

JUNIPER NETWORKS INTELLIGENT SERVICES EDGE SOLUTIONS FOR CABLE OPERATORS

A portfolio of hardware and software that enables rapid delivery of next-generation converged services

Challenge

Deploy a standards-based, high-performance, converged edge network that enables the rapid delivery of new services and streamlines operational efficiency for both residential and commercial services.

Solution

The Intelligent Services Edge offers MSOs the ability to converge networks and offer multiple residential and business services on a pragmatic, modular, market-driven platform to gain operational efficiencies required for service velocity and interoperability.

Benefits

Cable operators worldwide can benefit from ease of operations with a single converged network and the ability to rapidly deploy new, highly differentiated services via advanced Intelligent Services Edge platforms that enable cable operators to monetize their networks.

Cable operators are looking to maximize value from their network infrastructure investments through new and innovative service offerings at a time when new subscriber rates are flattening. Juniper Networks® addresses these emerging requirements through a set of modular, Juniper Networks Junos® operating system-based edge features that can be flexibly implemented on a variety of Juniper's edge routing platforms so that cable operators can more efficiently monetize the IP edge. Intelligent Services Edge solutions from Juniper Networks enable hardware consolidation and leverage market-driven technical innovation that combines proven features with architecturally consistent, proven platforms. Intelligent Services Edge is not a single product; it refers to multiple complimentary hardware and software features that can be flexibly implemented at the edge of the multiple service operator (MSO) network on a variety of platforms to enable next-generation video, telephony, and data services that enhance network performance and agility.

The Challenge

Cable operators are continually looking for new opportunities in adjacent markets. As a result, they are increasingly offering similar services in multiple markets, and this market and service convergence creates a shared set of Intelligent Services Edge network requirements for:

- High-performance, service-centric, standards-based edge infrastructure
- Integrated security such as intrusion prevention system (IPS) and deep packet inspection (DPI) functionality to reduce the need for appliances
- Business-class services for small and medium businesses (SMBs)
- Data Over Cable Service Interface Specifications (DOCSIS)-aware subscriber management that enables per-subscriber targeted service provisioning and aggregation
- An eco-system of value-added services from partners in various edge application areas, including video-quality monitoring

The Juniper Networks Intelligent Services Edge Solution

Juniper Networks allows cable operators to deploy a universally required set of services at the edge of the network. Video, VoIP, high-speed data, and converged multimedia services can be easily enabled so that cable operators can rapidly deploy innovative services, and efficiently scale the edge network to accommodate additional services and subscribers. This new approach to solving edge challenges can be universally applied independent of the underlying hardware or access technology, so that the edge platform takes on the personality of the software it hosts. In addition, this integration potentially reduces the need for external hardware appliances.

Cable operators can avoid the cost and complexity of building out multiple networks for voice, data, video and business services by selecting software-customized platforms at the edge of the network. Intelligent Services Edge solutions from Juniper Networks enable the high-performance, service-centric edge networks that allow MSOs to efficiently utilize bandwidth while delivering the quality of service (QoS) required for real-time services. By selecting Intelligent Services Edge solutions from Juniper Networks, cable operators can more efficiently monetize their networks to increase service velocity and flexibility while efficiently managing capital and operational costs. Juniper's edge routing platforms support a modular, software-centric feature set that efficiently and flexibly addresses a universal set of edge network requirements.

Features and Benefits

Juniper's solution for the Intelligent Services Edge is an IP converged environment with a rich set of solutions allowing MSOs to make the best use of network resources, and offer new revenue-generating services with the reliability that subscribers demand. This solution can be deployed with the Juniper Networks MX Series 3D Universal Edge Routers, M Series Multiservice Edge Routers and T Series Core Routers.

The Intelligent Services Edge is the introduction of a series of rich solutions—a shared set of edge network requirements needed for high-performance, service-centric, standards-based edge infrastructure that supports the quality delivery of converged video, voice, data, and multimedia services, while concurrently being resourced efficiently to acquire, implement, and operate with carrier-class reliability.

