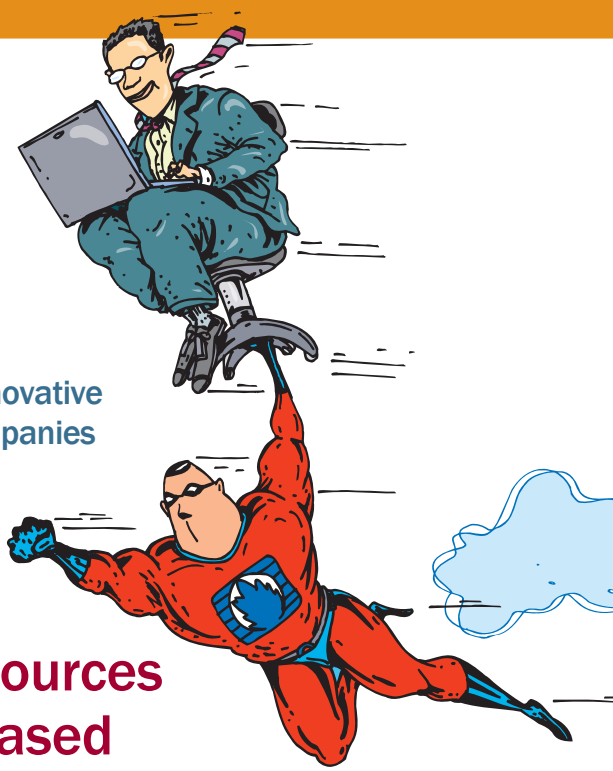
Solutions in Action

Real-world examples of how Juniper Networks innovative solutions are transforming high-performance companies



Protecting Vital Network Resources with Affordable, Standards-based Network Access Control

Network access control (NAC) is essential to mitigate risk and manage threats targeted at today's enterprise networks. Yet many organizations believe that deploying access control is complex, time-consuming and costly. Juniper Networks addresses these challenges with NAC solutions that are comprehensive, cost-effective and easy to deploy.

The Current Environment

Providing appropriate access while maintaining security and ensuring user compliance with internal policies and regulations can put a tremendous strain on the IT staff, network and resources. Mobile workforces, outside contractors, increasing numbers of vendors and partners all need access to certain enterprise network resources and applications.

The Juniper Networks Advantage

Juniper Networks offers access control solutions that meet the need for a secure, strong and flexible framework for authentication, access management, network security, data privacy and compliance requirements. The solutions—which include best-in-class Unified Access Control (UAC) with Juniper Networks EX-series Ethernet switches—deliver rich policy enforcement that extends to the network's edge. Deployed together, Juniper Networks UAC and EX-series switches provide a granular and complete policy-driven, standard-based network access control environment.

Access Control Solutions

To reduce network threats, Juniper Networks UAC combines user identity and device security state information with network location. This allows for a unique, session-specific access control policy for each user.

IT staff can enable policy enforcement at Layer 2 using 802.1X standards on switches and wireless access points, Layer 3-4 with ACLs on Juniper EX-series Ethernet switches, or at Layer 3-7 using an overlay deployment with Juniper firewalls. These technologies can be used together to gain very granular and flexible access controls solutions. In addition, the Access Control solution is standards-based, which allows enterprises to leverage their existing network environments, reduce CAPEX costs and take advantage of future innovation.

Network Access Control in Action

St. Mary's County Public Schools Keep Students Plugged In with Juniper Networks Access Control

CHALLENGE

After receiving 60 laptops for its Science, Technology, Engineering and Math (STEM) academy, this Maryland school district planned to provide wireless access to the students who would be using the computers. They needed to protect the privacy of communications and eliminate the threat of wireless attacks, while concurrently providing reliable access to students and laptops as they moved from classroom to classroom.

SOLUTION

Realizing that basic wireless encryption was insufficient against unauthorized network access and malware threats, the school district turned to Juniper Networks Unified Access Control (UAC) solutions. They deployed the Juniper Networks Infranet Controller 4000 to provide the same level of access control on the wireless

"Juniper's Unified Access Control (UAC) is the most complete NAC solution and scored highest in 'Current Offering.' It has an impressive array of enforcement options and deployment modes."

The Forrester Wave:™ NetworkAccess Control, Q3 2008
by Robert Whiteley and Usman Sindhu

Policy Enforcement with EX-series Switches
Juniper Networks EX-series Ethernet switches combine the carrier-class reliability and High Availability (HA) of modular systems with the economies and flexibility of stackable platforms. The switches act as enforcement points within the UAC environment.

Here's how the switches and UAC work together:

The UAC reviews the user's identity, device posture and location to determine network access policies to enforce at the switch. If the UAC grants network access, the appropriate policy information is sent to the EX-series switch. The switch then assigns the user to a specific VLAN or appropriate ACLs for that user based on their approved policy.

