

Installation Tasks

This section contains the following topics:

- Installation Workflow, on page 1
- Install Cisco Crosswork Change Automation and Health Insights, on page 2
- Install Cisco Crosswork Data Gateway, on page 24
- Enroll Cisco Crosswork Data Gateway With Cisco Crosswork Change Automation and Health Insights, on page 49
- Troubleshoot the Cisco Crosswork Data Gateway Installation and Enrollment, on page 53
- De-enroll Cisco Crosswork Data Gateway, on page 55

Installation Workflow

To set up Cisco Crosswork Change Automation and Health Insights and Cisco Crosswork Data Gateway complete the below installation tasks in the order of their listing:

- 1. Install Cisco Crosswork Change Automation and Health Insights, on page 2
 - **a.** Verify the VM Configuration, on page 20
 - **b.** Log In to the UI From a Browser, on page 20
 - c. Troubleshoot the Installation, on page 21
- 2. Install Cisco Crosswork Data Gateway, on page 24
 - **a.** Log In and Log Out, on page 45
 - **b.** Generate An Enrollment Package, on page 46
 - c. Export Enrollment Package, on page 47
- **3.** Enroll Cisco Crosswork Data Gateway With Cisco Crosswork Change Automation and Health Insights, on page 49
 - a. Enroll Cisco Crosswork Data Gateway, on page 49
 - b. Cisco Crosswork Data Gateway Authentication and Bootstrap, on page 53
 - c. Troubleshoot the Cisco Crosswork Data Gateway Installation and Enrollment, on page 53

Install Cisco Crosswork Change Automation and Health Insights

You can install Cisco Crosswork Change Automation and Health Insights using one of the following methods:

- Install Cisco Crosswork Change Automation and Health Insights Via vCenter, on page 2
- Install Cisco Crosswork Change Automation and Health Insights Via OVF Tool, on page 17

During installation, Cisco Crosswork Change Automation and Health Insights creates two special administrative IDs:

- The virtual machine (VM) administrator, with the username cw-admin, and the default password cw-admin. Data center administrators use this ID to log in to and troubleshoot the Cisco Crosswork Network Automation VM. You will use it to verify that the VM has been properly set up (see Verify the VM Configuration, on page 20).
- 2. The Crosswork administrator, with the username admin and the default password admin. Product administrators use this ID to log in to and configure the Cisco Crosswork Change Automation and Health Insights user interface, and to perform special operations, such as stopping and restarting services.

Note These two administrative usernames are reserved and cannot be changed. The first time you log in using either of these administrative IDs, you will be prompted to change that ID's password.

Install Cisco Crosswork Change Automation and Health Insights Via vCenter

This section explains the procedure to install Cisco Crosswork Change Automation and Health Insights for the first time. For details on upgrading the Cisco Crosswork Network Automation VM to a newer version, see Upgrade Cisco Crosswork Change Automation and Health Insights.

Before you begin, ensure that:

• You are creating the Cisco Crosswork Network Automation VM on VMware ESXi 6.5 (Update 2 or later), and using the VMware vCenter Server 6.5 (Update 2d or later) or 6.7 (Update 3b).



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 Network Automation VM deployment and is explained in this procedure. The vSphere Client (HTML5 mode) is supported only on VMware vCenter Server 6.7 Update 3b.

• You have a public IP address (IPv4 or IPv6) to assign to the Cisco Crosswork Network Automation VM's management network virtual interface. The default gateway must be reachable via this IP address.



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

• You have a public or private IP address (IPv4 or IPv6) to assign to the Cisco Crosswork Network Automation VM's data network virtual interface. This IP address must be able to reach the gateway address for the network where you Cisco Crosswork Data Gateway will be installed.

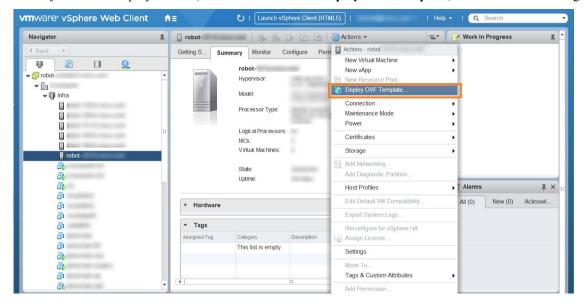


During the installation and first-time booting of the VM, the links to the specified gateways will be validated. VM configuration will fail if the links are inaccessible.

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

Warning The default VM ware 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 four separate Open Virtualization Format and Virtual Machine Disk component files: cw.ovf, cw_rootfs.vmdk, cw_dockerfs.vmdk, and cw extrafs.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**, similar to the following figure.



Step 3 The VMware **Deploy OVF Template** wizard appears and highlights the first step, **1 - Select template**, similar to 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.

Deploy OVF Template		(?) H
1 Select tem plate 2 Select name and location	Select template Select an OVF template.	
 3 Select a resource 4 Review details 5 Select storage 6 Ready to complete 	Enter a URL to download and install the OVF package from the Internet, or browse to a location accessible from your compute such as a local hard drive, a network share, or a CD/DVD drive. URL • Local file Browse 1 file(s) selected, click Next to validate • Use multiple selection to select all the files associated with an OVF template (ovf, .vmdk, etc.)	r,
	Back Next Finish Ca	incel

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 Network Automation 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 3.1 Build 283**).

👔 Deploy OVF Template		⑦ ₩
 Select tem plate 2 Select name and location 	Select name and location Enter a name for the OVF and select a deployment location.	
 Select a resource Review details Select storage Ready to complete 	Name cw Filter Browse Select a datacenter or folder. Crosswork Infra	
	Bac	k Next Finish Cancel

I

Step 5 Click Next to go to **3** - Select a resource, similar to the following figure. Choose the Cisco Crosswork Network Automation VM's host.

B	Deploy OVF Template		() () ()
> >	·	Select a resource Select where to run the deployed template.	
	3 Selecta resource	Filter Browse	
	4 Review details 5 Select storage	Select a host or cluster or resource pool or vapp.	
	6 Ready to complete		
		Back	Next Finish Cancel

Step 6 Click **Next**. The VMware vCenter Server validates the OVA. Network speed will determine how long validation takes. When validation is complete, the wizard moves to **4 - Review details**, similar to 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.

t	🍘 Deploy OVF Template					
* *	2 Select name and location					
Ĩ	3 Select a resource 4 Review details					
	5	Accept license agreements	Product	Cisco Crosswork Network Automation		
	6 Select configuration Version 3.1.0					
	7 Select storage Vendor <u>Cisco Systems, Inc.</u>					
	8 Select networks Publisher @ No certificate present					
	9 Customize template Download size 8.7 GB					
	10	Ready to complete	Size on disk	23.4 GB (thin provisioned) 816.0 GB (thick provisioned)		
				A The OVF uses dynamically sized disks. The size of those disks is not included here.		
			Description	Cisco Crosswork Change Automation and Health Insight		
			Extra configuration	uefi.secureBootenabled = true firmware = efi		
				Back Next Finish Ca	ancel)

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, similar to the following figure. Select the desired deployment configuration (IPv4, IPv6 or IPv4 Network on a Single Interface).

Note As indicated, the IPv4 on a Single Interface should only be used for demonstrations and lab installations.

🎲 Deploy OVF Template		(?) H
 Select tem plate Select name and location 	Select configuration	
 ✓ 3 Selecta resource ✓ 4 Review details 	Configuration:	IPv4 Network
✓ 5 Accept license agreements	Description:	IPv4 Network ta traffic. IPv6 Network IPv4 Network on a Single Interface (demo mo
6 Select configuration 7 Select storage		 Image: Image: Im
8 Select networks 9 Custom ize tem plate		
10 Ready to complete		
		Back Next Finish Cancel

- Step 9 Click Next to go to 7 Select Storage, similar to 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, choose **Thick provision eager zeroed** as it will preallocate disk space and provide the best performance. For development purposes, **Thin provision** is recommended as it saves disk space.

🎲 Deploy OVF Template					?
 1 Select template 2 Select name and location 3 Select a resource 4 Review details 5 Accept license agreements 6 Select configuration 7 Select storage 	Filter Thin prov	vision vision lazy æroed rision vision eager æroed	•		
8 Select networks 9 Customize tem plate 10 Ready to com plete	Name	Status	VM storage policy -	Capacity 2.17 TB	Free 1.76 TB
	4				
	M		Bad		Objects Copy -

Step 10 Click Next to go to 8 - Select networks, similar to 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.

1	Deploy OVF Template		(H (5
> >	1 Select tem plate 2 Select name and location	Select networks Select a destination network for each source network.		
~	3 Select a resource	Source Network	Destination Network	
~	4 Review details	Data Network	Underlay 🔹	
~	5 Accept license agreements	Management Network	VM Network 🗸 🗸	
~	6 Select configuration			
~	7 Select storage			
	8 Select networks			
	9 Customize template			
1	10 Ready to complete	= Description - Data Network Network for data plane traffic (Telemetry/SNMP/CLI) connected to	eth1	

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

1 Select tem plate 2 Select name and location	Customize template Customize the deployment prope	rties of this software solution.		
3 Select a resource	10 properties have invalid val	lues	Show next	Collapse all
4 Review details		1 setting		
5 Accept license agreements	Disclaimer	Enter the legal disclaimer.		
6 Select configuration				
7 Select storage	DNS and NTP Servers	3 settings		
8 Select networks	Data Network	3 settings		
9 Customize tem plate	 Deployment Type 	5 settings		
0 Ready to complete	Disk Configuration	3 settings		
	Management Network	3 settings		

Step 12Expand the Management Network settings. According to your deployment configuration, the fields displayed are
different, similar to the following figures. Make relevant entries for IPv4 deployment (Management IPv4 Address,
Management IPv4 Gateway, and Management IPv4 Netmask fields) or IPv6 deployment (Management IPv6
Address, Management IPv6 Gateway, and Management IPv6 Prefix fields) respectively.

6 properties have invalid value	ues	Show next	Collapse all
 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.		
Management IPv4 Gateway	Please enter the VM's IPv4 management gateway.		
	255.		
Management IPv4 Netmask	Please enter the VM's IPv4 management netmask		
	172.		

