



Release Notes for the Cisco IE 2000U and Cisco IOS Release 15.0(2)EH

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Cisco IOS Release 15.0(2)EH runs on the Cisco Industrial Ethernet 2000U switch.

These release notes include important information about Cisco IOS Release 15.0(2)EH and any limitations, restrictions, and caveats that apply to the release. Verify that these release notes are correct for your switch:

- If you are installing a new switch, see the Cisco IOS release label on the rear panel of your switch.
- If your switch is on, use the **show version** privileged EXEC command. See the [“Finding the Software Version and Feature Set”](#) section on page 9.
- If you are upgrading to a new release, see the software upgrade filename for the software version. See the [“Deciding Which Files to Use”](#) section on page 10.

For a complete list of IE 2000U switch documentation, see the [“Related Documentation”](#) section on page 14.

You can download the switch software from this site (registered Cisco.com users with a login password): <http://www.cisco.com/cisco/web/download/index.html>

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About the Cisco IE 2000U Series Switches

Cisco IE 2000U Industrial Ethernet Switch (IE 2000U) provides a Gigabit Ethernet aggregation and small form factor switch for the substation automation family of Connected Grid switches. It is suitable for Connected Energy applications such as grid automation, distributed generation, integrated renewable energy, and track-side substations.

You can mount the switch on a DIN rail in an industrial enclosure. Its components are designed to withstand extremes in temperature, vibration, and shock that are common in an industrial environment.

Network Management

The switch supports these management options:

Cisco Configuration Professional

Cisco Configuration Professional is a PC-based application that provides device management for switches and routers. It simplifies configuration of features through easy-to-use wizards.

Device Manager

You can use the device manager, which is in the switch memory, to manage individual and standalone switches. This web interface offers quick configuration and monitoring. You can access the device manager from anywhere in your network through a web browser. For more information, see the *Cisco IE 2000U Switch Getting Started Guide* and the device manager online help.

Cisco IOS CLI

The switch CLI is based on Cisco IOS software to fully configure and monitor the switch. You can access the CLI either by connecting your management station directly to the switch management port, to a console port, or by using Telnet from a remote management station.

For console connections, you can connect the switch to a PC running Windows 7, Windows XP, Vista, Windows 2000, or Windows Server 2003.

- For USB-to-USB connections between the switch and a PC, you must install the Cisco USB driver console driver, version 3.1. You can download this driver from Cisco.com.
- The switch also supports RJ-45 to DB-9 connections.



Note

For more details on management connections, refer to the *Cisco IE 2000U Switch Hardware Installation Guide* and *Cisco IE 2000U Switch Getting Started Guide* at www.cisco.com/go/ie2000u-docs

SNMP Network Management

You can use SNMP applications such as CiscoWorks LAN Management Solution (LMS) and Cisco netManager to configure and manage the switch. You also can manage it from an SNMP-compatible workstation that is running applications such as Cisco netManager or SunNet Manager.

Software Features

[Table 1](#) summarizes the software features supported on the IE 2000U.

Table 1 **Software Feature Support on Cisco IE 2000U Switches**

Feature	Support	Related Documentation
High Availability and Redundancy	<ul style="list-style-type: none"> Hot Standby Router Support (HSRP) Link-state routing to provide Trunk failover Etherchannels for fault-tolerant, bundled-links between switches Flex Links allow one Layer 2 interface (switchport, port channels) to serve as back-up to another MAC address-table move update when a standby link takes over for a primary link 	<p>For feature overview and configuration details, see the <i>Cisco Connected Grid Switches High Availability and Redundancy Software Configuration Guide</i> at:</p> <p>www.cisco.com/go/ie2000u-docs</p>
Layer 2 Switching	<ul style="list-style-type: none"> Network Node Interfaces (NNI), User Network Interfaces (UNI), and Enhanced Network Interfaces (ENI) VLANs, Voice VLANs, VLAN Trunking Protocol (VTP), VLAN Membership Policy Server (VMPS) IEEE 802.1Q tunnelling to provide multiple-point Layer 2 VPN services Layer 2 Protocol Tunnelling allows tunnelling of control protocols to be tunnelled across Service Provider networks Spanning Tree Protocol (STP), Multiple STP (MSTP), Cisco proprietary Resilient Ethernet Protocol (REP) 	<p>For feature overview and configuration details, see the <i>Cisco Connected Grid Switches Layer 2 Switching Software Configuration Guide</i> at:</p> <p>www.cisco.com/go/ie2000u-docs</p>

