



Cisco vWAAS Bundled Image Upgrade for ENCS 5400-W Series, with RMA Process for Cisco EOS/EOL WAVE Devices

July 27, 2018

Contents

This document contains the following sections:

- [RMA Process for Cisco WAVE Devices](#)
- [Cisco ENCS 5400 Series](#)
- [vWAAS Bundled Image Upgrade on ENCS 5400-W Series](#)
- [Additional Cisco Documentation for ENCS 5400 Series, WAAS, vWAAS, and Enterprise NFVIS](#)

RMA Process for Cisco WAVE Devices

This section contains the following topics:

- [ENCS 5400-W Series Replacements for WAVE Devices](#)
- [The RMA Process](#)

ENCS 5400-W Series Replacements for 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 1](#) shows the ENCS 5400 Series models that replace the EOS/EOL WAVE models, and the supported vWAAS models for each ENCS 5400 model.



Table 1 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 NCS 5400-W Series	Connection Size
WAVE-294	ENCS 5406-W or ENCS 5406-K9	vWAAS 200	200 connections
WAVE-594-8G	ENCS 5406-W or ENCS 5406-K9	vWAAS-750	750 connections
WAVE-594-12G	ENCS-5408-W or ENCS 5408-K9	vWAAS-1300	1300 connections
WAVE-694-16G	ENCS 5412-W or ENCS 5412-K9	vWAAS-2500	2500 connections
WAVE-694-24G	ENCS 5412-W or ENCS 5412-K9	vWAAS-6000-R	6000 connections

**Caution**

vWAAS is designed to run in appliance mode or as a Virtualized Network Function (VNF) in three Cisco ENCS 5400-W series models (ENCS 5406-W, ENCS 5408-W, and ENCS 5412-W) and three Cisco PIDs (ENCS 5406-K9, ENCS 5408-K9, and ENCS 5412-K9).

For guaranteed performance, the ENCS 5400 Series, UCS-C Series, UCS-E Series, and ISR configurations listed in the WAAS Sizing Guides and specifically noted in WAAS and vWAAS user guides and WAAS Release Notes are the only devices we recommend for use with vWAAS. Although vWAAS models may be able to operate with other Cisco or third-party hardware, successful performance and scale for those configurations is not guaranteed.

- For information on how to replace a WAVE device with an ENCS model, see [The RMA Process](#).
- For information on how to install vWAAS on ENCS 5400 Series, see [vWAAS Bundled Image Upgrade on ENCS 5400-W Series](#).

**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.

The RMA Process

Use the Cisco Product Returns and Replacement Process (RMA) to return your WAVE devices, follow these steps:

- Step 1** With your web browser, navigate to the [Cisco Product Returns & Replacements \(RMA\)](#), shown in [Figure 1](#).

Figure 1 Product Returns & Replacement (RMA) Page

Step 2 From the Search drop-down list, choose one of the following search options:

- Company Name
- Order Number
- Product Name
- Serial Number (Customer provided)
- Service Request Number

Step 3 In the Search field, enter the associated component name or number.



Note You must return devices by individual components of the device, not by the entire device.

Step 4 The default search time range is the past thirty days. To specify a different time range, click **Advanced Options**, which displays a screen to specify a different start date and end date.

Step 5 Click the search icon or press **Enter**.

- The Draft Orders area will display a listing of search results by RMA number, product name, and status (such as “Unsubmitted Draft, Your order is not complete”).
- The Recent Orders area will display a listing of each product with an RMA number, customer name, product name, and status (such as “In Transit, Arrives Mar 23 before 20:00”)

Step 6 If you need to review product specifications before you place your order, click **Look Up Products** in the Product Information area at the right side of the page.

Cisco ENCS 5400 Series

This section contains the following topics:

- [About the Cisco ENCS 5400 Series](#)
- [ENCS 5400 Series Hardware Features and Specifications](#)

