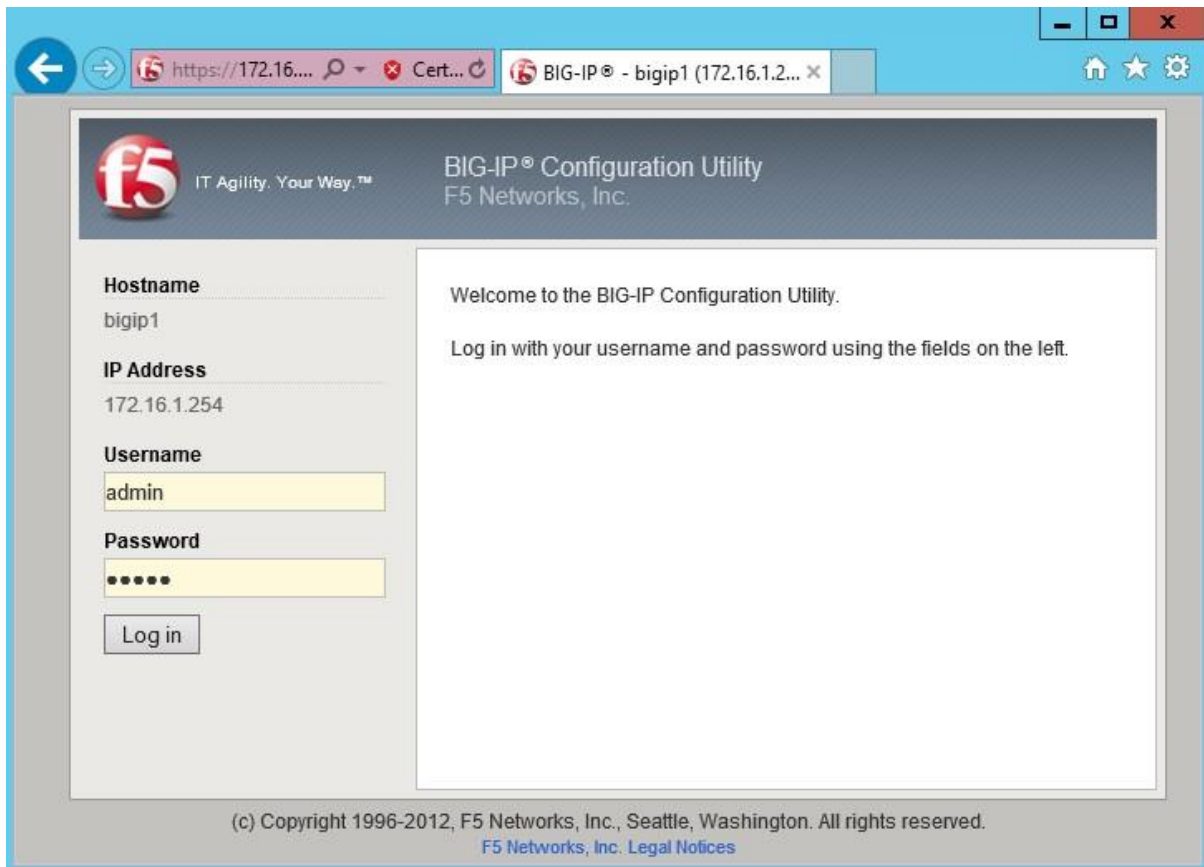
**Step 7**

Confirm the management IP address changes by clicking Yes

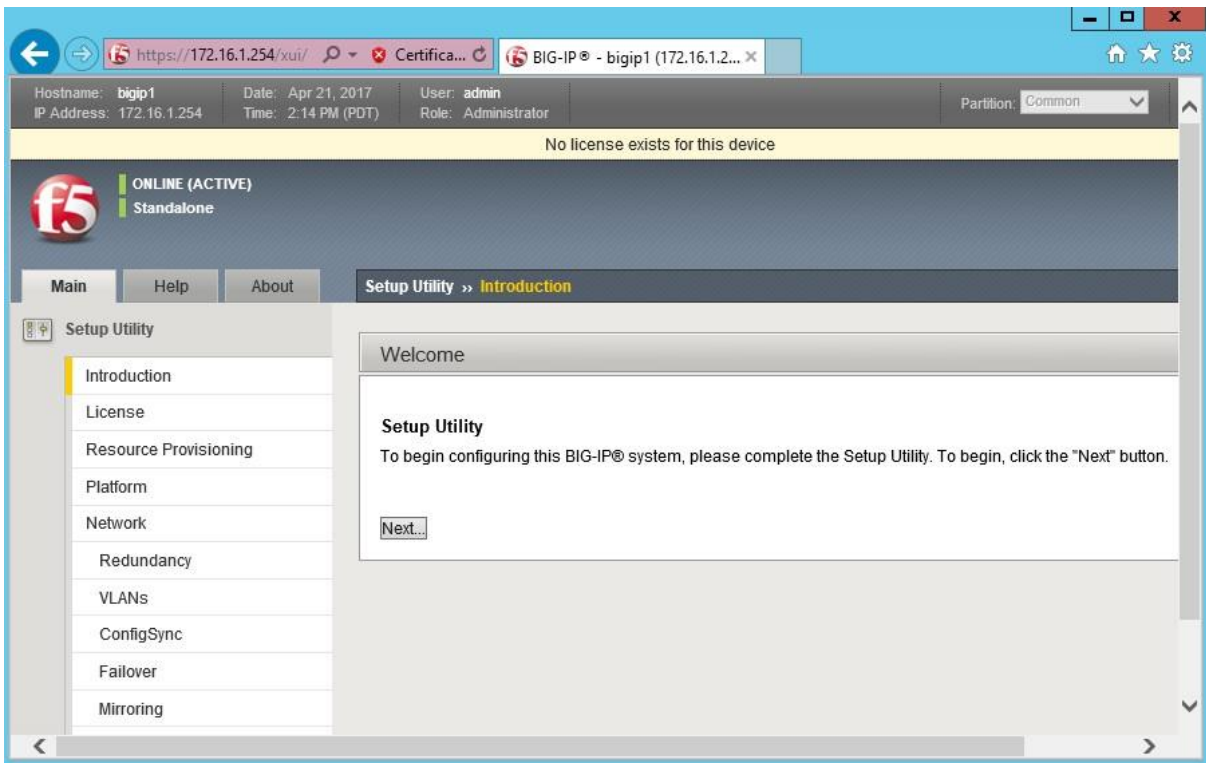


## Lab 2: Activation License

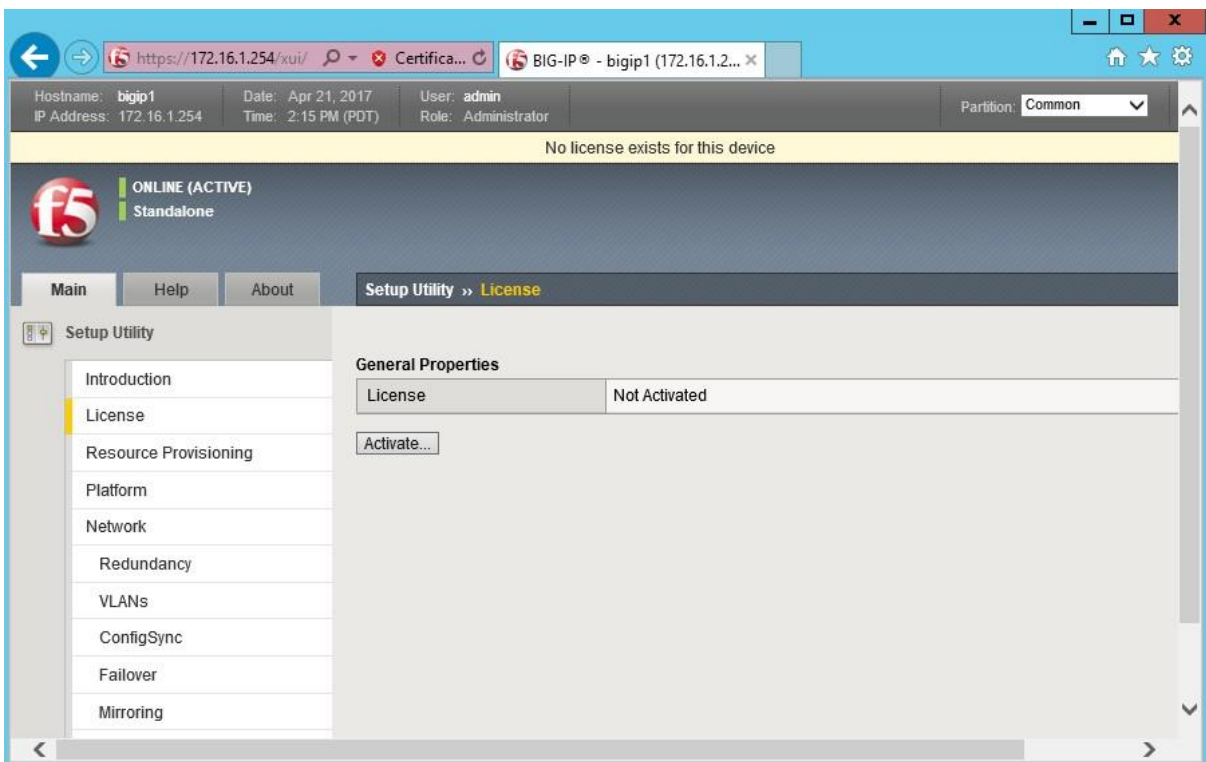
To access the BIG-IP Configuration Utility, open a web browser and enter the URL <https://172.16.1.254>. To log in, use the default username and password, which is `admin/admin`.



To start the Setup Utility wizard, click **Next** to continue.



You will be presented with a screen that asks you to activate the BIG-IP LTM license. Click **Activate**.

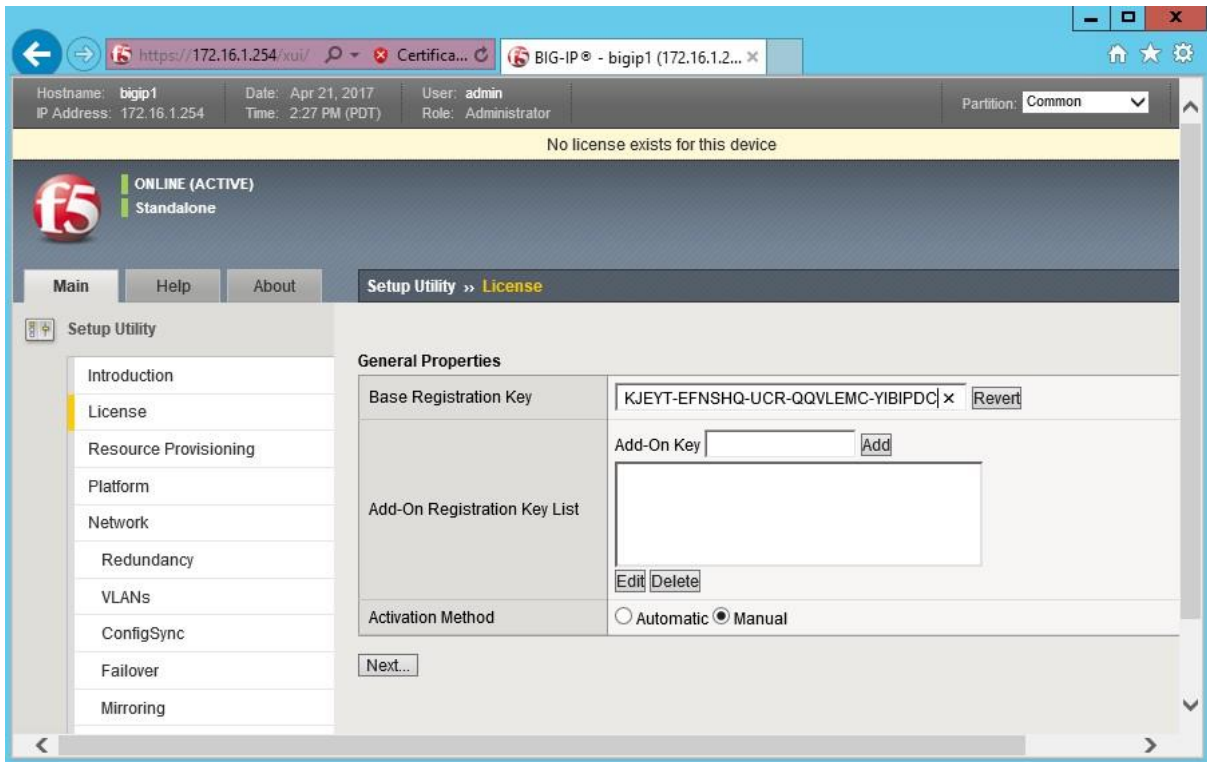


Enter the license key that you received from F5 Networks. Choose the activation method of automatic and manual.

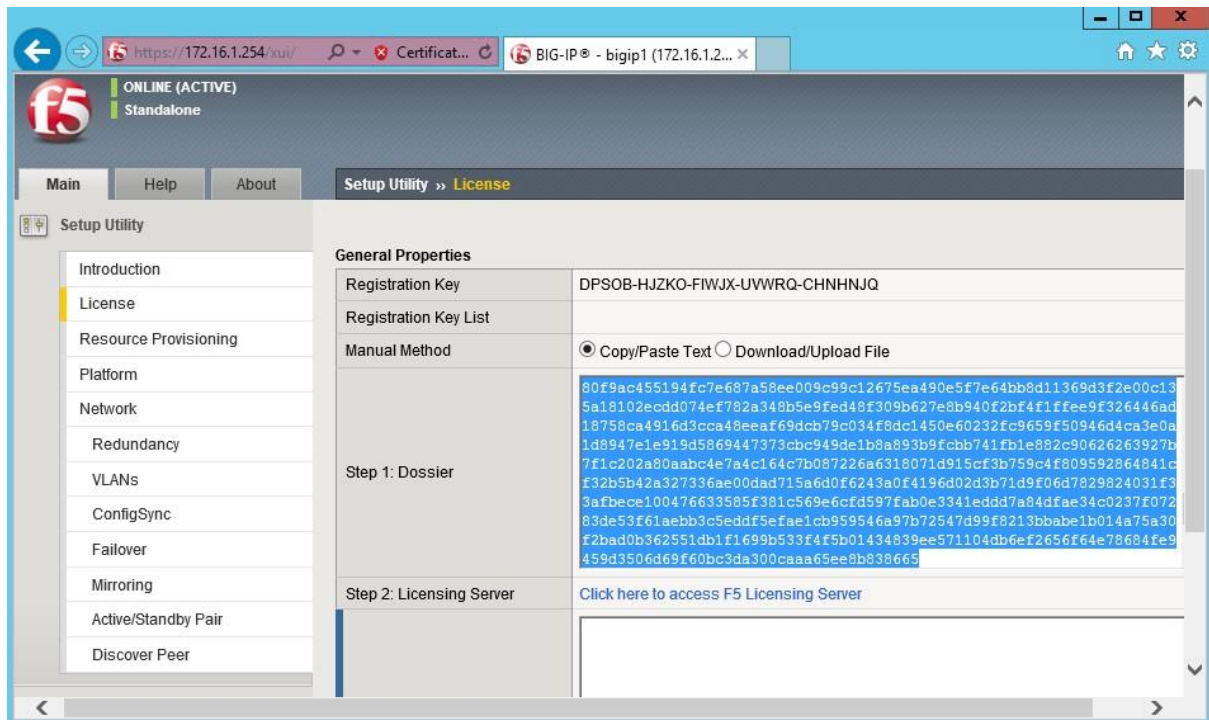


Automatic method requires the Internet access from the management interface. The manual method is used when the management interface does not have access to the Internet.

In this case, choose the manual method, enter the license key and click Next to continue.



Copy all text found in the dossier box.



Go to the F5's licensing site at <https://activate.f5.com/license/dossier.jsp> . Paste the dossier to the box. Alternatively, upload the dossier file. Click Next to continue.

To activate your product you will need your product dossier.

### Enter Your Dossier

```
0518311dfe2bb097c481d58b6d35fa09e2c5b8c1913c464b3ec2c96d622814be09cc4415a955d67b0c
5d0a59a0eb408408af084361362237a7e701d26aed40310fbefe74fe212916f7dbd25e2e0ea321bcbc
655bdc3cf8b32077e4eb7d0a98e3fea4faccaca6cce9fffb4e96c7f811e94616078b7f9f79aeba87e64
5098fd68958934147a864b6b139188a7cb43beebafd00db9823a681128b823b27454eb5cbb8aa4049
143da0d26b239f3daf5f4fa6aba32b5338c78fd77d634a29735964d3fad506ed674e36139938c87fbc
4339e8ef535def140d0a8b185f0717390e8c7c759b9fd2ea8ec2704c712f2846278bc4ddeab66354fe
8ee4d7b2ce18449f6da39e02a33cc694464339bc0973ee939bd7185a67e1f7823eee9d88e881c5f3d5
7c3fdfe5b26cf7152c3936e6dd36edfa07d6d268110d8b8f3469b7e809ecf5773b1cc9145a08a9ee8b
64f832fd1ae2957b640f668a04b873e3394a1bb47da0abac95b0d69e842299f7f4a57aa4499c532616
de959d2e70cc9a9386943f538d33cd0b5a167bebfff856efac8719d81f382bafac77605cd4ae3d9ee8
c8ae13120de1b0cd232eb0394447205e474875963209e17bbf436643ba8e6754d4f83640622378d0da
342ee1e1b004e6355125f8d34e1791d9438e60109d999fb16a4b2922f640cc5871402fba0c30df003b
43cd2ab25aa57605d193c49b4f8694d61b09fca478706f516248249a37399390522c5b91ed30727526
cc469027ae28880f9ac455194fc7e687a58ee009c99c12675ea490e5f7e64bb8d11369d3f2e00c135a
18102ecdd074ef782a348b5e9fed48f309b627e8b940f2bf4f1ffee9f326446ad18758ca4916d3cca4
8eeaf69dcb79c034f8dc1450e60232fc9659f50946d4ca3e0a1d8947e1e919d5869447373cbc949de1
b8a893b9fcbb741fb1e882c90626263927b7f1c202a80aabc4e7a4c164c7b087226a6318071d915cf3
b759c4f809592864841cf32b5b42a327336ae00dad715a6d0f6243a0f4196d02d3b71d9f06d7829824
031f33afbece100476633585f381c569e6cfd597fab0e3341eddd7a84dfae34c0237f07283de53f61a
ebb3c5eddf5efaelcb959546a97b72547d99f8213bbabe1b014a75a30f2bad0b362551db1f1699b533
f4f5b01434839ee571104db6ef2656f64e78684fe9459d3506d69f60bc3da300caaa65ee8b838665
```

or

### Select Your Dossier File

Parcourir... Aucun fichier sélectionné.

Next

Read and accept the F5 Networks<sup>®</sup> EULA. Click the check box to accept the EULA and click Next.

# Activate F5 Product

## Step 2: Accept User Legal Agreement

```
END USER LICENSE AGREEMENT
DOC-0355-08

IMPORTANT - READ BEFORE INSTALLING OR OPERATING THIS PRODUCT
LICENSEE ("LICENSEE") AGREES TO BE BOUND BY THE TERMS OF THIS
AGREEMENT BY INSTALLING, HAVING INSTALLED, COPYING, OR OTHERWISE
USING THE PRODUCT. IF LICENSEE DOES NOT AGREE, DO NOT INSTALL OR
USE THE PRODUCT.

1. Scope. This End User License Agreement ("License") applies to the
software product ("Software") Licensee has licensed from F5. All
references to "F5" in this License will be deemed to be a reference to
the applicable F5 entity as follows: (i) if Licensee's primary place of
business is located in the European Economic Area, the Middle East or
Africa ("EMEA"), the F5 entity is F5 Networks Ltd.; (ii) if Licensee's
primary place of business is located in the Asia-Pacific region,
excluding Japan, India and Taiwan ("APAC"), the F5 entity is F5
Networks Singapore Pte Ltd; and (iii) if Licensee's primary place of
business is located in Japan, India, Taiwan or a region outside of EMEA
or APAC, the F5 entity is F5 Networks, Inc. Certain Software is
licensed for use in conjunction with F5 hardware which together with
```

I have read and agree to the terms of this license

**Next**

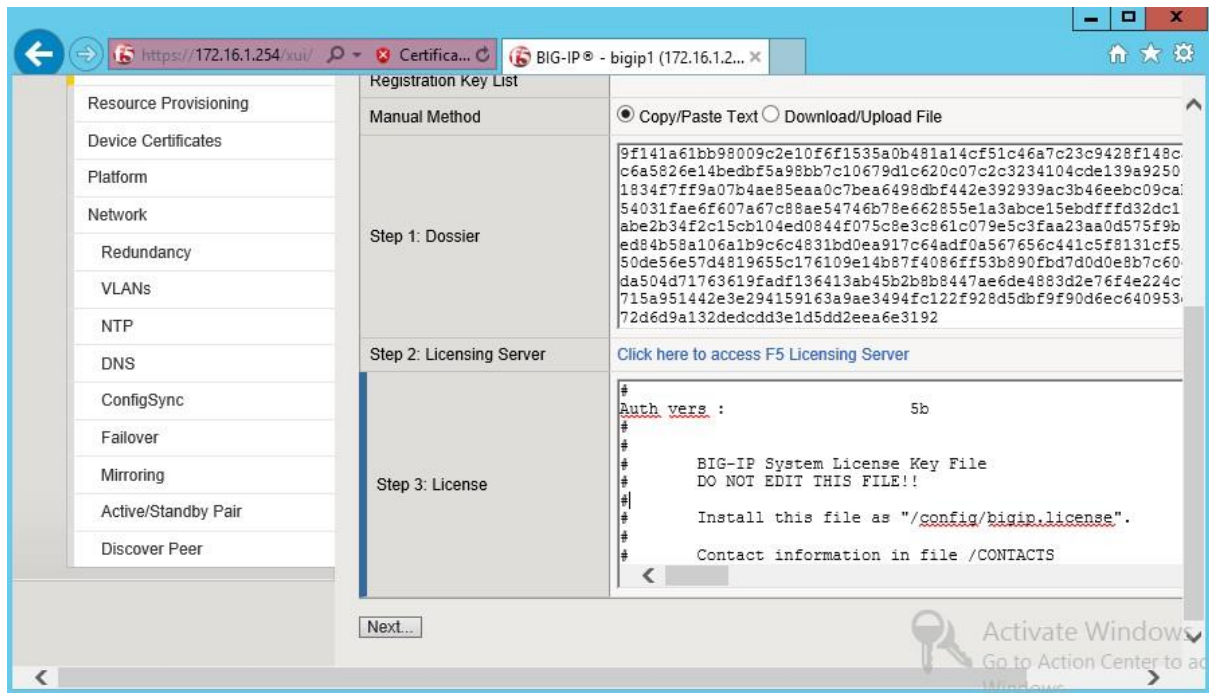
Copy the license information for your BIG-IP LTM. Alternatively, you can download the license file.

Cut and paste your license key from the form below, or click the download button to download a copy of the license file.

