

BIG-IP[®] Systems: Upgrading 11.x Software

Version 11.5



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Chapter 1

Upgrading Version 11.x BIG-IP Software

- *Introduction to upgrading version 11.x BIG-IP software*
- *Overview: Upgrading a version 11.x BIG-IP device group*
- *Task summary*
- *Implementation result*

Introduction to upgrading version 11.x BIG-IP software

Version 11.x BIG-IP® systems are typically configured to employ the functionality of a device group. When you upgrade version 11.x BIG-IP software for a BIG-IP system device group, to the new version software, you can use a simple sequence of steps to successfully upgrade each device within the device group. The following steps enable you to prepare for a software upgrade, perform the upgrade, and then verify that the upgrade successfully completed.

1. Preparing BIG-IP modules for an upgrade
2. Preparing BIG-IP device groups for an upgrade
3. Upgrading each device within the device group
4. Changing states of the traffic groups
5. Configuring HA groups (if applicable)
6. Configuring module-specific settings
7. Verifying the software upgrade for the device group

Overview: Upgrading a version 11.x BIG-IP device group

A BIG-IP® system device group for version 11.x includes two or more BIG-IP systems, with one or more traffic groups operating in active state. In this example, a version 11.x device group includes one BIG-IP system with traffic-group-1 operating in active state (Device A), one BIG-IP system with traffic-group-2 operating in active state (Device B), and one BIG-IP system with traffic-group-3 operating in active state (Device C).

Important: *If your version 11.x device group includes HA groups, note that an HA group applies to the respective device in version 11.0 through 11.4.x, whereas an HA group applies to a traffic group on the device in version 11.5, and later.*

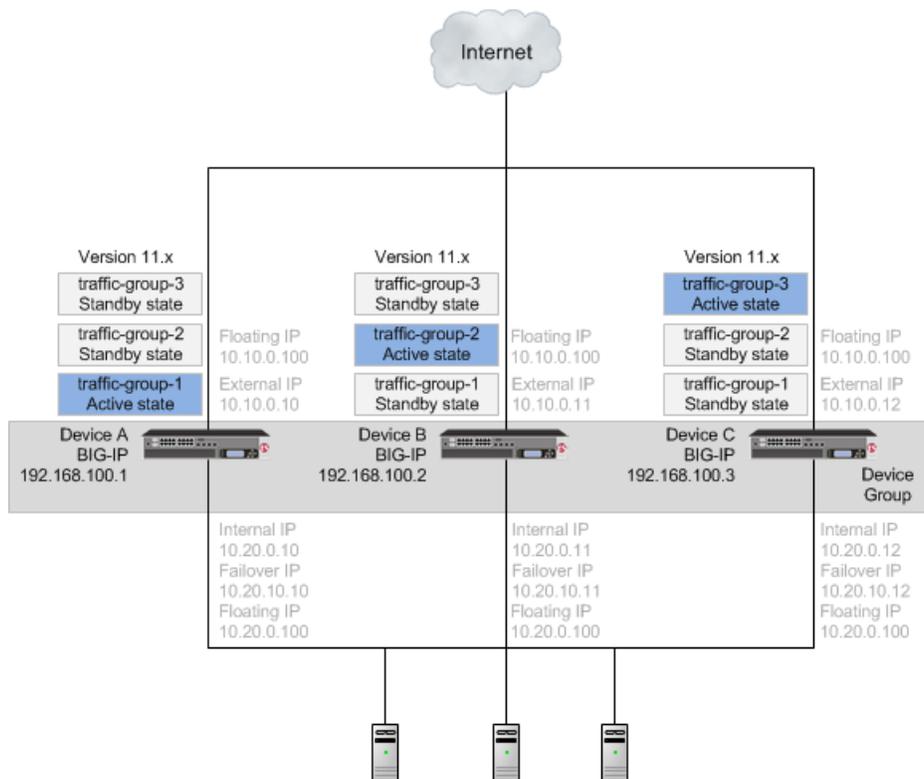


Figure 1: A version 11.x device group

When upgrading an 11.x device group to the new version software, you first need to prepare your devices. After preparing the devices, you force Device A to offline state, and install the new version software onto Device A. When you finish the installation of the new version software onto Device A, the traffic groups remain in standby state on Device A, and in active state on Device B and Device C.

Important: Once Device A reboots, if the BIG-IP system is configured to use a network hardware security module (HSM), you must reinstall network HSM client software on Device A before upgrading Device B, to ensure that traffic groups using the network HSM function properly.

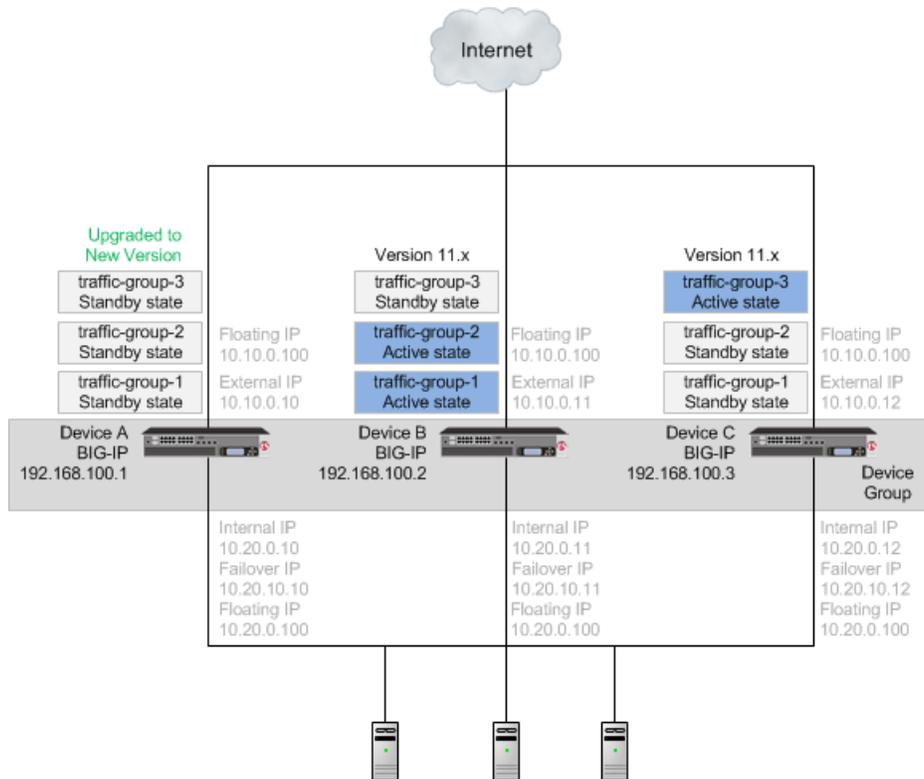


Figure 2: A device group with Device A upgraded to the new version software, and traffic groups in standby state

With the new version software installed on Device A and all traffic groups in standby state, you force Device B to offline state, changing the traffic groups on Device A to active state so that they can pass traffic. You can then install the new version software onto Device B, and reboot Device B to the location of the new version software image.

