

## Cisco Catalyst 4000 Series Enhances Control of Voice, Video, and Data Traffic for Converged Networks

The Cisco® Catalyst® 4000 Series integrates nonblocking Layers 2–4 switching with enhanced control, enabling business agility for enterprise and metropolitan Ethernet customers deploying Internet-based applications (Figure 1). As a component of Cisco AVVID (Architecture for Voice, Video and Integrated Data), the Cisco Catalyst 4000 Series extends control from the backbone to the network edge with intelligent network services, including advanced quality of service (QoS), scalable performance, comprehensive security, and simple manageability. The modular architecture, media flexibility, and expandability of the Cisco Catalyst 4000 Series enable a longer deployment life in converged networks, which reduces the overall cost of ownership by minimizing recurring operational expenses and improves return on investment (ROI).

The Cisco Catalyst 4500 Supervisor Engine IV (Figure 2) is backward-compatible with the Cisco Catalyst 4006 switch and delivers the intelligent network services and control required for a converged wiring closet, while offering high-performance Layers 3 and 4 switching capabilities to allow for deployment in small backbones or Layer 3 distribution points. The Supervisor Engine IV offers an extensive feature set with the simplicity of traditional LAN switching, multilayer services such as IP routing, advanced QoS, sophisticated traffic management, improved security, and simple management.

The Cisco Catalyst 4500 48-port 10/100/1000BASE-T Line Card (RJ-45) (Figure 2) delivers the industry's highest-density, triple-speed, autosensing 10/100/1000 connectivity from the network edge to the desktop. This new line card is affordable for every desktop in the enterprise. Now at the same port density as the 10/100 line card, the 10/100/1000 line card provides wiring-closet investment protection by allowing 10, 100, and 1000 Mbps on the same interface for flexibility and smooth migration to Gigabit Ethernet.

Figure 1  
Cisco Catalyst 4003 and  
4006





Figure 2  
Cisco Catalyst 4500 Series Supervisor Engine IV



#### Cisco Catalyst 4006 Series Switch

The Cisco Catalyst 4000 Series, now with two chassis alternatives and five supervisor engine alternatives, provides a common architecture that scales to 240 ports of 10/100 or 100BASE-FX Fast Ethernet, or 240 ports of 1000BASE-LX or 10/100/1000BASE-T Gigabit Ethernet. The Cisco Catalyst 4006 switch enhances the Cisco commitment to affordable enterprise and branch scalability, providing a cost-effective, flexible network solution that scales to meet today's high-performance needs with investment protection.



## Configuration Alternatives

The Cisco Catalyst 4000 Series with Supervisor Engine II-Plus, III, and IV; 10/100/1000 autosensing Fast Ethernet/Gigabit Ethernet; and 100-Mbps Fast Ethernet fiber line cards now offers an even more powerful and flexible network solution. This enables specific network configurations to be mixed and matched to meet the specific needs of any campus network (Table 1).

Table 1 Cisco Catalyst 4000 Series Port Densities

Cisco Catalyst 4000 Series Switching Modules	Number of Interfaces Supported per Line Card	Cisco Catalyst 4003 with Supervisor Engine I	Cisco Catalyst 4006 with Supervisor Engines II, II-Plus, III, or IV
Switched 10/100 Fast Ethernet (RJ-45)	32 or 48	96	240
Switched 10/100 Fast Ethernet (RJ-21)	48	96	240
Switched 100 Fast Ethernet (MT-RJ)	4, 24, or 48	96	240
Switched 1000 Gigabit Ethernet (fiber)	2, 6, 18, or 48	96	240
Switched 1000BASE-T Gigabit Ethernet	12, 24, or 48	96	240

Cisco Catalyst 4000 Series solutions now can be built with five powerful supervisor engine alternatives. Each provides a high-performance, centralized, shared-memory switch fabric, while protecting your line card investment by supporting the addition of optional higher-layer function engines (Table 2).

