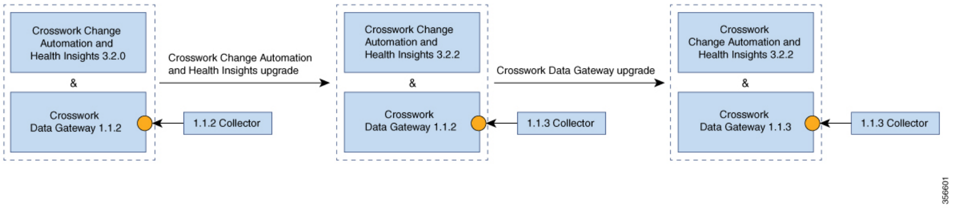
Upgrade

This section contains the following topics:

Upgrade Workflow

This section explains the upgrade workflow from Cisco Crosswork Change Automation and Health Insights 3.2.0 to 3.2.2.

Figure 1: Upgrade Workflow



Crosswork Change Automation and Health Insights 3.2.0
&
Crosswork Data Gateway 1.1.2
1.1.2 Collector
Crosswork Change Automation and Health Insights upgrade
Crosswork Change Automation and Health Insights 3.2.2
&
Crosswork Data Gateway 1.1.2
1.1.3 Collector
Crosswork Data Gateway upgrade
Crosswork Change Automation and Health Insights 3.2.2
&
Crosswork Data Gateway 1.1.3
1.1.3 Collector
356601

The upgrade workflow has two stages:

1. Cisco Crosswork Change Automation and Health Insights Upgrade:
    - Cisco Crosswork Change Automation and Health Insights is upgraded by following the instructions in Upgrade Cisco Crosswork Change Automation and Health Insights, on page 2 (Kafka security should be seamless).
    - Post upgrade, the same Cisco Crosswork Data Gateway 1.1.2 continues to work with Cisco Crosswork Change Automation and Health Insights 3.2.2 while using the latest collector images.
2. Cisco Crosswork Data Gateway Upgrade:
    - The new Cisco Crosswork Data Gateway VM is installed.
    - Cisco Crosswork Data Gateway 1.1.3 is enrolled on Cisco Crosswork Change Automation and Health Insights 3.2.2.

- All devices are detached from the old Cisco Crosswork Data Gateway VM and attached to the new Cisco Crosswork Data Gateway VM.
- Jobs start again automatically from the new Cisco Crosswork Data Gateway. At this point, the old Cisco Crosswork Data Gateway VM can be discarded.

Note It is not mandatory to upgrade Cisco Crosswork Data Gateway after upgrading Cisco Crosswork Change Automation and Health Insights. It can be performed later.

Upgrade Cisco Crosswork Change Automation and Health Insights

This section explains the procedure to upgrade the version of Cisco Crosswork Change Automation and Health Insights VM from 3.2 to 3.2.2.

The upgrade process retains the following:

- User uploaded inventory (devices, providers, credential profiles, and tags).
- Platform details (database credentials).
- User configurations (Playbooks, Topology).
- AAA server integration data, custom local roles and custom roles
- Cisco Crosswork Change Automation and Health Insights 3.2 VM settings for any rollback scenario.

Note The upgrade process for Cisco Crosswork Change Automation and Health Insights VM requires two instances (old and new) to exist at the same time. As a result you should plan to have resources (storage, disk and memory) within your data center (even if only temporarily) to support two VMs.

Without adequate resources, the upgrade operation will be unable to load the services successfully, and will fail in the first boot.

Before you begin, ensure that:

- You meet the system requirements to install Cisco Crosswork Change Automation and Health Insights and Cisco Crosswork Data Gateway. For more information, see Install Cisco Crosswork Change Automation and Health Insights using vCenter and Install Cisco Crosswork Data Gateway.
- You have details of the Cisco Crosswork Change Automation and Health Insights 3.2 VM including the Management IP address, username and password.
- You have a public IP address to assign to the Cisco Crosswork Change Automation and Health Insights 3.2.2 VM Management Network. This is a temporary address as the Management IP address from Cisco Crosswork Change Automation and Health Insights 3.2 VM is retained.

Note It is preferred that the DNS and NTP servers are reachable using the Management Network. However, it is not mandatory. The only requirement is that they are reachable on one of the networks connected to the server.

- You have a public or private IP to assign to the Cisco Crosswork Change Automation and Health Insights VM's Data Network. This IP address must be able to reach your managed devices, Cisco Crosswork Data Gateway network, and, if applicable, be reachable by Cisco Network Services Orchestrator (NSO).

Note Before upgrading, it is recommended to move the Cisco Crosswork Change Automation and Health Insights 3.2 VM to maintenance mode. The Health Insights KPIs and scheduled playbooks must be deactivated to stop any active collection on Cisco Crosswork Data Gateway.

Note VMware vCenter supports vSphere Web Client (flash mode) and vSphere Client (HTML5 mode), however vSphere Web Client (flash mode) is recommended for the Cisco Crosswork Change Automation and Health Insights VM deployment and is explained in this procedure. The vSphere Client (HTML5 mode) is supported only on VMware vCenter Server 6.7 Update 3g or later.

Note The following preparations need to be followed if you have telemetry KPIs enabled on Cisco Crosswork Change Automation and Health Insights 3.2 VM.

1. Pre-upgrade:
    - Move the devices to ADMIN_DOWN state.
    - Ensure that all telemetry collection has stopped and remove the telemetry configurations from the devices.
2. Proceed with the upgrade instructions.
3. Post-upgrade:
    - Move the devices to ADMIN_UP state.
    - Configure the telemetry settings in the devices again and ensure that all telemetry collection has resumed.