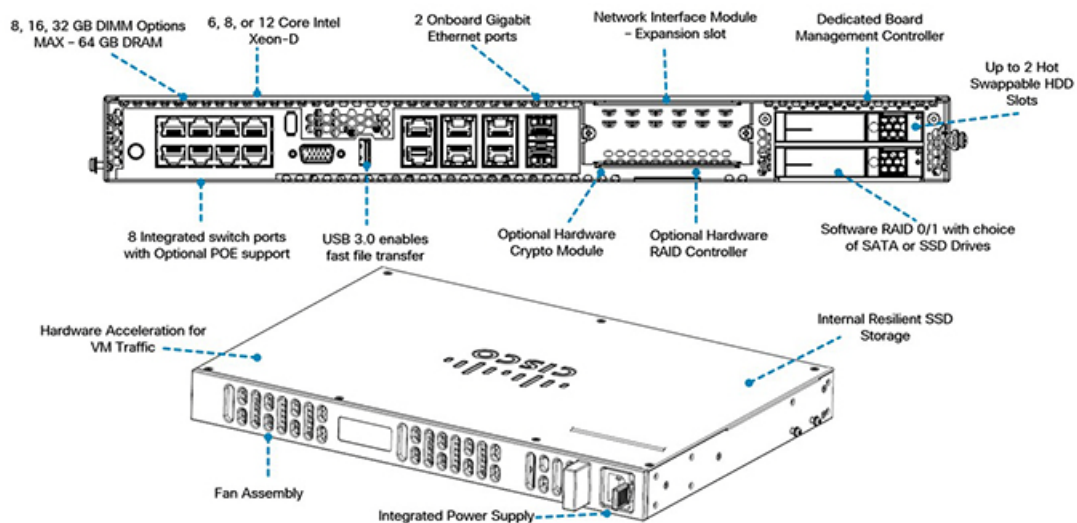
About the Cisco ENCS 5400 Series

The Cisco Enterprise Network Compute System (ENCS) 5400 Series is designed for the Cisco Enterprise Network Functions Virtualization (NFV) solution.

The ENCS 5400 Series—ENCS-5406/K9, 5408/K9, and 5412/K9—is an x86 hybrid platform for branch deployment and for hosting WAAS applications. This high-performance unit 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. [Figure 2](#) shows two views of the Cisco ENCS 5400 Series hardware features.

For more information on the Cisco ENCS 5400 series, see the [Cisco 5400 Enterprise Network Compute System Data Sheet](#).


Figure 2 Cisco ENCS 5400 Series Hardware Features



ENCS 5400 Series Hardware Features and Specifications

[Table 2](#) shows specifications that apply to all three ENCS 5400 series models. For views of the ENCS 5400 Series models, and further information, see the [Cisco 5400 Enterprise Network Compute System Data Sheet](#).

Table 2 ENCS 5400 Series Features and Specifications

ENCS 5400 Feature/Specification	Description
vWAAS models supported	One of the following configurations: <ul style="list-style-type: none"> ENCS-5406/K9 supports vWAAS 200, vWAAS-750 ENCS-5408/K9 supports vWAAS-1300 ENCS-5412/K9 supports vWAAS-2500, vWAAS-6000-R
CPU	One of the following specifications: <ul style="list-style-type: none"> ENCS-5406/K9: Intel Xeon Processor D-1528 (6-core, 1.9 GHz, and 9 MB cache) ENCS-5408/K9: Intel Xeon Processor D-1548 (8-core, 2.0 GHz, and 12 MB cache) ENCS-5412/K9: Intel Xeon Processor D-1557 (12-core, 1.5 GHz, and 18 MB cache)
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	Two DDR4 dual in-line memory module (DIMM) slots, for ENCS models with the following capacities: <ul style="list-style-type: none"> ENCS 5406/K9—16 GB ENCS-5408/K9—16 GB ENCS-5412/K9—32 GB <p>The memory module in each of the slots can be upgraded to a maximum of 32 GB, so that you can have a maximum capacity of 64 GB DIMM.</p>
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.

vWAAS Bundled Image Upgrade on ENCS 5400-W Series

This section contains the following topics:

- [vWAAS and Cisco Enterprise NFVIS](#)
- [vWAAS Bundled Image Upgrade Procedure](#)
- [Adding or Removing RAID-1 for ENCS 5400-W Series](#)
- [CLI Commands Used with vWAAS with NFVIS on ENCS](#)
- [Upgrade/Downgrade Guidelines for WAAS Devices on ENCS](#)

vWAAS and Cisco Enterprise NFVIS

This section provides an overview of vWAAS with Network Functions Virtualization Infrastructure Software (NFVIS) for Cisco Enterprise NFV:

- **Cisco Enterprise NFVIS** is a Linux-based software hosting layer with embedded KVM hypervisor with CentOS Version 7.x.
 - For more information on Cisco NFVIS, see [Cisco Enterprise Network Functions Virtualization Infrastructure Software Configuration Guide](#) and [Cisco Enterprise Network Functions Virtualization \(NFV\) Infrastructure Software Data Sheet](#).
- **vWAAS with NFVIS** enables vWAAS to run as a standalone virtual machine (VM) on the ENCS 5400 Series platform, to provide WAN application optimization, and, optionally, application optimization with Akamai Connect.
- **vWAAS with NFVIS on ENCS** is part of Cisco Intelligent WAN (IWAN)—a suite of components that brings together WAN optimization, performance routing, and security levels of leased lines and MPLS VPN services to the Internet.
 - For more information on vWAAS with NFVIS, see the [Cisco Virtual Wide Area Application Services Installation and Configuration Guide](#).
 - For more information on Cisco NFVIS and Cisco NFV, see the [Cisco Intelligent WAN - An SD-WAN Solution](#).
- NFVIS components and versions:

[Table 3](#) shows Cisco Enterprise NFVIS specifications used with vWAAS on the Cisco ENCS 5400 Series.

Table 3 *Cisco Enterprise NFVIS Components and Specifications*

Cisco NFVIS Component	Version Used with Cisco NFVIS 3.7.1
Linux distribution CentOS	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

- ENCS system requirements for vWAAS with NFVIS:
[Table 4](#) shows Cisco Enterprise NFVIS system requirements.

Table 4 Cisco Enterprise NFVIS System Requirements

System Component	ENCS-5406/K9	ENCS-5408/K9	ENCS-5412/K9
CPU	1	1	2
Memory	2 GB	2 GB	2 GB
Disk Space	10 GB	10 GB	10 GB

- ENCS system requirements for vWAAS with Akamai Connect

[Table 5](#) shows memory and disk requirements for vWAAS on ENCS with Akamai Connect, by vWAAS model.

Table 5 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

For more information on vWAAS with NFVIS, or vWAAS with other hypervisors, see the [Cisco Virtual Wide Area Application Services Installation and Configuration Guide](#).

For more information on Cisco NFVIS see the [Cisco Enterprise Network Functions Virtualization \(NFV\) Infrastructure Software Data Sheet](#).

For more information on vWAAS with NFVIS, see chapter in the

vWAAS Bundled Image Upgrade Procedure

Before You Begin

- Verify that the specified ENCS 5400 Series chassis (ENCS-5406/K9, 5408/K9, or 5412/K9) 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.

To install vWAAS with NFVIS on an ENCS 5400 Series device on your WAAS system, follow these steps:

- Step 1** Download the WAAS Appliance bundled image (an ISO file that contains the NFVIS 3.7.1 image and WAAS 6.4.1 image) from the [Cisco Software Download page](#) and copy it on your laptop.
- Step 2** Connect your laptop's Ethernet port to the ENCS device's Cisco Integrated Management Controller (CIMC) port.
- Step 3** Configure your laptop with a static IP address; for example, 192.168.1.3 and 255.255.255.0.



Note By default, the IP address on the ENCS device's CIMC port is configured as 192.168.1.2.

- Step 4** Open your web browser and enter **https://192.168.1.2**.
The CIMC console login page appears ([Figure 3](#)).

Figure 3 Sample CIMC Login Page



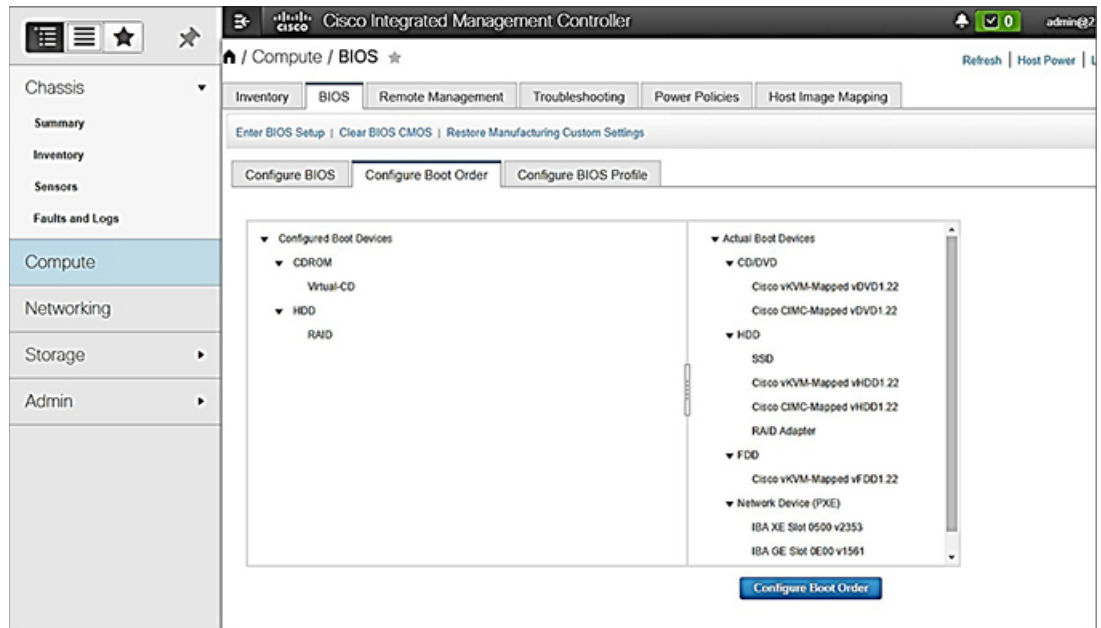
- Step 5** Log in with your user name and password.
Default user name is **admin**.
Default password is **password**.
- Step 6** Click **Login**.



