



F5 LTM Essentials

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WE MAKE APPS  FASTER.
SMARTER.
SAFER.

Agenda

- Set Up and Licensing
- TMOS and Networking
- Basic LTM Components
- Load Balancing and Monitoring
- Profiles and Persistence
- Security and SSL Offload
- Acceleration Technologies
- Device Service Clusters (High Availability)

Install

- **Initial System Setup**
- **Using the Setup Utility**
- **Using tmsh**

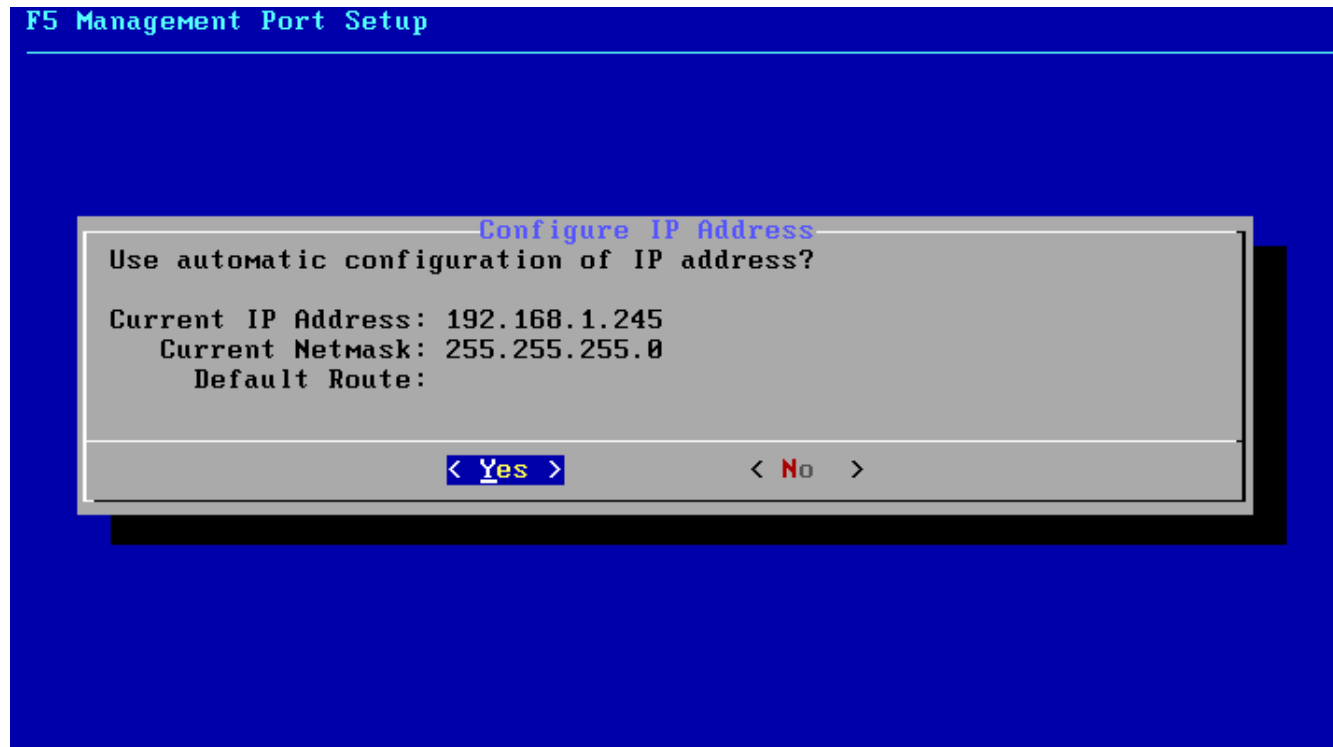
BIG-IP System Initial Setup

1 Set up the management port

- 2 Run the Setup Utility
- License the BIG-IP system
 - Provision modules
 - Configure the platform
 - Optionally, setup a failover pair

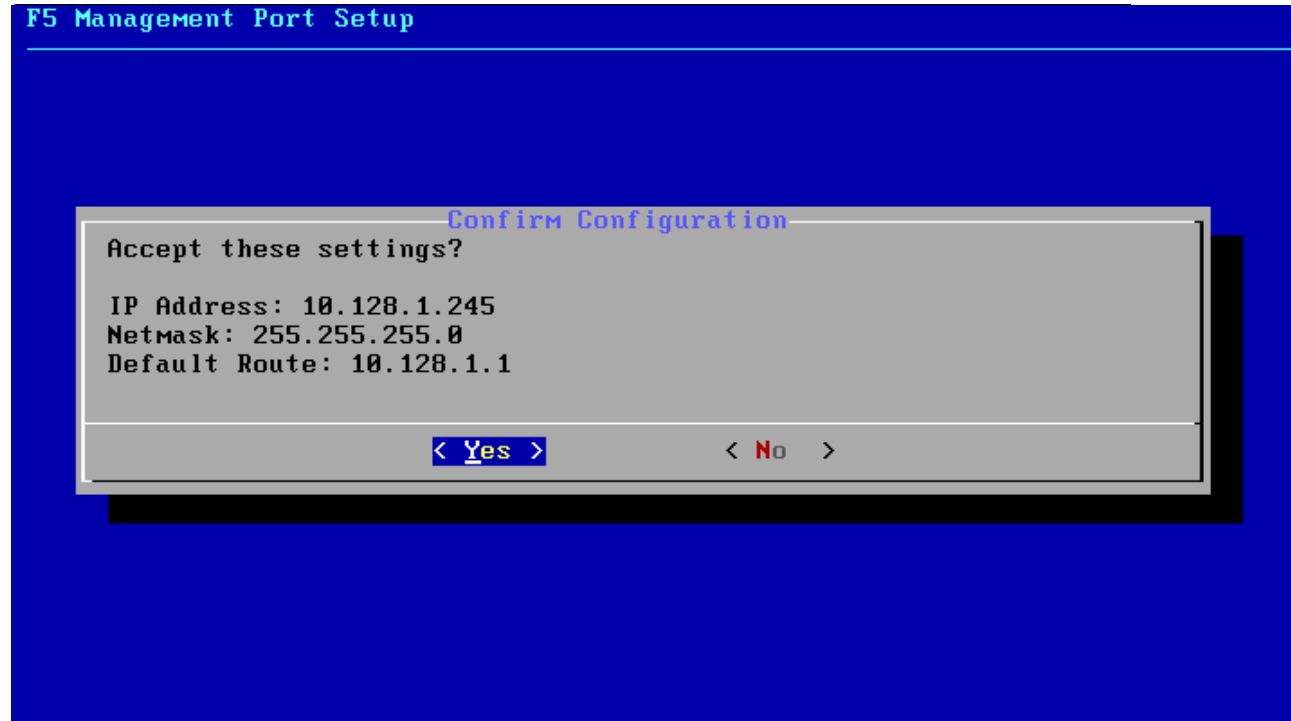
Management Port Defaults

IP Address	192.168.1.245/24
Username/Password	Web: admin/admin CLI: root/default

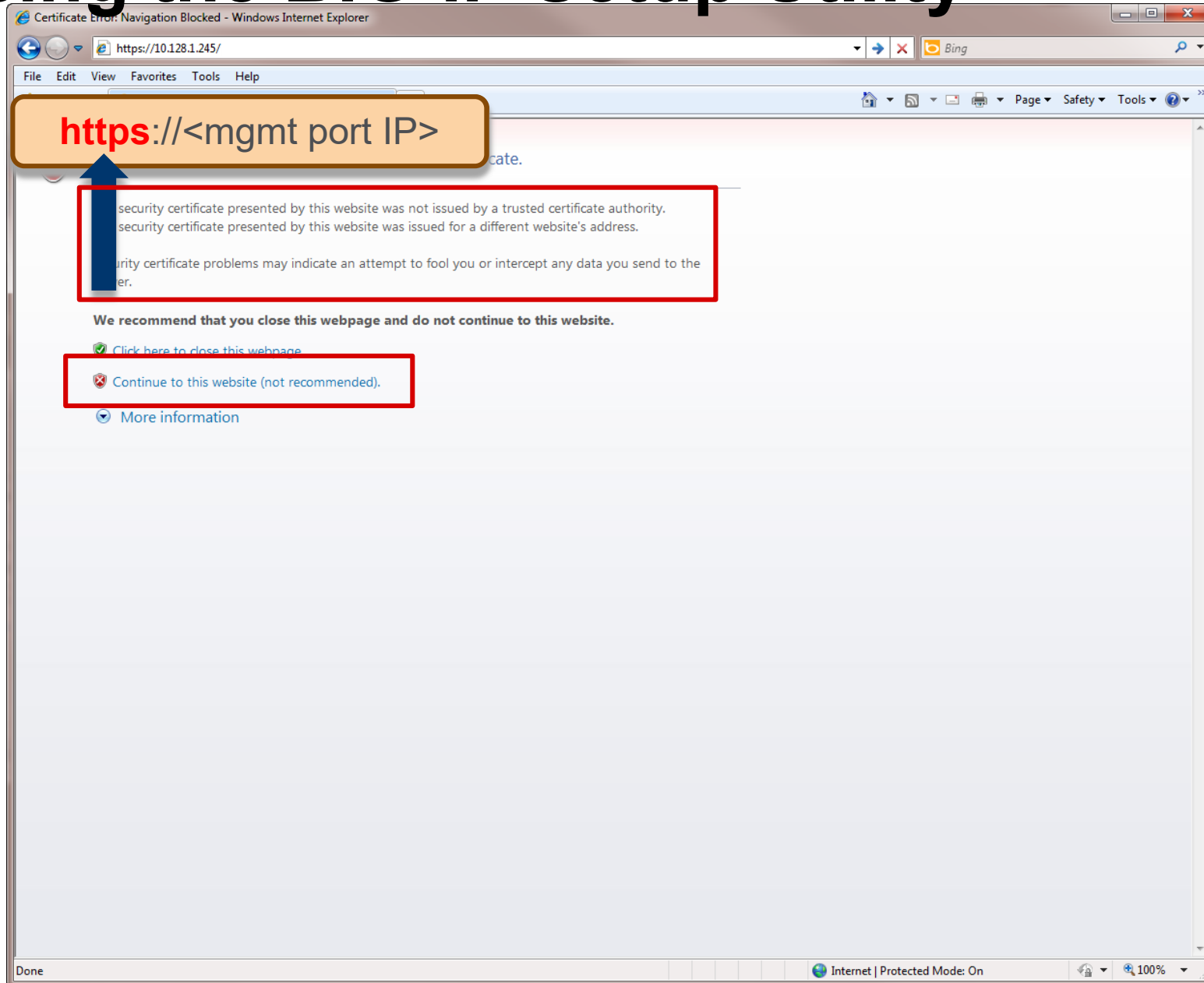


Configuring Management Port with CLI

- 1 Log into the CLI using root/default
- 2 Type “**config**” at the CLI prompt



Accessing the BIG-IP Setup Utility



Install

- **Initial System Setup**
- **Using the Setup Utility**
- **Using tmsh**

Setup Utility

Hostname: bigip1
IP Address: 10.128.1.245


Date: Jul 19, 2013
Time: 10:50 AM (PDT)

User: admin
Role: Administrator

Partition: Common

Log out

No license exists for this device



ONLINE (ACTIVE)
Standalone
Provisioning Warning

MainHelpAbout

Setup Utility » Introduction

Setup Utility

Introduction
License
Resource Provisioning
Device Certificates
Platform
Network
Redundancy
VLANs
ConfigSync
Failover
Mirroring
Active/Standby Pair
Discover Peer

Welcome

Setup Utility
To begin configuring this BIG-IP® system, please complete the Setup Utility. To begin, click the "Next" button.

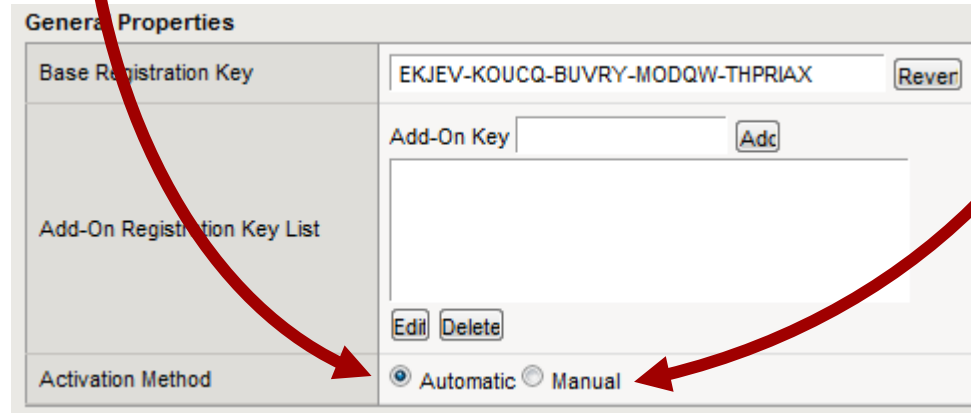
Next...

Obtain a BIG-IP system license
from F5 Networks

Licensing Methods

Automatic

Manual



The screenshot shows a 'General Properties' dialog box with the following sections:

- Base Registration Key:** A text field containing 'EKJEV-KOUCQ-BUVRY-MODQW-THPRIAX' and a 'Rever' button.
- Add-On Key:** A text field and an 'Add' button.
- Add-On Registration Key List:** A large empty text area.
- Buttons:** 'Edit' and 'Delete' buttons.
- Activation Method:** Two radio buttons, 'Automatic' (which is selected) and 'Manual'.

Two red curved arrows point from the 'Automatic' and 'Manual' labels above to the 'Automatic' and 'Manual' radio buttons respectively.

Using Automatic Licensing



F5 Licensing Server



18.202.191.1

LTM



/config/bigip.license



172.20.10.3



172.20.10.4

General Properties

Base Registration Key	EKJEV-KOUCQ-BUVRY-MODQW-THPRIAX Rever
Add-On Registration Key List	Add-On Key Adc
	Edit Delete
Activation Method	<input checked="" type="radio"/> Automatic <input type="radio"/> Manual

Using Manual Licensing



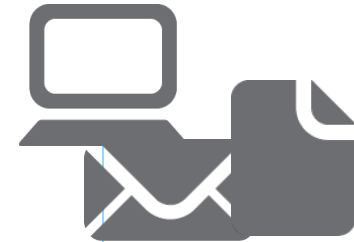
F5 Licensing Server



172.20.20.1



LTM



172.20.10.3



172.20.10.4

General Properties

Base Registration Key	EKJEV-KOUCQ-BUVRY-MODQW-THPRIAX Rever
Add-On Registration Key List	Add-On Key Adc
	Edit Delete
Activation Method	<input type="radio"/> Automatic <input checked="" type="radio"/> Manual

Two Methods for Manual Licensing

System >> License >> Re-activate...

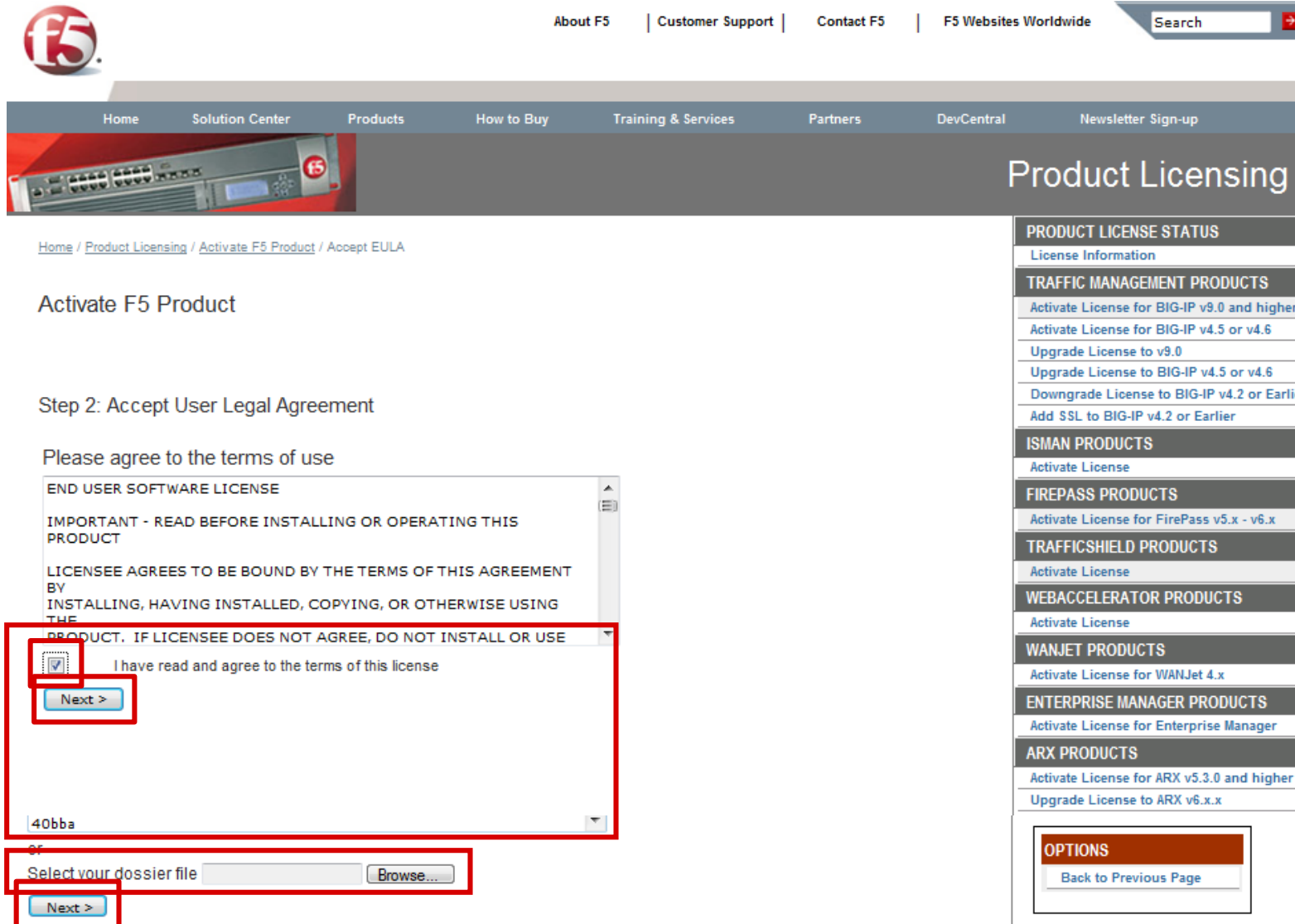
Summary

General Properties

Registration Key	EKJEV-KOUCQ-BUVRY-MODQW-THPRIAX
Registration Key List	
Manual Method	<input checked="" type="radio"/> Copy/Paste Text <input type="radio"/> Download/Upload File
Step 1: Dossier	<div>97a43a82ada8fa32e02a832723d905392fe5ba775051d550640fe807f74b361c1cec7715ae43a7bf 633ae518178f097e6ceaf5396fb4ef7a7381f760bb9cfb83a71c952b627e601a8e84705e165edf15 de50f373fd54ba8a38aa5e3ae890df3990102eedb85a08c328ca020a89ca 451c40b51dc6d69b2e6d9e7e7a081f4f6d1e519e076ed 3b5f15dc1f51d5354370569395c408ffffd9e12e61f1a 2a48b63895a6599e1ea07e63b97496ac643aa9e9e1b42 945330b5df36e8f091837422ec7f79f8383871268f73d fca2a1a3b8907bcacd462e56a1bf4ca9f9193ab8b1808 a4eada920ff497710cfb2da3885061dda2ce03e1b5324</div> <div><div>Undo</div><div>Cut</div><div>Copy</div><div>Paste</div><div>Delete</div><div>Send to OneNote</div><div>Select All</div></div>
Step 2: Licensing Server	Click here to add a new server
Step 3: License	

Cancel Next...