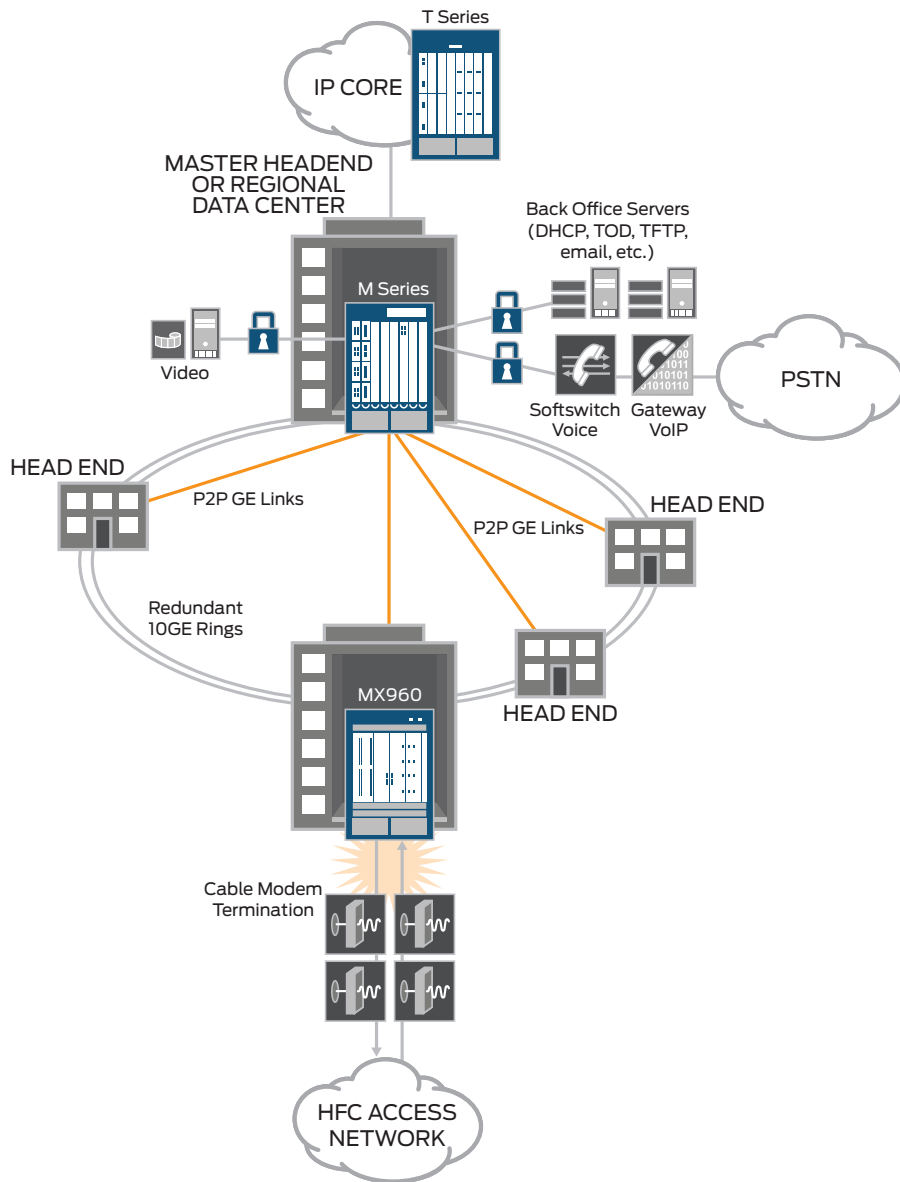


Figure 1: The MSO edge

Juniper Networks intelligently integrates features that support real-time voice and video applications, interactive communications, comprehensive security, identity and policy-based control, and DOCSIS-aware subscriber management onto service-centric, standards-based infrastructure that is efficient to deploy and manage. Junos OS is a strategic Juniper Networks advantage that plays a key role in determining OPEX, maintaining network stability/reliability, and enabling innovative service offerings.

A major feature of Intelligent Services Edge solutions is the fact that a single operating system can be used throughout the edge network, at peering points and in the core, thus offering compelling operational efficiencies in areas such as configuration, maintenance, and upgrades. Running a single Junos OS release throughout the MSO network increases operational efficiency, reduces upgrade complexity, reduces OPEX, and avoids multiple, expensive, operations support systems (OSS) integration efforts.

Deep Packet Inspection (DPI) technology enables packet inspection beyond Layer 3 and Layer 4 headers, and it enables stateful protocol/application monitoring. Deep Inspection at the edge of the network enables application classification and control that is protocol-agnostic and application-aware. IPS technology is central to network security, and Intelligent Services Edge solutions enable control plane and data plane monitoring.

MSOs can benefit from operational efficiency enabled by the Intelligent Services Edge. Consistent procurement, maintenance, and troubleshooting processes simplify support, and cable operators benefit from the efficiencies of common components and common sparring.

Modular software services on task-optimized hardware allow MSOs to benefit from the optimal mix of capacity, form factor, and feature set, and the Intelligent Services Edge permits layered services and eliminates the need for appliances. Support for a broad set of capabilities on edge routers eliminates the need for multiple platforms and initiatives, allowing cable operators to support “green” initiatives that eliminate the need for appliances and their associated power/interconnect/space/cooling inefficiencies.

For MSOs to take advantage of Intelligent Services Edge solutions, awareness of DOCSIS subscribers has to be extended from the cable modem termination system (CMTS) to the edge router. Juniper Networks offers dynamic subscriber and service activation where the edge router reads the IP detail record, aggregates CMTS data, and enables dynamic creation of the configuration per subscriber, including the necessary security services and additional class of service/quality of service as required.

