

# System Requirements to Implement Gigabit Ethernet on Catalyst Switches

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## Introduction

Each section of this document contains the system requirements to implement Gigabit Ethernet on the Cisco Catalyst Switch platforms described below:

## Before You Begin

### Conventions

For more information on document conventions, see the Cisco Technical Tips Conventions.

### Prerequisites

Important Installation Notes:

- All Gigabit Interface Converters (GBICs) are hot swappable.
- GigaStack GBICs (part number WS–X3500–XL ) are only supported on 2900–XL/3500–XL and 2950/3550 series switches with GBIC based module slots. For a complete list of GigaStack GBIC supported switches, please consult the Catalyst GigaStack Gigabit Interface Converter Switch Compatibility Matrix.

## Components Used

This document is not restricted to specific software and hardware versions.

## System Requirements for Switch Types

### Catalyst 6500/6000 Series Switch

For more information on the Catalyst 6000 Series Switch, [click here](#).

- The Catalyst 6000 family eight and 16 port Gigabit Ethernet modules are Institute of Electrical and Electronics Engineers (IEEE) standards compliant, and support full duplex operation.
- The eight port modules can be configured with Short-Wave (SX), Longwave/Long-Haul (LX/LH), and Extended Range (ZX) GBICs. All Gigabit Ethernet ports on these modules have SC-type connectors for Multi-Mode Fiber (MMF) or Single-Mode Fiber (SMF).
- The 16 port Gigabit Ethernet modules are available in a variety of interfaces: small form factor MT-RJ connectors, SX, LX/LH, and ZX GBICs, and RJ-45 connectors for Category 5, 5e, or 6 copper cabling.
- 1000Base-T copper GBICs with RJ-45 connectors(part number WS-G5483) are supported for the Catalyst 6000 series as of CatOS Release 7.2 or later. For a complete list of 1000 Base-T supported switches and the minimum IOS release required, please consult the Cisco Gigabit Ethernet Transceiver Modules Compatibility Matrix.
- Catalyst 6000 series switches support 10/100/1000BASE-T Ethernet Modules as of Catalyst OS 6.2(2) and Integrated Cisco IOS(Native Mode) release 12.1(8a)EX.
- Catalyst 6500 series switches using the supervisor 720 can use either Small Form-Factor Pluggable (SFP) modules, or 1000Base-T copper built in uplink ports. For more information on installing and using the (SFP) modules, consult the Catalyst 6500 Transceivers, Module Connectors, and Cables Specifications guide.
- Coarse Wave Division Multiplexing (CWDM) GBIC modules for fiber-optic connections are supported on the Catalyst 6500/0000 series switches from Cisco CatOS version 7.2(1) or later, or Cisco IOS code version 12.1(13)E1 or later. For more information regarding installing CWDM modules, refer to Cisco CWDM GBIC/SFP Install and Upgrade.
- Catalyst 6000 series software release notes.

### Catalyst 5500/5000 Series Switch

For more information on the Catalyst 5000 Series Switch, [click here](#).

- The Catalyst 5000 series switches support Gigabit Ethernet with different Gigabit Ethernet switching modules and two port Gigabit Ethernet uplinks in supervisor module.
- Supervisor Engine III A, Supervisor Engine II G, and Supervisor Engine III G all support two high speed wiring closet uplink ports.
- Gigabit Ethernet switching modules support nine port and three port Gigabit Ethernets per module.
- Supervisor Engine III can be configured with either 1000BaseSX, 1000BaseLX/LH, or 1000BaseZX, depending on the application.
- Catalyst 5000 series supervisor engine module software release notes.

### Catalyst 4500/4000 Series Switch

For more information on the Catalyst 4500/4000 Series Switch, [click here](#).

- The Catalyst 4000 series switches support Gigabit Ethernet modules with up to 48 ports, and two

Gigabit uplink ports on Supervisor II.

