

## Catalyst 5505 Switching System

THE CATALYST® 5505 IS A NEW, HIGH-PERFORMANCE, FIVE-SLOT CHASSIS FOR THE EVOLVING CATALYST 5000 FAMILY. THE CATALYST 5505 COMBINES THE SIZE OF THE ORIGINAL CATALYST 5000 WITH THE PERFORMANCE BOOST AND ADDED FEATURES OF THE CATALYST 5500. WITH A GIGABIT-READY ARCHITECTURE THAT SCALES TO MORE THAN 25 GBPS, THE CATALYST 5505 PROVIDES THE SCALABILITY, FLEXIBILITY, AND REDUNDANCY REQUIRED FOR BUILDING NEXT-GENERATION SWITCHED INTRANETS. THE CATALYST 5505 IS INTENDED FOR USE IN LARGE ENTERPRISE WIRING CLOSETS, AS WELL AS DISTRIBUTION-LAYER AND SERVER-CONNECTIVITY APPLICATIONS IN SMALL AND MEDIUM-SIZED ENTERPRISE NETWORKS.

### Overview

The Catalyst 5505 protects customers' Catalyst 5000 Family investments by integrating existing Catalyst 5000 interface modules and features into a new, high-performance chassis. Customers desiring a performance boost for existing Catalyst 5000 chassis can redeploy all Catalyst 5000 Family line cards and power supplies in the five-slot Catalyst 5505. Supervisor Engines II or higher can also be used in a Catalyst 5505. The Catalyst 5505 supports up to 194 users or devices at a multimillion-packet-per-second forwarding rate.

### Architecture

The Catalyst 5505 architecture delivers Catalyst 5500-class frame switching performance in a five-slot chassis. The Catalyst 5505 supports Asynchronous Transfer Mode (ATM) LAN Emulation (LANE) for wiring closet connectivity to an ATM backbone, but does not support ATM switching as the Catalyst 5500 does. Slot 1 is the only dedicated slot in the Catalyst 5505. It is reserved for the Supervisor Engine, which monitors all system components and is responsible for all frame switching and forwarding functions in the switch. Supervisor Engine II or greater is required for operation of the Catalyst 5505. Slot 2 is a dual-purpose slot and can be used for either a redundant Supervisor Engine or any Catalyst 5000 interface module.

The high-speed crossbar frame switching fabric uses an input/output (I/O) queuing model. This cost-effective architecture gives the most efficient switching fabric for unicast and multicast/multimedia applications. Multiple 1.2-Gbps input buses into the 3.6-Gbps crossbar fabric ensure backward compatibility to existing Catalyst 5000

interface modules. This benefit is key for customers with existing Catalyst 5000 interface modules in the network. Gigabit interface modules support full access to the 3.6-Gbps fabric.

The architecture starts at 3.6 Gbps and scales to more than 25 Gbps of total switching capacity. This capacity is reached through a combination of local switching modules, with support for Gigabit Ethernet technology across modules in the chassis.

The Catalyst 5500 maintains two additional buses, the management and index/control buses. The management bus is a serial bus that carries configuration information to each module and statistical information from each module to the Network Management Processor (NMP). The index/control bus carries port-select information from the central encoded address recognition logic to the ports. This information determines which ports forward the packet and which flush it from the buffer.

This architecture is a store-and-forward operation, meaning that each frame is stored in a frame buffer before it is forwarded to the next port. Each port maintains its own 192 Kb of frame buffer memory. This architecture uses fair arbitration and address recognition logic for all modules. Each frame traversing the frame switching bus may be destined to a single port or to multiple ports, allowing for high-speed multicast forwarding without the need for frame copies.

Only a single power supply is required for any module configuration in the switch, with the second power supply purely as a redundant, load-sharing backup.

## Building the Intranet Infrastructure

The Catalyst 5505 is the high-end, five-slot modular switching platform that further enables the Catalyst 5000 Family to meet the requirements of today's demanding and fast-growing enterprise intranets. At the same time, the Catalyst 5505 protects customers' investments in current Cisco products by seamlessly integrating existing Catalyst 5000 Family interface modules and Catalyst 5000 power supplies into the Catalyst 5505 chassis.

Figure 1 The Catalyst 5505 Delivers Top Performance in a Mid-Size Chassis

The media-independent architecture supports all legacy LAN and ATM switching technologies through a wide range of Ethernet, Fast Ethernet, Fiber Distributed Data Interface (FDDI), Token Ring, and ATM LANE modules. Depending on its configuration, the Catalyst 5505 can be used in distribution layer and server connectivity applications as a feature-rich, scalable Fast Ethernet switch. It can also be used in wiring closet applications supporting a wide array of switched Ethernet desktop 10/100 or Token Ring modules, delivering densities of more than 194 ports on a single platform.

