BROCADE SERVERIRON ADX 1000, 4000, and 10000 APPLICATION DELIVERY CONTROLLERS FREQUENTLY ASKED QUESTIONS

Introduction

This document answers frequently asked questions about the Brocade® ServerIron® ADX Series of application delivery controllers.

- For Brocade ADX product information, visit: http://www.brocade.com/adx
- See also the Brocade ADX Application Delivery Infrastructure (ADI) community page: http://www.brocade.com/adi

The Brocade ADX Series of high-performance application delivery switches provides a broad range of application optimization functions to ensure reliable delivery of critical applications. These switches enable:

- Low-latency, high-performance delivery of business-critical applications through data center-class application switches
- Optimized delivery of Web applications from BEA, IBM, Microsoft, Oracle, SAP, and Siebel, and infrastructure services such as DNS, RADIUS, firewalls, and cache services
- HTTP performance with up to 3 million connections per second, and 70 Gbps throughput
- Greater application visibility and elasticity in virtualized and cloud environments using Brocade Application Resource Broker, and simplified integration with third-party orchestration tools
- Enhanced operational simplicity with on-demand, field upgradable capability to meet increased performance, ports, and feature requirements
- A seamless and cost-effective transition to leading-edge Internet technologies such as IPv6

General Questions and Answers

Brocade ADX Series Overview

Q What is the Brocade ADX family of products?

A The Brocade ADX product family includes application delivery controller platforms that are purpose-built for large-scale, low-latency environments and provide high-performance, non-stop delivery of business-critical applications.

The Brocade ADX product family includes:

- **Brocade ADX 1000 Series:**
  - Compact, 1U application delivery switch with multiple port configurations:
    - Brocade ADX 1000 platform: Up to 16 1 Gigabit Ethernet (GbE) copper ports and two 10 GbE fiber XFP ports.
    - Brocade ADX 1000F platform: Eight 1 GbE copper ports, up to 16 1 GbE fiber Small Form-Factor Pluggable (SFP) ports, and two 10 GbE fiber SFP+ ports.
  - Four application cores, built-in SSL hardware, up to two AC/DC power supplies, and one 10/100/1000 Mbps management port.
  - Capacity-on-demand through simple, software-based license key upgrade to double or quadruple system performance, add Gigabit Ethernet copper or fiber ports, add SSL capabilities, or add Premium software features without requiring a hardware upgrade.
- **Brocade ADX 4000 Series:**
  - A 4U chassis-based modular application delivery switch with one management module and up to two application switching modules.
  - Each application switching module comes with eight application cores, one switch fabric module, up to two AC or DC power supplies, one hot-swappable fan tray, and up to two interface modules.
- **Brocade ADX 10000 Series:**
  - A 10U chassis-based modular application delivery switch with up to two management modules and up to four application switching modules.
  - Each application switching module comes with eight application cores, two switch fabric modules, up to four AC or DC power supplies, one hot-swappable fan tray, and up to four interface modules.

Q What are the key application delivery capabilities of the Brocade ADX Series?

A The Brocade ADX Series offers a wide range of functions for an optimal application experience, including:

- **Enterprise applications:** Provides uninterrupted, high-performance, and low-latency delivery of popular applications, including Microsoft Exchange, Microsoft SharePoint, Microsoft Lync Server (formerly Microsoft Office Communications Server), SAP, Oracle, BEA WebLogic, IBM WebSphere, and Siebel, and financial services applications based on the Financial Information eXchange (FIX) protocol.
- **Infrastructure load balancing:** Increases availability of infrastructure devices such as firewalls, caches, intrusion prevention appliances, Domain Name Server (DNS) and

DNS Security Extension (DNSSEC) servers, and Remote Authentication Dial-in User Service (RADIUS) servers.

