Upgrade Guide for Cisco SD-WAN Manager Cluster

Contents

Introduction

This document describes a clear and practical reference for upgrading Cisco SD-WAN vManage clusters across different software versions.

Background Information

This document covers all major upgrade scenarios, including direct and multi-step paths, in order to help engineers plan and execute upgrades safely. The document also outlines recommended sequences, key pre-checks, cluster considerations, and post-upgrade validations in order to ensure minimal disruption and consistent system stability.

SD-WAN Manager Cluster Upgrade Procedure: Version 20.9.x to 20.12.x

Prerequisites

Note: Base version must be 20.9.5.2 or later release in 20.9.x train in order to upgrade to 20.12.x or later release. If current version is lower than 20.9.5.2, upgrade to 20.9.5.2 or a later 20.9.x version.

1. Controller Snapshots
Create complete snapshots of all SD-WAN controllers prior to beginning the upgrade process.

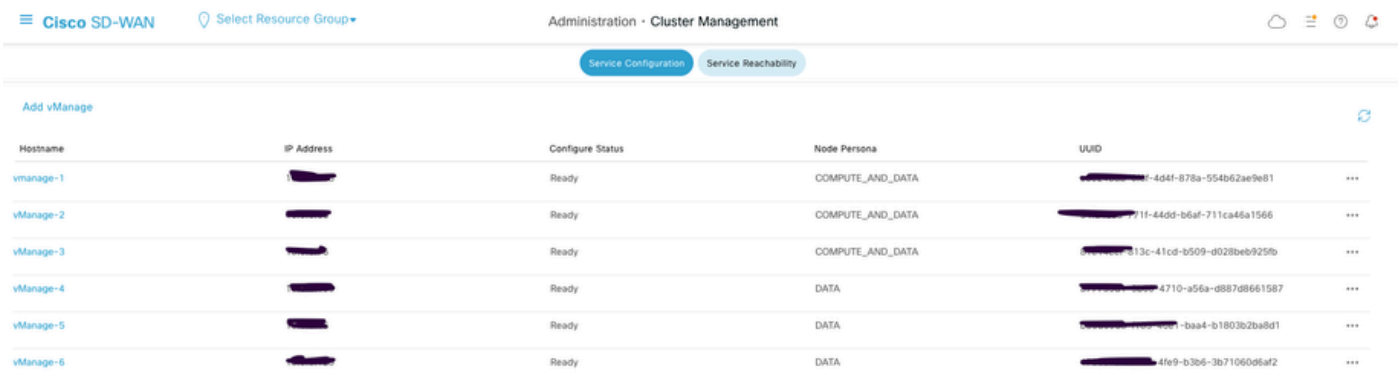
2. Configuration Database Backup
Execute a backup of the configuration database and store it in a location external to the sd-wan manager server using the **request nms configuration-db backup path <path_and_filename>** command.

3. AURA Health Check on sd-wan manager Nodes
Perform the AURA health check on all sd-wan manager nodes as documented in https://www.cisco.com/c/en/us/support/docs/routers/sd-wan/220514-execute-the-aura-script-on-vmanage.html.

4. Image Distribution to sd-wan manager Servers
Manually copy the 20.12.5 upgrade image 'vmanage-20.12.5-x86_64.tar.gz' to the **/home/admin** directory on each Cisco sd-wan manager server in the cluster.

5. Image Verification
Verify that the upgrade image has been successfully copied to the **/home/admin** location on all sd-wan manager servers.

6. Six-Node Cluster Persona Verification
For six-node sd-wan manager cluster upgrades, verify that the sd-wan manager persona distribution consists of three COMPUTE_DATA nodes and three DATA nodes. This information can be confirmed on the sd-wan manager cluster management page.



7. Software Inventory Management

- Execute the **show software** command on each sd-wan manager node in order to verify the installed software versions.
- Ensure that no more than two software images are installed on each sd-wan manager node.
- If additional images are present, remove the obsolete installed images using the **request software remove <version>** command.

Example output:

```
vmanage3-2093# show software
VERSION ACTIVE DEFAULT PREVIOUS CONFIRMED TIMESTAMP
------------------------------------------------------------------------
20.12.5 false false - - 2025-11-24T05:09:38-00:00
20.9.7 true true - - 2025-11-24T05:09:30-00:00
```

Pre-Upgrade Validation Checks

8. Control Connection Stability Verification

- Verify the stability of control connections between all SD-WAN controllers.
- Capture a screenshot of the sd-wan manager dashboard for documentation purposes.

9. Site-Level Verification
Choose representative sites and capture these logs and outputs:

a. Control Connection Verification
show sd-wan control connections

b. BFD Session Verification
show sd-wan bfd sessions

c. Routing Table Verification
show ip route vrf <vrf_id>
show sd-wan omp routes vpn <vpn_id>

d. Application Service Testing
Customer to perform application service testing from a minimum of five branch locations.

10. vSmart Controller Verification
a. Control Connections
Execute **show control connections** in order to verify that each vSmart maintains control connections with all controllers.

b. OMP Peer Status
Execute **show omp peers** in order to verify the number of peers on each vSmart controller.

c. OMP Summary
Execute **show omp summary** in order to verify overall OMP status.

Upgrade Procedure

These high-level steps outline the upgrade process:

1. Software Installation
Install the upgrade image on each Cisco sd-wan manager server using the **request software install <path>** command. Do not activate the image at this stage.

```
vmanage1-2093# request software install vmanage-20.12.5-x86_64.tar.gz
status vmanage-20.12.5-x86_64.tar.gz is local
status Installing vmanage-20.12.5-x86_64.tar.gz
status Signature verification Suceeded.
Signature verification Suceeded.
Signature verification Suceeded.
Signature verification Suceeded.
Successfully installed version: 20.12.5
status Installation of 20.12.5 complete
vmanage1-2093#
```

```
vmanage2-2093# request software install vmanage-20.12.5-x86_64.tar.gz
status vmanage-20.12.5-x86_64.tar.gz is local
status Installing vmanage-20.12.5-x86_64.tar.gz
status Signature verification Suceeded.
Signature verification Suceeded.
Signature verification Suceeded.
Signature verification Suceeded.
Successfully installed version: 20.12.5
status Installation of 20.12.5 complete
vmanage2-2093#
```

```
vmanage1-2093# request software install vmanage-20.12.5-x86_64.tar.gz
status vmanage-20.12.5-x86_64.tar.gz is local
status Installing vmanage-20.12.5-x86_64.tar.gz
status Signature verification Suceeded.
Signature verification Suceeded.
Signature verification Suceeded.
Signature verification Suceeded.
Successfully installed version: 20.12.5
status Installation of 20.12.5 complete
vmanage1-2093#
```