Important: Once Device B reboots, if the BIG-IP system is configured to use a network HSM, you must reinstall network HSM client software on Device B before upgrading Device C, to ensure that traffic groups using the network HSM function properly.

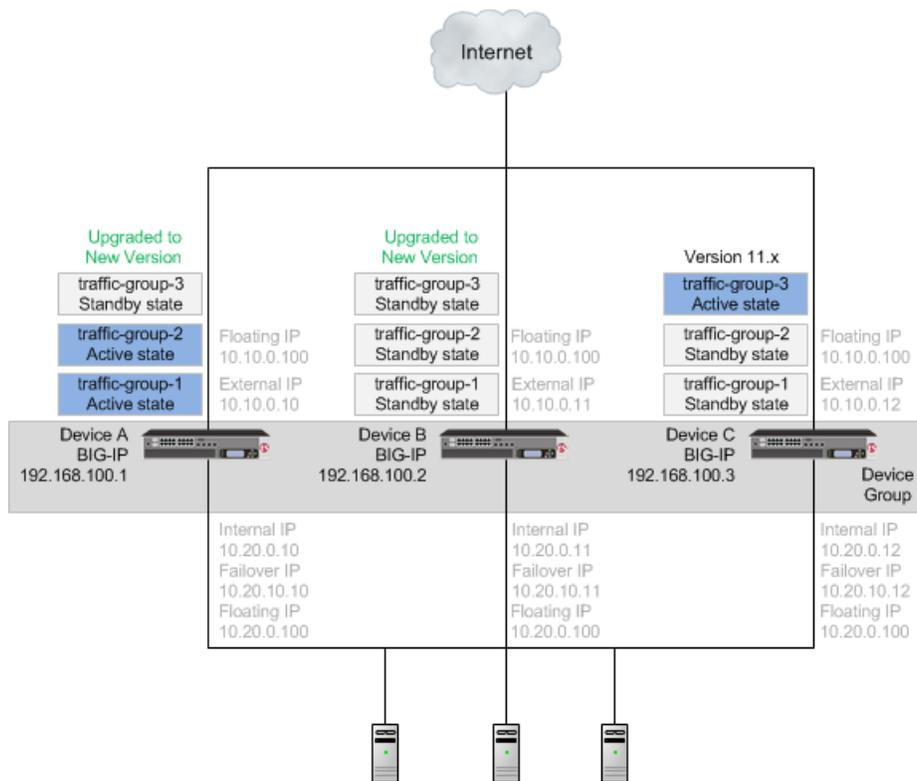


Figure 3: A device group with Device B upgraded to the new version software, and traffic groups in standby state

Once Device B reboots, you can force Device C to offline state, making traffic-group-3 active on Device B. When you complete upgrading Device C to the new version software and reboot Device C, the BIG-IP configuration includes traffic-group-1 and traffic-group-2 in active state on Device A, traffic-group-3 in active state on Device B, and a device group that includes all devices. If you use HA groups, observe that the HA group on Device A, Device B, and Device C applies to each traffic group.

Important: Once Device C reboots, if the BIG-IP system is configured to use a network HSM, you must reinstall network HSM client software on Device C, to ensure that traffic groups using the network HSM function properly.

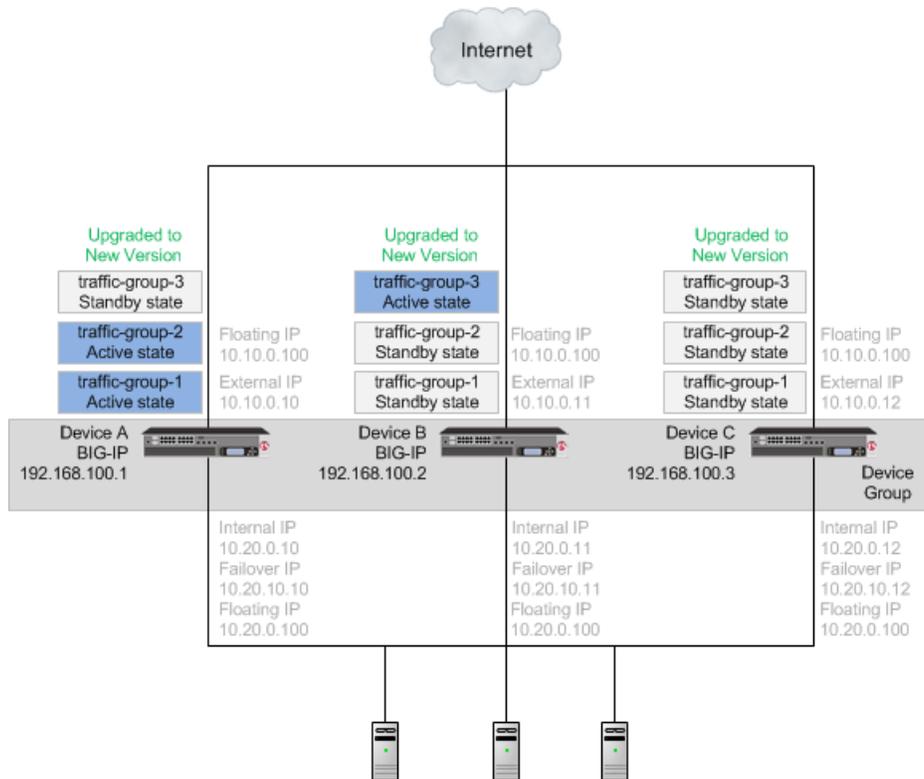


Figure 4: A device group with all devices upgraded to the new version software

Once each device is upgraded to the new version software, you can reconfigure the traffic groups to become active on the devices that you want by forcing the active traffic group on a device to standby state. When forcing the traffic group to standby state, you can target the device upon which you want that traffic group to run in active state. For example, you can force traffic-group-2 on Device A into standby state, and into active state on Device B, and then force traffic-group-3 on Device B into standby state, and into active state on Device C. Additionally, if you use HA groups, you can create a unique HA group for each traffic group on each device.

