

Cisco Crosswork Planning 7.1 Installation Guide

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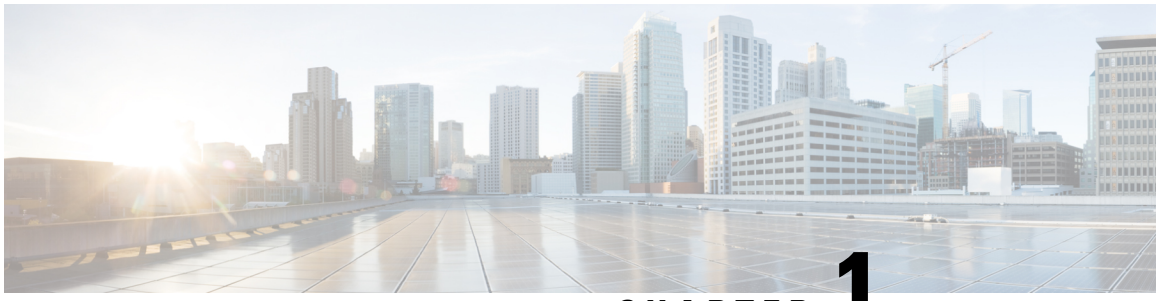
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CHAPTER 1

Overview

This guide explains the requirements and processes to install and upgrade Cisco Crosswork Planning. For detailed information on how to use the Cisco Crosswork Planning Design and Cisco Crosswork Planning Collector applications, see the *Cisco Crosswork Planning Design 7.1 User Guide* and *Cisco Crosswork Planning 7.1 Collection Setup and Administration*.

This section contains the following topics:

- Audience , on page 1
- Core capabilities of Cisco Crosswork Planning , on page 1
- Cisco Crosswork Planning applications, on page 2

Audience

This guide is for experienced network users and operators who want to install Cisco Crosswork Planning in their network. This guide assumes that you are familiar with

- using a Docker container
- running scripts in Python
- deploying OVF templates using VMware vCenter, and
- deploying using OVF tool.

Core capabilities of Cisco Crosswork Planning

Cisco Crosswork Planning runs on the Cisco Crosswork infrastructure and is part of the Cisco Crosswork Network Automation suite of products.

Cisco Crosswork Planning provides tools to create a model of the existing network by continuously monitoring the network and its traffic demands. At a given time, this network model contains all relevant information about a network, including topology, configuration, and traffic information. You can use this information as a basis for analyzing the impact on the network due to changes in traffic demands, paths, node and link failures, network optimizations, or other changes.

Key features

These are some of the important features of Cisco Crosswork Planning:

- **Traffic engineering and network optimization**: Compute TE LSP configuration to meet service level requirements, perform capacity management, and perform local or global optimization in order to maximize efficiency of deployed network resources.
- **Demand engineering**: Examine the impact on network traffic flow of adding, removing, or modifying traffic demands on the network.
- **Topology and predictive analysis**: Observe the impact to network performance of changes in the network topology, which is driven either by design or by network failures.
- **TE tunnel programming**: Examine the impact of modifying tunnel parameters, such as the tunnel path and reserved bandwidth.
- **Class of service (CoS)-aware bandwidth on demand**: Examine existing network traffic and demands, and admit a set of service-class-specific demands between routers.

Cisco Crosswork Planning applications

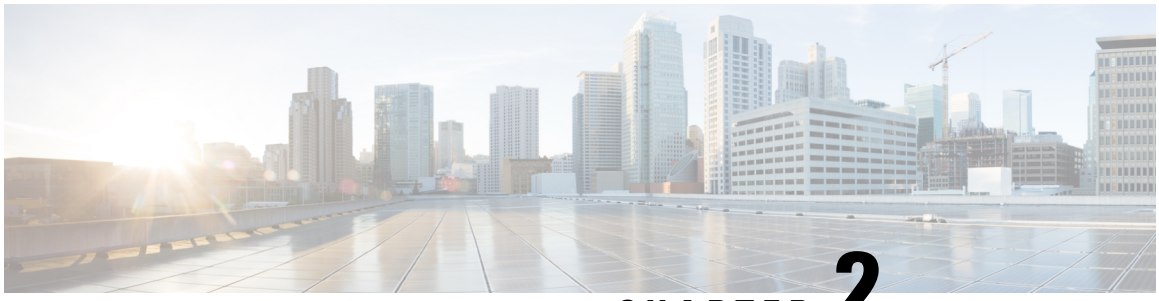
Cisco Crosswork Planning comprises the following two components. These components run independently of each other and you can enable/disable them based on your requirements.

- **Cisco Crosswork Planning Collector**

  Cisco Crosswork Planning Collector consists of a set of services that create, maintain, and archive a model of the current network through continual monitoring and analysis of the network and the traffic demands that are placed on it. For more information on this application, see *Cisco Crosswork Planning 7.1 Collection Setup and Administration*.

- **Cisco Crosswork Planning Design**

  Cisco Crosswork Planning Design is a network design and planning tool that helps network engineers and operators predict growth in their network, simulate failures, and optimize design to meet performance objectives while minimizing cost. For more information on this application, see *Cisco Crosswork Planning Design 7.1 User Guide*.



CHAPTER 2

Installation Requirements

This section contains the following topics:

- Profile specifications, on page 3
- VMware settings, on page 4
- Cisco Crosswork Planning VM requirements, on page 5
- KVM host bare metal requirements, on page 7
- IOS XR and IOS XE version support, on page 9
- Supported web browsers, on page 9
- Port requirements, on page 9
- Disk requirements, on page 10

Profile specifications

This table provides an overview of the scale support for various features and the hardware specifications for each profile in Cisco Crosswork Planning.

Table 1: Profile specifications

Parameters	Profile 1	Profile 2	Profile 3
Scale support			
Total number of network devices	1000	3000	6000
Total number of interfaces (including virtual interfaces)	40000	100000	200000
Total number of demands	50000	100000	500000
Total number of policies (SR and RSVP)	2000	5000	10000
Total number of VPNs	4 Endpoints per VPN service: 30	4 Endpoints per VPN service: 60	8 Endpoints per VPN service: 60

Parameters	Profile 1	Profile 2	Profile 3
Hardware requirements			
Number of VMs	1	2	2
CPU	16 vCPU	16 vCPU	24 vCPU
Memory	125 GB	125 GB	256 GB
Disk space	1 TB	1 TB	2 TB



Note

- For Profile 2 and Profile 3, two VMs are necessary: one operates exclusively as the Collector application, and the other functions as the Design application.
- There is no provision to tune the resource usage settings for individual services.

VMware settings

If your vCenter data center does not meet these requirements, you must deploy the Virtual Machine (VM) individually. For more information on manual installation, see Install Cisco Crosswork Planning using the vCenter vSphere UI, on page 22.

- Supported Hypervisor and vCenter versions:
  - VMware vCenter Server 8.0 (U2c or later) and ESXi 8.0 (U2b or later)
  - VMware vCenter Server 7.0 (U3p or later) and ESXi 7.0 (U3p or later)
- The machine where you run the installer must have high-speed network connectivity to the vCenter data center where you plan to install Cisco Crosswork Planning.
- Host the Cisco Crosswork Planning VM on hardware with Hyper Threading disabled.
- Ensure that the vCenter admin user has enabled profile-driven storage. Verify that the vCenter user has the necessary query permissions at the root level for all resources in vCenter.
- Build and configure the networks required for Crosswork Management and Data in the data centers. These networks must allow low-latency L2 communication (latency with RTT ≤10 ms).
- Ensure that the user account used to access vCenter has these privileges:
  - VM (Provisioning): Clone the VM on the VM you are cloning.
  - VM (Provisioning): Customize the VM or VM folder if you are customizing the guest operating system.
  - VM (Inventory): Create a new VM from an existing VM in the data center or VM folder.
  - VM (Configuration): Add new disk on the data center or VM folder.
  - Resource: Assign a VM to resource pool on the destination host or resource pool.

- Datastore: Allocate space in the destination datastore or datastore folder.
- Network: Assign the network to which the VM will be assigned.
- Profile-driven storage (Query): This permission setting needs to be allowed at the root of the data center tree level.

- We also recommend that you enable vCenter storage control.

Cisco Crosswork Planning VM requirements

This table describes the resource requirements per VM to deploy Cisco Crosswork Planning.

Table 2: Network requirements

Requirement	Description
Network connections	For production deployments, we recommend that you use dual interfaces, one for the Management network and one for the Data network. For optimal performance, the management and data networks should use links configured at a minimum of 10 Gbps with a latency of less than 10 milliseconds.

Requirement	Description
IP addresses	Four IPv4 addresses: One management and one data IP address for the Cisco Crosswork Planning node being deployed, and two additional IP addresses to be used as the Virtual IP (VIP) address (one for the Management network and one for the Data network). **Note** The assignment of VIP addresses follows the standard configuration approach used in clustered environments. In a Cisco Crosswork Planning (single node) deployment, these addresses are included for consistency; they are allocated but are not used for high availability functions. • **Management IP address:** Used for user access and node management. • **Data IP address:** Used for communication with external devices and for data collection. • **Management VIP address:** An additional IP address for the management network. It is typically used in clustered environments to provide high availability and seamless management access. In a Cisco Crosswork Planning (single node) deployment, this serves as a placeholder. • **Data VIP Address:** An additional IP address for the data network. It is generally used in clusters to ensure data network availability. In a Cisco Crosswork Planning (single node) deployment, this serves as a placeholder. **Note** • Cisco Crosswork Planning does not support dual-stack and IPv6 configurations. Therefore, all addresses for the environment must be IPv4. • The IP addresses must be able to reach the gateway address for the network, or the installation will fail. • At this time, your IP allocation is permanent. If you want to change your IP allocation, you must redeploy. For more information, contact the Cisco Customer Experience team.
Interfaces	Cisco Crosswork Planning is deployed on a single VM with two interfaces. • Number of NICs: 2 • vNIC0: Management traffic (for accessing the interactive console and passing the control/data information between servers). • vNIC1: Device access traffic (for device access and data collection).
NTP server	The IPv4 addresses or host names of the NTP server you plan to use. To specify multiple NTP servers, separate each entry with a space. These should be the same NTP servers you use to synchronize the Cisco Crosswork Planning VM clock, devices, clients, and servers across your network. Ensure that the NTP servers are reachable on the network before attempting installation. The installation will fail if the servers cannot be reached.

Requirement	Description
DNS servers	The IPv4 addresses of the DNS servers you plan to use. These should be the same DNS servers you use to resolve host names across your network. Verify that the DNS servers are reachable on the network you start installation. The installation will fail if the servers cannot be reached.
DNS search domain	The search domain you want to use with the DNS servers, for example, cisco.com. You can have only one search domain.
Backup server	Cisco Crosswork Planning will back up the configuration of the system to an external server using SCP. The SCP server storage requirements may vary slightly, but you must have at least 25 GB of storage.
FQDN (optional)	The installation process supports using either a VIP (Virtual IP address) or an FQDN (Fully Qualified Domain Name) to access the VM. If you choose to use the FQDN, you will need one for the Management and one for the Data network. Cisco Crosswork Planning deployed on a single VM does not support dual-stack and IPv6 configurations. Therefore, all FQDN addresses configured for the deployment environment must be IPv4. **Note** If you choose to supply the FQDNs during the initial installation, the DNS server must be populated with them before the VM is powered on; otherwise, the installation script will fail to complete the environment setup.

KVM host bare metal requirements

This table describes the host bare metal requirements for deploying Cisco Crosswork Planning on KVM.

Table 3: Host bare metal requirements

Component	Minimum requirement per host
Processor	Intel(R) Xeon(R) CPU E5-2699 v4 @ 2.20GHz or latest
NIC	2 x 10 Gbps NICs.
OS	Red Hat Enterprise Linux 9.4

Resource requirements

This table describes the resource requirements per host.

Table 4: Host resource requirements

Component	Minimum requirement per host	
	Large VM profile	**XLarge VM profile**
RAM	You can calculate the total RAM needed using this formula: Buffer (for example, 20%): RAM per VM * 0.20 Estimated total RAM needed (GB) = Total RAM + Buffer **Example:** RAM per VM (GB): 125 GB Buffer (20%): 125 * 0.20 = 25 GB Estimated total RAM needed (GB): 125 + 25 = 150 GB	You can calculate the total RAM needed using this formula: Buffer (for example, 20%): RAM per VM * 0.20 Estimated total RAM needed (GB) = Total RAM + Buffer **Example:** RAM per VM (GB): 256 GB Buffer (20%): 256 * 0.20 = 51.2 GB Estimated total RAM needed (GB): 256 + 51.2 = 307.2 GB
CPU	You can calculate the number of vCPUs needed using this formula: Buffer (for example, 20%): Total vCPUs * 0.20 Estimated total vCPUs needed = vCPUs per VM + Buffer **Example:** vCPUs per VM: 16 Buffer (20%): 16 * 0.2 = 3.2 Estimated total vCPUs needed: 16 + 3.2 = 19.2	You can calculate the number of vCPUs needed using this formula: Buffer (for example, 20%): Total vCPUs * 0.20 Estimated total vCPUs needed = vCPUs per VM + Buffer **Example:** vCPUs per VM: 24 Buffer (20%): 24 * 0.2 = 4.8 Estimated total vCPUs needed: 24 + 4.8 = 28.8
Storage	You can calculate the storage required using this formula: Buffer: additional 100 GB per VM Estimated total storage needed (GB) = Storage per VM + Buffer **Example:** Storage per VM (GB): 1000 GB Buffer: 100 GB Estimated total storage needed (GB): 1000 + 100 = 1100 GB	You can calculate the storage required using this formula: Buffer: additional 100 GB per VM Estimated total storage needed (GB) = Storage per VM + Buffer **Example:** Storage per VM (GB): 2000 GB Buffer: 100 GB Estimated total storage needed (GB): 2000 + 100 = 2100 GB

It is recommended to allocate a 20% buffer for CPU and memory resources, along with an additional 100 GB of storage per VM. This approach helps ensure smooth performance and minimizes the risk of resource-related issues during operation.

Note

- Ensure the networks required for the Crosswork Management and Data networks are built and configured in the data centers. These networks must allow low-latency L2 communication with a round-trip time (RTT) of 10 ms or less.
- You must use and configure the same network name on the RHEL bare metal host machine that is hosting the Cisco Crosswork Planning VM.

IOS XR and IOS XE version support

Cisco Crosswork Planning supports these Cisco IOS XR and IOS XE software versions.

Table 5: IOS XR/XE version support

Device	Tested with version
SR-PCE	25.2.1
XRv 9000	25.2.1, 25.1.1, 24.4.2
ASR 9000	25.2.1, 25.1.1, 24.4.2
NCS 5500	25.2.1, 25.1.1, 24.4.2
Cisco 8000	25.2.1, 25.1.1, 24.4.2
IOS-XE	17.16.1

Supported web browsers

This table lists the supported browser versions for Cisco Crosswork Planning.

Browser	Version
Google Chrome	131 or later
Mozilla Firefox	136 or later

Port requirements

This table lists the ports used by Cisco Crosswork Planning deployment on the management network.

Table 6: Ports used by Cisco Crosswork Planning

Port	Protocol	Used for	Direction
30602	TCP	Monitoring the installation (Cisco Crosswork Planning)	Inbound
30603	TCP	Cisco Crosswork Planning Web user interface (NGINX server listens for secure connections on port 443)	Inbound
7	TCP/UDP	Discovering endpoints using ICMP	Outbound
22	TCP	Initiating SSH connections with managed devices	Outbound
22	TCP	Remote SSH connection	Inbound
53	TCP/UDP	Connecting to DNS	Outbound
123	UDP	Network Time Protocol (NTP)	Outbound
179	TCP	NetFlow BGP	Inbound
830	TCP	Initiating NETCONF	Outbound
30742	TCP	WAE Modeling Daemon (WMD)	Inbound
30744	TCP	OPM/RPC	Inbound
31210	UDP	NetFlow packets	Inbound

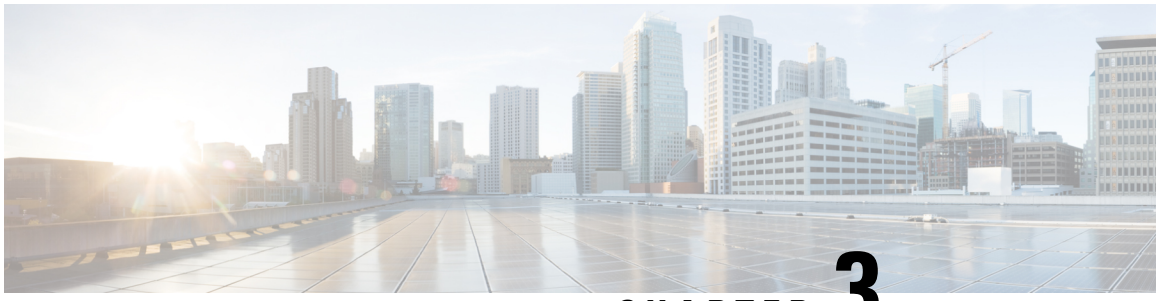
Disk requirements

The VM datastore(s) need to have disk access latency < 10 ms and > 4000 IOPS. For more information on diagnostic checks, see Diagnostic assessment.

