

Cisco ISR 4000 Series Router - Official Technical Overview & Hardware Datasheet

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EXECUTIVE SUMMARY

The Cisco ISR 4000 Series represents a transformative leap in enterprise routing, integrating advanced security, cloud intelligence, and high-performance networking within a single, unified platform. Engineered as the foundation for the Software-Defined WAN (SD-WAN) and intent-based networking, the ISR 4000 delivers superior application performance and streamlined IT operations.

This datasheet provides a comprehensive technical overview of the hardware architecture, specifications, and ordering options for the ISR 4000 Series routers. The platform is purpose-built to address the evolving demands of modern enterprises, offering unparalleled flexibility with modular design, embedded security, and carrier-class availability. By enabling secure connectivity and rich services at the edge, the ISR 4000 series ensures organizations are ready to thrive in a cloud-first, mobile-centric world.



ARCHITECTURE & CHASSIS DESIGN

The Cisco ISR 4000 Series features a groundbreaking, services-ready architecture with a powerful multicore processor and a sophisticated switching fabric that supports concurrent services without compromising performance . The platform utilizes a modular chassis design, available in several form factors ranging from compact 1RU to 3RU models, to suit diverse deployment environments from branch offices to large campuses.

A key architectural differentiator is the integration of an Application-Specific Integrated Circuit (ASIC) for high-performance encryption and a dedicated network processor unit (NPU) for advanced Quality of Service (QoS) and traffic management. The chassis is designed for high availability with dual redundant power supplies and fans on supported models, ensuring maximum uptime for

critical business applications. The modularity extends to the Network Interface Modules (NIMs) and Service Modules (SMs), which allow for flexible and cost-effective upgrades, protecting the investment as network demands grow.

HARDWARE FEATURES

The Cisco ISR 4000 Series is packed with hardware features designed to deliver industry-leading performance, security, and reliability.

Modular Flexibility and Interfaces: The platform supports a wide range of modular interface options, including Gigabit Ethernet, 10 Gigabit Ethernet, and T1/E1. This is facilitated through a combination of fixed ports and slots for pluggable Network Interface Modules (NIMs) and Enhanced Service Modules (SMs). This allows enterprises to customize their router to support TDM, serial, and legacy protocols, ensuring seamless integration with existing infrastructure.

Embedded Security and Acceleration: Security is embedded at the core of the ISR 4000 architecture. The hardware includes a dedicated security engine that accelerates IP Security (IPsec) VPNs, enabling line-rate encryption. Furthermore, the platform supports secure boot and hardware-anchored Trusted Platform Module (TPM) for robust device identity and integrity.

High-Performance Routing and Switching: The ISR 4000 is designed for high throughput, leveraging a multi-core CPU architecture. The platform delivers exceptional routing performance, supporting a comprehensive suite of routing protocols such as OSPF, EIGRP, and BGP . Its switching fabric provides non-blocking performance between ports, ensuring that data can be forwarded at wire speed.

COMPLIANCE & STANDARDS

The Cisco ISR 4000 Series is designed to meet rigorous industry standards and compliance requirements, making it suitable for the most demanding enterprise and service provider environments.

Regulatory and Safety Compliance: The platform complies with a wide array of international regulatory standards for safety and emissions, including UL, CSA, CE, and FCC certifications . This ensures the router is safe to operate and can be deployed globally without regulatory hurdles.

Environmental Standards: The ISR 4000 is manufactured in compliance with environmental directives such as RoHS and WEEE, reflecting Cisco's commitment to sustainability. The system is designed to operate within specified temperature and humidity ranges, ensuring reliable performance in

various environmental conditions.

TECHNICAL SPECIFICATIONS

The technical specifications of the Cisco ISR 4000 Series highlight its robust capabilities, designed to support the intense throughput and processing demands of modern converged networks .

Performance Metrics: The performance varies by model, with the capability to support up to 1.5 Gbps to 25 Gbps of throughput depending on the specific model, making it ideal for supporting branch office connectivity to large enterprise WAN edge deployments. High-end models support millions of concurrent sessions and thousands of VPN tunnels.

Memory and Storage: The platform is equipped with a high-capacity memory configuration, including 4 GB to 16 GB of DRAM and 4 GB to 8 GB of flash memory, which is expandable. This ensures the operating system (Cisco IOS XE) and security features have ample resources to run efficiently.

Network Interfaces: Interfaces vary by model but generally include a combination of fixed RJ-45 and SFP ports for copper and fiber connectivity, alongside modular slots that accept a wide variety of NIMs for additional

Ethernet, T1/E1, and Serial connections.

Parameter	Specification
Form Factor	1RU (ISR 4221, 4321), 2RU (ISR 4331, 4351), 3RU (ISR 4431, 4451, 4461)
Switching Capacity	Up to 25 Gbps aggregate depending on model
Power Supply	Internal or external, 1+1 Redundant AC/DC available on select models
DRAM Memory	4 GB to 16 GB, expandable
Flash Memory	4 GB to 8 GB, expandable
Network Interface Slots	2 to 6 NIM slots, 1 to 4 SM slots (varies by model)
Max Throughput	1.5 Gbps to 25 Gbps (Cisco CEF and FIB)
IPsec VPN Throughput	Up to 14 Gbps
Operating Temperature	32 to 104°F (0 to 40°C)
Relative Humidity	10% to 85% non-condensing

ORDERING OPTIONS

The Cisco ISR 4000 Series offers a flexible and comprehensive ordering structure, allowing organizations to precisely tailor their hardware to their specific business requirements.

Chassis and Bundles: The routers are available as standalone chassis, or in pre-configured bundles that include software licenses and a selection of modules. Common bundles include Security, Application Experience (AppX), and Unified Communications (UC) editions.

Network Interface Modules (NIMs): A broad portfolio of NIMs can be ordered separately, providing support for a variety of physical interfaces . This includes modules for 1G/10G Ethernet, T1/E1, T3/E3, and xDSL, offering extensive interface flexibility.

Service Modules (SMs): Enhanced Service Modules can be installed for additional functionality such as Voice and Video processing, application acceleration, and advanced security services. These modules provide deep packet inspection and content filtering capabilities.



GLOBAL SUPPORT INFRASTRUCTURE

Cisco offers a comprehensive global support infrastructure for the ISR 4000 Series, ensuring organizations can maximize their investment and maintain high network availability. Support services include 24x7 technical assistance, advanced hardware replacement, and ongoing software maintenance and updates. Cisco's extensive partner ecosystem also provides a global footprint for professional services, including installation, configuration, and optimization, ensuring that customers receive end-to-end support for their network infrastructure.