

# 3Com® Switch 4007



*Enterprise switching for small and medium businesses offers simplicity without compromising performance*



The 3Com Switch 4007 offers a straightforward backbone-in-a-box, high-speed LAN solution.

## Key Benefits

- Aggregate wiring closet solutions in one compact modular chassis
- Simplified installation with four preconfigured base systems
- Easy setup with the Installation Wizard and simplified administration with built-in Web-based management and the Transcend® Network Supervisor
- Nonstop network availability for mission-critical operations with hardware redundancy and software resilience features
- Mission-critical and time-sensitive applications with implementation of policy-based Class of Service/Quality of Service (CoS)/(QoS) from the edge through the LAN core

Network managers in small and medium commercial businesses are under tremendous pressure to create more powerful, adaptable, intelligent, and reliable local area networks (LANs), because they must support a wealth of new, converged e-business applications as well as a greater diversity of users. With limited IT resources at their disposal, the key to success in choosing, implementing, and managing networks is radical simplicity.

The 3Com® Switch 4007 offers a straightforward backbone-in-a-box, high-speed LAN solution to meet the needs of today's small and medium commercial businesses. With the 3Com Switch 4007, your business can support new applications, provide guaranteed network availability, and ensure access to the network

from anywhere. Most importantly, the Switch 4007 can support your business quickly, thanks to its straightforward, preconfigured, yet customizable chassis packages that give you the advantages of rapid implementation and network control.

The Switch 4007 is designed with the flexibility to support you where you need it most—as the ideal backbone or aggregator for SuperStack® II switches. The Switch 4007 lets you localize, prioritize, and secure traffic flows to serve user needs and adapt quickly to growth and change. For more demanding networks, the Switch 4007 not only delivers superior capacity and control, it also ensures a high level of network availability with hardware redundancy and software resilience features.

# Switches

## The Switch 4007 Platform

The Switch 4007 system is available in four preinstalled configurations. Each preinstalled system includes a Switch 4007 chassis, one power supply, one management module, one switch fabric, two I/O modules, and four empty payload slots. Each Switch 4007 system can be further tailored to specific network needs with the addition of I/O modules.

The 3Com Switch 4007 provides a comprehensive, yet simplified management solution. Shipped in four base configurations, the Switch 4007 is designed to provide Layer 2 and Layer 3 support for Gigabit Ethernet and Fast Ethernet aggregation, and can easily scale to support from 100 to 1,000 users. The Switch 4007 also includes easy-to-use network management tools such as Transcend® Network Supervisor for monitoring, support, and troubleshooting.

Now you can scale your backbone as your business grows and your requirements change. For increased reliability and scalability, you can further customize the Switch 4007 with a redundant power supply and management module, as well as add optional I/O modules. The Switch 4007 can support up to 216 Ethernet/Fast Ethernet ports or up to 54 Gigabit Ethernet ports.

Network managers can reduce their operational expenses. For example, at the device level, the Switch 4007 combines a distributed agent model with a unifying management module that presents the switch as a single system (with a single IP address) to the network administrator. Also, the switch provides network managers with the throughput and capacity they need to support mission-critical applications, provide service to an expanding base of users, and integrate real-time traffic, such as Voice-over-IP (VoIP) and videoconferencing—without impacting overall network performance.

### Class of Service/Quality of Service (CoS)/(QoS)

Today's networks need more than just raw bandwidth. During peak periods when congestion can create a bottleneck, network managers must have a

dependable mechanism for prioritizing traffic to ensure that critical applications are given a higher priority than less critical applications. Prioritization capabilities in the Switch 4007 allow the network to support latency-dependent applications.

The Switch 4007 provides extensive CoS/QoS capabilities for distinguishing between mission-critical or real-time streams and applications of lesser priority. For example, the Switch 4007 supports the IEEE 802.1p standard, so that the switch recognizes the priority tags assigned to individual packets and places them in weighted queues based on their respective priorities. Upper-layer traffic prioritization, a long-time feature of efficient WAN routing, has been much less useful in the LAN because router-based packet processing could not keep pace with the wire speeds of today's high-performance networks. The Switch 4007, however, can analyze the upper layer information in IP packets and apply traffic priorities instantly.

This intelligent management of mission-critical and time-sensitive applications allows the Switch 4007 to meet the varied applications of next-generation networks.

