

# NSX-T Data Center Upgrade Guide

VMware NSX-T Data Center 2.3



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# Upgrading NSX-T Data Center

The *NSX-T Data Center Upgrade Guide* provides step-by-step information about upgrading the NSX-T Data Center components, which include the data plane, control plane, and management plane with minimum system downtime.

## Intended Audience

This information is intended for anyone who wants to upgrade NSX-T Data Center 2.2. to NSX-T Data Center 2.3. The information is written for experienced system administrators who are familiar with virtual machine technology, virtual networking, and security concepts and operations.

## VMware Technical Publications Glossary

VMware Technical Publications provides a glossary of terms that might be unfamiliar to you. For definitions of terms as they are used in VMware technical documentation, go to <http://www.vmware.com/support/pubs>.

# NSX-T Data Center Upgrade Checklist





Use the checklist to track your work on the upgrade process.

You must follow the prescribed order and upgrade the hosts, NSX Edge cluster, NSX Controller cluster, and Management plane.

**Table 1-1. Upgrade NSX-T Data Center**

Task	Instructions
<input type="checkbox"/> Review the known upgrade problems and workarounds documented in the NSX-T Data Center release notes.	See the <i>NSX-T Data Center Release Notes</i> .
<input type="checkbox"/> Follow the system configuration requirements and prepare your infrastructure.	See the system requirements section of the <i>NSX-T Data Center Installation Guide</i> .
<input type="checkbox"/> Evaluate the operational impact of the upgrade.	See <a href="#">Operational Impact of the NSX-T Data Center Upgrade</a> .
<input type="checkbox"/> Upgrade your supported hypervisor.	See <a href="#">Upgrading Your Host</a> .
<input type="checkbox"/> Verify that the NSX-T Data Center environment is in a healthy state.	See <a href="#">Verify the Current State of NSX-T Data Center</a> .
<input type="checkbox"/> Download the latest NSX-T Data Center upgrade bundle.	See <a href="#">Download the NSX-T Data Center Upgrade Bundle</a> .
<input type="checkbox"/> If you are using NSX Cloud for your public cloud workload VMs, upgrade NSX Cloud components.	See <a href="#">Chapter 3 Upgrading NSX Cloud Components</a>
<input type="checkbox"/> Verify that the upgrade coordinator is free of errors.	See <a href="#">Prepare the Upgrade Coordinator</a> .
<input type="checkbox"/> Upgrade your upgrade coordinator.	See <a href="#">Upgrade the Upgrade Coordinator</a> .
<input type="checkbox"/> Upgrade the hosts.	See <a href="#">Configuring and Upgrading Hosts</a> .
<input type="checkbox"/> Upgrade the NSX Edge cluster.	See <a href="#">Upgrade NSX Edge Cluster</a> .
<input type="checkbox"/> Upgrade the NSX Controller cluster.	See <a href="#">Upgrade NSX Controller Cluster</a> .
<input type="checkbox"/> Upgrade the Management plane.	See <a href="#">Upgrade Management Plane</a> .

**Table 1-1. Upgrade NSX-T Data Center (Continued)**

Task	Instructions
 Post-upgrade tasks.	See <a href="#">Verify the Upgrade</a> .
 Troubleshoot upgrade errors.	See <a href="#">Chapter 6 Troubleshooting Upgrade Failures</a> .

# Preparing to Upgrade NSX-T Data Center

# 2

You must prepare your infrastructure and follow the task sequence provided in the checklist for the upgrade process to be successful.

You can perform the upgrade process in a maintenance time frame defined by your company. You can choose to, for example, upgrade only the host and upgrade the other NSX-T Data Center components later.

This chapter includes the following topics:

- [Operational Impact of the NSX-T Data Center Upgrade](#)
- [Supported Hypervisor Upgrade Path](#)
- [Upgrading Your Host](#)
- [Verify the Current State of NSX-T Data Center](#)
- [Download the NSX-T Data Center Upgrade Bundle](#)

## Operational Impact of the NSX-T Data Center Upgrade

The duration for the NSX-T Data Center upgrade process depends on the number of components you have to upgrade in your infrastructure. It is important to understand the operational state of NSX-T Data Center components during an upgrade, such as when some hosts have been upgraded, or when NSX Edge nodes have not been upgraded.

The upgrade process is as follows:

Hosts > NSX Edge cluster > NSX Controller cluster > Management plane.

## Hosts Upgrade

During Upgrade	After Upgrade
<ul style="list-style-type: none"> <li>■ For standalone vSphere ESXi hosts not managed by vCenter Server, power off tenant VMs running on the vSphere ESXi hosts and put these hosts in maintenance mode or move the VMs to another host.</li> <li>■ For vSphere ESXi hosts that are part of a DRS enabled cluster, do not power off tenant VMs running on the vSphere ESXi hosts or put the vSphere ESXi hosts in maintenance mode. NSX-T Data Center migrates the VMs running on the host to another host in the same cluster during the upgrade.</li> <li>■ For vSphere ESXi hosts that are part of a DRS disabled cluster, power off the tenant VMs running on the vSphere ESXi hosts. Put the vSphere ESXi hosts in maintenance mode.</li> <li>■ For KVM hosts, VMs do not need to be powered off.</li> <li>■ Configuration changes are allowed on NSX Manager.</li> </ul>	<ul style="list-style-type: none"> <li>■ Power on or move back the tenant VMs of vSphere ESXi hosts not managed by vCenter Server that were powered off before the upgrade.</li> <li>■ Power on the tenant VMs of vSphere ESXi hosts that are part of a DRS disabled cluster that were powered off before the upgrade.</li> <li>■ Upgraded hosts are compatible with non-upgraded hosts, NSX Edge cluster, NSX Controller cluster, and Management plane.</li> <li>■ New features introduced in the upgrade are not configurable until the NSX Edge cluster, NSX Controller cluster, and Management plane are upgraded.</li> </ul>

## NSX Edge Cluster Upgrade

During Upgrade	After Upgrade
<ul style="list-style-type: none"> <li>■ During the NSX Edge upgrade, you might experience the following traffic interruption:             <ul style="list-style-type: none"> <li>■ North-south datapath is affected if the NSX Edge is part of the datapath.</li> <li>■ East-west traffic between tier-1 routers using NSX Edge firewall, NAT, or load balancing.</li> <li>■ Temporary Layer 2 and Layer 3 interruption.</li> </ul> </li> <li>■ Configuration changes are not blocked on NSX Manager but might be delayed.</li> </ul>	<ul style="list-style-type: none"> <li>■ Configuration changes are allowed.</li> <li>■ Upgraded NSX Edge cluster is compatible with the upgraded hosts and older versions of the NSX Controller cluster and Management plane.</li> <li>■ New features introduced in the upgrade are not configurable until the NSX Controller cluster and Management plane are upgraded.</li> </ul>

## NSX Controller Cluster Upgrade

During Upgrade	After Upgrade
<ul style="list-style-type: none"> <li>■ Configuration changes are not blocked on NSX Manager but might be delayed.</li> </ul>	<ul style="list-style-type: none"> <li>■ Configuration changes are allowed.</li> <li>■ Upgraded NSX Controller cluster is compatible with only the upgraded NSX Edge cluster and older version of Management plane.</li> <li>■ New features introduced in the upgrade are not configurable until the Management plane is upgraded.</li> </ul>

**Note** Due to changes in the communication from the transport node to NSX Controller, you must open the TCP ports 1235 and 1234 before you upgrade from NSX-T Data Center 2.1 to higher. After the upgrade is successful, the TCP port 1235 is in use.



