

JUNIPER NETWORKS MULTIPLAY SOLUTION

Simplifying Growth While Enabling New Revenue Streams

Challenge

Broadband operators are looking to easily scale their networks to support more subscribers using higher speed services, to run networks hotter, to more easily add new services and service bundles, and to enable new revenues.

Solution

Juniper’s multiplay solution includes the MX Series 3D Universal Edge Routers, the SBR Series and SRC Series platforms which provide additional per-subscriber control, and the SRX Series for security. The overall solution includes the core network (T Series and M Series), as well as data center switches (EX Series).

Benefits

Juniper’s multiplay solution supports up to 2.8 Tbps, allowing you to easily add new subscribers or upgrade existing subscribers to higher speed service. Advanced network security, integrated video monitoring, and volume tracking further reduce operational expense and TCO. In addition, network operators can track access to and gain revenue from off-net applications.

Even as broadband penetration approaches saturation, traffic growth continues unabated. This is driven by the dynamic growth in video streaming, as well as demand for higher performance access to networked applications. In addition, video conferencing growth further strains broadband infrastructure by combining the low latency requirements of voice communication with the high bandwidth required by video services. As triple play bundling becomes essential to doing business, IPTV complicates this by introducing multicast technologies onto the access network while consuming much of the available bandwidth. At the same time, competitive pressures are making it difficult for operators to charge more for broadband access. This yields a dual strategy to increasing profitability. On the expense side, operators are looking to tightly control network expenses by simplifying network operations. On the revenue side, they are looking to increase revenue, typically by enforcing service tiers as well as gaining new revenues from “over the top” applications such as gaming and cloud computing.

Built on Juniper Networks® high performance infrastructure products, Juniper’s multiplay solution simplifies the process of adding new subscribers, upgrading existing subscribers to higher usage tiers, and restricting network access based on access rates or monthly volumes. To further simplify network operations, the solution integrates Juniper’s massively scalable security and policy management products. In addition, it enables operators to easily gain new revenues by ensuring quality delivery of “cloud computing” services which reside outside of the walled garden.

Juniper Networks multiplay solution allows operators to retain their existing digital subscriber line access multiplexer (DSLAM) investment while leveraging the unique strengths of Juniper’s solution to increase scalability. As the leader in high-performance networking, Juniper Networks provides a robust, scalable solution for broadband operators.

The Challenge

While broadband traffic continues to grow unabated, competitive pressures are making it difficult for operators to charge more for services. With no additional revenue in sight, broadband operators are unwilling to invest in building up their infrastructure. As a result, operators are looking to run networks hotter, simplify the process of adding new services and subscribers, and expand revenues from “over the top” applications including gaming and cloud computing.