Together, Juniper Networks UAC and EX-series switches can dynamically set user-specific quality of service (QoS) policies at the switch port. IT can prioritize data, voice and video traffic for optimal throughput and availability for multiple classes of users no matter which switch port they connect to. Juniper Networks UAC and EX-series switches can dynamically mirror individual users and specific application traffic to a central location for logging, honeypotting, monitoring and threat detection by intrusion prevention systems. They can also deliver broad application and traffic visibility by leveraging the capabilities of Juniper Networks Intrusion Detection and Prevention (IDP) platforms. This simplifies isolating and reporting threats before they enter the network and also makes it easy to run compliance reports.

Benefits

Juniper Networks Access Control Solutions provide a robust NAC environment that:

- Protects the network, applications and data from unauthorized or noncompliant access, attacks and security breaches
- Provides the freedom to work with diverse network components, including other 802.1X-compatible switches and access points as well as Juniper Networks firewalls
- Contributes significantly to meeting many typical compliance mandates

The Juniper Networks UAC and EX-series switches provide a complete, standard-based network access control environment that reduces costs and deployment time. Together, they deliver a seamless solution with powerful pre- and post-admission access control and enforcement that keeps the network secure while allowing dynamic access to a diverse community of users.

network as they had on their wired network. UAC determines session-specific access based on user identity, device security state and location information policy by user. The school district uses 802.1X standards-based wireless access points and switches for policy enforcement at Layer 2. Authentication is managed through a RADIUS server back to the Microsoft Active Directory server.

The UAC agent was dynamically downloaded to each of the laptops. This agent provides Host Checker, which scans endpoints and performs an assessment on the security state to ensure that only computers that met St. Mary's security policies were permitted access to the network. Malware-compromised computers are unable to access the network, which prevents the spread of viruses or other attacks. Host Checker also offers predefined policies to simplify administration.

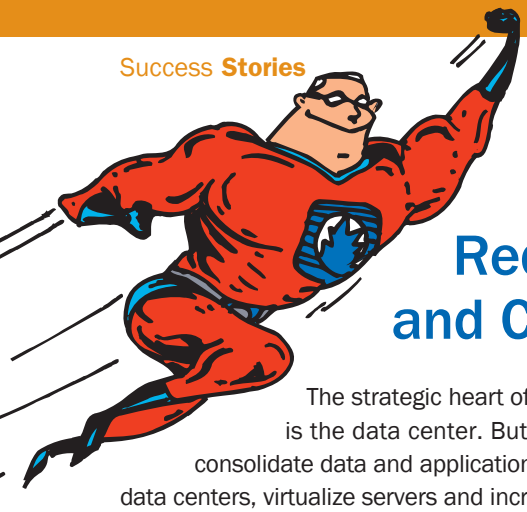
RESULTS

Juniper Networks UAC solutions were the pivotal factor in enabling the digital learning curriculum for St. Mary's Public School district, resulting in:

- Wireless network access with strong network security so students can use their laptops in any classroom
- Smooth deployment of network access control based on a phased approach
- Cost efficiencies realized by leveraging existing network equipment and IT infrastructure
- Simplified network administration resulting from Host Checker's predefined policies and the ability to customize endpoint host checks if needed

"With Juniper Networks UAC, we can allow our wireless network to support our digital learning curriculum and have the same level of control we have on our wired network."

William Caplins, Director of Technology, St. Mary's County Public Schools



Reducing Complexity and Cost in the Data Center

The strategic heart of today's enterprise is the data center. But as companies consolidate data and applications into centralized data centers, virtualize servers and increasingly migrate to storage over Ethernet technologies, the complexity and performance requirements of the data center network increase significantly—driving up capital and operational expenditures. Juniper Networks Data Center Infrastructure Solutions combine an innovative architecture with best-in-class products to reduce complexity and costs while providing improved scale, reliability and high performance.

Current Environment

As enterprises conduct business on a global scale, infrastructures are now geographically dispersed with data assets deployed throughout a larger number of locations. There are also growing numbers of mobile workers, outside vendors and contractors that require reliable, secure access to data center hosted applications and resources.

Many organizations have been left with an unwieldy data center infrastructure with multiple platforms, each with unique operating systems, management applications and interfaces. In addition, multiple layers of switching infrastructure—with a patchwork of security products—make managing, configuring and troubleshooting the array of devices both expensive and time-consuming.

The Juniper Networks Approach

Juniper Networks has taken a completely new approach to the data center. This architecture reduces cost and complexity while supporting enterprises' increased bandwidth, quality of service and high-availability requirements. Operations and manageability are improved—while latency is reduced—with fewer layers of switching, fewer devices, a single network operating system and one extensible network management model. Connectivity layers are consolidated to simplify the network, integrate security and enable centralized administration.

Juniper Networks Data Center Infrastructure Solutions are built on best-in-class products that incorporate proven technology innovations such as WAN acceleration, virtualization, coordinated threat control among network devices, and proven support for virtualized server environments—ensuring availability and security, while accelerating application performance.