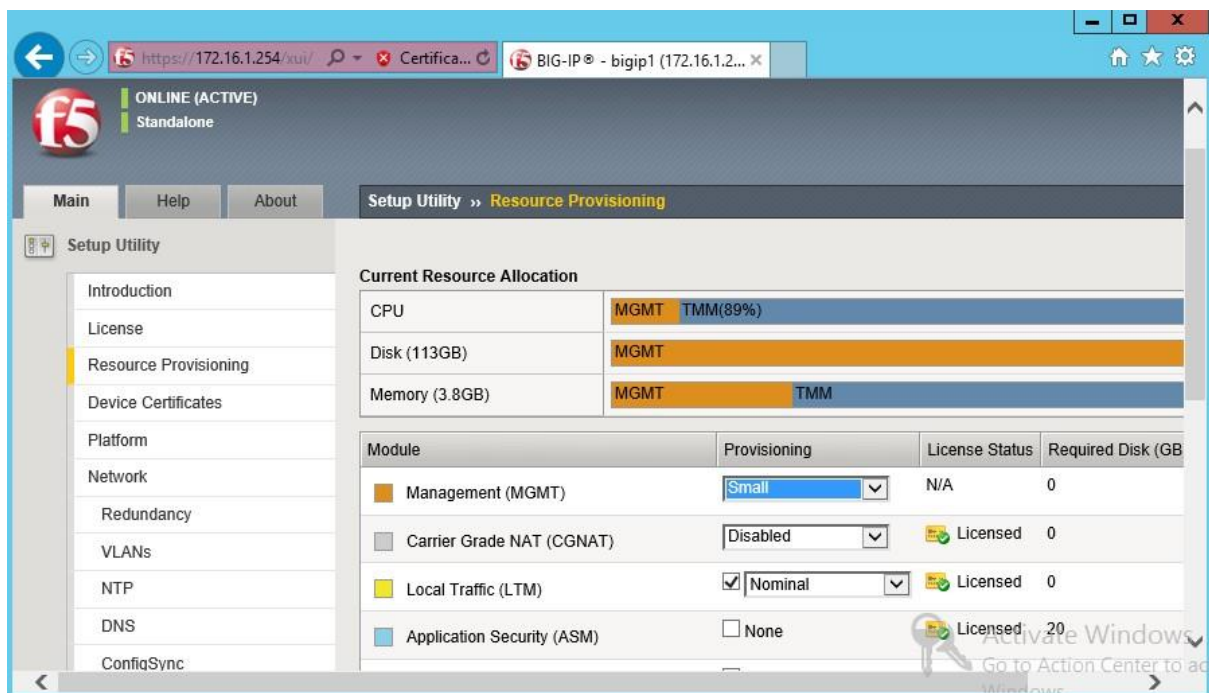
**Download license**

```
#
Auth vers :          5b
#
#
#   BIG-IP System License Key File
#   DO NOT EDIT THIS FILE!!
#
#   Install this file as "/config/bigip.license".
#
#   Contact information in file /CONTACTS
#
```

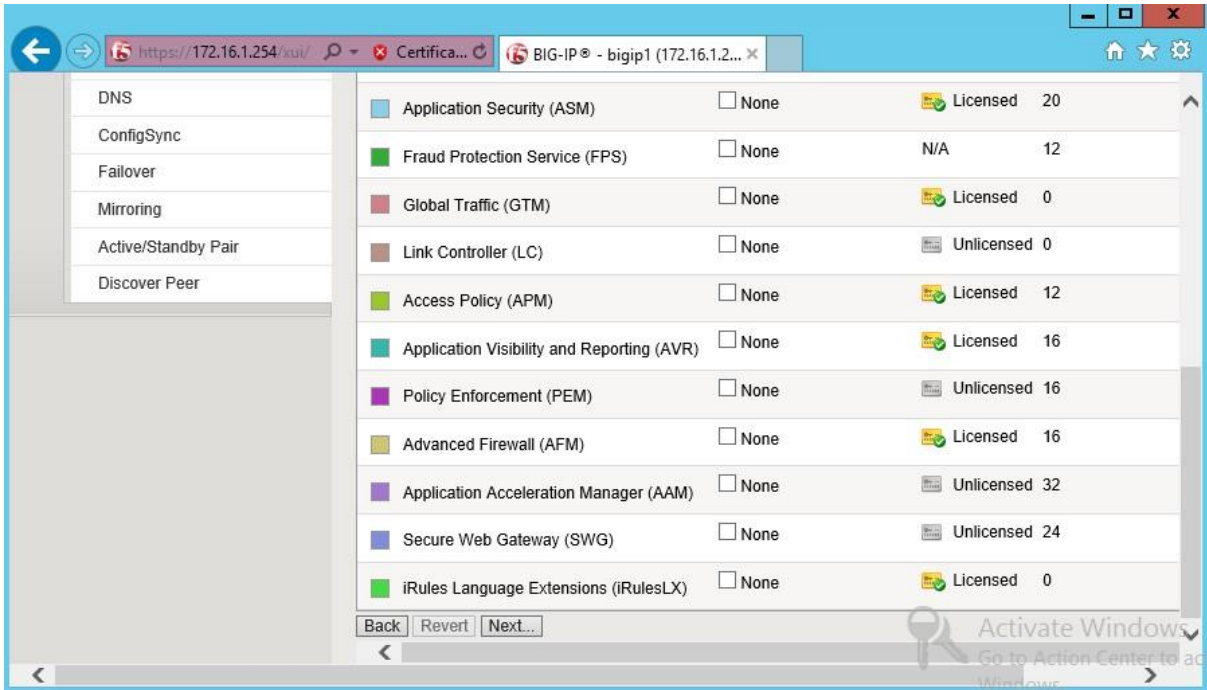
Paste the license information to License section of the Setup utility, click Next. You will then be presented with a screen as shown below. Wait one moment. Click continue button.



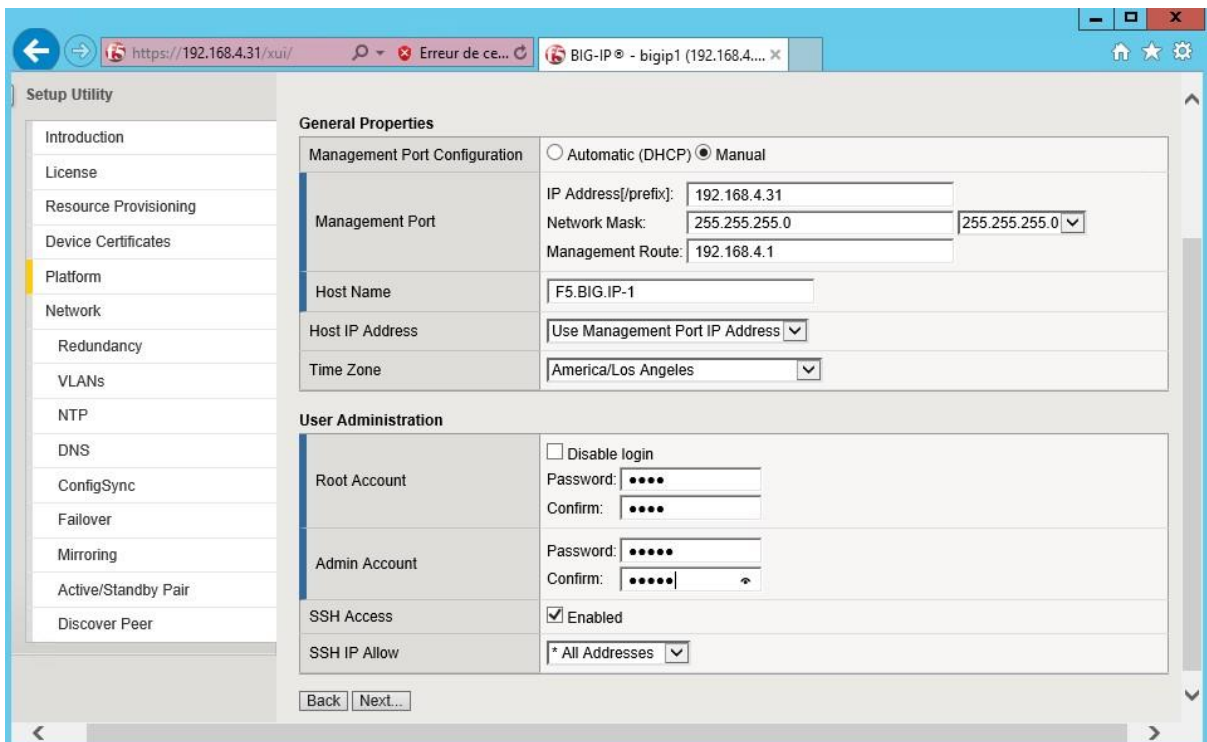
You can see that the LTM license is activated.



Click Next.



The setup utility wizard allows you to make configuration to the management interface, 192.168.4.31 in this case, host name, time zone, user account passwords for CLI and GUI access. The SSH IP Allow section acts as an ACL to allow certain IP addresses and/or ranges the BIG-IP access. Once you make changes to the account passwords, you will be logged out and need to log back in using the new IP address and the new accounts. Click **Next**.



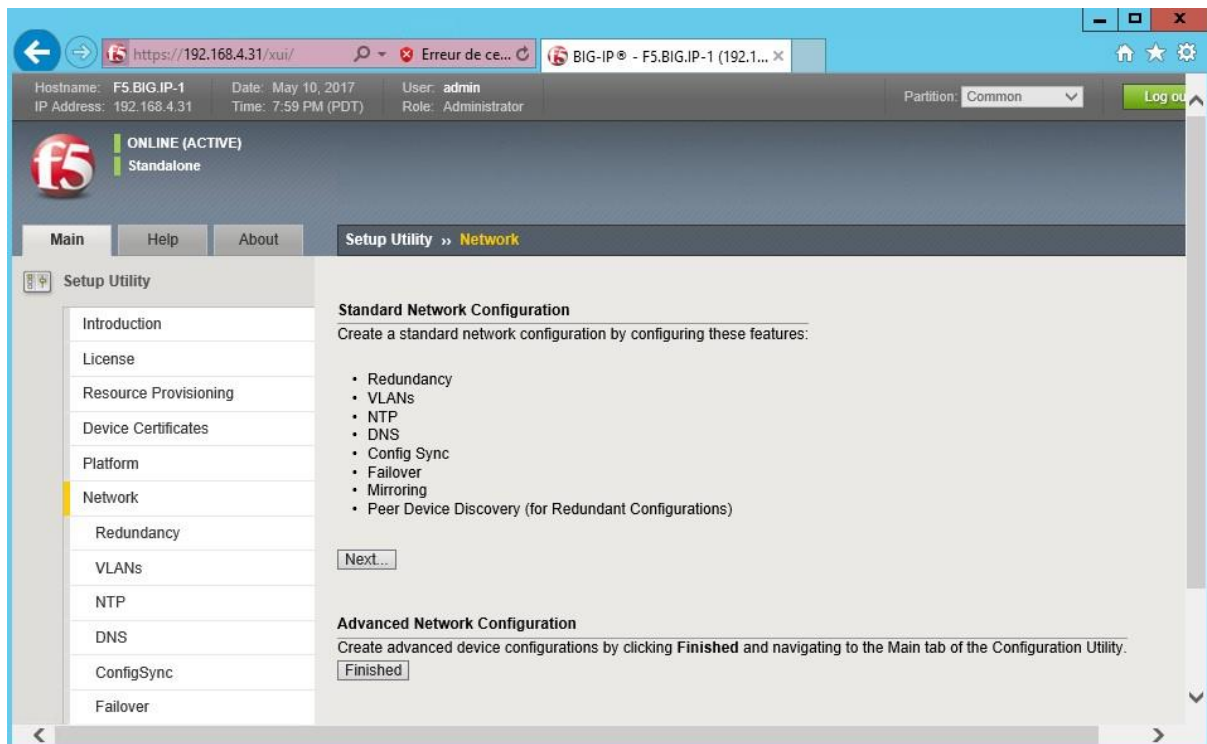
# Lab 3: Setup Utility

## Network Configuration

Once you log back in, you will be in the network section. You have ability to continue the setup utility to configure internal (real servers) and external (client side) vlans and associated interfaces and self IPs.

(Self IPs are the equivalent of SVI IP in Cisco switching)

Click Next.



Internal VLAN (connected to web servers):

Configure the internal network and VLAN by making the following settings:

Self IP Address: 172.16.4.31

Netmask: 255.255.0.0

Port Lockdown: Allow Default

Floating IP Address: 172.16.4.33

Port Lockdown: Allow Default

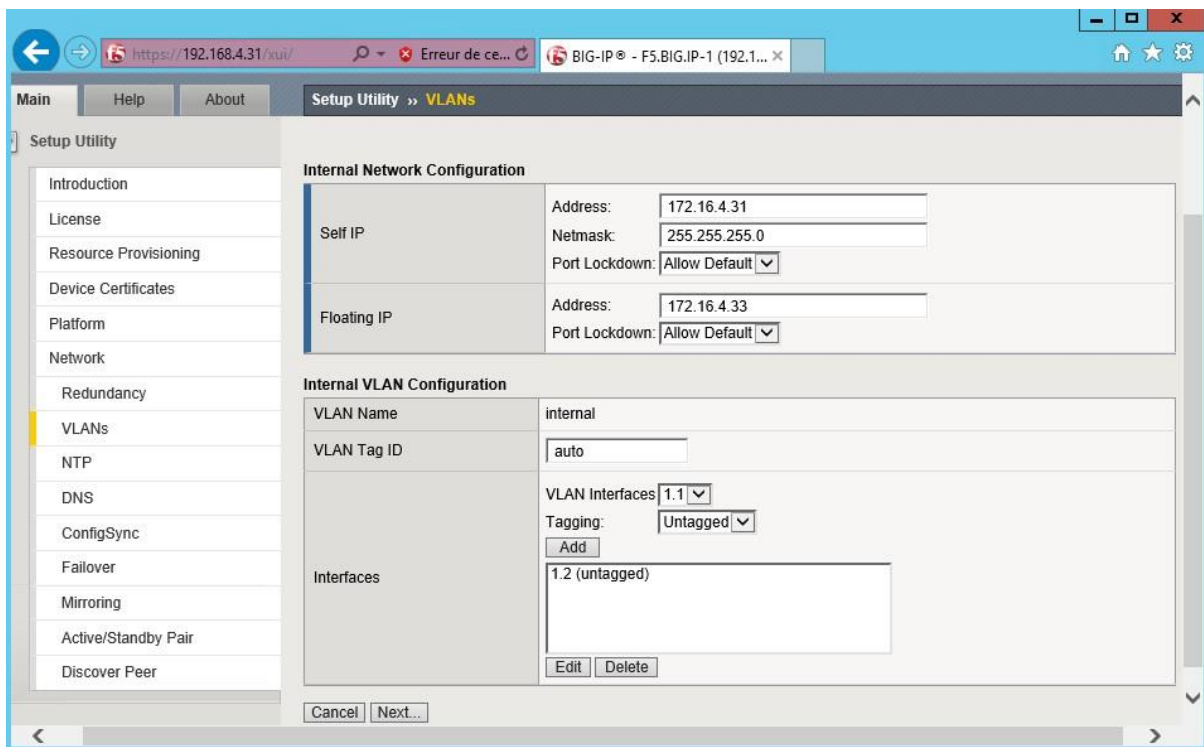
Internal VLAN Configuration section

VLAN Name: internal

VLAN Tag ID: auto

VLAN Interfaces: Select VLAN interface 1.2 and add it Untagged to the Interfaces list.

Click Next.



External VLAN (facing clients):

Configure the external network and VLAN by making the following settings:

External VLAN: Create VLAN external radio button selected

Self IP Address: 10.10.4.31

Netmask: 255.255.0.0

Port Lockdown: Allow 443

Default Gateway: Leave blank

Floating IP Address: 10.10.4.33

Port Lockdown: Allow Default

External VLAN Configuration section

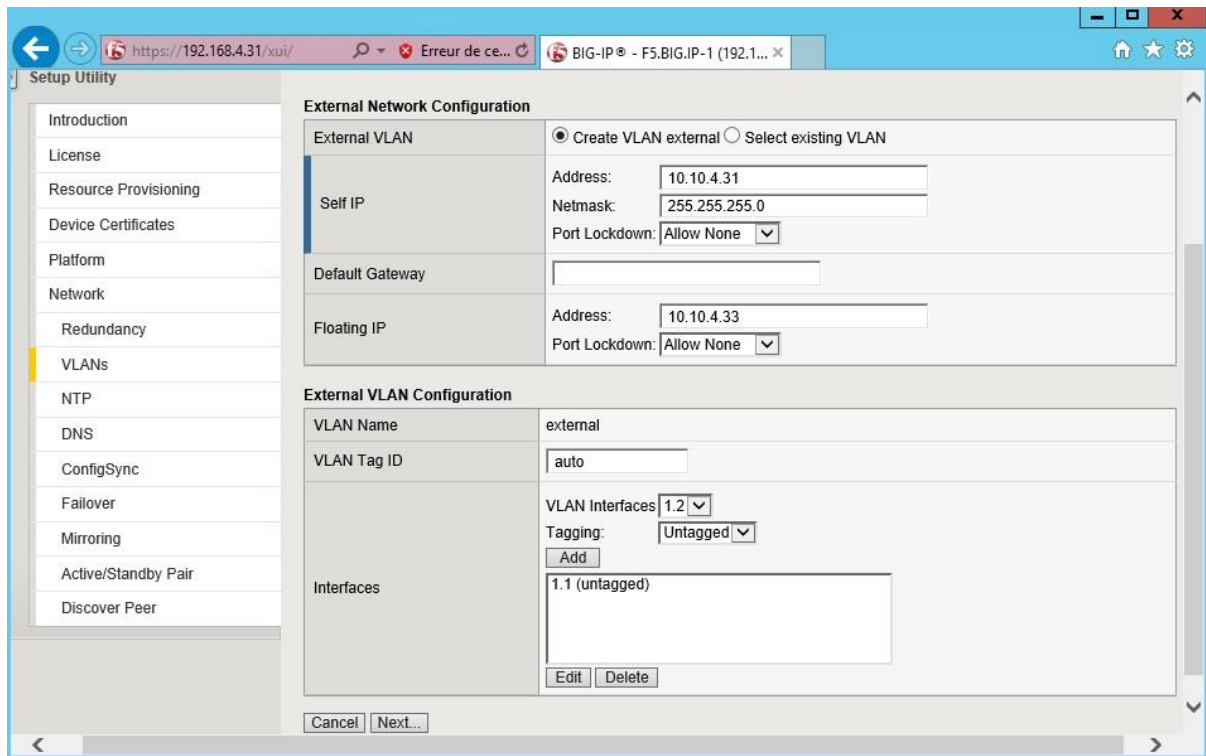
VLAN Name: external

VLAN Tag ID: auto

VLAN Interfaces: Select VLAN interface 1.1 and add it Untagged to the Interfaces list.

Click Next.





Configure the high availability network to use the existing VLAN, internal, by making the following settings:

**High Availability VLAN:** Click the Select existing VLAN radio button

**Select VLAN:** internal

**Self IP Address:** 172.16.4.31

**Netmask:** 255.255.0.0

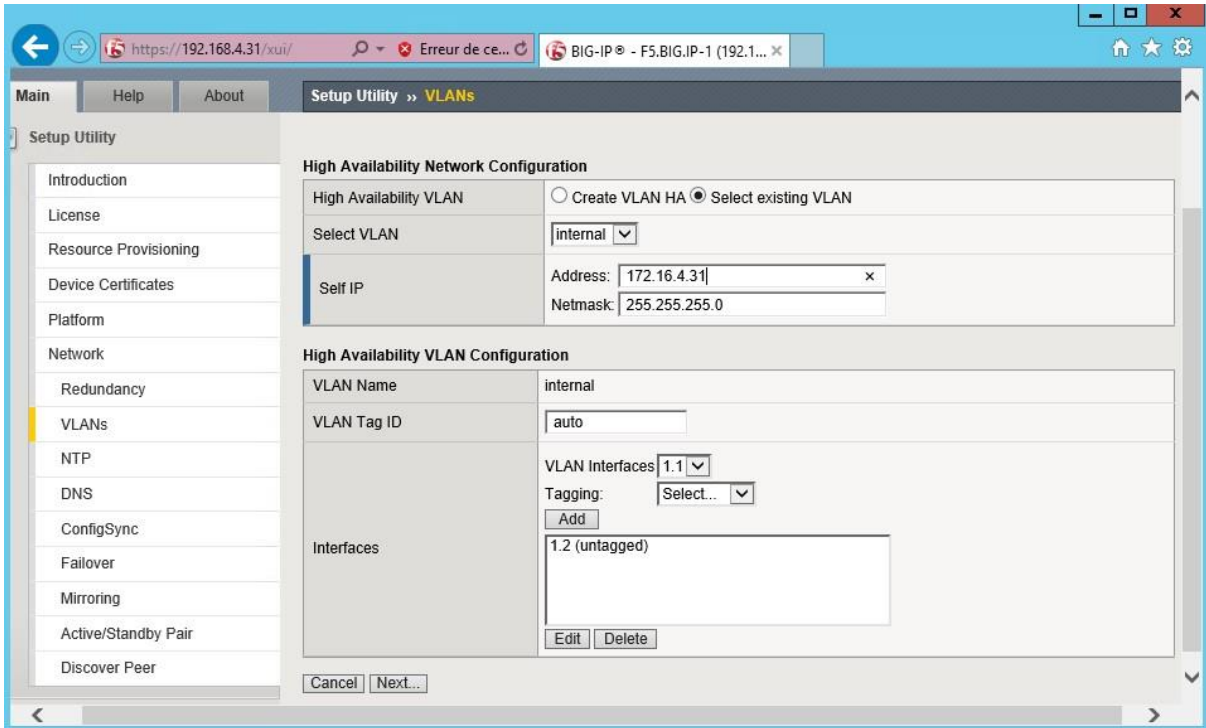
**High Availability VLAN Configuration section**

**VLAN Name:** internal

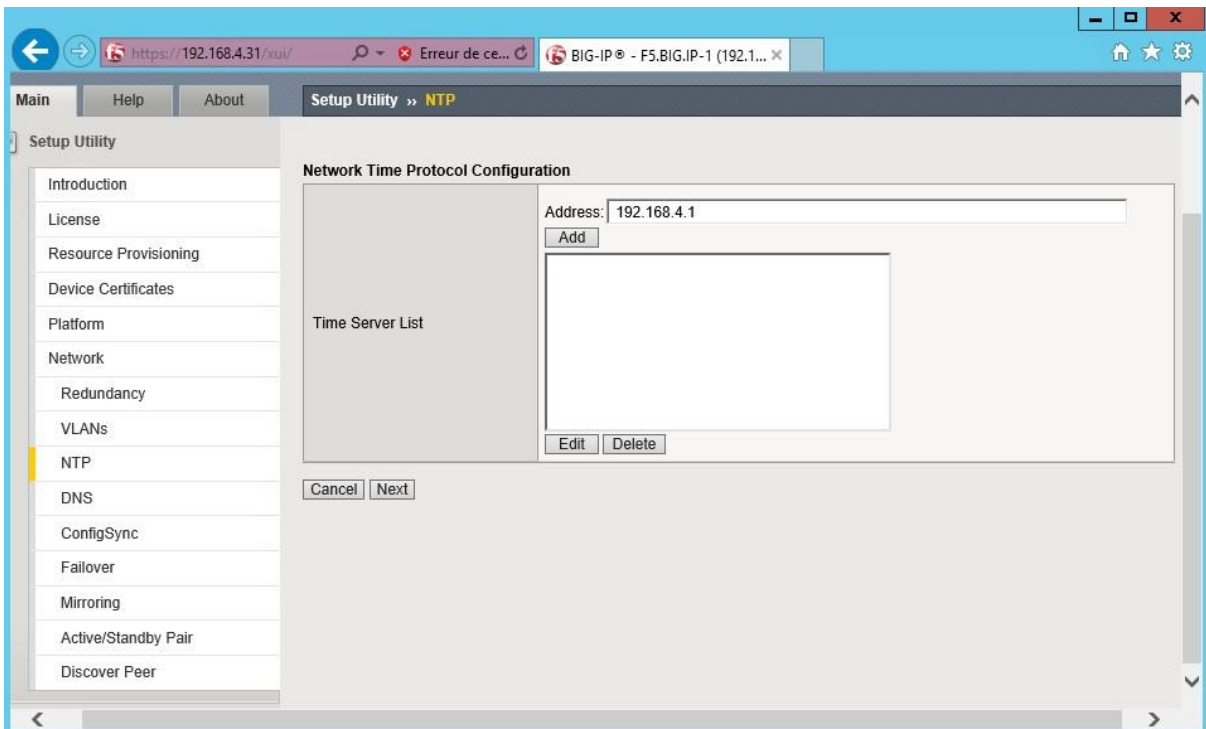
**VLAN Tag ID:** auto

**VLAN Interfaces:** 1.2 (untagged)

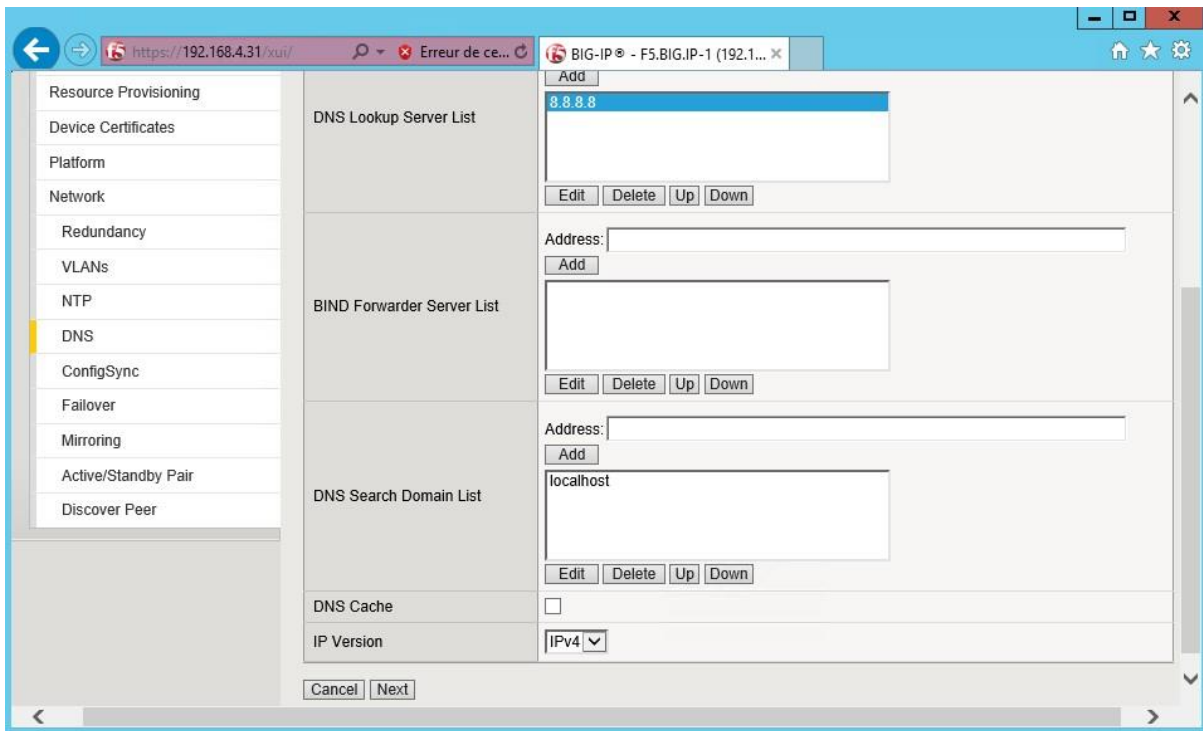
Click Next.



