



Cisco ENCS 5400-W Series Quick Start Guide

WAAS Software Version 6.4.1x

August 7, 2018

Contents

This document provides an overview of the ENCS-W 5400 Series, and describes the procedures used to install ENCS-W hardware, load software, and how to power up and configure the ENCS-W device. This document contains the following sections:

- [Cisco ENCS 5400-W Series](#)
- [ENCS 5400-W Models that Replace WAVE Devices](#)
- [Unpacking and Installing the ENCS 5400-W Device](#)
- [Powering Up and Initializing the ENCS 5400-W Device](#)
- [Configuring the ENCS 5400-W Device](#)
- [Upgrade/Downgrade Guidelines for ENCS 5400-W Devices](#)
- [Additional Cisco Documentation for the ENCS 5400-W Series](#)
- [Obtaining Documentation and Submitting a Service Request](#)

Cisco ENCS 5400-W Series

This section contains the following topics:

- [About the Cisco ENCS 5400-W Series](#)
- [vWAAS models supported on ENCS 5400-W](#)
- [Cisco NFVIS 3.7.1](#)
- [ENCS 5400-W Features and Specifications](#)



About the Cisco ENCS 5400-W Series

The Cisco Enterprise Network Compute System (ENCS) is an x86 hybrid platform for branch deployment and for hosting WAAS applications. Each model is a high-performance unit that achieves this goal by providing the infrastructure to deploy virtualized network functions while at the same time acting as a server that addresses processing, workload, and storage challenges.

vWAAS models supported on ENCS 5400-W

- ENCS 5406-W—Supports vWAAS 200 and vWAAS-750.
- ENCS 5408-W—Supports vWAAS-1300.
- ENCS 5412-W—Supports vWAAS-2500 and vWAAS-6000-R.

Cisco NFVIS 3.7.1

Cisco NFVIS 3.7.1 contains the following specifications:

- Linux distribution CentOS—Version 7.3
- Kernel version—3.10.0-514.21.1.el7.x86_64
- Libvirt version—2.0.0
- OVS version—2.5.2
- QEMU version—1.5.3



Note

ENCS 5400-W with Cisco NFVIS is designed as a simple, low-touch device for WAAS and vWAAS. Therefore, the hypervisor is hidden, and there is no need to load other VNFs onto an ENCS-W device. This is the case whether or not you use the CIMC console with an ENCS-W device.

ENCS 5400-W Features and Specifications

This section contains the following topics:

- [Table 1](#) shows ENCS CPU, memory, and disk space needed to run Cisco NFVIS.
- [Table 2](#) shows ENCS memory and disk requirements for vWAAS on ENCS with Akamai Connect, by vWAAS model.
- [Figure 1](#) shows two views of the Cisco ENCS 5400 Series hardware features. (For a more detailed view of the front panel components, see [Figure 6](#).)
- [Table 3](#) shows specifications that apply to all three ENCS 5400 series models.

Table 1 ENCS 5400-W CPU, Memory, and Disk Space Requirements for Cisco NFVIS

ENCS 5400-W Model	CPU	Memory	Disk Space
ENCS 5406-W	1	2 GB	10 GB
ENCS 5408-W	1	2 GB	10 GB
ENCS 5412-W	2	2 GB	10 GB

Table 2 Memory and Disk Requirements for vWAAS on ENCS with Akamai Connect

vWAAS model, Number of ENCS Connections	Memory	Data Disk	Akamai Cache
vWAAS-200, 200 ENCS connections	13 GB	160 GB	100 GB
vWAAS-750, 750 ENCS connections	13 GB	250 GB	250 GB
vWAAS-1300, 1300 ENCS connections	13 GB	300 GB	300 GB
vWAAS-2500, 2500 ENCS connections	28 GB	400 GB	350 GB
vWAAS-6000-R 6000 ENCS connections	28 GB	500 GB	350 GB