- **Efficient load balancing:** Enables efficient distribution of traffic among application servers using load-balancing methods that monitor server connection load, server resources such as CPU and memory, application response time, and pre-assigned server weights.
- **Application health monitoring:** Conducts periodic checks of application servers and services through Layer 2 ARP, Layer 3 PING, Layer 4 TCP three-way handshakes or UDP queries, and Layer 7 application-level queries (DNS, RADIUS, HTTP, SSL, LDAP, LDAPS, MMS, RTSP, SMTP, TELNET, FTP, NNTP, IMAP4, PNM, POP3, SIP).
- **Layer 7 content inspection:** Advanced Layer 7 inspection of the HTTP URL, cookie, host headers, and data for maintaining application flow persistence.
- **SSL and server connection offload:** Offloads Secure Sockets Layer (SSL) negotiation and connection management tasks from application servers, giving servers more cycles for delivering critical applications and improving application response time. Provides comprehensive support for a variety of cipher suites and 1024- and 2048-bit SSL keys.
- **Application infrastructure agility:** Enables on-demand inclusion and removal of application instances using Brocade Application Resource Broker.

Brocade Application Resource Broker Overview

Q What is Brocade Application Resource Broker?

A Brocade Application Resource Broker is an infrastructure software component that simplifies the management of on-demand application resources within IT data centers. This solution helps ensure optimal application performance by dynamically adding and removing application resources, such as Virtual Machines (VMs). The Brocade Application Resource Broker—which works in tandem with the Brocade ADX Series—provides these capabilities through real-time monitoring of application resource responsiveness, traffic load information, and infrastructure capacity information from server infrastructures. A programmable decision engine compares application experience information with preconfigured threshold rules. When thresholds are exceeded, Brocade Application Resource Broker initiates provisioning actions to ensure that necessary and appropriate application resources are available to meet Service Level Agreements (SLAs).

What's New in Brocade ADX v12.3 and Brocade Application Resource Broker v1.5?

Q What are the important new capabilities in Brocade ADX v12.3?

A With the latest Brocade ADX software release, Brocade ADX controllers include the following enhancements:

- Roughly doubles the performance of several key application delivery metrics, such as IPv4 and IPv6 HTTP connection rate and application health checks

- Improves DNS stateful performance[1] by more than 50 percent on all existing Brocade ADX platforms through software optimization, delivering investment protection for existing and new customers
- Enables HTTP performance with up to 3 million connections per second, and 70 Gbps throughput
- Leverages standards-based gateway[2] capabilities for a seamless transition to IPv6 without requiring forklift upgrades to existing infrastructure, enabling continued, high-performance delivery of IPv4 and IPv6 applications
- Enables a highly secure DNS deployment with full support for DNSSEC and DNS Denial of Service (DoS) attack prevention

Q What's new in Brocade Application Resource Broker v1.5?

A Brocade Application Resource Broker now delivers a range of capabilities for dramatically simplifying management of public and private cloud environments, including:

- **Streamlined provisioning of VMware ESX-based VMs:** Includes the ability to select VM and specific ESX interfaces to activate and to power off VMs following deactivation
- **Flexible policy management:** Includes maximum number of VMs per Virtual IP (VIP) and addition/removal of VMs based on time of day or date range
- **Extensive monitoring and reporting:** Includes predefined reports and export of historical data for use with third-party tools

Q How does the Brocade ADX Series help organizations transition to IPv6?

A While the ubiquity of the Internet creates vast new opportunities for service providers and enterprises alike, the rapid growth of Internet-enabled devices and applications has led to IPv4 address depletion. This depletion is forcing many organizations to begin serious adoption of IPv6. At the same time, many organizations face regulatory or governance-driven mandates to offer IPv6 services to their customers, but struggle with the cost of a complete network redesign.

The Brocade ADX Series eases migration to IPv6 by enabling service providers and enterprises to maximize their existing IPv4-based investments while communicating with the growing IPv6-based world, without requiring "rip-and-replace" upgrades.

IPv6 gateway: The Brocade ADX Series enables IPv4 networks to interoperate with IPv6 networks via a simple, standards-based Network Address Translation 64 (NAT64) gateway. This capability enables IPv4 clients to communicate with new IPv6 networks, as well as new IPv6-based clients to communicate with the traditional IPv4 networks, all without requiring forklift upgrades to existing infrastructure.

