HIGH-PERFORMANCE NETWORKING SOLUTIONS FOR FINANCIAL SERVICES

Flawless and Consistent Execution with Juniper Networks' Service Enabling Solution Suite

Challenge

In financial services, security and privacy are essential. At the same time, computerized trading and service offerings have made transaction speed increasingly important in order to compete with fortunes literally gained or lost based on microsecond order execution.

Solution

Juniper offers a variety of products to help financial services organizations excel in today's highly volatile and competitive market. These solutions combine products that work together to create a consistent user experience, unparalleled security, and a greatly simplified and consistent IT approach to the business.

Benefits

- Greatly simplified data center operations with significantly reduced latency
- Speed and consistency, from the data center to the remote user
- Inter and intra center redundancy and failover for seamless operations regardless of external conditions
- Cooperative security in the network by the network
- Flexibility, lower TCO, and future-proofing of the network

Today's financial services institutions face enormous challenges. First and foremost, they must comply with a number of different regulations designed to ensure security and privacy of customer transactions and financial data. Because customers themselves as well as core business operations are often affected by a security breach, a violated organization can lose its reputation overnight, and this can directly affect the viability of the business. This was the case earlier this year when Heartland Payment Systems (HPY)1 disclosed that intruders had hacked into the computers it uses to process 100 million payment card transactions per month for 175,000 merchants. In this kind of high risk environment, IT infrastructures that maintain security and privacy are virtually "table stakes" in today's financial services industry.

Financial services must also address unique requirements around the speed and efficiency of their networks. Latency and network downtime are perhaps more costly in this industry than in any other. To maintain a competitive edge and meet order execution requirements that have moved from milliseconds to microseconds, financial organizations are streamlining infrastructure and are looking for ways to reduce latency wherever possible. Disparate network management systems and multiple operating systems can add needless complexity and contribute to high operating and management costs, thus resulting in undesirable or even insurmountable limitations on the business.

These factors combine to create an environment where the network is far more than just a means of connectivity. It can be a significant asset or a disastrous liability. Juniper Networks® can help you make the most of your network with a suite of cooperative products that provide high performance and low latency, streamlining and securing infrastructure while maintaining operational efficiency. And, Juniper's solutions can be deployed incrementally, eliminating the requirement for forklift upgrades or disruptive network changes. This increases agility, performance, and security for the financial services institution while reducing costs.

The Challenge

Today's financial services institutions, including exchanges, brokerage houses, and banking services, face enormous hurdles. Data security and privacy are mandated by a host of regulations that include Basel II, Gramm Leach Bliley, Payment Card Industry Data Security Standard (PCI DSS), Sarbanes Oxley (SOX), Markets in Financial Instruments Directive (MiFID), and Regulation NMS to name a few. Meeting these regulations is not just a matter of compliance; providing security and privacy can make or break a business, since financial services companies are among the industries that lose the most customers after a data breach, estimated to be about 5.5 percent. And because the threat environment is constantly evolving, financial institutions must remain one step ahead.

Financial services must also contend with unique needs related to the speed and efficiency of their networks. Not only is network downtime unacceptable, mere latency can dramatically affect the bottom line as well, especially in those segments that are principally concerned with market transactions. In these businesses, almost by definition, information delayed is money lost. In the trading world, for example, a transaction could result in the purchase of thousands of shares, and missing it by just nanoseconds can cost huge amounts of money for buyer or seller. A 1-millisecond advantage in trading applications can be worth $100 million a year to a major brokerage firm, by one estimate.

These requirements have led financial services organizations to consolidate, reduce latency, and streamline operations wherever possible. Nowhere is this requirement as evident as in the data center, where years of force fitting campus switches into service has created multiple tiers of devices, each of which adds latency and complexity. In order to innovate while retaining high availability, today's financial services organization must accelerate consolidation, optimization, and virtualization initiatives to stay ahead. At the same time, financial services enterprises must remain flexible and broadly compatible, in order to seamlessly roll out new applications and resources.

Financial services, like most enterprises, also face a growth in branch office and remote computing. These organizations may directly service customers and are often the "storefront" to the outside world. As a result, all locations must exhibit "LAN-like" performance and retain optimal and consistent performance regardless of physical location. At the same time, enterprises must build operational consistency into their networks in order to provide end-to-end security as well as lower total cost of ownership (TCO).