The Gigabit and ATM-ready architecture supports Fast EtherChannel<sup>®</sup> technology, providing up to 800 Mbps (full duplex) of load sharing, redundant point-to-point connections between Catalyst 5000 Family switches (includes Catalyst 5002, 5000, 5505, 5509, and 5500), switch-to-router, and switch-to-server connections. The Catalyst 5505 supports Gigabit Ethernet uplinks, Gigabit Ethernet switch modules, Gigabit EtherChannel, and high-speed ATM uplink modules. The Catalyst 5505 delivers the bandwidth and scalability required in large campus intranets.

Fully integrated support for Cisco IOS<sup>®</sup> multiprotocol routing is provided on the route switch module. This module delivers the enterprise Cisco IOS routing feature set in the Catalyst 5000 series.

The Catalyst 5505 features a modular feature card on the Supervisor Engine that is ready to support distributed NetFlow switching from Cisco, delivering high-speed, multilayer switching on the Supervisor Engine. The combination of the route switch module (RSM) and the NetFlow switching feature card (NFFC) delivers on the promise of CiscoFusion, combining the speed and simplicity of switching with the intelligence and scalability of routing on a single platform.

With its support for hot-swappable modules, power supplies, and fans, the Catalyst 5505 chassis delivers high availability for production networks. Dual redundant switching engines, power supplies, and a passive backplane design ensure full system redundancy for mission-critical environments.

The Catalyst 5505 chassis fits into a standard 19-inch rack, and all system components are accessible from the same side of the chassis. Only one power supply is required to run a fully configured system.

Table 1 Catalyst 5000 Family Interfaces

Catalyst 5002, 5000, 5500/5505 Switching Modules	Number of Interfaces Supported per Module	Maximum Number of Interfaces				
		Catalyst 5002	Catalyst 5000	Catalyst 5505	Catalyst 5509	Catalyst 5500
Group-Switched 10BaseT Ethernet	48	48	192	192	384	528
Switched 10BaseT Ethernet (RJ-21)	24	24	96	96	192	264
Switched 10BaseT Ethernet (RJ-21)	48	48	192	192	384	528
Switched 10BaseT Ethernet (RJ-45)	24	24	96	96	192	264
Switched 10BaseFL Ethernet	12	12	48	48	96	132
Group-Switched 100BaseTX Ethernet	24	24	96	96	192	264

Catalyst 5002, 5000, 5500/5505 Switching Modules	Number of Interfaces Supported per Module	Maximum Number of Interfaces				
		26	100	100	196	268
Switched 10/100BaseTX Fast EtherChannel	24	26	100	100	196	268
Switched 10/100BaseTX Desktop Fast Ethernet	24	26	100	100	196	268
Switched 100BaseFX Fast Ethernet	12	14	50	50	98	134
ATM LAN Emulation	2	1 (Dual PHY)	3 (Dual PHY)	3 (Dual PHY)	7 (Dual PHY)	7 (Dual PHY)
CDDI/FDDI	1	1	4	4	8	11

### Delivering a Comprehensive Suite of Intranet Services

The Catalyst 5505 is ideally suited for building large campus intranets by delivering a full set of intranet services as part of the solution to deliver the application integrity required by large intranets. These services enable timely and quality delivery of applications to the desktop in the corporate intranet. The Catalyst 5505 provides the following intranet services.

- Efficient intranet multimedia and multicast support through Protocol Independent Multicast (PIM), Internet Group Management Protocol (IGMP), and the Cisco Group Management Protocol (CGMP) deliver end-to-end, scalable bandwidth for multimedia and multicast applications.
- The Catalyst 5505 is part of the CiscoAssure end-to-end QoS solution. Deployed in a wiring closet, the Catalyst 5505 can identify user applications and classify traffic with the appropriate priority level. It enables admission control at the network edge to prevent unauthorized applications from being allowed on the network. The Catalyst 5505 switch is a quality-of-service (QoS) edge device that is application aware.
- Network resilience is achieved through a combination of device, link, and network service redundancy supported on the Catalyst 5505. Device redundancy is provided with support for redundant switch engines, power supplies, and route switch modules. Link redundancy is implemented on the Cisco dual physical sublayer (PHY) ATM modules, integrated in Fast EtherChannel technology, and supported on all virtual LAN (VLAN) trunk links. Network service redundancy is achieved through ATM Simple Server

Redundancy Protocol (SSRP), Hot Standby Router Protocol (HSRP) and support for Spanning-Tree Protocol on a per-VLAN basis.

- Security in the intranet is supported with secure port filtering, enabling individual ports to allow access only to certain workstations. TACACS+ prevents unauthorized access to the switch in secure environments.
- Mobility or moves, adds, and changes in the intranet are supported using Dynamic Host Configuration Protocol (DHCP) and Domain Name System (DNS), along with dynamic VLAN services and distributed NetFlow Switching for optimal, scalable performance, regardless of location.

### Intranet Management

The Catalyst 5505 delivers a comprehensive set of management tools to provide the required visibility and control in the network.

Managed with CiscoWorks for Switched Internetworks (CWSI), the Catalyst 5505 switch can be configured and managed to deliver end-to-end device, VLAN, traffic, ATM, and policy management.