Table 2 Cisco Catalyst 4000 Series Supervisor Engine Features

Feature	Cisco Catalyst 4003 Supervisor Engine I	Cisco Catalyst 4006 Supervisor Engine II	Cisco Catalyst 4006 with Supervisor Engines II-Plus, III, and IV
Cisco Catalyst 4003 chassis support	Yes	No	No
Cisco Catalyst 4006 chassis support	No	Yes	Yes



Table 3 Cisco Catalyst 4000 Series SupervisorEngine Features

Feature	Cisco Catalyst 4003 Supervisor Engine I	Cisco Catalyst 4006 Supervisor Engine II	Cisco Catalyst 4006 with Supervisor Engines III and IV
<b>Switching fabric</b>	1 24-Gbps switching engine	3 24-Gbps switching engines	1 64-Gbps switching engine
<b>Switching throughput</b>	18 Mbps (Layer 2)	18 Mpps (Layer 3)	48 Mpps (Layer 2/3/4) Cisco Express Forwarding
<b>Multilayer switching</b>	Layer 2	Layer 2	Integrated Layer 2/3/4
<b>Dual Gigabit Ethernet uplinks</b>	No	Yes	Yes
<b>Operating system</b>	Cisco CatOS	Cisco CatOS	Cisco IOS® Software
<b>Maximum number of Media Access Control (MAC) addresses dynamically allocated between active ports</b>	16,384	16,384	32,768
<b>QoS</b>	System-based <ul style="list-style-type: none"> <li>• Classification</li> <li>• Scheduling</li> </ul>	System-based <ul style="list-style-type: none"> <li>• Classification</li> <li>• Scheduling</li> </ul>	Port-based <ul style="list-style-type: none"> <li>• Classification</li> <li>• Scheduling</li> <li>• Marking (class and type of service [CoS and ToS])</li> <li>• Dynamic Buffer Limiting (Congestion Avoidance) (Supervisor IV only)</li> </ul>
<b>Bandwidth management</b>	None	None	<ul style="list-style-type: none"> <li>• Policing (1024 ingress and egress policies)</li> <li>• Shaping and sharing</li> </ul>
<b>Access control lists (ACLs)</b>	Supported in hardware with Layer 3 services engine (IP only)	Supported in hardware with Layer 3 services engine (IP only)	Supported in hardware based on IP and MAC address
<b>Queues</b>	2	2	4
<b>Multicast</b>	<ul style="list-style-type: none"> <li>• Hardware-based Protocol Independent Multicast (PIM)</li> <li>• Cisco Group Management Protocol (GMP) client</li> </ul>	<ul style="list-style-type: none"> <li>• Hardware-based PIM</li> <li>• Cisco GMP client</li> </ul>	<ul style="list-style-type: none"> <li>• Hardware-based PIM</li> <li>• Cisco GMP server</li> <li>• Internet Group Management Protocol (IGMP) v1, v2, v3</li> <li>• IGMP snooping</li> <li>• Distance Vector Multicast Routing Protocol (DVMRP)</li> <li>• Source-Specific Multicast (SSM)</li> </ul>
<b>Removable compact flash</b>	No	No	Yes
<b>Hardware support for 4096 virtual LAN (VLAN) numbering</b>	Yes	Yes	Yes
<b>Environmental status of switch</b>	Yes	Yes	Yes



Table 4 Cisco Catalyst 4000 Series Supervisor Engine Features

Feature	Cisco Catalyst 4003 Supervisor Engine I	Cisco Catalyst 4006 Supervisor Engine II	Cisco Catalyst 4006 with Supervisor Engines II-Plus, III and IV
<b>Simple Network Management Protocol</b>	Yes	Yes	Yes
<b>NetFlow Services Card (Option)</b>	No	No	Yes (Supervisor IV)
<b>Remote Monitoring (RMON)</b>	Yes	Yes	Yes
<b>Per-VLAN Spanning Tree (PVST)</b>	Yes	Yes	Yes
<b>Console/Telnet Interface</b>	Yes	Yes	Yes
<b>Out-of-band management (RJ-45)</b>	10 Mbps	10/100 Mbps	10/100 Mbps
<b>Cisco Fast EtherChannel<sup>®</sup> and Gigabit EtherChannel technology across line cards</b>	Yes	Yes	Yes
<b>Fabric</b>	Store and forward	Store and forward	Store and forward
<b>Architecture</b>	Modular/shared memory	Modular/shared memory	Modular/shared memory