- All Gigabit Ethernet ports can be 1000BaseSX, 1000BaseLX/LH, or 1000BaseZX by using flexible, hot-swappable GBIC modules.
- 1000Base-T copper GBICs with RJ-45 connectors( part number WS-G5483) are supported for the Catalyst 4000 series as of CatOS Release 7.2 or later. For a complete list of 1000 Base-T supported switches and the minimum IOS release required, please consult the Cisco Gigabit Ethernet Transceiver Modules Compatibility Matrix.

**Note:** You can install only one WS-G5483 GBIC in a Catalyst 2948G switch.

- Catalyst 4000 series supports Gigabit Ethernet modules in software release 4.1(1) or later and integrated Cisco IOS(Native Mode) software support Gigabit Ethernet modules since first release 12.1(8a)EW.
- Catalyst 4000 series switches support 10/100/1000BASE-T Gigabit Ethernet switching module since Catalyst OS 6.3(1) and Integrated Cisco IOS(Native Mode) release 12.1(8a)EW.
- The Catalyst 4000 layer 3 module(WS-X4232-L3) supports two external Gigabit Ethernet ports on it.
- The Catalyst 4000 supervisor engine I and II requires Cisco Catalyst software version 5.5(1) or later to support layer 3 module. We recommend that you run software version 6.1(1) or later.
- Coarse Wave Division Multiplexing (CWDM) GBIC modules for fiber-optic connections are supported on the Catalyst 4500/4000 series switches from Cisco CatOS version 7.2(1) or later, or Cisco IOS code version 12.1(12c)EW or later. For more information regarding installing CWDM modules, refer to Cisco CWDM GBIC/SFP Install and Upgrade.

## Catalyst 3550 Series Switch

For more information on the Catalyst 3550 Series Switch, click [here](#).

- Currently, Catalyst 3550 series switches support both 10/100/1000 Ethernet ports and fixed GBIC-based Gigabit module slots.
- The 10/100/1000 switch ports on the Catalyst 3550 can be explicitly set to operate in any combination of half duplex, full duplex, 10 Mbps, 100 Mbps, or 1000 Mbps. These ports can also be set for speed and duplex autonegotiation, compliant with IEEE 802.3ab. (The default setting is autonegotiate.)
- 1000 Base-T traffic requires Category 5, 5e, or 6 cable.
- GBIC-based module slots support 1000Base-SX, 1000Base-LX/LH, 1000Base-ZX, 1000Base-T or Cisco GigaStack stacking GBICs.

**Note:** For a complete list of GigaStack GBIC supported switches and the minimum IOS release required, please consult the Catalyst GigaStack Gigabit Interface Converter Switch Compatibility Matrix.

**Note:** For a complete list of 1000Base-T supported switches and the minimum IOS required, please consult the Cisco Gigabit Ethernet Transceiver Modules Compatibility Matrix.

- GigaStack GBIC can be used for stacking up to nine Catalyst 3550 switches. GigaStack can also be a mixture of Catalyst 2900-XL/3500-XL, Catalyst 2950, and Catalyst 3550 series switches. For this mixed GigaStack configuration, Catalyst 2900-XL/3500-XL must run release 12.0(5)XW or later, and all Catalyst 3550 switches must run software release 12.1(4)EA1 or later..

## Catalyst 3750 Series Switch

For more information on the Catalyst 3750 Series Switch, click [here](#).

- Currently, Catalyst 3750 series switches support both 10/100/1000 Ethernet ports and Small Form-Factor Pluggable (SFP) module ports.

- 1000 Base–T traffic requires Category 5, 5e, or 6 cable.
- Catalyst 3750 series switches can use either Small Form–Factor Pluggable (SFP) modules, or 1000Base–T copper built in uplink ports depending on the model of switch. For more information on installing and using the (SFP) modules consult the Cisco SFP Optics For Gigabit Ethernet Applications and Cisco Gigabit Ethernet Transceiver Modules Compatibility Matrix
- The Catalyst 3750 models support these Cisco SFP options:

1000BASE–LX

1000BASE–SX

1000BASE–T

## Catalyst 3750 Metro Series Switch

For further information on the Catalyst 3750 Metro Switch, [click here](#).

