



Prepare the Appliance for Configuration

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Preparation for Appliance Configuration Overview

Before you can successfully configure your Cisco DNA Center appliance, first complete the following tasks:

1. Enable browser access to the appliance's Cisco IMC (see [Enable Browser Access to Cisco Integrated Management Controller](#)).
2. Use Cisco IMC to check and adjust important hardware and switch settings (see [Execute Preconfiguration Checks](#)).
3. If the Intel X710-DA4 network interface card (NIC) that shipped with your appliance is currently disabled, you need to enable it in order to make use of NIC bonding (see [Enable NIC on an Upgraded Appliance, on page 11](#)).
4. Cisco DNA Center software is preinstalled on your appliance, but you may need to reinstall the software in certain situations (such as before you change the current cluster link configuration). If this is the case, you must also complete the tasks described in [Reimage the Appliance](#).



Note If you do not need to reimage your appliance, proceed to the "Appliance Configuration Overview" topic specific to the configuration wizard you want to use:

- [Maglev configuration wizard](#)
 - [Browser-based configuration wizard \(44 and 56 core appliance\)](#)
 - [Browser-based configuration wizard \(112 core appliance\)](#)
-

Enable Browser Access to Cisco Integrated Management Controller

After installing the appliance, as described in [Appliance Installation Workflow](#), use the Cisco IMC configuration utility to assign an IP address and gateway to the appliance's CIMC port. This gives you access to the Cisco IMC GUI, which you should use to configure the appliance.

After you complete the Cisco IMC setup, log in to Cisco IMC and run the tasks listed in [Execute Preconfiguration Checks](#) to ensure correct configuration.



Tip To help ensure the security of your deployment, Cisco IMC prompts you to change the Cisco IMC user's default password when you boot the appliance for the first time. To change the Cisco IMC user password later, use the Cisco IMC GUI, as follows:

1. From the top-left corner of the GUI, click the **Toggle Navigation** icon () and then choose **Admin > User Management**.

The **Local User Management** tab should already be selected.

2. Check the check box for user **1**, and then click **Modify User**.

The **Modify User Details** dialog box opens.

3. Check the **Change Password** check box.

4. Enter and confirm the new password, and then click **Save**.

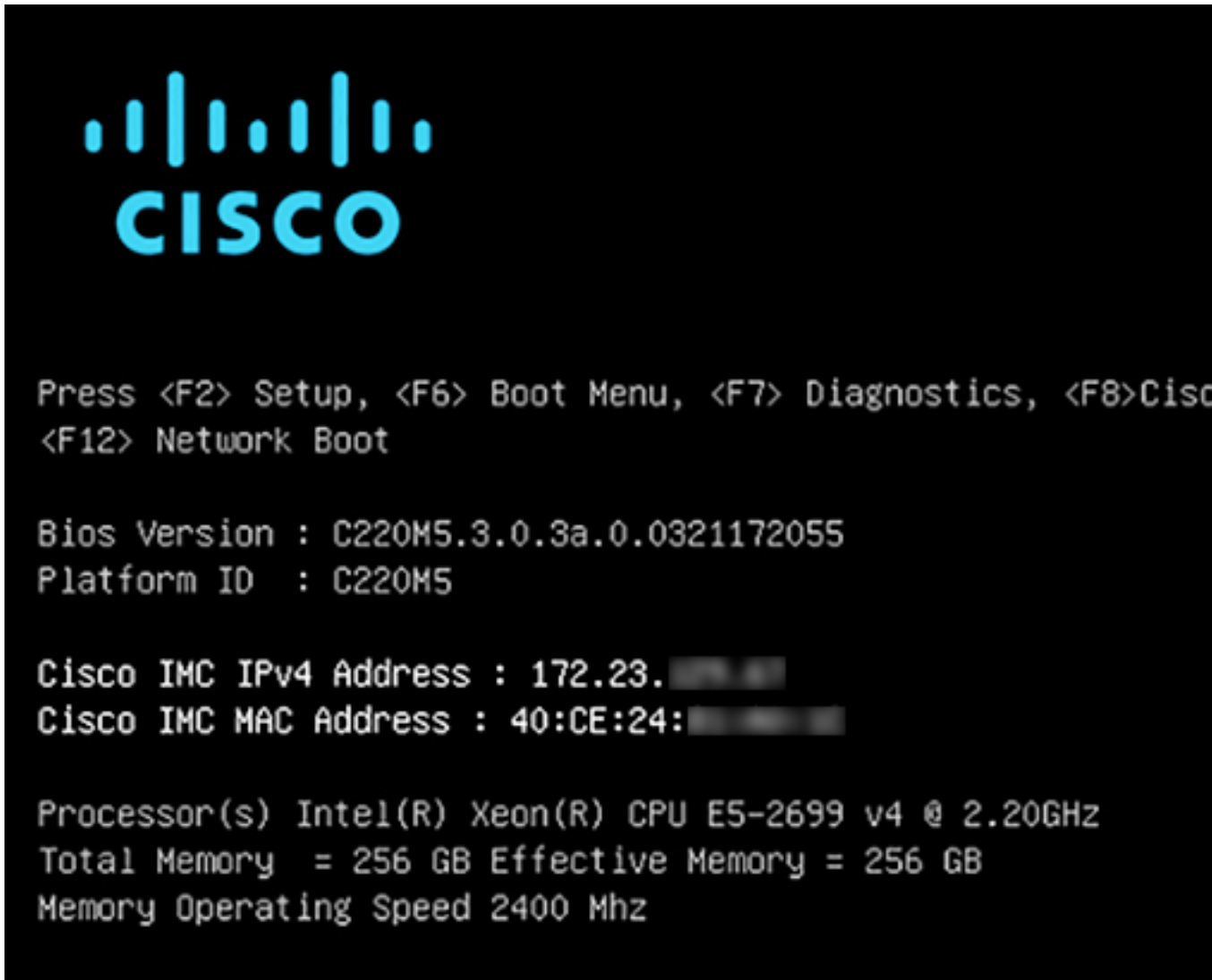
Step 1 Access the appliance console by attaching either of the following:

- A KVM cable to the KVM connector on the appliance's front panel (component 11 on the front panel illustrated in [Front and Rear Panels](#))
- A keyboard and monitor to the USB and VGA ports on the appliance's rear panel (components 2 and 5, respectively, on the rear panel illustrated in [Front and Rear Panels](#)).