## Management Plane Upgrade

During Upgrade	After Upgrade
<ul style="list-style-type: none"> <li>Configuration changes are not blocked on the Management plane. It is recommended not to make any changes during the Management plane upgrade.</li> <li>API service is available.</li> <li>User interface is unavailable for a short period.</li> </ul>	<ul style="list-style-type: none"> <li>Configuration changes are allowed.</li> <li>New features introduced in the upgrade are configurable.</li> </ul>

## Supported Hypervisor Upgrade Path

The supported hypervisor upgrade paths for the NSX-T Data Center product versions.

NSX-T Data Center 1.1	NSX-T Data Center 2.0	NSX-T Data Center 2.1	NSX-T Data Center 2.2	NSX-T Data Center 2.3
Supported vSphere Hypervisor (ESXi)	Supported vSphere Hypervisor (ESXi)	Supported vSphere Hypervisor (ESXi)	Supported vSphere Hypervisor (ESXi)	Supported vSphere Hypervisor (ESXi)
Ubuntu 14.04	Ubuntu 16.04.2 LTS with KVM 4.4.0.x	Ubuntu 16.04.2 LTS with KVM 4.4.0.x	Ubuntu 16.04.2 LTS with KVM 4.4.0.x	Ubuntu 16.04.2 LTS with KVM 4.4.0.x
		Red Hat 7.4 and Red Hat 7.3	Red Hat 7.4	Red Hat 7.5 and Red Hat 7.4
				CentOS 7.4

You must upgrade NSX-T Data Center in an incremental order. For example, you must upgrade from NSX-T Data Center 1.1 > NSX-T Data Center 2.0 > NSX-T Data Center 2.1 > NSX-T Data Center 2.2 > NSX-T Data Center 2.3.

**Note** If you have NSX-T Data Center 2.1 installed, you can upgrade to NSX-T Data Center 2.3.

## Upgrading Your Host

To avoid problems during the host upgrade, your host must be supported in NSX-T Data Center.

If your host is unsupported, you can manually upgrade your host to the supported version. See [Supported Hypervisor Upgrade Path](#).

### Upgrade vSphere ESXi Host

If your vSphere ESXi host is unsupported, manually upgrade your vSphere ESXi host to the supported version.

#### Prerequisites

Verify that the vSphere ESXi host is supported. See [Supported Hypervisor Upgrade Path](#).

**Procedure****1** Upgrade the vSphere ESXi host.

- Upgrade vSphere ESXi 6.7 to vSphere ESXi 6.7 U1.

```
esxcli software profile update --depot <build_path> --profile ESXi-6.7.0-XXXXX-standard --
allow-downgrades
--no-sig-check
```

- Upgrade vSphere ESXi 6.5 U1 to vSphere ESXi 6.7.

```
esxcli software profile update --depot <build_path> --profile ESXi-6.7.0-7981081-standard --
allow-downgrades
--no-sig-check
```

- Upgrade vSphere ESXi 6.5 U1 to vSphere ESXi 6.5 U2.

```
esxcli software profile update --depot <build_path> --profile ESXi-6.5.0-7942877-standard --
allow-downgrades
--no-sig-check
```

**2** Reboot the vSphere ESXi host.**reboot****3** (Optional) Upgrade vSphere ESXi in an offline environment using esxcli.

- a Download the depot file and copy the file to the server.
- b Upgrade the vSphere ESXi host.

```
esxcli software profile update -d <path-to-depot-file > -p <build> -standard
--allow-downgrades --no-sig-check
```

**4** (Optional) Upgrade vSphere ESXi in an offline environment using VUM.

- a Import an installation ISO image into VUM repository.
- b Create a baseline based on the imported image.

## Upgrade Ubuntu Host

If your Ubuntu host is unsupported, manually upgrade your Ubuntu host to the supported version.

**Prerequisites**

Verify that the Ubuntu host is supported. See [Supported Hypervisor Upgrade Path](#).

**Procedure****1** (Optional) Show all Linux Standard Base and distribution-specific information.

```
lsb_release -a
```

- 2 Install packages using the apt tool.

```
sudo apt update
```

- 3 Fetch the latest packages.

```
sudo apt-get upgrade
```

- 4 Handle dependencies such as substituting obsolete packages with new packages.

```
sudo apt dist-upgrade
```

Ubuntu requires the following dependencies for the LCP package and host components to work properly.

```
libunwind8, libgflags2v5, libgoogle-perftools4, traceroute, python-mako, python-simplejson, python-unittest2, python-yaml, python-netaddr, libprotobuf9v5, libboost-chrono1.58.0, libgoogle-glog0v5, dkms, libboost-date-time1.58.0, libleveldb1v5, libsnappy1v5, python-gevent, python-protobuf, ieee-data, libyaml-0-2, python-linecache2, python-traceback2, libtcmalloc-minimal4, python-greenlet, python-markupsafe, libboost-program-options1.58.0
```

- 5 Upgrade to the Ubuntu 16.04 version.

```
do-release-upgrade
```

- 6 If you have an existing Ubuntu KVM host as a transport node, back up the `/etc/network/interfaces` file.

## Upgrade Host to Red Hat 7.4

If your RHEL host is unsupported, manually upgrade your RHEL host to the supported version.

RHEL 7.4 requires the following dependencies for the LCP package and host components to work properly.

```
yum-utils, wget, redhat-lsb-core, tcpdump, boost-filesystem, PyYAML, boost-iostreams, boost-chrono, python-mako, python-netaddr, python-six, gperftools-libs, libunwind, snappy, boost-date-time, c-ares, libev, python-gevent, python-greenlet
```

### Prerequisites

Verify that the RHEL host is supported. See [Supported Hypervisor Upgrade Path](#).

### Procedure

- 1 Navigate to the `/etc/yum.conf` file.
- 2 Set the upgrade to the RHEL 7.5 release.
 

```
subscription-manager release --set=7.5
```
- 3 Clear the YUM cache.
 

```
yum clean all
```

- 4 Update the YUM packages.

```
yum update --releasever=7.4 update
```

- 5 Verify the Grub2 configuration file.

```
awk -F\ ' '$1=="menuentry " {print $2}' /etc/grub2.cfg
```

RHEL 7.4 appears in the grub2.cfg file.

- 6 Download the Red Hat 7.4 Link Control Protocol (LCP) bundle.

```
wget <RHEL_7.4_NSXT_21_LCP_URL>
```

- 7 Unzip the downloaded tar LCP bundle.

```
tar zxvf nsx-lcp-*rhel74_x86_64.tar.gz
```

- 8 Install the RPM packages.

```
cd nsx-lcp-rhel74_x86_64
rpm -Uvh --force *.rpm
```

- 9 Remove the comments from the /etc/yum.conf file to revert to the original state.

```
exclude=[existing list] kernel* redhat-release*
```

- 10 To upgrade NSX-T Data Center 2.1 to NSX-T Data Center 2.3, uninstall netcpa with --noscripts option.

```
rpm -evv --noscripts --nodeps nsx-netcpa 2>&1
if [ -f /opt/vmware/bin/netcpa.sh ]; then
    rm /opt/vmware/bin/netcpa.sh
fi
```

### What to do next

You can also upgrade to the supported RHEL 7.5

## Upgrade Host to RHEL 7.5

If your RHEL host is unsupported, manually upgrade your RHEL host to the supported version.

RHEL 7.5 requires the following dependencies for the LCP package and host components to work properly.

```
PyYAML, c-ares, libev, libunwind, libyaml, python-beaker, python-gevent, python-greenlet, python-mako,
python-markupsafe, python-netaddr, python-paste, python-tempita
```

### Prerequisites

Verify that the RHEL host is supported. See [Supported Hypervisor Upgrade Path](#).