2. Software Activation

Activate the upgrade image on each Cisco sd-wan manager server using the **request software activate <version>** command. Note that all sd-wan manager nodes will reboot simultaneously.

```
vmanage1-2093# request software activate 20.12.5
This will reboot the node with the activated version.
Are you sure you want to proceed? [yes,NO] yes

Broadcast message from root@vmanage1-2093 (somewhere) (Mon Nov 24 05:26:31 2025

Mon Nov 24 05:26:31 UTC 2025: The system is going down for reboot NOW!
```

```
vmanage2-2093# request software activate 20.12.5
This will reboot the node with the activated version.
Are you sure you want to proceed? [yes,NO] yes

Broadcast message from root@vmanage2-2093 (somewhere) (Mon Nov 24 05:26:17 2025

Mon Nov 24 05:26:17 UTC 2025: The system is going down for reboot NOW!

error-reason 'activate 20.12.5: successful'
vmanage2-2093# Connection to 192.168.103.35 closed.

Broadcast message from root@vmanage1-2093 (somewhere) (Mon Nov 24 05:26:31 2025
```

```
vmanage3-2093# request software activate 20.12.5
This will reboot the node with the activated version.
Are you sure you want to proceed? [yes,NO] yes
yes

Broadcast message from root@vmanage3-2093 (somewhere) (Mon Nov 24 05:26:14 2025

Mon Nov 24 05:26:14 UTC 2025: The system is going down for reboot NOW!

error-reason 'activate 20.12.5: successful'
vmanage3-2093# Connection to 192.168.103.36 closed.
```

3. Upgrade Confirmation
Confirm the upgrade within 15 minutes of activation using the **request software upgrade-confirm** command.

Note: Following the upgrade, a manual configuration database upgrade is required. Allow 20-25 minutes after the reboot for services to initialize. During this period, you will observe that the App-server and configuration database services do not start automatically, as they require a manual upgrade procedure.

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4. Service Status Verification

- Execute 'request nms all status' on all nodes in order to verify the status of services.
- Verify that all services except App-server and configuration database are operational.

Expected observation: App-server will be in a down state, and the configuration database will continuously restart.

5. Configuration Database Upgrade

- Perform the configuration database **upgrade only on one node** that is running the configuration database service.
- Upon successful completion, the App-server and Config-DB services will restart on all nodes.

Execute this command on one configuration database node:

```
vmanage-2# request nms configuration-db upgrade
== Upgrading configuration-db to 4.4.15 version..
```

```
== The configuration-db upgrade logs are available at /var/log/nms/neo4j-upgrade.log file
== Previous software version on this vmanage: 20.9.7

== Copying dump files remotely
== Loading configuration-db on remote nodes
== Starting configuration-db in all nodes
== Checking for remote nodes
== Starting application server.
== Configuration-db upgrade completed!
== Waiting for instances to synchronize...
== Successfully upgraded configuration-db to 4.4.15 version.
```

6. Final Service Status Verification

- Wait approximately 5 minutes after the configuration database upgrade completes.
- Execute 'request nms all status' on all nodes in order to verify that all services are operational.

Post-Upgrade Validation Checks

1. Software Version Verification
Verify that all controllers are running the correct software version.

2. sd-wan manager Service Status Verification
Confirm that all services on the sd-wan manager servers are operational.

3. Inter-Controller Connection Verification
Verify control connections between all controllers.

4. Policy Activation Verification
Confirm that policies are properly activated on the sd-wan manager servers.

5. Control Connection Distribution Verification

- Verify that control connections are properly distributed across all sd-wan manager nodes.
- Navigate to **Monitor > Network** and verify the control connection column.

6. Site-Level Post-Upgrade Validation
Perform these validation tests on all sites where pre-upgrade checks were conducted:

a. Control Connection and BFD Session Verification
show sd-wan control connections
show sd-wan bfd sessions

b. Routing Verification
show ip route
show ip route vrf <vrf_id>
show sd-wan omp routes vpn <vpn_id>

c. Data Center Service Reachability
Verify reachability to all data center services.

d. Template Synchronization Verification
Verify that device templates are properly attached and synchronized post the upgrade.

e. Policy Verification from vSmart
Execute 'show sd-wan policy from-vsmart' in order to verify policy distribution.

f. User Acceptance Testing
Conduct user acceptance testing on all validated sites to ensure application functionality.

SD-WAN Manager Cluster Upgrade Procedure: Version 20.9.5.2/20.9.7 to 20.15.x

Prerequisites

1. Controller Snapshots
Create complete snapshots of all SD-WAN controllers prior to beginning the upgrade process.

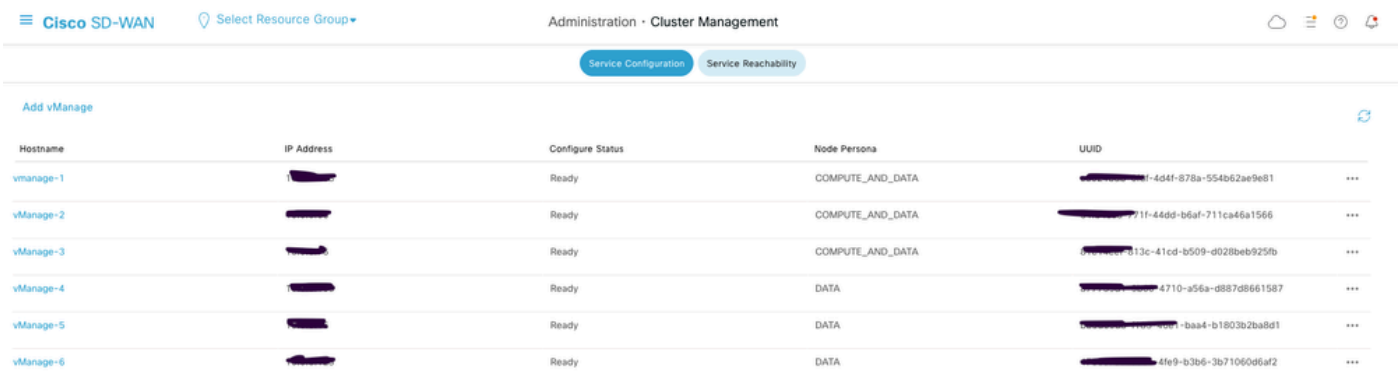
2. Configuration Database Backup
Execute a backup of the configuration database and store it in a location external to the sd-wan manager server using the **request nms configuration-db backup path <path_and_filename>** command.