The Junos Services Software Development Kit (SDK) allows members of the Juniper Networks Partner Solution Development Program (PSDP) to build custom applications that run on Multiservices Physical Interface Cards (MS-PICs) and on Services Dense Port Concentrator (DPC) modules, which are access-agnostic. The SDK supports third-party application integration as well as service customization based on a combination of policies,

subscriber identity and privileges, application requirements, and network state. The SDK provides the tools needed to customize the network and rapidly introduce innovative new services. It allows for the development of custom applications that run on the MS-PIC and Services DPC such as; enhanced voice services, video monitoring, event-optimized routing, extended operations toolsets, and security applications.

Advanced silicon in the edge routers provides the powerful packet processing needed at the edge of the network and enables enhanced QoS scalability and high performance. The Policy Decision Function (PDF) controls traffic entering the IP network by allocating or denying network resources, and it can be centrally located or distributed to the network elements. The Session Border Control Border Gateway Function (SBC BGF) for Junos operating system supports VoIP and IP Multimedia Subsystem (IMS) services, and cable operators can benefit from Deep Packet Inspection of intelligent services at the edge. Integrated IPS functionality allows cable operators to perform stateful inspection at the edge of the network to protect against network attacks.

High-performance hardware allows cable operators to deploy Intelligent Services Edge solutions that can cost-effectively scale to support new services and subscribers, and support emerging applications. The architectural consistency across routing platforms allows MSOs to deploy a strong services foundation that can meet QoS requirements for diverse converged services.

Solution Components

Junos OS is Juniper’s single network operating system, integrating routing, switching, security, and an array of network services. It runs on a broad portfolio of products for converged network deployments and helps build competitive advantage by improving flexibility and operational efficiency. Unlike other network operating systems, Junos OS offers one operating system, enhanced through one release train, and developed based on one modular architecture—the power of one differences. These differences allow us to provide carrier-class continuous systems availability, automated network operations, and the open innovation to quickly respond to rapid growth and change, while reducing complexity, cost and risk. Deploying platforms that run Junos OS creates an open network infrastructure that interoperates and integrates with existing solutions and systems.

Leveraging Junos OS, the MX Series offers a seamless, cost-effective way to deploy Ethernet. The Juniper Networks MX960 3D Universal Edge Router is the industry’s largest-capacity carrier Ethernet platform, with up to 960 gigabits per second (Gbps) of switching and routing capacity. It reduces costs, enables more revenue per platform, and can scale to protect MSO investments. Offering efficient support of high-density interfaces and high-capacity switching throughput, the MX960 supports a wide range of business and residential applications and services, including high-speed transport and VPN services, next-generation broadband multiplay services, and high-volume Internet data center internetworking.

Juniper Networks offers integrated platforms that allow the flexible and scalable delivery of converged services from the edge of the network across the core. Accelerate deployment of the ideal next-generation network (NGN) with the T Series family: T320, T640, T1600, and the TX Matrix for multi-chassis operations. Juniper Networks T Series Core Routers, including the T1600—a 1.6 Tbps system with 100 Gbps per slot—delivers performance without compromise rather than forcing a choice between either rich services or performance.

The T Series Core Routers offer sophisticated processing capabilities on a true multiservice platform. Cable operators can reduce operational and capital expenses while easily customizing the solution set and user experience. The result is flexible, powerful, and profitable network service delivery. On the control plane is Junos OS, which operates from edge to core across all Juniper Networks routing platforms. In addition to being the industry's most proven and trusted network operating system, Junos OS is integrated with Juniper Networks SRC Series Session and Resource Control Modules for policy-driven control of network resources.

The M Series Multiservice Edge Routers uniquely combines best-in-class reliability, stability, security, and service richness. These multiservice edge routing platforms allow cable operators to consolidate multiple networks into a single infrastructure while simultaneously generating new revenues with leading-edge services. M Series Routers use a hardware-based approach combined with the highly scalable, secure, and reliable Junos OS, which enables multiple services without compromise on a single IP platform.

Summary—Intelligent Consolidation at the Intelligent Services Edge

Juniper Networks offers market-driven technical innovation that combines complementary, proven, Juniper Networks features with architecturally proven Juniper Networks platforms. Cable operators worldwide can benefit from efficient resource utilization and advanced Intelligent Services Edge foundation platforms that share key Juniper Networks design principles:

- Separation of control and data planes
- Junos OS
- Advanced silicon

The Intelligent Services Edge enables cable operators to deploy a high-performance, service-centric, standards-based edge infrastructure that predictably supports the quality delivery of converged voice, video, data, and multimedia services, while concurrently being resource efficient to operate with carrier-class reliability and scalability.

Next Steps

To find out more about Intelligent Services Edge solutions from Juniper Networks, visit www.juniper.net/cable.

About Juniper Networks

Juniper Networks, Inc. is the leader in high-performance networking. Juniper offers a high-performance network infrastructure that creates a responsive and trusted environment for accelerating the deployment of services and applications over a single network. This fuels high-performance businesses. Additional information can be found at www.juniper.net.

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