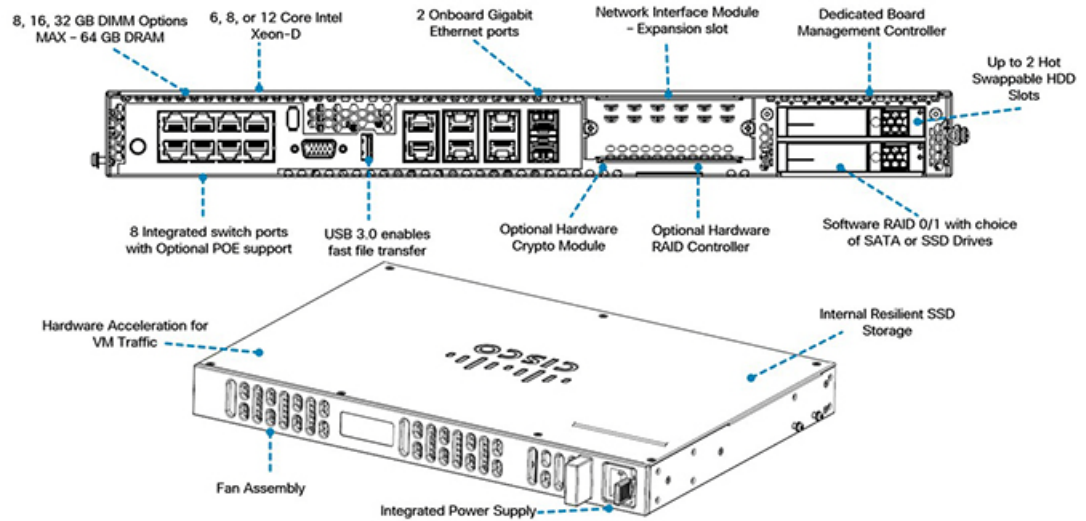

Figure 1 Cisco ENCS 5400-W Series Hardware Features

Table 3 shows ENCS 5400-W specifications.

**Note**

With the exception of the CPU capacity and the power supply unit, all other hardware features (standard, replaceable and upgradable) are common across all models.

Table 3 ENCS 5400 Series Features and Specifications

ENCS 5400 Feature/Specification	Description
vWAAS models supported	<p>One of the following configurations:</p> <ul style="list-style-type: none"> ENCS 5406-W supports vWAAS 200, vWAAS-750 ENCS 5408-W supports vWAAS-1300 ENCS 5412-W supports vWAAS-2500, vWAAS-6000-R
CPU	<p>One of the following specifications:</p> <ul style="list-style-type: none"> ENCS 5406-W: Intel Xeon Processor D-1528 (6-core, 1.9 GHz, and 9 MB cache) This model does not support a PoE power supply. ENCS 5408-W: Intel Xeon Processor D-1548 (8-core, 2.0 GHz, and 12 MB cache) This model has the option of a power supply that provides PoE power. ENCS 5412-W Intel Xeon Processor D-1557 (12-core, 1.5 GHz, and 18 MB cache) This model has the option of a power supply that provides PoE power.
BIOS	Version 2.4
Cisco NFVIS on KVM hypervisor	KVM hypervisor Version 3.10.0-327.el7.x86_64
CIMC	Version 3.2.3
Network Controller	Intel FTX710-AM2
WAN Ethernet port	Intel i350 dual port
DIMM	<p>Two DDR4 dual in-line memory module (DIMM) slots, for ENCS models with the following capacities:</p> <ul style="list-style-type: none"> ENCS 5406-W—16 GB ENCS-5408-W—16 GB ENCS-5412-W—32 GB
Gigabit Ethernet ports	Two Gigabit Ethernet ports—For each RJ45 port, there is a corresponding fiber optic port. At a given time, you can use either the RJ45 connection or the corresponding fiber optic port.
Management Controller	Ethernet management port for Cisco Integrated Management Controller (CIMC), which monitors the health of the entire system.
Storage	<ul style="list-style-type: none"> No RAID and 1 960 GB SSD RAID-1 and 2 SSDs (960 GB SSD) <p> Note If you need to add or remove RAID-1 for your system, see Adding or Removing RAID-1 for ENCS 5400-W Series. Note that the RAID-1 option is available for vWAAS for WAAS Version 6.4.1a and later.</p>
Offload Capabilities	Optional crypto module to provide offload capabilities to optimize CPU resources like VM-to-VM traffic and to maintain open software support.

For further information, see the [Cisco 5400 Enterprise Network Compute System Data Sheet](#).

ENCS 5400-W Models that Replace WAVE Devices

Cisco WAVE appliances have end-of-life (EOL) and end-of-sale dates (EOS), highlighted in the [End-of-Sale and End-of-Life Announcement for the Cisco WAVE 294, 594, 694, 7541, 7571 and 8541](#).

[Table 4](#) shows the ENCS 5400-W Series models that replace the EOS/EOL WAVE models, and the supported vWAAS models for each ENCS 5400-W model.

Table 4 ENCS 5400 Series Models that Replace WAVE Devices

EOS/EOL WAVE model	ENCS-W (WAAS Appliance) options to replace WAVE models	Supported vWAAS Models for ENCS 5400	Connection Size
WAVE-294	ENCS 5406-W	vWAAS 200	200 connections
WAVE-594-8G	ENCS 5406-W	vWAAS-750	750 connections
WAVE-594-12G	ENCS 5408-W	vWAAS-1300	1300 connections
WAVE-694-16G	ENCS 5412-W	vWAAS-2500	2500 connections
WAVE-694-24G	ENCS 5412-W	vWAAS-6000-R	6000 connections

For how to replace a WAVE device with an ENCS 5400-W device, see [Cisco vWAAS Bundled Image Upgrade for ENCS 5400 Series, with RMA Process for Cisco EOS/EOL Devices](#).



