

Installation Tasks

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Installation Workflow

To set up Cisco Crosswork Optimization Engine and Cisco Crosswork Data Gateway complete the below installation tasks in the order of their listing:

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 - **a.** Verify the VM Configuration, on page 17
 - **b.** Log In to the UI From a Browser, on page 17
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- 2. Install Cisco Crosswork Data Gateway, on page 21
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 - a. Enroll Cisco Crosswork Data Gateway, on page 45
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Install Cisco Crosswork Optimization Engine

This section explains the procedure to install using vCenter.

Before you begin, ensure that:

• You are creating the Cisco Crosswork Optimization Engine 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 Optimization Engine 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) to assign to the Cisco Crosswork Optimization Engine VM's management network virtual interface. The default gateway must be reachable via this IP address.



e 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) to assign to the Cisco Crosswork Optimization Engine VM's data network virtual interface. This IP address must be able to reach the gateway address for the network where Cisco Crosswork Data Gateway will be installed.
- The NTP server you will use to synchronize the Cisco Crosswork Optimization Engine VM clock is reachable on the network.



Note

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.

Also during installation, Cisco Crosswork Optimization Engine 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 Optimization Engine VM. You will use it to verify that the VM has been properly set up (see Verify the VM Configuration, on page 17).
- 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 Optimization Engine user interface, and to perform special operations, such as stopping and restarting services.

While this section describes installation, you must also set up Cisco SR-PCE in order to use Cisco Crosswork Optimization Engine. Refer to the appropriate device configuration guide (for example, Segment Routing Configuration Guide for Cisco ASR 9000 Series Routers).

- **Step 1** Download the latest available Cisco Crosswork Optimization Engine 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.

vm vSphere Client								?∼
C C	Clsco.com Summary Montor Configure Permit Premit Premit	ACTIONS V ACTIONS V New Vartual Machine. New Vartual Machine. New Resource Pool. New Vapp National Mode Consection Power	Datastores Networks					CPU Used: 5 Memory Used: 10 Storage Used: 10
	The vSphere Distributed Switch correspondence	Certificates	 od 06 ca-ef 7d d7 2e 4f b5 3f b6 or 	n the	host does not exist in vCenter Server or does	not contain this	host.	
	Hardware	Storage	•		Configuration			
	Manufacturer	Host Profiles	,		image Profile	10000	the bar bridge	-
> 🔒 🚽	Model	Reconfigure for vSphere HA			vSphere HA State	? N/A		
	> CPU	🖗 Assign License			> Fault Tolerance (Legacy)	Unsuppor	ted	
Recent Tasks Alarms		Settings						
Task Name v Target	✓ Status ↑	Move To	 Initiator 			 ⊂ Queue 	Stort Time	Compk
Enter maintenance	0500.00m	Tags & Custom Attributes	• 19% 🔕 CISCO.COMWIUC			13 ms	03/18/2020, 114.30	
maar		Remove from Inventory						
		Add Permission						

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

Select an OVF template	Select an OVF template
Select a name and folder	Select an OVF template from remote URL or local file system
Select a compute resource	Enter a URL to download and install the OVF package from the internet, or browse to a
Coloct storage	location accessible from your computer, such as a local hard drive, a network share, or a
serect storage	CD/DVD drive.
Ready to complete	UPL UPL
	Local file Choose Files C

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 Optimization Engine VM you are creating.

Cisco recommends that you include the Cisco Crosswork Optimization Engine version and build number in the name (for example: CW Optimization Engine 1.1 Build 123).