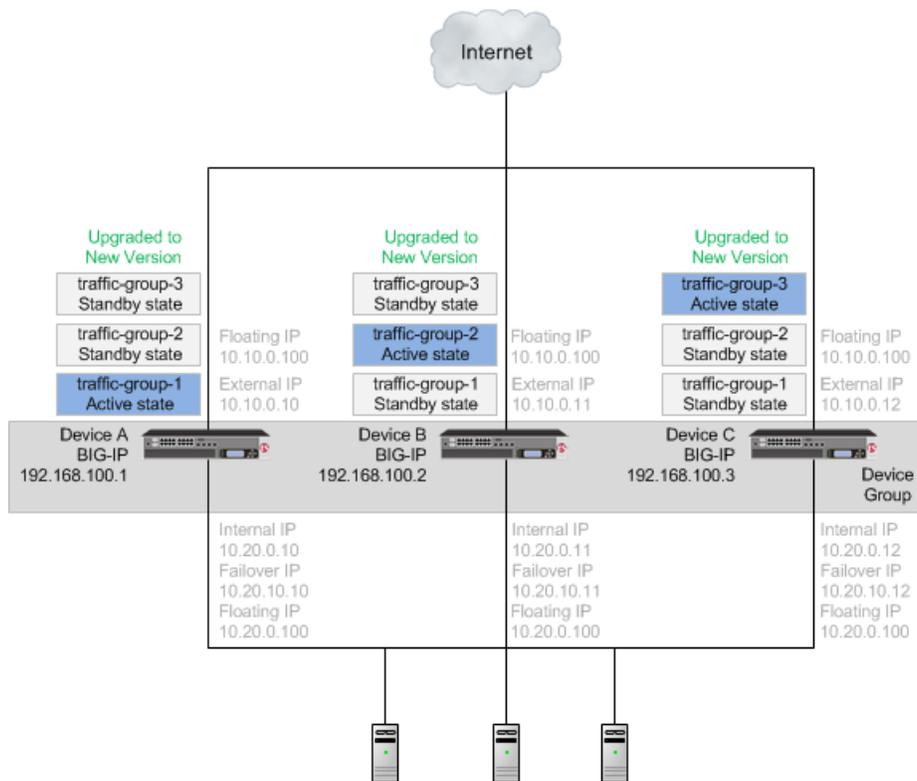


Figure 5: A device group with an active traffic group on each device

Summary of tasks

Task	Description
Preparing the devices in the device group	In preparing to upgrade the BIG-IP systems to the new version software, you need to understand any specific configuration or functional changes from the previous version, and prepare the systems. You also download the new version of software from the AskF5™ web site (http://support.f5.com/kb/en-us.html) and import the files onto each device.
Upgrading Device A	When you complete preparation of Device A, you can force that device to offline state, changing those traffic groups to active state on another device in the traffic group, and then upgrade the software on Device A. <i>Important: Once Device A reboots, if the BIG-IP system is configured to use a network HSM, you must reinstall network HSM client software on Device A before upgrading Device B, to ensure that traffic groups using the network HSM function properly.</i>
Upgrading Device B	When you complete preparation of Device B, you can force that device to offline state, changing those traffic groups to active state on another device in the traffic group, and then upgrade the software on Device B. <i>Important: Once Device B reboots, if the BIG-IP system is configured to use a network HSM, you must reinstall network HSM client software on Device B before upgrading Device C, to ensure that traffic groups using the network HSM function properly.</i>

Task	Description
Upgrading Device C	<p>When you complete preparation of Device C, you can force that device to offline state, changing those traffic groups to active state on another device in the traffic group, and then upgrade the software on Device C.</p> <hr/> <p>Important: <i>Once Device C reboots, if the BIG-IP system is configured to use a network HSM, you must reinstall network HSM client software on Device C to ensure that traffic groups using the network HSM function properly.</i></p> <hr/>
Changing states of traffic groups	When you finish upgrading all of the devices, you can restore the configuration of active traffic groups on each device.
Verifying the upgrade	Finally, you should verify that the BIG-IP device group is functioning properly.
Configuring HA groups	When you finish upgrading a device, the HA group on the device (in version 11.5, and later) applies to a traffic group, as opposed to the device. You can create a unique HA group for each traffic group on each device, as necessary.
Configuring module-specific settings	According to your understanding of the configuration and functional changes from the previous version, you can reconfigure any customized module settings.

DSC components

Device service clustering (DSC®) is based on a few key components.

Devices

A *device* is a physical or virtual BIG-IP® system, as well as a member of a local trust domain and a device group. Each device member has a set of unique identification properties that the BIG-IP system generates. For device groups configured for failover, it is important that the device with the smallest capacity has the capacity to process all traffic groups. This ensures application availability in the event that all but one device in the device group become unavailable for any reason.

Device groups

A *device group* is a collection of BIG-IP devices that trust each other and can synchronize, and sometimes fail over, their BIG-IP configuration data. You can create two types of device groups: A *Sync-Failover* device group contains devices that synchronize configuration data and support traffic groups for failover purposes when a device becomes unavailable. A *Sync-Only* device group contains devices that synchronize configuration data, such as policy data, but do not synchronize failover objects. The BIG-IP system supports either homogeneous or heterogeneous hardware platforms within a device group.

Important: *BIG-IP module provisioning must be equivalent on all devices within a device group. For example, module provisioning is equivalent when all device group members are provisioned to run BIG-IP® Local Traffic Manager™ (LTM®) and BIG-IP® Application Security Manager™ (ASM™) only. Maintaining equivalent module provisioning on all devices ensures that any device in the device group can process module-specific application traffic in the event of failover from another device.*

Traffic groups

A *traffic group* is a collection of related configuration objects (such as a virtual IP address and a self IP address) that run on a BIG-IP device and process a particular type of application traffic. When a BIG-IP device becomes unavailable, a traffic group can float to another device in a device group to ensure that application traffic continues to be processed with little to no interruption in service.

Device trust and trust domains

Underlying the success of device groups and traffic groups is a feature known as device trust. *Device trust* establishes trust relationships between BIG-IP devices on the network, through mutual certificate-based authentication. A *trust domain* is a collection of BIG-IP devices that trust one another and can therefore synchronize and fail over their BIG-IP configuration data, as well as exchange status and failover messages on a regular basis. A *local trust domain* is a trust domain that includes the local device, that is, the device you are currently logged in to.

