

secure and
optimize
application delivery, performance, and reliability

Product Brief

**Alteon Application
Switch Family**



Alteon Application Switch 2208



Alteon Application Switch 2216



Alteon Application Switch 2424-SSL



Alteon Application Switch 3408

Nortel Networks Alteon* Application Switches put an end to the brute force approach of application delivery and optimization. The Alteon Application Switch is a multi-application switching system designed to allow enterprises to prepare their network for business applications and 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 move towards converged networks and increasingly use business applications to drive efficiency, IT departments must support increased network traffic and server load while maintaining QoS and 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 utilizes a next-generation version of the proven Alteon Virtual Matrix Architecture and 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 delivery and security switches and enable the broadest range of high-performance traffic management and control services. Able to manage the traffic of any IP-based application, 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, CRM, ERP, etc.).

Major applications

Application optimization

- Comprehensive application switching
 - Local and global load balancing (Oracle, Siebel, BEA, IP, LDAP, DNS, RTSP, SIP, POP, SMTP, FTP, TFTP, NNTP, IMAP, RADIUS, and others)
 - Application health checking
- Intelligent application traffic management
 - Layer 7 bandwidth management and rate limiting
 - P2P application management
- Content intelligence
 - Layer 7 inspect, Cookie, URL, HTTP header, user agent
- Application redirection
 - Web Services, SSL acceleration, cache, streaming media
- Network device load balancing
 - Firewall, VPN, intrusion detection system, WAP gateway, etc.
 - WAN link
- Persistence support
 - Source IP, port, cookies, etc.

Application security

- Advanced Denial of Service protection (Application, TCP, IP, UDP, ICMP, SYN Flood)
- High profile virus and worm protection
- Application abuse protection
- Integrated SSL VPN
- Integrated SSL acceleration
- Access control
- Secure management (HTTPS, SNMP v3, SSH v2, RADIUS, TACACS+)
- Advanced Layer 7 filtering/ firewalling
 - Layer 2-7 attributes
 - VLAN
 - Accept, deny, NAT, redirect

Network services

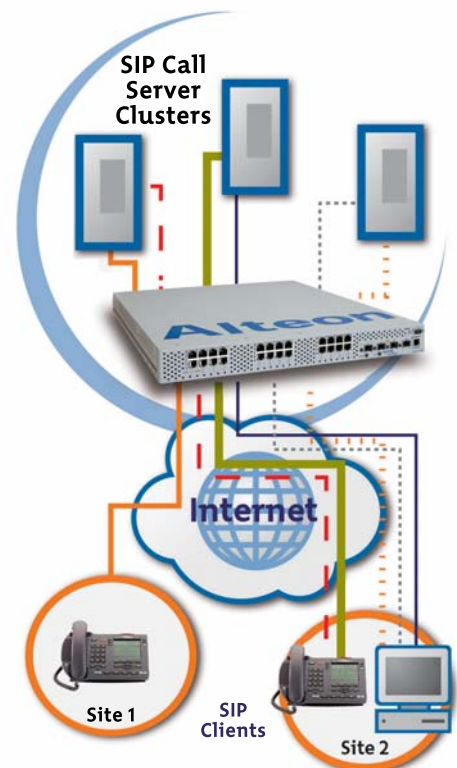
- Full Layer 2/3
- NAT
- VLAN tagging
- Trunking

Alteon Application Switches extend Nortel Networks award-winning Alteon switching portfolio, which has been the number one fixed Layer 4-7 switch for six straight years (Dell'Oro, May '04). Alteon Application Switches build on the success of previous generation Alteon Switches and drive the market forward in a number of key areas:

- Enabling Intelligent Application Traffic Management that optimizes application delivery through the use of application identification, prioritization, redirection, rate limiting, and shaping
- Supports resilient IP Telephony through SIP call server load balancing, NAT, and DDoS/DoS protection
- 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 application-layer security features such as comprehensive Denial of Service (Application, TCP, IP, UDP, ICMP, SYN Flood) protection, high-profile virus and worm protection, intrusion detection system (IDS) load balancing, port mirroring, bandwidth management, and Peer-to-Peer application management
- Supports the market's first Layer 4-7 switch integrated SSL virtual private networking (VPN) for clientless remote access to applications
- Includes integrated secure sockets layer (SSL) acceleration with accelerated end-to-end encryption
- Provides the market's most powerful Layer 4-7 switch with three to four times the performance of competitor switches, enabling deep packet inspection without adding latency to the network (Tolly, Jan '03)
- Enables custom application support through an open application programming interface that allows true application and switch integration
- Enables virtualized switch management that allows a service provider or enterprise to use a single switch to virtually support multiple customers/organizations

Figure 1. SIP Proxy Call Server load balancing

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



Optimizing application performance

Alteon Application Switches optimize networks for business application performance, enabling effective converged applications, improving productivity, and efficiently scaling and simplifying operations associated with applications such as Siebel, BEA, Oracle, etc.

