

Cisco Secure Firewall Threat Defense Upgrade Guide for Device Manager, Version 7.4.1–10.x

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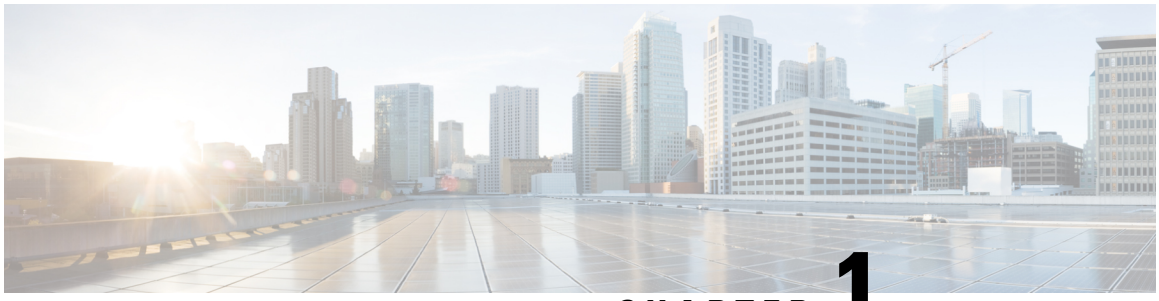
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CHAPTER 1

Planning Your Upgrade

Use this guide to plan and complete Firewall Threat Defense upgrades. Upgrades can be minor (A.x), maintenance (A.x.y), or vulnerability (A.x.y.z) releases. We also may provide hotfixes, which are minor updates that address particular, urgent issues.

Note Version 10 begins a new release numbering scheme and cadence. For more information, see the *Cisco's Next Generation Firewall Product Line Software Release and Sustaining Bulletin*.

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Is This Guide for You?

The procedures in this guide are for upgrading Firewall Threat Defense if you are currently running Version 7.4.1–10.

Compatibility

Before you upgrade, make sure the target version is compatible with your deployment. If you cannot upgrade due to incompatibility, contact your Cisco representative or partner contact for refresh information. For compatibility, see *Cisco Secure Firewall Threat Defense Compatibility Guide*.

Upgrade Guidelines

In addition to the guidelines and resource links in the following topics, see Reference, on page 33 for general information on time and disk space requirements, and for details on system behavior during upgrade, which can include interruptions to traffic flow and inspection.

Software Upgrade Guidelines

For release-specific upgrade warnings and guidelines for Firewall Threat Defense, and for information on features and bugs with upgrade impact, check all release notes between your current and target version: http://www.cisco.com/go/ftd-notes.

Upgrade Guidelines for the Firepower 4100/9300 Chassis

In most cases, we recommend you use the latest build for your FXOS major version.

For release-specific FXOS upgrade warnings and guidelines, as well as features and bugs with upgrade impact, check all release notes between your current and target version: http://www.cisco.com/go/firepower9300-rns.

Upgrade Guidelines for Firewall Threat Defense Virtual

Upgrade does not change the serial number or UUID of Firewall Threat Defense Virtual instances.

Update base image and template image ID before cluster upgrade

Before you upgrade a cluster in the public cloud, copy the target version image to your cloud image repository and update the image ID in the cluster deployment template (we actually recommend replacing the existing template with a modified copy). This ensures that after the upgrade, new instances — for example, instances launched during cluster scaling — will use the correct version. If the marketplace does not have the image you need, such as when the cluster has been patched, create a custom image from a snapshot of a standalone Firewall Threat Defense Virtual instance running the correct version, with no instance-specific (day 0) configurations.

Suspend health checks before autoscaled cluster upgrade

For Firewall Threat Defense Virtual for AWS, suspend the HealthCheck and ReplaceUnhealthy processes before autoscaled cluster upgrade. This ensures that instances are not terminated by the Auto Scaling group during the post-upgrade reboot. You can resume the suspended processes afterwards. For instructions, see the Amazon EC2 Auto Scaling user guide: Suspend and resume Amazon EC2 Auto Scaling processes.

Upgrade Path

Planning your upgrade path and order is especially important for high availability, multi-hop upgrades, and situations where you need to coordinate chassis, hosting environment, or other upgrades.

Choosing your upgrade target

Go **directly to the latest release possible** to minimize upgrade and other impact. This is because features, enhancements, and critical fixes can skip "future" releases that are ahead by version, but not by release date. For example, if you are up-to-date within major Version A, upgrading to dot-zero Version B can deprecate features and fixes.

If you cannot go to the latest release, at least make sure your current version was released on a date before your target version; see the Release Notes for Secure Firewall Threat Defense for your target version.

Upgrading a patched deployment

Critical fixes in patches/vulnerability (fourth-digit) releases can also skip future releases. If you depend on these critical fixes, verify that your target version contains them. For a full list of release dates, see *Cisco Secure Firewall Device Manager New Features by Release*.

Supported upgrades and downgrades

This section summarizes upgrade and downgrade capability.

Supported upgrades

This table shows the supported direct upgrades for Firewall Threat Defense software.

Note Patches can change the fourth digit only. You cannot upgrade directly to a patch from a previous major or maintenance release.

Table 1: Supported direct upgrades

Current version	Target software version							
	to 10.x	7.7	7.6	7.4	7.3	7.2	7.1	7.0
from 10.x	YES	—	—	—	—	—	—	—
from 7.7	YES	YES	—	—	—	—	—	—
from 7.6	YES	YES	YES	—	—	—	—	—
from 7.4	YES	YES	YES	YES	—	—	—	—
from 7.3	YES	YES	YES	YES	YES	—	—	—
from 7.2	—	YES	YES	YES	YES	YES	—	—
from 7.1	—	—	YES	YES	YES	YES	YES	—
from 7.0	—	—	—	YES	YES	YES	YES	YES
from 6.4	—	—	—	—	—	—	—	YES

Supported FXOS versions for Firepower 4100/9300 upgrades

For the Firepower 4100/9300, this table lists companion FXOS versions. If a chassis upgrade is required, Firewall Threat Defense upgrade is blocked. In most cases we recommend the latest build in each version; for minimum builds see the *Cisco Secure Firewall Threat Defense Compatibility Guide*.

Table 2: Supported FXOS versions for Firepower 4100/9300 upgrades

Target Firewall Threat Defense version	Minimum FXOS version
10.x	2.18.0
7.7	2.17.0
7.6	2.16.0
7.4.1–7.4.x	2.14.1
7.4.0	—
7.3	2.13.0
7.2	2.12.0
7.1	2.11.1
7.0	2.10.1
6.7	2.9.1
6.6	2.8.1
6.4	2.6.1

Supported downgrades

If an upgrade succeeds but the system does not function to your expectations, you may be able to return to a previous version; see Revert Firewall Threat Defense, on page 14.

Upgrade Order

Chassis Before Firewall Threat Defense

For the Firepower 4100/9300, major versions require a FXOS upgrade.

Because you upgrade the chassis first, you will briefly run a supported—but not recommended—combination, where the operating system is "ahead" of Firewall Threat Defense. If the chassis is already well ahead of its devices, further chassis upgrades can be blocked. In this case perform a three (or more) step upgrade: devices first, then the chassis, then devices again. Or, perform a full reimage. In high availability deployments, upgrade one chassis at a time.

Chassis with High Availability Firewall Threat Defense

When a chassis upgrade is required in high availability deployments, upgrade one chassis at a time.

Table 3: Chassis Upgrade Order for the Firepower 4100/9300

Firewall Threat Defense Deployment	Upgrade Order
Standalone	1. Upgrade chassis. 2. Upgrade Firewall Threat Defense.
High availability	Upgrade both chassis before you upgrade Firewall Threat Defense. To minimize disruption, always upgrade the standby. In the following scenario, Device A is the original active device and Device B is the original standby. 1. Upgrade chassis with the standby device (B). 2. Switch roles. 3. Upgrade chassis with the new standby device (A). 4. Upgrade Firewall Threat Defense on the new standby device (A). 5. Switch roles again. 6. Upgrade Firewall Threat Defense on the original standby device (B).