Folders

Folders are containers for the configuration objects on a BIG-IP device. For every administrative partition on the BIG-IP system, there is a high-level folder. At the highest level of the folder hierarchy is a folder named `root`. The BIG-IP system uses folders to affect the level of granularity to which it synchronizes configuration data to other devices in the device group.

About traffic groups

A *traffic group* is a collection of related configuration objects, such as a floating self IP address, a virtual IP address, and a SNAT translation address, that run on a BIG-IP® device. Together, these objects process a particular type of application traffic on that device. When a BIG-IP device becomes unavailable, a traffic group floats (that is, fails over) to another device in a device group to ensure that application traffic continues to be processed with little to no interruption in service. In general, a traffic group ensures that when a device becomes unavailable, all of the failover objects in the traffic group fail over to any one of the available devices in the device group.

A traffic group is initially active on the device on which you create it, until the traffic group fails over to another device. For example, if you initially create three traffic groups on Device A, these traffic groups remain active on Device A until one or more traffic groups fail over to another device. If you want an active traffic group to become active on a different device in the device group when failover has not occurred, you can intentionally force the traffic group to switch to a standby state, thereby causing failover to another device.

Only objects with floating IP addresses can be members of a floating traffic group.

An example of a set of objects in a traffic group is an iApps® application service. If a device with this traffic group is a member of a device group, and the device becomes unavailable, the traffic group floats to another member of the device group, and that member becomes the device that processes the application traffic.

Note: A Sync-Failover device group can support a maximum of 15 floating traffic groups.

About forcing a device offline

You can force a BIG-IP® device into an offline state, which stops that device from processing or responding to local traffic connections. When the device is in offline state, you can upgrade the software on that device or perform maintenance on that device.

When the BIG-IP system is forced offline, it terminates existing connections to local traffic objects, such as virtual servers, SNATs, and so on. In the forced offline state, the BIG-IP system does not allow new connections.

For BIG-IP systems running software version 11.1.0 and later, the Force Offline status persists through system reboots and upgrades. For BIG-IP systems running software versions earlier than 11.1.0, the Force Offline status does not persist through system reboots.

The BIG-IP system allows administrative connections to the management address to continue, but handles administrative connections to self IP addresses differently, depending on the platform:

- On appliance systems, the system maintains connections to self IP addresses.
- On VIPRION® systems, the system terminates connections to self IP addresses, and does not allow new connections.

Note: When you force a chassis system offline, the Traffic Management Microkernel (TMM) interfaces remain configured until the unit is rebooted. If the chassis is rebooted while Force Offline is enabled, the system marks all TMM interfaces as *Uninitialized* or *Missing*. This behavior is by design. The system will not attempt to initialize and bring up TMM interfaces while the system is in the offline state.

When you force VIPRION platforms offline, make sure to manage the system by using the management port or console. The system terminates connections to self IP addresses when you force the platform offline.

You will want to force the standby devices offline before you change the redundancy state (such as resetting the device trust for a device group). Forcing standby devices into offline state prevents a standby device from unexpectedly becoming active.

Task summary

The upgrade process involves preparation of the BIG-IP® devices (Device A, Device B, and Device C) configured in device group, followed by the installation and verification of the new version software on each device. When you upgrade each device, you perform several tasks. Completing these tasks results in a successful upgrade to the new version software on all BIG-IP devices, with the device group configured properly.

Preparing BIG-IP modules for an upgrade from version 11.x

Before you upgrade the BIG-IP® system from version 11.x to the new version, you might need to manually prepare settings or configurations for specific modules.

Application Acceleration Manager preparation

BIG-IP® Application Acceleration Manager™ (AAM®) modules require specific preparation tasks and changes to upgrade from version 11.x to the new version software. No additional configuration is required after completing the upgrade to the new version software.

Preparation activities

Before you upgrade the BIG-IP® Application Acceleration Manager™ (AAM®) modules from version 11.x to the new version software, you need to prepare the systems, based on your configuration. The following table summarizes the applicable tasks that you need to complete.

Feature or Functionality	Preparation Task
Unpublished policies	You must publish any policies that you want to migrate to the new version software. Only published policies are migrated into the new version software.

Advanced Firewall Manager system preparation

The BIG-IP® Advanced Firewall Manager™ (AFM™) system does not require specific preparation when upgrading from version 11.x to the new version software. No additional configuration is required after completing the upgrade to the new version software.

Access Policy Manager system preparation

The Access Policy Manager® system does not require specific preparation when upgrading from version 11.x to the new version software. However, additional configuration might be required after completing the upgrade to the new version software.

Supported high availability configuration for Access Policy Manager

Access Policy Manager is supported in an active-standby configuration with two BIG-IP® systems only.

Important: Access Policy Manager is not supported in an active-active configuration.

Post-upgrade activities

When you finish upgrading to the new version software, you should consider the following feature or functionality changes that occur for the Access Policy Manager systems. Depending on your configuration, you might need to perform these changes after you upgrade your systems.

Feature or Functionality	Description
Sessions	All users currently logged in while the upgrade occurs will need to log in again.
Authentication agents and SSO methods	If you have deployments using ActiveSync or Outlook Anywhere, where the domain name is part of the user name, you should enable the Split domain from username option in the login page agent if the authentication method used in the access policy requires only the user name for authentication.

Application Security Manager system preparation

The BIG-IP® Application Security Manager™ (ASM™) system does not require specific preparation when upgrading from version 11.x to the new version software. No additional configuration is required after completing the upgrade to the new version software.

What to expect after upgrading a redundant system

If you update two redundant systems that are running as an active-standby pair with BIG-IP Application Security Manager (ASM) and BIG-IP® Local Traffic Manager™ (LTM®) provisioned, the system maintains the active-standby status and automatically creates a Sync-Failover device group and a traffic group containing both systems. The device group is enabled for BIG-IP ASM (because both systems have ASM provisioned).

You can manually push or pull the updates (including BIG-IP LTM and ASM configurations and policies) from one system to the other (**Device Management > Overview**, click the name of a device, and then choose **Sync Device to Group** or **Sync Group to Device**).

Global Traffic Manager system preparation and configuration

BIG-IP® Global Traffic Manager systems require specific preparation and configuration when upgrading from version 11.x to the new version software.

Preparation activities

You should complete these activities before upgrading Global Traffic Manager systems from version 11.x to the new version software (BIG-IP® DNS).