Note

If you need to add or remove RAID-1 for your system, see [Adding or Removing RAID-1 for ENCS 5400-W Series](#). Note that the RAID-1 option is available for vWAAS for WAAS Version 6.4.1a and later.

Unpacking and Installing the ENCS 5400-W Device

This section contains the following topics:

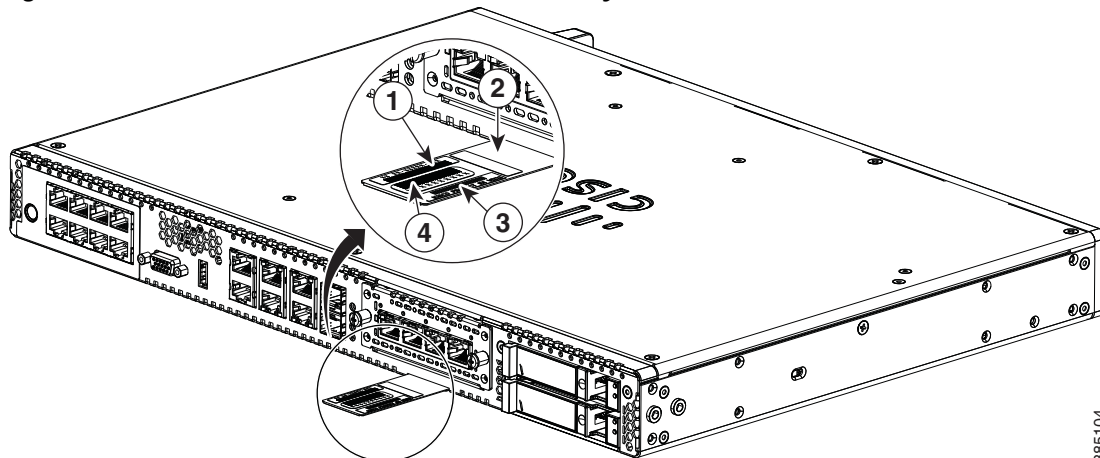
- [Unpacking the ENCS 5400-W Device](#)
- [Installing the ENCS 5400-W Device](#)

Unpacking the ENCS 5400-W Device

Guidelines for unpacking the ENCS 5400-W device:

- The device, accessory kit, publications, and any optional units may be shipped in more than one container. When you unpack the containers, check the packing list to ensure that you have received all the items on the list.
- Only unpack the product when you are ready to install it. This will help prevent accidental damage.
- As shown in [Figure 2](#), the serial number (SN), product ID (PID), version ID (VID), and Common Language Equipment Identifier (CLEI) are printed on a label on the label tray located on the server chassis or motherboard.

Figure 2 Cisco ENCS 5400-W Series Label Tray



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Installing the ENCS 5400-W Device

Before you begin:

- If it is not already installed, the DIMMs, M.2 storage module and RAID card must be installed before rack-mounting or wall-mounting the chassis.
- We recommend that you install the power supply when you have the best access to the back panel of the device; this could be before or after you mount the device.

To install the ENCS 5400-W device, follow these steps.

Step 1 You can rack-mount the chassis (Step 2) or wall-mount the chassis (Step 3).

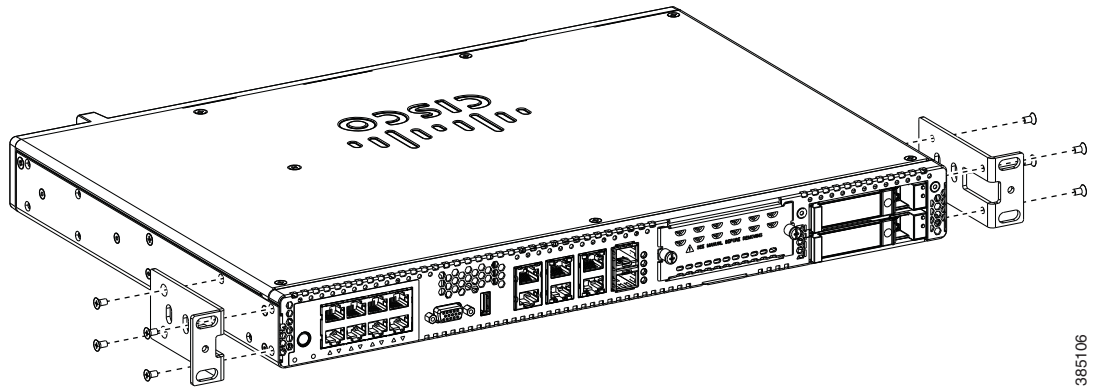
Step 2 To rack-mount the chassis:

- a. You can install the ENCS 5400-W in 19-inch (48.26-cm) racks. Use the standard brackets shipped with the router for mounting the chassis in a 19-inch EIA rack.