Innovative Data Center Infrastructure Solutions Architecture

The Juniper Networks solution reduces costs and complexity by incorporating the following key elements within this Architecture:

- **Application Server Virtualization.** Server virtualization is used to improve utilization rates and minimize costs. Juniper Networks EX-series Ethernet switches ensures High Availability (HA) with Virtual Chassis configurations and best-in-class low latency to support virtualized server environments.
- **Core Network.** The Core Network provides interconnects within and across data centers and can span multiple locations. The core configuration with HA and Juniper Networks MX or EX-series switches provides extremely fast transport of aggregate traffic, and JUNOS® software ensures scalability and operational efficiency.
- **Data Center Backbone.** A high-capacity network connects primary and backup data center facilities. It supports data replication, WAN or remote access to the primary data center, backup and restore services, fast and secure connectivity, and legacy technology support.
- **Edge Services.** WAN network services connecting to non-data center locations and remote users are

Data Center Infrastructure Solutions in Action

AmazingMail.com Switches Infrastructure, Gains Amazing Savings and Performance

CHALLENGE

As a rapidly growing company in the print-on-demand market, AmazingMail.com wanted to reduce costs while improving customer service levels for continued success. With technology at the core of its business, improving the IT infrastructure was a logical place to look for efficiencies. The company aimed to eliminate a costly service contract with its switch vendor, and reduce high power costs and the IT staff needed to manage the complex network.

SOLUTION

AmazingMail.com sold off its legacy firewalls and switches and used the proceeds to purchase Juniper Networks high-performance solutions. In their data center and headquarters, they deployed Juniper Networks EX 4200 series switches and Juniper Networks Secure Service

consolidated while providing best-in-class security services, throughput and granular Quality of Service performance. Juniper firewalls provide border security within this data center architecture.

- **Consolidated Network Management** Switching, routing and security run on JUNOS software as a common operating system. A single management interface enables provisioning across the data center network infrastructure. SSL VPN enables remote access, and Security Threat Response Manager (STRM) provides event correlation and visibility.

Virtual Chassis Configurations

Juniper Networks EX-series Ethernet switches offer a flexible, scalable Virtual Chassis architecture that allows the collapsing of the core and aggregation switching layers in the data center. Enterprises can link multiple EX-series chassis into a Virtual Chassis configuration to significantly reduce the number of network uplinks from the server aggregation and access switches to the core of the network This creates fewer physical network ports and devices to manage, saving the IT department both time and money while improving performance and availability. The EX-series Virtual Chassis supports a phased-growth approach, allowing administrators to scale the network by adding multiple interconnected physical units as the data center expands.

Services can also be virtualized for better efficiency and management. For example, installing every type of security appliance or blade into every switch wastes resources, creates infrastructure sprawl and increases power and cooling costs. Instead, data center network security services can be virtualized and consolidated into a single SRX platform with high availability and performance to meet data center network security demands.

JUNOS Software

All Juniper Networks Data Center Infrastructure Solutions products run on the industry-leading JUNOS software, which provides a modular design for the data center that protects existing infrastructure investments. JUNOS software improves operational productivity and processes by providing one operating system, enhanced through one release train, and developed based on one modular architecture. This "1-1-1 advantage" greatly simplifies deployment and upgrades, thereby reducing the chances of operator error and potential downtime.

Benefits

Juniper Networks Data Center Infrastructure Solutions can reduce cost and complexity while providing the performance, scale and security that enterprises are looking for through:

- Reduced complexity with less equipment derived from Virtual Chassis technology, virtualized services and a single OS
- Support for high performance with extremely low latency, plus the ability to scale as needed
- Lower space and power costs with a simplified architecture and decreased number of devices

Gateway (SSG) 320M firewall/VPN appliances. In their print production center, they deployed the Juniper Networks EX 3200 series fixed-configuration switch and the Juniper Networks SSG 140 firewall/VPN appliance.

The EX-series is designed to be highly efficient and reduce power and cooling costs. The switches' scalability and Virtual Chassis technology allowed up to 10 EX-series switches to be interconnected and managed as a single device—so the network could grow as needed without adding to the management burden. The switches are powered by JUNOS® software, which simplifies management and provides carrier-class reliability. The SSG appliances included Unified Threat Management (UTM) features that protected traffic from malware and threats.

RESULTS

With Juniper Networks, AmazingMail.com spent less on the network, which meant that there was more money to spend on revenue-generating activities. Benefits included:

- Annual savings of $90,000 in reduced IT costs
- 3x VPN performance and 10x increased switching capacity
- Reduced data center space requirements and power consumption
- Simplified network architecture and administration

"Not only did we increase performance, but we also reduced expenses so significantly that we had money left over to buy two of everything to make the network fully redundant in High Availability mode."

Larry Prine, Lead Systems Administrator, Amazing Mail