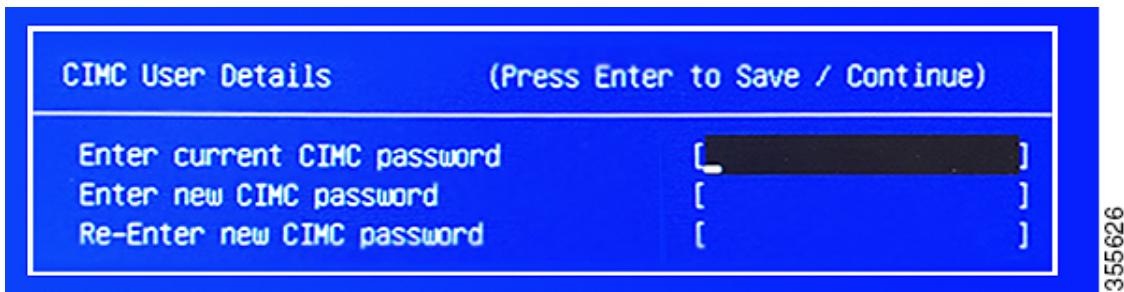
Step 2 Make sure that the appliance's power cord is plugged in and the power is on.

Step 3 Press the **Power** button on the front panel to boot the appliance.

The Cisco IMC configuration utility boot screen should be displayed, as shown below.



- Step 4** As soon as the boot screen is displayed, press **F8** to perform Cisco IMC configuration. The CIMC configuration utility displays the **CIMC User Details** screen, as shown below.



- Step 5** Enter the default CIMC user password (the default on a new appliance is *password*) in the **Enter current CIMC Password** field.

Step 6 Enter and confirm the new CIMC user password in the **Enter new CIMC password** and **Re-Enter new CIMC password** fields.

When you press **Enter** after entering the new password in the **Re-Enter new CIMC password** field, the Cisco IMC configuration utility displays the **NIC Properties** screen, as shown below.

```

Cisco IMC Configuration Utility Version 2.0 Cisco Systems, Inc.
*****
NIC Properties
NIC mode                               NIC redundancy
Dedicated:      [X]                    None:           [X]
Shared LOM:     [ ]                    Active-standby: [ ]
Cisco Card:
  Riser1:       [ ]                    Active-active:  [ ]
  Riser2:       [ ]                    VLAN (Advanced)
  MLOm:         [ ]                    VLAN enabled:   [ ]
Shared LOM Ext: [ ]                    VLAN ID:        1
                                           Priority:        0
IP (Basic)
IPV4:           [X]                    IPV6:           [ ]
DHCP enabled    [ ]
CIMC IP:        172.23.
Prefix/Subnet:  255.255.0.0
Gateway:        172.23.
Pref DNS Server: 171.70.
*****
<Up/Down>Selection  <F10>Save  <Space>Enable/Disable  <F5>Refresh  <ESC>Exit
<F1>Additional settings

```

Step 7 Perform the following actions:

- **NIC mode:** Select **Dedicated**.
- **IP (Basic):** Select **IPV4**.
- **CIMC IP:** Enter the IP address of the CIMC port.
- **Prefix/Subnet:** Enter the subnet mask for the CIMC port IP address.
- **Gateway:** Enter the IP address of your preferred default gateway.
- **Pref DNS Server:** Enter the IP address of your preferred DNS server.
- **NIC Redundancy:** Select **None**.

Step 8 Press **F1** to specify **Additional settings**.

The Cisco IMC configuration utility displays the **Common Properties** screen, as shown below.

```

Cisco IMC Configuration Utility Version 2.0 Cisco Systems, Inc.
*****
Common Properties
Hostname:   C220-FCH212
Dynamic DNS: [ ]
DDNS Domain:
FactoryDefaults
Factory Default: [ ]
Default User(Basic)
Default password:
Reenter password:
Port Properties
Auto Negotiation: [X]
Admin Mode      Operation Mode
Speed[1000/100/10Mbps]:   Auto      1000
Duplex mode[half/full]:   Auto      full
Port Profiles
Reset: [ ]
Name:
*****
<Up/Down>Selection  <F10>Save  <Space>Enable/Disable  <F5>Refresh  <ESC>Exit
<F2>PreviousPageettings

```

Step 9

Perform the following actions:

- **Hostname:** Enter a hostname for CIMC on this appliance.
- **Dynamic DNS:** Uncheck the check box to disable this feature.
- **Factory Defaults:** Uncheck the check box to disable this feature.
- **Default User (Basic):** Leave these fields blank.
- **Port Properties:** Enter new settings or accept the defaults shown in these fields.
- **Port Profiles:** Uncheck the check box to disable this feature.

Step 10

Press **F10** to save the settings.

Step 11

Press **Escape** to exit and reboot the appliance.

Step 12

After the settings are saved and the appliance finishes rebooting, open a compatible browser on a client machine with access to the subnet on which the appliance is installed, and enter the following URL:

https://CIMC_ip_address, where *CIMC_ip_address* is the Cisco IMC port IP address that you entered in Step 7.

Your browser displays a main Cisco IMC GUI login window similar to the one shown below.

**Step 13**

Log in using the Cisco IMC user ID and password you set in Step 5.

If the login is successful, your browser displays a **Cisco Integrated Management Controller Chassis Summary** window similar to the one shown below.

Cisco Integrated Management Controller

admin@10. .42 - C220-FCH212

Chassis / Summary ★ [Refresh](#) | [Host Power](#) | [Launch KVM](#) | [Ping](#) | [Reboot](#) | [Locator LED](#) | [?](#)

Server Properties Cisco Integrated Management Controller (Cisco IMC) Information

Product Name:	Hostname: C220-FCH212
Serial Number: FCH212	IP Address: 172. .223
PID: DN2-HW-APL	MAC Address: 70:69: .48
UUID: AF0FF4C-638C-4EC8-AB03-	Firmware Version: 3.1(2c)
BIOS Version: C220M5.3.1.2b.0.1025170315	Current Time (UTC): Thu May 16 51 2019
Description: <input type="text"/>	Local Time: Thu May 16 51 2019 UTC +0000
Asset Tag: <input type="text"/>	Timezone: UTC Select Timezone

