

## Catalyst 5509 Switching System

THE CISCO CATALYST® 5509 IS THE COMPANY'S MODULAR SWITCHING PLATFORM FOR HIGH-DENSITY, ENTERPRISE WIRING CLOSETS. WITH A GIGABIT ARCHITECTURE THAT SCALES THROUGHPUT TO MILLIONS OF PACKETS PER SECOND (PPS), THE CATALYST 5509 SUPPORTS ADVANCED MULTILAYER FEATURES, SUCH AS END-TO-END QUALITY OF SERVICE (QOS) OR MULTICAST ENHANCEMENTS, THAT PROVIDE THE INTELLIGENCE NEEDED TO SUPPORT MISSION-CRITICAL APPLICATIONS.

### Overview

The Catalyst 5509 is a nine-slot chassis that supports high-density, dedicated Token Ring or 10/100/1000 Ethernet switching. This chassis can support up to 384 user ports with only a 15A circuit requirement, allowing for easy installation in most wiring closet environments. The Catalyst 5509 also supports all of the advanced Cisco wiring closet features such as automatic protocol broadcast filtering to conserve valuable bandwidth, intelligent multicast forwarding to handle multimedia traffic, and load balancing over redundant links.

For Gigabit Ethernet applications, the Catalyst 5509 supports up to 38 ports of Gigabit Ethernet, the highest port density available today for the Catalyst 5500 Family. This capability can be combined with Cisco Gigabit EtherChannel® technology. Gigabit EtherChannel technology enables multiple Gigabit Ethernet links to be treated as one logical link, for up to 8 Gbps (full duplex) of device-to-device throughput. Used in such a configuration, the Catalyst 5509 creates an industry-leading Gigabit Ethernet solution to meet the requirements of today's demanding and fast-growing enterprise intranets.

With its support for hot-swappable modules, power supplies, and fans, the Catalyst 5509 chassis delivers high availability for production networks. Dual redundant switching engines, power supplies, and a passive backplane design ensure full system redundancy for mission-critical environments. The Catalyst 5509 chassis fits into a standard 19-inch rack, and all system components are accessible from the same side of the chassis. Only one power supply is required to run a fully configured system.

### Architecture

The Catalyst 5509 architecture delivers Catalyst 5500-class frame switching performance in a nine-slot chassis. The high-speed crossbar frame switching fabric uses an input/output (I/O) queuing model. This cost-effective architecture gives the most efficient switching fabric for unicast and multicast/multimedia applications. The Catalyst 5509 architecture delivers 3.6 Gbps of bandwidth to all slots. With switching modules that support local switching and deliver added forwarding capacity, the Catalyst 5509 architecture scales to more than 50 Gbps.

The Catalyst 5000 Family architecture maintains two additional buses, the management and index/control buses. The management bus is a serial bus that carries configuration information to each module and statistical information from each module to the Supervisor Engine. The index/control bus carries port-select information from the central encoded address recognition logic to the ports. This information determines which ports forward the packet and which flush it from the buffer. This architecture supports store-and-forward operation and uses fair arbitration and address recognition logic for all modules. Each frame that

traverses the frame-switching bus may be destined to a single port or to multiple ports, allowing for high-speed multicast forwarding without the need for frame copies.

### Summary

The Catalyst 5509 design is based upon proven Cisco switching technology that is being used in the largest campus networks in the world. For customers who need high-performance, high-density switching that is cost-effective and dependable, the Catalyst 5509 is an ideal platform. Table 1 gives the number of Ethernet ports that are deployable in a Catalyst 5500/5000 system.

Table 1 Number of Deployable Ethernet Ports

Catalyst 5002, 5000, 5500/5505 Switching Modules	No. of Interfaces Supported per Module	Maximum Number of Interfaces per Chassis				
		Catalyst 5002	Catalyst 5000	Catalyst 5505	Catalyst 5509	Catalyst 5500
Gigabit Ethernet	9/3/2	3	20	20	38	32
Group-Switched 10BaseT Ethernet	48	48	192	192	384	528
Switched 10BaseT Ethernet (RJ-21)	48/24	48	192	192	384	528
Switched 10BaseT Ethernet (RJ-45)	24	24	96	96	192	264
Switched 10BaseFL Ethernet	12	12	48	48	96	132
Group-Switched 100BaseTX Ethernet	24	24	96	96	192	264
Switched 10/100BaseTX Backbone	24/12	26	98	98	194	266
Switched 10/100BaseTX Desktop	24	26	98	98	194	266
Switched 100BaseFX	12	12	50	50	98	134
ATM Uplink	1 (dual PHY)	1 (dual PHY)	4 (dual PHY)	4 (dual PHY)	7 (dual PHY)	7 (dual PHY)
CDDI/FDDI	1	1	4	4	8	11

