



Nortel Networks

Alteon Application Switch Family

Optimizing networks for business application performance



Alteon 2208



Alteon 2216



Alteon 2424-SSL

Nortel Networks Alteon* Application Switches help put an end to the brute force approach to network optimization. The Alteon Application Switch is a multi-application switching system designed to allow enterprises to maximize the return on their existing investments in servers and networks through application intelligent traffic management, integrated application support, and sophisticated security features. The switches also allow service providers to efficiently enable differentiated services for their enterprise customers.

As enterprises increasingly use network-based applications to drive efficiency, IT departments must support increased network traffic and server load while facing numerous security challenges. In the past, IT departments could use brute force solutions to solve common problems—adding more bandwidth to relieve congestion, adding more servers to improve application performance, or buying more equipment than needed to meet future growth in data traffic. Stagnant or shrinking IT budgets have put an end to those days.



The Alteon Application Switch is built utilizing a next-generation version of the proven Alteon Virtual Matrix Architecture and the award-winning application-rich Alteon OS Traffic Management Software. The switches are built from the ground up as specialized high performance Layer 4-7 application switches and enable the broadest range of high-performance traffic management and control services. Able to manage the traffic of any IP-based application based on header or payload information, Alteon Application Switches have the power and intelligence required to perform deep packet inspection on today's most demanding applications (VoIP, wireless, Web services, database, etc.).

Alteon Application Switches extend Nortel Networks award-winning Alteon switching portfolio, which has been the number one fixed Layer 4-7 Switch for five straight years (Dell'Oro, May '03) and includes the Alteon Web Switch 180 series as well as the modular Passport 8600 Layer 2-7 Routing Switch. Alteon Application Switches build on the success of previous Alteon Switches and drive the market forward in a number of key areas:

- Provides the market's most powerful Layer 4-7 switch with four times the capacity and 2.5 times the performance of the Alteon Web Switch and three to four times the performance of competitor switches, enabling deep packet inspection without adding latency to the network (Tolly, Jan '03)
- Includes integrated secure sockets layer (SSL) acceleration with accelerated end-to-end encryption
- Supports SSL virtual private networking (VPN) for clientless remote access to applications. The first integrated SSL VPN Layer 4-7 switch on the market

- Enables virtualized switch management through the use of tiered management privileges and traffic segregation that allow a service provider or enterprise to use a single switch to virtually support multiple customers/organizations
- Provides the market's first Web services-aware specialized traffic management features that enable secure, fault-tolerant Web services
- Adds multi-layer security to networks through a host of features such as comprehensive Denial of Service (TCP, IP, UDP, ICMP) protection, intrusion detection system (IDS) load balancing, port mirroring, bandwidth management, and Peer to Peer application management.
- Protects network investment by extending the life of existing server and network infrastructures while also providing continued performance headroom for innovative software application and feature development
- Introduces high port density in a simplified small form factor, with up to 28 ports in a single rack unit

Alteon Application Switches optimize networks for business application performance, improving productivity and simplifying operations associated with these applications by:

- *Delivering multi-application support on a single platform to simplify operations.* Applications supported by Alteon Application Switches include local and global server load balancing, application redirection, security acceleration, SSL acceleration, SSL VPN, filtering, bandwidth management, and many others. The Alteon 2424-SSL switches recognize and act on a large number of protocols, including streaming and wireless protocols. Enterprises can enable one or more applications based on

specific business and networking requirements. All are concurrently supported in a small form factor for operational ease.

- *Tuning business application performance.* To fine-tune the performance and efficiency of business applications such as voice over IP, databases, Web services, streaming media, and others, granular information (e.g., Layer 7 information) about those applications is often required. Processing this information requires deep packet inspection and the flexibility to deal with multiple protocols. Alteon Application Switches are built to handle the computational load required for deep packet inspection and the flexibility to interact with and optimize any IP application or service.
- *Performing policy-based application redirection and load balancing based on application and content intelligence.* For example, in a domain name system (DNS) server optimization scenario, Alteon Application Switches can dynamically distribute load among multiple DNS servers using two forms of queries (TCP or UDP) and/or based on DNS names. Similar traffic distribution can be obtained with Intrusion Detection Systems, LDAP servers, and many others. As another example, Alteon Application Switches can use Layer 4-7 intelligence to enable differentiated services based on application (URL), user (cookie), or end-user device. Uniquely identifying users and enabling differentiated service is key to maximizing the value of new wireless mobility applications.
- *Ensuring support for applications that require persistence, in which the client must interact with the same server for the life of a session.* Examples of applications requiring persistence include multi-page forms, payment transactions, shopping carts, and wireless (WAP).

