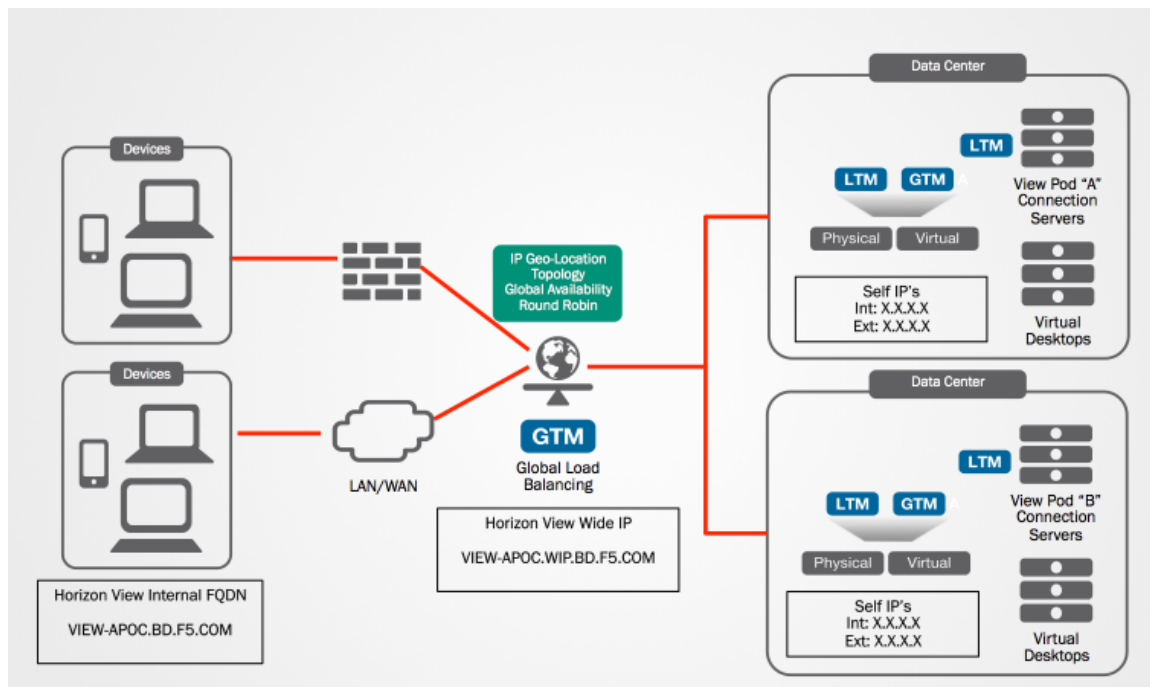


## Managing Horizon Traffic across Multiple Data Centers with BIG-IP



By deploying BIG-IP Global Traffic Manager (GTM), a single namespace (for example, <https://desktop.example.com>) can be provided to all end users. BIG-IP GTM and BIG-IP Local Traffic Manager (LTM) work together to ensure that requests are sent to a user's preferred data center, regardless of the user's current location. This type of implementation is common when there are multiple Horizon instances distributed throughout two or more physical/logical data centers.

We'll configure BIG-IP DNS (formerly Global Traffic Manager - GTM) to support Horizon environments across two data centers. This guide will give you instructions for setting up multiple data centers by using 2 separate BIG-IP appliances with 2 separate Horizon View instances.

### Access the BIG-IP Web Management Console

You will need access and login information to the BIG-IP web management consoles of the BIG-IP's that will be used for Global Traffic Management. Consult your BIG-IP administrator for more information on getting the credentials and access to the device management consoles.

## Create Load Balanced Virtual Servers

Before proceeding through these next steps, it's important to ensure each View pod is configured for load balancing on the BIG-IP using Local Traffic Manager (LTM), or Access Policy Manager (APM) if using F5's BIG-IP PCoIP Proxy as an alternative. This guide assumes these steps have been completed.

Additional guidance and step-by-step instructions on setting up the PCoIP Proxy can be found here:

<https://devcentral.f5.com/articles/implementing-pcoip-proxy-as-a-security-server-or-access-point-alternative>

Additional information on setting up load balancing for View Security Servers, Connection Servers, and/or Access Point can be found in the latest deployment guide for Horizon:

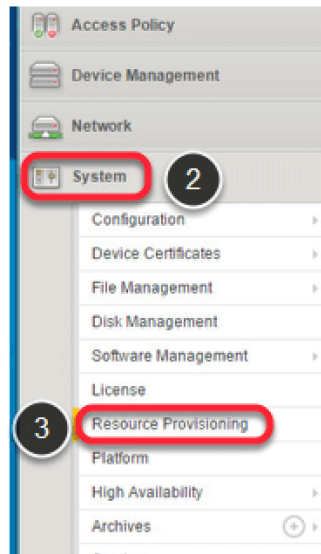
<https://www.f5.com/pdf/deployment-guides/vmware-view5-iapp-dg.pdf>

## Enable Global Traffic Management (GTM) Module

First, we'll enable the Global Traffic Manager (GTM) module on the BIG-IP.

It's important to ensure your BIG-IP has enough memory and CPU to run BIG-IP DNS in addition to any other modules that are currently running on the BIG-IP.