Step 1 Download the latest available Cisco Crosswork Change Automation and Health Insights image file (*.ova) to your system.

Warning The default VMware vCenter deployment timeout is 15 minutes. The total time needed to deploy the OVA image file may take much longer than 15 minutes, depending on your network speed and other factors. If vCenter times out during deployment, the resulting VM will be unbootable. To prevent this, Cisco recommends that you either set the vCenter deployment timeout to a much longer period (such as one hour), or unTAR the OVA file before continuing and then deploy using the OVA's three separate Open Virtualization Format and Virtual Machine Disk component files: `cw.ovf`, `cw_rootfs.vmdk`, and `cw_dockerfs`.vmdk.

Step 2 With VMware ESXi running, log in to the VMware vSphere Web Client. On the left side, choose the ESXi host on which you want to deploy the VM, then select Actions > Deploy OVF Template, as shown in the following figure.

Step 3 The VMware Deploy OVF Template window appears and highlights the first step, 1 - Select template, as shown in the following figure. Click Browse to navigate to the location where you downloaded the OVA image file and select it. Once selected, the file name is displayed in the window.

Step 4 Click Next to go to 2 - Select name and location, as shown in the following figure. Enter a name for the Cisco Crosswork Change Automation and Health Insights VM you are creating.

Cisco recommends that you include the Cisco Crosswork Change Automation and Health Insights version and build number in the name (for example: **`Crosswork CA/HI 3.2.2 Build 283`**).

Step 5 Click Next to go to 3 - Select a resource, as shown in the following figure. Choose the Cisco Crosswork Change Automation and Health Insights VM’s host.

Step 6 Click Next. The VMware vCenter Server validates the OVA. Network speed will determine how long validation takes. When validation is complete, the window moves to 4 - Review details, as shown in the following figure. Take a moment to review the OVF template you are deploying. Note that this information is gathered from the OVF and cannot be modified.

Step 7 Click Next to go to 5 - Accept license agreements. Review the End User License Agreement and click on Accept before you continue.

Step 8 Click Next to go to 6 - Select configuration, as shown in the following figure. Select the desired deployment configuration (IPv4 or IPv4 Network on a Single Interface).

Note The IPv4 on a Single Interface or IPv6 on a Single Interface configuration should only be used for demonstrations and lab installations.

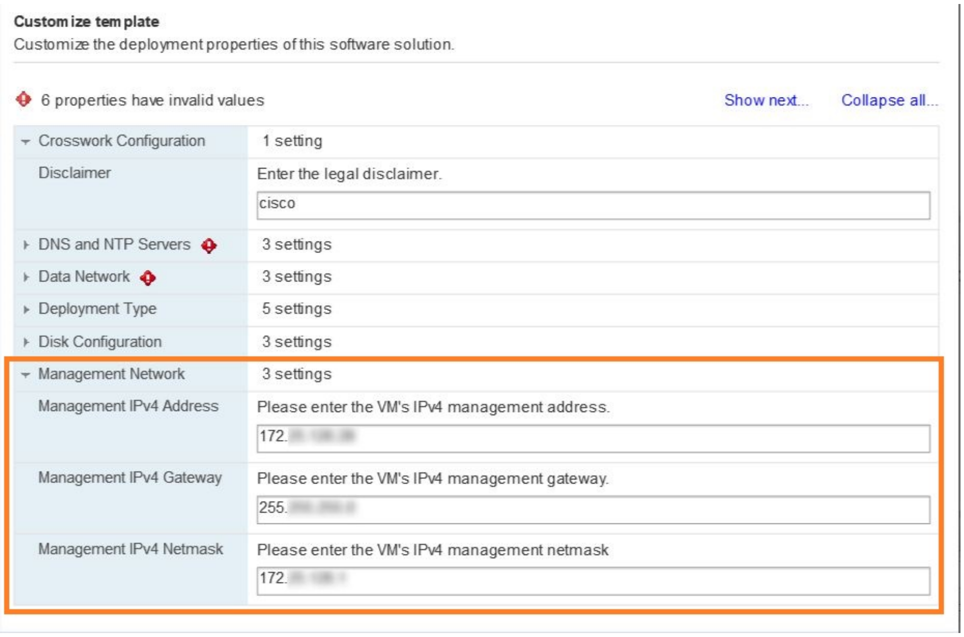
Step 9 Click Next to go to 7 - Select Storage, as shown in the following figure. Select the relevant option from the Select virtual disk format drop-down list. From the table, choose the datastore you want to use and review its properties to ensure there is enough available storage.

Note For production deployment, consider choosing Thick provision eager zeroed as it will not have a penalty of allocating and initializing disk space at runtime. For demo or testing purposes, Thin provision is recommended as it saves disk space.

Step 10 Click Next to go to 8 - Select networks, as shown in the following figure. In the dropdown table at the top of the page, choose the appropriate destination network for the source Data Network and Management Network, respectively.

Step 11 Click Next to go to 9 - Customize template, with the Crosswork Configuration settings already expanded, as shown in the following figure. Make entry in the Disclaimer field.

Step 12 Expand the Management Network settings. According to your deployment configuration, the fields displayed are different. Enter the temporary IP address you want to be associated with the VM during the upgrade. If as part of the upgrade you want to keep this address associated with the VM you can select this option later in the upgrade process. See how to customize the template (step 11).



