Application Note

Using F5 BIG-IP® traffic management and load balancing in a Cisco Unified Customer Voice Portal Solution

Aug 19, 2013

Overview

The Cisco Unified Customer Voice Portal (Unified CVP) leverages a VXML based architecture. The VXML browser can access the VXML server and media servers directly, but for larger deployments it may benefit from leveraging an HTTP load balancer.

Typically in a large Unified CVP solution deployment, Cisco load balancers are used to load-balance incoming http and https traffic. The F5 BIG-IP® (Load Balancer) can also provide the functionality required to load balance the Unified CVP http and https traffic. The Unified CVP solution can be deployed with the BIG-IP load balancer in both Standalone and Comprehensive deployment models, where the BIG-IP can perform the following functions:

- HTTP load balancing with CVP VXML Servers
- HTTPS load balancing with CVP VXML Servers
  - SSL offloading at F5-LTM
  - End-to-End HTTPS
- Media server load balancing

To validate the interworking of F5 BIG-IP® with the Unified CVP, the parameters can be adjusted based on the physical, virtual, or cloud deployment.

This Application Note details the use for connectivity of F5 BIG-IP® with CVP. It serves as guidance for integration. However, it does not guarantee interoperability for every use case. Under the same conditions, this document may also be leveraged with different component versions and different service providers. As in any third-party interoperability, Cisco provides support for its own components, but may not be able to fully assist in end-to-end troubleshooting or provide timely diagnostics and fixes.

Note The Big-IP load balancer can also be used to load balance requests to enterprise systems (like having the Call Server in IVR mode only). The load balancing of SIP protocol though BIG-IP is not supported for CVP components.

Versions of products used in testing

- Cisco ISR G2 3945E Version 15.3(3)M version of the IOS (gateway).
- Unified Customer Voice Portal 9.0 and 10.0 (CVP)
- Unified Communications Manager 9.0 (CUCM)
- BIG-IP 11.3.0 (F5 Load Balancer)

Tested Features

To validate the interworking of the F5 load balancer with the Cisco Unified CVP, the following functional areas have been tested in the Standalone mode:

- HTTP load balancing with CVP VXML Servers (Refer Figure 1 for the network topology)
- HTTPS load balancing with CVP VXML Servers
  - SSL offloading (Refer Figure 2 for the network topology)
  - End-to-End HTTPS traffic (Refer Figure 3 for the network topology)
- Media server load balancing (Refer Figure 4 for the network topology)

Figure 1 VXML HTTP load balancing with Unified CVP

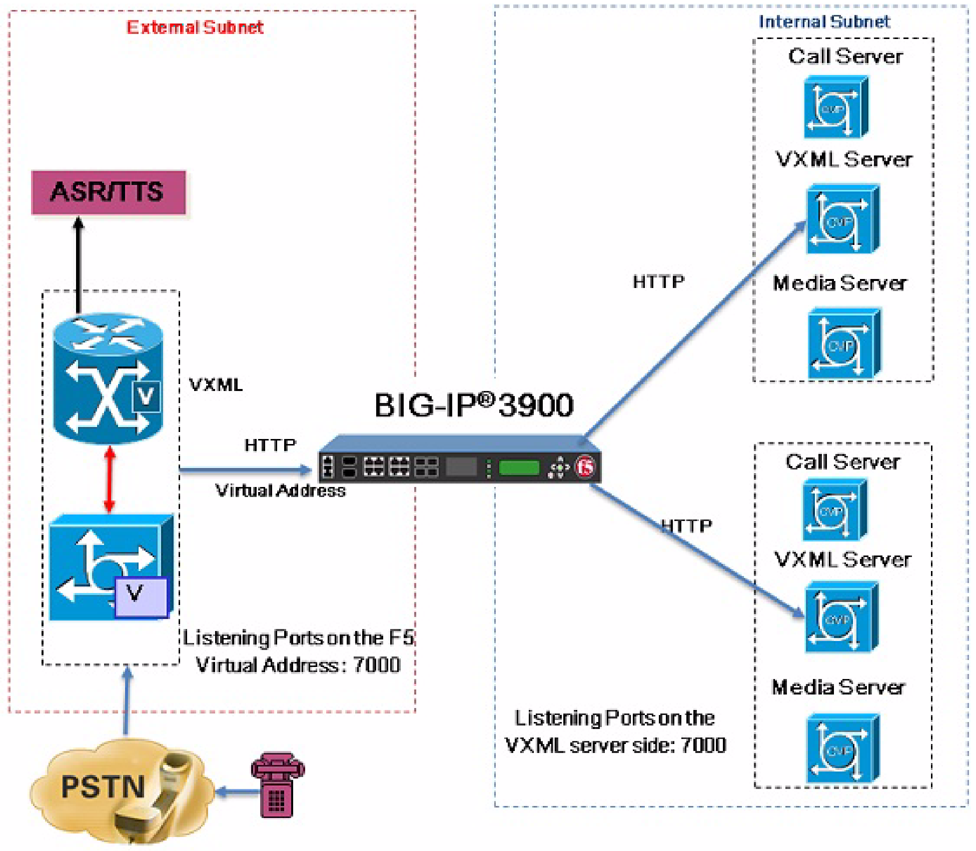


Figure 2 VXML HTTPS load balancing – SSL offload

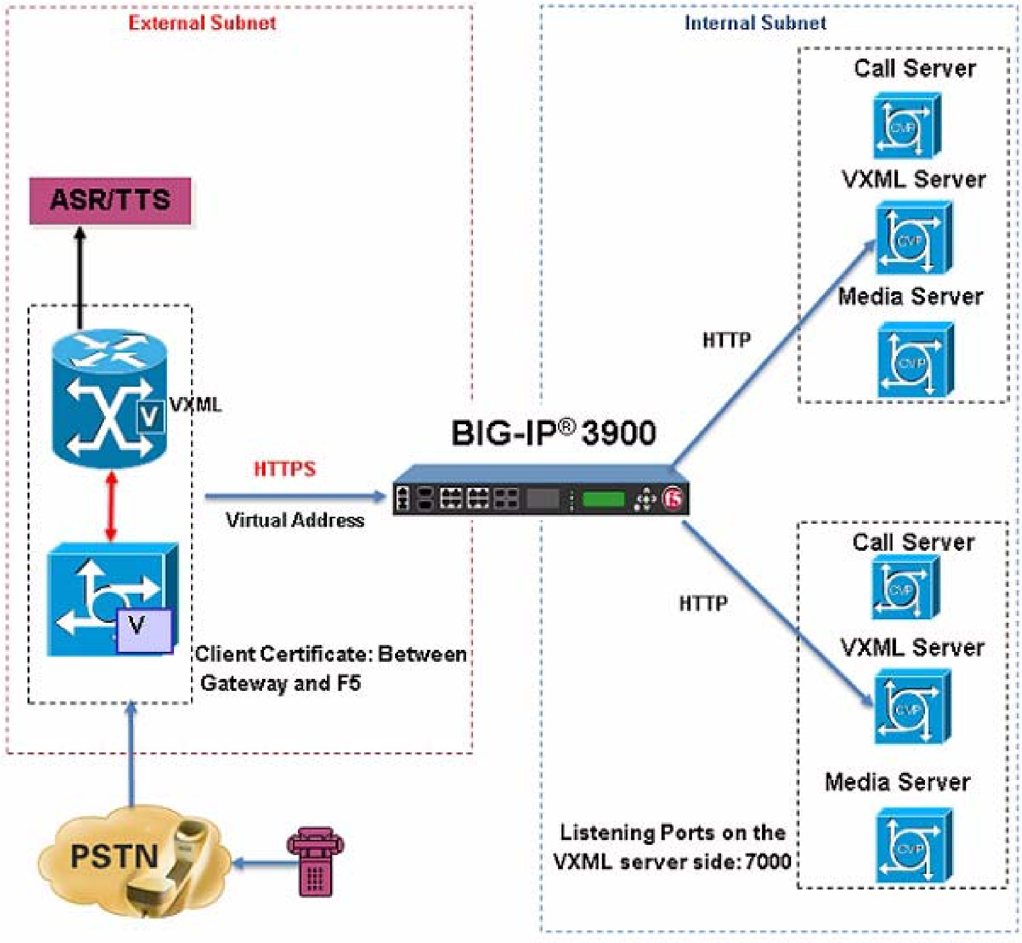


Figure 3 VXML HTTPS load balancing – HTTPS load balancing

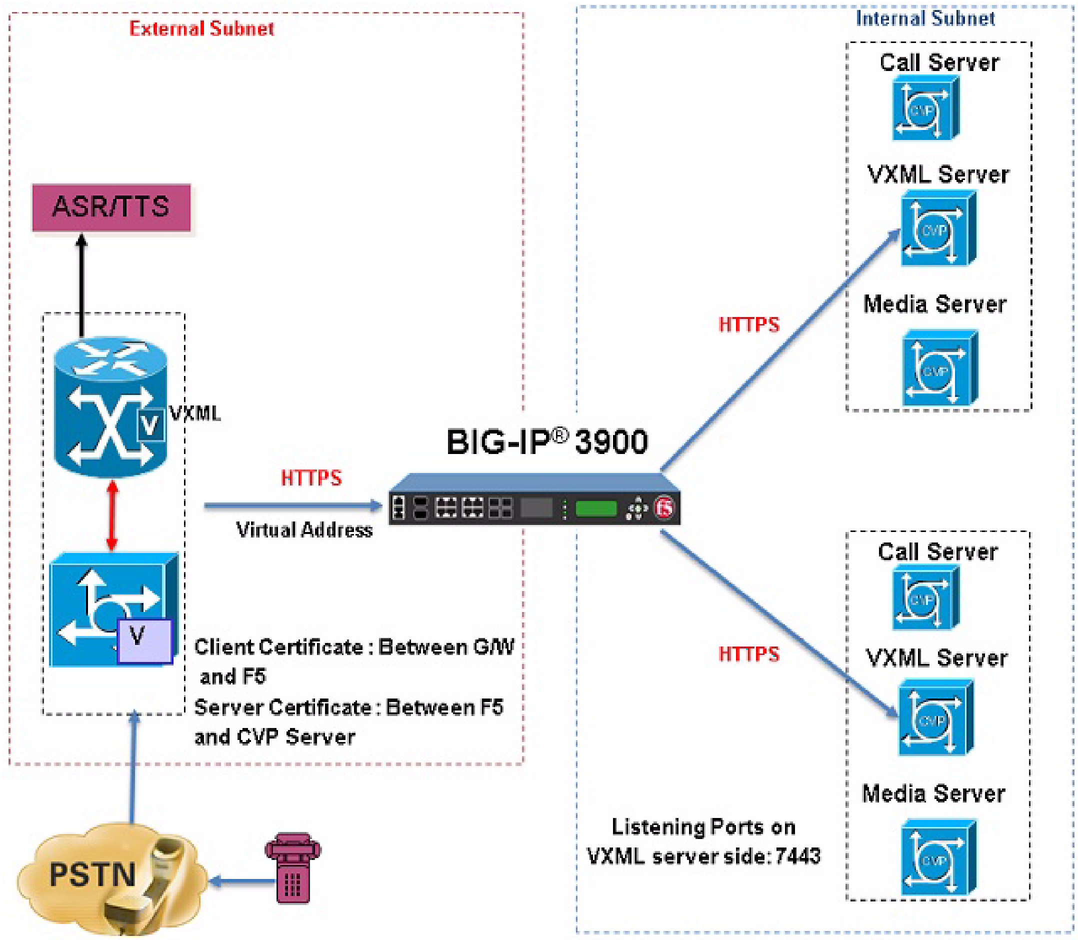
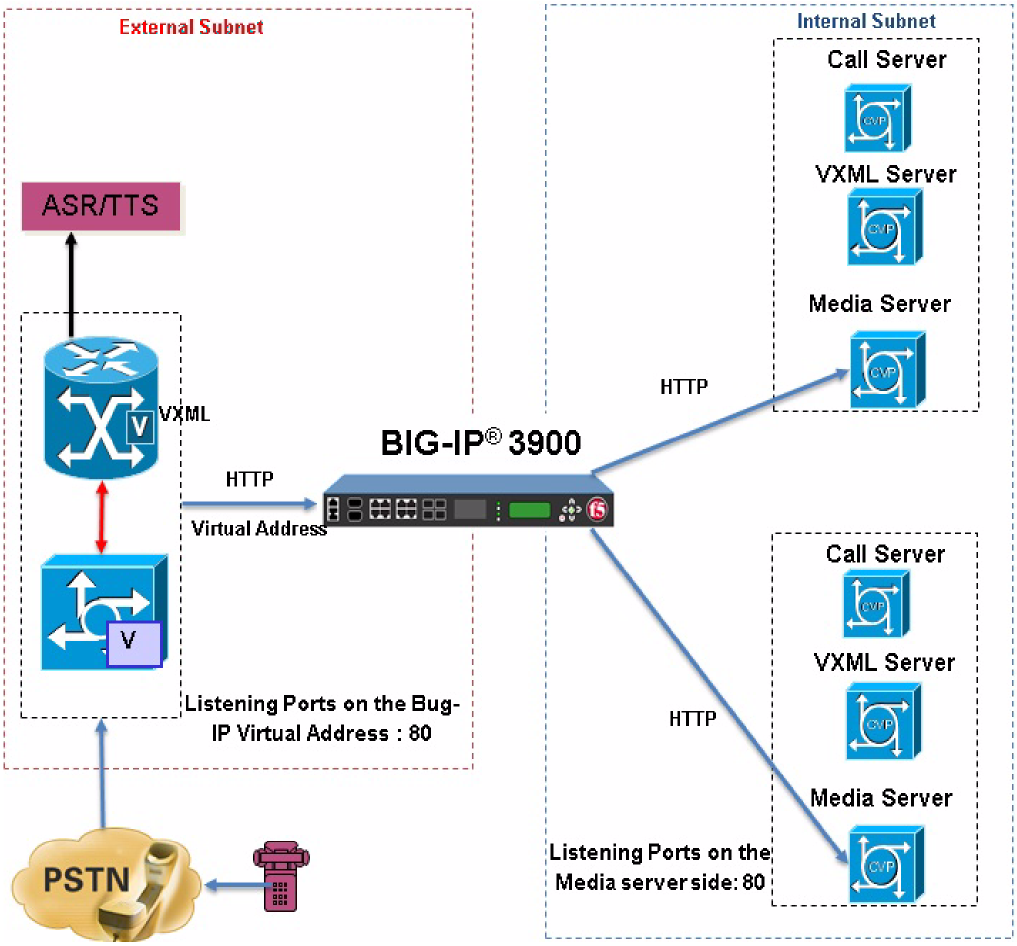


Figure 4 *Media server load balancing*



Note All the above features tested with Redirect = true / false in CVP Server (Session Based / Non Session Based)

Table 1 ***The following table provides information on the load balancing scenarios for http / https protocols that were tested.***

Component	Protocol	Port	Configuration of Internal port on F5	Comments
Media Server	TCP 80	HTTP	80	
Voice Gateway to Unified CVP VXML Server	TCP 7000	HTTP	7000	
Voice Gateway to Unified CVP VXML Server	TCP 7443	HTTPS	7443	Both End-to-End HTTPS and SSL off-loading at F5 scenarios have been tested.

Note The scope of the document is limited for testing HTTP and HTTPS load balancing of CVP VXML Server and CVP Media Server. The load balancing of Speech Servers is not covered as a part of this document. For speech server load balancing, it is recommended to work with the Speech Server vendor and F5 for support.

Note In the Comprehensive deployment mode, the VXML browser also fetches pages from the IVR Service in the Call Server using ports 8000/8443. This interaction must not be load balanced as the http request must use the same Call server that is handling the SIP signaling for the call.