Table 7: IOPS requirements

IOPS value	Status	Response
IOPS value > 4000	PASS	Installation proceeds without the need for user acknowledgment.

IOPS value	Status	Response
1000 < IOPS value > 4000	BLOCK	For production deployments, the installation requires ~ 4000 IOPS for optimal scaling performance. If the system operates in the suboptimal range of 1000 to 4000 IOPS, the installation process requires user acknowledgment before continuing. If the installation is blocked, you can choose to ignore the failure and continue. You must explicitly acknowledge the report before proceeding, and by doing so, you acknowledge this warning and accept the risks.
IOPS value < 1000	FAIL	Installation is blocked irrespective of user response.



CHAPTER 3

Install Cisco Crosswork Planning

This chapter explains the processes to install Cisco Crosswork Planning on a single VM or node. In a single VM-based solution, the Cisco Crosswork Platform Infrastructure, Cisco Crosswork Planning infrastructure, and Cisco Crosswork Planning Design and Cisco Crosswork Planning Collector applications are bundled together in a single OVA image. Once you complete the installation procedure, all these components are installed on your machine by default.

- The Cisco Crosswork Platform Infrastructure is a microservices-based platform and is the foundation required for running Crosswork applications.
- Cisco Crosswork Planning Collector provides a set of microservices to create, maintain, and archive a model of the current network.
- Cisco Crosswork Planning Design provides a set of microservices for network planning, designing, and visualization.
- Cisco Crosswork Planning Infrastructure provides a set of microservices to manage Smart Licensing and Archive services.

This section contains the following topics:

- Installation overview, on page 13
- Installation parameters, on page 14
- Install Cisco Crosswork Planning using the vCenter vSphere UI, on page 22
- Install Cisco Crosswork Planning via the OVF tool, on page 29
- Install Cisco Crosswork Planning using the Docker installer tool, on page 31
- Installing Cisco Crosswork Planning on KVM manually, on page 36
- Monitor the installation, on page 44
- Diagnostic assessment, on page 45
- Log in to Cisco Crosswork Planning UI, on page 48

Installation overview

Cisco Crosswork Planning can be installed using these methods:

- vCenter vSphere UI—For details, see Install Cisco Crosswork Planning using the vCenter vSphere UI, on page 22.
- OVF tool—For details, see Install Cisco Crosswork Planning via the OVF tool, on page 29.

- Docker installer tool—For details, see Install Cisco Crosswork Planning using the Docker installer tool, on page 31.

Note This method is less recommended compared to using the vCenter UI or the OVF tool for installation.

Installation parameters

This section explains the important parameters that you must specify while installing Cisco Crosswork Planning. Ensure that you have relevant information to provide for each of the parameters mentioned in the table.

Attention Use the latest template file that comes with the Cisco Crosswork Planning build file.

Table 8: General parameters

Parameter	Description
`Cw_VM_Image`	The name of Crosswork VM image in vCenter. This value is set as an option when running the installer tool and does not need to be set in the template file.
`ClusterIPStack`	The IP stack protocol: IPv4

`vm_sizes`	Create a custom profile as per your requirement. These two profiles are supported in Cisco Crosswork Planning:
	`vm_sizes = {`
	`  "large" = {`
	`  vcpus = 16,`
	`  cpu_reservation = 24000,`
	`  memory = 128000`
	`  },`
	`  "xlarge" = {`
	`  vcpus = 24,`
	`  cpu_reservation = 32000,`
	`  memory = 256000`
	`  }`
	`}`

`vcpus`	The number of virtual CPU instances allocated for virtual machine.
`cpu_reservation`	The guaranteed minimum CPU resource allocation for virtual machine.
`memory`	The amount of memory allocation for virtual machine.
`ManagementIPAddress`	The Management IP address of the VM (IPv4).

Parameter	Description
`ManagementIPNetmask`	The Management IP subnet in dotted decimal format (IPv4).
`ManagementIPGateway`	The Gateway IP on the Management Network (IPv4). The address must be reachable, otherwise the installation will fail.
`ManagementVIP`	The Management Virtual IP for the Crosswork VM.
`DataIPAddress`	The Data IP address of the VM (IPv4).
`DataIPNetmask`	The Data IP subnet in dotted decimal format (IPv4).
`DataIPGateway`	The Gateway IP on the Data Network (IPv4). The address must be reachable, otherwise the installation will fail.
`DataVIP`	The Data Virtual IP for the Crosswork VM.
`DNS`	The IP address of the DNS server (IPv4). The address must be reachable, otherwise the installation will fail.
`NTP`	NTP server address or name. The address must be reachable, otherwise the installation will fail.
`DomainName`	The domain name used for the VM.
`CWPassword`	Password to log into Cisco Crosswork. When setting up a VM, ensure the password is strong and meets the following criteria: • It must be at least eight characters long, and include uppercase and lowercase letters, numbers, and at least one special character. • These special characters are not allowed: backslash (\), single quote ('), or double quote ("). • Avoid using passwords that resemble dictionary words (for example, "Pa55w0rd!") or relatable words. While such passwords may meet the specified criteria, they are considered weak and will be rejected, resulting in a failure to set up the VM.
`VMSize`	VM size. Cisco Crosswork Planning supports the `Large` and `XLarge` profiles. For more information, see Profile specifications, on page 3.
`VMName`	Name of the VM.
`NodeType`	Type of VM. Choose "Hybrid".
`IsSeed`	Set to "True".
`InitNodeCount`	Set the value to 1.
`InitMasterCount`	Set the value to 1.

Parameter	Description
`bckup_min_percent`	Minimum percentage of the data disk space to be used for the size of the backup partition. The default value is 35 (valid range is from 1 to 80). Use the default value unless recommended otherwise. **Note** The final backup partition size will be calculated dynamically. This parameter defines the minimum.
`ThinProvisioned`	Set to "false" for production deployments.
`SchemaVersion`	The configuration Manifest schema version. This indicates the version of the installer to use with this template. Schema version should map to the version packaged with the sample template in the installer tool on cisco.com. You should always build a new template from the default template provided with the release you are deploying, as template requirements may change from one release to the next.
`EnableSkipAutoInstallFeature`	Pods marked as "skip auto install" will not be brought up unless explicitly requested by a dependent application or pod. By default, the value is set as `"False"`. Set the value as "True". **Note** • If left blank, the default value (`"False"`) is automatically selected. • This parameter accepts a string value, so be sure to enclose the value in double quotes.
`EnforcePodReservations`	Enforces minimum resource reservations for the pod. If left blank, the default value ("True") is selected. This parameter accepts a string value, so be sure to enclose the value in double quotes.
`K8sServiceNetwork`	The network address for the kubernetes service network. By default, the CIDR range is fixed to '/16'.
`K8sPodNetwork`	The network address for the kubernetes pod network. By default, the CIDR range is fixed to '/16'.

Parameter	Description
`IgnoreDiagnosticsCheckFailure`	Used to set the system response in case of a diagnostic check failure. If set to "false" (default value), the installation will terminate if the diagnostic check reports an error. If set to "true", the diagnostic check will be ignored, and the installation will continue. We recommend to select the default value. This parameter accepts a string value, so be sure to enclose the value in double quotes. **Note** • The log files (diagnostic_stdout.log and diagnostic_stderr.log) can be found at **/var/log**. The result from each diagnostic execution is kept in a file at **/home/cw-admin/diagnosis_report.txt**. • Use **diagnostic all** command to invoke the diagnostic manually on day N. • Use **diagnostic history** command to view previous test report.
`ManagementVIPName`	Name of the Management Virtual IP for the Crosswork VM. This is an optional parameter used to reach Crosswork Management VIP via DNS name. If this parameter is used, the corresponding DNS record must exist in the DNS server.
`DataVIPName`	Name of the Data Virtual IP for the Crosswork VM. This is an optional parameter used to reach Crosswork Data VIP via DNS name. If this parameter is used, the corresponding DNS record must exist in the DNS server.
`EnableHardReservations`	Determines the enforcement of VM CPU and Memory profile reservations. This is an optional parameter and the default value is `true`, if not explicitly specified. If set as `true`, the VM's resources are provided exclusively. In this state, the installation will fail if there are insufficient CPU cores, memory or CPU cycles. If set as `false` (only set for lab installations), the VM's resources are provided on best efforts. In this state, insufficient CPU cores can impact performance or cause installation failure.
`corefs`	Core partition size (in Giga Bytes). Default value is 18 GB and Maximum value is 1000 GB. You are recommended to use the default value.

Parameter	Description
ddatafs	Data disk size for the nodes (in Giga Bytes). This is an optional parameter and the default value is 485 (valid range is from 450 to 8000), if not explicitly specified. Please use the default value unless recommended otherwise.
logfs	Log partition size (in Giga Bytes). Default value is 20 GB and Maximum value is 1000 GB. You are recommended to use the default value.
RamDiskSize	Size of the RAM disk. This parameter is only used for lab installations (value must be at least 2). When a non-zero value is provided for RamDiskSize, the HSDatastore value is not used.
Timezone	Enter the timezone. Input is a standard IANA time zone (for example, "America/Chicago"). If left blank, the default value (UTC) is selected. This is an optional parameter.
UseNonDefaultCalicoBgpPort	Determines whether Calico should use the default port 179 for BGP or an alternative port. Set to "True".

Table 9: VMware template parameters

Parameter	Description
VCenterAddress	The vCenter IP or host name.
VCenterUser	The username needed to log into vCenter.
VCenterPassword	The password needed to log into vCenter.
DCname	The name of the Data Center resource to use. Example: DCname = "cp"
MgmtNetworkName	The name of the vCenter network to attach to the VM's Management interface. This network must already exist in VMware or the installation will fail.
DataNetworkName	The name of the vCenter network to attach to the VM's Data interface. This network must already exist in VMware or the installation will fail. However, if this is a single NIC installation using only the Management interface, then you need to specify DataNetworkName = "".
HostedCwVMs	The ID of the VM to be hosted by the ESXi host or resource.

Parameter	Description
`Host`	The ESXi host, or ONLY the vCenter VM/resource group name where the VM is to be deployed. The primary option is to use the host IP or name (all the hosts should be under the data center). If the hosts are under a VM in the data center, only provide the VM name (all hosts within the VM will be picked up). The subsequent option is to use a resource group. In this case, a full path should be provided. Example: `Host = "Main infrastructure/Resources/00_trial"`
`Datastore`	The datastore name available to be used by this host or resource group. The primary option is to use host IP or name. The subsequent option is to use a resource group. Example: `Datastore = "SDRS-DCNSOL-prodexsi/bru-netapp-01_FC_Prodesx_ds_15"`
`HSDatastore`	The high speed datastore available for this host or resource group. If the vCenter server has a separate high-speed datastore, then this should be set to the name of that high-speed data store. If the vCenter server uses only a high-speed datastore, then both Datatore and HSDatastore can be set to the same name. **Note:** The use of high-speed datastore is mandatory for Cisco Crosswork Planning.

Table 10: Parameters used in KVM deployment

Parameter	Description
`AdminIPv4Address`	The Admin IP address of the VM (IPv4).
`AdminIPv4Netmask`	The Admin IP subnet in dotted decimal format (IPv4).
`AwsIamRole`	The Amazon Web Services IAM role name for the VIP update.
`CWPassword`	Password to log into Cisco Crosswork. Use a strong VM Password (8 characters long, including upper and lower case letters, numbers, and at least one special character). Avoid using passwords similar to dictionary words (for example, "Pa55w0rd!") or relatable words (for example, C!sco123 or Cwork321!). While they satisfy the criteria, such passwords are weak and will be rejected resulting in failure to setup the VM.
`CWUsername`	Username to log into Cisco Crosswork.
`ClusterCaKey`	The CA private key. Use the default value (Empty).
`ClusterCaPubKey`	The CA public key. Use the default value (Empty).

Parameter	Description
`CwInstaller`	Set as "False".
`DNSv4`	The IP address of the DNS server (IPv4). The address must be reachable, otherwise the installation will fail.
`DataIPv4Address`	The Data IP address of the VM (IPv4).
`DataIPv4Gateway`	The Gateway IP on the Data Network (IPv4). The address must be reachable, otherwise the installation will fail.
`DataIPv4Netmask`	The Data IP subnet in dotted decimal format (IPv4).
`DataPeerIPs`	The Data peer IP addresses (IPv4) for the VM.
`DataVIP`	The Data Virtual IP for the Crosswork VM.
`DataVIPName`	Name of the Data Virtual IP for the Crosswork VM. This is an optional parameter used to reach Crosswork Data VIP via DNS name. If this parameter is used, the corresponding DNS record must exist in the DNS server.
`Deployment`	Enter the deployment type.
`Disclaimer`	Enter the disclaimer message.
`Domain`	The domain name used for the VM.
`EnableSkipAutoInstallFeature`	Any pods marked as skip auto install will not be brought up until a dependent application/pod explicitly asks for it. Set to "True".
`EnforcePodReservations`	Enforces minimum resource reservations for the pod. If left blank, the default value ("True") is selected.
`InitNodeCount`	Set the value to 1.
`InitMasterCount`	Set the value to 1.
`IsSeed`	Set to "True".
`K8Orch`	Enforces minimum resource reservations for the pod. If left blank, the default value ("True") is selected.
`K8sPodNetwork`	The network address for the kubernetes pod network. By default, the CIDR range is fixed to '/16'.
`K8sServiceNetwork`	The network address for the kubernetes service network. By default, the CIDR range is fixed to '/16'.
`ManagementIPv4Address`	The Management IP address of the VM (IPv4).
`ManagementIPv4Gateway`	The Gateway IP on the Management Network (IPv4). The address must be reachable, otherwise the installation will fail.

Parameter	Description
ManagementIPv4Netmask	The Management IP subnet in dotted decimal format (IPv4).
ManagementVIP	The Management Virtual IP for the Crosswork VM.
ManagementVIPName	Name of the Management Virtual IP for the Crosswork VM. This is an optional parameter used to reach Crosswork Management VIP via DNS name. If this parameter is used, the corresponding DNS record must exist in the DNS server.
ManagementPeerIPs	The Management peer IP addresses (IPv4) for the VM.
NBIIPv4Address	The NBI IP address of the VM (IPv4).
NBIIPv4Gateway	The Gateway IP on the NBI Network (IPv4). The address must be reachable, otherwise the installation will fail.
NBIIPv4Netmask	The NBI IP subnet in dotted decimal format (IPv4).
NBIVIP	The NBI Virtual IP address (IPv4) for the VM.
NTP	NTP server address or name. The address must be reachable, otherwise the installation will fail.
Timezone	Enter the timezone. Input is a standard IANA time zone (for example, "America/Chicago"). If left blank, the default value (UTC) is selected. This is an optional parameter.
VMLocation	Location of the VM.
VMType	Type of VM. Choose "Hybrid".
bckup_min_percent	Minimum percentage of the data disk space to be used for the size of the backup partition. The default value is 35 (valid range is from 1 to 80). Please use the default value unless recommended otherwise. **Note** The final backup partition size will be calculated dynamically. This parameter defines the minimum.
corefs	Core partition size (in Giga Bytes). Default value is 18 GB and Maximum value is 1000 GB. You are recommended to use the default value.
ddatafs	Data disk size for the nodes (in Giga Bytes). This is an optional parameter and the default value is 485 (valid range is from 450 to 8000), if not explicitly specified. Please use the default value unless recommended otherwise.