### Achieve Greater Control and Flexibility

The Switch 4007 gives network managers the widest variety of capabilities to control traffic flows to optimize service to users. At the logical level, the Switch 4007 provides IEEE 802.1Q VLAN (virtual local area network) support, which enables managers to localize and secure workgroup traffic. The system also supports port- and protocol-based VLANs. Full IP, IPX, and AppleTalk routing enables Layer 3 segmentation and secure communications between domains. Using the switch's upper layer awareness, comprehensive packet filtering capabilities can be used to manage traffic by Media Access Control (MAC) address, application socket number, and more.

The Switch 4007 is designed to deliver multicast traffic more efficiently through support of important traffic management features such as IGMP snooping. IGMP snooping contains broadcast propagation for IP multicast

sessions and sends the traffic only to those ports participating in active multicast sessions. By combining traffic queuing and 802.1p prioritization with IGMP snooping, multimedia and other high-bandwidth services can be delivered over the network at acceptable performance levels, without absorbing a disproportionate share of the available bandwidth.

### Deliver Continuous Application Availability

The Switch 4007 delivers high availability for mission-critical networks by building in reliability at both the device and network levels.

- At the device level, the Switch 4007 features distributed processing for switching and management so that traffic forwarding and management processes do not rely on any single component. Full redundancy with subsecond failover is provided for critical components such as management modules, power supplies, and fans—ensuring continuous operation in the event of failure. Hot-swappable media and management modules, power supplies, and fans guard against interruptions during component insertion or removal.
- At the network level, the system offers resilient and load-sharing links, plus automatic switchover capabilities inherent to standard protocols, including Spanning Tree Protocol (STP), Open Shortest Path First (OSPF), and Virtual Router Redundancy Protocol (VRRP).

Link aggregation (trunking) support, available on all Ethernet network interfaces, allows a group of ports to form a high-bandwidth, fault-tolerant logical pipe between switches. The Switch 4007 Layer 2 and multilayer switch modules support trunked port groupings of six and eight, respectively. Traffic load is shared over the ports in a group. A trunked port group is treated as one logical port with respect to STP, filtering, and VLAN membership.

## Architectural Overview

Each 7-slot Switch 4007 chassis is configured with a switch fabric, power supply, management module, and two I/O modules (4 slots available for expansion). Additional media modules, a redundant power supply, and a redundant management module may be added to the system, allowing network managers to customize their switching system to meet their network requirements.

Additionally, the Switch 4007 I/O modules are completely compatible with the CoreBuilder® 9000 chassis. In turn, the equivalent I/O modules existing in the CoreBuilder 9000 switch can be used with the Switch 4007.

## Management Subsystem

At the device level, the Switch 4007 is based on a distributed agent model, in which switch fabrics, media cards, and other device level components host individual 3Com SmartAgent® intelligent agents that have been specifically optimized for each host device. These embedded management agents support extensive standard and system level Simple Network Management Protocol (SNMP) Management Information Bases (MIBs), enabling the Switch 4007 to manage detailed information, such as buffer management figures, and transmit traffic statistics, switch/router status information, and more. The dis-

tributed agents also allow the switch to make control decisions independently of a centralized management application, for example, to take local action when detecting network events, or to call on a specialized resource such as an RMON (Remote Monitoring) probe. This flexible, distributed agent model provides the following advantages:

- In the event of a device failure, overall system manageability remains unaffected.
- Because the management processing burden is distributed, new devices can be added without imposing a processing penalty on other components.

An HTTP server is embedded in each distributed agent, providing browser-based management in addition to the full-featured command line interface (CLI). Web-based management offers an intuitive graphical user interface (GUI), and, like the CLI over Telnet, can be performed from anywhere in the network.

A single point of contact, the Enterprise Management Entity (EME), integrates the agents and presents the switch as a unified system while retaining all the benefits of the distributed model. In addition to providing a unifying interface to the distributed elements of the switch, the EME provides the following capabilities:

- Serves as the access point for SNMP applications, Web browsers,

Telnet sessions, and other management tools.

- The device agents automatically register with the EME to obtain system services when new hardware devices are added to the switch.
- Downloads/uploads configuration files.
- Supports system controller functionality to manage system timing, power supply operation, and environmental conditions.