IPv6 SLB: The Brocade ADX Series also allows existing IPv4 applications to be advertised via an IPv6-based VIP service. Existing servers and applications can then be slowly migrated to IPv6 on their natural upgrade cycles. Brocade ADX switches load-balance traffic destined to an IPv6 VIP among IPv4 application servers, enabling such application servers to be upgraded to support IPv6 at an evolutionary rate.

[1] Scheduled in software release 12.3.1.
[2] Scheduled in software release 12.3.1.

Q What benefits does the Brocade ADX switch provide to enterprise users transitioning to IPv6 versus relying on their service providers to handle such a transition?

A If enterprises offer services on a public-facing Internet or intranet, then they must ensure that their services are accessible equally by IPv4-only users and IPv6-only users. Enterprises can instantly establish an IPv6 presence for critical business services such as HTTP, DNS, and SSL. Such an approach does not require major updates to internal infrastructure—it uses the IPv6 Server Load Balancing (SLB) gateway to host virtual service in IPv6 format and has back-end servers in IPv4 format.

Brocade ADX Hardware Capabilities

Q What are the architectural benefits of the Brocade ADX Series?

A Brocade ADX application delivery controllers are purpose-built for high-speed application delivery. The Brocade ADX architecture:

- Offers complete physical and logical separation between data and management planes
- Leverages multi-chip, multi-core design for extremely high performance
- Provides distributed hardware architecture for scalability
- Enables specialized intelligence inside-interface modules for efficient distribution of traffic among application CPUs
- Capitalizes on a high-speed switching fabric for interconnection among system modules and for line-rate processing of pass-through traffic
- Includes hardware-based implementation of several system functions for optimization and attack prevention
- Delivers flexible port density—1 GbE copper, 1 GbE fiber (SFP), 10 GbE fiber (SFP+/XFP)
- Targets modular design for investment protection

Q What platform types are available on the Brocade ADX 1000 Series?

A Two distinct platform types are available for this compact 1U series—the Brocade ADX 1000 and the Brocade ADX 1000F. These platforms share a common hardware architecture, performance capacity, software license, and upgrade path. The two platforms differ in their number and type of Gigabit Ethernet ports.

Q What is the difference between Gigabit Ethernet ports in the Brocade ADX 1000 and Brocade ADX 1000F platforms?

A The Brocade ADX 1000 platform has up to 16 1 GbE copper ports and two 10 GbE fiber XFP ports. The Brocade ADX 1000F platform has eight 1 GbE copper ports, up to 16 1 GbE fiber SFP ports, and two 10 GbE fiber SFP+ ports.

Q What is the minimum software requirement for the Brocade ADX 1000 and Brocade ADX 1000F platforms?

A The Brocade ADX 1000 platform requires a minimum of Brocade ADX v12.0 software (while the Brocade ADX 1008-1 model requires a minimum of Brocade ADX v12.2 software).

The ADX 1000F platform requires a minimum of Brocade ADX v12.3.3 software.

Q What models are available on the Brocade ADX 1000 platform?

A The Brocade ADX 1000 platform is available in the following configurations:

- **Brocade ADX 1008-1:** Eight 1 GbE copper ports with a single application core
- **Brocade ADX 1016-2:** Sixteen 1 GbE copper ports with two application cores
- **Brocade ADX 1016-4:** Sixteen 1 GbE copper ports with four application cores
- **Brocade ADX 1216-4:** Sixteen 1 GbE copper ports and two 10 GbE fiber ports (XFP) with four application cores

Q What models are available on the Brocade ADX 1000F platform?

A The Brocade ADX 1000F platform is available in the following configurations:

- **Brocade ADX 1008F-1:** Eight 1 GbE copper ports and eight 1 GbE fiber ports (SFP) with a single application core
- **Brocade ADX 1016F-2:** Eight 1 GbE copper ports and 16 1 GbE fiber ports (SFP) with two application cores
- **Brocade ADX 1016F-4:** Eight 1 GbE copper ports and 16 1 GbE fiber ports (SFP) with four application cores
- **Brocade ADX 1216F-4:** Eight 1 GbE copper ports, 16 1 GbE fiber ports (SFP), and two 10 GbE fiber ports (SFP+) with four application cores

Q What is "capacity-on-demand?"