Chassis Status Server Utilization

Power State: ● On	Overall Utilization (%): N/A
Overall Server Status: ✔ Good	CPU Utilization (%): N/A
Temperature: ✔ Good	Memory Utilization (%): N/A
Overall DIMM Status: ✔ Good	IO Utilization (%): N/A
Power Supplies: ✔ Good	
Fans: ✔ Good	
Locator LED: ● Off	
Overall Storage Status: ✔ Good	

Execute Preconfiguration Checks

After installing the appliance (as described in [Appliance Installation Workflow](#)) and setting up access to the Cisco IMC GUI (as described in [Enable Browser Access to Cisco Integrated Management Controller](#)), use Cisco IMC to perform the following preconfiguration tasks, which help ensure correct configuration and deployment:

1. Synchronize the appliance hardware with the Network Time Protocol (NTP) servers you use to manage your network. These must be the same NTP servers whose hostnames or IPs you gathered for use when planning your implementation, as explained in [Required IP Addresses and Subnets](#). This is a critical task that ensures that your Cisco DNA Center data is synchronized properly across the network.
2. Reconfigure the switches connected to the 10-Gbps appliance ports to support higher throughput settings.

Step 1

Log in to the appliance's Cisco IMC using the Cisco IMC IP address, user ID, and password you set in [Enable Browser Access to Cisco Integrated Management Controller](#).


If the login is successful, your browser displays the **Cisco Integrated Management Controller Chassis Summary** window, as shown below.

The screenshot displays the Cisco IMC Chassis Summary page. The top navigation bar includes the Cisco logo, the title 'Cisco Integrated Management Controller', and user information 'admin@10...42 - C220-FCH212'. Below the navigation bar, the page is divided into several sections:

- Server Properties:**
 - Product Name: FCH212
 - Serial Number: FCH212
 - PID: DN2-HW-APL
 - UUID: AF0FFF4C-638C-4EC8-AB03-
 - BIOS Version: C220M5.3.1.2b.0.1025170315
 - Description: (empty field)
 - Asset Tag: Unknown
- Cisco Integrated Management Controller (Cisco IMC) Information:**
 - Hostname: C220-FCH212
 - IP Address: 172...223
 - MAC Address: 70:69:...48
 - Firmware Version: 3.1(2c)
 - Current Time (UTC): Thu May 16 51 2019
 - Local Time: Thu May 16 51 2019 UTC +0000
 - Timezone: UTC
- Chassis Status:**
 - Power State: On
 - Overall Server Status: Good
 - Temperature: Good
 - Overall DIMM Status: Good
 - Power Supplies: Good
 - Fans: Good
 - Locator LED: Off
 - Overall Storage Status: Good
- Server Utilization:**
 - Overall Utilization (%): N/A
 - CPU Utilization (%): N/A
 - Memory Utilization (%): N/A
 - IO Utilization (%): N/A

Step 2

Synchronize the appliance's hardware with the Network Time Protocol (NTP) servers you use to manage your network, as follows:

- a) From the top-left corner of the Cisco IMC GUI, click the **Toggle Navigation** icon (.
- b) From the Cisco IMC menu, select **Admin > Networking**, and then choose the **NTP Setting** tab.
- c) Make sure that the **NTP Enabled** check box is checked and enter up to four NTP server host names or addresses in the numbered **Server** fields, as shown in the example below.

Cisco Integrated Management Controller

admin@1 -C220-FCH212

Networking / NTP Setting

Network Network Security NTP Setting

NTP Properties

NTP Enabled:

Server 1:

Server 2:

Server 3:

Server 4:

Status: NTP service disabled

Save Changes Reset Values

- d) Click **Save Changes**. Cisco IMC validates your entries and then begins to synchronize the time on the appliance's hardware with the time on the NTP servers.

Note Unlike the previous generation of Cisco DNA Center appliances, second generation appliances do not use a virtual interface card (VIC). You do not need to configure the network interface card (NIC) that comes installed on your second generation appliance to support high throughput in Cisco IMC, as this is already enabled by default.

Step 3

Reconfigure your switches to match the high-throughput settings on the appliance, as follows:

- Using a Secure Shell (SSH) client, log in to the switch to be configured and enter EXEC mode at the switch prompt.
- Configure the switch port.

On a Cisco Catalyst switch, enter the following commands. For example:

```
MySwitch#Config terminal
MySwitch(config)#interface tengigabitethernet 1/1/3
MySwitch(config-if)#switchport mode access
MySwitch(config-if)#switchport access vlan 99
MySwitch(config-if)#speed auto
MySwitch(config-if)#duplex full
MySwitch(config-if)#mtu 1500
MySwitch(config-if)#no shut
MySwitch(config-if)#end
MySwitch(config)#copy running-config startup-config
```

On a Cisco Nexus switch, enter the following commands to disable Link Layer Discovery Protocol (LLDP) and priority flow control (PFC). For example:

```
N7K2# configure terminal
N7K2(config)# interface eth 3/4
N7K2(config-if)# no priority-flow-control mode auto
N7K2(config-if)# no lldp transmit
N7K2(config-if)# no lldp receive
```

Note the following:

- These commands are examples only.
 - The switch port on Cisco DNA Center second generation appliances must be set to access mode in order to function properly. Trunk mode is not supported, as it is on first generation appliances.
- c) Run the show interface tengigabitethernet *portID* command and verify that the port is connected, running, and has the correct MTU, duplex, and link-type settings in the command output. For example:

```
MySwitch#show interface tengigabitethernet 1/1/3
TenGigabitEthernet1/1/3 is up, line protocol is up (connected)
  Hardware is Ten Gigabit Ethernet, address is XXXe.310.8000 (bia XXX.310.8000)
  MTU 1500 bytes, BW 10000000 Kbit/sec, DLY 10 usec,
    reliability 255/255, txload 1/255, rxload 1/255
  Encapsulation ARPA, loopback not set
  Keepalive not set
  Full-duplex, 10GB/s, link type is auto, media type is SFP-10Gbase-SR
```

- d) Run the show run interface tengigabitethernet *portID* command to configure the switch ports where the cables from the Intel X710-DA2 NIC ports are connected. For example:

```
MySwitch#show run interface tengigabitethernet 1/1/3
Building configuration...
Current configuration : 129 bytes
! interface TenGigabitEthernet1/1/3
  switchport access vlan 99
  ip device tracking maximum 10
end
```

```
MySwitch#
```