Customize tem plate Customize the deployment properties of this software solution.				
6 properties have invalid val	ues	Show next	Collapse all.	
	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 IPv6 Address	Please enter the VM's IPv6 management address			
	2001:			
Management IPv6 Gateway	Please enter the VM's IPv6 management gateway			
	2001:			
Management IPv6 Prefix	Please enter the server's IPv6 management prefix			
	66			

Step 13 Expand the **Data Network** settings. According to your deployment configuration, the fields displayed are different, similar to the following figures. Make relevant entries for IPv4 deployment (**Data IPv4 Address**, **Data IPv4 Gateway**, and **Data IPv4 Netmask** fields) or IPv6 deployment (**Data IPv6 Address**, **Data IPv6 Gateway**, and **Data IPv6 Prefix** fields) respectively.

Custom ize tem plate

Customize the deployment properties of this software solution.

👂 3 properties have invalid val	ues	Show next	Collapse all.
F DNS and NTP Servers 😛	3 semngs		1.0
 Data Network 	3 settings		
Data IPv4 Address	Please enter the VM's IPv4 data address.		
	10.		
Data IPv4 Gateway	Please enter the VM's IPv4 data gateway.		
	10.		
Data IPv4 Netmask	Please enter the VM's IPv4 data netmask.		
	255.		
Deployment Type	5 settings		
 Disk Configuration 	3 settings		
 Management Network 	3 settings		
Management IPv4 Address	Please enter the VM's IPv4 management address.		
	172.		
Management IPv4 Gateway	Please enter the VM's IPv4 management gateway.		
	255.		

Customize tem plate

Customize the deployment properties of this software solution.

3 properties have invalid va	ues	Show next	Collapse all.
Disclaimer	Enter the legal disclaimer.		
	cisco		
DNS and NTP Servers 4	3 settings		
 Data Network 	3 settings		
Data IPv6 Address	Please enter the VM's IPv6 data address		
	10:		
Data IPv6 Gateway	Please enter the VM's IPv6 data gateway.		
	10:		
Data IPv6 Prefix	Please enter the server's IPv6 data prefix		
	64		
Deployment Type	5 settings		
Disk Configuration	3 settings		
 Management Network 	3 settings		
Management IPv6 Address	Please enter the VM's IPv6 management address		
	2001:		

Step 14Expand the Deployment Type settings, similar to the following figure. In the Deployment Type drop-down list, select
New. You can leave the remaining fields blank or with the default values.

🎲 Deploy OVF Template		(?)»
 1 Select tem plate 2 Select name and location 	Custom ize tem plate Customize the deployment prope	rties of this software solution.
✓ 3 Select a resource	3 properties have invalid value	es Show next Collapse all
 4 Review details 5 Accept license agreements 	- Deployment Type	5 settings
 ✓ 6 Select configuration ✓ 7 Select storage 	Deployment Type	Please select if this is a New or Upgrade deployment. New •
 Select storage 8 Select networks 9 Customize tem plate 	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.
10 Ready to complete	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 VM username
	Update Network Config?	Do you wish to update the network configuration of the New VM? By default the VM will come u with original network configuration.
		Back Next Finish Cancel

- **Step 15** Expand the **DNS and NTP Servers** settings, similar to the following figure. According to your deployment configuration (IPv4 or IPv6), the fields displayed are different. Make entries in three fields:
 - **DNS IP Address**: The IP 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.

Custom ize tem plate

Customize the deployment properties of this software solution.

Disclaimer	Enter the legal disclaimer.			
- DNS and NTP Servers	3 settings			
DNS IPv4 Address	Please enter the DNS server's IPv4 address. Multiple DNS server IPs can be provided space separated.			
	171.			
DNS Search Domain	Please enter the DNS search domain.			
	cisco.com			
NTP Servers	Please enter NTP server hostname. Multiple NTP servers can be provided space seperated.			
	cisco.com			
- Data Network	3 settings			
Data IPv4 Address	Please enter the VM's IPv4 data address.			
	10.			
Data IPv4 Gateway	Please enter the VM's IPv4 data gateway.			
	10.			

Customize tem plate

Customize the deployment properties of this software solution.

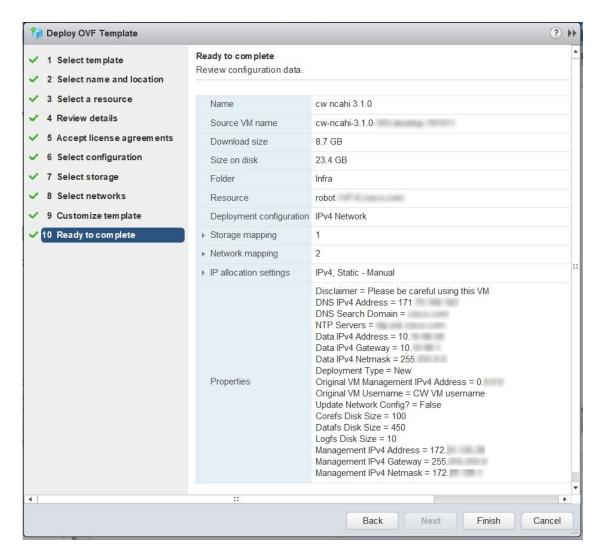
 Crosswork Configuration 	1 setting		
Disclaimer	Enter the legal disclaimer.		
	cisco		
 DNS and NTP Servers 	3 settings		
DNS IPv6 Address	Please enter the DNS server's IPv6 address. Multiple DNS server IPs can be provided space separated.		
	2001:		
DNS Search Domain	Please enter the DNS search domain.		
	cisco.com		
NTP Servers	Please enter NTP server hostname. Multiple NTP servers can be provided space seperated.		
	.cisco.com		
Data Network	3 settings		
Deployment Type	5 settings		
 Disk Configuration 	3 settings		
Management Network	3 settings		

Step 16

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.

All properties have valid	values Show next Collapse	all			
	10.10.200.200	1			
Data IPv4 Gateway	Please enter the VM's IPv4 data gateway.				
	10.10.00.1				
Data IPv4 Netmask	Please enter the VM's IPv4 data netmask.				
	200.200.0.0				
 Deployment Type 	5 settings				
 Disk Configuration 	3 settings	Π			
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.	1			
	450				
Logfs Disk Size	Please enter the size of the logfs disk in GB.				
	10				
Management Network	3 settings				

Step 17 Click Next to go to 10 - Ready to Complete, similar to the following figure (template name will depend on the version you are installing). Review your settings and then click Finish if you are ready to begin deployment.



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, similar to the following figure.

P -			
TaskName	1 🔺	Target	Status
Deploy OVF template		🗗 cw-	0% 😵
Import OVF package		172.	0% 😣

Step 19

- **9** 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, similar to the following figure.

etting St Summary	Monitor Configure Permissio Snapsh
• VM Hardware	
▶ 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	(Bristanti (Becometed)
Network adapter 2	
CD/DVD drive 1	Inconstat 🧈 O
▶ 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.

Note EFI boot needs to be manually set when using VMware vCenter Server 6.7 (Update 1).

Virtual Hardware	VM Options	SDRS Rules	vApp Options	
 General Options 		VM Name:	cw 0.110	
VMware Remote	e Console Opti	ons Lock the disconr	e guest operating system when the last remote user nects	
VMware Tools		E	Expand for VMware Tools settings	
 Power management 		E	Expand for power management settings	
 Boot Options 				
Firmware		Choose wi	hich firmware should be used to boot the virtual machine:	
		EFI	•	
			ging firmware might cause the installed guest operating m to become unbootable.	
Boot Delay		Whenever order for: 0		
Secure Boot		Secure	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			he virtual machine fails to find a boot device, automatically not after:	
Encryption		E	Expand for encryption settings	
Advanced		E	Expand for advanced settings	
Compatibility: ESXi	6.5 and later (/M version 13)	OK Cancel	

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

cw 📝 🛃		🚰 Actions 👻	=
Setting St Summary	Monitor Cor	🔁 Actions - cw	es Networks Update M
		Power	Power On
		Guest OS	Power Off
 VM Hardware 		Snapshots	Suspend
▶ CPU	16 CPU(s), 0 MH.	🛃 Open Console	Reset
Memory	98304 MB, 0 I	强 Migrate	Shut Down Guest OS
Hard disk 1	50.00 GB	Clone	 Restart Guest OS
Hard disk 2	156.00 GB	Template	•
Network adapter 1	-	Fault Tolerance	•
Network adapter 2		VM Policies	
CD/DVD drive 1	Decemental	Compatibility	•
▶ Video card	4.00 MB	Export System Logs	
Compatibility	ESXi 6.5 and late	Edit Resource Settings	

Figure 1: Power On

From this point, it will take 20 minutes for the Cisco Crosswork Network Automation VM to become operational. Please wait for the process to finish before continuing.

Install Cisco Crosswork Change Automation and Health Insights Via OVF Tool

Note

- Use vCenter UI to start the VM or the OVF tool command line.
- VMware OVF tool version 4.3 is required for this procedure.

Sample script for IPv4 deployment:

```
#!/bin/bash
# robot.ova path
ROBOT_OVA_PATH=<mention the orchestrator path>
# Download robot.ova
# Change the path to a convenient location for download
ova_path=<mention the ova path>
mkdir -p $ova_path
echo "Delete ova image if exists"
rm -rf $ova_path/*.ova
# Download robot.ova
cd $ova_path
echo "Downloading ova image"
wget -d --proxy=off -r -ll -H -tl -nd -N -np -A.ova -erobots=off ${ROBOT_OVA_PATH}
cd..
```

```
filename=`find $ova path -name \*.ova`
# This deployment is for IPv4.
Deployment="cw ipv4"
DM="thin"
corefs="100"
datafs="450"
logfs="10"
VM NAME=<mention the VM name>
ManagementIPv4Address=<Management IPv4 Address>
ManagementIPv4Netmask=<Management IPv4 Netmask>
ManagementIPv4Gateway=<Management IPv4 Gateway>
RouterIPv4Address=<Router IPv4 Address>
RouterIPv4Netmask=<Router IPv4 Netmask>
RouterIPv4Gateway=<Router IPv4 Gateway>
DNSv4=<DNS>
NTP=<NTP>
Domain=<Domain Name>
Disclaimer=<add a relevant disclaimer>
# Please replace this information according to your vcenter setup
VCENTER LOGIN=<vCenter login details>
VCENTER PATH=<vCenter path>
DS=<DS details>
ovftool --acceptAllEulas --skipManifestCheck --X:injectOvfEnv -ds=$DS --diskMode=$DM \
--overwrite --powerOffTarget --powerOn --noSSLVerify \
--allowExtraConfig \
--name="$VM NAME"
--net:"Data Network=Change Me" \
--deploymentOption="${Deployment}" \
--prop: "ManagementIPv4Address=${ManagementIPv4Address}" \
--prop:"ManagementIPv4Netmask=${ManagementIPv4Netmask}" \
--prop:"ManagementIPv4Gateway=${ManagementIPv4Gateway}" \
--prop:"DataIPv4Address=${RouterIPv4Address}" \
--prop:"DataIPv4Netmask=${RouterIPv4Netmask}" \
--prop:"DataIPv4Gateway=${RouterIPv4Gateway}" \
--prop:"DNSv4=${DNSv4}" \
--net: "Management Network=VM Network" \
--prop:"NTP=${NTP}" \
--prop:"Domain=${Domain}" \
--prop:corefs=${corefs} \
--prop:ddatafs=${datafs} \
--prop:logfs=${logfs} \
--prop:"Disclaimer=${Disclaimer}" \
--sourceType=OVA \
"$filename" \
vi://$VCENTER LOGIN/$VCENTER PATH
```