3. AURA Health Check on sd-wan manager Nodes
Perform the AURA health check on all sd-wan manager nodes as documented in https://www.cisco.com/c/en/us/support/docs/routers/sd-wan/220514-execute-the-aura-script-on-vmanage.html.

4. Image Distribution to sd-wan manager Servers
Manually copy the 20.15.2 upgrade image 'vmanage-20.15.2-x86_64.tar.gz' to the **/home/admin** directory on each Cisco sd-wan manager server in the cluster.

5. Image Verification
Verify that the upgrade image has been successfully copied to the **/home/admin** location on all sd-wan manager servers.

6. Six-Node Cluster Persona Verification
For six-node sd-wan manager cluster upgrades, verify that the sd-wan manager persona distribution consists of three COMPUTE_DATA nodes and three DATA nodes. This information can be confirmed on the sd-wan manager cluster management page.



7. Software Inventory Management

- Execute the **show software** command on each sd-wan manager node in order to verify the installed software versions.

- Ensure that no more than two software images are installed on each sd-wan manager node.
- If additional images are present, remove the obsolete installed images using the **request software remove <version>** command.

Example output:

```
vmanage1# show software

VERSION   ACTIVE  DEFAULT  PREVIOUS  CONFIRMED  TIMESTAMP
-------------------------------------------------------------------------------
20.15.2   false   false    false     -          2025-03-19T10:43:26-00:00
20.9.4    false   true     true      -          2024-11-25T08:16:14-00:00
20.9.5.2  true    false    false     user       2025-03-19T07:10:15-00:00

vmanage1#
```

Pre-Upgrade Validation Checks

8. Control Connection Stability Verification

- Verify the stability of control connections between all SD-WAN controllers.
- Capture a screenshot of the sd-wan manager dashboard for documentation purposes.

9. Site-Level Verification
Choose representative sites and capture these logs and outputs:

a. Control Connection Verification
show sd-wan control connections

b. BFD Session Verification
show sd-wan bfd sessions

c. Routing Table Verification
show ip route vrf <vrf_id>
show sd-wan omp routes vpn <vpn_id>

d. Application Service Testing
Customer to perform application service testing from a minimum of five branch locations.

10. vSmart Controller Verification
a. Control Connections
Execute 'show control connections' in order to verify that each vSmart maintains control connections with all controllers.

b. OMP Peer Status
Execute 'show omp peers' in order to verify the number of peers on each vSmart controller.

c. OMP Summary
Execute 'show omp summary' in order to verify overall OMP status.

Upgrade Procedure

These high-level steps outline the upgrade process:

1. Software Installation
Install the upgrade image on each Cisco sd-wan manager server using the **request software install <path>**

command. Do not activate the image at this stage.

```
vmanage1#request software install /home/admin/vmanage-20.15.2-x86_64.tar.gz
Signature verification Suceeded.
Signature verification Suceeded.
[2025-09-25 09:04:19,066][INFO][upgrade-context]: Upgrade context written to destination path: /opt
Signature verification Suceeded.
Successfully installed version: 20.15.2
vmanage1#
```

```
vmanage2#request software install /home/admin/vmanage-20.15.2-x86_64.tar.gz
Signature verification Suceeded.
Signature verification Suceeded.
[2025-09-25 09:04:19,066][INFO][upgrade-context]: Upgrade context written to destination path: /opt
Signature verification Suceeded.
Successfully installed version: 20.15.2
vmanage2#
```

```
vmanage3#request software install /home/admin/vmanage-20.15.2-x86_64.tar.gz
Signature verification Suceeded.
Signature verification Suceeded.
[2025-09-25 09:04:19,066][INFO][upgrade-context]: Upgrade context written to destination path: /opt
Signature verification Suceeded.
Successfully installed version: 20.15.2
vmanage3#
```

2. Software Activation
Activate the upgrade image on each Cisco sd-wan manager server using the **request software activate <version>** command. Note that all sd-wan manager nodes will reboot simultaneously.

```
vmanage1# request software activate 20.15.2
This will reboot the node with the activated version.
Are you sure you want to proceed? [yes,NO] yes

vmanage2# request software activate 20.15.2
This will reboot the node with the activated version.
Are you sure you want to proceed? [yes,NO] yes

vmanage3# request software activate 20.15.2
This will reboot the node with the activated version.
Are you sure you want to proceed? [yes,NO] yes
```

3. Upgrade Confirmation
Confirm the upgrade within 15 minutes of activation using the **request software upgrade-confirm** command:

Note: Post the upgrade, a manual configuration database upgrade is required. Allow 20-25 minutes after the reboot for services to initialize. During this period, you will observe that the App-server and configuration database services do not start automatically, as they require a manual upgrade

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procedure.

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4. Service Status Verification

- Execute 'request nms all status' on all nodes in order to verify the status of services.
- Verify that all services except App-server and configuration database are operational.

Expected observation: App-server will be in a down state, and the configuration database will continuously restart.

```
vmanage2# request nms all status
NMS service proxy
        Enabled: true
        Status: running PID:28748 for 638s
NMS service proxy rate limit
        Enabled: true
        Status: running PID:26818 for 644s
NMS application server
        Enabled: true
        Status: yet to start
NMS configuration database
        Enabled: true
        Status: running PID:7095 for nulls
        Native metrics status: ENABLED
        Server-load metrics status: ENABLED
NMS coordination server
        Enabled: true
        Status: running PID:27606 for 647s
NMS messaging server
        Enabled: true
        Status: running PID:29968 for 626s
NMS statistics database
        Enabled: false
        Status: not running
NMS data collection agent
        Enabled: true
        Status: yet to start
NMS CloudAgent v2
        Enabled: true
        Status: running PID:27486 for 656s
NMS cloud agent
        Enabled: true
        Status:  running PID:8518 for 1435s
NMS SDAVC server
        Enabled: false
        Status: not running
NMS SDAVC gateway
        Enabled: false
        Status: not running
vManage Device Data Collector
        Enabled: true
        Status: yet to start
NMS OLAP database
        Enabled: true
        Status: running PID:28926 for 652s
vManage Reporting
        Enabled: true
        Status: running PID:26653 for 671s
vmanage2#
```

5. Configuration Database Upgrade

- Perform the configuration database **upgrade only on one node** that is running the configuration database service.

