



## **Cisco UCS C-Series IMC Emulator Quick Start Guide**

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# Cisco IMC Emulator

## Overview

### About Cisco IMC Emulator

The Cisco IMC Emulator application emulates the Cisco Integrated Management Controller (Cisco IMC) on select UCS C-series servers. The emulator allows users to familiarize themselves with Cisco's management software and hardware offerings, without the need for a physical server.

The Cisco IMC Emulator consists of a platform-specific Cisco IMC image and a machine emulator for BMC controller, DRAM, flash, and network.

Use the Cisco IMC Emulator to

- View the available Cisco IMC features before upgrading to a new release.
- Set up your software and test the communication with Cisco IMC without having to wait for the real hardware.

### Supported Servers

Cisco IMC Emulator is available for the following servers:

- UCS C460 M4
- UCS C220 M4
- UCS C240 M4



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**Note** Users cannot run all the server-specific emulators simultaneously on a Linux host. Only one server-specific emulator can be run on the Linux host.

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### Supported FRUs

The following FRUs are supported in the emulator:

- Front Panel FRU
- Motherboard FRU
- Power Supply 1 FRU
- Power Supply 2 FRU
- VIC FRU
- MLOM FRU

- TPM FRU

## Supported Inventories

The following inventories are currently supported in the emulator:

- CPU
- Memory
- Power Supply
- PCI Adapters
- VIC Adapters
- Storage Adapters

## Limitations

Cisco IMC Emulator has the following limitations:

- Supports only a dedicated network mode.
- Does not support the host features, as it does not emulate the host machine. For example, KVM or virtual media cannot be accessed through the emulator.
- Does not support configuration for storage or flex flash cards.
- Does not support firmware updates.

## Setting up Cisco IMC Emulator

### Prerequisites

- VMware ESXi host version 4.0 or later.
- Minimum 50 GB free hard disk space in the ESXi host.

### Deploying the OVA File in the ESXi Host using the vSphere Client

Perform the following steps to deploy the OVA file in the ESXi host using the vSphere client:

#### Procedure

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- Step 1** Launch the vSphere client from your system.
- Step 2** Login to the ESXi host, on which you want to deploy the emulator.  
The homepage appears.
- Step 3** In the **File** menu, click **Deploy OVF Template**.

- The **Deploy OVF Template** page appears.
- Step 4** Click **Source** and browse to the OVA file location.
- Step 5** Click **Next**.  
The **OVF Template Details** page appears.
- Step 6** Verify the OVF template details, and click **Next**.  
The **Name and Location** page appears.
- Step 7** Enter the name of the deployed template in the **Name** textbox, and click **Next**.  
The **Disk Format** page appears.
- Step 8** Verify the format in which you want to store the virtual disks, and click **Next**.  
The **Ready to Complete** page appears.
- Step 9** Verify the deployment settings, and click **Finish**.
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## Linux Host Credentials

This chapter provides information on the login credentials for the Linux host:

**Table 1: Linux Host Credentials**

User Name	Password
root	password
emulator	password



**Note** The auto login feature has been enabled for the root user. The emulator configuration web user interface appears when the system boots up.

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## Configuring the Linux Host Network

The Linux host supports both the DHCP and the static IP addresses. By default, the Linux host is configured to use your local network to obtain an IP address via the DHCP server. If your network does not include a DHCP server, ensure that you assign a static IP address.

Perform the following steps to configure the static IP address in the Linux host:

### Procedure

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- Step 1** Power on the deployed Linux host.
- Step 2** Click on the network configuration button, located in the right hand side of the host desktop.  
The **Network Configuration** menu appears.
- Step 3** Select the **Wired** tab.