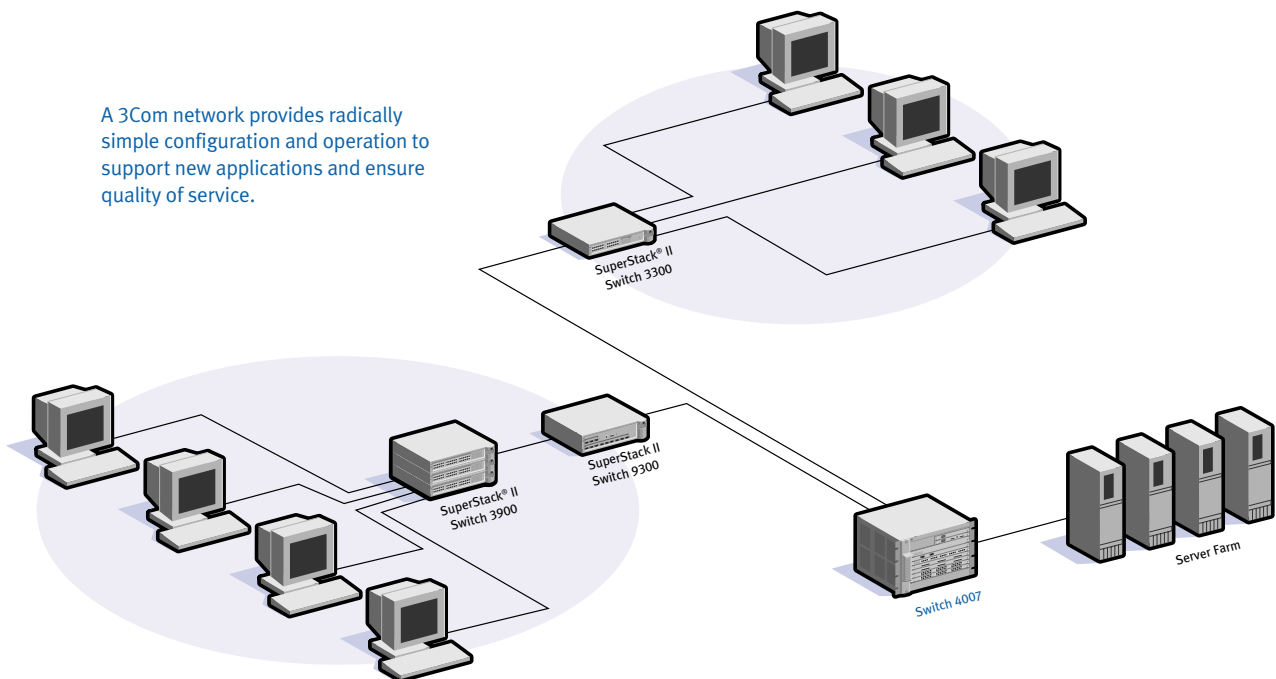
The Switch 4007 chassis accommodates two EME modules for full redundancy.

## Switch Fabric Design

The Switch 4007 supports two switch fabrics.

- The 18 Gbps switch fabric is optimized for high-density wiring closets, providing six internal full-duplex Gigabit Ethernet ports for backplane switching and three external full-duplex Gigabit Ethernet ports that can be used for high-capacity downlinks or local server connectivity.
- The 48 Gbps switch fabric is optimized for the network backbone and data center, providing 24 internal full-duplex Gigabit Ethernet ports for backplane switching.

A 3Com network provides radically simple configuration and operation to support new applications and ensure quality of service.



## Modules at a Glance

### Layer 2 Gigabit Ethernet Modules

#### Layer 2 Gigabit Ethernet Modules

Port Quantity per Module	Media	Connectors	Maximum Density of Wire-Speed Ports
9	1000BASE-SX	SC	54
4	1000BASE-X	GBIC-based	24

#### Layer 2 Fast Ethernet Modules

Port Quantity per Module	Media	Connectors	Maximum Density of Wire-Speed Ports
20	100BASE-FX	MT-RJ	120
36	10/100BASE-TX	RJ-45/RJ-21	216

#### MultiLayer Switch Modules

Port Quantity per Module	Media	Connectors	Maximum Density of Wire-Speed Ports
12	10/100BASE-TX	RJ-45	72
4	1000BASE-X	GBIC-based	24

## MultiLayer Switch Modules

The Switch 4007 MultiLayer Switch (MLS) modules provide media rate routing and switching with extensive CoS/QoS capabilities for Ethernet, Fast Ethernet, and Gigabit Ethernet ports. These modules deliver routing services simultaneously through all front-panel ports and through the backplane to other modules in the chassis. The MLS modules are available with 12 10/100BASE-TX ports, or 4 1000BASE-X ports with GBICs.