- *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 required. Alteon Application Switches are built to handle the computational load required for flow-based 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 VoIP (SIP) call server optimization scenario, Alteon Application Switches can dynamically distribute load among multiple SIP proxy servers using SIP call ID information (Figure 1). This solution enables resilient VoIP services by ensuring call processing resources are 'always up', capacity additions can be made without downtime, and call traffic is distributed across all call servers to optimize performance and utilization. Similar application optimization can be obtained with applications such as BEA, Siebel (Figure 2), Oracle, Web Services, streaming media (RTSP) servers, Intrusion Detection Systems, LDAP servers, and many others.
- *Implementing full application control and prioritization.* Intelligent Application Traffic Management (ITM) is a key component of enabling an application-optimized network. ITM is a solution utilizing Alteon Switches to inspect application flows for pre-defined attributes, classifying flows based on these attributes, applying traffic policies (monitor, discard, prioritize, rate limit, or rate shape), and reporting usage of such applications. (Figure 3 contains solution components.) These features enable the control of bandwidth down to the granularity of an individual's capability to use an application, allowing, for example, service providers, educational institutions, and enterprises to efficiently control network bandwidth abuse, reduce costs by conserving bandwidth, enhance network efficiency, enhance the user experience, and offer value-added services. Examples of ITM capabilities include combating high-profile network worms and viruses, identifying and restricting Peer-to-Peer file sharing applications, and shaping critical business application traffic so that it is not impacted in the event of a worm attack.

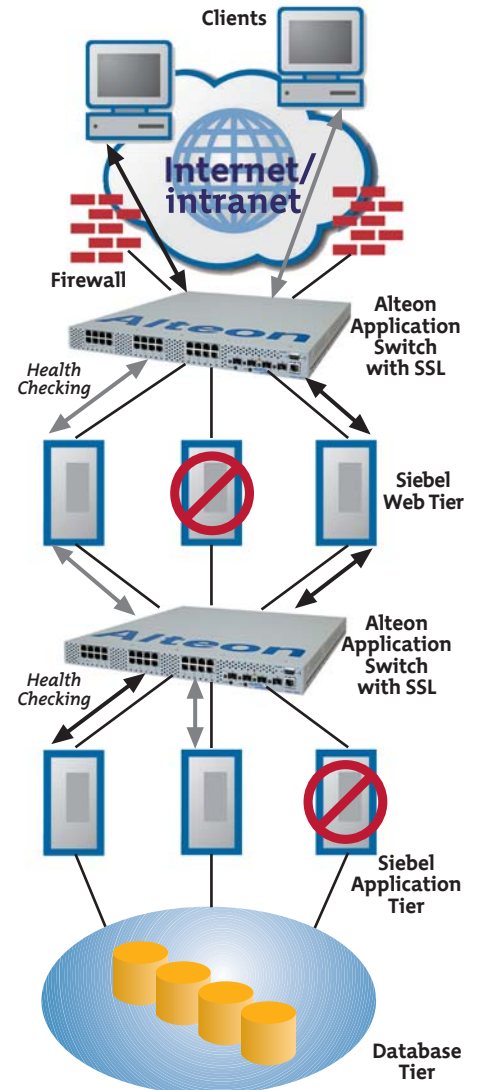


Figure 2. Siebel Web and application tier performance, availability, and security optimization

