Catalyst 4908G-Layer 3 Switch—High Performance Layer 3 Switching

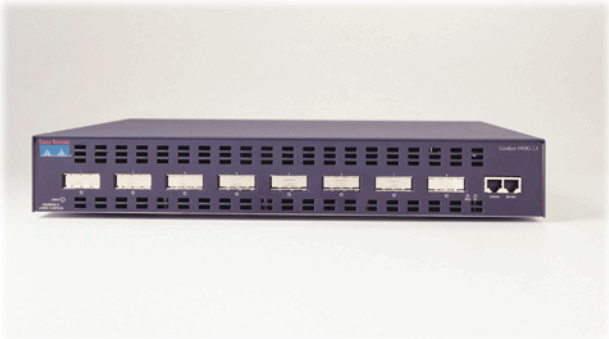
THE CATALYST® 4908G-L3 SWITCH IS A FIXED-CONFIGURATION LAYER 3 (L3) ETHERNET SWITCH FEATURING WIRE-SPEED SWITCHING FOR IP, IPX®, AND IP MULTICAST. THIS NEW CATALYST SWITCH PROVIDES THE HIGH PERFORMANCE THAT IS REQUIRED FOR MID-SIZE CAMPUS BACKBONES WITH JUST THE RIGHT PORT DENSITY. IT IS IDEAL FOR AGGREGATING MULTIPROTOCOL TRAFFIC FROM MULTIPLE WIRING CLOSETS OR WORKGROUP SWITCHES SUCH AS THE CATALYST 2900, CATALYST 3500, CATALYST 4000, OR CATALYST 5000 SWITCHES.

The Catalyst 4908G-L3 switch provides non-blocking routing and switching for IP, IPX, and IP multicast while also offering wire-speed Layer 2 switching for non-routable protocols such as NetBIOS and DECnet local-area transport (LAT). This capability allows network managers to augment their multiprotocol backbones with the Catalyst 4908G-L3 without having to build parallel networks, as is often required with IP-only switches.

Catalyst 4908G-L3 features at a glance:

- Eight ports of 1000BaseX Gigabit Ethernet with gigabit interface converter (GBIC) support, all ports with Layer Three switching capability at wire speed
- High Performance—over 11 Mpps Layer Three Switching and Routing of IP, IPX, and IP Multicast
- 22 Gbps non-blocking switch fabric
- High Performance CPU with Cisco IOS® system software
- Quality of Service (QoS)—multiple queues with Weighted Round Robin (WRR) scheduling
- Comprehensive management tools based on standard CiscoWorks2000 applications
- Access List Support on all ports

Figure 1 Catalyst 4908G-L3 Fixed Configuration Wire Speed Layer Three Switch



Introducing the Catalyst 4908G-L3

The Catalyst 4908G-L3 is a fixed-configuration Layer 3 Ethernet switch with 8 Gigabit Ethernet ports utilizing modular GBIC interfaces. The switch is ideal for backbone deployment in mid-sized networks that require wire speed Layer 3 performance but do not require the Gigabit Ethernet densities offered in the Catalyst 6000 and Catalyst 8500 Series of switches. Another application for the Catalyst 4908G-L3 is for server farm aggregation where Layer 3 services are required.

Catalyst 4908G-L3 Overview

The Catalyst 4908G-L3 provides an aggregate throughput of close to 12 Mpps for Layer 3 switching (it performs at wire speed for its 8 interfaces yielding an aggregate of 11,904 Mpps.) These data rates apply not only to IP and IPX traffic but also to IP multicast and bridged traffic and are a result of using high-speed application-specific integrated circuit (ASIC) technology on each port to perform true Layer 3 switching. The Catalyst 4908G-L3 supports a high-performance architecture with 22 Gbps bandwidth. The switch fabric is capable of supporting all 8 Gigabit Ethernet ports simultaneously at wire speed.

The Catalyst 4908G-L3 is housed in a 1.5 RU chassis and can be provisioned with an optional external redundant power supply. It supports a 22 Gbps shared-memory, fully non-blocking switch fabric, a high-performance RISC processor which provides the routing intelligence, and individual port based ASICs for the Layer 3 switching. The Catalyst 4908G-L3 uses Cisco Express Forwarding (CEF), which has been developed for the Cisco 12000 Gigabit Switch Router (GSR), the Catalyst 8500, and the Cisco 7500. This technology provides Layer 3 switching based on a topology map of the entire network that is distributed

to each port based ASIC, allowing it to make autonomous switching decisions without the involvement of a centralized CPU.