- Upon successful completion, the App-server and Config-DB services will restart on all nodes.

Execute the **request nms configuration-db upgrade** command on one configuration database node:

6. Final Service Status Verification

- Wait approximately 5 minutes after the configuration database upgrade completes.
- Execute 'request nms all status' on all nodes in order to verify that all services are operational.

Post-Upgrade Validation Checks

1. Software Version Verification
Verify that all controllers are running the correct software version.

2. sd-wan manager Service Status Verification
Confirm that all services on the sd-wan manager servers are operational.

3. Inter-Controller Connection Verification
Verify control connections between all controllers.

4. Policy Activation Verification
Confirm that policies are properly activated on the sd-wan manager servers.

5. Control Connection Distribution Verification

- Verify that control connections are properly distributed across all sd-wan manager nodes.
- Navigate to **Monitor > Network** and verify the control connection column.

6. Site-Level Post-Upgrade Validation
Perform these validation tests on all sites where pre-upgrade checks were conducted:

a. Control Connection and BFD Session Verification
show sd-wan control connections
show sd-wan bfd sessions

b. Routing Verification
show ip route
show ip route vrf <vrf_id>
show sd-wan omp routes vpn <vpn_id>

c. Data Center Service Reachability
Verify reachability to all data center services.

d. Template Synchronization Verification
Verify that device templates are properly attached and synchronized post the upgrade.

e. Policy Verification from vSmart
Execute 'show sd-wan policy from-vsmart' in order to verify policy distribution.

f. User Acceptance Testing
Conduct user acceptance testing on all validated sites in order to ensure application functionality.

SD-WAN Manager Cluster Upgrade Procedure: Version 20.12.x to 20.15.x

Prerequisites

1. Controller Snapshots
Create complete snapshots of all SD-WAN controllers prior to beginning the upgrade process.

2. Configuration Database Backup
Execute a backup of the configuration database and store it in a location external to the sd-wan manager server using the **request nms configuration-db backup path <path_and_filename>** command:

3. AURA Health Check on sd-wan manager Nodes
Perform the AURA health check on all sd-wan manager nodes as documented in https://www.cisco.com/c/en/us/support/docs/routers/sd-wan/220514-execute-the-aura-script-on-vmanage.html.

4. Image Distribution to sd-wan manager Servers
Manually copy the 20.15.x upgrade image 'vmanage-20.15.3-x86_64.tar.gz' to the **/home/admin** directory on each Cisco sd-wan manager server in the cluster.

5. Image Verification
Verify that the upgrade image has been successfully copied to the **/home/admin** location on all sd-wan manager servers.

6. Software Inventory Management

- Execute the **show software** command on each sd-wan manager node in order to verify the installed software versions.
- Ensure that no more than two software images are installed on each sd-wan manager node.
- If additional images are present, remove the obsolete installed images using the **request software remove <version>** command.

Example output:

```
vmanage1# show software

VERSION   ACTIVE  DEFAULT  PREVIOUS  CONFIRMED  TIMESTAMP
-------------------------------------------------------------------------
20.15.2   false   false    false     -          2025-03-19T10:43:26-00:00
20.9.4    false   true     true      -          2024-11-25T08:16:14-00:00
20.9.5.2  true    false    false     user       2025-03-19T07:10:15-00:00

vmanage1#
```

Pre-Upgrade Validation Checks

7. Control Connection Stability Verification

- Verify the stability of control connections between all SD-WAN controllers.
- Capture a screenshot of the sd-wan manager dashboard for documentation purposes.

8. Site-Level Verification
Choose representative sites and capture these logs and outputs:

a. Control Connection Verification
show sd-wan control connections

b. BFD Session Verification
show sd-wan bfd sessions

c. Routing Table Verification
show ip route vrf <vrf_id>
show sd-wan omp routes vpn <vpn_id>

d. Application Service Testing
Customer to perform application service testing from a minimum of five branch locations.

9. vSmart Controller Verification
a. Control Connections
Execute 'show control connections' in order to verify that each vSmart maintains control connections with all controllers.

b. OMP Peer Status
Execute 'show omp peers' in order to verify the number of peers on each vSmart controller.

c. OMP Summary
Execute 'show omp summary' in order to verify overall OMP status.

Upgrade Procedure

These high-level steps outline the upgrade process:

1. Software Installation
Install the upgrade image on each Cisco sd-wan manager server using the **request software install <path>** command. Do not activate the image at this stage.

```
vmanage1# request software install vmanage-20.15.3-x86_64.tar.gz
status vmanage-20.15.3-x86_64.tar.gz is local
status Installing vmanage-20.15.3-x86_64.tar.gz
status Signature verification Suceeded.
Signature verification Suceeded.
Signature verification Suceeded.
Signature verification Suceeded.
Successfully installed version: 20.15.3
status Installation of 20.15.3 complete
vmanage1#
```

```
vmanage2# request software install vmanage-20.15.3-x86_64.tar.gz
status vmanage-20.15.3-x86_64.tar.gz is local
status Installing vmanage-20.15.3-x86_64.tar.gz
status Signature verification Suceeded.
Signature verification Suceeded.
Signature verification Suceeded.
Signature verification Suceeded.
Successfully installed version: 20.15.3
status Installation of 20.15.3 complete
vmanage2#
```

```
vmanage3# request software install vmanage-20.15.3-x86_64.tar.gz
status vmanage-20.15.3-x86_64.tar.gz is local
status Installing vmanage-20.15.3-x86_64.tar.gz
status Signature verification Suceeded.
Signature verification Suceeded.
Signature verification Suceeded.
Signature verification Suceeded.
Successfully installed version: 20.15.3
status Installation of 20.15.3 complete
vmanage3#
```

2. Software Activation
Activate the upgrade image on each Cisco sd-wan manager server using the **request software activate <version>** command. Note that all sd-wan manager nodes will reboot simultaneously.

```
vmanage1# request software activate 20.15.3
This will reboot the node with the activated version.
Are you sure you want to proceed? [no,yes] yes
status activate 20.15.3: successful

vmanage2# request software activate 20.15.3
This will reboot the node with the activated version.
Are you sure you want to proceed? [no,yes] yes
status activate 20.15.3: successful


vmanage3# request software activate 20.15.3
This will reboot the node with the activated version.
Are you sure you want to proceed? [no,yes] yes
status activate 20.15.3: successful
```

3. Upgrade Confirmation
Confirm the upgrade within 15 minutes of activation using the **request software upgrade-confirm** command.

