Cisco AS5200/AS5300 Family Universal Access Servers

The award-winning Cisco AS5x00 family of universal access servers provide superior density and price/performance for dial pools. Utilizing the differentiated services delivered through Cisco IOS™ software, customers have best-of-breed scalability and investment protection. All of these servers include support of worldwide protocols such as V.110, Channelized E1 (R2), and Channelized T1 Robbed Bit signalling (RBS).

Universal Access

The AS5x00 family is designed to maximize customers' investment protection by terminating both analog modem and ISDN calls on the same chassis from the same bearer line. The AS5200 and AS5300 establishes the entry and midrange of this Access Server family. The AS5800 series provide carrier class high density in a single dial shelf. The AS5x00 family of Access Servers can all scale into AccessPath carrier class solutions. Modem ISDN Channel Aggregation (MICA) technology results in investment protection through modem modules that can be transferred to higher density AS5x00 servers as capacity needs increase.

Applications

Service Provider Point of Presence

Frequently, geographic concerns require a service provider to employ a large number of small points of presence (POPs) that are geographically dispersed.

The AS5200, with its compact, cost-effective, medium-density two-Primary Rate Interface (PRI) design is optimal for implementing such a dispersed dial infrastructure. Its redundant, high-speed serial ports provide for backhaul of data to points of aggregation. The AS5300, with a higher-density four-PRI and higher-performance design, is ideal for high-traffic, complex dial environments with multiple network access servers feeding a larger LAN backhaul aggregation point. The redundant LAN interfaces, including the ability to provide Fast Ethernet, results in maximum flexibility of deployment in dense POP environments.

High-Density Dial Access

In higher-density implementations, both access servers function as components of the Cisco dial access stack architecture (DASA), scaling to provide an access point to thousands of ports. Through the use of Multichassis Multilink Point-to-Point Protocol (MMP) enabled by Layer 2 Forwarding Technology (L2F), Layer 2 Tunneling Protocol (L2TP) and Cisco developed Stack Group Bidding Protocol (SGBP), Cisco's high-density access solutions can grow to meet the requirements of the frequently changing dial environments. Since the initial building block is a relatively small investment, providers can scale from very small to very large installations.

Multiprotocol Dial Access

Increasingly, enterprises and service providers are experiencing the need to extend network access to a broad range of remote users, including employees, customers, and partners. Successful remote access means being able to connect these users from practically any location, almost transparently.

Varying demands of telecommuters and mobile users necessitate both ISDN and modem connections. Today, users expect to get the same access and quality of service they receive when locally connected. To meet this requirement, the remote access server must be part of the total network solution and scale with it to meet the growing remote access needs. The AS5200 and AS5300, combined with Cisco IOS software, meet these needs by extending the core infrastructure by providing secure, reliable dial-in connections.

Both universal access servers also support the most complete set of access protocols of any access server in the industry, including Point-to-Point Protocol (PPP), IPX Control Protocol (IPXCP), AppleTalk Control Protocol (ATCP), AppleTalk Remote Access Protocol (ARAP), NetBIOS Frame Control Protocol (NBFCP), NetBIOS over TCP/IP, NetBEUI over PPP, protocol translation (PPP, SLIP, ARAP, X.25, TCP, LAT, Telnet), XRemote, and V.120.

Features

Full Power of Cisco IOS Software

The AS5x00 family is the key component of Cisco's complete end-to-end solution for dial connectivity. No other vendor can offer remote users as many options for Internet access and enterprise network extension. This solution is also boosted considerably by the power of the Cisco IOS software, the accepted standard in internetworking. Cisco IOS software gives customers the opportunity to affordably deploy dial virtual private networks (Dial VPNs) utilizing payload compression and data encryption. Scalability is enabled via MMP, which allows call aggregation across multiple chassis in the same dial pool.

Scalability

Cisco's implementation of MMP allows customers to start small and scale additional access servers as required, while still being able to dial into one call center. ISPs and enterprise network managers with large dial-in pools can easily scale and integrate their access infrastructures to aggregate multiple calls across multiple servers, providing a higher-bandwidth solution to their end users. These scalability features are critical for service providers and enterprise customers as they build resilient systems that leverage distributed network reliability.