Manually Downloading Upgrade Packages

Packages are available on the Cisco Support & Download site: https://www.cisco.com/go/ftd-software

Threat Defense Packages

You use the same upgrade package for all models in a family or series. To find the correct one, select or search for your model, then browse to the software download page for the appropriate version. Available upgrade packages are listed along with installation packages, hotfixes, and other applicable downloads. Upgrade package file names reflect the platform, software version, and build. Upgrade packages are signed, and terminate in .sh.REL.tar. Do not untar or rename them.

Table 4: Firewall Threat Defense Packages

Platform	Package	Notes
Firepower 1000	Cisco_FTD_SSP-FP1K_Upgrade-*Version-build*.sh.REL.tar	—
Firepower 2100	Cisco_FTD_SSP-FP2K_Upgrade-*Version-build*.sh.REL.tar	Cannot upgrade past Version 7.4.x.

Platform	Package	Notes
Firepower 4100/9300	Cisco_FTD_SSP_Upgrade-*Version-build*.sh.REL.tar	—
Secure Firewall 200		
Secure Firewall 1200	Cisco_Secure_FW_TD_1200-*Version-build*.sh.REL.tar	—
Secure Firewall 3100	Cisco_FTD_SSP-FP3K_Upgrade-*Version-build*.sh.REL.tar	—
ISA 3000 with FTD	Cisco_FTD_Upgrade-*Version-build*.sh.REL.tar	—
Threat defense virtual	Cisco_FTD_Upgrade-*Version-build*.sh.REL.tar	—

Chassis Packages for the Firepower 4100/9300

To find the correct FXOS package, select or search for your device model and browse to the *Firepower Extensible Operating System* download page for your target FXOS version and build. The FXOS package is listed along with recovery and MIB packages. Firmware is included in FXOS upgrades to 2.14.1+.

Table 5: FXOS Packages

Platform	Package
Firepower 4100/9300	fxos-k9.*fxos_version*.SPA

Upgrade Readiness

After you check compatibility, plan your upgrade path and order, and review upgrade guidelines, you need to assess upgrade readiness. The system does some of these checks for you, but you still need to perform additional checks (and actions) yourself, like deploying configuration changes and making backups.

Use the following sections to perform last minute-tasks and confirm upgrade readiness.

Network and Infrastructure Checks

Appliance Access

Devices can stop passing traffic during the upgrade or if the upgrade fails. Before you upgrade, make sure traffic from your location does not have to traverse the device itself to access the device's management interface.

Bandwidth

Make sure your management network has the bandwidth to perform large data transfers. Whenever possible, upload upgrade packages ahead of time. If you transfer an upgrade package to a device at the time of upgrade, insufficient bandwidth can extend upgrade time.

Configuration and Deployment Checks

Configurations

Make any required pre-upgrade configuration changes, and prepare to make required post-upgrade configuration changes. Deploy configuration changes. You will need to deploy again after upgrade. Deploying typically restarts Snort, which can affect traffic flow and inspection; see Traffic Flow and Inspection when Deploying Configurations, on page 34.

Deployment Health

Make sure devices are healthy and successfully communicating. Because being out of sync with your NTP server can cause upgrade failure, we also recommend you check time with the **show time** CLI command.

Running Tasks and Scheduled Tasks

Make sure essential tasks are complete. Tasks running when the upgrade begins are stopped and cannot be resumed; they become failed tasks. We also recommend you check for tasks that are scheduled to run during the upgrade and cancel or postpone them.

Backups

With the exception of hotfixes, upgrade deletes all backups stored on the system. We *strongly* recommend you back up to a secure remote location and verify transfer success, both before and after any upgrade:

- Before upgrade: If an upgrade fails catastrophically, you may have to reimage and restore. Reimaging returns most settings to factory defaults, including the system password. If you have a recent backup, you can return to normal operations more quickly.
- After upgrade: This creates a snapshot of your freshly upgraded deployment.

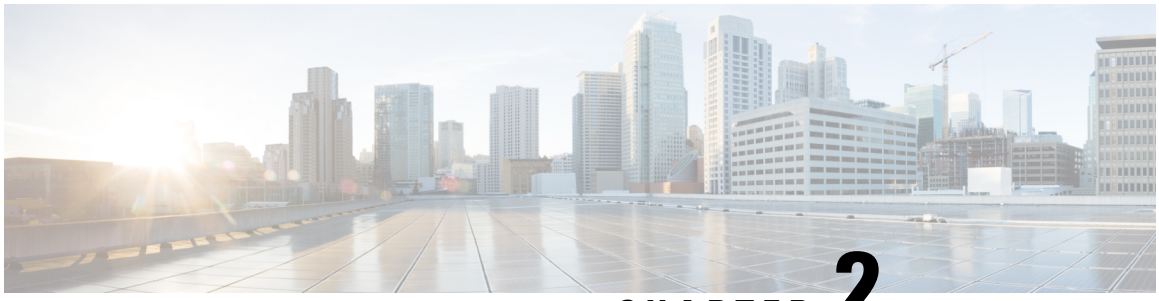
Table 6: Backups

Backup	Guide
Firewall Threat Defense	*Cisco Secure Firewall Device Manager Configuration Guide*: *System Management*
Firepower 4100/9300 chassis	Cisco Firepower 4100/9300 FXOS Configuration Guide: *Configuration Import/Export*
ASA on a Firepower 9300 chassis	Cisco ASA Series General Operations Configuration Guide: *Software and Configurations* For a Firepower 9300 chassis with Firewall Threat Defense and ASA logical devices, use ASDM or the ASA CLI to back up ASA configurations and other critical files, especially if there is an ASA configuration migration.

Software Upgrade Readiness Checks

Besides the checks you perform yourself, the system can also check its own upgrade readiness. You can run readiness checks outside your maintenance window, otherwise it runs when you start the upgrade. Passing

readiness checks is not optional. If you fail readiness checks, you cannot upgrade. The time required to run a readiness check varies depending on model and database size. Do not manually reboot or shut down during readiness checks.



CHAPTER 2

Upgrade Firewall Threat Defense

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Upgrade Readiness Checks for Firewall Threat Defense

Before the system installs an upgrade, it runs a readiness check to ensure the upgrade is valid for the system, and to check other items that sometimes prevent a successful upgrade. If the readiness check fails, you should fix the problems before trying the installation again. If the check has failed, you will be prompted about the failure the next time you try the installation, and you are given the option to force the installation if you want to.

You can also manually run the readiness check prior to initiating the upgrade, as described in this procedure.

Before you begin

Upload the upgrade package you want to check.

Procedure

Step 1 Select **Device**, then click **View Configuration** in the Updates summary.

The **System Upgrade** section shows the currently running software version and any update that you have already uploaded.

Step 2 Look at the **Readiness Check** section.

- If the upgrade check has not been performed yet, click the **Run Upgrade Readiness Check** link. The progress of the check is shown in this area. It should take about 20 seconds to complete the process.

- If the upgrade check has already been run, this section indicates whether the check succeeded or failed. For failed checks, click **See Details** to view more information about the readiness check. After fixing problems, run the check again.

Step 3 If the readiness check fails, you should resolve the issues before you install the upgrade. The detailed information includes help on how to fix indicated problems. For a failed script, click the **Show Recovery Message** link to see the information.

Following are some typical problems:

- FXOS version incompatibility—On systems where you install FXOS upgrades separately, such as the Firepower 4100/9300, an upgrade package might require a different minimum FXOS version than the Firewall Threat Defense software version you are currently running. In this case, you must first upgrade FXOS before you can upgrade the Firewall Threat Defense software.
- Unsupported device model—The upgrade package cannot be installed on this device. You might have uploaded the wrong package, or the device is an older model that is simply no longer supported in the new Firewall Threat Defense software version. Please check device compatibility and upload a supported package, if one is available.
- Insufficient disk space—If not enough space is available, try deleting unneeded files, such as system backups. Delete only those files you have created.

Upgrade Standalone Firewall Threat Defense

Use this procedure to upgrade a standalone Firewall Threat Defense device. If you need to update FXOS, do that first. To upgrade high availability threat defense, see Upgrade High Availability Firewall Threat Defense, on page 12.

Caution Traffic is dropped while you upgrade. Even if the system appears inactive or unresponsive, do not manually reboot or shut down during upgrade; you could place the system in an unusable state and require a reimage. You can manually cancel failed or in-progress major and maintenance upgrades, and retry failed upgrades. If you continue to have issues, contact Cisco TAC.