**Procedure**

1 Navigate to the `/etc/yum.conf` file.

2 Assign the upgrade to Red Hat 7.5.

```
subscription-manager release --set=7.5
```

3 Clear the YUM cache.

```
yum clean all
```

4 Update the YUM packages.

```
yum update redhat-release-server
yum update
```

5 Download the Red Hat 7.5 Link Control Protocol (LCP) bundle.

```
wget <RHEL_7.5_NSXT_23_LCP_URL>
```

6 Unzip the downloaded tar LCP bundle.

```
tar zxvf nsx-lcp-*rhel75_x86_64.tar.gz
```

7 Install the RPM packages.

```
yum install -y -v <Path-to-rpm-directory>/*.rpm && /etc/init.d/openvswitch force-reload-kmod &&
READ_INTERFACES=no /etc/init.d/openvswitch stop && /etc/init.d/openvswitch start
&& /etc/init.d/openvswitch start && /etc/init.d/nsxa restart
```

## Verify the Current State of NSX-T Data Center

Before you begin the upgrade process, it is important to test the NSX-T Data Center working state. Otherwise, you cannot determine if the upgrade caused post-upgrade problems or if the problem existed before the upgrade.

---

**Note** Do not assume that everything is working before you start to upgrade the NSX-T Data Center infrastructure.

---

**Procedure**

1 Identify administrative user IDs and passwords.

2 Verify that you can log in to the NSX Manager Web user interface.

3 Check the Dashboard, system overview, fabric hosts, NSX Edge cluster, transport nodes, and all logical entities to make sure that all the status indicators are green, normal, deployed, and do not show any warnings.

4 Validate North-South connectivity by pinging out from a VM.

5 Validate that there is East-West connectivity between any two VMs in your environment.

- 6 Record BGP states on the NSX Edge devices.
  - `get logical-routers`
  - `vrf`
  - `get bgp`
  - `get bgp neighbor`
- 7 (Optional) If you have a test environment, check the upgrade functionality before upgrading your production environment.

## Download the NSX-T Data Center Upgrade Bundle

The upgrade bundle contains all the files to upgrade the NSX-T Data Center infrastructure. Before you begin the upgrade process, you must download the correct upgrade bundle version.

You can also navigate to the upgrade bundle and save the URL. When you upgrade the upgrade coordinator, paste the URL so that the upgrade bundle is uploaded from the VMware download portal.

### Procedure

- 1 Locate the NSX-T Data Center build on the VMware download portal.
- 2 Navigate to the master upgrade bundle file and click **Read More**.
- 3 Verify that the master upgrade bundle filename extension ends with `.mub`.

The upgrade bundle filename has a format similar to `VMware-NSX-upgrade-bundle-ReleaseNumberNSXBuildNumber.mub`.
- 4 Download the NSX-T Data Center upgrade bundle to the same system you are using to access the NSX Manager user interface.

# Upgrading NSX Cloud Components

# 3

NSX Cloud components are upgraded using the CSM Upgrade Coordinator.

## The NSX Cloud Upgrade Workflow

---

**Note** Update the MTU in **NSX Manager > Fabric > Profiles > Uplink Profiles > PCG-Uplink-HostSwitch-Profile** to 1500 before starting the upgrade to NSX-T Data Center 2.3. This can be either done using the NSX Manager UI or NSX Manager REST APIs. See the *NSX-T Data Center Release Notes > NSX Cloud Known Issues*, for details.

---

First upgrade NSX Cloud components as follows. After that, upgrade NSX-T Data Center following the detailed steps here: [Chapter 4 Upgrading NSX-T Data Center](#).

### 1 Upgrade the CSM Upgrade Coordinator

Begin the upgrade process by upgrading the CSM Upgrade Coordinator.

### 2 Use the Upgrade Co-ordinator to Upgrade NSX Agent and PCG

Upload the upgrade bundle to proceed with upgrading NSX agent and PCG.

### 3 Upgrade CSM

In the current release, CSM can only be upgraded using NSX CLI.

## Upgrade the CSM Upgrade Coordinator

Begin the upgrade process by upgrading the CSM Upgrade Coordinator.

The Cross-Cloud upgrade bundle contains all the files to upgrade the NSX Cloud infrastructure. Before you begin the upgrade process, you must download the correct upgrade bundle version.

### Procedure

- 1 Locate the NSX-T Data Center build available to upgrade on the VMware download portal.
- 2 Navigate to the `upgrade_public_cloud` folder and expand that folder.

- 3 Verify that the master upgrade bundle filename has a format similar to `VMware-CC-upgrade-bundle-ReleaseNumberNSXBuildNumber.mub`.

**Note:** This is a separate file and must be downloaded in addition to the NSX-T Data Center upgrade bundle.

- 4 Download the NSX Cloud upgrade bundle.

**Note:** The upgrade bundle is uploaded into the Upgrade Coordinator from CSM. Download it either on the same system from where you access the CSM UI, or note the location of the system where you download it, to provide a remote URL of this system into the CSM Upgrade Coordinator for uploading.

## Use the Upgrade Co-ordinator to Upgrade NSX Agent and PCG

Upload the upgrade bundle to proceed with upgrading NSX agent and PCG.

### Prerequisites

- Outbound port 8080 must be open on workload VMs that need to be upgraded.
- The PCGs must be powered on when the upgrade of NSX agents installed on workload VMs or of PCGs is in progress.

### Procedure

- 1 Log in to CSM with the Enterprise Administrator role.
- 2 Click **Utilities > Upgrade**
- 3 Click **Upload Upgrade Bundle**. Pick a location for the upgrade bundle. You can provide a remote location using a URL.
- 4 After the upgrade bundle finishes uploading in CSM, click **Prepare for Upgrade** to start the process of upgrading the Upgrade Coordinator.

**Note:** The upgrade bundle must be a valid file in the .mub format. Do not use .nub or other files. See [Upgrade the Upgrade Coordinator](#) for details.

When the Upgrade Coordinator upgrade process finishes, the **Begin Upgrade** button becomes active.

- 5 Click **Begin Upgrade**. The **Upgrade CSM** wizard starts.

**Note:** Although the name of the wizard is **Upgrade CSM**, you can only upgrade NSX Agents and PCG from this wizard.

- 6 In the **Upgrade CSM > Overview** screen, you can see an overview of the default upgrade plan. Based on the upgrade bundle you have uploaded, you can see which versions of NSX agent and PCG are compatible for an upgrade via the upgrade bundle uploaded.



7 Click **Next**. The **CSM > Select NSX Agents** screen appears. A list of all compatible NSX agents that can be upgraded to the target version in all your VNets, are displayed. You can filter the agents based on which private cloud network they are in or which OS they are deployed on.

8 Select the NSX Agents you want to upgrade and move them to the **Selected** window. Click **Next**. CSM downloads the upgrade bits to the PCG on which the NSX agents reside. If you have an HA pair of PCG, CSM downloads the upgrade bits to each PCG and starts upgrading the selected NSX agents.

**Note:** 10 agents are upgraded simultaneously. If you have more than 10 agents, they are queued for upgrading. PCG maintains a flag on VMs that are unreachable and attempts to upgrade them when they can be reached. For example, a powered off workload VM is upgraded when powered on again and able to communicate with PCG. Similarly for a workload VM on which port 8080 is blocked at first but when port 8080 is opened and PCG can access it, the upgrade for that workload VM proceeds.

Until all the agents are upgraded, you cannot upgrade PCG. If some agents are not able to be upgraded, you can skip upgrading them in order to proceed with upgrading PCG. See [\(Not recommended\) Skip Upgrading NSX Agent\(s\)](#) for details on this option.

9 Click **Next** to proceed with upgrading the PCG. With an HA pair of PCGs, there are two failovers during the upgrade process and when the upgrade finishes, the preferred PCG is reinstated as the active gateway.

10 Click **Finish**.

## Example: How long does the upgrade process take?

**Note** CSM and NSX-T Data Center components are upgraded separately, and that time is not included here. This is an estimation to help you plan your upgrade cycles.