Using the F5 Licensing Server Web Site



The screenshot displays the F5 Licensing Server Web Site interface. At the top, there is a navigation bar with links for 'About F5', 'Customer Support', 'Contact F5', and 'F5 Websites Worldwide'. A search bar is located on the right. Below the navigation bar, a banner image shows an F5 network device. The main content area is titled 'Product Licensing' and contains a breadcrumb trail: 'Home / Product Licensing / Activate F5 Product / Accept EULA'. The page is divided into two main sections: a left sidebar and a right sidebar. The left sidebar contains the following content: 'Activate F5 Product', 'Step 2: Accept User Legal Agreement', 'Please agree to the terms of use', a scrollable text area containing the 'END USER SOFTWARE LICENSE' terms, a checkbox labeled 'I have read and agree to the terms of this license' (which is checked), a 'Next >' button, a text input field containing '40bba', and a file selection section with the text 'Select your dossier file', a 'Browse...' button, and another 'Next >' button. The right sidebar contains a 'PRODUCT LICENSE STATUS' section with a 'License Information' link, followed by sections for 'TRAFFIC MANAGEMENT PRODUCTS', 'ISMAN PRODUCTS', 'FIREPASS PRODUCTS', 'TRAFFICSHIELD PRODUCTS', 'WEBACCELERATOR PRODUCTS', 'WANJET PRODUCTS', 'ENTERPRISE MANAGER PRODUCTS', and 'ARX PRODUCTS', each with an 'Activate License' link. At the bottom of the right sidebar is an 'OPTIONS' section with a 'Back to Previous Page' button.

f5.

[About F5](#) | [Customer Support](#) | [Contact F5](#) | [F5 Websites Worldwide](#)

[Home](#) [Solution Center](#) [Products](#) [How to Buy](#) [Training & Services](#) [Partners](#) [DevCentral](#) [Newsletter Sign-up](#)

Product Licensing

[Home](#) / [Product Licensing](#) / [Activate F5 Product](#) / [Accept EULA](#)

Activate F5 Product

Step 2: Accept User Legal Agreement

Please agree to the terms of use

END USER SOFTWARE LICENSE

IMPORTANT - READ BEFORE INSTALLING OR OPERATING THIS PRODUCT

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

☒ I have read and agree to the terms of this license

[Next >](#)

40bba

or

Select your dossier file

[Next >](#)

PRODUCT LICENSE STATUS

[License Information](#)

TRAFFIC MANAGEMENT PRODUCTS

[Activate License for BIG-IP v9.0 and higher](#)

[Activate License for BIG-IP v4.5 or v4.6](#)

[Upgrade License to v9.0](#)

[Upgrade License to BIG-IP v4.5 or v4.6](#)

[Downgrade License to BIG-IP v4.2 or Earlier](#)

[Add SSL to BIG-IP v4.2 or Earlier](#)

ISMAN PRODUCTS

[Activate License](#)

FIREPASS PRODUCTS

[Activate License for FirePass v5.x - v6.x](#)

TRAFFICSHIELD PRODUCTS

[Activate License](#)

WEBACCELERATOR PRODUCTS

[Activate License](#)

WANJET PRODUCTS

[Activate License for WANJet 4.x](#)

ENTERPRISE MANAGER PRODUCTS

[Activate License for Enterprise Manager](#)

ARX PRODUCTS


[Activate License for ARX v5.3.0 and higher](#)

[Upgrade License to ARX v6.x.x](#)


OPTIONS

[Back to Previous Page](#)