Caveats

- The Oneconnect feature in the F5 load balancer cannot be used while using load balancing with CVP.
- Only the 7443 port of the F5 load balancer can be used for HTTPS connections.

Note The OneConnect profile is a configuration tool in F5 to enable connection pooling. By enabling Oneconnect profile, client requests try to utilize existing server-side connections. Since both, Gateway and CVP server prefer "connection = close" header in their http requests /responses, it is recommended to disable the Oneconnect feature in the F5 load balancer. However, session persistence is maintained through HTTP cookies.

Configurations

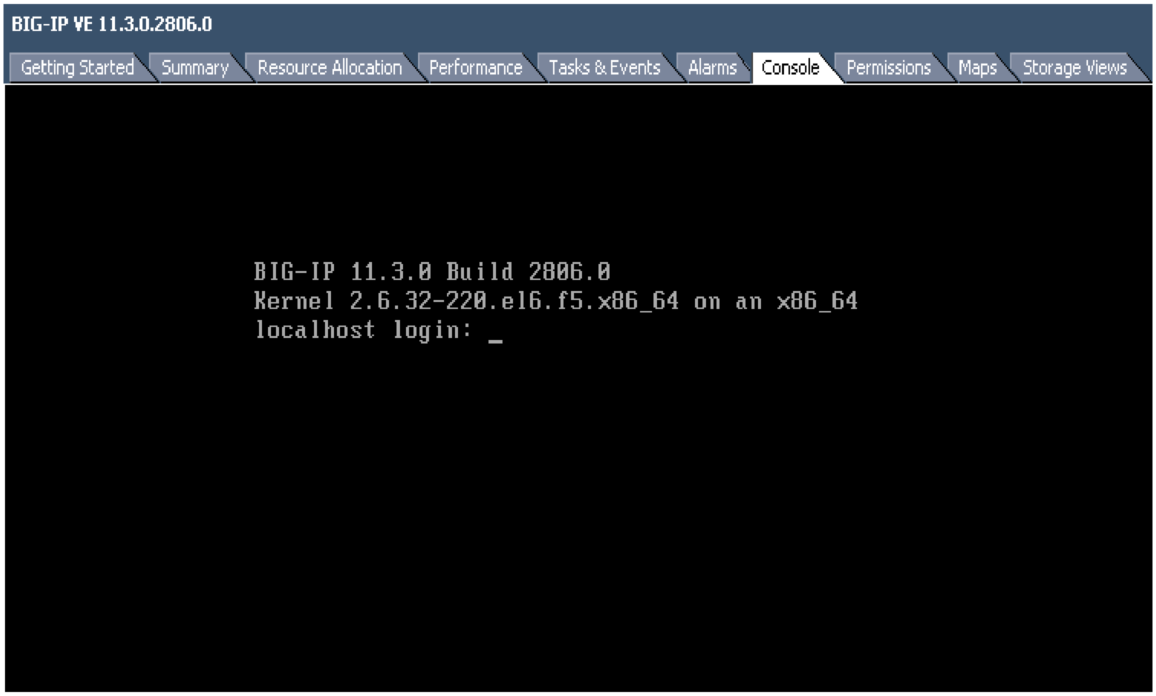
This section provides information on configuration of various components that were used to test the F5 load balancer with the Cisco CVP.

IP Configurations

The BIG-IP® VE virtual machine needs an IP address assigned to its virtual management port.

1. From the main vSphere Client screen, click the Administration menu.
2. In the resources pane, select the virtual machine you want to assign the management IP address.
3. Click the Console tab. After a few seconds, the login prompt is displayed.

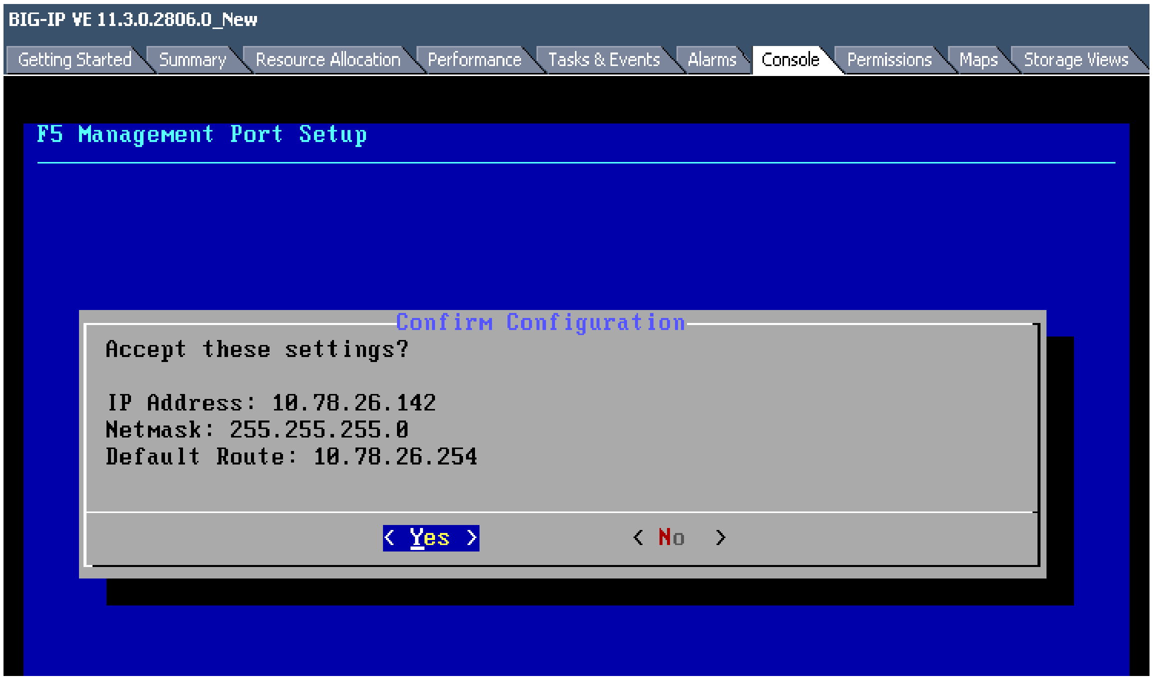
Figure 5 *Login Prompt*



```
BIG-IP 11.3.0 Build 2806.0
Kernel 2.6.32-220.el6.f5.x86_64 on an x86_64
localhost login: _
```

4. At the login prompt, type **root** and press Enter.
5. At the Password prompt, type **default**. and press Enter.
6. Type **config** and press Enter. The F5 Management Port Setup screen is displayed.

Figure 6 Management Port Setup screen



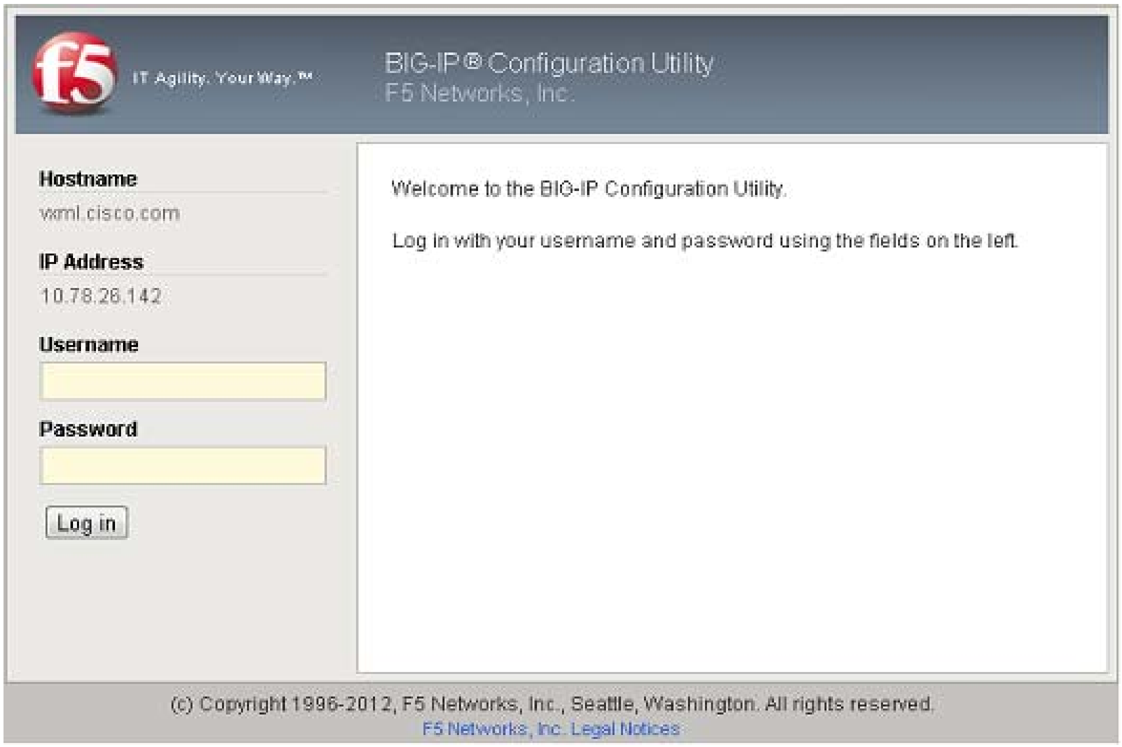
```
Accept these settings?

IP Address: 10.78.26.142
Netmask: 255.255.255.0
Default Route: 10.78.26.254
```

7. Click **Yes** if you want DHCP to automatically assign an IP address for the management port, or click **No** to manually assign an IP address and Netmask for the management port.

F5 BIG IP Load Balancer Configuration

1. Open browser and type https://mgmt-ip of F5. The F5 Login page is displayed.

Figure 7 F5 Login page



Hostname: vxml.cisco.com

IP Address: 10.78.26.142

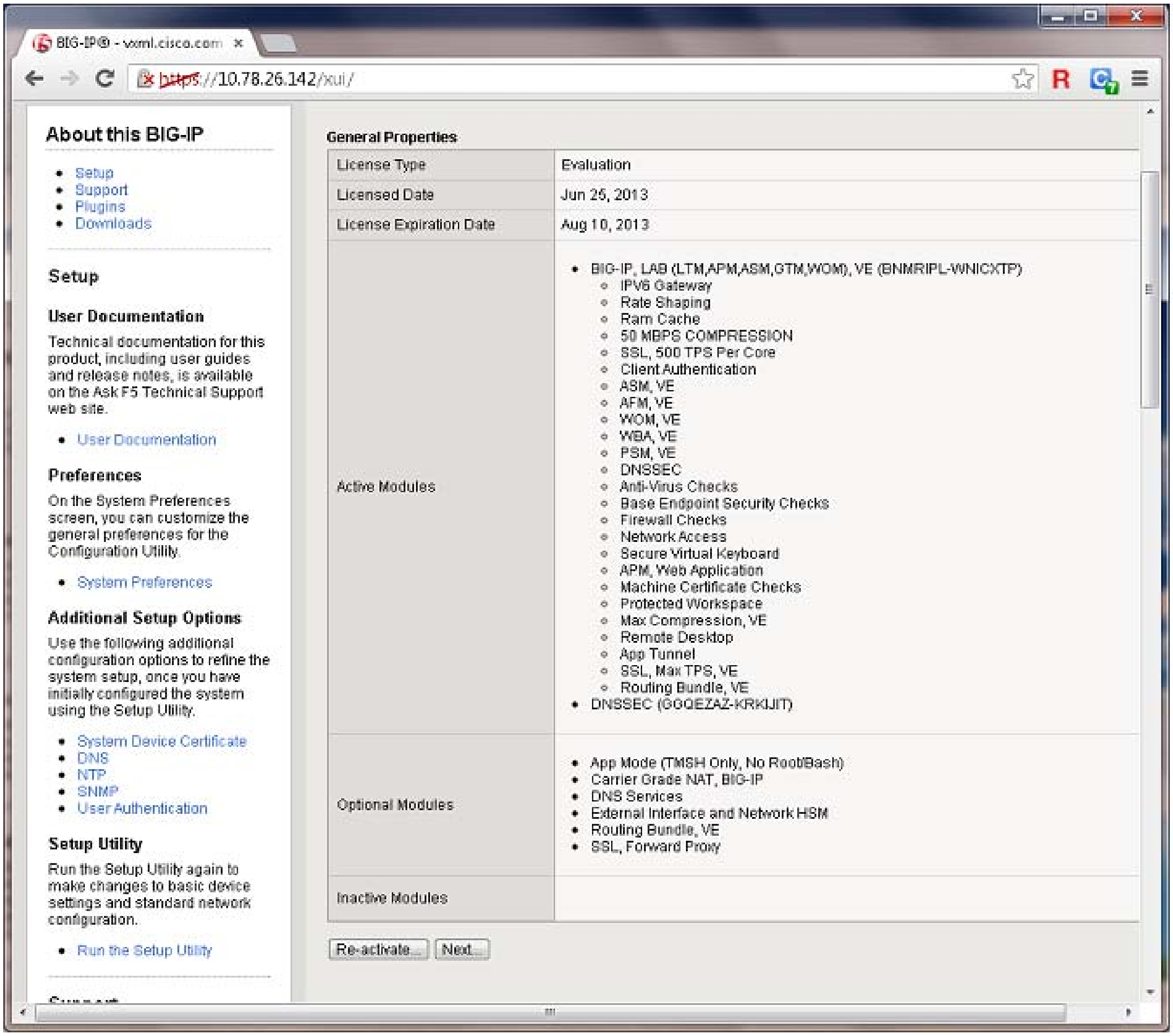
Welcome to the BIG-IP Configuration Utility.

Log in with your username and password using the fields on the left.

(c) Copyright 1996-2012, F5 Networks, Inc., Seattle, Washington. All rights reserved.

2. Type **admin** in the Username field and **admin** in the Password field.
3. Click Login. The F5 General Properties page is displayed.