### Configure Network Time Protocol

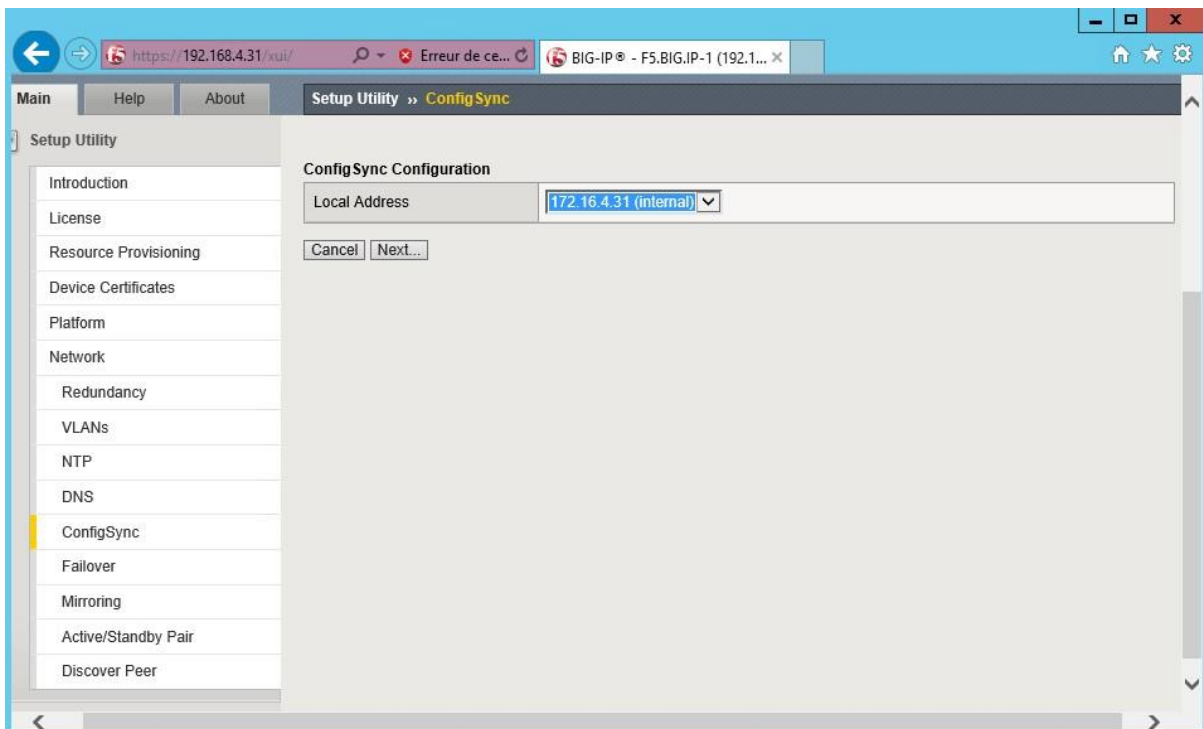


### Configure Domain Name Server

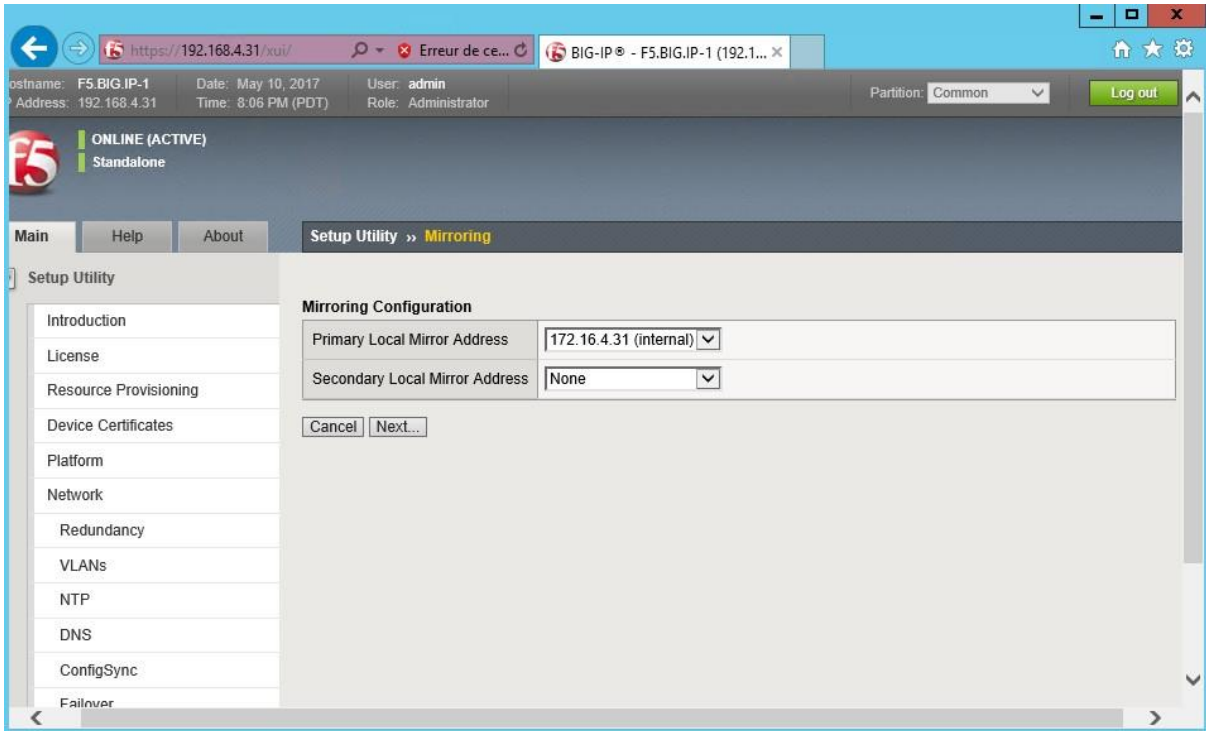


## Configure ConfigSync

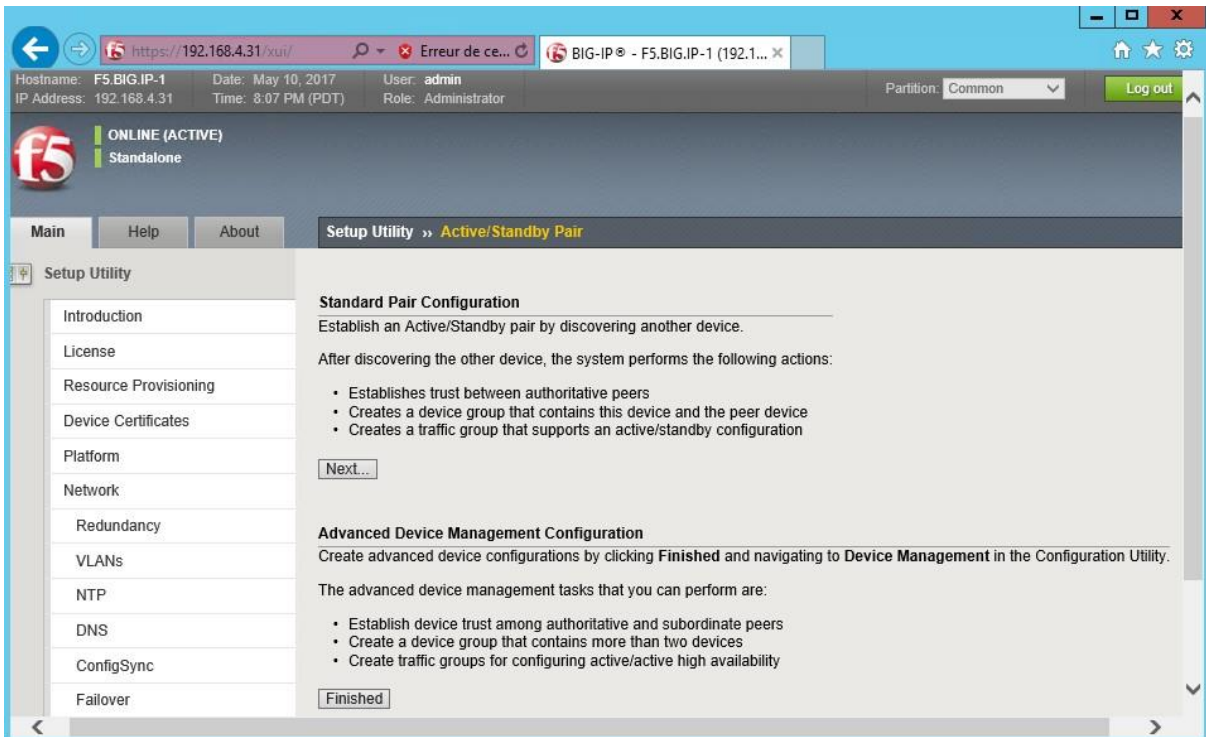
Configure ConfigSync on the non-floating self IP 172.16.4.31 for internal VLAN.



Use the default primary and secondary local mirror address settings for Mirroring Configuration.



Click Finished.



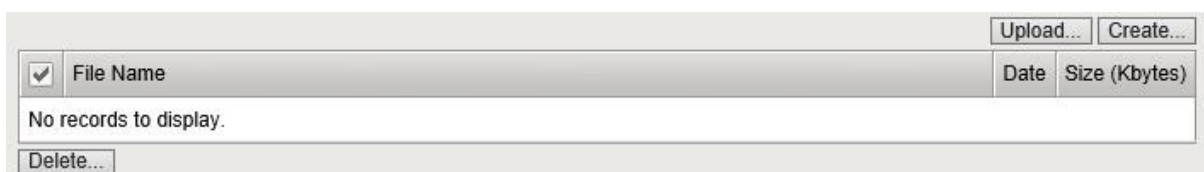
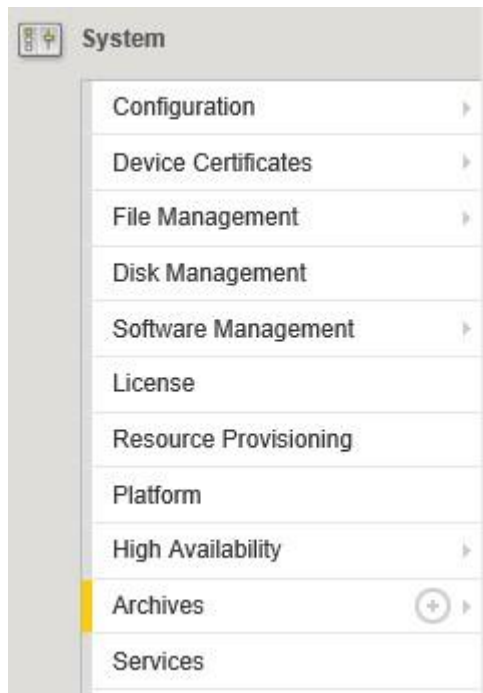
## Lab 4: Configuration Backup

### Create a UCS Archive of Your Configuration

Open a browser window to <https://192.168.4.31> and create a backup of your current configuration.

Configuration utility

System > Archives then click Create



File Name: F5-LTM-BASE.ucs

Encryption: Disabled

Private Keys: Include

When complete, click Finished, then click OK when the archive is complete.

**General Properties**

File Name	F5-LTM-BASE.ucs
Encryption	Disabled
Private Keys	Include
Version	BIG-IP 12.1.2 Build 0.0.249

Cancel Finished

**Operation Status**

```

Saving active configuration...
/var/local/ucs/F5-LTM-BASE.ucs is saved.

tar: conf/ssl.crt/server.crt: time stamp 2017-04-23 04:54:07 is 23429.274680157 s in the future
tar: conf/ssl.crt: time stamp 2017-04-23 04:54:07 is 23429.245527071 s in the future
tar: conf/ssl.key/server.key: time stamp 2017-04-23 04:54:06 is 23428.245335924 s in the future
tar: conf/ssl.key: time stamp 2017-04-23 04:54:06 is 23428.24530194 s in the future

```

OK

Download your new UCS backup to your workstation.

System Archives then click F5-LTM-BASE.ucs.

Upload... Create...

<input checked="" type="checkbox"/>	File Name	Date	Size (Kbytes)
<input type="checkbox"/>	F5-LTM-BASE.ucs	Sat Apr 22 22:23:55 CET 2017	3827

Delete...

Click Download: F5-LTM-BASE.ucs, then save to download folder.

**General Properties**

File Name	F5-LTM-BASE.ucs
Version	BIG-IP 12.1.2 Build 0.0.249
Encrypted	No
Date	Sat Apr 22 22:23:55 CET 2017
Size	3827 Kilobytes
Archive File	Download: F5-LTM-BASE.ucs

Restore Delete

The F5-LTM-BASE.ucs download has completed.

Open Open folder View downloads

## Lab 5: Traffic Processing Pool and Virtual Server

### Create a Pool

Create a Pool using the information in the following table.

Local Traffic  $\tau$  Pools  $\tau$  Pool List, then click Create

Configuration section:

Configuration: Basic

Name: HTTP-POOL

Resource section:

Load Balancing Method: Round Robin

Priority Group Activation: Disabled

Node Name: (Leave blank)

New Members:

Address:Port 172.16.4.10:80 Click Add

Address:Port 172.16.4.11:80 Click Add

Address:Port 172.16.4.12:80 Click Add

When complete, click Finished

Configuration: Basic

Name: HTTP-POOL

Description:

Health Monitors:

Active	Available
/Common http	/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 Name: (Optional)

Address: 172.16.4.12

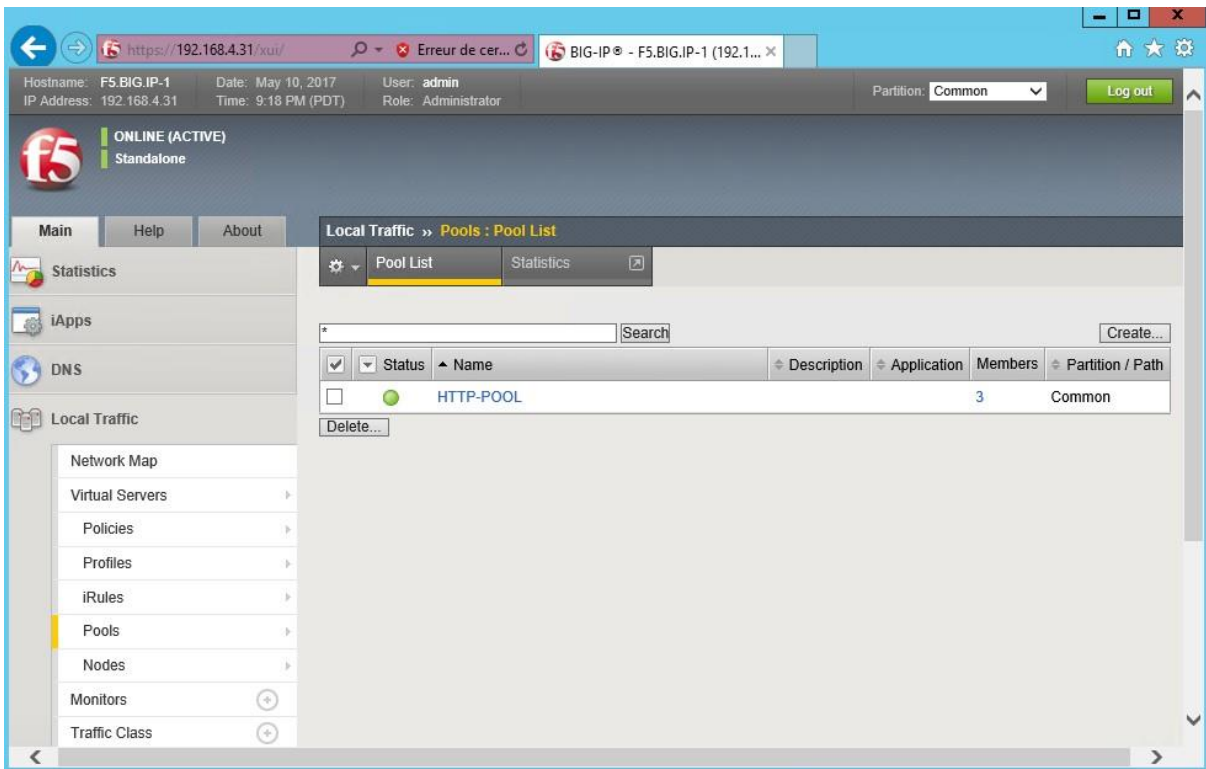
Service Port: 80 HTTP

Add

```
R:1 P:0 C:0 172.16.4.10 172.16.4.10 :80
R:1 P:0 C:0 172.16.4.11 172.16.4.11 :80
R:1 P:0 C:0 172.16.4.12 172.16.4.12 :80
```

Edit Delete

Cancel Repeat Finished



## Create a Virtual Server



Create a Virtual Server that uses the pool created in the previous step.

Local Traffic  $\tau$  Virtual Servers  $\tau$  Virtual Server List, then click Create

General Properties section: Name:

VS-HTTP

Destination Type: Standard

Address: 10.10.4.100

Service Port: 80 (or type or select HTTP)

State: Enabled

General Properties	
Name	VS-HTTP
Description	
Type	Standard <input type="button" value="v"/>
Source Address	
Destination Address/Mask	10.10.4.100
Service Port	80 <input type="button" value="HTTP"/> <input type="button" value="v"/>
Notify Status to Virtual Address	<input checked="" type="checkbox"/>
State	Enabled <input type="button" value="v"/>

Resources section:

Default Pool: HTTP-POOL

When complete, click Finished

Resources					
iRules	<table border="1"><thead><tr><th>Enabled</th><th>Available</th></tr></thead><tbody><tr><td></td><td><input type="button" value="v"/> /Common _sys_APM_ExchangeSupport_OA_BasicAuth _sys_APM_ExchangeSupport_OA_NtlmAuth _sys_APM_ExchangeSupport_helper _sys_APM_ExchangeSupport_main</td></tr></tbody></table>	Enabled	Available		<input type="button" value="v"/> /Common _sys_APM_ExchangeSupport_OA_BasicAuth _sys_APM_ExchangeSupport_OA_NtlmAuth _sys_APM_ExchangeSupport_helper _sys_APM_ExchangeSupport_main
	Enabled	Available			
	<input type="button" value="v"/> /Common _sys_APM_ExchangeSupport_OA_BasicAuth _sys_APM_ExchangeSupport_OA_NtlmAuth _sys_APM_ExchangeSupport_helper _sys_APM_ExchangeSupport_main				
	<input type="button" value="Up"/> <input type="button" value="Down"/>				
Policies	<table border="1"><thead><tr><th>Enabled</th><th>Available</th></tr></thead><tbody><tr><td></td><td></td></tr></tbody></table>	Enabled	Available		
Enabled	Available				
Default Pool	<input type="button" value="+"/> HTTP-POOL <input type="button" value="v"/>				
Default Persistence Profile	None <input type="button" value="v"/>				
Fallback Persistence Profile	None <input type="button" value="v"/>				

Open a new browser session on the external client and point it to the virtual server at <http://10.10.4.100>.



Refresh the web page.

Web-Server

[Home](#) [Exec](#) [Configure](#)

Command

Output

Command base-URL was: /level/15/exec/-  
Complete URL was: /level/15/exec/-/sh/run/int/fa0\0/CR  
Command was: sh run int fa0/0

Building configuration...

Current configuration : 115 bytes  
!  
interface FastEthernet0/0  
ip address 172.16.4.11 255.255.255.0  
no ip route-cache  
speed auto  
duplex auto  
end

Refresh the web page.



## Create a Second Pool

Local Traffic  $\tau$  Pools: Pool List  $\tau$  New Pool

Configuration section:

Name: HTTPS-POOL

Resources section:

Load Balancing Method: Round Robin

Node Name: (Leave blank)

New Members:

Click **Node List** and use the resulting pull-down to select the nodes to add to the member list:

Address: 172.16.4.10 Service Port: 443 Click Add

Address: 172.16.4.11 Service Port: 443 Click Add

Address: 172.16.4.12 Service Port: 443 Click Add

When complete, click **Finished**

Name	HTTPS-POOL
Description	
Health Monitors	<div style="display: flex; justify-content: space-between;"> <div style="border: 1px solid gray; padding: 2px;"> <p>Active</p> <p>/Common https</p> </div> <div style="border: 1px solid gray; padding: 2px;"> <p>Available</p> <p>http http_head_f5 https_443 https_head_f5 inband</p> </div> </div>
<b>Resources</b>	
Load Balancing Method	Round Robin
Priority Group Activation	Disabled
New Members	<p><input checked="" type="radio"/> New Node <input type="radio"/> New FQDN Node <input type="radio"/> Node List</p> <p>Node Name: <input type="text"/> (Optional)</p> <p>Address: <input type="text" value="172.16.4.12"/> x</p> <p>Service Port: <input type="text" value="443"/> <input type="text" value="HTTPS"/></p> <p><input type="button" value="Add"/></p> <div style="border: 1px solid gray; padding: 2px;"> <p>R:1 P:0 C:0 172.16.4.10 172.16.4.10 :443</p> <p>R:1 P:0 C:0 172.16.4.11 172.16.4.11 :443</p> <p>R:1 P:0 C:0 172.16.4.12 172.16.4.12 :443</p> </div> <p><input type="button" value="Edit"/> <input type="button" value="Delete"/></p>
<input type="button" value="Cancel"/> <input type="button" value="Repeat"/> <input type="button" value="Finished"/>	

Local Traffic » Pools : Pool List

Pool List Statistics

\*  Search

<input checked="" type="checkbox"/>	Status	Name	Description	Application	Members	Partition / Path
<input type="checkbox"/>	<span style="color: green;">●</span>	HTTP-POOL			3	Common
<input type="checkbox"/>	<span style="color: green;">●</span>	HTTPS-POOL			3	Common

Create a Virtual Server that uses the pool HTTPS-POOL created in the previous step.

