NORTEL NETWORKS ALTEON STACKABLE WEB SWITCHES 180 AND ACEDIRECTOR SERIES

Enhancing Network and Data Centre Return on Investment

Nortel Networks award-winning Alteon 180 Series and Alteon ACEdirector (AD) Series are a proven generation of Web switches created to deliver not only high-performance but also Return on Investment (ROI) for today's most demanding networks. Alteon Web Switches are built on an innovative, distributed processing architecture and leverage Alteon Web OS Traffic Control Software to provide a broad range of high-speed Internet/Intranet traffic application and control services.

Combining market leading high-performance traffic management in a fixed configuration platform, the Alteon 180 and AD series provide an ideal solution for enterprises and service providers to maximise their network and server investment. These switches are also key revenue-generating components of any service provider's managed service strategy. Alteon Web Switches, used in conjunction with the

remainder of the Nortel Networks Alteon Portfolio, provide industry-leading performance and capacity for security solutions and Content Delivery Networks (CDN). The portfolio includes the Alteon iSD-SSL Accelerator, Alteon Switched Firewall System, and Alteon Content Cache, among others.

The Alteon 180 and AD series deliver the ultimate in high-performance traffic management functions and application support within a single platform. Alteon Web Switches deliver simultaneous support for Layer 2, 3, and 4 through 7 switching. Unlike traditional packet switches, Alteon Web Switches combine a unique collection of traffic management services and applications support within a high-performance Ethernet switch – optimised for switching hundreds of thousands of Web sessions every second. The stackable Alteon Web Switching Portfolio provides a full range of performance and interface options, from the entry level Alteon AD3 Fast Ethernet Web Switch to the Alteon 184 gigabit Web Switch. Applications that can be performed on a single Alteon Web Switch include: (See Alteon Web OS Product Brief for Complete Application Support)

- Local and global server load balancing including firewall, Virtual Private Network (VPN), Intrusion Detection System (IDS), Wireless Application Protocol (WAP), streaming media, etc.

- Cache (static and streaming media) redirection and load balancing

- Quality of Service (QoS) and bandwidth management, metering, and classification

- URL-based application redirection and load balancing

- Advanced TCP/IP filtering

Nortel Networks Alteon 180e and 184 are the first Ethernet Web switches to provide per port selectable 10/100/1000 Mbps Ethernet connectivity on every port, giving users the utmost in flexibility and investment protection. With nine-gigabit ports, the Alteon 180e and 184 are ideal for high-performance Web server farms, data centres, CDNs and the aggregation of 10/100 Mbps Ethernet ports.

Intelligent Traffic Management

Alteon Web Switch application and content-based traffic management improves network and server utilisation and performance. Several Alteon Web Switch features that support intelligent traffic management include:

High-Performance Switching and Server Load-Balancing

With eight gigabits of switching capacity, Alteon Web Switches support wire-speed Layer 2/3 Ethernet throughput. In addition, server load-balancing on Alteon Web Switches enables virtually unbounded server capacity.

Alteon Web Switch Benefits

- Intelligent Traffic Management
- Multi-Application Support
- Network Scalability
- Fail-Safe Network Assurance
- High-Performance Security
- Rapid Deployment

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Alteon Web Switches process entire Web sessions at blazing speeds using Layer 4 through 7 information such as TCP port numbers, URLs, HTTP headers, and HTTP cookies. Unlike competing server load-balancing products built around a single, central processor, Alteon Web Switches employ two powerful Reduced Instruction Set Computer (RISC) processors on each port. This allows Web sessions to be switched at high speeds – up to 296,000 sessions per second can be load balanced. Up to 512,000 Web connections can be concurrently processed on any given port through the use of the Web switch's network processing Application Specific Integrated Circuits (ASIC) – the WebIC. Alteon WebICs, deployed across every switch port, incorporate dual 32-bit RISC network processors for processing scalability of Web sessions.