Download or Copy the F5 License



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Product Licensing

[Home](#) / [Product Licensing](#) / [Activate F5 Product](#) / Finished

Activate F5 Product

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
#
#
#   Warning: Changing the system time while this system is running
#           with a time-limited license may make the system unusable.
#
Usage :          Evaluation
#
#
#   Only the specific use referenced above is allowed. Any other uses are prohibited.
#
Vendor :         F5 Networks, Inc.
#
#   Module List
#
active module :   BIG-IP, LAB (LTM,APM,ASM,GTM,WOM), VE|WRBIKGU-
DIFWINM|IPv6 Gateway|Rate Shaping|Ram Cache|50 MBPS COMPRESSION|SSL, 500 TPS Per
Core|Client Authentication|ASM, VE|PSM, VE|WBA, VE|AFM, VE|WOM, VE|DNSSEC|Anti-Virus
Checks|Base Endpoint Security Checks|Firewall Checks|Network Access|Secure Virtual
Keyboard|APM, Web Application|Machine Certificate Checks|Protected Workspace|Max
Compression, VE|Remote Desktop|App Tunnel|SSL, Max TPS, VE|Routing Bundle, VE
active module :   DNSSEC|YOJVEBP-QDRHSV1
active module :   GTM, VE|EIRQTVE-QUXPYLX|IPv6 Gateway|Ram Cache|STP|DNS
```

PRODUCT LICENSE STATUS

[License Information](#)

TRAFFIC MANAGEMENT PRODUCTS

[Activate License for BIG-IP v9.0 and higher](#)[Activate License for BIG-IP v4.5 or v4.6](#)[Upgrade License to v9.0](#)[Upgrade License to BIG-IP v4.5 or v4.6](#)[Downgrade License to BIG-IP v4.2 or Earlier](#)[Add SSL to BIG-IP v4.2 or Earlier](#)

ISMAN PRODUCTS

[Activate License](#)

FIREPASS PRODUCTS

[Activate License for FirePass v5.x - v6.x](#)

TRAFFICSHIELD PRODUCTS

[Activate License](#)

WEBACCELERATOR PRODUCTS

[Activate License](#)

WANJET PRODUCTS

[Activate License for WANJet 4.x](#)

ENTERPRISE MANAGER PRODUCTS

[Activate License for Enterprise Manager](#)

ARX PRODUCTS

[Activate License for ARX v5.3.0 and higher](#)[Upgrade License to ARX v6.x.x](#)

OPTIONS

[Start](#)

Paste the License on the BIG-IP

Hostname: bigip1 Date: Apr 1, 2012 User: admin Partition: Common Log out

IP Address: 10.0.10.129 Time: 8:19 AM (PDT) Role: Administrator

ff ONLINE (ACTIVE)
Standalone

General Properties

Registration Key	EKJEV-KOUQC-BUVRY-MODQW-THPRIAX
Registration Key List	
Manual Method	<input checked="" type="radio"/> Copy/Paste
Step 1: Dossier	4044bb802 9c63a5252 886fc9b3d 197978f60 ff7692a67 6809a7dd9 37d802102 71ebde61f c29cc9ddb 95cd6a881
Step 2: Licensing Server	Click here to add licensing server
Step 3: License	# # O # # Authoriza # #----- # Copyrig # All rig #-----

BIG-IP system configuration has changed

Fri Apr 26 10:52:39 2013

The configuration for this device has been updated. Consequently, the features and functionality previously available on the BIG-IP system might have changed.

Elapsed Time: 27 seconds

Please wait while the configuration changes are verified...
The BIG-IP Configuration utility will be updated momentarily.

☐ WebAccelerator (WAM)

None (Disabled)


☐ WAN Optimization (WOM)

None (Disabled) Limited mode available without a license

Back Next...

Resource Provisioning

Hostname: bigip1 Date: Jul 19, 2013 User: admin
IP Address: 10.128.1.245 Time: 11:00 AM (PDT) Role: Administrator Partition: Common Log out

 ONLINE (ACTIVE)
Standalone

Main Help About Setup Utility » Resource Provisioning

Setup Utility

Introduction

License

Resource Provisioning

Device Certificates

Platform

Network

Redundancy

VLANs

ConfigSync

Failover

Mirroring

Active/Standby Pair

Discover Peer

Provisioning a module requires a license

Current Resource Allocation

CPU	MGMT	TMM(89%)
Disk (33GB)	MGMT	
Memory (3.8GB)	MGMT	TMM

Module	Provisioning	License Status	Required Disk (GB)	Required Memory (MB)
Management (MGMT)	Small	N/A	0	840
Carrier Grade NAT (CGNAT)	Disabled	Unlicensed	0	0
Advanced Firewall (AFM)	<input type="checkbox"/> None	Licensed	16	628
Application Acceleration Manager (AAM)	<input type="checkbox"/> None	Licensed	32	2050
Access Policy (APM)	<input type="checkbox"/> None	Limited mode available without a license	12	366
Application Security (ASM)	<input type="checkbox"/> None	Licensed	12	808
Application Visibility and Reporting (AVR)	<input type="checkbox"/> None	Licensed	16	448
Global Traffic (GTM)	<input type="checkbox"/> None	Licensed	0	148
Link Controller (LC)	<input type="checkbox"/> None	Unlicensed	0	148
Local Traffic (LTM)	<input checked="" type="checkbox"/> Nominal	Licensed	0	884
Policy Enforcement (PEM)	<input type="checkbox"/> None	Unlicensed	16	696
Protocol Security (PSM)	<input type="checkbox"/> None	Licensed	12	764

Back Revert Next...

Setup Utility – Platform Page


Hostname: bigip1
IP Address: 10.128.1.245

Date: Jul 19, 2013
Time: 11:06 AM (PDT)

User: admin
Role: Administrator

Partition: Common

Log out

 **ONLINE (ACTIVE)**
Standalone

Activation Complete
Configure your platform.

Main Help About

Setup Utility » Platform

Setup Utility

- Introduction
- License
- Resource Provisioning
- Device Certificates
- Platform
- Network
 - Redundancy
 - VLANs
 - ConfigSync
- Failover
- Mirroring
- Active/Standby Pair
- Discover Peer

General Properties

Management Port Configuration

Management Port

IP Address[/prefix]: 10.128.1.245
Network Mask: 255.255.255.0
Management Route: 10.128.1.1

Host Name

Host IP Address

Use Management Port IP Address

Time Zone

America/Los Angeles

User Administration

Root Account

Admin Account

Password:

Confirm:

SSH Access

SSH IP Allow

Enabled

* All Addresses

Bac

Next...

F5 Networks recommends changing the **root** and **admin** account passwords

Setup Utility – Standard Network

The screenshot shows the F5 Setup Utility interface. At the top, a status bar displays system information: Hostname: bigipA1.f5demo.com, IP Address: 10.128.1.245, Date: Jul 19, 2013, Time: 11:10 AM (PDT), User: admin, Role: Administrator, Partition: Common, and a Log out button. Below this is a navigation bar with tabs for Main, Help, and About, and a breadcrumb trail for Setup Utility >> Network. The left sidebar contains a tree view for Setup Utility with options: Introduction, License, Resource Provisioning, Device Certificates, Platform, Network (selected), Redundancy, VLANs, ConfigSync, Failover, Mirroring, Active/Standby Pair, and Discover Peer. The main content area is titled 'Standard Network Configuration' and includes a description: 'Create a standard network configuration by configuring these features:'. A list of features is provided: Redundancy, VLANs, Config Sync, Failover, Mirroring, and Peer Device Discovery (for Redundant Configurations). Below this list is a 'Next...' button. Further down, the 'Advanced Network Configuration' section is visible, with a description: 'Create advanced device configurations by clicking **Finished** and navigating to the Main tab of the Configuration Utility.' A 'Finished' button is present, with a blue arrow pointing to it from a large orange callout box. The callout box contains the text: 'You must manually configure network settings'.

Hostname: bigipA1.f5demo.com
IP Address: 10.128.1.245
Date: Jul 19, 2013
Time: 11:10 AM (PDT)
User: admin
Role: Administrator
Partition: Common
Log out

ONLINE (ACTIVE)
Standalone

Main Help About Setup Utility >> Network

Setup Utility

- Introduction
- License
- Resource Provisioning
- Device Certificates
- Platform
- Network
- Redundancy
- VLANs
- ConfigSync
- Failover
- Mirroring
- Active/Standby Pair
- Discover Peer

Standard Network Configuration