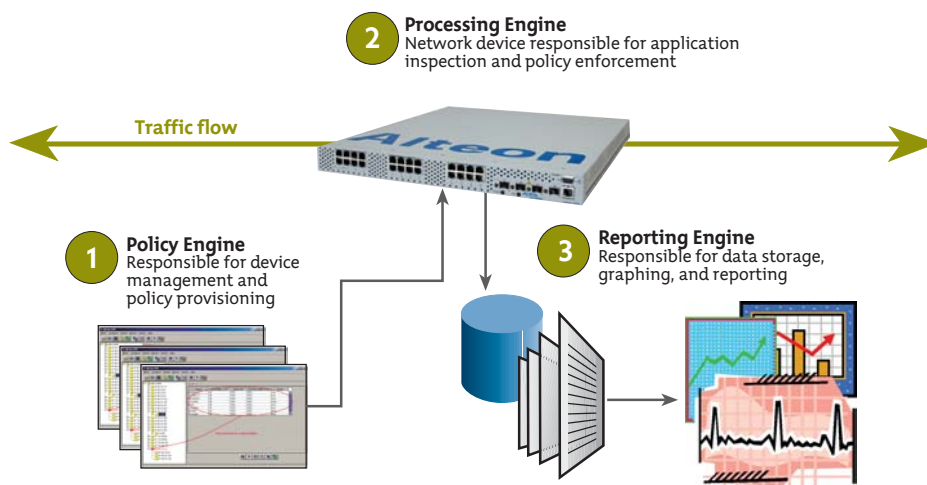


Figure 3. Intelligent Application Traffic Management components

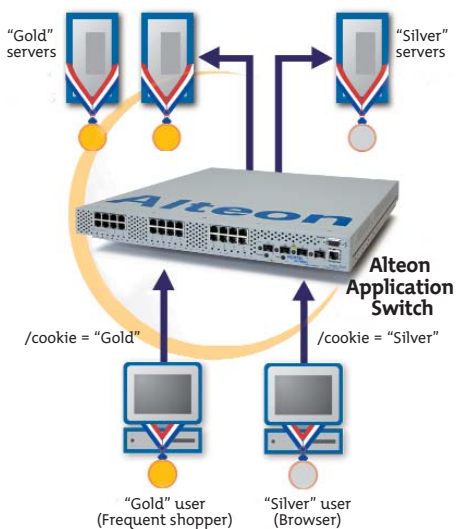


Figure 4. Content intelligence enables user awareness for differentiated services

- *Enabling custom application integration.* Nortel Networks Application Switch—Application Programming Interface and standards-based XML interface for the Alteon Element Management System (EMS) enable applications or appliance communication directly with the Alteon Switch. Policies can be modified in real-time (add server, remove server, modify load balancing metric, etc.) with true application and switch integration that ensures both custom and off-the-shelf applications can be optimized and react in concert to provide efficient application delivery and user quality of experience.
- *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).
- *Identifying users uniquely for differentiated services.* Alteon Application Switches can use Layer 4-7 intelligence to enable differentiated services based on application, user (cookie), or end-user device (Figure 4). Uniquely identifying users and enabling differentiated service is key to maximizing the value of new wireless mobility applications.

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 simple, efficient scalability include:

- *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.
- *Multi-application support on a single platform—simplifying 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. Enterprises can enable one or more applications based on specific business and networking requirements, reducing the need for complex multi-box implementations. All are concurrently supported in a small form factor for operational ease.
- *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. 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.
- *Multi-protocol IP switching based on Routing Information Protocol (RIP), Open Shortest Path First (OSPF), Border Gateway Protocol (BGP) v4, 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.

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:

- *Sophisticated server, link, and application health checking with user-scriptable health checks that 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. 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 provide the network the ability to route traffic dynamically based on application, users, and network conditions. This helps ensure high availability, improves application performance, and decreases work for IT departments.
- *Geographic redundancy through Global Server Load Balancing (GSLB).* GSLB allows application content to be distributed globally by directing requests for application content to the best site based on server health, proximity to the client, and response times. Each Alteon Switch has a global view of the health and performance of other application-serving sites. This enables requests for content to be sent to the optimal site in the event of a failure, disaster, or network performance degradation at one site.
- *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.

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 (Figure 5). Multi-layer security features include:

- *Thwarting performance-robbing application-level Denial of Service (DoS) attacks, worms, and viruses without blocking valid traffic.* Alteon Application Switches enable comprehensive DDoS/DoS attack protection based on TCP, IP, UDP, and ICMP attacks. Sophisticated pattern matching enables DDoS/DoS protection which thwarts a whole host of availability attacks such as ping of death, fictitious DNS requests, and SQL Slammer.
- *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 healthcare, government, and financial applications, Alteon Application Switches, with the integrated SSL application processor, support end-to-end encryption all the way to the server. The integrated SSL accelerator greatly simplifies certificate management. External SSL acceleration appliances can be added in a plug-and-play fashion for additional capacity. For more information on the industry-leading Alteon SSL acceleration features, see the *VPN 3050 Product Brief*.
- *SSL VPN allows the Alteon Application Switch to function as a secure remote access gateway.* 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. For more information on SSL VPN features, see the *VPN 3050 Product Brief*.
- *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.

