

Juniper Networks **DX Application Acceleration Platforms**



and performance for any business environment. Working with other Juniper solutions such as the WX/WXC application acceleration platforms and the Secure Access SSL VPN, the DX platform contributes to the industry's most complete, secure and assured application delivery solution for the distributed enterprise.

The DX application acceleration platform resides in the data center in front of content servers, where it serves as a full request/response-aware bi-directional HTTP proxy for processing incoming and outgoing requests. By offloading servers from CPU-intensive tasks, the DX platform makes servers much more efficient, accelerating the performance of web-enabled applications and improving the productivity of remote, branch office and mobile employees accessing centralized business applications.

Server Load Balancing

As a fundamental service, the DX platform delivers full Layer 4-7 server load balancer (SLB) functionality.

Equipped with multiple load-balancing methods and sticky modes, the DX platform can load-balance any application that needs to be scaled or made highly available. The DX platform performs server health checks ranging from simple ICMP ping and Layer 7 HTTP content validation to scriptable health-check facilities to verify that applications, whether custom or off the shelf, are healthy before any requests are sent to the server. Full server/connection management features ensures that servers and services can be inserted or deactivated at any time in a live network without causing a service outage.

The DX application acceleration platform delivers a complete data center acceleration solution for web-enabled and IP-based business applications. Based on the unique DX Framework, the DX platform greatly improves end-user experience by delivering content quicker and solves IT budget, high-availability and security requirements through a combination of centralized services – including server load balancing, global server load balancing, SSL encryption and termination, HTTP compression, and application security – on a single device. The DX platform has scaling options in both functionality

Securing the Application and Data Center

The DX platform provides transport-level security by providing full Secure Sockets Layer (SSL) session termination for any web- or IP-based application, offloading this task from content servers and providing an extra layer of protection for critical data center resources. With options for either hardware-assisted SSL termination for high-capacity needs or FIPS L3 for maximum protection, the DX platform can secure all applications to the desired level.

The DX platform also acts as an “internal firewall,” protecting the web tier and content servers from malicious TCP and HTTP/web-based attacks by authenticating all users and HTTP sessions before allowing access. The DX platform can provide per-request authorization by leveraging the existing RADIUS and LDAP infrastructure, secure data and connections, protect servers from denial-of-service (DoS) attacks and SYN floods, and provide other security features based on native HTTP protocol communication.

DX Application Acceleration Platform Features

- Accelerates web-enabled applications by up to 50 percent
- Reduces data center infrastructure and bandwidth costs by up to 60 percent
- Increases server capacity by three to four times
- Increases both application and data center security

Bi-directional HTTP Proxy: Unparalleled Web Acceleration, Security and Flexibility

Designed with HTTP in mind, the DX platform provides a full suite of services for web-enabled applications that benefit both the end-user and the data center.

- **TCP Multiplexing: Efficient Access to the Web Server**

TCP/IP connection multiplexing enables the DX platform to reduce thousands of incoming client connections down to just a few, relieving the TCP/IP connection-management burden on back-end servers and allowing them to do what they do best: serve content. By assuming responsibility for resource-intensive tasks such as session set-up and tear-down, the DX platform frees up CPU cycles on the servers, allowing them to process up to four times the normal number of requests.

- **Auto-adaptive Compression: Beyond Deflate and GZIP**

A full understanding of the requesting and sending browser, as well as content and network conditions, enables the DX platform to speed content to the user in record time without requiring a proprietary client to the browser.

The DX platform employs standards-based Deflate and GZIP algorithms to compress all application flows, from standard HTTP objects to Microsoft Office documents and XML content, to accelerate web-enabled applications for all local, remote and mobile users. To provide the best possible performance, the DX platform imposes no size restriction for documents being compressed, and support for mechanisms such as chunking allow content to be displayed as soon as it's available to accelerate page loads.