Create a standard network configuration by configuring these features:

- Redundancy
- VLANs
- Config Sync
- Failover
- Mirroring
- Peer Device Discovery (for Redundant Configurations)

Next...

Advanced Network Configuration
Create advanced device configurations by clicking **Finished** and navigating to the Main tab of the Configuration Utility.

Finished

You must manually configure network settings

Setup Utility – Internal Network Configuration


Hostname: bigipA1.f5demo.com
IP Address: 10.128.1.245

Date: Jul 19, 2013
Time: 11:18 AM (PDT)

User: admin
Role: Administrator

Partition: Common

Log out

 ONLINE (ACTIVE)
Standalone

[Main](#) [Help](#) [About](#) Setup Utility » VLANs

Setup Utility

- Introduction
- License
- Resource Provisioning
- Device Certificates
- Platform
- Network
- Redundancy
- VLANs
- ConfigSync
- Failover
- Mirroring
- Active/Standby Pair
- Discover Peer

Internal Network Configuration

Self IP	Address: <input type="text"/> Netmask: <input type="text"/> Port Lockdown: Allow Default
Floating IP	Address: <input type="text"/> Port Lockdown: Allow Default

Internal VLAN Configuration

VLAN Name	internal		
VLAN Tag ID	auto		
VLAN Interfaces	Untagged	Available	Tagged
	<input type="text"/>	1.1 1.2 1.3	<input type="text"/>

Cancel Next...

Setup Utility – External Network Configuration


Hostname: bigipA1.f5demo.com
IP Address: 10.128.1.245

Date: Jul 19, 2013
Time: 11:23 AM (PDT)

User: admin
Role: Administrator

Partition: Common

Log out

 ONLINE (ACTIVE)
Standalone

MainHelpAbout

Setup Utility » VLANs

Setup Utility

- Introduction
- License
- Resource Provisioning
- Device Certificates
- Platform
- Network
- Redundancy
- VLANs

External Network Configuration

External VLAN

☒ Create VLAN external ☐ Select existing VLAN

Self IP

Address:
Netmask:
Port Lockdown: Allow 443

Default Gateway

External VLAN Configuration

VLAN Name

external

VLAN Tag ID

auto

VLAN Interfaces

Untagged

Available

Tagged

1.1
1.2
1.3

Cancel

Finished

Using the Configuration Utility

The screenshot displays the F5 Configuration Utility web interface. At the top, a banner indicates 'Setup Utility Complete' with a green checkmark icon. Below this, a navigation bar includes 'Main', 'Help', and 'About' tabs. A left sidebar contains icons for 'Statistics', 'iApp', 'Local Traffic', 'Acceleration', 'Device Management', 'Network', and 'System'. The main content area is divided into two columns. The left column, titled 'Setup', contains sections for 'User Documentation', 'Preferences', 'Additional Setup Options', and 'Setup Utility'. The 'Setup Utility' section is highlighted with a red rectangular border and contains the text: 'Run the Setup Utility again to make changes to basic device settings and standard network configuration.' followed by a link 'Run the Setup Utility'. The right column, titled 'Support', contains sections for 'Ask F5', 'Solution Center', 'DevCentral', and 'Modules'. At the bottom, there are two more sections: 'Plug-ins' and 'Downloads'.

f5 **Setup Utility Complete**
Additional setup options can be found below, or in the System and Network sections of the Main tab.

Main Help About

Statistics
iApp
Local Traffic
Acceleration
Device Management
Network
System

Setup

User Documentation
Technical documentation for this product, including user guides and release notes, is available on the Ask F5 Technical Support web site.
• [User Documentation](#)

Preferences
On the System Preferences screen, you can customize the general preferences for the Configuration Utility.
• [System Preferences](#)

Additional Setup Options
Use the following additional configuration options to refine the system setup, once you have initially configured the system using the Setup Utility.
• [System Device Certificate](#)
• [DNS](#)
• [NTP](#)
• [SNMP](#)
• [User Authentication](#)

Setup Utility
Run the Setup Utility again to make changes to basic device settings and standard network configuration.
• [Run the Setup Utility](#)

Support

Ask F5
Ask F5 features quick solutions to technical questions, product manuals, release notes, an online support case generator, and general information about F5 Networks and products. Ask F5 provides unlimited access to all customers covered under an F5 service agreement.
• [Visit Ask F5](#)

Solution Center
The Solution Center features step-by-step Deployment Guides, White Papers, Application Briefs, Success Stories, Tutorials and much more.
• [Visit the Solution Center](#)

DevCentral
DevCentral provides network administrators and application developers with extensive tools, tips, techniques, and community resources designed to speed iControl development and act as a forum to share best practices.
• [Visit DevCentral](#)

Modules
F5 BIG-IP devices are a modular system, so you can add new functions as necessary to quickly adapt to changing application and business needs. Modules include options for acceleration, security, and other application delivery solutions.
• [Visit BIG-IP Modules](#)

Plug-ins

Agents
The following agents provide additional functionality for Microsoft® Windows Server™ platforms.
• [ISAPI Plug-in](#)
• [ISAPI Plug-in \(x64 edition\)](#)
This plug-in uses the WMI interface to gather system metrics for use in Dynamic Ratio load balancing mode

Downloads

SNMP MIBs
The compressed files listed below contain all SNMP MIBs related to the BIG-IP and Enterprise Manager systems.
• [Download F5 MIBs \(mibs_f5.tar.gz\)](#)
• [Download NET-SNMP MIBs \(mibs_netsnmp.tar.gz\)](#)

SSH Clients

Configuration Utility User Interface

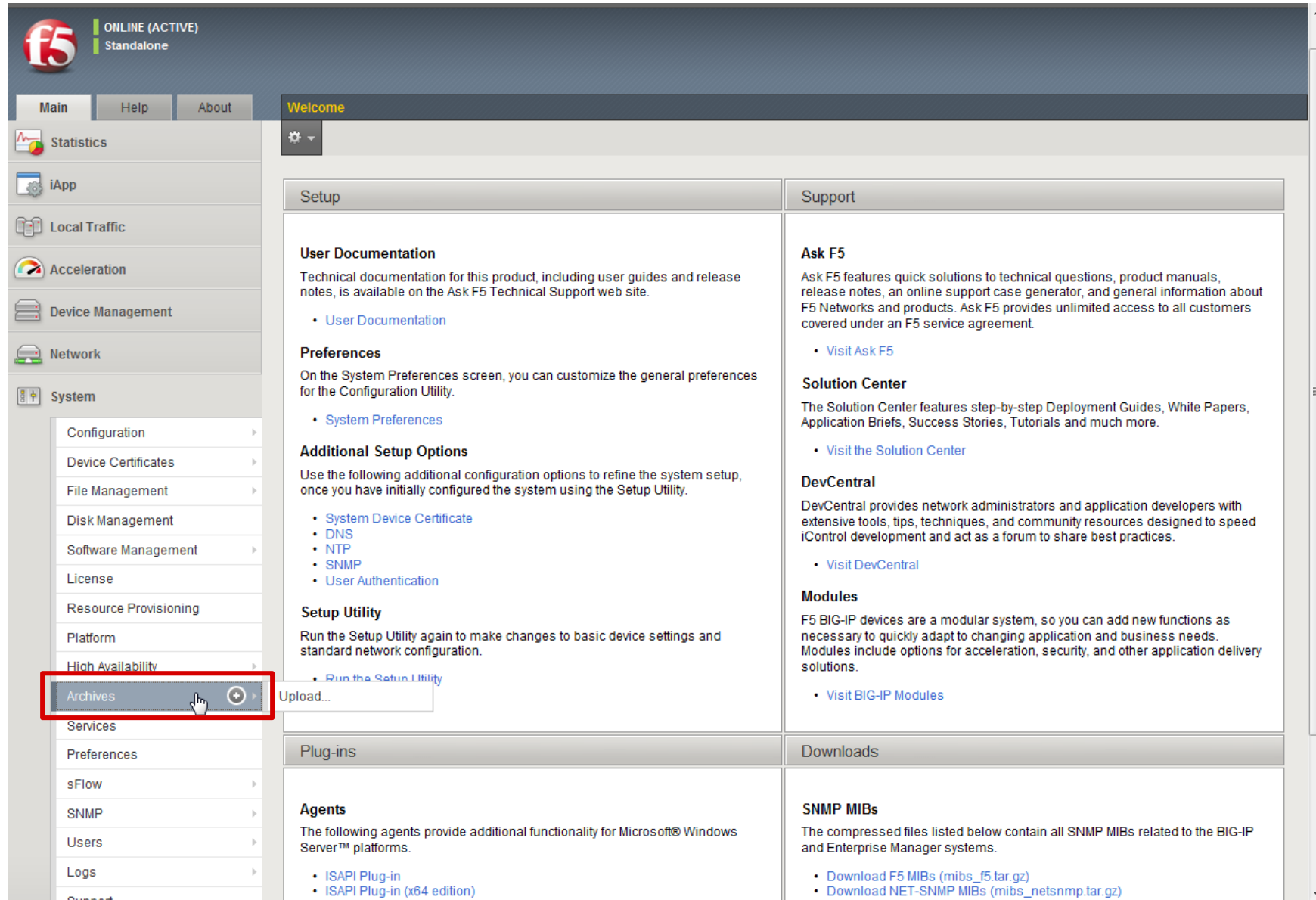
The screenshot displays the F5 Configuration Utility User Interface. At the top left, the F5 logo is shown next to the status "ONLINE (ACTIVE) Standalone". A navigation bar includes "Main", "Help", and "About" tabs. A left-hand sidebar lists several modules: "Statistics", "iApp", "Local Traffic", "Acceleration", "Device Management", "Security" (highlighted with a red box), "Network", and "System". A red arrow points from the "Security" module to a callout box labeled "For LTM".

Overlaid on the right side of the interface are several callout boxes describing key capabilities:

- System dashboard, traffic
- Global server load balancing using
- Web application firewall using BIG-IP Application Security Manager (ASM)
- Routing and switching
- ICSA-certified network firewall using BIG-IP Advanced Firewall Manager (AFM)

The main content area on the right contains text about additional configuration options and links to resources like the Solution Center, DevCentral, and BIG-IP Modules.

Accessing Archives Page



The screenshot displays the F5 configuration utility interface. The top header shows the F5 logo, "ONLINE (ACTIVE)", and "Standalone". Below this is a navigation bar with "Main", "Help", and "About" tabs. A "Welcome" message is visible. The left sidebar contains a list of system components: Statistics, iApp, Local Traffic, Acceleration, Device Management, Network, and System. The "System" component is expanded, showing a list of sub-items: Configuration, Device Certificates, File Management, Disk Management, Software Management, License, Resource Provisioning, Platform, High Availability, Archives, Services, Preferences, sFlow, SNMP, Users, Logs, and Support. The "Archives" item is highlighted with a red rectangle, and a mouse cursor is pointing at it. The main content area is divided into four sections: Setup, Support, Plug-ins, and Downloads. The "Setup" section contains links for User Documentation, Preferences, Additional Setup Options, and Setup Utility. The "Support" section contains links for Ask F5, Solution Center, DevCentral, and Modules. The "Plug-ins" section contains a link for Agents. The "Downloads" section contains links for SNMP MIBs. The "Archives" page is currently selected, showing an "Upload..." button.