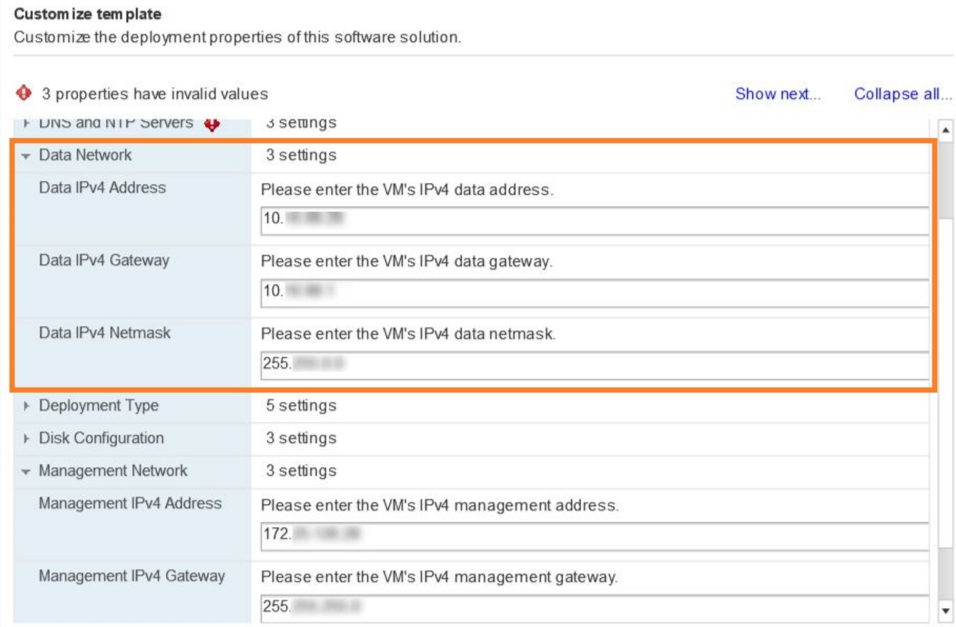
Customize template

Customize the deployment properties of this software solution.

6 properties have invalid values

Crosswork Configuration	1 setting
Disclaimer	Enter the legal disclaimer. cisco
DNS and NTP Servers	3 settings
Data Network	3 settings
Deployment Type	5 settings
Disk Configuration	3 settings
Management Network	3 settings
Management IPv4 Address	Please enter the VM's IPv4 management address. 172.[redacted]
Management IPv4 Gateway	Please enter the VM's IPv4 management gateway. 255.[redacted]
Management IPv4 Netmask	Please enter the VM's IPv4 management netmask 172.[redacted]

Step 13 Expand the Data Network settings. According to your deployment configuration, the fields displayed are different. Enter a temporary IP address and other information for the data network. If you want to change the IP to this value you can choose to do that in the customizing template section (step 11).



Customize template

Customize the deployment properties of this software solution.

3 properties have invalid values

DNS and NTP Servers	3 settings
Data Network	3 settings
Data IPv4 Address	Please enter the VM's IPv4 data address. 10.[redacted]
Data IPv4 Gateway	Please enter the VM's IPv4 data gateway. 10.[redacted]
Data IPv4 Netmask	Please enter the VM's IPv4 data netmask. 255.[redacted]
Deployment Type	5 settings
Disk Configuration	3 settings
Management Network	3 settings
Management IPv4 Address	Please enter the VM's IPv4 management address. 172.[redacted]
Management IPv4 Gateway	Please enter the VM's IPv4 management gateway. 255.[redacted]

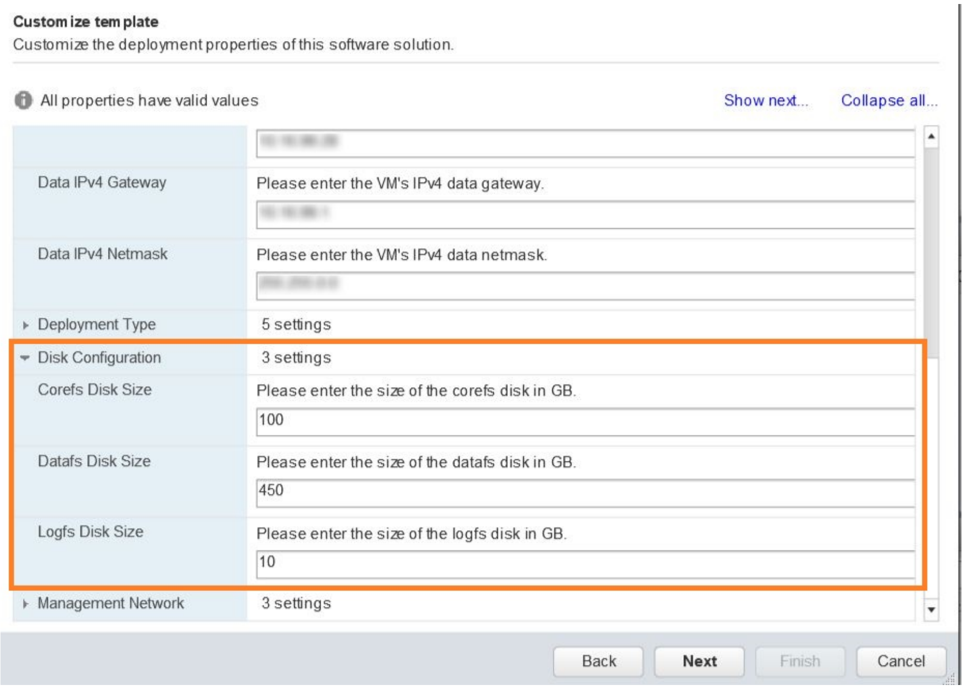
Step 14 Expand the DNS and NTP Servers settings, as shown in the following figure. According to your deployment configuration, the fields displayed are different. Make entries in three fields:

- DNS IP Address: The IPv4 addresses of the DNS servers you want the Cisco Crosswork Change Automation and Health Insights server to use. Separate multiple IP addresses with spaces.