For details on these and other issues you may encounter during upgrade, see Troubleshooting Threat Defense Upgrades, on page 15.

Before you begin

Complete upgrade planning. Make sure your deployment is healthy and successfully communicating.

Procedure

Step 1 Select **Device**, then click **View Configuration** in the Updates panel.
The System Upgrade panel shows the currently running software version and any upgrade package that you have already uploaded.

Step 2 Upload the upgrade package.

You can upload one package only. If you upload a new package, it replaces the old one. Make sure you have the correct package for your target version and device model. Click **Browse** or **Replace File** to begin the upload.

When the upload completes, the system displays a confirmation dialog box. Before you click **OK**, optionally select **Run Upgrade Immediately** to choose rollback options and upgrade now. If you upgrade now, it is especially important to have completed as much of the pre-upgrade checklist as possible (see the next step).

Step 3 Perform final pre-upgrade checks, including the readiness check.

Revisit the pre-upgrade checklist. Make sure you have completed all relevant tasks, especially the final checks. If you do not run the readiness check manually, it runs when you initiate the upgrade. If the readiness check fails, the upgrade is canceled. For more information, see Upgrade Readiness Checks for Firewall Threat Defense, on page 9.

Step 4 Click **Upgrade Now** to start the upgrade.

a) Choose rollback options.

You can **Automatically cancel on upgrade failure and roll back to the previous version**. With this option enabled, the device automatically returns to its pre-upgrade state upon major or maintenance upgrade failure. Disable this option if you want to be able to manually cancel or retry a failed upgrade.

b) Click **Continue** to upgrade and reboot the device.

You are automatically logged off and taken to a status page where you can monitor the upgrade until the device reboots. The page also includes an option to cancel the in-progress installation. If you disabled automatic rollback and the upgrade fails, you can manually cancel or retry the upgrade.

Traffic is dropped while you upgrade. For the ISA 3000 only, if you configured hardware bypass for power failure, traffic is dropped during the upgrade but is passed without inspection while the device completes its post-upgrade reboot.

Step 5 Log back in when you can and verify upgrade success.

The Device Summary page shows the currently running software version.

Step 6 Complete post-upgrade tasks.

a) Update system databases. If you do not have automatic updates configured for intrusion rules, VDB, and GeoDB, update them now.
b) Complete any other required post-upgrade configuration changes.
c) Deploy.

What to do next

- For the Firepower 4100/9300, set a new Firewall Threat Defense startup version for the upgraded logical device. You can use the **Logical Devices** tab on the Firewall Chassis Manager or the `set startup-version` FXOS command. This ensures that if you need to restore the logical device from the post-upgrade backup, the backup and startup versions match. For more information, see the *Image Management* chapter in the *Cisco Firepower 4100/9300 FXOS Secure Firewall Chassis Manager Configuration Guide*, or the *Cisco Firepower 4100/9300 FXOS Command Reference*.
- Back up to create a snapshot of your freshly upgraded device.

Upgrade High Availability Firewall Threat Defense

Use this procedure to upgrade high availability devices. Upgrade them one at a time. To minimize disruption, always upgrade the standby. That is, upgrade the current standby, switch roles, then upgrade the new standby. If you need to update FXOS, do that on both chassis before you upgrade Firewall Threat Defense on either. Again, always upgrade the standby.



Caution Do not make or deploy configuration changes on one unit while the other is upgrading, or to a mixed version pair. Even if the system appears inactive, do not manually reboot or shut down during upgrade; you could place the system in an unusable state and require a reimage. You can manually cancel failed or in-progress major and maintenance upgrades, and retry failed upgrades. If you continue to have issues, contact Cisco TAC.

For details on these and other issues you may encounter during upgrade, see Troubleshooting Threat Defense Upgrades, on page 15.

Before you begin

Complete upgrade planning. Make sure your deployment is healthy and successfully communicating.

Procedure

Step 1 Log into the standby unit.

Step 2 Select **Device**, then click **View Configuration** in the Updates panel.
The System Upgrade panel shows the currently running software version and any upgrade package that you have already uploaded.

Step 3 Upload the upgrade package.

You can upload one package only. If you upload a new package, it replaces the old one. Make sure you have the correct package for your target version and device model. Click **Browse** or **Replace File** to begin the upload.

When the upload completes, the system displays a confirmation dialog box. Before you click **OK**, optionally select **Run Upgrade Immediately** to choose rollback options and upgrade now. If you upgrade now, it is especially important to have completed as much of the pre-upgrade checklist as possible (see the next step).

Step 4 Perform final pre-upgrade checks, including the readiness check.

Revisit the pre-upgrade checklist. Make sure you have completed all relevant tasks, especially the final checks. If you do not run the readiness check manually, it runs when you initiate the upgrade. If the readiness check fails, the upgrade is canceled. For more information, see Upgrade Readiness Checks for Firewall Threat Defense, on page 9.

Step 5 Click **Upgrade Now** to start the upgrade.

a) Choose rollback options.

You can **Automatically cancel on upgrade failure and roll back to the previous version**. With this option enabled, the device automatically returns to its pre-upgrade state upon major or maintenance upgrade failure. Disable this option if you want to be able to manually cancel or retry a failed upgrade.

b) Click **Continue** to upgrade and reboot the device.

You are automatically logged off and taken to a status page where you can monitor the upgrade until the device reboots. The page also includes an option to cancel the in-progress installation. If you disabled automatic rollback and the upgrade fails, you can manually cancel or retry the upgrade.

Traffic is dropped while you upgrade. For the ISA 3000 only, if you configured hardware bypass for power failure, traffic is dropped during the upgrade but is passed without inspection while the device completes its post-upgrade reboot.

Step 6 Log back in when you can and verify upgrade success.

The Device Summary page shows the currently running software version and high availability status. Do not proceed until you have verified success *and* high availability has resumed. If high availability remains suspended after successful upgrade, see Troubleshooting Threat Defense Upgrades, on page 15.

Step 7 Upgrade the second unit.

a) Switch roles, making this device active: Select **Device** > **High Availability**, then select **Switch Mode** from the gear menu ( ). Wait for the unit's status to change to active and confirm that traffic is flowing normally. Log out.

b) Upgrade: Repeat the previous steps to log into the new standby, upload the package, upgrade the device, monitor progress, and verify success.

Step 8 Examine device roles.

If you have preferred roles for specific devices, make those changes now.

Step 9 Log into the active unit.

Step 10 Complete post-upgrade tasks.

a) Update system databases. If you do not have automatic updates configured for intrusion rules, VDB, and GeoDB, update them now.

b) Complete any other required post-upgrade configuration changes.

c) Deploy.

What to do next

- For the Firepower 4100/9300, set a new Firewall Threat Defense startup version for the upgraded logical devices. You can use the **Logical Devices** tab on the Firewall Chassis Manager or the `set startup-version` FXOS command. This ensures that if you need to restore a logical device from the post-upgrade backup, the backup and startup versions match. For more information, see the *Image Management* chapter in the *Cisco Firepower 4100/9300 FXOS Secure Firewall Chassis Manager Configuration Guide*, or the *Cisco Firepower 4100/9300 FXOS Command Reference*.
- Back up to create a snapshot of your freshly upgraded deployment.

Monitor Firewall Threat Defense Upgrades

When you start the Firewall Threat Defense upgrade, you are automatically logged off and taken to a status page where you can monitor overall upgrade progress. The page also includes an option to cancel the in-progress installation. If you disabled automatic rollback and the upgrade fails, the page allows you to manually cancel or retry the upgrade.

You can also SSH to the device and use the CLI: **show upgrade status**. Add the **continuous** keyword to view log entries as they are made, and **detail** to see detailed information. Add both keywords to get continuous detailed information.

After the upgrade completes, you lose access to the status page and the CLI when the device reboots.

Cancel or Retry Firewall Threat Defense Upgrades

Use the upgrade status page or the CLI to manually cancel failed or in-progress major or maintenance upgrades, and to retry failed upgrades:

- Upgrade status page: Click **Cancel Upgrade** to cancel an in-process upgrade. If the upgrade fails, you can click **Cancel Upgrade** to stop the job and to return to the state of the device prior to the upgrade, or click **Continue** to retry the upgrade.
- CLI: Use **upgrade cancel** to cancel an in-process upgrade. If the upgrade fails, you can use **upgrade cancel** to stop the job and to return to the state of the device prior to the upgrade, or use **upgrade retry** to retry the upgrade.



