Cisco ASR 1000 Series Aggregation Services Routers

TRANSFORM AND EXTEND THE ENTERPRISE WAN EDGE AND HIGH-END BRANCH OFFICE IN YOUR BORDERLESS NETWORK

Cisco ASR 1000 Series Routers: Transform and Extend the Enterprise WAN Edge

Cisco creates a new paradigm for the WAN edge with the Cisco® ASR 1000 Series Aggregation Services Routers, which offer business-critical resiliency with intelligent services flexibility to allow enterprise businesses to accelerate their growth potential.

What Is the Cisco ASR 1000 Series Router?

Figure 1. Cisco ASR 1000 Series Router
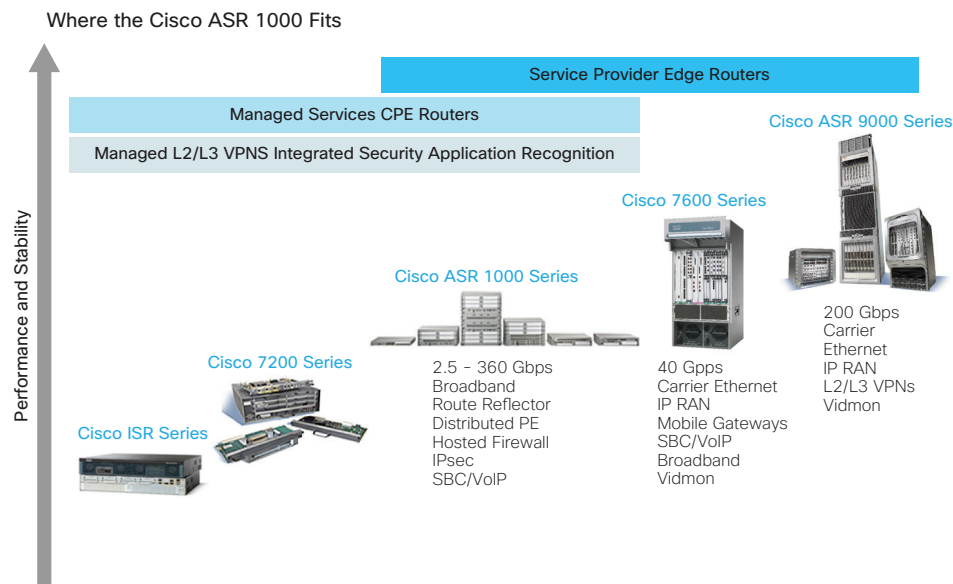
The Cisco ASR 1000 Series Router, a critical part of the Cisco Borderless Network Architecture, is the industry's first aggregation services router and the first system within the Cisco portfolio to use the Cisco QuantumFlow Processor, a processor built for edge-based service delivery (refer to Figure 1). You can deploy the Cisco ASR 1000 Series Routers at the enterprise to provide secure WAN aggregation services;

integrated threat and defense services at the WAN or Internet edge; data center interconnect (DCI) router; managed customer premises-equipment (CPE) services; or to deliver complex residential quadruple-play (data, voice, video, and mobile) or business services from the provider edge.

Cisco QuantumFlow Processor: The Next-Generation Network Processor from Cisco

Meeting the requirements of the aggregation service edge required an entirely new category of network processors. Cisco has developed an innovative router engine called the Cisco QuantumFlow Processor, which is the industry's first fully integrated and programmable flow processor. The Cisco QuantumFlow Processor combines massive parallel processing, customized quality of service (QoS), advanced memory management, and integrated services programmability. With these capabilities, the Cisco ASR 1000 Series accelerates service deployment and feature velocity, resulting in reduced qualification and deployment time and lower operating expenses (OpEx).

What Problems Does It Help Solve?

Enterprises worldwide face several new WAN infrastructure challenges:

- WAN edge infrastructure performance: Enterprises need to deliver higher-performance, higher-bandwidth services over their converged WANs, along with capacity headroom to operate efficiently.

- Highly available WAN infrastructure: Enterprises need to provide anytime, everywhere access to applications and services over the WAN. This provision requires a more highly available, resilient, and adaptive infrastructure than they have today.

- WAN security for data protection and compliance: Businesses need to satisfy industry regulations regarding data privacy, and adhere to regulations such as the Sarbanes-Oxley Act (SOX), Payment Card Industry (PCI), Health Insurance Portability and Accountability Act (HIPAA), and so on.

