

# TAKING RESPONSIBILITY FOR VOICE

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Making the Transition to Intelligent “Voice-Aware” Networking in the Financial Services Sector

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## Executive Summary

Voice communication is evolving. For financial services institutions (FSIs), voice over IP (VoIP) is not only attractive because of potential cost-savings, but also because of benefits like simplified collaboration, unified communications and improved customer service through fully integrated IP telephony.

Nevertheless, while the functionality of IP PBX continues to develop rapidly, the next generation of voice solutions will not be a 'turn key' affair. The IP network will also need to evolve to provide the necessary quality and security that voice demands. In fact, according to Infonetix Research, 68 percent of IP telephony deployments will require operators to upgrade their routers to support voice traffic, and 59 percent will have to upgrade their network security.

This calls for a change of attitude in terms of what constitutes a convergence-ready network. FSIs require products that can dynamically and intelligently make decisions about voice traffic for to ensure protection and performance. FSIs need to make sure that they are not wasting bandwidth on data that could be compressed or removed. They need to be certain that new control protocols do not become the next weak point for network attack, and their users have to be confident that they can always rely on a high-quality voice experience to get the job done when it counts.

Today, the requirement is for "voice-aware" networking from Juniper Networks® networking that provides the security and performance necessary to take VoIP forward as an integrated part of a corporate networking strategy.

## The Strategic Application of Voice

### The Importance of Voice in Finance Today

There are few applications more important than voice for FSIs. If anything, its importance has grown over the years. It is a sector where pressure to deliver operational flexibility and agility—and the need for more effective workplace collaboration and productivity—are continuing to drive the evolution of VoIP technologies.

Today, and in the future, working strategically with voice increasingly means the adoption and deployment of IP telephony. But whatever the platform, voice remains a mission critical application, and users must be able to rely on voice just as much as at any point in the past.

### The Changing Face of Voice

VoIP isn't new, but the methods for deployment are. New features, such as customer response applications, click-to-talk, unified communications, Web conferencing and personal assistance have transformed the way we think about using voice technologies. It has become a strategic enabler for new opportunities within a diverse range of initiatives, including customer service, entering new markets and creating greater staff collaboration across operations.

We are a far cry from the early commercial availability of VoIP in the 1990s. Then, the focus was on trunks between sites for cheaper voice connectivity, effectively lowering the TCO of voice. Today, VoIP is truly about driving the top line, achieving very real and demonstrable productivity and revenue growth.

But one key component of using VoIP for strategic advantage has been overlooked. As its use changes so do the issues around its deployment. VoIP is not just a case of backhauling voice across a data network. It is about delivering fully integrated IP telephony solutions, where the network needs to intimately understand voice's requirements. Most importantly, the network must be sensitive to the threats and vulnerabilities that IP telephony presents by ensuring high performance from end to end.

This is the path to the future of voice, and it is the significance of intelligent "voice-aware" networking from Juniper Networks.

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## Deploying Voice over IP Today and Tomorrow

### The Challenges of the Data Network

Many organizations believe that any enterprise-class IP network is ready for voice, or that an IP PBX vendor alone can resolve any potential challenges. However, in order for VoIP to be truly effective and flexible, organizations need to pay close attention to the network infrastructure.

On the one hand, there are the traditional VoIP obstacles of delay, jitter and packet loss. IP alone provides no mechanism to ensure that voice packets are delivered in sequential order, nor does it provide any quality of service (QoS) guarantees and a disparate and proliferated networking environment can have a dramatic effect on quality. In fact, the result can be a user experience that is unacceptable to mission critical communications.

But more than simply the nature of IP networking itself, there are also challenges created by individual devices that can be found within an enterprise-wide deployment of VoIP. Certain firewalls, for example, can remove information relating to QoS when voice traffic passes through. Devices applying Network Address Translation (NAT) can lower the likelihood of voice traffic reaching its intended recipient, and even cause a call to fail. Moreover, VoIP itself can pose a security threat to the data network by leaving firewall ports open for short but significant lengths of time after calls have terminated.