1. Logon to the BIG-IP Web Administration interface on the 1<sup>st</sup> BIG-IP.
2. Click on System
3. Click on Resource Provisioning.



4. CHECK the box next to Global Traffic (GTM).

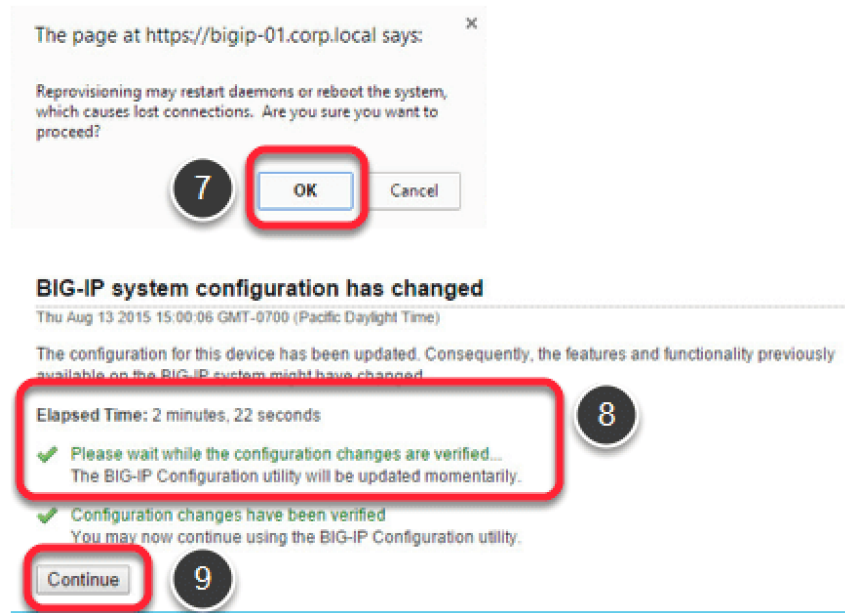
Module	Provisioning	License Status	Required Disk (GB)	Req
Management (MGMT)	Small	N/A	0	920
Carrier Grade NAT (CGNAT)	Disabled	Unlicensed	0	0
Local Traffic (LTM)	<input checked="" type="checkbox"/> Minimum	Licensed	0	140
Application Security (ASM)	<input type="checkbox"/> None	Licensed	16	876
Fraud Protection Service (FPS)	<input type="checkbox"/> None	N/A	12	416
Global Traffic (GTM)	<input checked="" type="checkbox"/> Minimum	Licensed	0	148
Link Controller (LC)	<input type="checkbox"/> None	Unlicensed	0	148

5. Scroll down until you see the Submit and Revert buttons.

6. Click Submit.

Application Security and Reporting (ASR)				
Policy Enforcement (PEM)	<input type="checkbox"/> None	Unlicensed	16	
Advanced Firewall (AFM)	<input type="checkbox"/> None	Licensed	16	
Application Acceleration Manager (AAM)	<input type="checkbox"/> None	Licensed	32	
Secure Web Gateway (SWG)	<input type="checkbox"/> None	Unlicensed	24	
<div> Revert Submit </div>				

7. You will then be prompted to re-provision the system resources (which will temporarily disconnect your session from the BIG-IP); click OK.
8. Next, you will see the following message on the screen; this will remain on the screen until the BIG-IP is back on-line.
9. Click Continue when prompted.



10. You should automatically return to the Resource Provisioning screen.
11. Repeat these steps on the 2<sup>nd</sup> BIG-IP.

## Configure BIG-IP DNS (Global Traffic Management)

In this step, we'll use PUTTY to SSH to each BIG-IP and establish the communications trust relationship between the BIG-IP's exchange DNS and BIG-IP pool information. Go ahead and open an SSH/Putty session to each of the BIG-IP's.

### Establish connectivity between BIG-IP's



The screenshot shows a terminal window titled 'bigip-01'. It contains three distinct steps of a configuration process, each highlighted with a red box and a numbered circle:

- Step 1:** The prompt is `[root@bigip-01:Active:Standalone] config #`. The command `bigip_add 192.168.100.132` has been entered.
- Step 2:** The terminal displays the RSA key fingerprint: `RSA key fingerprint is 10:8a:f0:53:56:1d:20:35:06:60:f5:f4:b9:77:b9:ab.` and asks: `Are you sure you want to continue connecting (yes/no)?`. The user has responded with `yes`.
- Step 3:** The terminal displays the message: `Enter root password for 192.168.100.132 if prompted`. Below this, it shows `==> Done <==` and the prompt `[root@bigip-01:Active:Standalone] config #` with a cursor.