Figure 1: Basic Server Load Balancing:
- **Improves server utilisation**
- **Increases reliability**
- **Enhances performance**
- **Provides scalability**

Comprehensive Multi-Application Support

Alteon Web OS provides Alteon Web Switches with the ability to concurrently support multiple intelligent traffic management applications. Sophisticated load-balancing algorithms, including metrics based on response time and bandwidth allocation, content-based scriptable health checking, and content-aware and URL-based switching can all be concurrently supported. Applications such as firewall, VPN, IDS, DNS, etc., load balancing can all be performed while a switch also performs bandwidth management. Multi-application support is designed to optimise network ROI by integrating multiple network devices and significantly reducing network capital investment and network administration.

Simple, Effective Load-Balancing Algorithms

System managers can configure the load-balancing method – round-robin and response-time metrics are a few of the available methods. Maximum connection thresholds and different weightings can be assigned to servers to avoid overloading. Any server can be designated as backup or overflow, further ensuring application availability.

Content Awareness

URL-based Web cache redirection and server load balancing optimises cache server farms and Web farms by sending requests with specific URLs or URL "sub-string" matches to designated cache or Web servers. Via URL parsing, up to 64 content rules can be applied per switch, allowing server tuning by separating static and dynamic content requests. Server tuning provides the ability to use servers that are tuned specifically for the content they serve. Multimedia content can be stored on high-end servers, and static content can be stored on low-end servers.

This flexibility increases server utilisation and reduces server costs by removing the requirement that all servers in a load-balanced pool be built to support the most demanding pool supported applications.

Bandwidth Management and QoS

Alteon Web Switches can meter, control, and account for bandwidth use – by client, server farm, virtual service, application, user class, content type and port – using a variety of Layer 2 through 7 attributes. Establishing bandwidth allocation as a business priority helps ensure that network investments are aligned with business goals.

Network Scalability

Alteon Web Switches support mission-critical applications by facilitating smooth network growth without network downtime. Alteon Web Switches provide your network with the ability to grow as you need additional capacity. Pay for what you need now and add capacity without incurring network downtime in the future.