- **Symmetric Caching**

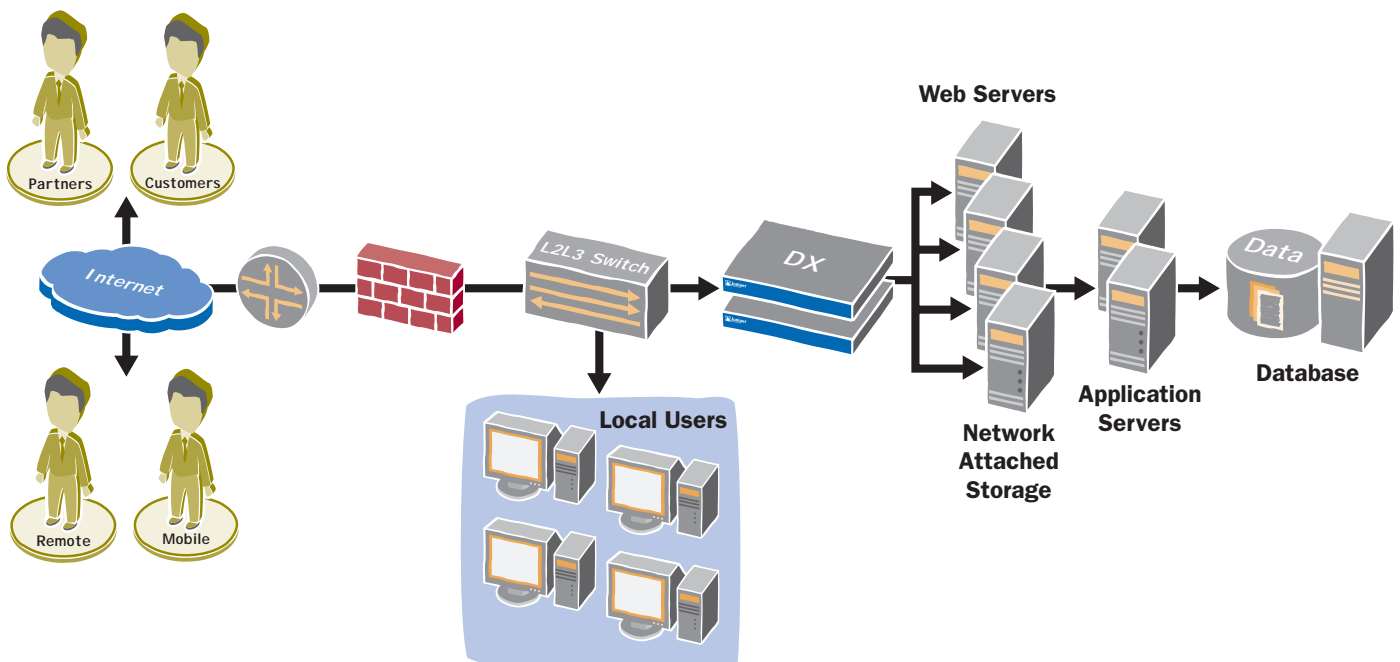
The DX platform's on-board DRAM cache, coupled with the ability to rewrite HTTP content on-the-fly to enable browser-side caching, ensures that no bandwidth is wasted on downloading unnecessary objects. The 3G caching capability enables the DX platform to locally store commonly-requested objects in fast DRAM and quickly respond to requests for those objects at speeds that only silicon-based storage can achieve. The server never sees the request, preserving valuable cycles for serving dynamic content.

The DX platform's ability to dynamically rewrite content also allows previously uncacheable HTTP objects to be stored on the client browser so that the next time the object is requested, it is locally served without wasting WAN bandwidth or consuming data-center processing cycles.

- **Client TCP Connection Keep-alive**

A major cause of web traffic delay is the TCP connection set-up and bandwidth tuning process called slow-start, which can take multiple round trips before everything is optimized. Servers and clients automatically close these connections after a brief period of inactivity, even within an active browser session, forcing users to incur the start-up penalty each time they initiate an action.

To accelerate performance, the DX platform keeps all client TCP connections open for as long as capacity allows, ensuring an immediate response the next time the client browser retrieves content from the server, even if hours or days later.