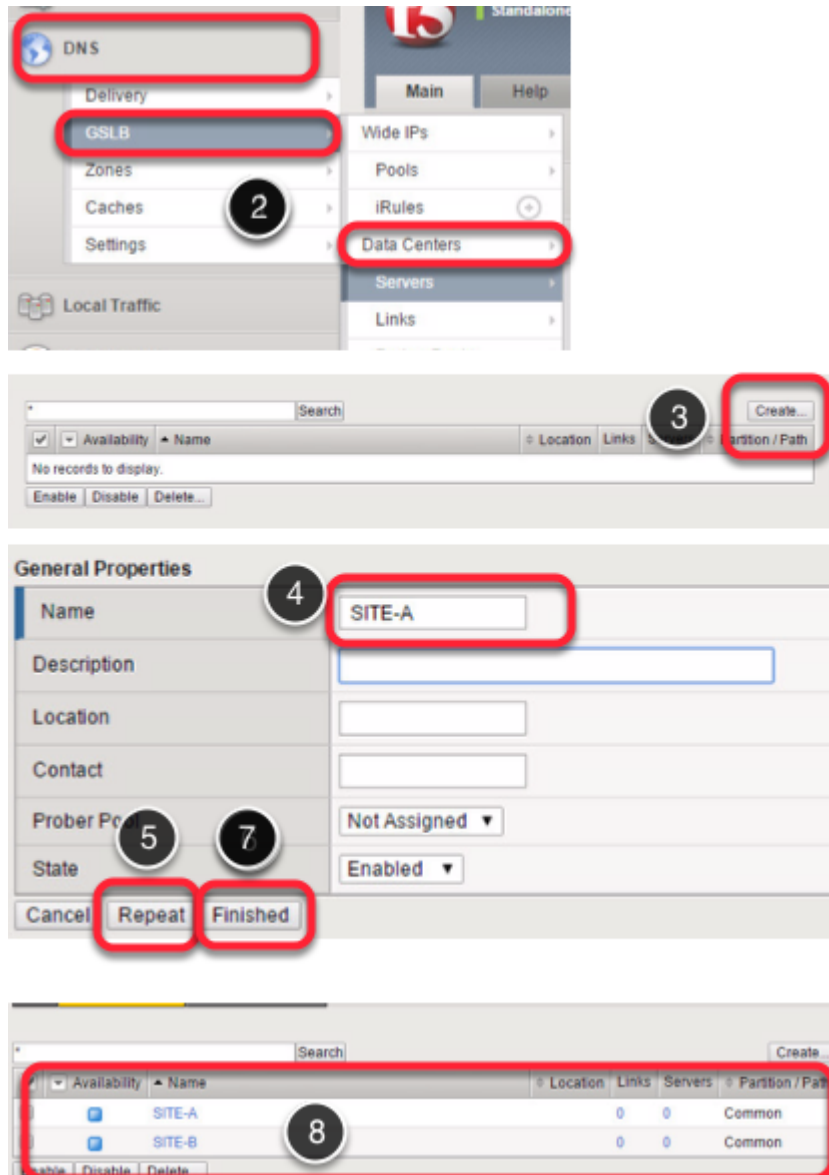
From the Putty/SSH window for BIGIP-01.

1. Type in `bigip_add "IP address"` (i.e. `bigip_add 192.168.100.32`) and press ENTER.
2. Type in `yes` to accept the fingerprint.
3. Once completed, you will see the "Done" message.
4. Repeat steps 1 through 3 from the Putty/SSH session for BIGIP-02
5. When completed, minimize both BIGIP-01 and BIGIP-02 Putty Sessions (we will need them later).

## Configure BIG-IP DNS (Global Traffic Manager) Pool Settings and DNS Configuration

We'll now setup some of the additional settings required for global load balancing.

## Create Data Centers for BIG-IP DNS



First, we'll configure objects on the BIG-IP that will represent the 2 Horizon sites.

1. Open the BIG-IP Web Administrator interface on the 1<sup>st</sup> BIG-IP.
2. Click on DNS --> GSLB --> Data Centers.
3. Click Create.
4. Type in the name of the data center for the 1<sup>st</sup> BIG-IP (i.e. Site-A).
5. Click Repeat.

6. Repeat step 4, typing in the name of the data center for the 2<sup>nd</sup> BIG-IP (i.e. Site-B).
7. Click Finish.
8. You should see the 2 data center/sites created.

## Create BIG-IP Server Objects

Next, we will create the server objects. These are actually the BIG-IP's themselves and will be used to auto discover virtual servers hosted on Local Traffic Manager. In this case, we'll let GTM auto discover the virtual servers used for Horizon.

The image shows three screenshots of the BIG-IP configuration interface, illustrating the steps to create server objects.

**Top Screenshot:** The 'Servers' page is shown. The 'GSLB' menu is selected (1), and the 'Servers' option is highlighted (2). The 'Create' button is visible (3).

**Middle Screenshot:** The 'General Properties' form for a new server is shown. The 'Name' field is set to 'SITE-A-GTM' (3). The 'Address' field is set to '192.168.100.131' (4). The 'Address List' contains the same address (5). The 'Data Center' is set to 'SITE\_A' (6). The 'Virtual Server Discovery' is set to 'Enabled' (7). The 'Repeat' button is highlighted (8).