Sample script for IPv6 deployment:

```
#!/bin/bash
```

```
# robot.ova path
ROBOT OVA PATH=<mention the orchestrator path>
```

```
# Download robot.ova
# Change the path to a convenient location for download
ova_path=<mention the ova path>
```

```
mkdir -p $ova path
echo "Delete ova image if exists"
rm -rf $ova path/*.ova
# Download robot.ova
cd $ova path
echo "Downloading ova image"
wget -d --proxy=off -r -l1 -H -t1 -nd -N -np -A.ova -erobots=off ${ROBOT OVA PATH}
cd..
filename=`find $ova path -name \*.ova`
# This deployment is for IPv6.
Deployment="cw ipv6"
DM="thin"
corefs="100"
datafs="450"
logfs="10"
VM NAME=<mention the VM name>
ManagementIPv6Address=<Management IPv6 Address>
ManagementIPv6Netmask=<Management IPv6 Netmask>
ManagementIPv6Gateway=<Management IPv6 Gateway>
RouterIPv6Address=<Router IPv6 Address>
RouterIPv6Netmask=<Router IPv6 Netmask>
RouterIPv6Gateway=<Router IPv6 Gateway>
DNSv6=<DNS>
NTP=<NTP>
Domain=<Domain Name>
Disclaimer=<add a relevant disclaimer>
# Please replace this information according to your vcenter setup
VCENTER LOGIN=<vCenter login details>
VCENTER PATH=<vCenter path>
DS=<DS details>
ovftool --acceptAllEulas --skipManifestCheck --X:injectOvfEnv -ds=$DS --diskMode=$DM \
--overwrite --powerOffTarget --powerOn --noSSLVerify \
--allowExtraConfig \
--name="$VM NAME"
--net:"Data Network=Change Me" \
--deploymentOption="${Deployment}" \
--prop: "ManagementIPv6Address=${ManagementIPv6Address}" \
--prop:"ManagementIPv6Netmask=${ManagementIPv6Netmask}" \
--prop:"ManagementIPv6Gateway=${ManagementIPv6Gateway}" \
--prop:"DataIPv6Address=${RouterIPv6Address}" \
--prop:"DataIPv6Netmask=${RouterIPv6Netmask}" \
--prop:"DataIPv6Gateway=${RouterIPv6Gateway}" \
--prop:"DNSv6=${DNSv6}" \
--net: "Management Network=VM Network" \
--prop:"NTP=${NTP}" \
--prop:"Domain=${Domain}" \
--prop:corefs=${corefs} \
--prop:ddatafs=${datafs} \
--prop:logfs=${logfs} \
--prop:"Disclaimer=${Disclaimer}" \
--sourceType=OVA \
"$filename" \
vi://$VCENTER LOGIN/$VCENTER PATH
```

Verify the VM Configuration

Before trying to log in to the new installation, verify that the VM is properly configured. You will be prompted to change the VM administrator's password during first login via the console.

- **Step 1** After Cisco Crosswork Change Automation and Health Insights VM is powered on, launch the console. You will see one of the following prompts:
 - A message prompt informing you that the Cisco Crosswork Change Automation and Health Insights VM is being configured. Please wait until the message disappears before attempting to login.
 - A password prompt. Go to step 2.
 - A banner with directions to check the firstBoot.log. Go to step 3.
 - Note If you do not get any prompts, please contact the Cisco Customer Experience team.
- **Step 2** In the password prompt, enter the default cw-admin user password, **cw-admin**. When prompted to change the cw-admin user's password, enter the default password again for verification. Then enter and confirm the new password as prompted.

To verify the IP addresses provided during installation, you can check the firstBoot.log file. If you find any discrepancy and want to investigate further, refer to Troubleshoot the Installation, on page 21.

- **Step 3** If you see instructions to check firstBoot.log, use the command sudo cat /var/log/firstBooot.log to view the log file. After you have identified the error, perform the following:
 - a) Power off the Cisco Crosswork Change Automation and Health Insights VM.
 - b) Delete the Cisco Crosswork Change Automation and Health Insights VM from the disk.
 - c) Repeat the installation procedure, while rectifying the error(s) that prevented the installation from completing.
 - d) Launch the console (go to step 1).

Log In to the UI From a Browser

To log in to the Cisco Crosswork Change Automation and Health Insights web-based user interface from a browser, perform these steps. If you are unable to display the user interface, see Troubleshoot the Installation, on page 21.

- **Step 1** Launch one of the supported browsers (see Supported Web Browsers).
- **Step 2** In the browser's address bar, enter:

https://<Crosswork_VM_management_IP_adddress>:30603/

The Log In window opens, as shown in the following figure.

Figure 2: Cisco Crosswork Network Change Automation and Health Insights Log In Window

cisco

Crosswork Network Automation

Username		
Password		
	Log In	

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When you access Cisco Crosswork Change Automation and Health Insights for the first time, some browsers display a warning that the site is untrusted. When this happens, follow the prompts to add a security exception and download the self-signed certificate from the Cisco Crosswork Change Automation and Health Insights server. After you add a security exception, the browser accepts the server as a trusted site in all future login attempts. If you want to use a CA signed certificate, see the "Manage Certificates" section in the *Cisco Crosswork Optimization Engine User Guide*.

Step 3 Log into Cisco Crosswork Change Automation and Health Insights as follows:

- a) Enter the Cisco Crosswork Network Automation administrator username admin and the default password admin.
- b) Click Log In.
- c) When prompted to change the Cisco Crosswork Network Automation administrator's default password, enter the new password in the fields provided and then click **OK**.

Step 4 To exit the web GUI, close the browser window or click **O** at the top right of the home page and choose **Log out**.

Troubleshoot the Installation

The following table lists common problems experienced while installing Cisco Crosswork Change Automation and Health Insights, and approaches to identifying the source of the problem and solving it.

Note

You need to login as a super user to perform the troubleshooting.

Table 1: Troubleshoot the Installation			
Issue	Action		
Cannot Connect to the VM			

Issue	Action
VM cannot be reached by the provided gateways due to IP misconfiguration	1. You will see error messages in the login banner indicating this problem when you try to connect to the VM via SSH following the steps in as explained in Verify the VM Configuration, on page 20.
	2. Redeploy the VM from scratch, using the correct IP configuration.
Configure NTP after installation	
User wants to configure NTP after the VM deployment, in the scenario of giving the wrong NTP address, or the server being down.	<pre>1. You need to edit the /etc/chrony/chrony.conf file. Add the pool line at the bottom of the file with relevant NTP server details. keyfile /etc/chrony/chrony.keys driftfile /var/lib/chrony/chrony.drift logdir /var/log/chrony maxupdateskew 100.0 rtcsync makestep 1 -1 pool <ntp address=""> iburst maxsources 1 2. Restart the chronyd service (systemctl restart chronyd).</ntp></pre>
	3. Please verify that the NTP server has been configured (chronyc sources).
Cannot Display the User Interface	
Browser does not display the login screen.	1. Make sure you are using a supported browser (see Supported Web Browsers and that you entered the correct IP address in the browser (this should be the same as the management IP4 address you entered during installation).
	2. Log in to the VM using SSH, as explained in Verify the VM Configuration, on page 20.
	3. At the prompt, enter the command collect . This generates a file.
	4. Open a ticket with the Cisco Customer Experience team and attach the file to the ticket.
Unable to resolve other network addresses on the local network.	 While connected to the VM, open the file /etc/resolv.conf file and check that it contains the correct DNS name server and search domain. If it does not, redeploy the VM using the correct DNS name server and search domain configuration.

Issue	Action		
Running kubectl get nodes does not display the correct VM management IP address.	1. While connected to the VM, open the file /etc/hosts file and check if the IP address assigned to the VM is correct.		
	2. If the address is wrong, redeploy the VM using the correct management IP address.		
Running kubectl get nodes does not display a Ready status for the VM IPv4 address.	1. While connected to the VM, check the login banner for any error messages.		
	2. If there are error messages in the login banner, they will be recorded in /var/log/firstBoot.log file, along with recommended remediation steps. Open the log and follow the steps given for the error message found in the banner.		
	3. If this does not help, run kubectl get pods namespace kube-system and look for mismatched Ready counts.		
Running kubectl get podsnamespace kube-system displays one or more system containers that are not in Running status.	1. Check for user input errors in the /var/log/boot.log file and perform the log's recommended remediation steps.		
	2. If this does not help, please contact the Cisco Customer Experience team.		
Running kubectl get pods displays one or more system containers that are not launched properly.	Please contact the Cisco Customer Experience team.		
Able to Display the User Interface			
I cannot log in.	1. Make sure you are using the Crosswork administrator default user ID and password (admin and admin).		
	2. If the Crosswork administrator default password has already been changed, use the new password.		
I can log in but cannot access some features.	Make sure all the applications and their underlying services are up and running by selecting Admin > Crosswork Manager and checking the status of the applications and services. See the <i>Cisco Crosswork</i> <i>Change Automation and Health Insights User Guide</i> topic "Monitor Cisco Crosswork Infrastructure and Resources".		

Issue	Action
Crosswork Manager shows one or more applications or their underlying services are not running.	 In Crosswork Manager, check the description of the application or service issue and, if possible, try restarting the application or service. See the <i>Cisco</i> <i>Crosswork Change Automation and Health Insights</i> <i>User Guide</i> topic "Monitor Cisco Crosswork Infrastructure and Resources". Gather log and metric information about the application or service with issues. See the <i>User Guide</i> topic "View, Control and Log Cisco Crosswork Applications and Services". Contact Cisco Customer Experience team.