Catalyst 4908G-L3 Layer 3 Highlights- IP at Mpps

The Catalyst 4908G-L3 provides a complete IP routing solution without sacrificing any of the services that are required to build a scalable network. The Catalyst 4908G-L3 is a feature-rich switch with full Cisco IOS implementation that allows network managers to continue to administer and manage their networks as they do today while scaling their backbone bandwidths to gigabit speeds. The Catalyst 4908G-L3 supports all the routing protocols that are used today in mid-sized networks. These protocols include:

- Border Gateway Protocol (BGP)
- Interior Gateway Routing Protocol (IGRP)
- Enhanced IGRP (EIGRP)
- Open Shortest Path First (OSPF)
- Routing Information Protocol (RIP) Versions 1 and 2
- Static routes
- Route redistribution

In addition to these routing protocols, the Catalyst 4908G-L3 supports all the additional protocols necessary to build scalable, reliable networks, including:

- Hot Standby Router Protocol (HSRP)
- Internet Group Management Protocol (IGMP) 1 and 2
- Dynamic Host Configuration Protocol (DHCP) Relay
- Cisco Group Management Protocol (CGMP)
- Internet Control Message Protocol (ICMP)
- Gateway Discovery Protocol (GDP)
- ICMP Router Discovery Protocol (IRDP)
- Bootstrap Protocol (BOOTP) Relay

IPX Switching Feature Set

The Catalyst 4908G-L3 with its IPX wire-speed performance is also a full-fledged IPX router with the enhancements only Cisco IOS can offer. It provides basic services such as Novell NetWork RIP and Service Advertising Protocols (SAPs), value-added routing protocols such as Novell Enhanced IGRP, as well as route distribution among all of these protocols. In addition, the Catalyst 4908G-L3 supports those features that help to make a large Novell network scale. These features include:

- Get Nearest Server (GNS) response filtering and round-robin GNS support
- Novell RIP
- SAP, protocol, and NetBIOS name filtering
- Equal-cost path load sharing
- Variable RIP and SAP timers
- Novell NetBIOS type 20 propagation support for legacy applications that continue to be mission critical
- Novell-compliant IPX ping utility

This feature set as well as the wire-speed IPX switching make the Catalyst 4908G-L3 unique in terms of switch platforms.

IP Multicast Switching and Routing

The Catalyst 4908G-L3 Switch supports IP multicast at wire speeds across all its ports. As multicast applications such as Microsoft NetShow and NetMeeting become more widely deployed, end-to-end multicast support becomes increasingly important with multicast routing protocols that are integral to a consistent end-to-end multicast solution. The Catalyst 4908G-L3 supports both Protocol Independent Multicast (PIM) sparse and dense modes, and Distance Vector Multicast Routing Protocol (DVMRP) interoperability for legacy applications. The Catalyst 4908G-L3 provides support for IGMP, Versions 1 and 2, and CGMP server capabilities for integrating IP multicast support with Catalyst wiring closet switches. These protocols are necessary not only for IP multicast clients to join groups but also for efficient leave processing, which saves bandwidth and end-station CPU cycles.

Security

The Catalyst 4908G-L3 has the ability to prevent security breaches via the use of both IP and IPX access lists. This is useful in preventing users from accessing certain applications or services. The Catalyst 4908G-L3 will support both inbound and outbound access lists on all its Gigabit Ethernet interfaces. These access lists can be defined similar to any Cisco IOS router as standard IPX access lists as well as standard and extended IP based access lists. Having both inbound and outbound control of packets on the Gigabit Ethernets allows Network Managers to prevent traffic both on egress as well as ingress.

Gigabit EtherChannel Technologies

The Catalyst 4908G-L3 supports Gigabit EtherChannel technologies, allowing Network Managers to group up to four of the Gigabit Ethernet ports into a channel.