The Juniper Networks Financial Services Solutions

Juniper's innovative financial services solutions deliver products that work together and also work with other standards-based products throughout the network to help you realize an infrastructure that is:

- High-performance, featuring unified switching and routing platforms that extend from the branch to the core
- Operationally streamlined, cutting through server sprawl with optimized, virtual platforms
- Threat resistant, with a portfolio of products that can dynamically adapt to changing network conditions
- Consistent in architecture and management, thereby lowering your TCO
- Agile, enabling you to roll out new products and services

Juniper's offerings consistently address all locations of the financial services deployment, from the data center to the campus, from the branch office to the remote user. Product portfolios are designed to interoperate and to provide a consistent experience from location to location. Juniper's market leading switches and routers collapse antiquated architectures and add virtualization, lowering TCO as they speed performance. Juniper's security solutions are built to cooperate with each other as well as with other standards-based offerings, and are available in modular data center/campus form factors that you can add to as you grow, or in integrated platforms that provide the branch/remote office with a host of functionality in one appliance. Juniper's products can be managed through a single pane of glass using Juniper Networks Network and Security Manager. Overall network visibility is provided with the Juniper Networks STRM Series Security Threat Response Managers and Junos® operating system, which ties together routing, switching, and security devices.

Speed and Consistency, from the Data Center to the Remote User

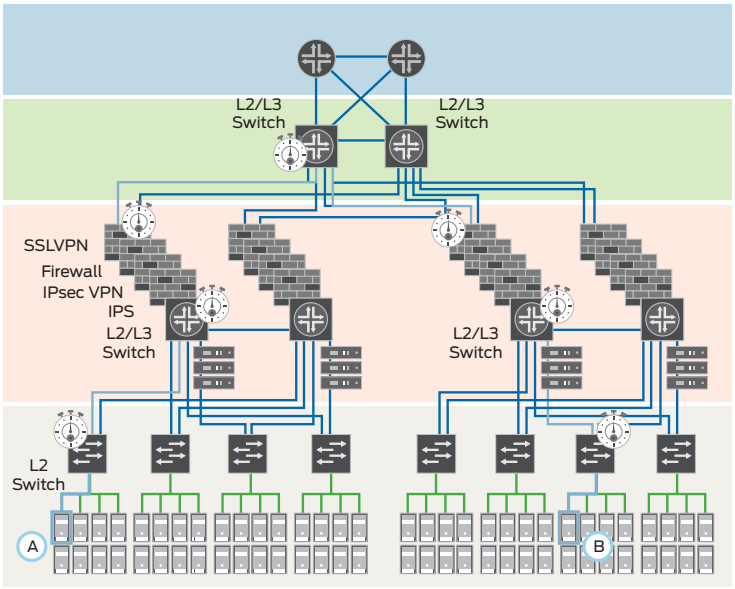
Juniper's financial services solutions begin in the data center, where architectures are perhaps the most complicated. Switches intended for the campus LAN have often been pressed into service in the data center, resulting in three tiers of devices at the access layer, the aggregation layer, and the core. In some cases, there is even an extra distribution layer. It is not uncommon to have a different operating system in each of these layers, making the overall deployment expensive and cumbersome to manage. The access tier serves as the direct interface to servers, and is typically deployed as top of rack or end of row switches connecting servers deployed in racks. Multiple uplinks from the access layer

interconnect to the aggregation layer. The aggregation layer is required due to the large number of uplinks from the access layer, which is generally a larger number than can be supported by devices within the core of the data center.

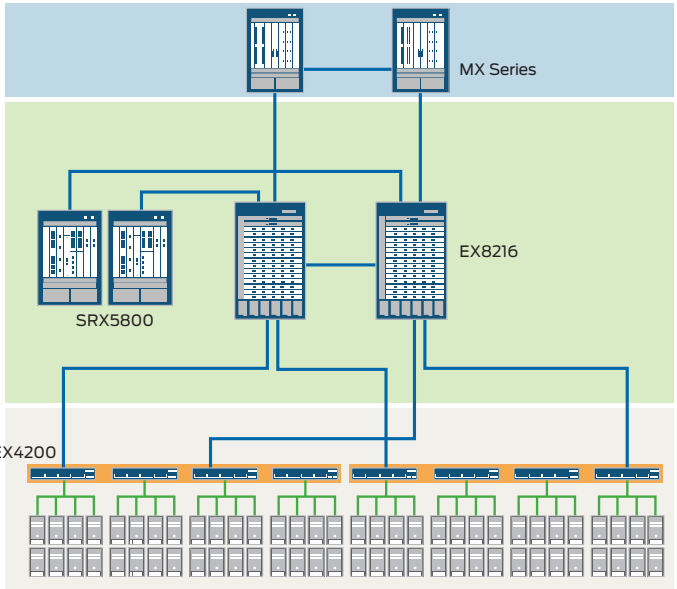
Racks can be consolidated in either end of row or top of rack switch configurations. Unfortunately, these end of row and aggregation switches were originally built for campus environments and can present several limitations in this use case, including Forwarding Engine, Routing Engine, and their switch fabric. This means that oversubscription corner cases are unpredictable and you can't provision a new application with confidence. Meanwhile, in order to transit the network, data must go throughout the entire tiered infrastructure to reach its destination, which results in increasingly unacceptable latency in the network. Security is an afterthought, and often provisioned via a disparate mix of security blades across the aggregation layer. Not only does this take up space and power, but it represents yet another management/operating system that IT staff must master. To be successful in today's marketplace, financial services institutions need to virtualize the access layer and collapse the core and aggregation layers, while consolidating and virtualizing security appliances.