f5 ONLINE (ACTIVE)
Standalone

Main Help About

Statistics
iApp
Local Traffic
Acceleration
Device Management
Network
System

Configuration
Device Certificates
File Management
Disk Management
Software Management
License
Resource Provisioning
Platform
High Availability
Archives
Services
Preferences
sFlow
SNMP
Users
Logs
Support

Welcome

Setup

User Documentation
Technical documentation for this product, including user guides and release notes, is available on the Ask F5 Technical Support web site.
• [User Documentation](#)

Preferences
On the System Preferences screen, you can customize the general preferences for the Configuration Utility.
• [System Preferences](#)

Additional Setup Options
Use the following additional configuration options to refine the system setup, once you have initially configured the system using the Setup Utility.
• [System Device Certificate](#)
• [DNS](#)
• [NTP](#)
• [SNMP](#)
• [User Authentication](#)

Setup Utility
Run the Setup Utility again to make changes to basic device settings and standard network configuration.
• [Run the Setup Utility](#)

Support

Ask F5
Ask F5 features quick solutions to technical questions, product manuals, release notes, an online support case generator, and general information about F5 Networks and products. Ask F5 provides unlimited access to all customers covered under an F5 service agreement.
• [Visit Ask F5](#)

Solution Center
The Solution Center features step-by-step Deployment Guides, White Papers, Application Briefs, Success Stories, Tutorials and much more.
• [Visit the Solution Center](#)

DevCentral
DevCentral provides network administrators and application developers with extensive tools, tips, techniques, and community resources designed to speed iControl development and act as a forum to share best practices.
• [Visit DevCentral](#)

Modules
F5 BIG-IP devices are a modular system, so you can add new functions as necessary to quickly adapt to changing application and business needs. Modules include options for acceleration, security, and other application delivery solutions.
• [Visit BIG-IP Modules](#)

Plug-ins

Agents
The following agents provide additional functionality for Microsoft® Windows Server™ platforms.
• [ISAPI Plug-in](#)
• [ISAPI Plug-in \(x64 edition\)](#)

Downloads

SNMP MIBs
The compressed files listed below contain all SNMP MIBs related to the BIG-IP and Enterprise Manager systems.
• [Download F5 MIBs \(mibs_f5.tar.gz\)](#)
• [Download NET-SNMP MIBs \(mibs_netsnmp.tar.gz\)](#)

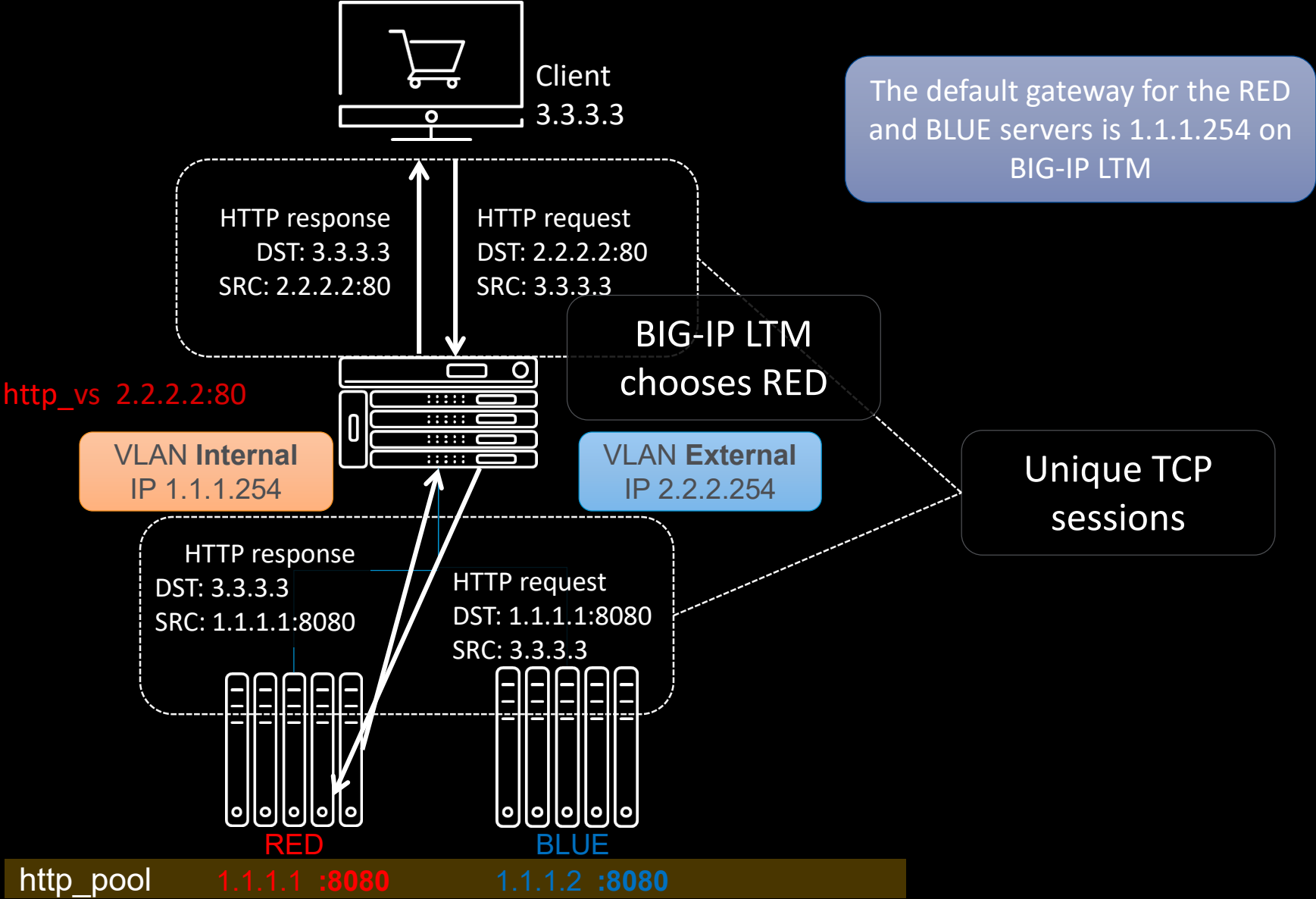
Upload...

BIG-IP NETWORKING

Overview of Networking

- **TMOS is a full proxy architecture**
 - Traffic must pass through BIG-IP to gain the benefits of TMOS
- **Routed mode (recommended)**
 - Real servers are on an internal network behind the BIG-IP
 - The BIG-IP is default gateway for the servers
 - The virtual servers are on an external network
 - Accessible by the clients
- **Source Network Address Translation (SNAT) Mode**
 - Also known as, One-Armed mode
 - Allows a BIG-IP to be inserted into existing networks without changing the existing IP address structure

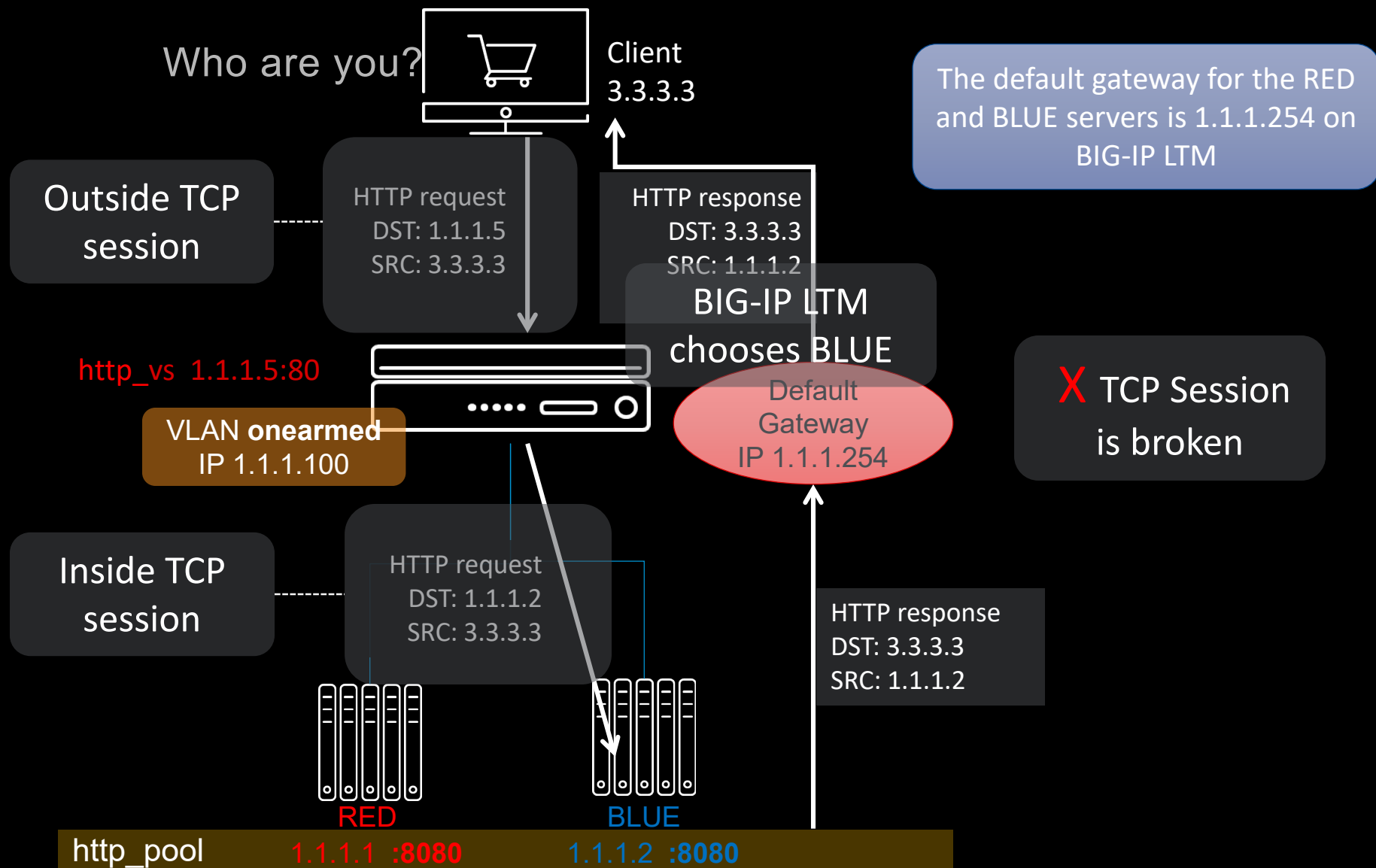
How Routed Mode Works



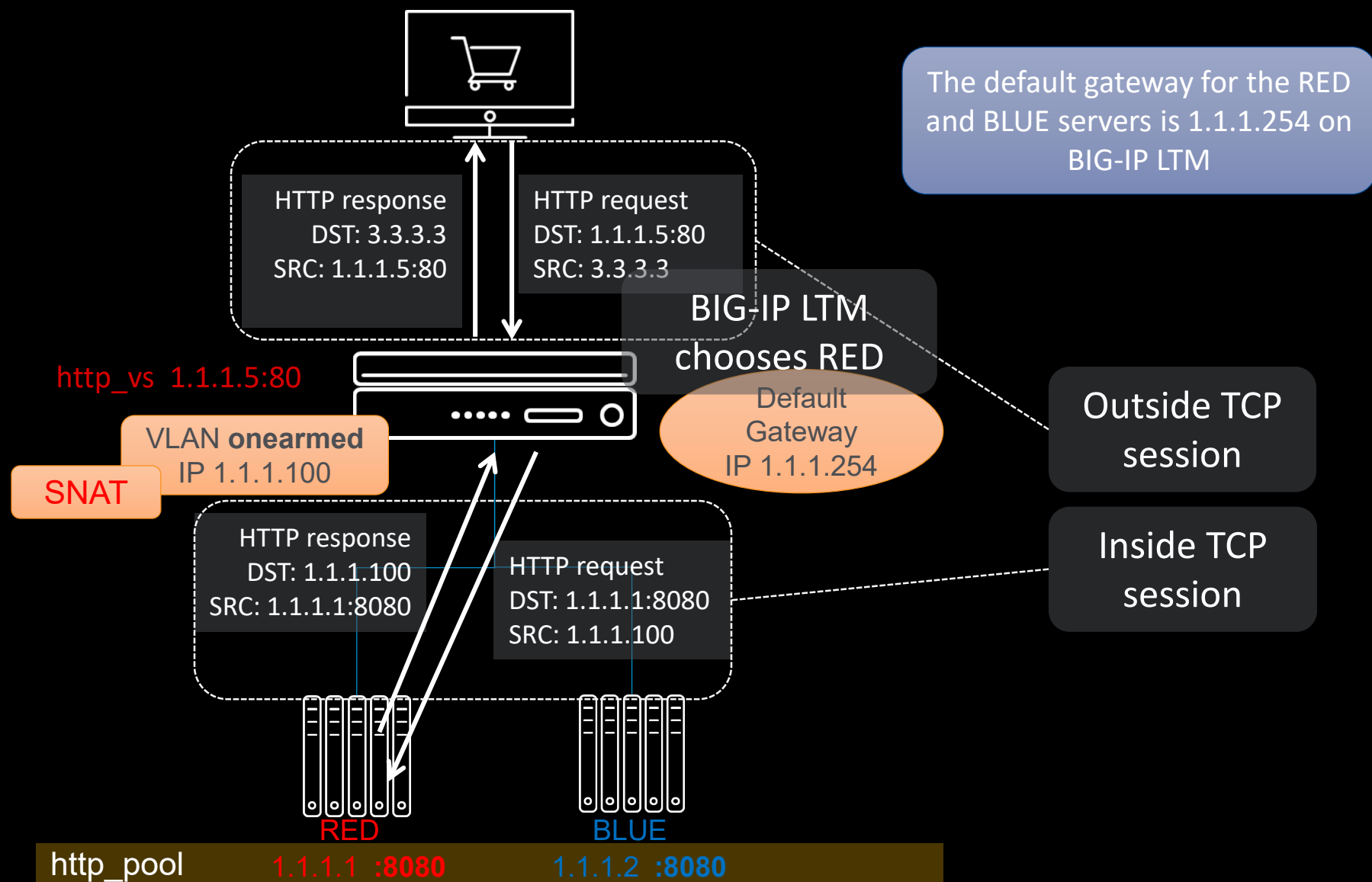
SNAT or One Armed Setup

- **SNATs translate the source IP to an IP owned by BIG-IP**
- **Advantages**
 - No changes to your servers or network
 - Easy option for quick proof of concept testing
 - OneConnect can operate in its most aggressive mode
 - Requires no BIG-IP configuration for direct access to real servers
- **Disadvantages**
 - Servers see the BIG-IP as the source IP, you lose the original source IP
 - May impact logging mechanisms and harder to debug
 - Allows direct access to servers, which reduces security
- **The BIG-IP can insert the original IP address into the headers using:**
 - An x-forward for the header through an HTTP profile (RFC compliant)
 - A custom header through iRules

Why SNATs May be Required

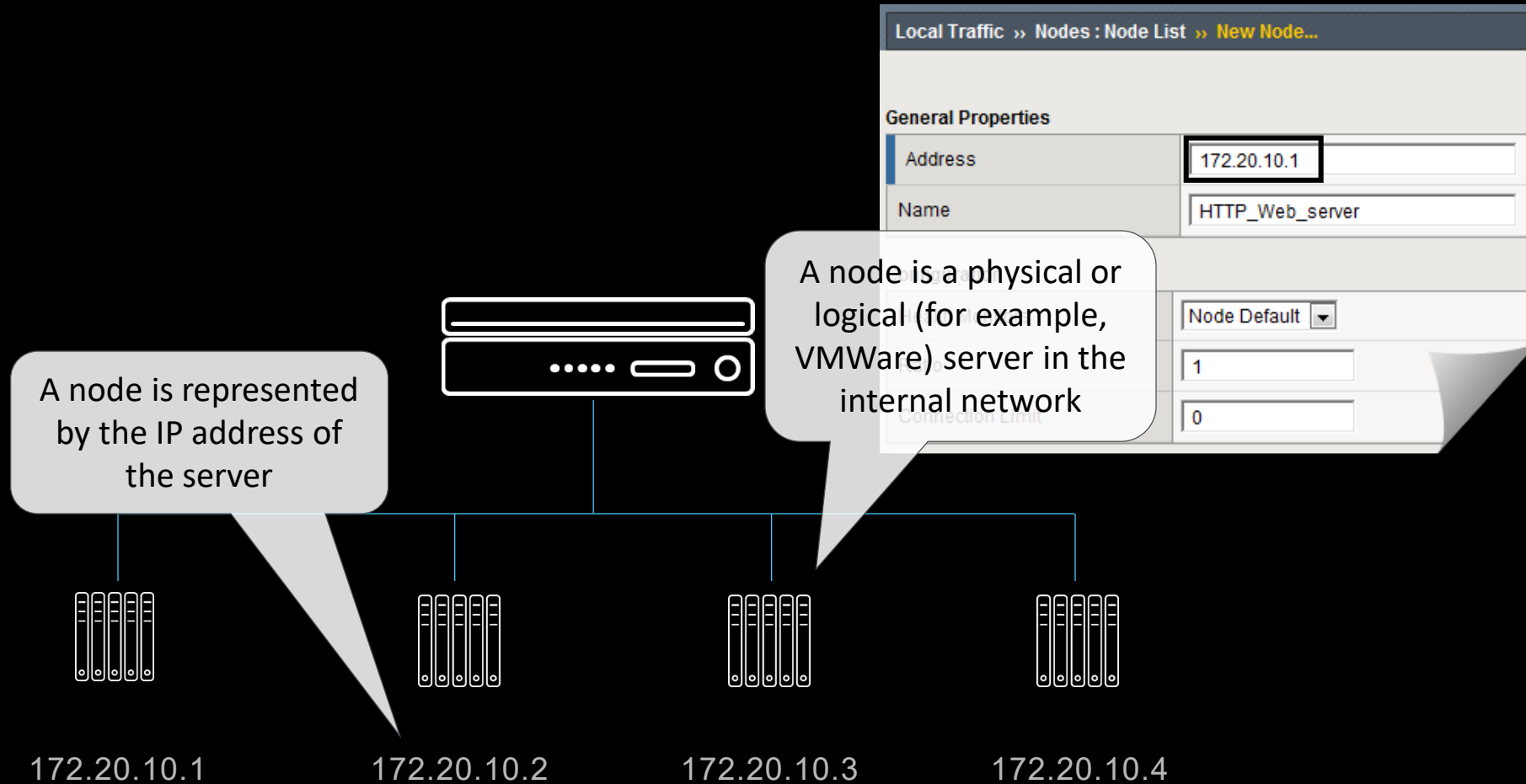


How SNAT Mode Works

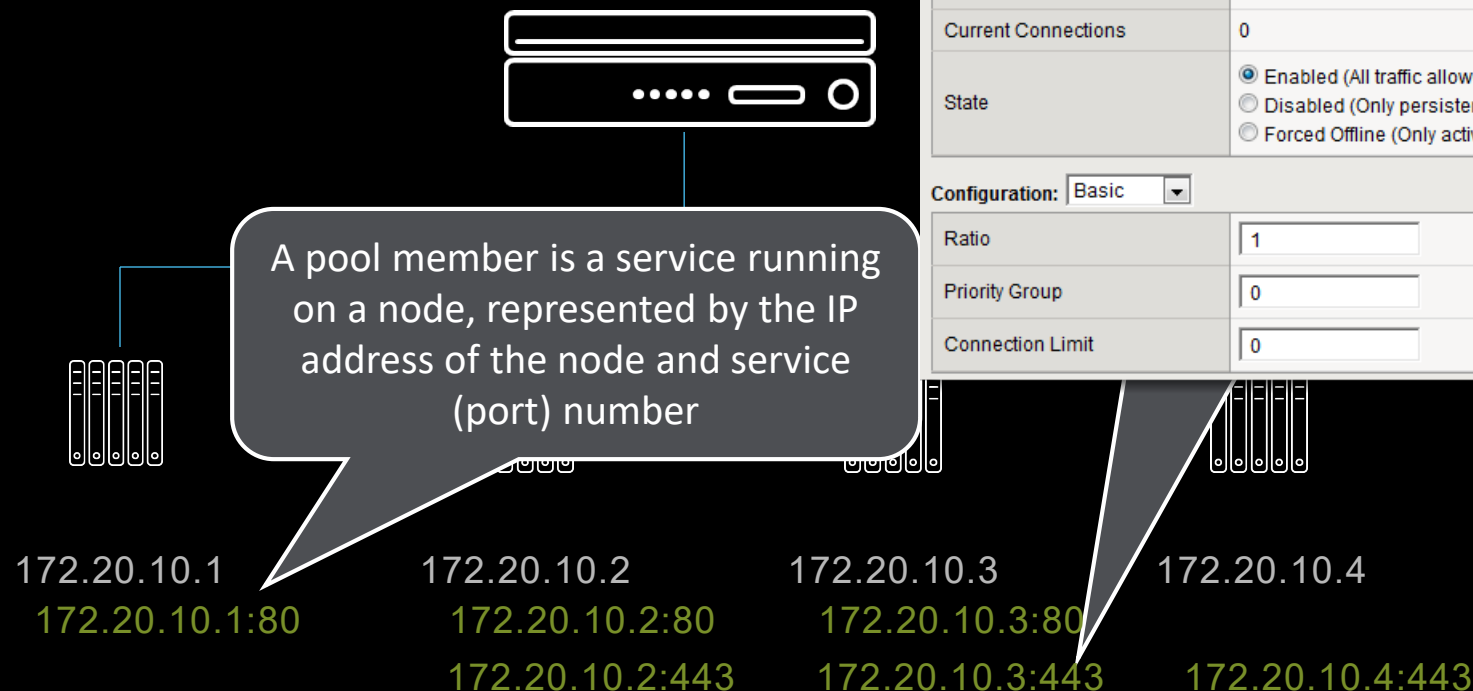


LTM COMPONENTS

BIG-IP LTM Components: Nodes



BIG-IP LTM Components: Pool Members



Local Traffic » Pools : Pool List » HTTP_Web_server_pool

Properties Members Statistics

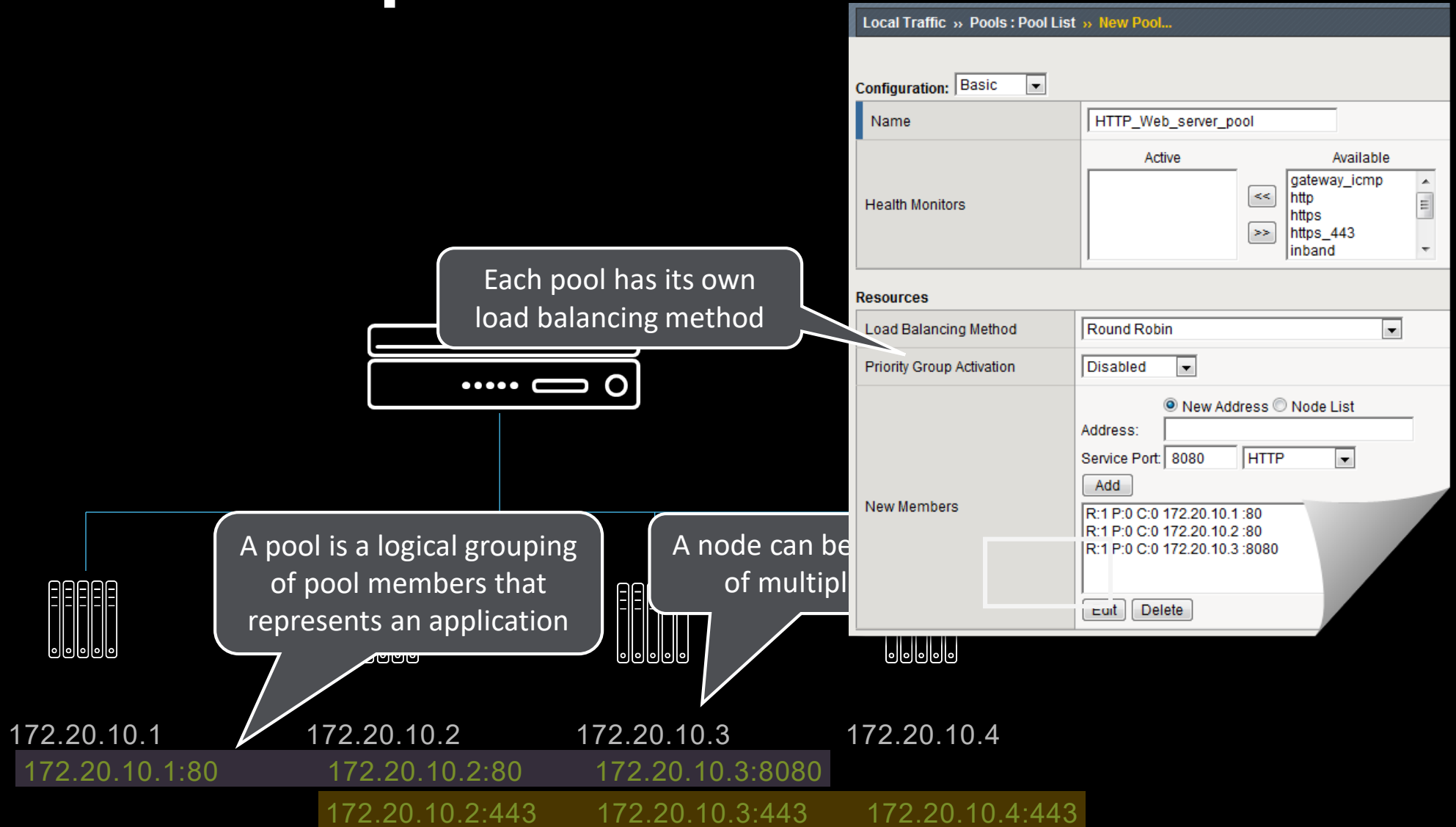
Member Properties

Address	172.20.10.1
Service Port	80
Partition	Common
Parent Node	<input checked="" type="checkbox"/> 172.20.10.1 (HTTP_Web_server)
Availability	<input checked="" type="checkbox"/> Unknown (Enabled) - Pool member does not have service checking enabled
Health Monitors	
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	1
Priority Group	0
Connection Limit	0

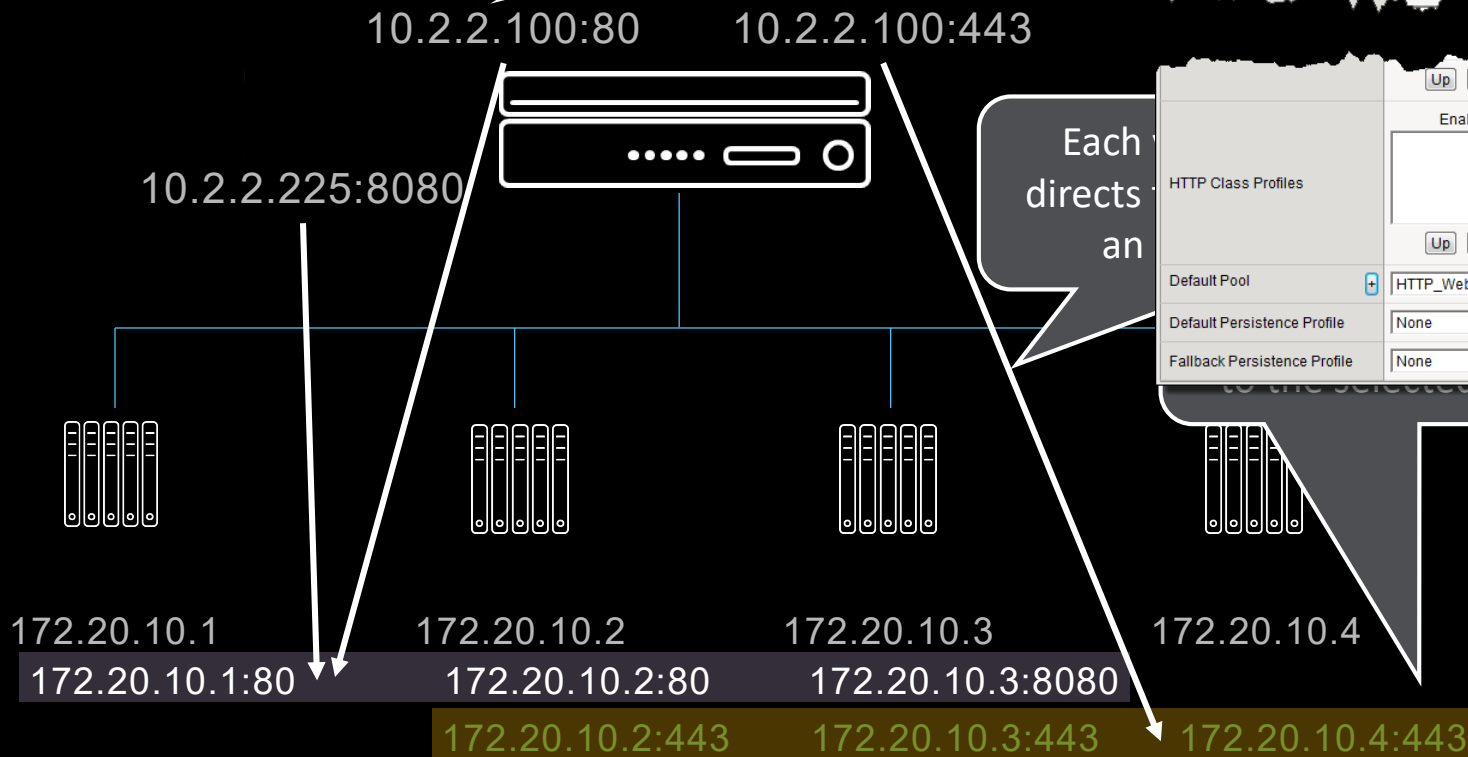
BIG-IP LTM Components: Pools



BIG-IP LTM Components: Virtual Servers

NOTE: Multiple virtual servers can reference the same pools, pool members, and/or nodes

Default deny rule is the most common rule that listens for client requests



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

General Properties

Name	HTTP_virtual_server	
Destination	Type: <input checked="" type="radio"/> Host <input type="radio"/> Network	Address: 10.2.2.100
Service Port	80	HTTP
State	Enabled	

Configuration: Basic

Up Down

Enabled Available

httpclass

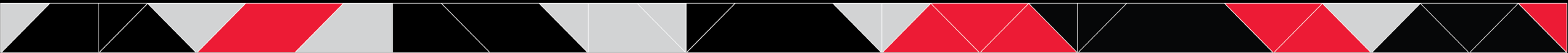
Up Down

HTTP Class Profiles

Default Pool: HTTP_Web_server_pool

Default Persistence Profile: None

Fallback Persistence Profile: None



Virtual Servers

- **One of the most important configuration components**
 - Determines what traffic is to pass
 - Where the traffic goes
 - How it is viewed/manipulated/validated (mostly via profiles)
 - So in the last slides we saw virtual server basics (in and out)

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

General Properties

Name	<input type="text"/>
Description	<input type="text"/>
Type	Standard <input type="button" value="v"/>
Source Address	<input type="text"/>
Destination Address/Mask	<input type="text"/>
Service Port	<input type="text"/> <input type="button" value="Select..."/> <input type="button" value="v"/>
Notify Status to Virtual Address	<input checked="" type="checkbox"/>
State	Enabled <input type="button" value="v"/>

Resources

iRules	<div>Enabled</div> <div><input type="button" value="Up"/> <input type="button" value="Down"/></div>	<div>Available</div> <div>/Common _sys_APM_ExchangeSupport_OA_BasicAuth _sys_APM_ExchangeSupport_OA_NtlmAuth _sys_APM_ExchangeSupport_helper _sys_APM_ExchangeSupport_main</div>
Policies	<div>Enabled</div> <div><input type="button" value="Up"/> <input type="button" value="Down"/></div>	<div>Available</div> <div><input type="button" value="Up"/> <input type="button" value="Down"/></div>
Default Pool	<input type="button" value="+"/> <input type="button" value="v"/>	None <input type="button" value="v"/>
Default Persistence Profile	None <input type="button" value="v"/>	
Fallback Persistence Profile	None <input type="button" value="v"/>	

But there is so much more....

- And this is just the basic menu...
 - Layer 4-7 profiles
 - Restrictions on traffic