- e) Run the show mac address-table interface tengigabitethernet *portID* command and verify the MAC address from the command output. For example:

```
MySwitch#show mac address-table interface tengigabitethernet 1/1/3
          Mac Address Table
-----
Vlan    Mac Address      Type    Ports
----    -
99      xxxe.3161.1000   DYNAMIC Te1/1/3
Total Mac Addresses for this criterion: 1

MySwitch#
```

What to do next

When this task is complete, do one of the following:

- If you need to reinstall Cisco DNA Center software before you configure your appliance, see [Reimage the Appliance](#).
- If you are ready to configure your appliance, proceed to the "Appliance Configuration Overview" topic specific to the configuration wizard you want to use:
 - [Maglev configuration wizard](#)
 - [Browser-based configuration wizard \(44 and 56 core appliance\)](#)

NIC Bonding Overview

On any given Cisco DNA Center appliance, you can configure the Enterprise, Intracluster, Management, and Internet interface. Starting with this release, Cisco DNA Center now supports network interface controller (NIC) bonding. If you enable NIC bonding on an appliance, each of these interfaces has two instances: The primary instance (located on either your appliance's motherboard or Intel X710-DA2 NIC) is connected to one switch, and the secondary instance (located on your appliance's Intel X710-DA4 NIC) is connected to a different switch. NIC bonding consolidates the two instances of each interface into a single logical interface, appearing as a single device with one MAC address. Depending on the bonding mode that you choose when configuring the interfaces on your appliance, this feature provides the following benefits when enabled:

- **Active-Backup mode:** By default, this is the bonding mode that's configured for your appliance's interfaces when this feature is enabled on your appliance. It enables high availability (HA) for the two interfaces that Cisco DNA Center has grouped together. When the interface that's currently active goes down, the other interface takes its place and becomes active.



Note When this mode is enabled on an interface that supports both 1-Gbps and 10-Gbps throughput, Cisco DNA Center automatically sets the throughput to 1-Gbps.

- **LACP mode:** When selected, the two interfaces that Cisco DNA Center has grouped together share the same speed and duplex settings. This provides load balancing and higher bandwidth for the interfaces. In order to enable this mode, the following items must first be in place:
 - The switch that is connected to the Enterprise port must support dynamic interface aggregation.
 - After you enable LACP on the switch, ensure that you have set the LACP mode to **active** (which places the switch port connected to your appliance into an active negotiating state, in which the port initiates negotiations with remote ports by sending LACP packets) and the LACP rate to **fast** (which changes the rate at which the LACP control packets are sent to an LACP-supported interface from the default every 30 seconds to once every second).



Note You can only enable LACP mode on your appliance's Enterprise and Intracluster interfaces. The Management and Internet Access interfaces only support Active-Backup mode.

Before you use NIC bonding in your production environment, you should do the following:

- Confirm that your appliance supports this feature. See [Appliance Support, on page 11](#).
- By default, the Intel X710-DA4 NIC is already enabled on new Cisco DNA Center appliances that have software version 2.2.1.0 installed. To enable this NIC on an appliance that you will upgrade from a previous Cisco DNA Center version, complete the steps described in [Enable NIC on an Upgraded Appliance, on page 11](#).
- Determine where the secondary ports are located on your appliance's rear panel. See [Front and Rear Panels](#).
- View the recommended appliance–switch cabling. See [Interface Cable Connections](#).

Appliance Support

All second-generation Cisco DNA Center appliances support NIC bonding:

- 44-core appliance: Cisco part number DN2-HW-APL
- 44-core promotional appliance: Cisco part number DN2-HW-APL-U
- 56-core appliance: Cisco part number DN2-HW-APL-L
- 56-core promotional appliance: Cisco part number DN2-HW-APL-L-U
- 112-core appliance: Cisco part number DN2-HW-APL-XL
- 112-core promotional appliance: Cisco part number DN2-HW-APL-XL-U

Enable NIC on an Upgraded Appliance

In order to enable the Intel X710-DA4 NIC on an appliance that you plan to upgrade to Cisco DNA Center 2.2.1.0 from a previous version, complete the following procedure.



Important If you have a new appliance with Cisco DNA Center 2.2.1.0 installed, this NIC is already configured for use. You do *not* need to complete this procedure.

Step 1

Confirm that your appliance has the Intel X710-DA4 NIC installed.

- Log in to the appliance's Cisco IMC.
- In the **Summary** window's **Server Properties** area, confirm that the following values are set:
 - PID: **DN2-HW-APL** for a 44-core appliance, **DN2-HW-APL-L** for a 56-core appliance, or **DN2-HW-APL-XL** for a 112-core appliance (see the following example).
 - BIOS Version: This value should start with either **C220M5** for a 44 and 56-core appliance or **C480M5** for a 112-core appliance (see the following example).

Server Properties

Product Name:

Serial Number: FCH224

PID: **DN2-HW-APL-XL**

UUID: 6FF202AA-EEF9-4DF4-9FE4-

BIOS Version: **C480M5**4.0.1c.0.0706181854

Description:

Asset Tag:

Cisco Integrated Management Controller

Hostname: C480-FCH224

IP Address: 10.195.

MAC Address: A8:B4:56:

Firmware Version: 4.0(1a)

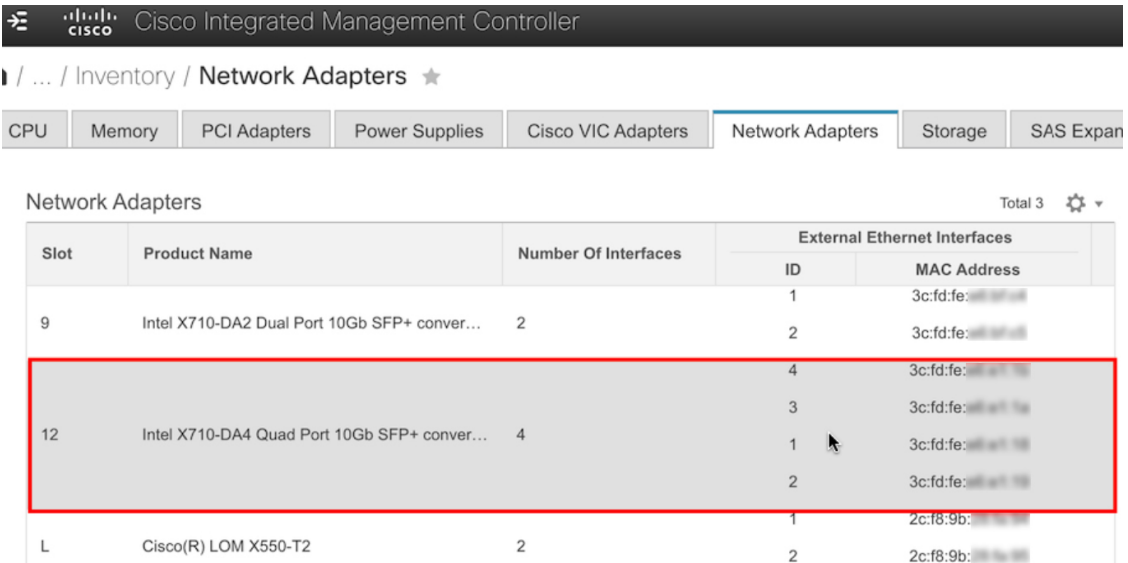
Current Time (UTC): Wed Nov 6 18:51:54 2019