Local Traffic » Virtual Servers » Virtual Server List, then click Create

General Properties section:

**Name:** VS-HTTPS

**Destination Type:** Standard

**Address:** 10.10.4.101

**Service Port:** 443 (or type or select HTTP)

**State:** Enabled

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

**General Properties**

Name	VS-HTTPS
Description	
Type	Standard
Source Address	
Destination Address/Mask	10.10.4.101
Service Port	443 HTTPS
Notify Status to Virtual Address	<input checked="" type="checkbox"/>
State	Enabled

**Resources section:**  
**Default Pool: HTTPS-POOL**  
 When complete, click **Finished**

**Resources**

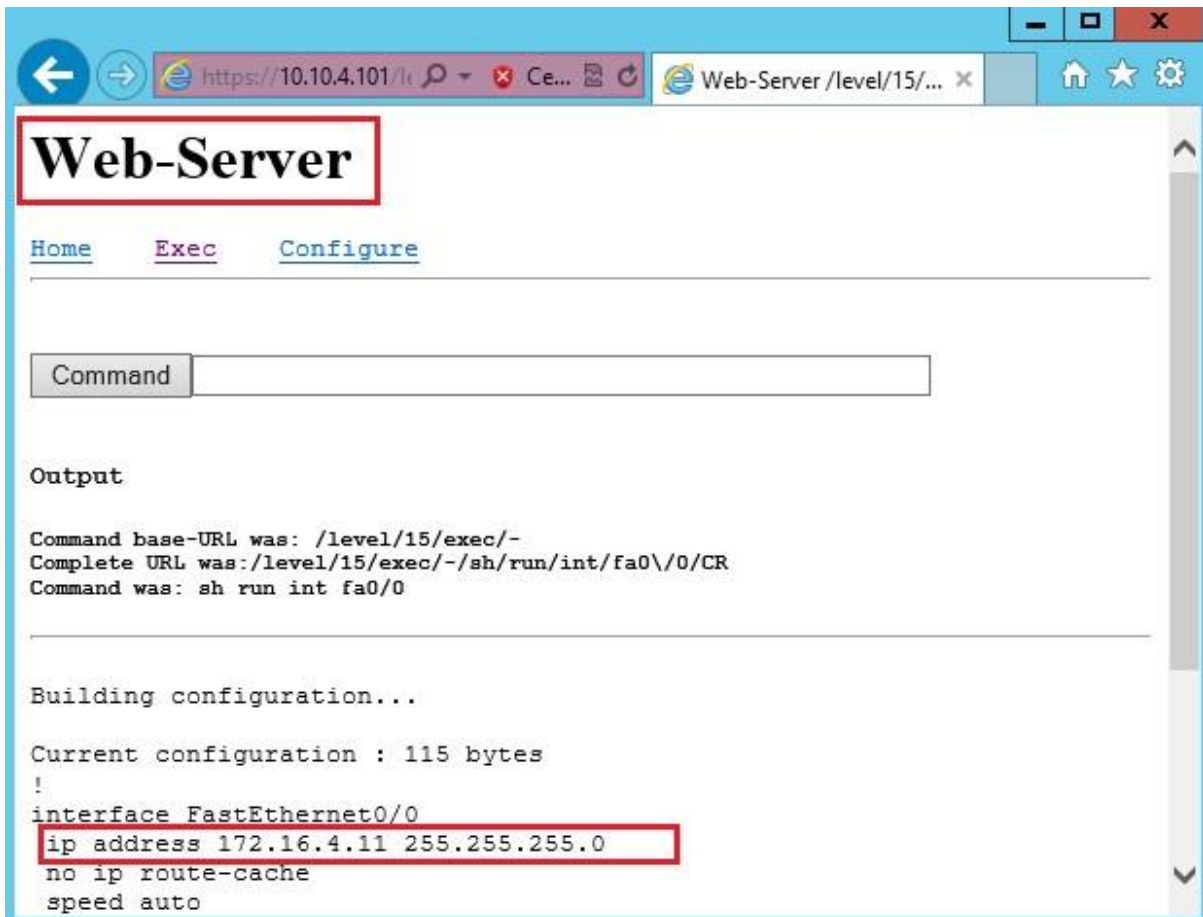
iRules	<table border="1"> <thead> <tr> <th>Enabled</th> <th>Available</th> </tr> </thead> <tbody> <tr> <td></td> <td>           sys_auth_ssl_cc_idap            _sys_auth_ssl_cridp            _sys_auth_ssl_ocsp            _sys_auth_tacacs            _sys_https_redirect         </td> </tr> </tbody> </table>	Enabled	Available		sys_auth_ssl_cc_idap _sys_auth_ssl_cridp _sys_auth_ssl_ocsp _sys_auth_tacacs _sys_https_redirect
Enabled	Available				
	sys_auth_ssl_cc_idap _sys_auth_ssl_cridp _sys_auth_ssl_ocsp _sys_auth_tacacs _sys_https_redirect				
Policies	<table border="1"> <thead> <tr> <th>Enabled</th> <th>Available</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> </tr> </tbody> </table>	Enabled	Available		
Enabled	Available				
Default Pool	HTTPS-POOL				
Default Persistence Profile	None				
Fallback Persistence Profile	None				

Cancel Repeat Finished

Open a new browser session on the external client and enter the address of the virtual server at <https://10.10.4.100>.



Refresh the web page



Refresh the web page



The screenshot shows a web browser window with the address bar containing `https://10.10.4.101/`. The page title is **Web-Server**. Below the title are three tabs: [Home](#), [Exec](#), and [Configure](#). A **Command** input field is present. The **Output** section displays the following text:

```
Command base-URL was: /level/15/exec/-  
Complete URL was: /level/15/exec/-/sh/run/int/fa0\0/CR  
Command was: sh run int fa0/0
```

---

```
Building configuration...  
  
Current configuration : 115 bytes  
!  
interface FastEthernet0/0  
ip address 172.16.4.12 255.255.255.0  
no ip route-cache  
speed auto
```

The line `ip address 172.16.4.12 255.255.255.0` is highlighted with a red box.

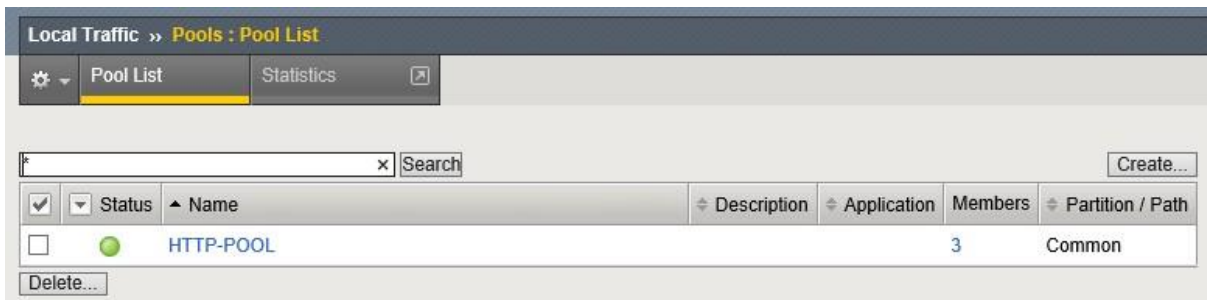
# Lab 6: Load Balancing

Configure Ratio (member) Load Balancing.

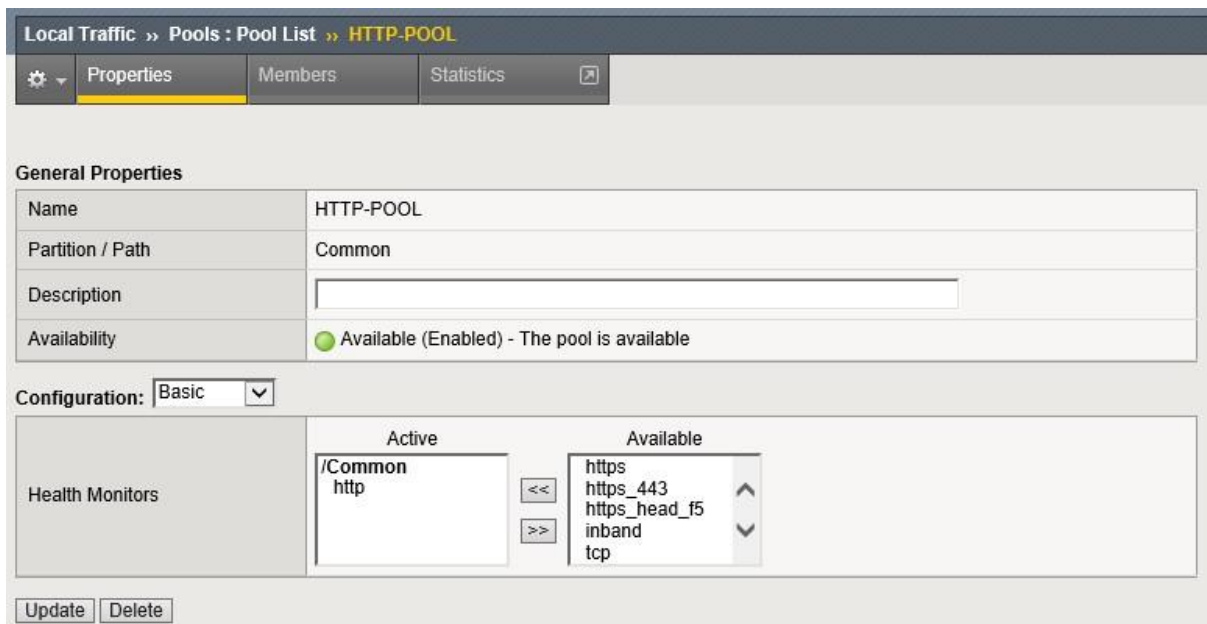
In the Navigation pane, expand the Local Traffic section.

Click Pools.

Click HTTP-POOL.



Click the Members tab.



In the Load Balancing section, change Load Balancing Method to Ratio (member) and then click Update.

Local Traffic » Pools : Pool List » HTTP-POOL

Properties Members Statistics

**Load Balancing**

Load Balancing Method: Round Robin

Priority Group Activation: Disabled

Update

**Current Members** Add...

✓	▼	Status	Member	Address	Service Port	FQDN	Ephemeral	Ratio	Priority Group	Connection Limit	Partition / Path
<input type="checkbox"/>		●	172.16.4.10:80	172.16.4.10	80		No	1	0 (Active)	0	Common
<input type="checkbox"/>		●	172.16.4.11:80	172.16.4.11	80		No	1	0 (Active)	0	Common
<input type="checkbox"/>		●	172.16.4.12:80	172.16.4.12	80		No	1	0 (Active)	0	Common

Enable Disable Force Offline Remove

Local Traffic » Pools : Pool List » HTTP-POOL

Properties Members Statistics

**Load Balancing**

Load Balancing Method: Ratio (member)

Ignore Persisted Weight:

Priority Group Activation: Disabled

Update

**Current Members** Add...

✓	▼	Status	Member	Address	Service Port	FQDN	Ephemeral	Ratio	Priority Group	Connection Limit	Partition / Path
<input type="checkbox"/>		●	172.16.4.10:80	172.16.4.10	80		No	1	0 (Active)	0	Common
<input type="checkbox"/>		●	172.16.4.11:80	172.16.4.11	80		No	2	0 (Active)	0	Common
<input type="checkbox"/>		●	172.16.4.12:80	172.16.4.12	80		No	3	0 (Active)	0	Common

Enable Disable Force Offline Remove

Local Traffic » Pools : Pool List » HTTP-POOL

Properties Members Statistics

**Load Balancing**

Load Balancing Method: Ratio (member)

Ignore Persisted Weight:

Priority Group Activation: Disabled

Update

**Current Members** Add...

✓	▼	Status	Member	Address	Service Port	FQDN	Ephemeral	Ratio	Priority Group	Connection Limit	Partition / Path
<input type="checkbox"/>		●	172.16.4.10:80	172.16.4.10	80		No	1	0 (Active)	0	Common
<input type="checkbox"/>		●	172.16.4.11:80	172.16.4.11	80		No	2	0 (Active)	0	Common
<input type="checkbox"/>		●	172.16.4.12:80	172.16.4.12	80		No	3	0 (Active)	0	Common

Enable Disable Force Offline Remove

In the Current **Members** section, click each member, set **Ratio** to the value in the table and then click **Update**. Click the **Members** tab to return to the Current Members list.

### Member Ratio

172.16.4.10:80 1 (default)

172.16.4.11:80 2

172.16.4.12:80 3

Address	172.16.4.11
Service Port	80
Partition / Path	Common
Description	<input type="text"/>
Parent Node	172.16.4.11
Availability	Available (Enabled) - Pool member is available 2017-05-11 22:59:07
Health Monitors	http
Monitor Logging	<input type="checkbox"/> Enable
Current Connections	0
State	<input checked="" type="radio"/> Enabled (All traffic allowed) <input type="radio"/> Disabled (Only persistent or active connections allowed) <input type="radio"/> Forced Offline (Only active connections allowed)

Configuration: Basic

Ratio	<input type="text" value="2"/> <input type="button" value="x"/>
Priority Group	<input type="text" value="0"/>
Connection Limit	<input type="text" value="0"/>
Connection Rate Limit	<input type="text" value="0"/>

Address	172.16.4.12
Service Port	80
Partition / Path	Common
Description	<input type="text"/>
Parent Node	172.16.4.12
Availability	Available (Enabled) - Pool member is available 2017-05-11 22:56:21
Health Monitors	http
Monitor Logging	<input type="checkbox"/> Enable
Current Connections	0
State	<input checked="" type="radio"/> Enabled (All traffic allowed) <input type="radio"/> Disabled (Only persistent or active connections allowed) <input type="radio"/> Forced Offline (Only active connections allowed)

Configuration: Basic

Ratio	<input type="text" value="3"/> <input type="button" value="x"/>
Priority Group	<input type="text" value="0"/>
Connection Limit	<input type="text" value="0"/>
Connection Rate Limit	<input type="text" value="0"/>

Open a new browser session on the external client and connect to <http://10.10.4.100>. Refresh the browser 5-10 times.  
 In the Configuration Utility, view the pool statistics. Traffic should be distributed to the members with a 1:2:3 ratio.

Statistics » Module Statistics : Local Traffic » Pools

Traffic Summary | DNS | Local Traffic | Network | Memory

Display Options

Statistics Type: Pools  
 Data Format: Normalized  
 Auto Refresh: Disabled Refresh

/Common/HTTP-POOL		Search	Reset Search	Bits		Packets		Connections			Requests	
<input type="checkbox"/>	Status	Pool	Pool Member	Partition / Path	In	Out	In	Out	Current	Maximum	Total	Total
<input type="checkbox"/>	<span style="color: green;">●</span>	HTTP-POOL		Common	43.8K	218.3K	66	67	0	6	9	0
<input type="checkbox"/>	<span style="color: green;">●</span>		172.16.4.10:80	Common	9.0K	47.4K	14	14	0	2	2	0
<input type="checkbox"/>	<span style="color: green;">●</span>		172.16.4.11:80	Common	13.5K	72.5K	21	21	0	2	3	0
<input type="checkbox"/>	<span style="color: green;">●</span>		172.16.4.12:80	Common	21.2K	98.2K	31	32	0	2	4	0

Reset

### Priority Group Activation Lab

Configure Priority Group Activation

Reset the statistics for HTTP-POOL.

From the Navigation pane, expand the Local Traffic section and select Pools.

Select HTTP-POOL.

Select the Members tab.

In the Load Balancing section, change the Priority Group Activation setting to Less than 0, the number of Available Members to 2, and click Update.

Local Traffic » Pools : Pool List » HTTP-POOL

Properties | Members | Statistics

Load Balancing

Load Balancing Method: Ratio (member)  
 Ignore Persisted Weight:   
 Priority Group Activation: Disabled / Less than... 0 Available Member(s)

Update

Current Members Add...

<input type="checkbox"/>	Status	Member	Address	Service Port	FQDN	Ephemeral	Ratio	Priority Group	Connection Limit	Partition / Path
<input type="checkbox"/>	<span style="color: green;">●</span>	172.16.4.10:80	172.16.4.10	80		No	1	0 (Active)	0	Common
<input type="checkbox"/>	<span style="color: green;">●</span>	172.16.4.11:80	172.16.4.11	80		No	2	0 (Active)	0	Common
<input type="checkbox"/>	<span style="color: green;">●</span>	172.16.4.12:80	172.16.4.12	80		No	3	0 (Active)	0	Common

Enable | Disable | Force Offline | Remove

Local Traffic » Pools : Pool List » HTTP-POOL

Properties Members Statistics

**Load Balancing**

Load Balancing Method: Ratio (member)

Ignore Persisted Weight:

Priority Group Activation: Less than... 2 Available Member(s)

Update

**Current Members** Add...

<input checked="" type="checkbox"/>	Status	Member	Address	Service Port	FQDN	Ephemeral	Ratio	Priority Group	Connection Limit	Partition / Path
<input type="checkbox"/>		172.16.4.10:80	172.16.4.10	80		No	1	0 (Active)	0	Common
<input type="checkbox"/>		172.16.4.11:80	172.16.4.11	80		No	2	0 (Active)	0	Common
<input type="checkbox"/>		172.16.4.12:80	172.16.4.12	80		No	3	0 (Active)	0	Common

Enable Disable Force Offline Remove

Within the Configuration section of each member, set the Priority values as follows:

Member Ratio Priority Group

172.16.4.10:80 1 0 172.16.4.11:80

2 4

172.16.4.12:80 3 4

Address	172.16.4.11
Service Port	80
Partition / Path	Common
Description	
Parent Node	172.16.4.11
Availability	Available (Enabled) - Pool member is available 2017-05-11 22:59:07
Health Monitors	http
Monitor Logging	<input type="checkbox"/> Enable
Current Connections	0
State	<input checked="" type="radio"/> Enabled (All traffic allowed) <input type="radio"/> Disabled (Only persistent or active connections allowed) <input type="radio"/> Forced Offline (Only active connections allowed)

Configuration: Basic

Ratio	2
Priority Group	4
Connection Limit	0
Connection Rate Limit	0

Update Delete

Address	172.16.4.12
Service Port	80
Partition / Path	Common
Description	<input type="text"/>
Parent Node	172.16.4.12
Availability	Available (Enabled) - Pool member is available 2017-05-11 22:56:21
Health Monitors	http
Monitor Logging	<input type="checkbox"/> Enable
Current Connections	0
State	<input checked="" type="radio"/> Enabled (All traffic allowed) <input type="radio"/> Disabled (Only persistent or active connections allowed) <input type="radio"/> Forced Offline (Only active connections allowed)

Configuration: Basic

Ratio	<input type="text" value="3"/>
Priority Group	<input type="text" value="4"/> <input type="button" value="x"/>
Connection Limit	<input type="text" value="0"/>
Connection Rate Limit	<input type="text" value="0"/>

Local Traffic » Pools : Pool List » HTTP-POOL

Properties Members Statistics

**Load Balancing**

Load Balancing Method	<span>Ratio (member)</span> <input type="button" value="v"/>
Ignore Persisted Weight	<input type="checkbox"/>
Priority Group Activation	<span>Less than...</span> <input type="button" value="v"/> <input type="text" value="2"/> Available Member(s)

**Current Members**

<input checked="" type="checkbox"/>	<input type="button" value="v"/> Status	<input type="button" value="v"/> Member	<input type="button" value="v"/> Address	<input type="button" value="v"/> Service Port	<input type="button" value="v"/> FQDN	<input type="button" value="v"/> Ephemeral	<input type="button" value="v"/> Ratio	<input type="button" value="v"/> Priority Group	<input type="button" value="v"/> Connection Limit	<input type="button" value="v"/> Partition / Path
<input type="checkbox"/>		172.16.4.10:80	172.16.4.10	80		No	1	0 (Active)	0	Common
<input type="checkbox"/>		172.16.4.11:80	172.16.4.11	80		No	2	4 (Active)	0	Common
<input type="checkbox"/>		172.16.4.12:80	172.16.4.12	80		No	3	4 (Active)	0	Common

Open a new browser session on the external client and connect to <http://10.10.4.100>.  
 Refresh the screen 5-10 times.  
 View the pool statistics.

With Priority Group Activation set to less than 2 members and all pool members enabled, 172.16.4.11:80 should receive no traffic. Traffic is distributed to members 172.16.4.11 and 172.16.4.12 in a 2:3 ratio.

Statistics » Module Statistics : Local Traffic » Pools

Traffic Summary DNS Local Traffic Network Memory

Display Options

Statistics Type: Pools

Data Format: Normalized

Auto Refresh: Disabled Refresh

/Common/HTTP-POOL Search Reset Search

		Bits		Packets		Connections			Requests			
	Status	Pool	Pool Member	Partition / Path	In	Out	In	Out	Current	Maximum	Total	Total
<input type="checkbox"/>		HTTP-POOL		Common	31.3K	154.2K	48	49	0	4	7	0
<input type="checkbox"/>			172.16.4.10:80	Common	0	0	0	0	0	0	0	0
<input type="checkbox"/>			172.16.4.11:80	Common	12.9K	58.1K	19	19	0	2	3	0
<input type="checkbox"/>			172.16.4.12:80	Common	18.4K	96.0K	29	30	0	2	4	0

Reset

Reset the statistics for HTTP-POOL.  
 Disable pool member 172.16.4.11:80 in HTTP-POOL.

Local Traffic » Pools : Pool List » HTTP-POOL

Properties Members Statistics

Load Balancing

Load Balancing Method: Ratio (member)

Ignore Persisted Weight:

Priority Group Activation: Less than... 2 Available Member(s)

Update

Current Members Add...

	Status	Member	Address	Service Port	FQDN	Ephemeral	Ratio	Priority Group	Connection Limit	Partition / Path
<input type="checkbox"/>		172.16.4.10:80	172.16.4.10	80		No	1	0 (Active)	0	Common
<input checked="" type="checkbox"/>		172.16.4.11:80	172.16.4.11	80		No	2	4 (Active)	0	Common
<input type="checkbox"/>		172.16.4.12:80	172.16.4.12	80		No	3	4 (Active)	0	Common

Enable Disable Force Offline Remove

Current Members Add...

	Status	Member	Address	Service Port	FQDN	Ephemeral	Ratio	Priority Group	Connection Limit	Partition / Path
<input type="checkbox"/>		172.16.4.10:80	172.16.4.10	80		No	1	0 (Active)	0	Common
<input type="checkbox"/>		172.16.4.11:80	172.16.4.11	80		No	2	4 (Active)	0	Common
<input type="checkbox"/>		172.16.4.12:80	172.16.4.12	80		No	3	4 (Active)	0	Common

Enable Disable Force Offline Remove

In the browser session connect to <http://10.10.4.100>, refresh the screen 5-10 times by pressing.  
 Refresh and view the pool statistics.



With Priority Group Activation set to less than 2 members and pool member 172.16.4.11:80 disabled, 172.16.4.11:80 is not eligible to receive traffic. The next lower priority group (0) is activated as the number of available members in the pool has now fallen below the minimum 2. Traffic is distributed to members 172.16.4.10 and 172.16.4.12 in a 1:3 ratio

Statistics » Module Statistics : Local Traffic » Pools														
Traffic Summary		DNS		Local Traffic		Network		Memory						
Display Options														
Statistics Type		Pools												
Data Format		Normalized												
Auto Refresh		Disabled <input type="button" value="Refresh"/>												
/Common/HTTP-POOL				Search		Reset Search		Bits		Packets		Connections		Requests
<input type="checkbox"/>	Status	Pool	Pool Member	Partition / Path	In	Out	In	Out	Current	Maximum	Total	Total		
<input type="checkbox"/>		HTTP-POOL		Common	34.7K	133.1K	47	46	0	4	8	0		
<input type="checkbox"/>			172.16.4.10:80	Common	9.2K	37.2K	12	12	0	2	2	0		
<input type="checkbox"/>			172.16.4.11:80	Common	0	0	0	0	0	0	0	0		
<input type="checkbox"/>			172.16.4.12:80	Common	25.4K	95.9K	35	34	0	2	6	0		
<input type="button" value="Reset"/>														

Enable pool member 172.16.4.11:80 in HTTP-POOL.

## Lab 7: Monitors

Create a Custom ICMP Monitor Create a new ICMP monitor called MY-ICMP.

Local Traffic » Monitors » Create

General Properties section:

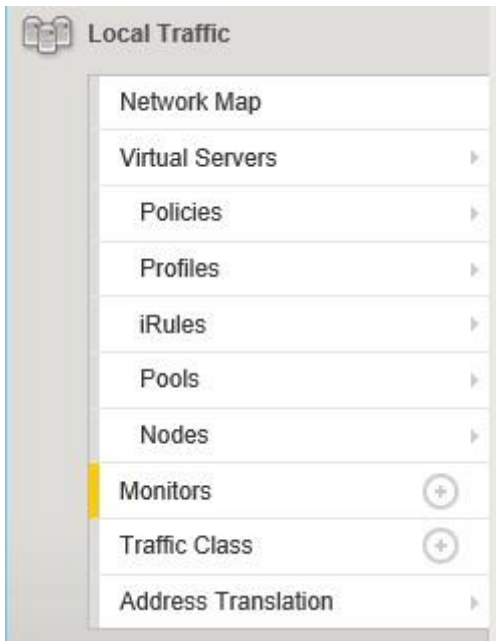
Name: MY-ICMP

Type: ICMP

Configuration section:

Interval: 10 seconds

Timeout: 31 seconds  
 Transparent: No  
 When complete, click Finished



Local Traffic » Monitors

Monitor List

Search Create...

<input checked="" type="checkbox"/>	▲ Name	↕ Application	▼ Type	↕ Partition / Path
<input type="checkbox"/>	gateway_icmp		Gateway ICMP	Common
<input type="checkbox"/>	http		HTTP	Common
<input type="checkbox"/>	http_head_f5		HTTP	Common
<input type="checkbox"/>	https		HTTPS	Common
<input type="checkbox"/>	https_443		HTTPS	Common
<input type="checkbox"/>	https_head_f5		HTTPS	Common
<input type="checkbox"/>	icmp		ICMP	Common
<input type="checkbox"/>	inband		Inband	Common
<input type="checkbox"/>	real_server		Real Server	Common
<input type="checkbox"/>	snmp_dca		SNMP DCA	Common

Delete... Page 1 of 2

**General Properties**

Name	MY-ICMP
Description	
Type	ICMP
Parent Monitor	icmp

Configuration: Basic

Interval	10 seconds
Timeout	31 seconds
Transparent	<input type="radio"/> Yes <input checked="" type="radio"/> No
Alias Address	* All Addresses
Adaptive	<input type="checkbox"/> Enabled

Cancel Repeat Finished

Local Traffic >> Monitors

Monitor List

Search Create...

<input checked="" type="checkbox"/>	Name	Application	Type	Partition / Path
<input type="checkbox"/>	MY-ICMP		ICMP	Common
<input type="checkbox"/>	gateway_icmp		Gateway ICMP	Common
<input type="checkbox"/>	http		HTTP	Common
<input type="checkbox"/>	http_head_f5		HTTP	Common
<input type="checkbox"/>	https		HTTPS	Common
<input type="checkbox"/>	https_443		HTTPS	Common
<input type="checkbox"/>	https_head_f5		HTTPS	Common
<input type="checkbox"/>	icmp		ICMP	Common
<input type="checkbox"/>	inband		Inband	Common
<input type="checkbox"/>	real_server		Real Server	Common

Delete... Page 1 of 2

Assign the custom monitor to selected node  
 Add MY-ICMP as the default monitor for node 172.16.4.10.