Activity	Instructions
Verify that the device certificates are current, and that expiration does not occur until after upgrading.	<ol style="list-style-type: none"> 1. On the Main menu, click System > Device Certificates > Device Certificate. 2. Verify the Expires date.
Disable configuration synchronization and DNS zone files synchronization.	<ol style="list-style-type: none"> 1. On the Main menu, click DNS > Settings > GSLB > General. 2. Clear the Synchronize check box. 3. Clear the Synchronize DNS Zone Files check box.
<p><i>Note: To use a backup UCS file without synchronizing the GTM configuration, disable synchronization. If synchronization is enabled, restoring the UCS backup file loads the configuration and initiates synchronization.</i></p>	

Post-upgrade activities

You should complete these tasks after upgrading BIG-IP DNS systems from 11.x to the new version software.

- From the command line, run the `big3d_install` script on the first BIG-IP DNS system that you upgraded, so that you can monitor other BIG-IP DNS systems.

Important: Run this script only once, only from the first BIG-IP DNS system that you upgraded. This step momentarily degrades monitoring performance as new `big3d` agents start.

- On each device, verify the configuration.
- On each device, test queries against listeners.
- On each device, verify iQuery® connections by using the `tmsh` command `tmsh show /gtm iquery all`.
- Enable synchronization on each device.
- Verify configuration synchronization by using a dummy test object; for example, by using an object that can be deleted after the configuration synchronization is verified as operational.

Link Controller system preparation

The BIG-IP® Link Controller™ (LC™) system does not require specific preparation when upgrading from version 11.x to the new version software. No additional configuration is required after completing the upgrade to the new version software.

Local Traffic Manager system preparation

The BIG-IP® Local Traffic Manager™ (LTM®) system does not require specific preparation when upgrading from version 11.x to the new version software. No additional configuration is required after completing the upgrade to the new version software.

HTTP Class profiles

F5 Networks® replaced the HTTP Class profile in BIG-IP® version 11.4.0, and later, with the introduction of the Local Traffic Policies feature. During an upgrade to BIG-IP version 11.4.0, if your configuration contains an HTTP Class profile, the BIG-IP system attempts to migrate the HTTP Class profile to an equivalent local traffic policy. For additional support information regarding the change of HTTP Class profiles to Local Traffic Policies, refer to SOL14409 on www.askf5.com.

Policy Enforcement Manager system preparation

The BIG-IP® Policy Enforcement Manager™ (PEM™) system does not require specific preparation when upgrading from version 11.x to the new version software. No additional configuration is required after completing the upgrade to the new version software.

Preparing BIG-IP device groups for an upgrade

The following prerequisites apply when you upgrade BIG-IP® device groups from version 11.x to the new version.

- The BIG-IP systems (Device A, Device B, and Device C) are configured as a device group.
- Each BIG-IP device is running the same version of 11.x software.
- The BIG-IP version 11.x devices are the same model of hardware.

When you upgrade a BIG-IP device group from version 11.x to the new version, you begin by preparing the devices.

***Note:** If you prefer to closely observe the upgrade of each device, you can optionally connect to the serial console port of the device that you are upgrading.*

1. For each device, complete the following steps to prepare the configuration and settings.
 - a) Examine the Release Notes for specific configuration requirements, and reconfigure the systems, as necessary.
 - b) Examine the Release Notes for specific changes to settings that occur when upgrading from version 11.x to the new version, and complete any in-process settings.
2. From the device that is running the latest configuration, synchronize the configuration to the devices in the device group.

Option	Description
For version 11.2, and earlier.	<ol style="list-style-type: none">1. On the Main menu, click Device Management > Device Groups. A list of device groups appears.2. In the Group Name column, click the name of a device group.3. On the menu bar, click ConfigSync.4. Click Synchronize To Group.
For version 11.3, and later.	<ol style="list-style-type: none">1. On the Main menu, click Device Management > Overview. A message appears for the Status Message.2. In the Devices area of the screen, in the Sync Status column, click the device that shows a sync status of <code>Changes Pending</code>.3. Click Synchronize Device to Group.

3. For each device, create a QKView file, and upload it to iHealth™.

- a) On the Main menu, click **System > Support**.
The Support screen opens.
 - b) Select the **QKView** check box.
 - c) Click **Start**.
The BIG-IP system creates a QKView file.
 - d) Click **Download Snapshot File**, and click **Save**.
The BIG-IP system downloads the QKView file, named `case_number_###_support_file.qkview`, into the browser's download folder.
 - e) Rename the QKView file to include a case number and an identifier.
An example of a renamed file is: `c123456_A_support_file.qkview`.
 - f) Go to <https://ihealth.f5.com>, and log in using your F5 WebSupport credentials.
 - g) Click **Upload**.
 - h) Click **Browse**, navigate to the QKView file in the download folder, and then click **Open**.
 - i) Click **Upload QKView(s)**.
4. For each device, create a backup file.
 - a) Access the `tmsh` command line utility.
 - b) At the prompt, type `save /sys ucs /shared/filename.ucs`.
 - c) Copy the backup file to a safe location on your network.

Note: For additional support information about backing up and restoring BIG-IP system configuration files, refer to SOL11318 on www.askf5.com.

5. Download either the latest BIG-IP system hotfix image file, if available, or the new version software image file from the AskF5 downloads web site (<http://support.f5.com/kb/en-us.htm>) to a preferred location.

Note: Using a tool or utility that computes an md5 checksum, you can verify the integrity of the BIG-IP system latest hotfix `.iso` file or new version `.iso` file in the preferred location.

6. Import either the latest BIG-IP system hotfix image file, if available, or the new version software image file to each device.

Option	Description
Import the latest BIG-IP system hotfix image file	<ol style="list-style-type: none"> 1. On the Main menu, click System > Software Management > Hotfix List > Import. 2. Click Browse, locate and click the image file, click Open, and click Import. 3. When the hotfix image file completes uploading to the BIG-IP device, click OK. A link to the image file appears in the Software Image list.
Import the new version software image file	<ol style="list-style-type: none"> 1. On the Main menu, click System > Software Management > Image List > Import. 2. Click Browse, locate and click the image file, click Open, and click Import. 3. When the software image file completes uploading to the BIG-IP device, click OK. A link to the image file appears in the Software Image list.

7. If the BIG-IP system is configured to use a network hardware security module (HSM), the HSM client software must be available for reinstallation.

Important: Make sure that the available version of HSM client software supports the new version of BIG-IP software.