Flexible Groupings of Applications and Servers

Alteon Web Switches provide Virtual IP (VIP) addresses to represent target servers and applications – assigning each session to the most available server associated with the destination VIP address specified. It monitors each session from start to finish, providing full address translation as it forwards packets between the client and server. VIP addresses can be administered in blocks, allowing virtually unlimited numbers of virtual addresses while making administration fast, simple, and error-free. Up to 256 applications can be grouped on one VIP address. Add servers, caches, and Secure Sockets Layer (SSL) accelerators transparently to a network by simply adding the device into the load-balance rotation for an existing VIP address.
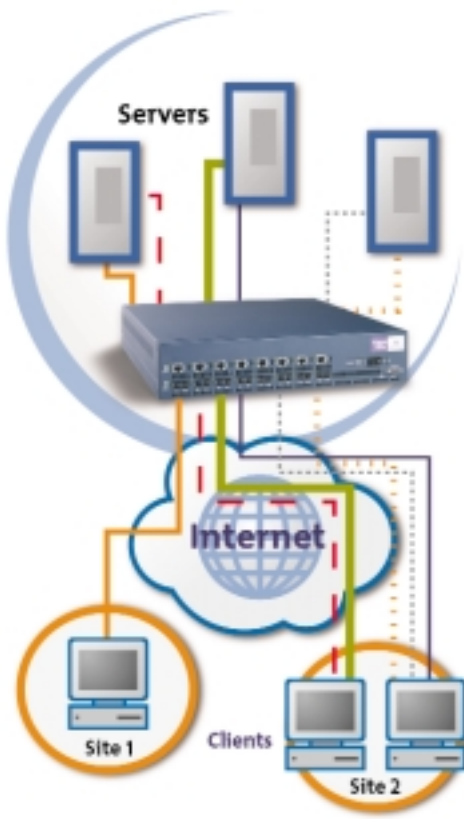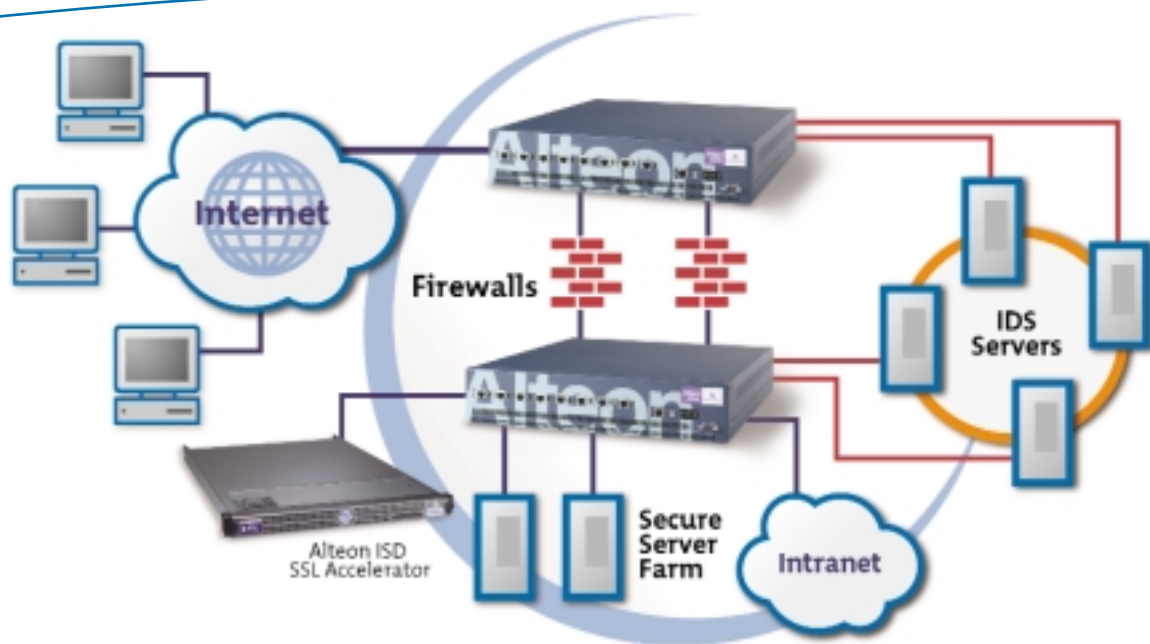
Figure 2: High-Performance Security – Firewall, IDS, SSL, and Server Load Balancing.

Policy-Based Application Redirection

Policy-based redirection and load balancing allows network managers to use powerful filtering rules to intercept traffic for any device and redirect it to a group of the same type of devices, such as firewalls or routers. Application redirection enables the use of transparent caches and firewalls in clusters to enable scaling of Web sites.

Fail-Safe Network Assurance

Alteon Web Switches eliminate single points of failure in a network, provide device and application failover, and enhance network reliability.

High Availability

Alteon Web Switches protect applications against failure of a server link, switch port, or switch, with sub-second detection and failover. The switch constantly monitors server, application, and content availability, bypassing unhealthy servers when it distributes new sessions and automatically re-enrolling them upon service restoration. Intelligent application health checking ensures integrity of the entire data path. Alteon Web Switches can be deployed in Active-Active and Active-Standby redundancy configurations. Based on Alteon Web OS extensions to the Virtual Router Redundancy Protocol (VRRP), Alteon Web

Switches support the active and simultaneous operation of Layer 3 interfaces and Layer 4 services across switches.

Global Server Load Balancing

Global server load balancing allows mirrored servers or server farms to be distributed around the world, enabling requests to be directed to the best performing site and eliminating single points of failure in the network. Alteon Web Switches determine the best site based on server health, proximity to the client, and server response time. Alteon Web Switches automatically exchange this performance information with all other Web switches supporting the same virtual server farm. With a global view of every site's health and performance, each Web switch develops a list of the best performing sites. Switches then direct traffic to the sites capable of providing the fastest response back to the client. Leveraging global server load balancing also ensures network survivability. In the event of a data centre failure, Alteon Web Switches will automatically and transparently reroute traffic to an alternate healthy data centre.