Install Cisco Crosswork Data Gateway

Cisco Crosswork Data Gateway is initially deployed as just a basic VM called Base VM (containing only enough software to register itself with Crosswork).

Before installing Cisco Crosswork Data Gateway, it helpful to be familiar with Cisco Crosswork Data Gateway OVF Parameters and Deployment Scenarios, on page 24.

You can use either of the following two ways to install Cisco Crosswork Data Gateway:

- Install Cisco Crosswork Data Gateway Via vCenter, on page 32
- Install Cisco Crosswork Data Gateway Via OVF Tool, on page 42

Cisco Crosswork Data Gateway OVF Parameters and Deployment Scenarios

Before you begin installing Cisco Crosswork Data Gateway, we recommend you read about OVF parameters and possible deployment scenarios.



Note Mandatory parameters are denoted by an ^{*}. Others are optional. You might choose them based on the kind of deployment scenario you require. Deployment scenarios are explained wherever applicable.

OVF Parameter	Description	Deployment Scenario
Host Information		

OVF Parameter	Description	Deployment Scenario	
Hostname*	Hostname of the server specified as a fully qualified domain name (FQDN).		
	Note Even though the DNS enforces uniqueness of the hostname, it's recommended that hostnames be unique unique for better management in Crosswork UI.		
Description*	User-friendly description to be displayed in the controller i.e., Crosswork.		
	Note This need not be unique.		
Label	Label used by Crosswork to categorize and group multiple Cisco Crosswork Data Gateway instances.		
	Note This need not be unique.		
Private Key URI	SCP URI to private key file for session key signing. You can retrieve this using SCP (user@host:path/to/file).	Crosswork uses self-signed certificates for handshake with Cisco Crosswork Data Gateway. These certificates are generated upon installation. However, if you want to use third-party or your own certificat files, then you must input these three parameters.	
Certificate File URI	SCP URI to PEM formatted signing certificate chain for this VM. You can retrieve this using SCP (user@host:path/to/file).		
Certificate File and Key Passphrase	SCP user passphrase to retrieve the Cisco Crosswork Data Gateway PEM formatted certificate file and private key.		
Passphrases			
dg-admin Password [*]	Password of the dg-admin user.		
dg-oper Password [*]	Password of the dg-oper user.		
¹ Management IPv4 Address			

OVF Parameter Description		Deployment Scenario		
Management IPv4 Method*	How the management interface gets its IPv4 address.	You must select Static as selecting None will result in a non-functional deployment.		
Management IPv4 Address	IPv4 address of the management interface.			
Management IPv4 Netmask	IPv4 netmask of the management interface in dotted quad format.			
Management IPv4 Gateway	IPv4 address of the management gateway.			
¹ Management IPv6 Address				
Management IPv6 Method*	How the Management interface gets its IPv6 address.	You must select Static as selecting None will result in a non-functional deployment.		
Management IPv6 Address	IPv6 address of the management interface.			
Management IPv6 Netmask	IPv6 prefix of the management interface.			
Management IPv6 Gateway	IPv6 address of the management gateway.			
¹ Southbound Data IPv4 Address	\$			
Southbound Data IPv4 Method*	How the southbound data interface gets its IPv4 address.	You must select Static as selecting None will result in a non-functional deployment.		
Southbound Data IPv4 Address	IPv4 address of the southbound data interface.			
Southbound Data IPv4 Netmask	IPv4 netmask of the southbound data interface in dotted quad format.			
Southbound Data IPv4 Gateway	IPv4 address of the southbound Cisco Crosswork Data Gateway.			
¹ Southbound Data IPv6 Address	5	1		
Southbound Data IPv6 Method*	How the southbound data interface gets its IPv6 address.	You must select Static as selecting None will result in a non-functional deployment.		
Southbound Data IPv6 Address	IPv6 address of the southbound data interface.			

OVF Parameter	Description	Deployment Scenario
Southbound Data IPv6 Netmask	IPv6 netmask of the southbound data interface in dotted quad format.	
Southbound Data IPv6 Gateway	IPv6 address of the southbound data gateway.	
¹ Northbound Data IPv4 Addres	S	
Northbound Data IPv4 Method [*]	How the Northbound data interface gets its IPv4 address.	You must select Static as selecting None will result in a non-functional deployment.
Northbound Data IPv4 Address	IPv4 address of the Northbound data interface.	
Northbound Data IPv4 Netmask	IPv4 netmask of the Northbound data interface in dotted quad format.	
Northbound Data IPv4 Gateway	IPv4 address of the Northbound data gateway.	
¹ Northbound Data IPv6 Addres	s	
Northbound Data IPv6 Method*	How the Northbound data interface gets its IPv6 address.	You must select Static as selecting None will result in a non-functional deployment.
Northbound Data IPv6 Address	IPv6 address of the Northbound data interface.	
Northbound Data IPv6 Netmask	IPv6 netmask of the Northbound data interface in dotted quad format.	
Northbound Data IPv6 Gateway	IPv6 address of the Northbound data gateway.	
DNS, NTP, and SCP		
DNS Address*	Space-delimited list of IPv4/IPv6 addresses of the DNS server accesible from the management interface.	
DNS Search Domain*	DNS search domain	

· ·	tion	Dehioai	nent Scenario
addresse servers a	es or hostnames of the NTP accessible from the	You must enter a value here, suc as pool.ntp.org. NTP server is important for time synchronizatio between Cisco Crosswork Data Gateway VM and Cisco Crosswor Change Automation and Health Insights. Using a non-functional dummy address may cause issue when Crosswork and Cisco Crosswork Data Gateway try to communicate with each other. If you are not using an NTP server, ensure that time gap between Cisco Crosswork Data Gateway and Cisco Crosswork Data Gateway and Cisco Crosswork Data Gateway and Cisco Crosswork Change Automation an Health Insights is not more than 1 minutes. Else, Cisco Crosswork Data Gateway will fail to pull	
server a	ccessible from the	If you want to use an external syslog server, you must specify these 7 settings.	
Note	If you are using an IPv6 addres, it must be surrounded by square brackets ([1::1]).	Note	If you have configured an external syslog server, the service (CLI/MDT/SNMP) events are sent to that
Port nur	nber of the syslog server.		external syslog server.
			Otherwise, they are logged in /optdg/log in Cisco Crosswork
Use TLS	S to encrypt syslog traffic.		Data Gateway VM.
as enter Subject	ed in the server certificate AltName or subject		
Passwoi	d of SCP user to retrieve		
	addresse servers a manager IPv4 or server a manager Note Port nur Use UD sending Use TLS Syslog s as entere Subject common PEM for	addres, it must be surrounded by square	addresses or hostnames of the NTP servers accessible from the management interface.as pool. importa betweer Gatewar Change Insights dummy when C Crosswar communy you are ensure t Crosswar crosswar Crosswar Syslog stretificeIPv4 or IPv6 address of a syslog server accessible from the management interface.If you w syslog st these 7 is NoteIPv4 or IPv6 address of a syslog surrounded by square brackets ([1::1]).If you w syslog server.Vse UDP, TCP, or RELP when sending syslog.Use TLS to encrypt syslog traffic.Syslog server's hostname exactly as entered in the server certificate<

OVF Parameter	Description	Deployment Scenario
Controller IP*	IP address of the Crosswork controller i.e., Cisco Crosswork Change Automation and Health Insights.	
	Note If you are using an IPv6 addres, it must be surrounded by square brackets ([1::1]).	
Controller Port [*]	Port of the Crosswork controller i.e., Cisco Crosswork Change Automation and Health Insights.	
Controller Signing Certificate File URI	PEM formatted root cert of Cisco Crosswork Change Automation and Health Insights to validate signing certs retrived using SCP. PEM file is generated by Crosswork and is available at the following location: cw-admin@ <crosswork_vm_ Management_IP_Address> :/home/cw-admin/controller.pem</crosswork_vm_ 	
	Note Theoretically, it can be placed on any host where the SCP server is running but best practive is uploading from Crosswork, directly.	
SSL/TLS Certificate File URI	Crosswork controller PEM formatted SSL/TLS certificate file retrieved using SCP.	
Controller Certificate File Passphrase	Password of SCP user to retrieve Cisco Crosswork Change Automation and Health Insights certificate chain.	

OVF Parameter	Description	Deployment Scenario	
Proxy Server URL	URL of management network proxy server.	If you want to use a proxy serve you must specify these paramete	
Proxy Server Bypass List	Space-delimited list of subnets and domains that will not be sent to the proxy server.		
Authenticated Proxy Username	Username for authenticated proxy servers.		
Authenticated Proxy Passphrase	Passphrase for authenticated proxy servers.		
HTTPS Proxy SSL/TLS Certificate File URI	HTTPS proxy PEM formatted SSL/TLS certificate file retrieved using SCP.		
HTTPS Proxy SSL/TLS Certificate File passphrase	Password of SCP user to retrieve proxy certificate chain.		
Auto Enrollment Package	1	1	

OVF Parameter	Description	Deployment Scenario
Enrollment Destination Host and Path	SCP host and path to transfer the enrollment package using SCP (user@host:/path/to/file).	Although required for the Cisco Crosswork Data Gateway enrollment with Crosswork, this step is optional here and can be run
Enrollment Passphrase	SCP user passphrase to transfer enrollment package.	directly from the Cisco Crosswork Data Gateway's interactive menu at a later time, but anyway before the enrollment takes place.
		Specifying these parameters will cause the enrollment package to be transferred when the Cisco Crosswork Data Gateway boots up for the first time.
		If you do not specify these parameters during installation, then you must export enrollment package manually following the procedure Export Enrollment Package, on page 47.
		Note • Even if you are specifying these parameters here, you must perform Step Step 5, on page 49 o Task: Export Enrollment Package on page 47.
		• The host must run SCP server. If no alternative SCP server is available, then Crosswork can be used. An example UH is given below:
		cw-admin@ <crosswork_m Management_IP_ Address> :/home/cw-admin</crosswork_m

¹Either an IPv4 or IPv6 address must be specified. Selecting None for both will result in a non-functional deployment.