You can mount the device in the following ways:

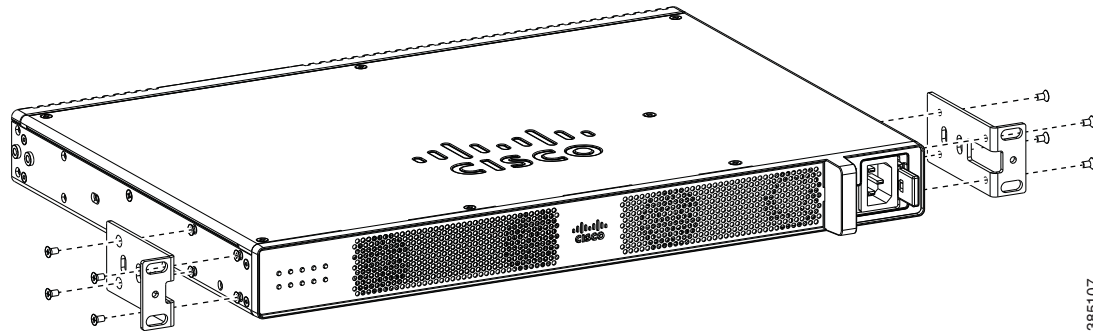
- Front mounting—Brackets attached at the front of the chassis with the front panel facing forward ([Figure 3](#)).

Figure 3 Bracket Installation for Front Mounting the ENCS 5400-W Device



- Back mounting—Brackets attached at the back of the chassis with the back panel facing forward (Figure 4).

Figure 4 Bracket Installation for Back Mounting the ENCS-5400-W Device



- Center-front mounting—Brackets attached in the center front of the chassis with the front panel facing forward.
 - Center-back mounting—Brackets attached in the center back of the chassis with the back panel facing forward.
- Attach brackets to the chassis.
 - Attach one mounting bracket to each side of the device. You will need four screws to attach each bracket to the device—you will need eight screws in total to attach both the brackets to the device.
 - Use the screws provided along with the mounting kit to attach the screws to the device.
 - Mount the device in a rack:
 - After you attach the brackets to the device, install the chassis on the rack.
 - You will need two screws to attach each bracket to the rack—you will need four screws in total to attach the device to the rack.
 - The screws for attaching the device to the rack are not provided with the kit.



Tip

The screw slots in the brackets are spaced to line up with every *second* pair of screw holes in the rack. When the correct screw holes are used, the small threaded holes in the brackets line up with unused screw holes in the rack. If the small holes do not line up with the rack holes, you must raise or lower the brackets to the next rack hole.

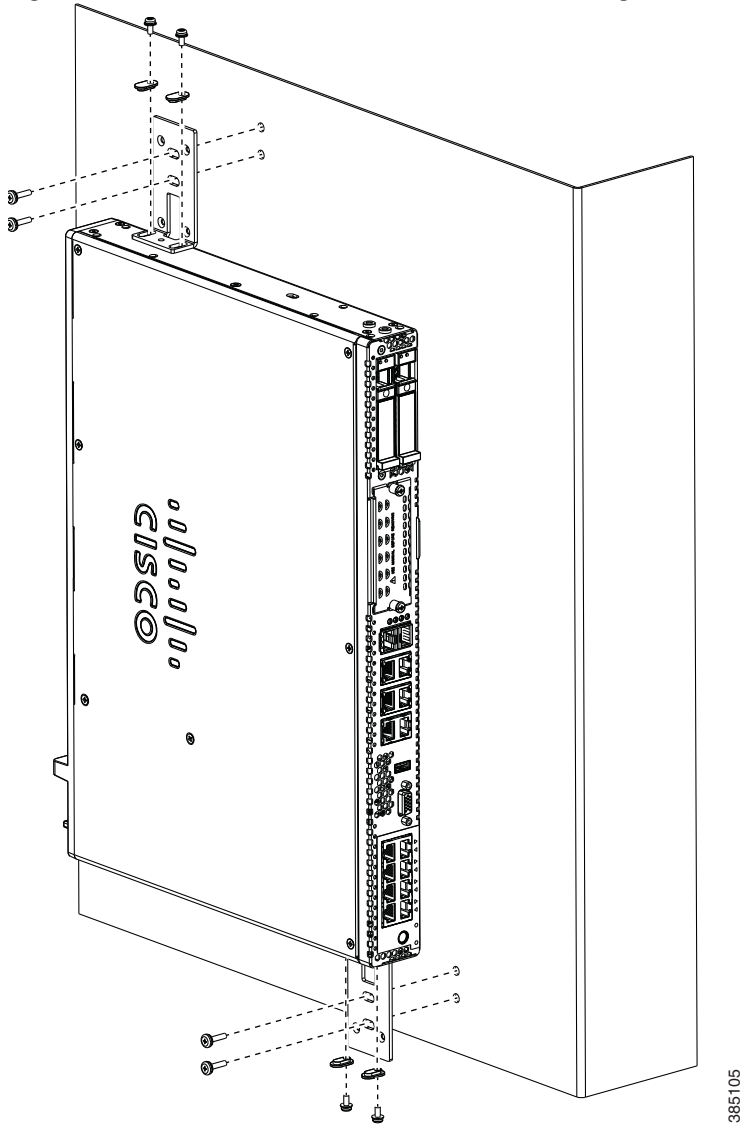
Step 3 To wall-mount the device:

- a. As shown in [Figure 5](#), attach the brackets to the device using the screws and plastic spacers provided with the mounting kit. Use two screws and two plastic spacers should be used to attach each bracket to the chassis.
- b. Fix the router to the wall using the brackets that you attached to the device. The screws for attaching the device to the wall are not provided with the kit. Depending on the type of wall (wood, brick, stone etc), use appropriate screws to fix the device to the wall.



Note Route the cables so that they do not put a strain on the connectors or mounting hardware.

Figure 5 *Bracket Installation for Wall Mounting the Cisco ENCS 5400-W*



Powering Up and Initializing the ENCS 5400-W Device

This section contains the following topics:

- [About the ENCS 5400-W Front Panel](#)
- [Powering Up the ENCS 5400-W Device](#)
- [Initializing the ENCS 5400-W Device](#)

About the ENCS 5400-W Front Panel

Figure 6 shows the ENCS 5400-W front panel and Table 5 describes each numbered component.

Figure 6 ENCS 5400-W Front Pane Detail

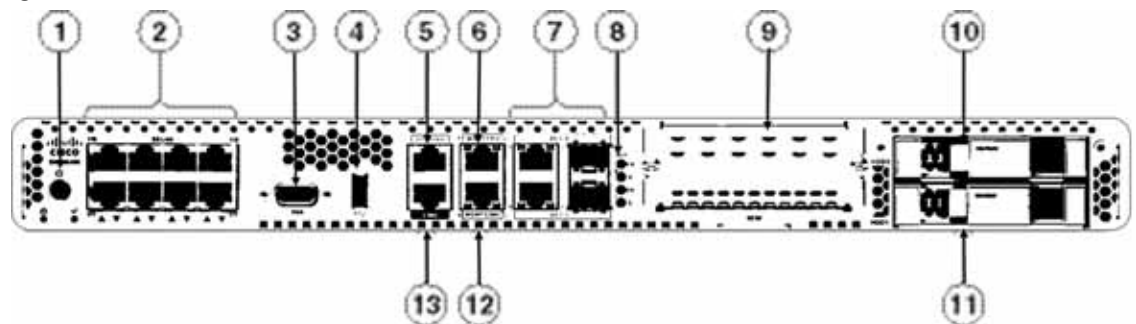


Table 5 Components Shown in Figure 6, "ENCS-W Front Panel"

#	Component	Description
1	Power on/off switch	<ul style="list-style-type: none"> • The power supply provides AC power. <ul style="list-style-type: none"> – The ENCS 5406-W supports only non-PoE (Power over Ethernet) power, therefore the LAN ports of this device cannot provide PoE. – The ENCS 5408-W and 5412-W support both PoE and non-PoE power supply options. – If you want to upgrade from a non-PoE power supply to a PoE power supply, you can do that by replacing the power supply unit. The reverse is also possible (replacing a PoE power supply with a non-POE power supply). – The power supply can provide a total of 250 watts of inline power across the 8 PoE capable ports in the system; a maximum of 30 watts of PoE power per port and 60 watts of UPoE power per port.
2	Integrated LAN ports	<ul style="list-style-type: none"> • Optional PoE support is available for ENCS 5408-W and 5412-W.