A Capacity-on-demand is an ability to upgrade Brocade ADX units in the field for performance, ports, and features using simple software license keys. Capacity-on-demand eliminates the requirement for hardware replacement, supporting a "pay-as-you-grow" deployment strategy. Organizations can unlock additional interface density and advanced software capabilities with license upgrades.

Q How does "capacity-on-demand" work for the Brocade ADX 1000 Series?

A The capacity-on-demand functionality available for the Brocade ADX 1000 Series allows organizations to grow from the entry-level Brocade ADX 1008-1/1008-1F through the high-end Brocade ADX 1216-4/1216-4F via software license keys, without requiring hardware replacement. Organizations can double or quadruple system performance, add 1 GbE and 10 GbE ports, and add software features as simple upgrades.

The same software license part numbers are used for both the Brocade ADX 1000 and Brocade ADX 1000F platforms.

Q How are the 1 GbE copper and fiber ports licensed for the Brocade ADX 1000F platform?

A The eight 1 GbE copper ports in the Brocade ADX 1000F platform are always enabled on all models, and do not require a software license. The Brocade ADX 1008F-1 has eight 1 GbE fiber SFP ports, and all other models of the Brocade ADX 1000F platform have 16 1 GbE fiber SFP ports. (*Note: SFP optic modules are not included.)*

Q What is the performance difference between the Brocade ADX 1000 and Brocade ADX 1000F platforms?

A There is no performance difference. Both platforms have capacity-on-demand functionality to grow from an entry-level model (Brocade ADX 1008-1/1008F-1) to the high-end model (Brocade ADX 1216-4/1216F-4) through software license keys, without requiring hardware replacement. Organizations can double or quadruple system performance, add 1 GbE and 10 GbE ports, and add software features as simple upgrades.

Q Is there a difference between the Brocade ADX 1000 and Brocade ADX 1000F 10 GbE fiber optic transceiver modules?

A For 10 GbE ports, the Brocade ADX 1000F uses SFP+ transceivers, while the Brocade ADX 1000 uses XFP transceivers.

Q Will the Brocade ADX 1008F-1 model support the GSLB feature?

A Similar to the Brocade ADX 1008-1, the Brocade ADX 1008F-1 does not support the Global Server Load Balancing (GSLB) feature (while the rest of the Brocade ADX 1000F models will support GSLB).

Q Is there a factory bundle (SKU) for both the SSL and Premium software licenses with the Brocade ADX 1000F platform?

A No. Organizations need to first order any of the available base hardware SKUs, and then add the software license SKUs for SSL and Premium software (PREM).

Q Do any of the Brocade ADX 1000F hardware platforms have a built-in SSL hardware chip?

A Yes. They are equipped to be field upgradable for future SSL acceleration function.

Q What specific modules are available for use with Brocade ADX chassis models?

A The following modules are available with chassis-based Brocade ADX 4000 and Brocade ADX 10000 systems:

- **Management module:** Handles all control functions, such as telnet, Secure Shell (SSH), routing, and more. It includes one dual-core management processor, one console port, one management port, one USB port, internal USB flash, and an optional mezzanine daughter card. A Brocade ADX 4000 chassis houses one management module, whereas a Brocade ADX 10000 chassis can house up to two management modules.
- **Application Switch Module:** Handles processing of application traffic. Each Application Switch Module (ASM8) is equipped with eight application CPUs (four dual-core processors). The Brocade ADX 4000 chassis can house up to two ASM8 modules, and the Brocade ADX 10000 chassis can house up to four ASM8 modules.
- **Switch fabric module:** Offers connectivity and raw switching among system modules. Each switch fabric module provides switch capacity of 160 Gbps, delivering a total of 320 Gbps raw switching in a Brocade ADX 10000 system. The Brocade ADX 10000 requires two switch fabric modules.