**Bottom Screenshot:** The 'Server List' page is shown. The 'Server List' tab is selected (10). The table lists the created servers:

Status	Name	Address	Data Center	Virtual Servers	Product	Partition / Path
Enabled	SITE-A-GTM	192.168.100.131	SITE_A	2	BIG-IP System (Single)	Common
Enabled	SITE-B-GTM	192.168.100.132	SITE_B	2	BIG-IP System (Single)	Common

1. Click on DNS --> GSLB --> Servers.
2. Click Create.
3. Type in the name for the 1<sup>st</sup> GTM that will be used for the 1<sup>st</sup> data center (i.e. GTM-SITE-A).
4. In the IP Address box, type in the IP address for the 1<sup>st</sup> GTM (i.e. 192.168.100.131).
5. Click Add - you will see the IP address move into the box below.
6. For the Data Center, choose the name from the 1<sup>st</sup> data center (i.e. SITE-A).
7. Next to Virtual Server Discovery - choose Enabled.
8. Click Create.
9. Repeat steps 3 through 8, using the 2<sup>nd</sup> GTM (i.e. GTM-SITE-B) for the name, choosing the name for the 2<sup>nd</sup> data center (i.e. SITE-B) for the Data Center and the IP Address for the 2<sup>nd</sup> data center (i.e. 192.168.100.132).
10. You should see the GTM objects in the list, and they should have green circles next to them. If you don't see them right away, click the Server List box as shown in the diagram to refresh the screen until the circles are green and you see two virtual servers for each Site GTM.



## Create BIG-IP GTM Pool

Next, we will create a pool of resources that will be used by GTM to route users to an available Horizon instance.

**Step 1:** In the DNS menu, select **Pools**.

**Step 2:** Click the **Create...** button.

**Step 3:** In the **General Properties** tab, set the **Name** to **VIEW-GTM-POOL**.

**Step 4:** Under **Configuration: Basic**, set the **Load Balancing Method** to **Preferred: Least Connection**, **Alternate: Round Robin**, and **Fallback: Return to DNS**.

**Step 5:** In the **Members** section, add the **Virtual Server** **/Common/HZN-SITE-A\_app/HZN-SITE-A\_redirect (/Common/SITE-A-GTM) - 192.168.100.133:80**.

**Step 6:** Add the following members to the **Member List**:

- /Common/HZN-SITE-A\_app/HZN-SITE-A\_https (/Common/SITE-A-GTM) - 192.168.100.133:443, Ratio(1)**
- /Common/HZN-SITE-B\_app/HZN-SITE-B\_https (/Common/SITE-B-GTM) - 192.168.100.134:443, Ratio(1)**

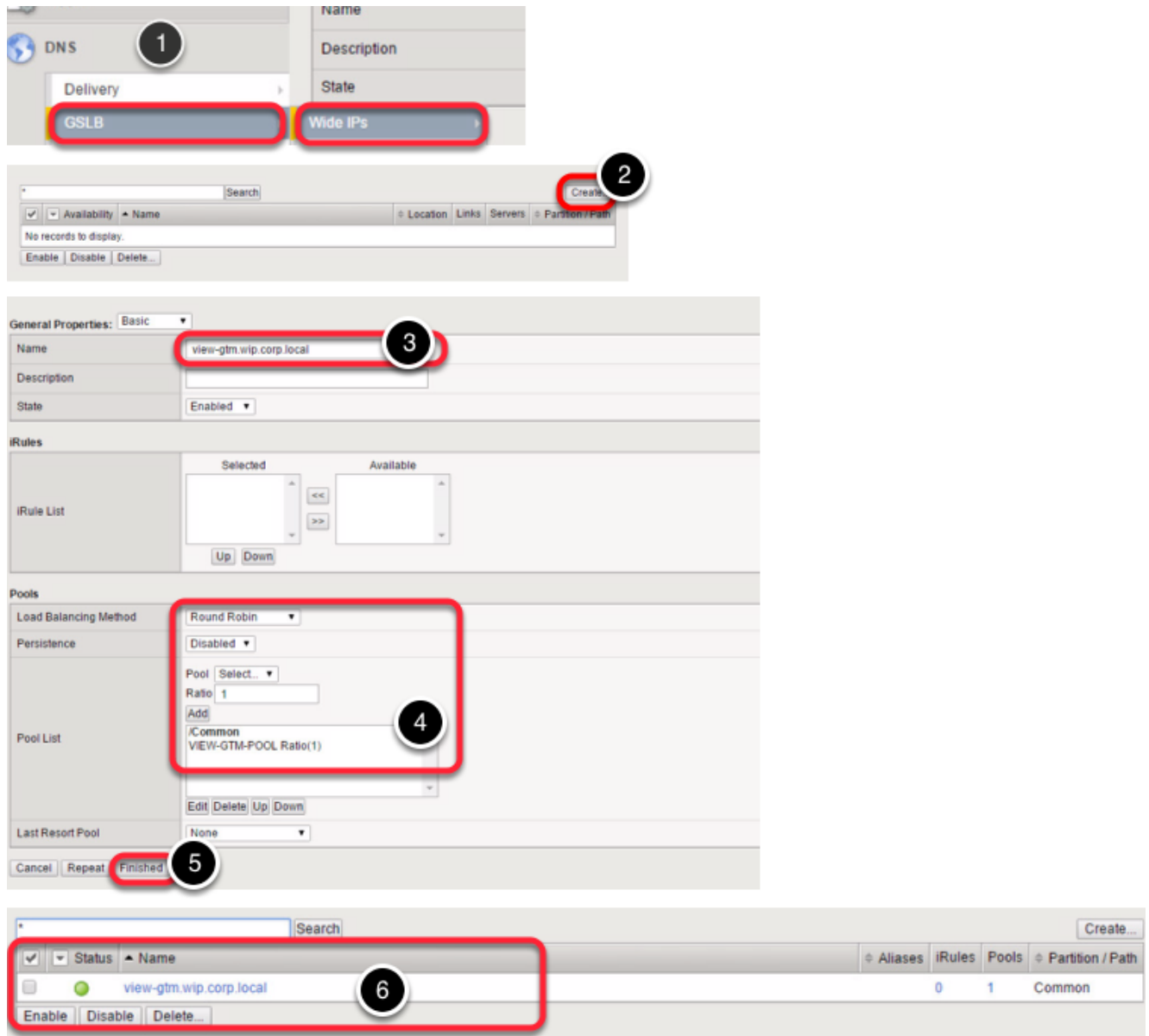
**Step 7:** Click the **Finished** button.