Parameter	Description
`logfs`	Log partition size (in Giga Bytes). Default value is 20 GB and Maximum value is 1000 GB. You are recommended to use the default value.
`ramdisk`	Size of the RAM disk. This parameter is only used for lab installations (value must be at least 2). When a non-zero value is provided for `RamDiskSize`, the `HSDatastore` value is not used.
`ssd`	SSD disk size. This is an optional parameter and the default value is 15. Please use the default value unless recommended otherwise.
`ThinProvisioned`	Set to "false" for production deployments.
`UseNonDefaultCalicoBgpPort`	Determines whether Calico should use the default port 179 for BGP or an alternative port. Set to "True".
`bootOptions.efiSecureBootEnabled`	Default value is "False".

Guidelines for custom profiles

Ensure that the vm_sizes parameter is set in accordance with your deployment profile. These two profiles are supported in Cisco Crosswork Planning:

```
vm_sizes = {
  "large" = {
    vcpus = 16,
    cpu_reservation = 24000,
    memory = 128000
  },
  "xlarge" = {
    vcpus = 24,
    cpu_reservation = 32000,
    memory = 256000
  }
}
```

Install Cisco Crosswork Planning using the vCenter vSphere UI

This topic explains how to deploy Cisco Crosswork Planning on a single VM using the vCenter user interface. This is the recommended method for installing Cisco Crosswork Planning on a single VM.

Note When you install Cisco Crosswork Planning using the vCenter vSphere UI, you must import the inventory file manually. For details on importing an inventory file, see Import an inventory file, on page 28.

Procedure

Step 1 Download the latest available Cisco Crosswork Planning image file (*.ova) to your system.

Step 2 With VMware ESXi running, log in to the VMware vSphere Web Client. On the left navigation pane, choose the ESXi host where you want to deploy the VM.

Step 3 In the vSphere UI, go to **Host** > **Configure** > **Networking** > **Virtual Switches** and select the virtual switch for the Management Network that will be used to access the UI of the VM. In the virtual switch, select **Edit** > **Security**, and configure the following DVS port group properties:

- Set **Promiscuous mode** as *Reject*
- Set **MAC address changes** as *Reject*

Confirm the settings and repeat the process for the virtual switch that will be used for the Data Network.

Step 4 Review and confirm that your network settings meet the requirements.

Ensure that the networks that you plan to use for Management network and Data network are connected to the host. Contact your Cisco Customer Experience team for assistance.

Step 5 Choose **Actions** > **Deploy OVF Template**.

Caution
The default VMware vCenter deployment timeout is 15 minutes. If vCenter times out during deployment, the resulting VM will not be bootable. To prevent this, we recommend that you document the choices (such as IP address, gateway, DNS server, etc.) so that you can enter the information quickly and avoid any issues with the VMware configuration.

Step 6 The VMware **Deploy OVF Template** window appears, with the first step, **1 - Select an OVF template**, highlighted. Click **Choose Files** to navigate to the location where you downloaded the OVA image file and select it. Once selected, the file name is displayed in the window.

Step 7 Click **Next**. The **Deploy OVF Template** window is refreshed, with **2 - Select a name and folder** now highlighted. Enter a name and select the respective data center for the Cisco Crosswork Planning VM you are creating.

We recommend that you include the Cisco Crosswork Planning version and build number in the name, for example: Cisco Crosswork Planning 7.1 Build 152.

Step 8 Click **Next**. The **Deploy OVF Template** window is refreshed, with **3 - Select a compute resource** highlighted. Select the host for your Cisco Crosswork Planning VM.

Step 9 Click **Next**. The VMware vCenter Server validates the OVA. Network speed will determine how long validation takes. After the validation is complete, the **Deploy OVF Template** window is refreshed, with **4 - Review details** highlighted.

Step 10 Review the OVF template that you are deploying. Note that this information is gathered from the OVF, and cannot be modified.

Note
Even though the **Product** field displays as "Cisco Crosswork Network Automation", once the installation procedure completes, the product name is displayed as "Cisco Crosswork Planning" in the application UI. The term "Cisco Crosswork Network Automation" is used universally for all the products under Crosswork portfolio.

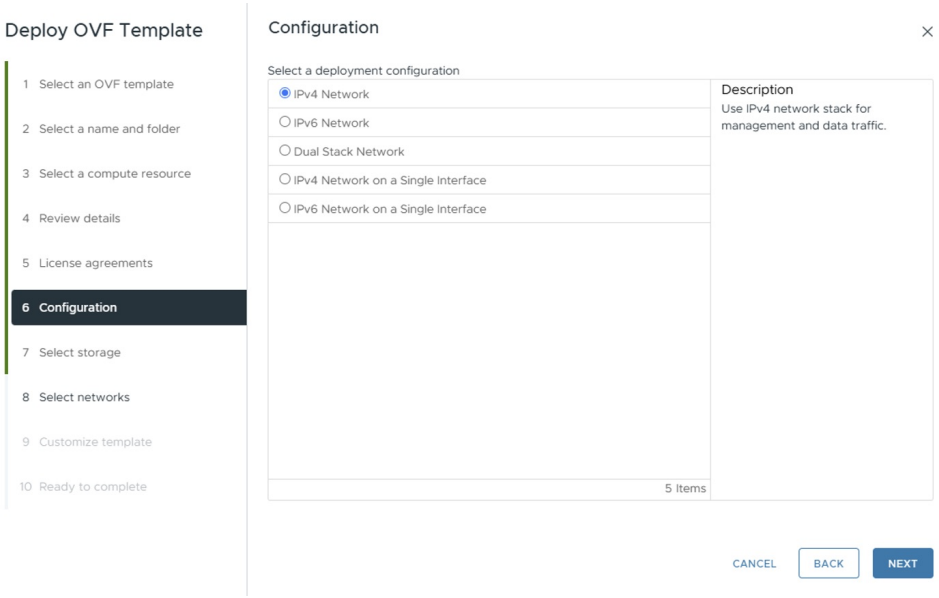
Note
You may see alerts regarding the OVF package containing advanced configuration options and/or about trusted certificates. These are common and you can safely select the "Ignore" option.

Step 11 Click **Next**. The **Deploy OVF Template** window is refreshed, with **5 - License agreements** highlighted. Review the End User License Agreement and if you agree, click the **I accept all license agreements** checkbox. Otherwise, contact your Cisco Customer Experience team for assistance.

Step 12 Click **Next** The **Deploy OVF Template** window is refreshed, with **6 - Configuration** highlighted. Choose the desired deployment configuration.

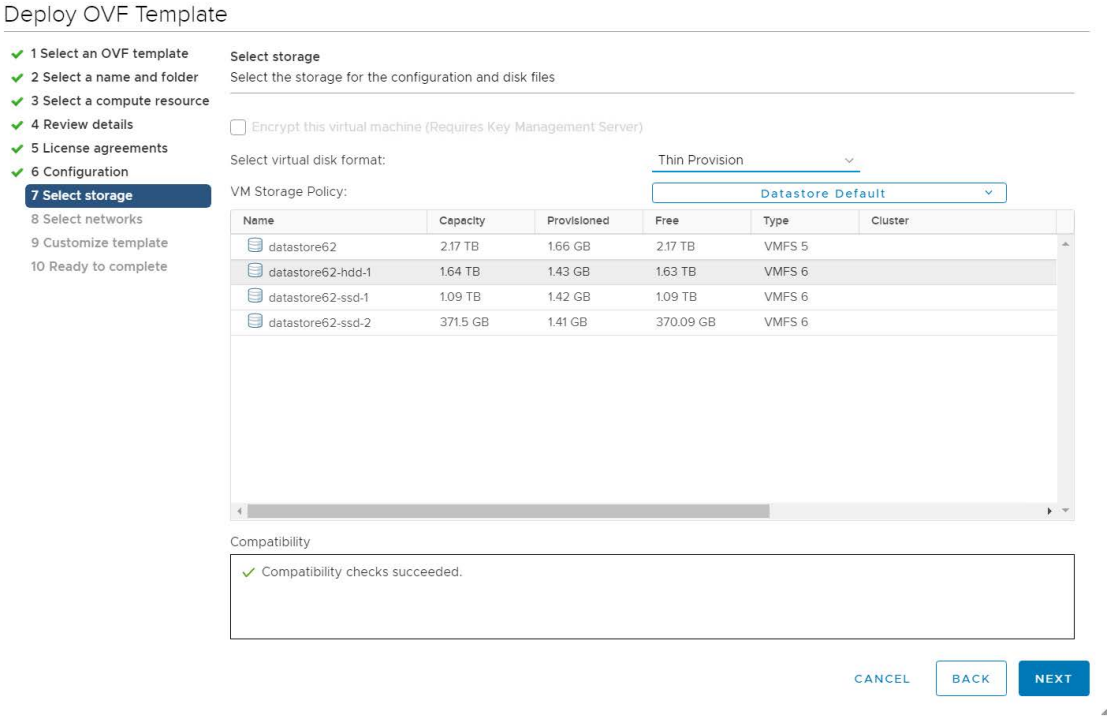
Important
For Cisco Crosswork Planning deployment, the supported configuration is **IPv4 Network** using two NICs.

Figure 1: Select a deployment configuration



Step 13 Click **Next**. The **Deploy OVF Template** window is refreshed, with **7 - Select Storage** highlighted. Choose 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.

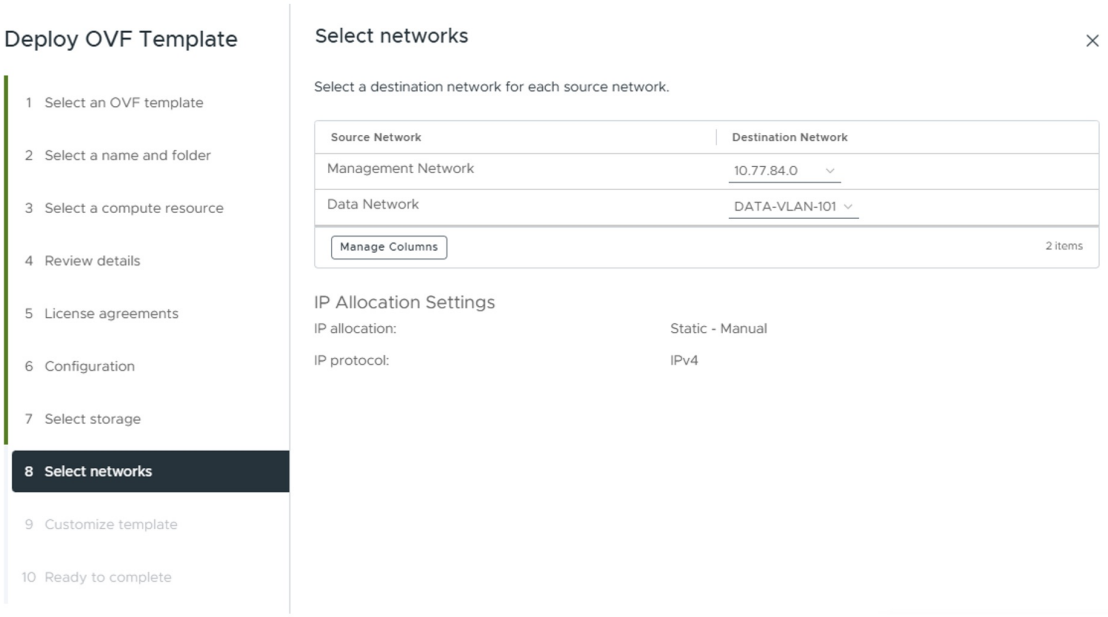
Figure 2: Select storage



Note
For production deployment, choose the **Thick Provision Eager Zeroed** option because this will preallocate disk space and provide the best performance. For lab purposes, we recommend the **Thin Provision** option because it saves disk space.

Step 14 Click **Next**. The **Deploy OVF Template** window is refreshed, with **8 - Select networks** highlighted. From the **Destination Network** drop-down list, select the proper networks for the Management Network and the Data Network.

Figure 3: Select networks



Step 15 Click **Next**. The **Deploy OVF Template** window is refreshed, with **9 - Customize template** highlighted.

a) Expand the **Management Network** settings. Provide information for the deployment, such as IP address, IP netmask, IP gateway, virtual IP address, and virtual IP DNS name.

b) Expand the **Data Network** settings. Provide information for the deployment, such as IP address, IP netmask, IP gateway, virtual IP address, and virtual IP DNS name.

c) Expand the **Deployment Credentials** settings. Enter relevant values for the VM Username and Password.

Note
Avoid using passwords that resemble dictionary words (for example, 'Pa55w0rd!') or easily guessable patterns. While such passwords might meet the initial criteria, they are considered weak and could cause the VM setup to fail without a clear explanation. To ensure a successful installation, use a complex password with a minimum of 8 characters that combines uppercase and lowercase letters, numbers, and special characters in a non-predictable sequence.

d) Expand the **DNS and NTP Servers** settings. Provide information in these three fields:

- **DNS IP Address**: The IP addresses of the DNS servers you want the Cisco Crosswork server to use. Separate multiple IP addresses with spaces.
- **NTP Servers**: The IP addresses or host names of the NTP servers you want to use. Separate multiple IPs or host names with spaces.
- **DNS Search Domain**: The name of the DNS search domain.
- **Timezone**: Enter the timezone details. Default value is UTC.

Note
The DNS and NTP servers must be reachable using the network interfaces you have mapped on the host. Otherwise, the configuration of the VM will fail.

e) Expand **Disk Configuration** settings. Provide relevant values for these fields:

- **Logfs Disk Size**
- **Datafs Disk Size**
- **Corefs Partition Size**
- **High Speed Disk Size**
- **Minimum backup partition size**

The default disk configuration settings should work for most environments. Change the settings only if you are instructed to by the Cisco Customer Experience team.

f) Expand **Crosswork Configuration** and enter your legal disclaimer text (you will see this text if you log into the CLI).

g) Expand **Crosswork Cluster Configuration**. Provide relevant values for these fields:

- **VM Type**: Choose **Hybrid**.
- **Cluster Seed node**: Choose **True**.
- **Crosswork Management Cluster Virtual IP**: Enter virtual IP of the management network.
- **Crosswork Management Cluster Virtual IP Name**: Enter DNS hostname of virtual IP interface of the management network.
- **Crosswork Data Cluster Virtual IP**: Enter virtual IP of the data network.
- **Crosswork Data Cluster Virtual IP Name**: Enter DNS hostname of virtual IP interface of the data network.
- **Initial hybrid node count**: Set to 1.
- **Initial total node count**: Set to 1.
- **Location of VM**: Enter the location of VM.
- **Disclaimer**: Enter your legal disclaimer text (you will see this text if you log into the CLI).
- **Installation type**: Not applicable to single VM deployment. Do not select any checkbox.
- **Enable Skip Auto Install Feature**: Set to **True**.
- **Auto Action Manifest Definition**: Use the default value (Empty).
- **Product specific definition**: Enter the product specific definition.
- **Ignore Diagnostics Failure?**: Use the default value (False).

Step 16 Click **Next**. The **Deploy OVF Template** window is refreshed, with **10 - Ready to Complete** highlighted.

Step 17 Review your settings and then click **Finish** if you are ready to begin deployment. Wait for the deployment to finish before continuing. To check the deployment status:

a) Open a VMware vCenter client.

b) In the **Recent Tasks** tab of the host VM, view the status of the **Deploy OVF template** and **Import OVF package** jobs.

Step 18 Once the deployment is completed, right-click on the VM and select **Edit Settings**. The **Edit Settings** dialog box is displayed. Under the **Virtual Hardware** tab, update these attributes based on your profile requirement.

- **CPU:** change to **16** (for Large profile) or **24** (for XLarge profile)
- **Memory:** change to **125 GB** (for Large profile) or **256 GB** (for XLarge profile)

For more information, see Profile specifications, on page 3.

Click **OK** to save the changes.

Step 19 Power on the Cisco Crosswork Planning VM. To power on, expand the host's entry, click the Cisco Crosswork Planning VM, and then choose **Actions** > **Power** > **Power On**.

The time taken to create the VM can vary based on the size of your deployment profile and the performance characteristics of your hardware.

Import an inventory file

If you have installed your VM manually using the vCenter UI, you must import an inventory file (.tfvars file) to Cisco Crosswork Planning to reflect the details of your VM. The inventory file contains information about the VM along with the data center parameters. A sample inventory file can be downloaded from the Cisco Crosswork Planning UI.