Note The Change Password dialog box appears the first time, only, that you log into the CIMC console. Change the password as needed and click **Save**.

- Step 7** The CIMC Home page is displayed.
- Step 8** Navigate to **Home > Compute > BIOS > Configure Boot Order** ([Figure 4](#)).

Figure 4 *Configure Boot Order Pane*



The Configure Boot Order dialog box appears (Figure 5).

Figure 5 *Configure Boot Order Dialog Box*



- Step 9** At the Device Types listing, select **CD/DVD** as **Cisco vKVM-Mapped vDVD1.22**.
- Step 10** At the Device Type listing, select **HDD** as **HDD/Slot**.
Click **Save Changes**.
- Step 11** Using the **Up** and **Down** options, set the boot order sequence.
- Step 12** **CD/DVD Cisco vKVM-Mapped vDVD1.22** must be the first list in the boot order.
- Step 13** To complete the boot order setup, click **Apply**.
- Step 14** Launch the KVM console. You can launch the KVM console from CIMC Home page or the Remote Management area.

Step 15 *At the KVM console:*

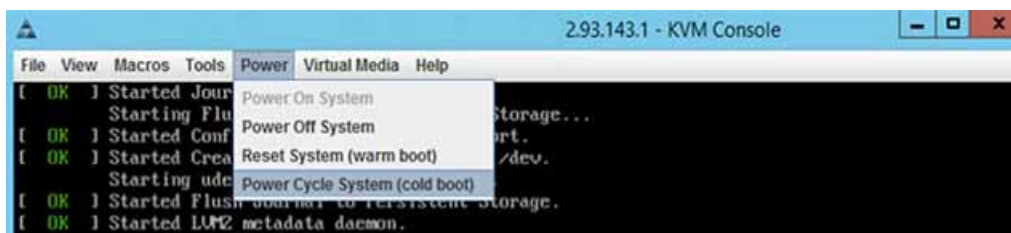
After the KVM console is initialized, map the vWAAS bundled image through the **Server > Remote Presence > Virtual Media** tab on the KVM console (Figure 6).

Figure 6 *KVM Console Virtual Media Tab*



Step 16 To load the mapped image, at the KVM Console Power tab, use the **Power Cycle System [cold boot]** option to power off and then power on the device (Figure 7).

Figure 7 *KVM Console Power Tab*



Step 17 Use SSH to connect to CIMC default IP (192.168.1.2).

Step 18 *At your ENCS 5400 device:*

Enable and connect to the SOL connection by using the following commands:

```
ENCS5412-deviceID# scope sol
ENCS5412-deviceID# set enabled yes
ENCS5412-deviceID# commit
ENCS5412-deviceID# connected host
CISCO Serial over LAN:
Press Ctrl+x to Exit the session
```

Step 19 After the installation is successful, the ENCS device reboots.

```
[ OK ] Unmounted /mnt/sysimage/dev.
[ OK ] Unmounted /mnt/sysimage/sys.
Unmounting /mnt/sysimage...
[ OK ] Unmounted /mnt/sysimage.
[ OK ] Reached target Unmount All Filesystems.
[ OK ] Stopped target Local File Systems (Pre).
[ OK ] Stopped Create Static Device Nodes in /dev.
Stopping Create Static Device Nodes in /dev...
[ OK ] Stopped Remount Root and Kernel File Systems.
Stopping Remount Root and Kernel File Systems...
[ OK ] Stopped Collect Read-Ahead Data.
Stopping Collect Read-Ahead Data...
Stopping Monitoring of LVM2 mirrors...
dmeventd or progress polling...
[ OK ] Stopped Monitoring of LVM2 mirrors,...
ng dmeventd or progress polling.
Stopping LVM2 metadata daemon...
[ OK ] Stopped LVM2 metadata daemon.
[ OK ] Started Restore /rdracut Warning: Killing all remaining processes
```

Rebooting.