- **Interface modules:** Three different types of line cards are available:
  - 12-port 1 GbE copper module (RJ45)
  - 12-port 1 GbE fiber module (SFP)
  - 4-port 10 GbE fiber module (XFP)
- **SSL expansion module:** Provides hardware-based SSL offload to decrypt and then re-encrypt SSL traffic, supported by 1024- and 2048-bit keys and a variety of cipher suites. The SSL expansion module fits as a daughter card on the management module. A Brocade ADX 10000 chassis that houses up to two management modules can carry two SSL daughter cards—and both of these SSL modules can remain active and process traffic simultaneously.

Q Can these modules be used on both the Brocade ADX 4000 and Brocade ADX 10000 chassis?

A Yes. All system modules are interchangeable between the Brocade ADX 4000 and Brocade ADX 10000 chassis.

Q Do these platforms support the same software features?

A Yes. All Brocade ADX platforms run the same software and support the same set of features with just one exception—the Brocade ADX 1008 does not support Global Server Load Balancing (GSLB).

Q What are the available fiber optic and copper transceiver configurations (SKUs) for the Brocade ADX 1000, 4000, and 10000 Series?

A The following 1 GbE fiber optic and copper transceivers are available for the Brocade ADX 1000, 4000, and 10000 Series:

- **E1MG-SX-OM:** 1000BASE-SX SFP optic, LC connector, MMF, 550 m (SI-12GF line-card modules only)
- **E1MG-SX-OM-8:** 1000BASE-SX SFP optic 8-pack, LC connector, MMF, 550 m (SI-12GF line-card modules only)
- **E1MG-LX-OM:** 1000BASE-LX SFP optic, LC connector, SMF, 5 km (SI-12GF line-card modules only)
- **E1MG-LX-OM-8:** 1000BASE-LX SFP optic 8-pack, LC connector, SMF, 5 km (SI-12GF line-card modules only)
- **E1MG-TX:** 1000BASE-TX Mini-GBIC copper, RJ-45 connector, 100 m (SI-12GF line-card modules only)

The following 10 GbE XFP optic modules are available for the Brocade ADX 1000, 4000, and 10000 Series:

- **10G-XFP-SR:** 850 nm serial XFP optic, LC connector, MMF, 300 m
- **10G-XFP-SR-4:** 850 nm serial XFP optic 4-pack, LC connector, MMF, 300 m
- **10G-XFP-LR:** 1310 nm serial XFP optic, LC connector, SMF, 10 km
- **10G-XFP-LR-4:** 1310 nm serial XFP optic 4-pack, LC connector, SMF, 10 km

The following 10 GbE SFP+ optic modules are available for the Brocade ADX 1000F platform:

- **10G-SFPP-SR:** 10GBASE-SR, SFP+ optic, LC connector, MMF, 300 m
- **10G-SFPP-LR:** 10GBASE-LR, SFP+ optic, LC connector, SMF, 10 km
- **10G-SFPP-LRM**: 10GBASE-LRM, 1310 nm SFP+ optic, LC connector, TAR

Q Can I upgrade my Brocade ADX 1000 unit for SSL acceleration function?

A Yes. The Brocade ADX 1000 units shipped after February 1, 2010, have built-in SSL hardware. This SSL hardware, however, is not activated at the factory unless the SSL offload function is purchased. These Brocade ADX 1000 units can be quickly upgraded in the field for SSL using a software license key.

Q What about enabling SSL on a Brocade ADX chassis? Does it require buying a separate SSL license?

A There is no need to purchase a separate SSL license for chassis systems. The Brocade ADX 4000 and Brocade ADX 10000 chassis systems can be upgraded for SSL function by purchasing an SSL expansion module. This module is then installed in the mezzanine area of the management module.

Q Is the Brocade ADX Series compliant with the Network Equipment Building System (NEBS)?

A Yes. The NEBS-compliant kit for Brocade ADX 1000 systems is available for purchase.

Q What is an ASM4-based Brocade ADX bundle?