Note: For a more detailed list of Cisco Catalyst 4006 Supervisor Engine III and the Cisco Catalyst 4500 Series Supervisor Engine II-Plus and IV features, refer to the Cisco Catalyst 4000 and 4500 Supervisor Engine data sheets at:

[http://www.cisco.com/en/US/products/hw/switches/ps4324/products\\_data\\_sheets\\_list.html](http://www.cisco.com/en/US/products/hw/switches/ps4324/products_data_sheets_list.html)

Cisco Catalyst 4000 Series solutions can be built with two powerful chassis alternatives. Each provides enterprise-class functions (Table 5) with cost-effective pricing.



Table 5 Cisco Catalyst 4000 Series Chassis Features

Feature	Cisco Catalyst 4003 Chassis	Cisco Catalyst 4006 Chassis
Total number of slots	3	6
Supervisor Engine supported	Supervisor Engine I	Supervisor Engine II, II-Plus, III, or IV
Number of hot-swappable switching module slots	2	5
Switching modules supported	All (except WS-X4019)	All
Number of power-support bays	2	3
AC input power	Yes	Yes
DC input power	Yes	Yes
Integrated inline DC power	No	Yes
External inline power IP phone support	Yes	Yes
Minimum power supplies	1	2
Number of fan-tray bays	1	1
WAN Integration	Yes	Yes
Rack mount	Center, front	Center, front

The industry-proven Cisco IOS Software network service strategy spans years of customer-suggested evolution to meet the most demanding network needs. Networks benefit from the breadth and depth of these network services and mature protocols.

#### Configuration Flexibility and Modular Superiority

Cisco Catalyst 4003 and 4006 switches offer a comprehensive, scalable suite of 10/100/1000-Mbps Ethernet switch modules that deliver hot-swappable, “plug-and-play” enterprise intelligence today, while providing easy growth and flexible protection to keep pace with the increasing network demands of tomorrow. Several Cisco Catalyst 4000 Series modules are available, which can be mixed and matched to suit numerous wiring-closet, data-center, or branch-office deployments. All Gigabit Ethernet ports can be 1000BASE-SX, 1000BASE-LX/LH, or 1000BASE-ZX by using flexible, hot-swappable gigabit interface converter (GBIC) modules. The Cisco Catalyst 4000 Series supports the following switching modules:

- *48-port 10/100/1000-Mbps Gigabit Ethernet (RJ-45)—WS-X4548-GB-RJ45 (power-efficient) and WS-X4448-GB-RJ45*—This module, with multispeed autosensing, autonegotiating technology, provides wiring-closet investment protection by allowing Fast Ethernet desktops to migrate to Gigabit Ethernet in the future, without replacing the switch line cards. All 48 ports can be used at 10 Mbps, 100 Mbps, or 1000 Mbps up to 100 meters over Category 5 copper cabling. The 48 ports can burst to Gigabit Ethernet line rate and can share 12 Gbps of full-duplex bandwidth into the switching fabric. The amount of oversubscription can be controlled simply by varying the number of ports used at 1000 Mbps. All ports use the standard IEEE 802.3x flow-control (pause frame) mechanism to control Gigabit Ethernet host traffic.



