Catalyst **2924M XL**
10/100 Autosensing Fast Ethernet Switch
Catalyst **2912MF XL**
100BaseFX Fast Ethernet Aggregator Switch

The Cisco Catalyst® 2924M XL 10/100 autosensing Fast Ethernet switch combines outstanding performance, ease of use, and from the leader in networking, integrated Cisco IOS® software. The Catalyst 2924M XL is a flexible, scalable, and affordable solution, ideal for aggregating Ethernet and Fast Ethernet workgroups and delivering dedicated 10 or 100 Mbps connectivity for individual users and servers with high-speed uplink modules, including Gigabit Ethernet and ATM, to connect to servers and LAN backbones.

The Catalyst 2924M XL switch, a member of the Catalyst 2900 Series XL family, contains 24 10Base-T/100Base-TX ports and two versatile module slots to provide unmatched expansion capabilities and high-speed connectivity. The modular design allows users to easily add 10Base-T/100Base-T, 100Base-FX, Gigabit Ethernet, or Asynchronous Transfer Mode (ATM) (OC-3) ports to increase port density and deliver high-speed uplinks. With the Gigabit Ethernet module, Catalyst 2924M XL switches can be stacked (up to nine switches) with the low-cost Cisco GigaStack™ gigabit interface controller (GBIC). The advanced Cisco architecture incorporates a switch fabric of 3.2 Gbps and a forwarding rate of 3.0 million packets per second (pps) to deliver wire-speed performance across all ports.

The Cisco Catalyst 2912MF XL Fast Ethernet switch combines outstanding performance, ease of use, and integrated Cisco IOS software from the leader in networking. The Catalyst 2912MF XL is a flexible, scalable, and affordable solution, ideal for aggregating Fast Ethernet workgroups over 100Base-FX connections in small and midsized campus environments.

The Catalyst 2912MF XL switch, a member of the Catalyst 2900 Series XL family, contains 12 100Base-FX ports and two versatile module slots to provide unmatched expansion capabilities and high-speed connectivity. The modular design allows users to easily add 10Base-T/100Base-T, 100Base-FX, Gigabit Ethernet, or ATM (OC-3) ports to increase port density and deliver high-speed uplinks. With the Gigabit Ethernet module, Catalyst 2912MF XL switches (as well as the Catalyst 2924M XL switch) can be stacked (up to nine switches) with the low-cost Cisco GigaStack GBIC. The advanced Cisco architecture incorporates a switch fabric of 3.2 Gbps and a forwarding rate of 3.0 million pps to deliver wire-speed performance across all ports.

Flexible Stacking with the GigaStack GBIC

Gigabit Ethernet-enabled Catalyst 2900 Series XL switches and Catalyst 3500 Series XL can be stacked using the low-cost two-port Cisco GigaStack GBIC, which offers a range of highly flexible stacking and performance options. Customers can deploy a 1-Gbps independent stack backplane in a cascade configuration, or scale up to 5-Gbps of bandwidth in a star configuration using the Catalyst 3508G XL Gigabit Ethernet aggregation switch. Network managers may use one or both of the available GBIC ports on a Gigabit Ethernet-enabled Catalyst 2900 Series XL switch to create high-speed uplinks to the network core, using standard Gigabit Ethernet or Gigabit EtherChannel technology. High resiliency can also be implemented by deploying dual Gigabit Ethernet uplinks, a redundant GigaStack loopback cable, Cisco Uplink Fast and Cross-stack Uplink Fast technologies for high-speed uplink and stack interconnection failover, and PVST+ (Per VLAN Spanning Tree) for uplink load balancing.

Cisco Switch Clustering

Breakthrough Cisco Switch Clustering technology enables up to 16 interconnected Catalyst 3500 XL, 2900 XL, and Catalyst 1900 switches, regardless of geographic proximity, to form a single IP management domain. Switch Clustering supports a broad range of standards-based connectivity options and configurations to deliver levels of performance that are scalable to meet customer requirements. Switch Clustering connectivity options for the Catalyst 2900 Series XL include Ethernet, Fast Ethernet, Fast EtherChannel ports, low-cost Cisco GigaStack GBIC, Gigabit Ethernet, and Gigabit EtherChannel ports. Because the technology is not limited by proprietary stacking modules and stacking cables, Cisco Switch Clustering expands the traditional stacking domain beyond a single wiring closet and lets users mix and match interconnections to meet specific management, performance, and cost requirements.