- The **Wired** drop down menu appears.
- Step 4** Click **Wired Settings**.  
The **Wired Settings** menu appears.
- Step 5** Click **Add Profile**.  
The **Add Profile** menu appears.
- Step 6** Click **New Profile**.  
The **New Profile** menu appears.
- Step 7** In the **Network Type** menu, select **IPV4**.  
The **IPV4 New Profile** menu appears.
- Step 8** In the **Address** drop down menu, select **Manual**.
- Step 9** In the **DNS** menu, enter the DNS server IP address in the **Server** text box.
- Step 10** In the **Routes** menu, enter the following details:
- Enter the static IP address of the Linux host in the **Address** text box.
  - Enter the Netmask ID in the **Netmask** text box.
  - Enter the Gateway ID in the **Gateway** text box.
- Step 11** Click **Add**.
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## Configuring the Additional Settings

In order to test the emulator in bridge with the DHCP and the static IP method, ensure that you enable the promiscuous mode in the ESXi host.

Perform the following steps to enable the promiscuous mode in the ESXi host:

### Procedure

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- Step 1** Login to the vSphere client from your system.
- Step 2** Click on the ESXi host IP.  
The ESXi homepage appears.
- Step 3** Select the **Configuration** tab.
- Step 4** In the **Hardware** menu, select the **Networking** tab.
- Step 5** Click **Properties**.  
The **Switch Properties** page appears.
- Step 6** In the **Configuration** menu, click **VM Network**.  
The **VM Network Properties** page appears.
- Step 7** Click on the **Security** tab.
- Step 8** In the **Policy Exceptions** menu, perform the following steps:
- In the **Promiscuous Mode** drop down menu, select **Accept**.
  - In the **MAC Address Changes** drop down menu, select **Accept**.
  - In the **Forged Transmits** drop down menu, select **Accept**.
- Step 9** Click **OK**.
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## Emulator Package Location

The release package is located in /root/Desktop folder of Linux Host. The release package consists of the following files:

- Server-specific Cisco IMC Image  
Cisco IMC Emulator supports the C220 M4, C240 M4, and C460 M4 servers.
- Launch.sh—script file to start the emulator configuration Web UI  
Run this script with root privileges.
- network.sh—script file to create a TAP or a bridge network using the CLI
- UCSC-CXXX-M4-Config.ini—sensor configuration file
- Binary files  
The binary files such as FRU, SMBIOS, and DIMM SPD are extracted from the physical server.

## Guidelines For Creating a Bridge or TAP Network on the Host

To run the Cisco IMC Emulator, you must first create a bridge or TAP network on the host. See the following sections for guidelines on creating a bridge or TAP interface:

- [TAP Network Mode, on page 6](#)
- [Bridge Mode with DHCP Support, on page 6](#)
- [Bridge Mode with Static IPs, on page 7](#)

### TAP Network Mode

The Linux operating system enables users to create virtual network interfaces called the TAP devices. A TAP device is entirely virtual and managed by the kernel. User applications (for example, Cisco IMC Emulator) can interact with the TAP devices as if they were real. In the background, Linux pushes the packets into the regular networking stack as required, thus making it appear as if a real device is being used.

In a **Tap Network** mode, both the tap and emulator interfaces must be in the same IP subnet. For example: tap IP at 192.168.0.10 with netmask at 255.255.255.224; emulator IP at 192.168.0.11 with netmask at 255.255.255.224. In this mode, you can access the emulator only from the local host machine where it has been set up. You cannot access the emulator externally.

### Bridge Mode with DHCP Support

A bridge is a layer two device that connects many Ethernet networks together to form a single larger network. A basic transparent bridge passes all packets arriving on its input port to the output ports.

In the Bridge mode, a physical interface (for example, eth0) is connected to the bridge. The packets received from emulator are forwarded to the physical interface through the bridge. Likewise, the bridge forwards the packets received from the physical interface to the emulator. This enables users to access the Cisco IMC Emulator externally.

The **Bridge Mode with DHCP Support** mode must have the following interfaces:

- A tap interface for the emulator
- A physical ethernet interface for external communication, and for fetching the IP address from the DHCP server for the emulator.