Note By default, Firewall Threat Defense automatically reverts to its pre-upgrade state upon upgrade failure ("auto-cancel"). To be able to manually cancel or retry a failed upgrade, disable the auto-cancel option when you initiate the upgrade. In a high availability deployment, auto-cancel applies to each device individually. That is, if the upgrade fails on one device, only that device is reverted.

Cancel and retry are not supported for patches. For information on reverting a successful upgrade, see Revert Firewall Threat Defense, on page 14.

Revert Firewall Threat Defense

If an upgrade succeeds but the system does not function to your expectations, you may be able to revert. Reverting Firewall Threat Defense returns the software to its state just before the last upgrade; post-upgrade configuration changes are not retained. Reverting after patching (fourth-digit upgrades) necessarily removes patches as well. You cannot revert individual patches or hotfixes.

The following procedure explains how to revert from Firewall Device Manager. If you cannot get into Firewall Device Manager, you can revert from the Firewall Threat Defense command line in an SSH session using the **upgrade revert** command. You can use the **show upgrade revert-info** command to see what version the system will revert to.

Before you begin

If the unit is part of a high availability pair, you must revert both units. Ideally, initiate the revert on both units at the same time so that the configuration can be reverted without failover issues. Open sessions with both units and verify that revert will be possible on each, then start the processes. Note that traffic will be interrupted during the revert, so do this at off hours if at all possible.

For the Firepower 4100/9300 chassis, major Firewall Threat Defense versions have a specially qualified and recommended companion FXOS version. This means that after you revert the Firewall Threat Defense software,

you might be running a non-recommended version of FXOS (too new). Although newer versions of FXOS are backwards compatible with older the Firewall Threat Defense versions, we do perform enhanced testing for the recommended combinations. You cannot downgrade FXOS, so if you find yourself in this situation, and you want to run a recommended combination, you will need to reimage the device.

Procedure

Step 1 Select **Device**, then click **View Configuration** in the **Updates** summary.

Step 2 In the **System Upgrade** section, click the **Revert Upgrade** link.

You are presented with a confirmation dialog box that shows the current version and the version to which the system will revert. If there is no available version to revert to, there will not be a **Revert Upgrade** link.

Step 3 If you are comfortable with the target version (and one is available), click **Revert**.

What to do next

- Re-register the device with the Smart Software Manager.
- For the Firepower 4100/9300, set a new Firewall Threat Defense startup version for the reverted logical device. You can use the **Logical Devices** tab on the Firewall Chassis Manager or the `set startup-version` FXOS command. This ensures that if you need to restore the logical device from a post-revert backup, the backup and startup versions match. For more information, see the *Image Management* chapter in the *Cisco Firepower 4100/9300 FXOS Secure Firewall Chassis Manager Configuration Guide*, or the *Cisco Firepower 4100/9300 FXOS Command Reference*.

Troubleshooting Threat Defense Upgrades

General Upgrade Troubleshooting

These issues can occur when you are upgrading any device, whether standalone or in a high availability pair.

Upgrade package errors.

To find the correct upgrade package, select or search for your model on the Cisco Support & Download site, then browse to the software download page for the appropriate version. Available upgrade packages are listed along with installation packages, hotfixes, and other applicable downloads. Upgrade package file names reflect the platform, package type (upgrade, patch, hotfix), software version, and build.

Upgrade packages from Version 6.2.1+ are signed, and terminate in .sh.REL.tar. If you are upgrading from an older version, download the package that terminates in .sh instead. The Cisco Support & Download site indicates the correct package for your version. Do not untar signed upgrade packages. Do not rename upgrade packages or transfer them by email.

Cannot reach the device at all during upgrade.

Devices stop passing traffic during the upgrade or if the upgrade fails. Before you upgrade, make sure traffic from your location does not have to traverse the device itself to access the device's management interface.

Device appears inactive or is unresponsive during upgrade.

You can manually cancel in-progress major and maintenance upgrades; see Cancel or Retry Firewall Threat Defense Upgrades, on page 14. If the device is unresponsive, or if you cannot cancel the upgrade, contact Cisco TAC.

Caution Even if the system appears inactive, do *not* manually reboot or shut down during upgrade. You could place the system in an unusable state and require a reimage.

Upgrade is successful but the system does not function to your expectations.

First, make sure that cached information gets refreshed. Do not simply refresh the browser window to log back in. Instead, delete any "extra" path from the URL and reconnect to the home page; for example, http://threat-defense.example.com/.

If you continue to have issues and need to return to an earlier major or maintenance release, you may be able to revert; see Revert Firewall Threat Defense, on page 14. If you cannot revert, you must reimage.

Upgrade fails.

When you initiate a major or maintenance upgrade, you use the **Automatically cancel on upgrade failure...** (auto-cancel) option to choose what happens if upgrade fails, as follows:

- Auto-cancel enabled (default): If upgrade fails, the upgrade cancels and the device automatically reverts to its pre-upgrade state. Correct any issues and try again later.
- Auto-cancel disabled: If upgrade fails, the device remains as it is. Correct the issues and retry immediately, or manually cancel the upgrade and try again later.

For more information, see Cancel or Retry Firewall Threat Defense Upgrades, on page 14. If you cannot retry or cancel, or if you continue to have issues, contact Cisco TAC.

High Availability Upgrade Troubleshooting

These issues are specific to high availability upgrades.

Upgrade will not begin without deploying uncommitted changes.

If you get an error message stating that you must deploy all uncommitted changes even though there are none, log into the active unit (remember, you should be upgrading the standby), create some minor change, and deploy. Then, undo the change, redeploy, and try the upgrade again on the standby.

If this does not work, and the units are running different software versions against recommendations, switch roles to make the standby unit active, then suspend high availability. Deploy from the active/suspended unit, resume high availability, then switch roles to make the active unit the standby again. Upgrade should then work.

Deployment from active unit fails during standby upgrade, or causes an application synchronization error.

This can happen if you deploy from the active unit while the standby is upgrading, which is not supported. Proceed with the upgrade despite the error. After you upgrade both units, make any required configuration changes and deploy from the active unit. The error should resolve.

To avoid these issues, do not make or deploy configuration changes on one unit while the other is upgrading, or to a mixed version pair.

Configuration changes made during upgrade are lost.

If you absolutely must make and deploy changes to a mixed version pair, you must make the changes to both units or they will be lost after you upgrade the down-level active unit.

High availability is suspended after upgrade.

After the post-upgrade reboot, high availability is briefly suspended while the system performs some final automated tasks, such as updating libraries and restarting Snort. You are most likely to notice this if you log into the CLI *very* shortly after upgrade. If high availability does not resume on its own after the upgrade fully completes and Firewall Device Manager is available, do it manually:

1. Log into both the active device and the standby device and check the task lists. Wait until all tasks are finished running on both devices. If you resume high availability too soon, you may have a future issue where failover causes an outage.
2. Select **Device** > **High Availability**, then select **Resume HA** from the gear menu ( ).

Failover does not occur with a mixed version pair.

Although an advantage of high availability is that you can upgrade your deployment without traffic or inspection interruptions, failover is disabled during the entire upgrade process. That is, not only is failover necessarily disabled when one device is offline (because there is nothing to fail over to—you are essentially already failed over), but failover is also disabled with mixed version pairs. During upgrade is the only time where mixed version pairs are (temporarily) allowed. Schedule upgrades during maintenance windows when they will have the least impact if something goes wrong, and make sure you have enough time to upgrade both devices in that window.

Upgrade failed on only one device, or one device was reverted. The pair is now running mixed versions.

Mixed version pairs are not supported for general operations. Either upgrade the down-version device or revert the higher version device. For patches, because revert is not supported, if you cannot successfully upgrade the down-version device you must break high availability, reimage one or both devices, then re-establish high availability.