- *48-port 10/100-Mbps Ethernet (RJ-45)—WS-X4148-RJ*—This module provides 48 ports of dedicated 10/100 Ethernet switching for Ethernet or Fast Ethernet client or server switching. All ports can use Cisco Fast EtherChannel® technology for higher-speed uplinks or server connections.
- *48-port 10/100-Mbps Ethernet with inline power (RJ-45)—WS-X4148-RJ45V*—The inline power 10/100BASE-T Ethernet switching module supports up to 48 ports per module (RJ-45 interfaces). Along with phone discovery, these modules support autosensing and autonegotiation to determine the speed and duplex mode of the attached device. The Cisco Catalyst 4003 uses the Cisco Catalyst Inline Power Patch Panel to provide inline power. The Cisco Catalyst 4006, with support for up to 240 multiservice ports, directly provides inline power. To support the new demand for phone power and WLANs, Cisco has developed a new auxiliary DC power shelf that supplies the Cisco Catalyst 4006 with the 48 volts needed for inline power.
- *48-port 100-Mbps Ethernet (RJ-21 telco)—WS-X4148-RJ21*—This module provides 48 ports of dedicated 100 Ethernet switching for Fast Ethernet client or server switching. All ports can use Cisco Fast EtherChannel technology for higher-speed uplinks or server connections.
- *Layer 3 Services Engine—32-port 10/100-Mbps Ethernet plus 2-port Gigabit Ethernet uplinks—WS-X4232-L3*—This module gives access to Layer 3 services to all Cisco Catalyst 4000 Series supervisor engines, delivering Layer 3 routing to the entire chassis. In addition, this module provides 32 ports of dedicated 10/100 Ethernet switching for Ethernet or Fast Ethernet client or server switching, along with 2 dedicated Gigabit Ethernet connections for Cisco Gigabit EtherChannel connection to a high-speed core or Gigabit Ethernet server connections. All 10/100 ports can use Cisco Fast EtherChannel technology for higher-speed uplinks or server connections.
- *Access Gateway Module—WS-X4604-GWY*—The Cisco Catalyst 4500 Access Gateway Module (AGM) integrates Cisco IOS Software routing and Cisco CallManager voice services into Cisco Catalyst 4000 Series switches. Combining the LAN and WAN infrastructure enables businesses to reduce network complexity, improve network deployment times, and prepare for voice, video, and data convergence.
- *48-port 100-Mbps Ethernet 100BASE-LX10 (MT-RJ)—WS-X4148-FX-MT*—The 48-port 100BASE-LX10 Fast Ethernet line card for single-mode fiber provides high-density connectivity for both residential and small business customers over distances up to 10 km. Fast Ethernet over single-mode fiber offers an attractive choice of cost and future performance; the same access fiber infrastructure can be Gigabit-enabled by upgrading the switching equipment.
- *24-port 100-Mbps Ethernet 100BASE-FX (MT-RJ)—WS-X4124-FX-MT*—This module provides 24 ports of dedicated 100 Fast Ethernet client or server switching. All ports can use Cisco Fast EtherChannel technology for higher-speed uplinks or server connections.
- *48-port 100-Mbps Ethernet 100BASE-FX (MT-RJ)—WS-X4148-FX-MT*—The 48-port line card (single-slot) is based on the same architecture as the 24-port 100BASE-FX line card with MT-RJ connectors. Both line cards offer the security and resiliency features of fiber-optic cable plants, optimizing them for networks with concerns for distance limitations, intrusion, or radio frequency interference. Government agencies or enterprise customers that process confidential information or offer e-commerce are optimal candidates for these line cards.