4. Service Status Verification

- Allow approximately 30 minutes after the reboot for services to initialize.
- Execute 'request nms all status' on all nodes to verify the status of services.

Expected output:

```
vmanage2# request nms all status
NMS service proxy
        Enabled: true
        Status: running PID:20190 for 766s
NMS service proxy rate limit
        Enabled: true
        Status: running PID:19114 for 776s
NMS application server
        Enabled: true
        Status: running PID:20191 for 768s
NMS configuration database
        Enabled: true
        Status: running PID:16598 for 797s
        Native metrics status: ENABLED
        Server-load metrics status: ENABLED
NMS coordination server
        Enabled: true
        Status: running PID:19507 for 775s
NMS messaging server
        Enabled: true
        Status: running PID:20563 for 771s
NMS statistics database
        Enabled: false
        Status: not running
NMS data collection agent
        Enabled: true
        Status: running PID:47109 for 38s
NMS CloudAgent v2
        Enabled: true
        Status: running PID:19154 for 781s
NMS cloud agent
        Enabled: true
        Status:  running PID:5562 for 1069s
NMS SDAVC server
        Enabled: false
        Status: not running
NMS SDAVC gateway
        Enabled: false
        Status: not running
vManage Device Data Collector
        Enabled: true
        Status: running PID:47032 for 43s
NMS OLAP database
        Enabled: true
        Status: running PID:20487 for 770s
vManage Reporting
        Enabled: true
        Status: running PID:18119 for 791s
vmanage2#
```

Post-Upgrade Validation Checks

1. Software Version Verification
Verify that all controllers are running the correct software version.

2. sd-wan manager Service Status Verification
Confirm that all services on the sd-wan manager servers are operational.

3. Inter-Controller Connection Verification
Verify control connections between all controllers.

4. Policy Activation Verification
Confirm that policies are properly activated on the sd-wan manager servers.

5. Control Connection Distribution Verification

- Verify that control connections are properly distributed across all sd-wan manager nodes.
- Navigate to **Monitor** > **Network** and verify the control connection column.

6. Site-Level Post-Upgrade Validation
Perform these validation tests on all sites where pre-upgrade checks were conducted:

a. Control Connection and BFD Session Verification
show sd-wan control connections
show sd-wan bfd sessions

b. Routing Verification
show ip route
show ip route vrf <vrf_id>
show sd-wan omp routes vpn <vpn_id>

c. Data Center Service Reachability
Verify reachability to all data center services.

d. Template Synchronization Verification
Verify that device templates are properly attached and synchronized post the upgrade.

e. Policy Verification from vSmart
Execute 'show sd-wan policy from-vsmart' in order to verify policy distribution.

f. User Acceptance Testing
Conduct user acceptance testing on all validated sites in order to ensure application functionality.

SD-WAN Manager Cluster Upgrade Procedure: Version 20.15.x to 20.18.x

Prerequisites

Note: Base version must be 20.15.x in order to upgrade to 20.18.x or later release. If current version is lower than 20.15.x, upgrade to 20.15.x relase first.

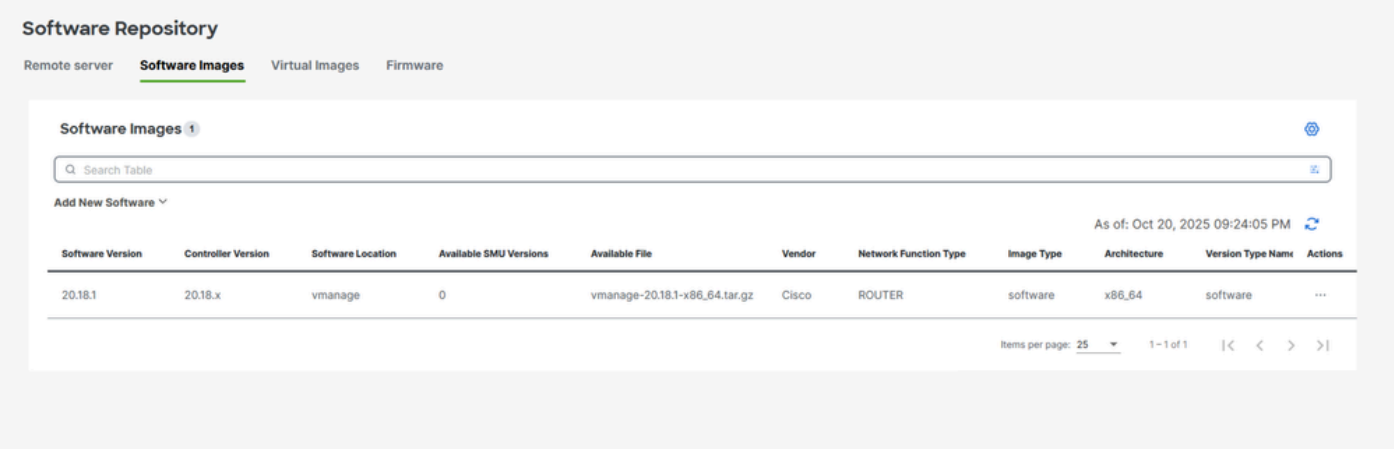
---

1. Controller Snapshots
Create complete snapshots of all SD-WAN controllers prior to beginning the upgrade process.

2. Configuration Database Backup
Execute a backup of the configuration database and store it in a location external to the sd-wan manager server using the **request nms configuration-db backup path <path_and_filename>** command.