Install Cisco Crosswork Data Gateway Via vCenter

Before you begin

Ensure that

- You are creating the Cisco Crosswork Data Gateway VM on a recommended VMware version (See Virtual Machine (VM) Requirements for supported versions). To know which vCenter build you have, check on the vSphere web client under **Help** menu.
- The Cisco Crosswork Data Gateway VM has allocated to it a minimum of 32 GB of RAM, 8 vCPUs, and 50 GB of hard drive space.
- You have a public/private IPv4/IPv6 address to assign to the Cisco Crosswork Data Gateway VM's management network virtual interface. The DNS servers, NTP servers, and the Crosswork application must be reachable via this IP address.
- You have two public or private IPv4/IPv6 addresses to assign to the Cisco Crosswork Data Gateway VM's Northbound and Southbound data network virtual interfaces. Your managed devices must be reachable via the Southbound data network interface and your output destinations (either Crosswork, external Kafka, or gRPC server) must be reachable via the Northbound data network interface.

During installation, Cisco Crosswork Data Gateway creates two default accounts:

- 1. A Cisco Crosswork Data Gateway administrator, with the username dg-admin and password set during installation. The product administrator uses this ID to log in to and troubleshoot the Cisco Crosswork Data Gateway.
- 2. A Cisco Crosswork Data Gateway operator, with the username dg-oper and password set during installation. This is a read-only user and has permissions to perform all 'read' operations and some limited 'action' commands. To know what operations can an operator perform, see *Table 20 Permissions Per Role* in the *Cisco Crosswork Change Automation and Health Insights 3.1 User Guide 1.1 User Guide*.



Note These two pre-defined usernames are reserved and cannot be changed.

Change of password would be allowed from the console for both the accounts.

In case of lost or forgotten passwords, the user would have to create a new VM, destroy the current VM, and re-enroll the new one on the Cisco Crosswork Change Automation and Health Insights.

Step 1 Download the latest available Cisco Crosswork Data Gateway image file from CCO (*.ova).

Warning The default VMware vCenter deployment timeout is 15 minutes. If the time taken to fill the OVF template exceeds 15 minutes, vCenter times out and you will have to start over again. To prevent this, Cisco recommends that you set the vCenter deployment timeout to a much longer period (such as one hour). Refer your vCenter guide.

Step 2 Connect to vCenter vSphere Client. Then select **Actions > Deploy OVF Template**, as shown in the following figure:

vm vSphere Client	Menu 🗸 🛛 Q Search in all e	environments		9
□ □ ○ ✓ □ □ ✓ □ □ ✓ □ □ ✓ □ □ ✓ □ □ ✓ □ □ ✓ □ □ ✓ □ □ ✓ □ □ ✓ □ □	IT2.20.98.77 Summary Monitor Cor Model: Processor Ty Logical Proce NiCs: Virtual Machi State: Uptime:	 New Virtual Machine Deploy OVF Template New Resource Pool New vApp 	•	74 GHz 17 GHz .03 GB .89 GB 3.85 TB 4.35 TB
	4	Settings		
Recent Tasks Alarms		Move To	-	1

Step 3 The VMware **Deploy OVF Template** wizard appears and highlights the first step, **1 Select template**, as shown in the following figure.

🍞 Deploy OVF Template	(?)))
1 Select template	Select template	
2 Select name and location	Select an OVF template.	
3 Select a resource	Enter a URL to download and install the OVF package from the Internet, or browse to a location accessible from your computer,	
4 Review details	such as a local hard drive, a network share, or a CD/DVD drive.	
5 Select storage	• URL	
6 Ready to complete	· · · · · · · · · · · · · · · · · · ·)
	 Local file Browse ▲ Use multiple selection to select all the files associated with an OVF template (.ovf, .vmdk, etc.) 	
	Back Next Finish Cance	

- a) Click Browse to navigate to the location where you downloaded the OVA image file and select it.
 Once selected, the filename is displayed in the window.
- **Step 4** Click Next to go to 2 Select name and location, as shown in the following figure.
 - a) Enter a name for the Cisco Crosswork Data Gateway VM you are creating.
 - b) In the **Select a location for the virtual machine** list, choose the datacenter under which the Cisco Crosswork Data Gateway VM will reside.

Deploy OVF Template		(
1 Select template 2 Select name and location	Select name and location Enter a name for the OVF and select a deployment	location.
3 Select a resource 4 Review details 5 Select storage 6 Ready to complete	Name dg	
	Select a datacenter or folder.	

Step 5 Click Next to go to 3 Select a resource, as shown in the following figure. Choose the VM's host.

8	Deploy OVF Template		?₩
> >		Select a resource Select where to run the deployed template.	
	 3 Select a resource 4 Review details 5 Select storage 6 Ready to complete 	Filter Browse Select a host or cluster or resource pool or vapp. DS6x5U2 Image: Cluster of the select of t	
		Back Next Finish	Cancel

Step 6 Click Next. The VMware vCenter Server validates the OVA. Network speed will determine how long validation takes. When the validation is complete, the wizard moves to **4 Review details**, as shown in the following figure. Review the OVA's information and then click Next.

Take a moment to review the OVF template you are deploying.

Note This information is gathered from the OVF and cannot be modified.

Select template Select name and location	Review details Verify the template det	ails.			
Select a resource Review details	The OVF package contains advanced configuration options, which might pose a security risk. Review the advanced configuration options below. Click next to accept the advanced configuration options.				
Accept license agreements	Product	Cisco Crosswork Data Gateway			
Select configuration	Version	1.1			
Select storage	Vendor	Cisco Systems, Inc.			
Select networks	Publisher	⑦ No certificate present			
Customize template	Download size	1.4 MB			
Ready to complete	Size on disk	47.7 MB (thin provisioned) 50.0 GB (thick provisioned)			
	Description	Cisco Crosswork Data Gateway			
	Extra configuration	uefi.secureBoot.enabled = true firmware = efi			

Step 7 Click Next to go to 5 accept license agreements. Review the End User License Agreement and click Accept.

8	Deploy OVF Template		(?) >>
× ×	1 Select template 2 Select name and location	Accept license agreements Read and accept the license agreements associated with this template before continuing.	
`	3 Select a resource	Pad Hard Survey American	
`	4 Review details	End User License Agreement	
	5 Accept license agreements	I agree to the Cisco Systems, Inc. End user License Agreement. The text in multiple languages may be found here: https://www.cisco.com/c/en/us/about/legal/cloud-and-software/software-terms.html	
	6 Select configuration		
	7 Select storage		
	8 Select networks		
	9 Customize template		
	10 Ready to complete		
		Accept	
		Back Next Finish Ca	ancel

Step 8Click Next to go to 6 Select configuration, as shown in the following figure. To install Cisco Crosswork Data Gateway
for Cisco Crosswork Change Automation and Health Insights, you must select Crosswork On Premise from the
Configuration dropdown.

🍞 Deploy OVF Template						
 1 Select template 	Select configuration Select a deploymen Configuration: Description:					••
			Back	Next	Finish	Cancel

- **Step 9** Click Next to go to 7 Select storage, as shown in the following figure.
 - a) Cisco recommends that you select **Thick provision lazy zeroed** from the **Select virtual disk format** drop-down list.
 - b) From the **Datastores** table, choose the datastore you want to use and review its properties to ensure there is enough available storage.

7 Deploy OVF Template							
 1 Select template 2 Select name and location 	Select storage Select location to store the files for the deployed template.						
 2 Solect name and obtained 3 Select a resource 4 Review details 5 Accept license agreements 6 Select configuration 7 Select storage 8 Select networks 9 Customize template 10 Ready to complete 	Filter	Thick provision lazy zeroed None Storage DRS clusters Clusters Status Normal	VM storage policy VM Encryption P	Capacity 1.81 TB	Free 812.62 GB		
	< M		Back		nish Cancel		

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 **Management Network**, **Northbound Data Network**, and **Southbound Data Network** respectively.

🎲 Deploy OVF Template				(?) H
 1 Select template 2 Select name and location 	Select networks Select a destination network for each source network.			
 3 Select a resource 	Source Network	Destination Network		
4 Review details	Source Network	E2-L3-VLAN-1		•
 5 Accept license agreements 	NorthData	E2-L3-VLAN-2		•
✓ 6 Select configuration	Management	E2-VLAN-Primary		•
✓ 7 Select storage				
8 Select networks	1			
9 Customize template				
10 Ready to complete				
	Description - Management			
	Network for management plane traffic connected to eth0			
	IP Allocation Settings			
	IP protocol: IPv4	IP allocation: Static - Manual		
			Back Next Finish	Cancel
			Next Finish	Cancel

- **Step 11** Click Next to go to 9 Customize template, with the Host Information Settings already expanded. As per the deployment scenario chosen by you in Section: Cisco Crosswork Data Gateway OVF Parameters and Deployment Scenarios, on page 24, enter the information for the parameters:
 - Certificate chains override any preset or generated certificates in the VM and are given as an SCP URI (user:host:/path/to/file).

a) Host Information

- Hostname: Hostname of the server specified as a fully qualified domain name (FQDN).
- **Note** Even though the DNS enforces uniqueness of the hostname, it's recommended that hostnames be unique unique for better management in Crosswork UI.
- Description: User-friendly description to be displayed in the controller i.e., Crosswork.
- **Note** This need not be unique.
- Label: Label used by Crosswork to categorize and group multiple Cisco Crosswork Data Gateway instances.
- Note This need not be unique.
- Private Key URI: SCP URI to private key file for session key signing. You can retrieve this using SCP (user@host:path/to/file).

- Certificate File URI: SCP URI to PEM formatted signing certificate chain for this VM. You can retrieve this using SCP (user@host:path/to/file).
- Certificate File and Key Passphrase: SCP user passphrase to retrieve the Cisco Crosswork Data Gateway PEM formatted certificate file and private key.

b) Passphrases

- dg-admin Password: Password of the dg-admin user.
- dg-oper Password: Password of the dg-oper user.

c) Management IPv4 Address

- Management IPv4 Method: How the Management interface gets its IPv4 address.
- Note You must select Static as selecting None will result in a non-functional deployment.
- Management IPv4 Address: IPv4 address of the Management interface.
- Management IPv4 Netmask: IPv4 netmask of the Management interface in dotted quad format.
- Management IPv4 Gateway: IPv4 address of the Management gateway.

d) Management IPv6 Address

• Management IPv6 Method: How the Management interface gets its IPv6 address.

Note You must select Static as selecting None will result in a non-functional deployment.