- *32-port 10/100-Mbps Ethernet plus 2-port Gigabit Ethernet uplinks—WS-X4232-GB-RJ*—This module provides 32 ports of dedicated 10/100 Ethernet switching for Ethernet or Fast Ethernet client or server switching, along with 2 dedicated Gigabit Ethernet connections for Cisco Gigabit EtherChannel connection to a high-speed core or Gigabit Ethernet server connections. All 10/100 ports can use Cisco Fast EtherChannel technology for higher-speed uplinks or server connections.
- *32-port 10/100-Mbps Ethernet BASE plus modular uplink support—WS-X4232-RJ-XX*—This module provides 32 ports of dedicated 10/100 Ethernet switching for Ethernet or Fast Ethernet client or server switching. Optional uplink daughter cards provide 4-port 100BASE-FX multimode fiber connections when attached to the 32-port 10/100BASE card. All ports can use a Cisco EtherChannel connection to connect to a high-speed core or Gigabit Ethernet server. All 10/100 ports can use Cisco Fast EtherChannel technology for higher-speed uplinks or server connections.
- *4-port 100-Mbps Fast Ethernet uplink module—WS-U4504-FX-MT*—This daughter-card option provides 4 ports of dedicated 100 Fast Ethernet (multimode) switching for client or server switching (requires the 32-port 10/100-Mbps Ethernet BASE card).
- *2-port Gigabit Ethernet (GBIC slot)—WS-X4302-GB*—This module provides two ports of dedicated 1000BASE-X Gigabit Ethernet uplinks for high-speed backbone switch-to-switch applications or smaller server-farm applications. It uses versatile GBIC technology, allowing intrabuilding multimode connections to be intermixed with long-distance campus single-mode connections. All ports can use Cisco Gigabit EtherChannel technology for high-speed interconnection applications.
- *6-port Gigabit Ethernet (GBIC slot)—WS-X4306-GB*—This module provides six ports of dedicated 1000BASE-X Gigabit Ethernet uplinks for high-speed backbone switch-to-switch applications or smaller server-farm applications. It uses versatile GBIC technology, allowing intrabuilding multimode connections to be intermixed with long-distance campus single-mode connections. All ports can use Cisco Gigabit EtherChannel technology for high-speed interconnection applications.
- *18-port Gigabit Ethernet (GBIC slot)—WS-X4418-GB*—This module is targeted specifically at building cost-effective 1000BASE-X Gigabit Ethernet server farms, rather than backbone switch-to-switch applications. It provides 2 dedicated Gigabit Ethernet uplinks, and up to 16 ports per module for high-performance Gigabit Ethernet server connectivity. The 16 server ports can burst to Gigabit Ethernet line rate and share 8 Gbps of full-duplex bandwidth into the switching fabric. Because all ports use GBICs, the amount of oversubscription can be controlled simply by varying the number of GBICs used. The server ports use the standard IEEE 802.3x flow-control (pause frame) mechanism to control Gigabit Ethernet host traffic.
- *48-port 1000BASE-LX Gigabit Ethernet module (small form-factor pluggable [SFP])—WS-X4448-GB-LX*—This module is targeted specifically at Ethernet in the First Mile (EFM) opportunities. It can provide up to 240 ports of IEEE 802.3z 1000BASE-LX per Cisco Catalyst 4000 Series switch, allowing service providers to run point-to-point Gigabit Ethernet fiber links over single-mode fiber within the access/distribution layer of the network. The module includes 48 1000BASE-LX SFP optics preloaded at the factory.
- *24-port 10/100/1000BASE-T module (RJ-45)—WS-X4424-GB-RJ45*—This module, with multispeed autosensing, autonegotiating technology, provides wiring-closet and server-farm investment protection by allowing Fast Ethernet desktops and servers to migrate to Gigabit Ethernet in the future without replacing the switch line cards. All 24 ports can be used at 10 Mbps, 100 Mbps, or 1000 Mbps up to 100 meters over Category 5 copper cabling. The 24 ports can burst to Gigabit Ethernet line rate and share 12 Gbps of full-duplex



bandwidth into the switching fabric. The amount of oversubscription can be controlled simply by varying the number of ports used at 1000 Mbps. All ports use the standard IEEE 802.3x flow-control (pause frame) mechanism to control Gigabit Ethernet host traffic.