Ensuring fail-safe business continuity

To help ensure business continuity, Alteon Application Switches eliminate single points of failure in a network and provide device and application failover. Features that enable business continuity include:

- *Supporting sophisticated server, link, and application health checking and allowing user-scriptable health checks to determine application availability via a sequence of checks.* Application-specific health checking is important because it can identify that an application is unavailable, even if the server is operational. For example, a standard TCP health check may indicate that an LDAP server is operational when the LDAP process is hung. LDAP specific health checking allows Alteon Application Switches to identify the problem and distribute traffic to healthy LDAP servers. Another example is the Alteon Application Switch's ability to enable fault-tolerant streaming media architectures with features like RTSP load balancing. Alteon Application

Switches bypass “unhealthy” servers or devices when distributing new sessions and automatically re-enroll them upon service restoration.

- *Enabling a “dynamic data path.”* The combination of sophisticated health checking and application/content intelligence allows Alteon Application Switches to enable a dynamic data path. Enabling a dynamic data path provides the network the ability to route traffic dynamically based on application, users, and network conditions. This ensures high availability, improves application performance, and minimizes work for IT departments.
- *Enabling a high-availability architecture via support for an advanced implementation of the Virtual Router Redundancy Protocol (VRRP).* Alteon Application Switches support active-active, active-standby, and hot-standby modes. Active-Active mode enables simultaneous High Availability and increases device performance.

Providing secure access to business applications and networks

Alteon Application Switches simplify network implementation and management through support for integrated compute-intensive applications. The integrated applications initially supported by the switches enable secure access to business applications and/or intranets by remote employees, business partners, and other trusted third parties.

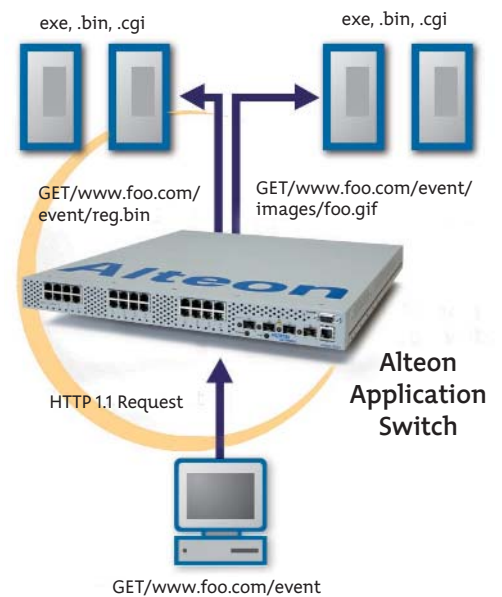


Figure 2. Content intelligent load balancing: dynamic datapath technology enables application awareness for flexible content location and reduced server costs.

- *SSL acceleration offloads and accelerates compute-intensive SSL processing from servers, resulting in improved application performance at a fraction of the cost of adding general purpose servers.* To meet the stringent security requirements commonly found in health care, government, and financial applications, Alteon Application Switches, with the optional integrated SSL application processor, support end-to-end encryption all the way to the server and all the features of the industry-leading Alteon SSL Accelerator. The integrated SSL accelerator greatly simplifies certificate management. SSL is also a cost-effective alternative to traditional VPNs when securing Web services transactions. The switches support a maximum of 1,000 transactions per second (real world testing). External SSL acceleration appliances can be added in a plug-and-play fashion for customers requiring additional capacity. For more information on SSL acceleration features, see the *Alteon SSL Accelerator Product Brief*.