Note

- If the manual installation was performed to replace a failed VM, you must delete the original VM after importing the inventory file.
- Uncomment or set the "*OP_Status = 2*" parameter while importing the inventory file manually. If you fail to do this, the status of the VM will incorrectly appear as "Initializing" even after the VM becomes functional.

Procedure

Step 1 From the main menu, choose **Administration** > **Crosswork Manager**.

Step 2 On the **Crosswork Summary** tab, click the **System summary** tile to display the **System Summary** page.

Step 3 Click ••• > **Import inventory** to display the Import Inventory page.

Step 4 (Optional) Click **Download sample template file** to download and edit the template. For more details on the installation parameters, see Installation parameters, on page 14.

Step 5 Click **Browse** and select the inventory file.

Step 6 Click **Import** to complete the operation.

Install Cisco Crosswork Planning via the OVF tool

This topic explains how to deploy Cisco Crosswork Planning on a single VM using the OVF tool. You must modify the list of mandatory and optional parameters in the script as per your requirements and run the OVF tool.

Follow these steps to log in to the Cisco Crosswork Planning VM from SSH.

Before you begin

- In your vCenter data center, go to **Host** > **Configure** > **Networking** > **Virtual Switches** and select the virtual switch. In the virtual switch, select **Edit** > **Security**, and ensure that these DVS port group properties are as shown.
  - Set **Promiscuous mode** as Reject
  - Set **MAC address changes** as Reject

  Confirm the settings and repeat the process for each virtual switch used by Cisco Crosswork Planning.
- Ensure you are using the OVF tool version 4.4 or higher.

Procedure

Step 1 On the machine where you have the OVF tool installed, use this command to confirm that you have OVF tool version 4.4.

```
ovftool --version
```

Step 2 Create the script file (see the example in this step) and provide relevant information as per your target environment, such as IP addresses, gateway, netmask, password, and VCENTER_PATH, and so on.

Note
The file names mentioned in this topic are sample names and may differ from the actual file names on cisco.com.

Important
This is a sample script for deploying an `XLarge` VM profile. If you need to deploy a `Large` VM profile, replace the `XLarge` values with corresponding values for the `Large` profile.

- **XLarge profile**:

```
--numberOfCpus:"*"=24 --viCpuResource=:32000: \
--memorySize:"*"=256000 --viMemoryResource=:256000: \
```

- **Large profile**:

```
--numberOfCpus:"*"=16 --viCpuResource=:24000: \
--memorySize:"*"=128000 --viMemoryResource=:128000: \
```

```
cat cp_install.sh
#!/usr/bin/env bash
Host="X.X.X.X"
DM="thick"
DS="DS36"
```

```
Deployment="cw_ipv4"
DNSv4="10.10.0.99"
NTP="<NTP-Server>"
Timezone="US/Pacific"
EnforcePodReservations="True"
EnableSkipAutoInstallFeature="True"
Domain="cisco.com"
Disclaimer="ACCESS IS MONITORED"
VM_NAME="cp"
DataNetwork="DataNet"
ManagementNetwork="MgmtNet"
DataIPv4Address="x.x.x.x"
DataIPv4Gateway="x.x.x.x"
DataIPv4Netmask="x.x.x.x"
ManagementIPv4Address="x.x.x.x"
ManagementIPv4Gateway="x.x.x.x"
ManagementIPv4Netmask="x.x.x.x"
K8sServiceNetworkV4="10.75.0.0"
K8sPodNetworkV4="10.225.0.0"
Password="CLI Password"
Username="cw-admin"
ManagementVIP="x.x.x.x"
DataVIP="x.x.x.x"
VMType="Hybrid"
IsSeed="True"
InitNodeCount="1"
InitMasterCount="1"

CP_OVA_PATH=$1

VCENTER_LOGIN="Administrator%40vsphere%2Elocal:Password%40123%21@x.x.x.x"
VCENTER_PATH="DC1/host"

ovftool --version
ovftool --acceptAllEulas --skipManifestCheck --X:injectOvfEnv -ds=$DS \
--numberOfCpus:"*"=24 --viCpuResource=:32000: \
--memorySize:"*"=256000 --viMemoryResource=:256000: \
--diskMode=$DM --overwrite --powerOffTarget --powerOn --noSSLVerify \
--allowExtraConfig \
--deploymentOption=$Deployment \
--prop:"DNSv4=${DNSv4}" \
--prop:"NTP=${NTP}" \
--prop:"Timezone=${Timezone}" \
--prop:"EnforcePodReservations=${EnforcePodReservations}" \
--prop:"EnableSkipAutoInstallFeature=${EnableSkipAutoInstallFeature}" \
--prop:"Domain=${Domain}" \
--prop:"Disclaimer=${Disclaimer}" \
--name=$VM_NAME \
--net:"Data Network=${DataNetwork}" \
--net:"Management Network=${ManagementNetwork}" \
--prop:"DataIPv4Address=${DataIPv4Address}" \
--prop:"DataIPv4Gateway=${DataIPv4Gateway}" \
--prop:"DataIPv4Netmask=${DataIPv4Netmask}" \
--prop:"ManagementIPv4Address=${ManagementIPv4Address}" \
--prop:"ManagementIPv4Gateway=${ManagementIPv4Gateway}" \
--prop:"ManagementIPv4Netmask=${ManagementIPv4Netmask}" \
--prop:"K8sServiceNetworkV4=${K8sServiceNetworkV4}" \
--prop:"K8sPodNetworkV4=${K8sPodNetworkV4}" \
--prop:"CWPassword=${Password}" \
--prop:"CWUsername=${Username}" \
--prop:"ManagementVIP=${ManagementVIP}" \
--prop:"DataVIP=${DataVIP}" \
--prop:"VMType=${VMType}" \
--prop:"IsSeed=${IsSeed}" \
```

```
--prop:"InitNodeCount=${InitNodeCount}" \
--prop:"InitMasterCount=${InitMasterCount}" \
$CP_OVA_PATH \
vi://$VCENTER_LOGIN/$VCENTER_PATH/$Host
```

Step 3 Download the OVA and install scripts from cisco.com. For the purpose of these instructions, we use the file name as **crosswork-planning-single-node-deployment-7.1.0-48**.

Use this command to extract the files from the tar bundle.

```
tar -xvzf crosswork-planning-single-node-deployment-7.1.0-48.ova
```

The OVA is extracted.

```
cp]# ls -al
-rw-r--r--   1 root root 15416145920 Mar 28 11:12 crosswork-planning-single-node-deployment-7.1.0-48.ova
-rwxr-xr-x   1 root root        2324 Apr  2 14:06 cp_install.sh
```

Step 4 Use this command to make the scripts executable.

```
chmod +x {filename}
```

For example:

```
chmod +x cp_install.sh
```

Step 5 Execute the script with the OVA file name as parameter.

```
cp]# ./cp_install.sh crosswork-planning-single-node-deployment-7.1.0-48.ova
VMware ovftool 4.4.0 (build-16360108)
Opening OVA source: crosswork-planning-single-node-deployment-7.1.0-48.ova
<Removed some output >
Completed successfully
```

The time taken to create the VM can vary based on the size of your deployment profile and the performance characteristics of your hardware.

Install Cisco Crosswork Planning using the Docker installer tool

This section explains the procedure to install Cisco Crosswork Planning on a single VM using the docker installer tool. This method is less recommended compared to using the vCenter UI or the OVF tool for installation.

Before you begin

- Make sure that your environment meets all the vCenter requirements specified in VMware settings, on page 4.
- The edited template in the `/data` directory contains sensitive information (VM passwords and the vCenter password). The operator needs to manage access to this content. Store the templates used for your install in a secure environment or edit them to remove the passwords.
- The `install.log`, `install_tf.log`, and `.tfstate` files will be created during the install and stored in the `/data` directory. If you encounter any trouble with the installation, provide these files to the Cisco Customer Experience team when opening a case.

- The install script is safe to run multiple times. Upon error, input parameters can be corrected and re-run. You must remove the `install.log`, `install_tf.log`, and `tfstate` files before each re-run. Running the installer tool multiple times may result in the deletion and re-creation of VMs.
- In case you are using the same installer tool for multiple Cisco Crosswork Planning installations, it is important to run the tool from different local directories, allowing for the deployment state files to be independent. The simplest way for doing so is to create a local directory for each deployment on the host machine and map each one to the container accordingly.
- Docker version 19 or higher is required while using the installer tool. For more information on Docker, see https://docs.docker.com/get-docker/.
- To change the install parameters or to correct the parameters following the installation errors, it is important to distinguish whether the installation has managed to deploy the VM or not. Deployed VM is evidenced by the output of the installer similar to:

```
vsphere_virtual_machine.crosswork-IPv4-vm["1"]: Creation complete after 2m50s
[id=4214a520-c53f-f29c-80b3-25916e6c297f]
```

- If you do not have Python installed, go to python.org and download the version of Python that is appropriate for your workstation.

Known limitations:

- The vCenter host VMs defined must use the same network names (vSwitch) across all hosts in the data center.
- The vCenter storage folders or datastores organized under a virtual folder structure, are not supported currently. Ensure that the datastores referenced are not grouped under a folder.

Procedure

Step 1 In your Docker capable machine, create a directory where you will store everything you will use during this installation.

Note
If you are using a Mac, ensure that the directory name is in lower case.

Step 2 Download the installer bundle (.tar.gz file) and the OVA file from cisco.com to the directory you created previously. For the purpose of these instructions, we will use the file name as **crosswork-planning-single-node-docker-deployment-7.1.0-48.tar.gz** and **crosswork-planning-single-node-deployment-7.1.0-48.ova**.

Attention
The file names mentioned in this topic are sample names and may differ from the actual file names on cisco.com.

Step 3 Use the following command to unzip the installer bundle:

```
tar -xvf crosswork-planning-single-node-docker-deployment-7.1.0-48.tar.gz
```

The contents of the installer bundle is unzipped to a new directory. This new directory will contain the installer image (**cw-na-planning-installer-7.1.0-48-releasecnc710-250606.tar.gz**) and files necessary to validate the image.

Step 4 Review the contents of the README file to understand everything that is in the package and how it will be validated in the following steps.

Step 5 Use the following command to verify the signature of the installer image:

Note
Use `python --version` to find out the version of python on your machine.

If you are using Python 2.x, use the following command to validate the file:

```
python cisco_x509_verify_release.py -e <.cer file> -i <.tar.gz file> -s
<.tar.gz.signature file> -v dgst -sha512
```

If you are using Python 3.x, use the following command to validate the file:

```
python3 cisco_x509_verify_release.py3 -e <.cer file> -i <.tar.gz file> -s
<.tar.gz.signature file> -v dgst -sha512
```

Step 6 Use the following command to load the installer image file into your Docker environment.

```
docker load -i <.tar.gz file>
```

For example:

```
docker load -i cw-na-planning-installer-7.1.0-48-releasecnc710-250606.tar.gz
```

Step 7 Run the `docker image list` or `docker images` command to get the "image ID" (which is needed in the next step).

For example:

```
docker images
```

The result will be similar to the following: (section we will need is underlined for clarity)

```
My Machine% docker images
REPOSITORY                          TAG                       IMAGE ID      CREATED    SIZE
dockerhub.cisco.com/cw-installer  cw-na-planning-7.1.0-48-
                                    releasecnc710-250606      4b99cf7d0684 7 days ago 280MB
```

Note
Pay attention to the "CREATED" time stamp in the table presented when you run `docker images`, as you might have other images present from the installation of prior releases. If you wish to remove these, the `docker image rm {image id}` command can be used.

Step 8 Launch the Docker container using the following command:

```
docker run --rm -it -v `pwd`:/data {image id of the installer container}
```

To run the image loaded in our example, use the following command:

```
docker run --rm -it -v `pwd`:/data 4b99cf7d0684
```

Note

- You do not have to enter that full value. In this case, `docker run --rm -it -v `pwd`:/data 4b9` was adequate. Docker requires enough of the image ID to uniquely identify the image you want to use for the installation.
- In the above command, we are using the backtick (`). Do not use the single quote or apostrophe (') as the meaning to the shell is very different. By using the backtick (recommended), the template file and OVA will be stored in the directory where you are on your local disk when you run the commands, instead of inside the container.
- CentOS/RHEL hosts, by default, enforce a strict SELinux policy which does not allow the installer container to read from or write to the mounted data volume. On such hosts, run the Docker volume command with the Z option as shown below:

  ```
  docker run --rm -it -v `pwd`:/data:Z <remainder of docker options>
  ```

Note
The Docker command provided will use the current directory to read the template and the ova files, and to write the log files used during the install. If you encounter either of the following errors you should move the files to a directory where the path is in lowercase (all lowercase, no spaces or other special characters). Then navigate to that directory and rerun the installer.

Error 1:

```
% docker run --rm -it -v `pwd`:/data 4b9
docker: invalid reference format: repository name must be lowercase.
See 'docker run --help'
```

Error 2:

```
docker: Error response from daemon: Mounts denied: approving /Users/Desktop:
file does not exist
ERRO[0000] error waiting for container: context canceled
```

Step 9 Navigate to the directory with the VMware template.

```
cd /opt/installer/deployments/7.1.0/vcentre
```

Step 10 Copy the template file found under `/opt/installer/deployments/7.1.0/vcentre/deployment_template_tfvars` to the `/data` folder using a different name.

For example, `cp deployment_template_tfvars /data/deployment.tfvars`

For the rest of this procedure, we will use `deployment.tfvars` in all the examples.

Step 11 Edit the template file located in the `/data` directory in a text editor, to match your planned deployment (for reference, see Sample manifest template, on page 35). The <sample manifest template> includes an example that you can reference for proper formatting. The example is more compact due to the removal of descriptive comments.

Step 12 From the `/opt/installer` directory, run the installer.

```
./cw-installer.sh install -m /data/<template file name> -o /data/<.ova file>
```

For example:

```
./cw-installer.sh install -m /data/deployment.tfvars -o /data/crosswork-planning-single-
node-deployment-7.1.0-48.ova
```

Step 13 Read, and then enter "yes" if you accept the End User License Agreement (EULA). Otherwise, exit the installer and contact your Cisco representative.

Step 14 Enter "yes" when prompted to confirm the operation.

Note
It is not uncommon to see some warnings like the following during the install:

```
Warning: Line 119: No space left for device '8' on parent controller '3'.
Warning: Line 114: Unable to parse 'enableMPTSupport' for attribute 'key' on element
'Config'.
```

If the install process proceeds to a successful conclusion (see sample output below), these warnings can be ignored.

Sample output:

```
cw_vms = <sensitive>
INFO: Copying day 0 state inventory to CW
INFO: Waiting for deployment status server to startup on 10.90.147.66.
Elapsed time 0s, retrying in 30s
Crosswork deployment status available at http://{VIP}:30602/d/NK1bwVxGk/crosswork-
deployment-readiness?orgId=1&refresh=10s&theme=dark
```

```
Once deployment is complete login to Crosswork via: https://{VIP}:30603/#/
logincontroller
INFO: Cw Installer operation complete.
```

Note
If the installation fails, open a case with Cisco and provide the .log files that were created in the /data directory (and the local directory where you launched the installer Docker container), to Cisco for review. The two most common reasons for the install to fail are: (a) password that is not adequately complex, and (b) errors in the template file. If the installer fails for any errors in the template (for example, mistyped IP address), correct the error and rerun the install script.