#	Component	Description
3	VGA connector	<ul style="list-style-type: none"> Connects a monitor to the device. It supports a display resolution of up to 1600 x 1200 16bpp @ 60Hz.
4	USB 3.0 port	<ul style="list-style-type: none"> To connect to a mouse, keyboard, or any other USB device. Using a USB hub, you can connect more than one USB device to this port. <p>Because this port is backward compatible, you can also use an older version of USB devices on this port.</p>
5	Serial console port for CPU	<ul style="list-style-type: none"> Provides a connection to initially configure the main system's CPU, including the NFVIS software that runs there, using a traditional serial terminal. The terminal should be configured for 9600 8-N-1.
6	Ethernet management port for CPU	<ul style="list-style-type: none"> Connects to the CPU in your device.
7	Front panel Gigabit Ethernet ports	<ul style="list-style-type: none"> A set of two dual ports. <p>For each RJ45 port, there is a corresponding fiber optic port. At a given time, you can use either the RJ45 connection or the corresponding fiber optic port.</p>
8	LEDs for front panel Gigabit Ethernet ports	<ul style="list-style-type: none"> There are four LEDs for the front panel: the first two LEDs are for the first set of ports and the last two LEDs are for the second set of ports. <p>If both RJ45 and fiber optic ports are enabled when the system boots, the fiber optic port is used and the RJ45 port is disabled.</p>
9	Network Interface Module (NIM) expansion slot	<ul style="list-style-type: none"> NIM is not used on ENCS 5400-W models (it is used on ENCS 5400 models).
10	Drive Bay 0	<ul style="list-style-type: none"> Drive bay 0
11	Drive Bay 1	<ul style="list-style-type: none"> Drive bay 1
12	Ethernet management port for CIMC	<ul style="list-style-type: none"> CIMC is the component in the device that monitors the health of the entire system.
13	Serial console port for CIMC	<ul style="list-style-type: none"> Provides a connection to initially configure the main system's CPU, including the NFVIS software that runs there, using a traditional serial terminal. The terminal should be configured for 9600 8-N-1.

Powering Up the ENCS 5400-W Device

To power up the ENCS 5400-W device, follow these steps.

-
- Step 1** Attach the power cord to the power supply unit in the ENCS 5400-W device and then attach the other end of the power cord to the grounded power outlet.
- Step 2** Wait for approximately three minutes.
- Step 3** Verify the power status of the system by looking at the system power status LED. The power status LED blinks in amber color during initial boot up and in solid amber when the system reaches the standby power mode.

Initializing the ENCS 5400-W Device

This section contains the following topics:

- [Initializing the ENCS 5400-W Device Locally](#)
- [Initializing the ENCS 5400-W Device Remotely](#)

Initializing the ENCS 5400-W Device Locally

To perform an initial setup of the ENCS 5400-W device locally, follow these steps.

-
- Step 1** Ensure that the device is powered on.
- Step 2** Connect a keyboard and a monitor to the corresponding ports on the front panel of the device.
- Step 3** When you see the prompt, you can do the following:
Press **F2** to get into the setup (BIOS) to change some settings.
Or
Press **F8** to configure the IP address of the CIMC.
- Step 4** After you have performed the required configuration, save the setup and continue to boot the device.
-

Initializing the ENCS 5400-W Device Remotely

To perform an initial setup of the ENCS 5400-W device remotely, follow these steps.

-
- Step 1** Plug in your terminal server to the Serial CIMC port. Refer to the front of the ENCS 5400-W chassis for this port.
- Step 2** Telnet into the console and perform the necessary configuration using corresponding commands.
You can also configure the IP address for the Ethernet CIMC port.
Consider the following guidelines about using the CIMC CLI command-line interface:
- You can launch the CIMC CLI and manage the server over the network by SSH or Telnet. By default, Telnet access is disabled.
 - A user of the CLI will be one of three roles: admin, user (can control, cannot configure), and read-only.
 - The CLI is organized into a hierarchy of command modes; higher-level modes branch into lower-level modes (such as **bios** mode branches into **advanced**, **main**, or **server-management**).
 - EXEC mode is the highest-level mode.
 - Use the **scope** command to move from higher-level modes to modes in the next lower level.
 - Use the **exit** command to move up one level in the mode hierarchy.
 - Use the **top** command to return to EXEC mode from any level.
-

Configuring the ENCS 5400-W Device

This section contains the following topics:

- [Adding or Removing RAID-1 for ENCS 5400-W Series](#)
- [CLI Commands Used with ENCS 5400-W](#)

Before You Begin

- Verify that the specified ENCS 5400 Series chassis (ENCS 5406-W, 5408-W, or 5412-W) is already installed and powered up. For information on how to install the an ENCS 5400 Series device, see the *Cisco 5400 Enterprise Network Compute System Hardware Installation Guide*.
- If you need to add or remove RAID-1 for your system, see [Adding or Removing RAID-1 for ENCS 5400-W Series](#). Note that the RAID-1 option is available for vWAAS for WAAS Version 6.4.1a and later.