- **NSX Agent installed on a workload VM:** It takes from 3 to 5 minutes for 1 NSX agent to upgrade, not accounting for the time it takes to upload the upgrade bundle from CSM to the public cloud. 10 agents are upgraded simultaneously. The time to upgrade agents also varies for different operating systems and the VM size.
- **One or an HA pair of PCGs:** PCGs in different VPCs or VNets are upgraded in parallel, but PCGs in HA pair upgrade serially. It takes about 20 minutes for one PCG to upgrade.
- **One VPC or VNet:** For a VPC or VNet with up to 10 VMs and an HA pair of PCGs, it can take up to 45 minutes to upgrade. This time may vary depending on the OS on the VMs and their size.

## (Not recommended) Skip Upgrading NSX Agent(s)

You have the option to skip upgrading NSX agents, but this is not recommended.

You must upgrade NSX agents before upgrading PCG, but you have the option to skip upgrading NSX agents as a feature to continue with the workflow under certain conditions. We do not recommend skipping the upgrade of NSX agents because VMs with NSX agents in a different version compared to PCG will lose connectivity with the PCG.

Why you may consider skipping agent upgrade:

- You want to upgrade only selected private clouds within your public cloud.
- You do not want any downtime on certain critical managed workload VMs.
- You do not want powered off VMs to block the upgrade process.
- You may want to apply a bug-fix patch only to the PCG without affecting the agents.

If you do skip upgrading NSX agents, you cannot upgrade them later using the UI or APIs. This can potentially break connectivity between such NSX agents and the upgraded PCG. The only workaround for restoring connectivity in that case is to uninstall the old NSX agents and reinstall the latest NSX agents on those VMs.

---

**Note** If there are any quarantined VMs, they are not included in the upgrade plan and you cannot upgrade them. Quarantined VMs do not have any connectivity with PCG and therefore not upgrading them does not affect the upgrade process.

---

## Upgrade CSM

In the current release, CSM can only be upgraded using NSX CLI.

### Copy the Unified Appliance Upgrade Bundle into CSM

You need the file `VMware-NSX-unified-appliance-<version>.nub` in the location `/var/vmware/nsx/file-store/` on the CSM appliance to upgrade CSM.

You can get the file in this location in either of the following ways, depending on your privileges:

- Without root privileges for the CSM appliance:
  - Download the file `VMware-NSX-unified-appliance-<version>.nub` from the VMware download portal. This file is typically located under `nsx-unified-appliance > upgrade`.
  - Use the following NSX CLI commands to copy this file:

```
Autoimport-nsx-cloud-service-manager-thin> copy url
scp://<username>@<host_where_the_.nub_file_is_downloaded>/<path_to_file>/VMware-NSX-unified-
appliance-<version>.nub
```

- Alternatively, with `root` privileges, you can copy this file from CSM as follows:

```
root@Autoimport-nsx-cloud-service-manager-thin:~#
cp /repository/<version>/CloudServiceManager/nub/VMware-NSX-unified-appliance-
<version>.nub /var/vmware/nsx/file-store/
```

## Follow this procedure to upgrade CSM

### 1 Extract and verify the .nub file:

```

Autoimport-nsx-cloud-service-manager-thin> verify upgrade-bundle VMware-NSX-unified-appliance-
<version>
Checking upgrade bundle /var/vmware/nsx/file-store/VMware-NSX-unified-appliance-<version>.nub
contents
Verifying bundle VMware-NSX-unified-appliance-<version>.bundle with signature VMware-NSX-unified-
appliance-<version>.bundle.sig
Moving bundle to /image/VMware-NSX-unified-appliance-<version>.bundle
Extracting bundle payload
Successfully verified upgrade bundle
Bundle manifest:
  appliance_type: 'nsx-unified-appliance'
  version: '<upgrade version>'
  os_image_path: 'files/nsx-root.fsa'
  os_image_md5_path: 'files/nsx-root.fsa.md5'
Current upgrade info:
{
  "info": "",
  "body": {
    "meta": {
      "from_version": "<current version>",
      "old_config_dev": "/dev/mapper/nsx-config",
      "to_version": "<post-upgrade version>",
      "new_config_dev": "/dev/mapper/nsx-config__bak",
      "old_os_dev": "/dev/xvda2",
      "bundle_path": "/image/VMware-NSX-unified-appliance-<version>",
      "new_os_dev": "/dev/xvda3"
    },
    "history": []
  },
  "state": 1,
  "state_text": "CMD_SUCCESS"
}
Autoimport-nsx-cloud-service-manager-thin>

```

### 2 Start the upgrade:

```

Autoimport-nsx-cloud-service-manager-thin> start upgrade-bundle VMware-NSX-unified-appliance-
<version> playbook VMware-NSX-cloud-service-manager-<version>-playbook
Validating playbook /var/vmware/nsx/file-store/VMware-NSX-cloud-service-manager-<version>-
playbook.yml
Running "shutdown_csm_svc" (step 1 of 6)
Running "install_os" (step 2 of 6)
Running "migrate_csm_config" (step 3 of 6)

System will now reboot (step 4 of 6)
After the system reboots, use "resume" to start the next step, "start_csm_svc".
{
  "info": "",
  "body": null,

```

```

"state": 1,
"state_text": "CMD_SUCCESS"
}
Autoimport-nsx-cloud-service-manager-thin>
Broadcast message from root@Autoimport-nsx-cloud-service-manager-thin (Fri 2017-08-25 21:11:36
UTC):

The system is going down for reboot at Fri 2017-08-25 21:12:36 UTC!

```

- 3 Wait for the upgrade to complete. CSM reboots during upgrade, and the upgrade is finalized when the CSM UI restarts after rebooting.
- 4 Verify the version of CSM to confirm that it has upgraded:

```

Autoimport-nsx-cloud-service-manager-thin> get version
VMware NSX Software, Version <upgraded version>

```

- 5 If using a Microsoft Azure account in CSM, you must generate the MSI role names that are new in this release:
  - Follow the steps in the *NSX-T Data Center Administration Guide* to **Enable CSM to access your Microsoft Azure inventory**. You must do this when upgrading in order to generate MSI roles for CSM and PCG, and the NSX Cloud Service Principal.
  - Log in to CSM and go to **Clouds > Accounts > Azure > Actions > Edit Account** and add the Gateway Role Name. The default name is nsx-pcg-role.

## What to do next

Follow the steps here for [Chapter 4 Upgrading NSX-T Data Center](#).

# 4

## Upgrading NSX-T Data Center

After you finish the prerequisites for upgrading, your next step is to prepare the upgrade coordinator for upgrade and update the upgrade coordinator to initiate the upgrade process.

After the upgrade, based on your input, the upgrade coordinator updates the hosts, NSX Edge cluster, NSX Controller cluster, and Management plane.

### 1 Prepare the Upgrade Coordinator

The upgrade coordinator runs in the NSX Manager. It is a self-contained Web application that orchestrates the upgrade process of hosts, NSX Edge cluster, NSX Controller cluster, and Management plane.

### 2 Upgrade the Upgrade Coordinator

The upgrade coordinator must be upgraded before you start the upgrade process.

### 3 Configuring and Upgrading Hosts

You can upgrade your hosts using the upgrade coordinator.

### 4 Upgrade NSX Edge Cluster

Edge upgrade unit groups consist of NSX Edge nodes that are part of the same NSX Edge cluster. You can reorder Edge upgrade unit groups and enable or disable an Edge upgrade unit group from the upgrade sequence.

### 5 Upgrade NSX Controller Cluster

You can only upgrade the NSX Controller cluster.

### 6 Upgrade Management Plane

The upgrade sequence upgrades the Management plane at the end.

## Prepare the Upgrade Coordinator

The upgrade coordinator runs in the NSX Manager. It is a self-contained Web application that orchestrates the upgrade process of hosts, NSX Edge cluster, NSX Controller cluster, and Management plane.