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Dep	lov	OVE	Tem	plate
~~~~	·~ .	~ ~ .		~ ~ ~ ~ ~ ~

2 Select a name and folder	Specify a unique name and target location		
3 Select a compute resource 4 Review details	Virtual machine name:		_
5 Select storage 8 Ready to complete	Select a location for the virtual machine.		
	✓		

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

#### Deploy OVF Template

Select a compute resource		
Review details	✓ <u>I</u> Optima	
Select storage		
Ready to complete		
	× 🗖	
	> [	
	>	
	>	
	> 🛛 1	
	Compatibility	
	Comparison ()	
	<ul> <li>Compatibility checks succeeded.</li> </ul>	

**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.

1 Select an OVF template 2 Select a name and folder 3 Select a compute resource	Review details Verify the template deta	ils.			
4 Review details 5 License agreements 6 Configuration 7 Select storage 8 Select networks 9 Customize template 10 Ready to complete	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.				
	Publisher	No certificate present			
	Product	Cisco Crosswork Network Automation			
	Version	11.0			
	Vendor	Cisco Systems, Inc.			
	Description	Cisco Crosswork Optimization Engine			
	Download size	8.7 GB			
	Size on disk	23.4 GB (thin provisioned)			
		857.0 GB (thick provisioned)			
	Extra configuration	uefi.secureBoot.enabled = true timoware = eti			

|--|

- 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 an IPv4 network on a single interface is not currently supported.
- 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 an OVF template	Select storage Select the storage for the configuration and disk files				
2 Select a name and rocer	Select the storage for the conn	guration ar	id disk mes		
4 Review details	Encovol this writual machine				
5 License agreements	End ypi this virtual machine (Requires key Management Server)				
6 Configuration	Select virtual disk format:	_	Thick Provision Lazy Zer	rbed v	
7 Select storage	VM Storage Policy:	[	Datastore Detault		
8 Select networks	Name	Capacity	Provisioned	Free	Typ
9 Customize template		272 10	106 TP	167 TP	VIL A
10 Ready to complete	-05K1	2.7210	1.0010	LOT ID	VIN
	4				¥ •
	< Compatibility	_			÷ ۲
	< Compatibility Compatibility checks success	eeded.			
	Compatibility	seded.			\$ T

**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.

Deploy OVF Template

Select a name and folder	Select a destination network for ea	ach source	network.	
Select a compute resource				
Review details	Source Network	т	Destination Network	Ŧ
5 License agreements	Data Network		VM Network	~ *
5 Configuration	Management Network		VM Network	-
/ Select storage				2 items
3 Select networks				2 110 110
Customize template Ready to complete	IP Allocation Settings			
	IP allocation:	Sta	ntic - Manual	
	IP protocol:	IPV	4	
				 _

- Step 11 Click Next to go to 9 Customize template.
- Step 12Expand the Management Network settings. According to your deployment configuration, the fields displayed are<br/>different, similar to the following figures. Make relevant entries for IPv4 deployment (Management IPv4 Address,<br/>Management IPv4 Gateway, and Management IPv4 Netmask fields).

## Deploy OVF Template

4 Review details 5 License agreements	O All properties have valid values	
6 Configuration	Management Network	3 settings
7 Select storage 8 Select networks	Management IPv4 Address	Please enter the VM's IPv4 management address.
9 Customize template 10 Ready to complete		10.00.00
	Management IPv4 Netmask	Please enter the VM's IPv4 management netmask
		255.
	Management IPv4 Gateway	Please enter the VM's IPv4 management gateway.
		10.
	> Data Network	3 settings
	> DNS and NTP Servers	3 settings
	> Disk Configuration	3 settings
	> Crosswork Configuration	b 1 settings
	Crosswork Collection	1 settings

**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) respectively.

Deploy	/ OVF	Tem	plate

4 Review details	All properties have valid value	s
5 License agreements 6 Cooficuration		
7 Select storage	> Management Network	3 settings
3 Select networks	<ul> <li>Data Network</li> </ul>	3 settings
9 Customize template 10 Ready to complete	Data IPv4 Address	Please enter the VM's IPv4 data address. 192
	Data IPv4 Netmask	Please enter the VM's IPv4 data netmask. 255.
	Data IPv4 Gateway	Please enter the VM's IPv4 data gateway. C
	> DNS and NTP Servers	3 settings
	> Disk Configuration	3 settings
	> Crosswork Configuration	1 settings
	> Crosswork Collection	1 settings

- **Step 14** Expand the **DNS and NTP Servers** settings, similar to the following figure. According to your deployment configuration (IPv4), 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 Optimization Engine 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.
  - **Note** The DNS and NTP servers must be reachable via the network interfaces you have mapped on the host or the configuration of the VM will fail.

1 Select an OVF template 2 Select a name and folder	IVF template Customize template Customize the deployment properties of this software solution.		
4 Review details 5 License agreements	O All properties have valid value	15 X	
6 Configuration	> Management Network	3 settings	
8 Select networks	> Data Network	3 settings	
9 Customize template	V DNS and NTP Servers	3 settings	
io ready to comprete	DNS IPv4 Address	Please enter the DNS server's IPv4 address. Multiple DNS server IPs can be provided space separated.	
	NTP Servers	Please enter NTP server hostname. Multiple NTP servers can be provided space seperated.	
	DNS Search Domain	Please enter the DNS search domain cisco.com	
	> Disk Configuration	3 settings	
	> Crosswork Configuration	1 settings	
N.	> Crosswork Collection	1 settings	

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

<ul> <li>1 Select an OVF template</li> <li>2 Select a name and folder</li> </ul>	Customize template Customize the deployment properti	ies of this software solution.	
<ul> <li>3 Select a compute resource</li> <li>4 Review details</li> <li>5 License agreements</li> </ul>	All properties have valid value	s	×
6 Configuration	> Management Network	3 settings	