### MultiLayer Switch Modules—Services and Features

- IP, IPX, and AppleTalk routing using RIP, RIP2, and OSPF protocols
- Media rate IP and IPX routing on Fast Ethernet and Gigabit Ethernet
- Link aggregation up to 8 load-sharing ports
- VLANs based on port, protocol, and standard IEEE 802.1Q, including GVRP
- IEEE 802.1p priorities (four priority queues)

- Extensive route filtering
- Import and export policies for IP and IPX
- Hardware-based filtering for various packet types
- IGMP routing and IGMP snooping for multicast traffic control
- VRRP (for Fast Ethernet, Gigabit Ethernet, and FDDI)
- RSVP (Resource Reservation Protocol)
- SNMP and Web Management
- QoS Time-of-Day Policies, including SNTP (Simple Network Time Protocol)
- RMON-1 and RMON-2 support

## Layer 2 Modules

The Layer 2 switching modules support both high-density Ethernet/Fast Ethernet switching and Gigabit Ethernet switching. The Ethernet/Fast Ethernet modules support SX and FX cabling while the Gigabit modules support SX and LX configurations. All Gigabit Ethernet modules are compliant with the IEEE 802.3z standard.

### Layer 2 Modules—Services and Features

- Full-duplex or half-duplex (Fast Ethernet only) operation and flow control with standard IEEE 802.3x
- IEEE 802.1D-compliant Layer 2 switching, including Spanning Tree Protocol
- Broadcast/multicast throttling
- Link aggregation (trunking) of up to 6 load-sharing ports
- Up to 127 VLANs based on port, protocol, and standard IEEE 802.1Q
- CoS via Layer 2 priority queuing and IEEE 802.1p
- IGMP snooping
- Four groups of RMON
- Hot standby resilient links

### Summary of Switch 4007 Characteristics

- Backplane capacity of 120 Gbps (passive, full duplex)
- 6 payload slots
- 1 switch fabric slot
- 2 slots for redundant management modules
- Distributed processing architecture
- Hot-swappable power supplies (N+1)
- Power management system

## Switch 4007 Base Configurations

Layer 2 Gigabit Ethernet	<ul style="list-style-type: none"> <li>• 7-slot Switch 4007 chassis with 48 Gbps switch fabric, single management module, and power supply</li> <li>• 18 Gigabit ports:             <ul style="list-style-type: none"> <li>– Two 9-port Gigabit Ethernet modules (1000BASE-SX)</li> </ul> </li> <li>• 4 empty payload slots, expandable to 54 Gigabit ports</li> </ul>
Layer 3 Gigabit Ethernet	<ul style="list-style-type: none"> <li>• 7-slot Switch 4007 chassis with 48 Gbps switch fabric, single management module, and power supply</li> <li>• 13 Gigabit ports:             <ul style="list-style-type: none"> <li>– One 4-port Gigabit Ethernet MultiLayer Switch module (GBIC)</li> <li>– One 9-port Gigabit Ethernet module (1000BASE-SX)</li> </ul> </li> <li>• 4 empty payload slots, expandable to 49 Gigabit ports</li> </ul>
Layer 3 Fast Ethernet TX	<ul style="list-style-type: none"> <li>• 7-slot Switch 4007 chassis with 18 Gbps switch fabric with three GBIC slots for uplinks, single management module, and power supply</li> <li>• 48 10/100BASE-TX and 3 Gigabit Ethernet ports:             <ul style="list-style-type: none"> <li>– One 12-port Fast Ethernet MultiLayer Switch module (RJ-45)</li> <li>– One 36-port Fast Ethernet module (RJ-45)</li> <li>– Three GBIC slots on the switch fabric for Gigabit Ethernet ports</li> </ul> </li> <li>• 4 empty payload slots, expandable to 192 Fast Ethernet ports</li> </ul>
Layer 3 Fast Ethernet FX	<ul style="list-style-type: none"> <li>• 7-slot Switch 4007 chassis with 18 Gbps switch fabric with three GBIC slots for uplinks, single management module, and power supply</li> <li>• 32 Fast Ethernet (TX and FX) and 3 Gigabit Ethernet ports:             <ul style="list-style-type: none"> <li>– One 12-port MultiLayer Fast Ethernet Switch module (RJ-45)</li> <li>– One 20-port Fast Ethernet module (MT-RJ)</li> <li>– Three GBIC slots on the switch fabric for Gigabit Ethernet ports</li> </ul> </li> <li>• 4 empty payload slots, expandable to 112 Fast</li> </ul>