The upgrade coordinator guides you through the proper upgrade sequence. You can track the upgrade process in real time and if required you can pause and resume the upgrade process from the user interface.

The upgrade coordinator allows you to upgrade groups in a serial or parallel order. It also provides the option of upgrading the upgrade units within that group in the serial or parallel order.

### Procedure

- 1 From your browser, log in with admin privileges to an NSX Manager at `https://nsx-manager-ip-address`.
- 2 Select **System > Utilities > Upgrade** from the navigation panel.  
If the upgrade coordinator is not running, you receive a notification to enable the upgrade coordinator.
- 3 Enable the upgrade coordinator.

- a Log in to the NSX Manager node using `nsx-cli`.
- b Check whether the upgrade coordinator is enabled and running.

```
get service install-upgrade
```

- c Start the install-upgrade service if the service is disabled.

```
set service install-upgrade enabled
```

The upgrade coordinator is ready to be upgraded. See [Upgrade the Upgrade Coordinator](#).

## Upgrade the Upgrade Coordinator

The upgrade coordinator must be upgraded before you start the upgrade process.

### Prerequisites

- Verify the upgrade coordinator status. See [Prepare the Upgrade Coordinator](#).
- Verify that the upgrade bundle is available. See [Download the NSX-T Data Center Upgrade Bundle](#).

### Procedure

- 1 From your browser, log in with admin privileges to an NSX Manager at `https://nsx-manager-ip-address`.
- 2 Select **System > Utilities > Upgrade** from the navigation panel.  
The existing NSX-T Data Center release version and nodes are listed.
  - a Identify a component such as, Host or Edge.
  - b Click the number listed under the Count column.  
A list of all the configured hosts or NSX Edge nodes appear in the dialog box.
- 3 Click **Proceed to Upgrade**.
- 4 Navigate to the upgrade bundle `.mub` file.
  - Click **Browse** to navigate to the location you downloaded the upgrade bundle `.mub` file.
  - Paste the VMware download portal URL where the upgrade bundle `.mub` file is located.

- 5 Click **Upload** to transfer the upgrade bundle into the NSX Manager.

Upgrading the upgrade coordinator might take 25–30 minutes, depending on your network speed. If the network times out, reload the upgrade bundle.

When the upload process finishes, the **Begin Upgrade** button becomes active.

- 6 Click **Begin Upgrade** to upgrade the upgrade coordinator.

---

**Note** Do not initiate multiple simultaneous upgrade processes for the upgrade coordinator.

---

- 7 Accept the notification to upgrade the upgrade coordinator.

The new upgrade coordinator version such as, Upgrade Coordinator version: 2.3.0.0.0.9735854 appears.

- 8 Identify and resolve any errors that appear in the upgrade coordinator.

---

**Note** If you see a warning notification, click the notification to see the warning details. Resolve the warning notification before you proceed with the upgrade to avoid problems during the upgrade.

---

- 9 (Optional) If a patch release becomes available after the upgrade coordinator is updated, you can upload or add the URL of the latest upgrade bundle and upgrade the upgrade coordinator.

The hosts are ready to be upgraded and the planned upgrade sequence appears. See [Configure Hosts](#).

## Configuring and Upgrading Hosts

You can upgrade your hosts using the upgrade coordinator.

### Configure Hosts

You can customize the upgrade sequence of the hosts, disable certain hosts from the upgrade, or pause the upgrade at various stages of the upgrade process.

All the existing standalone vSphere ESX hosts, vSphere ESX hosts managed by vCenter Server in a single cluster, and KVM hosts are grouped in separate host upgrade unit groups by default.

Before you upgrade the hosts, you can select to update the hosts simultaneously or consecutively. If you select simultaneous upgrade for all the hosts and host upgrade unit groups in your environment, the maximum limit for a simultaneous upgrade is five host upgrade unit groups and five hosts per group.

---

**Note** Host upgrade unit group with vSphere ESX hosts managed by vCenter Server in a single cluster can be only upgraded consecutively.

---

You can customize the host upgrade sequence prior to the upgrade. You can edit a host upgrade unit group to move a host to a different host upgrade unit group that upgrades immediately and another host to a host upgrade unit group that upgrades at a later date. If you have a frequently used host, you can reorder the upgrade sequence of the host within a host upgrade unit group so it is upgraded first and move the least used host to upgrade last.

---

**Note** If you register any vSphere ESX host after uploading the latest upgrade bundle, you must click **Reset** so that you can upgrade the recently added vSphere hosts.

---

### Prerequisites

- Verify that for standalone vSphere ESXi hosts not managed by vCenter Server, the tenant VMs running on the vSphere ESXi hosts are powered off and these hosts are in maintenance mode.
- Verify that for vSphere ESXi hosts that are part of a DRS enabled cluster, the tenant VMs running on the vSphere ESXi hosts are not powered off.

Do not put the vSphere ESXi hosts in maintenance mode. NSX-T Data Center migrates the VMs running on the host to another host in the same cluster during the upgrade.

- Verify that for vSphere ESXi hosts that are part of a DRS disabled cluster, the tenant VMs running on the vSphere ESXi hosts are powered off. Put the vSphere ESXi hosts in maintenance mode.
- For KVM hosts, the VMs do not need to be powered off.
- Verify that the transport zone or transport node N-VDS name does not contain spaces. If there are spaces, create a transport zone with no spaces in the N-VDS name, reconfigure all the components that are associated with the old transport zone to use the new transport zone, and delete the old transport zone.

### Procedure

- 1 Complete the host upgrade plan details.

You can configure the overall group upgrade order to set the host upgrade unit groups to be upgraded first.

Option	Description
<b>Serial</b>	<p>Upgrade all the host upgrade unit groups consecutively.</p> <p>This menu item is selected by default and applied to the overall upgrade sequence. This selection is useful to maintain the step-by-step upgrade of the host components.</p> <p>For example, if the overall upgrade is set to serial and the host upgrade unit group upgrade is set to parallel, the host upgrade unit group is upgraded one after the other while hosts within the group are updated in parallel.</p>
<b>Parallel</b>	<p>Upgrade all the host upgrade unit groups simultaneously.</p> <p>You can upgrade up to five hosts simultaneously.</p>



Option	Description
<b>When an upgrade unit fails to upgrade</b>	Select to pause the upgrade process if any host upgrade fails. This selection allows you to fix the error on the host upgrade unit group and resume the upgrade.
<b>After each group completes</b>	Select to pause the upgrade process after each host upgrade unit group finishes upgrading. By default, the upgrade pauses when all the hosts are upgraded. After you review the upgrade result, you can proceed to upgrade the next host upgrade unit group or the NSX Edge cluster.

## 2 (Optional) Change the host upgrade unit group upgrade order.

If you configure the overall group upgrade in the serial order, the upgrade waits for a host upgrade unit group upgrade to finish before proceeding to upgrade the second host upgrade unit group. You can reorder the host upgrade unit group upgrade sequence to set a host upgrade unit group to upgrade first.

- a Select the host upgrade unit group and click the **Actions** tab.
- b Select **Reorder** from the drop-down menu.
- c Select **Before** or **After** from the drop-down menu.
- d Click **Save**.

## 3 (Optional) Remove a host upgrade unit group from the upgrade sequence.

You can disable some host upgrade unit groups and upgrade them later.

- a Select the host upgrade unit group and click the **Actions** tab.
- b Select **Set State** from the drop-down menu.
- c Select **Disabled** to remove the host upgrade unit group.
- d Click **Save**.

## 4 (Optional) Change the individual host upgrade unit group upgrade sequence.

By default, the upgrade sequence is set to the parallel order.

- a Select the host upgrade unit group and click the **Actions** tab.
- b Select **Set Upgrade Order** from the drop-down menu.
- c Select **Serial** to change the upgrade sequence.
- d Click **Save**.