Table 1 **Software Feature Support on Cisco IE 2000U Switches (continued)**

Feature	Support	Related Documentation
Quality of Service	<ul style="list-style-type: none"> • Classification • Marking • Policing • Priority queuing to manage traffic flow 	For feature overview and configuration details, see the <i>Cisco Connected Grid Switches Quality of Service Software Configuration Guide</i> at: www.cisco.com/go/ie2000u-docs
Routing	<ul style="list-style-type: none"> • IPv4 and IPv6 Routing • IPv6 Multicast Listener Discovery (MLD) Snooping for Multicast Router Discovery • IGMP Snooping and Multicast VLAN Registration (MVR) • Multicast Source Discovery Protocol (MSDP) 	For feature overview and configuration details, see the <ul style="list-style-type: none"> – <i>Cisco Connected Grid Switches Multicast Routing Software Configuration Guide</i> – <i>Cisco Connected Grid Switches Unicast Routing Software Configuration Guide</i> at: www.cisco.com/go/ie2000u-docs

Table 1 **Software Feature Support on Cisco IE 2000U Switches (continued)**

Feature	Support	Related Documentation
Security	<ul style="list-style-type: none"> • Authentication, Authorization, and Accounting (AAA) using RADIUS and TACACS+ • Port, Switch, and Web-based Authentication • VLAN ID-based MAC Authentication • DHCP Snooping • Dynamic ARP Inspection • IP Source Guard • IP access control lists (ACLs) to filter traffic • SSH and Telnet secure access 	<p>For feature overview and configuration details, see the <i>Cisco Connected Grid Switches Security Software Configuration Guide</i> at:</p> <p>www.cisco.com/go/ie2000u-docs</p>
System Management	<ul style="list-style-type: none"> • Cisco Discovery Protocol • Port-based Traffic Control • Precision Time Protocol (PTP) • RMON • SNMP • Switch Boot Optimization 	<p>For feature overview and configuration details, see the <i>Cisco Connected Grid Switches System Management Software Configuration Guide</i> at:</p> <p>www.cisco.com/go/ie2000u-docs</p>

Hardware Support

[Table 2](#) summarizes the supported IE 2000U switches and their required software image.

All IE 2000U hardware platforms support LAN Base and IP Services software images. Both software images include support for IEEE 1588 PTP.

[Table 3](#) summarizes the SFP modules supported on the IE 2000U switches.

Table 2 **Cisco IE 2000U Models Supported**

Model	Description
IE-2000U-4T-G	4- 10/100 BASE-T ports and 2- 10/100/1000 BASE-T ports.
IE-2000U-4TS-G	4- 10/100 BASE-T ports and 2- SFP Gigabit Ethernet ports.

Table 2 *Cisco IE 2000U Models Supported (continued)*

Model	Description
IE-2000U-8TC-G	8- 10/100 BASE-T ports and 2- Gigabit Ethernet dual-purpose ports.
IE-2000U-16TC-G	16- 10/100 BASE-T ports, 2- Gigabit Ethernet dual-purpose ports, and 2- SFP Fast Ethernet ports.
IE-2000U-16TC-G-X	16- 10/100 BASE-T ports, 2- Gigabit Ethernet dual-purpose ports, and 2- SFP Fast Ethernet ports. This platform has conformal coating.
IE-2000U-16TC-GP	16- 10/100 BASE-T ports, 4- Power over Ethernet (PoE) ports, and 2- Gigabit Ethernet dual-purpose ports. Note The four PoE ports can operate as PoE, or as PoE+ ports with certain constraints.
PWR-IE50W-AC= PWR-IE65W-PC-AC= PWR-IE65W-PC-DC=	IE 2000U Power supply modules.

Table 3 *SFP Models Supported on Cisco IE 2000U*

Model	Description
Rugged and Industrial SFPs –40 to 185°F (–40 to 85°C)	<ul style="list-style-type: none"> GLC-SX-MM-RGD GLC-LX-SM-RGD GLC-ZX-SM-RGD GLC-FE-100FX-RGD GLC-FE-100LX-RGD