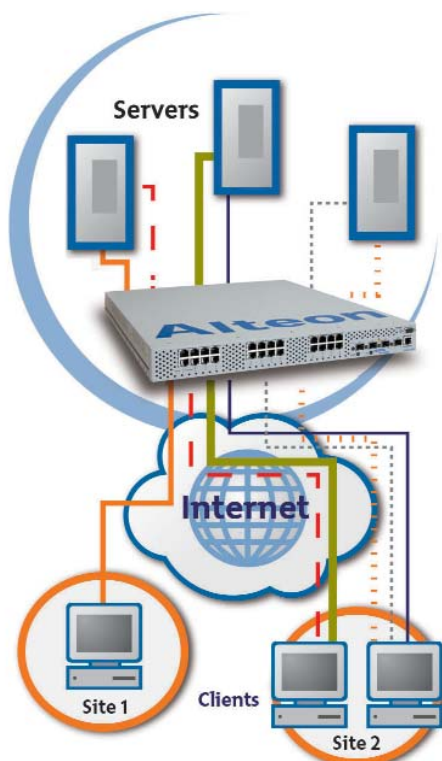


Figure 1. Basic server load balancing

- *Improves server utilization*
- *Increases reliability*
- *Enhances performance*
- *Provides scalability*

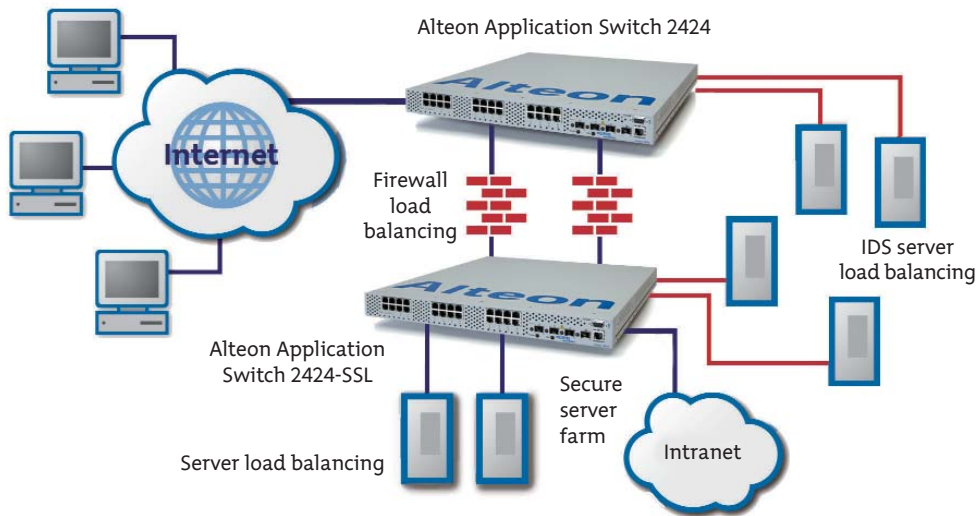


Figure 3. High-performance multi-layer security protects the network, transport, and application layer

- *SSL VPN allows the Alteon Application Switch to function as a secure remote access gateway.* As an optional feature on Alteon Application Switches, Alteon SSL VPN is a remote access security solution that extends the reach of enterprise applications to mobile workers, telecommuters, partners, and customers. With SSL as the underlying security protocol, Alteon SSL VPN allows for truly unrestricted remote access, using the Internet for remote connectivity and the ubiquitous Web browser as the primary client interface. SSL VPN is also more forgiving on the underlying network, minimizing connection disruption and firewall incompatibility issues. The Alteon SSL VPN supports common authentication mechanisms such as RADIUS, LDAP, and Active Directory, and establishes data security at the session/application layer, allowing granular access control and auditing. For more information on SSL VPN features, see the *Alteon SSL VPN Solution Brief*.

Protecting business applications with multi-layer security

Inherent multi-layer security features allow Alteon Application Switches to protect against external and internal security threats without sacrificing network and application performance. Multi-layer security features include:

- *Providing extensive network traffic control through network address translation (NAT) and powerful filtering capabilities.* These capabilities allow Alteon Application Switches to offload firewalls from some tasks, enabling a more efficient “DMZ” for business applications and allowing IT departments to maximize the use of existing firewalls. Alteon Application Switches support up to 2,048 filtering rules per switch. Filters can be configured to allow, deny, or redirect traffic based on application type, protocol, IP source/destination addresses, Layer 7 attributes (e.g., URL, cookie, HTTP header), and VLAN ID.

Utilizing Layer 7 filtering enables the inspection, classification, and blocking of malicious application level attacks such as the “Code Red” worm and enables IT administrators to inspect and manage the use of Peer to Peer file sharing applications such as KaZaA.