Local Traffic > Nodes: Node List > 172.16.4.10

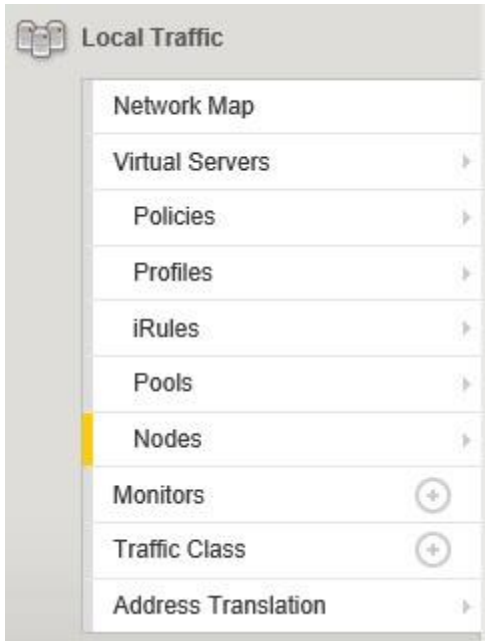
Configuration section:

Health Monitors: Node Specific

Select Monitors: Select MY-ICMP

Press << button

When complete, click Update



Local Traffic » Nodes : Node List

Node List | Default Monitor | Statistics

\* Search Create...

<input type="checkbox"/>	Status	Name	Description	Application	Address	FQDN	Ephemeral	Partition / Path
<input type="checkbox"/>		172.16.4.10			172.16.4.10		No	Common
<input type="checkbox"/>		172.16.4.11			172.16.4.11		No	Common
<input type="checkbox"/>		172.16.4.12			172.16.4.12		No	Common

Enable | Disable | Force Offline | Delete...

**General Properties**

Name	172.16.4.10
Address	172.16.4.10
Partition / Path	Common
Description	<input type="text"/>
Availability	<input checked="" type="checkbox"/> Unknown (Enabled) - Node address does not have service checking enabled 2017-05-11 22:56:19
Monitor Logging	<input type="checkbox"/> Enable
Current Connections	0
State	<input checked="" type="radio"/> Enabled (All traffic allowed) <input type="radio"/> Disabled (Only persistent or active connections allowed) <input type="radio"/> Forced Offline (Only active connections allowed)

**Configuration**

Health Monitors: Node Specific

Select Monitors:

Active	Available
<input type="checkbox"/> /Common <input checked="" type="checkbox"/> MY-ICMP	<input type="checkbox"/> https_443 <input type="checkbox"/> icmp <input type="checkbox"/> real_server <input type="checkbox"/> snmp_dca <input type="checkbox"/> tcp_echo

Availability Requirement: All Health Monitor(s)

Ratio:

Connection Limit:

Connection Rate Limit:

Check node status indicators.

**General Properties**

Name	172.16.4.10
Address	172.16.4.10
Partition / Path	Common
Description	<input type="text"/>
Availability	<span style="color: green;">●</span> Available (Enabled) - Node address is available 2017-05-11 23:30:53
Health Monitors	<span style="color: green;">●</span> MY-ICMP
Monitor Logging	<input type="checkbox"/> Enable
Current Connections	0
State	<input checked="" type="radio"/> Enabled (All traffic allowed) <input type="radio"/> Disabled (Only persistent or active connections allowed) <input type="radio"/> Forced Offline (Only active connections allowed)

Local Traffic » Nodes : Node List

Node List | Default Monitor | Statistics

\*  Search

<input checked="" type="checkbox"/>	Status	Name	Description	Application	Address	FQDN	Ephemeral	Partition / Path
<input type="checkbox"/>	<span style="color: green;">●</span>	172.16.4.10			172.16.4.10		No	Common
<input type="checkbox"/>	<span style="color: blue;">■</span>	172.16.4.11			172.16.4.11		No	Common
<input type="checkbox"/>	<span style="color: blue;">■</span>	172.16.4.12			172.16.4.12		No	Common

Disassociate all monitors from selected node

Remove the monitor from node 172.16.4.11. Leave monitor MY-ICMP on 172.16.4.10.

Local Traffic » Nodes: Node List » 172.16.4.11

Configuration section:

Health Monitors: None

When complete, click Update

General Properties	
Name	172.16.4.11
Address	172.16.4.11
Partition / Path	Common
Description	<input type="text"/>
Availability	<input checked="" type="checkbox"/> Unknown (Enabled) - Node address does not have service checking enabled 2017-05-11 22:56:19
Monitor Logging	<input type="checkbox"/> Enable
Current Connections	0
State	<input checked="" type="radio"/> Enabled (All traffic allowed) <input type="radio"/> Disabled (Only persistent or active connections allowed) <input type="radio"/> Forced Offline (Only active connections allowed)
Configuration	
Health Monitors	<div style="border: 1px solid black; padding: 2px;"> Node Default  Node Specific  <b>None</b> </div>
Ratio	<input type="text" value="1"/>
Connection Limit	<input type="text" value="0"/>
Connection Rate Limit	<input type="text" value="0"/>
<input type="button" value="Update"/> <input type="button" value="Delete"/>	

Configuration	
Health Monitors	<input type="text" value="None"/> ▼
Ratio	<input type="text" value="1"/>
Connection Limit	<input type="text" value="0"/>
Connection Rate Limit	<input type="text" value="0"/>
<input type="button" value="Update"/> <input type="button" value="Delete"/>	

Check the nodes' statuses.

Node 172.16.4.10 has a specific assignment, MY-ICMP.

Node 172.16.4.11 has no monitor assigned.

**Create a New HTTP Monitor**

Create a customized monitor based on the HTTP Monitor.

**Local Traffic > Monitors > New Monitor**

**General Properties:**

Name: MY-HTTP

Type: HTTP

Parent Monitor: http

**Configuration section:**

Send String: GET /index.html\r\n

Receive String: Server

When complete, click Finished

General Properties

Name	MY-HTTP
Description	
Type	HTTP
Parent Monitor	http

Configuration: Basic

Interval	5 seconds
Timeout	16 seconds
Send String	GET /\r\n
Receive String	Server
Receive String	Server
Receive Disable String	
User Name	
Password	
Reverse	<input type="radio"/> Yes <input checked="" type="radio"/> No
Transparent	<input type="radio"/> Yes <input checked="" type="radio"/> No
Alias Address	* All Addresses
Alias Service Port	* All Ports
Adaptive	<input type="checkbox"/> Enabled

Cancel Repeat Finished

Local Traffic » Monitors			
Monitor List			
* Search			Create...
<input checked="" type="checkbox"/>	Name	Application	Partition / Path
<input type="checkbox"/>	MY-HTTP		HTTP Common
<input type="checkbox"/>	MY-ICMP		ICMP Common
<input type="checkbox"/>	gateway_icmp		Gateway ICMP Common
<input type="checkbox"/>	http		HTTP Common
<input type="checkbox"/>	http_head_f5		HTTP Common
<input type="checkbox"/>	https		HTTPS Common
<input type="checkbox"/>	https_443		HTTPS Common
<input type="checkbox"/>	https_head_f5		HTTPS Common
<input type="checkbox"/>	icmp		ICMP Common
<input type="checkbox"/>	inband		Inband Common

Delete... Page 1 of 2

### Assign the Custom Monitor to a Pool Member

From the Navigation pane, click Local Traffic » Pools and then click HTTP-POOL.

Click the Members tab.

Click the member 172.16.4.11:80.

### Local Traffic » Pools : Pool List » HTTP-POOL Configuration section:

Select Advanced from the dropdown list.

Address	172.16.4.11
Service Port	80
Partition / Path	Common
Description	<input type="text"/>
Parent Node	<input checked="" type="checkbox"/> 172.16.4.11
Availability	<input checked="" type="radio"/> Available (Enabled) - Pool member is available 2017-05-11 22:59:07
Health Monitors	<input checked="" type="radio"/> http
Monitor Logging	<input type="checkbox"/> Enable
Current Connections	0
State	<input checked="" type="radio"/> Enabled (All traffic allowed) <input type="radio"/> Disabled (Only persistent or active connections allowed) <input type="radio"/> Forced Offline (Only active connections allowed)
Configuration:	<input checked="" type="button"/> Basic <input type="button"/> Advanced
Ratio	<input type="text" value="2"/>
Priority Group	<input type="text" value="4"/>
Connection Limit	<input type="text" value="0"/>
Connection Rate Limit	<input type="text" value="0"/>
<input type="button"/> Update <input type="button"/> Delete	

Health Monitors: Member Specific

Select Monitors: Select MY-HTTP

Press << button



When complete, click **Update**

Configuration: **Advanced** ▾

Ratio	<input type="text" value="2"/>
Priority Group	<input type="text" value="4"/>
Connection Limit	<input type="text" value="0"/>
Connection Rate Limit	<input type="text" value="0"/>
Health Monitors	<input type="radio"/> None <input checked="" type="radio"/> Inherit From Pool <input type="radio"/> Member Specific
IP Encapsulation	<input type="text" value="Inherit From Pool"/>

Configuration: **Advanced** ▾

Ratio	<input type="text" value="2"/>
Priority Group	<input type="text" value="4"/>
Connection Limit	<input type="text" value="0"/>
Connection Rate Limit	<input type="text" value="0"/>
Health Monitors	<input type="radio"/> Member Specific ▾
Select Monitors	<div style="display: flex; justify-content: space-between;"> <div style="border: 1px solid #ccc; padding: 5px;"> <p>Active</p> <ul style="list-style-type: none"> <li>/Common</li> <li><b>MY-HTTP</b></li> </ul> </div> <div style="text-align: center;"> <input type="button" value="←←"/>  <input type="button" value="→→"/> </div> <div style="border: 1px solid #ccc; padding: 5px;"> <p>Available</p> <ul style="list-style-type: none"> <li>/Common</li> <li>gateway_icmp</li> <li>http</li> <li>http_head_f5</li> <li>https</li> </ul> </div> </div>
Availability Requirement	<input type="radio"/> All ▾ Health Monitor(s)
IP Encapsulation	<input type="radio"/> Inherit From Pool ▾

Check the members' statuses.

Member Properties	
Node Name	172.16.4.11
Address	172.16.4.11
Service Port	80
Partition / Path	Common
Description	<input type="text"/>
Parent Node	<input checked="" type="checkbox"/> 172.16.4.11
Availability	<input checked="" type="radio"/> Available (Enabled) - Pool member is available 2017-05-11 22:59:07
Health Monitors	<input checked="" type="radio"/> MY-HTTP
Monitor Logging	<input type="checkbox"/> Enable
Current Connections	0
State	<input checked="" type="radio"/> Enabled (All traffic allowed) <input type="radio"/> Disabled (Only persistent or active connections allowed) <input type="radio"/> Forced Offline (Only active connections allowed)

### Disassociate all Monitors for Selected Member

From the Navigation pane, click Local Traffic > Pools and click HTTP-POOL.




Click the **Members** tab.  
 Click the member **172.16.4.12:80**

Local Traffic  $\tau$  Pools : Pool List  $\tau$  HTTP-POOL  
 Configuration section



Select **Advanced** from the dropdown list.

**Health Monitors:** None

When complete, click **Update**

Description	<input type="text"/>
Parent Node	 172.16.4.12
Availability	 Available (Enabled) - Pool member is available 2017-05-11 22:56:21
Health Monitors	 http
Monitor Logging	<input type="checkbox"/> Enable
Current Connections	0
State	<input checked="" type="radio"/> Enabled (All traffic allowed) <input type="radio"/> Disabled (Only persistent or active connections allowed) <input type="radio"/> Forced Offline (Only active connections allowed)
Configuration: <b>Advanced</b> <input type="button" value="v"/>	
Ratio	<input type="text" value="3"/>
Priority Group	<input type="text" value="4"/>
Connection Limit	<input type="text" value="0"/>
Connection Rate Limit	<input type="text" value="0"/>
Health Monitors	<b>None</b> <input type="button" value="v"/>
IP Encapsulation	<b>Inherit From Pool</b> <input type="button" value="v"/>
<input type="button" value="Update"/> <input type="button" value="Delete"/>	

Check the member's status

Member Properties	
Node Name	172.16.4.12
Address	172.16.4.12
Service Port	80
Partition / Path	Common
Description	<input type="text"/>
Parent Node	 172.16.4.12
Availability	 Unknown (Enabled) - Pool member does not have service checking enabled 2017-05-11 23:44:55
Health Monitors	
Monitor Logging	<input type="checkbox"/> Enable
Current Connections	0
State	<input checked="" type="radio"/> Enabled (All traffic allowed) <input type="radio"/> Disabled (Only persistent or active connections allowed) <input type="radio"/> Forced Offline (Only active connections allowed)

Member **172.16.4.10:80** has its health monitor set to inherit from pool, so it inherits an http health monitor.

Description	<input type="text"/>
Parent Node	<span style="color: green;">●</span> 172.16.4.10
Availability	<span style="color: green;">●</span> Available (Enabled) - Pool member is available 2017-05-11 22:59:43
Health Monitors	<span style="color: green;">●</span> http
Monitor Logging	<input type="checkbox"/> Enable
Current Connections	0
State	<input checked="" type="radio"/> Enabled (All traffic allowed) <input type="radio"/> Disabled (Only persistent or active connections allowed) <input type="radio"/> Forced Offline (Only active connections allowed)

Configuration: Advanced ▼

Ratio	<input type="text" value="1"/>
Priority Group	<input type="text" value="0"/>
Connection Limit	<input type="text" value="0"/>
Connection Rate Limit	<input type="text" value="0"/>
Health Monitors	<span>Inherit From Pool</span> ▼
IP Encapsulation	<span>Inherit From Pool</span> ▼

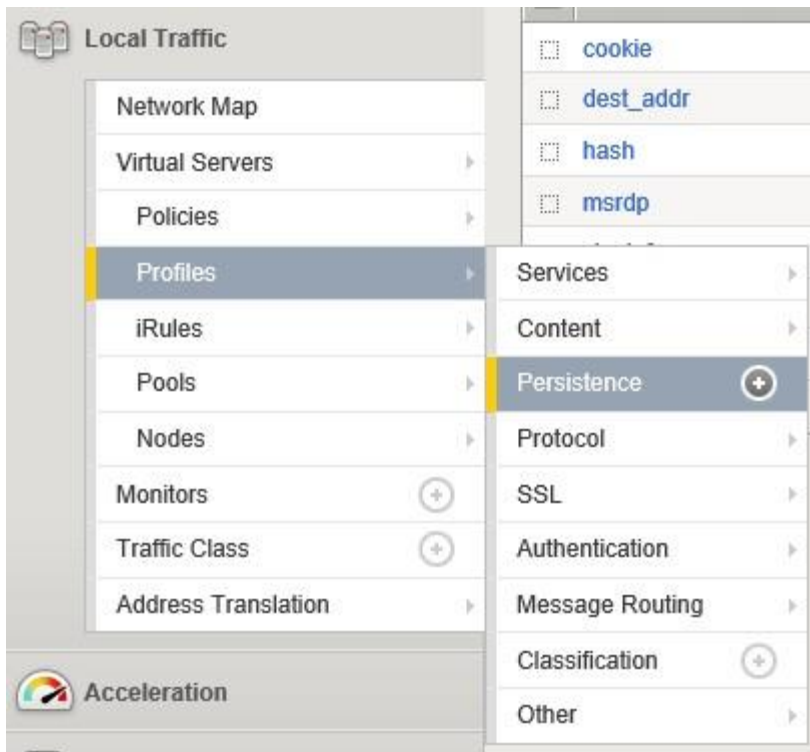
Member 172.16.4.11:80 has a specific monitor assigned: MY-HTTP. Member 172.16.4.12:80 does not have an assigned monitor.

## Lab 8: Profiles

### Source Address Persistence

Configure a Source Address Affinity persistence profile and assign it to a virtual server  
 Create a Persistence Profile based on the following:

Local Traffic τ Profiles τ Persistence τ Create



**General Properties section:**

Name: PR-Source-Add

Persistence Type: Source Address Affinity

**Configuration section:**

Timeout: Select (check) the Custom checkbox for Timeout and then set Timeout to 30 seconds.

Mask: Click on the Custom checkbox for Mask and specify a network mask of /24. When complete, click Finished

Local Traffic » Profiles : Persistence » New Persistence Profile...

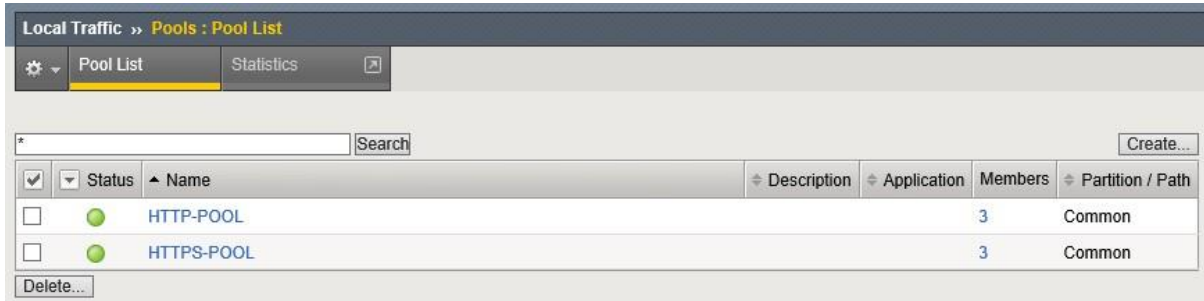
General Properties	
Name	PR-Source-Add
Persistence Type	Source Address Affinity
Parent Profile	source_addr

Configuration		Custom <input type="checkbox"/>
Match Across Services	<input type="checkbox"/>	<input type="checkbox"/>
Match Across Virtual Servers	<input type="checkbox"/>	<input type="checkbox"/>
Match Across Pools	<input type="checkbox"/>	<input type="checkbox"/>
Hash Algorithm	Default	<input type="checkbox"/>
Timeout	Specify... 30 seconds	<input checked="" type="checkbox"/>
Prefix Length	Specify... IPv4 24	<input checked="" type="checkbox"/>
Map Proxies	<input checked="" type="checkbox"/> Enabled	<input type="checkbox"/>
Override Connection Limit	<input type="checkbox"/>	<input type="checkbox"/>

Cancel Repeat Finished

## Assign PR-Source-Add to VS-HTTPS

Local Traffic » Virtual Servers » VS-HTTPS » Resources

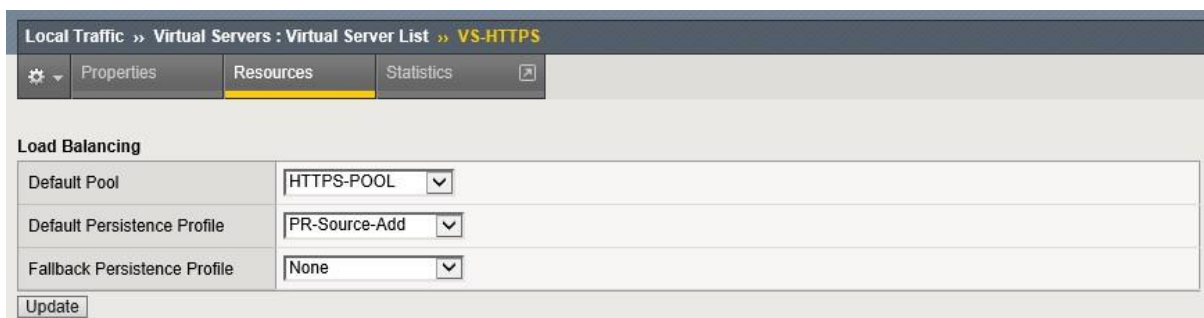
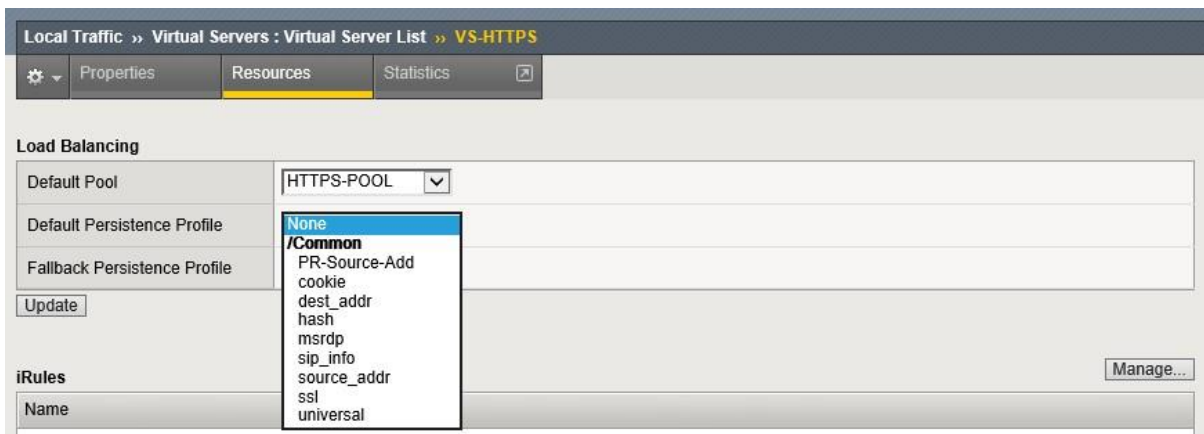


Load Balancing section:

Default Pool: HTTPS-POOL

Default Persistence Profile: PR-Source-Add

When complete, click Update



Confirm traffic behavior after persistence

Open a new browser session and connect to <https://10.10.4.101>.

Refresh the web page five to ten times.

View the pool HTTPS-POOL statistics.

Statistics » Module Statistics : Local Traffic » Pools

Traffic Summary DNS Local Traffic Network Memory

Display Options

Statistics Type: Pools

Data Format: Normalized

Auto Refresh: Disabled Refresh

/Common/HTTPS-POOL		Search	Reset Search	Bits		Packets		Connections			Requests	
<input type="checkbox"/>	Status	Pool	Pool Member	Partition / Path	In	Out	In	Out	Current	Maximum	Total	Total
<input type="checkbox"/>	<span style="color: green;">●</span>	HTTPS-POOL		Common	58.7K	211.9K	58	55	0	2	7	0
<input type="checkbox"/>	<span style="color: green;">●</span>		172.16.4.10:443	Common	58.7K	211.9K	58	55	0	2	7	0
<input type="checkbox"/>	<span style="color: green;">●</span>		172.16.4.11:443	Common	0	0	0	0	0	0	0	0
<input type="checkbox"/>	<span style="color: green;">●</span>		172.16.4.12:443	Common	0	0	0	0	0	0	0	0

Reset

Wait for at least 30 seconds, and then refresh again the <https://10.10.4.101> website again. Now the web traffic should be load-balanced to another pool member. Confirm this by refreshing and viewing the pool member statistics.

Statistics » Module Statistics : Local Traffic » Pools

Traffic Summary DNS Local Traffic Network Memory

Display Options

Statistics Type: Pools

Data Format: Normalized

Auto Refresh: Disabled Refresh

/Common/HTTPS-POOL		Search	Reset Search	Bits		Packets		Connections			Requests	
<input type="checkbox"/>	Status	Pool	Pool Member	Partition / Path	In	Out	In	Out	Current	Maximum	Total	Total
<input type="checkbox"/>	<span style="color: green;">●</span>	HTTPS-POOL		Common	58.5K	220.2K	67	66	0	2	10	0
<input type="checkbox"/>	<span style="color: green;">●</span>		172.16.4.10:443	Common	0	0	0	0	0	0	0	0
<input type="checkbox"/>	<span style="color: green;">●</span>		172.16.4.11:443	Common	58.5K	220.2K	67	66	0	2	10	0
<input type="checkbox"/>	<span style="color: green;">●</span>		172.16.4.12:443	Common	0	0	0	0	0	0	0	0

Reset

## Cookie Persistence

Create a cookie persistence profile and assign it to a virtual server

Create a custom cookie persistence profile named PR-Cookie. When you select Cookie as the Persistence Type, the Configuration Section appears. Leave all of the settings in the Configuration section in their default state for now.

Local Traffic » Profiles » Persistence » Create

General Properties section:

Name: PR-Cookie  
 Persistence Type: Cookie  
 When complete, click Finished

Local Traffic » Profiles : Persistence » New Persistence Profile...

**General Properties**

Name	PR-Cookie x
Persistence Type	Cookie
Parent Profile	cookie

**Configuration** Custom

Cookie Method	HTTP Cookie Insert	<input type="checkbox"/>
Cookie Name		<input type="checkbox"/>
HTTPOnly Attribute	Enabled	<input type="checkbox"/>
Secure Attribute	Enabled	<input type="checkbox"/>
Always Send Cookie	<input type="checkbox"/>	<input type="checkbox"/>
Expiration	<input checked="" type="checkbox"/> Session Cookie	<input type="checkbox"/>
Cookie Encryption Use Policy	disabled	<input type="checkbox"/>
Encryption Passphrase		<input type="checkbox"/>
Override Connection Limit	<input type="checkbox"/>	<input type="checkbox"/>

Cancel Repeat Finished

Local Traffic » Profiles : Persistence

Services Content Persistence Protocol SSL Authentication

Message Routing Other

Search Create...