- DNS Search Domain: The name of the DNS search domain.

- NTP Servers: The IP addresses or host names of the NTP servers you want to use. Separate multiple IPs or host names with spaces.

Step 15 Disk Configuration settings allows you to adjust the amount of storage space available to Cisco Crosswork Change Automation and Health Insights. The default settings should work for most environments. For assistance in adding additional storage, contact the Cisco Customer Experience team.



Customize template

Customize the deployment properties of this software solution.

All properties have valid values

	[redacted]
Data IPv4 Gateway	Please enter the VM's IPv4 data gateway. [redacted]
Data IPv4 Netmask	Please enter the VM's IPv4 data netmask. [redacted]
▸ Deployment Type	5 settings
▾ Disk Configuration	3 settings
Corefs Disk Size	Please enter the size of the corefs disk in GB. 100
Datafs Disk Size	Please enter the size of the datafs disk in GB. 450
Logfs Disk Size	Please enter the size of the logfs disk in GB. 10
▸ Management Network	3 settings

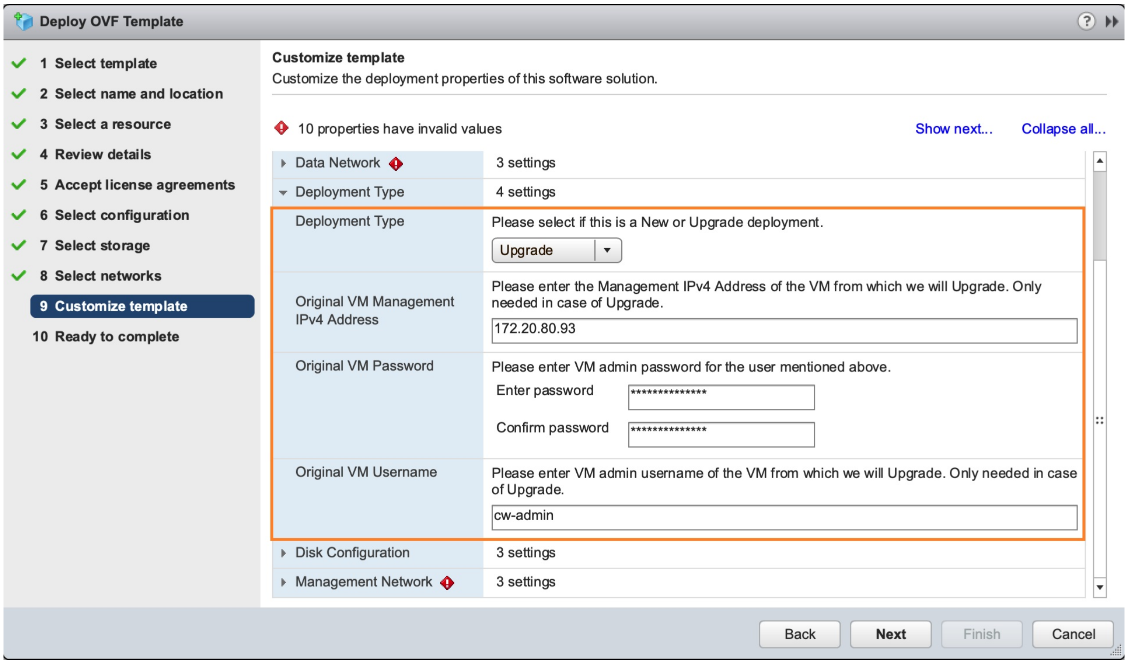
Step 16 Expand the Deployment Type settings, as shown in the following figure. In the Deployment Type dropdown, select Upgrade, and make relevant entries for the following fields:

a) Original VM Management IPv4 Address: Management IPv4 address of Cisco Crosswork Change Automation and Health Insights 3.2 VM.

b) Original VM Password: Provide the Cisco Crosswork Change Automation and Health Insights 3.2 VM password in the Enter Password and Confirm Password fields.

c) Original VM Username: Username of Cisco Crosswork Change Automation and Health Insights 3.2 VM. Typically, it is **`cw-admin`** unless it has been changed by your system administrator.

Note Switching the Management or Data IPv4 address, or changing the IP stack from IPv4 to IPv6 is not supported during upgrade owing to restrictions in Cisco Crosswork Change Automation and Health Insights and Cisco Crosswork Data Gateway certificates. For more information, see Supported TCP/IP Stack