## 5 Click **Reset** to discard your custom upgrade plan and revert to the default state.

---

**Caution** You cannot restore your previous upgrade configuration.

---

### What to do next

Determine whether to add, edit, or delete host upgrade unit groups or to upgrade host upgrade unit groups. See [Manage Host Upgrade Unit Groups](#) or [Upgrade Hosts Using the Upgrade Coordinator](#).

## Manage Host Upgrade Unit Groups

You can edit and delete an existing host upgrade unit group before you start the upgrade or after you pause the upgrade.

Hosts in a vSphere ESXi cluster appear in one host upgrade unit group in the upgrade coordinator. You can move these hosts from one host upgrade unit group to another host upgrade unit group.

### Prerequisites

Verify that you have configured the overall hosts upgrade. See [Configure Hosts](#).

### Procedure

#### 1 Create a host upgrade unit group.

- a Click **Add** to include existing hosts into a host upgrade unit group.
- b Toggle the **State** button to enable or disable the host upgrade unit group from the upgrade.
- c Select an existing host and click the arrow icon to move that host to the newly created host upgrade unit group.

If you select an existing host that was part of a host upgrade unit group, the host is moved to the new host upgrade unit group.

- d Select whether to upgrade the host upgrade unit group simultaneously or consecutively.
- e Click **Save**.
- f (Optional) Select **Reorder** from the drop-down menu to reposition the host upgrade unit groups.
- g (Optional) Select **Before** or **After** from the drop-down menu.
- h (Optional) Click **Save**.

#### 2 Move an existing host to another host upgrade unit group.

If a DRS enabled vSphere ESXi cluster is part of the upgrade, then a host upgrade unit group is created for the hosts managed by this cluster.

- a Select a host upgrade unit group.
- b Select a host.
- c Click the **Actions** tab.
- d Select **Change Group** from the drop-down menu to move the host to another host upgrade unit group.
- e Select the host upgrade unit group name from the drop-down menu to move the host to.
- f Click **Save**.
- g (Optional) Select **Reorder** from the drop-down menu to reposition the host within the host upgrade unit group.

- h (Optional) Select **Before** or **After** from the drop-down menu.
- i (Optional) Click **Save**.

### 3 Delete a host upgrade unit group.

You cannot delete a host upgrade unit group that has hosts. You must first move the hosts to another group.

- a Select the host upgrade unit group.
- b Select a host.
- c Click the **Actions** tab.
- d Select **Change Group** from the drop-down menu to move the host to another host upgrade unit group.
- e Select the host upgrade unit group name from the drop-down menu to move the host to.
- f Click **Save**.
- g Select the host upgrade unit group you want to remove and click **Delete**.
- h Accept the notification.

#### What to do next

Upgrade the newly configured hosts. See [Upgrade Hosts Using the Upgrade Coordinator](#).

## Upgrade Hosts Using the Upgrade Coordinator

Upgrade the hosts in your environment using the upgrade coordinator.

#### Prerequisites

- Verify that you have configured the overall hosts upgrade plan. See [Configure Hosts](#).
- Verify that for standalone vSphere ESXi hosts not managed by vCenter Server, the tenant VMs running on the vSphere ESXi hosts are powered off and these hosts are in maintenance mode.
- Verify that for vSphere ESXi hosts that are part of a DRS enabled cluster, the tenant VMs running on the vSphere ESXi hosts are not powered off.

Do not put the vSphere ESXi hosts in maintenance mode. NSX-T Data Center migrates the VMs running on the host to another host in the same cluster during the upgrade.

- Verify that for vSphere ESXi hosts that are part of a DRS disabled cluster, the tenant VMs running on the vSphere ESXi hosts are powered off. Put the vSphere ESXi hosts in maintenance mode.
- For KVM hosts, the VMs do not need to be powered off.

#### Procedure

- 1 Click **Start** to upgrade the hosts.

The EULA appears.

- 2 Scroll to the bottom of the EULA.
- 3 Accept the EULA terms and click **Continue**.
- 4 Click **Continue**.
- 5 Monitor the upgrade process.

You can view the overall upgrade status and specific progress of each host upgrade unit group. The upgrade duration depends on the number of host upgrade unit groups you have in your environment.

Wait until the in progress upgrade units are successfully upgraded. You can then pause the upgrade to configure the host upgrade unit group that is not upgraded and resume the upgrade.

---

**Note** If a host upgrade unit failed to upgrade and you removed the host from NSX-T Data Center, refresh the upgrade coordinator to view all the successfully upgraded host upgrade units.

If a host crashes during the upgrade, reboot the host and try the upgrade again.

---

- 6 After the upgrade is successful, verify that the latest version of NSX-T Data Center packages is installed on the vSphere and Ubuntu hosts.
  - For vSphere hosts, enter `esxcli software vib list | grep nsx`
  - For Ubuntu hosts, enter `dpkg -l | grep nsx`
  - For Red Hat hosts, enter `rpm -qa | egrep 'nsx|openvswitch|nicira'`
- 7 Power on the tenant VMs of vSphere ESXi hosts not managed by vCenter Server that were powered off before the upgrade.
- 8 Migrate the tenant VMs on hosts managed by vCenter Server that are part of the DRS enabled cluster to the upgraded host.
 

The DRS enabled cluster is powered off and migrated before the upgrade.
- 9 Power on the tenant VMs of vSphere ESXi hosts that are part of a DRS disabled cluster that were powered off before the upgrade.
- 10 (Optional) In the NSX Manager appliance, select **Fabric > Nodes**.
  - a Under the **Hosts** tab, verify that all the status indicators for deployment appear as installed and connection status is up.
  - b Under the **Transport Nodes** tab, verify that all the status indicators for configuration are up and green.

### What to do next

You can proceed with the upgrade only after the upgrade process finishes successfully. If some of the hosts are disabled, you must enable and upgrade them before you proceed. See [Upgrade NSX Edge Cluster](#).

If there are upgrade errors, you must resolve the errors. See [Chapter 6 Troubleshooting Upgrade Failures](#).

## Upgrade Hosts Manually

You can manually upgrade hosts in a host upgrade unit group.

### Prerequisites

Verify that the upgrade coordinator is updated. See [Upgrade the Upgrade Coordinator](#).

### Procedure

- 1 In the upgrade coordinator, navigate to the Host Upgrade tab.
- 2 Select a host upgrade unit group.
- 3 Select **Actions > Set State > Disabled**.

If you have other host upgrade unit groups, set them to **Disabled**.

- 4 Click **Start** to perform the pre-upgrade process.
- 5 Wait for the host upgrade to pause.
- 6 Upgrade your vSphere ESXi host manually.

---

**Note** If a host crashes during the upgrade, reboot the host and try the upgrade again.

---

- a Put the vSphere ESXi host in Maintenance mode.
- b Navigate to the vSphere ESXi offline bundle location from the NSX Manager.  
`http://<nsx-manager-ip-address>:8080/repository/<target-nsx-t-version>/metadata/manifest`
- c Download the vSphere ESXi offline bundle to /tmp on vSphere ESXi.
- d Upgrade the vSphere ESXi host.  
`esxcli software vib install -d /tmp/<offline-bundle-name>.`

## 7 Upgrade your KVM host manually.

---

**Note** If a host crashes during the upgrade, reboot the host and try the upgrade again.

---

- a Download the upgrade script.

```
http://<nsx-manager-ip-address>:8080/repository/<target-nsx-t-version>/HostComponents/<os-type>/upgrade.sh
```

Where the `os_type` is `rhel74_x86_64` or `xenial_amd64`.

- b Upgrade the KVM host.

```
upgrade.sh <host-upgrade-bundle-url>
```

Where the host upgrade bundle URL is, `http://<nsx-manager-ip-address>:8080/xyz` where `xyz`, is one of the paths from the `http://<nsx-manager-ip-address>:8080/repository/<target-nsx-version>/metadata/manifest` file.