The result is that most corporate WANs are not yet up to the challenge of delivering voice integrally and reliably. Indeed, according to Infonetics Research, 68 percent of IP telephony deployments will require operators to upgrade their routers to support voice traffic. And with tighter integration with other applications in the clear future for VoIP, organizations need to act now to ensure that they have a network that is capable of delivering on the full promise of IP telephony.

### Looking Towards True Convergence

Despite increasing convergence, voice and IP networks are still treated as separate entities, and are often managed by two different sets of people. While this is not a problem in itself, it is indicative of the old voice and data schism that hasn't completely disappeared.

Delivering the full benefit of VoIP means adopting a truly converged mindset, one where the needs of both real-time applications, such as voice, and traditional applications, like email, are fully taken into account. It is, after all, the responsibility of the IP network to secure and assure the performance of all applications running across it, whether they are latency-sensitive or not.

It is important to ensure that bandwidth is not wasted on data that could be compressed or removed to allow voice traffic to flow more easily. Also, it is important to ensure that devices on the network intelligently support all applications rather than hamper them. Finally, it is important to make certain that new control protocols for voice do not become the latest way to carry out an attack on the network.

All of this requires a more intelligent network, a high-performance voice-aware network from Juniper Networks, specifically designed for high-performance financial services businesses.

## Changing the Way We Think About Voice

### Creating Intelligent "Voice-Aware" Networking

If organizations are to be confident in moving their mission-critical voice applications onto a converged IP infrastructure, they must include industry-leading routing and network security within their design. This means relying on more than an IP PBX vendor. Most PBX vendors naturally focus on building and differentiating their PBX product and not on IP network routing and security. And while some vendors offer limited routing and security functionality, these solutions do not offer the same breadth, depth and intelligence as those of a traffic-processing specialist like Juniper Networks.

By employing the expertise of Juniper Networks, organizations can obtain a networking foundation for IP telephony that is both reliable and robust. Most importantly, it will be a network that is voice-aware: able to make decisions about security and performance of voice, dynamically.

This will mean, for example, that firewall ports can be automatically opened for a voice call and automatically closed the moment that call has terminated. It also means that bandwidth use will be optimized for flow of voice and data traffic depending on demand and that QoS can be enacted end-to-end across the WAN.

## Voice Awareness and the Financial Call Center

VoIP is often touted as taking up relatively little bandwidth. As a result, the importance of bandwidth is downplayed, and this is quite right for most enterprise-based implementations. However, when looking to deploy VoIP between networked call centers, the requirement for bandwidth can become a real issue.

This is partly because the amount of voice traffic is on an altogether different scale but also, notably, because each call generates a significant amount of data traffic that is also time-sensitive. A call agent will be required to log and recall information from systems, for example, throughout the duration of a customer's call. Having to wait for the intensity of voice traffic on the network to subside before being allowed to do this effectively is simply unacceptable.

One answer to such situations would be to over-provision network bandwidth. However, when a call center is not open for business, usually outside of normal working hours, this extra bandwidth represents a considerable and wasteful cost.

A much better solution is to have a voice-aware network that uses its intelligence to process traffic. This way, use of bandwidth is optimized and the need for over-provisioning removed.

## Attributes of the Voice-Aware Network

### Choosing Juniper Networks

Juniper Networks voice-aware networking delivers the predictable service quality, highly available services, pervasive security and standards-based architecture that FSIs require to migrate to a properly converged IP network. These high-performance networking capabilities provide the foundation for the most demanding applications and architectures, and offer secure and predictable performance.

Organizations throughout the financial services sector use Juniper Networks alongside their strategic voice partners to deploy comprehensive IP telephony solutions. By adding the industry-leading routing and security expertise required to deliver voice services reliably across the WAN, Juniper Networks technology complements hybrid/IP PBXs.

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### Juniper's Strategic Partnership with Avaya

Juniper Networks and Avaya have combined industry-leading routing, security and IP telephony products to provide a complete, end-to-end IP telephony solution that addresses the key challenges of performance, security and interoperability.