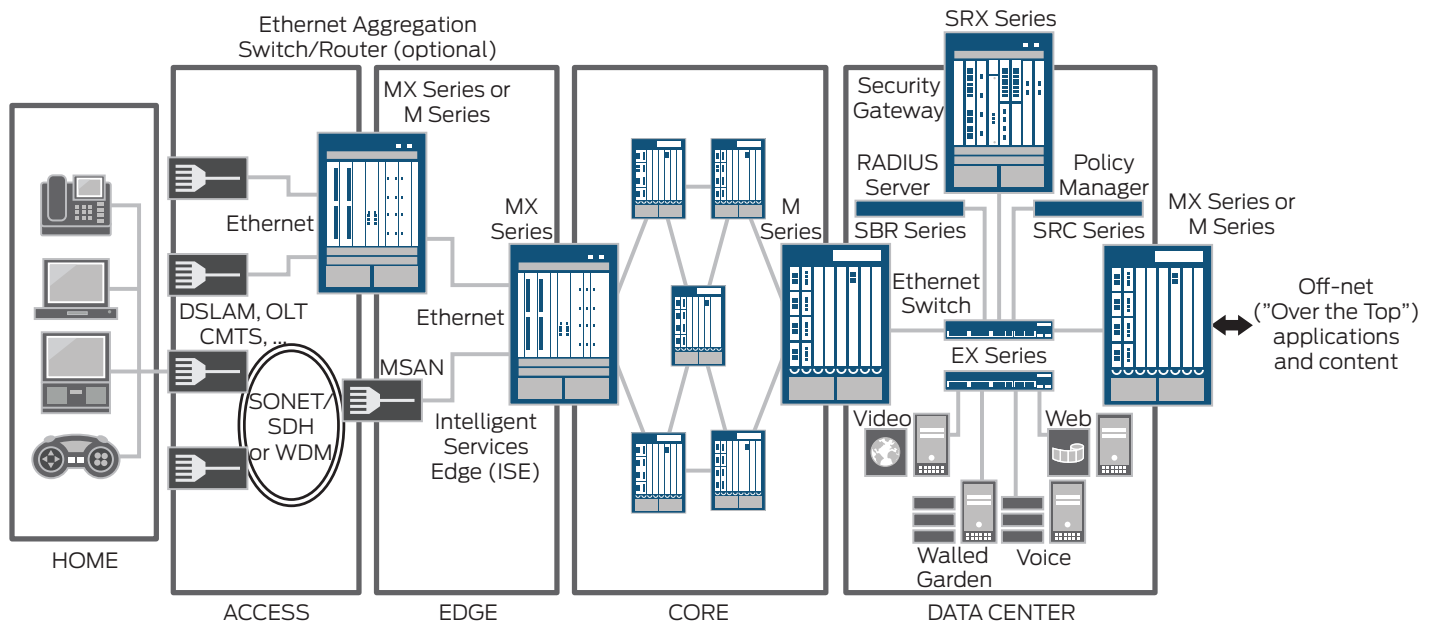


Figure 1: Multiplay network overview

The Juniper Networks Multiplay Solution

Juniper's "multiplay" approach to delivering residential services focuses around delivering a wide range of services easily, efficiently, and with assured quality of experience. Juniper's solution allows broadband operators to fully utilize the bandwidth to each subscriber, without dedicating bandwidth to specific applications. This differentiates it from a static "triple play" network in which bandwidth is dedicated to each service, making it difficult to carve out bandwidth for new applications. Key attributes of the multiplay solution include:

- Centralized architecture:** Implementing all network intelligence in the Juniper Networks Intelligent Services Edge router eliminates the need to modify hundreds or thousands of Multi-Service Access Nodes (MSANs) such as DSLAMs and OLTs whenever a network change occurs. In addition, this "access agnostic" approach allows you to implement a single operational model which supports multiple types and brands of MSANs.
- Intelligent Services Edge:** All voice, video, and data traffic across the access network terminates at a single router, which provides routing, quality of service (QoS), and logging/accounting for each subscriber. This device has full visibility into network activity, allowing it to manage traffic independently to ensure the "quality of experience" for each subscriber by managing bandwidth for all applications to all subscribers. Traffic is queued per subscriber, per DSLAM, and per port with compound shared shaping. This ensures that each subscriber's traffic is unaffected by other subscribers, and allows the broadband operator to offer different service priorities by subscriber type (for example, from small businesses to residential). This device also tracks which channels are being watched by each subscriber, allowing it to calculate the remaining bandwidth available to each subscriber for unicast traffic.
- TR-101 compliant:** The Juniper multiplay solution supports both models described in the DSL Forum's TR-101 specification. In the 1:1 (or customer VLAN) model, a single VLAN carries all unicast traffic to a given subscriber. Placing all traffic to a given subscriber into a single VLAN allows the network to dynamically manage traffic to each subscriber. This model is operationally simpler but is not supported by all MSANs. In the N:1 (or service VLAN) model, each VLAN carries one service to all subscribers. This model is supported by more MSANs, but does not allow prioritizing traffic destined to a single subscriber.
- Integrated security:** The Juniper Networks multiplay solution protects the network, application servers, and subscribers against a variety of attacks using filtering, firewall, and intrusion detection. It detects threats, filters or redirects the offending traffic, identifies the subscriber or other source generating the attack, and/or notifies the security response team.
- Enhanced network operations:** Juniper's multiplay solution integrates advanced policy management capabilities to automate and simplify operations. Available capabilities include volume tracking, which allows setting volume limits (typically per month) for each subscriber and redirecting the subscriber to a portal when thresholds are exceeded; bandwidth-on-demand, including subscriber-initiated (such as "turbo button") and network initiated (such as unlimited nights and weekends); and application admission control, in which the network determines whether sufficient resources are available to support a requested service flow.
- Service awareness:** Video and voice monitoring capabilities are integrated into the router, allowing service-level monitoring using the same operational model as used for data traffic. This simplifies network troubleshooting while minimizing training costs and eliminating additional failure points.