- Catalyst 3750 Metro 24–AC switch supports two 1000X standard SFP module slots and two 1000X ES SFP slots with a minimum support of Cisco IOS Release 12.1(14)AX
- Catalyst 3750 Metro 24–DC switch supports two 1000X standard SFP module slots and two 1000X ES SFP slots with a minimum support of Cisco IOS Release 12.1(14)AX

## Catalyst 2900–XL/Catalyst 3500–XL Series Switch

For more information on the Catalyst 2900–XL/Catalyst 3500–XL Series Switch, [click here](#).

- Catalyst 2900–XL support 1000BaseX modules with one port GBIC and 1000BaseT modules with one port Unshielded Twisted Pair (UTP).

**Note:** For a complete list of 1000Base–T supported switches and the minimum IOS required, please consult the Cisco Gigabit Ethernet Transceiver Modules Compatibility Matrix.

- GigaStack GBIC can be used for stacking up to nine Catalyst 3500–XL/2900–XLs.
- Catalyst 2900–XL supports GigaStack GBIC into a 1000BaseX module.
- Catalysts 3512, 3524, 3524–PWR, and 3548–XL support two GBIC–based Gigabit Ethernet slots.
- Catalyst 3508G–XL supports eight Gigabit Ethernet ports.
- GBIC–based Gigabit Ethernet ports give a choice of 1000BaseSX, 1000BaseLX/LH, or Cisco GigaStack stacking GBICs.

**Note:** For a complete list of GigaStack GBIC supported switches and the minimum IOS release required, please consult the Catalyst GigaStack Gigabit Interface Converter Switch Compatibility Matrix.

- Catalyst 3500–XL supports 1000BaseZX GBIC with software release 12.0(5) or later. Catalyst 2900–XL series switches do not support 1000BaseZX GBICs.
- Catalyst 2900–XL/3500–XL supports Gigabit modules in software release 11.2(8)SA5 or later.

## Catalyst 2940 Series Switch

For more information on the Catalyst 2940 Switch, [click here](#).

- The Catalyst 2940–8TT–S switch has a 10/100/1000 uplink port on the switch. This port uses RJ–45 connectors and twisted–pair category 5, 5e or 6 cabling.
- The Catalyst 2940–8TF–S switch uses a field–replaceable SFP module to establish Gigabit connections. You insert an SFP module into the SFP module slot on the front of the switch.

## Catalyst 2950 Series Switch

For more information on the Catalyst 2950 Series Switch, [click here](#).

- The Catalyst 2950T–24 switch has two fixed 10/100/1000 Ethernet ports. These ports use RJ–45 connectors and Category 5 UTP cabling. The 10/100/1000 ports configure themselves to operate at the speed and duplex settings of the attached devices. If the attached devices do not support autonegotiation, you can explicitly set speed and duplex parameters. The ports operate at 10 or 100 Mbps in half– or full–duplex mode, but when they are set to 1000 Mbps, they can operate only in full–duplex mode. Catalyst 2950 series software release 12.0(5.2)WC(1) or later is required.
- GBIC–based module slots support 1000Base–SX, 1000Base–LX/LH, 1000Base–ZX, 1000Base–T or Cisco GigaStack stacking GBICs.

**Note:** For a complete list of GigaStack GBIC supported switches and the minimum IOS release required, please consult the Catalyst GigaStack Gigabit Interface Converter Switch Compatibility Matrix.

**Note:** For a complete list of 1000Base–T supported switches and the minimum IOS required, please consult the Cisco Gigabit Ethernet Transceiver Modules Compatibility Matrix.

