Cisco ASR 1001-X Enterprise Edge Router Cryptographic Acceleration Throughput Specs - Official Technical Overview & Hardware Datasheet

CISCO ASR 1001-X ENTERPRISE EDGE ROUTER

CRYPTOGRAPHIC ACCELERATION THROUGHPUT SPECIFICATIONS

OFFICIAL TECHNICAL OVERVIEW & HARDWARE DATASHEET

EXECUTIVE SUMMARY

The Cisco ASR 1001-X Aggregation Services Router represents a paradigm shift in enterprise edge routing, delivering an unprecedented combination of high-performance forwarding and robust cryptographic acceleration within a compact 1-Rack-Unit (1RU) form factor. Engineered for the modern digital enterprise, this platform addresses the critical need for secure, high-speed WAN connectivity, seamlessly integrating advanced encryption capabilities without compromising line-rate performance .

The ASR 1001-X is purpose-built to aggregate multiple WAN connections and network services, intelligently forwarding traffic at high line speeds while simultaneously accelerating advanced features such as crypto-based access security, deep packet inspection, and diverse data center interconnect functions. Leveraging the next-generation Quantum Flow Processor, the router delivers up to 20 Gbps of forwarding capacity and provides exceptional cryptographic

throughput, making it an ideal solution for enterprises experiencing explosive network traffic growth or service providers needing to deliver high-performance, secure services .



HARDWARE ARCHITECTURE & SILICON

At the heart of the ASR 1001-X is the innovative Cisco Quantum Flow Processor (QFP), a purpose-built, programmable network processor that integrates a dedicated cryptographic engine. This silicon-level integration is the cornerstone of the platform's ability to perform high-speed encryption and decryption with minimal latency overhead. Unlike software-based solutions that tax the main CPU, the cryptographic engine offloads these compute-intensive operations, allowing the system to maintain high throughput even with sophisticated encryption protocols like Suite-B and

AES-256 .

The hardware architecture includes an embedded services processor that accelerates a wide range of features, including:

- Thread Defense and Deep Packet Inspection (DPI)
- IPsec and SSL VPN termination
- Layer 2 MAC Security (MACsec)

This approach ensures that the router's control plane remains responsive and its data plane operates at wire speed, providing a deterministic and high-performance platform for critical network functions.

KEY FEATURES & ROUTING LOGIC

The ASR 1001-X is distinguished by its versatile and robust feature set, designed to meet the demands of a secure, agile enterprise network:

- Up to 20 Gbps Forwarding Capacity: The platform supports a pay-as-you-grow throughput model, scalable from 2.5 Gbps to 5, 10, and up to 20 Gbps, ensuring investment protection .
- Industry-Leading Cryptographic Throughput: The hardware-accelerated

crypto engine delivers up to 8 Gbps of robust Suite-B encryption and supports up to 10 Gbps IPsec/SSL throughput, capable of processing millions of concurrent VPN sessions .

- High-Performance WAN MACsec: Provides overlay encrypted secure channels over provider Ethernet circuits, supporting point-to-point or point-to-multipoint configurations for comprehensive Layer 2 security .

- Advanced Routing and Programmability: Supports Locator/ID Separation Protocol (LISP) for host mobility, acts as a route reflector for up to 3.5 million IPv4 routes, and includes modern programmability interfaces (NETCONF, RESTCONF) for simplified automation and management .

- Software Redundancy and High Availability: Incorporates hardware and software redundancy in a high-availability design, featuring Software Maintenance Upgrades (SMUs) for patching critical bugs and security vulnerabilities without a full software release recertification .

COMPLIANCE & STANDARDS

The Cisco ASR 1001-X is fully compliant with a comprehensive set of industry standards and certifications, ensuring seamless integration into diverse network environments:

- Security Standards: Suite-B Cryptography, AES-256, MACsec (IEEE 802.1AE).

- Cloud and SDN Integration: Azure ExpressRoute certified, Catalyst SD-WAN and SD-Access ready .

- Management Standards: Support for NETCONF, RESTCONF, and Cisco DNA Center orchestration.

- Physical Standards: ETSI compliant, front-to-back airflow, 1RU rack-mountable chassis.

TECHNICAL SPECIFICATIONS

The table below provides a detailed summary of the platform's key performance and physical specifications .

Parameter	**Specification**
Form Factor	1RU Rack-Mountable (Front-to-Back Airflow)
Total Forwarding Capacity	Up to 20 Gbps (Scalable from 2.5G, 5G, 10G, 20G)
Packet Forwarding Performance	19 Mpps
Cryptographic Throughput (Max)	Up to 8 Gbps (Suite-B) / Up to 10 Gbps (IPsec/SSL)
Built-in Interfaces	6x 1GE RJ-45, 2x 10GE SFP+
Expansion Slots	1 x SPA Slot (Shared Port Adapter)

Control Plane Memory (DRAM)	8 GB / 16 GB (Configurable)
IPv4 Route Scale	Up to 3.5 Million Routes
Power Supply	Dual Hot-Swappable Redundant (AC/DC)
Dimensions (W x D x H)	17.3 x 22.5 x 1.7 in (43.9 x 57.2 x 4.3 cm)

ORDERING SKU INFORMATION

- **Cisco ASR 1001-X**: Base chassis with 6x 1GE and 2x 10GE built-in ports, 1 SPA slot, and 8GB/16GB memory options.
- **Software Licensing**: Flexible subscription-based software licensing options are available to enable on-demand services, features, and throughput upgrades.
- **Power Supply**: Dual hot-swappable redundant power supplies (AC/DC options) for maximum system availability.



CONCLUSION

The Cisco ASR 1001-X is a market-leading enterprise edge router that sets the standard for secure, high-performance networking. Its integrated hardware-based cryptographic acceleration, scalable throughput, and comprehensive feature set provide a future-proof solution for enterprises embracing cloud, mobility, and the IoT era. By delivering up to 8-10 Gbps of secure encryption throughput alongside 20 Gbps of routing capacity, the ASR 1001-X ensures that security is never a bottleneck to performance, enabling a truly agile and resilient network infrastructure .