Consider a scenario where a bridge interface retrieves the IP address from a DHCP server. Assume that the IP address is 10.0.0.1. Assume too that the emulator fails to retrieve this IP address from the DHCP server. The emulator then uses the default IP address, 192.168.0.10 with netmask 255.255.255.224, from the configuration file. As the subnets are different, you cannot access the emulator. In this case, you might have to set up the bridge IP manually (using the `ifconfig` command) to match the same subnet of the emulator IP.



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**Note** If you access the host machine through a remote session such as SSH or VNC, the connection may be lost for a few seconds until the bridge obtains an IP address from the DHCP server.

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### Bridge Mode with Static IPs

The **Bridge Mode with Static IPs** mode is similar to the **Bridge Mode with DHCP Support**. However, users must provide the IP address manually for the bridge and emulator in this mode.

Use this mode only when a DHCP server is not available in the user network. If you use this mode even when the DHCP server is available in your network, the emulator ignores the IP that you specified and obtains the IP from the DHCP server.



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**Note** If you access the host machine through a remote session such as SSH or VNC, the connection is completely lost until the bridge IP address is set up manually. Run the script directly on the host machine.

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## Creating a Bridge or TAP Network through the CLI

Run the **network.sh** script to create the tap or the bridge network interface on the host machine to communicate with the emulator.

### Procedure

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**Step 1** At the command prompt, navigate to the extracted release package folder.

**Step 2** From the release package folder, navigate to the **prod/cxxx-m4-emu-cimc.x.x.xxxx** folder .  
For example, typing `$ cd prod/c240-m4-emu-cimc.3.0.3s18` takes you to the C240 M4 server folder.

**Step 3** Type `$sudo ./network.sh` at the command prompt to run the **network.sh** script.

**Step 4** Configure your network mode by using any one of the following options:

- **Tap Network**
- **Bridge Mode with DHCP support**
- **Bridge Mode using Static IPs**

Use the **Remove Tap Network** option or the **Remove Bridge Network** option to remove the existing network configurations.

**Step 5** Optionally, you can set a MAC address through the **Set Mac and Serial number** option. If you do not use this option, the MAC address of the emulator is automatically set.

The MAC address is a 6-byte hexadecimal number. You can only use numbers ranging from 0 to 9 and letters from A to F. The first byte should be an even number. For example, 32-D0-56-F2-B5-12 or 00-80-C8-E3-4C-BD.

**Step 6** After configuring the network, type **Exit** to exit the script.

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## Creating a Bridge or TAP Network through the Web UI

Run the **launch.sh** script to create the tap or the bridge network interface on the host machine to communicate with the emulator.

### Procedure

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- Step 1** At the command prompt, type **./launch.sh** to run the launch.sh script.  
Run the script with root privileges.
- Step 2** Go to the Emulator Configuration page by typing the following URL in a Web browser: <http://127.0.0.1:8080/>  
The **IMC Emulator Configuration** page appears.
- Step 3** In the **IMC Emulator Configuration** page, expand the **Configuration** section and click the **Create/Edit Instance** option.
- Step 4** In the **Create/Edit Instance** page, enter a name for the emulator instance and select the UCS server model.  
Cisco IMC Emulator supports C220 M4, C240 M4, and C460 M4 servers.
- Step 5** In the **Create/Edit Instance** page, choose the network configuration option.  
Configure your network mode by using any one of the following options:
- **Tap Network**
  - **Bridge Mode with DHCP support**
  - **Bridge Mode using Static IPs**
- Note** Use the **Remove Tap Network** or the **Remove Bridge Network** option to remove the existing network configurations.
- Step 6** Optionally, you can set a MAC address through the **Set MAC Address** option. If you do not use this option, the MAC address of the emulator is automatically set.  
The MAC address is a 6-byte hexadecimal number. You can only use numbers ranging from 0 to 9 and letters from A to F. The first byte should be an even number. For example, 32-D0-56-F2-B5-12 or 00-80-C8-E3-4C-BD.
- Step 7** Click **Create** to create the bridge or tap interface.
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## Viewing the Hardware Specifications of the Supported Servers

Cisco IMC Emulator supports the C220 M4, C240 M4, and C460 M4 servers. You can view the hardware specifications (CPU, DIMM, and PSU configurations) of the supported C-Series servers.