Local Time: Wed Nov 6 10:51:54 2019 PST -08

Timezone: America/Los_Angeles

- Choose > **Chassis** > **Inventory** > **Network Adapters**.
- In the **Network Adapters** table, confirm that the Intel X710-DA4 Quad Port network adapter is listed for one of the following slots:

- For a 44 or 56-core appliance, **PCIe Slot 2**.
- For a 112-core appliance, **PCIe Slot 12** (see the following example).



Cisco Integrated Management Controller

/ ... / Inventory / Network Adapters ★

CPU Memory PCI Adapters Power Supplies Cisco VIC Adapters Network Adapters Storage SAS Expan

Network Adapters Total 3 ⚙️

Slot	Product Name	Number Of Interfaces	External Ethernet Interfaces	
			ID	MAC Address
9	Intel X710-DA2 Dual Port 10Gb SFP+ conver...	2	1	3c:fd:fe:af:af:af
			2	3c:fd:fe:af:af:af
12	Intel X710-DA4 Quad Port 10Gb SFP+ conver...	4	4	3c:fd:fe:af:af:af
			3	3c:fd:fe:af:af:af
			1	3c:fd:fe:af:af:af
			2	3c:fd:fe:af:af:af
L	Cisco(R) LOM X550-T2	2	1	2c:f8:9b:af:af:af
			2	2c:f8:9b:af:af:af

Step 2 Confirm that the your appliance's PCIe card is enabled:

a) Choose  > **Compute**.

The **BIOS > Configure BIOS > I/O** tab opens.

b) If necessary, set the following parameters to **Enabled** and then click **Save**:

- For a 44 or 56-core appliance, **PCIe Slot 2 OptionROM** and **PCIe Slot 2 Link Speed**.
- For a 112-core appliance, **PCIe Slot 12 OptionROM** and **PCIe Slot 12 Link Speed** (see the following example).

Note: Default values are shown in bold.

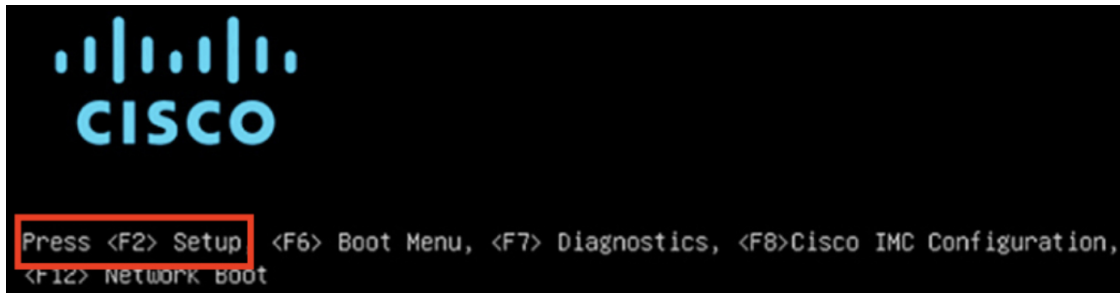
Reboot Host Immediately:	<input type="checkbox"/>
Intel VT for directed IO:	Enabled
Intel VTD ATS support:	Enabled
LOM Port 1 OptionRom:	Enabled
Pcie Slot 1 OptionRom:	Enabled
Pcie Slot 3 OptionRom:	Enabled
Pcie Slot 5 OptionRom:	Enabled
Pcie Slot 7 OptionRom:	Enabled
Pcie Slot 9 OptionRom:	Enabled
Pcie Slot 11 OptionRom:	Enabled
RAID OptionRom:	Enabled
Front NVME 2 OptionRom:	Enabled
Front NVME 12 OptionRom:	Enabled
Front NVME 14 OptionRom:	Enabled
Front NVME 16 OptionRom:	Enabled
Front NVME 18 OptionRom:	Enabled
Front NVME 20 OptionRom:	Enabled
Legacy USB Support:	Enabled
Intel VTD coherency support:	Disabled
All Onboard LOM Ports:	Enabled
LOM Port 2 OptionRom:	Enabled
Pcie Slot 2 OptionRom:	Enabled
Pcie Slot 4 OptionRom:	Enabled
Pcie Slot 6 OptionRom:	Enabled
Pcie Slot 8 OptionRom:	Enabled
Pcie Slot 10 OptionRom:	Enabled
Pcie Slot 12 OptionRom:	Disabled
Front NVME 1 OptionRom:	Enabled
Front NVME 11 OptionRom:	Enabled
Front NVME 13 OptionRom:	Enabled
Front NVME 15 OptionRom:	Enabled
Front NVME 17 OptionRom:	Enabled
Pcie Slot 12 Link Speed:	Disabled

c) Do one of the following:

- If you needed to set these two parameters to **Enabled** for your appliance, reboot your appliance and then proceed with its configuration. You do not need to complete the rest of this procedure.
- If you have a 112-core appliance and only see one of these parameters displayed in the **I/O** tab, proceed to Step 3 and complete the rest of this procedure.

Step 3 Boot into your appliance's BIOS:

- From Cisco IMC, start a KVM session.
- Power cycle the appliance by clicking the **Host Power** link and then choosing **Power Cycle**.
- During startup, press the **F2** key as soon as you see the following screen to boot into your appliance's BIOS and open the Aptio Setup Utility.