- Service delivery with application intelligence: Enterprises need to meet demanding internal service-level agreements (SLAs), with improved service delivery and application performance over the WAN.

Cisco ASR 1000 Series Positioning

The Cisco ASR 1000 Series provides scalable, secure multiservice aggregation at the headquarters, and high-end branch-office and managed CPE services in remote offices. By meeting or exceeding these requirements, the Cisco ASR 1000 Series Routers are helping to define the new enterprise WAN.

Figure 2.   Cisco Enterprise WAN Routing Portfolio
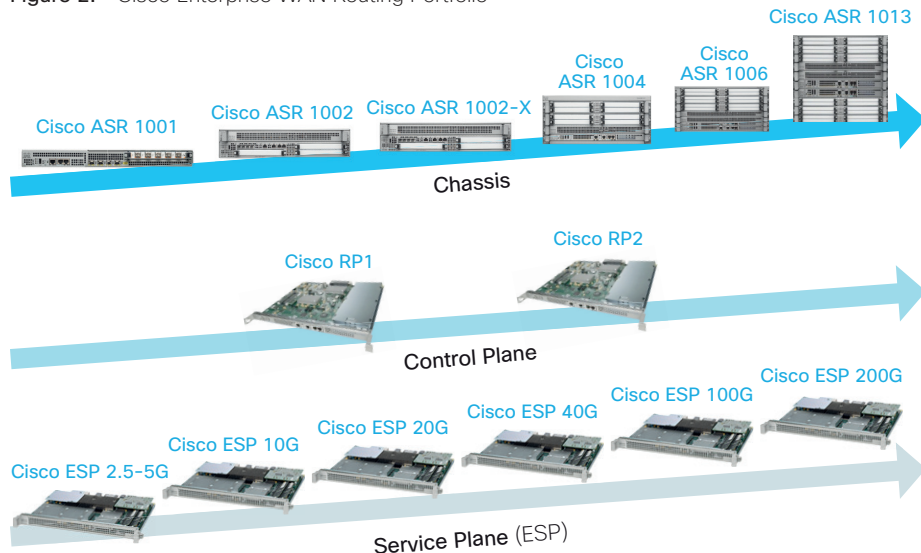
Benefits of Cisco ASR 1000 Series Routers

Enterprises deploying the Cisco ASR 1000 Series Routers can realize the following benefits:

Very high performance at the WAN edge to support new and faster WAN services:

- More than twentyfold increase in WAN bandwidth performance and capacity compared with Cisco 7200 Series Routers

- New collaborative and secure connectivity features enabled with Cisco WebEx® Node on Cisco ASR 1000 Series for on-premises web meeting acceleration, Cisco Unified Border Element (UBE) Service Provider and Enterprise Editions for enhanced business-to-business telepresence, high-definition (HD) voice and video telephony, voice-over-IP (VoIP) public-switched-telephone-network (PSTN) interconnect, and enhanced secure connectivity and application optimization

- New WAN initiatives such as segmentation of enterprise networks for workgroups, data-center consolidation, and converged data, voice, and video applications facilitated

- Easy upgrade path because the Cisco ASR 1000 Series Router price/performance is positioned between the Cisco 7200 Series at the low end of the portfolio and the Cisco 7600 Series and Cisco Catalyst® 6500 Series at the high end

Unparalleled WAN availability for consistent and reliable service delivery across the WAN:

- Highly available carrier-class design with redundant hardware and software, providing consistent, reliable, and "always-on" services

- Resilient hardware platform architecture with control- and data-plane separation for powerful system availability

- Complete hardware redundancy for forwarding and route processors with millisecond failover and zero packet loss (Note: forwarding engine failover results in minimal packet loss.)