Sample manifest template

This section presents the manifest template example for deploying Cisco Crosswork Planning on a single VM.

```
Cw_VM_Image = "crosswork-planning-single-node-deployment-7.1.0-48"  # Line added automatically
 by installer.
ClusterIPStack = "IPv4"
ManagementVIP = "172.20.118.86"
ManagementIPNetmask = "255.255.255.0"
ManagementIPGateway = "172.20.118.1"
DataVIP = "172.20.118.87"
DataIPNetmask = "255.255.255.0"
DataIPGateway = "172.20.118.1"
DNS = "172.24.97.250"
DomainName = "cisco.com"
CWPassword = "*****!"
VMSize = "Large"
NTP = "ntp.esl.cisco.com"
Timezone = "Asia/Calcutta"
ThinProvisioned = true
EnableHardReservations = false
EnableSkipAutoInstallFeature = "True"
ManagementVIPName = "CP-svm"
EnforcePodReservations = "True"
ThinProvisioned = "true"
ManagerDataFsSize = "2000"
bckup_min_percent = "35"

CwVMs = {
    "0" = {
        VMName = "vm1",
        ManagementIPAddress = "172.20.118.88",
        DataIPAddress = "172.20.118.89",
        NodeType = "Hybrid"
    }
}

VCentreDC = {
    VCentreAddress = "172.20.118.84",
    VCentreUser = "<your-username>",
    VCentrePassword = "******",
    DCname = "cp",
    MgmtNetworkName = "VM Network",
    DataNetworkName = "vlan101",
    VMs = [
        {
```

```
            HostedCwVMs = ["0"],
            Host = "172.20.118.81",
            Datastore = "datastore1 (2)",
            HSDatastore = "datastore1 (2)"
        }
    ]
}
# VM size definitions
UseNonDefaultCalicoBgpPort = "true"
vm_sizes = {
    "large" = {
        vcpus = 16,
        cpu_reservation = 32000,
        memory = 128000
    }
}
SchemaVersion = "7.1.0"
```

Installing Cisco Crosswork Planning on KVM manually

This section provides the high-level workflow for installing Cisco Crosswork Planning on KVM manually using CLI.

Installation workflow

Follow these steps to complete the installation process.

Table 11: Installation workflow

Step	Action
1. Ensure that your KVM host meets all the requirements.	See KVM host bare metal requirements, on page 7.
2. Ensure that your environment meets all the installation prerequisites.	See Preliminary checks, on page 36.
3. Set up and validate the KVM environment.	See Set up and validate KVM on RHEL, on page 37.
4. Configure network bridges or SRIOV.	See Configure network bridges or SRIOV, on page 38.
5. Install Cisco Crosswork Planning on KVM.	See Install Cisco Crosswork Planning on KVM using CLI, on page 40.

Known limitations

If you use a non-root user ID for deployment on bare metal systems, ensure to add this user ID to the sudoers list (`/etc/sudoers`).

Preliminary checks

This section describes the preliminary checks required for installing Cisco Crosswork Planning on KVM.

- **Virtualization**: Ensure that your system supports virtualization. This is typically enabled in the BIOS. To check, use these commands:
  - For Intel CPUs: `grep -wo 'vmx' /proc/cpuinfo`
  - For AMD CPUs: `grep -wo 'svm' /proc/cpuinfo`
- **KVM modules**: Ensure that the KVM modules are loaded: `lsmod | grep kvm`

Set up and validate KVM on RHEL

Follow these steps to set up KVM on RHEL.

Procedure

Step 1 Refresh repositories and install updates. This command updates all the packages on your system to their latest versions.

```
sudo dnf update -y
```

Step 2 Reboot the system after all the updates are installed successfully.

```
sudo reboot
```

Step 3 Install virtualization tools.

a) Install virt-install and virt-viewer.

```
sudo dnf install virt-install virt-viewer -y
```

virt-install is a command-line tool for creating virtual machines.

virt-viewer is a Lightweight UI for interacting with VMs.

b) Install libvirt virtualization daemon, which is necessary for managing VMs.

```
sudo dnf install -y libvirt
```

c) Install virt-manager, a graphical interface for managing VMs.

```
sudo dnf install virt-manager -y
```

d) Install additional virtualization tools for managing VMs.

```
sudo dnf install -y virt-top libguestfs-tools
```

Step 4 Start and enable libvirtd virtualization daemon.

a) Start the libvirtd daemon.

```
sudo systemctl start libvirtd
```

b) Enable the libvirtd daemon.

```
sudo systemctl enable libvirtd
```

c) Verify that the Daemon is running.

```
sudo systemctl status libvirtd
```

Step 5 Add users to the required groups, for example, libvirt and qemu. In the following commands, replace *your_username* with the actual username.

```
sudo usermod --append --groups libvirt your_username
sudo usermod --append --groups qemu your_username
```

Step 6 Ensure that IOMMU is enabled. If it is not enabled, run this command to enable it.

```
grubby --update-kernel=ALL --args=intel_iommu=on
dmesg | grep -I IOMMU
```

Step 7 Check IOMMU and validate the setup. Ensure that all checks show as PASS.

```
virt-host-validate
```

If the IOMMU check is not PASS, then use the following commands to enable it.

```
sudo grubby --update-kernel=ALL --args=intel_iommu=on
sudo reboot
```

Configure network bridges or SRIOV

Crosswork needs the 10G interface for all the data layer communications to support functionality at a scale. You may choose any networking configuration which can provide 10G throughput.

The following sections explain how to enable bridging and SRIOV network configuration.



Important For KVM deployment, configure either network bridges or SRIOV, but not both.

Configure network bridges

A network bridge acts like a virtual network switch, allowing multiple network interfaces to communicate as if they are on the same physical network.

Follow these steps to configure network bridges.

Procedure

Step 1 Create a new network connection of type "bridge" with the interface name `intMgmt` and assign it the connection name `intMgmt`.

```
nmcli connection add type bridge ifname intMgmt con-name intMgmt
```

Step 2 Add a new `bridge-slave` connection, associating the physical network interface `<interface1>` with the previously created bridge `intMgmt`.

```
nmcli connection add type bridge-slave ifname <interface1> controller intMgmt
```

Example:

```
nmcli con add type bridge-slave ifname <hostdataIntf> master intData con-name
intData-slave-<hostdataIntf>
```

Step 3 Assign IP address to the bridge.

```
nmcli connection modify intMgmt ipv4.addresses <IPv4-address>/<subnet-mask>
```

Example:

```
nmcli con modify intMgmt ipv4.addresses <hostmgmtIp/mask> ipv4.gateway
<mgmtgw> ipv4.dns <dnsIp> ipv4.method manual ipv4.route-metric 50
```

Step 4 Bring up the `intMgmt` network connection.

```
nmcli connection up intMgmt
```

Example:

```
nmcli con up intMgmt
nmcli con up intMgmt-slave-<hostmgmtIntf>
```

Step 5 Create another network bridge connection with the interface name `intData` and assign it the connection name `intData`.

```
nmcli connection add type bridge ifname intData con-name intData
```

Example:

```
nmcli con add type bridge ifname intData con-name intData
```

Step 6 Add a bridge-slave connection, associating the physical network interface `<interface2>` with the previously created bridge `intData`.

```
nmcli connection add type bridge-slave ifname <interface2> controller intData
```

Example:

```
nmcli con add type bridge-slave ifname <hostmgmtIntf> master intMgmt con-name
intMgmt-slave-<hostmgmtIntf>
```

Step 7 Assign IP address to `intData`.

```
nmcli connection modify intData ipv4.addresses <IPv4-address>/<subnet-mask>
```

Example:

```
nmcli con modify intData ipv4.addresses <hostdataIp/mask> ipv4.method manual ipv4.gateway <datagw>
ipv4.route-metric 90
```

Step 8 Bring up the `intData` network connection.

```
nmcli connection up intData
```

Example:

```
nmcli con up intData
nmcli con up intData-slave-<hostdataIntf>
```

Configure SRIOV

SRIOV allows a single physical network interface to be shared among multiple VMs by creating multiple Virtual Functions (VFs).

Follow these steps to configure SRIOV.

Procedure

Step 1 Open the `rc.local` file in the vi editor.

```
vi /etc/rc.d/rc.local
```

Step 2 Set the number of VFs for the network interfaces based on your requirement. For instance, in a Cisco Crosswork Planning single VM installation, you need a minimum of two network interfaces—one for management and the other for data. Two VFs are configured for each interface by default. You may also configure additional VFs for future scalability needs.

For example, to set the number of VFs to 2 for each `<interface1>` and `<interface2>`, use these commands. In this example, `<interface1>` refers to the management interface and `<interface2>` refers to the data interface.

```
echo 2 > /sys/class/net/<interface1>/device/sriov_numvfs
echo 2 > /sys/class/net/<interface2>/device/sriov_numvfs
```

Step 3 Change the permissions of the `rc.local` file to make it executable.

```
chmod +x /etc/rc.d/rc.local
```

Step 4 If any of the interfaces are configured over the VLAN, set the VLAN IDs to the interfaces.

```
ip link set <interface1> vf 0 vlan <vlanid>
ip link set <interface2> vf 1 vlan <vlanid>
```

Step 5 Save the changes and reboot the system.

Step 6 List all the PCI devices for all the virtual functions in a tree format. This is useful for verifying the setup and ensuring that the VFs are correctly recognized by the KVM hypervisor.

```
virsh nodedev-list --tree
```

```
|+- pci_0000_17_00_0
|||
||+- net_ens1f0_40_a6_b7_ce_04_c8
||
|+- pci_0000_17_00_1
|||
||+- net_ens1f1_40_a6_b7_ce_04_c9
||
|+- pci_0000_17_00_2
|||
||+- net_ens1f2_40_a6_b7_ce_04_ca
||
|+- pci_0000_17_00_3
|||
||+- net_ens1f3_40_a6_b7_ce_04_cb
```

In this procedure, since we set the number of VFs as 2 in Step 2, two VFs for each management interface and data interface are created. As a result, a total of four PCI devices are generated: two for management and two for data.

This PCI device information is used during the installation process with SRIOV (Step 4 of Install Cisco Crosswork Planning on KVM using CLI, on page 40).

Install Cisco Crosswork Planning on KVM using CLI

Follow these steps to install Cisco Crosswork Planning on KVM manually using CLI.

Before you begin

Ensure that

- the KVM host meets all the requirements specified in KVM host bare metal requirements, on page 7
- your KVM environment is set up (see Preliminary checks, on page 36 and Set up and validate KVM on RHEL, on page 37), and
- the network bridge or SRIOV is configured (see Configure network bridges or SRIOV, on page 38).

Procedure

Step 1 As a first step, prepare the config ISO file for Cisco Crosswork Planning.

a) Update the `ovf-env.xml` file as per your needs. For reference, see Sample configuration file, on page 42. For description of installation parameters, see Installation parameters, on page 14.

```
$ cat ovf-env.xml
```

b) Generate the ISO file.

```
$ mkisofs -R -relaxed-filenames -joliet-long -iso-level 3 -l -o cp1.iso ovf-env.xml
```

Note
In the above command, "cp1" is the host name of the Cisco Crosswork Planning VM.

Step 2 Download the installer bundle (.tar.gz file) from cisco.com and extract it.

```
tar -xvf crosswork-planning-single-node-deployment-7.1.0-48-qcow2.tar.gz
```

Step 3 Extract the Cisco Crosswork Planning qcow2 tar file.

```
tar -xvf cw-na-planning-7.1.0-48-releasecnc710-250606-qcow2.tar.gz
```

This command creates three qcow2 files:

- cw-na-planning-7.1.0-48-releasecnc710-250606_rootfs.qcow2
- cw-na-planning-7.1.0-48-releasecnc710-250606_dockerfs.qcow2
- cw-na-planning-7.1.0-48-releasecnc710-250606_extrafs.qcow2

Step 4 Navigate to the required installation folder and create three disks.

```
cd cp1/
qemu-img create -f qcow2 disk3 20G
qemu-img create -f qcow2 disk4 485G
qemu-img create -f qcow2 disk6 15G
```

Step 5 Install Cisco Crosswork Planning using network bridge or SRIOV.

- Using network bridges:

```
virt-install --boot uefi --boot hd,cdrom --connect qemu:///system --virt-type kvm --name cp1
--ram 128000 --vcpus 16 --os-type linux --disk
path=cw-na-planning-7.1.0-48-releasecnc710-250606_rootfs.qcow2,format=qcow2,bus=scsi --disk
path=cw-na-planning-7.1.0-48-releasecnc710-250606_dockerfs.qcow2,format=qcow2,bus=scsi --disk
path=disk3,format=qcow2,bus=scsi --disk path=disk4,format=qcow2,bus=scsi --disk
path=cw-na-planning-7.1.0-48-releasecnc710-250606_extrafs.qcow2,format=qcow2,bus=scsi --disk
```

```
path=disk6,format=qcow2,bus=scsi --disk=cp1.iso,device=cdrom,bus=scsi --import --network
bridge=intMgmt,model=virtio --network bridge=intData,model=virtio --noautoconsole --os-variant
ubuntu22.04 --graphics vnc,listen=0.0.0.0
```

- Using SRIOV:

```
virt-install --boot uefi --boot hd,cdrom --connect qemu:///system --virt-type kvm --name cp1
--ram 128000 --vcpus 16 --cpu host-passthrough --disk
path=cw_rootfs.vmdk.qcow2,format=qcow2,bus=scsi --disk
path=cw_dockerfs.vmdk.qcow2,format=qcow2,bus=scsi --disk path=disk3,format=qcow2,bus=scsi --disk
 path=disk4,format=qcow2,bus=scsi --disk path=cw_extrafs.vmdk.qcow2,format=qcow2,bus=scsi --disk
 path=disk6,format=qcow2,bus=scsi --disk=cp1.iso,device=cdrom,bus=scsi --import --network none
--host-device=pci_0000_17_00_0 --host-device=pci_0000_17_00_2 --os-variant ubuntu-lts-latest &
```

Sample configuration file

This section provides the sample `ovf-env.xml` file for installing Cisco Crosswork Planning on KVM.

```
<Environment
     xmlns="http://schemas.dmtf.org/ovf/environment/1"
     xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
     xmlns:oe="http://schemas.dmtf.org/ovf/environment/1"
     xmlns:ve="http://www.vmware.com/schema/ovfenv"
     oe:id=""
   <PlatformSection>
      <Kind>KVM</Kind>
      <Locale>en</Locale>
   </PlatformSection>
    <PropertySection>
         <Property oe:key="AdminIPv4Address" oe:value="0.0.0.0"/>
         <Property oe:key="AdminIPv4Netmask" oe:value="0.0.0.0"/>
         <Property oe:key="AwsIamRole" oe:value=""/>
         <Property oe:key="CWPassword" oe:value="Cwork123!"/>
         <Property oe:key="CWUsername" oe:value="cw-admin"/>
         <Property oe:key="ClusterCaKey" oe:value=""/>
         <Property oe:key="ClusterCaPubKey" oe:value=""/>
         <Property oe:key="CwInstaller" oe:value="False"/>
         <Property oe:key="DNSv4" oe:value="72.163.128.140"/>
         <Property oe:key="DataIPv4Address" oe:value="10.225.120.180"/>
         <Property oe:key="DataIPv4Gateway" oe:value="10.225.120.129"/>
         <Property oe:key="DataIPv4Netmask" oe:value="255.255.255.128"/>
         <Property oe:key="DataPeerIPs" oe:value=""/>
         <Property oe:key="DataVIP" oe:value="10.225.120.179"/>
         <Property oe:key="DataVIPName" oe:value=""/>
         <Property oe:key="Deployment" oe:value="cw_ipv4"/>
         <Property oe:key="Disclaimer" oe:value="Cisco Crosswork"/>
         <Property oe:key="Domain" oe:value="cisco.com"/>
         <Property oe:key="EnableSkipAutoInstallFeature" oe:value="True"/>
         <Property oe:key="EnforcePodReservations" oe:value="True"/>
         <Property oe:key="InitMasterCount" oe:value="1"/>
         <Property oe:key="InitNodeCount" oe:value="1"/>
         <Property oe:key="IsSeed" oe:value="True"/>
         <Property oe:key="K8Orch" oe:value=""/>
         <Property oe:key="K8sPodNetworkV4" oe:value="10.244.0.0"/>
         <Property oe:key="K8sServiceNetworkV4" oe:value="10.96.0.0"/>
         <Property oe:key="ManagementIPv4Address" oe:value="10.225.120.111"/>
         <Property oe:key="ManagementIPv4Gateway" oe:value="10.225.120.1"/>
         <Property oe:key="ManagementIPv4Netmask" oe:value="255.255.255.128"/>
         <Property oe:key="ManagementVIP" oe:value="10.225.120.56"/>
         <Property oe:key="ManagementVIPName" oe:value=""/>
```

```
        <Property oe:key="ManagerPeerIPs" oe:value=""/>
        <Property oe:key="NBIIPv4Address" oe:value="0.0.0.0"/>
        <Property oe:key="NBIIPv4Gateway" oe:value="0.0.0.0"/>
        <Property oe:key="NBIIPv4Netmask" oe:value="0.0.0.0"/>
        <Property oe:key="NBIVIP" oe:value="NBI VIP address"/>
        <Property oe:key="NTP" oe:value="ntp.esl.cisco.com"/>
        <Property oe:key="Timezone" oe:value="US/Pacific"/>
        <Property oe:key="VMLocation" oe:value="default"/>
        <Property oe:key="VMType" oe:value="Hybrid"/>
        <Property oe:key="bckup_min_percent" oe:value="35"/>
        <Property oe:key="corefs" oe:value="18"/>
        <Property oe:key="ddatafs" oe:value="485"/>
        <Property oe:key="logfs" oe:value="20"/>
        <Property oe:key="ramdisk" oe:value="0"/>
        <Property oe:key="ssd" oe:value="15"/>
        <Property oe:key="ThinProvisioned" oe:value="true"/>
        <Property oe:key="UseNonDefaultCalicoBgpPort" oe:value="True"/>
        <Property oe:key="bootOptions.efiSecureBootEnabled" oe:value="False"/>
   </PropertySection>
</Environment>
```

Manage Cisco Crosswork Planning VM on KVM

This section provides the commands to manage the Cisco Crosswork Planning VM on KVM. In these examples, "cp1" is the host name of Cisco Crosswork Planning VM.