- GigaStack GBIC can be used for stacking up to nine Catalyst 3550 switches. GigaStack can also be a mixture of Catalyst 2900–XL/3500–XL, 2950, and Catalyst 3550 series switches. For this mixed GigaStack configuration, Catalyst 2900–XL/3500–XL must run release 12.0(5)XW or later, and all Catalyst 3550 switches must run release 12.1(4)EA1 or later.
- Catalyst 2950 series switches support GBIC–based modules in software release 12.1(6)EA2 or later.
- You can configure interface speed on Gigabit Ethernet (10/100/1000 Mbps), but you cannot configure speed on the 1000BASE–SX, GBIC–module, and SFP–module interfaces.
- For certain types of GBICs, you can configure speed to not negotiate (**nonegotiate**) if connected to a device that does not support autonegotiation.

## Catalyst 2955 Series Switch

For more information on the Catalyst 2955 Switch, [click here](#).

- The Catalyst 2955T–12 switch has two 10/100/1000Base–T ports. These ports use standard RJ–45 connectors and four twisted–pair, Category 5 cabling. The 10/100/1000 ports on the Catalyst 2955T–12 switch can be set to operate at 10 or 100 Mbps at half– or full–duplex mode or 1000 Mbps in full–duplex mode. They can also be set for speed autonegotiation, compliant with IEEE 802.3ab. In all cases, the cable length from a switch to an attached device cannot exceed 328 feet (100 meters).

## Catalyst 2970 Series Switch

For more information on the Catalyst 2970 Switch, [click here](#).

- The Catalyst 2970 series switches support gigabit ethernet on all Ethernet access and uplink ports. You can set the 10/100/1000 ports to operate at 10 Mbps, 100 Mbps, or 1000 Mbps in full–duplex mode. You can also set these ports for speed and duplex autonegotiation in compliance with IEEE 802.3AB. (The default setting is autonegotiate.)
- 100BASE–TX and 1000BASE–T traffic requires Category 5, 5e or 6 cable.
- The Catalyst 2970 models support these Cisco SFP modules:

1000BASE–LX

1000BASE–SX

1000BASE-ZX

1000BASE-T

- The Catalyst 2970 switch uses Gigabit Ethernet SFP modules on some models to establish fiber-optic connections. You can use the SFP modules for Gigabit uplink connections to other switches, and fiber-optic cables with LC or MT-RJ connectors to connect to a fiber-optic SFP module. For more information refer to the Cisco Gigabit Ethernet Transceiver Modules Compatibility Matrix

## Catalyst 2948G-L3/4908G-L3/4840G Switch

For more information on the Catalyst 2948G-L3/4908G-L3/4840G Switch, [click here](#).

- Catalyst 2948G-L3/4908G-L3/4840G switches support two 802.3z Gigabit Ethernet ports with modular GBIC interfaces. The ports support GBICs, such as 1000BaseSX, 1000BaseLX/LH, and 1000BASE-ZX.
- Catalyst 2948G-L3/4908G-L3 switches have supported Gigabit Ethernet modules since software release 12.0(7)W5(15d) or later.
- Catalyst 4840G switch has supported Gigabit Ethernet modules since software release 12.0(10)W5(18) or later.

## Catalyst 8500 Series Switch Router

For more information on the Catalyst 8500 Series Switch Router, [click here](#).

- Catalyst 8540 supports eight port Gigabit Ethernet line cards with GBIC connectors.
- Catalyst 8540 supports two port enhanced Gigabit Ethernet interface modules, which support L3 and Gigabit backbone applications.
- Catalyst 8540 has supported Gigabit Ethernet modules since software release 12.0(1a)W5(6f) or later.
- Catalyst 8510 supports one port Gigabit Ethernet line cards with GBIC connector.
- Catalyst 8510 has supported Gigabit Ethernet modules since software release 12.0(1a)W5(6f) or later.

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