 - Source Address Translation
 - Destination IP and Port Translation in Advanced

Content Rewrite	
Rewrite Profile	+ None
HTML Profile	None

Acceleration: Basic	
Rate Class	None
OneConnect Profile	None
NTLM Conn Pool	None
HTTP Compression Profile	None
Web Acceleration Profile	None
HTTP/2 Profile	None

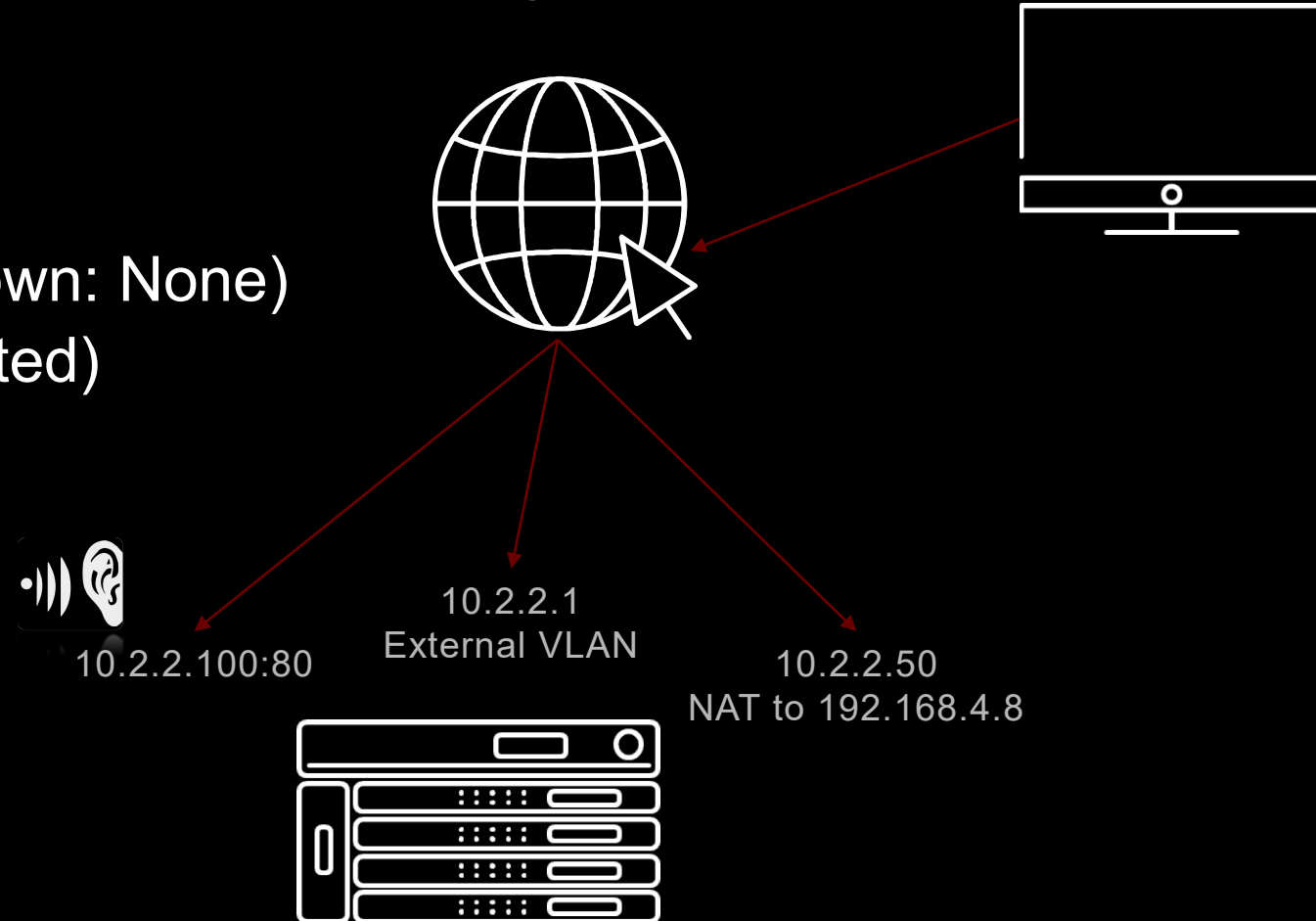
Configuration: Basic	
Protocol	TCP
Protocol Profile (Client)	tcp
Protocol Profile (Server)	(Use Client Profile)
HTTP Profile	None
FTP Profile	None
RTSP Profile	None
SSH Proxy Profile	None
SSL Profile (Client)	<div>Selected: <div></div> Available: <div>/Common clientssl clientssl-insecure-compatible clientssl-secure crypto-server-default-clientssl</div></div>
SSL Profile (Server)	<div>Selected: <div></div> Available: <div>/Common apm-default-serverssl crypto-client-default-serverssl pcoip-default-serverssl serverssl</div></div>
SMTSP Profile	None
Client LDAP Profile	None
Server LDAP Profile	None
SMTP Profile	None
VLAN and Tunnel Traffic	All VLANs and Tunnels
Source Address Translation	None

How Does a BIG-IP Handle Inbound Traffic

- But virtual server isn't the only listener

- **Listeners are**

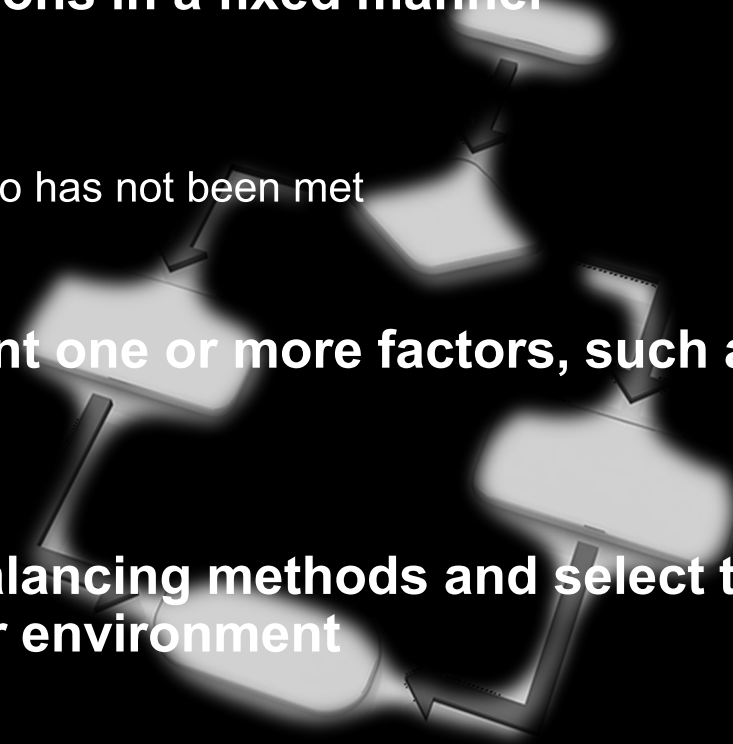
- Self IPs (Port Lockdown: None)
- SNATs (Source initiated)
- NATs (Two-way)
- Virtual Servers



LOAD BALANCING

Introduction to Load Balancing

- **A load balancing method is an algorithm or formula used to determine which pool member to send traffic to**
 - Load balancing is connection based
- **Static load balancing methods distribute connections in a fixed manner**
 - Round Robin (RR)
 - Ratio (Weighted Round Robin)
 - Distributes in a RR fashion for members/nodes whose ratio has not been met
- **Dynamic load balancing methods take into account one or more factors, such as the current connection count**
- **It is important to experiment with different load balancing methods and select the one that offers the best performance in your particular environment**



Dynamic Load Balancing Methods

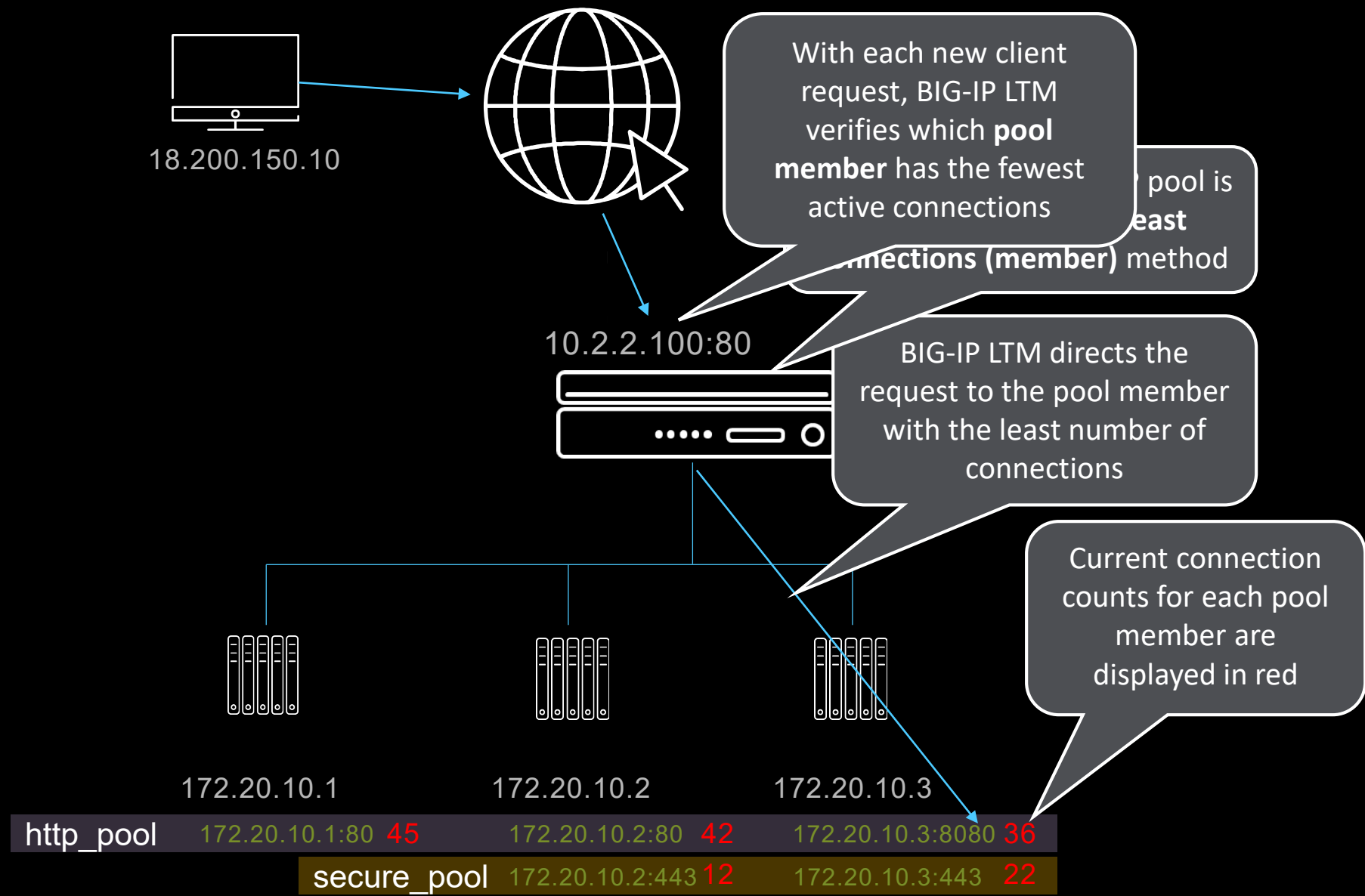
- **Least Connections**
 - Fewest L4 connections when load balancing decision is being made
 - Recommended when servers have similar capabilities
 - Very commonly used
- **Fastest**
 - Balances based upon the number of outstanding L7 requests and then L4 connections
 - Requires a L7 profile on the virtual server, else its just Least Connection
 - Recommended when servers have similar capabilities
- **Observed**
 - Calculates a ratio each second based on the number of L4 connections
 - Not recommended for large pools

*SOL6406 - Change in Behavior: Fastest, Observed, and Predictive load balancing modes

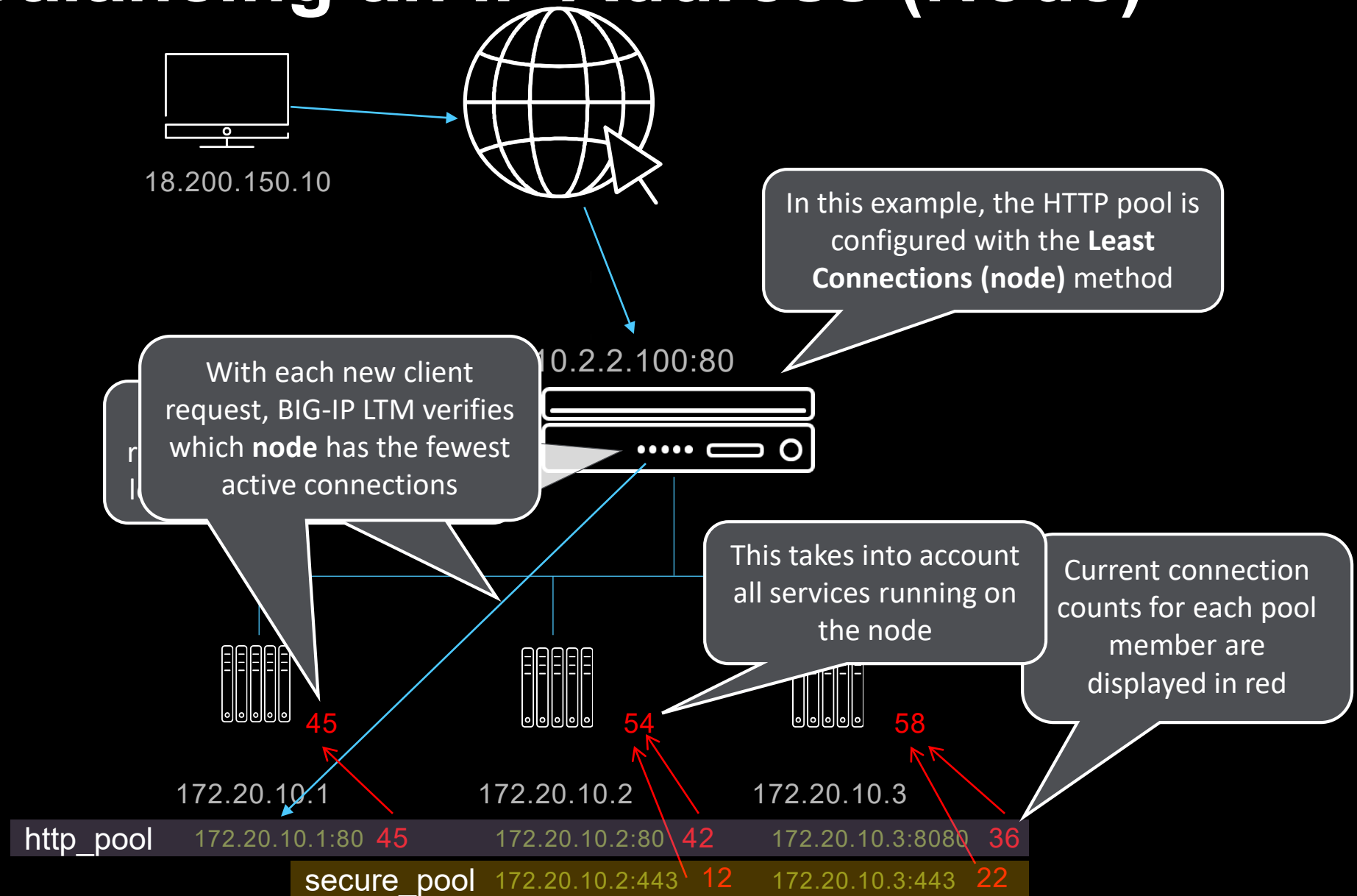
Dynamic Load Balancing Methods

- **Predictive**
 - Calculates ratio base on the change between the previous connection counts and the current connection counts
 - Not recommended for large pools
- **Weighted Least Connections**
 - Based on how close the number of connections are to meeting the connection limit for a pool member or node
 - Requires connection limits be set on pool member or node
 - Recommended when servers have different capabilities
- **Dynamic Ratio**
 - Dynamically weights servers based on the results of SNMP/WMI queries
 - Requires SNMP_DCA , SNMP_Base, or WMI pool monitoring
 - Recommended when custom calculations are needed

Load Balancing a Service (Member)

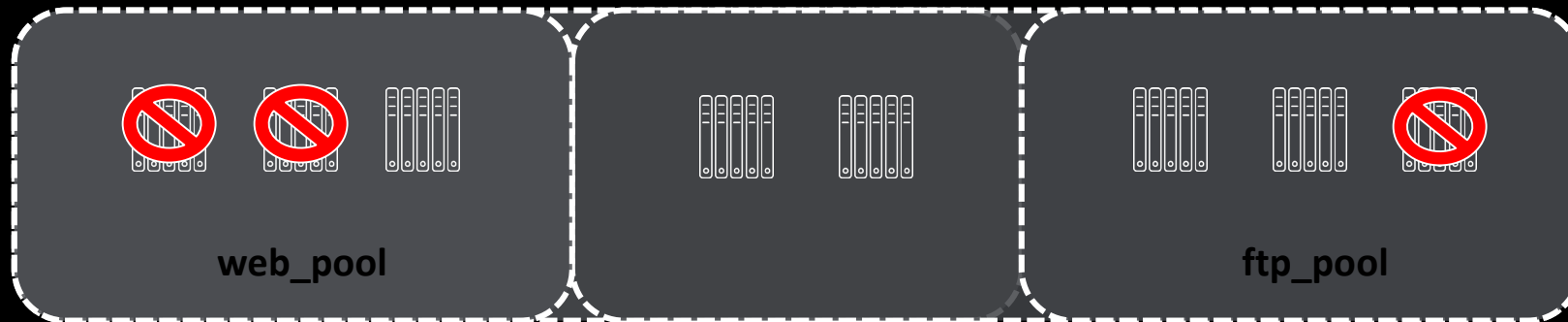


Load Balancing an IP Address (Node)



Pool Failure Mechanisms

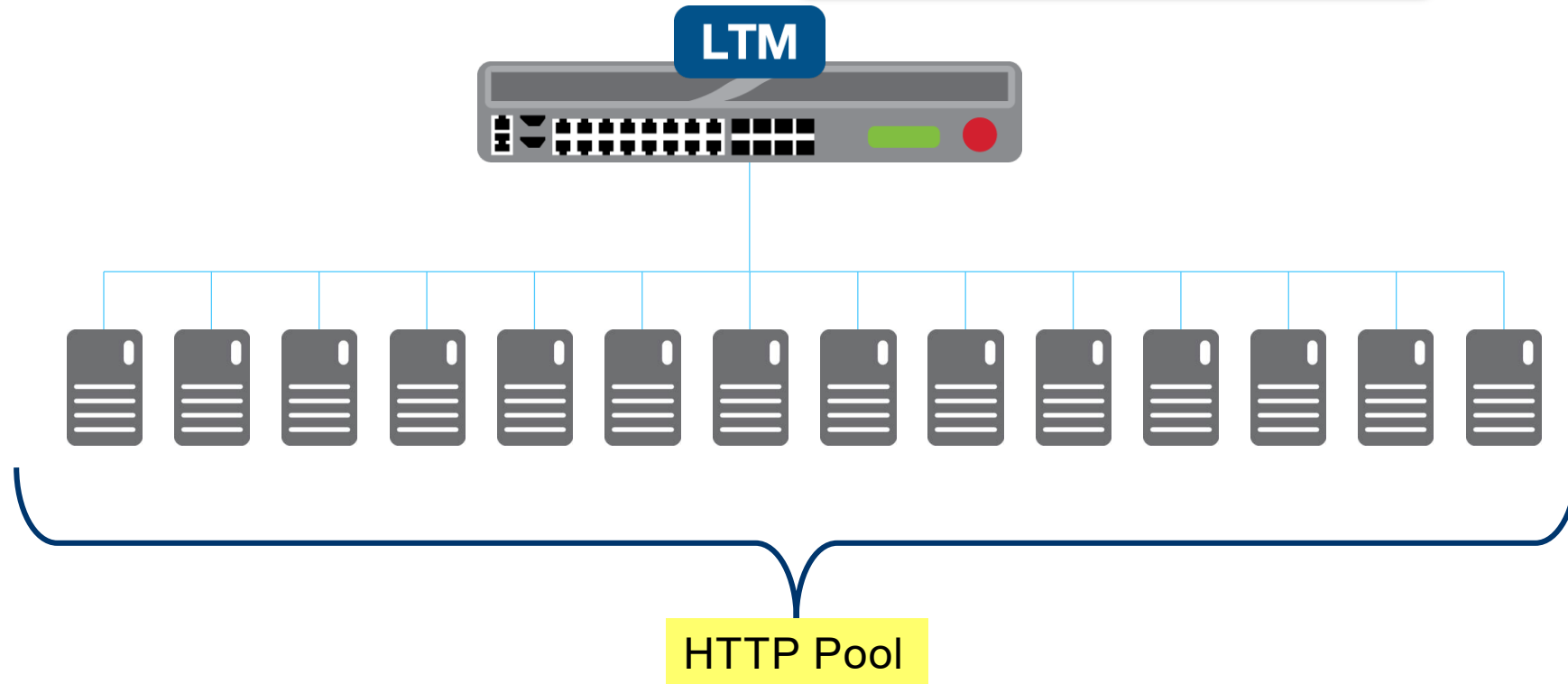
- **Fallback Host (for HTTP and HTTPS applications)**
 - Is the server of last resort if all pool members are unavailable
 - Returns HTTP redirect (http 302) to client
 - Configured in the HTTP profile, the fallback host is not monitored
- **Priority Group Activation**
 - Can dynamically pull in new members into the pool
 - Pulls lower priority groups into higher priority groups
 - Pulls in all members of a priority group together



Priority Group Activation

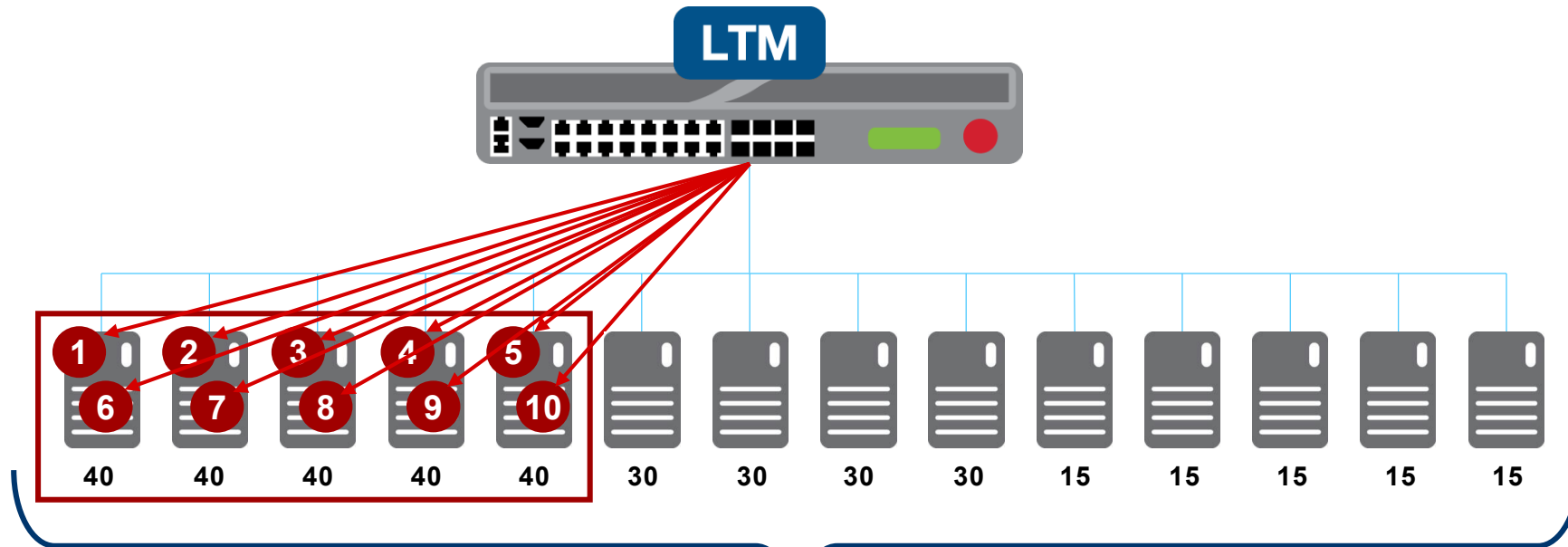
Preferred and backup sets of pool members

To meet client traffic demands



Using Priority Group Activation

BIG-IP LTM uses members with the highest priority number first



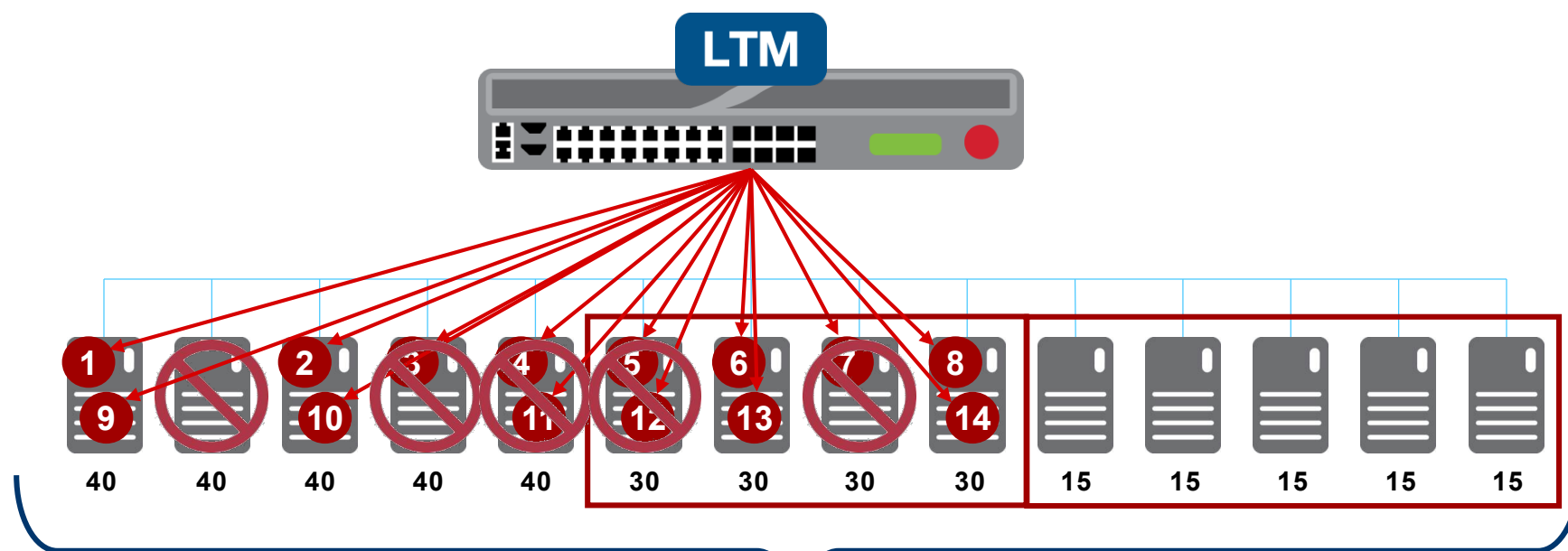
HTTP Pool

Priority Group Activation: Enabled

Less than 5 members

How Priority Group Activation Works

Priority Group Activation ensures that a pool doesn't go **below** a threshold



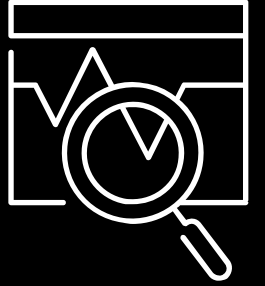
HTTP Pool

Priority Group Activation: Enabled

Less than 5 members

MONITORS

Types of Monitor Checks



- **Node checks**
 - Determines availability of all services for a particular node
 - For example, ICMP check determines if the node is pingable
 - When a check fails, the node is pull from all pools it has membership in
- **Service checks**
 - Checks connectivity to services/ports
 - For example, HTTP check determines if port 80 can be opened
- **Content checks**
 - Queries the service and checks the contents of the query
 - For example, HTTP GET / determines if the page returns with correct content
 - Content checks can involve username and passwords
- **Path checks**
 - Are transparent monitors that check devices outside the pool
- **Interactive checks**
 - Custom scripts that interact with application

Monitor Types in the GUI

- **Simple monitors**

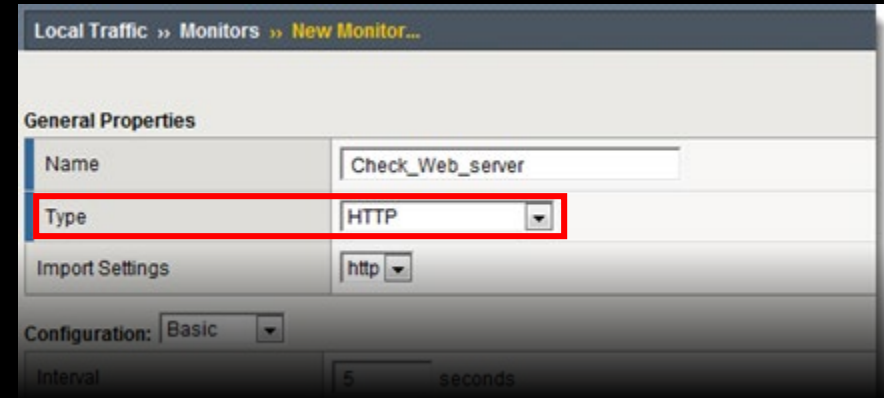
- ICMP
- Gateway ICMP
- TCP Echo

- **Extended Content Verification (ECV) monitors**

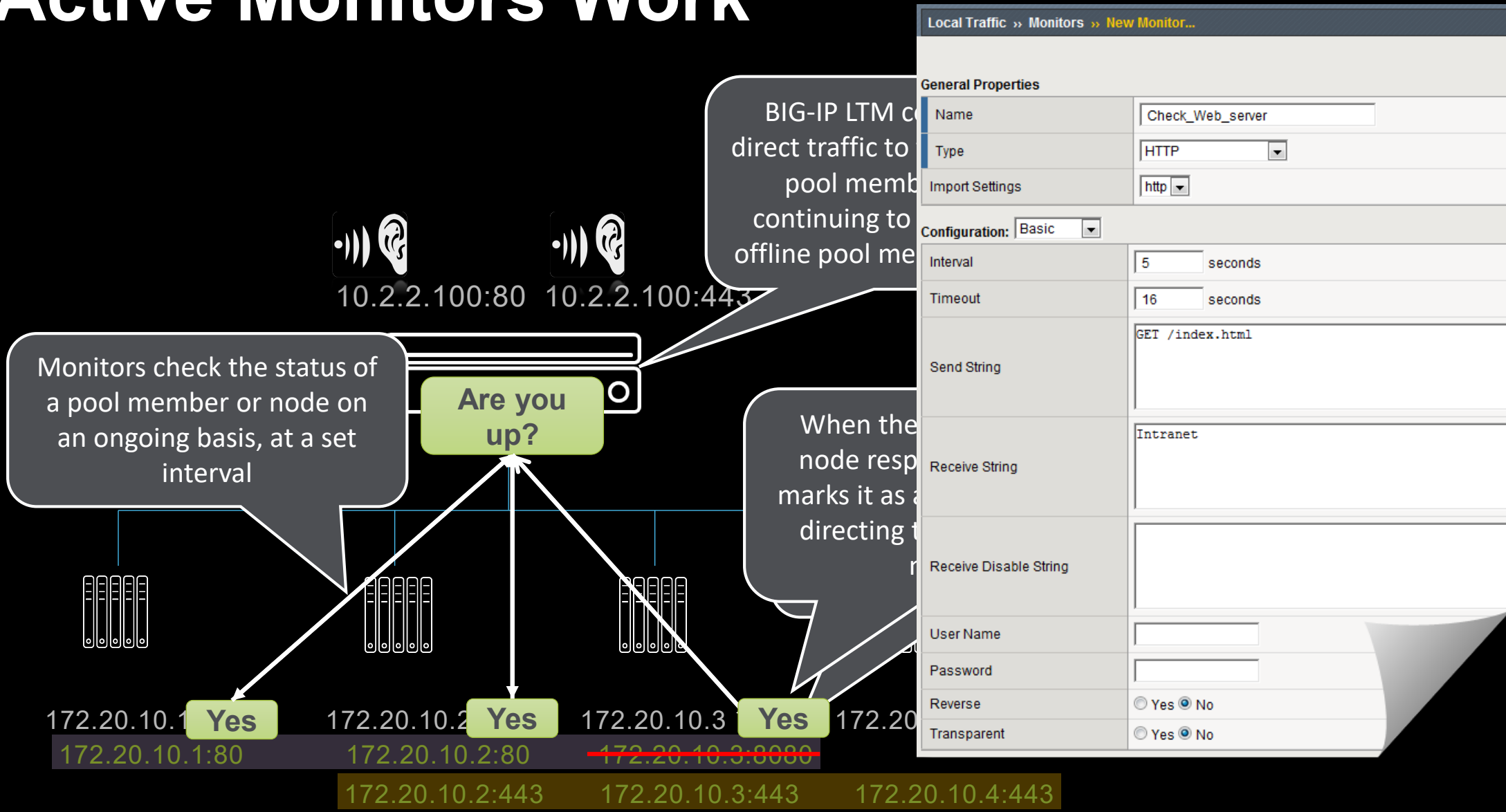
- TCP
- HTTP
- HTTPS

- **Extended Application Verification (EAV) monitors**

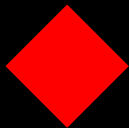
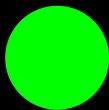
- | | | |
|------------|---------------|--------|
| • External | • Oracle POP3 | • SNMP |
| • FTP | • RADIUS | • SOAP |
| • IMAP | • Real Server | • UDP |
| • LDAP | • SIP | • WMI |
| • MSSQL | • SMTP | |
| • NNTP | • SNMP DCA | |



How Active Monitors Work



Monitor Status Reporting



Status	Status Definition	
Available	General: Child	• Monitor successful
	General: Parent	• At least one child is Green
	Child –Node	• Most recent monitor successful
	Pool Member	• Most recent monitor successful
	Pool	• <u>At least one</u> pool member is available
	Virtual Server	• <u>At least one</u> pool is available
Unknown	General: Child	• No associated monitor (or timeout of first check not reached)
	General: Parent	• All child objects are unknown (blue)
	Node	• No associated monitor (or timeout of first check not reached and not successful)
	Pool Member	• No associated monitor (or timeout of first check not reached and not successful)
	Pool	• All pool members are unknown (blue)
	Virtual Server	• All pools are unknown (blue)
Offline	General: Child	• Monitor failed
	General: Parent	• At least one child red AND no green or yellow children available
	Node	• Most recent monitor failed (no successful checks within timeout period)
	Pool Member	• Most recent monitor failed (no successful checks within timeout period)
	Pool	• One or more members are offline and no members are available
	Virtual Server	• One or more pools offline and no members available

Inband (Passive) Monitors

- **Inband monitors use client request to see if the pool member:**
 - Connects (SYN-SYN/ACK-ACK)
 - If there is a L7 profile on the virtual server (ie. HTTP), checks for a response to the L7 request
- **Inband monitors require pools and virtual servers that:**
 - Are Standard or Performance (Layer 4)