- To access the Cisco Crosswork Planning VM console from KVM:

  ```
  [root@KVM-41 cp1]# virsh console cp1
  ```

- To see the current status of Cisco Crosswork Planning in KVM:

  ```
  [root@KVM-41 cp1]# virsh list --all
  Id   Name   State
  ----------------------
  2    cp1    running
  ```

- To shutdown the Cisco Crosswork Planning VM:

  ```
  [root@KVM-41 cp1]# virsh shutdown cp1
  Domain 'cp1' is being shutdown

  [root@KVM-41 cp1]# virsh list --all
  Id   Name      State
  --------------------------
  -    cp1   shut off
  ```

- To restart the Cisco Crosswork Planning VM:

  ```
  [root@KVM-41 ~]# virsh start cp1
  Domain 'cp1' started

  [root@KVM-41 cp1]# virsh list --all
  Id   Name   State
  ----------------------
  1    cp1    running
  ```

- To set the Cisco Crosswork Planning VM to auto-start, that is, to boot up automatically in case of power-reset of KVM:

  ```
  [root@KVM-41 ~]# virsh autostart cp1

  Domain 'cp1' marked as autostarted
  ```

Uninstall the Cisco Crosswork Planning VM in KVM deployment

This section describes how to uninstall the Cisco Crosswork Planning VM in KVM deployment.

Procedure

Step 1 Use the **virsh destroy** command to stop the Cisco Crosswork Planning VM forcefully.

Example:

```
[root@KVM-41 cp1]# virsh destroy cp1
Domain 'cp1' destroyed
```

Step 2 Use the **virsh undefine** command to remove the configuration of the Cisco Crosswork Planning VM.

Example:

```
[root@KVM-41 cp1]# virsh undefine --nvram cp1
Domain 'cp1' has been undefined
```

Monitor the installation

This topic explains how to monitor and verify if the installation has completed successfully.

As the installer builds and configures the VM, it will report progress. The installer will prompt you to accept the license agreement and then ask whether you want to continue the installation. After you confirm, the installation will progress. Any possible errors will be logged in either installer.log or installer_tf.log. If the VM is built and is able to boot, the errors in applying the operator specified configuration will be logged on the VM in the /var/log/firstboot.log file.

Note During installation, Cisco Crosswork Planning will create a special administrative ID (virtual machine (VM) administrator, *cw-admin*, with the password that you provided in the manifest template. In case the installer is unable to apply the password, it creates the administrative ID with the default password *cw-admin*). The first time you log in using this administrative ID, you will be prompted to change the password.

The administrative username is reserved and cannot be changed. Data center administrators use this ID to log in to and troubleshoot the Cisco Crosswork Planning application VM.

These are the steps you can watch for to be certain that things are progressing as expected:

Procedure

Step 1 The installer uploads the Cisco Crosswork Planning image file (.ova file) to the data center.

Step 2 The installer creates the VM and displays a success message, such as "Creation Complete".

Step 3 After the VM is created, it is powered on—either automatically when the installer completes or after you power on the VM during manual installation. The parameters specified in the template are applied to the VM and it is then rebooted.

Step 4 Once the VM becomes accessible, a success message, such as "Crosswork Installer operation complete" appears. The installer script will exit and return you to a prompt on the screen.

Step 5 You can monitor startup progress using the following methods:

Using browser accessible dashboard:

a) While the VM is being created, monitor the setup process from a browser accessible dashboard.
b) The URL for this Grafana dashboard is in the format http://{VIP}:30602/d/NK1bwVxGk/crosswork-deployment-readiness?orgId=1&refresh=10s&theme=dark. This URL is displayed once the installation completes. This URL is temporary and will be available only for a limited period of approximately 30 minutes.
c) At the end of the deployment, the Grafana dashboard will report a "Ready" status. If the URL is inaccessible, use the SSH console described in this section to monitor the installation process.

Using the console:

a) Check the progress from the console of the VM or by using SSH to the Virtual IP address.
b) In the latter case, log in using the *cw-admin* user name and the password you assigned to that account in the install template.
c) Switch to super user using `sudo su -` command.
d) Run `kubectl get nodes` to see if the nodes are ready. Run `kubectl get pods` to see the list of active running pods.
e) Repeat the `kubectl get pods` command until you see robot-ui in the list of active pods.
f) At this point, you can try to access the Cisco Crosswork Planning UI.

What to do next

In the event of any of these failure scenarios, contact the Cisco Customer Experience team and provide the installer.log, installer_tf.log, and firstBoot.log files for review:

- Installation is incomplete
- Installation is complete, but the VM is not functional
- Installation is complete, but you are directed to check /var/log/firstBoot.log or /opt/robot/bin/firstBoot.log file.

Diagnostic assessment

This topic explains the diagnostic checks performed during the Cisco Crosswork Planning deployment.

During deployment, the system checks the VM datastore(s) for disk latency and IOPS. If a fetched value is lower than the recommended value for any parameter, the diagnostic assessment reports a failure. You can then choose to either ignore the report and proceed with the installation, accepting the risk of failure, or update your VM resources to meet the required criteria and retry installation.

The outcome of the diagnostic assessment depends on the value set for the **IgnoreDiagnosticsCheckFailure** parameter:

- If set to "false" (default value), the installation will be blocked if the diagnostic check reports an error.
- If set to "true", the diagnostic check result is ignored, and the installation will proceed.

Diagnostic failure scenario

This is a breakdown of the failure scenario for the diagnostic assessment when set to its default value, (**IgnoreDiagnosticsCheckFailure** = **false**).

In this scenario, the fetched value is lower than the recommended value (such as IOPS < 4000), resulting in a diagnostic assessment failure.

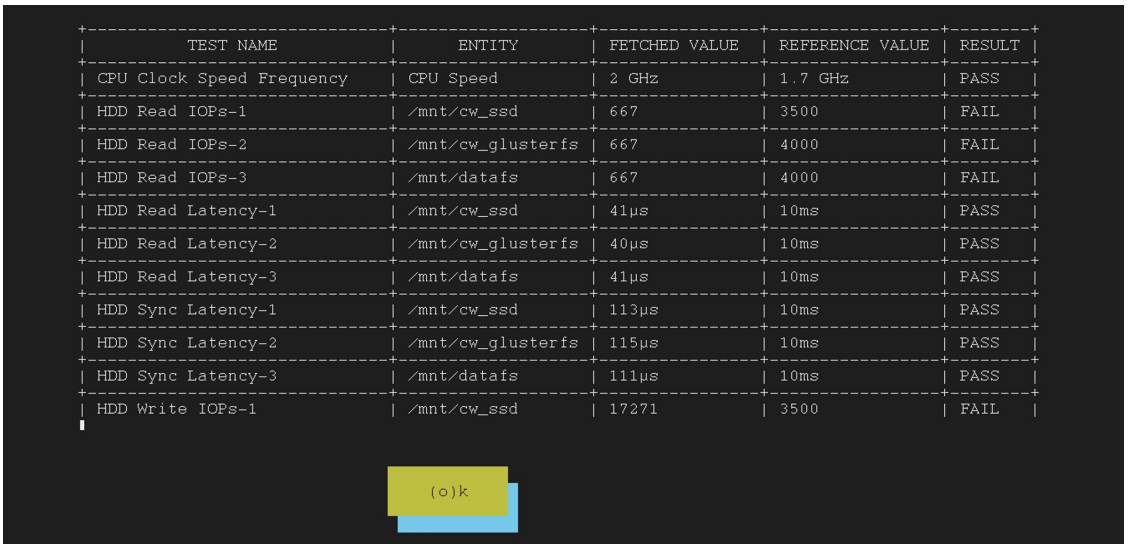
1. A banner message is displayed to notify you about the failure.

   Figure 4: Sample diagnostic failure report



2. You can use `diagnostics all` and `diagnostics history` commands to view the detailed diagnostic report.

   Figure 5: Diagnostic all output



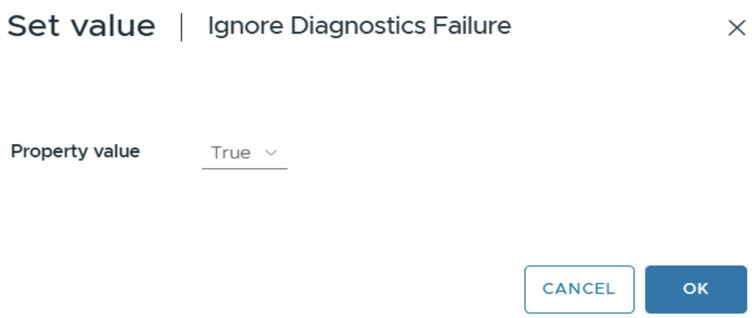
3. To ignore the failure report and proceed with the installation, you must change the value of the **IgnoreDiagnosticsCheckFailure** parameter.
   a. Log in to the vCenter UI.
   b. Power off the VM reporting the failure. Right-click on the VM, and click **Power** > **Power Off**. Click **Yes** in the confirmation pop-up window.
   c. Click on the **Configure** tab and click **vApp Options** in the **Settings** drop-down menu.
   d. Under **Properties**, select the **IgnoreDiagnosticsCheckFailure** parameter and click **Set Value**.

Figure 6: Select parameter



e. Set the **Property value** as **True**. Click **OK** to confirm.

Figure 7: Set value



f. Power on the VM. Right-click on the VM, and click **Power** > **Power On**. Click **Yes** in the confirmation pop-up window.

4. (Optional) If the diagnostic check reports failures and the installation is blocked, you can also proceed with a full installation using the skip option (**-s**) command in the Docker installer.

   Example:

   ```
   ./cw-installer.sh install -p -m /data/<template file name> -o /data/<.ova file> -y -s
   ```

5. After **IgnoreDiagnosticsCheckFailure** is set to **True**, a banner message appears to inform you that the diagnostic check failure will be skipped.

Figure 8: Skip install check banner message



Important If the parameter value is lower than suboptimal (IOPS < 1000), the installation will fail irrespective of your choice to ignore the diagnostic check.

Diagnostic success scenario

The diagnostic check is successful and the installation will proceed without requiring any user action.

Backend checks

This backend check is used to verify the resource values of the VM:

- Directory IOPS:

```
fio --randrepeat=1  --fdatasync=1 --ioengine=sync --name=test --rw=rw
--filename=<DIR>/mytest --bs=8k --size=600M --runtime=10 --time_based=1
```

Replace `<DIR>` with `/mnt/cw_ssd/`, `/mnt/datafs`, or `/mnt/cw_glusterfs`, as appropriate.

Log in to Cisco Crosswork Planning UI

After installing Cisco Crosswork Planning, you can access the Cisco Crosswork Planning UI by using the following steps.

Cisco Crosswork Planning is a browser-based application. For the supported browser versions, see Supported web browsers, on page 9.

Procedure

Step 1 Open a web browser and enter:

```
https://<Crosswork Management Network Virtual IP (IPv4)>:30603/
```

When you access Cisco Crosswork Planning from your browser 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 server. After you do this, the browser accepts the Cisco Crosswork Planning server as a trusted site in all subsequent logins.

Step 2 Log in to Cisco Crosswork Planning.

a) Enter the administrator username **admin** and the default password **admin**.
b) Click **Login**.
c) When prompted to change the administrator's default password, enter the new password in the fields provided and then click **OK**.

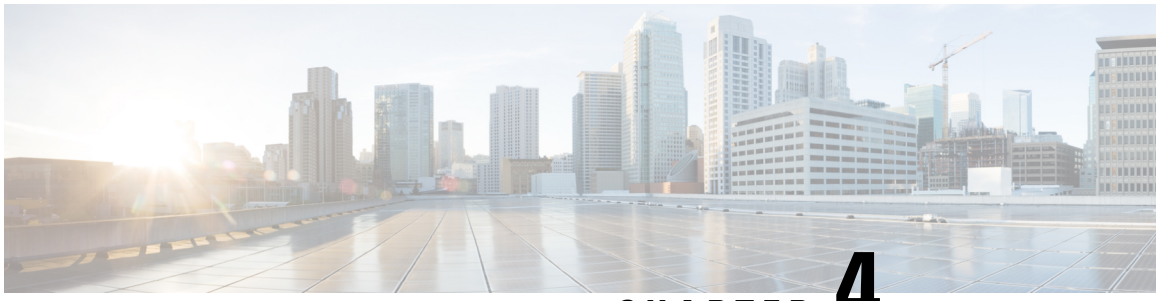
Note
Use a strong VM password (minimum eight characters long, including upper and lower case letters, numbers, and one special character). Avoid using passwords similar to dictionary words (for example, "Pa55w0rd!") or relatable words.

The **Crosswork Manager** page appears.

Step 3 Click the **Crosswork Health** tab, and click the **Crosswork Platform Infrastructure** tab to view the health status of the microservices running on Cisco Crosswork Planning.

Step 4 (Optional) Change the name assigned to the admin account to something more relevant.

Step 5 In case of manual installation: After logging into the UI, ensure the VM is healthy. Download the inventory sample (.tfvars file) from the Cisco Crosswork Planning UI and update it with information about the VM, along with the data center parameters. Then, import the file back into the Cisco Crosswork Planning UI. For more information, see Import an inventory file, on page 28.



CHAPTER 4

Upgrade Cisco Crosswork Planning

This section contains the following topics:

- Upgrade methods, on page 51
- Upgrade limitations and required post-upgrade actions, on page 51
- Upgrading using existing hardware, on page 52
- Upgrading using parallel hardware, on page 56
- Upgrade Cisco Crosswork Planning applications (standalone activity), on page 58
- Collector configuration migration, on page 60

Upgrade methods

Upgrading Cisco Crosswork Planning to the latest version includes upgrading Cisco Crosswork Platform and Cisco Crosswork Planning Applications within a single maintenance window.

Supported upgrade scenarios

The supported upgrade scenario for Cisco Crosswork Planning 7.1 is from Cisco Crosswork Planning 7.0 (IPv4 stack) to Cisco Crosswork Planning 7.1 (IPv4 stack).

Available upgrade methods

You can upgrade Cisco Crosswork Planning using these methods:

- Upgrading using existing hardware, on page 52
- Upgrading using parallel hardware, on page 56

You can also update the Cisco Crosswork Planning applications from the Cisco Crosswork Planning UI in case of minor updates or patch releases. For details, see Upgrade Cisco Crosswork Planning applications (standalone activity), on page 58.

Upgrade limitations and required post-upgrade actions

After upgrading from an earlier version, perform these actions to avoid data loss or system errors:

- Manually register all license tags, as they are not auto-registered as part of the upgrade operation.

- Manually update any custom user roles (Read-Write/Read) created in the earlier version, since these are not migrated.
- Assign new permissions to any user roles with administrative privileges to re-enable their administrative access.
- Always perform a hard refresh or clear your browser cache before proceeding to use the system. Failing to do this step can result in data discrepancies.

Upgrading using existing hardware

Summary

Upgrading to the latest version of Cisco Crosswork Planning using existing hardware is a multi-step process. This process enables you to upgrade Cisco Crosswork Planning on current physical infrastructure without replacing any hardware.

Workflow

These are the stages of upgrading using existing hardware. Execute each stage in sequence to ensure a successful upgrade.