The DX application acceleration platform speeds the delivery of web-enabled applications from the data center for local, remote and mobile users.

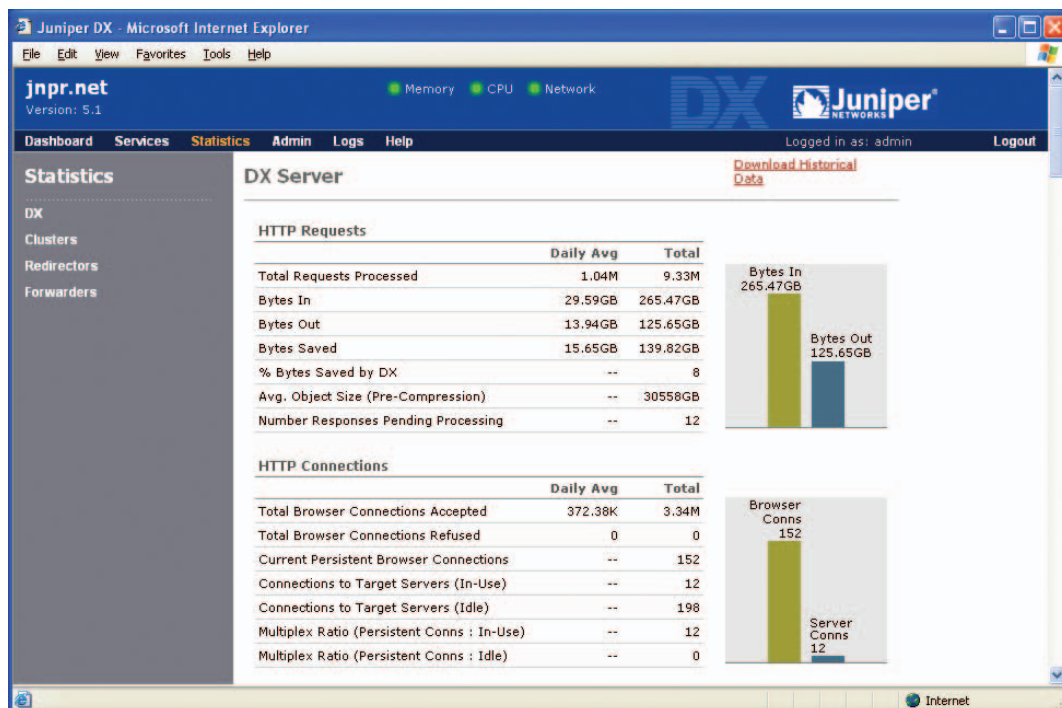
AppRules Control Environment

The DX platform features a flexible bi-directional HTTP header and body inspection/content rewriting capability called AppRules™ which enables IT to modify application behavior on active traffic flows to compensate for inefficiencies or other problems without altering the application code itself. Users can choose from an existing template of general optimization rules or, using a simple GUI-based wizard, they can write their own custom “if/then” rules based on any combination of factors for both incoming user requests and outgoing server responses. Some AppRules examples include:

- AutoSSL™, which automatically converts HTTP to HTTPS for complex applications such as OWA
- HTTP transaction assurance, which intercepts server errors and automatically resubmits the request to other servers
- URL rewrite, which allows IT to hide back-end directory structures for security purposes

ActiveN: Capacity Scaling and High Availability

The DX platform includes the unique ActiveN™ scaling and high-availability feature, which allows new DX devices to be incrementally added as needed to meet growing demands. More than just a high-availability system, the ActiveN feature enables the entire DX cluster to act as a single device, linearly scaling performance. Up to 64 units can be clustered in a mesh topology, and the ActiveN feature ensures that if a single DX platform becomes unavailable, the workload is automatically redistributed among the remaining units, providing N + 1 redundancy.