All Juniper Networks infrastructure elements have been designed with voice sensitivities in mind and will work with Avaya IP telephony applications to deliver a certified, best-in-class enterprise VoIP solution with security and performance unmatched in the industry.

### Predictable Service Quality and Performance

The human ear can detect the tiniest of delays on a phone call. As a result, ensuring a high-quality user experience is a difficult task requiring the network to actively adapt to changing conditions. This means more than simply routing voice traffic along the shortest possible route across the WAN. It involves many different measures making sure the network is dynamically responsive to the requirements of voice applications and their users.

Because Juniper Networks products such as J Series Services Routers, M Series Multiservice Edge Routers, and WXC Series Application Acceleration Platforms, are voice-aware and designed to provide performance without compromise, operators can enable all of these features without affecting the performance or security.

Such features include:

- Comprehensive QoS functionality
- Voice-enabled architecture, which provides the low latency and jitter to support clear voice communications
- Application-specific integrated circuit (ASIC)-based processing, which accelerates the performance of processor-intensive functions in routing and security appliances
- Modular Juniper Networks Junos® operating system, which reduces integration costs and increases network efficiency by providing a common software across all enterprise routing platforms

- Compressed Real Time Protocol (cRTP), which increases network efficiency by compressing the packet headers
- Link Fragmentation and Interleaving (LFI), which minimizes jitter by breaking up large packets and interjecting smaller voice packets
- High-performance IPsec VPN technology to support low latency encrypted voice traffic

## Resilient VPN Connectivity

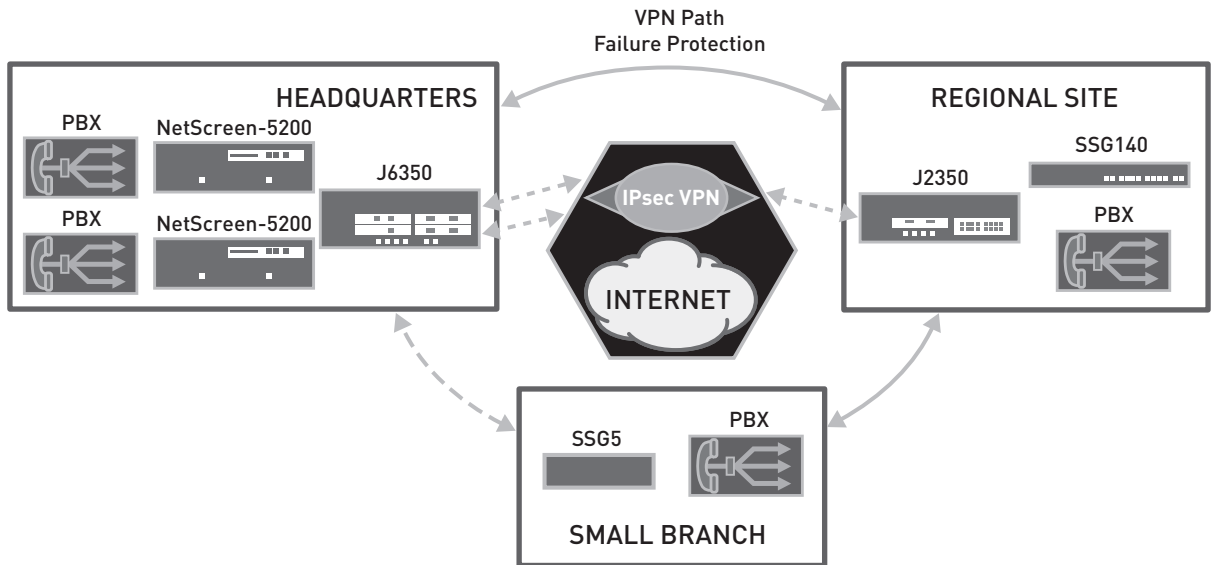


Figure 1: Ensures no calls are dropped if failures occur

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### Juniper Networks WXC Series Application Acceleration Platforms

The WXC Series platform is based on the unique WX Framework, which integrates powerful compression and caching, accelerations, application control and visibility capabilities to enable maximum application performance from voice in a dynamic WAN environment.