1. Back up your data on the existing hardware. For details, see Create a backup of your system configuration, on page 52.
2. Shut down the system to prepare for upgrade. For details, see Shut down Cisco Crosswork Planning, on page 54.
3. Install the latest version of Cisco Crosswork Planning onto the existing hardware. For details, see Install the latest version of Cisco Crosswork Planning, on page 54.
4. Restore your backed up configuration data to the upgraded system. For details, see Migrate Cisco Crosswork Planning backup, on page 55.

Create a backup of your system configuration

This topic describes how to create a backup of your system configuration, so you can restore it later.

This task is the first stage of the upgrade process. Before upgrading to a new version, you must back up your current system configuration.



Note We recommend that you create a backup only during a scheduled upgrade window. Do not access Cisco Crosswork Planning while the backup operation is running.

Before you begin

- Configure a destination SCP server to store the backup files. This is a one-time activity. Before you begin, have this information ready:
  - The host name or IP address and the port number of a secure SCP server

- A preconfigured path on the SCP server where the backup will be stored
- User credentials with file read and write permissions to the directory
- At least 25 GB of storage on the SCP server

- Ensure both Cisco Crosswork Planning and the SCP server use the same IP environment. For example, if Cisco Crosswork Planning is communicating over IPv4, so must the backup server.

Procedure

Step 1 Log in to the Cisco Crosswork Planning UI.

Step 2 Verify that the Cisco Crosswork Planning VM and applications are healthy.

Step 3 Configure an SCP backup server.

a) From the main menu, choose **Administration** > **Backup and Restore**.
b) Click **Destination** to display the Edit Destination drawer panel.
c) Enter the required information in the provided fields.
d) Save the details of the backup server.

Step 4 Create a backup.

a) Click **Actions** > **Data backup**.
The Data Backup drawer panel opens with the destination server details pre-filled.
b) In **Job name**, enter a relevant name for the backup.
c) If the VM or any application is not healthy and you still want to create the backup, check the **Force** check box.

Note
You must use the **Force** option only after consultation with the Cisco Customer Experience team.

d) Complete the remaining fields as needed.

To specify a different remote server upload destination, edit the pre-filled **Host name**, **Port**, **Username**, **Password**, and **Server path/Location** to specify a different destination.

e) (Optional) Click **Verify backup readiness** to verify that Cisco Crosswork Planning has enough free resources to complete the backup.

If the check is successful, Cisco Crosswork Planning displays a warning about the time-consuming nature of the operation. Click **OK** to continue.

If the verification fails, contact the Cisco Customer Experience team for assistance.

f) Click **Backup** to start the backup operation.

Cisco Crosswork Planning creates the corresponding backup job set and adds it to the Backup and Restore Job Sets table. The Job Details panel reports the status of each backup step as it is completed.

Note
If you do not see your backup job in the list, refresh the Backup and Restore Job Sets table.

Step 5 Monitor the progress of the backup job.

a) To view the progress of a backup job, enter the job details, such as Status or Job Type, in the search fields in the Backup and Restore Job Sets table. Then, click the job set you want.

The Job Details panel displays information about the selected job set, including job status, job type, and start time. If there is a failed job, hover the mouse pointer over the icon near the **Status** column to view the error details.

b) If the backup fails during upload to the remote server, under the Status icon, click the **Upload backup** button to retry the upload.

Note
Upload can fail due to connectivity problems with the SCP backup server (for example, incorrect credentials, missing directory or directory permissions, missing path, and so on). This is indicated by failure of the task `uploadBackupToRemote`). If this happens, check the SCP server details, correct any mistakes and try again. Alternatively, you can use the **Destination** button to specify a different SCP server and path before clicking **Upload backup**.

Step 6 Navigate to the destination SCP server directory and ensure that the backup file is created. You will require this backup file in the later stages of the upgrade process.

The system configuration backup is created and available on the specified SCP server.

Shut down Cisco Crosswork Planning

After a successful backup, shut down Cisco Crosswork Planning by powering down the VM.

Procedure

Step 1 Log in to the VMware vSphere Web Client.
Step 2 In the **Navigator** pane, right-click the VM that you want to shut down.
Step 3 Choose **Power** > **Power Off**.
Step 4 Wait for the VM status to change to **Off**.

Install the latest version of Cisco Crosswork Planning

After you successfully back up the old version of Cisco Crosswork Planning, install the latest version of Cisco Crosswork Planning.

Procedure

Step 1 Install the latest version of Cisco Crosswork Planning using the instructions in Install Cisco Crosswork Planning using the vCenter vSphere UI, on page 22.

During installation, a special administrative ID (virtual machine (VM) administrator, with the username "cw-admin" and the default password "cw-admin") is created. The administrative username is reserved and cannot be changed.

The first time you log in using this administrative ID, you are prompted to change the password. Data center administrators use this ID to log in to and troubleshoot the Cisco Crosswork Planning VM. Use this ID to verify that the VM has been properly set up.

Step 2 After the installation is complete, verify that all applications display a **Healthy** status.

a) Log in to the Cisco Crosswork Planning UI.
b) From the main menu, choose **Administration** > **Crosswork Manager** > **Crosswork summary**.
c) Ensure all applications display **Healthy**.

Migrate Cisco Crosswork Planning backup

After successfully installing the new version of Cisco Crosswork Planning, proceed to migrate the Cisco Crosswork Planning backup taken earlier.

Before you begin

Ensure that you have

- the host name or IP address and the port number of a secure destination SCP server used in Create a backup of your system configuration, on page 52
- name and path of the backup file created in Create a backup of your system configuration, on page 52, and
- user credentials with file read and write permissions to the directory.

Procedure

Step 1 Verify that the Cisco Crosswork Planning VM is healthy.

Step 2 Configure an SCP backup server.

a) From the main menu, choose **Administration** > **Backup and Restore**.
b) Click **Destination** to display the Edit Destination drawer panel.
c) Enter the required information in the provided fields. In **Server path/Location**, provide the location of the backup created in Create a backup of your system configuration, on page 52.
d) Save the details of the backup server.

Step 3 Migrate the old Cisco Crosswork Planning backup.

a) Click **Actions** > **Data migration**.
The Data Migration drawer panel opens with the destination server details prefilled.
b) In **Backup file name**, provide the name of the data migration backup (created in Create a backup of your system configuration, on page 52).
c) To perform the data migration backup despite any Cisco Crosswork Planning application or microservice issues, check the **Force** check box.
d) Click **Start migration** to start the data migration operation.

Cisco Crosswork Planning creates the corresponding data migration job set and adds it to the Backup and Restore Job Sets table. The Job Details panel reports the status of each migration step as it is completed.

Note
If you do not see your job in the list, refresh the Backup and Restore Job Sets table.

Step 4 Monitor the progress of the migration job.

a) To view the progress of a data migration job, enter the job details, such as Status or Job Type, in the search fields in the Backup and Restore Job Sets table. Then, click the job set you want.

The Job Details panel displays information about the selected job set, including job status, job type, and start time. If there is a failed job, hover the mouse pointer over the icon near the **Status** column to view the error details.

Note
Cisco Crosswork Planning UI might become temporarily unavailable during the data migration operation. When the Cisco Crosswork Planning UI is down, you can view the job status in the Grafana dashboard. The Grafana link is available as View Data Migration Process Dashboard option on the right side of the Job Details panel.

b) If the data migration fails at any point during the process, restart the procedure.

Step 5 After the data migration is successfully completed, ensure that all applications are healthy.

a) From the main menu, choose **Administration** > **Crosswork Manager** > **Crosswork summary**.
b) Ensure that all the applications display **Healthy**.

Upgrading using parallel hardware

Summary

Upgrading to the latest version of Cisco Crosswork Planning using new hardware relies on installing the new Cisco Crosswork Planning on new hardware in parallel while the data from the old Cisco Crosswork Planning is being backed up. This method is faster but requires twice the resources for creating the new VM in parallel.

Workflow

The stages of the parallel upgrade workflow are:

1. Install the latest version of Cisco Crosswork Planning on a new VM. For details, see Deploy Cisco Crosswork Planning on a different VM, on page 56.
2. Back up your data on the existing hardware. For details, see Back up your Cisco Crosswork Planning data, on page 57.
3. Update DNS server and migrate your backed up configuration data. For details, see Update DNS server and migrate backup data, on page 57.
4. Shut down the old Cisco Crosswork Planning VM. For details, see Shut down the old Cisco Crosswork Planning, on page 58.

Deploy Cisco Crosswork Planning on a different VM

This topic describes how to install the latest version of Cisco Crosswork Planning on a new VM in parallel.



Note You must install the new Cisco Crosswork Planning with the same FQDN as the old version of Cisco Crosswork Planning.

Procedure

Step 1 Install the latest of Cisco Crosswork Planning on the new VM using the instructions in Install Cisco Crosswork Planning using the vCenter vSphere UI, on page 22 .

During installation, a special administrative ID (virtual machine (VM) administrator, with the username "cw-admin" and the default password "cw-admin") is created. The administrative username is reserved and cannot be changed.

The first time you log in using this administrative ID, you are prompted to change the password. Data center administrators use this ID to log in to and troubleshoot the Cisco Crosswork Planning VM. Use this ID to verify that the VM has been properly set up.

Step 2 After the installation is complete, verify that all applications display a **Healthy** status.

a) Log in to the Cisco Crosswork Planning UI.
b) From the main menu, choose **Administration** > **Crosswork Manager** > **Crosswork summary**.
c) Ensure all applications display **Healthy**.

Back up your Cisco Crosswork Planning data

Log in to the old Cisco Crosswork Planning UI and create a backup. For detailed instructions on creating the backup, see Create a backup of your system configuration, on page 52.

Update DNS server and migrate backup data

This topic describes how to migrate the Cisco Crosswork Planning backup taken earlier.

Before you begin

Ensure that you have

- the host name or IP address and the port number of a secure SCP server
- the name and path of the backup file created in Back up your Cisco Crosswork Planning data, on page 57, and
- user credentials with file read and write permissions to the directory.

Procedure

Step 1 Update the DNS server to point the FQDN of the previous version of Cisco Crosswork Planning to the <VIP> of the new Cisco Crosswork Planning VM.

Step 2 Log in to the upgraded Cisco Crosswork Planning UI using https://<new_VIP>:30603.

Step 3 Configure an SCP backup server.

a) From the main menu, choose **Administration** > **Backup and Restore**.
b) Click **Destination** to display the Edit Destination drawer panel.

c) Enter the required information in the provided fields. In **Server path/Location**, provide the location of the backup created in Create a backup of your system configuration, on page 52.
d) Save the details of the backup server.

Step 4 Migrate the old Cisco Crosswork Planning backup.

a) Click **Actions** > **Data migration**.
The Data Migration drawer panel opens with the destination server details prefilled.
b) In **Backup file name**, provide the name of the data migration backup (created in Create a backup of your system configuration, on page 52).
c) To perform the data migration backup despite any Cisco Crosswork Planning application or microservice issues, check the **Force** check box.
d) Click **Start migration** to start the data migration operation.

Cisco Crosswork Planning creates the corresponding data migration job set and adds it to the Backup and Restore Job Sets table. The Job Details panel reports the status of each migration step as it is completed.

Note
If you do not see your job in the list, refresh the Backup and Restore Job Sets table.

Step 5 Monitor the progress of the migration job.

a) To view the progress of a data migration job, enter the job details, such as Status or Job Type, in the search fields in the Backup and Restore Job Sets table. Then, click the job set you want.

The Job Details panel displays information about the selected job set, including job status, job type, and start time. If there is a failed job, hover the mouse pointer over the icon near the **Status** column to view the error details.

Note
Cisco Crosswork Planning UI might become temporarily unavailable during the data migration operation. When the Cisco Crosswork Planning UI is down, you can view the job status in the Grafana dashboard. The Grafana link is available as View Data Migration Process Dashboard option on the right side of the Job Details panel.

b) If the data migration fails at any point during the process, restart the procedure.

Step 6 After the data migration is successfully completed, ensure that all applications are healthy.

a) From the main menu, choose **Administration** > **Crosswork Manager** > **Crosswork summary**.
b) Ensure that all the applications display **Healthy**.

Shut down the old Cisco Crosswork Planning

After a successful backup, shut down the old Cisco Crosswork Planning. For details on shutdown instructions, see Shut down Cisco Crosswork Planning, on page 54.

Upgrade Cisco Crosswork Planning applications (standalone activity)

This section explains how to upgrade Cisco Crosswork Planning applications independently for minor updates or patch releases. This procedure is not part of the upgrade workflow described in previous sections.

Note Cisco Crosswork Planning does not support the downgrade operation of an application file (CAPP). However, to revert to an older application version, you can uninstall the application and install the older version of the application. We recommend taking a backup of your data before starting the operation.

Before you begin

Ensure that you

- take a backup of your data (using the backup and restore functionality) before any critical upgrade
- download the latest version of the Cisco Crosswork Planning application to your local machine, and
- perform upgrade operations in a maintenance window to minimize disruptions.

Procedure

Step 1 Download and validate the CAPP files.

a) Navigate to cisco.com and locate the CAPP files (.tar.gz) that you require.
b) Hover over the file and copy the MD5 or SHA512 checksum to your clipboard.
c) Download the files to a server that can be reached from the Crosswork server.
d) Run a tool of your choice to calculate the checksum, and compare the checksum value in your downloaded file with the value you copied in the clip board.

For example, on a MAC you can use the **md5** command to calculate the MD5 sum on a file:

```
md5 signed-cw-na-design-patch-7.0.1-2-release-241112.tar.gz

3e3becf10a509c8e3787eec8e362fd4f
```

Verify that the result value matches with the posted value on cisco.com.

Step 2 Log in to Cisco Crosswork Planning UI.

Step 3 From the main menu, choose **Administration** > **Crosswork Manager**, and click the **Application management** tab.

The Crosswork Platform Infrastructure and any applications that are added are displayed here as tiles.

Step 4 Click **Add new file** > **Upload application bundle file (.tar.gz)**. The **Add Application Bundle (.tar.gz)** dialog box is displayed.

Step 5 Select either **URL** or **SCP** as your preferred protocol. Based on your selection, fill in the additional fields with the required information. Click **Add** to proceed.

Step 6 To upgrade, click the Upgrade prompt and the new version of the application is installed. Alternatively, click ••• on the tile, and select the **Upgrade** option from the drop-down list.

Step 7 In the Upgrade screen, select the new version that you want to upgrade to, and click **Upgrade**.

Step 8 (Optional) Click **Job History** to see the progress of the upgrade operation.

Note

During an upgrade, only the changed components are installed, with the new version reusing most resources from the older version to ensure a fast and non-disruptive process. However, the application being updated will be degraded until the upgrade is complete, and users will be notified of the upgrade through an alarm.

The application is upgraded to the selected version.

Collector configuration migration

A collector configuration migration is a process that enables you to migrate collector configurations from Cisco WAE 7.5.x/7.6.x or between different Cisco Crosswork Planning instances.



Note When using collectors that have file upload options, ensure to upload the correct files after importing the collector configuration. This is necessary because, after you import the configuration, the server restores only the file name and not the actual file. If you do not use the correct file, the collection will fail.

Migrate collector configurations from Cisco WAE

This section explains how to migrate collector configurations from Cisco WAE 7.5.x/7.6.x to Cisco Crosswork Planning.

Before you begin

- Download the upgrade script from the Cisco Software Download page.