- *Load balancing firewall, IDS, and VPN devices to ensure graceful scalability for increased performance and reliability.* Alteon Application Switches can support multiple IDS vendors simultaneously, a requirement in enterprise networks that use multiple IDS vendors to leverage the strengths of each.
- *Thwarting performance-robbing Denial of Service (DoS) attacks without blocking valid session requests.* Alteon Application Switches enable comprehensive DoS attack protection based on TCP, IP, UDP, and ICMP attacks. Using delayed binding, SYN floods are denied. The switch temporarily terminates each TCP connection, only allocating/passing a session when a valid response has been received from the client. Sophisticated pattern matching enables ICMP and UDP DoS protection which thwarts a whole host of availability attacks such as ping of death, Fictitious DNS requests, and SQL Slammer.
- *Protecting applications by enabling IT departments to limit the rate of new TCP connections to the application servers on a per-client basis.* This feature, called Application Abuse Protection, increases control over access to applications and improves application availability.

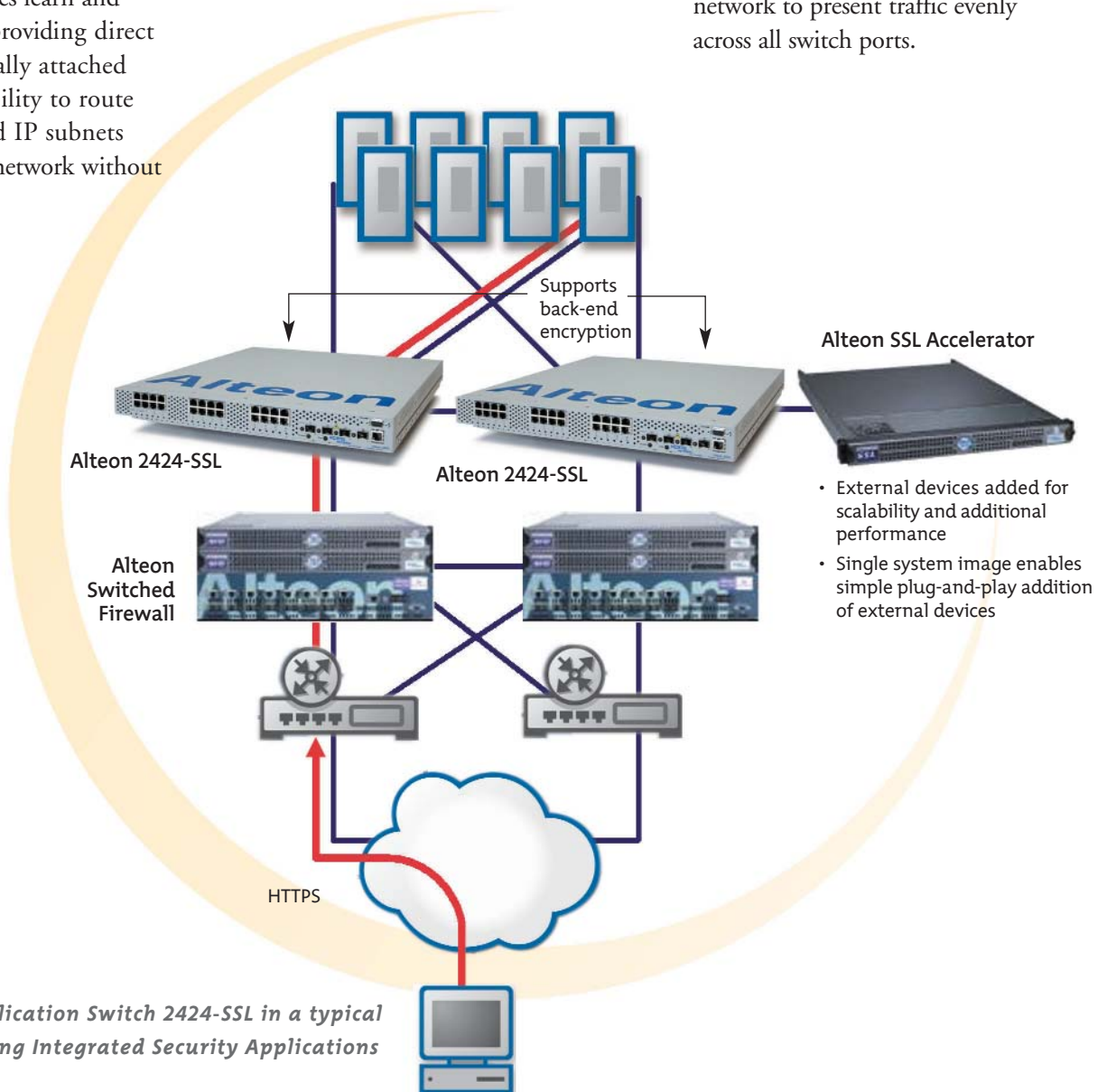
Scaling business applications efficiently

