Release Notes for the Industrial Ethernet 4010 Switch, Cisco IOS Release 15.2(4)EC1

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Cisco IOS Release 15.2(4)EC1 runs on all Cisco Industrial Ethernet IE 4010 switches.

Cisco IOS Software Release 15.2(4)EC1 is part of the new software releases on Cisco IE 4010 Series Switches. This release delivers new software innovations in Industrial deployments that span across many technologies.

These release notes include important information about Cisco IOS Release15.2(4)EC1, and any limitations, restrictions, and caveats that apply to it.

You can download the switch software from this site (registered Cisco.com users with a login password):

http://software.cisco.com/download/navigator.html

System Requirements

Hardware Supported

Switch Models

Table 1   **Switch Models**

Model	Total Ports	Uplinks	SFP Fiber Ports	Copper 10/100/1000 PoE/PoE+ Ports[1]	Default Software License[2]	Power Supplies
IE-4010-16S12P	28	4 SFP (100/1000M)	12 (100/1000M)	12 (10/100/1000M)	LAN Base	Support for 2 field-replaceable, redundant AC or DC power supplies. For detailed specifications, see the IE 4010 Data Sheet.
IE-4010-4S24P	28	4 SFP (100/1000M)		24 (10/100/1000M)	LAN Base	Support for 2 field-replaceable, redundant AC or DC power supplies. For detailed specifications, see the IE 4010 Data Sheet.

1. All copper Gigabit Ethernet interfaces support speed negotiation to 10/100/1000 mbps and duplex negotiation.Ethernet 4010 Series.
2. Can be upgraded to IP Services at a fee. IP Services License Product Numbers are the following: L-IE4000-RTU= (Electronic SW License for IE4010 Switches)

SFP Modules Supported

The SFP modules are switch Ethernet SFP modules that provide connections to other devices. Depending on the switch model, these field-replaceable transceiver modules provide uplink interfaces. The modules have LC connectors for fiber-optic connections. For a complete list of supported SFP modules refer to the Data Sheet.

Express Setup Requirements

Hardware

- 1 gigahertz (GHz) or faster 32-bit (x86) or 64-bit (x64) processor

- 1 gigabyte (GB) RAM (32-bit) or 2 GB RAM (64-bit)

- 16 GB available hard disk space (32-bit) or 20 GB (64-bit)

Software

- PC with Windows 7, or Mac OS 10.6.x

- Web browser (Internet Explorer 9.0, 10.0, and 11.0; or Firefox minimum version 25, recommended version 32) with JavaScript enabled

- Straight-through or crossover Category 5 or 6 cable

Express Setup verifies the browser version when starting a session, and it does not require a plug-in.

Upgrading the Switch License

The IE 4010 is shipped with a Permanent "lanbase" license. This can be upgraded to an "ipservices" Evaluation or Permanent Right-To-Use (RTU) license using CLI commands.

Installation Notes

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

- Express Setup program, as described in the switch getting started guide.

- CLI-based setup program, as described in the switch hardware installation guide.

- DHCP-based autoconfiguration, as described in the switch software configuration guide.

- Manual assignment of an IP address, as described in the switch software configuration guide.

Software Features

This release is a deviation of the 15.2(4)EA IOS release and therefore the features supported in this release are similar.

For more information about the following new features for this release, please see the associated Configuration Guide here:
http://www.cisco.com/c/en/us/td/docs/switches/lan/cisco_ie4010/software/release/15-2_4_ec/configuration/guide/scg-ie4000_4010_5000.html

Right-to-Use License

"Right to Use" (RTU) is a trust based licensing scheme designed to make life easier for customers. It is designed to give customers the flexibility to upgrade, downgrade, or move the license for RMA purpose by using simple EXEC CLI commands. As this is a "trust" based scheme, customer can pay for a certain number of licenses in advance, and then activate these flexibly across a full range of switches deployed provided the number of licenses does not exceed that number at any given time.

There are 2 main types of licenses used for the IE4010 - "Evaluation" and "Permanent RTU (PRTU)". An "Evaluation" license allows the customer to evaluate an image for 60 days at no cost. A "Permanent RTU" license is a paid license with no expiration. A user is prompted to change to a permanent license before the evaluation license expires, with periodic reminders. This license is "in-built" in the image just like the current "Evaluation License" in the CISL model, so customers do not need to connect to Cisco servers to get a license. A PRTU license is not tied to a particular hardware. It can be deactivated from the old/swapped out hardware and activated on the replacement switch using the CLI.

MACsec (IEEE 802.1AE)

MACsec is the IEEE 802.1AE standard for providing strong cryptographic protection at Layer 2. MACsec provides secure (encryption and authentication) MAC Service on a frame-by-frame basis, between stations that are attached to the same LAN.

Note - You must have the IP Service license installed to support the MACsec feature

Profinet

Supports PROFINET V2.31, which is PROFIBUS International (PI) open Industrial Ethernet Standard that uses TCP/IP and IT standards for automation control. PROFINET is useful for industrial automation systems and process control networks, in which motion control and precision control of instrumentation and test equipment are important. It emphasizes data exchange and defines communication paths to meet speed requirements.

CIP

Common Industrial Protocol (CIP) is an industrial protocol for industrial automation applications. It is supported by Open DeviceNet Vendors Association (ODVA), an organization that supports network technologies based upon CIP such as DeviceNet, EtherNet/IP, CIP Safety and CIP Sync.