### Procedure

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- Step 1** Go to the Emulator Configuration page by typing the following URL in a Web browser: <http://127.0.0.1:8080/>  
The **IMC Emulator Configuration** page appears.
- Step 2** In the **IMC Emulator Configuration** page, expand the **Configuration** section and click the **Templates** option.
- Step 3** In the **Templates** page, select the UCS server model.  
The hardware specifications of the selected server appear.



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## Using Cisco IMC Emulator

### Starting Cisco IMC Emulator through the CLI

#### Before You Begin

Configure the Bridge or TAP network first before performing this procedure.

#### Procedure

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- Step 1** At the command prompt, type the server-specific script file and the tap network name.  
For example, type `./UCSC-C240-m4_cimc.sh tap0` to launch the emulator instance of a C240 M4 server. Here, tap 0 is the network configured previously using the network.sh script.
- Step 2** Wait for 10 to 15 minutes for the emulator to start the BMC services. A message appears after the emulator starts successfully. BMC is configured with <IP address>. IP Emulator is launched successfully.  
In **Bridge Mode with Static IPs** and the **Tap Network** mode, the IP address is specified by the user when creating the network. In **Bridge Mode with DHCP Support**, the emulator IP is dynamic as it is fetched from the DHCP server.
- Step 3** Use the IP address to access the Web UI, CLI, and XML API of the server.
- **Web User Interface**—Enter the following information in a web browser: `https://<IP address configured for the emulator>` .
  - **XMI API Interface**—Enter the following information in a web browser: `https://<IP address configured for the emulator> /visore.html`
  - **CLI User Interface**—Enter the following in the command prompt: `ssh admin@<IP address configured for the emulator>`
- Step 4** Use the following default credentials to access the emulator:
- User name—admin
  - Password—password
- Step 5** To exit the emulator, press **Control+C** at the command prompt.
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### Starting Cisco IMC Emulator through the Web UI

#### Before You Begin

Create the Bridge or TAP interface first before performing this procedure.

## Procedure

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**Step 1** Go to the Emulator Configuration page by typing the following URL in a Web browser: `http://127.0.0.1:8080/`  
The IMC Emulator Configuration page appears.

**Step 2** In the **IMC Emulator Configuration** page, click the **Rack Servers** section.  
The following options appear:

- **Name:** The name of the emulator instance.
- **Model:** The server model type.
- **Serial:** The serial number of the emulator.
- **Status:** The current status of the emulator, whether running or stopped.
- **Connect:** The access options. You can access Web UI, XML API, and CLI interface of the emulator using the **Connect** option.
- **Edit Sensors:** The option to edit the sensor values.
- **Remove:** The option to remove the emulator instance and its associated network configuration.
- **Log:** Information about the current status of the emulator.

**Step 3** Click **Start** in the **Start/Stop EMU** column.  
Wait for the emulator to start.

**Step 4** After the emulator starts, click **Connect** and select from one of the following interface options:

- **WebUI**
- **CLI**
- **XML**

**Step 5** Use the following default credentials to access the emulator:

- User name—admin
- Password—password

**Step 6** To stop the emulator, click **Stop** in the **Start/Stop EMU** column.

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## Editing Sensor Values through the CLI

The configuration file (UCSC-CXXX-M4-Config.ini) is a part of the release package. Use the configuration file to edit the sensor values to simulate a desired behavior.