Adding or Removing RAID-1 for ENCS 5400-W Series



Note

The RAID-1 option is available for vWAAS for WAAS Version 6.4.1a and later.



Note

Do not swap or replace a drive used by another ENCS system without reformatting it beforehand.

This section contains the following topics:

- [Migrating Equipment from No RAID and 1 SSD to RAID-1 and 2 SSDs](#)
- [Migrating Equipment from RAID-1 and 2 SSDs to No RAID and 1 SSD](#)



Note

For further information on RAID and the ENCS 5400 Series, see the *Cisco 5400 Enterprise Network Compute System Hardware Installation Guide*.

Migrating Equipment from No RAID and 1 SSD to RAID-1 and 2 SSDs

This section contains two topics:

- [Before You Begin](#)
- [Procedure for Creating the Virtual Disk](#)

Before You Begin



Note

The RAID-1 option is available for vWAAS for WAAS Version 6.4.1a and later.

- Verify that the supported RAID card has been inserted into the ENCS device.
- Verify that each slot has an SSD inserted; the SSD is used to perform RAID-1 configuration.
- Before creating the virtual disk, both drives must be in **Unconfigured Good** state. If drive is in other status, use the CIMC Web GUI or CLI and do the following:

If disk is in JBOD state:

- a. Navigate to **Storage** tab > **Physical Drive Info** tab.
- b. In the Actions area, choose **Set State as Unconfigured Good**.
- c. Confirm that disk is in Unconfigured Good state.

If disk is in Foreign Config state:

- a. Navigate to **Storage** tab > **Controller Info** tab.
- b. In the Actions area, choose **Clear Foreign Config**.
- c. In the Actions area, choose **Unconfigured Good**.
- d. Confirm that disk is in Unconfigured Good state.

Procedure for Creating the Virtual Disk

To create the virtual disk, follow these steps:

-
- Step 1** Log in to the CIMC console.
- Step 2** In the CIMC console left pane, click the **Storage** tab.
- Step 3** In the CIMC console middle pane, click the **Controller Info** tab.
- Step 4** In the Action area, click **Create Virtual Drive from Unused Physical Drives**.
The Create Virtual Drive from Unused Physical Drives Wait dialog box is displayed.
- Step 5** In the Create Virtual Drive from Unused Physical Drives dialog box, choose the following:
- a. At the RAID Level drop-down box, choose **1**.
 - b. In the Create Drive Groups area:
Select physical drives for your system from the Physical Drives pane and click >> to add these to the Drive Groups pane.
 - c. In the Virtual Drive Properties area:
 - The Virtual Drive Name field displays the automatically assigned name.
 - At the Strip Size drop-down list, select the strip size (default is 64k).
 - At the Write Policy drop-down list, select the Write policy (default is Write Through).
 - At the Access Policy drop-down list, select the Access policy (default is Read Write).
 - At the Read Policy drop-down list, select the Read policy (default is No Read Ahead).
 - At the Cache Policy drop-down list, select the Cache policy (default is Direct IO).
 - At the Disk Cache Policy drop-down list, select the Disk Cache policy (default is Unchanged).
 - The value for the Size drop-down list automatically filled.
- Step 6** Click **Create Virtual Drive**. Use the boot order shown in [Figure 7](#).



Note Because the disk will be part of RAID-1, to migrate from no RAID to RAID-1, you must perform a new image installation.

Figure 7 Create Virtual Drive Boot Order



Migrating Equipment from RAID-1 and 2 SSDs to No RAID and 1 SSD



Note

The RAID-1 option is available for vWAAS for WAAS Version 6.4.1a and later.

Before You Begin

- Verify that the RAID card has been removed from the ENCS, and that the SSD is in Slot 1 alone.
- You must wait for the disk to be completely shut down before you physically remove the disk from the WAE. When the RAID removal process is complete, WAAS generates a disk failure alarm and trap. In addition, a syslog error message is logged.
- If the removal event occurs while the RAID array is in the rebuild process, the RAID removal process may take up to 1 minute to complete. The duration of this process depends on the size of the disk.

If you administratively shut down the disk during the RAID rebuild process, a RAID rebuild abort alarm is generated instead.

To remove a RAID-1 disk, follow these steps:

Step 1 Remove the RAID card. Verify that the device is completely shut down before you remove the RAID card from the device.

Step 2 Replace the RAID card with one disk in Slot 1 alone.



Note

After removing the RAID card and replacing it with one disk on Slot 1 alone, you must perform a new image installation.