Figure 8 *General Properties page*



About this BIG-IP

- Setup
- Support
- Plugins
- Downloads

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

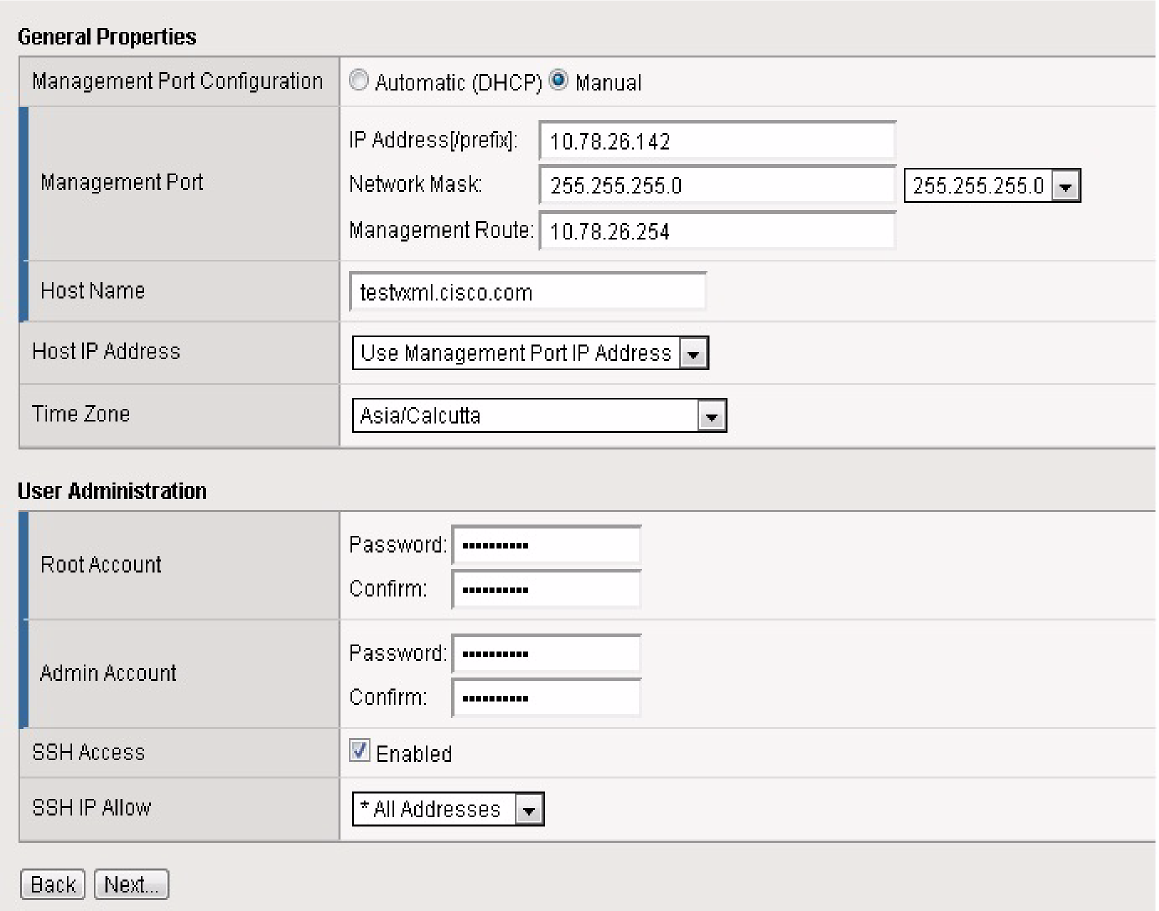
Support

General Properties

License Type	Evaluation
Licensed Date	Jun 25, 2013
License Expiration Date	Aug 10, 2013
Active Modules	• BIG-IP, LAB (LTM,APM,ASM,GTM,WOM), VE (BNMRIPL-WNICXTP) ○ IPV6 Gateway ○ Rate Shaping ○ Ram Cache ○ 50 MBPS COMPRESSION ○ SSL, 500 TPS Per Core ○ Client Authentication ○ ASM, VE ○ AFM, VE ○ WOM, VE ○ WBA, VE ○ PSM, 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 • DNSSEC (GGQEZAZ-KRKIJIT)
Optional Modules	• App Mode (TMSH Only, No Root/Bash) • Carrier Grade NAT, BIG-IP • DNS Services • External Interface and Network HSM • Routing Bundle, VE • SSL, Forward Proxy
Inactive Modules	

4. Click Next. The Current Resource Allocation page is displayed.
5. Click Next.

Figure 9 The Management IP page



General Properties

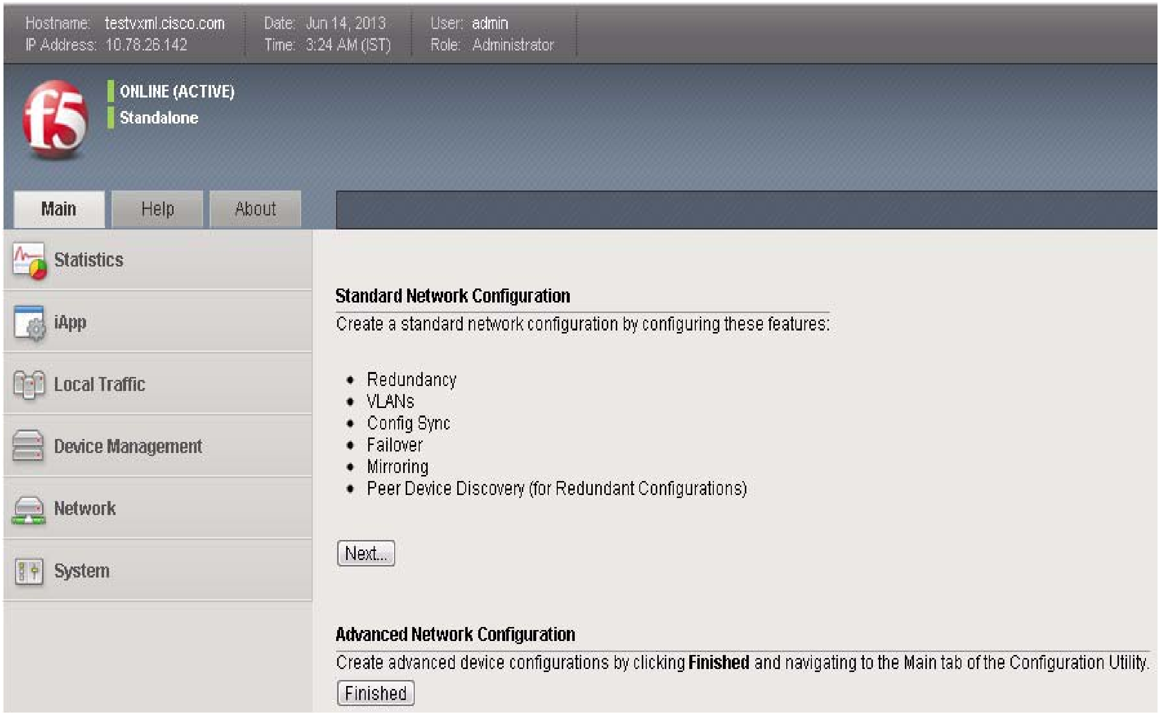
Management Port Configuration	○ Automatic (DHCP) ● Manual
Management Port	IP Address[/prefix]: 10.78.26.142 Network Mask: 255.255.255.0 255.255.255.0 Management Route: 10.78.26.254
Host Name	testxml.cisco.com
Host IP Address	Use Management Port IP Address
Time Zone	Asia/Calcutta

User Administration

Root Account	Password: •••••••••• Confirm: ••••••••••
Admin Account	Password: •••••••••• Confirm: ••••••••••
SSH Access	☑ Enabled
SSH IP Allow	* All Addresses

6. Select Manual option, so that big-IP does not reset to default IP address.
7. Type the IP address in the IP Address[/Prefix] field and click Next.
8. The F5 login page is displayed again. After login, the Network Configuration page is displayed.

Figure 10 Network Configuration page



Hostname: testvxml.cisco.com
IP Address: 10.78.26.142
Date: Jun 14, 2013
Time: 3:24 AM (IST)
User: admin
Role: Administrator

Standard Network Configuration

Create a standard network configuration by configuring these features:

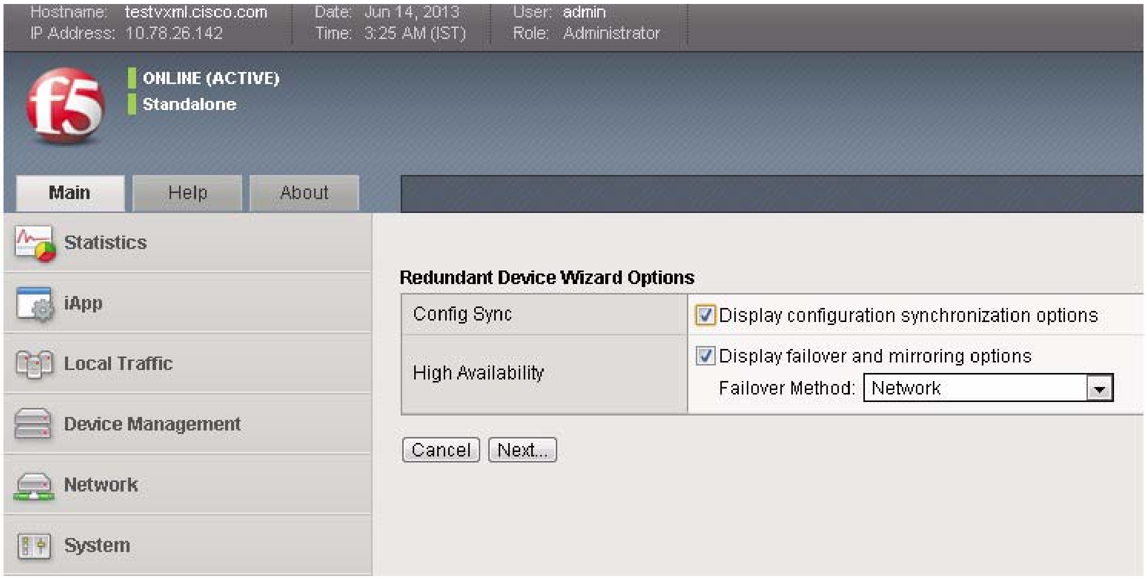
- Redundancy
- VLANs
- Config Sync
- Failover
- Mirroring
- Peer Device Discovery (for Redundant Configurations)

Advanced Network Configuration

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

9. Click Next.

Figure 11 The Redundant Device Wizard options



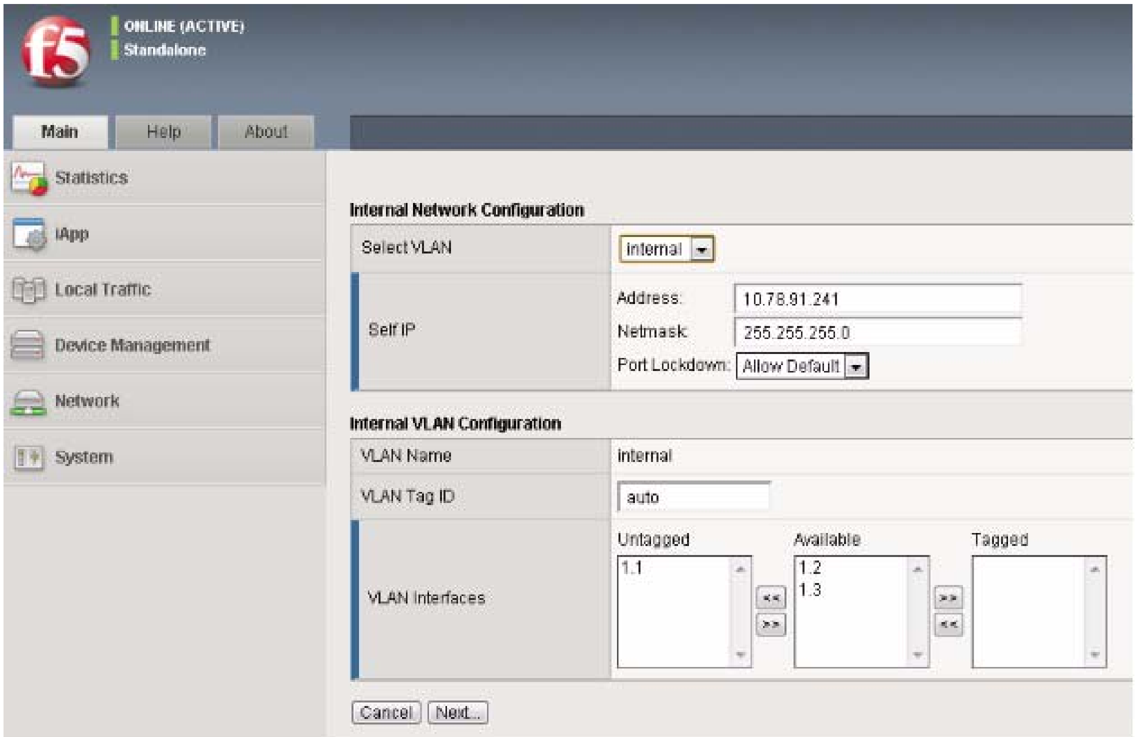
Hostname: testvxml.cisco.com
IP Address: 10.78.26.142
Date: Jun 14, 2013
Time: 3:25 AM (IST)
User: admin
Role: Administrator

Redundant Device Wizard Options

Config Sync	☑ Display configuration synchronization options
High Availability	☑ Display failover and mirroring options Failover Method: Network

10. Clear the Config Sync option, and click Next. The network configuration page is displayed. You can configure both internal and external IP address.

Figure 12 *Internal Network Configuration*



Internal Network Configuration

Select VLAN	internal	
Self IP	Address:	10.78.91.241
	Netmask:	255.255.255.0
	Port Lockdown:	Allow Default

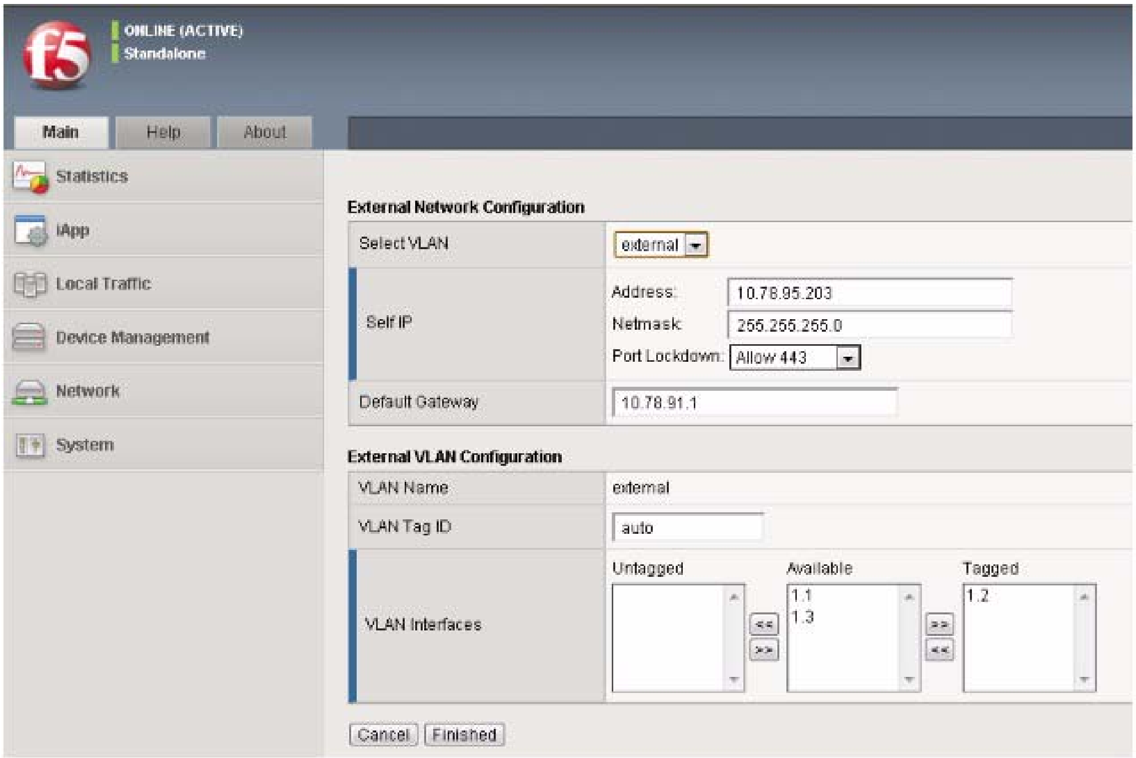
Internal VLAN Configuration

VLAN Name	internal		
VLAN Tag ID	auto		
VLAN Interfaces	Untagged	Available	Tagged
	1.1	1.2 1.3	

11. In the Self IP, type the IP address and Netmask as mentioned in the Figure 12 for internal configuration.

12. Click Next. The external configuration page is displayed.

Figure 13 External IP configuration



External Network Configuration

Select VLAN	external
Self IP	Address: 10.78.95.203 Netmask: 255.255.255.0 Port Lockdown: Allow 443
Default Gateway	10.78.91.1

External VLAN Configuration

VLAN Name	external
VLAN Tag ID	auto
VLAN Interfaces	Untagged: Available: 1.1, 1.3 Tagged: 1.2