- Industry's first redundant software (Cisco IOS® XE Software) on nonredundant hardware (1-rack-unit [1RU], 2RU, and 4RU chassis)

- Modular Cisco IOS XE Software that provides ability to remotely restart, fault containment, and In-Service Software Upgrades (ISSUs)

High-performance embedded WAN edge security for attack prevention and compliance:

- Ability to instantly turn on embedded security services without affecting WAN routing performance

- Integrated "all-in-one" router approach that simplifies operation and reduces costs and time to qualify, deploy, and maintain the WAN infrastructure

- Secure services aggregation for private WAN and remote sites

- Embedded secure Internet access, session border controller, firewall, and VPN termination

- Built-in high-performance, integrated security services that reduce the need for standalone devices:

  - Control packets, computation of routes, and connection setup; a redundant route-processor module option is available for the 6RU and 13RU chassis

  - Secure connectivity services: Provides secure and scalable network connectivity, incorporating multiple types of traffic; examples include various VPN services such as Dynamic Multipoint VPN (DMVPN), Group Encrypted Transport VPN, Enhanced Easy VPN, and up to 11-Gbps IP Security (IPsec) VPN services

- Integrated threat control: Prevents and responds to network attacks and threats using network services; examples include Virtual Route Forwarding (VRF)–aware firewall and Network Address Translation (NAT) services with up to 100-Gbps throughput, NetFlow services, and multigigabit deep packet inspection through Network-Based Application Recognition (NBAR), Flexible Packet Matching (FPM), and Application Visibility and Control (AVC) to provide a rapid first line of defense against network threats and notable worms and viruses

Improved WAN service levels and operational excellence:

- Reduced and optimized total WAN operating costs through effective bandwidth usage, and overlaid network and device consolidation, power efficiencies, and service integration

- Improved bandwidth usage with WAN optimization features such as Web Cache Communication Protocol Version 2 (WCCPv2), and traffic management and instrumentation (scalable full NetFlow Version 9)

- Innovative hardware and software architecture to readily adapt to new business requirements

- Sophisticated Cisco ASR 1000 Series Router system software and hardware design to address oversubscription and provide scalable and flexible QoS for predictable application performance

Cisco ASR 1000 Series Components

A common hardware and software architecture and common components are used across the Cisco ASR 1000 Series Routers. Primary components include:

- Chassis: The chassis is available in five different form factors, and all have capability for dual power supplies (refer to Table 1):

Table 1.   Chassis Form Factors

Chassis	Rack Unit Height	Part Numbers and Additional Notes
Cisco ASR 1001 Router	1RU	ASR1001, ASR1001-2XOC3POS, ASR1001-4TX3, ASR1001-HDD, ASR1001-4X1GE, and ASR1001-8XCHT1E1
Cisco ASR 1002 Router Cisco ASR 1002-X Router	2RU	ASR1002 ASR1002-X
Cisco ASR 1004 Router	4RU	ASR1004
Cisco ASR 1006 Router	6RU	ASR1006
Cisco ASR 1013 Router	13RU	ASR1013 (with option for quad power supply)

For more details about the different chassis SKUs and bundles, please refer to the data sheet or ordering guide.

- Route processor: The route processor runs the router control plane, including processing of network control packets, computation of routes, and connection setup.

- Embedded services processor (ESP): The ESP includes the Cisco Quantum Flow Processor chip set and provides forwarding, services, and traffic management (QoS) capabilities. A redundant ESP module option is available for the 6RU and 13RU chassis.

- SPA interface processor (SIP): The SIP is the housing for the shared port adapters (SPAs) in the system, each of which can take up to 4 half-height SPAs, or 2 double-height SPAs, or 1 double-height SPA and 2 single-height SPAs. For more information about the Cisco ASR 1000 Series Routers, please visit http://www.cisco.com/go/asr1000.

Cisco and Partner Services for the Borderless Network Architecture

Enable the Borderless Networks Architecture and the business solutions that run on it with smart, personalized services from Cisco and our partners. Backed by deep networking expertise and a broad ecosystem of partners, these services help you plan, build, and run a network that enables you to expand geographically, embrace new business models, and promote business innovation. Whether you plan to transition to a Borderless Networks Architecture, solve specific business problems, or improve operational efficiency, we have a service that can help you get the most from your IT environment. For more information, visit http://www.cisco.com/go/services.

Why Cisco?

With the Cisco ASR 1000 Series Router as part of the Cisco Borderless Networks Architecture, Cisco provides powerful WAN services aggregation products, architectures, guidance, and support to help you transform your network as the platform to aid business excellence. Building on the success of existing Cisco WAN platforms, including the Cisco 7200 Series Routers, Cisco 7600 Series Routers, and Cisco Catalyst 6500 Series Switches, this innovation can help you achieve business success by providing services on your WAN securely and reliably, while minimizing the total cost of ownership.