ENTERPRISE WAN SOLUTION MEETS THE CHALLENGES OF THE CLOUD ERA

Modernizing mission-critical enterprise architectures for the cloud era that are flexible, automated, secure, and resilient

Challenge

The exponential increase in bandwidth consumption presents security, scalability, performance, and management challenges. Transport networks with different requirements increase complexity and are challenging to manage, while cloud services and edge compute adoption place increased focus on WAN scale and performance.

Solution

A complete enterprise WAN solution that addresses the WAN aggregation and backbone, data center interconnectivity, multicloud connectivity, and the Internet edge—along with automation and visibility using a single OS that provides rich network services—is desperately needed.

Benefits

- *Flexible, automated, secure, and resilient WAN solution supports modern architectures*
- *Lower costs due to efficiency, scalability, and performance of carrier-grade WAN devices*
- *Less complexity thanks to automation and visibility tools that enable simpler configuration and operation*

The network is critical to the success of any modern cloud-ready and edge-compute-ready enterprise needing high performance and predictable access to applications. A fast and reliable WAN that connects an organization's widely distributed offices is no longer a luxury—it is table stakes for most routing business operations.

A workforce's productivity is enhanced by the quality of the WAN in the enterprise, as it ensures a superior application user experience. As the WAN grows in importance, however, the operational and financial burdens of running the network grow as well. Businesses must face this challenge head-on and address it in a way that enhances not only performance and reliability, but security, privacy, and compliance.

The cost and complexity associated with networks have also grown as these systems become faster and more robust in order to support both current and next-generation business applications. Growth in the WAN segment has introduced several key challenges to the enterprise, with ease of deployment, flexibility, and scalability emerging as particular challenges:

- How does the enterprise deploy a WAN easily while ensuring that the components are future-proofed and able to perform at scale?
- How do enterprises enable cloud services such as access to hosted applications?
- How do businesses deliver latency-sensitive applications by connecting edge data to the hosted applications?

Effective enterprise WAN network architecture is needed to address this set of growing challenges.

The Challenge

Companies are increasingly looking to cloud, both public and/or private, to augment their business with immediate access to applications and services. With data processing spanning centralized clouds to the distributed edge, future-proofing against WAN bandwidth growth and agility are essential for their success. But adding services and devices to address this challenge increases total cost of ownership, impacting the bottom line.
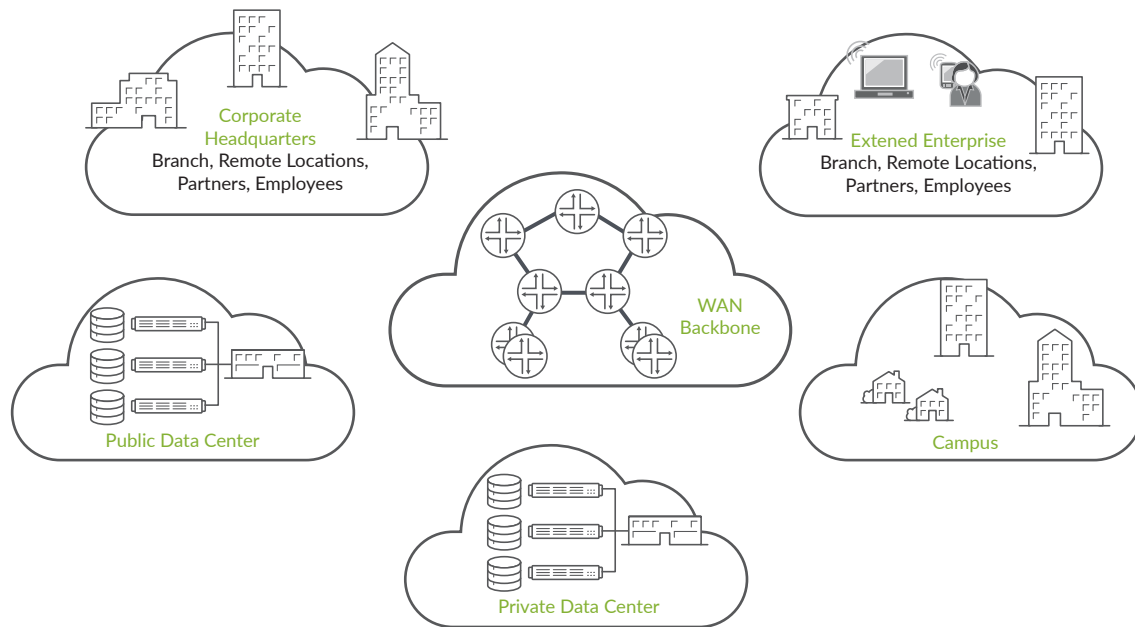
ENTERPRISE WAN