EtherChannel Trunking

Alteon Web Switches support Layer 2, 3, and 4 EtherChannel-compatible trunk groups, enabling link level redundancy and load sharing with Cisco routers and switches

as well as other EtherChannel-compatible devices. If a link within a trunk group fails, traffic is redirected over the remaining trunks in less than a second.

High-Performance Security

The OPSEC certified Alteon Web Switch provides unmatched security enhancement capabilities. Alteon accelerates firewall applications by offloading policy filtering and Denial of Service (DoS) protection support from firewalls. The reliability and throughput of SSL accelerators, firewalls, VPNs and IDS are significantly increased when implemented as part of an Alteon Web Switch load-balance cluster.

Secure Sockets Layer Load Balancing

SSL-based load balancing optimises SSL sessions, ensures session persistency, and scales SSL session capacity – allowing users to continue to re-establish secure connections to a particular server during e-commerce transactions with out the loss of session persistence.

Security Acceleration and Monitoring

Alteon Web Switches can increase the utilisation and reliability of your security infrastructure by offloading tasks such as filtering and DoS attack protection. Capacity and reliability are increased through firewall, VPN, and IDS load

balancing. Alteon Web Switches also provide security monitoring features such as SYN Attack Alarms and Enhanced Port Mirroring (VLAN based, ingress/egress traffic monitoring). Proactive network security features such as Layer 7 Deny Filters and Application Abuse Protection provide your network with the ability to fight back when intrusions are detected.

Flexible Filtering

Filtering delivers unprecedented levels of network traffic control and security. Administrators can forward or drop packets based on application type, protocol, and IP source and destination address. Filtering rules can be created per switch, with any or all rules applied to each port.

Rapid Deployment

All Alteon 180 and AD series Web Switches provide a common management interface and utilise a fixed configuration architecture.

The fixed configuration provides a single complete platform for Layer 2-7 services and multiple-application support that can be easily deployed. Starting with the entry-level Alteon ACEdirector 3 Fast Ethernet Web switch and moving to the Alteon 184, all Alteon Web Switches are designed for ease of installation and rock-solid reliability.

Complete IP Switching

IP switching in Alteon Web Switches provides complete topological flexibility, with support for Routing Information Protocol (RIP) v1, Open Shortest Path First (OSPF), Spanning Tree, static routes, and two default routes with health checking. Routing updates are enabled on a per port basis to avoid sending unnecessary broadcast traffic. Alteon Web Switches learn and cache IP addresses, providing direct IP switching for locally attached networks. They can route between VLANs or IP subnets within the switched network without an external router.

Dual-Speed Ports Deliver the Ultimate in Flexibility

The Alteon 180 series supports eight selectable 10/100-TX/1000-SX ports plus one 1000-SX uplink (184 comes with 100 or 1000 Mbps uplink). Each dual-speed port is equipped with an RJ-45 connector (10/100-TX) and an SC connector (1000-SX). The Web switch automatically detects and uses the highest speed port for each interface.

Adaptive Network Management

Network managers can configure and monitor all switch functions via standard Web browsers, SNMP applications, and CLI from the console port or via Telnet. Private MIB and RMON on every port are supported. Robust port mirroring capability provides for switch and server performance analysis. The management interface is integrated with Nortel Networks Optivity Network Management System and HP OpenView.