<ul> <li>8 Select networks</li> </ul>	> Data Network	3 settings	
9 Customize template	> DNS and NTP Servers	3 settings	
10 Ready to complete	~ Disk Configuration	3 settings	
R	Logfs Disk Size	Please enter the size of the logts disk in GB.	
		10	
	Datats Disk Size	Please enter the size of the datafs disk in GB.	
		450	
	Corefs Disk Size	Please enter the size of the corefs disk in GB.	
		100	
	Crosswork Configuration	1 settings	
	<ul> <li>Crosswork Collection</li> <li>Configuration</li> </ul>	1 settings	

- **Step 16** Expand the **Crosswork Configuration** and enter any legal disclaimer text (users will see this text if they log into the CLI).
- Step 17Expand the Crosswork Collection Configuration settings, similar to the following figure.Check this option if you plan to use Cisco NSO. For more guidance and information on which mode to select, see<br/>Collection Considerations).

## Deploy OVF Template

<ul> <li>4 Review details</li> <li>5 License agreements</li> <li>6 Configuration</li> </ul>	<ul> <li>All properties have valid value.</li> </ul>	s X
	> Management Network	3 settings
Select networks	> Data Network	3 settings
Customize template	> DNS and NTP Servers	3 settings
o Ready to complete	> Disk Configuration	3 settings
Ŀş.	> Crosswork Configuration	1 settings
	<ul> <li>Crosswork Collection</li> <li>Configuration</li> </ul>	1 settings
	NSO as Provider	Is NSO used as the provider for device management?

**Step 18** 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.

1 Select an OVF template 2 Select a name and folder	Ready to complete Click Finish to start creation.		
3 Select a compute resource 4 Review details			
5 License agreements	Provisioning type	Deploy from template	
6 Configuration 7 Select storage	Name	coe	
8 Select networks	Template name	cw	
9 Customize template	Download size	8.7 GB	
to Ready to complete	Size on disk	857.0 GB	
	Folder	Optima	
	Resource	9 cisco com	
	Location	?-dski	
	Storage mapping	1	
	All disks	Datastore: wouesxc240m3qq09-dsk1, Format: Thick Provision Lazy Zeroed	
	Network mapping	2	
	Data Network	VM Network	
	Management Network	VM Network	
	IP allocation settings		

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**Step 19** 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.

Step 20

- 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.

ummary	Monitor	Configure	Permissions	Datastores	Networks
> Netwo	ork adapter 1		VM Network	(disconnected)	
> Netwo	ork adapter 2		VM Network	(disconnected)	
CD/D	VD drive 1		Disconnecte	d	
> Video	card		4 MB		
VMCI	device		Device on th	ne virtual machin	e PCI bus that provides
			support for	the virtual machi	ne communication interface
> Other	8		Additional H	lardware	
Comp	atibility				
Edit Setty	n <u>s</u>				
Related O	biects				

- 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.

 $\times$ 

# Edit Settings Virtual Hardware VM Options

General Options	VM Name: v
VMware Remote Console Options	Lock the guest operating system when the last remote user disconnects
Encryption	Expand for encryption settings
Power management	Expand for power management settings
VMware Tools	Expand for VMware Tools settings
Boot Options	
Firmware	EFI ~
Boot Delay	When powering on or resetting, delay boot order by 0 milliseconds
Force EFI setup	$\hfill\square$ During the next boot, force entry into the EFI setup screen
Failed Boot Recovery	If the VM fails to find boot device, automatically retry after 10 seconds
Advanced	Expand for advanced settings

CANCEL	ок
--------	----

Step 21You can now power on the Cisco Crosswork Optimization Engine VM to complete the deployment process. Expand<br/>the host's entry so you can click the Cisco Crosswork Optimization Engine VM and then choose Actions > Power ><br/>Power On, similar to the following figure.

## Figure 1: Power On

6	ACTIONS ~		
_	Actions - woptime9		
Summary Monitor	Power	PowerOn	inn - si / B
> Network adapter 1	Guest OS	Power Off	i ciri + at + E
> Network adapter 2	Snapshots	Suspend	
CD/DVD drive 1	🚅 Open Remote Console	C Reset	
> Video card	📇 Migrate	Shut Down Guest OS	
VMCI device	Clone	Restart Guest OS	
	Fault Tolerance	Intrachine communication	menace
Other			

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

# 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 the VM is powered on, wait for 20 minutes, and then launch the console.
- **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.
- **Step 3** If you see instructions to check firstBoot.log, use the command sudo cat /var/log/firstBoot.log to view the log file. If you find any discrepancy and want to investigate further, refer to Troubleshoot the Installation, on page 18. After you have identified the error, perform the following:
  - a) Power off the Cisco Crosswork Optimization Engine VM.
  - b) Delete the Cisco Crosswork Optimization Engine 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 Optimization Engine 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 18.

- **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.

When you access Cisco Crosswork Optimization Engine 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 Optimization Engine 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 Optimization Engine as follows:
  - a) Enter the Cisco Crosswork Optimization Engine administrator username admin and the default password admin.
  - b) Click Log In.
  - c) When prompted to change the Cisco Crosswork Optimization Engine 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 ⁽²⁾ 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 Optimization Engine, 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		
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 17.	
	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.	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.	
	<pre>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</ntp></pre>	
	2. Restart the chronyd service (systemctl restart chronyd).	
	3. Please verify that the NTP server has been configured (chronyc sources).	
Cannot Display the User Interface		

Issue	Action
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 and port number (30603) you entered during installation).