Features and Benefits

Juniper's multiplay solution is built upon Juniper's philosophy of providing open, agile, and flexible solutions for customers. This solution provides several advantages:

- **Scalable in all dimensions:** Juniper's multiplay solution was designed to meet the high-performance needs of today's video-enabled networks. The solution supports up to (192) 10-Gigabit Ethernet connections to MSANs and aggregation switches, while supporting up to 64,000 subscribers. A unique strength of this solution is dynamic bandwidth management, allowing you to easily add new services into the network without reserving bandwidth or modifying each existing MSAN. Bandwidth is allocated to services and subscribers only as required, reducing the total bandwidth requirement.
- **Enables new revenue streams:** A unique strength of Juniper's multiplay solution is its ability to dynamically adjust the amount of bandwidth required to deliver each service across the network to each subscriber, making it simpler for operators to add new services without reallocating bandwidth or affecting subscribers. These applications may reside within your walled garden, or they may be over-the-top applications residing at outside data centers. In addition, the solution easily supports a three-screen strategy by allowing any client to access any service.
- **Protects your investment:** Juniper's multiplay solution works with any existing investment in MSANs, aggregation switches, and core routers. Juniper's advanced shaping and policing allows a broadband operator to deploy a single DSLAM which supports both residential and business subscribers. Automating operations and using Juniper Networks Junos® operating system lowers the total cost of network operations¹. By tightly integrating with existing RADIUS servers, the solution facilitates the migration away from Point-to-Point Protocol (PPP)-based broadband access.
- **Provides quality of experience:** Juniper's solution allows the application to optionally request that the network reserve bandwidth for the duration of the connection, ensuring that the subscriber is satisfied with the broadband experience. Integrated video monitoring capability allows network operators to verify that received content meets their video quality criteria.

Solution Components

As broadband networks evolve to support multiple services, including more and more unicast IP video such as video on demand (VOD), network reliability and scalability move to the forefront. As a result, Juniper Networks switches and routers are deployed in the world's largest broadband and IPTV networks. Key elements of Juniper's portfolio include:

- **Intelligent Services Edge (MX Series)²:** Juniper Networks MX Series 3D Universal Edge Routers provide subscriber management services for up to 64,000 subscribers and 960 Gbps of non-blocking throughput. In addition, advanced functions such as integrated Dynamic Host Configuration Protocol (DHCP) server and RADIUS proxy reduce the need for additional servers, while simplifying the migration from PPPoX-based to DHCP-based subscriber management. The Intelligent Services Edge also supports other services required to create a truly universal broadband edge, including session border controller capability, deep packet inspection, and video quality monitoring.
- **Steel-Belted Radius (SBR Series)³:** Juniper Networks SBR Series Steel-Belted Radius Servers are high availability servers designed for the demanding needs of service providers, provides IP address assignment, QoS flow management, and billing to more than 120 service providers worldwide. It allows service providers to monetize their networks by accurately accounting for and tracking each service and service level. The single physical platform also allows a smooth network transition from a variety of technologies to the consolidated technologies of next-generation networks, supporting the carrier-class performance and scalability that service providers require to step into the future with confidence.
- **Session and Resource Controller (SRC Series)⁴:** Juniper Networks SRC Series Session and Resource Control Modules enable the rapid creation and deployment of new IP services to millions of subscribers. The SRC Series provides a mechanism to dynamically modify each subscriber's capabilities, such as allowing the subscriber to pay for a bandwidth boost ("turbo button") or providing additional bandwidth during off-peak hours. Network changes can also be initiated by authorized applications, which interact with the SRC Series through open and standards-based APIs. In addition, the SRC Series provides automated, policy-based "zero touch" service and subscriber provisioning.