Table 3 **SFP Models Supported on Cisco IE 2000U (continued)**

Model	Description
Commercial SFPs 32 to 158°F (0 to 70°C)	<ul style="list-style-type: none"> • GLC-BX-U • GLC-BX-D • CWDM-SFP-1470 • CWDM-SFP-1490 • CWDM-SFP-1510 • CWDM-SFP-1530 • CWDM-SFP-1550 • CWDM-SFP-1570 • CWDM-SFP-1590 • CWDM-SFP-1610
Extended temperature SFPs 23 to 185°F (–5 to 85°C)	<ul style="list-style-type: none"> • SFP-GE-S • SFP-GE-L • SFP-GE-Z • GLC-FE-100FX • GLC-FE-100LX • GLC-FE-100EX • GLC-FE-100ZX • GLC-FE-100BX-U • GLC-FE-100BX-D • GLC-EX-SMD

**Note**

For additional information about SFP modules, see the “Installing SFP Modules into SFP Module Slots” section of Chapter 2 in the [Cisco IE 2000U Switch Hardware Installation Guide](#). For cable specifications, see the “SFP Module Cables” section in Appendix C of that guide.

System Requirements

[Table 4](#) lists the minimum software requirements for the Cisco Configuration Professional.

[Table 5](#) lists the minimum hardware requirements for Express Setup. You can find its minimum software requirements summarized under the table.

Table 4 Minimum Software Requirement for Cisco Configuration Professional

Component	Minimum Software Requirement
Cisco Configuration Professional	Version 2.8

Table 5 Express Setup Minimum Hardware Requirements for a PC

Processor Speed	DRAM	Number of Colors	Resolution	Font Size
233 MHz ¹	Hardware ²	256	1024 x 768	Small

1. We recommend 1 GHz.

2. We recommend 1 GB of DRAM.

Express Setup Minimum Software Requirements for a PC

- PC with Windows 2000, XP, Vista, or Windows Server 2003
- Web browser (Internet Explorer 6.0, 7.0, or Firefox 1.5, 2.0, 3.0) with JavaScript enabled
Express Setup verifies the browser version when starting a session, and it does not require a plug-in.
- Straight-through or crossover Category 5 or 6 cable

Upgrading to a New Software Release

These are the procedures for downloading software. Before downloading software, read these sections for important information:

- [Finding the Software Version and Feature Set, page 9](#)
- [Deciding Which Files to Use, page 10](#)
- [Archiving Software Images, page 10](#)
- [Upgrading a Switch by Using the CLI, page 11](#)
- [Installation Notes, page 12](#)

Finding the Software Version and Feature Set

The Cisco IOS image is stored as a bin file in a directory that is named with the Cisco IOS release. A subdirectory contains the files needed for web management. The image is stored on the compact flash memory card.

You can use the **show version** privileged EXEC command to see the software version that is running on your switch. The second line of the display shows the version.

You can also use the **dir filesystem:** privileged EXEC command to see the directory names of other software images stored in flash memory. For example, use the **dir flash:** command to display the images in the flash memory.

Deciding Which Files to Use

The upgrade procedures in these release notes describe how to perform the upgrade by using a combined tar file. This file contains the Cisco IOS image file and the files needed for the embedded device manager. You must use the combined tar file to upgrade the switch through the device manager. To upgrade the switch through the command-line interface (CLI), use the tar file and the **archive download-sw** privileged EXEC command.

Table 6 lists the filenames for this software release.



Note

If you download the IP services image and plan to use Layer 3 functionality, you must use the Switch Database Management (SDM) routing template. To determine the currently active template, enter the **show sdm prefer** privileged EXEC command. If necessary, enter the **sdm prefer** global configuration command to change the SDM template to a specific template. For example, if the switch uses Layer 3 routing, change the SDM template from the default to the routing template. You must reload the switch for the new template to take effect.

Table 6

Cisco IOS Software Image Files

Filename	Description
ie2000u-ip-services-lmk9-tar.150-2.EH	IP services image file, which includes PTP.
ie2000u-lan-base-lmk9-tar.150-2.EH	LAN base image file, which includes PTP.

Archiving Software Images

Before upgrading your switch software, make sure that you archive copies of both your current Cisco IOS release and the Cisco IOS release to which you are upgrading. Keep these archived images until you have upgraded all devices in the network to the new Cisco IOS image and verified that the new Cisco IOS image works properly in your network.

Cisco routinely removes old Cisco IOS versions from Cisco.com. See *Product Bulletin 2863* for information:

http://www.cisco.com/en/US/prod/collateral/iosswrel/ps8802/ps6969/ps1835/prod_bulletin0900aecd80281c0e.html

You can copy the bin software image file on the flash memory to the appropriate TFTP directory on a host by using the **copy flash: tftp:** privileged EXEC command.