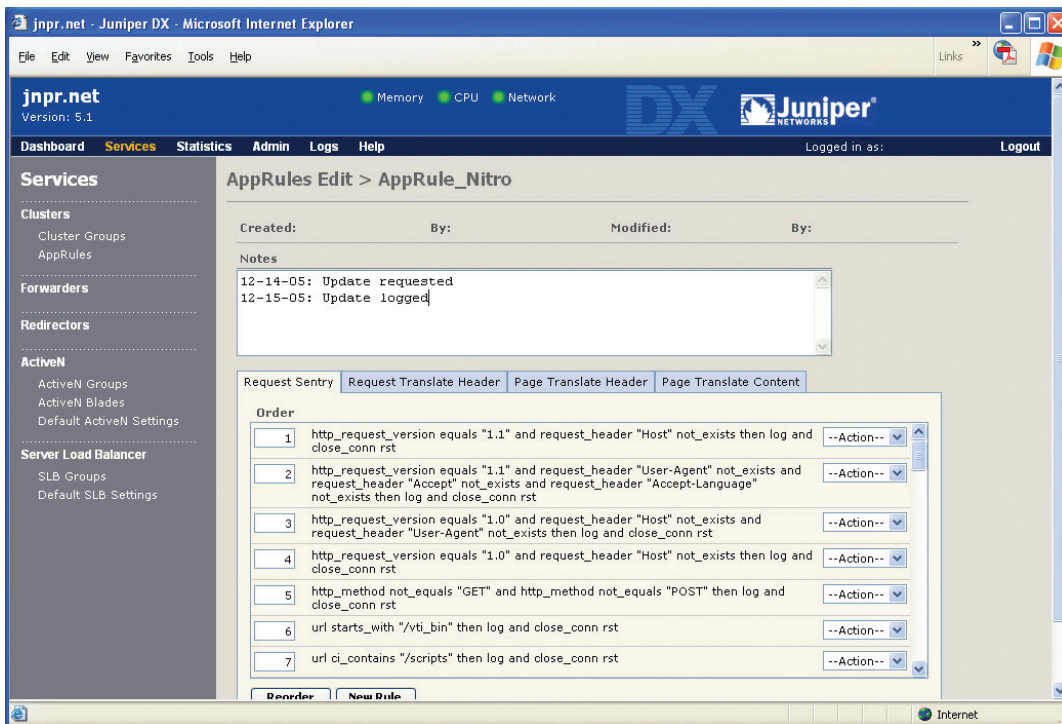
Reporting capabilities provide a wealth of historical performance data for the DX platform.

Global Server Load Balancing: Worldwide Application Support

For widely distributed environments supporting multiple data centers, the DX platform offers a global server load balancing (GSLB) feature that allows clients to be connected to the data center best equipped to fulfill their request, regardless of location. GSLB routing decision algorithms include active/standby status, closest data center, least-loaded data center, or a combination of these and other decision metrics. Acting either as a DNS transparent proxy or a full DNS BIND agent, the GSLB feature can be incorporated into any DNS infrastructure. A combination of GSLB and DX platform stickiness means clients will always connect to the same server in the same data center, ensuring server-resident client information is always available.

Monitoring and Reporting

The DX platform provides IT with real-time and historical reports that offer a complete overview of web-based application performance. Through the DX dashboard, users can assess the health of their data center at a glance and quickly identify and drill down to find and correct problems. All data can be exported and viewed via a web interface, providing universal access to performance statistics.



The AppRules wizard enables users to easily modify application behavior in real time without having to change any actual code.

DX Product Family

The DX product family is composed of six members: the DX 3200/3250; the DX 3600/3650; the DX 3650-FIPS; and the DX 3670. The DX 3650-FIPS is FIPS 140-2 Level 3 compliant, offering an even higher level of security to organizations seeking compliance with the Federal Information Processing Standard (FIPS).

The following table provides additional details on each of the platforms.