Step 3 When the RAID removal process is complete, WAAS generates a disk failure alarm and trap. In addition, a syslog error message is logged.



Note We recommend that you disable the **disk error-handling reload** option if it is enabled because it is not necessary to power down the system to remove a disk.

Step 4 After migration, verify that boot order is as shown in [Figure 8](#).

Figure 8 Migration Equipment Configure Boot Order




CLI Commands Used with ENCS 5400-W

[Table 6](#) shows the CLI commands used to display information about vWAAS on ENCS.

For an overview of CIMC CLI commands, see [Initializing the ENCS 5400-W Device Remotely](#).

Table 6 CLI Commands Used with vWAAS with NFVIS on ENCS

Mode	Command	Description
EXEC	copy sysreport disk	The ENCS logs are part of the sysreport generation for debugging.
	reload	Halts the operation and performs a cold restart of the VM.
	show hardware	Displays the following information for the specified device: <ul style="list-style-type: none"> • Hardware Information—Manufacturer, PID, serial number, hardware version, CPU information, Memory information, and disk size. • System Information—UUID, NFVIS version, compile time, kernel version, Qemu version, LibVirt version, and OVS version.
	show inventory	Displays system inventory information, including a description of the device, and the device’s PID, chassis or slot number, version number, and serial number.
	show version	Displays the version of the OE-ENCS device, as well as device ID, system restart time, system restart reason, and amount of time system has been up.
	shutdown	Powers down the ENCS host/server.
global config	interface virtual	<p>The internal interface is used for communication between the NFVIS host and the WAAS guest. The IP address associated with this interface (virtual 0/0) is assigned automatically by NFVIS while booting up, and cannot be modified.</p> <p> Note The interface virtual slot/port command cannot be used to configure ENCS internal interface.</p>

Upgrade/Downgrade Guidelines for ENCS 5400-W Devices

Consider the following for upgrading or downgrading a WAAS device on ENCS:

- You can use the WAAS Central Manager or the CLI to upgrade a WAAS device on ENCS to WAAS Version 6.4.1.
- You can use the Central Manager to upgrade from the device level and the device group level. To use the Central Manager to upgrade a WAAS device or vWAAS on ENCS:
 1. Telnet to the vWAAS device.
 2. Update the Central Manager IP address.
 3. Login to the Central Manager.
- You cannot downgrade a WAAS device on ENCS to a version earlier than WAAS Version 6.4.1.

If you try to downgrade a WAAS device on ENCS to a version earlier than WAAS Version 6.4.1, the WAAS Central Manager displays the following warning message:

Device Group has unsupported devices *ENCS-DeviceName* to the selected version. The image installation will not be applied on such devices.

Do you still want to proceed with the downgrade?

- The Central Manager supports upgrade and downgrade of all *applicable* device types in a device group.

For example, if you are downgrading a device group that has a physical WAE, a virtual WAE, and an ENCS platform to a version earlier than WAAS Version 6.4.1, the Central Manager will initiate the downgrade process only for the physical and virtual WAEs, but not for the ENCS platform.

Additional Cisco Documentation for the ENCS 5400-W Series

Table 7 provides additional Cisco documentation for topics included in this document.

Table 7 Additional Cisco Documentation for ENCS 5400-W Devices

Topic	Documents
Cisco ENCS 5400 Series	<ul style="list-style-type: none"> • Cisco 5400 Enterprise Network Compute System Data Sheet
Installing an ENCS 5400 Series device	<ul style="list-style-type: none"> • Cisco 5400 Enterprise Network Compute System Hardware Installation Guide.
Cisco WAVE appliances: End-of-life (EOL) and end-of-sale (EOS) dates.	<ul style="list-style-type: none"> • End-of-Sale and End-of-Life Announcement for the Cisco WAVE 294, 594, 694, 7541, 7571 and 8541
Cisco Enterprise NFV and Cisco NFVIS	<ul style="list-style-type: none"> • Cisco Enterprise Network Functions Virtualization Infrastructure Software Configuration Guide • Cisco Enterprise Network Functions Virtualization (NFV) Infrastructure Software Data Sheet. • Cisco Intelligent WAN - An SD-WAN Solution
WAAS	<ul style="list-style-type: none"> • Cisco Wide Area Application Services Configuration Guide • Cisco Wide Area Application Services Command Reference
vWAAS	<ul style="list-style-type: none"> • Cisco Virtual Wide Area Application Services Installation and Configuration Guide
vWAAS in NFVIS	<ul style="list-style-type: none"> • Cisco Virtual Wide Area Application Services Installation and Configuration Guide.

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, submitting a service request, and gathering additional information, see the monthly *What's New in Cisco Product Documentation*, which also lists all new and revised Cisco technical documentation, at:

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