- Management IPv6 Address: IPv6 address of the Management interface.
- Management IPv6 Netmask: IPv6 netmask of the Management interface in dotted quad format.
- Management IPv6 Gateway: IPv6 address of the Management gateway.

e) Southbound Data IPv4 Address

- Southbound Data IPv4 Method: How the Southbound data interface gets its IPv4 address.
- **Note** You must select **Static** as selecting **None** will result in a non-functional deployment.
- Southbound Data IPv4 Address: IPv4 address of the Southbound data interface.
- Southbound Data IPv4 Netmask: IPv4 netmask of the Southbound data interface in dotted quad format.
- Southbound Data IPv4 Gateway: IPv4 address of the Southbound data gateway.

f) Southbound Data IPv6 Address

• Southbound Data IPv6 Method: How the Southbound data interface gets its IPv6 address.

Note You must select Static as selecting None will result in a non-functional deployment.

- Southbound Data IPv6 Address: IPv6 address of the Southbound data interface.
- Southbound Data IPv6 Netmask: IPv6 netmask of the Southbound data interface in dotted quad format.

• Southbound Data IPv6 Gateway: IPv6 address of the Southbound data gateway.

g) Northbound Data IPv4 Address

- Northbound Data IPv4 Method: How the Northbound data interface gets its IPv4 address.
 - Note You must select Static as selecting None will result in a non-functional deployment.
- Northbound Data IPv4 Address: IPv4 address of the Northbound data interface.
- Northbound Data IPv4 Netmask: IPv4 netmask of the Northbound data interface in dotted quad format.
- Northbound Data IPv4 Gateway: IPv4 address of the Northbound data gateway.

h) Northbound Data IPv6 Address

- Northbound Data IPv6 Method: How the Northbound data interface gets its IPv6 address.
- Note You must select Static as selecting None will result in a non-functional deployment.
- Northbound Data IPv6 Address: IPv6 address of the Northbound data interface.
- Northbound Data IPv6 Netmask: IPv6 netmask of the Northbound data interface in dotted quad format.
- Northbound Data IPv6 Gateway: IPv6 address of the Northbound data gateway.

i) DNS, NTP, and SCP

- DNS Address: Space-delimited list of IPv4/IPv6 addresses of the DNS server accesible from the management interface.
- DNS Search Domain: DNS search domain
- NTP Servers: Space-delimited list of IPv4/IPv6 addresses or hostnames of the NTP servers accessible from the management interface.
 - Note You must enter a value here, such as pool.ntp.org. NTP server is important for time synchronization between Cisco Crosswork Data Gateway VM and Cisco Crosswork Change Automation and Health Insights. Using a non-functional or dummy address may cause issues when Crosswork and Cisco Crosswork Data Gateway try to communicate with each other. If you are not using an NTP server, ensure that time gap between Cisco Crosswork Data Gateway and Cisco Crosswork Change Automation and Health Insights is not more than 10 minutes. Else, Cisco Crosswork Data Gateway will fail to pull images.

j) Syslog Servers

- Server Address: IPv4 or IPv6 address of a syslog server accessible from the management interface.
- **Note** If you are using an IPv6 addres, it must be surrounded by square brackets ([1::1]).
- Syslog Port: Port number of the syslog server.
- Syslog Protocol: Use UDP, TCP, or RELP when sending syslog.
- Use Syslog over TLS?: Use TLS to encrypt syslog traffic.

- TLS Peer Name: Syslog server's hostname exactly as entered in the server certificate SubjectAltName or subject common name.
- Syslog Root Certificate File URI: PEM formatted root cert of syslog server retrieved using SCP.
- Syslog Certificate File Passphrase: Password of SCP user to retrieve Syslog certificate chain.

k) Controller Settings

- Controller IP: IP address of the Crosswork controller i.e., Cisco Crosswork Change Automation and Health Insights.
- Note If you are using an IPv6 addres, it must be surrounded by square brackets ([1::1]).
- Controller Port: Port of the Crosswork controller i.e., Cisco Crosswork Change Automation and Health Insights.
- Controller Signing Certificate File URI: PEM formatted root cert of Cisco Crosswork Change Automation and Health Insights to validate signing certs retrived using SCP. PEM file is generated by Crosswork and is available at the following location:

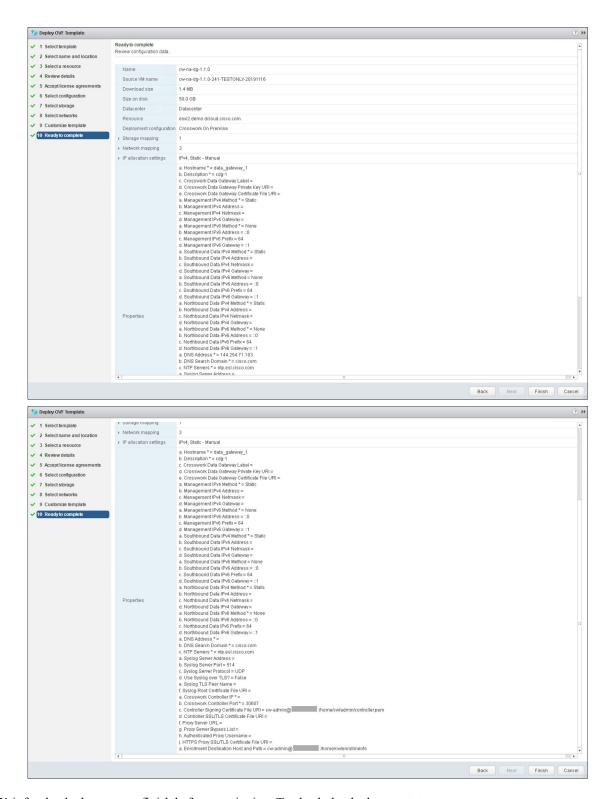
cw-admin@<Crosswork VM Management IP Address> :/home/cw-admin/controller.pem

- SSL/TLS Certificate File URI: Crosswork controller PEM formatted SSL/TLS certificate file retrieved using SCP.
- Controller Certificate File Passphrase: Password of SCP user to retrieve Cisco Crosswork Change Automation and Health Insights certificate chain.
- Proxy Server URL: URL of management network proxy server.
- Proxy Server Bypass List: Space-delimited list of subnets and domains that will not be sent to the proxy server.
- Authenticated Proxy Username: Username for authenticated proxy servers.
- Authenticated Proxy Passphrase: Passphrase for authenticated proxy servers.
- HTTPS Proxy SSL/TLS Certificate File URI: HTTPS proxy PEM formatted SSL/TLS certificate file retrieved using SCP.
- HTTPS Proxy SSL/TLS Certificate File passphrase: Password of SCP user to retrieve proxy certificate chain.

1) Auto Enrollment Package

- Enrollment Passphrase: SCP user passphrase to transfer enrollment package.
- Enrollment Destination Host and Path: SCP host and path to transfer the enrollment package using SCP (user@host:/path/to/file).
- **Step 12** 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.

L





- **3** Wait for the deployment to finish before continuing. To check the deployment status:
 - a) Open the vCenter vSphere 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 🛛 👻	Target	Start Time	Server	`
Import OVF package	robot-	0/29/2018, 12:28:57 P	xbot-vcenter2.	.com
Deploy OVF template	[]m	10/29/2018, 12:31:43 PM	bot-vcenter2.	com

Wait for the deployment status to become 100%.

- **Note** If you are deploying Cisco Crosswork Data Gateway on VCenter 6.7U1 and above, you also need to set boot option to EFI before powering on the VM. Follow these steps:
 - a. On the host VM Summary tab, below the VM Hardware table, click Edit Settings.
 - 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.

You can now proceed to power on the VM.

Step 14 Once the deployment status is 100%, power on the VM to complete the deployment process. Expand the host's entry so you can click the VM and then choose **Actions** > **Power On**, as shown in the following figure:

cdg-vm-137	🗗 Actions - cw-vm-137		1000
ummary Monitor	Power	•	Power On
	Guest OS	+ I	Power Off
Powered Off	Snapshots	•	Suspend
VM Hardware	VM Policies	•	~
> CPU	Template		

Wait for at least 5 minutes for the Cisco Crosswork Data Gateway VM to come up and then login via vCenter or SSH as explained in the Section Log In and Log Out, on page 45.

Install Cisco Crosswork Data Gateway Via OVF Tool

This is an alternative way to install Cisco Crosswork Data Gateway. You can modify mandatory/optional parameters in the script as per your requirement and run the OVF Tool.