Step 4 Enable the PCIe card:

- a) From the Aptio Setup Utility's **Main** tab, open the **Advanced** tab and then choose **LOM and PCIe Slots Configuration**.

```

Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
Main  Advanced  Server Mgmt  Security  Boot Options  Save & Exit

▶ Trusted Computing
▶ Serial Port Console Redirection
▶ PCI Subsystem Settings
▶ USB Configuration
▶ LOM and PCIe Slots Configuration
▶ Network Stack Configuration
▶ iSCSI Configuration
▶ All Cpu Information

▶ Driver Health
▶ Platform Configuration
▶ Socket Configuration

LOM, PCIe Slots
OptionROM dispatching
configuration and PCIe
slots inventory.

++: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F9: Optimized Defaults
F10: Save & Reset System
ESC: Exit
K/M: Scroll help UP/DOWN

```

- b) In the **LOM and PCIe Slots Configuration** tab, choose **PCIE Link Speed Configuration**.

```

Aptio Setup Utility - Copyright (C) 2019 American Megatrends, Inc.
  LOM and PCIe Slots Configuration

Current Boot Mode      LEGACY
SecureBoot Support    Disabled

SWRAID Configuration
pSATA SATA OpROM      [DISABLED]
M.2 SATA OpROM        [AHCI]

M.2 HWRAID Controller
MSTOR-RAID Option ROM [Enabled]
Mode

LOM and PCIe Slots Configuration
All Onboard LOM Ports [Enabled]
CDN Support for LOMs  [Disabled]

▶ PCIe Slots Inventory Details
▶ PCIe Link Speed Configuration
▶ PCI OpROM Configuration

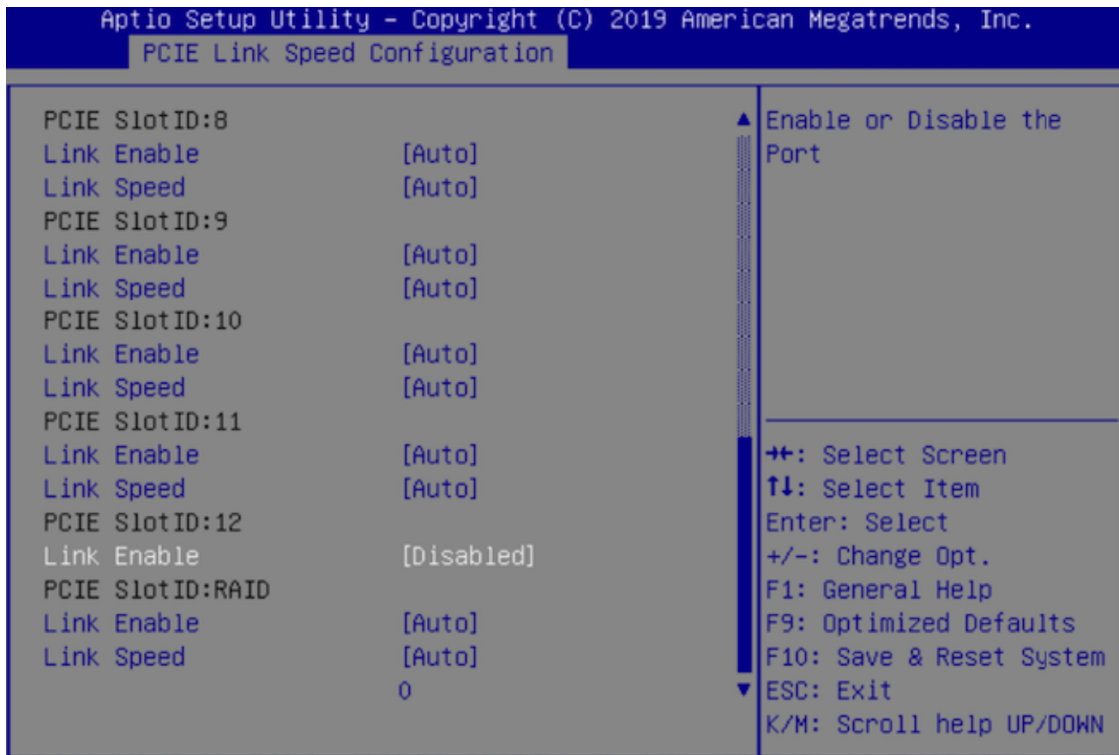
PCIE Link Speed Configuration

++: Select Screen
↑↓: Select Item
Enter: Select
+/-: Change Opt.
F1: General Help
F9: Optimized Defaults
F10: Save & Reset System
ESC: Exit
K/M: Scroll help UP/DN

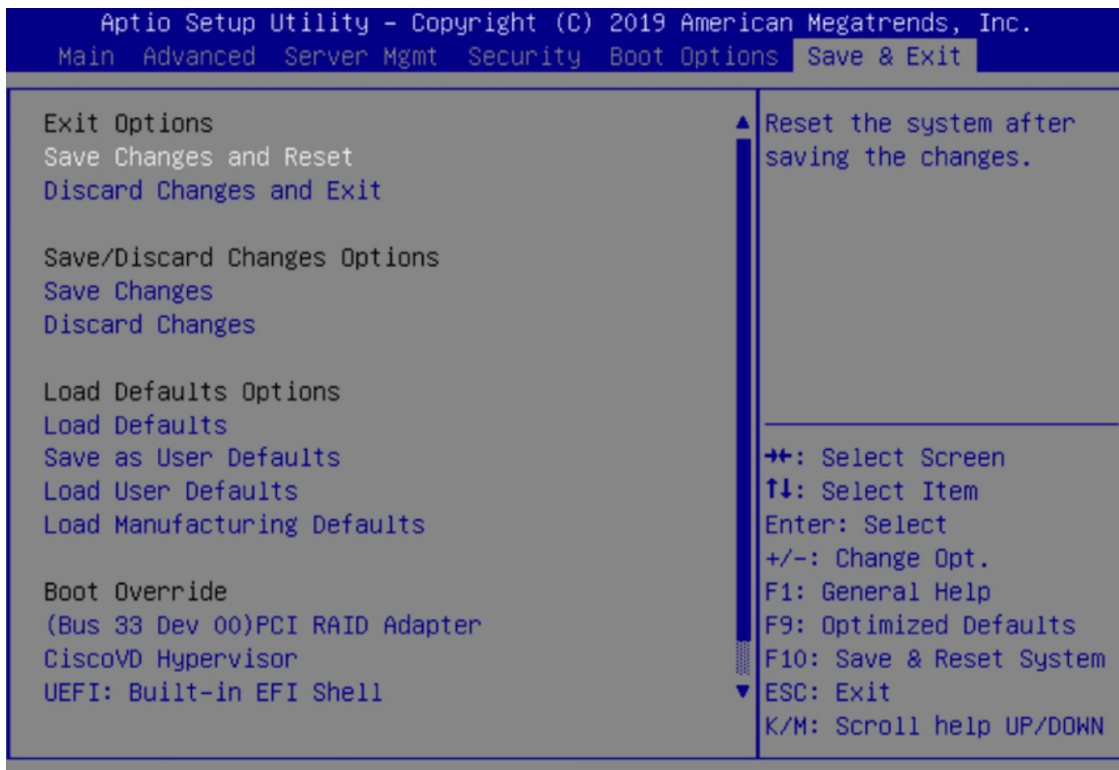
```