### Port Densities

Gigabit Ethernet ports: 54

10/100 Mbps Ethernet ports: 216

### Indicators

Switch fabric modules: PCMCIA status, control terminal status, and module status

Interface ports: link status, fail, and activity

Chassis unit: power, fail, and activity

Power supply: power on/off

EME status display: chassis, EME, PSU, and fans

### Management Characteristics

#### Management Functionality

SNMP and Telnet support

Multiple agents with single management entry point

Web-based management

RMON-1, RMON-2

RAP (Roving Analysis Port)

Statistics gathering and reporting

#### Management Interfaces

10BASE-T (RJ-45) Ethernet

RS-232 (DB-9) control port

#### Management Applications

Transcend Network Supervisor

## Specifications

### Dimensions and Weight

Height: 30.98 cm (12.2 in)  
 Width: 48.26 cm (19 in)  
 Depth (with AC power supply): 51.05 cm (20.7 in)  
 Weight (base): 18.14 kg (40 lb)  
 Weight (fully loaded with AC power supply): 38.55 kg (85 lb)

### Power Specifications

930 W AC Power Supply  
 Power consumption: 930 W  
 Input voltage: 90-264 VAC autoranging  
 Operating frequency: 47-63 Hz  
 Maximum current: 15.5 A at 100 VDC; 7.8 A at 200 VDC

### Maximum Power Consumption

2,860 W (9,724 BTU/hour)

### Environmental Ranges

Operating temperature: 0° to 50°C (32° to 122°F)  
 Operating humidity: 10% to 90% noncondensing  
 Storage temperature: -40° to 66°C (-40° to 117°F)  
 Storage humidity: 10% to 90% noncondensing

### Switching Performance

Gigabit Ethernet fabric capacity: 18 and 48 Gbps (aggregate)

### Industry Standards Supported

#### Administration Protocols

UDP (RFC 768)  
 IP (RFC 791)  
 ICMP (RFC 792)  
 TCP (RFC 793)  
 ARP (RFC 826)

#### Ethernet Protocols

IEEE 802.1d  
 IEEE 802.3  
 IEEE 802.3z  
 IEEE 802.3x  
 IEEE 802.1Q  
 IEEE 802.1p

#### MIBs Supported

MIB II (RFC 1213)  
 SNMP MIB  
 Bridge MIB (RFC 1493)  
 Entity MIB (RFC 2037)  
 Ethernet MIB (RFC 1398)  
 Source Routing MIB  
 VRRP MIB  
 RMON MIB (RFC 1757)  
 FDDI SMT MIB  
 RMON-1 (up to 7 groups)  
 RMON-2 (6 groups)  
 OSPF MIB  
 IGMP MIB  
 Router MIB  
 ATOM MIB  
 LEC MIB  
 Interface MIB (RFC 1573)

### Agency Approvals

Electromagnetic Compatibility  
 FCC Part 15 Class A (EN 55022 Class A)  
 EN 50082-1  
 ICES 003 Class A  
 VCCI Class A  
 AS/NZS 3548 Class A  
 EN 61000-3-2  
 EN 61000-3-3

### Safety

EN/IEC 60950  
 UL 1950  
 CSA 22.2 No. 950  
 EN/IEC 60825  
 FDA 21 CFR 1040

## Ordering Information

### Preconfigured Chassis

Layer 2 Gigabit Ethernet Aggregator	3C16810
Layer 3 Gigabit Ethernet Aggregator	3C16811
Layer 3 Fast Ethernet Aggregator (copper)	3C16815
Layer 3 Fast Ethernet Aggregator (fiber)	3C16816

### I/O Modules

4-port Gigabit MultiLayer Switch Module (GBIC)	3CB9RG4
4-port Gigabit Ethernet I/O Module (GBIC)	3CB9LG4
9-port 100BASE-SX Gigabit Ethernet Switch Module (MMF, SC connectors)	3CB9LG9MC
12-port 10/100BASE-TX Ethernet/ Fast Ethernet MultiLayer Switch Module (RJ-45)	3CB9RF12R
36-port 10/100BASE-TX Ethernet/ Fast Ethernet Switch Module (RJ-45)	3CB9LF36R
20-port 100BASE-FX Switch Module (MT-RJ)	3CB9LF20MM

### GBICs

SX GBIC	3CGBIC91
LX GBIC	3CGBIC92
Long Haul GBIC	3CGBIC97

### Spare Components

7-slot chassis	3CB9E7
930 W AC Power Supply	3CB9EP9
Management Module	3CB9EME
Fan Assembly	3CB9EF7
EEPROM	3CB9EE
9-port 18 Gbps Switching Fabric	3CB9FG9
24-port 48 Gbps Switching Fabric	3CB9FG24T

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