Unresponsive and Failed Firewall Threat Defense Upgrades

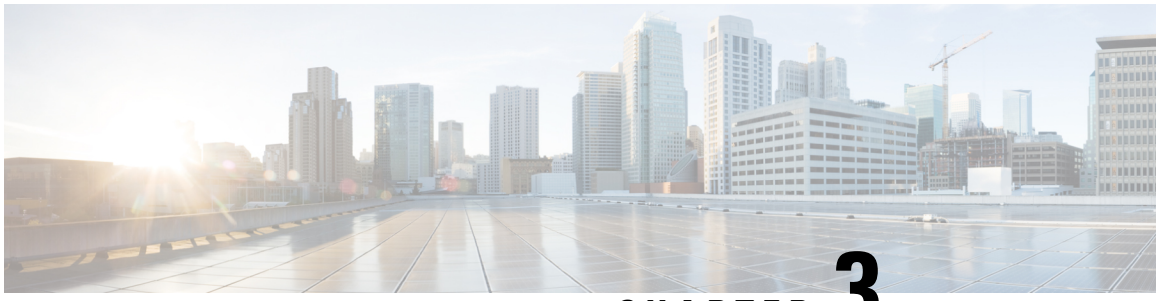
The following table has troubleshooting information for unresponsive and failed Firewall Threat Defense upgrades. For issues with chassis upgrades, contact Cisco TAC.

Caution Do not reboot or shut down at any point during upgrade, even if the system appears inactive. You could place the system in an unusable state and require a reimage.

Table 7: Unresponsive and Failed Firewall Threat Defense Upgrades

Issue	Solution
Cannot reach the device.	Devices can stop passing traffic during the upgrade or if the upgrade fails. Before you upgrade, make sure traffic from your location does not have to traverse the device itself to access the device's management interface.

Issue	Solution
Upgrade or patch appears hung/device appears inactive.	If device upgrade status has stopped updating but there is no report of upgrade failure, you can try canceling the upgrade; seeCancel or Retry Firewall Threat Defense Upgrades, on page 14. If you cannot cancel or canceling does not work, contact Cisco TAC.
Upgrade failed.	If an upgrade fails and: • The device reverted to its pre-upgrade state (auto-cancel is enabled), correct any issues and try again from the beginning. • The device is still in maintenance mode, correct any issues and resume the upgrade. Or, cancel and try again later. For more information, see Cancel or Retry Firewall Threat Defense Upgrades, on page 14. If you cannot retry or cancel, or if you continue to have issues, contact Cisco TAC.
Patch failed.	You cannot cancel in-progress or failed patches. However, if a patch fails early, for example, during validation stages, the device may remain up and running normally. Simply correct any issues and try again. If a patch fails after the device has entered maintenance mode, contact Cisco TAC.
I want to cancel an upgrade.	Canceling reverts the device to its pre-upgrade state. You can cancel failed and in-progress upgrades on the upgrade status page that automatically appears during upgrade. You can also use the **upgrade cancel** CLI command. You cannot cancel patches. If you cannot cancel or canceling does not work, contact Cisco TAC.
I want to retry (resume) a failed upgrade.	You can resume an upgrade on the upgrade status page that automatically appears during upgrade. You can also use the **upgrade retry** CLI command. If you continue to have issues, contact Cisco TAC.
I want to change what happens when upgrade fails.	Part of the upgrade process is choosing what happens if it fails. This is done with the **Automatically cancel on upgrade failure...** (auto-cancel) option: • Auto-cancel enabled (default): If upgrade fails, the upgrade cancels and the device automatically reverts to its pre-upgrade state. This returns you to normal operations as quickly as possible while you regroup and try again. • Auto-cancel disabled: If upgrade fails, the device remains as it is. This allows you to correct any issues and resume the upgrade. For high availability devices, auto-cancel applies to each device individually. That is, if the upgrade fails on one device, only that device is reverted.



CHAPTER 3

Upgrade Firepower 4100/9300 Chassis

- Upgrade FXOS with Firewall Chassis Manager, on page 19
- Upgrade FXOS on the Firepower 4100/9300 with the CLI, on page 24

Upgrade FXOS with Firewall Chassis Manager

Upgrade FXOS for Standalone FTD Logical Devices Using Firepower Chassis Manager

The section describes the upgrade process for the following types of devices:

- A Firepower 4100 series chassis that is configured with a FTD logical device and is not part of a failover pair.
- A Firepower 9300 chassis that is configured with one or more standalone FTD logical devices that are not part of a failover pair.

Before you begin

Before beginning your upgrade, make sure that you have already done the following:

- Download the FXOS platform bundle software package to which you are upgrading.
- Back up your FXOS and FTD configurations.

Procedure

Step 1 In Firepower Chassis Manager, choose **System** > **Updates**.
The Available Updates page shows a list of the FXOS platform bundle images and application images that are available on the chassis.

Step 2 Upload the new platform bundle image:

a) Click **Upload Image** to open the Upload Image dialog box.
b) Click **Choose File** to navigate to and select the image that you want to upload.
c) Click **Upload**.

The selected image is uploaded to the Firepower 4100/9300 chassis.

d) For certain software images you will be presented with an end-user license agreement after uploading the image. Follow the system prompts to accept the end-user license agreement.

Step 3 After the new platform bundle image has been successfully uploaded, click **Upgrade** for the FXOS platform bundle to which you want to upgrade.

The system will first verify the software package that you want to install. It will inform you of any incompatibility between currently installed applications and the specified FXOS platform software package. It will also warn you that any existing sessions will be terminated and that the system will need to be rebooted as part of the upgrade.

Step 4 Click **Yes** to confirm that you want to proceed with installation, or click **No** to cancel the installation.

The system unpacks the bundle and upgrades/reloads the components.

Step 5 Firepower Chassis Manager will be unavailable during upgrade. You can monitor the upgrade process using the FXOS CLI:

a) Enter **scope system**.

b) Enter **show firmware monitor**.

c) Wait for all components (FPRM, Fabric Interconnect, and Chassis) to show `Upgrade-Status: Ready`.

Note
After the FPRM component is upgraded, the system will reboot and then continue upgrading the other components.

Example:

```
FP9300-A# scope system
FP9300-A /system # show firmware monitor
FPRM:
    Package-Vers: 2.3(1.58)
    Upgrade-Status: Ready

Fabric Interconnect A:
    Package-Vers: 2.3(1.58)
    Upgrade-Status: Ready

Chassis 1:
    Server 1:
        Package-Vers: 2.3(1.58)
        Upgrade-Status: Ready
    Server 2:
        Package-Vers: 2.3(1.58)
        Upgrade-Status: Ready
```

Step 6 After all components have successfully upgraded, enter the following commands to verify the status of the security modules/security engine and any installed applications:

a) Enter **top**.

b) Enter **scope ssa**.

c) Enter **show slot**.

d) Verify that the Admin State is `Ok` and the Oper State is `Online` for the security engine on a Firepower 4100 series appliance or for any security modules installed on a Firepower 9300 appliance.

e) Enter **show app-instance**.

f) Verify that the Oper State is `Online` for any logical devices installed on the chassis.

Upgrade FXOS on an FTD High Availability Pair Using Firepower Chassis Manager

If you have Firepower 9300 or Firepower 4100 series security appliances that have FTD logical devices configured as a high availability pair, use the following procedure to update the FXOS platform bundle on your Firepower 9300 or Firepower 4100 series security appliances:

Before you begin

Before beginning your upgrade, make sure that you have already done the following:

- Download the FXOS platform bundle software package to which you are upgrading.
- Back up your FXOS and FTD configurations.

Procedure

Step 1 Connect to Firepower Chassis Manager on the Firepower security appliance that contains the *standby* Firepower Threat Defense logical device:

Step 2 In Firepower Chassis Manager, choose **System** > **Updates**.
The Available Updates page shows a list of the FXOS platform bundle images and application images that are available on the chassis.

Step 3 Upload the new platform bundle image:

a) Click **Upload Image** to open the Upload Image dialog box.
b) Click **Choose File** to navigate to and select the image that you want to upload.
c) Click **Upload**.
The selected image is uploaded to the Firepower 4100/9300 chassis.
d) For certain software images you will be presented with an end-user license agreement after uploading the image. Follow the system prompts to accept the end-user license agreement.

Step 4 After the new platform bundle image has successfully uploaded, click **Upgrade** for the FXOS platform bundle to which you want to upgrade.