<input checked="" type="checkbox"/>	Name	Application	Type	Parent Profile	Partition / Path
<input type="checkbox"/>	PR-Cookie		Cookie	cookie	Common
<input type="checkbox"/>	PR-Source-Add		Source Address Affinity	source_addr	Common
<input type="checkbox"/>	cookie		Cookie	(none)	Common
<input type="checkbox"/>	dest_addr		Destination Address Affinity	(none)	Common
<input type="checkbox"/>	hash		Hash	(none)	Common
<input type="checkbox"/>	msrdp		Microsoft® Remote Desktop	(none)	Common
<input type="checkbox"/>	sip_info		SIP	(none)	Common
<input type="checkbox"/>	source_addr		Source Address Affinity	(none)	Common
<input type="checkbox"/>	ssl		SSL	(none)	Common
<input type="checkbox"/>	universal		Universal	(none)	Common

Delete...

Assign PR-Cookie to VS-HTTP.

Local Traffic » Virtual Servers » VS-HTTP » Resources

Load Balancing section:  
 Default Pool: HTTP-POOL

**Default Persistence Profile: PR-Cookie**  
 When complete, click Update

Don't forget to modify VS-HTTP to include an HTTP Profile and repeat the step above.

Confirm traffic behavior after persistence  
 Access and reset the statistics for HTTP-POOL.  
 On the browser connect to <http://10.10.4.100>, refresh the screen 5 to 10 times. View the pool statistics.

All traffic is directed to one member.

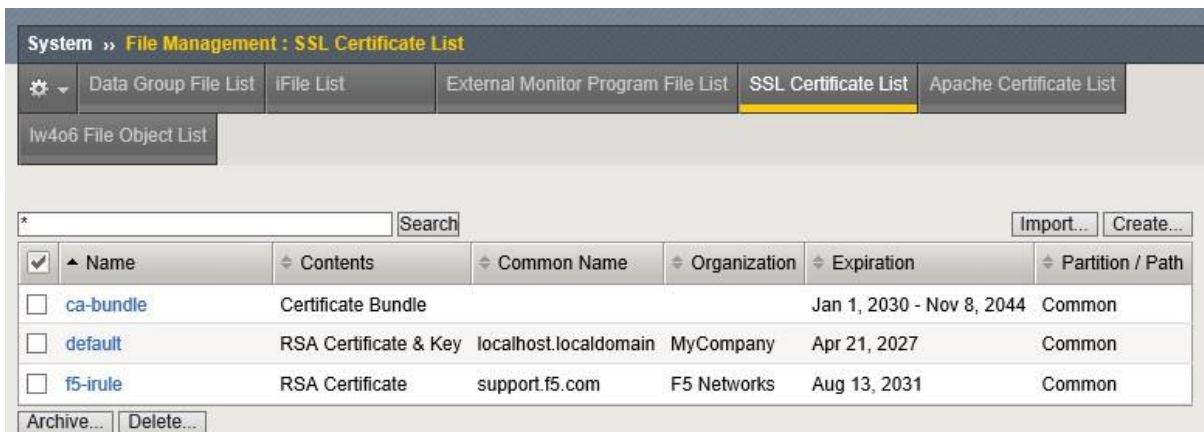
		Bits		Packets		Connections		Requests				
	Status	Pool	Pool Member	Partition / Path	In	Out	In	Out	Current	Maximum	Total	Total
<input type="checkbox"/>	<span style="color: green;">●</span>	HTTP-POOL		Common	95.1K	425.2K	130	128	0	2	19	19
<input type="checkbox"/>	<span style="color: green;">●</span>		172.16.4.10:80	Common	95.1K	425.2K	130	128	0	2	19	19
<input type="checkbox"/>	<span style="color: green;">●</span>		172.16.4.11:80	Common	0	0	0	0	0	0	0	0
<input type="checkbox"/>	<span style="color: green;">●</span>		172.16.4.12:80	Common	0	0	0	0	0	0	0	0



## Lab 9: Client SSL

Create an SSL Certificate  
a custom SSL Certificate.

System > File Management : SSL Certificate List > click Create.



General Properties section:

Name: Self-Signed-Cert

Certificate Properties section:

Issuer: Self

Common Name: www.test.com

Division: IT Division

Organization: Test Organization

Locality: Algiers

State or Province: Algiers

Country: Algeria

E-mail Address: Leave blank

Lifetime: 365

Key Properties section: Size 2048

When complete, click Finished

System » File Management : SSL Certificate List » New SSL Certificate...

**General Properties**

Name: Self-Signed-Cert

**Certificate Properties**

Issuer: Self

Common Name: www.test.com

Division: IT Division

Organization: Test Organization

Locality: Algiers

State Or Province: Algiers

Country: Algeria DZ

E-mail Address:

Lifetime: 365 days

Subject Alternative Name:

**Key Properties**

Security Type: Normal

Key Type: RSA

Size: 2048 bits

Cancel Finished

System » File Management : SSL Certificate List

Data Group File List | iFile List | External Monitor Program File List | **SSL Certificate List** | Apache Certificate List

lw4o6 File Object List

\* Search Import... Create...

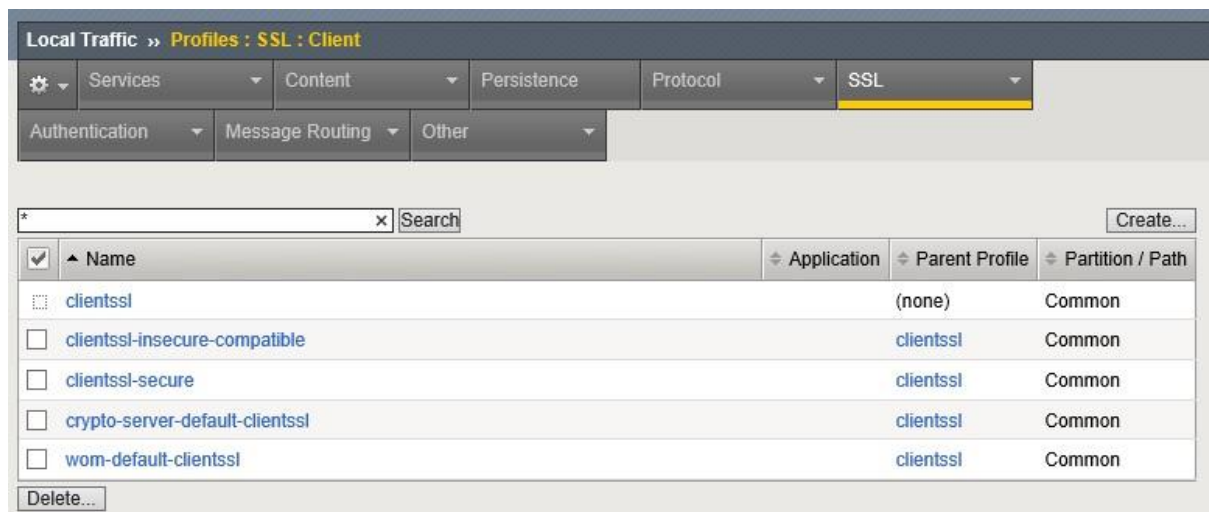
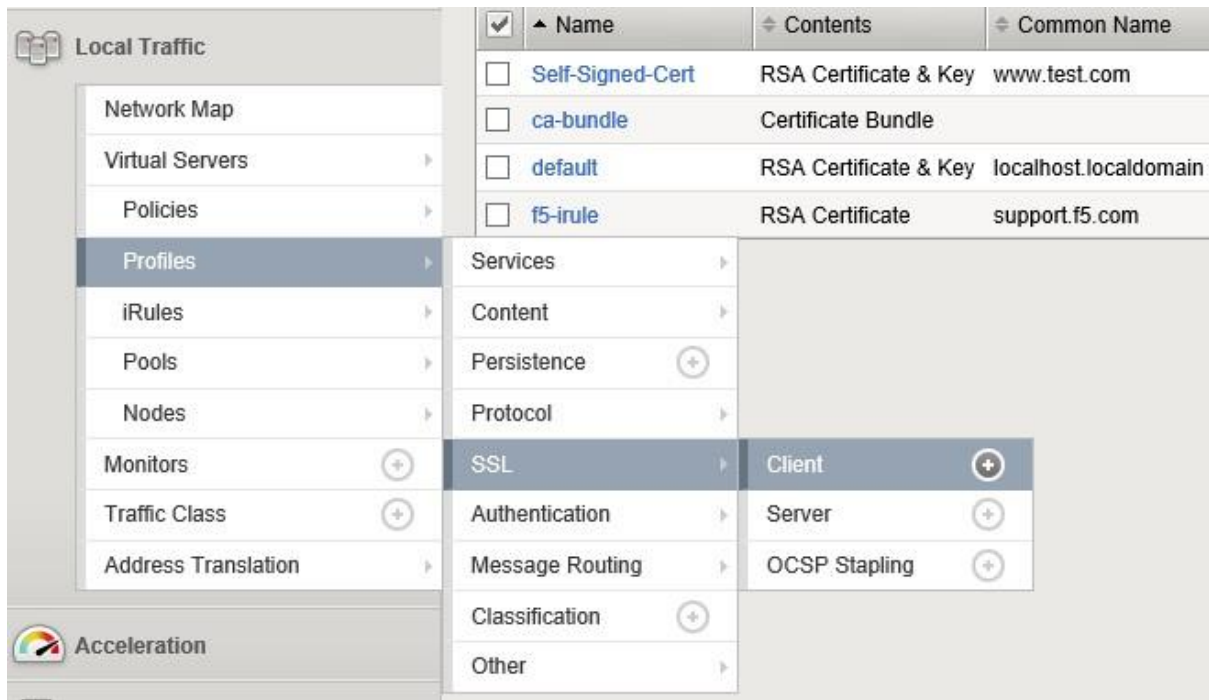
<input checked="" type="checkbox"/>	Name	Contents	Common Name	Organization	Expiration	Partition / Path
<input checked="" type="checkbox"/>	Self-Signed-Cert	RSA Certificate & Key	www.test.com	Test Organization	May 13, 2018	Common
<input type="checkbox"/>	ca-bundle	Certificate Bundle			Jan 1, 2030 - Nov 8, 2044	Common
<input type="checkbox"/>	default	RSA Certificate & Key	localhost.localdomain	MyCompany	Apr 21, 2027	Common
<input type="checkbox"/>	f5-irule	RSA Certificate	support.f5.com	F5 Networks	Aug 13, 2031	Common

Archive... Delete...

### Create an SSL Profile

Create a Client SSL profile called SSL-Client-Profile with clientssl as its parent.

Local Traffic » Profiles » SSL » Client and click Create.



**General Properties section:**

Name: SSL-Client-Profile

Parent Profile: clientssl

**Configuration section:**

Certificate Key Chain: Add the Self-Signed-Cert created previously

Local Traffic » Profiles : SSL : Client » New Client SSL Profile...

**General Properties**

Name	SSL-Client-Profile
Parent Profile	clientssl

Configuration: Basic  Custom

Certificate Key Chain	<input checked="" type="checkbox"/>
Proxy SSL	<input type="checkbox"/>
Proxy SSL Passthrough	<input type="checkbox"/>

**Add SSL Certificate to Key Chain**

Certificate	Self-Signed-Cert
Key	Self-Signed-Cert
Chain	Self-Signed-Cert
Passphrase	
OCSP Stapling	None

Add Cancel

Local Traffic » Profiles : SSL : Client » New Client SSL Profile...

**General Properties**

Name	SSL-Client-Profile
Parent Profile	clientssl

Configuration: Basic  Custom

Certificate Key Chain	/Common/Self-Signed-Cert.crt /Common/Self-Signed-Cert.key /Common/Self-Signed-Cert.crt <input checked="" type="checkbox"/>
Proxy SSL	<input type="checkbox"/>
Proxy SSL Passthrough	<input type="checkbox"/>

When complete, click Finished

SSL Forward Proxy: Basic Custom

SSL Forward Proxy	Disabled <input type="checkbox"/>
CA Certificate	Select... <input type="checkbox"/>
CA Key	Select... <input type="checkbox"/>
Certificate Lifespan	30 day(s) <input type="checkbox"/>
Certificate Extensions	Extensions List... <input type="checkbox"/>
Certificate Extensions List	<p>Enabled Extensions</p> <ul style="list-style-type: none"> <li>Basic Constraints</li> <li>Subject Alternative Name</li> </ul> <p>Disable</p> <p>Available extensions</p> <ul style="list-style-type: none"> <li>Authority Key Identifier</li> <li>Certificate Policies</li> <li>CRL Distribution Points</li> <li>Extended Key Usage</li> <li>Fresh CRL (a.k.a. Delta CRL Distribution Point)</li> </ul> <p>Enable</p>
Cache Certificate by Addr-Port	<input type="checkbox"/> <input type="checkbox"/>
SSL Forward Proxy Bypass	Disabled <input type="checkbox"/>

Cancel Repeat Finished

Local Traffic » Profiles : SSL : Client

Services Content Persistence Protocol SSL

Authentication Message Routing Other

Search Create...

Name	Application	Parent Profile	Partition / Path
<input checked="" type="checkbox"/> SSL-Client-Profile		clientssl	Common
<input type="checkbox"/> clientssl		(none)	Common
<input type="checkbox"/> clientssl-insecure-compatible		clientssl	Common
<input type="checkbox"/> clientssl-secure		clientssl	Common
<input type="checkbox"/> crypto-server-default-clientssl		clientssl	Common
<input type="checkbox"/> wom-default-clientssl		clientssl	Common

Delete...

### Create a New Virtual Server

Create a new virtual server called VS-SSL with an IP address of 10.10.4.104:443 and assign pool HTTP-POOL as its default pool.

Local Traffic » Virtual Servers » Virtual Server List, then click Create

Local Traffic » Virtual Servers : Virtual Server List

Virtual Server List Virtual Address List Statistics

\* Search Create...

<input checked="" type="checkbox"/>	Status	Name	Description	Application	Destination	Service Port	Type	Resources	Partition / Path
<input type="checkbox"/>	<span style="color: green;">●</span>	VS-HTTP			10.10.4.100	80 (HTTP)	Standard	<a href="#">Edit...</a>	Common
<input type="checkbox"/>	<span style="color: red;">◆</span>	VS-HTTPS			10.10.4.101	443 (HTTPS)	Standard	<a href="#">Edit...</a>	Common

Enable Disable Delete...

General Properties section: Name:

VS-SSL

Destination Type: Standard

Address: 10.10.4.104

Service Port: 443 (or type or select HTTPS)

State: Enabled

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

General Properties

Name	VS-SSL
Description	
Type	Standard
Source Address	
Destination Address/Mask	10.10.4.104
Service Port	443 HTTPS
Notify Status to Virtual Address	<input checked="" type="checkbox"/>
State	Enabled

Configuration section:

SSL Profile (Client): SSL-Client-Profile

Configuration: Basic

Protocol	TCP												
Protocol Profile (Client)	tcp												
Protocol Profile (Server)	(Use Client Profile)												
HTTP Profile	None												
FTP Profile	None												
RTSP Profile	None												
SSH Proxy Profile	None												
SSL Profile (Client)	<table border="1"> <thead> <tr> <th>Selected</th> <th>Available</th> </tr> </thead> <tbody> <tr> <td>/Common</td> <td>clientssl</td> </tr> <tr> <td>SSL-Client-Profile</td> <td>clientssl-insecure-compatible</td> </tr> <tr> <td></td> <td>clientssl-secure</td> </tr> <tr> <td></td> <td>crypto-server-default-clientssl</td> </tr> <tr> <td></td> <td>wom-default-clientssl</td> </tr> </tbody> </table>	Selected	Available	/Common	clientssl	SSL-Client-Profile	clientssl-insecure-compatible		clientssl-secure		crypto-server-default-clientssl		wom-default-clientssl
Selected	Available												
/Common	clientssl												
SSL-Client-Profile	clientssl-insecure-compatible												
	clientssl-secure												
	crypto-server-default-clientssl												
	wom-default-clientssl												

Resources section:  
 Default Pool: HTTP-POOL  
 When complete, click Finished

Resources

iRules	<table border="1"> <thead> <tr> <th>Enabled</th> <th>Available</th> </tr> </thead> <tbody> <tr> <td></td> <td>/Common</td> </tr> <tr> <td></td> <td>_sys_APM_ExchangeSupport_OA_BasicAuth</td> </tr> <tr> <td></td> <td>_sys_APM_ExchangeSupport_OA_NtlmAuth</td> </tr> <tr> <td></td> <td>_sys_APM_ExchangeSupport_helper</td> </tr> <tr> <td></td> <td>_sys_APM_ExchangeSupport_main</td> </tr> </tbody> </table>	Enabled	Available		/Common		_sys_APM_ExchangeSupport_OA_BasicAuth		_sys_APM_ExchangeSupport_OA_NtlmAuth		_sys_APM_ExchangeSupport_helper		_sys_APM_ExchangeSupport_main
Enabled	Available												
	/Common												
	_sys_APM_ExchangeSupport_OA_BasicAuth												
	_sys_APM_ExchangeSupport_OA_NtlmAuth												
	_sys_APM_ExchangeSupport_helper												
	_sys_APM_ExchangeSupport_main												
Policies	<table border="1"> <thead> <tr> <th>Enabled</th> <th>Available</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> </tr> </tbody> </table>	Enabled	Available										
Enabled	Available												
Default Pool	HTTP-POOL												
Default Persistence Profile	None												
Fallback Persistence Profile	None												

Cancel Repeat Finished

Local Traffic >> Virtual Servers : Virtual Server List

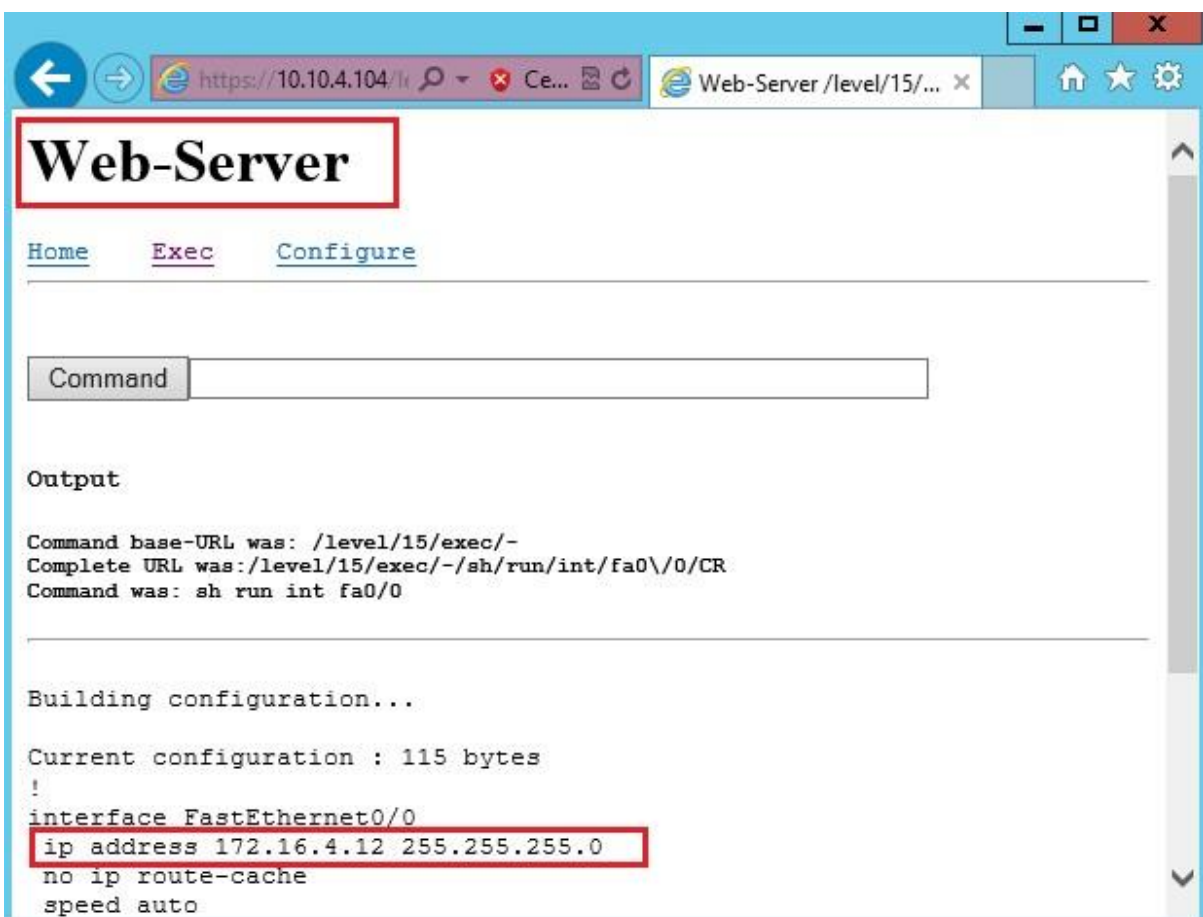
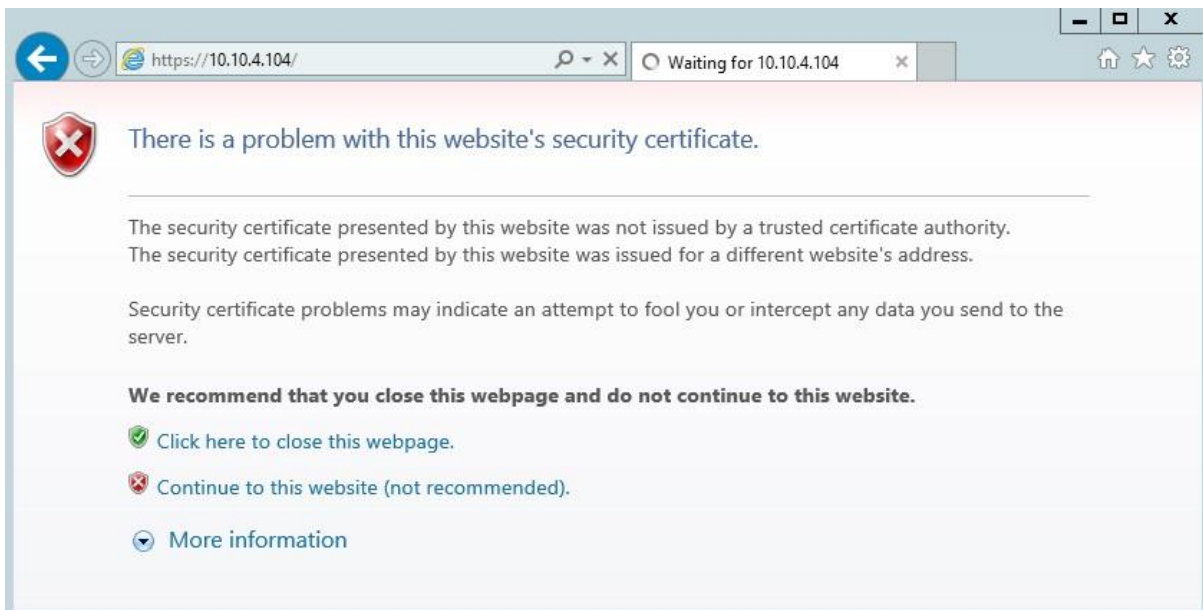
Virtual Server List Virtual Address List Statistics

\* Search Create...

✓	Status	Name	Description	Application	Destination	Service Port	Type	Resources	Partition / Path
<input type="checkbox"/>	●	VS-HTTP			10.10.4.100	80 (HTTP)	Standard	Edit...	Common
<input type="checkbox"/>	◆	VS-HTTPS			10.10.4.101	443 (HTTPS)	Standard	Edit...	Common
<input type="checkbox"/>	●	VS-SSL			10.10.4.104	443 (HTTPS)	Standard	Edit...	Common

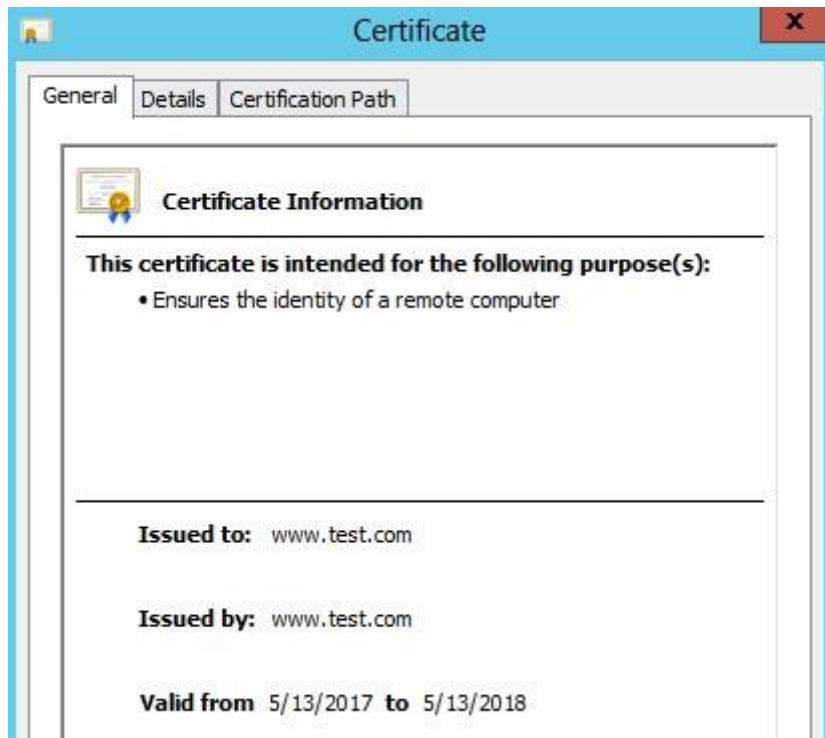
Enable Disable Delete...