Juniper has the answer with a complete line of Juniper Networks EX Series Ethernet Switches. The Juniper Networks EX4200 Ethernet Switch features Virtual Chassis technology, which dramatically reduces latency across racks. In fact, the EX4200 has the lowest latency in its class at 1.96 picoseconds. The EX4200 also reduces the number of uplinks required, and drastically lowers the number of switches you have to manage by up to 10 times, which saves you not only in capital expenses, but in ongoing power, space, and cooling costs. Best of all, the EX4200 enables end of rack chassis features at a top of rack price, and gives you the flexibility to choose the configuration that works best for you. In fact, Virtual Chassis technology can save you up to 33% over a standard configuration.

The EX Series can also help you realize your goal of collapsing the core and aggregation layers. This begins with Juniper's unique Virtual Chassis technology, and carries through to Juniper Networks EX8200 line of Ethernet switches in the core. The EX8200 line features industry leading line rate density, which can serve to collapse the aggregation layer. Not only does this simplify the architecture, but it reduces latency as it decreases your space, power, and cooling requirements. In fact, the Juniper Networks EX8216 Ethernet Switch features massively scalable 12.4 Tbps fabric, 2 billion packets-per-second (pps) line rate performance, and the ability to aggregate as many as 6,000 servers in a single domain.



Before—Server sprawl



After—Optimized network

Replacement of the access and aggregation tiers with EX Series switches results in:

- Management of up to 10 physical EX4200 switches as a single logical device, which drastically cuts down the number of devices being managed.
- Fewer number of uplinks from the access tier, because a low latency, high-performance Virtual Chassis backplane is the preferred mechanism for server-to-server traffic. Access to aggregation interconnections need only serve the traffic in and out of the data center or across networks within the data center.
- No extra cost to use Layer 3 protocols-based connectivity between access and aggregation tiers, unlike competitive products.
- Reduction in the total number of ports required in the aggregation tier—hence requiring fewer switches and fewer switching tiers (fewer switches translate into fewer ports to aggregate by high tiers in the hierarchy).

As you speed up data center traffic, the ability to apply security and policy consistently is vital, since today's blended threats need only a single chink in the armor to spread throughout your network. Juniper delivers, with best-in-class products including Juniper Networks SRX Series Services Gateways. Powered by Junos OS, Juniper's single unified operating system, the SRX Series gateways provide a host of features in a variety of cost-effective platforms that scale. SRX Series for the high end, the fastest firewall in the world, offers functionality that can be added to the platform as your deployment grows. SRX Series for the branch features integrated functionality in right-sized form factors for remote or branch offices.

> The problem with branch offices today is that they have become independent islands of IT. This is the culmination of many years of incremental addition, beginning at a time when the operational overhead of IT and communications at the branch level simply couldn't have been predicted. "Banks today are reinvigorating their business by making the branch a value center that offers a broad range of customer services. It is important to consider the impact these new services may have on IT infrastructure."
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> Don Free,
> Financial Industry Analyst, Gartner Group

Juniper also has unique capabilities for the remote user, including its market leading Juniper Networks SA Series SSL VPN Appliances. Not only does the SA Series provide secure, role-based access to applications and resources, but it also dynamically provisions Juniper Networks WX Client and antimalware/antispyware at the same time. This gives you the ability to extend your security stance, even to remote, unmanaged devices, while you speed performance.

Consolidate a Highly Available Data Center While Extending Your Reach

In mission critical data center networks, any outage is unacceptable. In financial services institutions, the requirements for high availability go beyond network outages to encompass slowdowns as well, since latency measured in milliseconds can literally sink a business. High availability requirements in the data center are becoming similar to carrier availability requirements. Inter and intra site redundancy is vital in the financial services industry, both to speed performance and to reduce costs. Advanced routing capabilities enhance application performance, security, and availability. Juniper's long experience in creating products to satisfy the world's largest service providers is the foundation for products that make the data center highly available as well as easy to manage and maintain.