Below is a sample script for installing using this method:

```
#!/usr/bin/env bash
# robot.ova path
ROBOT OVA PATH="<mention the orchestrator path>"
```

```
# Download robot.ova
# Change the path to a convenient location for download
ova path=<mention the ova path>
mkdir -p $ova path
echo "Delete ova image if exists"
rm -rf $ova path/*.ova
# Download robot.ova
cd $ova path
echo "Downloading ova image"
wget -d --proxy=off -r -l1 -H -t1 -nd -N -np -A.ova -erobots=off ${ROBOT_OVA_PATH}
filename=`find $ova path -name \*.ova`
VM NAME="dg-42"
DM="thin"
Deployment="onpremise"
Hostname="Hostname"
ManagementIPv4Address="<management ipv4 address>"
ManagementIPv4Gateway="<management ipv4 gateway>"
ManagementIPv4Netmask="<management ipv4 netmask>"
ManagementIPv4Method="Static"
SouthDataIPv4Address="<southdata_ipv4_address>"
SouthDataIPv4Gateway="<southdata ipv4 gateway>"
SouthDataIPv4Netmask="<southdata ipv4 netmask>"
SouthDataIPv4Method="Static"
NorthDataIPv4Address="<northdata ipv4 address>"
NorthDataIPv4Gateway="<northdata_ipv4_gateway>"
NorthDataIPv4Netmask="<northdata ipv4 netmask>"
NorthDataIPv4Method="Static"
DNS="<DNS ip address>"
NTP="<NTP Server>"
Domain="cisco.com"
ControllerIP="<controller_ipv4_address>"
ControllerPort="<controller_port>"
ControllerSignCertChain="cw-admin@<management ip address>:/home/cw-admin/controller.pem"
ControllerCertChainPwd="<Password>"
Description="Description for Cisco Crosswork Data Gateway for 42"
Label="Label for Cisco Crosswork Data Gateway dq-42"
dg adminPassword="<dg-admin password>"
dg operPassword="<dg-oper password>"
EnrollmentURI="<enrollment_package_URI>"
EnrollmentPassphrase="<password>"
# Please replace this information according to your vcenter setup
VCENTER LOGIN="<vCenter login details>"
VCENTER PATH="<vCenter path>"
DS="<DS details>"
ovftool --acceptAllEulas --X:injectOvfEnv --skipManifestCheck --overwrite --noSSLVerify
--powerOffTarget --powerOn \
--allowExtraConfig --extraConfig:firmware=efi --extraConfig:uefi.secureBoot.enabled=true \
--datastore="$DS" --diskMode="$DM" \
```

```
--name=$VM NAME \
--net: "Management=VM Network" \
--net:"SouthData=DPortGroupVC-1" \
--net:"NorthData=DPortGroupVC-2" \
--deploymentOption=$Deployment \
--prop:"ControllerIP=$ControllerIP"
--prop:"ControllerPort=$ControllerPort" \
--prop:"ControllerSignCertChain=$ControllerSignCertChain"
--prop:"ControllerCertChainPwd=$ControllerCertChainPwd"
--prop:"EnrollmentURI=$EnrollmentURI" \
--prop:"EnrollmentPassphrase=$EnrollmentPassphrase" \
--prop:"Hostname=$Hostname" \
--prop:"Description=$Description" \
--prop:"Label=$Label" \
--prop:"ManagementIPv4Address=$ManagementIPv4Address"
--prop: "ManagementIPv4Gateway=$ManagementIPv4Gateway"
--prop: "ManagementIPv4Netmask=$ManagementIPv4Netmask"
--prop: "ManagementIPv4Method=$ManagementIPv4Method" \
--prop:"SouthDataIPv4Address=$SouthDataIPv4Address" \
--prop:"SouthDataIPv4Gateway=$SouthDataIPv4Gateway" \
--prop:"SouthDataIPv4Netmask=$SouthDataIPv4Netmask" \
--prop:"SouthDataIPv4Method=$SouthDataIPv4Method" \
--prop: "NorthDataIPv4Address=$NorthDataIPv4Address" \
--prop:"NorthDataIPv4Gateway=$NorthDataIPv4Gateway" \
--prop:"NorthDataIPv4Netmask=$NorthDataIPv4Netmask" \
--prop:"NorthDataIPv4Method=$NorthDataIPv4Method" \
--prop:"DNS=$DNS"
--prop:"NTP=$NTP" \
--prop:"dg-adminPassword=$dg adminPassword"
--prop:"dg-operPassword=$dg operPassword" \
--prop:"Domain=$Domain" $ROBOT OVA PATH "vi://$VCENTER LOGIN/$VCENTER PATH"
```

Step 1 Open a command prompt.

Step 2 Navigate to the location where you installed the OVF Tool.

Step 3 Run the OVF Tool using the following command:

The command contains the location of the source OVF file and location of the vmx file that will be created as a result of executing the command:

ovftool <location of source ovf file> <location of vmx file>

For example,

root@cxcloudctrl:/opt# ./cdgovfdeployVM197

Post-installation Tasks

Once the Cisco Crosswork Data Gateway is installed, complete the following tasks in the order of their listing:

- Log In and Log Out, on page 45
- Generate An Enrollment Package, on page 46
- Export Enrollment Package, on page 47

Log In and Log Out

You can use either of the following two ways to access Cisco Crosswork Data Gateway:

- Access Cisco Crosswork Data Gateway Through vCenter, on page 45
- Access Cisco Crosswork Data Gateway Via SSH, on page 45

Access Cisco Crosswork Data Gateway Through vCenter

Follow these steps to log in via vCenter:

Step 1 Locate the VM in vCenter and then right click and select **Open Console**.

The Cisco Crosswork Data Gateway flash screen comes up.

Step 2 Enter username (dg-admin or dg-oper as per the role assigned to you) and the corresponding password (the one that you created during installation process) and press **Enter**.

Cisco Crosswork Data Gateway

±# Copyright (c) 2019 by Cisco Systems, Inc. Version: 1.1.0 (branch dg110dev - build number 245) Built on: Nov-20-2019 00:06 AM UTC Password:

Access Cisco Crosswork Data Gateway Via SSH

Follow these steps to login via SSH.

Step 1 Run the following command:

ssh <username>@<ManagementNetworkIP>

where ManagementNetworkIP is the management network IP address.

For example,

To login as adminstrator user: ssh dg-admin@<ManagementNetworkIP>

To login as operator user: ssh dg-oper@<ManagementNetworkIP>

The following Cisco Crosswork Data Gateway flash screen opens prompting for password:

Cisco Crosswork Data Gateway ##### ###### ####### ##### ##### # # ####### ###### ###### # # ##### ##### # # # # # ###### ### ##### # # ####### ##### ##### ## ## ###### # # # # Copyright (c) 2019 by Cisco Systems, Inc. Version: 1.1.0 (branch dg110dev - build number 245) Built on: Nov-20-2019 00:06 AM UTC Password:

Step 2 Input the corresponding password (the one that you created during installation process) and press **Enter**.

Log Out

To log out, select option **I Logout** from the Main Menu and press Enter or click **OK**.



Generate An Enrollment Package

Every Cisco Crosswork Data Gateway instance must be identified by means of an immutable identifier. This requires generation of a Cisco Crosswork Data Gateway enrollment package. The enrollment package can be generated during installation by supplying OVF parameters or by using the **Export Enrollment Package** option from the interactive menu in the console.

The enrollment package is a JSON document created from the information obtained through the OVF template populated by the user during installation. It includes the all necessary information about Cisco Crosswork

Data Gateway required for registering, such as Certificate, UUID of the Cisco Crosswork Data Gateway instance, and metadata like Cisco Crosswork Data Gateway instance name, creation time, version info, and so on.

You must export it before using it to enroll Cisco Crosswork Data Gateway with Crosswork. The steps to do so are described in Export Enrollment Package, on page 47.

A sample enrollment package JSON file is shown below:

```
"name": "dg116.cisco.com",
"description": "CDG Base VM for Automation",
"profile": {
  "cpu": 8,
  "memory": 31,
  "nics": 3
}.
"interfaces": [
  {
    "name": "eth0",
    "mac": "00:50:56:9e:09:7a",
    "ipv4Address": "<ip_address>/24"
  },
    "name": "eth1",
    "mac": "00:50:56:9e:67:c3",
    "ipv4Address": "<ip_address>/16"
  },
  {
    "name": "eth2",
    "mac": "00:50:56:9e:83:83",
    "ipv4Address": "<ip address>/16"
  }
],
"certChain": [
```

```
"version": "1.1.0 (branch dg110dev - build number 152)",
"duuid": "d58fe482-fdca-468b-a7ad-dfbfa916e58b"
```

Export Enrollment Package

}

{

Before enrolling Cisco Crosswork Data Gateway with Cisco Crosswork Change Automation and Health Insights, you must export the enrollment package.

Ŵ,

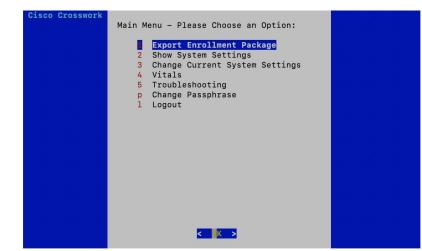
Note

This is needed only if you have not specified **Auto Enrollment Package Transfer** settings in the OVF template. Otherwise, the file will be at the SCP URI destination after the VM boots.

Also, even if you have specified **Auto Enrollment Package Transfer** settings in the OVF template, you must perform **Step** Step 5, on page 49 of this task.

Follow these steps:

Step 1 Log into the Cisco Crosswork Data Gateway Base VM as explained in Section Log In and Log Out, on page 45.



Step 2 From the Main Menu, select 1 Export Enrollment Package and click OK.

- **Step 3** Enter the SCP URI for exporting the enrollment package and click **OK**.
 - **Note** The host must run an SCP server. If no alternative SCP server is available, then Crosswork can be used. An example URI is given below:

cw-admin@<Crosswork_VM_Management_IP_Address>:/home/cw-admin

SCP URI for export (user@host:/path) Enter SCP URI for export (user@host:/path)
root@172.23.213.46:/root/SCP/42
<mark>< OK ></mark> <cancel></cancel>

Step 4 Enter the SCP passphrase (the SCP user password) and click **OK**.

Enter user passphrase Enter SCP passphrase for export

<mark>< OK ></mark> <cancel></cancel>

The enrollment package is exported.

Step 5 Manually copy the enrollment package from the above SCP server to your local PC, to be used in the next task to enroll Cisco Crosswork Data Gateway with Cisco Crosswork Change Automation and Health Insights.

Enroll Cisco Crosswork Data Gateway With Cisco Crosswork Change Automation and Health Insights

Enroll Cisco Crosswork Data Gateway

Step 1Log into Cisco Crosswork Change Automation and Health Insights as described in Section Log In to the UI From a
Browser, on page 20.

Step 2 From the Main Menu, select Admin > Data Gateway Management.

The Data Gateway Management page opens.

📽 Network Visualization	✓ Health Insights		Change Automation
High Utilization Links Down Lir		Impacted KPIs	No Data Available
Degraded Links	No Data Available	No Data Available	
→ Show Topology Map	→ View Health Insights dashboar	ď	→ View Change Automation dashboard
Crosswork Manager Users			
ААА			
Visualization Settings Certificate Management			
Data Gateway Management Data Gateway Global Settings			

Step 3 Click the Add button.

🏫 / Admin / Data Gateway Management			
✓ Data Gateway Metrics Summary			
Administration State	Operational State	0) ded (0)	4 Detached Devices
Data Gateways			Selected 0 / Total 1 💍 🌣
+ / m Attach Devices Detach Devices Administr	ration State 🗸		T
Name	Administration State	Operational State	Attached Device Count
dg116.cisco.com ()	O Up	O Up	1 🚯

The Enroll New Data Gateway dialog opens.

Step 4 Click **Browse** and navigate to the folder to which you copied the enrollment package and select it.