Figure 1: The enterprise WAN covers all areas of the business, including the data center and partners

Once installed, businesses are then faced with managing the WAN. This challenge grows especially problematic as the complexity of the network increases. The WAN needs to be services-ready, so that services can be added as needed without requiring changes to the network. A WAN implementation must also support technologies that enable future growth and the addition of value-added services.

The key challenges of the WAN are ease of deployment and its attendant flexibility and scalability. This ease should extend to the manageability of the network. The enterprise WAN does not consist of a single branch location; rather, it includes geographically dispersed sites of various sizes and purposes. These challenges can be effectively addressed by introducing a common network that excels at carrying traffic of varying importance, with the ability to identify and prioritize it between sites, as well as between partners and third-party support organizations. The technology used to enable the single WAN network should have commonality. Network platforms that share the same operating system can be easily migrated to more robust platforms as needed. In addition, a single operating system makes it easier to introduce new network services and configurations, as the same configuration is likely to migrate wherever it is needed.

Another key requirement is ensuring that cloud services are easily adopted by the enterprise. The drive to reduce costs, combined with the need to provide a high-quality user experience, often collide, shifting priorities and making controlling expenses more important than business needs. An answer to this conflict is often found in the adoption of cloud services. An effective enterprise WAN not only enables intercompany communication, but also a robust and high-quality connection to the data center, either through direct interconnection to an enterprise data center or through a direct connection to a cloud data center. Meeting this challenge is critical to controlling costs while enhancing the user's data center experience.

The final challenge of the enterprise WAN is ensuring that the network is services-ready. With the technological advancements in cloud and edge computing, data transgresses the physical enterprise boundary, presenting scale, availability, security, and privacy challenges. The security challenge is further amplified with regulations akin to the General Data Protection Regulation (GDPR). The network needs to be flexible, scalable, resilient, and secure—all critical requirements of any service-ready network. An effective architecture in this space should be modular in nature, allowing the new services such as quality of service (QoS), VPN, Media Access Control Security (MACsec), Network Address Translation (NAT), and stateful firewall services to be added to the enterprise WAN. In addition, the enterprise WAN should allow the addition of value-added services such as WAN acceleration and content caching services, among others.

The Juniper Networks Enterprise WAN Solution

Juniper has been pioneering routing technology for over two decades and has been instrumental in driving new network architectures during various phases of network evolution. Drawing from this experience, Juniper addresses each of the areas that typically challenge enterprise WANs, including WAN aggregation and backbone, data center interconnectivity, multicloud connectivity, and the Internet edge for both enterprises and managed service providers (Figure 2).

The Juniper Networks enterprise WAN solution can be viewed as an aggregation services point of presence (POP) at the enterprise edge. The solution is built upon Juniper Networks® MX Series 5G Universal Routing Platforms as the large and medium site enterprise WAN routers. This enables easy deployment, as the MX Series routers all run on a single version of Juniper Networks Junos® operating system, which provides a common set of commands as well as robust and proven automation capabilities for configuration, operations,

and event management. Junos OS also supports a rich feature set of proven as well as new technologies that give customers the ability to fully utilize network bandwidth. The MX Series enables flexibility and scalability with its capabilities and performance, future-proofing against demanding technological advancements. The solution also enables resiliency and security, providing faster protocol convergence and redundancy as well as security in a single enterprise WAN platform. This ensures high availability, protection from outages, and fast recovery in the event of a network incident.