13. In the Self IP, type the IP address and the Netmask as mentioned in the Figure 13 for internal configuration.

14. Click Finished. The F5 IP configuration is completed.

HTTP Configuration

HTTP Gateway Configuration - Dial-peer configuration at gateway (Standalone configuration)

```
Application
service helloworld flash:CVPSelfService.tcl
 paramspace english index 0
 paramspace english language en
 paramspace english location flash
 param CVPSelfService-app HelloWorld
 param CVPPrimaryVXMLServer 10.78.91.242 ( F5 Virtual IP Address)
 param CVPSelfService-port 7000
```

```
dial-peer voice  8778778 voip
service helloworld
incoming called-number 8778778
codec g711ulaw
exit
```

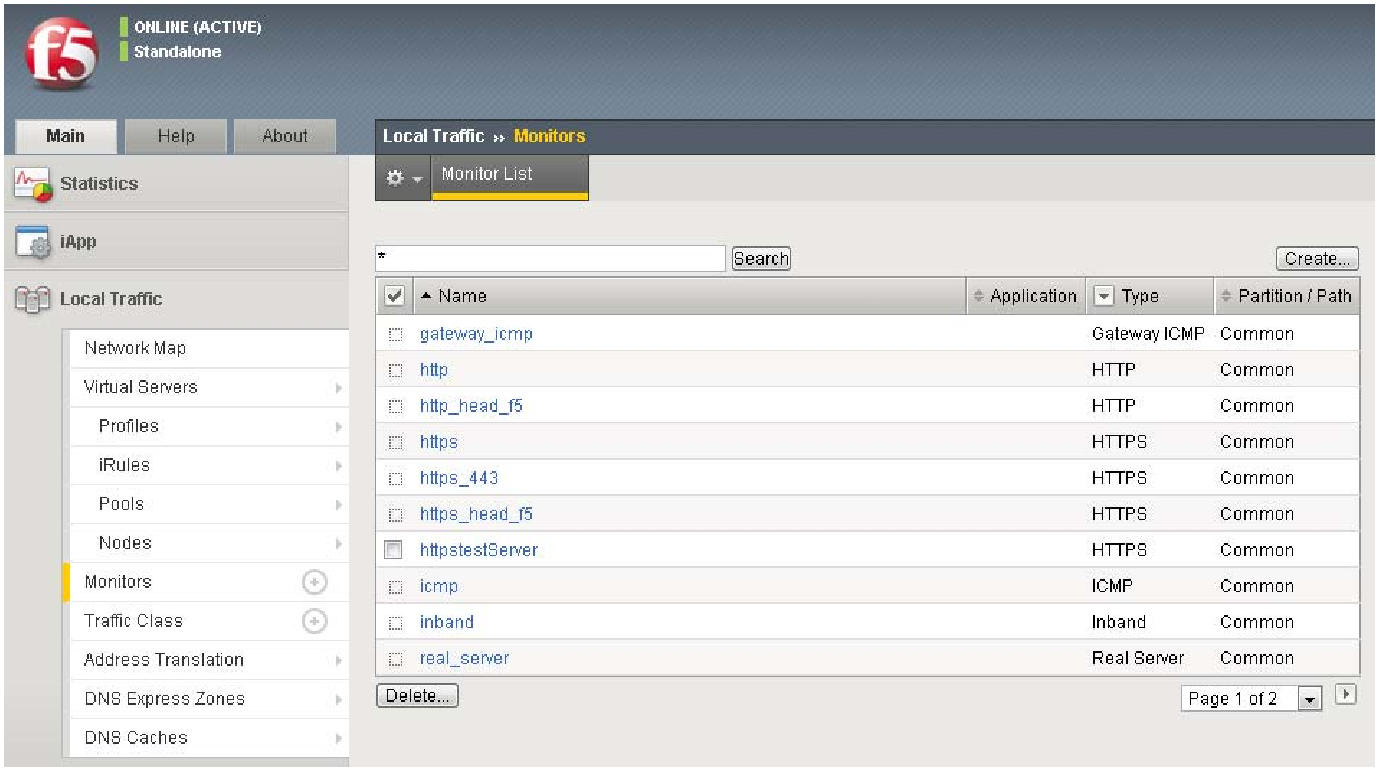
HTTP F5 BIG IP Load Balancer Configuration

The following are the steps to configure F5 for HTTP.

Create a monitor (probe) for CVP

1. Login to the F5 system.
2. Click the Local Traffic tab on left pane and select Monitor from the list. The Monitors page displays the list of monitors in the right pane.

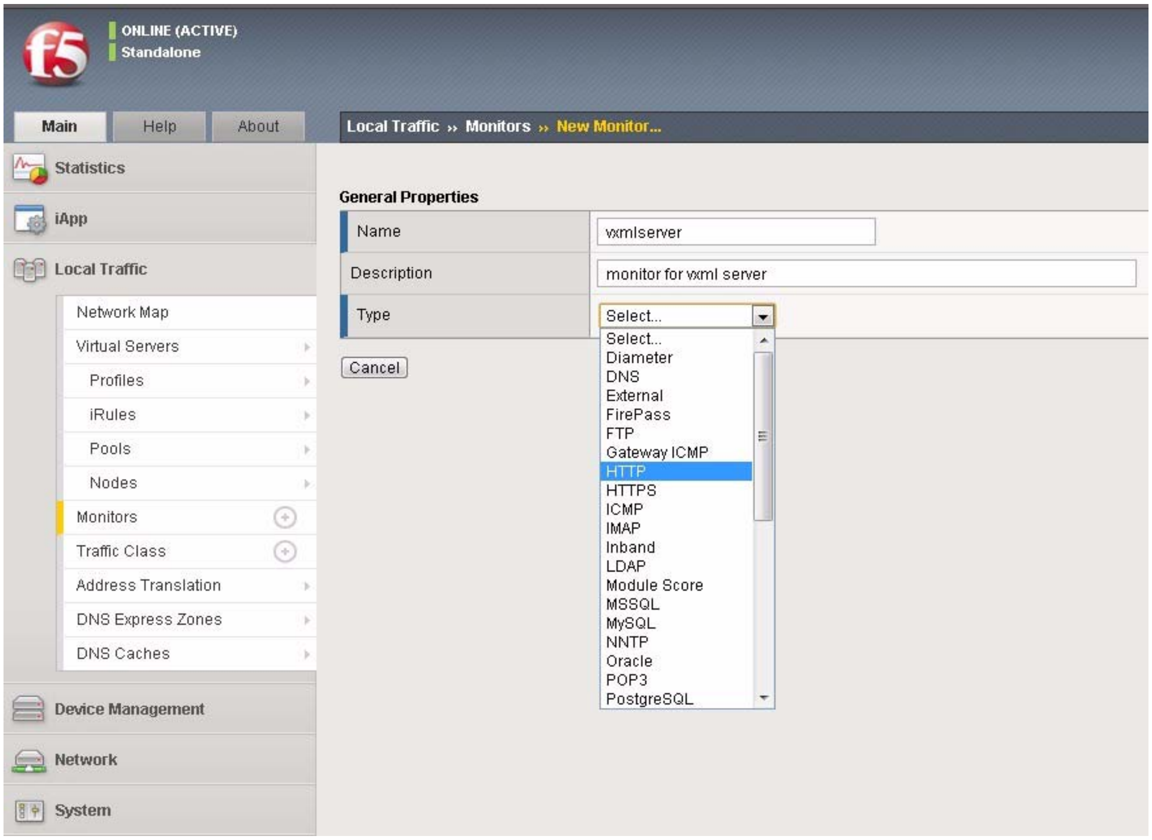
Figure 14 Monitor page



☑	Name	Application	Type	Partition / Path
□	gateway_icmp		Gateway ICMP	Common
□	http		HTTP	Common
□	http_head_f5		HTTP	Common
□	https		HTTPS	Common
□	https_443		HTTPS	Common
□	https_head_f5		HTTPS	Common
□	httpstestServer		HTTPS	Common
□	icmp		ICMP	Common
□	inband		Inband	Common
□	real_server		Real Server	Common

3. Click Create. The New Monitor page is displayed.

Figure 15 *New Monitor page*

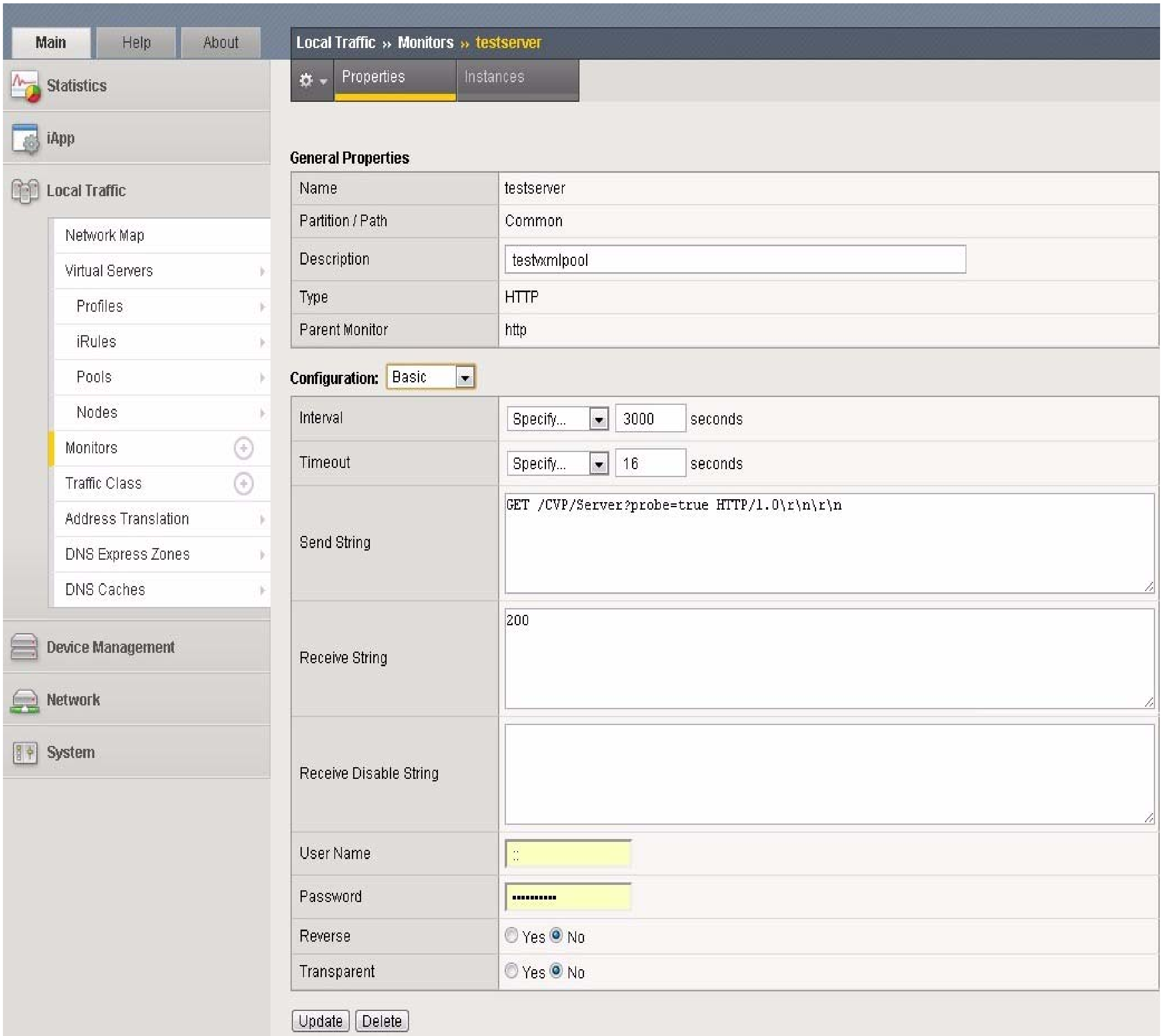


General Properties

Name	vxmlserver
Description	monitor for vxml server
Type	Select...

4. Enter a monitor name and description in the respective fields.
5. From the Type drop-own list, select http.

Figure 16 Monitor Configuration page



General Properties

Name	testserver
Partition / Path	Common
Description	testxmlpool
Type	HTTP
Parent Monitor	http

Configuration: Basic

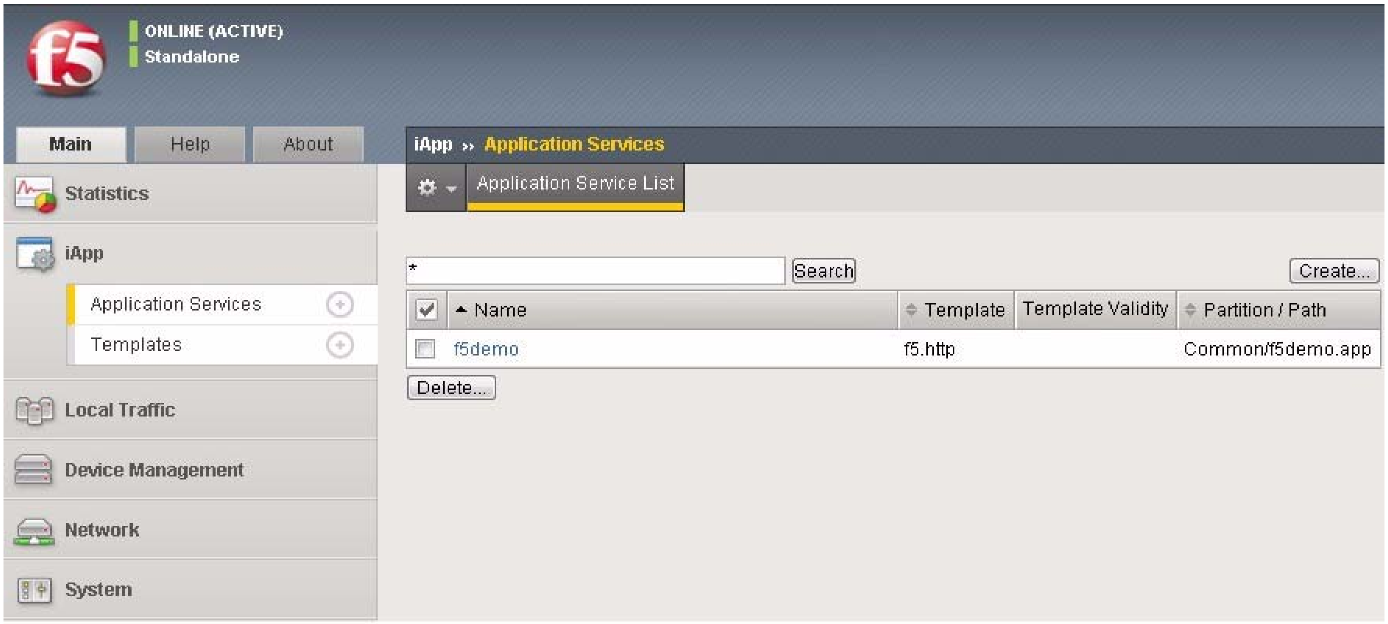
Interval	Specify... 3000 seconds
Timeout	Specify... 16 seconds
Send String	GET /CVP/Server?probe=true HTTP/1.0\r\n\r\n
Receive String	200
Receive Disable String	
User Name	::
Password	••••••••••
Reverse	○ Yes ● No
Transparent	○ Yes ● No

6. Under Configuration section, in the Send String text box, enter `GET /CVP/Server?probe=true HTTP/1.0\r\n\r\n` command.
7. Click Update. The monitor is created successfully.

Create a virtual server for CVP

1. Login to the F5 system.
2. In the main page, click iApp tab on the left pane.
3. Select Application servers from the list.