### Juniper Networks M Series Multiservice Edge Routers

Rich packet processing enables the M Series to support multiple levels of granular QoS per port, per logical circuit (DLCI, VC/VP, VLAN) and per channel (to DS0) for traffic prioritization. These comprehensive QoS functions include classification, rate limiting, shaping, weighted round-robin scheduling, strict priority queuing, weighted random early detection, random early detection and packet marking.

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## Pervasive Security

It is well known that IP telephony is susceptible to the same viruses, worms, denial of service (DoS) attacks, unauthorized access and other security risks that affect corporate data networks. However, what often goes unmentioned is the risk that voice presents to the data infrastructure too.

Juniper Networks secures both the voice and data end of the proposition with innovative security techniques unmatched in the industry. One key technique, voice-aware Application Layer Gateways (ALGs) for SIP and H.323, allows the network to dynamically open and close firewall ports to permit incoming and outgoing calls through the firewall. VoIP solutions by other vendors require the network to leave a range of firewall ports open—either indefinitely or for an extended period of time—exposing the network to port scanning and hacking.

Juniper Networks security appliances also implement a range of critical security features, including:

- Intra-/inter-zone support, which operators use to separate VoIP network elements to segment traffic by policies to each zone
- High-performance encryption for voice conversations, which prevents eavesdropping and man-in-the-middle
- A scalable VPN architecture, which handles thousands of connections to link headquarters with remote workers, partners and suppliers
- Policy-based access control, which prevents unauthorized use of corporate voice assets and toll fraud

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## Zone-Based Architecture

### Juniper Networks: Leading Security

Juniper Networks provides voice-aware security devices unmatched in the industry to meet all LAN and WAN requirements:

**SSG Series Secure Services Gateways:** The Juniper Networks SSG500 line represents a new class of purpose-built security appliance that delivers a perfect mix of high-performance, security and LAN/WAN connectivity for regional and branch office deployments.

For locations where a single-box solution for security and routing is essential, the SSG Series platform from Juniper is an ideal fit. Offering security solutions familiar to the ScreenOS® operating system, the SSG Series adds a range of WAN and LAN interfaces and advanced content security. These features are further enhanced by an impressive price-performance ratio, making the SSG Series an excellent choice as a platform for integration. In fact, by adding their VoIP vendor of choice, the SSG Series provides organizations with an alternative to restrictive (and expensive) networking 'monocultures'.

**ISG Series Integrated Security Gateways:** The Juniper Networks ISG1000 Integrated Security Gateway and ISG2000 Integrated Security Gateway are ideally suited for securing enterprise, carrier and data center environments where applications such as VoIP and streaming media dictate consistent, scalable performance.

**IDP Series Intrusion Detection and Prevention Appliances:** The Juniper Networks IDP Series provides comprehensive and easy to use inline protection, including the industry's first SIP anomaly detection engine. It stops network and application-level attacks before they inflict any damage, minimizing the time and costs associated with intrusions.

**SSG5 Secure Services Gateway:** The Juniper Networks SSG5 Secure Services Gateway is a feature-rich, enterprise-class network security solution. The SSG5 is ideally suited for securing remote offices, retail outlets and broadband telecommuter environments, where IT staff support is minimal and ease of configuration and management is crucial.

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## Conclusion—Delivering On the Vision of Fully Integrated IP Telephony

As IP PBX vendors have argued, IP telephony promises a new era of improved communications for financial institutions. Unified communications will ensure it is always possible to contact the right person at the right time, wherever they are. Integrated collaboration software will enable closer working between teams and individuals across operations and across the world. And improved contact center responsiveness and flexibility will enable greater levels of customer interaction and satisfaction.

Nevertheless, all this will stand for nothing if the IP network is not ready to take responsibility for voice. Organizations that recognize the need for intelligent, voice-aware networking will see the value in choosing Juniper Networks as their partner for network traffic processing.

## 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](http://www.juniper.net).

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