- c) In the **PCIE Link Speed Configuration** tab, scroll down to PCIE SlotID: 12's **Link Enable** option and then press **Enter**.
- d) Choose **Enable**, then press **ENTER**.


Your screen should look like the following example:



- e) Press the **ESC** key twice to return to the main BIOS menu, then open the **Save & Exit** tab.
- f) Choose the **Save Changes and Reset** option, then press **Enter**.



Your appliance reboots and opens the configuration wizard. Proceed with the configuration of your appliance.

Important After you have enabled your appliance's NIC, if you reset your appliance to the default settings in Cisco IMC ( > **Admin** > **Utilities** > **Reset to factory Default**), you will need to complete this procedure again.

Step 5 Upgrade to Cisco DNA Center 2.2.1.0.

In the [Cisco DNA Center Upgrade Guide](#), complete the upgrade procedure specific to your current version.

During the upgrade, Cisco DNA Center will prepare your appliance to use the Intel X710-DA4 NIC. After the upgrade completes and your appliance reboots, Cisco IMC recognizes this NIC and the four interfaces that reside on it. Counting the four interfaces located on the Intel X710-DA2 NIC and appliance motherboard, that makes a total of eight interfaces on your appliance.

Step 6 Complete the configuration wizard to finalize the use of the Intel X710-DA4 NIC on your appliance, as described in [Reconfigure the Appliance Using the Configuration Wizard](#).

Reimage the Appliance

Situations that require you to reimage your Cisco DNA Center appliance, such as recovering from a backup or changing your cluster link configuration, might arise. To do so, complete the following procedure.

Step 1 Download the Cisco DNA Center ISO image and verify that it is a genuine Cisco image.

See [Verify the Cisco DNA Center ISO Image](#).

Step 2 Create a bootable USB drive that contains the Cisco DNA Center ISO image.

See [Create a Bootable USB Drive](#).

Step 3 Reinitialize the virtual drives that are managed by your appliance's RAID controller.

See [Reinitialize the Virtual Drives on a Cisco DNA Center Appliance, on page 20](#).

Step 4 Reinstall Cisco DNA Center onto your appliance.

See [Install the Cisco DNA Center ISO Image](#).

Verify the Cisco DNA Center ISO Image

Prior to deploying Cisco DNA Center, we strongly recommend that you to verify that the ISO image you downloaded is a genuine Cisco image.

Before you begin

Obtain the location of the Cisco DNA Center ISO image (through email or by contacting the Cisco support team).

-
- Step 1** Download the Cisco DNA Center ISO image (.iso) from the location specified by Cisco.
- Step 2** Download the Cisco public key (cisco_image_verification_key.pub) for signature verification from the location specified by Cisco.
- Step 3** Download the secure hash algorithm (SHA512) checksum file for the ISO image from the location specified by Cisco.
- Step 4** Obtain the ISO image's signature file (.sig) from Cisco support through email or by download from the secure Cisco website (if available).
- Step 5** (Optional) Perform an SHA verification to determine whether the ISO image is corrupted due to a partial download. Run one of the following commands (depending upon your operating system):
- On a Linux system: `sha512sum ISO-image-filename`
 - On a Mac system: `shasum -a 512 ISO-image-filename`
- Microsoft Windows does not include a built-in checksum utility, but you can install a utility from Microsoft at this link: <http://www.microsoft.com/en-us/download/details.aspx?id=11533>.
- Compare the output of the command you run (or Microsoft Windows utility) to the SHA512 checksum file downloaded in Step 3. If the command output fails to match, download the ISO image again and run the appropriate command a second time. If the output still fails to match, contact Cisco support.
- Step 6** Verify that the ISO image is genuine and from Cisco by verifying its signature:
- ```
openssl dgst -sha512 -verify cisco_image_verification_key.pub -signature signature-filename ISO-image-filename
```
- Note** This command works in both MAC and Linux environments. For Windows, you need to download and install OpenSSL (available [here](#)) if you have not already done so.
- If the ISO image is genuine, running this command should display a `verified OK` message. If this message fails to appear, do not install the ISO image and contact Cisco support.
- Step 7** After confirming that you have downloaded a Cisco ISO image, create a bootable USB drive that contains the Cisco DNA Center ISO image. See [Create a Bootable USB Drive](#).
- 

## Create a Bootable USB Drive

Complete one of the following procedures to create a bootable USB drive from which you can install the Cisco DNA Center ISO image.

Before you begin:


- Download and verify your copy of the Cisco DNA Center ISO image. See [Verify the Cisco DNA Center ISO Image](#).
- Confirm that the USB flash drive you are using has a capacity of at least 32 GB.


## Using Etcher

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- Step 1** Download and install Etcher (Version 1.3.1 or later), an open-source freeware utility that allows you to create a bootable USB drive on your laptop or desktop.

Linux, macOS, and Windows versions of Etcher are currently available. You can download a copy at <https://www.balena.io/etcher/>.

**Note** Use only the Windows version of Etcher on machines running Windows 10, as there are known compatibility issues with older versions of Windows.

- Step 2** From the machine on which you installed Etcher, connect a USB drive and then start Etcher.
- Step 3** In the top-right corner of the window, click  and verify that the following Etcher settings are set:
- Auto-unmount on success
  - Validate write on success
- Step 4** Click **Back** to return to the main Etcher window.
- Step 5** Click **Select Image**.
- Step 6** Navigate to the Cisco DNA Center ISO image you downloaded previously, select it, and then click **Open**.

The name of the USB drive you connected should be listed under the drive icon (). If it is not:

- a. Click **Select drive**.
- b. Click the radio button for the correct USB drive, and then click **Continue**.