🏫 / Admin / Data Gateway Management			
✓ Data Gateway Metrics Summa	ry		
Administration State	Enroll New Data Gateway Enrollment Package *	×	5 Detached Devices
Data Gateways	informe tiles to view summing	Enroll Cancel	Selected 0 / Total 1 Ö 🌣
Name	Administration State	Operational State	Attached Device Count
dg116.cisco.com ④	O Up	O Up	

Step 5 Select the **Data gateway admin state** in which you want to bring up the Cisco Crosswork Data Gateway:

- Up (recommended): Select this state if you want to bring up the Cisco Crosswork Data Gateway in active mode. Up state moves the operational state of the Cisco Crosswork Data Gateway to up with no intermediate step.
- Maintenance: Select this state if you want to bring up the Cisco Crosswork Data Gateway in maintenance mode. Maintenance state moves the operational state of the Cisco Crosswork Data Gateway to up. However, it applies an identifying flag to the Cisco Crosswork Data Gateway while you perform any additional testing and setup.

/ Admin / Data Gateway Management	Enroll New Data Gateway ×	
✓ Data Gateway Metrics Summa	Enrollment Package * Browse	
Administration State	Data Gateway admin state O Maintenance O Up	
● Up (1) ● Maintenan	 ✓ Current Enrollment Summary name: dg116.cisco.com description: CDG Base VM for Automation 	8
	✓ Additional Details duuid: ce78a75c-4490-4564-b0d5-b4599ad93b16 version: 1.1.0 (branch dg110 - build number 18) role: ACTIVE	Detached Devices
Data Gateways	cpu: 8 memory: 31 nics: 3 interfacename: eth0	Selected 1 / Total 1 💍
+ / E Attach Devices Detach Dev	interfacemac: 00:50:56:9e:0e:19 interfaceipv4Address: 172:29.194.116/24	
Name		Attached Device Count
dg116.cisco.com (j)	Enroll Cancel	

The Enroll New Data Gateway dialog displays a summary of the selected enrollment package:

- Name of the Cisco Crosswork Data Gateway instance
- · Description of the Cisco Crosswork Data Gateway instance
- · Labels associated with the Cisco Crosswork Data Gateway instance

It also displays additional details:

• Number of CPUs

- Memory
- Number of NICs
- Interface name
- Interface MAC address
- Interface IPv4Address
- certChain
- Version
- DUUID

Step 6 Click Enroll.Cisco Crosswork Data Gateway displays the following message upon successful enrollment:

Administration State	Operational State					
Up (1) Maintenance (0)		Up (0) Error (0) Degraded (1) Unknown (0)		4 Detached Devices		
a Gateways			Error Details		×) / Total
Name	Administration State	Operational State	Service Name	Service Status vitals not reported yet.		
			mdt collector	vitals not reported yet.		
cdg.demo.dcloud.cisco.com	O Up	Obegraded ()	snmp collector	vitals not reported yet.		

Once you click **Enroll**, a dialog pops up asking if you want to attach devices now or later. It is recommended to choose **Later** as devices must only be attached once the operational state of the Cisco Crosswork Data Gateway instance is **Up**.

What to do next

The Operational Status of a Cisco Crosswork Data Gateway instance is shown as "**Degraded**" until it establishes a connection with Cisco Crosswork Change Automation and Health Insights and downloads collector binary files. This operation can take up to 5 minutes. It also depends on the bandwidth between the Cisco Crosswork

Data Gateway instance and Cisco Crosswork Change Automation and Health Insights. Click the \bigcirc icon in the **Data Gateways** pane to refresh the pane to reflect the latest operational status of the Cisco Crosswork Data Gateway instance and wait for it to become **Up**.

Cisco Crosswork Data Gateway Authentication and Bootstrap

During the enrollment process, the enrollment package is uploaded to the controller application, i.e., Cisco Crosswork Change Automation and Health Insights, which then instantiates a new Cisco Crosswork Data Gateway instance in its database and waits for a "first-sign-of-life" from the Cisco Crosswork Data Gateway.

Session Establishment

Once the connectivity is established, the Cisco Crosswork Data Gateway instance confirms the identity of the controller and offers its own proof of identity via signed certificates during this initial connection.

Download of Configuration Files

Once the session is established, Cisco Crosswork Data Gateway downloads the following configuration files:

Table 2: Configuration Files

boot-config	A json response created by Crosswork that contains a list of services (docker containers) and functional images should be downloaded on that particular Cisco Crosswork Data Gateway instance.
docker-compose	A YAML file that contains instructions and order to start up the right set of services and functional images.

Download of Functional Images

A functional image represents a collection profile for a protocol, i.e., CLI, SNMP, or MDT. Cisco Crosswork Data Gateway downloads the following functional images:

Table 3: Functional Images

CLI Collection	To connect to a device using SSH/Telnet, collect show commands output, and send it to the designated output destination.
SNMP Collection	To connect to a device using SNMP protocol, collect SNMP responses, receive SNMP traps, and send them to a designated output destination.
MDT Collection	To connect to a device and collect model-driven telemetry or event-driven telemetry events, and send them to a designated output destination.

After the downloads, Cisco Crosswork Data Gateway boots the containers.

Cisco Crosswork Data Gateway is now ready to collect data.

Troubleshoot the Cisco Crosswork Data Gateway Installation and Enrollment

The following table lists common problems that might be experienced while installing or enrolling Cisco Crosswork Data Gateway, and provides approaches to identifying the source of the problem and solving it.

Issue	Action				
1. Cannot enroll Cisco Crosswork Data Gateway with Crosswork					
Cisco Crosswork Data Gateway cannot be enrolled with Crosswork due to an NTP issue, i.e., there is a clock-drift between the two. The clock-drift might be with either Cisco Crosswork Data Gateway or Cisco Crosswork Change Automation and Health Insights. Also, on the NTP servers for Cisco Crosswork Change Automation and Health Insights and Cisco Crosswork Data Gateway, the initial time is set to the ESXi server. For this reason, the ESXi server must also have NTP configured. Sync the clock time on the host and retry.	In the show-tech logs (in file session.log at location /opt/dg/data/controller-gateway), if you see the error UNAUTHENTICATED:invalid certificate.				
	System Settings > 1 Configure NTP. Configure NTP to sync with the clock time on the Crosswork server and try re-enrolling Cisco Crosswork Data Gateway. It is also possible that the Cisco Crosswork Change Automation and Health Insights's NTP server might be down or its address might be incorrect. To configure NTP on the Cisco Crosswork Change Automation and Health Insights side, see Configure NTP after installation.				

Issue	Action		
Cisco Crosswork Data Gateway remains in degraded state for more than 10 minutes with reason stated as "Could not collect vitals" due to certificate errors.	1. Log into the Cisco Crosswork Data Gateway VM		
	2. From the main menu, select 5 Troubleshooting > Run show-tech .		
	Enter the destination to save the tarball containing logs and vitals and click OK .		
	In the show-tech logs (in file gateway.log at location /opt/dg/log/controller-gateway/gateway.log), if you see certificate errors, then re-upload the Controller Signing Certificate, as explained in the steps below:		
	1. From the main menu, select 3 Change Current System Settings > 7 Import Certification.		
	2. From the Import Certificates menu, select 1 Controller Signing Certificate File and click OK.		
	3. Enter the SCP URI for the certificate file and click OK .		
3. Cisco Crosswork Data Gateway remains in deg stated as "gRPC connection cannot be established			
Cisco Crosswork Data Gateway remains in degraded state for more than 10 minutes with reason stated as "gRPC connection cannot be established" due to certificate errors.	1 1. Re-upload the certificate file as explained in the troubleshooting scenario 2. above.		
	2. Reboot the Cisco Crosswork Data Gateway VM following the steps below:		
	a. From the main menu, select 5 Troubleshooting and click OK .		
	b. From the Troubleshooting menu, select 7 Reboot VM and click OK .		
	c. Once the reboot is complete, check if the Cisco Crosswork Data Gateway's operational status is Up .		

De-enroll Cisco Crosswork Data Gateway

Step 1 Log in to Crosswork UI as desribed in Log In to the UI From a Browser, on page 20.

Step 2 From the navigation panel, select **Admin > Data Gateway Management**.

The Data Gateway Management page opens.

Crosswork Net	work Automat	ion		002
🐜 😽 Network Visualizat	on	≁ Health Insights	5	Change Automation
High Utilization Links	Down Links	Impacted Devices	Impacted KPIs	No Data Available
Theory Degraded Links		No Data Available	No Data Available	
th Show Topology Map		→ View Health Insights dashboa	ard	→ View Change Automation dashboard
Aawn Crosswork Manager Users AAA				
Visualization Settings Certificate Management				
Data Gateway Management Data Gateway Global Settings				

Step 3 In the **Data Gateways** panel, select the Cisco Crosswork Data Gateway VM you want to remove and click **Delete** button.

n / Admin / Data Gateway Management			
✓ Data Gateway Metrics Summary			
Administration State		Up (1) Error (0) Degraded (0) Infoncoun (0)	5 Detached Devices
Data Gateways			Selected 1 / Total 1 💍 🌣
+ / iii Attach Devices Detach Devices Administration) State 🗸		T
Name Delete Data Gateway	Administration State	Operational State	Attached Device Count
dg116.cisco.com (j)	O Up	O Up	0

Step 4 A Cisco Crosswork Data Gateway instance must be in maintenance mode to be deleted. Click **Switch & Continue** when prompted to switch to maintenance mode.

🏦 / Admin / Data Gateway Management			
✓ Data Gateway Metrics Summary	Deleting Data Gateway dg116.cisco.	com ×	
Administration State	Dg116.cisco.com Data Gateway needs to b maintenance state before it can be deleted. Are you OK to switch to administration state 'Maintenance' and continue to delete?		A
Up (1) Maintenance (0)	Switch & Continue	Unknown (0)	5 Detached Devices
			Selected 1 / Total 1 💍 🌣
+ / Attach Devices Detach Devices Administ	stration State 🗸		T
Name	Administration State	Operational State	Attached Device Count
dg116.cisco.com (j)	O Up	O Up	

The selected Cisco Crosswork Data Gateway VM is deleted.

🏫 / Admin / Data Gateway Management			and the second second		
✓ Data Gateway Metrics Summary		g116.cisco.com Data Gateway deleted s	successfully. X		
Administration State	Operation	nal State			
● Up (0) ● Maintenance (0)		Up (0) Error (0) Degraded (0) Unknown (0)		0 Detached Devices	
Data Gateways				Selec	cted 0 / Total 1 💍 🌣
+ / Attach Devices Detach Devices Administrat	ion State 🗸				T
Name	Administration State	Operational State	Attached Device Count	Unique Identifier	
	No R	ows To Show			
0 to 0 of 0 << < Page 0 of 0	> >>				