Product	Interface	Size	SSL	DRAM	Flash	Processing	Redundant Power
DX 3200	2 x FE	1U	Software	2 GB	512MB	1x 2.8 GHz P4	
DX 3250	2 x FE	1U	Hardware	2 GB	512MB	1x 2.8 GHz P4	
DX 3600	4 x GE	2U	Software	4 GB	512MB	2x 3.2 GHz Xeon	Yes
DX 3650*	4 x GE	2U	Hardware	4 GB	512MB	2x 3.2 GHz Xeon	Yes

*FIPS L3 option available

DX Licensing Options

Four DX licensing options are available, each offering additional levels of functionality. The licensing options, enabled via software upgrades, include:

- Server load balancing (SLB) and SSL termination functionality as the base DX license
- HTTP acceleration and compression, including transport connection multiplexing (includes SLB and SSL termination functionality)
- Advanced HTTP acceleration, including AppRules adaptive content processing (includes transport connection multiplexing and SLB and SSL termination functionality)
- Global SLB functionality (applicable across all license levels)

SLB and SSL Termination License Features

The DX platform base-level license includes the following features:

Layer 4 TCP/UDP Load Balancing

- Supports full Layer 4 server load balancing of HTTP, HTTPS (SSL), FTP, and most TCP and UDP protocols
- Supports full-function, flexible, scriptable health checking, enabling programmatic verification of external devices and services (ICMP, HTTP, SMTP, FTP, etc.)
- Supports common load-balancing techniques such as weighted round robin, least connections, fail-over chaining, etc.

SSL Transport and DoS Security

- End-to-end and one-way SSL termination with accelerated download of secure content
- Supports ARC4, RSA, DES, 3DES, AES, MD5 and SHA-1 encryption algorithms
- Defends against SYN flood and denial-of-service (DoS) attacks
- Terminates and tunnels any TCP protocol over SSL for session-based, point-to-point, or client-to-gateway SSL security (including mail, Telnet, etc.)

LDAP and RADIUS Authentication Caching

- Caches successful login attempts to reduce load on the authentication server, dramatically improving performance of authentication and authorization

Historical Statistics

- Reports more than 200 real-time statistics, available by second, minute, hour, day, month and year

Role-based Multi-level Administrative Access

- Supports differentiated user access levels
- Provides complete system, administration and audit logs

Administration Tools

- Web browser interface (HTTP, HTTPS) simplifies configuration and management
- Supports command line interface via SSH, Telnet, SCP, or console (RS-232)
- Includes administration dashboard and e-mail alerts
- Supports SNMP through Juniper MIB
- Synchronizes configuration across multiple DX platforms, simplifying configuration and management for large scale deployments

Configuration Flexibility

- Supports one- or two-arm configuration modes
- Supports client IP transparency to simplify configuration and installation into an existing network
- Offers wide range of functionality, including load balancing, compression, SSL, TCP offload, HTML rewrite, accounting/authentication/authorization, application firewall
- Offers performance linearity – all functions can be used simultaneously while maintaining performance linearity
- Enables drop-in replacement of existing server load balancing equipment, or can complement existing SLB equipment
- Supports 802.1Q VLAN Tagging to differentiate packets belonging to different VLANs in a multi-VLAN environment
- Supports DX redundancy for SLB

HTTP Acceleration and Compression License Features

In addition to the SLB and SSL termination features, the HTTP acceleration and compression license offers the following features:

Acceleration

- Transport connection multiplexing engine reduces server connections by a ratio of up to 1,000:1
- Terminates and persistently maintains separate internal and external TCP and HTTP/S connections (full TCP and HTTP Proxy)
- Multiplexes HTTP/S requests and supports pipelining and chunking
- Real-time HTTP 1.0-to-1.1 conversions
- Client connection keep-alive for quicker performance on return visits.