	2. Log in to the VM using SSH, as explained in Verify the VM Configuration, on page 17.
	3. At the prompt, enter the command <b>collect</b> . 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.	1. 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.
	2. If it does not, redeploy the VM using the correct DNS name server and search domain configuration.
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	

Issue	Action		
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 <b>Admin</b> > <b>Crosswork Manager</b> and checking the status of the applications and services. See the <i>Cisco Crosswork</i> <i>Optimization Engine User Guide</i> topic "Monitor Cisco Crosswork Infrastructure and Resources".		
Crosswork Manager shows one or more applications or their underlying services are not running.	1. 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 Optimization Engine User Guide</i> topic "Monitor Cisco Crosswork Infrastructure and Resources".		
	2. 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".		
	3. Contact Cisco Customer Experience team.		
CPU Overcommitment			
CPU/memory overcommitment occurs when the vCPUs are running on a host are more than the total number of physical processor cores in that host. VMware vCenter/ESXi allows this for the flexibility in deploying and running the VMs on physical hosts. It is natural to assume that the vCenter users will try to maximize the physical resources usage by deploying and running a reasonably high amount of VMs on a specific ESXi host. However, it can lead to a problem manifested in a "soft lockup" situation, where a VM will not be able to get a vCPU allocated in a reasonable amount of time.	<ol> <li>Perform an analysis to confirm that an overcommitment has led to the manifested problem. The vSphere ESXi host Monitor screens have a <b>Performance</b> &gt; <b>Advanced</b> tab which can display several views and performance counters to illustrate. For example, CPU usage in MHz displays the spike in CPU usage at a particular date and time compared to the average usage.</li> <li>After you confirm the analysis, use a CPU or Memory reservation to resolve an overcommitment. The CPU reservation specifies the CPU allocation (in MHz) for your VM, while Memory reservation specifies the guaranteed minimum allocation for a VM (in MB). If the reservation is not met, the VM cannot be turned on.</li> </ol>		

# Install Cisco Crosswork Data Gateway

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

Before installing Cisco Crosswork Data Gateway, it is helpful to be familiar with Cisco Crosswork Data Gateway OVF Parameters and Deployment Scenarios, on page 21.

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

- Install Cisco Crosswork Data Gateway Via vCenter, on page 27
- Install Cisco Crosswork Data Gateway Via OVF Tool, on page 38

# **Cisco Crosswork Data Gateway OVF Parameters and Deployment Scenarios**

Before you begin installing Cisco Crosswork Data Gateway, read below 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.
- Although Cisco Crosswork Data Gateway supports both IPv6 and IPv4, it is recommended to use IPv4 as Cisco Crosswork Optimization Engine supports only IPv4.

OVF Parameter	Description	Deployment Scenario
Host Information		
Hostname*	Hostname of the server specified as a fully qualified domain name (FQDN).	
	Note For larger systems it is likely that you will have more than one Cisco Crosswork Data Gateway instance. The Cisco Crosswork Data Gateway hostname should, therefore, be unique and created in a way that makes identifying a specific instance easy.	
Description*	A detailed description of the Cisco Crosswork Data Gateway instance.	

OVF Parameter	Description	Deployment Scenario		
Label	Label used by Crosswork to categorize and group multiple Cisco Crosswork Data Gateway instances.			
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		
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).	However, if you want to use third-party or your own certificate files, then you must input these three parameters.		
Certificate File and Key Passphrase	SCP user passphrase to retrieve the Cisco Crosswork Data Gateway PEM formatted certificate file and private key.	<b>Note</b> The host with the URI files must be reachable on the network and files must be present at the time of install.		
Passphrases				
dg-admin Password [*]	The password you have chosen for the dg-admin user.			
dg-oper Password*	The password you have chosen for the dg-oper user.			
<b>Note</b> For Management, Southbound, and Northbound interfaces, Cisco Crosswork Data Gateway supports both IPv4 and IPv6. For the protocol you choose to use, select <b>Method</b> as <b>Static</b> and enter information in <b>Address</b> , <b>Netmask</b> , and <b>Gateway</b> fields. Also, for the protocol you are not using, set <b>Method</b> as <b>none</b> and leave <b>Address</b> , <b>Netmask</b> , and <b>Gateway</b> fields blank.				
¹ Management IPv4 Address				
Management IPv4 Method*	How the management interface gets its IPv4 address.			
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				

OVF Parameter	Description	Deployment Scenario
Management IPv6 Method*	How the Management interface gets its IPv6 address.	
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.	
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		
Southbound Data IPv6 Method*	How the southbound data interface gets its IPv6 address.	
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.	
¹ Northbound Data IPv4 Address		
Northbound Data IPv4 Method*	How the Northbound data interface gets its IPv4 address.	
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.	

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OVF Parameter	Description	Deployment Scenario
Northbound Data IPv4 Gateway	IPv4 address of the Northbound data gateway.	
¹ Northbound Data IPv6 Address		
Northbound Data IPv6 Method*	How the Northbound data interface gets its IPv6 address.	
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 and NTP		