3. AURA Health Check on sd-wan manager Nodes
Perform the AURA health check on all sd-wan manager nodes as documented in https://www.cisco.com/c/en/us/support/docs/routers/sd-wan/220514-execute-the-aura-script-on-vmanage.html.

4. Image copy to sd-wan manager Servers
Copy the 20.18.x upgrade image 'vmanage-20.18.1-x86_64.tar.gz' in order to sd-wan manager repository.



5. Software Inventory Management

- Execute the **show software** command on each sd-wan manager node in order to verify the installed software versions.
- Ensure that no more than two software images are installed on each sd-wan manager node.
- If additional images are present, remove the obsolete installed images using the **request software remove <version>** command.

Example output:

```
vmanage1# show software

VERSION   ACTIVE  DEFAULT  PREVIOUS  CONFIRMED  TIMESTAMP
-------------------------------------------------------------------------
20.15.2   false   false    false     -          2025-03-19T10:43:26-00:00
20.9.4    false   true     true      -          2024-11-25T08:16:14-00:00
20.9.5.2  true    false    false     user       2025-03-19T07:10:15-00:00

vmanage1#
```

6. Verify container status
Verify docket container status using the command shown:

```
vmanage2# request nms container-manager dia
NMS container manager
Checking container-manager status
Listing all containers
------------------------
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
3578e5ac3e1e sd-wan/messaging-server:0.20.0 "/entrypoint.sh" 25 minutes ago Up 25 minutes (healthy) 127
e2c1e54dd48f sd-wan/olap-db:23.3.13.6 "/usr/bin/docker-ini…" 25 minutes ago Up 25 minutes (healthy) 127
e3375e1c2254 sd-wan/coordination-server:3.7.1 "/docker-entrypoint.…" 25 minutes ago Up 25 minutes (healt
8ae9ce33bbc8 cloudagent-v2:91a62b952db9 "./entrypoint.sh" 25 minutes ago Up 25 minutes 127.0.0.1:9051-9
b1a298cc3d4e sd-wan/ratelimit:latest "/usr/local/bin/rate…" 25 minutes ago Up 25 minutes (healthy) 6379
c077a9cc59b0 sd-wan/reporting:latest "/sbin/tini -g -- py…" 25 minutes ago Up 25 minutes 80/tcp, 127.0.
07dcbc92acbb sd-wan/data-collection-agent:1.0.1 "/usr/bin/docker-ini…" 25 minutes ago Up 12 minutes (hea
ca58a770f2dc sd-wan/vault:1.0.1 "docker-entrypoint.s…" 25 minutes ago Up 25 minutes (healthy) 8200/tcp,
ca838f61299f sd-wan/service-proxy:1.27.2 "/entrypoint.sh" 25 minutes ago Up 25 minutes (healthy) servic
8c0e15c9e552 sd-wan/configuration-db:4.4.19 "/usr/bin/docker-ini…" 25 minutes ago Up 25 minutes (healthy
671dfed47394 sd-wan/device-data-collector:1.0.0 "/bin/sh -c /vMDDC/v…" 25 minutes ago Up 12 minutes (hea
ceb808046e34 sd-wan/application-server:19.1.0 "/sbin/tini -g -- /e…" 25 minutes ago Up 25 minutes (healt
dd744e0aa80f sd-wan/host-agent:1.0.1 "/entrypoint.sh pyth…" 25 minutes ago Up 25 minutes (healthy) 127.
972a13290a15 sd-wan/cluster-oracle:1.0.1 "/entrypoint.sh java…" 25 minutes ago Up 25 minutes (healthy)
```

Pre-Upgrade Validation Checks

7. Control Connection Stability Verification

- Verify the stability of control connections between all SD-WAN controllers.
- Capture a screenshot of the sd-wan manager dashboard for documentation purposes.

8. Site-Level Verification
Choose representative sites and capture these logs and outputs:

a. Control Connection Verification
show sd-wan control connections

b. BFD Session Verification
show sd-wan bfd sessions

c. Routing Table Verification
show ip route vrf <vrf_id>
show sd-wan omp routes vpn <vpn_id>

d. Application Service Testing
Customer to perform application service testing from a minimum of five branch locations.

9. vSmart Controller Verification
a. Control Connections
Execute 'show control connections' in order to verify that each vSmart maintains control connections with all controllers.

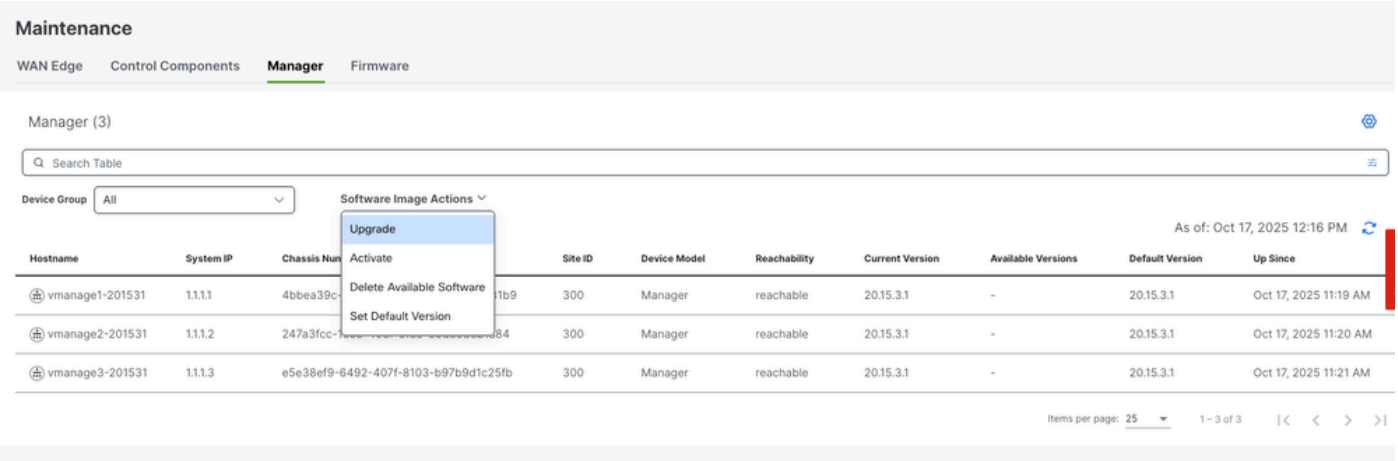
b. OMP Peer Status
Execute 'show omp peers' in order to verify the number of peers on each vSmart controller.

c. OMP Summary
Execute 'show omp summary' in order to verify overall OMP status.