[*deviceID*] Restarting system.

Step 20 The ENCS device boots up and displays options to install vWAAS. Depending on your ENCS model, one of the following choices is displayed:

- For ENCS-5406/K9—vWAAS 200 or vWAAS-750
- For ENCS-5408/K9—vWAAS-1300
- For ENCS-5412/K9—vWAAS-2500 or vWAAS-6000-R

Step 21 Example:

In the following example, a vWAAS-6000-R is selected for an ENCS-5412:

```
vWAAS Model
1) vWAAS-2500
2) vWAAS-6000-R
3) Quit
Please enter your choice: 2

nfvis# show running-config | begin deployments
deployments deployment waasUnifiedImage
vm_group waasUnifiedImage
image waasUnifiedImage
vWAAS-6000R
bootup_time 6000
recovery_wait_time 0
recovery_policy action_on_recovery REBOOT_ONLY
interfaces interface 0
network int-mgmt-net
!
interfaces interface 1
network GE0-0-SRIOV-1
!
interfaces interface 2
network GE0-1-SRIOV-1
!
```

Table 6 shows installation times by vWAAS model/number of connections:

Table 6 *Installation Time by vWAAS Model/Number of Connections*

vWAAS Model	Number of connections	NFVIS Installation Time	WAAS Installation Time	Total Installation Time
vWAAS-200	200 connections	60 minutes	15 minutes	75 minutes
vWAAS-750	750 connections	60 minutes	24 minutes	84 minutes
vWAAS-1300	1300 connections	55 minutes	28 minutes	83 minutes
vWAAS-2500	2500 connections	67 minutes	34 minutes	101 minutes
vWAAS-6000-R	6000 connections	66 minutes	38 minutes	104 minutes

Step 22 After installation is complete, the Cisco WAAS login prompt appears.

Step 23 You can verify the installation using the System API or by viewing the system information from the Cisco Enterprise NFVIS portal.

Using the internal interface, the vWAAS can communicate directly with the NFVIS manager using the Representative State Transfer (REST) API. 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.

For more information on the REST API, see the [Cisco APIC REST API Configuration Guide](#).

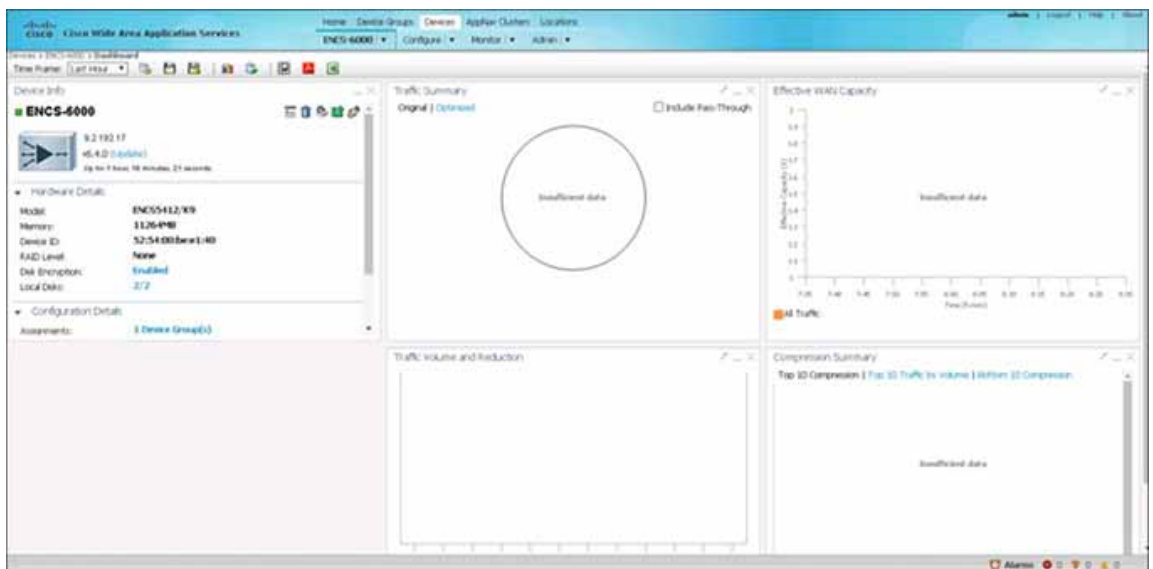
- Step 24** The new OE-ENCS device will be displayed in the WAAS Central Manager **Devices > All Devices** listing table ([Figure 8](#)).