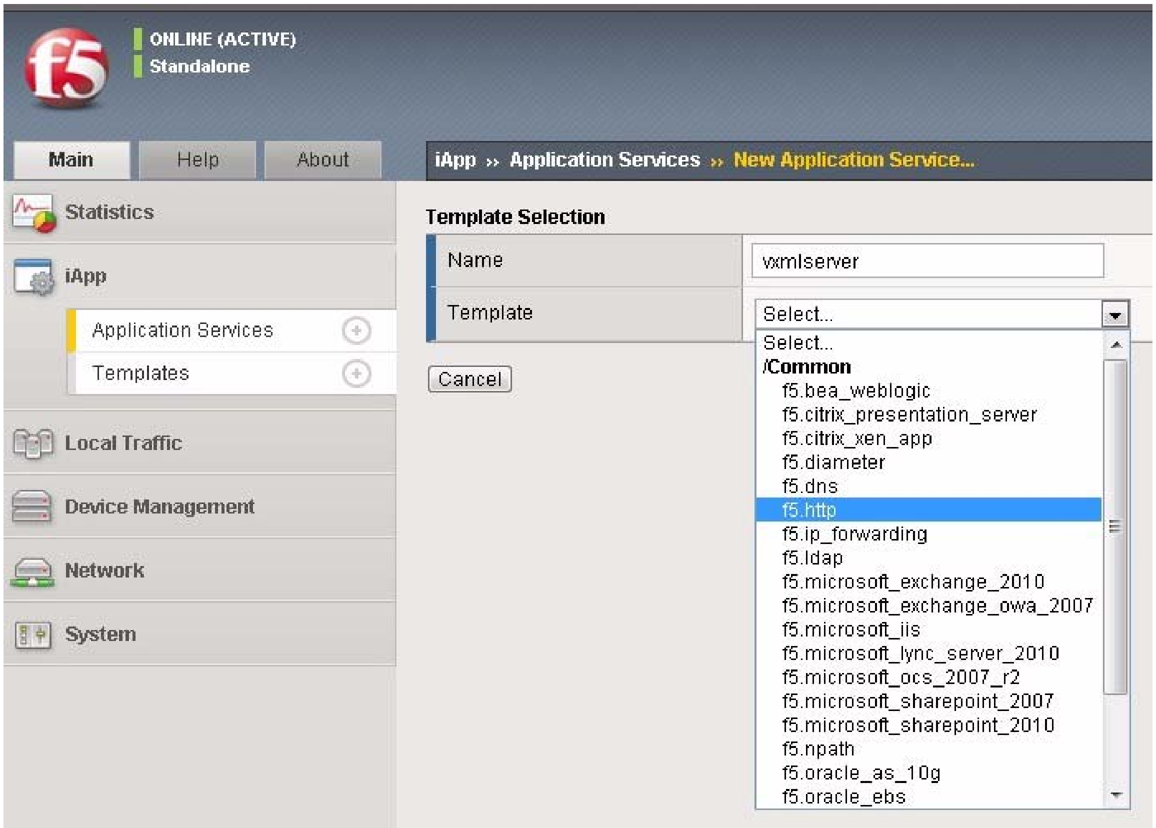
Figure 17 iApp page to create virtual server for CVP



☑	Name	Template	Template Validity	Partition / Path
□	f5demo	f5.http		Common/f5demo.app

4. Click Create.The new application service page is displayed.

Figure 18 New Application Service page



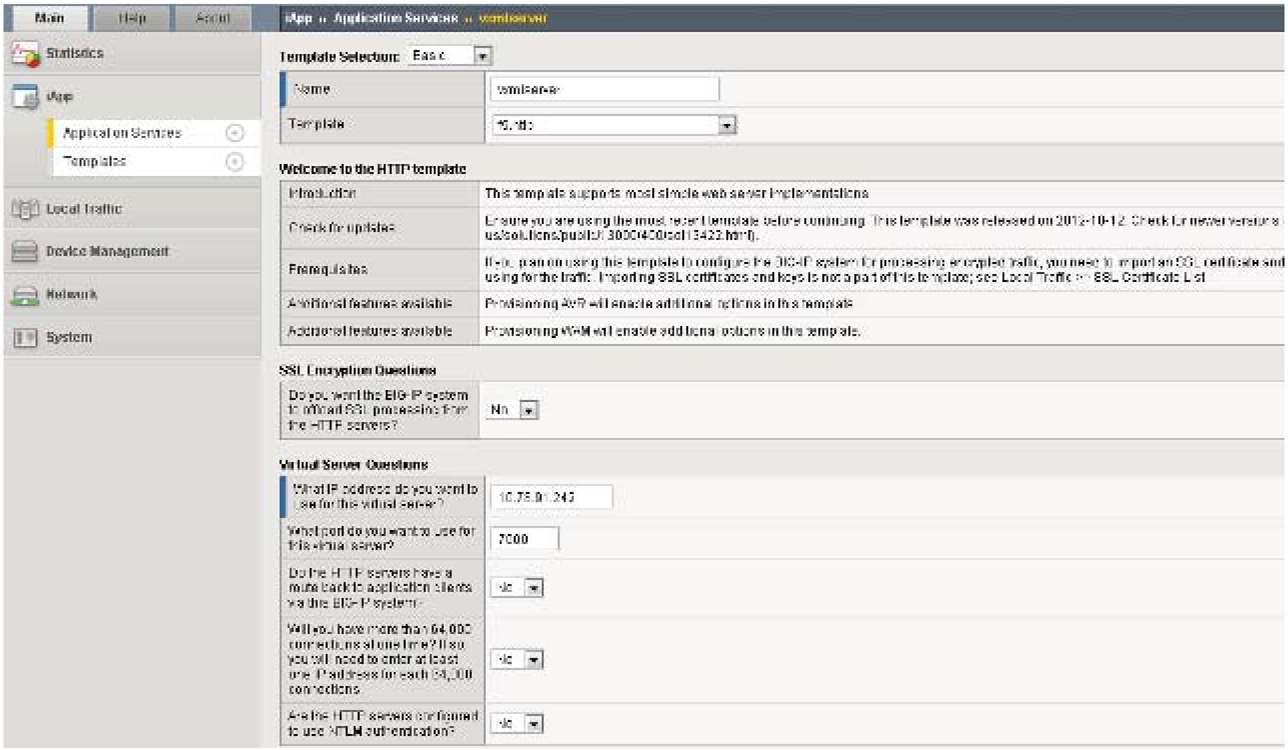
Template Selection

Name	vxmlserver
Template	Select...

Select...
/Common
f5.bea_weblogic
f5.citrix_presentation_server
f5.citrix_xen_app
f5.diameter
f5.dns
f5.http
f5.ip_forwarding
f5.ldap
f5.microsoft_exchange_2010
f5.microsoft_exchange_owa_2007
f5.microsoft_iis
f5.microsoft_lync_server_2010
f5.microsoft_ocs_2007_r2
f5.microsoft_sharepoint_2007
f5.microsoft_sharepoint_2010
f5.npath
f5.oracle_as_10g
f5.oracle_ebs

5. Enter the server name in the Name field.
6. From the Template drop-down list, select “f5.http”. The F5 template for HTTP is displayed.

Figure 19 F5 HTTP Application services page



iApp » Application Services » vmlserver

Template Selection: Basic

Name	vmlserver
Template	f5.http

Welcome to the HTTP template

Introduction	This template supports most simple web server implementations
Check for updates	Ensure you are using the most recent template before continuing. This template was released on 2012-10-12. Check for newer versions us/solutions/public/13000/400/sol13422.html).
Prerequisites	If you plan on using this template to configure the BIG-IP system for processing encrypted traffic, you need to import an SSL certificate and using for the traffic. Importing SSL certificates and keys is not a part of this template; see Local Traffic >> SSL Certificate List
Additional features available	Provisioning AVR will enable additional options in this template
Additional features available	Provisioning WAM will enable additional options in this template.

SSL Encryption Questions

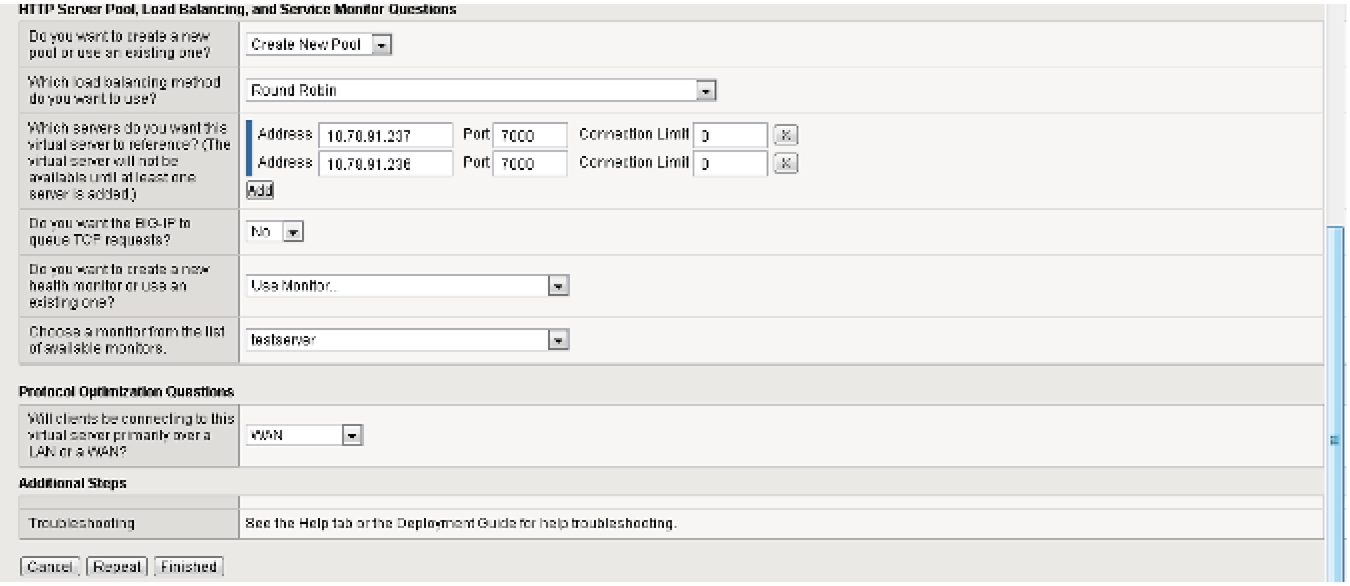
Do you want the BIG-IP system to offload SSL processing from the HTTP servers?	No

Virtual Server Questions

What IP address do you want to use for this virtual server?	10.78.91.243
What port do you want to use for this virtual server?	7000
Do the HTTP servers have a route back to application clients via this BIG-IP system?	No
Will you have more than 64,000 connections at one time? If so you will need to enter at least one IP address for each 64,000 connections	No
Are the HTTP servers configured to use NTLM authentication?	No

7. Under the Virtual Server Creations, type the IP address that you want to use for the virtual server.
8. Enter the port number you want to use for the virtual server.

Figure 20 F5 HTTP Application services page Cont...



HTTP Server Pool, Load Balancing, and Service Monitor Questions

Do you want to create a new pool or use an existing one?	Create New Pool
Which load balancing method do you want to use?	Round Robin
Which servers do you want this virtual server to reference? (The virtual server will not be available until at least one server is added.)	Address 10.70.91.237 Port 7000 Connection Limit 0 Address 10.70.91.236 Port 7000 Connection Limit 0
Do you want the BIG-IP to queue TCP requests?	No
Do you want to create a new health monitor or use an existing one?	Use Monitor...
Choose a monitor from the list of available monitors.	testserver

Protocol Optimization Questions

Will clients be connecting to this virtual server primarily over a LAN or a WAN?	WAN

Additional Steps

Troubleshooting	See the Help tab or the Deployment Guide for help troubleshooting.

9. Under HTTP Server Pool, Load Balancing, and Service Monitor Questions section,
    a. To create a new server pool, select Create New Pool from the “Do you want to create a new pool use an existing one?” drop-down list.
    b. Enter the CVP server IP address and enter Port number.
10. Click Finished. The HTTP virtual server for CVP is created.

Disable Oneconnent

1. To disable Oneconnect, click Local Traffic tab on the left pane.
2. Select Virtual Machine from the list. The Virtual Machine page displays with the configuration.
3. Under Configuration section, set the Oneconnect option to None. This disables the Oneconnect option.

HTTPS Configuration

HTTPS Configuration for CVP Server

- The following certificates are available for HTTPS configuration with CVP:
  - Call server self-signed certificate (callserver.crt) and keys (callserver.key) located in $CVP_HOME/conf/security
  - VXML server self-signed certificate (vxml.crt) and key (vxml.key) located in $CVP_HOME/conf/security
- Call Server running HTTPS listens (accepting connections) on port 8443
- VXML Server running HTTPS listens (accepting connections) on port 7443.

Note Certificates must be signed by a Certificate Authority (CA) prior to use on the F5 or IOS gateway.

- To request for a certificate enter the following command
  ```
  openssl req -new -key <keyfile>.key -out <certrequest>.csr
  ```
- Certificate is then signed by the CA using the .csr file.
- Signed certificate returned by the CA is put in place of the self-signed .crt file.

Note The CVP VXML and Call Server must be restarted when signed certificate is installed.

Example,

```
-----BEGIN CERTIFICATE-----
MIIGTzCCBTegAwIBAgIKJozFswAAAAAACjANBgkqhkiG9w0BAQUFADCBvDEdMBsG
CSqGSIb3DQEJARYOc3BhbUBjaXNjby5jb20xCzAJBgNVBAYTAlVTMRYwFAYDVQQI
...
MkYIfimRdD1U3AH6iPczbi+ryUM5mvcl9fTnq/DiaKqDSAo=
-----END CERTIFICATE-----
```

Note Certificate file should be in base 64 encoded format, before uploading to F5.

Gateway Configuration for HTTPS

To apply certificates to the IOS gateway use the following command:

```
crypto pki trustpoint <name>
enroll terminal
exit
crypto pki authenticate <name>
 <paste in contents of the previously copied cert file>
```

Note Certificates must be applied to the IOS gateway for F5 load balancer system using HTTPS.

To display certificates configured on a gateway use the following command

```
show crypto pki certificates
```

For better performance, it is recommended to use the following configuration on the Cisco IOS VoiceXML Gateway with HTTPS option:

```
http client connection persistent
http client cache memory pool 15000
http client cache memory file 1000
```

Dial-peer configuration at gateway (Standalone configuration)

```
Application
service Secure flash:CVPSelfService.tcl
 paramspace english index 0
 paramspace english language en
 paramspace english location flash
 param CVPSelfService-app Test_GD_DTMF
 param CVPPrimaryVXMLServer 10.78.91.242 (F5 Virtual IP)
 param CVPSelfService-port 7443
 param CVPSelfService-SSL 1

dial-peer voice  4586797 voip
service Secure
incoming called-number 4586797
codec g711ulaw
exit
```

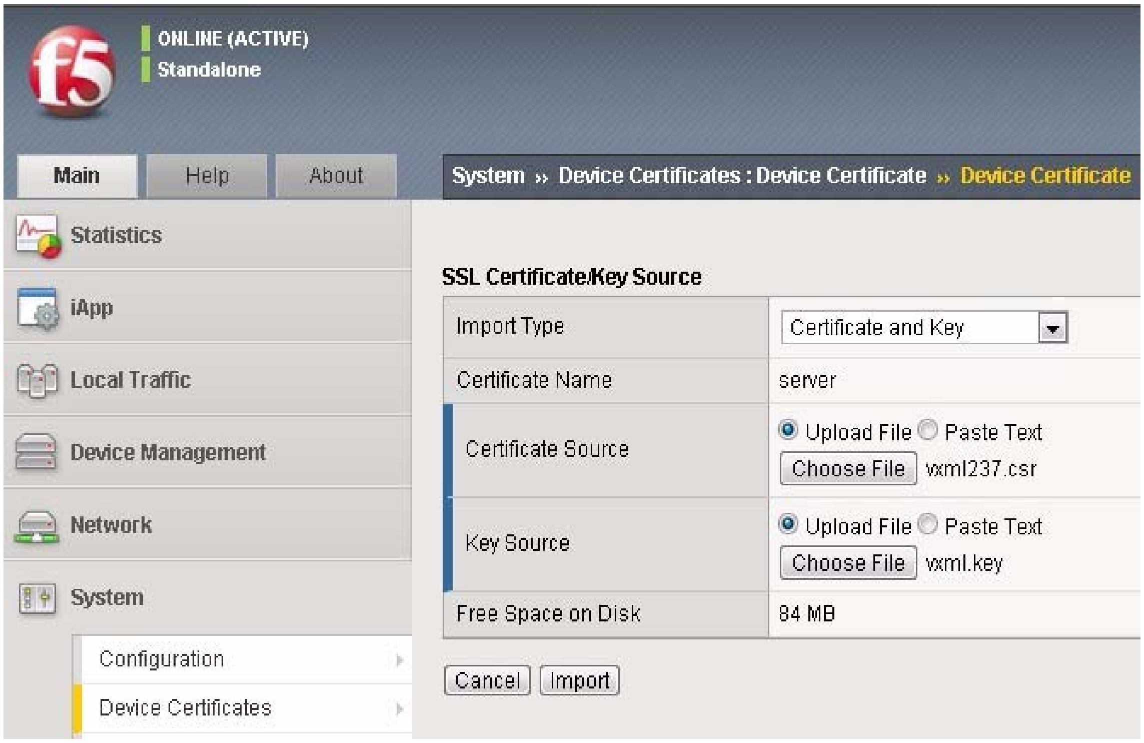
HTTPS F5 BIG IP Configuration

Pre requisites for HTTPS configuration at F5

The following are the steps to configure F5 for HTTPS to create SSL offloading and end to end HTTPS traffic.