**Step 8:** In the **Pool List**, the **VIEW-GTM-POOL** pool is created with **2** members.

1. Click on DNS --> GSLB --> Pools.
2. Click Create.
3. For the name of the pool, type in the name of the pool (i.e. VIEW-GTM-POOL).
4. Under the load balancing method, choose the appropriate load balancing method (i.e. Least Connection for the Preferred method, and Round Robin for the alternate method).
5. To create the member list, click the down arrow on the right side of the virtual server box. Choose one of the virtual servers listed from the 1<sup>st</sup> data center (i.e. 192.168.100.133:443), then click Add.
6. Choose the other virtual server listed from the 2<sup>nd</sup> data center (i.e. 192.168.100.134:443) from the list and click Add.
7. Click Finished.
8. You will then see the pool show up in the list. Click the "Pool List" button until you see the pool's status change to Green.

### **Setup GTM Wide IP**

In this next step, we'll configure the Wide IP. The Wide IP is used to help make the appropriate load balancing/routing decision to a pool of virtual servers that are contained within or across data centers. The Wide IP will be used as the FQDN that returns the IP address of the site the user is directed to.



1. Click on GSLB --> Wide IPs.
2. Click the Create button
3. Type in the DNS name that will be used for the Wide IP (i.e. view-gtm.wip.corp.local) in the name box.
4. In the pool list box, click the down arrow next to Pool. Choose the pool created in the previous step (i.e. VIEW-GTM-POOL), and then click Add.
5. Click Finished.
6. Make sure the Wide IP address returns a green status.

## Add BIGIP-02 to Sync Group

We'll now establish the trust and perform the initial sync up BIGIP-02 to sync the GTM configuration to the other simulated data center. This configuration allows GTM to failover to an alternate site in the event of a primary site failure.

2

```
[root@bigip-02:Active:Standalone] config # gtm_add 192.168.100.131
```

3

WARNING: Running this script will wipe out the current configuration files (bigip\_gtm.conf, named.conf and named zone files) on the BIG-IP GTM Controller on which this script is run. The configuration will be replaced with the configuration of the remote BIG-IP GTM Controller in the specified sync group  
The local BIG-IP GTM MUST already be added in the configuration of the other GTM.  
Are you absolutely sure you want to do this? [y/n] y

4

Enter root password if prompted  
The authenticity of host '192.168.100.131 (192.168.100.131)' can't be established.  
SA key fingerprint is 10:8a:f0:53:56:1d:20:35:06:60:f5:f4:b9:77:b9:ab.  
Are you sure you want to continue connecting (yes/no)?

5

Rekeying Master Key...  
Verifying iQuery connection to 192.168.100.131. This may take up to 30 seconds  
Retrieving remote GTM configuration...  
Retrieving remote DNS/named configuration...  
Restarting gtmd  
Restarting named  
Restarting zrd  
=> Done <==  
root@bigip-02:gtmd DOWN:Standalone config #

7

DNS  
Delivery: GSLB  
Wide IPs

8

Status	Name	Aliases	iRules	Pools	Partition / Path
✓	view-gtm.wip.corp.local		0	1	Common

1. Open the Putty/SSH session to the 2<sup>nd</sup> BIG-IP. MAKE SURE YOU ARE ON BIGIP #2 - if you run the command in step #2 on the 1<sup>st</sup> BIG-IP, the configuration will be deleted.
2. Type in gtm\_add "IP Address" (i.e. gtm\_add 192.168.100.131) and press Enter.
3. When prompted, type y and press Enter.
4. If prompted again, type yes and press enter.
5. You will see the following message once the sync is completed.

6. Minimize the Putty window.
7. Open the Web Interface to the 2<sup>nd</sup> BIG-IP; click on DNS → GSLB → Wide IP
8. You should see the configuration for GTM from the 1<sup>st</sup> BIG-IP; this verifies the sync is complete.

### Enable GTM Sync on both BIG-IP's

Next, we will turn on the GTM Sync for each BIG-IP.