## Technical Specifications

### Standard Network Protocols

- IEEE 802.1Q, 802.1p, 802.3x
- Ethernet: IEEE 802.3, 10BaseT, and 10BaseFL
- Fast Ethernet: IEEE 802.3u, 100BaseTX, 100BaseFX
- Gigabit Ethernet: IEEE 802.3z
- Fiber Distributed Data Interface (FDDI): ISO 9314-1 FDD physical sublayer (PHY) standard; ISO 9314-3 FDDI physical medium dependent (PMD) standard; Copper Distributed Data Interface (CDDI) TP-PMD standard; ANSI FDDI X3T9.5 Station Management (SMT) 7.3
- ATM: ATM Forum 3.1 User-Network Interface (UNI) specification, Q.2931 signaling protocols, LANE v.1.0, LUNI v.2.0, Multiprotocol over ATM (MPOA)

### Network Management

CiscoWorks for Switched Internetworks (CWSI) Campus, a graphical user interface (GUI) based product for managing Catalyst and LightStream<sup>®</sup> switches, includes the following applications:

- CiscoView device configuration software
- VlanDirector<sup>™</sup> software
- TrafficDirector<sup>™</sup> software
- AtmDirector<sup>™</sup> software

Other supported network management products, protocols and interfaces include:

- Resource Manager Essentials
- Netsys Technologies
- Cisco Discovery Protocol
- VLAN Trunking Protocol (VTP)
- Simple Network Management Protocol (SNMP) agent V.1 (RFCs 1155-1157)
- SNMPv2c
- Cisco WorkGroup Management Information Base (MIB)
- Ethernet MIB (RFC 1643)
- Ethernet repeater MIB (RFC 1516)
- SNMP MIB II (RFC 1213)
- Remote Monitoring (RMON) (RFC 1757)
- Interface table (RFC 1573)
- Bridge MIB (RFC 1493)
- Interim Local Management Interface (ILMI) MIB
- FDDI MIB (RFC 1512)
- AToM MIB (RFC 1695)
- ATM RMON

- LAN Emulation Client (LEC) MIB (ATM Forum LANE v. 1.0)
- Cisco LAN Emulation Configuration Server (LECS), LAN Emulation Server/broadcast and unknown server (LES/BUS) MIB
- Private Network-Network Interface (PNNI) MIB
- LECS, LES, BUS, MIB
- SMT 7.3 (RFC 1285)
- Enhanced Switched Port Analyzer (SPAN)
- Port snooping and connection steering
- Text-based command-line interface based on familiar router interface
- Standard Cisco IOS<sup>®</sup> security capabilities: passwords and TACACS+
- Telnet, Trivial File Transfer Protocol (TFTP), BOOTP, LEC, RFC 1577 classical IP over ATM client, for management access

### Supervisor Engine Indicators and Interfaces

- System status: green (operational)/red (faulty)
- Switch load: 1- to 100 percent aggregate switching usage
- Link good: green (good)/orange (disabled)/off (not connected)
- 100-Mbps Fast Ethernet: green (100 Mbps)
- Power supply status: green (on)/red (faulty)/off (not present)
- Fan status: green (on)/red (faulty)
- Auxiliary port (Supervisor Engine III only)
- RJ-45 (female) data terminal equipment (DTE)

### Supervisor Console

- Supervisor Engine I, II: DB-25 (female) data communications equipment (DCE)
- Supervisor Engine III: RJ-45 (female) DCE
- Software requirements: Catalyst 5500 Family supervisor software 4.2(1) or higher

### Physical Specifications

- Dimensions (H x W x D): 20 x 17.25 x 18.4 in. (50.8 x 43.1 x 46.0 cm)
- Minimum weight: 55 lb (24.9 kg)
- Maximum weight: 150 lb (67.9 kg)
- Mounting: 19-in. rack-compatible (rack and cable guide hardware included)
- 23-in. center rack mount available on request

## Power Requirements

- Input current:
  - 12.0A max. @ 100VAC 60Hz
  - 6.0A max. @ 200VAC 50Hz
- KVA rating:
  - 1.3 KVA
- Output power: 805 watts per supply AC or DC
- Heat Dissipation: 1150 watts (3920 BTUs per hour)

## Environmental Conditions

- Operating temperature: 32 to 104 F (0 to 40 C)
- Storage temperature: -40 to 167 F (-40 to 75 C)
- Relative humidity: 10% to 90%, noncondensing
- Operating altitude: -60 to 4000 m
- Mean time between failures (MTBF): seven years for system configuration

## Regulatory Compliance

### Safety Certifications

- UL 1950
- EN 60950
- CSA-C22.2 no. 950
- IEC 950

### Electromagnetic Emissions Certifications

- FCC 15J Class A
- VCCI CE II
- CE Mark
- EN 55022 Class B
- CISPR 22 Class B

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