Note

Although you can copy any file on the flash memory to the TFTP server, it is time consuming to copy all of the HTML files in the tar file. We recommend that you download the tar file from Cisco.com and archive it on an internal host in your network.

You can also configure the switch as a TFTP server to copy files from one switch to another without using an external TFTP server by using the **tftp-server** global configuration command.

Upgrading a Switch by Using the CLI

This procedure is for copying the combined tar file to the switch. You copy the file to the switch from a TFTP server and extract the files. You can download an image file and replace or keep the current image.



Note

Make sure that the compact flash card is in the switch before downloading the software.

To download software, follow these steps:

- Step 1** Use [Table 6 on page 10](#) to identify the file that you want to download.
- Step 2** Download the software image file. If you have a SMARTNet support contract, go to this URL, and log in to download the appropriate files:
<http://www.cisco.com/kobayashi/sw-center/sw-lan.shtml>
 To download the image for a IE 2000U switch, click **Cisco IE 2000U software**. To obtain authorization and to download the cryptographic software files, click **IE 2000U 3DES Cryptographic Software**.
- Step 3** Copy the image to the appropriate TFTP directory on the workstation, and make sure that the TFTP server is properly configured.
 For more information, see the “Assigning the Switch IP Address and Default Gateway” chapter in the *Cisco Connected Grid Switches System Management Software Configuration Guide*.
- Step 4** Log into the switch through the console port or a Telnet session.
- Step 5** (Optional) Ensure that you have IP connectivity to the TFTP server by entering this privileged EXEC command:

```
Switch# ping tftp-server-address
```

For more information about assigning an IP address and default gateway to the switch, see the *Cisco Connected Grid Switches System Management Software Configuration Guide*.

- Step 6** Download the image file from the TFTP server to the switch.

If you are installing the same version of software that currently exists on the switch, overwrite the current image by entering this privileged EXEC command:

```
Switch# archive download-sw /overwrite /reload
tftp:[[/location]/directory]/image-name.tar
```

- The **/overwrite** option overwrites the software image in flash memory with the downloaded one.
- The **/reload** option reloads the system after downloading the image unless the configuration has been changed and not saved.
- For *//location*, specify the IP address of the TFTP server.
- For */directory/image-name.tar*, specify the directory (optional) and the image to download. Directory and image names are case sensitive.

This example shows how to download an image from a TFTP server at 198.30.20.19 and to overwrite the image on the switch:

```
Switch# archive download-sw /overwrite tftp://198.30.20.19/image-name.tar
```

You can also download the image file from the TFTP server to the switch and keep the current image by replacing the **/overwrite** option with the **/leave-old-sw** option.

Installation Notes

You can assign IP information to your switch using these methods:

- The Express Setup program, as described in the *Cisco IE 2000U Switch Getting Started Guide*.
- The CLI-based setup program, as described in the *Cisco IE 2000U Switch Hardware Installation Guide*.
- The DHCP-based autoconfiguration, as described in the *Cisco Connected Grid Switches System Management Software Configuration Guide*.
- Manually assigning an IP address, as described in the *Cisco Connected Grid Switches System Management Software Configuration Guide*.

Important Notes

- [Configuring the Device Manager and HTTP Server Interface, page 12](#)
- [Open Caveats, page 14](#)

Configuring the Device Manager and HTTP Server Interface

We recommend this browser setting to enhance loading speed of the device manager from Microsoft Internet Explorer.

From Microsoft Internet Explorer:

1. Choose **Tools > Internet Options**.
2. Click **Settings** in the “Temporary Internet files” area.
3. From the Settings window, choose **Automatically**.
4. Click **OK**.
5. Click **OK** to exit the Internet Options window.

The HTTP server interface must be enabled to display the device manager. By default, the HTTP server is disabled on the switch. Use the **show running-config** privileged EXEC command to see if the HTTP server is enabled or disabled.

Beginning in privileged EXEC mode, follow these steps to configure the HTTP server interface:

	Command	Purpose
Step 1	configure terminal	Enter global configuration mode.
Step 2	ip http authentication {aaa enable local}	Configure the HTTP server interface for the type of authentication that you want to use. <ul style="list-style-type: none"> • aaa—Enables the authentication, authorization, and accounting feature. You must enter the aaa new-model interface configuration command for the aaa keyword to appear. • enable—Enables password, which is the default method of HTTP server user authentication, is used. • local—Uses the local user database, as defined on the Cisco router or access server.
Step 3	end	Return to privileged EXEC mode.
Step 4	copy running-config startup-config	(Optional) Saves the configuration change to the startup configuration file.
Step 5	show running-config	Verify your entries.