For example, `http://<nsx-manager-ip-address>:`

```
8080/repository/2.3.0.0.0.9999999/HostComponents/rhel74_x86_64/nsx-lcp-2.3.0.0.0.9999999-rhel74_x86_64.tar.gz
```

- 8 In the upgrade coordinator, navigate to the Host Upgrade tab and refresh the page.

All the manually upgraded hosts appear in the upgraded state.

- 9 After the upgrade is successful, verify that the latest version of NSX-T Data Center packages is installed on the vSphere and Ubuntu hosts.

- For vSphere hosts, enter `esxcli software vib list | grep nsx`
- For Ubuntu hosts, enter `dpkg -l | grep nsx`
- For Red Hat hosts, enter `rpm -qa | egrep 'nsx|openvswitch|nicira'`

- 10 Power on the tenant VMs of vSphere ESXi hosts not managed by vCenter Server that were powered off before the upgrade.

- 11 Migrate the tenant VMs on hosts managed by vCenter Server that are part of the DRS disabled cluster to the upgraded host.

The DRS enabled cluster is powered off and migrated before the upgrade.

- 12 Power on the tenant VMs of vSphere ESXi hosts that are part of a DRS disabled cluster that were powered off before the upgrade.

- 13 (Optional) In the NSX Manager appliance, select **Fabric > Nodes**.

- a Under the **Hosts** tab, verify that all the status indicators for deployment appear as installed and connection status is up.
- b Under the **Transport Nodes** tab, verify that all the status indicators for configuration are up and green.

**What to do next**

You can proceed with the upgrade only after the upgrade process finishes successfully. If some of the hosts are disabled, you must enable them and upgrade them before you proceed. See [Upgrade NSX Edge Cluster](#).

If there are upgrade errors, you must resolve the errors. See [Chapter 6 Troubleshooting Upgrade Failures](#).

## Upgrade NSX Edge Cluster

Edge upgrade unit groups consist of NSX Edge nodes that are part of the same NSX Edge cluster. You can reorder Edge upgrade unit groups and enable or disable an Edge upgrade unit group from the upgrade sequence.

---

**Note** You cannot move an NSX Edge node from one Edge upgrade unit group to another because the Edge upgrade unit group membership is determined by the NSX Edge cluster membership before the upgrade.

---

The NSX Edge nodes are upgraded consecutively so that the upgrading node is down and the other nodes in the NSX Edge cluster remain active to continuously forward traffic.

The maximum limit of simultaneous upgrade of Edge upgrade unit groups is five.

**Prerequisites**

- Verify that the hosts are upgraded successfully. See [Upgrade Hosts Using the Upgrade Coordinator](#).
- Familiarize yourself with the upgrade impact during and after the NSX Edge cluster upgrade. See [NSX Edge Cluster Upgrade](#).

**Procedure**

- 1 Complete the NSX Edge cluster upgrade plan details.

Option	Description
<b>Serial</b>	Upgrade all the Edge upgrade unit groups consecutively. This menu item is selected by default. This selection is applied to the overall upgrade sequence.
<b>Parallel</b>	Upgrade all the Edge upgrade unit groups simultaneously. For example, if the overall upgrade is set to the parallel order, the Edge upgrade unit groups are upgraded together and the NSX Edge nodes are upgraded one at a time.

Option	Description
<b>When an upgrade unit fails to upgrade</b>	Selected by default to let you fix an error on the Edge node and continue the upgrade. You cannot deselect this setting.
<b>After each group completes</b>	Select to pause the upgrade process after each Edge upgrade unit group finishes upgrading. By default, the upgrade pauses when the NSX Edge cluster is updated. After you review the upgrade result, you can proceed to upgrade the next Edge upgrade unit group or the NSX Controller cluster.

## 2 (Optional) Reorder the upgrade sequence of an Edge upgrade unit group.

For example, if you configure the overall group upgrade as serial, you can reorder the Edge upgrade unit groups serving internal networks or Edge upgrade unit groups interfacing with external networks to be upgraded first.

You cannot reorder the NSX Edge nodes within an Edge upgrade unit group.

- a Select the Edge upgrade unit group and click the **Actions** tab.
- b Select **Reorder** from the drop-down menu.
- c Select **Before** or **After** from the drop-down menu.
- d Click **Save**.

## 3 (Optional) Disable an Edge upgrade unit group from the upgrade sequence.

You can disable some Edge upgrade unit groups and upgrade them later.

- a Select the Edge upgrade unit group and click the **Actions** tab.
- b Select **Set State > Disabled** to disable the Edge upgrade unit group.
- c Click **Save**.

## 4 (Optional) Click **Reset** to revert to the default state.

**Caution** After reset, you cannot restore your previous configuration.

## 5 Click **Start** to upgrade the NSX Edge cluster.

## 6 Monitor the upgrade process.

You can view the overall upgrade status and progress details of each Edge upgrade unit group. The upgrade duration depends on the number of Edge upgrade unit groups you have in your environment.

You can pause the upgrade to configure the Edge upgrade unit group that is not upgraded and restart the upgrade.

When the upgrade finishes, the status of each Edge upgrade unit group appears as successful or failed.

## 7 (Optional) In the NSX Manager, select **System > Overview** and verify that the product version is updated on each NSX Edge node.



**What to do next**

If the process is successful, you can proceed with the upgrade. See [Upgrade NSX Controller Cluster](#).

If there are upgrade errors, you must resolve the errors. See [Chapter 6 Troubleshooting Upgrade Failures](#).

## Upgrade NSX Controller Cluster

You can only upgrade the NSX Controller cluster.

The NSX Controller nodes are upgraded in parallel order.

---

**Note** Due to changes in the communication from the transport node to NSX Controller, you must open the TCP ports 1235 and 1234 before you upgrade from NSX-T Data Center 2.1 to higher. After the upgrade is successful, the TCP port 1235 is in use.

---

For troubleshooting and verification of communication, use the TCP port 1235.

**Prerequisites**

- Familiarize yourself with the details of the temporary interruption. See [NSX Controller Cluster Upgrade](#).
- Verify that the NSX Edge cluster is upgraded successfully. See [Upgrade NSX Edge Cluster](#).

**Procedure**

- 1 Click **Start** to upgrade the NSX Controller cluster.
- 2 Monitor the upgrade process.

You can view the overall upgrade status and progress details of each Controller node in real time.

During the upgrade, the NSX Controller cluster connectivity to the hosts is temporarily interrupted. When the upgrade finishes, the status of each Controller node appears as successful or failed.

- 3 (Optional) In the NSX Manager appliance, select **System > Overview** and verify that the product version is updated on each NSX Controller node.

**What to do next**

If the process was successful, you can proceed with the upgrade. See [Upgrade Management Plane](#).

If the upgrade fails and the following upgrade error message is in the syslog of the NSX Controller,

```
<179>1 2018-06-04T06:03:09.819560+00:00 ctrl2 NSX - -
[nsx@6876 comp="nsx-controller" subcomp="upgrade-bundle"]
upgrade_bundle_helper: Failed to verify bundle:
/image/VMware-NSX-controller-2.2.0.0.0.8680774 has bad permissions:
0750
```

This is because the NSX Controller was rebooted during the upgrade process. Identify the failed NSX Controller node and log in to the CLI of that node. Run the command, `verify upgrade-bundle <bundle-name>`. Start the NSX Controller upgrade.

## Upgrade Management Plane

The upgrade sequence upgrades the Management plane at the end.

Do not make any configuration changes when the Management plane is being upgraded.

**Note** The NSX Manager user interface is accessible for one to two minutes after you initiate the upgrade. Then the NSX Manager user interface, API, and CLI are not accessible about 10 minutes until the upgrade finishes and the Management plane is restarted.