Security

A primary concern for most network managers today is security. The AS5200 and AS5300, along with the popular and robust Cisco IOS software, provide comprehensive security throughout customer core networks. For remote user environments, AS5x00s extend this proven core security to hybrid dial-in locations. Several security features are supported by the Cisco IOS software, such as access lists, violation logging, RADIUS, Kerberos V, and TACACS+ with authentication, authorization and accounting (AAA).

Management

The Cisco AS5x00 series provides complete, centrally managed modem capabilities, which are key requirements for service providers and enterprises building large dial-in pools. The modems can be managed via the same tools used to manage the rest of the network, providing network managers with one solution at a central management point. Cisco provides extensive modem management that no other vendor of access servers provides, including the ability to directly access the modem at anytime (including when the modem is connected and on line) to capture statistics, to force a reset, or to check modem configurations.

Lower operating costs are achievable with Cisco's set of central management capabilities. In addition to advanced modem management features, the universal access servers can be managed with GUI-based CiscoWorks software. Additionally, Cisco's configuration management capabilities provide network managers with complete control over network statistics and the ability to configure and tune network operations from a central location. Finally, comprehensive debugging tools in Cisco IOS software substantially reduce the time and cost associated with problem isolation and correction. Cisco's access management solutions allow service providers and enterprise customers to lower the recurring costs associated with operating a geographically dispersed wide-area network.

Life Cycle-Focused Support Solutions

Ciscos comprehensive support portfolio delivers solutions that enhance the network throughout its life cycle. From design and installation, to preventive and scheduled maintenance, to performance optimization, Cisco's solutions promote network reliability, efficiency, and flexibility. Designed to function as an integral product component, these programs deliver seamless support. Together, they proactively help organizations sharpen their competitive edge. Through access to the Cisco Connection Online (CCO) Web site, customers can add and use expanded functionality and new features as soon as they become available. Moreover, access to Cisco's technical expertise is available around the clock and around the globe. This virtual team of the world's top networking engineers is equipped to address every need from troubleshooting to network design and planning.

Summary

Through the rich features available in the Cisco IOS software, combined with the AS5x00 universal access platforms and other industry-leading Cisco remote access, router, and switching products, enterprises and service providers can for the first time deploy massive access infrastructures that are universally accessible, completely scalable, and cost effective. Customers can protect and leverage their Cisco infrastructure investments in training and expertise across new Cisco platforms. This true end-to-end solution differentiates Cisco from its competition.

Modem ISDN Channel Aggregation (MICA) Specifications for AS5200/AS5300

- Rockwell K56flex at 56000 to 32000 in 2000 bps increments
- ITU V.90 56K (Q2 1998)
- ITU-T V.34 Annex 12 at 33600 and 31200 bps
- ITU-T V.34 at 28800, 26400, 24000, 21600, 19200, 16800, 14400, 12000, 9600, 7200, 4800, and 2400 bps
- ITU-T V.32terbo at 19,200, 16,800, 14400, 12000, 9600, 7200, and 4800 bps
- ITU-T V.32bis at 14400, 12000, 9600, 7200, and 4800 bps
- ITU-T V.32 at 9600 and 4800 bps
- ITU-T V.23 1200/75 bps (back channel)
- ITU-T V.22bis at 2400 and 1200 bps
- ITU-T V.22 at 1200 bps
- ITU-T V.21 at 300 bps
- Bell 212A at 1200 bps
- Bell 103A at 300 bps

Error correction:

- ITU-T V.42 (including MNP 2-4 and LAPM)

Data compression:

- ITU-T V.42bis (1K nodes) and MNP 5

Rear Panel Layout

Figure 1 AS5200 Rear Panel

AS5200 Technical Specifications

Processor Type	20-MHz 68030
Memory	Up to 16M main DRAM and 16M packet DRAM
Flash Memory	Up to 8M boot Flash Up to 16M system Flash
Chassis Slots	Three (2 Modem Carrier Card, one WAN interface)
WAN Interface Options	Dual T1/PRI (RJ-45) Dual E1/PRI (DB15)
Ethernet (AUI)	One 10MB
High-Speed Synchronous Serial	Two
Modems	Up to 48 (T1) or 60 (E1)
Console and Auxiliary Ports	One each
Other Standard Components	Power supply and cord, one console cable

Environmental Condition and Power Requirements

Dimensions (H x W x D)	3.4 x 17.5 x 15 in.
Weight	25 lb. (11.4 kg)
Input Power	170 watts, AC or DC (typical)
Output Power	120 watts, AC or DC (typical)
Peak	180 watts
Power Factor	>.88
Ripple and Noise	Below 100 mV at board level
Frequency	50/60 Hz
Efficiencies	0.65 to 0.70
Heat Dissipation	514 Btu/hr
AC Input Voltage	85 VAC minimum 120 VAC nominal 260 (132) VAC maximum
DC Input Voltage	40 VDC minimum 48 VDC nominal 72 (56) VDC maximum
AC Input Current (maximum)	3A (rms)
DC Input Current (maximum)	5A (3A) (rms)
Operating Temperature	32 to 104 F (0 to 40 C)
Nonoperating Temperature	-4 to 149 F (-20 to 65 C)
Operating Humidity	10 to 85%, noncondensing
Nonoperating Relative Humidity	5 to 95%, noncondensing

Regulatory Compliance

Safety Certifications

- UL 1950, third edition
- CSA 950, third edition
- EN 60950, with amendments 1, 2, and 3
- IEC 950
- AS/NZS 3260
- TS 001

Electromagnetic Emissions Certifications

- EN 55022B
- NZ/AS3548B
- VCCI II
- FCC A

Immunity

- 1000-4-2 (electrostatic discharge)
- 1000-4-3 (radiated emissions)
- 1000-4-4 (electrical fast transients)
- 1000-4-5 (surge)
- 1000-4-6 (conducted emissions)

PTT Certification for AS5200

- CTR2
- CTR4 (NET5)
- CTR12/13
- JATE
- TS 014
- BE/SP-103
- SS 63 63 34
- PD 7024
- HKT CR11
- HKT CR13
- FCC Part 68
- Industry Canada DOC CS-03

Figure 2 AS5300 Rear Panel

AS5300 Technical Specifications

Processor Type	150-MHz R4700
Memory	Up to 64M main DRAM and 32M packet DRAM
Flash Memory	Up to 8M boot Flash, single or dual bank Up to 16M system Flash, single or dual bank
Chassis Slots	Three
Ethernet (RJ-45)	Two (one 10MB, one 10/100MB)
56K Modems	Up to 96 (T1) or 120 (E1)
ISDN PRI/T1 or ISDN PRI/E1	Four
Channelized T1/E1	Four
Other Standard Components	Power supply and cord, console cable, two RJ-48C cables, carrier card tool

Environmental Conditions and Power Requirement

Dimensions (H x W x D)	3.4 x 17.5 x 18.25 in.
Weight	32 lb. (12 kg)
Operating Environment	32 to 104 F (0 to 40 C)
Nonoperating Temperature	-40 to 185 F (--40 to 85 C)
Operating Humidity	5 to 95%, noncondensing
Noise Level	34 dB1 @ 3 feet (0.914 m)
Input Voltage, AC Power Supply	100 to 240 VAC2
Current	1.5 to 3.0A
Frequency	50/60 Hz
Power Factor	0.80 to 0.95
Input AC Power	200 to 400W (maximum)
Input voltage, DC Power Supply	-48 to --60 VDC
Maximum Input Current	6.0A
Typical Input Current	3.0 to 4.0A
Efficiency	63%
Protection	Current limit, overpower, over temperature,
Output Voltage	(latch off)
Output Voltage	3.3 VDC
Output Voltage	5.0 VDC
Output Voltage	12.0 VDC