A command switch, either a Catalyst 2900 XL or 3500 XL, provides the proxy and redirection services for single IP address management for each cluster. All cluster management commands are targeted to the command switch IP address. For redundancy, a second switch can be assigned an IP address, and the overall cluster can then be managed using a single virtual IP address. If the primary command switch fails, the backup or secondary command switch seamlessly takes over the management of the cluster while a user still accesses the cluster via the virtual IP address.

Cisco Switch Clustering can be accessed via Cisco Cluster Management Suite (CMS), a Web-based management interface, which allows network administrators to configure, monitor, and manage a switch from anywhere on the network through a standard browser such as Microsoft Internet Explorer or Netscape Navigator. Network administrators simply point their Web-browsers to the IP address of the cluster Command switch and access all management capabilities. The CMS interface is launched from the switch itself and delivers simple, cluster-wide, device-level management, including port configuration, VLAN setup, network views, and port monitoring—all from a single graphical interface. Web-based management is an integral part of the Cisco Switch Clustering architecture, allowing users to easily configure and manage stacks and switch clusters, and administer software upgrades across multiple switches. Command switch and cluster management redundancy are ensured via an automatic failover scheme in the rare event of a command switch failure.

Figure 1 Catalyst 2924M XL 10/100 Autosensing Fast Ethernet Switch

Figure 2 Catalyst 2912MF XL 100Base-FX Fast Ethernet Aggregation Switch

Key Features/Benefits

Outstanding Performance

- 24 10Base-T/100Base-TX autosensing ports deliver Fast Ethernet performance where it is needed most—to individual users, servers, and demanding workgroups—while preserving legacy 10Base-T connectivity.
- Full-duplex operation on switched 100Base-T ports delivers up to 200 Mbps of bandwidth to end stations servers and between switches.
- A 3.2 Gbps switching fabric and 3.0 million-pps forwarding rate ensure wire-speed operation on all 10Base-T/100Base-TX ports.
- A 4-MB shared-memory architecture ensures the highest possible throughput by eliminating head-of-line blocking, minimizing packet loss, and reducing congestion from multicast and broadcast traffic.
- Two high-speed expansion slots provide 1.6 Gbps of total available bandwidth for additional 10Base-T/100Base-TX or 100Base-FX ports, as well as Asynchronous Transfer Mode (ATM) and Gigabit Ethernet uplinks.
- Bandwidth aggregation through Fast EtherChannel and Gigabit EtherChannel technology enhances fault tolerance and offers up to 800 Mbps of bandwidth among switches, routers, and individual servers.
- 12 EtherChannel bandwidth aggregation groups per switch allow for a high-performance EtherChannel group for every two ports on a 24-port Catalyst 2900 XL switch.
- CGMP enables a switch to selectively and dynamically forward routed IP multicast traffic to targeted multimedia end stations, reducing overall network traffic.
- A configurable network port supports unlimited Media-Access-Control (MAC) addresses for backbone connectivity.
- Dual-priority forwarding queues on each 10/100 and Gigabit Ethernet port, enabling network traffic prioritization and seamless data, voice, and video integration through IEEE 802.1p protocol.
- Trusted extension settings allow the switch to ensure that voice traffic from an IP phone gets high-priority treatment by controlling how traffic from a daisy-chained device is classified.

Flexible and Scalable Switch Clustering Architecture

- Cisco Switch Clustering technology allows a user to manage up to sixteen interconnected Catalyst 3500 XL, 2900 XL, and 1900 switches through a single IP address, regardless of location.
- Cluster management is ensured in the rare event of command switch failure via a failover scheme that runs automatically.