Procedure

Step 1 If you have not backed up the configuration, use these steps to back up and migrate it to a configuration compatible with Cisco Crosswork Planning:

a) Log in to the machine where Cisco WAE 7.x is installed.

b) Enter this command:

```
# ./wae_upgrade --export --install-dir <WAE_7.x_INSTALL_DIR> --cfg-dir
<dir_to_save_exported_config>
Where:
     --install-dir   indicates the directory where 7.x WAE is installed.
     --cfg-dir       indicates the folder where the backup of 7.x configuration
                     must reside. The migrated configurations are saved as
                     wae_networks.cfg in the provided directory.
```

Step 2 If you already have the backed-up configuration, use these steps to convert the file into a format compatible with Cisco Crosswork Planning:

a) Log in to the machine where the Cisco WAE 7.x configuration is backed up.

b) Enter this command:

```
# ./wae_upgrade --migrate --cfg-dir <dir_containing_7.x_config>

Where:
      --cfg-dir   indicates the folder where the 7.x configuation is backed up.
                  This configuration will be migrated to Cisco Crosswork Planning
                  compatible configuration. The migrated configurations are saved as
                  wae_networks.cfg in the provided directory.
```

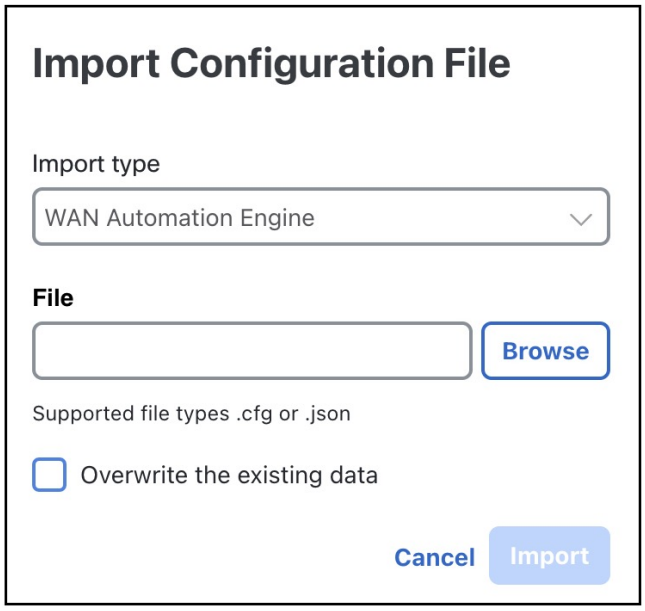
Step 3 Import the migrated configurations (**wae_networks.cfg**) to Cisco Crosswork Planning using these steps:

Note
Before migration, ensure that configurations are backed up using the upgrade scripts. Otherwise, the migration will fail.

a) Log in to the Cisco Crosswork Planning UI.
b) From the main menu, choose **Collector** > **Migration**.
c) Click **Actions** and select **Configuration migration**.

The Import Configuration File page appears.

Figure 9: Import Configuration File page



d) Select **WAN Automation Engine** from the **Import type** drop-down list.
e) Click **Browse** and select the **wae_networks.cfg** file.
f) (Optional) To overwrite the existing collector configuration, check the **Overwrite the existing data** check box.
g) Click **Import**.

The system proceeds with the import using your configuration. You can monitor the progress on the Migration page (**Collector** > **Migration**). Once the import is successful, the **Import status** column displays **Success**.

What to do next



Note After migrating from Cisco WAE to Cisco Crosswork Planning, the Telnet and SSH settings are not preserved. You need to manually verify and update these settings, if required.

Migrate collector configurations between Cisco Crosswork Planning instances

This section explains how to migrate collector configurations from one Cisco Crosswork Planning instance (source) to the other (target).



Note If using the SR-PCE collector in your configurations, ensure to update the **SR-PCE host** and **Backup SR-PCE host** fields manually after migration. This is necessary because, these fields are not updated while migrating the collector configurations between Cisco Crosswork Planning instances.

Procedure

Step 1 Download the collector configuration file from the source machine.

a) Log in to the Cisco Crosswork Planning instance from which you want to migrate the configuration.
b) From the main menu, choose **Collector** > **Migration**.
c) Click **Actions** and select **Configuration backup**.

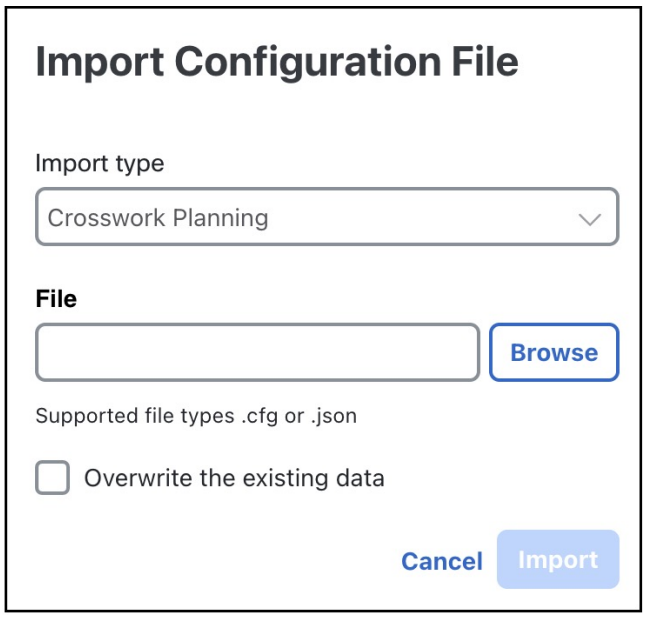
The collector configuration file is downloaded to your local machine.

Step 2 Import the collector configuration file to the target machine.

a) Log in to the Cisco Crosswork Planning instance to which you want to migrate the configuration.
b) From the main menu, choose **Collector** > **Migration**.
c) Click **Actions** and select **Configuration migration**.

The Import Configuration File page appears.

Figure 10: Import Configuration File page



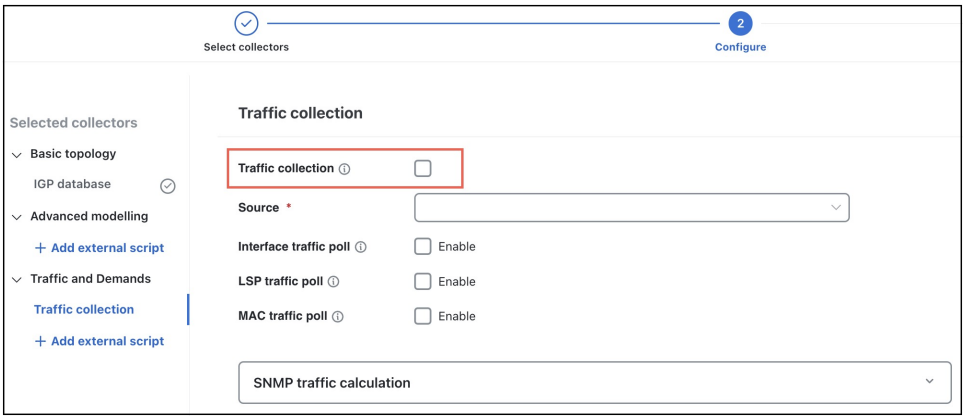
d) Select **Crosswork planning** from the **Import type** drop-down list.
e) Click **Browse** and select the collector configuration file downloaded earlier in the Step 1 (c).
f) (Optional) If you want to overwrite the existing collector configuration, check the **Overwrite the existing data** check box.
g) Click **Import** to import the collector configuration file.

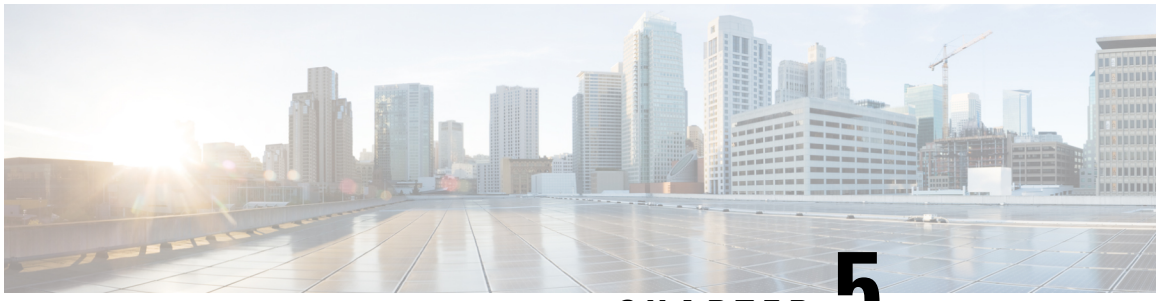
The system proceeds with the import using your configuration. You can monitor the progress on the Migration page (**Collector** > **Migration**). Once the import is successful, the **Import status** column displays **Success**.

What to do next

Note In case of traffic collection, if the traffic poller agent status is displayed as down on the Agent page after migration, even though traffic collection has run successfully, follow these steps:

1. On the Collections page, click **Edit collection** for the collection corresponding to the agent.
2. On the Traffic collection configuration page, uncheck the **Traffic collection** check box and save the configuration.
3. Re-enable the **Traffic collection** check box and save the configuration again.





CHAPTER 5

Next Steps

The following topics describe the next steps you perform to get started with Cisco Crosswork Planning. You access the Cisco Crosswork Planning UI to perform operations. For detailed information, see the *Cisco Crosswork Planning Design 7.1 User Guide* and *Cisco Crosswork Planning 7.1 Collection Setup and Administration*.

- Install Smart License, on page 65
- Network model creation, on page 65

Install Smart License

A license is required to use all the features in Cisco Crosswork Planning. If you have questions about obtaining a license, contact your Cisco support representative or system administrator.

Cisco Crosswork Planning supports Smart Licensing, which enables you to monitor Cisco Crosswork Planning software licenses and endpoint license consumption easily and efficiently through a simple registration and license consumption reporting process instead of having to install node-locked license files. Details of all licenses that you have purchased are maintained in a centralized database called the Cisco Smart Software Manager (CSSM). For more information, refer to the Cisco Smart Licensing Overview on Cisco.com.

To install Smart Licensing, follow the steps outlined in the *"Workflow: Smart Licensing Configuration"* section in the *"Manage Licenses"* chapter of the *Cisco Crosswork Planning 7.1 Collection Setup and Administration*.

Network model creation

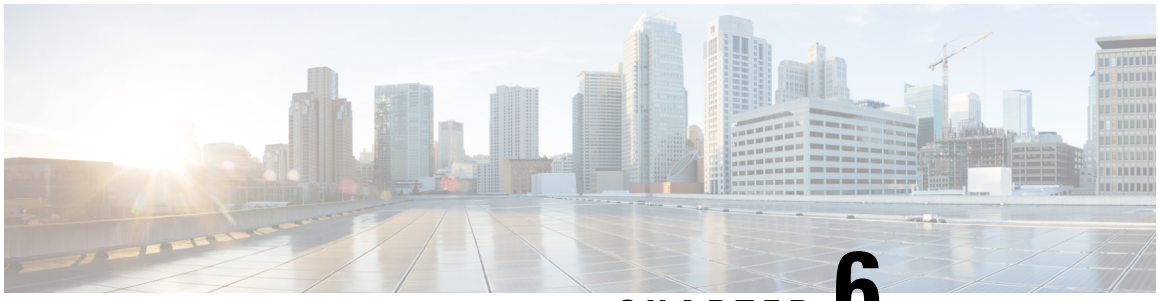
The Cisco Crosswork Planning UI provides an easy-to-use interface that hides the complexity of creating a model building chain for a network. It combines the configuration of multiple data collectors under one network (collection) and can produce a single plan file that contains the consolidated data.

Use the Cisco Crosswork Planning UI for device and network access configuration, network model creation, user management, agent configuration, and so on.

The following is a high-level description of tasks that are necessary to build a network model. For details, see the *Cisco Crosswork Planning 7.1 Collection Setup and Administration*.

1. Configure device auth groups, SNMP groups, and network profile access.
2. (Optional) Configure agents. This step is required only for collecting SR-PCE or NetFlow information.

3. Configure the collections (basic and advanced collections).
4. Schedule when to run collections.
5. (Optional) Manage the aggregation and archive of network model as per your requirement.
6. View or download the plan files in the Cisco Crosswork Planning Design application.



CHAPTER 6

Uninstall Cisco Crosswork Planning

This section contains the following topics:

- Uninstall the Cisco Crosswork Planning VM, on page 67
- Uninstall Cisco Crosswork Planning applications, on page 68

Uninstall the Cisco Crosswork Planning VM

This section explains the various methods to uninstall Cisco Crosswork Planning VM:

- Delete the VM using the Docker installer tool, on page 67
- Delete the VM using the vSphere UI, on page 68

Delete the VM using the Docker installer tool

In case of a failed installation, the Docker installer tool is used to cleanup or delete any previously created VMs. This is a critical activity during failed deployments. Any changes made to the VM settings or the data center host requires a cleanup operation before redeployment.

Note The installer cleanup option will delete the VM deployment based on the inventory in `/data` directory.

Procedure

Step 1 Enter the directory storing the deployment info.

For example, `_cd ~/cw-planning`.

Step 2 Run the container on the host.

```
docker run --rm -it -v `pwd`:/data <cw-installer docker container>
```

Step 3 Edit the copy of the template file (for example, `v4.tfvars`) in a text editor, adding the data center access parameters. Remaining parameters can be provided with dummy values, or entered on the command line during the execution of the operation.

Step 4 Run the `_cw-installer.sh install_` script with the clean directive along with the deployment manifest using the `-m` flag.

Add `-o` option to remove the Cisco Crosswork image template from the data center.

For example:

```
./cw-installer.sh clean -m /data/deployment.tfvars -o
```

Step 5 Enter "yes" when prompted to confirm the operation.

Step 6 (Optional) To clean the VM quickly (without verification), run the installer using this command:

```
docker run --rm -it -v `pwd`:/data <cw installer docker image> -exec
'./cw-installer.sh clean -m /data/deployment.tfvars'
```

Delete the VM using the vSphere UI

Follow these steps to delete a Cisco Crosswork Planning VM from vCenter.

Note Be aware that this procedure deletes all your app data.

Procedure

Step 1 Log into the VMware vSphere Web Client.

Step 2 In the **Navigator** pane, right-click the app VM that you want to remove and choose **Power** > **Power Off**.

Step 3 Once the VM is powered off, right-click the VM again and choose **Delete from Disk**.

The VM is deleted.

Uninstall Cisco Crosswork Planning applications

This procedure describes how to uninstall a Cisco Crosswork Planning application from the UI. The **Uninstall** option removes the application, application-specific menus, and associated data.

Caution Do not uninstall **Crosswork Platform Infrastructure** and **Crosswork Planning Infra**, as this will disrupt the product's functionality. You can only uninstall the Design and Collector applications.

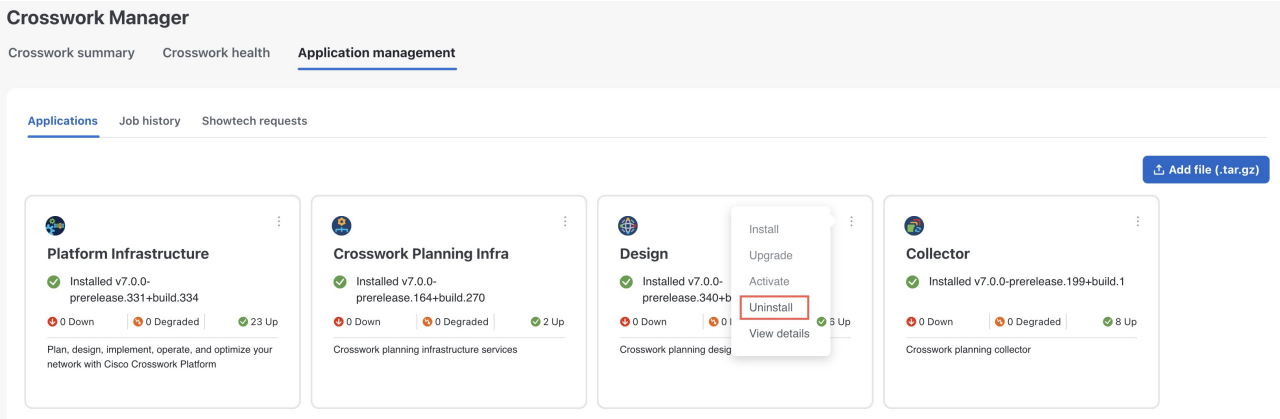
Procedure

Step 1 From the main menu, choose **Administration** > **Crosswork Manager**, and select the **Application Management** tab.

The Crosswork Platform Infrastructure and any Cisco Crosswork Planning applications that were added during installation are displayed here as tiles.

Step 2 Click ⋮ on the application tile that you want to uninstall, and select the **Uninstall** option.

Figure 11: Application management page



Step 3 Click **Uninstall** to confirm when prompted.

The selected application is uninstalled and the application tile is modified to reflect the same.

You can also view the progress of uninstallation in the Job History window (**Application Management** > **Job History**). If the uninstall fails, you can reattempt using the relevant options in the Job History window.

Note
The uninstall operation does not remove the CAPP file from the repository. The CAPP file will remain visible in the Cisco Crosswork Planning UI, in case you want to install the application in future.