Figure 8 *New OE-ENCS Device Displayed in WAAS CM All Devices Page*

Device Name	Serial	IP Address	Management Status	Device Status	Location	Software Version	Device Type	Max Commitment	License Status	Normal Cost
SR-CSR1000V	Application Controller	9.2.192.1	Online	OK	SR-CSR1000V-location	15.2C1YSD/3.8.2	osso (CSR1000V) VME	N/A	Permanent	Not Supported
SR-vWAAS	Application Accelerator	9.2.192.19	Online	OK	SR-vWAAS-location	6.4.0	OE-vWAAS-ESX	12000	Enterprise	Not Active
DC-vWAAS	Application Accelerator	9.2.192.19	Online	OK	DC-vWAAS-location	6.4.0-mpc	OE-vWAAS-ESX	150	Enterprise	Not Active
ENCS-6000	Application Accelerator	9.2.192.17	Online	OK	ENCS-6000-location	6.4.0	OE-ENCS	6000	Enterprise	Not Active
vDM	CM (Primary)	9.2.192.16	Online	OK		6.4.0-mpc	OE-vWAAS-ESX	N/A	Enterprise	Not Supported

- Step 25** You can view detailed information on the new OE-ENCS device by navigating to **Devices > DeviceName > Dashboard** ([Figure 9](#)).

Figure 9 *ENCS Device Dashboard*



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:

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

If disk is in Foreign Config state:

- Navigate to **Storage** tab > **Controller Info** tab.
- In the Actions area, choose **Clear Foreign Config**.
- In the Actions area, choose **Unconfigured Good**.
- 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 10](#).



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 as described in [vWAAS Bundled Image Upgrade on ENCS 5400-W Series](#).

Figure 10 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 as described in [vWAAS Bundled Image Upgrade on ENCS 5400-W Series](#).

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 11](#).


Figure 11 Migration Equipment Configure Boot Order



CLI Commands Used with vWAAS with NFVIS on ENCS

Table 7 shows the CLI commands used to display information about vWAAS on ENCS.

Table 7 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	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> Note The interface virtual slot/port command cannot be used to configure ENCS internal interface.</p>

Upgrade/Downgrade Guidelines for WAAS Devices on ENCS

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 ENCS 5400 Series, WAAS, vWAAS, and Enterprise NFVIS

Table 8 provides additional Cisco documentation for topics included in this document:

Table 8 Additional Cisco Documentation

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

Topic	Documents
vWAAS	<ul style="list-style-type: none"> • <i>Cisco Virtual Wide Area Application Services Installation and Configuration Guide</i>
vWAAS in NFIVS	<ul style="list-style-type: none"> • <i>Cisco Virtual Wide Area Application Services Installation and Configuration Guide.</i>

Cisco WAAS Documentation Set

In addition to this document, the WAAS documentation set includes the following publications:

- *Release Note for Cisco Wide Area Application Services*
- *Cisco Wide Area Application Services Configuration Guide*
- *Cisco Wide Area Application Services Command Reference*
- *Cisco Virtual Wide Area Application Services Configuration Guide*
- *Cisco Wide Area Application Services API Reference*
- *Cisco Wide Area Application Services Monitoring 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:

<http://www.cisco.com/en/US/docs/general/whatsnew/whatsnew.html>

Subscribe to the *What's New in Cisco Product Documentation* as a Really Simple Syndication (RSS) feed and set content to be delivered directly to your desktop using a reader application. The RSS feeds are a free service and Cisco currently supports RSS Version 2.0.

This document is to be used in conjunction with the documents listed in the section.

Cisco and the Cisco logo are trademarks or registered trademarks of Cisco and/or its affiliates in the U.S. and other countries. To view a list of Cisco trademarks, go to this URL: www.cisco.com/go/trademarks. Third-party trademarks mentioned are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (1721R)

© 2018 Cisco Systems, Inc. All rights reserved.