Modular, High-Speed Slots

- Two versatile high-speed slots support a range of expansion modules with different media configurations and port densities, allowing users the flexibility to upgrade their networks and preserve their initial investment. All ports support the Cisco ISL and standards-based 802.1Q VLAN trunking protocols.
- Four-port 10Base-T/100Base-TX, two-port 100Base-FX, and four-port 100Base-FX modules for the Catalyst 2924M XL switch allow customers to easily increase port density, provide fiber connectivity over extended distances, and deliver higher-speed uplinks through Fast EtherChannel bandwidth aggregation.
- A GBIC-based Gigabit Ethernet module for the Catalyst 2924M XL switch allows customers to use a range of media tranceivers that include multiple stacking options, short- and long-haul fiber, and copper connectivity (including SX, LX/LH, ZX, TX, and Cisco GigaStack converters).
- For Gigabit Ethernet connectivity at an affordable price, the Cisco 1000Base-T module delivers gigabit over copper uplinks for the wiring closet.
- ATM OC-3 modules support connectivity to ATM backbones.

Ease of Use and Ease of Deployment

- The cluster software upgrade feature allows the network manager to quickly and easily upgrade the system software on a group of Catalyst 2900 XL, 3500 XL, and 1900 switches.
- CMS software, a Web-based interface, provides network and stack views of a group of Catalyst 2900 XL switches from any node on the Internet with a Web browser.

- Autosensing on each port detects the speed of the attached device and automatically configures the port for 10 or 100 Mbps operation, easing the deployment of the switch in mixed 10Base-T and 100Base-T environments.
- Autonegotiation on all 10/100 ports automatically selects half- or full-duplex transmission mode to optimize bandwidth.
- Default configuration stored in Flash memory ensures that the switch can be connected to the network and pass traffic with minimal user intervention, and preserves the configuration data in case of power outages.

Integrated Cisco IOS Switching Software

- CGMP Fast Leave software allows end stations to quickly exit from a multicast session, reducing superfluous traffic on the network.
- Bandwidth aggregation through Fast EtherChannel and Gigabit EtherChannel technology enhances fault tolerance and offers up to 800 Mbps and 4 Gbps of bandwidth between switches, and to routers and individual servers.
- Per-port broadcast, multicast, and unicast storm control prevents faulty end stations from degrading overall systems performance.
- Command-line interface (CLI) support provides common user interface and a command set with Catalyst 5000, 5500 and 8500 Series switches and all Cisco routers.

Comprehensive Manageability

- Simple Network Management Protocol (SNMP) and Telnet interface support delivers comprehensive in-band management, and the Cisco IOS CLI-based management console provides detailed out-of-band management.
- CMS, a built-in Hypertext Transfer Protocol (HTTP) server, provides an ease-of-use Web-based management interface through a standard browser such as Netscape Navigator or Microsoft Explorer.
- The switch is manageable through CiscoWorks Windows and CiscoWorks 2000 network management software on a per-port and per-switch basis, providing a common management interface for Cisco routers, switches, and hubs.
- Cisco Discovery Protocol (CDP) enables a CiscoWorks network management station to automatically discover the switch in a network topology.
- An embedded Remote Monitoring (RMON) software agent supports four RMON groups (history, statistics, alarms, and events) for enhanced traffic management, monitoring, and analysis.
- Cisco IOS software supports all nine RMON groups through use of a Switched Port Analyzer (SPAN) port, which permits high-performance traffic monitoring of a single port, a group of ports, or the entire switch from a single network analyzer or RMON probe.
- Autoconfiguration eases deployment of switches in the network by automatically configuring multiple switches across a network via a boot server.
- Trivial File Transfer Protocol (TFTP) reduces the cost of administering software upgrades by enabling downloads from a centralized location.
- Each port includes a multifunction LED for port status, half-duplex/full-duplex, and 10Base-T/100Base-T indications as well as switch-level status LEDs for system, module status, redundant power supply (RPS), and bandwidth utilization, providing a comprehensive and convenient visual management system.
- Domain Name Services (DNS) client support provides IP address resolution with user-defined device names.
- Network Time Protocol (NTP) provides an accurate and consistent timestamp to all switches within the intranet.
- Spanning Tree Root Guard (STRG) prevents devices not in the network administrator's or service provider's control from becoming STP root nodes.
- Cisco Virtual Trunking Protocol (VTP) Pruning limits broadcasts on VTP trunks. When VTP pruning is enabled, broadcast traffic is flooded only on trunk links required to reach the destination devices.