A An ASM4-based Brocade ADX 4000 bundle comprises the following components:

- One Brocade ADX 4000 chassis
- One management module
- One ASM4 module (a regular ASM8 module that is restricted to only four application CPUs through software)
- One switch fabric module
- One 12-port 1 GbE fiber interface module
- Eight copper SFP connectors
- Two AC power supplies
- Premium software license (includes Layer 3 routing, IPv6, and GSLB)

Q Can I upgrade my ASM4-based Brocade ADX system?

A Yes. An ASM4-based Brocade ADX system can be activated for four additional application CPUs on the application switching module, making it an eight-application CPU system.

Q Can I buy two ASM4 bundles for my Brocade ADX system?

A No. Organizations must upgrade ASM4 to ASM8 and then buy a second ASM8 system for performance expansion.

Q Can I buy a Brocade ADX 10000 system with the ASM4 module?

A No. An ASM4 bundle is available only with a Brocade ADX 4000 system. There is no equivalent ASM4 bundle for Brocade ADX 10000 systems. An ASM4 module is not available for purchase separately—it is sold as part of the bundle only.

Q Can you describe the ASM8 Brocade ADX bundle?

A An ASM8 Brocade ADX 4000 bundle comprises the following components:

- One Brocade ADX 4000 chassis
- One management module
- One ASM8 module
- One switch fabric module
- Two AC power supplies
- Premium software license (includes Layer 3 routing, IPv6, and GLSB)

Note: The ASM8 bundle does not include a line card or copper SFPs. These must be purchased separately.

Brocade ADX Management

Q What management capabilities does the Brocade ADX Series support?

A The Brocade ADX Series supports a range of flexible control interfaces to simplify installation, configuration, operation, and management of application delivery infrastructures:

- **Command Line Interface:** The Brocade ADX Series supports an industry-standard Command Line Interface (CLI) for device configuration.
- **Programmatic interface:** A standards-based SOAP/XML-application programmatic interface allows for tighter integration with third-party orchestration and automation tools. This interface provides greater application visibility and control over the application infrastructure.
- **Web Graphical User Interface:** Application and network administrators can also use a browser-based Graphical User Interface (GUI) for configuring and monitoring the Brocade ADX switches.
- **SNMP support:** The Brocade ADX controllers support Simple Network Management Protocol (SNMP) v1, v2, and v3, enabling device monitoring through third-party network management applications.
- **Role-based management:** This capability allows organizations to create multiple administrative domains and assign different access privileges to users inside these domains.
- **Brocade Network Advisor:** Large numbers of Brocade ADX switches can be managed from one central console using Brocade Network Advisor. Brocade Network Advisor provides additional simplification tools for SSL key and certificate management and management of application services, such as Virtual IP Manager and GSLB.

Q Can the management port on the Brocade ADX Series be used for handling data traffic?

A The Brocade ADX Series supports a dedicated management port for out-of-band management functions, such as telnet, SSH v2, SNMP, HTTP, and HTTPS. The management port is used only for management functions and cannot be used for processing data traffic.

Q What support options and services are available for Brocade ADX switches?

A Brocade Global Services delivers world-class professional services and technical support to enable the transition to virtualized data centers and cloud-optimized architectures. Brocade Professional Services offers assessment, design, and implementation services to help organizations optimize application delivery in cloud-optimized data centers. Brocade Premier Support and onsite residencies help organizations maximize the availability of mission-critical applications through personalized, preferential, and proactive technical support.

Application Delivery Infrastructure Community

Q What is the Brocade ADX Application Delivery Infrastructure user community?

A Brocade ADX users can find numerous support resources through the Brocade Application Delivery Infrastructure (ADI) community. This group focuses on Brocade ADX products and related partner technologies, and provides a Web 2.0 social networking resource for application and networking professionals seeking discussions, solutions, information, education, and implementation guidance. Learn more at http://community.brocade.com/adi.

Learn More

Q How do I find out more about Brocade ADX switches?

A Contact your Brocade Sales Representative or Partner for details, or visit www.brocade.com/adx.

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