## Technical Specifications for the Cisco Catalyst 4000 Series

Table 6 Cisco EtherChannel Technology

	Cisco Catalyst 4003 Supervisor Engine I	Cisco Catalyst 4006 Supervisor Engine II	Cisco Catalyst 4006 Supervisor Engine III
<b>Cisco EtherChannel Technology</b>	All 10-Mbps ports	All 10-Mbps ports	All 10-Mbps ports
<b>Cisco Fast EtherChannel technology</b>	All 10/100-Mbps ports; all 100-Mbps ports	All 10/100-Mbps ports; all 100-Mbps ports	All 10/100-Mbps ports; all 100-Mbps ports
<b>Cisco Gigabit EtherChannel technology</b>	All 1000-Mbps ports	All 1000-Mbps ports	All 1000-Mbps ports
<b>Port Aggregation Protocol (PAgP)</b>	Yes	Yes	Yes
<b>Number of ports per tuple</b>	8	8	8
<b>Cisco EtherChannel technology access line cards</b>	Yes	Yes	Yes

Table 7 Cisco Catalyst Supervisor Engine Memory Specifications

Specification	Cisco Catalyst 4003 Supervisor Engine I	Cisco Catalyst 4006 Supervisor Engine II	Cisco Catalyst 4006 with Supervisor Engine III and IV
<b>Packet Memory</b>	Shared (dynamically allocated) 8 MB	Shared (dynamically allocated) 8 MB per engine	Shared (dynamically allocated) 16 MB
<b>NVRAM</b>	512 kB	1 MB	512 kB
<b>Compact Flash</b>	12 MB	16 MB	64 MB (on board; in addition to compact Flash)
<b>SDRAM</b>	64 MB	64 MB	256 MB
<b>CompactFlash card option</b>	No	No	Yes, 64- and 128-MB options



Table 8 Cisco Catalyst Supervisor Engine Indicator and Port Specifications

Specification	Cisco Catalyst 4003 Supervisor Engine I	Cisco Catalyst 4006 Supervisor Engine II	Cisco Catalyst 4006 with Supervisor Engine II-Plus, III, and IV
<b>Gigabit uplinks</b>	None	2	2
<b>System status</b>	Green (operational)/red (faulty)	Green (operational)/red (faulty)	Green (operational)/red (faulty)
<b>Switch utilization lead</b>	1-to 100-percent aggregate switching usage	1-to 100-percent aggregate switching usage	1-to 100-percent aggregate switching usage
<b>Console</b>	DB-25 female	RJ-45 female	RJ-45 female
<b>Management port</b>	10BASE-T, RJ-45 female	10/100BASE-TX; RJ-45 female	10/100BASE-TX; RJ-45 female

Table 9 Cisco Catalyst Supervisor Engine Software Requirements

Specification	Cisco Catalyst 4003 Supervisor Engine I	Cisco Catalyst 4006 Supervisor Engine II	Cisco Catalyst 4006 Supervisor Engine III
<b>Software requirements</b>	Cisco Catalyst 4000 Series Supervisor Engine Software Version 4.4(x) or higher	Cisco Catalyst 4000 Series Supervisor Engine Software Version 5.4(x) or higher	Cisco IOS Software for the Cisco Catalyst 4000 Series Version 12.1(8a)EW or higher

Table 10 Gigabit Ethernet Link Distances

Fiber Core	62.5_m Multimode	50_m Multimode	9/10_m Single-Mode
<b>Fiber modal bandwidth</b>	160/500 MHz-km 200/500 MHz-km	400/400 MHz-km 500/500 MHz-km	—
<b>1000BASE-SX</b>	220 m 275 m	500 m 550 m	—
<b>1000BASE-LX/1.H</b>	550 m 550 m	550 m 550 m	10 km
<b>1000BASE-ZX</b>	n/a	n/a	70 to 100 km