This solution is also built to simplify management. Because the entire solution runs on a single code base (Junos OS), configurations are portable, designed to be moved and repurposed across the network. The solution supports standard management interfaces such as SSH and HTTPS and will interoperate with various network management systems, including the open and extensible network application platform, Juniper Networks Junos Space®. The management of the enterprise WAN solution is a key component in simplifying the operations of the network.
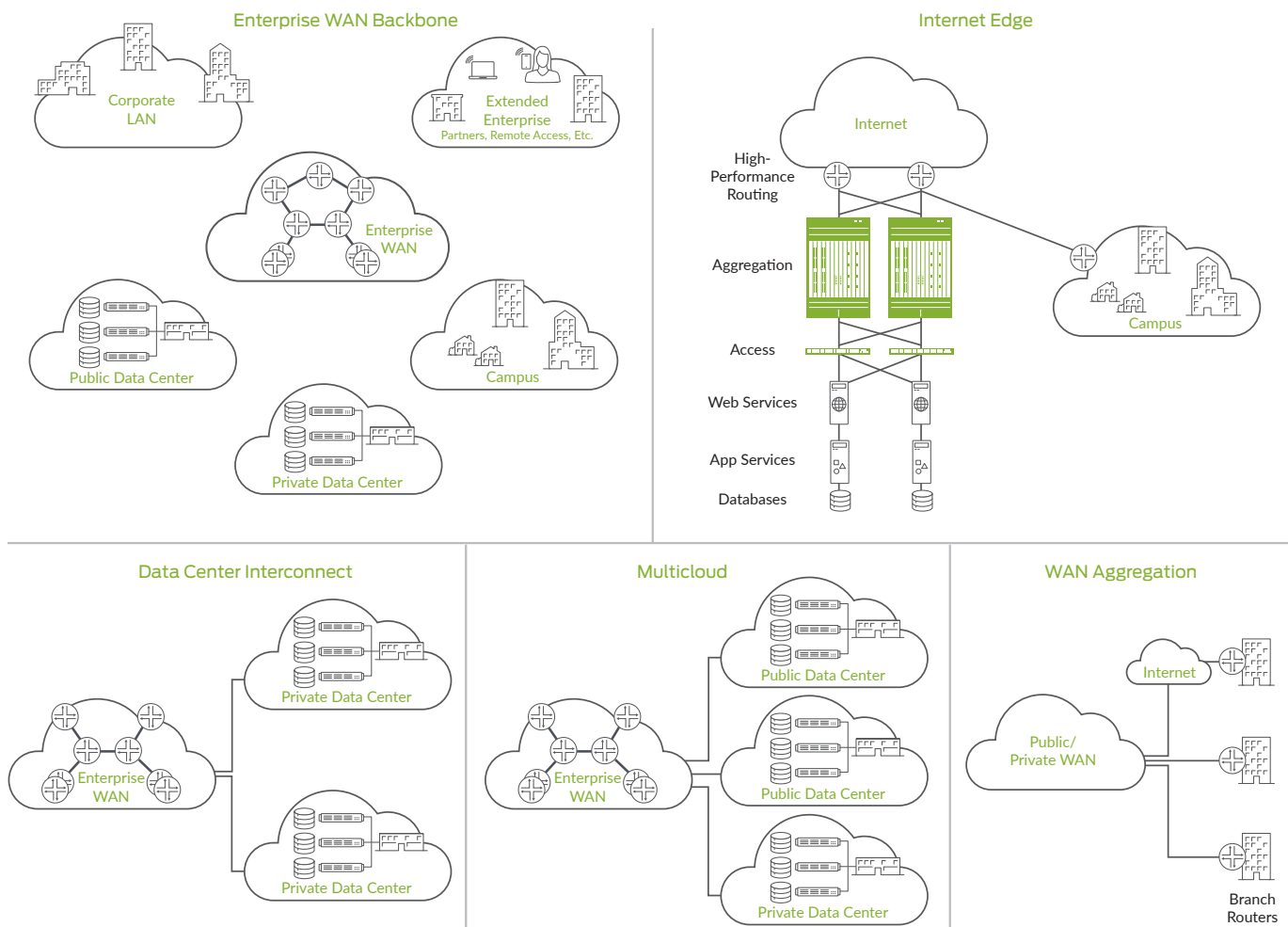

Figure 2: The enterprise WAN ecosystem.