 - Use the TCP or SCTP protocol profile
- **Inband monitors are effective in marking a pool member down**
 - Not as efficient in marking a member up
 - Member remains uncheck for a period of time
- **Active monitors are more effective in marking members up**
- **Active and inband monitors can be combined**
 - For effective monitoring with a lower overhead monitoring
 - Monitors at a different interval if the pool member is available

Receive Disabled String

- This setting works like Receive String
- If the response matches Receive Disable String **AND NOT** the Receive String
- The node or member **Disabled**
- Can be used to allow web admins to disable members without needing BIG-IP access
- To use this setting, you must specify both
- Receive Disable String and Receive String.

Receive String	<div>Site Status: UP</div>
Receive Disable String	<div>Site Status: DISABLED</div>

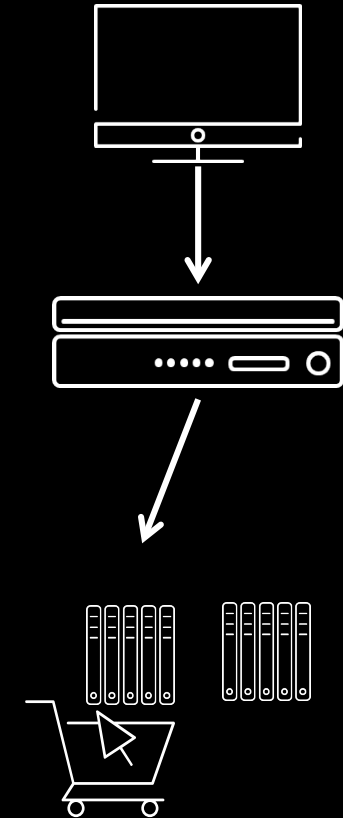
PROFILES & PERSISTENCE

Profiles

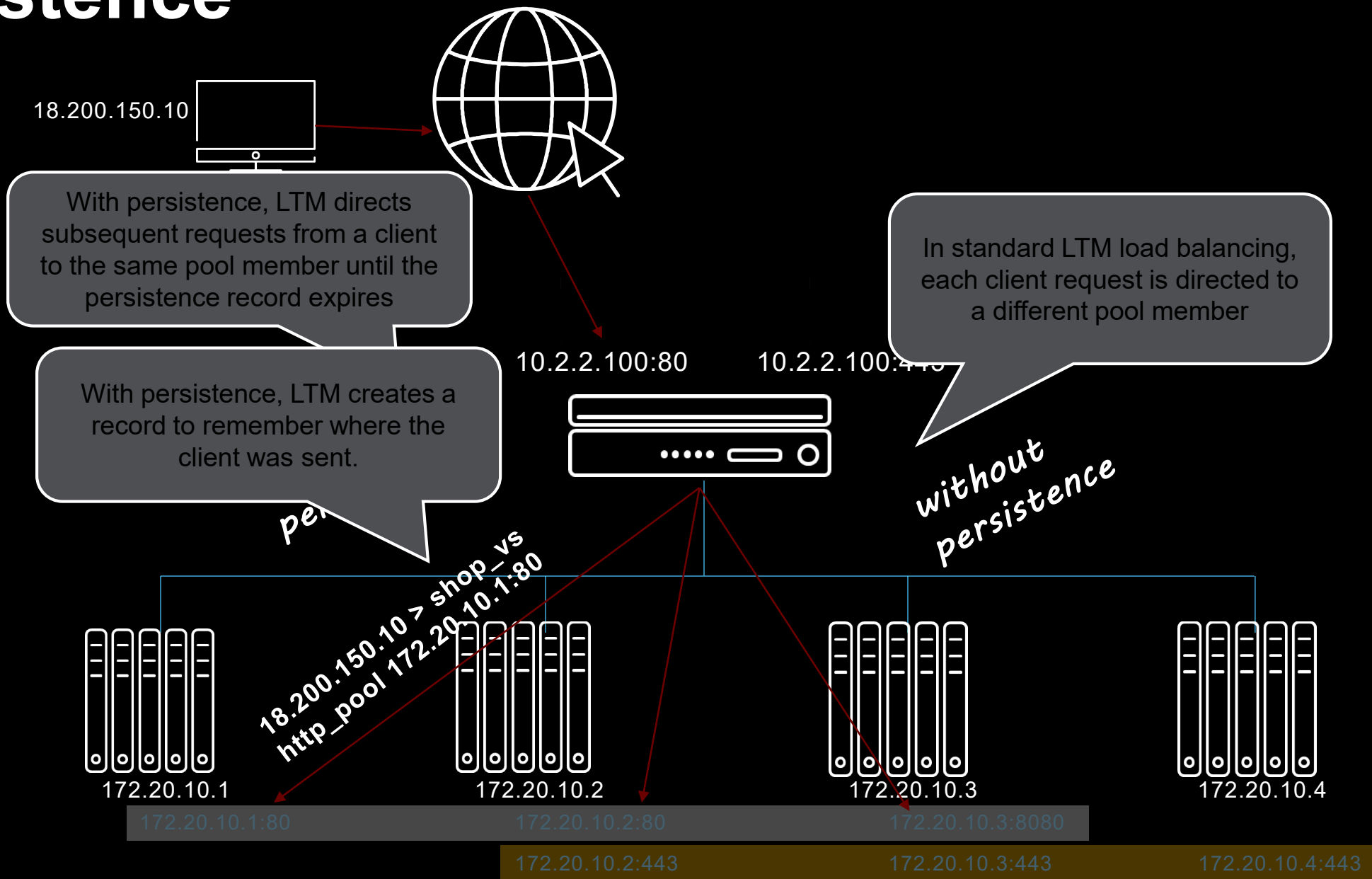
- **Are a configuration tool that aids you in managing application traffic**
- **A profile defines how a virtual server processes packets it receives**
 - Based on which profiles are assigned to the virtual server
 - Based upon the profile's configured parameters
 - The same profile can be associated with one or more virtual servers
- **Different profile types, different traffic processing capabilities**
 - Protocol profiles, such as, TCP and UDP
 - SSL profiles, for client-side and server-side certificates and keys
 - Service (L7) profiles, such as, HTTP, FTP, DNS
 - And many more.....
- **Profiles have a parent/child relationship**
 - Changes to a parent profile are passed down to the child profile(s)

Persistence

- **Persistence**
 - Directs a client back to the same server after the initial load balancing decision has been made
 - Is required for stateful applications
 - such as e-commerce shopping carts
 - May skew load balancing statistics
- **Basic persistence methods**
 - Simple Persistence
 - SSL Session ID
 - Cookie Persistence (Recommended for HTTP)
- **Other persistence methods**
 - Session Initiated Protocol (SIP)
 - MSRDp
- **Universal Persistence**
 - iRules can create persistence records based on anything in the clients request
 - Such as, jsessionid, username, etc.



Persistence



Persistence Settings

Match Across Services

- When enabled, specifies that all persistent connections from a client IP address that go to the same virtual IP address also go to the same pool member

Timeout

- Specifies the duration of the persistence entries
- Resets on a new connection

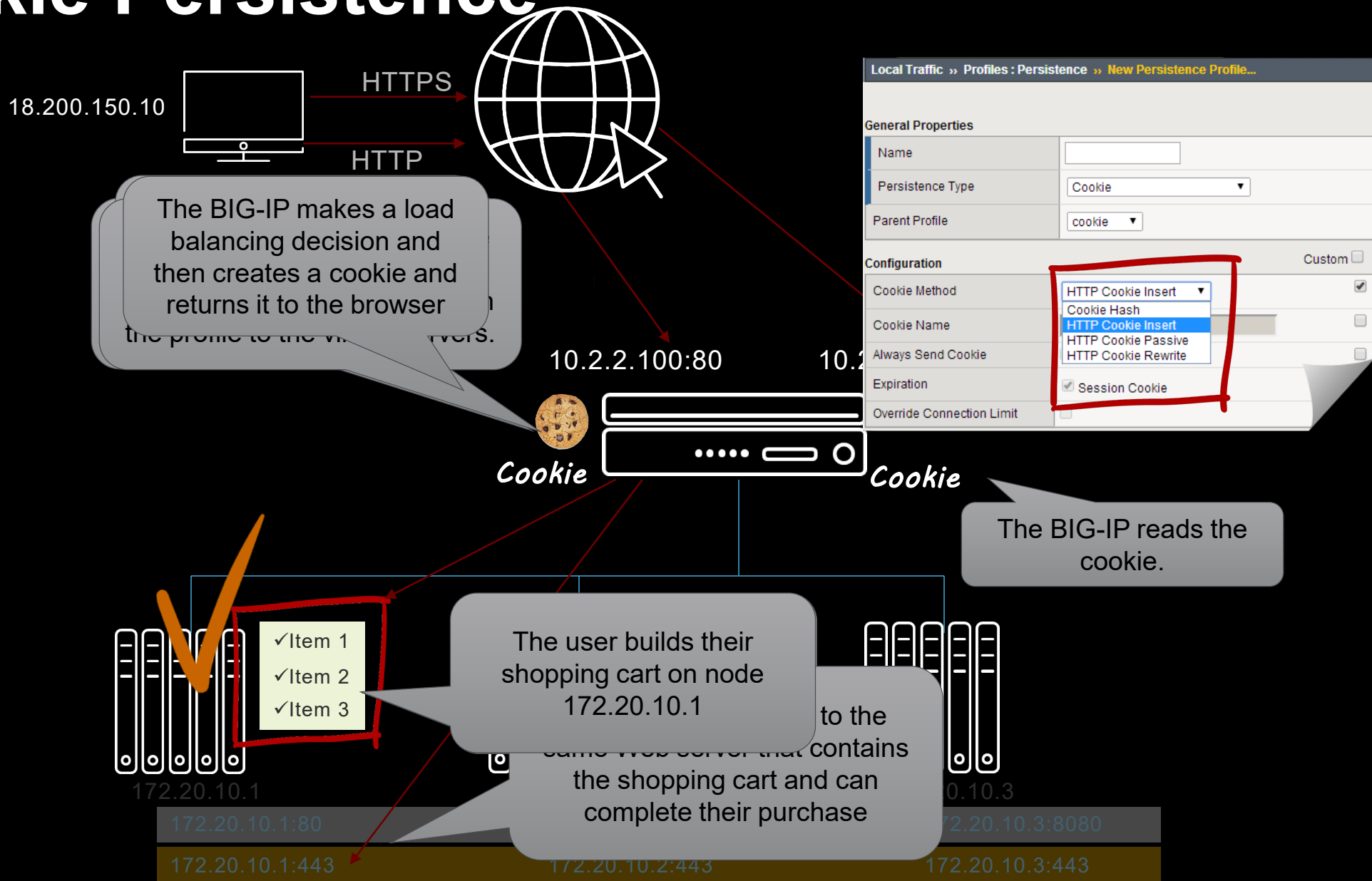
Override Connection Limit

- Allows new connections to be established if the connection limit is reached, if there is a persistence record

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

General Properties	
Name	HTTP_user_persis
Persistence Type	Source Address Affinity ▾
Parent Profile	source_addr ▾
Configuration	
Match Across Services	<input type="checkbox"/>
Match Across Virtual Servers	<input type="checkbox"/>
Match Across Pools	<input type="checkbox"/>
Hash Algorithm	Default ▾
Timeout	Specify... ▾ 360 seconds
Mask	Specify... ▾ 255255.255.255
Map Proxies	<input checked="" type="checkbox"/> Enabled
Override Connection Limit	<input type="checkbox"/>

Cookie Persistence



SSL OFFLOAD

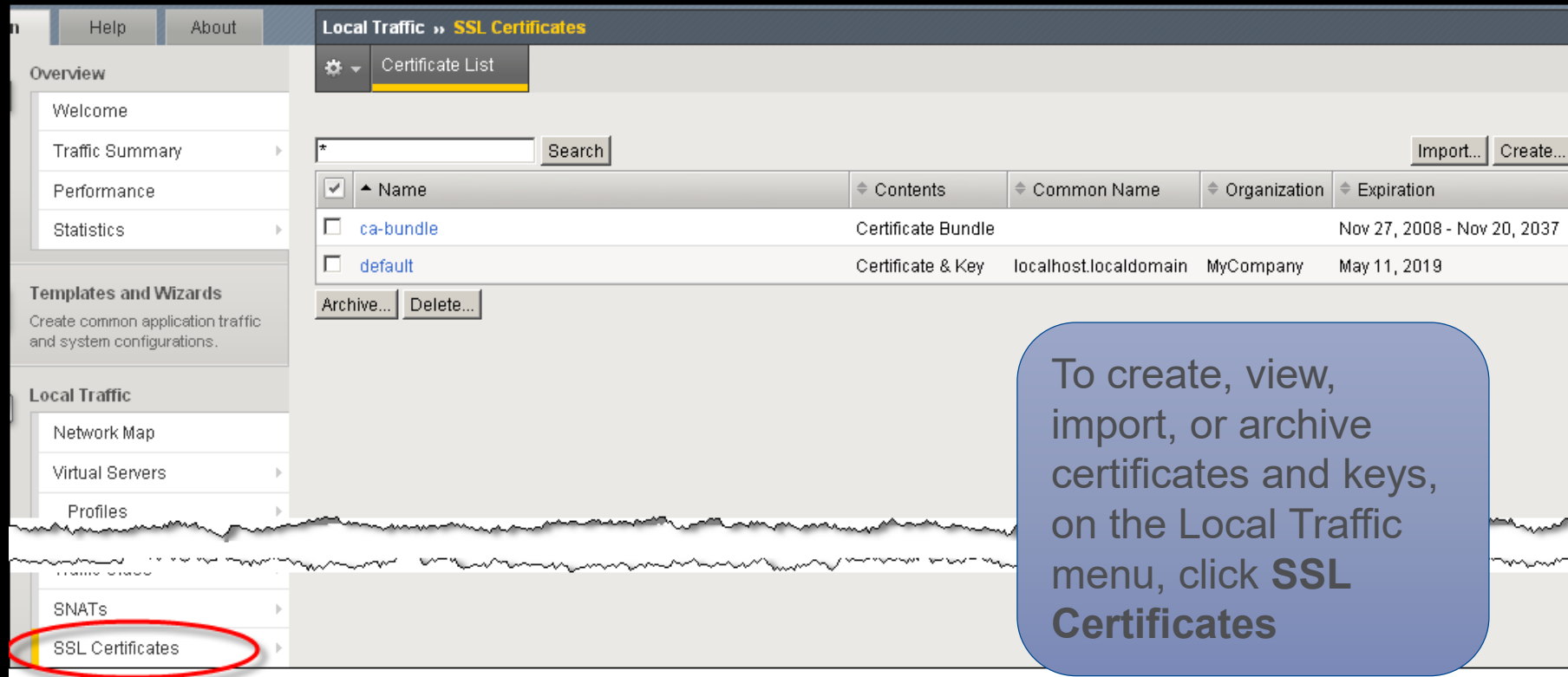
SSL Offload (aka SSL Visibility)

- **Terminates the SSL connection at BIG-IP**
 - BIG-IP has full visibility into the application
 - Enables the use of iRules, Profiles, et al
 - Can decrypt/encrypt for 3rd party security devices (ie. IPS/IDS)
 - Can free up valuable server resources
- **Includes:**
 - Consolidated certificate and key management
 - Support for FIPS hardware-based key security
- **Can selectively insert/retrieve SSL client certificate information to be used in traffic management decisions**
- **BIG-IP has hardware ASIC to perform:**
 - SSL key exchange
 - **SSL bulk encryption**

7	APPLICATION
6	PRESENTATION
5	SESSION
4	TRANSPORT
3	NETWORK
2	DATA LINK
1	PHYSICAL

Certificates and Keys

- BIG-IP allows you to create, import and view certificates



Certificates and Keys

You can create self-signed certificates or work with a Certificate Authority

You can import certificates into BIG-IP LTM

- Both PEM and PKCS certificates
- Or you can import previously archived certificates

Local Traffic » SSL Certificates » New SSL Certificate...

General Properties	
Name	<input type="text"/>
Certificate Properties	
Issuer	<div>Certificate Authority</div> <div>Certificate Authority</div> <div>Self</div>
Common Name	<input type="text"/>
Division	<input type="text"/>
Organization	<input type="text"/>
Locality	<input type="text"/>
State Or Province	<input type="text"/>
Country	<div>United States</div> <div>US</div>
E-mail Address	<input type="text"/>
Challenge Password	<input type="text"/>
Confirm Password	<input type="text"/>
Key Properties	
Size	<div>1024</div> bits
<div>Cancel</div> <div>Finished</div>	

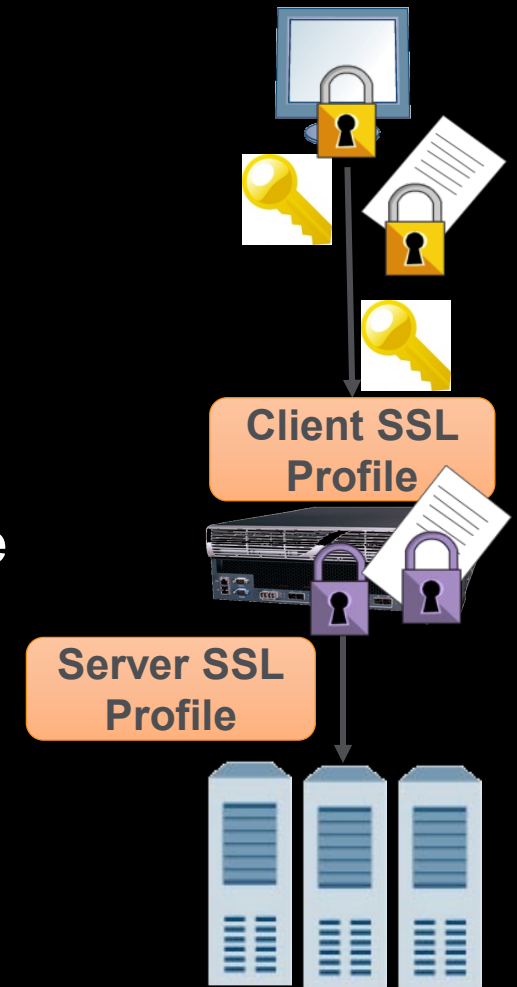
Processing SSL Traffic on the Client-Side

- **To configure a virtual server to process HTTPS:**
 - Import/Create certificate and key
 - Create a client SSL profile,
 - Attach the certificate and key
 - Create a virtual server
 - In the **SSL Profile (Client)** box choose the SSL profile
- **How client-side processing works**
 - Client connects to a virtual server that is configured with the client SSL profile
 - The client and BIG-IP perform a key exchange and establish an encrypted session
 - The virtual server receives the client traffic
 - Decrypts traffic
 - Performs traffic management functions
 - For example, iRules or cookie persistence
 - The BIG-IP then sends the unencrypted traffic to the chosen pool member



Processing SSL Traffic on the Server

- **Use SSL server profiles for highly secure environments**
 - Configure a server-side SSL profile
 - *Certificate could be self signed of lower encryption*
 - Attach the SSL Server profile to the virtual server
- **How server-side processing works**
 - Client connects to the virtual server using the cert and key in the client SSL profile
 - They establish an encrypted session
 - The virtual server receives and decrypts the traffic
 - Performs traffic management functions
 - An encrypted session is established between BIG-IP LTM and the selected pool member.
 - Using the certificate and key in the SSL Server profile
 - The data is re-encrypted and sent to the pool member

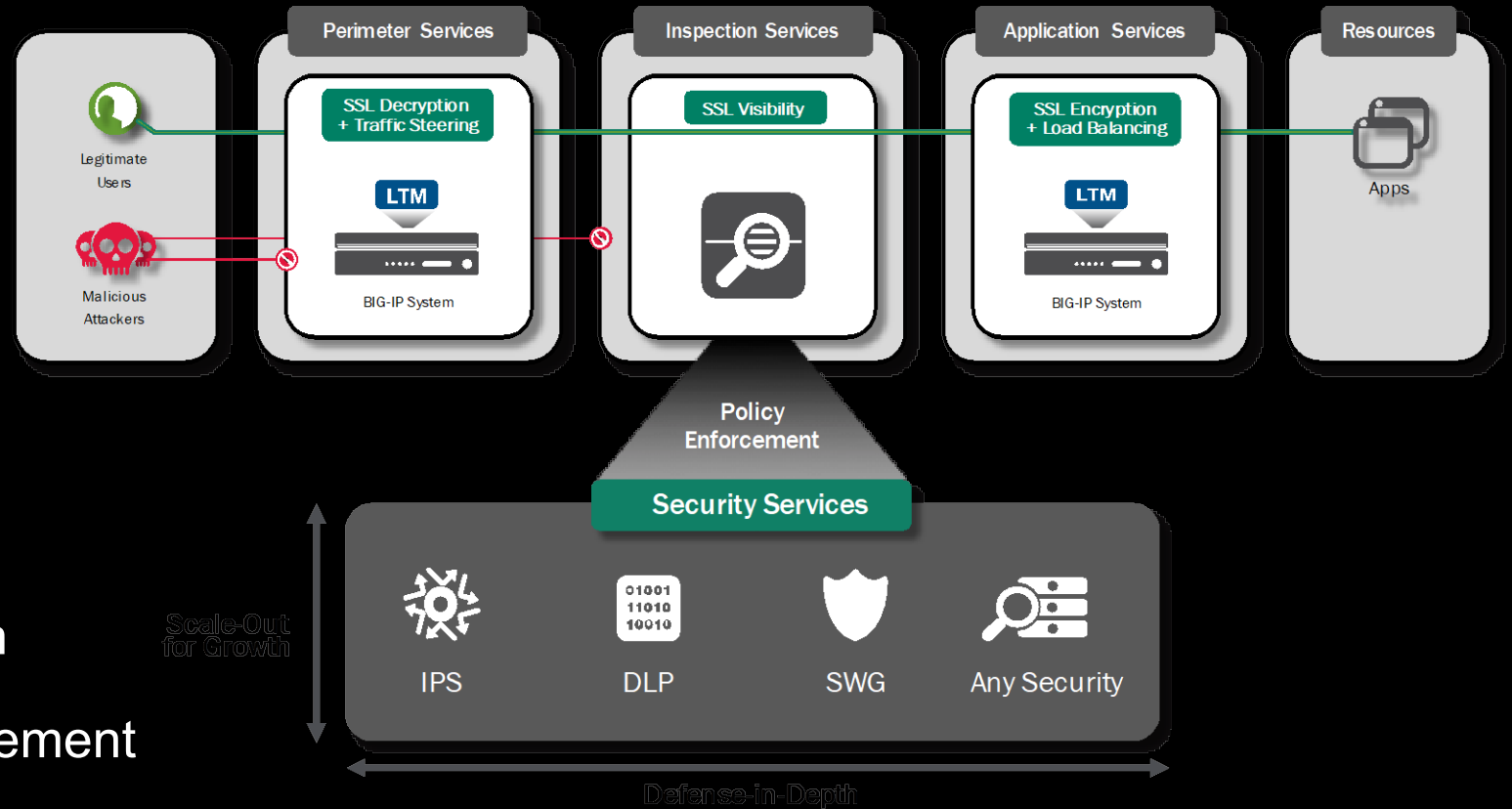


SSL visibility and inspection

Benefits of SSL visibility

SSL visibility provides:

- Malware protection
- Corporate compliance
- Productivity monitoring
- Intellectual property protection
- Customer experience enhancement
- Decreased cost and complexity of content security functions



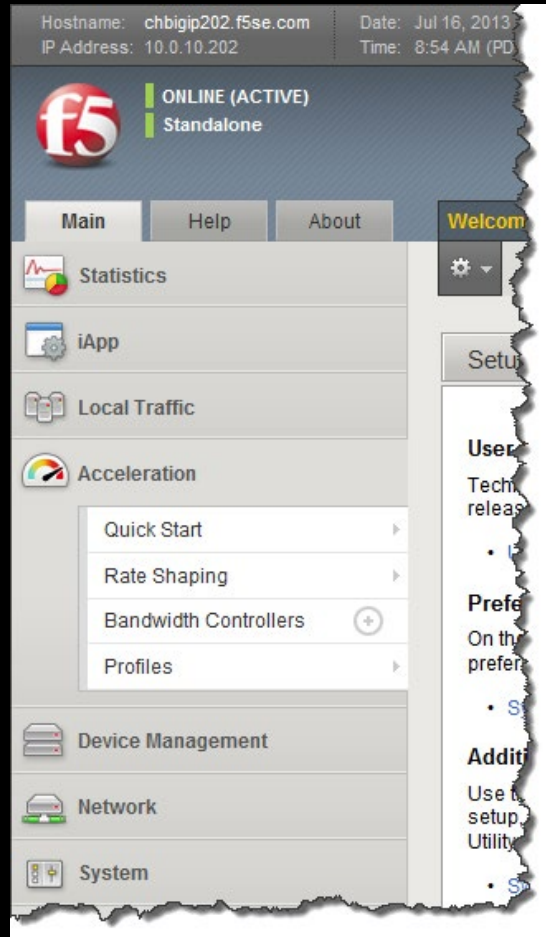
ACCELERATION

LTM (TMOS) Core Acceleration Features

- **Core TMOS acceleration technologies**
 - TCP Express
 - OneConnect
 - HTTP compression
 - Fast Cache
 - iSessions
 - Rate Shaping
 - Bandwidth Controller
 - SPDY Gateway
 - HTTP/2 Gateway

Acceleration Interface

- Prior to V11.4 acceleration profiles appeared only under Local Traffic >> Profiles
- After V11.4 acceleration profiles are also under the Acceleration tab, along with other features



Quick Start	Symmetric Properties
Rate Shaping	Deploy Applications

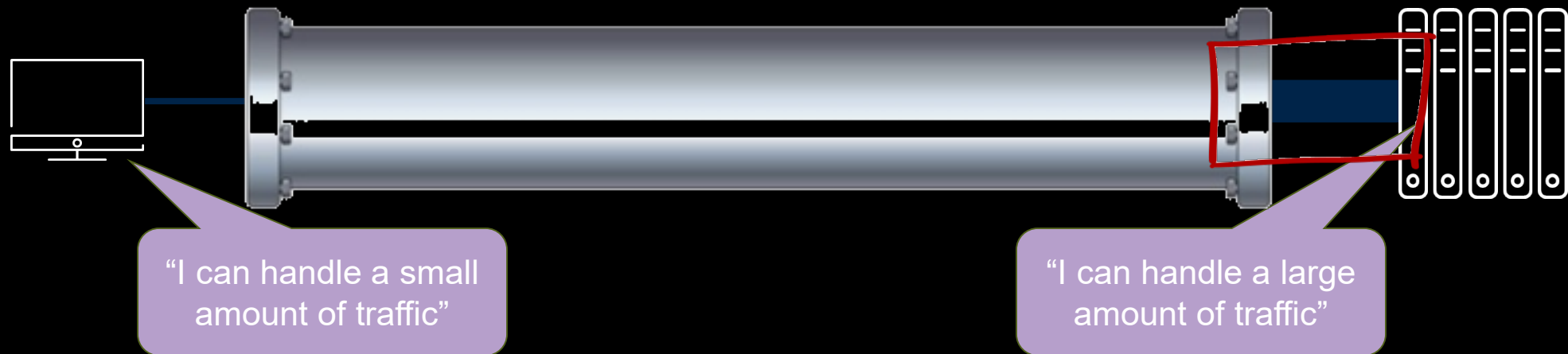
Quick Start	