The system will first verify the software package that you want to install. It will inform you of any incompatibility between currently installed applications and the specified FXOS platform software package. It will also warn you that any existing sessions will be terminated and that the system will need to be rebooted as part of the upgrade.

Step 5 Click **Yes** to confirm that you want to proceed with installation, or click **No** to cancel the installation.

The system unpacks the bundle and upgrades/reloads the components.

Step 6 Firepower Chassis Manager will be unavailable during upgrade. You can monitor the upgrade process using the FXOS CLI:

a) Enter **scope system**.
b) Enter **show firmware monitor**.
c) Wait for all components (FPRM, Fabric Interconnect, and Chassis) to show `Upgrade-Status: Ready`.

Note
After the FPRM component is upgraded, the system will reboot and then continue upgrading the other components.

Example:

```
FP9300-A# scope system
FP9300-A /system # show firmware monitor
FPRM:
    Package-Vers: 2.3(1.58)
    Upgrade-Status: Ready

Fabric Interconnect A:
    Package-Vers: 2.3(1.58)
    Upgrade-Status: Ready

Chassis 1:
    Server 1:
        Package-Vers: 2.3(1.58)
        Upgrade-Status: Ready
    Server 2:
        Package-Vers: 2.3(1.58)
        Upgrade-Status: Ready
```

Step 7 After all components have successfully upgraded, enter the following commands to verify the status of the security modules/security engine and any installed applications:

a) Enter **top**.
b) Enter **scope ssa**.
c) Enter **show slot**.
d) Verify that the Admin State is `Ok` and the Oper State is `Online` for the security engine on a Firepower 4100 series appliance or for any security modules installed on a Firepower 9300 appliance.
e) Enter **show app-instance**.
f) Verify that the Oper State is `Online` for any logical devices installed on the chassis.

Step 8 Make the unit that you just upgraded the *active* unit so that traffic flows to the upgraded unit:

a) Connect to Firepower Management Center.
b) Choose **Devices** > **Device Management**.
c) Next to the high availability pair where you want to change the active peer, click the Switch Active Peer icon ( ).
d) Click **Yes** to immediately make the standby device the active device in the high availability pair.

Step 9 Connect to Firepower Chassis Manager on the Firepower security appliance that contains the *new standby* Firepower Threat Defense logical device:

Step 10 In Firepower Chassis Manager, choose **System** > **Updates**.
The Available Updates page shows a list of the FXOS platform bundle images and application images that are available on the chassis.

Step 11 Upload the new platform bundle image:

a) Click **Upload Image** to open the Upload Image dialog box.
b) Click **Choose File** to navigate to and select the image that you want to upload.
c) Click **Upload**.
The selected image is uploaded to the Firepower 4100/9300 chassis.
d) For certain software images you will be presented with an end-user license agreement after uploading the image. Follow the system prompts to accept the end-user license agreement.

Step 12 After the new platform bundle image has successfully uploaded, click **Upgrade** for the FXOS platform bundle to which you want to upgrade.

The system will first verify the software package that you want to install. It will inform you of any incompatibility between currently installed applications and the specified FXOS platform software package. It will also warn you that any existing sessions will be terminated and that the system will need to be rebooted as part of the upgrade.

Step 13 Click **Yes** to confirm that you want to proceed with installation, or click **No** to cancel the installation.

The system unpacks the bundle and upgrades/reloads the components. The upgrade process can take up to 30 minutes to complete.

Step 14 Firepower Chassis Manager will be unavailable during upgrade. You can monitor the upgrade process using the FXOS CLI:

a) Enter **scope system**.
b) Enter **show firmware monitor**.
c) Wait for all components (FPRM, Fabric Interconnect, and Chassis) to show `Upgrade-Status: Ready`.

Note
After the FPRM component is upgraded, the system will reboot and then continue upgrading the other components.

Example:

```
FP9300-A# scope system
FP9300-A /system # show firmware monitor
FPRM:
    Package-Vers: 2.3(1.58)
    Upgrade-Status: Ready

Fabric Interconnect A:
    Package-Vers: 2.3(1.58)
    Upgrade-Status: Ready

Chassis 1:
    Server 1:
        Package-Vers: 2.3(1.58)
        Upgrade-Status: Ready
    Server 2:
        Package-Vers: 2.3(1.58)
        Upgrade-Status: Ready
```

Step 15 After all components have successfully upgraded, enter the following commands to verify the status of the security modules/security engine and any installed applications:

a) Enter **top**.
b) Enter **scope ssa**.
c) Enter **show slot**.
d) Verify that the Admin State is `Ok` and the Oper State is `Online` for the security engine on a Firepower 4100 series appliance or for any security modules installed on a Firepower 9300 appliance.
e) Enter **show app-instance**.
f) Verify that the Oper State is `Online` for any logical devices installed on the chassis.

Step 16 Make the unit that you just upgraded the *active* unit as it was before the upgrade:

a) Connect to Firepower Management Center.
b) Choose **Devices** > **Device Management**.
c) Next to the high availability pair where you want to change the active peer, click the Switch Active Peer icon ( ).

d) Click **Yes** to immediately make the standby device the active device in the high availability pair.

Upgrade FXOS on the Firepower 4100/9300 with the CLI

Upgrade FXOS for Standalone FTD Logical Devices Using the FXOS CLI

The section describes the FXOS upgrade process for the following types of devices:

- A Firepower 4100 series chassis that is configured with a FTD logical device and is not part of a failover pair.
- A Firepower 9300 chassis that is configured with one or more standalone FTD devices that are not part of a failover pair.

Before you begin

Before beginning your upgrade, make sure that you have already done the following:

- Download the FXOS platform bundle software package to which you are upgrading.
- Back up your FXOS and FTD configurations.
- Collect the following information that you will need to download the software image to the Firepower 4100/9300 chassis:
  - IP address and authentication credentials for the server from which you are copying the image.
  - Fully qualified name of the image file.

Procedure

Step 1 Connect to the FXOS CLI.

Step 2 Download the new platform bundle image to the Firepower 4100/9300 chassis:

a) Enter firmware mode:

Firepower-chassis-a # **scope firmware**

b) Download the FXOS platform bundle software image:

Firepower-chassis-a /firmware # **download image** *URL*

Specify the URL for the file being imported using one of the following syntax:

- **ftp**://*username@hostname*/*path*/*image_name*
- **scp**://*username@hostname*/*path*/*image_name*
- **sftp**://*username@hostname*/*path*/*image_name*
- **tftp**://*hostname***:***port-num*/*path*/*image_name*

c) To monitor the download process:

Firepower-chassis-a /firmware # **scope download-task** *image_name*

Firepower-chassis-a /firmware/download-task # **show detail**

Example:

The following example copies an image using the SCP protocol:

```
Firepower-chassis-a # scope firmware
Firepower-chassis-a /firmware # download image scp://user@192.168.1.1/images/fxos-k9.2.3.1.58.SPA
Firepower-chassis-a /firmware # scope download-task fxos-k9.2.3.1.58.SPA
Firepower-chassis-a /firmware/download-task # show detail
Download task:
    File Name: fxos-k9.2.3.1.58.SPA
    Protocol: scp
    Server: 192.168.1.1
    Userid:
    Path:
    Downloaded Image Size (KB): 853688
    State: Downloading
    Current Task: downloading image fxos-k9.2.3.1.58.SPA from
192.168.1.1(FSM-STAGE:sam:dme:FirmwareDownloaderDownload:Local)
```

Step 3 If necessary, return to firmware mode:

Firepower-chassis-a /firmware/download-task # **up**

Step 4 Enter auto-install mode:

Firepower-chassis-a /firmware # **scope auto-install**

Step 5 Install the FXOS platform bundle:

Firepower-chassis-a /firmware/auto-install # **install platform platform-vers** *version_number*

version_number is the version number of the FXOS platform bundle you are installing--for example, 2.3(1.58).

Step 6 The system will first verify the software package that you want to install. It will inform you of any incompatibility between currently installed applications and the specified FXOS platform software package. It will also warn you that any existing sessions will be terminated and that the system will need to be rebooted as part of the upgrade.

Enter **yes** to confirm that you want to proceed with verification.

Step 7 Enter **yes** to confirm that you want to proceed with installation, or enter **no** to cancel the installation.

The system unpacks the bundle and upgrades/reloads the components.