Table 1: Alteon Stackable Web Switch Family Specification Matrix

Alteon Web Switch	AD3	AD4	180e	184
Total # of Ports	8 – 10/100 Mbps 1 – Gig SX	8 – 10/100 Mbps 1 – 10/100/1000 Mbps	8 – 10/100/1000 Mbps 1 – Gig SX	9 – 10/100/1000 Mbps
Concurrent Session	336k	512k	336k	512k
Session per Second	296k	296k	296k	296k
IP routing Interfaces	256	256	256	256
Policy Filters	224	2048	224	2048
VLANS	256	256	256	256
Switch Capacity	8 Gbps	8 Gbps	8 Gbps	8 Gbps

Technical Specifications

Table 2: Alteon Stackable Web Switch Series Technical Specifications.

Network Protocol and Standards Compatibility

- Spanning Tree (IEEE 802.1d)
- Logical Link Control (IEEE 802.2)
- 10BASE-T/100BASE-TX (IEEE 802.3, 802.3u)
- Flow Control (IEEE 802.3x)
- RMON (RFC 1757)
- SNMP (1213 MIB-II, 1643 Ethernet, 1493 Bridge)
- 1000BASE-SX (IEEE 802.3z)
- IP
- RIPv1
- OSPF
- TFTP (RFC 783)
- BootP (RFC 1542)
- BootP (RFC 951)
- Telnet (RFC 854)

Layer 2/3 Support

- 802.1Q (256 VLANs)
- Jumbo Frames (all ports)
- EtherChannel-compatible trunking
- 802.1d Spanning Tree
- 4K MAC addresses per port
- 8K per switch
- IP switching
- 256 IP interfaces
- Four default routes supported by load balancing, health checking, and automatic failover
- IP-based trunking

Interface Port Specifications

- 1000BASE-SX Ports
  - Full-duplex Gigabit Ethernet SC fibre connectors
- Operating Distance
  - Shortwave (850 nm)
  - 62.5 micron MM fibre – 2 to 275 meters
  - 50 micron MM fibre – 2 to 550 meters
- 10BASE-T/100BASE-TX Ports
  - 10/100 full or half-duplex (auto-negotiation) with RJ-45 connections for UTP ports

Console Interface

- RS-232C, DB-9 serial connection, female DCE interface for out-of-band management

Environmental and Safety Certifications

- Emissions
  - FCC
  - CFR 47 Part 15
  - Subpart A ANSI C63.4D11.4 1991
  - VCCI Class 1
  - FCC OST 55
  - CISPR 16
  - CISPR 22
  - CSA C108.8-M1983 (R1989)
  - EN55022
  - CE
  - EN6100-3-2
  - EN60555-2
- Safety
  - UL 1950
  - CUL
  - DIN/VDE 0805
  - CSA 22.2
  - No. 950-93
  - IEC 950
  - EN 60950
  - TUV EMKO-TSE (74-SEC) 207/94 Nordic Deviations to EN 60950

Environmental Specifications

- Operating Temperature 0° to 40° C
- Operating Humidity 5% to 85% (non-condensing)
- AC
  - Power Auto-ranging supply 100-240 VAC @ 50-60 Hz, 3A
  - Power consumption 90 W
- DC
  - Power Auto-ranging supply -48 to 60 VDC, 3A
  - Power consumption 80 W

Physical Dimensions

- Width 17.00 inches (431.8mm)
- Depth 18.00 inches (457.2mm)
- Height 3.47 inches (88.1mm) (Standard 19" EIA rack or wall mountable)

Acronym Glossary

ASIC	Application Specific Integrated Circuit
CDN	Content Delivery Network
CLI	Command Line Interface
DoS	Denial of Service
IDS	Intrusion Detection System
MIB	Management Information Base
OPSEC	Open Platform for Secure Enterprise Connectivity
QoS	Quality of Service
RIP	Routing Information Protocol
RISC	Reduced Instruction Set Computer
RMON	Remote Monitoring
SNMP	Simple Network Management Protocol
SSL	Secure Sockets Layer
TCP	Transmission Control Protocol
VIP	Virtual Internet Protocol
VPN	Virtual Private Network
VRRP	Virtual Router Redundancy Protocol
WAP	Wireless Access Protocol

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