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.	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 Optimization Engine. 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 Data Gateway and Cisco Crosswork Optimization Engine is not more than 10 minutes. Else, Cisco Crosswork Data Gateway will fail to pull images.

OVF Parameter	Description	Deployment Scenario	
Server Address	IPv4 or IPv6 address of a syslog server accessible from the management interface.	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	
Syslog Port	Port number of the syslog server.	external syslog server. Otherwise, they are	
Syslog Protocol	Use UDP, TCP, or RELP when sending syslog.	logged in /optdg/log in Cisco Crosswork Data Gateway VM	
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.	Note The host with the URI files must be reachable on the network and files must be present at the time of install.	
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.		
Controller Settings			
Controller IP*	IP address of the Crosswork controller i.e., Cisco Crosswork Optimization Engine.		
	<b>Note</b> If you are using an IPv6 address, it must be surrounded by square brackets ([1::1]).		
Controller Port [*]	Port of the Crosswork controller i.e., Cisco Crosswork Optimization Engine.		

OVF Parameter	Description	Deployment Scenario
Controller Signing Certificate File URI	PEM formatted root cert of Cisco Crosswork Optimization Engine 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&gt; :/home/cw-admin/controller.pem Note Theoretically, it can be placed on any host where the SCP server is running but best practice is uploading from Crosswork, directly.</crosswork_vm_ 	
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 Optimization Engine certificate chain.	
Proxy Server URL	URL of management network proxy server.	If you want to use a proxy server, you must specify these parameters.
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		

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).	Enrollment package is required for enrolling Cisco Crosswork Data Gateway with Crosswork. The enrollment package is automatically
Enrollment Passphrase	SCP user passphrase to transfer enrollment package.	transferred once Cisco Crosswork Data Gateway boots up for the first time if you specify these parameters during the installation.
		If you do not specify these parameters during installation, then you must export enrollment package manually following the procedure Export Enrollment Package, on page 43.
		Note:
		• The host must run 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&gt; :/home/cw-admin</crosswork_vm_ 

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



Note

Although Cisco Crosswork Data Gateway supports both IPv6 and IPv4, it is recommended to use IPv4 as Cisco Crosswork Optimization Engine supports only IPv4.

Ensure the following:

- 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: Permissions Per Role* in the *Cisco Crosswork Optimization Engine 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 Optimization Engine.

**Step 1** Download the Cisco Crosswork Data Gateway 1.1.0 image file from CCO (*.ova).

**Note** Crosswork Optimization Engine is designed and tested to be used with only the Cisco Crosswork Data Gateway 1.1.0 release.

**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:

L

vm vSphere Client	Menu 🗸 🛛 🔍 Search in all e	environments	
□     □     ○       >     □     □       >     □     □       >     □     □       >     □     □       >     □     □       >     □     □       >     □     □       >     □     □	172.20.98.77      Summary Monitor Cor      Monitor Cor      Mode:     Processor Ty      Processor Ty      Virtual Mach:     State:     Uptime:	Actions - 172.20.98.77 Actions - 172.20.98.77 New Virtual Machine Deploy OVF Template New Resource Pool New vApp Maintenance Mode Connection Settings	esource 74 GHz 0: 3.200 76 GHz 0: 0 GB 3.85 TB 4.35 TB
Recent Tasks Alarms		Move To	•

**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 <b>multiple selection</b> to select all the files associated with an OVF template (.ovf, .vmdk, etc.)	
	Back Next Finish Car	icel

- 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.

loy OVF Template		
elect template elect name and location	Select name and location Enter a name for the OVF and select a deployment location.	
alect a resource eview details elect storage	Name dg	
eady to complete	Select a datacenter of folder.	

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

Peploy OVF Template		? »
<ul> <li>✓ 1 Select template</li> <li>✓ 2 Select name and location</li> </ul>	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.         >       >         >       >         >       >         >       >         >       >         >       >         >       >         >       >         >       >         >       >	
	Back Next Finas	h 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.

1	Deploy OVF Template				
* * *	1 2 3	Select template Select name and location Select a resource	Review details         Verify the template details.         Image: A second seco		
	5 6 7 8 9	Accept license agreements Select configuration Select storage Select networks Customize template Ready to complete	Product Version Vendor Publisher Download size Size on disk Description Extra configuration	Cisco Crosswork Data Gateway 1.1 Cisco Systems, Inc.  (>) No certificate present 1.4 MB 47.7 MB (thin provisioned) 50.0 GB (thick provisioned) Cisco Crosswork Data Gateway uef.secureBootenabled = true firmware = efi	
				Back Next Finish Ca	ncel

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

Deploy OVF Template		?
<ul><li>1 Select template</li><li>2 Select name and location</li></ul>	Accept license agreements Read and accept the license agreements associated with this template before continuing.	
3 Select a resource		
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:	
6 Select configuration	https://www.cisco.com/c/en/us/about/legal/cloud-and-software/software-terms.html	
7 Select storage		
8 Select networks		
9 Customize template		
10 Ready to complete		
	Accept	
	Back Next Eliziah	ancol
	Dack Next Finish C	ance