Table 11 Standard Network Protocols

Standard	Cisco Catalyst 4003 Supervisor Engine I	Cisco Catalyst 4006 Supervisor Engine II	Cisco Catalyst 4006 Supervisor Engine III
<b>Ethernet</b>	IEEE 802.3, 10BASE-T	IEEE 802.3, 10BASE-T	IEEE 802.3, 10BASE-T
<b>Fast Ethernet</b>	IEEE 802.3 , 100BASE-TX	IEEE 802.3 , 100BASE-TX	IEEE 802.3 , 100BASE-TX
<b>Fast Ethernet</b>	IEEE 802.3, 100BASE-FX	IEEE 802.3, 100BASE-FX	IEEE 802.3, 100BASE-FX
<b>Gigabit Ethernet</b>	IEEE 802.3z, IEEE 802.3x, IEEE 802.3ab	IEEE 802.3z, IEEE 802.3x, IEEE 802.3ab	IEEE 802.3z, IEEE 802.3x, IEEE 802.3ab
<b>1000BASE-X (GBIC)</b>	<ul style="list-style-type: none"> <li>• 1000BASE-SX</li> <li>• 1000BASE-LX/LH</li> <li>• 1000BASE-ZX</li> </ul>	<ul style="list-style-type: none"> <li>• 1000BASE-SX</li> <li>• 1000BASE-LX/LH</li> <li>• 1000BASE-ZX</li> </ul>	<ul style="list-style-type: none"> <li>• 1000BASE-SX</li> <li>• 1000BASE-LX/LH</li> <li>• 1000BASE-ZX</li> </ul>
<b>VLAN trunking/tagging</b>	IEEE 802.3ad IEEE 802.1Q	IEEE 802.3ad IEEE 802.1Q	IEEE 802.3ad <sup>1</sup> IEEE 802.1Q
<b>Spanning-Tree Protocol</b>	IEEE 802.1D IEEE 802.1w IEEE 802.1s	IEEE 802.1D IEEE 802.1w IEEE 802.1s	IEEE 802.1D IEEE 802.1w <sup>1</sup> IEEE 802.1s <sup>1</sup>
<b>Security</b>	IEEE 802.1x	IEEE 802.1x	IEEE 802.1x <sup>1</sup>

1. Supported in future software release

## Network Management

- CiscoWorks Network Management Suite and Resource Manager Essentials support, including:
  - Inventory manager
  - Change audit
  - Device configuration manager
  - Software image manager
  - Availability manager
  - Syslog analyzer
  - Cisco management connection
- CiscoWorks Network Management Suite and CiscoWorks for Switched Internetworks. Campus support, including:
  - Network topology discovery and display services
  - VLAN provisioning and logical display representation
  - Traffic monitoring and performance assessment
  - End-station tracking with search utilities
  - CiscoView graphical device management
  - Network topology integrity checking
  - Cisco Discovery Protocol
  - Cisco Virtual Trunking Protocol (VTP)



- Simple Network Management Protocol (SNMP) agent Version 1 (RFCs 1155–1157)
- SNMP Version 2c
- 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)
- RMON II (RFC 2021)
- Interface table (RFC 1573)
- Bridge MIB (RFC 1493)
- Switched Port Analyzer (SPAN)
- Enhanced Switched Port Analyzer (ESpan)
- Port snooping and connection steering
- Text-based command-line interface (CLI) based on the familiar Cisco Catalyst 5000 Series interface
- Standard Cisco IOS Software security capabilities: passwords and TACACS+
- Telnet, Trivial File Transfer Protocol (TFTP), and BOOTP for management access

#### Power Supply Indicators and Interfaces

- Fan cooling: Integrated in hot-insertion/hot-extraction unit
- Good: Green (good)
- Fail: Red (faulty)
- SNMP MIB supported

#### Physical Specifications—Cisco Catalyst 4003 Chassis

- Dimensions (H x W x D): 10.5 x 17.25 x 12 in. (26.6 x 43.7 x 30 cm)
- Six rack units high
- Minimum weight: 27.5 lb (12 kg)
- Maximum weight: 40 lb (18 kg)
- Mounting: 19-in. rack compatible (rack and cable guide hardware included)