Policy management is achieved through a combination of intelligent, embedded agents on the switches and CWSI, a powerful network management application. CWSI provides policy management for all Cisco network services, including: CoS, multicast, security, network resiliency, and mobility of users. Policy management is implemented using Cisco Virtual Membership Policy Server (VMPS). Present on all Catalyst 5000 Family switches, VMPS delivers the database information required to implement policies for all Cisco network services.

Intelligent, embedded agents on all Catalyst 5000 switches include support for Cisco Discovery Protocol (CDP), delivering network topology discovery and mapping, and Cisco VLAN Trunking Protocol (VTP), supporting dynamic VLANs and dynamic trunk configurations across all switches. Embedded, intelligent Remote Monitoring (RMON) agents on every port deliver powerful traffic monitoring and control—RMON groups supported include statistics, history, events, and alarms.

Enhanced Switched Port Analyzer (SPAN) functionality enables the user to mirror traffic on any port or VLAN to another Ethernet or Fast Ethernet port for analysis by a sniffer or RMON SwitchProbe<sup>®</sup> product.

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

### Summary

The Catalyst 5505 brings more scalability, flexibility, and functionality to the Catalyst 5000 Family. With the wide range of modules available, the Catalyst 5000 Family effectively meets all requirements of the new corporate intranet.

### Technical Specifications

#### Standard Network Protocols

- Ethernet: IEEE 802.3, 10BaseT, and 10BaseFL
- Fast Ethernet: IEEE 802.3u, 100BaseTX, 100BaseFX
- FDDI: ISO 9314-1 FDD PHY standard; ISO 9314-3 FDDI physical medium dependent (PMD) standard; CDDI TP-PMD standard; ANSI FDDI X3T9.5 Station Management (SMT) 7.3
- ATM: ATM Forum—3.1 UNI specification, Q.2931 signaling protocols, LANE

#### Network Management

CWSI graphical user interface (GUI) management, including:

- CiscoView
- VlanDirector<sup>™</sup> software
- TrafficDirector<sup>™</sup> software
- AtmDirector<sup>™</sup> software
- Netsys Technologies
- Cisco Discovery Protocol
- VTP
- SNMP agent V.1 (RFCs 1155-1157)

- Cisco WorkGroup Management Information Base (MIB)
- Ethernet MIB (RFC 1643)
- Ethernet repeater MIB (RFC 1516)
- SNMP MIB II (RFC 1213)
- RMON (RFC 1757)
- Interface table (RFC 1573)
- Bridge MIB (RFC 1493)
- Interim Local Management Interface (ILMI) MIB
- FDDI MIB (RFC 1512)
- AToM MIB (RFC 1695)
- ATM RMON
- LAN Emulation Client (LEC) MIB (ATM Forum LANE v. 1.0)
- Cisco LAN Emulation Configuration Server (LECS), LAN Emulation Server/broadcast and unknown server (LES/BUS) MIB
- Private Network to Network Interface (PNNI) MIB
- LECS, LES, BUS, MIB
- SMT 7.3 (RFC 1285)
- Enhanced SPAN
- Port snooping and connection steering
- Text-based command-line interface based on familiar router interface
- Standard Cisco IOS security capabilities: passwords and TACACS
- Telnet, TFTP, BOOTP, LEC, RFC 1577 classical IP over ATM client, for management access

#### Supervisor Engine II Indicators and Interfaces

- Flash memory: 8 MB
- Erasable programmable read-only memory (EPROM): 512 KB
- RAM memory: 20 MB
- Nonvolatile random-access memory (NVRAM): 256 KB
- System status: green (operational)/red (faulty)
- Switch load: 1 to 100-percent aggregate backbone usage
- Link good: green (good)/orange (disabled)/off (not connected)
- 100-Mbps Fast Ethernet: green (100 Mbps)
- Power supply status: green (on)/red (faulty)/off (not present)
- Fan status: green (on)/red (faulty)
- Supervisor console: DB-25 (female)
- 100BaseTX: RJ-45 (female), MII (female) for external transceiver
- 100BaseFX: SC (female)

#### Physical Specifications

- Dimensions (H x W x D): 10.4 x 17.21 x 18.14 in. (26.2 x 42.5 x 44.5 cm)
- Minimum weight: 43 lb/19.5 kg
- Maximum weight: 84 lb/39 kg
- Mounting: 19-in. rack-compatible (rack and cable guide hardware included)

#### Power Requirements

- 8.0A @ 100 VAC 60 Hz
- KVA rating: 0.8 KVA
- 4.0A @ 200 VAC 50 Hz
- Power consumption: 376 watts

#### 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%, noncondensing

- Operating altitude: -60 to 4000 m
- Mean time between failures (MTBF): seven years for system configuration

#### Regulatory Compliance

##### Safety Certifications

- UL 1950
- EN 60950
- CSA-C22.2 no. 950
- IEC 950

##### Electromagnetic Emissions Certifications

- FCC 15J Class A
- VCCI CE II
- CE Mark
- EN 55022 Class B
- CISPR 22 Class B



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