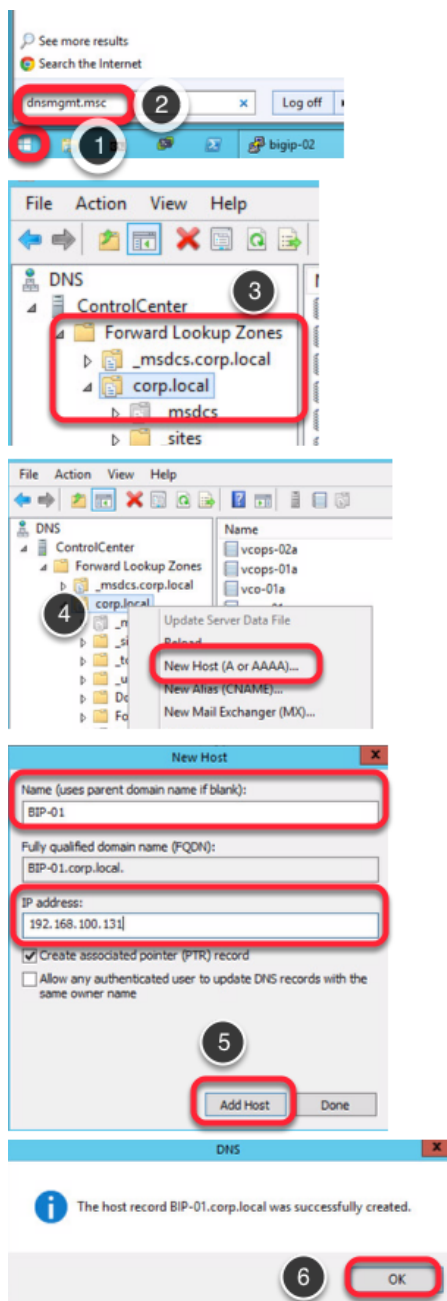
Configuration Synchronization	
Synchronize	<input checked="" type="checkbox"/> Enabled
Group Name	BIG-IP
Time Tolerance	10 seconds
Synchronize DNS Zone Files	<input checked="" type="checkbox"/> Enabled

1. Navigate to the BIG-IP Web Interface for the 1<sup>st</sup> BIG-IP. Click on DNS --> Settings --> GSLB --> General.
2. Check the box to enable Synchronization; Set the group name to BIG-IP, and check the box to enable Synchronize DNS Zone Files.
3. Scroll to the bottom of the screen and click Update
4. Repeat steps 1 through 4 on the 2<sup>nd</sup> BIG-IP.
5. When completed, minimize the browser window.

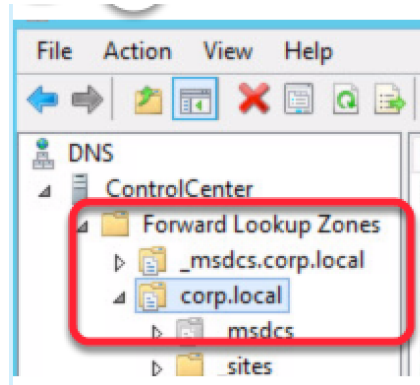
### Configure DNS Records

In order for BIG-IP to properly route traffic, it needs the authority to manage the DNS record and/or zone that's used for the global load balancing. The first step is to put DNS "A" records in place for each BIG-IP GTM interface that we want to respond to DNS.

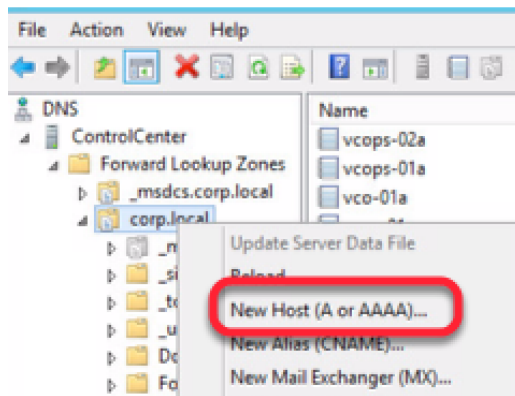
Next, we'll create a zone in DNS that we'll delegate resolving the FQDN for Horizon to the BIG-IP. For the lab, we will use the internal self IP's of the BIG-IP's as the resolving IP addresses for DNS. This example uses Active Directory's DNS Services.



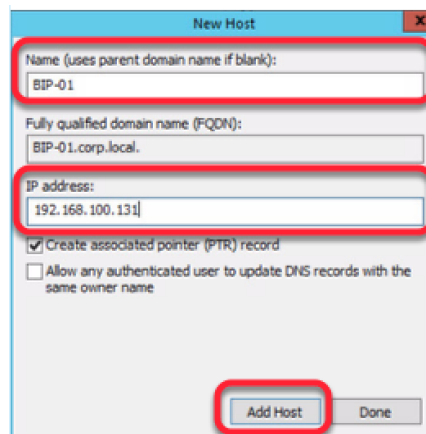
1. Launch the DNS management snap-in for Active Directory.
2. Click the arrow by Forward Lookup Zones to show the domains. Highlight the domain you will be adding the the A records for the BIG-IP (i.e. corp.local).



3. Right-click and choose New Host (A or AAAA)...



4. Type in the host name and the IP address for the 1<sup>st</sup> BIG-IP (i.e. BIP-01 and 192.168.100.131) then click Add Host.



5. Click OK.

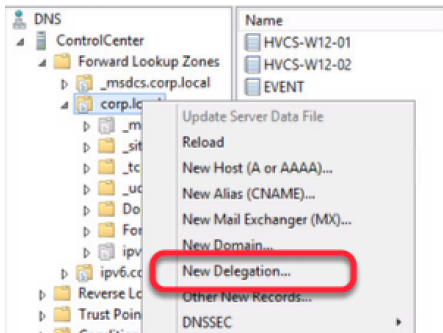
6. Repeat steps 4 and 5 for the 2<sup>nd</sup> BIG-IP.