1. Import certificates (.Key and .CSR) files using Local Traffic -> SSL Certificates.

Figure 21 SSL Certificate Loading Page

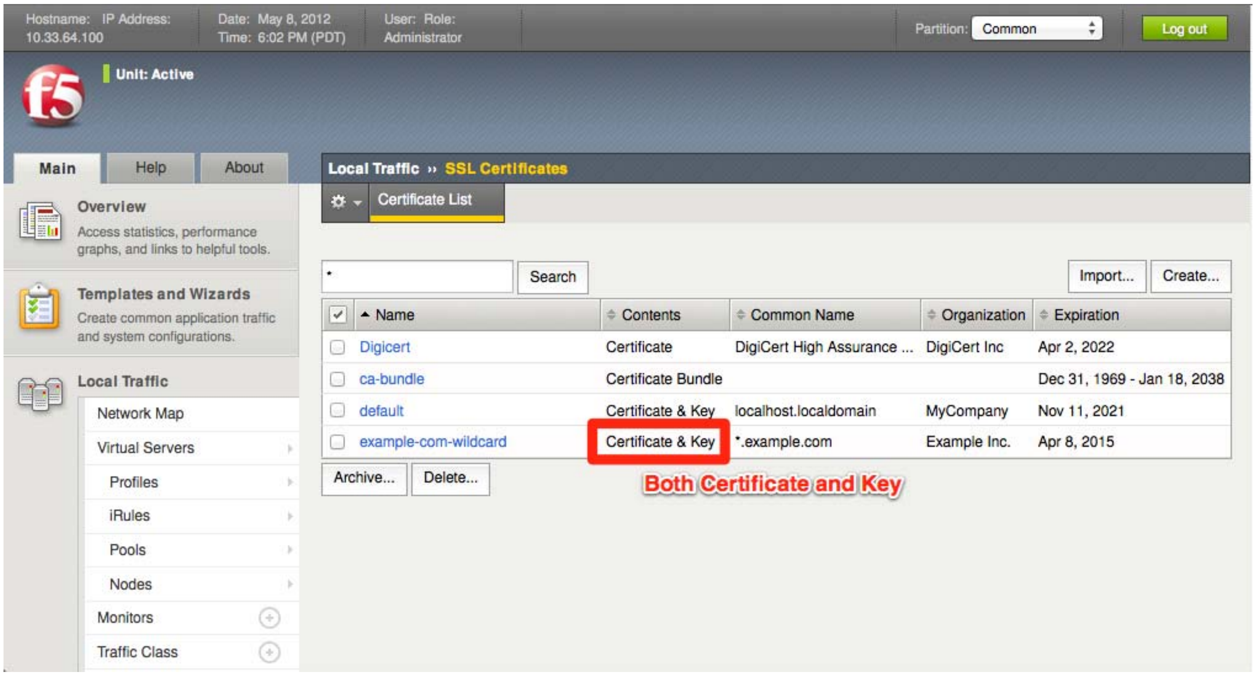


SSL Certificate/Key Source

Import Type	Certificate and Key
Certificate Name	server
Certificate Source	● Upload File ○ Paste Text Choose File vxml237.csr
Key Source	● Upload File ○ Paste Text Choose File vxml.key
Free Space on Disk	84 MB

2. From the Import Type drop-down list, select Certificate and Key option.
3. To upload a certificate (.csr file), select Upload File and then click Choose File.
4. To upload the Key(.key file), select Upload option and then click Choose File.
5. Click Import.

Figure 22 SSl Certificate and key is displayed



☑	Name	Contents	Common Name	Organization	Expiration
□	Digicert	Certificate	DigiCert High Assurance ...	DigiCert Inc	Apr 2, 2022
□	ca-bundle	Certificate Bundle			Dec 31, 1969 - Jan 18, 2038
□	default	Certificate & Key	localhost.localdomain	MyCompany	Nov 11, 2021
□	example-com-wildcard	Certificate & Key	*.example.com	Example Inc.	Apr 8, 2015

Both Certificate and Key

Create SSL profile

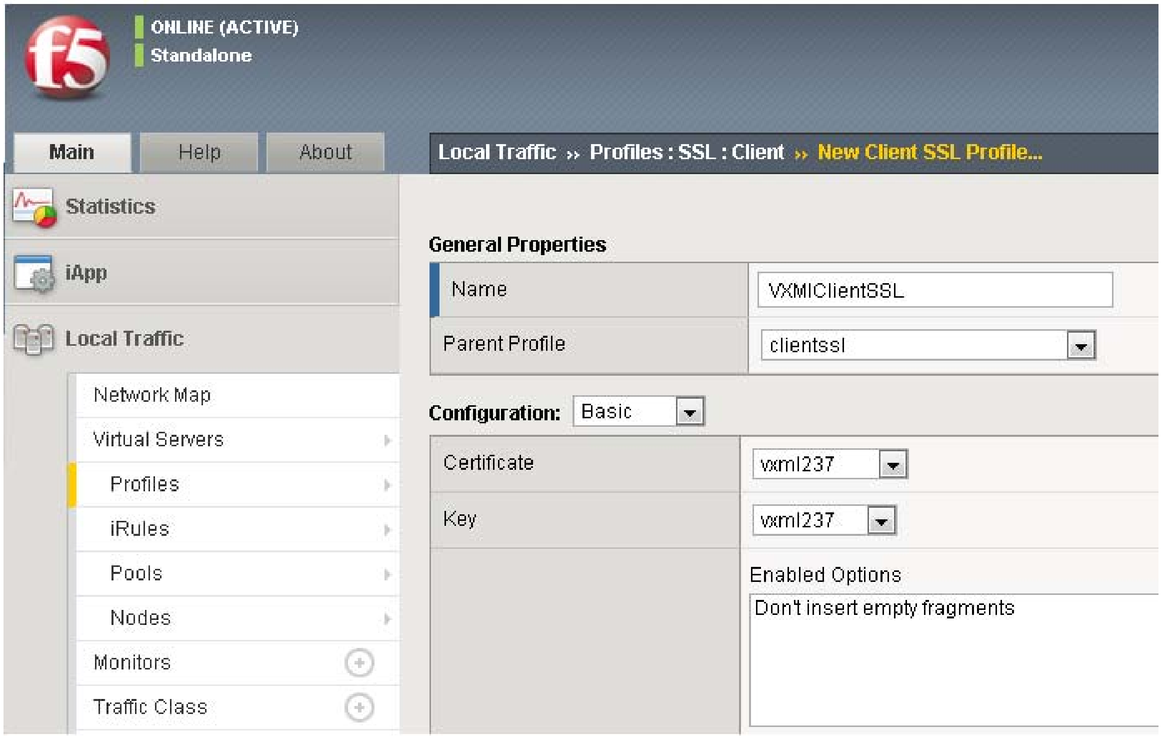
After the SSL certificate is uploaded to the load balancer, create an SSL profile to use the certificate.

The following are the steps to create SSL profile:

1. Start F5 console.
2. Click Local Traffic in the left pane.
3. Click Profiles, select SSL, and then select Client. The New Client SSL Client page is displayed.

Note The term "Client" is the traffic between the gateway and the load balancer (conversely "Server" means traffic between your CVP VXML servers and the load balancer).

Figure 23 New SSL Profile Configuration



General Properties

Name	VXMIClientSSL
Parent Profile	clientssl

Configuration: Basic

Certificate	vxml237
Key	vxml237

Enabled Options

Don't insert empty fragments

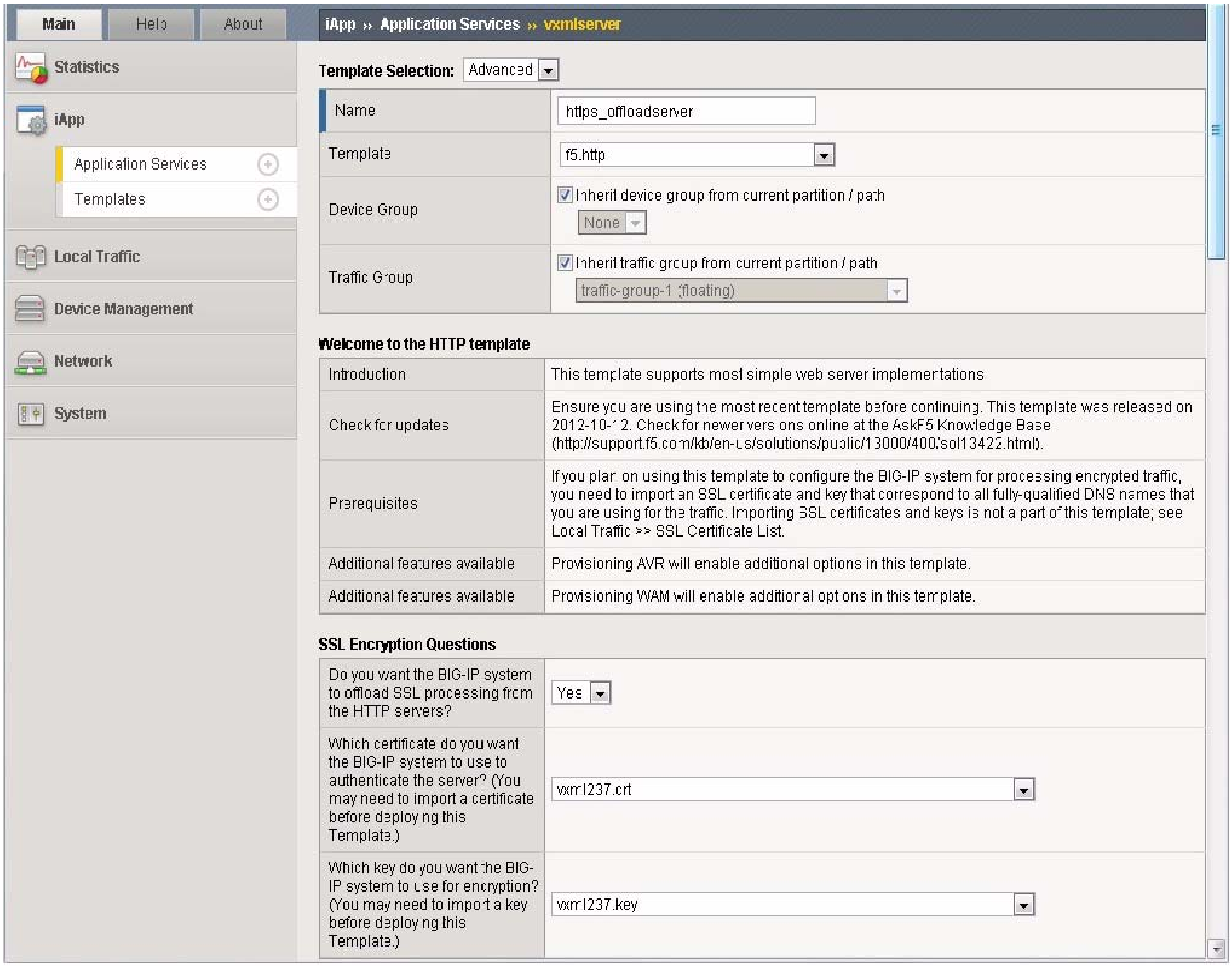
4. From the Certificate and Key fields, select the certificate and key you want to use.
5. Click Finished.

Create Virtual Server for SSL Offloading at F5

1. Open F5 console.
2. Click iAPP in the left pane, and select Application Services.
3. Select Template.
4. In the Application Services page, under SSL Encryption Questions section, set the **Do you want the BIG-IP system to offload SSL processing from the HTTP servers?** option to “Yes”.
5. Select the SSL certificate (.crt file) from the **Which certificate do you want the BIG-IP system to use to authenticate the server? (You may need to import a certificate before deploying this Template.)** option.
6. Select the key from the **Which key do you want the BIG-IP system to use for encryption? (You may need to import a key before deploying this Template.)** option.

Note These certificates can be mapped to the install certificates on the IOS gateway.