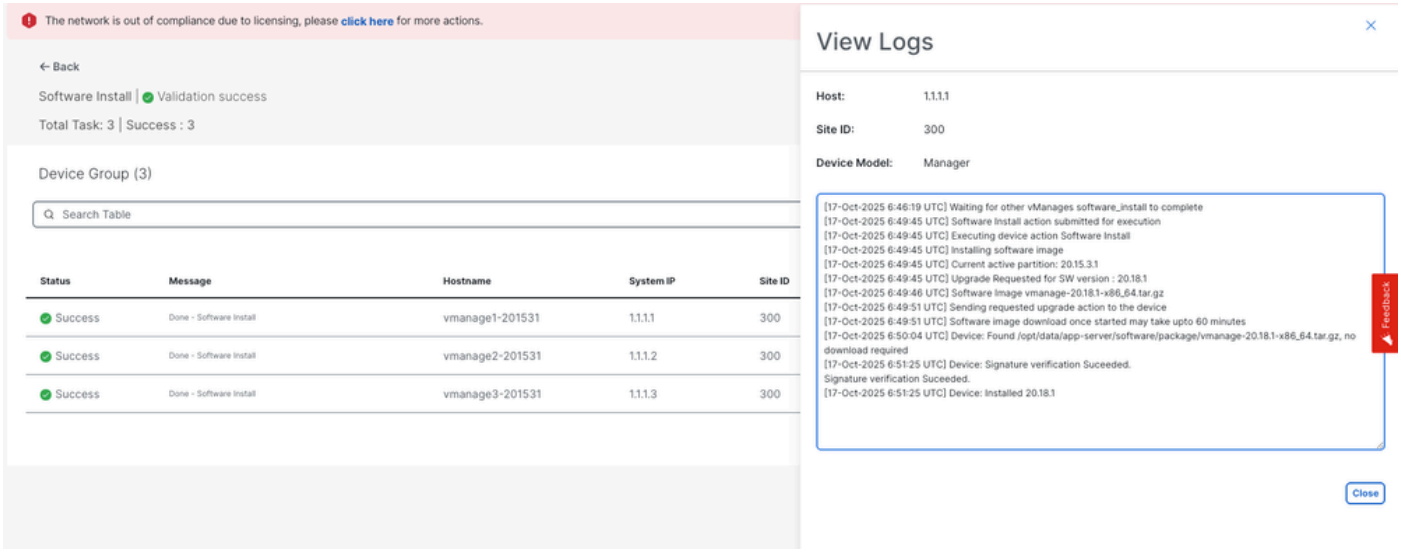
Upgrade Procedure

Here are the high-level steps to be followed for the upgrade:

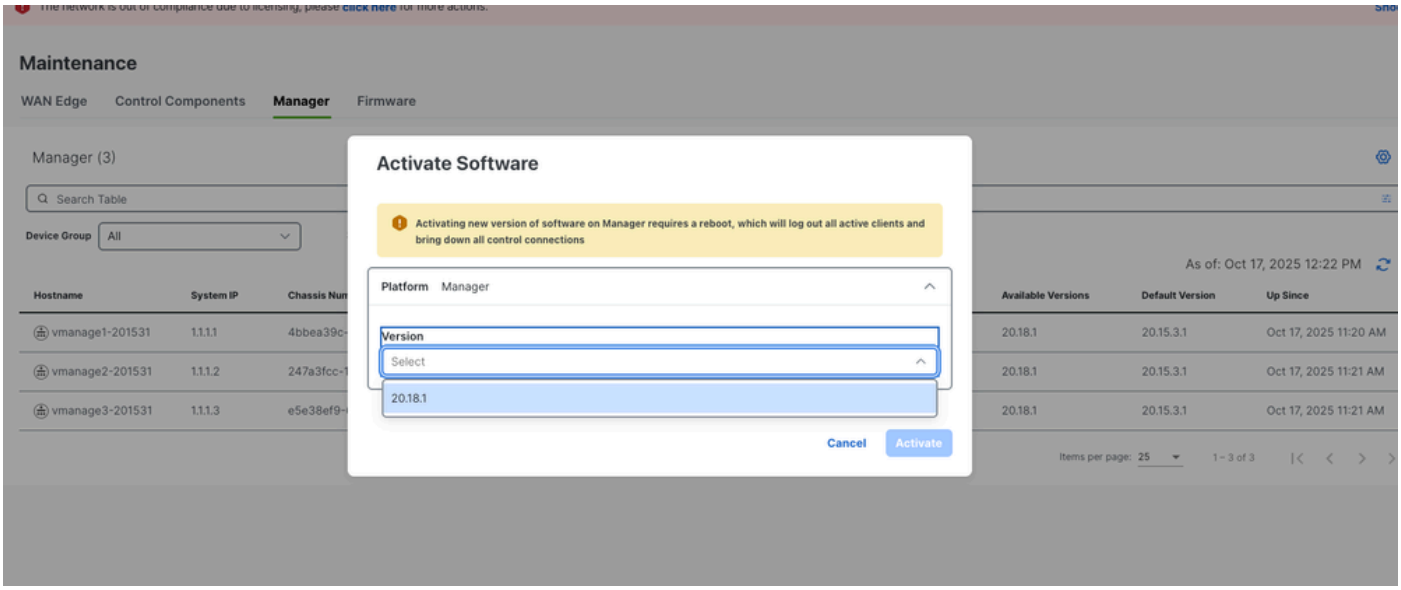
Navigate to **Maintainence > Software Upgrade > Manager > Software Image Action** and choose **Upgrade**. Image will be installed on all three nodes.