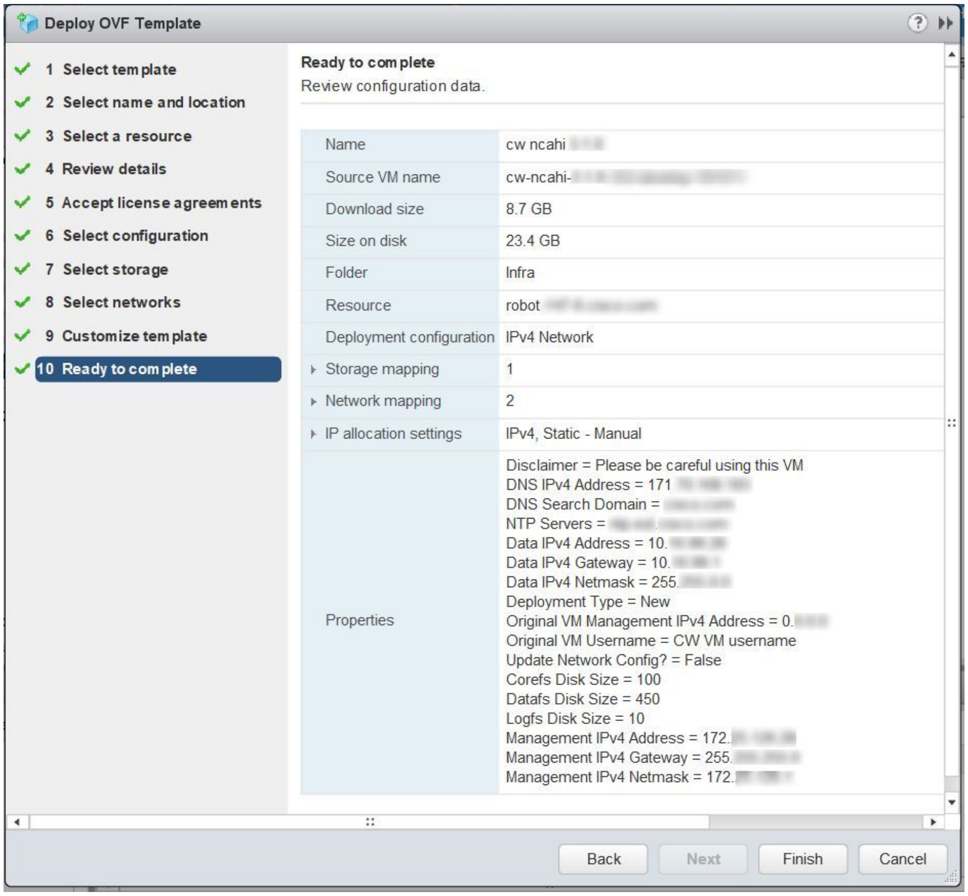
Customize template

Customize the deployment properties of this software solution.

10 properties have invalid values

Data Network	3 settings
Deployment Type	4 settings
Deployment Type	Please select if this is a New or Upgrade deployment. Upgrade
Original VM Management IPv4 Address	Please enter the Management IPv4 Address of the VM from which we will Upgrade. Only needed in case of Upgrade. 172.20.80.93
Original VM Password	Please enter VM admin password for the user mentioned above. Enter password *************** Confirm password ***************
Original VM Username	Please enter VM admin username of the VM from which we will Upgrade. Only needed in case of Upgrade. cw-admin
Disk Configuration	3 settings
Management Network	3 settings

Step 17 Click Next to go to 10 - Ready to Complete, as shown in the following figure. Review your settings and then click Finish if you are ready to begin deployment.



Ready to complete

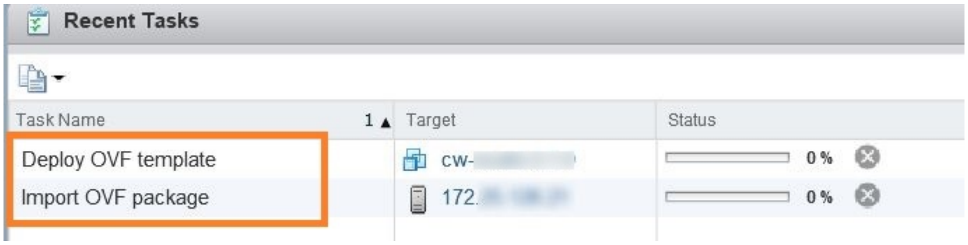
Review configuration data.

Name	cw ncahi [redacted]
Source VM name	cw-ncahi-[redacted]
Download size	8.7 GB
Size on disk	23.4 GB
Folder	Infra
Resource	robot [redacted]
Deployment configuration	IPv4 Network
Storage mapping	1
Network mapping	2
IP allocation settings	IPv4, Static - Manual
Properties	Disclaimer = Please be careful using this VM DNS IPv4 Address = 171 [redacted] DNS Search Domain = [redacted] NTP Servers = [redacted] Data IPv4 Address = 10.[redacted] Data IPv4 Gateway = 10.[redacted] Data IPv4 Netmask = 255.[redacted] Deployment Type = New Original VM Management IPv4 Address = 0.[redacted] Original VM Username = CW VM username Update Network Config? = False Corefs Disk Size = 100 Datafs Disk Size = 450 Logfs Disk Size = 10 Management IPv4 Address = 172.[redacted] Management IPv4 Gateway = 255.[redacted] Management IPv4 Netmask = 172.[redacted]

Step 18 Wait for the deployment to finish before continuing. To check on the deployment status:

a) Open a VMware vCenter client.

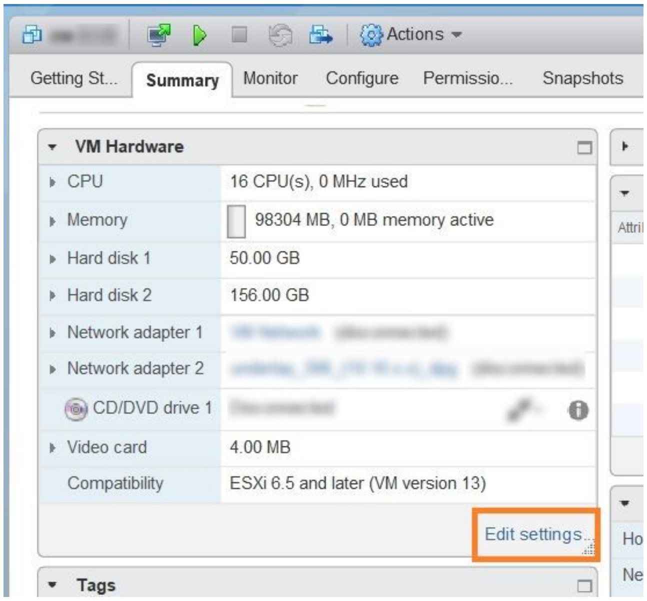
b) In the Recent Tasks tab for the host VM, view the status for the Deploy OVF template and Import OVF package jobs, as shown in the following figure.