7. When completed with the above steps, click Done.

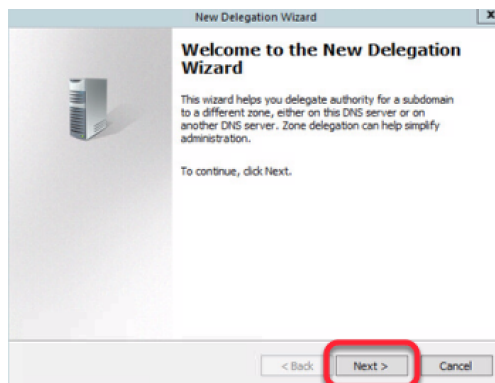
## Configure DNS Records (Continued)

Let's continue and setup the delegated domain (i.e. WIP).

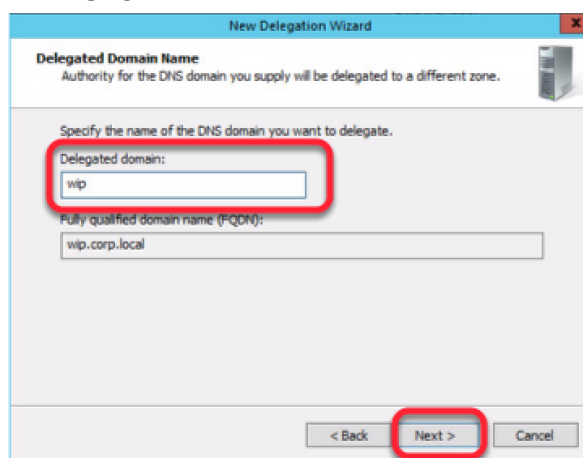
1. Right-click on the domain name (i.e. corp.local) in the DNS window and choose New Delegation.



2. Click Next.



3. Type in the name of the delegated DNS zone (i.e. wip), then click Next.





#### 4. Click Add.

**Name Servers**  
You can select one or more name servers to host the delegated zone.

Specify the names and IP addresses of the DNS servers you want to have host the delegated zone.

Name servers:

Server Fully Qualified Domain Name (FQDN)	IP Address
---	------------

**Add...** Edit... Remove

< Back Next > Cancel

#### 5. Type in the FQDN of the 1<sup>st</sup> BIG-IP, then click OK. Repeat by typing in the FQDN for the 2<sup>nd</sup> BIG-IP (i.e. BIP-01.corp.local and BIP-02.corp.local). Then click Next.

**Name Servers**  
You can select one or more name servers to host the delegated zone.

Specify the names and IP addresses of the DNS servers you want to have host the delegated zone.

Name servers:

Server Fully Qualified Domain Name (FQDN)	IP Address
bip-01.corp.local.	Unknown
bip-02.corp.local.	Unknown

Add... Edit... Remove

< Back **Next >** Cancel

#### 6. Click Finish. You will see the DNS zone WIP that will be delegated to the BIG-IP.

**DNS Manager**

File Action View Help

DNS

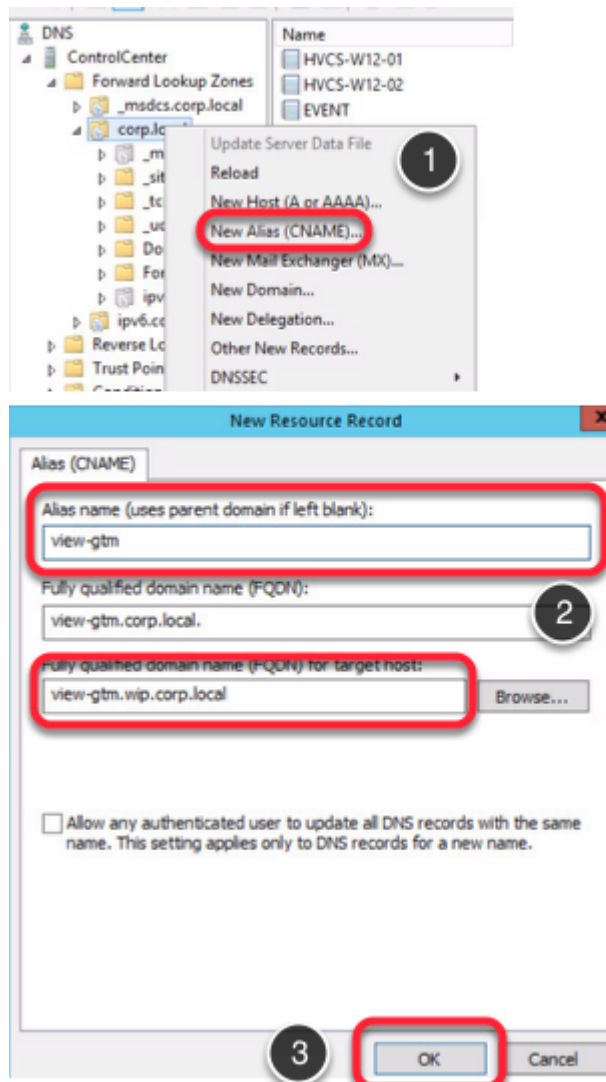
- ControlCenter
- Forward Lookup Zones
  - \_msdcs.corp.local
  - corp.local
    - \_msdcs
    - \_sites
    - \_tcp
    - \_udp
    - DomainDnsZones
    - ForestDnsZones
    - wip**

Zone Details

Name	Type	Value
(same as parent folder)	Name Server (NS)	bip-01.corp.local.
(same as parent folder)	Name Server (NS)	bip-02.corp.local.