Compression

- Compresses all HTML, SHTML, DHTML, JHTML, PHTML, Javascript, J2EE, JSP, CSS stylesheets, XML, SOAP
- Compresses all Microsoft Office documents
- Internal compression policy engine includes more than 4,000 compression policies to ensure 100 percent page fidelity
- Programmatically controls compression of any MIME type, including doc, xls, ppt, Flash, etc., on a per-object or per-object-class basis
- Web-services compression for server-to-server protocols including SOAP
- Supported by all standard browsers (IE 7.0 + , Netscape 4.0 +)

Protocol Scrubbing (HTTP and TCP)

- Ensures only valid, well-formed HTTP/S requests reach servers; never passes packet fragments
- Delivers full-function Authentication and Authorization
- Supports Client Certificate Authentication, Radius and LDAP
- Offers full content-stream inspection
- Blocks, logs or rewrites bad URLs and malicious requests
- Provides buffer overflow inspection and protection

Native HTTP Protocol Communication

- Dynamically inspects, verifies and rewrites client requests or server responses
- Acts on HTTP headers, POSTs, SOAP and HTML, JavaScript, etc.

SLA Monitoring and Analysis

- Tracks, monitors, and logs server response time and client download time for each HTTP/S request and response

ActiveN High Availability

- Supports self-healing mesh of up to 64 DX platforms, actively processing traffic to one or more VIPs with cascading failover and linear scaling
- Provides active-active or active-standby high-availability

Layer 7 Load Balancing

- Supports full Layer 7 load balancing based on any request method, protocol version, URL, cookie, other header, POST data, header or body content, SOAP, or XML contents
- Utilizes patented Fewest Outstanding Requests balancing algorithm for HTTP/S, delivering most optimal load distribution and performance

Advanced HTTP Acceleration License Features

In addition to the SLB, SSL termination, HTTP acceleration and compression features, the advanced HTTP acceleration license offers the following features:

3G Caching

- Improves server performance and scalability by serving from internal, memory-resident cache
- Provides complete operational transparency to both client and server

Application Control

- AppRules control environment enables bi-directional modification of HTTP applications with a wide range of actions, including alert, block, groom, transform, repair, and rewrite
- GUI-based AppRules wizard supports simple creation of “if/then” rules for modifying application behavior without rewriting underlying code
- Rules template allows selection and enforcement of predefined AppRules changes
- Content manipulation such as compression and 3G Caching can be controlled with near-infinite granularity for maximum flexibility

Network and Transport Security through Content Rewrite

- AutoSSL feature rewrites HTML “on the fly” to secure content without modifying the application

Transaction Assurance

- Detects transaction errors by incorrect content within the page itself or error code
- Repairs and retries, redirects requests, shielding users from errors and increasing transaction success

Global Server Load Balancing License Features

- Distributes requests to the data center best equipped to fulfill them
- DNS resolution decisions based on active/standby status, closest data center to origin of request (round-trip time), least-loaded data center (bandwidth, packets, connections), DX loading (memory or CPU utilization), or a combination of these metrics
- DX can act as a full DNS proxy (using BIND) or transparent DNS cache
- DX-to-DX communication conducted over secure communication channel

Physical Specifications

Power Requirements

110 ~ 240 VAC, 50 ~ 60 Hz, auto-sensing

1U Systems: 150 Watts

2U Systems: 300 Watts

Dimensions and Weight

1RU Systems: 1 RU 1.8in (45mm) h x 17.1in (435 mm) w x 6.7in (425mm) d, 24 lbs.

2RU Systems: 2 RU 3.44in (88mm) h x 17.1in (435 mm) w x 6.7in (425mm) d, 32 lbs.

Operating Environment

Temperature: 5° to 40° C

Humidity: Less than 90 % humidity, non-condensing

Regulations

Emissions: FCC Class A, VCCI Class A, EN 55022 Class A, EN 61000-3-2, EN 55024 Immunity