Step 8Click Next to go to 6 Select configuration, as shown in the following figure. To install Cisco Crosswork Data Gateway<br/>for Cisco Crosswork Optimization Engine, you must select Crosswork On Premise from the Configuration dropdown.

🍘 Deploy OVF Template						? »
Pepioy OVF Template     1 Select template     2 Select name and location     3 Select a resource     4 Review details     5 Accepticense agreements     Select configuration     7 Select storage     8 Select networks     9 Customize template     10 Ready to complete	Select configuratio Select a deploymen Configuration: Description:	n nt configuration. Crosswork On Premise 8 CPU, 32GB RAM; 3 NICs, 50GB Disk	T			<b>«</b> ()
				Back	Next	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.

🍞 Deploy OVF Template	Ultranian VA				• •
<ul> <li>1 Select template</li> <li>2 Select name and location</li> <li>3 Select a resource</li> <li>4 Review details</li> <li>5 Accept license agreements</li> <li>6 Select configuration</li> <li>7 Select storage</li> </ul>	Select storage Select location to store th Select virtual disk format: VM storage policy: Show datastores from Filter Datastores Datastore	e files for the deployed template. Thick provision lazy zeroed None Storage DRS clusters Clusters	▼ ▼		
8 Select networks 9 Customize template 10 Ready to complete	Name  Name  Name  A	Status Normal	VM storage policy VM Encryption P	Capacity 1.81 TB	ler
			Back	< Next	Finish 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.

Select transe and location     Select assume and location     Select assume and location     Select assume     S	🍘 Deploy OVF Template				? •
<ul> <li>3 Skitch i resource</li> <li>4 Review diskis</li> <li>Succes Nateerak</li> <li>Suces Nateerak</li> <li>Succes Nateerak</li> <li></li></ul>	<ul> <li>1 Select template</li> <li>2 Select name and location</li> </ul>	Select networks Select a destination network for each source network.			
<ul> <li>4 Rotew details</li> <li>5 SociDials</li> <li>5 SociDials</li> <li>9 SociDials</li> <li>9 E243/LAN-2</li> <li>9 SociDials</li> <li>9 E243/LAN-2</li> <li>9 SociDials</li> <li>9 SociDials</li> <li>9 SociDials</li> <li>9 SociDials</li> <li>9 SociDials</li> <li>9 E243/LAN-2</li> <li>9 SociDials</li> <li>9</li></ul>	<ul> <li>3 Select a resource</li> </ul>	Source Natarrik	Destination Nationsk		
S Scoeptiteenes agreement   • 6 Soeptiteenes agreements   • 6 Soeptiteenes agreements   • 7 Select storage   • 0 Select storage   • 0 Select storage   • 0 Select storage     • 0 Select storage     • 0 Select storage     • 0 Select storage     • 0 Select storage     • 0 Select storage     • 0 Select storage     • 0 Select storage     • 0 Select storage     • 0 Select storage     • 0 Select storage     • 0 Select storage     • 0 Select storage     • 0 Select storage     • 0 Select storage     • 0 Select storage     • 0 Select storage     • 0 Select storage     • 0 Select storage     • 0 Select storage     • 0 Select storage     • 0 Select storage     • 0 Select storage     • 0 Select storage           • 0 Select storage           • 0 Select storage <td>✓ 4 Review details</td> <td>SouthData</td> <td>F2-I 3-M AN-1</td> <td></td> <td>•</td>	✓ 4 Review details	SouthData	F2-I 3-M AN-1		•
<ul> <li> <ul> <li></li></ul></li></ul>	<ul> <li>5 Accept license agreements</li> </ul>	NorthData	E2-L3-VLAN-2		 -
<ul> <li>7 Select storage</li> <li>8 Select networks</li> <li>9 Customize template</li> <li>10 Ready to complete</li> </ul> Description - Management       Description - Management       Network for management plane traffic connected to eth0         P Allocation Settings       IP protoco: IP-4         Pallocation Settings              Pallocation	✓ 6 Select configuration	Management	E2-VLAN-Primary		•
	V 7 Select storage				
9 Customize template 10 Ready to complete 10 Ready to complete Description - Management Description - Management Network for management plane traffic connected to eth0 IP Allocation Settings IP protocol: IP-4 IP allocation: Static - Manual	V 8 Select networks				
10 Ready to complete	9 Customize template				
Description - Management Network for management plane traffic connected to eth0  IP Allocation Settings IP protocol: IP-4  Ret Net Pinkh Careel	10 Ready to complete				
Description - Management Network for management plane traffic connected to eth0    P Allocation Settings  P protocoi: IP4  Ret Net Pinkh Carcel					
Description - Management Network for management plane traffic connected to eth0					
Description - Management Network for management plane traffic connected to eth0  IP Allocation Settings IP protocot: IPV4 IP allocation: Static - Manual  Rack Net Pinkh Cancel					
Description - Management Network for management plane traffic connected to eth0  IP Allocation Settings IP protocol: IPV4 IP allocation: Static - Manual  Rack Net Finish Cancel					
Network for management plane traffic connected to eth0  IP Allocation Settings IP protocol: IPv4 IP allocation: Static - Manual  Rack Net Finish Cancel		Description - Management			
IP Allocation Settings IP protocol: IPv4 IP allocation: Static - Manual ① Back Next Finish Cancel		Network for management plane traffic connected to eth0			
IP Atlocation Settings IP protocol: IPV4 IP allocation: Static - Manual ① Back Next Finish Cancel		Network for management plane tranic connected to etho			
IP Atlocation Settings IP protocol: IPv4 IP allocation: Static - Manual O Back Next Finish Cancel					
IP Allocation Settings IP protocol: IPv4 IP allocation: Static - Manual O Back Next Finish Cancel					
IP Allocation Settings IP protocol: IPv4 IP allocation: Static - Manual O Back Next Finish Cancel					
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IP Allocation Settings IP protocol: IPv4 IP allocation: Static - Manual O Back Next Finish Cancel					
IP Allocation Settings IP protocol: IPv4 IP allocation: Static - Manual Back Next Finish Cancel					
IP Allocation Settings IP protocol: IPv4 IP allocation: Static - Manual O Back Next Finish Cancel					
IP Allocation Settings IP protocol: IPv4 IP allocation: Static - Manual O Back Next Finish Cancel					