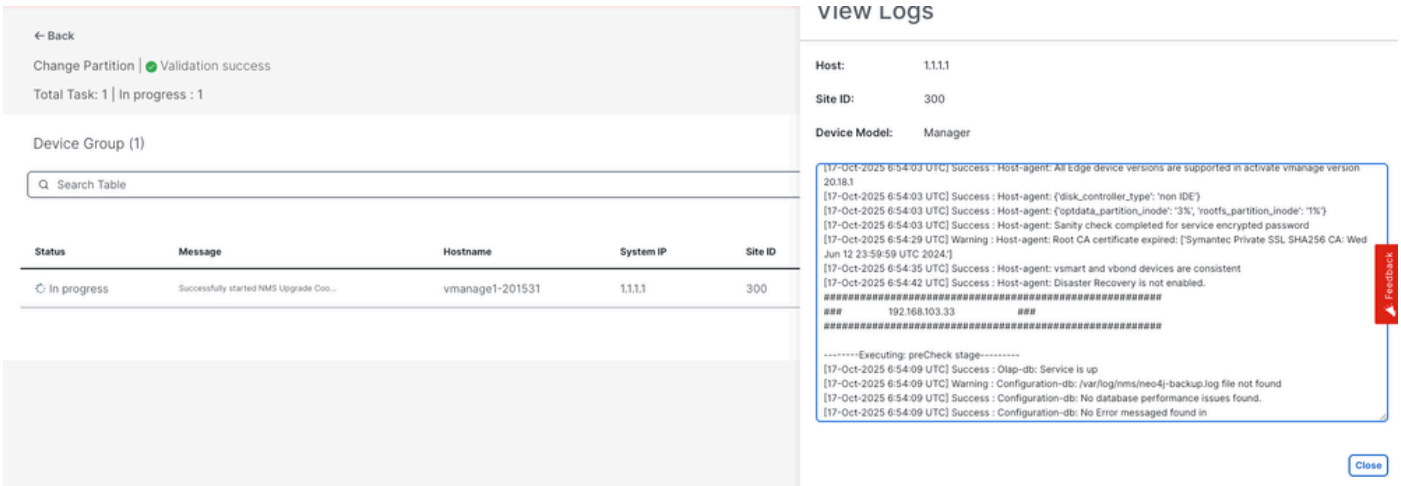


Installation of the image is successful on all three nodes.



Once installation is complete, activate 20.18.1 image. All three nodes will be rebooted.





Service Status Verification

- Allow approximately 30 minutes after the reboot for services to initialize.

- Execute 'request nms all status' on all nodes in order to verify the status of services.

Expected output:

```
vManage-DC# request nms all status
 NMS service proxy
        Enabled: true
        Status: running PID:3622 for 3299063s
NMS service proxy rate limit
        Enabled: true
        Status: running PID:4268 for 3299011s
NMS application server
        Enabled: true
        Status: running PID:18 for 3299103s
NMS configuration database
        Enabled: true
        Status: running PID:35159 for 3299049s
        Native metrics status: ENABLED
        Server-load metrics status: ENABLED
NMS coordination server
        Enabled: true
        Status: running PID:33080 for 3299052s
NMS cluster orchestrator
        Enabled: true
        Status: running PID:13467 for 3299113s
NMS messaging server
        Enabled: true
        Status: running PID:42073 for 3298949s
NMS data collection agent
        Enabled: true
        Status: running PID:57888 for 3297473s
NMS CloudAgent v2
        Enabled: false
        Status: not running
NMS cloud agent
        Enabled: true
        Status:  running PID:25673 for 3299092s
NMS SDAVC server
        Enabled: false
        Status: not running
NMS SDAVC gateway
        Enabled: true
        Status: running PID:30108 for 3299073s
vManage Device Data Collector
        Enabled: true
        Status: running PID:34186 for 3297583s
NMS OLAP database
        Enabled: true
        Status: running PID:41757 for 3298955s
vManage Reporting
        Enabled: false
        Status: not running
NMS Radkit
        Enabled: true
        Status: running PID:33666 for 3299058s
vManage-DC#
```

Verify docker container status post upgradation:

```
vmanage2# request nms container-manager dia
NMS container manager
Checking container-manager status
Listing all containers
------------------------
CONTAINER ID IMAGE COMMAND CREATED STATUS PORTS NAMES
378d13a98478 sd-wan/messaging-server:0.20.0 "/bin/bash /entrypoi…" 9 minutes ago Up 9 minutes (healthy)
```

```
cf4f3dae69bc sd-wan/olap-db:24.3.6.48 "/usr/bin/tini -- /e…" 10 minutes ago Up 10 minutes (healthy) 127
e6af832a551d sd-wan/configuration-db:4.4.38 "/usr/bin/tini -g --…" 10 minutes ago Up 10 minutes (healthy
3ff5a7f12bbd sd-wan/coordination-server:3.8.4 "/docker-entrypoint.…" 10 minutes ago Up 10 minutes (healt
e065840d7736 sd-wan/application-server:24.0.1 "/usr/bin/tini -g --…" 3 days ago Up 11 minutes (healthy)
3bdf71f009e9 sd-wan/cluster-orchestrator:1.0.1 "/entrypoint.sh" 3 days ago Up 11 minutes (healthy) 127.0
4c06c0be3efe sd-wan/vault:1.0.1 "docker-entrypoint.s…" 3 days ago Up 11 minutes (healthy) 8200/tcp, 127
```

Post-Upgrade Validation Checks

1. Software Version Verification
Verify that all controllers are running the correct software version.

2. sd-wan manager Service Status Verification
Confirm that all services on the sd-wan manager servers are operational.

3. Inter-Controller Connection Verification
Verify control connections between all controllers.

4. Policy Activation Verification
Confirm that policies are properly activated on the sd-wan manager servers.

5. Control Connection Distribution Verification

- Verify that control connections are properly distributed across all sd-wan manager nodes.
- Navigate to **Monitor > Network** and verify the control connection column.

6. Site-Level Post-Upgrade Validation
Perform these validation tests on all sites where pre-upgrade checks were conducted:

a. Control Connection and BFD Session Verification
show sd-wan control connections
show sd-wan bfd sessions

b. Routing Verification
show ip route
show ip route vrf <vrf_id>
show sd-wan omp routes vpn <vpn_id>

c. Data Center Service Reachability
Verify reachability to all data center services.

d. Template Synchronization Verification
Verify that device templates are properly attached and synchronized post the upgrade.

e. Policy Verification from vSmart
Execute 'show sd-wan policy from-vsmart' in order to verify policy distribution.

f. User Acceptance Testing
Conduct user acceptance testing on all validated sites to ensure application functionality.