Step 8 To monitor the upgrade process:

a) Enter **scope system**.
b) Enter **show firmware monitor**.
c) Wait for all components (FPRM, Fabric Interconnect, and Chassis) to show `Upgrade-Status: Ready`.

Note
After the FPRM component is upgraded, the system will reboot and then continue upgrading the other components.

Example:

```
FP9300-A# scope system
FP9300-A /system # show firmware monitor
FPRM:
    Package-Vers: 2.3(1.58)
    Upgrade-Status: Ready

Fabric Interconnect A:
    Package-Vers: 2.3(1.58)
    Upgrade-Status: Ready

Chassis 1:
    Server 1:
        Package-Vers: 2.3(1.58)
        Upgrade-Status: Ready
    Server 2:
        Package-Vers: 2.3(1.58)
        Upgrade-Status: Ready

FP9300-A /system #
```

Step 9 After all components have successfully upgraded, enter the following commands to verify the status of the security modules/security engine and any installed applications:

a) Enter **top**.
b) Enter **scope ssa**.
c) Enter **show slot**.
d) Verify that the Admin State is `Ok` and the Oper State is `Online` for the security engine on a Firepower 4100 series appliance or for any security modules installed on a Firepower 9300 appliance.
e) Enter **show app-instance**.
f) Verify that the Oper State is `Online` for any logical devices installed on the chassis.

Upgrade FXOS on an FTD High Availability Pair Using the FXOS CLI

If you have Firepower 9300 or Firepower 4100 series security appliances that have FTD logical devices configured as a high availability pair, use the following procedure to update the FXOS platform bundle on your Firepower 9300 or Firepower 4100 series security appliances:

Before you begin

Before beginning your upgrade, make sure that you have already done the following:

- Download the FXOS platform bundle software package to which you are upgrading.
- Back up your FXOS and FTD configurations.
- Collect the following information that you will need to download the software image to the Firepower 4100/9300 chassis:
  - IP address and authentication credentials for the server from which you are copying the image.
  - Fully qualified name of the image file.

Procedure

Step 1 Connect to FXOS CLI on the Firepower security appliance that contains the *standby* Firepower Threat Defense logical device:

Step 2 Download the new platform bundle image to the Firepower 4100/9300 chassis:

a) Enter firmware mode:

Firepower-chassis-a # **scope firmware**

b) Download the FXOS platform bundle software image:

Firepower-chassis-a /firmware # **download image** *URL*

Specify the URL for the file being imported using one of the following syntax:

- **ftp**://*username@hostname*/*path*/*image_name*
- **scp**://*username@hostname*/*path*/*image_name*
- **sftp**://*username@hostname*/*path*/*image_name*
- **tftp**://*hostname***:***port-num*/*path*/*image_name*

c) To monitor the download process:

Firepower-chassis-a /firmware # **scope download-task** *image_name*

Firepower-chassis-a /firmware/download-task # **show detail**

Example:

The following example copies an image using the SCP protocol:

```
Firepower-chassis-a # scope firmware
Firepower-chassis-a /firmware # download image scp://user@192.168.1.1/images/fxos-k9.2.3.1.58.SPA
Firepower-chassis-a /firmware # scope download-task fxos-k9.2.3.1.58.SPA
Firepower-chassis-a /firmware/download-task # show detail
Download task:
    File Name: fxos-k9.2.3.1.58.SPA
    Protocol: scp
    Server: 192.168.1.1
    Userid:
    Path:
    Downloaded Image Size (KB): 853688
    State: Downloading
    Current Task: downloading image fxos-k9.2.3.1.58.SPA from
192.168.1.1(FSM-STAGE:sam:dme:FirmwareDownloaderDownload:Local)
```

Step 3 If necessary, return to firmware mode:

Firepower-chassis-a /firmware/download-task # **up**

Step 4 Enter auto-install mode:

Firepower-chassis-a /firmware # **scope auto-install**

Step 5 Install the FXOS platform bundle:

Firepower-chassis-a /firmware/auto-install # **install platform platform-vers** *version_number*

version_number is the version number of the FXOS platform bundle you are installing; for example, 2.3(1.58).

Step 6 The system will first verify the software package that you want to install. It will inform you of any incompatibility between currently installed applications and the specified FXOS platform software package. It will also warn you that any existing sessions will be terminated and that the system will need to be rebooted as part of the upgrade.

Enter **yes** to confirm that you want to proceed with verification.

Step 7 Enter **yes** to confirm that you want to proceed with installation, or enter **no** to cancel the installation.

The system unpacks the bundle and upgrades/reloads the components.

Step 8 To monitor the upgrade process:

a) Enter **scope system**.
b) Enter **show firmware monitor**.
c) Wait for all components (FPRM, Fabric Interconnect, and Chassis) to show `Upgrade-Status: Ready`.

Note
After the FPRM component is upgraded, the system will reboot and then continue upgrading the other components.

Example:

```
FP9300-A# scope system
FP9300-A /system # show firmware monitor
FPRM:
    Package-Vers: 2.3(1.58)
    Upgrade-Status: Ready

Fabric Interconnect A:
    Package-Vers: 2.3(1.58)
    Upgrade-Status: Ready

Chassis 1:
    Server 1:
        Package-Vers: 2.3(1.58)
        Upgrade-Status: Ready
    Server 2:
        Package-Vers: 2.3(1.58)
        Upgrade-Status: Ready

FP9300-A /system #
```

Step 9 After all components have successfully upgraded, enter the following commands to verify the status of the security modules/security engine and any installed applications:

a) Enter **top**.
b) Enter **scope ssa**.
c) Enter **show slot**.
d) Verify that the Admin State is `Ok` and the Oper State is `Online` for the security engine on a Firepower 4100 series appliance or for any security modules installed on a Firepower 9300 appliance.
e) Enter **show app-instance**.
f) Verify that the Oper State is `Online` for any logical devices installed on the chassis.

Step 10 Make the unit that you just upgraded the *active* unit so that traffic flows to the upgraded unit:

a) Connect to Firepower Management Center.

b) Choose **Devices** > **Device Management**.

c) Next to the high availability pair where you want to change the active peer, click the Switch Active Peer icon ( ).

d) Click **Yes** to immediately make the standby device the active device in the high availability pair.

Step 11 Connect to FXOS CLI on the Firepower security appliance that contains the *new standby* Firepower Threat Defense logical device:

Step 12 Download the new platform bundle image to the Firepower 4100/9300 chassis:

a) Enter firmware mode:

Firepower-chassis-a # **scope firmware**

b) Download the FXOS platform bundle software image:

Firepower-chassis-a /firmware # **download image** *URL*

Specify the URL for the file being imported using one of the following syntax:

- **ftp**://*username@hostname*/*path*/*image_name*
- **scp**://*username@hostname*/*path*/*image_name*
- **sftp**://*username@hostname*/*path*/*image_name*
- **tftp**://*hostname***:***port-num*/*path*/*image_name*

c) To monitor the download process:

Firepower-chassis-a /firmware # **scope download-task** *image_name*

Firepower-chassis-a /firmware/download-task # **show detail**

Example:

The following example copies an image using the SCP protocol:

```
Firepower-chassis-a # scope firmware
Firepower-chassis-a /firmware # download image scp://user@192.168.1.1/images/fxos-k9.2.3.1.58.SPA
Firepower-chassis-a /firmware # scope download-task fxos-k9.2.3.1.58.SPA
Firepower-chassis-a /firmware/download-task # show detail
Download task:
    File Name: fxos-k9.2.3.1.58.SPA
    Protocol: scp
    Server: 192.168.1.1
    Userid:
    Path:
    Downloaded Image Size (KB): 853688
    State: Downloading
    Current Task: downloading image fxos-k9.2.3.1.58.SPA from
192.168.1.1(FSM-STAGE:sam:dme:FirmwareDownloaderDownload:Local)
```

Step 13 If necessary, return to firmware mode:

Firepower-chassis-a /firmware/download-task # **up**

Step 14 Enter auto-install mode:

Firepower-chassis-a /firmware # **scope auto-install**

Step 15 Install the FXOS platform bundle:

Firepower-chassis-a /firmware/auto-install # **install platform platform-vers** *version_number*

version_number is the version number of the FXOS platform bundle you are installing; for example, 2.3(1.58).