High availability in the data center is provided through a number of features, such as those found in Juniper Networks MX Series 3D Universal Edge Routers. The MX Series provides industry leading port density, power savings, performance, and reliability for data center network core and aggregation deployments. High availability begins with Junos OS, Juniper's unified operating system used throughout the entire switching and routing platform. Junos OS separates the forwarding and control planes, and this creates a modular software architecture that is remarkably resilient. This design enables individual processes to restart without bringing down the entire router.

MX Series routers also feature a wealth of powerful features that have been designed specifically for use in large, mission critical networks. Unlike routers from some vendors, Juniper's products feature MPLS that is designed to operate at scale. Virtual private LAN service (VPLS) also extends VLANs, enabling mobility. The MX Series provides unprecedented levels of Layer 2 and Layer 3 scalability, as well as IP multicast, which is frequently not offered in competitive products. With the MX Series, financial services organizations can effectively collapse the core and the WAN edge, resulting in lower capital and operating expenses.

The MX Series, as well as the rest of the Juniper portfolio for the data center, runs over a common operating system with a single management system, accelerating application deployments and leading to improved efficiencies in space, power, cooling, and management. Juniper Networks M Series Multiservice Edge Routers and MX Series 3D Universal Edge Routers at the edge provide high performance, port dense routing and switching functionality without compromise on a single platform.

Enable Flexibility as You Future Proof

In order to remain competitive, today's financial organization must be agile, able to roll out new applications and services quickly and effectively. The number of different management and operating systems running in the average network, however, can make this task almost insurmountable. Juniper's products address this issue in three ways. First, Juniper builds its products around open standards. This enables you to choose the right product for each of your requirements, and avoids the cost and limitations of single vendor lock in. Second, Juniper has built its routing, switching, and security appliances around a single operating system—Junos OS. This means that your IT staff has only one OS to learn, and this saves you money. And, because each release of Junos OS is backwards compatible and the release train is predictable, you never have to worry about upgrading to the latest release. Finally, most Juniper products are managed by Network and Security Manager. This makes it easy to deploy new products or design new policies around a service offering. Best of all, with NSM, you can push a policy throughout your deployment from a single management console. And the STRM Series can unite your entire network, including devices from third-party vendors, to give you a single consolidated view of your deployment.

Security in the Network by the Network

Juniper Networks Adaptive Threat Management Solutions feature a suite of products that are designed to work together cooperatively. Any one of Juniper Networks Adaptive Threat Management Solutions can be deployed as a best-in-class point product on its own—after all, each has consistently been rated among the top devices in its category. But because these devices are designed to work together, they offer benefits that go beyond the unique functionality that each offers individually. The ability to communicate interactively, regardless of location, makes the network work with you to maximize productivity, mitigate risk, and ensure compliance with regulatory statutes.

Adaptive Threat Management Solutions include these products:

- Juniper's suite of firewalls
- SRX Series Services Gateways
- SA Series SSL VPN Appliances
- IC Series Unified Access Control Appliances
- IDP Series Intrusion Detection and Prevention Appliances
- Network and Security Manager
- STRM Series Security Threat Response Managers

See it—Control it

Key among Juniper's offerings are products designed to offer visibility and control, because you cannot control what you cannot see. Juniper offers comprehensive and innovative centralized management, monitoring, and reporting capabilities with its STRM Series devices. The STRM Series not only works with your Juniper devices but with the third-party devices you have already deployed as well, to give you a single "aerial" view of what's going on throughout your network in real time. This gives your IT department the ability to monitor, trend, and report on activities throughout the deployment, as well as to easily meet regulatory compliance with over 1,500 pre-formatted reports. Still more operational simplicity is provided via NSM, the single platform that can provision and update virtually every product in the Juniper Networks portfolio, as well as create and push policies throughout your entire enterprise.

Summary—Meeting Financial Services Challenges with Juniper Networks Solutions (Consistent, highly available and secure across the financial services network)

Juniper Networks innovation in financial services solutions delivers a responsive and trusted environment for handling high volume, time sensitive transactions and interactions based on a lower cost structure. Juniper's solutions help to ensure risk management and regulatory compliance by working together to provide unwavering performance from anywhere in the network. With a Juniper solution, you can ensure a consistent experience from both a threat and a throughput perspective, whether users are remote, in the branch, or on campus. And because Juniper Networks products are based on industry standards, products within the solution can be added incrementally and are compatible with other standards-based products from any vendor.

Next Steps

For more information, visit us online at **www.juniper.net** or contact your local Juniper sales representative.

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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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