- Step 7** Click **Flash!** to copy the ISO image to the USB drive.
- Etcher configures the USB drive as a bootable drive with the Cisco DNA Center ISO image installed.

## Using the Linux CLI

- Step 1** Verify that your USB flash drive is recognized by your machine:
- a) Insert a flash drive into your machine's USB port.
  - b) Open a Linux shell and run the following command: **lsblk**

The command lists the disk partitions that are currently configured on your machine, as illustrated in the following example:

```
$ lsblk
NAME MAJ:MIN RM SIZE RO TYPE MOUNTPOINT
sda 8:0 0 446.1G 0 disk
├─sda1 8:1 0 1M 0 part
├─sda2 8:2 0 28.6G 0 part /
├─sda3 8:3 0 28.6G 0 part /install2
├─sda4 8:4 0 9.5G 0 part /var
├─sda5 8:5 0 30.5G 0 part [SWAP]
└─sda6 8:6 0 348.8G 0 part /data
sdb 8:16 0 1.8T 0 disk
├─sdb1 8:17 0 426.1G 0 part /data/maglev/srv/fusion
└─sdb2 8:18 0 1.3T 0 part /data/maglev/srv/maglev-system
sdc 8:32 0 3.5T 0 disk
└─sdc1 8:33 0 3.5T 0 part /data/maglev/srv/ndp
sdd 8:48 1 28.7G 0 disk
└─sdd1 8:49 1 12G 0 part
```

c) Confirm that an `sdd` partition (which indicates the presence of a USB flash drive) is listed.

**Step 2** Burn the Cisco DNA Center ISO image you downloaded previously onto your USB flash drive: **time sudo dd if=/data/tmp/ISO-image-filename of=/dev/flash-drive-partition bs=4M && sync**

For example, to create a bootable USB drive using an ISO image named `CDNAC-SW-1.330.iso`, you would run the following command: **time sudo dd if=/data/tmp/CDNAC-SW-1.330.iso of=/dev/sdd bs=4M && sync**

## Using the Mac CLI

**Step 1** Determine the disk partition associated with your USB flash drive:

a) Open a Terminal window and run the following command: **diskutil list**

The command lists the disk partitions that are currently configured on your machine.

b) Insert a flash drive into your machine's USB port and run the **diskutil list** command a second time.

The partition that was not listed the first time you ran this command corresponds to your flash drive. For example, let's assume that your flash drive's partition is `/dev/disk2`.

**Step 2** Unmount the flash drive's partition: **diskutil unmountDisk flash-drive-partition**

Continuing our example, you would enter **diskutil unmountDisk /dev/disk2**

**Step 3** Using the Cisco DNA Center ISO image you downloaded previously, create a disk image: **hdiutil convert -format UDRW -o Cisco-DNA-Center-version ISO-image-filename**

Continuing our example, let's assume that you are working with a Cisco DNA Center ISO image named `CDNAC-SW-1.330.iso`. You would run the following command, which creates a macOS disk image named `CDNAC-1.330.dmg`: **hdiutil convert -format UDRW -o CDNAC-1.330 CDNAC-SW-1.330.iso**

**Important** Ensure that the ISO image does not reside on a `Box` partition.

**Step 4** Create a bootable USB drive: **sudo dd if=macOS-disk-image-filename of=flash-drive-partition bs=1m**


Continuing our example, you would run the following command: **sudo dd if=CDNAC-1.330.dmg of=/dev/disk2 bs=1m**

The ISO image is about 18 GB in size, so this can take around an hour to complete.

## Reinitialize the Virtual Drives on a Cisco DNA Center Appliance

Complete the following procedure to reinitialize the virtual drives on your Cisco DNA Center appliance.

**Step 1** Log in to the appliance's Cisco IMC using the Cisco IMC IP address, user ID, and password you set in [Enable Browser Access to Cisco Integrated Management Controller](#).

**Step 2** From the top-left corner of the Cisco IMC GUI, click the **Toggle Navigation** icon ()

**Step 3** From the Cisco IMC menu, choose **Storage > Cisco 12G Modular Raid Controller**.

**Step 4** Click the **Virtual Drive Info** tab.

- Step 5** Check the check box for the first virtual drive that's listed (drive number 0), then click **Initialize**.
- Step 6** From the **Initialize Type** drop-down list, choose **Full Initialize**.
- Step 7** Click **Initialize VD**.
- Step 8** Repeat Steps 5 through 7 for the appliance's other virtual drives.
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## Install the Cisco DNA Center ISO Image

Complete the following procedure to install the Cisco DNA Center ISO image onto your appliance.

### Before you begin

Create the bootable USB drive from which you will install the Cisco DNA Center ISO image. See [Create a Bootable USB Drive](#).

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- Step 1** Connect the bootable USB drive with the Cisco DNA Center ISO image to the appliance.
- Step 2** Log in to Cisco IMC and start a KVM session.
- Step 3** Power on or power cycle the appliance:
- Choose **Power > Power On System** if the appliance is not currently running.
  - Choose **Power > Power Cycle System (cold boot)** if the appliance is already running.
- Step 4** In the resulting pop-up window, click **Yes** to acknowledge that you are about to execute a server control action.
- Step 5** When the Cisco logo appears, either press the **F6** key or choose **Macros > User Defined Macros > F6** from the KVM menu.
- The boot device selection menu appears.
- Step 6** Select your USB drive and then press **Enter**.
- Step 7** In the **GNU GRUB** bootloader window, choose **Manufacture Cisco DNA appliance** and then press **Enter**.
- Note** The bootloader automatically boots the Maglev Installer instead if you do not make a selection within 30 seconds.
- 

## Cisco DNA Center Appliance Configuration

When installation of the Cisco DNA Center ISO image completes, the installer reboots and opens the Maglev Configuration wizard's welcome screen. To configure your appliance for day-to-day use in your network, complete the steps described in one of the following chapters:

- If you are using the Maglev Configuration wizard, see [Configure the Appliance Using the Maglev Wizard](#).
- If you are using the newly available browser-based configuration wizard to configure a 44 or 56-core appliance, see [Configure the 44/56 Core Appliance Using the Browser-Based Wizard](#).

- If you are using the newly available browser-based configuration wizard to configure a 112-core appliance, see [Configure the 112 Core Appliance Using the Browser-Based Wizard](#).