Figure 24 Application Services Setting



iApp » Application Services » vxmlserver

Template Selection: Advanced

Name	https_offloadserver
Template	f5.http
Device Group	☑ Inherit device group from current partition / path None
Traffic Group	☑ Inherit traffic group from current partition / path traffic-group-1 (floating)

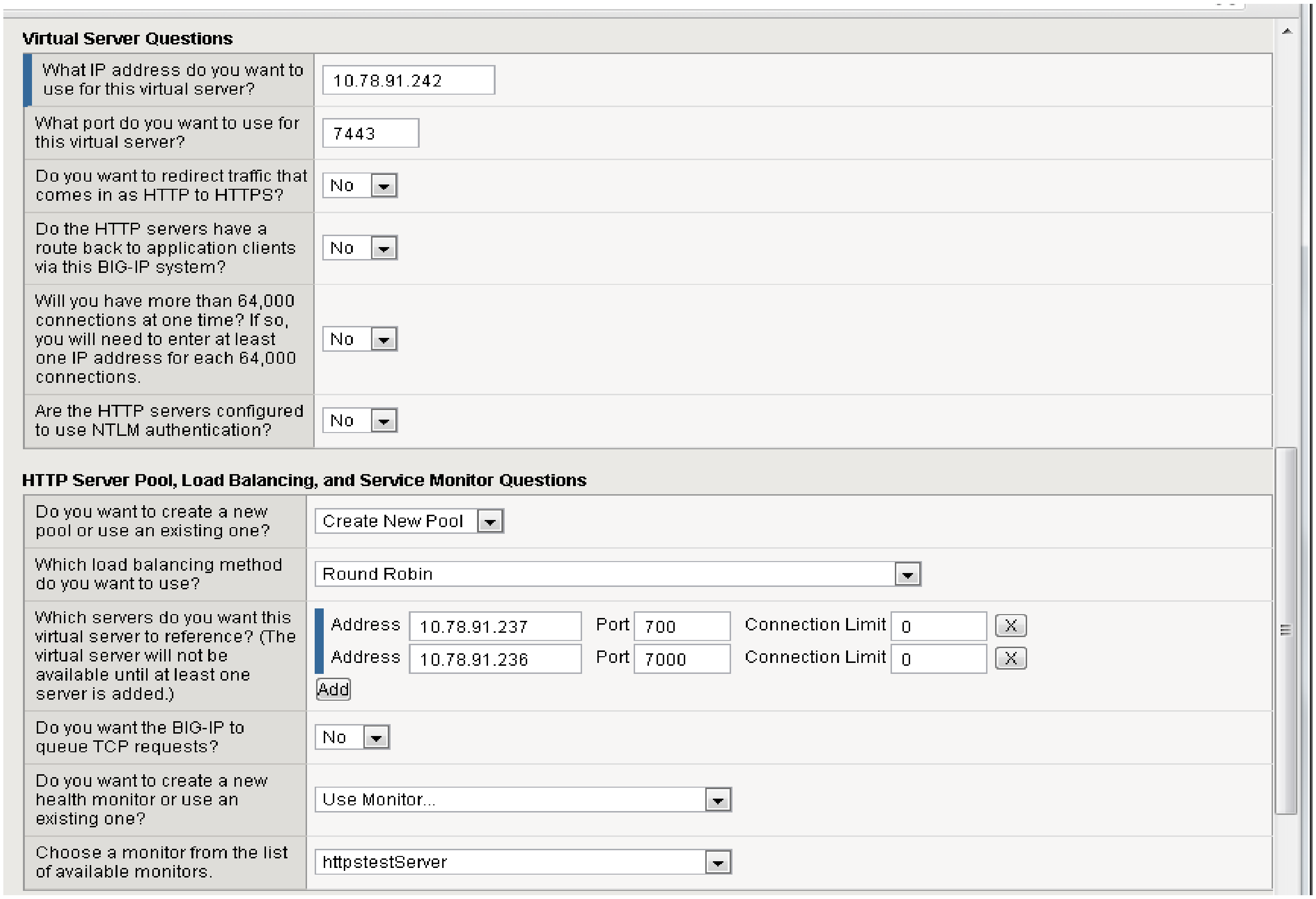
Welcome to the HTTP template

Introduction	This template supports most simple web server implementations
Check for updates	Ensure you are using the most recent template before continuing. This template was released on 2012-10-12. Check for newer versions online at the AskF5 Knowledge Base (http://support.f5.com/kb/en-us/solutions/public/13000/400/sol13422.html).
Prerequisites	If you plan on using this template to configure the BIG-IP system for processing encrypted traffic, you need to import an SSL certificate and key that correspond to all fully-qualified DNS names that you are using for the traffic. Importing SSL certificates and keys is not a part of this template; see Local Traffic >> SSL Certificate List.
Additional features available	Provisioning AVR will enable additional options in this template.
Additional features available	Provisioning WAM will enable additional options in this template.

SSL Encryption Questions

Do you want the BIG-IP system to offload SSL processing from the HTTP servers?	Yes
Which certificate do you want the BIG-IP system to use to authenticate the server? (You may need to import a certificate before deploying this Template.)	vxml237.crt
Which key do you want the BIG-IP system to use for encryption? (You may need to import a key before deploying this Template.)	vxml237.key

Figure 25 Application Services Setting Cont...



Virtual Server Questions

What IP address do you want to use for this virtual server?	10.78.91.242
What port do you want to use for this virtual server?	7443
Do you want to redirect traffic that comes in as HTTP to HTTPS?	No
Do the HTTP servers have a route back to application clients via this BIG-IP system?	No
Will you have more than 64,000 connections at one time? If so, you will need to enter at least one IP address for each 64,000 connections.	No
Are the HTTP servers configured to use NTLM authentication?	No

HTTP Server Pool, Load Balancing, and Service Monitor Questions

Do you want to create a new pool or use an existing one?	Create New Pool
Which load balancing method do you want to use?	Round Robin
Which servers do you want this virtual server to reference? (The virtual server will not be available until at least one server is added.)	Address 10.78.91.237 Port 700 Connection Limit 0 X Address 10.78.91.236 Port 7000 Connection Limit 0 X Add
Do you want the BIG-IP to queue TCP requests?	No
Do you want to create a new health monitor or use an existing one?	Use Monitor...
Choose a monitor from the list of available monitors.	httpstestServer

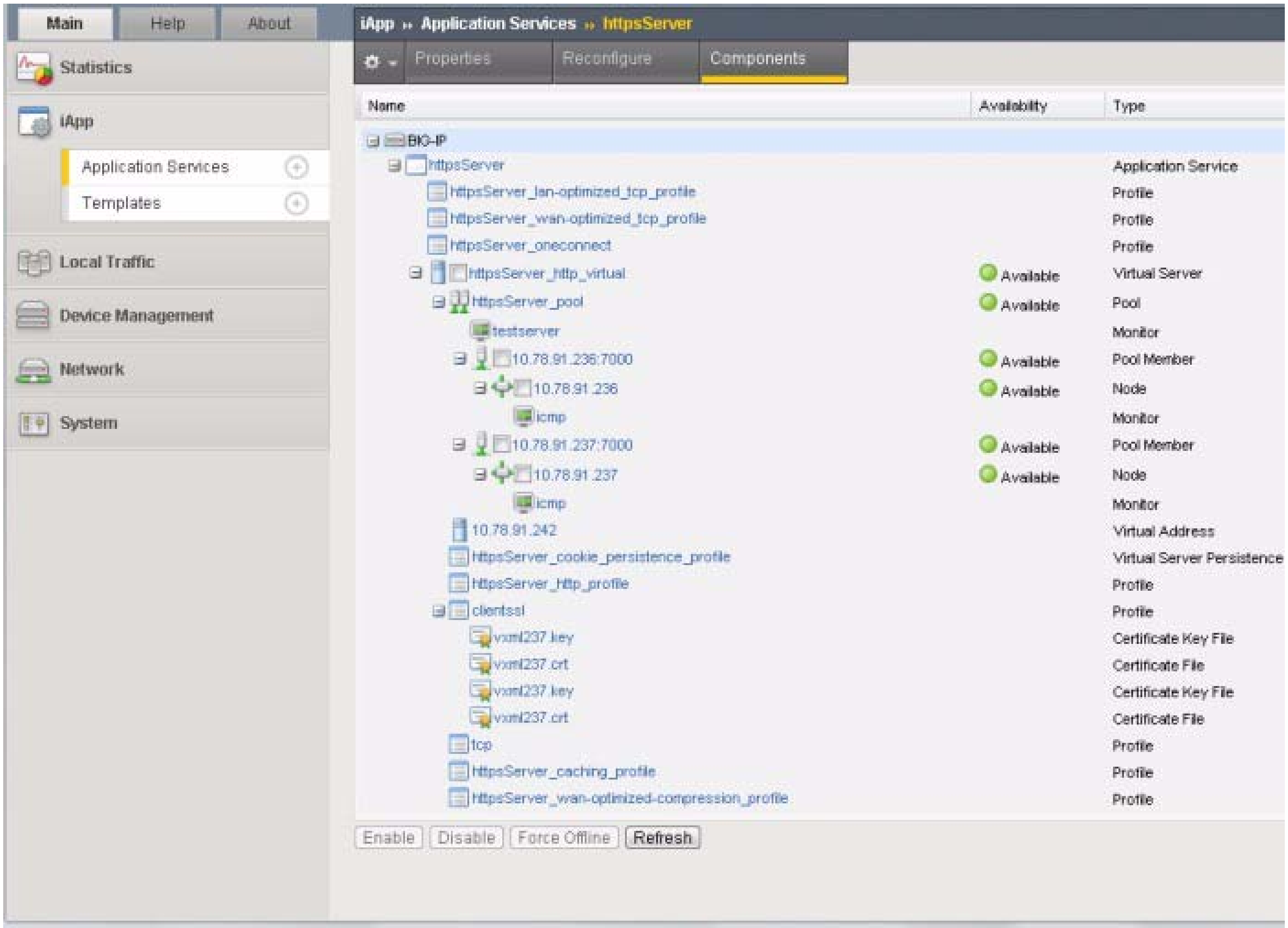
7. Enter F5 virtual IP address (The same IP address that was configured for Dial-Peer Configure at gateway)
8. Enter the port you want to use the virtual server.
9. Click Finished.

Note Leave all the other fields in its default values.

After you creating the HTTPS Application Service for SSL Offloading, configure the virtual server by following these steps:

1. From the Local Traffic > Virtual Servers options, select the virtual server that is created.
2. Under Configuration settings, set the **Oneconnect profile** option to None.
3. From SSL Profile (Client) option, select a client profile that is listed and click Add.
4. Click Update. The F5 configuration for HTTPS Application Service - SSL Offloading is completed.

Figure 26 F5 configuration for HTTPS Application Service - SSL Offloading



Name	Availability	Type
BIG-IP		
httpsServer		Application Service
httpsServer_lan-optimized_tcp_profile		Profile
httpsServer_wan-optimized_tcp_profile		Profile
httpsServer_oneconnect		Profile
httpsServer_http_virtual	Available	Virtual Server
httpsServer_pool	Available	Pool
testserver		Monitor
10.78.91.236:7000	Available	Pool Member
10.78.91.236	Available	Node
icmp		Monitor
10.78.91.237:7000	Available	Pool Member
10.78.91.237	Available	Node
icmp		Monitor
10.78.91.242		Virtual Address
httpsServer_cookie_persistence_profile		Virtual Server Persistence
httpsServer_http_profile		Profile
clientssl		Profile
vxml237.key		Certificate Key File
vxml237.crt		Certificate File
vxml237.key		Certificate Key File
vxml237.crt		Certificate File
tcp		Profile
httpsServer_caching_profile		Profile
httpsServer_wan-optimized-compression_profile		Profile

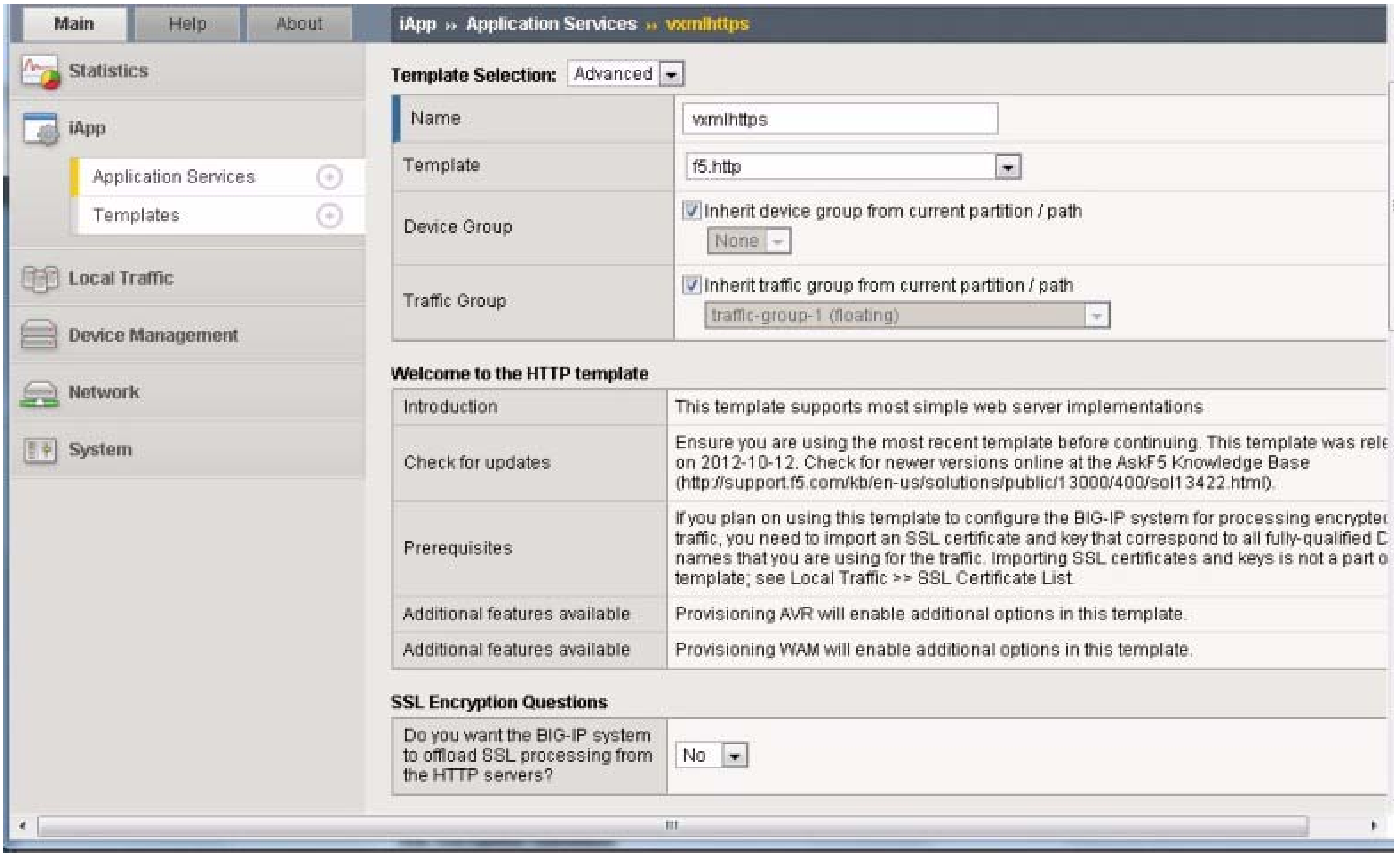
Configuration of End to End HTTPS at F5

The following are the steps to configure end to end HTTPS traffic at F5:

Create Virtual Server for End to End HTTPS Traffic

1. Open F5 console.
2. Click iAPP in the left pane, and select Application Services.
3. Select HTTP Template.
4. In the Application Services page, under SSL Encryption Questions section, set the **Do you want the BIG-IP system to offload SSL processing from the HTTP servers?** option to “No”. The default setting of this option is “No”

Figure 27 Application Services configuration for end to end HTTPS traffic



Template Selection: Advanced

Name	vxmlhttps
Template	f5.http
Device Group	☑ Inherit device group from current partition / path None
Traffic Group	☑ Inherit traffic group from current partition / path traffic-group-1 (floating)