The BIG-IP devices are prepared to install the latest hotfix or new version software.

Upgrading the Device A system

The following prerequisites apply for this task.

- Each device must be prepared to upgrade Device A with the new version software.
- Either the latest hotfix image file, if available, or the new version software image file is downloaded and accessible.

After you prepare each device for upgrading the software, you force the device offline, reactivate the software license, and install the new version software onto Device A.

1. Force Device A to offline state.
 - a) On the Main menu, click **Device Management > Devices**.
 - b) Click the name of Device A.
The device properties screen opens.
 - c) Click **Force Offline**.
Device A changes to offline state.

Important: Once Device A changes to offline state, ensure that traffic passes normally for all active traffic groups on the other devices.

Note: When **Force Offline** is enabled, make sure to manage the system using the management port or console. Connections to self IP addresses are terminated when **Force Offline** is enabled.

2. Reactivate the software license.
 - a) On the Main menu, click **System > License**.
 - b) Click **Re-activate**.
 - c) For the **Activation Method** setting, select the **Automatic (requires outbound connectivity)** option.
 - d) Click **Next**.
The BIG-IP software license renews automatically.
 - e) Click **Continue**.

3. Install either the latest hotfix image, if available, or the new version software.

Option	Description
Install the latest hotfix image	<ol style="list-style-type: none">1. On the Main menu, click System > Software Management > Hotfix List.2. In the Available Images area, select the check box for the hotfix image, and click Install. The Install Software Hotfix popup screen opens.3. From the Volume set name list, select the location of the new version software volume to install the hotfix image, and click Install.

Option	Description
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Important: In the **Install Status** list for the specified location, a progress bar indicates the status of the installation. Ensure that installation successfully completes, as indicated by the progress bar, before proceeding.

- | | |
|---|--|
| Install the new version software | <ol style="list-style-type: none"> 1. On the Main menu, click System > Software Management > Image List. 2. In the Available Images area, select the check box for the new version software image, and click Install. The Install Software Image popup screen opens. 3. From the Volume set name list, select a location to install the image, and click Install. |
|---|--|

Important: In the **Install Status** list for the specified location, a progress bar indicates the status of the installation. Ensure that installation successfully completes, as indicated by the progress bar, before proceeding.

4. Reboot the device to the location of the installed new software image.

Option	Description
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- | | |
|---|--|
| Reboot from version 11.3.0, or earlier | <ol style="list-style-type: none"> 1. On the Main menu, click System > Software Management > Boot Locations. 2. In the Boot Location list, click the boot location of the installed new software image. |
|---|--|

Note: Upgrading from version 11.3.0, or earlier, automatically installs the configuration of that version to the new boot location.

3. Click **Activate**. Device A reboots to the new software image boot location in offline state.

Note: If the device appears to be taking a long time to reboot, do not cycle the power off and on. Instead, verify the status of the device by connecting to its serial console port. The device might be performing firmware upgrades.

- | | |
|---|--|
| Reboot from version 11.4.0, or later | <ol style="list-style-type: none"> 1. On the Main menu, click System > Software Management > Boot Locations. 2. In the Boot Location list, click the boot location of the installed new software image. 3. From the Install Configuration list, select Yes. The Source Volume list appears. 4. From the Source Volume list, select the location of the configuration to install when activating the boot location of the new software image. For example, for an installation of a new software image on HD1.3, selecting HD1.2:11.6.0 installs the version 11.6.0 configuration. 5. Click Activate. Device A reboots to the new software image boot location in offline state. |
|---|--|

Note: If the device appears to be taking a long time to reboot, do not cycle the power off and on. Instead, verify the status of the device by connecting to its serial console port. The device might be performing firmware upgrades.

5. If the BIG-IP system is configured to use a network hardware security module (HSM), reinstall and configure the HSM client software.

Important: You must reinstall network HSM client software on this device before upgrading another device in the device group, to ensure that traffic groups using the network HSM function properly.

6. Release Device A from offline state.
 - a) On the Main menu, click **Device Management > Devices**.
 - b) Click the name of Device A.
The device properties screen opens.
 - c) Click **Release Offline**.
Device A changes to standby state.

The new version of BIG-IP® software is installed on Device A, with all traffic groups in standby state.

Upgrading the Device B system

The following prerequisites apply in upgrading Device B.

- Device B must be prepared to upgrade the software to new version software.
- Either the latest hotfix image file, if available, or the new version software image file is downloaded and accessible.
- If the BIG-IP system is configured to use a network hardware security module (HSM), you must reinstall network HSM client software on Device A before upgrading Device B, to ensure that traffic groups using the network HSM function properly.
- Device A (the new version BIG-IP® device) is in standby state.

After you prepare Device B for upgrading the software, you force the device offline, reactivate the software license, and install the new version software.

1. Force Device B to offline state.
 - a) On the Main menu, click **Device Management > Devices**.
 - b) Click the name of Device B.
The device properties screen opens.
 - c) Click **Force Offline**.
Device B changes to offline state.

Important: Once Device B changes to offline state, ensure that Device A passes traffic normally for all active traffic groups.

Note: When **Force Offline** is enabled, make sure to manage the system using the management port or console. Connections to self IP addresses are terminated when **Force Offline** is enabled.

2. Reactivate the software license.
 - a) On the Main menu, click **System > License**.
 - b) Click **Re-activate**.
 - c) For the **Activation Method** setting, select the **Automatic (requires outbound connectivity)** option.
 - d) Click **Next**.
The BIG-IP software license renews automatically.
 - e) Click **Continue**.