## Create CNAME DNS Record

We'll now create the CNAME record that will redirect the DNS request to the BIG-IP for resolution.



1. Right-click on the domain name (i.e. corp.local) and choose New Alias (CNAME)...
2. Type in the hostname of the FQDN that will be used (i.e. view-gtm if view-gtm.corp.local is the FQDN) for the Alias name and the FQDN that will be used to redirect to the Wide IP on the BIG-IP (i.e. view-gtm.wip.corp.local) for target host.

The FQDN for target host contains the DNS zone we delegated to BIG-IP. In this example, BIG-IP will resolve the DNS name for anyone trying to resolve view-gtm.corp.local.

3. Click OK.

4. Exit the DNS Management snap-in

### Configure DNS Listening on the BIG-IP

The last step is to configure the BIG-IP to answer DNS requests.

The screenshot displays the BIG-IP Web Administration interface for configuring a DNS listener. The interface is divided into several sections:

- General:** Name is set to "GTM-A-DNS", Description is empty, and State is "Enabled".
- Listener:** Listener is set to "Basic", Destination is "192.168.100.131", and Type is "Host".
- Service:** Service is set to "Basic", Protocol is "UDP", and DNS Profile is "dns".
- Load Balancing:** Default Pool, Default Persistence Profile, and Fallback Persistence Profile are all set to "None".
- Rules:** Statistics Profile is set to "None". The IRules section shows a list of available rules: \_sys\_APM\_ExchangeSupport\_OA\_BasicAuth, \_sys\_APM\_ExchangeSupport\_OA\_NtlmAuth, \_sys\_APM\_ExchangeSupport\_helper, and \_sys\_APM\_ExchangeSupport\_main.

The "Finished" button is highlighted. A table at the bottom shows the configuration details for the listener:

State	Name	Destination	Protocol	Path
Enabled	GTM-A-DNS	192.168.100.131	UDP	

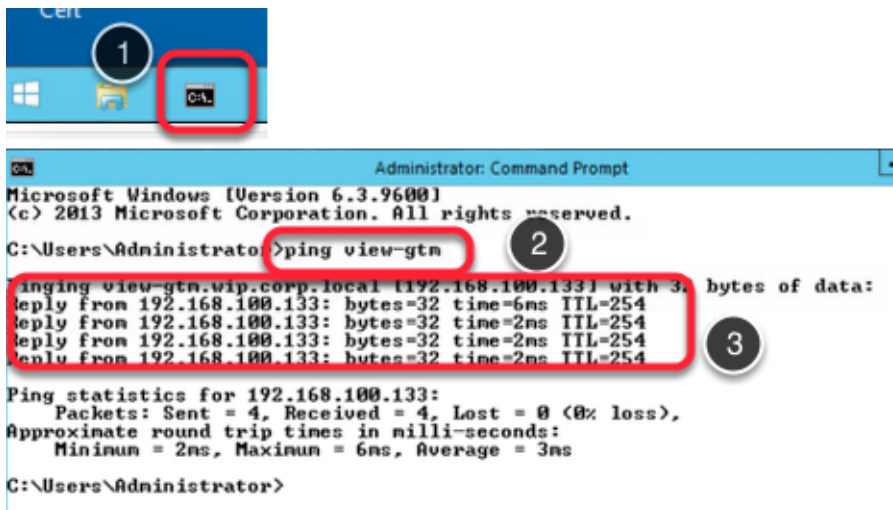
1. Open the Web Administration interface on the 1<sup>st</sup> BIG-IP.
2. Click on DNS --> Delivery --> Listeners.
3. Click Create.

4. Type in the name that we will use to identify the listener (i.e. GTM-A-DNS, type in the IP address that will be used for DNS requests (i.e. 192.168.100.131) for the Destination IP Address, then click Finished.
5. You will then see the DNS listener created on BIGIP-01.
6. From the BIG-IP Web Administration browser for the 2<sup>nd</sup> BIG-IP repeat steps 2 through 5 using the values for the 2<sup>nd</sup> BIG-IP.

**NOTE:** You may have to repeat these steps 2 more times if you use TCP for DNS resolution as well. If this is required, repeat the steps, except change the Protocol to TCP.

## Testing Access using PING

Now, we are ready to test! First, let's ping the FQDN to make sure we are resolving DNS properly.



1. Open a command prompt window by clicking on the command prompt icon located in the lower left corner of the desktop.
2. Type in the FQDN to resolve (i.e. view-gtm.wip.corp.local) and press Enter.
3. You should see the DNS name resolve to view-gtm.wip.corp.local with the IP addresses of the virtual servers. If you continually repeat the ping test, you should see it switch back and forth between each virtual server.
4. Exit the Command Prompt window by clicking the "X" in the upper right corner of the window.

## Testing Access using Horizon

To simulate the GTM working properly, disable the GTM in Site A first and make a connection to Horizon. Then, enable the GTM in Site-A and disable the GTM in Site-B to show GTM working properly.