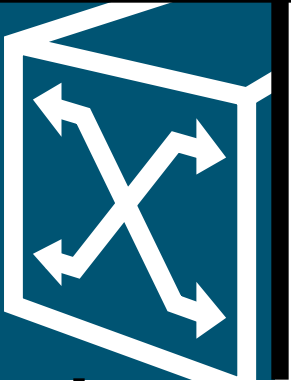


# Catalyst 2924M XL DC

## for Service Provider Networks



The Cisco Catalyst® 2924M XL DC is a 10/100 autosensing Fast Ethernet switch designed for Service Provider Networks that combines outstanding performance, ease of use, and integrated Cisco IOS® software. The Catalyst 2924M XL DC is a DC-powered, flexible, and scalable solution, ideal for aggregating Ethernet and Fast Ethernet workgroups and delivering dedicated 10 or 100 Mbps connectivity for network components with high-speed uplink modules, including Gigabit Ethernet and ATM, to connect to servers and LAN backbones.

The Catalyst 2924M XL DC switch, a DC-powered member of the Catalyst 2900 Series XL family, contains 24 10BaseT/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 10BaseT/100BaseT, 100BaseFX, 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 2924M XL DC switch meets telcos' critical physical requirements for depth (maximum 12 inch depth), -48v DC power, and Common Language Equipment Identification (CLEI) codes. The Catalyst 2924M XL DC switch is also NEBS Level 3-compliant.

### Service Provider Networks

Service Providers [for example, Regional Bell Operating Companies (RBOCs), Intra Exchange Carriers (IXCs), Internet Service Providers and Wireless companies] can use the Catalyst 2924M XL DC to provide Ethernet connectivity between network elements in central offices, points of presence (POP), and Wireless/Mobile Switching Centers that are provisioned with DC power.

- *Central Office:* Service Providers can use the Catalyst 2924M XL DC in Central Offices as a component of the Data Communications Network (DCN). The DCN is an out-of-band network that separates network management traffic from customer service networks in order to reduce complexity in managing the network. The DCN provides network element (NE)



connectivity (for example SONET/SDH GNEs, digital cross connect systems, DSLAMs, and so on) for alarm monitoring, remote provisioning, and software download. The Catalyst 2924M XL DC switch provides a non-contending Ethernet interface for SONET/SDH gateway network elements (GNEs) to the Cisco 2610/2611/2621DC and Cisco 3662-DC-CO DCN access routers. Features such as switched 10/100 Mbps bandwidth, Cisco Switch Clustering Technology which allows the Catalyst 2924M XL DC to manage up to 16 interconnected Catalyst 2924M XL DC and 1924DC switches, and optional fiber module to satisfy ground isolation requirements between central office floors make the Catalyst 2924M XL DC switch a powerful DCN solution.

- **Points of Presence:** The Catalyst 2924M XL DC can be used by Internet Service Providers (ISPs) to inter-connect components in POPs that are provisioned with DC power. At distributed POPs, ISPs receive dial-up traffic from the CO and pass it onto routers, which then connect customers to the Internet. The Catalyst 2924M XL DC can be used to aggregate traffic from Access Servers to routers or to interconnect servers (for example, DNS servers, Billing Processing Servers) and other components (for example, Management agents, Routers) in the POP. Features such as switched 10/100 Mbps bandwidth and optional fiber connectivity make the Catalyst 2924M XL DC switch a powerful solution for ISPs.
- **Wireless/Mobile Switching Centers:** The Catalyst 2924M XL DC can be used by wireless companies to connect and manage components in Mobile Switching Centers (MSCs). Mobile Switching Centers aggregate wireless voice traffic from multiple wireless base stations. At each MSC, voice messaging, paging, network management components are housed. The Catalyst 2924M XL DC can be used to interconnect these components and connect them to central management applications. Features, such as switched 10/100 Mbps bandwidth, make the Catalyst 2924M XL DC switch a powerful solution for wireless communications companies.

### Cisco Switch Clustering Technology

The Catalyst 2924M XL DC features Cisco Switch Clustering technology. This breakthrough technology enables up to 16 interconnected Catalyst 2900 XL, 3500 XL, and 1900 switches, regardless of physical proximity, to form a single-IP managed network. Catalyst 2900 XL switches can be clustered using a broad range of connectivity options to meet customer requirements, including Fast Ethernet, Fast EtherChannel® technology, Gigabit Ethernet, Gigabit EtherChannel technology and the Cisco low-cost GigaStack GBIC. Because customers are not limited by proprietary stacking modules and stacking cables, Cisco Switch Clustering technology 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.

Catalyst 2900 XL switches can be configured either as command (with command software upgrade) or member switches in a Cisco switch stack or cluster. The command switch serves as the single IP address management point and disburses all management instructions dictated by the network administrator.

The Catalyst 2924M XL DC switch is an integral component of the complete line of Cisco end-to-end LAN solutions. Integrated Cisco IOS software provides superior functionality for network management, bandwidth aggregation, networked multimedia, and virtual LAN (VLAN) support. The Catalyst 2924M XL DC switch is upgradable via software, so your investment is protected if your network grows or changes.