¹ See "How Operating Systems Create Network Efficiency" www.juniper.net/solutions/literature/white_papers/lake_partners_network_efficiency.pdf.

² For additional information on the MX Series portfolio and Intelligent Services Edge capabilities, see www.juniper.net/us/en/products-services/routing/mx-series/ and www.juniper.net/us/en/solutions/service-provider/intelligent-edge/ respectively.

³ For additional information on the SBR Series Steel-Belted Radius Servers, see www.juniper.net/us/en/products-services/software/ipc/sbr-series/.

⁴ For additional information on SRC Series Session and Resource Control Modules, see www.juniper.net/us/en/products-services/software/ipc/src-series/.

- **Services gateways (SRX Series)⁵:** A critical multiplay requirement is to protect the network and application servers against attacks. Juniper Networks SRX Series Services Gateways are massively scalable, and they provide comprehensive and easy-to-use protection against application and network layer threats. Juniper's asymmetric security solution redirects upstream subscriber traffic to the SRX Series, which applies firewall and intrusion detection capabilities to ensure that the incoming traffic is a valid and safe request. Downstream content destined for the set-top box (STB) bypasses the SRX Series.
- **WAN routers (MX Series, M Series, T Series)⁶:** Juniper Networks MX Series 3D Universal Edge Routers, M Series Multiservice Edge Routers, and T Series Core Routers are modular, carrier-class networking devices that deliver performance, reliability, and service differentiation to broadband and business subscribers. They support the high-performance routing required to support video-intensive networks. Open APIs allow third-party applications to be integrated directly into the router.
- **Ethernet switches (EX Series)⁷:** Juniper Networks EX Series Ethernet Switches deliver wire-speed performance on all ports for any packet size. The EX Series switches support eight QoS queues per port, ensuring proper prioritization of control plane, voice, video, and multiple levels of data traffic. Juniper's unique Virtual Chassis technology allows up to 10 switches to be interconnected and managed as a single, logical device, delivering the reliability, scalability, and manageability of traditional chassis-based systems in a cost-effective, compact platform.

Summary: Faster, Simpler Broadband Networks

Juniper Networks has over 10 years experience in building the world's largest broadband and IPTV networks. With the Juniper Networks Intelligent Services Edge capabilities integrated into the MX Series routers, Juniper now makes the network easier to deploy and manage broadband services. Intelligent Services Edge capabilities include session border controller functionality, as well as voice and video monitoring. In addition, policy management, DHCP server, RADIUS, and security integration ensures a robust and scalable broadband solution. SBR Series Steel-Belted Radius Servers and SRC Series Session and Resource Control Modules enable dynamic, per-subscriber network control. The carrier-grade SRX Series integrates advanced security services, while Juniper's routing and switching products complete the end-to-end IP network using a common Junos OS.

Next Steps

Juniper Networks multiplay solution is a subset of Juniper Networks business model evolution architecture which allows you to offer residential, business, and backhaul services on a single IP infrastructure. For more information on multiplay and business model evolution, contact your Juniper Networks representative, visit www.juniper.net/us/en/solutions/service-provider/residential/, or call us at 866-298-6428 (USA, Canada, and Mexico) or +1-978-589-0500.

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.

⁵For additional information on the SRX Series, see www.juniper.net/us/en/products-services/security/srx-series/.

⁶For additional information on Juniper's routing products including the M Series and T Series, see www.juniper.net/us/en/products-services/routing/.

⁷For additional information on the EX Series, see www.juniper.net/us/en/products-services/switching/ex-series/.

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