Task Name 1 ▲	Target	Status
Deploy OVF template	cw-[redacted]	0 %
Import OVF package	172.[redacted]	0 %

Step 19 After the deployment tasks are complete, check the host's VM settings to permit boot from EFI Firmware:

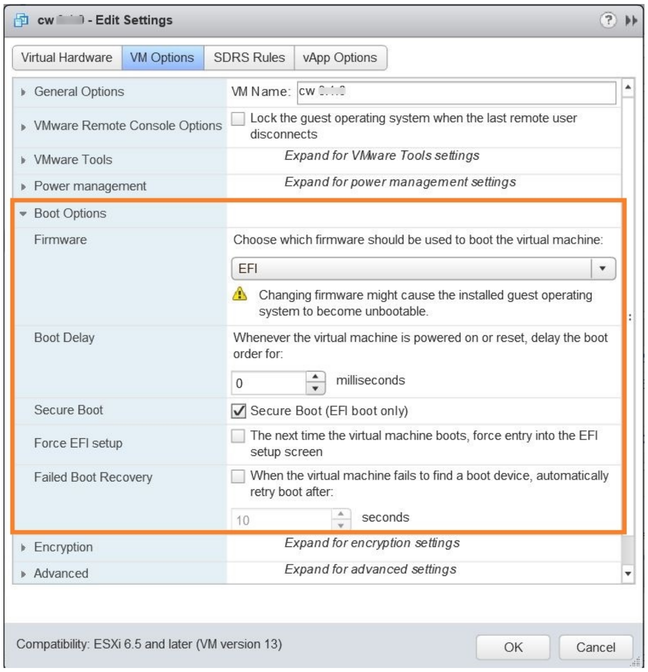
a) On the host VM Summary tab, below the VM Hardware table, click Edit Settings, as shown in the following figure.



CPU	16 CPU(s), 0 MHz used
Memory	98304 MB, 0 MB memory active
Hard disk 1	50.00 GB
Hard disk 2	156.00 GB
Network adapter 1	[redacted]
Network adapter 2	[redacted]
CD/DVD drive 1	[redacted]
Video card	4.00 MB
Compatibility	ESXi 6.5 and later (VM version 13)

b) On the Edit Settings page, click the VM Options tab.

c) Expand the Boot Options dropdown list and change the Firmware setting to EFI, if it not set by default. When you are finished, click OK. You may want to take a snapshot of the VM at this point.



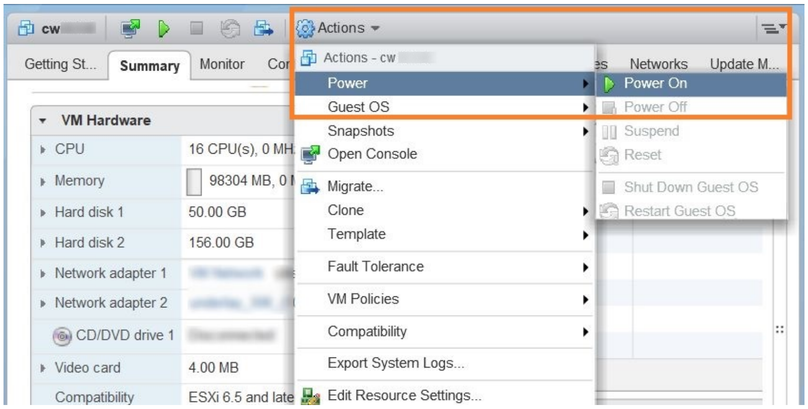
cw [redacted] - Edit Settings

- General Options — VM Name: cw [redacted]
- VMware Remote Console Options — □ Lock the guest operating system when the last remote user disconnects
- VMware Tools — *Expand for VMware Tools settings*
- Power management — *Expand for power management settings*
- Boot Options
  - Firmware — Choose which firmware should be used to boot the virtual machine: EFI
    - Changing firmware might cause the installed guest operating system to become unbootable.
  - Boot Delay — Whenever the virtual machine is powered on or reset, delay the boot order for: 0 milliseconds
  - Secure Boot — ☑ Secure Boot (EFI boot only)
  - Force EFI setup — □ The next time the virtual machine boots, force entry into the EFI setup screen
  - Failed Boot Recovery — □ When the virtual machine fails to find a boot device, automatically retry boot after: 10 seconds
- Encryption — *Expand for encryption settings*
- Advanced — *Expand for advanced settings*

Compatibility: ESXi 6.5 and later (VM version 13)

Step 20 You can now power on the Cisco Crosswork Change Automation and Health Insights VM to complete the deployment process. Expand the host's entry so you can click the Cisco Crosswork Change Automation and Health Insights VM and then choose Actions > Power > Power On, as shown in the following figure.