#### Physical Specifications—Cisco Catalyst 4006 Chassis

- Dimensions (H x W x D): 15.75 x 17.25 x 12 in. (40 x 43.7 x 30 cm)
- 10 rack units high
- Minimum weight: 40 lb (18 kg)
- Maximum weight: 54 lb (24 kg)
- Mounting: 19-in. rack compatible (rack and cable guide hardware included)



#### AC Power Requirements (per power supply)

- Input current:
  - 6.0A maximum @ 100 VAC 60 Hz (10 percent)
  - 3.0A maximum @ 200 VAC 50 Hz (10 percent)
- Output current: 12V @ 33.3A maximum
- KVA rating: 0.58 KVA
- Output power: 400W per power supply
- Heat dissipation: 530W (1800 BTUs per hour)
- Holdup time: 20 ms

#### DC Power Requirements (per power supply)

- Input current:
  - 11.6A maximum @ -48 VDC
  - 9.3A maximum @ -60 VDC
- Output current: +12V @ 33.3A maximum
- KVA rating: 0.56 KVA
- Output power: 400W per power supply
- Heat dissipation: 555W maximum (1900 BTUs per hour)
- Holdup time: 8 ms

#### 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 percent, noncondensing
- Operating altitude: -60 to 4000 m



## Regulatory Standards Compliance

Table 12 Regulatory Standards Compliance

Specification	Standard
<b>Regulatory Compliance</b>	Products bearing the CE mark indicate compliance with the 1999/5/EEC directives, which include the following safety and EMC standards:
<b>Safety</b>	UL 1950 CAN/CSA-C22.2 No. 950 EN 60950 IEC 60950 TS 001 AS/NZS 3260
<b>EMC</b>	FCC Part 15 (CFR-47) Class A ICES-003 Class A EN55022 Class A CISPR22 Class A AS/NZS 3548 Class A VCCI Class A EN55022 AA/NZS 3548 Class A
<b>Industry EMC, Safety, and Environmental Standards</b>	GR-63-Core NEBS Level 3 GR-1092-Core Level 3 ETS 300-019 Storage Class 1.1 ETS 300-019 Transportation Class 2.3 ETS 300-019 Stationary Use Class 3.1 ETS 300 386
<b>Telecom (E1)</b>	CTR 12/13 CTR-4 ACA TS016
<b>Telecom (T1)</b>	FCC Part 68 Canada CS-03 JATE Green Book

### Warranty

The warranty for the Cisco Catalyst 4000 Series is 90 days; it includes hardware replacement with a 10-day turnaround from return to manufacturer authorization (RMA).

### Service and Support

Cisco offers life-cycle service and support for the Cisco Catalyst 4000 Series directly and for resale through Cisco distributors. From implementation to operation and optimization, Cisco offers advanced services and technical support.

## Advanced Services

Cisco Total Implementation Solutions (TIS) offers many implementation solutions, including project management, project engineering, configuration, staging and rollout coordination, and ensuring correct installation and deployment. For more information on Cisco TIS, visit:

[http://www.cisco.com/en/US/products/svcs/ps11/services\\_segment\\_category\\_home.html](http://www.cisco.com/en/US/products/svcs/ps11/services_segment_category_home.html)

## Technical Support Services

Cisco SMARTnet<sup>®</sup> support augments the resources of your operations staff by providing them with access to online and telephone expertise, including the ability to refresh system software at will, and several hardware Advance Replacement options. Cisco SMARTnet Onsite support provides all Cisco SMARTnet services

and complements the hardware Advance Replacement feature by adding the services of a field engineer—services that can be critical for locations where staffing is insufficient or unavailable to perform parts-replacement activities. For more information on Cisco SMARTnet support, visit:

[http://www.cisco.com/en/US/products/svcs/ps3034/serv\\_category\\_home.html](http://www.cisco.com/en/US/products/svcs/ps3034/serv_category_home.html)

For more information on Cisco products, contact:

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