Security and Redundancy

- IEEE 802.1D Spanning-Tree Protocol support for redundant backbone connections and loop-free networks simplifies network configuration and improves fault tolerance.
- MAC-based port level security prevents unauthorized stations from accessing a switch.
- The user-selectable address learning mode simplifies configuration and enhances security.

- Secures a port to an individual MAC address group of up to 132 MAC addresses; addresses can be learned or manually entered; can prevent unauthorized stations from accessing the switch.
- Password-protected in-band and out-of-band management provides protection against unauthorized configuration changes and secures against unwanted intruders. Provides administrators the choice of level of security, notification, and resulting actions.
- TACACS+ authentication enables centralized control of the switch and restricts unauthorized users from altering the configuration.
- Private VLAN Edge provides security and isolation between ports on a switch, ensuring that voice traffic travels directly from its entry point to the aggregation device through a virtual path and cannot be directed to a different port.
- Support for the optional Cisco 600-watt redundant AC power system provides a backup power source for up to four units for improved fault tolerance and network uptime.
- Multilevel security on the console access prevents unauthorized users from altering the switch configuration.
- Cisco Uplink Fast technology ensures quick failover recovery, enhancing overall network stability and reliability.
- Cross-stack Uplink Fast (CSUF) technology provides increased redundancy and network resiliency through fast spanning-tree convergance (less than 2 seconds) across a stack of switches using Gigastack GBICs.
- Redundant stacking connections support a redundant loopback connection in top and bottom switches in a stack.
- Command Switch Redundancy allows customers to designate a backup command switch, which takes over cluster management functions in the event of a failure of the primary command switch.
- Unidirectional Link Detection (UDLD) detects and disables unidirectional links caused by incorrect wiring or interface faults, preventing Spanning Tree loops.

Technical Specifications

Performance

- 3.2 Gbps switching fabric
- 3.0 million-pps forwarding rate for 64-byte packets
- 1.6 Gbps maximum forwarding bandwidth
- 4-MB shared-memory architecture shared by all ports
- Packet forwarding rate for 64-byte packets:
  - 14,880 pps to 10-Mbps ports
  - 148,800 pps to 100BaseT ports
- 8-MB DRAM and 4-MB Flash memory
- 8192 MAC addresses

Management

- SNMP Management Information Base (MIB) II, SNMP MIB extensions, Bridging MIB (RFC 1493)

Standards

- IEEE 802.3x full duplex on 10Base-T and 100Base-T ports
- IEEE 802.1D Spanning-Tree Protocol
- IEEE 802.3u 100Base-TX and 100Base-FX specification
- IEEE 802.3 10Base-T specification
- IEEE 802.3z
- IEEE 802.3ab

Connectors and Cabling

- 10Base-T ports: RJ-45 connectors; two-pair Category 3, 4, or 5 unshielded twisted-pair (UTP) cabling
- 100Base-TX ports: RJ-45 connectors; two-pair Category 5 UTP cabling
- Management console port: RJ-45 connector

Indicators

- Per-port status LEDs—link integrity, disabled, activity, speed, and full-duplex indications
- System status LEDs—system, RPS, module status, and bandwidth utilization indications

Dimensions and Weight (H x W x D)

- 3.46 x 17.5 x 12 in. (8.8 x 44.5 x 30.5 cm)
- 13.5 lb (6.12 kg)
- 15 lb (6.8 kg) with two modules installed

Environmental Conditions and Power Requirements

- Operating temperature: 32 to 122 F (0 to 50 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 consumption (base unit): 90W maximum; 307 BTU per hour
- Power consumption (with two modules): 170W maximum; 580 BTU per hour
- AC input voltage/frequency: 100 to 127/200 to 240 VAC (autoranging) 50 to 60 Hz
- MTBF 164,528 hours

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

Warranty

- Lifetime limited warranty

Ordering Information

Model Numbers:

- WS-C2924M-XL-EN (Enterprise Edition)
- WS-C2924M-XL-EN-5P (Five-Pack)

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