In Web browser of the external client, go to <https://10.10.4.104>. If prompted, accept the SSL certificate.



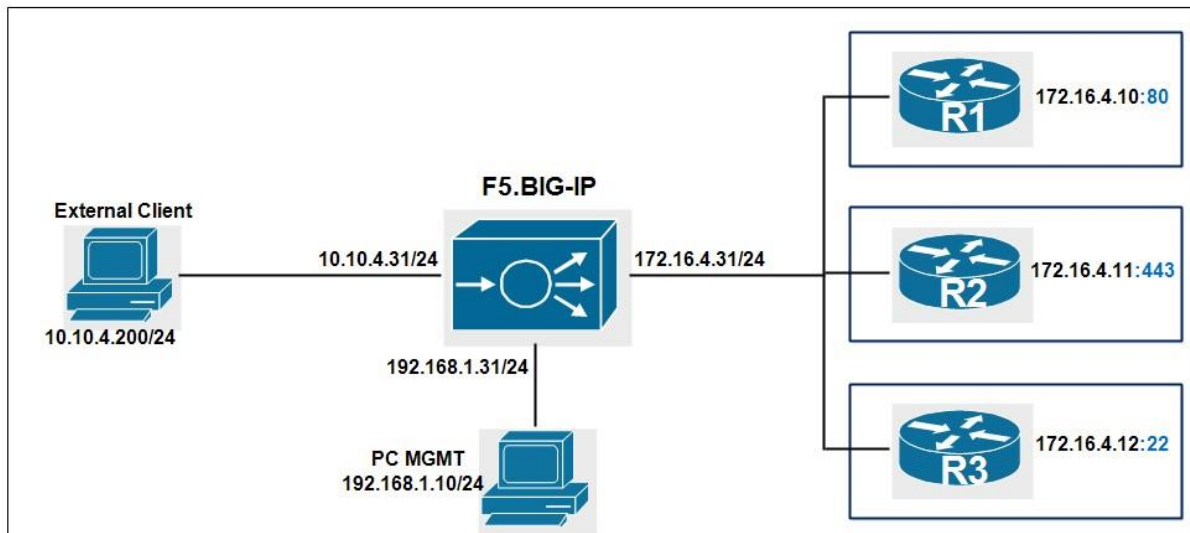
In the web browser, view the certificate.





Traffic is encrypted from client to the BIG-IP system, but unencrypted between the BIG-IP and the pool members.

## Lab 10: iRules



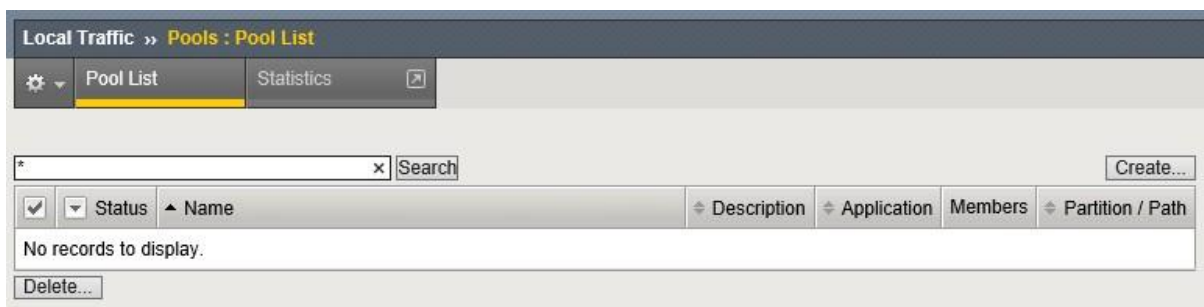
R1 is running HTTP.  
 R2 is running HTTPS.  
 R3 is running SSH.

The HTTP traffic initiated by the External Client should be redirected to R1.  
 The HTTPS traffic initiated by the External Client should be redirected to R2. The SSH traffic initiated by the External Client should be redirected to R3.

Create pools for application services deployment

In Local Traffic > Pools, create three new pools.

1. Create POOL-1 that contains one member, 172.16.4.10:\* (Port is **All services**)
2. Create POOL-2 that contains one member, 172.16.4.11:\* (Port is **All services**)
3. Create POOL-3 that contains one member, 172.16.4.12:\* (Port is **All services**)



Creation of POOL-1.

Name	POOL-1				
Description					
Health Monitors	<table border="1"> <thead> <tr> <th>Active</th> <th>Available</th> </tr> </thead> <tbody> <tr> <td>/Common gateway_icmp</td> <td>https_head_f5 inband tcp tcp_half_open udp</td> </tr> </tbody> </table>	Active	Available	/Common gateway_icmp	https_head_f5 inband tcp tcp_half_open udp
Active	Available				
/Common gateway_icmp	https_head_f5 inband tcp tcp_half_open udp				
<b>Resources</b>					
Load Balancing Method	Round Robin				
Priority Group Activation	Disabled				
New Members	<p> <input checked="" type="radio"/> New Node <input type="radio"/> New FQDN Node <input type="radio"/> Node List </p> <p> Node Name: _____ (Optional)  Address: 172.16.4.10  Service Port: * All Services </p> <p>Add</p> <p>R:1 P:0 C:0 172.16.4.10 172.16.4.10 :*</p> <p>Edit Delete</p>				
Cancel Repeat Finished					

Creation of POOL-2.

Name	POOL-2				
Description					
Health Monitors	<table border="1"> <thead> <tr> <th>Active</th> <th>Available</th> </tr> </thead> <tbody> <tr> <td>/Common gateway_icmp</td> <td>/Common MY-HTTP http http_head_f5 https</td> </tr> </tbody> </table>	Active	Available	/Common gateway_icmp	/Common MY-HTTP http http_head_f5 https
Active	Available				
/Common gateway_icmp	/Common MY-HTTP http http_head_f5 https				
<b>Resources</b>					
Load Balancing Method	Round Robin				
Priority Group Activation	Disabled				
New Members	<p> <input checked="" type="radio"/> New Node <input type="radio"/> New FQDN Node <input type="radio"/> Node List </p> <p> Node Name: _____ (Optional)  Address: 172.16.4.11  Service Port: * All Services </p> <p>Add</p> <p>R:1 P:0 C:0 172.16.4.11 172.16.4.11 :*</p> <p>Edit Delete</p>				
Cancel Repeat Finished					

Creation of POOL-3.

Name	POOL-3
Description	
Health Monitors	<div style="display: flex; justify-content: space-between;"> <div style="width: 45%;"> <p>Active</p> <ul style="list-style-type: none"> <li>/Common</li> <li>gateway_icmp</li> </ul> </div> <div style="width: 10%; text-align: center;"> <p>&lt;&lt;</p> <p>&gt;&gt;</p> </div> <div style="width: 45%;"> <p>Available</p> <ul style="list-style-type: none"> <li>/Common</li> <li>MY-HTTP</li> <li>http</li> <li>http_head_f5</li> <li>https</li> </ul> </div> </div>
<b>Resources</b>	
Load Balancing Method	Round Robin
Priority Group Activation	Disabled
New Members	<p><input checked="" type="radio"/> New Node <input type="radio"/> New FQDN Node <input type="radio"/> Node List</p> <p>Node Name: _____ (Optional)</p> <p>Address: 172.16.4.12 x</p> <p>Service Port: * All Services</p> <p>Add</p> <p>R:1 P:0 C:0 172.16.4.12 172.16.4.12 :*</p> <p>Edit Delete</p>
<p>Cancel Repeat Finished</p>	

Local Traffic » Pools : Pool List

Pool List Statistics

\* Search Create...

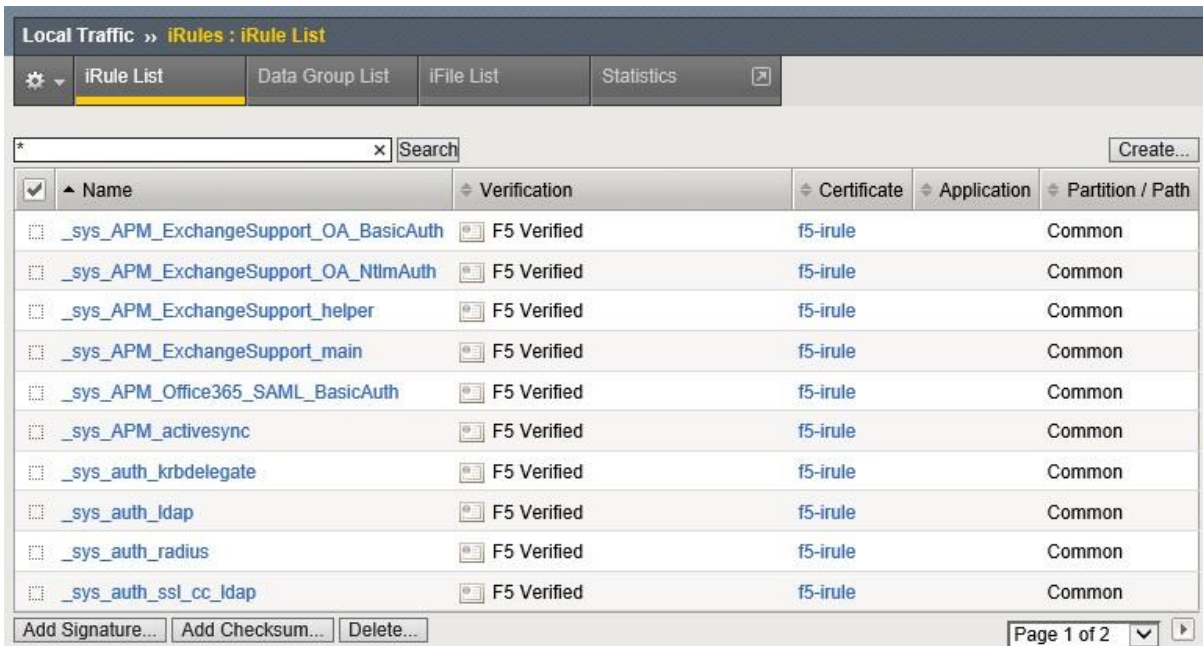
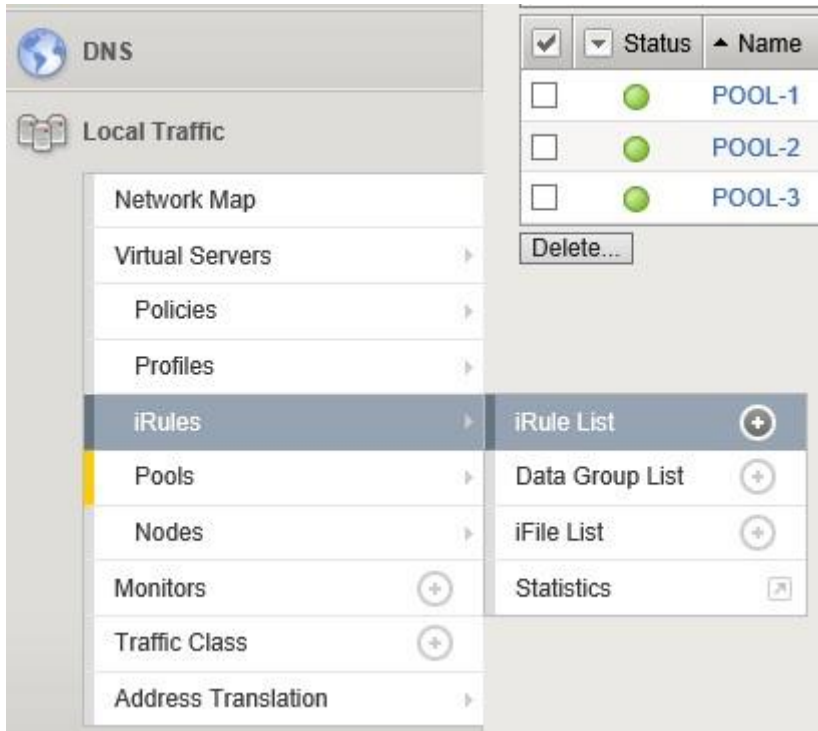
<input checked="" type="checkbox"/>	Status	Name	Description	Application	Members	Partition / Path
<input type="checkbox"/>	<span style="color: green;">●</span>	POOL-1			1	Common
<input type="checkbox"/>	<span style="color: green;">●</span>	POOL-2			1	Common
<input type="checkbox"/>	<span style="color: green;">●</span>	POOL-3			1	Common

Delete...

Create an iRule to check TCP port

Navigate to Local Traffic and create an iRule as follows:

Local Traffic » iRules : iRule List then click Create

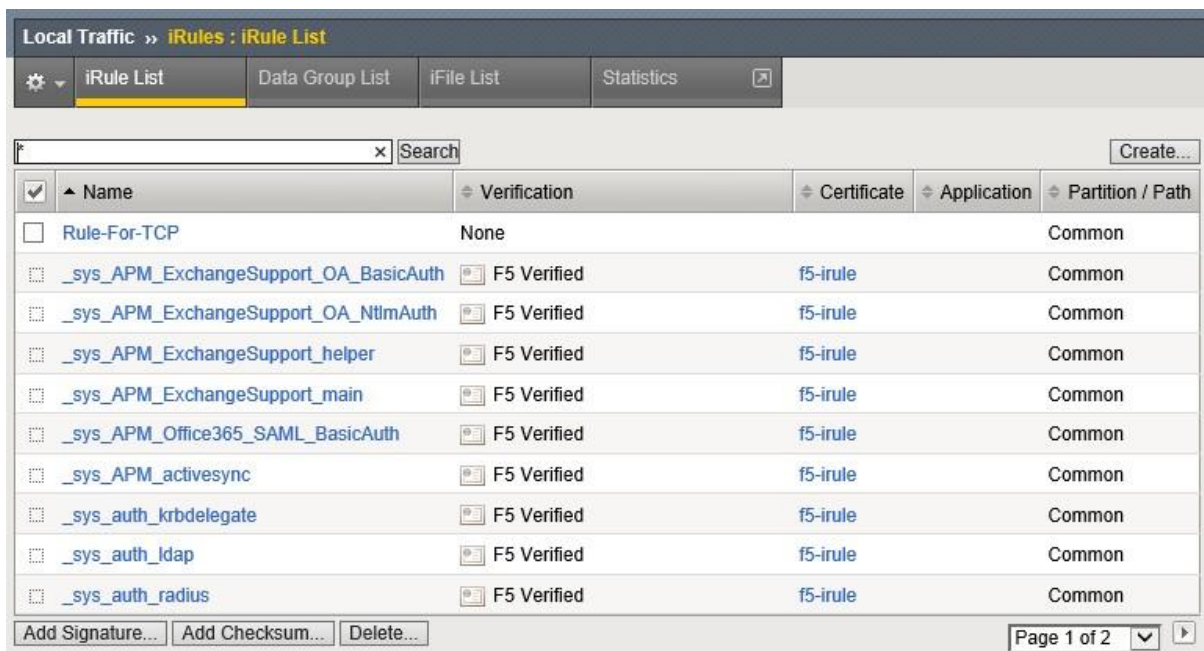


General Properties section:  
Name: Rule-For-TCP Definition:

```
when CLIENT_ACCEPTED {
  if {[TCP::local_port] == 80} {
    pool pool1
  }
  elseif {[TCP::local_port] == 443} {
```

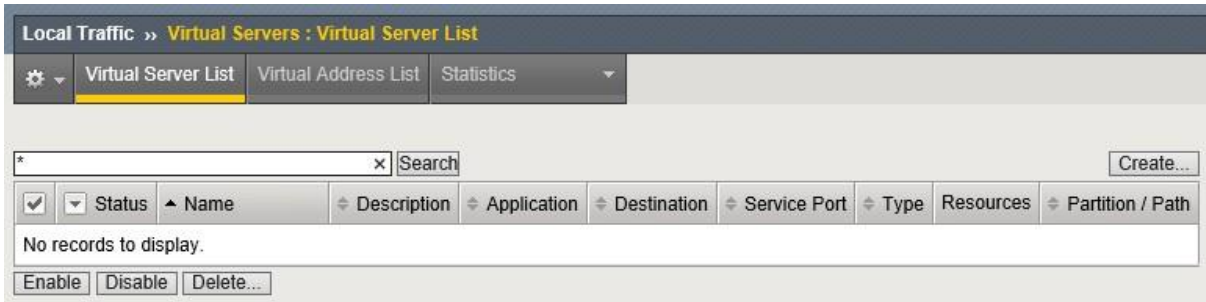
```
pool pool2
}}
```

When complete, click Finished



Create a virtual server that uses this iRule:

Local Traffic  $\tau$  Virtual Servers : Virtual Server List then click Create

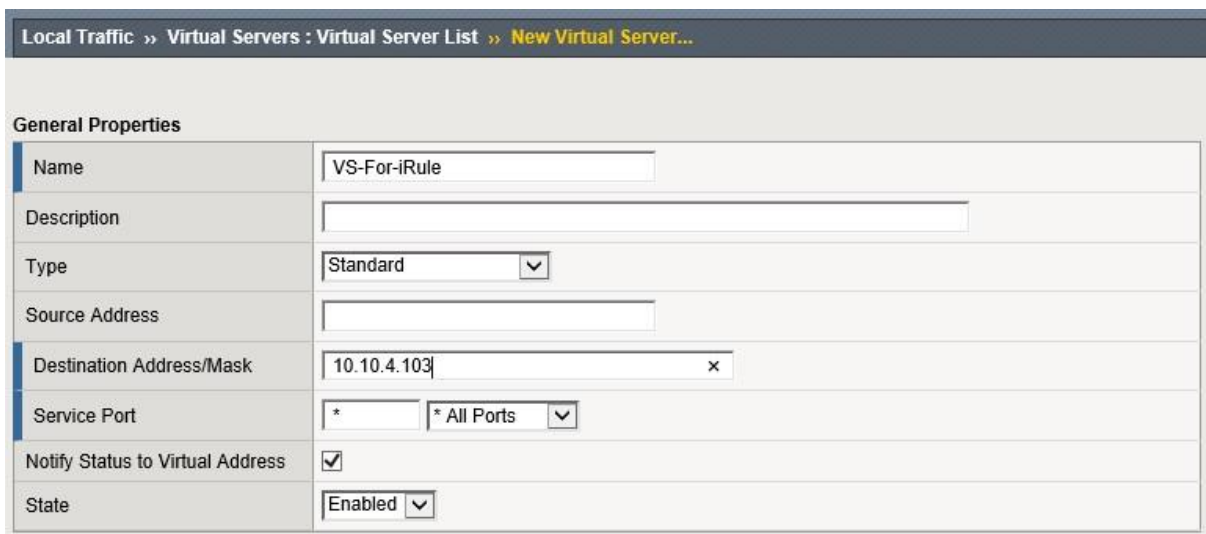


**General Properties section:**

**Name:** VS-For-iRule

**Destination:** 10.10.1.103

**Service Port:** \*All Ports

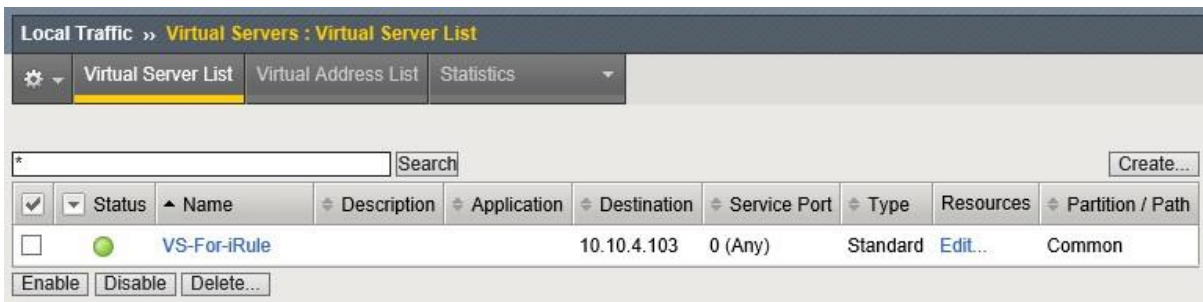
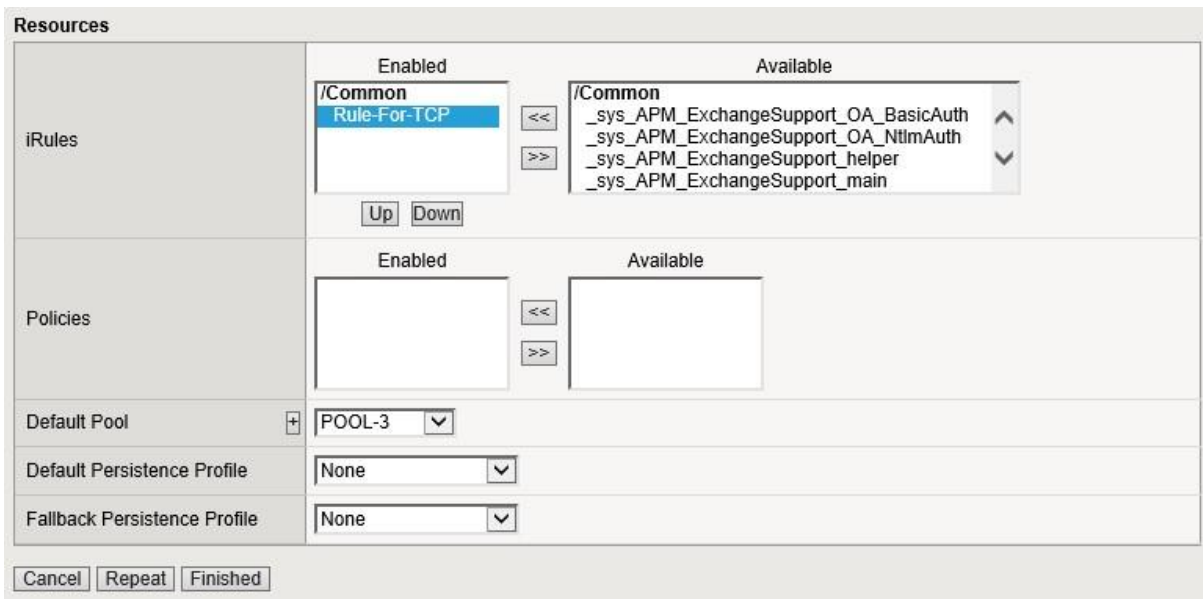