The enterprise WAN solution is built to be services ready, able to provide VPN, NAT, stateful firewall services, and WAN acceleration. In addition, through Juniper Networks Junos SDK and virtualized security services such as Juniper Networks vSRX Virtual Firewall, value-added services can be introduced at the enterprise WAN, further enhancing the utility and functionality of the WAN router.

Finally, this solution includes automation to simplify network operations, lowering cost and minimizing operational errors. The automation suite provides network visibility, enabled by the Junos Telemetry Interface (JTI), network health analytics via the Juniper Paragon Insights, and operational automation using Juniper Networks Paragon Pathfinder. These automation tools are provided as programmable frameworks, allowing custom applications such as route computations to be built with the goal of influencing routing decisions.

Modernize Your Mission-Critical Enterprise WAN Infrastructure

Juniper enterprise WAN solution empowers customers to transition smoothly to a modernized architecture that is flexible, automated, secure, and resilient.

A Flexible WAN – Juniper provides the agility to adapt to the unknown with flexible chip sets, a consistent Junos operating system across the entire portfolio, modular platforms that are backward compatible, future-proof protocols (IPv6, segment routing, MPLS), and a flexible consumption model supporting pay-as-you grow or software subscriptions for features and services.

An Automated WAN – Juniper offers closed-loop automation that translates business intent into service performance, assuring customers receive a differentiated service experience. Open and standard APIs, customizable DIY tools and visual workflows for visibility, AI, and real-time telemetry streaming allow automation of the entire network operations life cycle to improve operational efficiency while reducing complexity.

A Secure WAN – To defend your WAN, Juniper Connected Security extends threat intelligence to Juniper MX Series routing infrastructure. You can block command and control

(C&C) traffic discovered by Juniper Advanced Threat Prevention, Juniper Threat Labs, and custom blacklists at the network hardware level. Juniper Connected Security turns your WAN connectivity layers into automated defense layers.

A Resilient WAN - For maximized uptime and mission-critical Quality of Experiences (QoE), Juniper delivers multi-layer resiliency to ensure uptime, reliability, business continuity, and user satisfaction. At the product and OS level Juniper offers redundant hardware and resilient software features that support graceful RE switchover (GRES), nonstop active routing (NSR), and unified in-service software upgrade (unified ISSU). Juniper offers high-availability architecture features, including multi-homing capabilities, IPVPN, L2VPNs, EVPN, multicast, segment routing with TI-LFA, and others. Additionally, with software-defined management and control, you gain the network visibility to monitor, manage, and diagnose with the latest AI and ML techniques and integrate these technologies into your network operations.

Features and Benefits

- Lower costs through scalability, efficiency, and performance of carrier-grade WAN devices
- Reduced complexity due to a homogenized approach that uses automation and visibility tools to simplify configuration and operation
- Support for L4-L7 inline services, which enables the introduction of services to the enterprise WAN

A Simpler and More Cost-Effective Enterprise WAN

The Juniper Networks enterprise WAN solution meets modern business requirements and digital transformation strategies while easily supporting business continuity.

Next Steps

For more information about the Juniper Networks enterprise WAN solution, please go to www.juniper.net or contact your Juniper account representative.

About Juniper Networks

Juniper Networks brings simplicity to networking with products, solutions and services that connect the world. Through engineering innovation, we remove the constraints and complexities of networking in the cloud era to solve the toughest challenges our customers and partners face daily. At Juniper Networks, we believe that the network is a resource for sharing knowledge and human advancement that changes the world. We are committed to imagining groundbreaking ways to deliver automated, scalable and secure networks to move at the speed of business.

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