Alteon Application Switches fit into existing networks and help IT administrators cost-effectively scale networks and applications to meet changing business requirements. Features that enable efficient scalability include:

- *Supporting multi-protocol IP switching based on Routing Information Protocol (RIP) v1, Open Shortest Path First (OSPF), Border Gateway Protocol (BGP) 4, Spanning Tree, static routes, and more.* The switches learn and cache IP addresses, providing direct IP switching for locally attached networks and the ability to route between VLANs and IP subnets within the switched network without an external router.

- *Enabling plug-and-play deployment.* Because Alteon Application Switches use virtual IP (VIP) addresses to represent groups of real servers, firewalls, or other devices, IT administrators can add capacity without having to reconfigure the network by simply adding servers or devices into an existing VIP pool. In addition, one switch can support multiple applications, reducing the need for complex multi-box implementations.

- *Utilizing all switch resources with the Alteon Virtual Matrix Architecture (VMA).* VMA dynamically distributes the processing power of multiple switch and application processors to maximize utilization. To ensure the highest performance, VMA distributes processing capacity dynamically to support traffic across all switch ports. This simplifies network provisioning because the switch provisions itself for network traffic patterns instead of requiring IT administrators to architect the network to present traffic evenly across all switch ports.



- External devices added for scalability and additional performance
- Single system image enables simple plug-and-play addition of external devices

Figure 4. Alteon Application Switch 2424-SSL in a typical configuration utilizing Integrated Security Applications

Maximizes return on IT investment

Alteon Application Switches are designed to maximize return on investment by helping to reduce capital and operating expenses even as network performance increases. Instead of employing brute force techniques, IT departments can use Alteon Application Switches to help provide immediate savings, including:

- Capturing additional value from existing network infrastructure via improved server/device utilization enabled by a dynamic data path which can reduce server requirements and costs up to 50 percent
- Enabling deferral of capital expenditures by gracefully scaling server or security implementations as business requirements dictate
- Extending network asset life which can result in up to 40 percent lower annual costs
- Prioritizing traffic for the most effective use of bandwidth which can drive significant ROI
- Enables efficient, highly available streaming media architectures that drive significant ROI through enhanced employee communication and training without the traditional travel expenses.

Alteon Application Switch family technical specifications

Major applications

Server load balancing	<ul style="list-style-type: none"> • Local and global server load balancing • IP, FTP, LDAP, DNS, RTSP, POP, SMTP, NNTP, IMAP, RADIUS, and others
Network device load balancing	<ul style="list-style-type: none"> • Firewall, VPN • Intrusion detection system • WAN link (inbound and outbound) • WAP gateway
Application redirection and load balancing	<ul style="list-style-type: none"> • SSL acceleration • Cache • Streaming media
Advanced filtering	<ul style="list-style-type: none"> • Layer 2-7 attributes • VLAN • Accept, deny, NAT, redirect • Rewrite ToS byte
Content intelligence	<ul style="list-style-type: none"> • Layer 7 inspect • Cookie, URL, HTTP header, user agent
Embedded security services	<ul style="list-style-type: none"> • Access control • Advanced Denial of Service protection (TCP, IP, UDP, ICMP) • Application abuse protection • Layer 7 filtering (Peer to Peer management) • Integrated SSL VPN • Integrated SSL acceleration
Traffic management	<ul style="list-style-type: none"> • Bandwidth management and rate limiting • ToS marking
Persistence support	<ul style="list-style-type: none"> • Source IP • Source port • Cookies • SSL identifier • HTTP header
Network services	<ul style="list-style-type: none"> • Layer 2/3 • NAT • VLAN tagging • Trunking