Step 16 The system will first verify the software package that you want to install. It will inform you of any incompatibility between currently installed applications and the specified FXOS platform software package. It will also warn you that any existing sessions will be terminated and that the system will need to be rebooted as part of the upgrade.

Enter **yes** to confirm that you want to proceed with verification.

Step 17 Enter **yes** to confirm that you want to proceed with installation, or enter **no** to cancel the installation.

The system unpacks the bundle and upgrades/reloads the components.

Step 18 To monitor the upgrade process:

a) Enter **scope system**.
b) Enter **show firmware monitor**.
c) Wait for all components (FPRM, Fabric Interconnect, and Chassis) to show `Upgrade-Status: Ready`.

Note
After the FPRM component is upgraded, the system will reboot and then continue upgrading the other components.

Example:

```
FP9300-A# scope system
FP9300-A /system # show firmware monitor
FPRM:
    Package-Vers: 2.3(1.58)
    Upgrade-Status: Ready

Fabric Interconnect A:
    Package-Vers: 2.3(1.58)
    Upgrade-Status: Ready

Chassis 1:
    Server 1:
        Package-Vers: 2.3(1.58)
        Upgrade-Status: Ready
    Server 2:
        Package-Vers: 2.3(1.58)
        Upgrade-Status: Ready

FP9300-A /system #
```

Step 19 After all components have successfully upgraded, enter the following commands to verify the status of the security modules/security engine and any installed applications:

a) Enter **top**.
b) Enter **scope ssa**.
c) Enter **show slot**.
d) Verify that the Admin State is `Ok` and the Oper State is `Online` for the security engine on a Firepower 4100 series appliance or for any security modules installed on a Firepower 9300 appliance.
e) Enter **show app-instance**.
f) Verify that the Oper State is `Online` for any logical devices installed on the chassis.

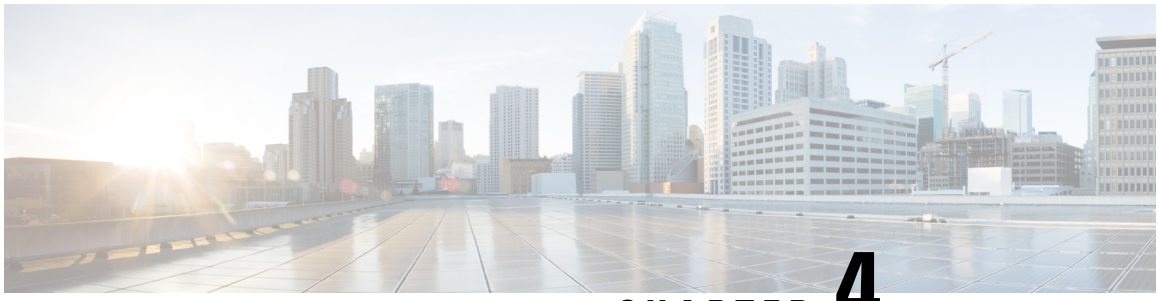
Step 20 Make the unit that you just upgraded the *active* unit as it was before the upgrade:

a) Connect to Firepower Management Center.

b) Choose **Devices** > **Device Management**.

c) Next to the high availability pair where you want to change the active peer, click the Switch Active Peer icon ( ).

d) Click **Yes** to immediately make the standby device the active device in the high availability pair.



CHAPTER 4

Reference

- Traffic Flow and Inspection, on page 33
- Time and Disk Space, on page 34
- Upgrade Feature History, on page 35

Traffic Flow and Inspection

Schedule maintenance windows when upgrade will have the least impact, considering any effect on traffic flow and inspection.

Traffic Flow and Inspection for Firewall Threat Defense Upgrades

Software Upgrade

Traffic is dropped while you upgrade. In a high availability deployment, you can minimize disruption by upgrading devices one at a time.

For the ISA 3000 only, if you configured hardware bypass for power failure, traffic is dropped during the upgrade but is passed without inspection while the device completes its post-upgrade reboot.

Software Revert (Major/Maintenance Releases)

Traffic is dropped while you revert. In a high availability deployment, revert is more successful when you revert both units simultaneously. Traffic flow and inspection resume when the first unit comes back online.

Traffic Flow and Inspection for Chassis Upgrades

Upgrading FXOS reboots the chassis. For FXOS upgrades to Version 2.14.1+ that include firmware upgrades, the chassis reboots twice—once for FXOS and once for the firmware.

Even in high availability deployments, you upgrade FXOS on each chassis independently. To minimize disruption, upgrade one chassis at a time; see Upgrade Order, on page 4.

Table 8: Traffic Flow and Inspection: FXOS Upgrades

Firewall Threat Defense Deployment	Traffic Behavior	Method
Standalone	Dropped.	—
High availability	Unaffected.	**Best Practice:** Update FXOS on the standby, switch active peers, upgrade the new standby.
	Dropped until one peer is online.	Upgrade FXOS on the active peer before the standby is finished upgrading.

Traffic Flow and Inspection when Deploying Configurations

Restarting the Snort process briefly interrupts traffic flow and inspection on all devices, including those configured for high availability. When you deploy without restarting Snort, resource demands may result in a small number of packets dropping without inspection.

Snort typically restarts during the first deployment immediately after the upgrade. It does not restart during other deployments unless, before deploying, you modify specific policy or device configurations.

Time and Disk Space

Time to Upgrade

We recommend you track and record your own upgrade times so you can use them as future benchmarks. The following table lists some things that can affect upgrade time.



Caution Do not make or deploy configuration changes during upgrade. Even if the system appears inactive, do not manually reboot or shut down. In most cases, do not restart an upgrade in progress. You could place the system in an unusable state and require a reimage. If you encounter issues with the upgrade, including a failed upgrade or unresponsive appliance, see Troubleshooting Threat Defense Upgrades, on page 15.

Table 9: Upgrade Time Considerations

Consideration	Details
Versions	Upgrade time usually increases if your upgrade skips versions.
Models	Upgrade time usually increases with lower-end models.
Virtual appliances	Upgrade time in virtual deployments is highly hardware dependent.

Consideration	Details
High availability	In a high availability configuration, devices upgrade one at a time to preserve continuity of operations, with each device operating in maintenance mode while it upgrades. Upgrading a device pair, therefore, takes longer than upgrading a standalone device.
Configurations	Upgrade time can increase with the complexity of your configurations and whether/how they are affected by the upgrade. For example, if you use a lot of access control rules and the upgrade needs to make a backend change to how those rules are stored, the upgrade can take longer.
Components	You may need additional time to perform operating system or virtual hosting upgrades, upgrade package transfers, readiness checks, VDB and intrusion rule (SRU/LSP) updates, configuration deployment, and other related tasks.

Disk Space to Upgrade

To upgrade, the upgrade package must be on the device. Readiness checks should indicate whether you have enough disk space to perform the upgrade. Without enough free disk space, the upgrade fails. To check disk space, use the **show disk** CLI command.

Upgrade Feature History

Table 10: Device Upgrade Feature History

Feature	Minimum Threat Defense	Details
Pre-upgrade readiness check.	7.0.0	You can run a readiness check before upgrade. The readiness check verifies that the upgrade is valid for the system, and that the system meets other requirements needed to install the package. Running an upgrade readiness check helps you avoid failed installations. A link to run the upgrade readiness check was added to the **System Upgrade** section of the **Device** > **Updates** page.

Feature	Minimum Threat Defense	Details
Cancel and revert a failed upgrade.	6.7.0	If a major software upgrade fails or is otherwise not functioning correctly, you can revert to the state of the device as it was when you installed the upgrade. We added the ability to revert the upgrade to the System Upgrade panel in FDM. During an upgrade, the FDM login screen shows the upgrade status and gives you the option to cancel or revert in case of upgrade failure. In the Firewall Threat Defense API, we added the CancelUpgrade, RevertUpgrade, RetryUpgrade, and UpgradeRevertInfo resources. In the Firewall Threat Defense CLI, we added the following commands: **show last-upgrade status**, **show upgrade status**, **show upgrade revert-info**, **upgrade cancel**, **upgrade revert**, **upgrade cleanup-revert**, **upgrade retry**.
Upgrade with Firewall Device Manager.	6.2.0	You can install software upgrades through Firewall Device Manager. Select **Device** > **Updates**.