Previously known as Control and Information Protocol, CIP encompasses a comprehensive suite of messages and services for the collection of manufacturing automation applications - control, safety, synchronization, motion, configuration and information. CIP allows users to integrate these manufacturing applications with enterprise-level Ethernet networks and the Internet.

Dying Gasp

- If there is a loss of power to the switch, it sends out "Dying Gasp" messages to the OAM center to notify about the situation.

- These messages inform the downstream nodes about the loss of the switch, which helps downtime recovery.

Parallel Redundancy Protocol (PRP)

PRP allows a data communication network to prevent data transmission failures by providing network nodes two alternate paths for the traffic to reach its destination.

Two local area networks (LANs) provide alternate paths for the traffic over independent LAN segments. However, the two LANs must share a similar topology.

The IE4010 operating with PRP by sending two packets simultaneously to each LAN through the two different ports to its destination node. When the destination node receives the first packet successfully, it discards the second packet if it also arrives successfully as well. Each packet sent includes an incremented sequence number that helps the destination node distinguish between duplicate packets.

Precision Time Protocol (PTP)

PTP is defined in IEEE-1588 as Precision Clock Synchronization for Networked Measurements and Control Systems, and was developed to synchronize the clocks in packet-based networks that include distributed device clocks of varying precision and stability. PTP is optimal for use in distributed systems because it requires minimal bandwidth and little overhead processing.

Power over Ethernet plus (PoE+)

- Support for IEEE 802.3af-compliant powered devices (up to 15.4 W PoE per port) and support for IEEE 802.3at-compliant powered devices (up to 30 W PoE+ per port).

- Support for pre-standard Cisco powered devices.

- Configurable support for Cisco intelligent power management, including:

    – enhanced power negotiation

- – power reservation

- – per-port power policing

Resilient Ethernet Protocol (REP)

The Resilient Ethernet Protocol (REP) is a Cisco proprietary protocol that provides an alternative to the Spanning Tree Protocol (STP). REP provides a way to control network loops, handle link failures, and improve convergence time. It controls a group of ports connected in a segment, ensures that the segment does not create any bridging loops, and responds to link failures within the segment. REP provides a basis for constructing complex networks and supports VLAN load balancing.

Zero Touch Replacement

Included in the box with the IE 4010 Switch is an SD card which contains the IOS image. If hardware replacement is needed in the field, simply remove the SD card and insert it into the new switch. The image will be loaded onto the new switch, thus achieving zero touch replacement.

Important Notes

Express Setup Notes

- This browser setting is recommended for speeding up the time required to display Express Setup 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 Express Setup. By default, the HTTP server is enabled 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
1.	**configure terminal**	Enters global configuration mode.
2.	**ip http authentication {aaa	enable	local}**	Configures the HTTP server interface for the type of authentication that you want to use. **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 the password, which is the default method of HTTP server user authentication. **local**–Specifies the local user database, as defined on the Cisco router or access server.
3.	**end**	Returns to privileged EXEC mode.
4.	**show running-config**	Verifies your entries.

- Express Setup 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). 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 (the 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
1.	**configure terminal**	Enters global configuration mode.
2.	**ip http authentication {enable	local	tacacs}**	Configures the HTTP server interface for the type of authentication that you want to use. **enable**–Enables the password, which is the default method of HTTP server user authentication. **local**–Specifies the local user database, as defined on the Cisco router or access server. **tacacs**–Specifies the TACACS server.
3.	**end**	Returns to privileged EXEC mode.
4.	**show running-config**	Verifies your entries.

Note - If the Express Setup failed in the Web Browser, use the reset button to reset the switch to factor default

Caveats

The following sections provide information about caveats. You can click the issue number to view more information in the Cisco Bug Search tool (login required):

Open Caveats

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Issue	Description	Workaround
CSCva80784	GE port with SPEED AUTO 1000/DUPLEX FULL permits FE link at 100Full	Disconnect and reconnect the link.
CSCuw28503	On IE platforms, Flex-Link fail-over time could be around 700msec when using Gigabit Ethernet ports.	Use the CLI for setting alarm contacts as follows: switch(config)# alarm contact 1 descriptions TEST You can view it from the following command: switch# show run | inc alarm alarm contact 1 description TEST
CSCux98673	With GLC-FE-T-I, the FCS-Err/Rcv-Err counters (show interfaces counter errors) does not increment when Bad FCS frames are received.	None: This SFP not supported on IE 4010
CSCur09517	The PRP LED will not work properly in the following events. 1. shut/no shut on Logical PRP interface (interface prp-channel 1|2) 2. unplug and plug in cables for uplink ports 3. Certain sequence issues observed with shutting/no shutting logical interface PRP-channel 1 followed by logical interface PRP-channel 2 and vice versa	None
CSCuw95573	The ciscoenvMonAlarmContact MIB object is not supported in this release.	Use the CLI for setting alarm contacts as follows: switch(config)# alarm contact 1 descriptions TEST You can view it from the following command: switch# show run | inc alarm alarm contact 1 description TEST

Documentation Updates

Related Documentation

Installation, Configuration, Maintenance, and Operation Guides

http://www.cisco.com/en/US/products/ps11245/tsd_products_support_series_home.html

Online Help (available on the switch)

- Express Setup online help

- Device Manager online help

SFP Information

- Data Sheet

MIBs

- MIBs can be located with this MIB tool by using the IOS version number:
  tools.cisco.com/ITDIT/MIBS/

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