Technical specifications

- IP routing interfaces: 256
- VLANs: 255
- Default gateways: 259
- Trunk groups: 12

In addition to immediate savings, Alteon Application Switches can improve application performance and availability, resulting in higher revenue opportunities and reduced costs over time through improved customer satisfaction and employee productivity. As little as a 1/2 percent increase in application availability can drive revenues with an ROI of greater than 900 percent. Alteon switches help enterprises achieve these results by:

- Simplifying network design and management/operations through support for multiple load balancing applications, bandwidth management, and security application integration in one simple platform
- Maximizing fail-safe business continuity through sophisticated health checking and load balancing functionality
- Providing secure remote access simply and cost-effectively with SSL VPN
- Protecting network and application infrastructure through multi-layer security features
- Enabling transparent scalability of networking and application infrastructure without operations headaches or application downtime
- Allowing IT administrators to adjust network and server infrastructure quickly to meet rapidly changing business requirements.

For additional detail on Alteon Application Switch, Alteon Web Switch, Alteon OS, Alteon SSL Accelerator and Alteon SSL VPN capabilities, please refer to: www.nortelnetworks.com/alteon

Alteon Application Switch family technical specifications (continued)

Network protocol and standards compatibility	
	<ul style="list-style-type: none"> • 10BASE-T/100BASE-TX (IEEE 802.3-2000) • 1000BASE-SX (IEEE 802.3z) • Spanning Tree (IEEE 802.1d) • Logical link control (IEEE 802.2) • Flow control (IEEE 802.3x) • Link negotiation (IEEE 802.3z) • VLANs (IEEE 802.1Q) • Frame tagging (IEEE 802.1Q) on all ports when VLANs enabled • SNMP support: RFC 1213 MIBII, RFC 1493 Bridge MIB, RFC 1398 Ethernet-like MIB, RFC 1757 RMON1 (groups 1-4), and RFC 1573 MIB compliant. Alteon Enterprise MIB. • IP • RIPv1 • OSPF • TFTP (RFC 783) • BootP (RFC 1542) • BootP (RFC 951) • Telnet (RFC 854) • EtherChannel-compatible trunking
Power	
Auto-ranging power supply	00-240 VAC @ 3.5 Amps, 50-60 Hz
Maximum power consumption	250 Watts
Environmental temperature	0° to 40° C (+32° to +104° F)
Relative humidity	85% maximum, non-condensing
Certifications	
EMC (Electromagnetic requirements)	<ul style="list-style-type: none"> • USA: FCC Part 15, Subpart B Class A • Australia: AS/NZS CISPR 22:2002 • Canada: ICES-003 • Japan: VCCI Class A • Europe: EN 300 386 v1.3.1 (2001-09) • Taiwan: BSMI Registration Certificate • Rest of World: CISPR 22 Class A
Safety	
	<ul style="list-style-type: none"> • IEC 60950 (International) • National Deviation per CB Member Countries to IEC 60950 • UL 1950 (USA) • CSA 22.2, No. 950 (Canada) • EN 60950 (Europe)

Alteon Application Switches

Alteon switches	2424	2424-SSL	2216	2208
Total ports	28	28	18	10
10/100 Ethernet ports	24	24	16	8
Gigabit Ethernet ports	4	4	2	2
SFP GBIC concurrent sessions (1000BASE SX/LX)	2,000,000	2,000,000	1,000,000	600,000
Layer 7 performance (sessions/second)	up to 51K*		30K*	15K*
Layer 4 performance (sessions/second)	>64K*		40K*	20K*
Virtual server support	1,024	1,024	1,024	1,024
Real server support	1,024	1,024	1,024	1,024
Policy filters	2,048	2,048	2,048	2,048
Integrated SSL acceleration (tps.)**	no	Base: 300 Max: 1,000	no	no
Integrated SSL VPN	no	yes Maximum concurrent sessions: 16,000	no	no
Height (inches/RU)	1.75/1	1.75/1	1.75/1	1.75/1

* Using real-world test scenarios with zero session loss.

** Using real-world test scenarios.

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www.nortelnetworks.com

For more information, contact your Nortel Networks representative, or call 1-800-4 NORTEL or 1-800-466-7835 from anywhere in North America.

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