You can update the configuration file even when the emulator is running. The emulator reads the values dynamically and updates them accordingly.

The following table lists some of the configuration parameters available in the configuration file.

**Table 2: Cisco IMC Emulator Configuration File**

<b>//PSU1 configurations</b>	<ul style="list-style-type: none"><li>• PSU1_VOUT = 12</li><li>• PSU1_IOUT = 9</li><li>• PSU1_VIN = 10</li><li>• PSU1_IIN = 10</li><li>• PSU1_TEMPERATURE = 50</li></ul>
<b>//PSU2 configurations</b>	<ul style="list-style-type: none"><li>• PSU2_VOUT = 12</li><li>• PSU2_IOUT = 9</li><li>• PSU2_VIN = 11</li><li>• PSU2_IIN = 11</li><li>• PSU2_TEMPERATURE = 55</li></ul>
<b>//Temperature Sensor values</b>	<ul style="list-style-type: none"><li>• RISER1_INLET_TMP = 50</li><li>• RISER2_INLET_TMP = 65</li><li>• RISER1_OUTLET_TMP = 40</li><li>• RISER2_OUTLET_TMP = 39</li><li>• RISER1_SLOT1_TMP = 30</li></ul>

## Procedure

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- Step 1** In the release package folder, browse to the location that contains the configuration file and open the file. Alternatively, at the command prompt, type the edit command to open the configuration file. For example, typing **\$ gedit UCSC-C240-M4-Config.ini** opens the UCS C240 M4 server configuration file.
- Step 2** In the configuration file, modify the sensor values and save the file.
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## Editing Sensor Values through the Web UI

You can edit the sensor values in the configuration file to simulate a desired behavior. You can update the configuration file even when the emulator is running. The emulator reads the values dynamically and updates them accordingly.

## Procedure

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- Step 1** Go to the Emulator Configuration page by typing the following URL in a Web browser: `http://127.0.0.1:8080/`  
The IMC Emulator Configuration page appears.
- Step 2** In the **IMC Emulator Configuration** page, click the **Rack Servers** section.
- Step 3** Click **Edit** in the **Edit Sensors** column.  
The **Sensor Configuration** page appears.
- Step 4** In the **Sensor Configuration** page, edit the sensor values and click **Save**.  
To reset the sensors to default values, click **Reset to Default**.
- 

## Troubleshooting

### Problem Accessing the Emulator Web UI

**Issue:** Unable to access the emulator through the web UI.

**Solution:**

- Make sure the Linux host is set to the current date and time.
- Make sure your browser supports the TLS V1.2 protocol. For a list of browsers that support the TLS V1.2 protocol, see [https://en.wikipedia.org/wiki/Transport\\_Layer\\_Security#Web\\_browsers](https://en.wikipedia.org/wiki/Transport_Layer_Security#Web_browsers)
- If your browser version doesn't support the TLS V1.2 protocol, then change the following settings:

```
ssh admin@IP address of emulator #ssh admin@192.168.0.1
scope http
set http-redirect no
commit
```

Now use the address, `http://192.168.0.1` to launch the emulator web UI. This method establishes an unsecured connection to the emulator.

### Problem Accessing Emulator Web UI Using Firefox 45.4.0

**Issue:** Unable to access the emulator through the web UI when using Firefox 45.4.0.

**Solution:**

More than one SSL certificate entries might have been saved in the Firefox browser. Delete the SSL certificate entry from the browser cache.

To delete the SSL certificate entries, do the following:

- 1 Browse to **Settings > Preferences > Advanced > Certificates**.
- 2 In the **Certificates** tab, click **View Certificates**.
- 3 In the **Certificate Manager** dialog box, click the **Servers** tab.
- 4 In the **Servers** tab, delete the unknown server SSL certificates.
- 5 After deleting the unknown server SSL certificates, click the **Authorities** tab.

6 In the **Authorities** tab, delete the Cisco self-signed certificates.

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