3. Install either the latest hotfix image, if available, or the new version software.

Option	Description
--------	-------------

- | | |
|--|--|
| Install the latest hotfix image | <ol style="list-style-type: none"> 1. On the Main menu, click System > Software Management > Hotfix List. 2. In the Available Images area, select the check box for the hotfix image, and click Install. The Install Software Hotfix popup screen opens. 3. From the Volume set name list, select the location of the new version software volume to install the hotfix image, and click Install. |
|--|--|

***Important:** In the **Install Status** list for the specified location, a progress bar indicates the status of the installation. Ensure that installation successfully completes, as indicated by the progress bar, before proceeding.*

- | | |
|---|--|
| Install the new version software | <ol style="list-style-type: none"> 1. On the Main menu, click System > Software Management > Image List. 2. In the Available Images area, select the check box for the new version software image, and click Install. The Install Software Image popup screen opens. 3. From the Volume set name list, select a location to install the image, and click Install. |
|---|--|

***Important:** In the **Install Status** list for the specified location, a progress bar indicates the status of the installation. Ensure that installation successfully completes, as indicated by the progress bar, before proceeding.*

4. Reboot the Device B to the location of the installed new software image.

Option	Description
--------	-------------

- | | |
|---|--|
| Reboot from version 11.3.0, or earlier | <ol style="list-style-type: none"> 1. On the Main menu, click System > Software Management > Boot Locations. 2. In the Boot Location list, click the boot location of the installed new software image. |
|---|--|

***Note:** Upgrading from version 11.3.0, or earlier, automatically installs the configuration of that version to the new boot location.*

3. Click **Activate**. Device B reboots to the new software image boot location in offline state.

***Note:** If the device appears to be taking a long time to reboot, do not cycle the power off and on. Instead, verify the status of the device by connecting to its serial console port. The device might be performing firmware upgrades.*

- | | |
|---|---|
| Reboot from version 11.4.0, or later | <ol style="list-style-type: none"> 1. On the Main menu, click System > Software Management > Boot Locations. 2. In the Boot Location list, click the boot location of the installed new software image. 3. From the Install Configuration list, select Yes. The Source Volume list appears. 4. From the Source Volume list, select the location of the configuration to install when activating the boot location of the new software image. For example, for an installation of a new software image on HD1.3, selecting HD1.2:11.6.0 installs a version 11.6.0 configuration. |
|---|---|

Option	Description
	5. Click Activate . Device B reboots to the new software image boot location in offline state.

***Note:** If the device appears to be taking a long time to reboot, do not cycle the power off and on. Instead, verify the status of the device by connecting to its serial console port. The device might be performing firmware upgrades.*

5. If the BIG-IP system is configured to use a network HSM, reinstall and configure the HSM client software.

***Important:** You must reinstall network HSM client software on this device before upgrading another device in the device group, to ensure that traffic groups using the network HSM function properly.*

6. Release Device B from offline state.
- On the Main menu, click **Device Management > Devices**.
 - Click the name of Device B.
The device properties screen opens.
 - Click **Release Offline**.
Device B changes to standby state.

The new version of BIG-IP software is installed on Device B with configured traffic groups in standby state.

Upgrading the Device C system

The following prerequisites apply in upgrading Device C.

- Device C must be prepared to upgrade the software to new version software.
- Either the latest hotfix image file, if available, or the new version software image file is downloaded and accessible.
- If the BIG-IP system is configured to use a network hardware security module (HSM), you must reinstall network HSM client software on Device B before upgrading Device C, to ensure that traffic groups using the network HSM function properly.
- Device C is in active state.

After you prepare Device C for upgrading the software, you force the device offline, reactivate the software license, and install the new version software.

1. Force Device C to offline state.
- On the Main menu, click **Device Management > Devices**.
 - Click the name of Device C.
The device properties screen opens.
 - Click **Force Offline**.
Device C changes to offline state.

***Important:** Once Device C changes to offline state, ensure that the other devices pass traffic normally for all active traffic groups.*

*Note: When **Force Offline** is enabled, make sure to manage the system using the management port or console. Connections to self IP addresses are terminated when **Force Offline** is enabled.*

2. Reactivate the software license.
 - a) On the Main menu, click **System > License**.
 - b) Click **Re-activate**.
 - c) For the **Activation Method** setting, select the **Automatic (requires outbound connectivity)** option.
 - d) Click **Next**.
The BIG-IP software license renews automatically.
 - e) Click **Continue**.

3. Install either the latest hotfix image, if available, or the new version software.

Option	Description
Install the latest hotfix image	<ol style="list-style-type: none"> 1. On the Main menu, click System > Software Management > Hotfix List. 2. In the Available Images area, select the check box for the hotfix image, and click Install. The Install Software Hotfix popup screen opens. 3. From the Volume set name list, select the location of the new version software volume to install the hotfix image, and click Install.

***Important:** In the **Install Status** list for the specified location, a progress bar indicates the status of the installation. Ensure that installation successfully completes, as indicated by the progress bar, before proceeding.*

Install the new version software	<ol style="list-style-type: none"> 1. On the Main menu, click System > Software Management > Image List. 2. In the Available Images area, select the check box for the new version software image, and click Install. The Install Software Image popup screen opens. 3. From the Volume set name list, select a location to install the image, and click Install.
---	--

***Important:** In the **Install Status** list for the specified location, a progress bar indicates the status of the installation. Ensure that installation successfully completes, as indicated by the progress bar, before proceeding.*

4. Reboot Device C to the location of the installed new software image.

Option	Description
Reboot from version 11.3.0, or earlier	<ol style="list-style-type: none"> 1. On the Main menu, click System > Software Management > Boot Locations. 2. In the Boot Location list, click the boot location of the installed new software image.

***Note:** Upgrading from version 11.3.0, or earlier, automatically installs the configuration of that version to the new boot location.*

3. Click **Activate**. Device C reboots to the new software image boot location in offline state.

Option	Description
Reboot from version 11.4.0, or later	<p data-bbox="602 212 1468 302"><i>Note: If the device appears to be taking a long time to reboot, do not cycle the power off and on. Instead, verify the status of the device by connecting to its serial console port. The device might be performing firmware upgrades.</i></p> <hr/> <ol style="list-style-type: none"> <li data-bbox="602 348 1468 373">1. On the Main menu, click System > Software Management > Boot Locations. <li data-bbox="602 384 1468 443">2. In the Boot Location list, click the boot location of the installed new software image. <li data-bbox="602 453 1468 512">3. From the Install Configuration list, select Yes. The Source Volume list appears. <li data-bbox="602 522 1468 642">4. From the Source Volume list, select the location of the configuration to install when activating the boot location of the new software image. For example, for an installation of a new software image on HD1.3, selecting HD1.2:11.6.0 installs a version 11.6.0 configuration. <li data-bbox="602 653 1468 709">5. Click Activate. Device C reboots to the new software image boot location in offline state. <hr/> <p data-bbox="602 764 1468 854"><i>Note: If the device appears to be taking a long time to reboot, do not cycle the power off and on. Instead, verify the status of the device by connecting to its serial console port. The device might be performing firmware upgrades.</i></p>

5. If the BIG-IP system is configured to use a network hardware security module (HSM), reinstall and configure the HSM client software.