Quality of Service

The Catalyst 4908G-L3 incorporates a centralized non-blocking 22 Gigabit shared-memory switching fabric. The rich QoS capabilities of the switching fabric enable network managers to protect mission-critical applications by supporting delay-sensitive traffic, while managing bandwidth in the campus backbone. The switching fabric supports Per-Flow Queuing (PFQ), differentiated delay priorities using a WRR scheduler for delay-sensitive applications, and differentiated loss priorities for managing congestion and traffic policing and shaping. The fast packet memory embedded in the switching fabric is allocated dynamically on a per-queue (flow) basis. This dynamic allocation used in conjunction with user-defined queue thresholds and configurable queue scheduling weights ensures that time-sensitive traffic is handled properly with no packet loss. These thresholds and queuing weights can be dynamically adjusted with Cisco Assure Policy Networking, allowing an end-to-end QoS solution.

The Catalyst 4908G-L3 supports per-port input rate limiting, output rate limiting, and traffic shaping on Gigabit Ethernet and Fast Ethernet interfaces. The per-port rate limiting feature provides the ability to rate limit the input and/or output traffic of a port. The traffic rate of the port is monitored. The conforming traffic is allowed, and the nonconforming traffic is dropped. The per-port shaping feature provides the ability to shape the output of a port. The output traffic rate of the port is monitored to verify that the traffic leaves the interface at the user-configured rate. When excess traffic comes into the switch, back pressure is applied from the modules to the switch fabric, and the excess traffic gets queued in the switch fabric. If the switch fabric queues overflow, the excess traffic is dropped. The minimum rate is 32 kbps, with a granularity of 32 kbps.

Comprehensive Network Management of CiscoWorks2000

Catalyst 4908G-L3 Series products are managed by Cisco powerful CiscoWorks 2000 network management products (option). The Essentials product suite leverages the power of the intranet with browser-based access anywhere within the network. Network managers can walk up to any browser console, simply identify who they are via the access control interface, and immediately begin checking on the uptime of each device, the active software versions that are running the Catalyst 4908G-L3, and print a Year 2000-compliant report. For drill-down real-time device status information, the network operations staff can launch the Cisco award-winning CiscoView application from their fault-management station and at a glance check on the health of the power supplies, line cards, and the operational status of each port.

For more sophisticated network-wide information, network managers can launch the CiscoWorks for Switched Internetworks (CWSI)-campus product bundle, which automatically discovers the physical and logical representations of the Catalyst switch networks. This object-based discovery system offers detailed information on the location and type of each switch within the network, the type of links that connect the switches together, and displays integrity reports on the configurations between each switch. All this information is provided graphically within the topology interface with search and location utilities. This topology interface offers a convenient launching point for other applications within CWSI campus, including the Remote Monitoring (RMON) based traffic-analysis application.

Support for local, out-of-band management is delivered through a terminal or modem attached to either of the two EIA/TIA-232 interfaces; remote in-band management is available via Simple Network Management Protocol (SNMP), Telnet client, BOOTP, and Trivial File Transfer Protocol (TFTP).

Summary

The Catalyst 4908G-L3 is a cost-effective, high-performance, feature-rich Layer3 Ethernet switch ideally suited for mid-size backbones that require Layer 3 switching in increments of 8 Gigabit Ethernet ports. It supports wire speed routing and switching of IP, IPX, IP Multicast across all interfaces. This new Catalyst has a non-blocking, 22 Gbps architecture that enables all ports to L3 switch simultaneously at wire speed. All the Gigabit Ethernets support standard GBIC technology, giving Network Managers the flexibility to select and change gigabit interfaces in the Catalyst 4908G-L3 quickly,.

Technical Specifications

Performance

- 22 Gbps switching fabric
- Over 11 million PPS wire-speed forwarding rate for 64-byte packets
- MIPs RISC CPU- R5000 CPU, 16 MM Flash, 64 MB DRAM
- Route Entries: 16,000 minimum/-32,000 maximum
- 12 MB memory architecture shared by all ports
- Packet forwarding rate for 64-byte packets:
- 1,488,000 PPS to 1000BaseX ports
- Includes RIP I and RIP II, OSPF, IGRP, EIGRP

Management

- SNMP Management Information Base (MIB) II

Standards

- IEEE 802.3x full duplex 1000BaseX ports
- IEEE 802.1D Spanning-Tree Protocol
- IEEE 802.1Q VLAN
- IEEE 802.3z 1000BaseX specification
- 1000BaseX (GBIC)
- 1000BaseSX
- 1000BaseLX/LH
- 1000Base ZX