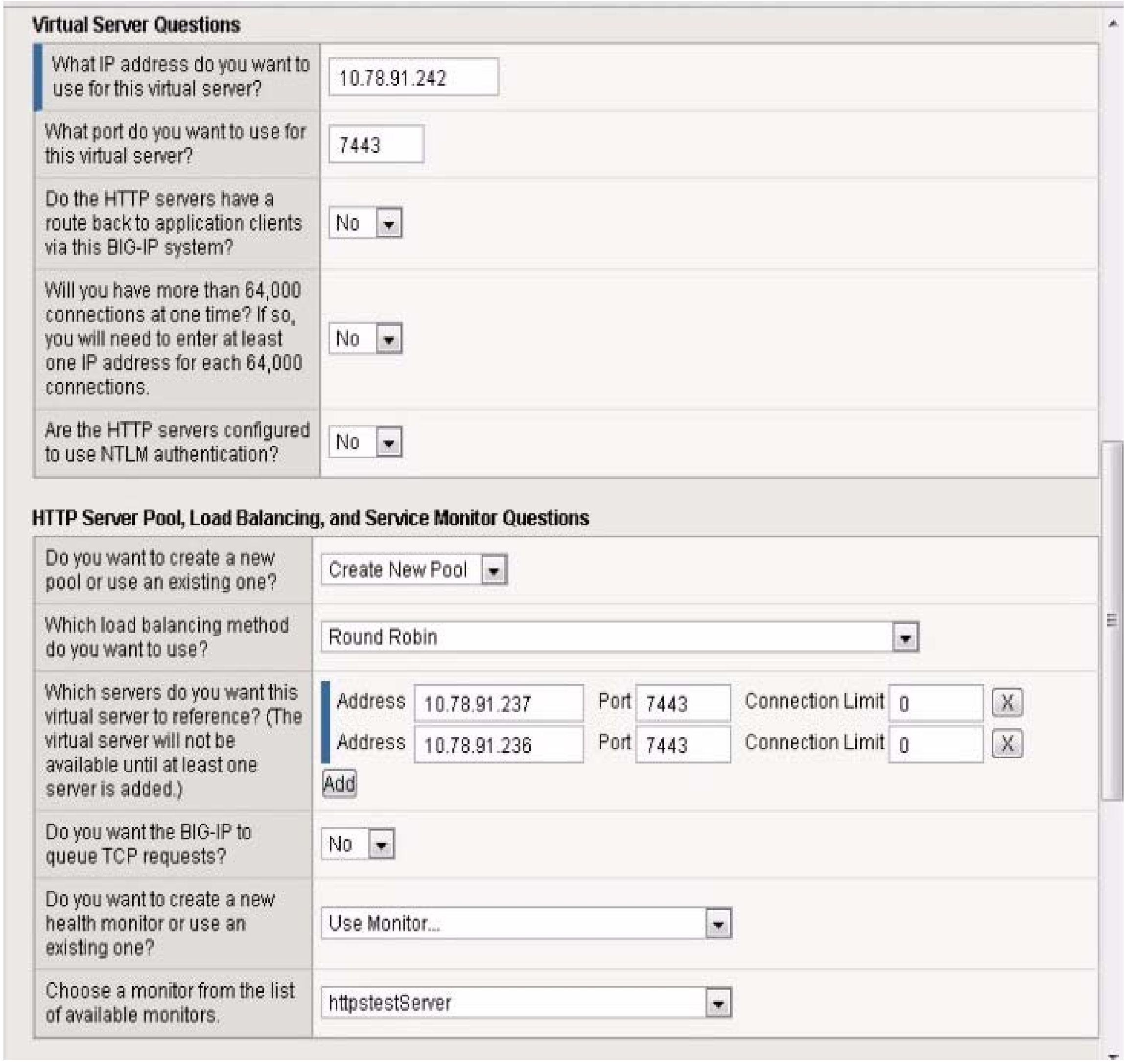
Welcome to the HTTP template

Introduction	This template supports most simple web server implementations
Check for updates	Ensure you are using the most recent template before continuing. This template was rele on 2012-10-12. Check for newer versions online at the AskF5 Knowledge Base (http://support.f5.com/kb/en-us/solutions/public/13000/400/sol13422.html).
Prerequisites	If you plan on using this template to configure the BIG-IP system for processing encrypte traffic, you need to import an SSL certificate and key that correspond to all fully-qualified D names that you are using for the traffic. Importing SSL certificates and keys is not a part o template; see Local Traffic >> SSL Certificate List.
Additional features available	Provisioning AVR will enable additional options in this template.
Additional features available	Provisioning WAM will enable additional options in this template.

SSL Encryption Questions

Do you want the BIG-IP system to offload SSL processing from the HTTP servers?	No

Figure 28 *Application Services configuration for end to end HTTPS traffic Cont...*



Virtual Server Questions

What IP address do you want to use for this virtual server?	10.78.91.242
What port do you want to use for this virtual server?	7443
Do the HTTP servers have a route back to application clients via this BIG-IP system?	No
Will you have more than 64,000 connections at one time? If so, you will need to enter at least one IP address for each 64,000 connections.	No
Are the HTTP servers configured to use NTLM authentication?	No

HTTP Server Pool, Load Balancing, and Service Monitor Questions

Do you want to create a new pool or use an existing one?	Create New Pool
Which load balancing method do you want to use?	Round Robin
Which servers do you want this virtual server to reference? (The virtual server will not be available until at least one server is added.)	Address 10.78.91.237 Port 7443 Connection Limit 0 Address 10.78.91.236 Port 7443 Connection Limit 0
Do you want the BIG-IP to queue TCP requests?	No
Do you want to create a new health monitor or use an existing one?	Use Monitor...
Choose a monitor from the list of available monitors.	httpstestServer

5. Enter F5 virtual IP address (The same IP address that was configured for Dial-Peer Configure at gateway)
6. In the **Which servers do you want this virtual server to reference? (The virtual server will not be available until at least one server is added.)** field, enter the IP address of CVP server. Also, configure the Port to 7443 for virtual server.
7. From the **Do you want to create a new health monitor or use an existing one?** list, select Use Monitor.
8. Click Finished.

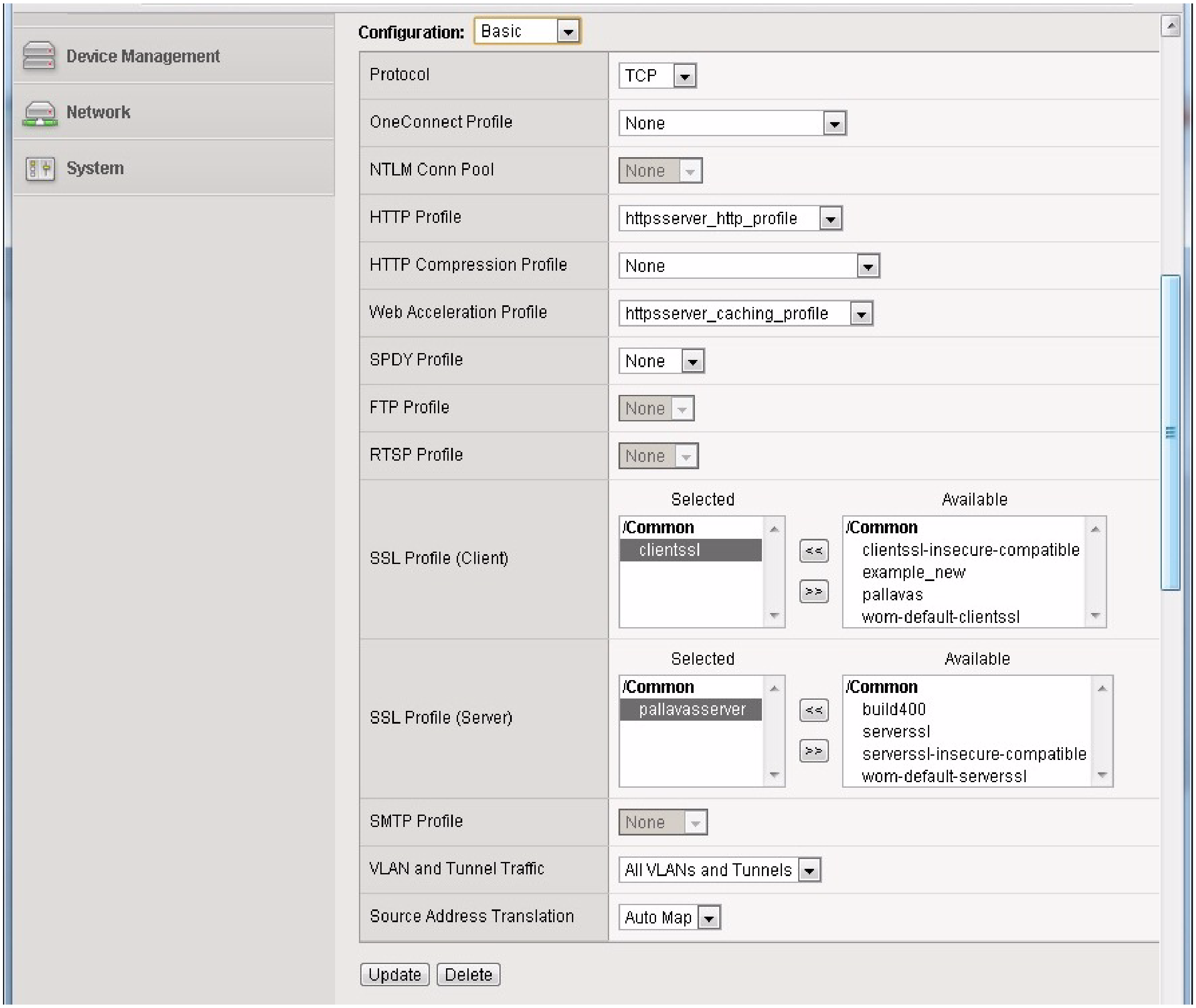
Note Leave all the other fields in its default values.

After you creating the HTTPS Application Service for end to end traffic , configure the virtual server by following these steps:

1. From the Local Traffic > Virtual Servers options, select the virtual server that is created.

2. Under Configuration settings, set the **Oneconnect profile** option to None.

Figure 29 F5 configuration for HTTPS Application Service - SSL Offloading

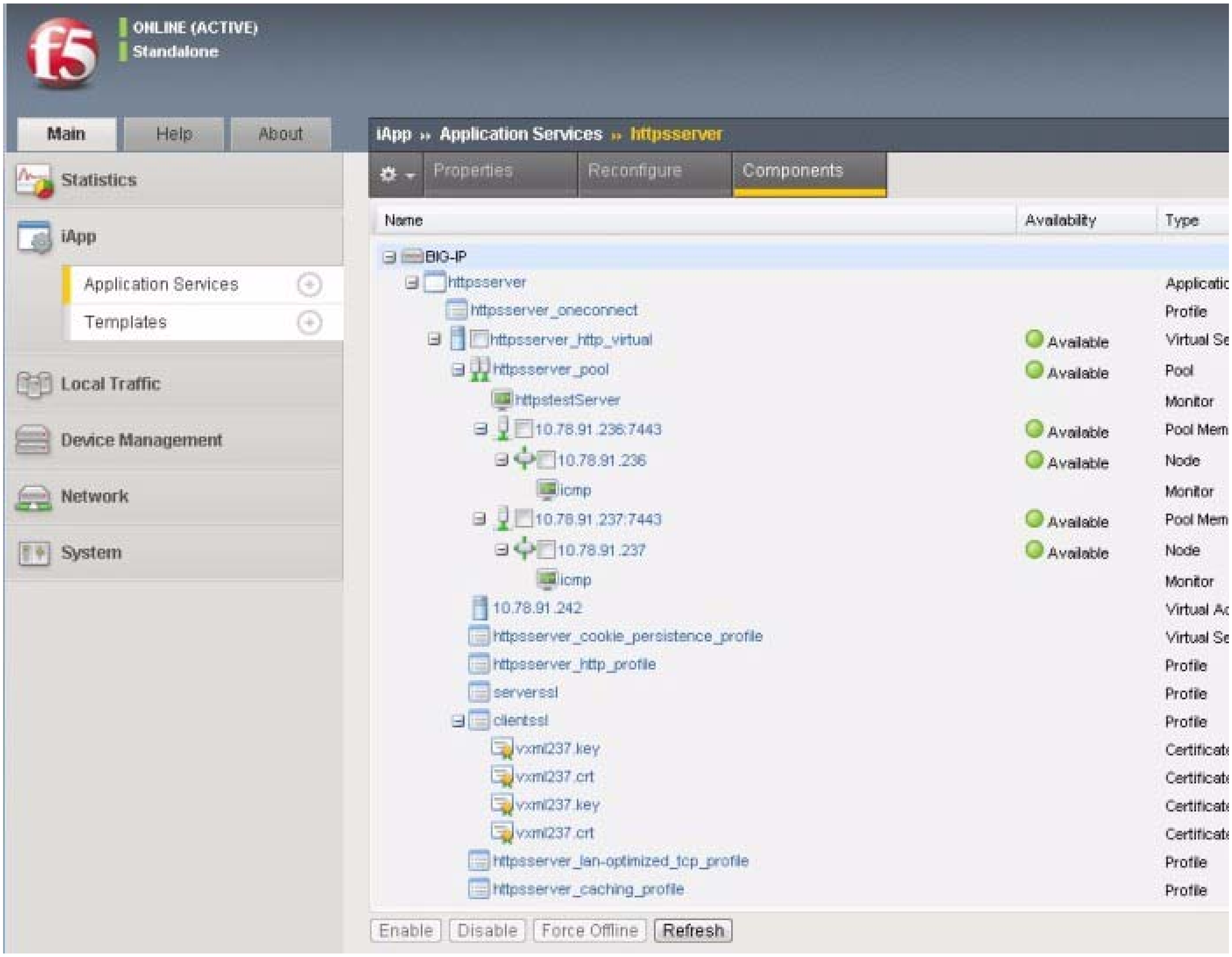


Configuration: Basic

Protocol	TCP
OneConnect Profile	None
NTLM Conn Pool	None
HTTP Profile	httpsserver_http_profile
HTTP Compression Profile	None
Web Acceleration Profile	httpsserver_caching_profile
SPDY Profile	None
FTP Profile	None
RTSP Profile	None
SSL Profile (Client)	Selected: /Common clientssl Available: /Common clientssl-insecure-compatible example_new pallavas wom-default-clientssl
SSL Profile (Server)	Selected: /Common pallavasserver Available: /Common build400 serverssl serverssl-insecure-compatible wom-default-serverssl
SMTP Profile	None
VLAN and Tunnel Traffic	All VLANs and Tunnels
Source Address Translation	Auto Map

3. From SSL Profile (Client) option, select a client profile that is listed and click Add.
4. Click Update. The F5 configuration for HTTPS Application Service end to end traffic is completed.

Figure 30 HTTPS Application Service for end to end traffic



Name	Availability	Type
BIG-IP		
httpsserver		Applicatic
httpsserver_oneconnect		Profile
httpsserver_http_virtual	Available	Virtual Se
httpsserver_pool	Available	Pool
httpstestServer		Monitor
10.78.91.236:7443	Available	Pool Mem
10.78.91.236	Available	Node
icmp		Monitor
10.78.91.237:7443	Available	Pool Mem
10.78.91.237	Available	Node
icmp		Monitor
10.78.91.242		Virtual Ac
httpsserver_cookie_persistence_profile		Virtual Se
httpsserver_http_profile		Profile
serverssl		Profile
clientssl		Profile
vxml237.key		Certificat
vxml237.crt		Certificat
vxml237.key		Certificat
vxml237.crt		Certificat
httpsserver_lan-optimized_tcp_profile		Profile
httpsserver_caching_profile		Profile

Corporate Headquarters

Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 526-4100

European Headquarters

Cisco Systems International BV
Haarlerbergpark
Haarlerbergweg 13-19
1101 CH Amsterdam
The Netherlands
www-europe.cisco.com
Tel: 31 0 20 357 1000
Fax: 31 0 20 357 1100

Americas Headquarters

Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
www.cisco.com
Tel: 408 526-7660
Fax: 408 527-0883

Asia Pacific Headquarters

Cisco Systems, Inc.
Capital Tower
168 Robinson Road
#22-01 to #29-01
Singapore 068912
www.cisco.com
Tel: +65 317 7777
Fax: +65 317 7799

Cisco Systems has more than 200 offices in the following countries and regions. Addresses, phone numbers, and fax numbers are listed on the Cisco Web site at www.cisco.com/go/offices.

Argentina • Australia • Austria • Belgium • Brazil • Bulgaria • Canada • Chile • China PRC • Colombia • Costa Rica • Croatia • Czech Republic • Denmark • Dubai, UAE • Finland • France • Germany • Greece • Hong Kong SAR • Hungary • India • Indonesia • Ireland • Israel • Italy • Japan • Korea • Luxembourg • Malaysia • Mexico • The Netherlands • New Zealand • Norway • Peru • Philippines • Poland • Portugal • Puerto Rico • Romania • Russia • Saudi Arabia • Scotland • Singapore • Slovakia • Slovenia • South Africa • Spain • Sweden • Switzerland • Taiwan • Thailand • Turkey Ukraine • United Kingdom • United States • Venezuela • Vietnam • Zimbabwe

Printed in the USA