Figure 2: Power On



VM Hardware	
CPU	16 CPU(s), 0 MH
Memory	98304 MB, 0 M
Hard disk 1	50.00 GB
Hard disk 2	156.00 GB
Network adapter 1	[redacted]
Network adapter 2	[redacted]
CD/DVD drive 1	[redacted]
Video card	4.00 MB
Compatibility	ESXi 6.5 and late

From this point, the upgrade is automatically triggered. The Data and IP configurations are transferred from the old Cisco Crosswork Change Automation and Health Insights VM to the new VM. Once the transfer is completed, the old Cisco Crosswork Change Automation and Health Insights VM will shut down. It will take 30 minutes or more for the new Cisco Crosswork Change Automation and Health Insights VM to become operational. Please wait for the process to finish before continuing.

To get the current status of the upgrade, login as the super user and use the cli `upgrade status` command on the VM.

Note

- Each time the Cisco Crosswork Change Automation and Health Insights VM is re-imaged, you need to refresh the Cisco Crosswork Change Automation and Health Insights login page to accept the new certificate. Otherwise, the error message Http failure response for /crosswork/sso/v1/tickets: 0 Unknown Error is displayed on the login page.
- Each time the Cisco Crosswork Change Automation and Health Insights VM is re-imaged, Cisco Crosswork Data Gateway must be restarted to re-initialize the certificates. Otherwise, the devices become unreachable and collection stops.

Step 21 Install Cisco Crosswork Data Gateway and complete the post-installation tasks using the instructions in Install Cisco Crosswork Data Gateway and Post-installation Tasks respectively.

Step 22 Enroll the Cisco Crosswork Data Gateway with Cisco Crosswork Change Automation and Health Insights as instructed in Enroll Cisco Crosswork Data Gateway. For information on adding devices to the Cisco Crosswork Data Gateway, see the Manage Crosswork Data Gateway Instances section in the Cisco Crosswork Change Automation and Health Insights User Guide

What to do next

- Verify that you are able to login to Cisco Crosswork Change Automation and Health Insights 3.2.2 VM using the 3.2 VM credentials (**`cw-admin`** as username and password).
- Verify if the inventory data, application configurations, and AAA user configurations from Cisco Crosswork Change Automation and Health Insights 3.2 VM have been retained in version 3.2.2.
- While managing inventory in Cisco Crosswork Change Automation and Health Insights 3.2.2:
  - Make sure to use the latest CSV template for managing inventory.
  - Configured state of devices being onboarded needs to be marked as DOWN.

  Note The default policy behavior has changed in Cisco Crosswork Change Automation and Health Insights 3.2.2 with the removal of the node-ip field. You can use inventoryid, te-routerid, OspfRouterId, or IsisSystemId fields to onboard devices. After upgrade to 3.2.2 version, any devices with conflicting data are marked as DOWN and the conflict values are assigned empty values, as per the new policy behavior. A report with the confict device's UUID, conflicted field and value is generated at `/mnt/robot_datafs/robot-dlminvmgr/1/conflictEntry.csv`. You can check the report to identify the conflicted devices, and onboard them again after correcting the conflicting data.

- Verify if the device details are visible in the Topology page.
- Verify if Cisco Crosswork Data Gateway is onboarded and functioning properly.

Note

- After upgrade to 3.2.2 version, all historical alerts will be available only for an hour. Future alerts will be available once devices are mapped to Cisco Crosswork Data Gateway for the enabled KPIs.
- Post upgrade, if helios fails to cleanup some of the nodes there will not be any impact, as the devices will be remapped to the new Cisco Crosswork Data Gateway VM.
- Post upgrade, and after enabling NSO, the devices need to be mapped to Cisco Crosswork Data Gateway for auto sync as the software type information is not migrated to 3.2.2 version.

- Check the health status of the upgraded Cisco Crosswork Change Automation and Health Insights and Cisco Crosswork Data Gateway using the Crosswork Manager and Data Gateway Management windows in the GUI respectively.

  For more information, see the Perform Administrative Tasks chapter in the Cisco Crosswork Change Automation and Health Insights User Guide.
- Check if you are able to configure and use the applications in the upgraded Cisco Crosswork Change Automation and Health Insights. For more information on the GUI workflow, see the Cisco Crosswork Change Automation and Health Insights User Guide.

Upgrade Cisco Crosswork Data Gateway

Note This procedure is required only for a Cisco Crosswork Data Gateway Base VM upgrade. Upgrade of other components, such as collectors, is performed by Crosswork as explained is Section Crosswork Patch Framework, on page 12.

Cisco Crosswork Data Gateway functions as a passive device in the network. As such, the upgrade process consists of stopping the active Cisco Crosswork Data Gateway instance and replacing it with a Cisco Crosswork Data Gateway instance that is running the new version of Cisco Crosswork Data Gateway software, essentially exchanging one Cisco Crosswork Data Gateway instance for another.

Step 1 Install the new Cisco Crosswork Data Gateway VM. See Install Cisco Crosswork Data Gateway.

Step 2 Enroll the new Cisco Crosswork Data Gateway instance with Crosswork and ensure its Administration state is Up. See Enroll Cisco Crosswork Data Gateway With Cisco Crosswork Change Automation and Health Insights.

Step 3 Once the new Cisco Crosswork Data Gateway VM is Up, detach devices from the old Cisco Crosswork Data Gateway VM.

See Section Detach a Device from a Cisco Crosswork Data Gateway Instance in Cisco Crosswork Change Automation and Health Insights 3.2.2 User Guide.

Step 4 Attach the devices to the new Cisco Crosswork Data Gateway VM.

See Section Attach a Device to a Cisco Crosswork Data Gateway Instance in Cisco Crosswork Change Automation and Health Insights 3.2.2 User Guide.

Step 5 Set the administrative state of the old Cisco Crosswork Data Gateway VM to Maintenance.