Y2K

- Y2K compliant

Connectors and Cabling

- 1000BaseX GBIC ports: SC fiber connectors, single mode or multimode fiber
- Console and auxiliary port: RJ-45 connectors, RS-232 serial cabling

Indicators

- Per-port status LEDs
  - Link up: illuminated Color—green
  - Link down: not illuminated

Dimensions and Weight (H x W x D)

- 2.69 x 17.1 x 18 in (6.6 x 43.4 x 45.7 cm)
- One and half rack unit
- 18 lb (8.08 kg)

Environmental Conditions and Power Requirements

- Operating temperature: 32 to 113 F (0 to 45 C)
- Storage temperature: -4 to 149 F (-20 to 65 C)
- Operating relative humidity: 10 to 85% noncondensing
- Operating altitude: Up to 10,000 ft. (3000 m)
- Power supply output 175 W; BTU 820 per hour
- AC input voltage/frequency: 100 to 120/200 to 240 VAC (autoranging) 50 to 60 Hz

Safety Certifications

- UL 1950
- CSA 22.2 No. 950
- EN 60950
- IEC 950
- AS/NZS 3260, TS001
- CE

Electromagnetic Emissions Certifications

- FCC Part 15 Class A
- EN 55022B Class A (CISPR 22 Class A)
- VCCI Class A
- AS/NZS 3548 Class A
- BCIQ
- CE Marking

Ordering Information

Product Number	Description
WS-C4908G-L3	Catalyst 4908G-L3 switch, 8 port 1000BaseX L3 Switch (GBIC) Included IP, IP Multicast, Bridging. Note: GBIC modules need to be ordered separately
FR4908GL3-IPX	IPX Switching License
WS-G5484 =	1000BaseSX GBIC module
WS-G5486 =	1000BaseLX/LH GBIC module
WS-G5487 =	1000BaseZX GBIC module
CAB-GELX-	Gigabit Ethernet multimode conditioning cable
PWR600-AC-RPS-NCAB	600W redundant AC power system without DC power cables
CAB-RPSY-2218	Two-to-one DC Power cable (for RPS)
STKRACKMOUNT1.5RU=	Catalyst 4908G-L3 rack mount kit (spare)
CON-SNT-WS-C49XX	SMARTnet™ 8 x 5 x nbd
CON-SNTE-WS-C49XX	SMARTnet 8 x 5 x 4
CON-SNTP-WS-C49XX	SMARTnet 24 x 7 x 4
CON-OS-WS-C49XX	SMARTnet Onsite 8 x 5 x nbd
CON-OSE-WS-C49XX	SMARTnet Onsite 8 x 5 x 4
CON-OSP-WS-C49XX	SMARTnet Onsite 24 x 7 x 4
Mini-RMON Agent License	

Ordering Information

Product Number	Description
WS-C4900-EMS-LIC	Catalyst 4908G-L3 RMON Agent License

Additional Information

For More Information on Cisco Products, Contact:

- U. S. and Canada: 800 553-NETS (6387)
- Europe: 32 2 778 4242
- Australia: 612 9935 4107
- Other: 408 526-7209
- World Wide Web URL: http://www.cisco.com

Corporate Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
http://www.cisco.com
Tel: 408 526-4000
800 553-NETS (6387)
Fax: 408 526-4100

European Headquarters
Cisco Systems Europe s.a.r.l.
Parc Evolic, Batiment L1/L2
16 Avenue du Quebec
Villebon, BP 706
91961 Courtaboeuf Cedex
France
http://www-europe.cisco.com
Tel: 33 1 69 18 61 00
Fax: 33 1 69 28 83 26

Americas Headquarters
Cisco Systems, Inc.
170 West Tasman Drive
San Jose, CA 95134-1706
USA
http://www.cisco.com
Tel: 408 526-7660
Fax: 408 527-0883

Asia Headquarters
Nihon Cisco Systems K.K.
Fuji Building, 9th Floor
3-2-3 Marunouchi
Chiyoda-ku, Tokyo 100
Japan
http://www.cisco.com
Tel: 81 3 5219 6250
Fax: 81 3 5219 6001

Cisco Systems has more than 200 offices in the following countries. Addresses, phone numbers, and fax numbers are listed on the Cisco Connection Online Web site at http://www.cisco.com/offices.

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