Peak Output Power	-12.0 VDC
Typical Output Power	350W
Ripple and Noise	250W under 200 mv at board level
WAN Interface Options	Quad T1/PRI (RJ-45) Quad E1/PRI (RJ-45)
Console and Auxiliary Ports	Asynchronous serial (RJ-45)

Regulatory Compliance

Safety Certifications (correct)

- UL 1950, third edition
- CSA 950, third edition
- EN 60950, with amendments 1, 2, and 3
- IEC 950
- AS/NZS 3260
- TS 001

Electromagnetic Emissions Certifications (correct)

- EN 55022B
- NZ/AS3548B
- VCCI II
- FCC A

Immunity (correct)

- 1000-4-2 (electrostatic discharge)
- 1000-4-3 (radiated immunity)
- 1000-4-4 (electrical fast transients)
- 1000-4-5 (surge)
- 1000-4-6 (conducted immunity)

PTT Certification for AS5300

- CTR4 (NET5)
- CTR12/13
- JATE
- TS 014
- BE/SP-103
- T14-03
- SS63 63 34
- PD 7024
- HKT CR11
- HKT CR13
- FCC Part 68
- Industry Canada DOC CS-03

Cisco AS5x00 Family Features And Benefits

Feature	Benefit
Integrated Channel Service Units (CSUs), channel bank, router, and modems accommodate ISDN Primary Rate Interface (PRI) T1/E1 lines or channelized T1/E1 lines	Services and terminates asynchronous modem and digital ISDN calls with one trunk line and one phone number as a simple, cost-efficient migration path from today's analog dialup environment to the fast-growing ISDN digital services
Modem management	Monitors modem call progress and statistics in real time to reduce problem detection and resolution time. Includes modem statistics, real-time call-in-progress, monitoring modem activity log, modem hard/soft busy out, modem firmware up-grade, and so on
Flexible, dual-bank Flash architecture	Reduces software upgrade time and allows the storage of multiple software images in the same chassis
Full Cisco IOS support	Provides the widest array of networking and routing protocol support in the industry for large-scale deployment
Remote management of CSU, router, and modem components	Centralizes network management to reduce operating cost
Scalable chassis with MMP	Allows customers to start small and stack additional servers as required, while still being able to dial into one call center
Bandwidth management with MMP and dialer load threshold	Manages network bandwidth effectively to reduce unnecessary bandwidth associated costs for customers
Dial VPN with L2F and L2TP	Adds more value to ISP's service package by: • Enabling the sharing of very large investments in access and core infrastructure • Allowing local dialup calls to an ISP who agrees to forward the client users to a company run gateway • Supporting investments in non-IP protocol applications in a secure manner
VPDN Scalability: L2F Tunnel Backup and load sharing	• Improves reliability • Improves number of sessions home corporations can support
Compression, routing filters, snapshot routing, and dial-on-demand routing for WAN optimization	Helps customers to reduce WAN costs, the single largest factor of internetwork cost operation
Bandwidth Allocation Control Point (BACP)	• Allows multilink interoperability through controlling call linktypes, speeds and phone numbers • Ensures all ends of a multilink are informed of added or removed links • Controls thrashing of links added and removed in a short timeframe
ISDN Nonfacility Associated Signalling (NFAS)	Uses a single D-channel to control multiple PRI interfaces freeing one B-channel on each interface to carry other traffic
Comprehensive security management	Provides security throughout customer's core network infrastructure including TACACS+, RADIUS, access lists, violation logging, and support for one-time-password tokens
Internal socket for expansion to compression and encryption— hardware assist engines (AS5300 only)	Allows easy future hardware upgrade of existing systems
R2 signaling in channelized E1 environments	Enables worldwide deployment for global service providers
Cisco DialOut Utility for Windows v3.11, Windows 95 and Windows NT v 4.0	• Centralized dial pool eliminates need for desktop modems • Transparent operation with most third-party communications applications (requires Cisco IOS software v11.3 and above)

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