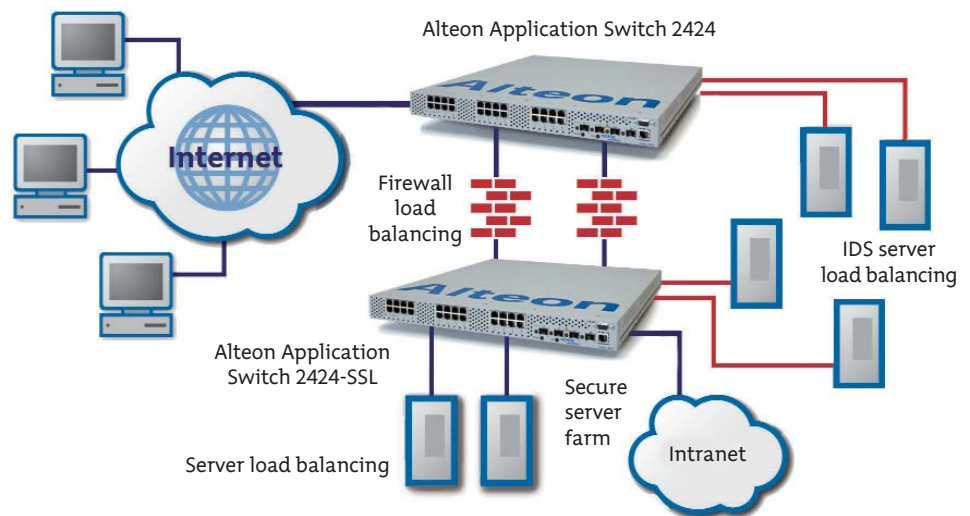


Figure 5. High-performance multi-layer security protects the network, transport, and application layer

Technical specifications

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

Network protocol and standards compatibility

- 10BASE-T/100BASE-TX/1000BASE-TX (IEEE 802.3-2000)
- 1000BASE-SX/LX (IEEE 802.3z)
- Spanning Tree (IEEE 802.1d)
- Logical link control (IEEE 802.2)
- Flow control (IEEE 802.3x)
- Link negotiation (IEEE 802.3z)
- Link aggregation (IEEE 802.3ad)
- VLANs (IEEE 802.1Q)
- Frame tagging (IEEE 802.1Q) on all ports when VLANs enabled
- SNMP v3, Alteon Enterprise MIB
- IP
- RIP
- OSPF
- BGP v4
- 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)

- 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

- IEC 60950 (International)
- National Deviation per CB Member Countries to IEC 60950
- UL 1950 (USA)
- CSA 22.2, No. 950 (Canada)
- EN 60950 (Europe)

- *Protecting applications by enabling IT departments to limit the rate of new TCP connections to application servers on a per-client basis.* This feature, called Application Abuse Protection, increases control over access to applications and improves application availability.
- *Extensive network traffic control through network address translation (NAT) and powerful Layer 7 filtering/firewall capabilities.* Alteon Application Switches can offload filtering tasks from firewalls enabling a more efficient “DMZ” for business applications and allowing IT departments to maximize the use of existing firewalls. Filters can be configured to allow, deny, or redirect traffic. Utilizing Layer 7 filtering enables the inspection, classification, and blocking of malicious application level attacks such as the “Code Red” worm.
- *Secure management.* Alteon Application Switches ensure secure switch management through allowable source IP address filtering, authentication and authorization of remote administrators (including RADIUS and TACACS+ support), and encryption of management information (HTTPS, SNMP v3, SSH v2).

Maximizing return on IT investment

Alteon Application Switches are designed to optimize application delivery, enable networks to effectively support convergence, and 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 which can reduce server requirements and costs up to 50 percent
- Enabling the 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
- Leveraging efficient, highly-available streaming media architectures that drive significant ROI through enhanced employee communication and training without the traditional travel expenses

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 half percent increase in application availability can drive revenues with an ROI of greater than 900 percent.

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

Alteon Application Switches

Alteon switches	3408	2424	2424-SSL	2216	2208
Total ports	12	28	28	18	10
10/100 Ethernet ports	0	24	24	16	8
Gigabit Ethernet ports	12	4	4	2	2
Concurrent sessions	2,000,000	2,000,000	2,000,000	1,000,000	600,000
Layer 7 performance (sessions per second)	51K*	51K*	51K*	30K*	15K*
Layer 4 performance (sessions per second)	110K*	110K*	110K*	40K*	20K*
Virtual server support	1,024	1,024	1,024	1,024	1,024
Real server support	1,024	1,024	1,024	1,024	1,024
Policy filters	2,048	2,048	2,048	2,048	2,048
Integrated SSL acceleration (tps.)**	no	no	Base: 300 Maximum: 1,000	no	no
Integrated SSL VPN	no	no	yes	no	no
Height (inches/RU)	1.75/1	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.



In the United States:

Nortel Networks
35 Davis Drive, Research Triangle Park, NC 27709 USA

In Canada:

Nortel Networks
8200 Dixie Road, Suite 100, Brampton, Ontario L6T 5P6 Canada

In Caribbean and Latin America:

Nortel Networks
1500 Concorde Terrace, Sunrise, FL 33323 USA

In Europe:

Nortel Networks
Maidenhead Office Park, Westacott Way, Maidenhead Berkshire SL6 3QH UK

In Asia Pacific:

Nortel Networks
Level 5, 495 Victoria Avenue, Chatswood, NSW, 2067, Australia, Phone: (61) 2 8870 5200

In Greater China:

Nortel Networks
Sun Dong An Plaza, 138 Wang Fu Jing Street, Beijing 100006, China, Phone: (86) 10 6528 8877

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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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