After you upgrade the Management plane, you can join the Customer Experience Improvement Program (CEIP) for NSX-T Data Center. See Customer Experience Improvement Program in the *NSX-T Data Center Administration Guide* for more information, including how to join or leave the program.

### Prerequisites

Verify that the NSX Controller cluster is upgraded successfully. See [Upgrade NSX Controller Cluster](#).

### Procedure

- 1 Click **Start** to upgrade the Management plane.
- 2 Accept the upgrade notification.

The screenshot shows the NSX Manager Upgrade Status page. The page has a navigation bar with tabs: SUPPORT BUNDLE, BACKUP, and UPGRADE. The UPGRADE tab is active. Below the navigation bar, there are five numbered steps: 1. BUNDLE AND STATUS, 2. HOSTS UPGRADE, 3. EDGE UPGRADE, 4. CONTROLLER NODES UPGRADE, and 5. MANAGEMENT UPGRADE. The current step is 5. MANAGEMENT UPGRADE. The page shows a progress bar at 30% and a status of 'In Progress'. Below the progress bar, there is a table titled 'Management Nodes' with columns: Upgrade Unit, ID, and Upgrade Status. The table contains one row: mp-1, 421A..E618, and In Progress. A modal dialog titled 'Upgrade Status' is displayed, with the text: 'Management node upgrade status could not be fetched. The Management node is rebooting as part of the upgrade. If you wait 10 minutes and reload the browser, the status will be updated.'

You can safely ignore any upgrade related errors such as, HTTP service disruption that appears at this time. These errors appear because the Management plane is rebooting during the upgrading.

Wait about 10 minutes until the reboot finishes and the services are reestablished.

- 3 (Optional) In the CLI, log in to the NSX Manager to verify that the services have started.

**get services**

When the services start, the Service state appears as running. Some of the services include, SSH, install-upgrade, and manager.

- 4 In the web browser, click **Reload** to refresh the browser.
- 5 From your browser, log in with admin privileges to an NSX Manager at <https://nsx-manager-ip-address>.

The EULA appears.

- 6 Scroll to the bottom of the EULA and accept the EULA terms.
- 7 Select whether to join the VMware's Customer Experience Improvement Program (CEIP).
- 8 Click **Save**
- 9 (Optional) Click the Help icon in the top right corner.
- 10 (Optional) Select **About** to verify that the product version is updated.

**What to do next**

Perform post-upgrade tasks or troubleshoot errors depending on the upgrade status. See [Chapter 5 Post-Upgrade Tasks](#) or [Chapter 6 Troubleshooting Upgrade Failures](#).

# Post-Upgrade Tasks

After you upgrade NSX-T Data Center, perform post-upgrade verification tasks to check whether the upgrade was successful.

This chapter includes the following topics:

- [Verify the Upgrade](#)
- [Upgrade NSX Policy Manager Appliance](#)

## Verify the Upgrade

After you upgrade NSX-T Data Center, you can check whether the versions of the upgraded components have been updated.

### Prerequisites

Perform a successful upgrade. See [Chapter 4 Upgrading NSX-T Data Center](#).

### Procedure

- 1 From your browser, log in with admin privileges to an NSX Manager at `https://nsx-manager-ip-address`.
- 2 Select **System > Utilities > Upgrade** from the navigation panel.
- 3 Verify that the overall upgrade version, component version, and initial and target product version are accurate.

The status of the upgrade appears as Successful.

- 4 (Optional) Verify that the Dashboard, fabric hosts, NSX Edge cluster, transport nodes, and all logical entities status indicators are green, normal, deployed, and do not show any warnings.
- 5 (Optional) Check the status of several components.
  - Fabric nodes installation
  - Transport node Local Control Plane (LCP) and Management plane agent connectivity
  - Routers connectivity
  - NAT rules
  - DFW rules

- DHCP lease
  - BGP details
  - Flows in the IPFIX collector
  - TOR connectivity to enable network traffic
- 6 If you have an existing Ubuntu KVM host as a transport node, backup the `/etc/network/interfaces` file.

## Upgrade NSX Policy Manager Appliance

The NSX Policy Manager appliance must be upgraded post the NSX Manager upgrade.

### Prerequisites

Verify that the NSX Manager is properly upgraded. See [Chapter 4 Upgrading NSX-T Data Center](#).

### Procedure

- 1 Open a command prompt on the NSX Manager with administrator privileges.
- 2 Get the NSX Manager version.

```
get version
```

- 3 Open a command prompt on the NSX Policy Manager that you want to upgrade.
- 4 Log in to the appliance with administrator privileges.
- 5 Copy the URL.

```
copy url http://<NSX_Manager_IP>:8080/repository/<NSX-T_Build>/Manager/nub/VMware-NSX-unified-appliance-<NSX_Unified_Appliance_Build>.nub
```

Where `<NSX-T_Build>` is the target upgrade build and `<NSX_Unified_Appliance_Build>` is the NSX Manager version.

- 6 Verify the upgrade bundle. Note:

```
verify upgrade_bundle <BUNDLE_NAME>
```

Press the tab after `upgrade_bundle` and the `<BUNDLE_NAME>` is populated.

- 7 Upgrade the NSX Policy Manager appliance.

```
start upgrade_bundle <BUNDLE_NAME> playbook <PLAYBOOK_NAME>
```

Press the tab after `upgrade_bundle` and the `<BUNDLE_NAME>` is populated. Press the tab after `playbook` and the `<PLAYBOOK_NAME>` is populated.

After the upgrade is complete, the NSX Policy Manager appliance restarts.

- 8 Open a command prompt on the newly upgraded NSX Policy Manager appliance.
- 9 Log in to the appliance with administrator privileges to verify that the upgrade was successful.

# Troubleshooting Upgrade Failures

# 6

You can review the support bundle log messages to identify the upgrade problem.

You can also perform any of the following debugging tasks.

- Log in to the NSX Manager CLI as root user and navigate to the upgrade coordinator log files `/var/log/upgrade-coordinator/upgrade-coordinator.log`.
- Navigate to the system log files `/var/log/syslog` or API log files `/var/log/proton/nsxapi.log`.
- Configure a remote logging server and send log messages for troubleshooting. See *NSX-T Data Center Administration Guide*.

---

**Note** If you are unable to troubleshoot the failure and want to revert to the previous working version of NSX-T Data Center, contact VMware support.


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## Collecting Support Bundles

You can collect support bundles on registered cluster and fabric nodes and download the bundles to your machine or upload them to a file server.

If you choose to download the bundles to your machine, you get a single archive file consisting of a manifest file and support bundles for each node. If you choose to upload the bundles to a file server, the manifest file and the individual bundles are uploaded to the file server separately.

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 **NSX Cloud Note** If you want to collect the support bundle for CSM, log in to CSM, go to **System > Utilities > Support Bundle** and click on **Download**. The support bundle for PCG is available from NSX Manager using the following instructions. The support bundle for PCG also contains logs for all the workload VMs.

---

### Procedure

- 1 From your browser, log in with admin privileges to an NSX Manager at `https://nsx-manager-ip-address`.
- 2 Select **System > Utilities** from the navigation panel.
- 3 Click the **Support Bundle** tab.

4 Select the target nodes.

The available types of nodes are Management Nodes, Controller Nodes, Edges, Hosts, and Public Cloud Gateways.

5 (Optional) Specify log age in days to exclude logs that are older than the specified number of days.

6 (Optional) Toggle the switch that indicates whether to include or exclude core files and audit logs.

---

**Note** Core files and audit logs might contain sensitive information such as passwords or encryption keys.

---

7 (Optional) Select a check box to upload the bundles to a file server.

8 Click **Start Bundle Collection** to start collecting support bundles.

Depending on how many log files exist, each node might take several minutes.

9 Monitor the status of the collection process.

The status field shows the percentage of nodes that completed support bundle collection.

10 Click **Download** to download the bundle if the option to send the bundle to a file server was not set.