***Important:** You must reinstall network HSM client software on this device, to ensure that traffic groups using the network HSM function properly.*

6. Release Device C from offline state.
 - a) On the Main menu, click **Device Management > Devices**.
 - b) Click the name of Device C.
The device properties screen opens.
 - c) Click **Release Offline**.
Device C changes to standby state.
7. On the Main tab, click **Device Management > Overview**.
8. In the Devices area of the screen, in the Sync Status column, select the device that shows a sync status of `Changes Pending`.
9. In the Sync Options area of the screen, select **Sync Device to Group**.
10. Click **Sync**.

The new version of BIG-IP[®] software is installed on Device C with configured traffic groups in standby state.

Changing states of the traffic groups

Manually configuring active state traffic groups across devices within a device group involves forcing an active state traffic group on a device to standby state, and retargeting that active state traffic group to a different device. Completing these tasks results in active state traffic groups on the appropriate devices in a device group.

Viewing a list of traffic groups for a device

You can view a list of traffic groups for the device group. Using this list, you can add floating IP addresses to a traffic group, force a traffic group into a Standby state, and view information such as the current and next-active devices for a traffic group and its HA load factor.

1. On the Main tab, click **Device Management > Traffic Groups**.
2. In the Name column, view the names of the traffic groups on the local device.

Forcing a traffic group to a standby state

You perform this task when you want the selected traffic group on the local device to fail over to another device (that is, switch to a Standby state). Users typically perform this task when no automated method is configured for a traffic group, such as auto-failback or an HA group. By forcing the traffic group into a Standby state, the traffic group becomes active on another device in the device group. For device groups with more than two members, you can choose the specific device to which the traffic group fails over.

1. Log in to the device on which the traffic group is currently active.
2. On the Main tab, click **Device Management > Traffic Groups**.
3. In the Name column, locate the name of the traffic group that you want to run on the peer device.
4. Select the check box to the left of the traffic group name.

If the check box is unavailable, the traffic group is not active on the device to which you are currently logged in. Perform this task on the device on which the traffic group is active.
5. Click **Force to Standby**.

This displays target device options.
6. Choose one of these actions:
 - If the device group has two members only, click **Force to Standby**. This displays the list of traffic groups for the device group and causes the local device to appear in the Next Active Device column.
 - If the device group has more than two members, then from the **Target Device** list, select a value and click **Force to Standby**.

The selected traffic group is now in a standby state on the local device and active on another device in the device group.

Verifying a BIG-IP device group upgrade

When you have completed upgrading the BIG-IP® device group from version 11.x to the new version, you should verify that the upgraded configuration is working properly.

1. Verify the Platform configuration for each device.
 - a) On the Main menu, click **System > Platform**.
 - b) For the **Root Folder Device Group** setting, verify that the device group is identical on each device.
 - c) From the **Root Folder Traffic Group** list, verify that the correct traffic group (**traffic-group-1**) is selected.
2. Verify the configuration for each device.
 - a) On the Main menu, click **Device Management > Devices**.

- b) Verify the following information for the device and the peer devices.
 - active-standby status
 - device name
 - management IP address
 - hostname
 - TMOS version
- c) On the Main menu, click **Device Management > Device Trust > Peer List**.
- d) Verify that the peer devices are specified as Peer Authority Devices.

Note: Ensure that all information for each peer device appears correctly and completely.

3. Verify the traffic groups for each device.
 - a) On the Main menu, click **Device Management > Traffic Groups**.
 - b) From the Name list, click a traffic group.
 - c) If you configured **MAC Masquerade** addresses for VLANs on the devices, verify that the **traffic-group-1** includes an address in the **MAC Masquerade Address** field.
 - d) Verify that the floating traffic group is correct.
 - e) Verify that the failover objects are correct.
4. Verify the Current ConfigSync State for each device.
 - a) On the Main menu, click **Device Management > Overview**.
 - b) In the Devices area of the screen, in the Sync Status column, verify that each device shows a sync status of green.

Implementation result

Your upgrade of the BIG-IP[®] device group from version 11.x to the new version software is now complete. The new version software configuration includes a device group with three devices (Device A, Device B, and Device C) and three traffic groups (`traffic-group-1`, `traffic-group-2`, and `traffic-group-3`), with a traffic group on each device in active state.

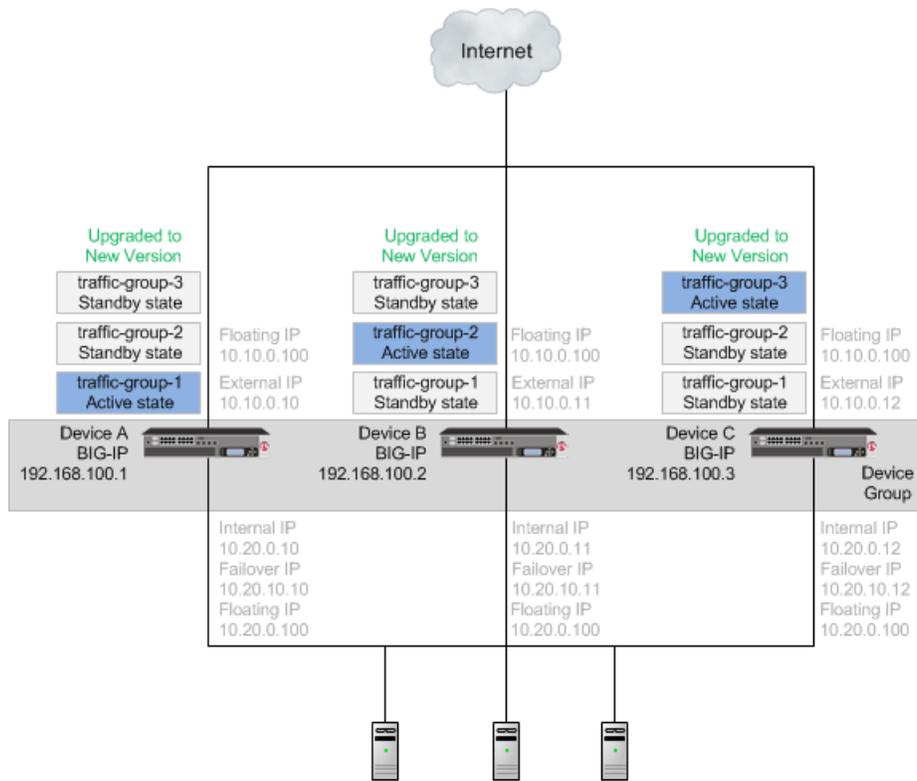


Figure 6: An upgraded device group

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