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



#### Web-Based Switch Management: Cluster Manager Suite

The Catalyst 2924M XL DC features the Cisco Web-based management tool, Cluster Management Suite (CMS), which allows network administrators to view and manage the switch from anywhere on the network through a standard browser such as Microsoft Internet Explorer or Netscape Navigator. Launched from the switch itself, CMS delivers simple network- and device-level management, including port configuration, VLAN setup, network views, and port monitoring. CMS is an integral part of the Cisco scalable stacking architecture, allowing users to easily configure and manage stacks and switch clusters and to administer software upgrades across multiple switches.

#### Enterprise Edition Software

The Cisco Catalyst 2924M XL DC Enterprise Edition switch includes several exceptional features to increase network performance for users. Fast EtherChannel or Gigabit EtherChannel technology offers up to 800 Mbps or 4 Gbps of high-performance bandwidth between other Catalyst 2900 XL switches, servers, and other key network stations. Cisco Group Management Protocol (CGMP) enhances performance of multimedia applications and reduces network traffic by allowing a switch to selectively and dynamically forward IP multicast traffic to targeted end stations. Up to 64 port-based VLANs per switch allow data packets to be forwarded only to stations within a specific VLAN, creating a virtual

firewall between groups of ports on the network. CMS, a Web-browser interface, makes all Catalyst 2900 XL switches exceptionally easy to use and manage. CMS allows network administrators to view and manage the switch from anywhere on the network through a standard browser such as Microsoft Explorer or Netscape Navigator. Multilevel security on the switch console prevents unauthorized users from gaining access and altering the switch configuration. And auto-configuration eases deployment by automatically configuring multiple switches across a network from a single boot server.

The switch also has enhanced end-to-end VLAN trunk support to your Catalyst 2924M XL DC switch. VLAN trunks can be created from any port using either standards-based 802.1Q protocols or the Cisco Inter-Switch Link (ISL) VLAN architecture. Each Catalyst 2924M XL DC switch supports up to 64 VLANs to provide broadcast control, enhance network security, and simplify moves, adds, and changes. With this added feature set this switch can be in a network with enterprise-wide VLAN trunks spanning multiple Cisco routers, chassis switches, and access servers.

#### Key Features/Benefits

##### Outstanding Performance

- 24 10BaseT/100BaseTX autosensing ports deliver Fast Ethernet performance where it is needed most—to individual users, servers, and demanding workgroups—while preserving legacy 10BaseT connectivity.
- Full-duplex operation on switched 100BaseT 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 10BaseT/100BaseTX 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 10BaseT/100BaseTX or 100BaseFX 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.

#### **Flexible and Scalable Switch Clustering and Stacking**

- The GigaStack GBIC delivers a low-cost, independent stack bus with a 1 Gbps forwarding bandwidth in a daisy-chain configuration, with up to nine Catalyst 2924M XL DC switches (populated with a Gigabit Ethernet module), or a 2 Gbps forwarding rate in a point-to-point configuration.
- Cisco Switch Clustering allows a user to manage up to 16 interconnected Catalyst 3500 XL, 2900 XL, and 1900 switches through a single IP address, regardless of location.

#### **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 10BaseT/100BaseTX, two-port 100BaseFX, and four-port 100BaseFX modules for the Catalyst 2924M XL DC 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 transceivers that include multiple stacking options, short- and long-haul fiber, and copper connectivity (including SX, LX/LH, TX and Cisco GigaStack GBICs).

- For Gigabit Ethernet connectivity at an affordable price, Cisco's 1000BaseT 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.
- Visual Switch Manager, 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 10BaseT and 100BaseT 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 storm control prevents faulty end stations from degrading overall systems performance with broadcast storms.
- 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.
- Visual Switch Manager, 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 10BaseT/100BaseT 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.

### 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.
- Multilevel security on the console access prevents unauthorized users from altering the switch configuration.

### 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 10BaseT and 100BaseT ports
- IEEE 802.1D Spanning-Tree Protocol
- IEEE 802.3u 100BaseTX and 100BaseFX specification
- IEEE 802.3 10BaseT specification

#### Y2K

- Y2K compliant

#### Connectors and Cabling

- 10BaseT ports: RJ-45 connectors; two-pair Category 3, 4, or 5 unshielded twisted-pair (UTP) cabling
- 100BaseTX 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
- Dual-feed 48-volt DC power system, input voltage 40 to 72 volts, DC
- MTBF 164,528 hours

## Safety Certifications

- Bellcore GR-63 and GR-1089 NEBS Level 3 Compliance
- 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

- Limited lifetime warranty

## Ordering Information

### Model Numbers:

- WS-C2924M-XL-EN-DC

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  
[www.cisco.com](http://www.cisco.com)  
Tel: 408 526-4000  
800 553-NETS (6387)  
Fax: 408 526-4100

### European Headquarters

Cisco Systems Europe  
11, Rue Camille Desmoulins  
92782 Issy-les-Moulineaux  
Cedex 9  
France  
[www.cisco.com](http://www.cisco.com)  
Tel: 33 1 58 04 60 00  
Fax: 33 1 58 04 61 00

### Americas Headquarters

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

### Asia Pacific Headquarters

Cisco Systems Australia, Pty., Ltd  
Level 9, 80 Pacific Highway  
P.O. Box 469  
North Sydney  
NSW 2060 Australia  
[www.cisco.com](http://www.cisco.com)  
Tel: +61 2 8448 7100  
Fax: +61 2 9957 4350

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