IP protocol: IPv4 IP allocation: Static - Manual O Back Next Finish Cancel		IP Allocation Settings			
Back Next Finish Cancel		IP protocol: IPv4	IP allocation: Static - Manual 🕚		
LOCK HCAL DURCH				Back Next	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 21, enter the information for the parameters:
  - Note
     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** For larger systems it is likely that you will have more than one Cisco Crosswork Data Gateway instance. The Cisco Crosswork Data Gateway hostname should, therefore, be unique and created in a way that makes identifying a specific instance easy.
- Description: A detailed description of the Cisco Crosswork Data Gateway instance.
- Label: Label used by Crosswork to categorize and group multiple Cisco Crosswork Data Gateway instances.
- 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: The password you have chosen for the dg-admin user.
- dg-oper Password: The password you have chosen for the dg-oper user.
- Note For Management, Southbound, and Northbound interfaces, Cisco Crosswork Data Gateway supports both IPv4 and IPv6. For the protocol you choose to use, select **Method** as **Static** and enter information in **Address**, **Netmask**, and **Gateway** fields. Also, for the protocol you are not using, set **Method** as **none** and leave **Address**, **Netmask**, and **Gateway** fields blank.

## c) Management IPv4 Address

- Management IPv4 Method: How the Management interface gets its IPv4 address.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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 and NTP

- 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 Optimization Engine. 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 Optimization Engine 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 Optimization Engine.

**Note** If you are using an IPv6 address, it must be surrounded by square brackets ([1::1]).

- Controller Port: Port of the Crosswork controller i.e., Cisco Crosswork Optimization Engine.
- Controller Signing Certificate File URI: PEM formatted root cert of Cisco Crosswork Optimization Engine 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 Optimization Engine 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.

<ul> <li>I service</li> <li>I service</li></ul>
<ul> <li>Section Section S</li></ul>
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1. Prov Server URL =

- **Step 13** 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	bot-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** > **Power On**, as shown in the following figure:

- 0	Actions - cw-vm-137		]
ummary Monitor	Power	٠	Power On
	Guest OS	•	Power Off
Powered Off	Snapshots	•	33 Suspend
VM Hardware	VM Policies	•	-
> CPU	Template	Þ	

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 40.

# 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 40
- Generate An Enrollment Package, on page 42
- Export Enrollment Package

## 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 40
- Access Cisco Crosswork Data Gateway Via SSH, on page 41

#### 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 ##### ###### ####### ##### ####### ###### # # ##### # # # # # # # # # # # # # # # # # # # # # # # # # # # # # # ###### # # # # # # ###### ## ##### # # # # # # # # # # # # # # # # # # # # # # ##### ####### ##### ##### ## Ħ 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

**Note** The SSH process is protected from brute force attacks by blocking the client IP after a number of login failures. Failures such as incorrect username or password, connection disconnect, or algorithm mismatch are counted against the IP. Up to 4 failures within a 20 minute window will cause the client IP to be blocked for at least 7 minutes. Continuing to accumulate failures will cause the blocked time to be increased. Each client IP is tracked separately.

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 administrator 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.

If you opted not to export the enrollment package during install, then you must export it before you can enroll the Cisco Crosswork Data Gateway instance with Crosswork. The steps to do so are described in Export Enrollment Package, on page 43.



Note

The enrollment package is unique to each Cisco Crosswork Data Gateway instance.

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 Optimization Engine, you must export the enrollment package.

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.

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 40.

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>&lt; OK &gt;</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>&lt; OK &gt;</mark> <cancel></cancel>

The enrollment package is exported.

**Step 5** Manually copy the enrollment package from the above SCP server to your local computer, to be used in the next task to enroll Cisco Crosswork Data Gateway with Cisco Crosswork Optimization Engine.

# Enroll Cisco Crosswork Data Gateway With Cisco Crosswork Optimization Engine

# **Enroll Cisco Crosswork Data Gateway**

Step 1Log into Cisco Crosswork Optimization Engine as described in Section Log In to the UI From a Browser, on page 17.Step 2From the Main Menu, select Admin > Data Gateway Management.<br/>The Data Gateway Management page opens.

Step 3 Click the Add button.

🔒 / Admin / Data Gateway Management			
✓ Data Gateway Metrics Summary			
Administration State	Operational State	● Up (1) ● Error (0) ● Degraded (0) ● Unknown (0)	<b>4</b> Detached Devices
Data Gateways			Selected 0 / Total 1 💍 🌣
+ Attach Devices Detach Devices Administration	State 🗸		T
Name	Administration State	Operational State	Attached Device Count
dg116.cisco.com (j)	🗿 Up	🗿 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.

<ul> <li>↑ Admin / Data Gateway Management</li> <li>✓ Data Gateway Metrics Summ</li> </ul>	ary		
Administration State	Enroll New Data Gateway Enrollment Package * Data Gateway admin state Maintenance Up Browse files to view Summary	×	5 Detached Devices
Data Gateways		Enroll Cancel	Selected 0 / Total 1 Ö Ö