Rate Shaping	Rate Class List (+)
Bandwidth Controllers (+)	Statistics (x)
Profiles	

Quick Start	
Rate Shaping	
Bandwidth Controllers (+)	
Profiles	

Quick Start	
Rate Shaping	
Bandwidth Controllers (+)	
Profiles	HTTP Compression (+)
	Web Acceleration (+)
	SPDY (+)
	CIFS (+)
	MAPI (+)
	OneConnect (+)
	NTLM (+)
	iSession (+)
	TCP (+)

Problems with Traditional TCP

- **TCP/IP inefficiencies, coupled with WAN latency and packet loss, all contribute to slow application performance**
 - Inflated client response times
 - Reduced bandwidth utilization (ability to “fill the pipe”)



TCP Acceleration Features



Goal: To improve the client experience

TCP Express (or TCP optimization)

- Adaptive congestion windows
- Fast retransmits
- Selective acknowledgements
- Congestion notification

TCP Client-Side Profiles

Goal: Server offload

Content Buffering

- Content spooling

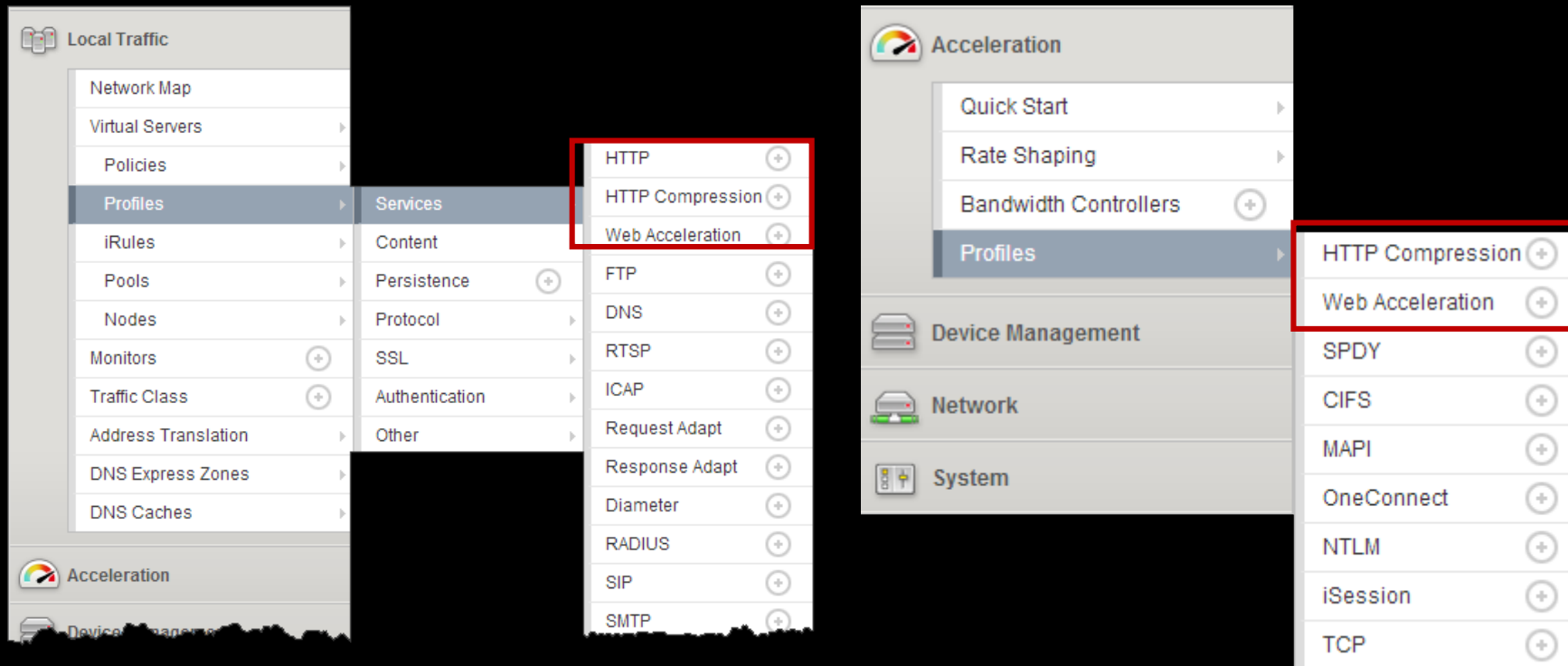
Connection Management

- OneConnect

TCP Server-Side Profiles

What Is the HTTP Profile?

- Layer 7 profile, notifies the virtual server to parse the HTTP protocol, headers and request/response sequences
- The all HTTP profiles are under **Local Traffic > Profile > Services**
- The HTTP acceleration profiles are also under **Acceleration > Profiles**



HTTP Profile

Local Traffic » Profiles : Services : HTTP » http

Properties

General Properties

Name	http
Partition / Path	Common

Settings

Basic Auth Realm	
Fallback Host	
Fallback on Error Codes	

Request Chunking

Request Chunking	Preserve
Response Chunking	Selective
OneConnect Transformations	Enabled
Redirect Rewrite	None
Encrypt Cookies	
Cookie Encryption Passphrase	*****
Confirm Cookie Encryption Passphrase	*****
Maximum Header Size	32768 bytes
Maximum Header Count	64
Pipelining	Enabled

Insert X

Insert X	Disabled
----------	----------

LWS M

LWS S

Maximum Requests	0
Protocol Security	
Send Proxy Via Header In Request	Preserve
Send Proxy Via Header In Response	Preserve

Local Traffic » Profiles : Services : HTTP Compression » httpcompression

Properties

General Properties

Name	httpcompression
Partition / Path	Common

Compression

Selective Compression	
URI Compression	URI List...
URI	
Include	
Exclude	
Include List	
Exclude List	

Content Compression

Content List	
Content Type	
Include	
Exclude	
Include List	text/ application/(xml x-javascript)
Exclude List	

Preferred Method

Preferred Method	Gzip
------------------	------

Minimum Content Length

Minimum Content Length	1024 bytes
------------------------	------------

Vary Header

Vary Header	Enabled
HTTP/1.0 Requests	
Keep Accept Encoding	
Browser Workarounds	
CPU Saver	Enabled
CPU Saver High Threshold	90 %
CPU Saver Low Threshold	75 %

Local Traffic » Profiles : Services : Web Acceleration » webacceleration

Properties

General Properties

Name	webacceleration
Partition / Path	Common

Cache Settings

Cache Size	100 megabytes
Maximum Entries	10000
Maximum Age	3600 seconds
Minimum Object Size	500 bytes
Maximum Object Size	50000 bytes

URI List

Include List	
Exclude List	

Ignore Headers

Ignore Headers	All
----------------	-----

Insert Age Header

Insert Age Header	Enabled
-------------------	---------

Aging Rate

Aging Rate	9
------------	---

Fallback Host

- For HTTP and HTTPS virtual servers
- Redirects the user when pool is down
- Use the format `http://<hostname>`

Insert XForwarded For

- Enable to insert the original client IP in the HTTP header

COMPRESSION

Using Standard HTTP Compression

- **Benefits:**
 - Clients get data more quickly
 - Reduces bandwidth usage
 - Less data to encrypt
- **Drawbacks:**
 - Adds an extra load to both the client and server
 - Often requires compression software/hardware on every web server

BIG-IP Intelligent HTTP Compression

- **All the benefits previously discussed**
- **Offload compression from the servers, reducing CPU**
 - This can be accomplished even if the servers are currently compression
 - We will review this on the next slide
- **If iRules or BIG-IP policies are required to manipulated the data**
 - HTTP headers are not compressed
- **Compress on a per virtual server**
- **Compress based on URI or file type**
- **Compression can be scaled based on CPU load**
 - Important if you are doing compression through the software
- **Base Licensing**
 - On current hardware, max compression part of base license
 - Compression in hardware on X200 series.

DEVICE SERVICE CLUSTER (DSC)

Device Service Cluster (DSC)

- **DSC is a series BIG-IPs supporting each other**
 - May also be referred to as Centralized Management Infrastructure (CMI)
- **Each BIG-IP has a Device Object for itself containing;**
 - Unique device information
 - A Certificate for building trusts
 - Device HA and failover settings for the local device
- **BIG-IPs are then placed in Device Trust Groups**
 - Exchange certificates for secure communications
 - Exchange HA settings
- **BIG-IPs in a Trust Group are combined into Device Groups**
 - A device group may support config sync and failover
 - Or synchronization of selected configuration items only

Sync Only Device Groups

- **Allows flexible membership**

- Different hardware platforms
- Different license/modules

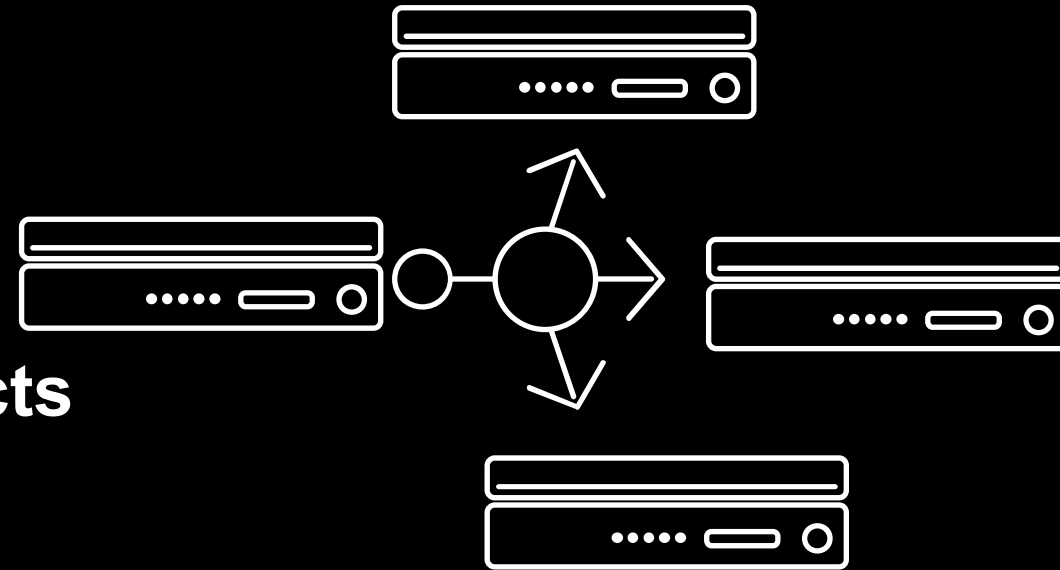
- **Can be configured to auto-sync objects**

- | | |
|---------------------|------------|
| • Certificates | • iApps |
| • CRL | • iRules |
| • Data groups | • Policies |
| • External monitors | • Profiles |

- **Max of 32 Sync-Only groups are supported**

- **Device trust uses built-in sync-only group “device_trust_group”**

- Auto-sync enabled
- Adding devices to trust-domain auto-adds to device_trust_group



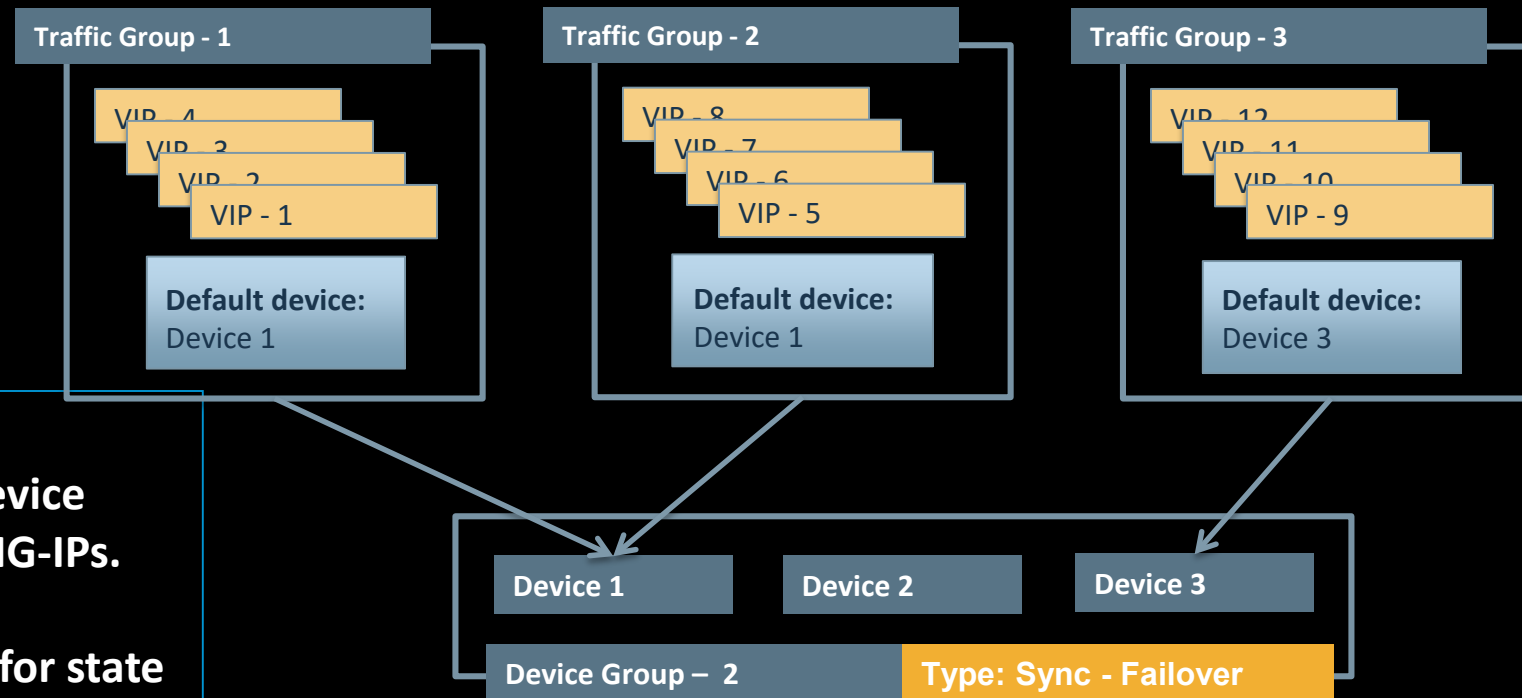
Traffic Groups

- **A group of listeners (IP addresses)**
 - Virtual address
 - Self IP address
 - SNAT
 - NAT
- **Two different types**
 - Non-floating
 - Floating

Going Beyond Two Devices

If a customer wishes to add devices to the sync-failover group

- Set up the configsync and HA configuration and add the new device to the trust
- Assign the new to the sync-failover device group and sync to the new device
- Adjust traffic group



Caveats:

- GTM can only monitor device groups of two or fewer BIG-IPs.
- V11.4 or higher required for state mirroring.

Oh! In case you missed it!

- **Automatic synchronization is now available for sync-failover**
 - Disabled by default

Device Management » Device Groups » my-device-group

⚙️ Properties Failover

General Properties

Name	my-device-group
Group Type	Sync-Failover
Description	

Configuration: **Advanced**

Members	Includes	Available
	<i>/Common</i> chbigip131.f5se.com chbigip132.f5se.com chbigip133.f5se.com	







Automatic Sync ☐

Full Sync ☐

Maximum Incremental Sync Size (KB) 1024

F5 DoD Account Team



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F5 DoD Virtual User Group (DoDVUG) Schedule

Date	Title	F5 DoDVUG Topic
Apr 9th Thursday@ 1500	F5 DoD Virtual User Group #1	F5 Access Policy Manager with remote access, network tunneling, and CAC/PIV Authentication.
April 23rd Thursday@ 1500	F5 DoD Virtual User Group #2	Get Your SaaS in Gear Enterprise Application Strategy
May 7th Thursday@ 1500	F5 DoD Virtual User Group #3	Ghastly Wealth Compliance using F5 ASM
May 21st Thursday@ 1500	F5 DoD Virtual User Group #4	Automation/Orchestration - F5 A/O Toolchain
June 4th Thursday@ 1500	F5 DoD Virtual User Group #5	SCCA / SACA
June 18th Thursday@ 1500	F5 DoD Virtual User Group #6	SSLO Orchestrator

Thank You