**Resources section: iRules:**

**Rule-For-TCP Default Pool:**

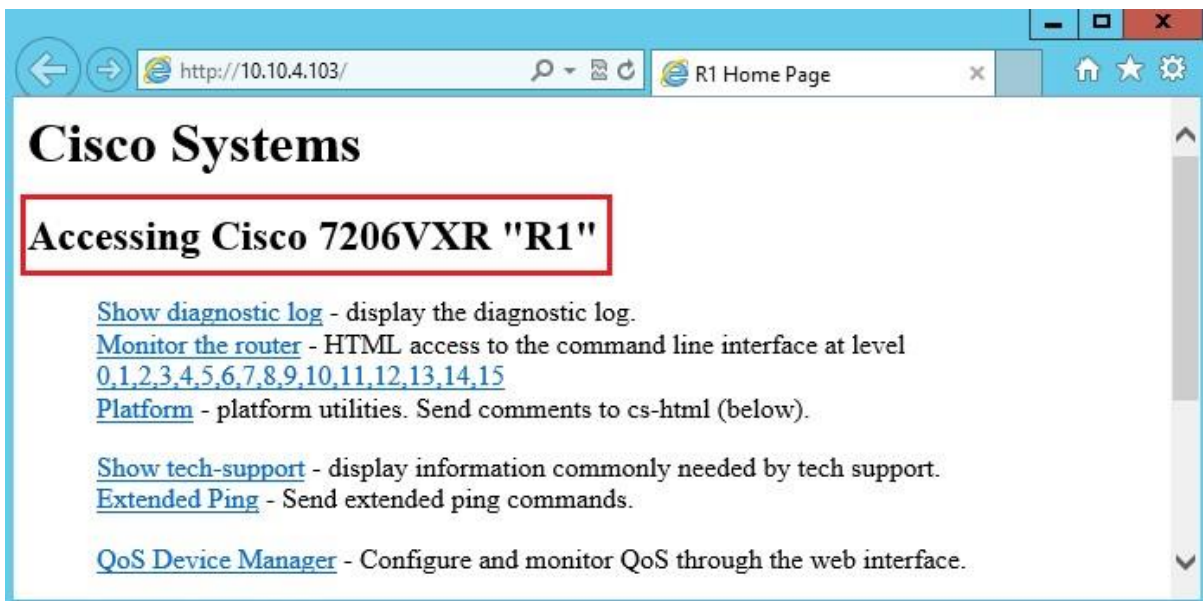
**POOL-3**

**When complete, click Finished**

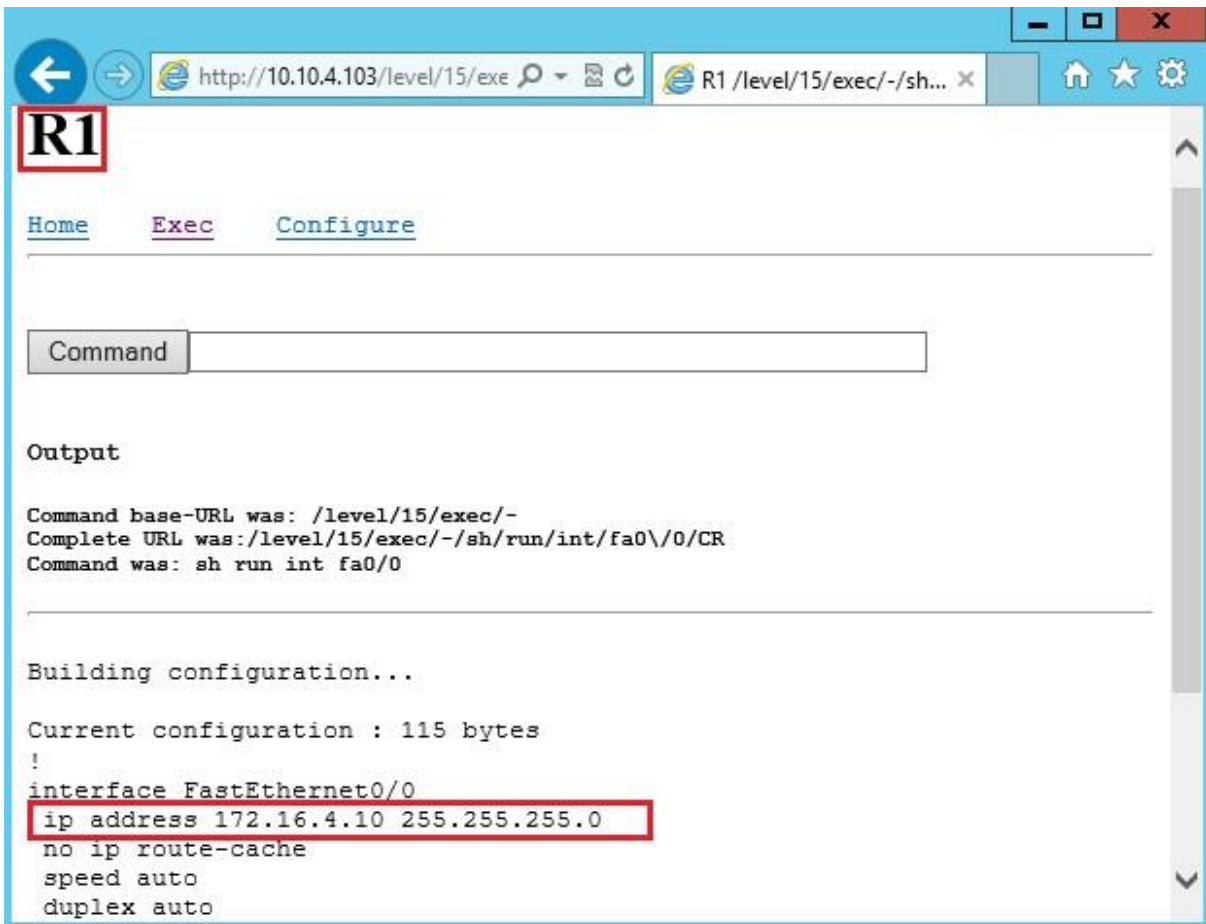


Verify behavior through statistics

Open a new browser session on the external PC and type the URL <http://10.10.1.103>. The HTTP traffic should be redirected to the node 172.16.4.10 which is the router R1.







View statistics and configuration information in the Pools.

Since the node 172.16.4.10 belongs to the POOL-1, the number of the bits and the packets is increased.

Statistics » Module Statistics : Local Traffic » Pools

Traffic Summary DNS Local Traffic Network Memory

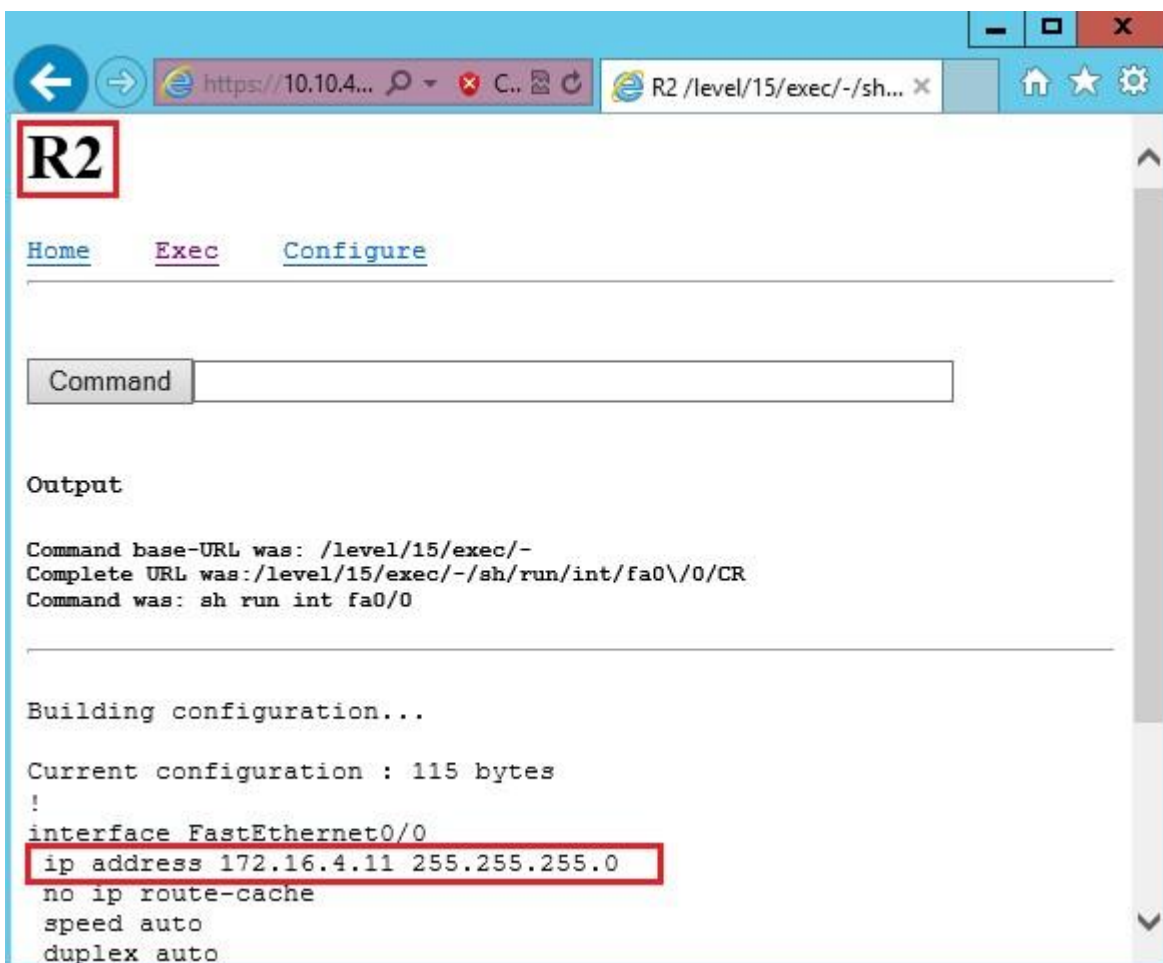
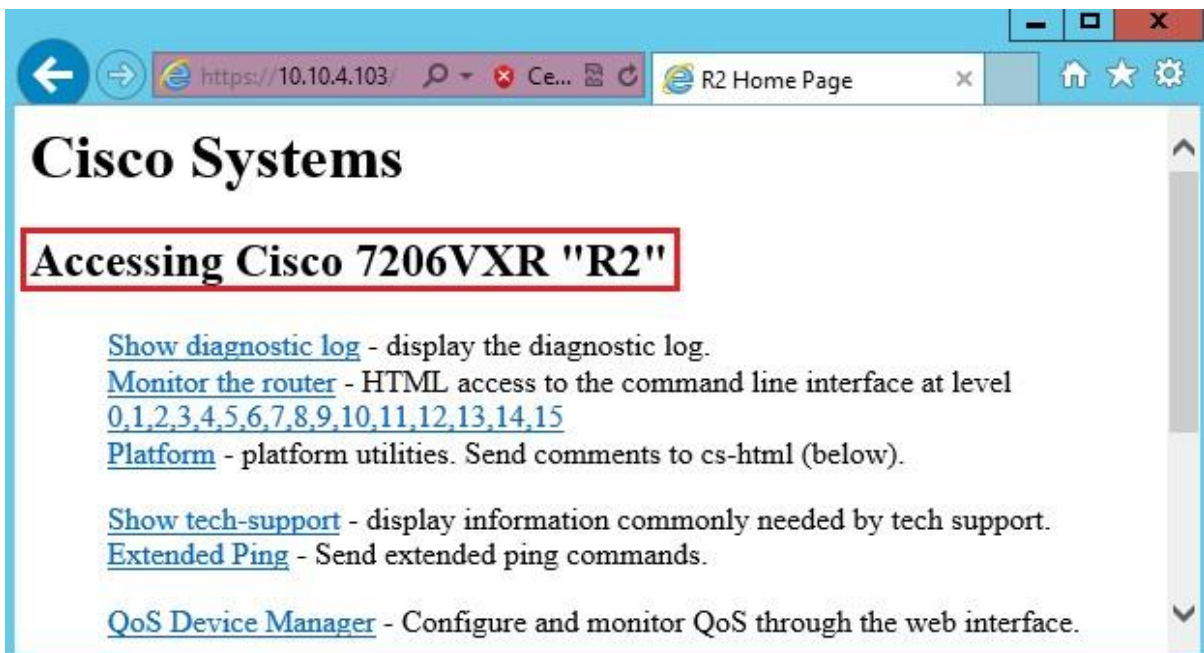
Display Options

Statistics Type: Pools  
 Data Format: Normalized  
 Auto Refresh: Disabled Refresh

				Bits		Packets		Connections					
✓	▼	+	▲	Pool	Pool Member	Partition / Path	In	Out	In	Out	Current	Maximum	Total
<input type="checkbox"/>	●	+	▲	POOL-1		Common	4.3K	18.6K	6	6	1	2	2
<input type="checkbox"/>	●	+	▲	POOL-2		Common	0	0	0	0	0	0	0
<input type="checkbox"/>	●	+	▲	POOL-3		Common	0	0	0	0	0	0	0

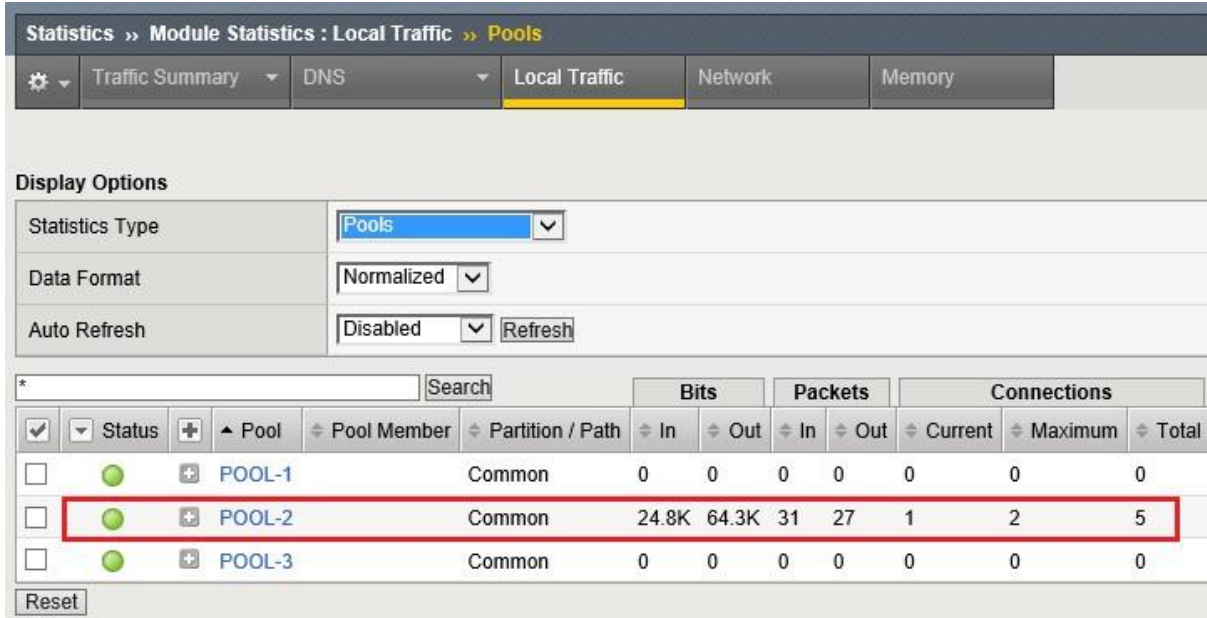
Reset

Open a new browser session on the external PC and type the URL <https://10.10.1.103>. The HTTPs traffic should be redirected to the node 172.16.4.11 which is the router R2.



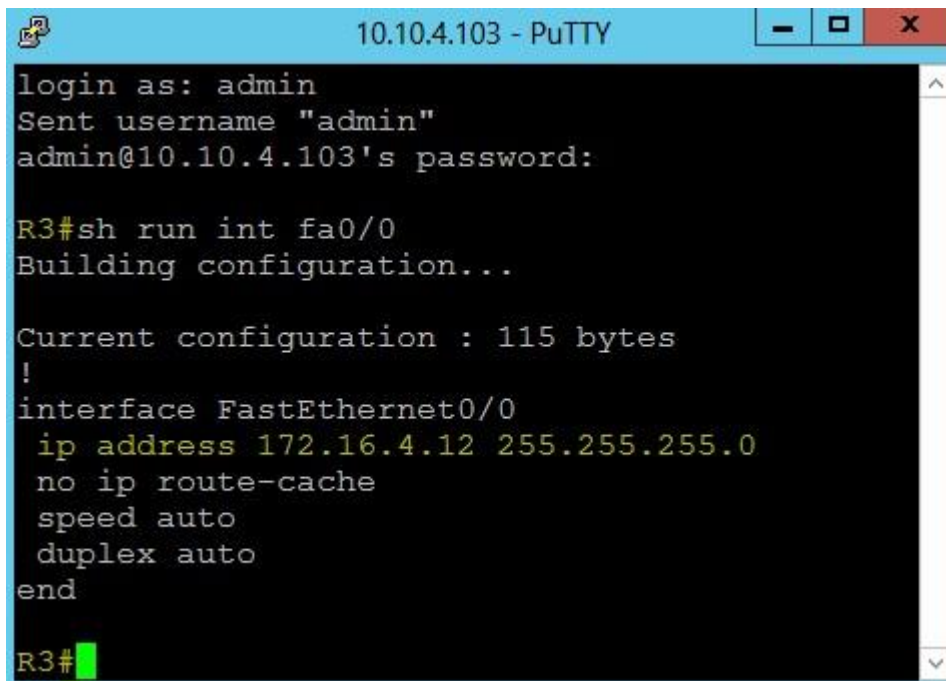
View statistics and configuration information in the Pools.

Since the node 172.16.4.11 belongs to the POOL-2, the number of the bits and the packets is increased.



Statistics » Module Statistics : Local Traffic » Pools												
Traffic Summary DNS Local Traffic Network Memory												
Display Options												
Statistics Type		Pools										
Data Format		Normalized										
Auto Refresh		Disabled Refresh										
* Search												
				Bits		Packets		Connections				
<input type="checkbox"/>	Status	Pool	Pool Member	Partition / Path	In	Out	In	Out	Current	Maximum	Total	
<input type="checkbox"/>	●	POOL-1		Common	0	0	0	0	0	0	0	
<input type="checkbox"/>	●	POOL-2		Common	24.8K	64.3K	31	27	1	2	5	
<input type="checkbox"/>	●	POOL-3		Common	0	0	0	0	0	0	0	

Using Putty, open an SSH session to 10.10.1.103 port 22. The SSH traffic should be redirected to the node 172.16.4.12 which is the router R3.



```
10.10.4.103 - PuTTY
login as: admin
Sent username "admin"
admin@10.10.4.103's password:

R3#sh run int fa0/0
Building configuration...

Current configuration : 115 bytes
!
interface FastEthernet0/0
 ip address 172.16.4.12 255.255.255.0
 no ip route-cache
 speed auto
 duplex auto
end
R3#
```

View statistics and configuration information in the Pools.

Since the node 172.16.4.12 belongs to the POOL-3, the number of the bits and the packets is increased.

Statistics » Module Statistics : Local Traffic » Pools

Traffic Summary | DNS | Local Traffic | Network | Memory

Display Options

Statistics Type: Pools  
 Data Format: Normalized  
 Auto Refresh: Disabled Refresh

				Bits		Packets		Connections		
	Status	Pool	Partition / Path	In	Out	In	Out	Current	Maximum	Total
<input type="checkbox"/>	<span style="color: green;">●</span>	POOL-1	Common	0	0	0	0	0	0	0
<input type="checkbox"/>	<span style="color: green;">●</span>	POOL-2	Common	0	0	0	0	0	0	0
<input type="checkbox"/>	<span style="color: green;">●</span>	POOL-3	Common	13.5K	9.4K	32	18	1	1	1

Reset

## Lab 11: SNAT

Configure Auto map with Self IP

Add SNAT Auto Map to the virtual server

Local Traffic » Address Translation, SNAT List, then click Create



General Properties:

Name: AUTO-NAT

Configuration section:

Translation: Select Auto Map

Origin: Address List  
 Address List: 10.10.4.200, then click Add  
 Source Port: Preserve  
 VLAN / Tunnel Traffic: \* All  
 Auto Last Hop: Default  
 When complete, click Finished

**General Properties**

Name	AUTO-NAT
Description	

**Configuration**

Translation	Automap
Origin	All IPv4 Addresses
Source Port	
VLAN / Tunnel Traffic	* All
Auto Last Hop	Default

Cancel Repeat Finished

**General Properties**

Name	AUTO-NAT
Description	

**Configuration**

Translation	Automap
Origin	Address List
Address List	Address/Prefix Length: 10.10.4.200 Add 10.10.4.200 Edit Delete
Source Port	Preserve
VLAN / Tunnel Traffic	* All
Auto Last Hop	Default

Cancel Repeat Finished

Create...

<input checked="" type="checkbox"/>	Name	Description	Application	Translation	SNAT Pool	Partition / Path
<input type="checkbox"/>	AUTO-NAT			Automap		Common

Delete...

Configure SNAT with a Single IP

**General Properties:**

Name: SNAT-Single-IP

**Configuration section:**

Translation: Select IP Address: 172.16.4.41

Origin: Address List

Address List: 10.10.4.201, then click Add

Source Port: Preserve

VLAN / Tunnel Traffic: \* All

Auto Last Hop: Default

When complete, click Finished

The screenshot shows a configuration window for 'SNAT-Single-IP'. The 'General Properties' section includes fields for Name (SNAT-Single-IP) and Description. The 'Configuration' section includes: Translation (IP Address dropdown, 172.16.4.41); Origin (Address List dropdown); Address List (Address/Prefix Length: 10.10.4.201, with an 'Add' button and a list containing '10.10.4.201', and 'Edit' and 'Delete' buttons); Source Port (Preserve dropdown); VLAN / Tunnel Traffic (\* All dropdown); and Auto Last Hop (Default dropdown). At the bottom are 'Cancel', 'Repeat', and 'Finished' buttons.

<input checked="" type="checkbox"/>	Name	Description	Application	Translation	SNAT Pool	Partition / Path
<input type="checkbox"/>	AUTO-NAT			Automap		Common
<input type="checkbox"/>	SNAT-Single-IP			172.16.4.41		Common

Buttons: Create... (top right), Delete... (bottom left)

**Configure SNAT Pool**

Local Traffic  $\tau$  Address Translation  $\tau$  SNAT Pool List, then click Create

**General Properties section:**

Name: SNAT-POOL-LIST

Member List: IP Address: 172.16.4.51, then click Add

IP Address: 172.16.4.52, then click Add

IP Address: 172.16.4.53, then click Add

When complete, click **Finished**

**General Properties**

Name: SNAT-POOL-LIST

**Configuration**

IP Address: 172.16.4.53

Member List

Add

172.16.4.51  
172.16.4.52  
172.16.4.53

Edit Delete

Cancel Repeat Finished

Create...

<input checked="" type="checkbox"/> Name	Application	Partition / Path
<input checked="" type="checkbox"/> SNAT-POOL-LIST		Common

Delete...

Navigate to **Local Traffic**  $\tau$  **Address Translation, SNAT List**, then click **Create**

**General Properties:**  
**Name:** SNAT-POOL

**Configuration section:**  
**Translation:** Select SNAT Pool and SNAT-POOL-LIST  
**Origin:** Address List  
**Address List:** 10.10.4.202, then click **Add**  
**Source Port:** Preserve  
**VLAN / Tunnel Traffic:** \* All  
**Auto Last Hop:** Default  
When complete, click **Finished**

**General Properties**

Name: SNAT-Pool

Description:

---

**Configuration**

Translation: SNAT Pool | SNAT-POOL-LIST

Origin: Address List

Address List: Address/Prefix Length: 10.10.4.202  
 Add: 10.10.4.202  
 Edit Delete

Source Port: Preserve

VLAN / Tunnel Traffic: \* All

Auto Last Hop: Default

Cancel Repeat Finished

Create...

<input checked="" type="checkbox"/>	Name	Description	Application	Translation	SNAT Pool	Partition / Path
<input type="checkbox"/>	AUTO-NAT			Automap		Common
<input type="checkbox"/>	SNAT-Pool				SNAT-POOL-LIST	Common
<input type="checkbox"/>	SNAT-Single-IP			172.16.4.41		Common

Delete...

From the external client, open a web browser, connect to <http://10.10.4.100>.  
 View SNAT statistics, you should see the Auto map used to translate the IP 10.10.4.200.

**Display Options**

Statistics Type: SNATs

Data Format: Normalized

Auto Refresh: Disabled Refresh

		Bits		Packets		Connections			
<input checked="" type="checkbox"/>	SNAT	Partition / Path	In	Out	In	Out	Current	Maximum	Total
<input type="checkbox"/>	AUTO-NAT	Common	45.8K	191.8K	70	80	0	4	10
<input type="checkbox"/>	SNAT-Pool	Common	0	0	0	0	0	0	0
<input type="checkbox"/>	SNAT-Single-IP	Common	0	0	0	0	0	0	0

Reset

On the external client, change the IP address to 10.10.4.201.  
 Still from the external client, open a web browser, connect to <http://10.10.4.100>. View SNAT statistics, you should see the SNAT single IP used to translate the IP 10.10.4.201.



**Display Options**

Statistics Type: SNATs

Data Format: Normalized

Auto Refresh: Disabled Refresh

		Bits		Packets		Connections			
<input checked="" type="checkbox"/>	▲ SNAT	↕ Partition / Path	↕ In	↕ Out	↕ In	↕ Out	↕ Current	↕ Maximum	↕ Total
<input type="checkbox"/>	AUTO-NAT	Common	0	0	0	0	0	0	0
<input type="checkbox"/>	SNAT-Pool	Common	0	0	0	0	0	0	0
<input type="checkbox"/>	SNAT-Single-IP	Common	36.3K	153.5K	55	62	0	4	8

Reset

On the external client, change the IP address to 10.10.4.202.  
 Still from the external client, open a web browser, connect to <http://10.10.4.100>.  
 View SNAT statistics, you should see the SNAT Pool used to translate the IP 10.10.4.202.

**Display Options**

Statistics Type: SNATs

Data Format: Normalized

Auto Refresh: Disabled Refresh

		Bits		Packets		Connections			
<input checked="" type="checkbox"/>	▲ SNAT	↕ Partition / Path	↕ In	↕ Out	↕ In	↕ Out	↕ Current	↕ Maximum	↕ Total
<input type="checkbox"/>	AUTO-NAT	Common	0	0	0	0	0	0	0
<input type="checkbox"/>	SNAT-Pool	Common	41.2K	158.5K	63	71	1	4	9
<input type="checkbox"/>	SNAT-Single-IP	Common	0	0	0	0	0	0	0

Reset