The device manager uses the HTTP protocol (the default is port 80) and the default method of authentication (the enable password) to communicate with the switch through any of its Ethernet ports and to allow switch management from a standard web browser.

If you change the HTTP port, you must include the new port number when you enter the IP address in the browser **Location** or **Address** field (for example, `http://10.1.126.45:184`, where 184 is the new HTTP port number). Be sure to write down the port number through which you are connected. Use care when changing the switch IP information.

If you are *not* using the default method of authentication (that is, **enable password**), you need to configure the HTTP server interface with the method of authentication used on the switch.

Beginning in privileged EXEC mode, follow these steps to configure the HTTP server interface:

	Command	Purpose
Step 1	configure terminal	Enter global configuration mode.
Step 2	ip http authentication {enable local tacacs}	Configure the HTTP server interface for the type of authentication that you want to use. <ul style="list-style-type: none"> • enable—Enables password as the default method of HTTP server user authentication. • local—Uses the Local user database, as defined on the Cisco router or access server. • tacacs—Uses the TACACS server.
Step 3	end	Return to privileged EXEC mode.
Step 4	show running-config	Verify your entries.

Open Caveats

- **CSCuh47733**

Symptom: When the PTP feature is working on an interface with Small Form Factor Pluggable (SFP) transceivers on the IE 2000U, the PTP path delay becomes negative affecting the PTP accuracy. The issue is specific to Gigabit Ethernet (1000Mbps) transceivers.

Conditions: The issue is seen mostly with the SFP transceivers and not with RJ45 copper interfaces.

Workaround: Enter the **shutdown** and **no shutdown** commands on the interface or reload the switch.

- **CSCuh68503**

Symptom: Precision Time Protocol (PTP) is enabled by default on all IE 2000U interfaces. However, if you disable PTP on a specific port using the **no ptp enable** command, and then reload the switch after saving the configuration, the configuration change is lost. Instead, PTP is enabled on the port.

Conditions: Problem occurs when PTP is disabled on a port and the switch reloads after saving the configuration change.

Workaround: Disable PTP on the switch interface after the switch reloads by using the **no ptp enable** command.

- **CSCuh81776**

Symptom: In some configurations, PTP accuracy for IE 2000U might not be optimal.

Conditions: Occurs when you employ 100 Mb/s on the ingress and 1000 Mb/s on the egress of the IE 2000 U. It can also occur when you have 1000 Mb/s on the ingress and 100 Mb/s on the egress.

Workaround: For best results, use the same speed, 100 Mb/s or 1000 Mb/s, on both on the ingress and egress.

- **CSCui12890**

Symptom: PTP accuracy might not be optimal when ports are operating at 10Mb/s.

Conditions: Occurs when the IE 2000U port interfaces run at 10 Mb/s.

Workaround: For best results, use port speeds of either 100 Mb/s or 1000 Mb/s.

Related Documentation

All of the following documents can be found at: www.cisco.com/go/ie2000u-docs

- *Cisco Connected Grid Switches High Availability and Redundancy Software Configuration Guide*
- *Cisco IOS Basics and File Management for Connected Grid Switches*
- *Cisco Connected Grid Switches Layer 2 Switching Software Configuration Guide*
- *Cisco Connected Grid Switches Multicast Routing Software Configuration Guide*
- *Cisco Connected Grid Switches QoS Software Configuration Guide*
- *Cisco Connected Grid Switches Security Software Configuration Guide*
- *Cisco Connected Grid Switches System Management Software Configuration Guide*
- *Cisco Connected Grid Switches Unicast Routing Software Configuration Guide*
- *Cisco IE 200U Switch Hardware Installation Guide*

- *Cisco IE 2000U Switch Getting Started Guide*
- *Cisco IE 2000U 65 W DC-Input Power Supply Installation Note*
- *Regulatory Compliance and System Information (RCSI) Guide*

User documentation on the Cisco Configuration Professional can be found at:

http://www.cisco.com/en/US/products/ps9422/tsd_products_support_series_home.html

Obtaining Documentation and Submitting a Service Request

For information on obtaining documentation, submitting a service request, and gathering additional information, see *What's New in Cisco Product Documentation* at:

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

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