Safety: CSA C22.2 No. 950, EN 60950

Ordering Information

DX with Server Load Balancing and SSL Termination License

SLB, high-speed SSL termination with 4 x 10/100/1000BASE-T interfaces, dual PS	DX-3650-SLB-SSL-S-4G
SLB, high-speed SSL termination with 2 x 10/100/1000BASE-T and 2 x 1000BASE-SX (fiber) interfaces, dual PS	DX-3650-SLB-SSL-S-2G2F
SLB/SSL termination with 4 x 10/100/1000BASE-T interfaces, dual PS	DX-3600-SLB-SSL-N-4G
SLB/SSL termination with 2 x 10/100/1000BASE-T and 2 x 1000BASE-SX (fiber) interfaces, dual PS	DX-3600-SLB-SSL-N-2G2F
SLB and high-speed SSL termination with 2 x 10/100BASE-T interfaces	DX-3250-SLB-SSL-S-2C
Entry-level SLB/SSL termination with 2 x 10/100BASE-TX interfaces	DX-3200-SLB-SSL-N-2C

DX with Server Load Balancing / SSL Termination and HTTP / S Acceleration

FIPS Level 3 certified SSL, HTTP Acceleration, SLB with 4 x 10/100/1000BASE-T interfaces, dual PS	DX-3650-F-2G
HTTP Acceleration, SLB, high-speed SSL termination with 4 x 10/100/1000BASE-T interfaces, dual PS	DX-3650-S-4G
HTTP Acceleration, SLB, high-speed SSL termination with 2 x 10/100/1000BASE-T and 2 x 1000BASE-SX (fiber) interfaces, dual PS	DX-3650-S-2G2F
HTTP Acceleration, SLB, SSL termination with 4 x 10/100/1000BASE-T interfaces, dual PS	DX-3600-N-4G
HTTP Acceleration, SLB/SSL termination with 2 x 10/100/1000BASE-T and 2 x 1000BASE-SX (fiber) interfaces, dual PS	DX-3600-N-2G2F
HTTP Acceleration, SLB and high-speed SSL termination with 2 x 10/100BASE-T interfaces	DX-3250-S-2C
Entry-level HTTP Acceleration, SLB/SSL termination with 2 x 10/100BASE-TX interfaces	DX-3200-N-2C

DX Upgrade Licenses

Adaptive content processing module for AppRules	DX-OVERDRIVE-LTU
High-speed 3G RAM-based cache. Requires OverDrive to be purchased.	DX-CACHING-LTU
Upgrade license to enable Global Server Load Balancing (GSLB)	DX-UPGRADE-GSLB

Spares

Single field-replaceable power supply module for 2U units (3670, 3650 FIPS, 3650, 3600)	DX-PWR-S
--	----------



CORPORATE HEADQUARTERS
AND SALES HEADQUARTERS
FOR NORTH AND SOUTH AMERICA
Juniper Networks, Inc.
1194 North Mathilda Avenue
Sunnyvale, CA 94089 USA
Phone: 888-JUNIPER (888-586-4737)
or 408-745-2000
Fax: 408-745-2100
www.juniper.net

EAST COAST OFFICE
Juniper Networks, Inc.
10 Technology Park Drive
Westford, MA 01886-3146 USA
Phone: 978-589-5800
Fax: 978-589-0800

ASIA PACIFIC REGIONAL
SALES HEADQUARTERS
Juniper Networks (Hong Kong) Ltd.
Suite 2507-11, Asia Pacific Finance Tower
Citibank Plaza, 3 Garden Road
Central, Hong Kong
Phone: 852-2332-3636
Fax: 852-2574-7803

EUROPE, MIDDLE EAST, AFRICA
REGIONAL SALES HEADQUARTERS
Juniper Networks (UK) Limited
Juniper House
Guildford Road
Leatherhead
Surrey, KT22 9JH, U. K.
Phone: 44(0)1372-385500
Fax: 44(0)1372-385501

Copyright 2006, Juniper Networks, Inc. All rights reserved. Juniper Networks and the Juniper Networks logo are registered trademarks of Juniper Networks, Inc. in the United States and other countries. All other trademarks, service marks, registered trademarks, or registered service marks in this document are the property of Juniper Networks or their respective owners. All specifications are subject to change without notice. Juniper Networks assumes no responsibility for any inaccuracies in this document or for any obligation to update information in this document. Juniper Networks reserves the right to change, modify, transfer, or otherwise revise this publication without notice.