See Section Change the Administration State of a Cisco Crosswork Data Gateway Instance in Cisco Crosswork Change Automation and Health Insights 3.2.2 User Guide.

Step 6 Confirm that the new Cisco Crosswork Data Gateway VM is operating properly. Time to monitor it is up to the operator, but Cisco recommends at least an hour of normal operations before proceeding with Step 7.

See Section De-enroll Cisco Crosswork Data Gateway in Cisco Crosswork Change Automation and Health Insights 3.2.2 User Guide.

Step 7 Delete the old Cisco Crosswork Data Gateway VM from Crosswork.

See Section De-enroll Cisco Crosswork Data Gateway in Cisco Crosswork Change Automation and Health Insights 3.2.2 User Guide.

Step 8 From vCenter, power off the old Cisco Crosswork Data Gateway VM.

Step 9 Double check that all is still working correctly with the new Cisco Crosswork Data Gateway VM.

Step 10 From vCenter, delete the old Cisco Crosswork Data Gateway VM from the disk.

Crosswork Patch Framework

There are three types of patches in Cisco Crosswork Change Automation and Health Insights:

- Crosswork Application Patching (PATCH_IMAGE): This is a patch on the Crosswork applications such as Change Automation and Health Insights, and the configuration packages within the application layer. One or more applications can be patched simultaneously.
- Crosswork Data Gateway Patching (PATCH_CDG): This is a patch on the collector images for Cisco Crosswork Data Gateway VM.
- Crosswork Data Patching (PATCH_DATA): This is a patch to dynamically update the pre-built set of fundamental data such as YANG models and system MIB packages used by the Crosswork applications.

The patch versioning is done in the [MAJOR: MINOR: PATCH] format, where MAJOR corresponds to every major release of the Cisco Crosswork Change Automation and Health Insights, MINOR corresponds to every critical (backward incompatible) change made during a release, and PATCH corresponds to every patch created in a release.

The unit of a patch is a TAR file. The TAR file consists of the patch metadata, list of docker images, checksum and signature. The metadata contains platform and product details, patch version, type of patch and other creation details. Signature is a security requirement in order to safeguard the patch; the signature is verified by the patch framework. It also helps to perform error correction mechanisms and detect if the patch is corrupted or not.

The platform orchestrator (such as Robot orchestrator) maintains and manages the lifecycle of all applications in the Crosswork platform. Each Crosswork product has its own centralized manifest file `<orchmanifest.json>` which contains the list of applications and the corresponding configurations. When the orchestrator is up, it goes through the manifest. Along with the manifest, the dependency diagram

`<orch.yaml>` explains the logical grouping of applications and their dependencies. Currently, simultaneous application patching is possible as the applications are independent of each other. Patching the Collection Infra is a system-wide change and requires shutting down other dependent applications. A patch on the Core Infra is not allowed and is considered as a VM upgrade. Schema changes are not allowed during patching. Users are recommended to take backup of the system before patching, to restore in case of any error.

Patching Activation Workflow:

Each stage of the patching workflow, performed using APIs, are explained below:

1. Validate
    - API: /crosswork/platform/v1/patch/validate
    - User downloads the patch to any reachable host from the Crosswork VM. After the download, the patch is validated for accuracy and compatibility to the product version.
2. Add
    - API: /crosswork/platform/v1/patch/add
    - After the patch is validated, it is added to the corresponding registry in the system, such as updating the IMAGE registry in case of an IMAGE patch. The add operation prepares the system for the patch to be activated. It is an asynchronous operation and may take around 15 mins. Once add is initiated, user receives a corresponding job ID and the operation is performed in the background.
3. Status
    - There are 2 status APIs:
    - Status - which displays the current status of the Patch framework.
        - API: /crosswork/platform/v1/patch/status
        - This API displays the current status of the patch framework, such as if add is successful or ongoing, or if activate has been triggered.
    - Job Status - which displays the specific job status.
        - API: /crosswork/platform/v1/patch/jobstatus
        - This API return the status of a specific job based on the Job ID.
4. Activate
    - API: /crosswork/platform/v1/patch/activate
    - After successful addition, the patching is locked. If a patch is added, it needs to be activated before another patch can be added to the application. Activate, like add, is an asynchronous operation that generates a job ID for the user and continues the process in the background. Activation takes the backup of the current state and updates the configuration. If the patch fails, the auto-roll back functionality rolls back to the previous version and the status is updated with the failure details.
5. Summary
    - API: /crosswork/platform/v1/patch/summary

- Summary provides the overall summary of the Patch framework, and summary of the different patch types including patch version. This information changes each time a new patch is added and activated:
    - PATCH_IMAGE - Patch version and the applications changed as part of the patch.
    - PATCH_CDG - Patch version
    - PATCH_DATA - Patch version and the applications to which the new data has been uploaded.

6. Remove
    - API: /crosswork/platform/v1/patch/remove
    - A patch can be removed in 2 ways:
        - Flow 1: A patch can be removed after it is validated and added. For example, if user chooses to cancels after the add is successful, remove can be used.
        - Flow 2: A patch can be removed after it is validated, added and activated. For example, if user chooses to go back to a previous version after a patch is applied successfully, remove can be used.

For more information, refer the Swagger file for Payload in https://developer.cisco.com/docs/crosswork/#!platform.

Upon successful activation of a patch, user can verify the health of the application using the Crosswork Manager or Data Gateway Management feature in Cisco Crosswork Change Automation and Health Insights, depending on the type of the patch. For more information, see the Perform Administrative Tasks chapter in the Cisco Crosswork Change Automation and Health Insights User Guide.