Name dg116.cisco.com (j)	Administration State	Operational State	Attached Device Count

**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.



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:

Data Gateway Metrics Summary						
Administration State	Operational State					
© Up (1) Martenance (8)	0	• Up (0) • Error (0) • Degraded (1) • Unknown (0)		4 Detached Devices		
ta Gateways			Error Details		× ) / Tota	al 1 C
Name	Administration State	Operational State	Service Name	vitals not reported vet.		
			mdt collector	vitals not reported yet.		
cdg.demo.dcloud.cisco.com	Ο υρ	Degraded ()	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**.

**Note** Steps to attach devices to a Cisco Crosswork Data Gateway instance are available in *Cisco Crosswork Change Automation and Health Insights 3.1 User Guide.* 

<ul> <li>Data Gateway Metrics Summary</li> <li>Administration State</li> <li>I bit 00</li> <li< th=""><th>A Admin / Data Gateway Management</th><th></th><th></th></li<></ul>	A Admin / Data Gateway Management		
Administration State   Operational State   Image: Data Gateways   Data Gateways   Image: Data Cateways   Data Gateways   Data Gateways   Image: Data Cateways   Image: Da	✓ Data Gateway Metrics Summary		
Image: set of the set			
Data Gateways   Add Devices   Later	() () () Maintenance (1)	• Up (7) • Errer (8) • Degraded (8)	0 Detached Devices
Image: Market Devices     Administration State       Name     Add Devices       Image: Imag	Data Gateways	Data Gateway Enrolled Successfully	Selected 0 / Total 1 💍 🛱
dg dummy @     0	Attach Devices Detach Devices Administration State	Next Steps Add devices and then attach them to the Data Gateway.	Technol Davido Count
C dg.dummy ()	Neille	Add Devices Later	
	☐ dg.dummy ⊕		

## 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 Optimization Engine and downloads collector binary files. While it

depends on the bandwidth between the Cisco Crosswork Data Gateway instance and Cisco Crosswork

Optimization Engine, this operation typically takes less than 5 minutes. Click the  $\circ$  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**. If the Cisco Crosswork Data Gateway instance fails to enroll, contact Cisco CX for assistance.

## **Cisco Crosswork Data Gateway Authentication and Bootstrap**

During the enrollment process, the enrollment package is uploaded to the controller application, i.e., Cisco Crosswork Optimization Engine, 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 <b>show</b> 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.

## Table 4: Troubleshooting the Installation/Enrollment

Issue	Action		
1. Cannot enroll Cisco Crosswork Data Gateway v	vith Crosswork		
Cisco Crosswork Data Gateway cannot be enrolled	1. Log into the Cisco Crosswork Data Gateway VM.		
with Cisco Crosswork Optimization Engine due to an NTP issue, i.e., there is a clock-drift between the two.	2. From the main menu, go to <b>5 Troubleshooting</b> > <b>Run show-tech</b> .		
The clock-drift might be with either Cisco Crosswork Data Gateway or Cisco Crosswork Optimization Engine.	Enter the destination to save the tarball containing logs and vitals and click <b>OK</b> .		
Also, on the NTP servers for Cisco Crosswork Optimization Engine 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.	In the show-tech logs (in file session.log at location /opt/dg/data/controller-gateway), if you see the error UNAUTHENTICATED:invalid certificate. reason: x509: certificate has expired or is not yet valid, then there is a clock-drift between Cisco Crosswork Data Gateway and .		
Sync the clock time on the host and retry.	3. From the main menu, go to <b>3 Change Current</b> System Settings > 1 Configure NTP.		
	Configure NTP to sync with the clock time on the Cisco Crosswork Optimization Engine server and try re-enrolling Cisco Crosswork Data Gateway.		
	It is also possible that the Cisco Crosswork Optimization Engine's NTP server might be down or its address might be incorrect. To configure NTP on the Cisco Crosswork Optimization Engine side, see Configure NTP after installation.		
2. Cisco Crosswork Data Gateway remains in deg	aded state for more than 10 minutes with reason		

2. Cisco Crosswork Data Gateway remains in degraded state for more than 10 minutes with reason stated as "Could not collect vitals"

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

# **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 17.
- **Step 2** From the navigation panel, select **Admin > Data Gateway Management**.

The Data Gateway Management page opens.

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

🕈 / Admin / Data Gateway Management			
✓ Data Gateway Metrics Summary			
Administration State	Operational State	● Up (1) ● Eror(0) ● Degraded (0) ● Unknown (0)	5 Detached Devices
Data Gateways			Selected 1 / Total 1 💍 🌣
+ Attach Devices Detach Devices Administration State	e 🗸		T
Name Delete Data Gateway	Administration State	Operational St	ate Attached Device Count
dg116.cisco.com (j)	O Up	🕜 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.

n / Admin / Data Gateway Management			
✓ Data Gateway Metrics Summary	Deleting Data Gateway dg116.cisco.	com ×	
Administration State	Dq116.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?     Switch & Continue	e in No Unkrown (0)	5 Detached Devices
			Selected 1 / Total 1 💍 🌣
+ Attach Devices Detach Devices Administration	tion State 🗸		T
Name	Administration State	Operational State	Attached Device Count
dg116.cisco.com 👔	O Up	O Up	

The selected Cisco Crosswork Data Gateway VM is deleted.

🔒 / Admin / Data Gateway Management	$\bigcirc$				
✓ Data Gateway Metrics Summary		Dg116.cisco.com Data Gateway deleted	successfully. X		
Administration State ونه (۵)	Operatio	onal State ●Up(0) ●Erry(0)		8	
Mantenance (0)		Erior (0)     Degraded (0)     Unknown (0)		0 Detached Devices	
Data Gateways					Selected 0 / Total 1 💍 🌣
+ / 🗊 Attach Devices Detach Devices Administra	ation State V				T
Name	Administration State	Operational State	Attached Device Count	Unique Identifier	
No Rows To Show					
0 to 0 of 0 << < Page 0 of 0 > >>					