
- The value of B2B Appliances
- The benefits of IBM WebSphere DataPower B2B Appliance XB60
- Customer deployment scenarios
Executive overview

As organizations move to on demand businesses by implementing a service-oriented architecture (SOA), the largest barriers continue to be implementation complexity, cost-prohibitive scalability, and data security. To recognize improved time to value companies are looking for opportunities to consolidate functions into single-purpose built solutions that provide exceptional performance, easy deployment, ease of use, and a low total cost of ownership.

In this IBM® Redguide™ publication we discuss how the IBM WebSphere® DataPower® B2B Appliance redefines the boundaries of middleware by extending the IBM SOA Foundation with a specialized, consumable, dedicated SOA appliance that combines business-to-business (B2B) standards, simplified integration, superior performance, and hardened security for SOA implementations. Meticulously designed to augment all phases of the SOA life cycle and implementation, these highly specialized devices combine a host of essential SOA functions in a specialized appliance for easy consumption, deployment, and service delivery.

Why an appliance for B2B

Business processes extend across the supply chain and value chains on a global basis and companies depend upon trading partners to run their businesses smoothly. Processes and rules change constantly and you must quickly disseminate these changes to your trading partners. To keep pace, it is crucial that you strengthen your trading-partner relationships through tighter automated integration, so that you can make your trading partners an extension of your enterprise.

The global economy, large outsourcing initiatives, and the virtual supply chain have blurred the boundaries of the enterprise and of the distinction between public and private processes. As a result, internal application-to-application (A2A) and external B2B technologies are converging. Many enterprises are seeking a single business integration platform to meet all of their internal and external messaging needs to reduce duplication of effort and increase the speed of externalizing internal processes. The appliance model enables strong B2B business value by accelerating the pace of innovative value-creating processes and strategic initiatives, allowing customers to utilize B2B services to quickly and securely connect to their external partners and integrating the partner connections to your application integration flows, all in a purpose-built hardware solution.
To take advantage of the improved business processes, flexibility, and IT efficiency that come with moving to B2B appliances, organizations require pervasive, scalable services and controls, robust security, and high service assurances in their infrastructures. Today, enterprises often find themselves struggling to deliver these critical requirements without being hindered by prohibitive cost, complexity, and infrastructures that are difficult to manage. Addressing these challenges requires a pragmatic approach—one that simultaneously recognizes the evolution of standards, the value of existing infrastructure investments, your organizational challenges, and how performance can be affected across applications.

SOA appliances simplify SOA deployment
By integrating core functions required for adopting B2B, SOA, or Web services into a single, purpose-built device with enterprise service bus (ESB) capability, WebSphere DataPower B2B Appliance XB60 simplifies an overall B2B/SOA infrastructure. It is designed to deploy easily into an existing environment as an inline network device. You gain business value without having to change your network or application software. As a result, proprietary schemas, coding, and application programming interfaces (APIs) are not required to install or manage the device.

Drop-in integration for heterogeneous environments
As a core offering in the IBM B2B and ESB product portfolio, WebSphere DataPower B2B Appliance XB60 is a purpose-built hardware B2B-enabled ESB for simplified deployment and hardened security with the ability to quickly transform data between a wide variety of formats, including Extensible Markup Language (XML), industry standard formats, and custom formats. The device provides core B2B functions, including:

- AS2 and AS3 messaging
- Partner profile administration
- Routing of electronic data interchange (EDI), XML, and binary payloads
- Auto archiving and purging of B2B transactions
- B2B transaction viewing capabilities

The ESB functions include routing, bridging, transformation, and event handling. It provides a reliable, performance-oriented solution to many integration challenges. Because it is not limited to handling just XML, WebSphere DataPower B2B Appliance XB60 resonates with IT organizations that must benefit from the connectivity of SOA deployments but must also deal with managing a combination of multiple proprietary, industry, company-specific, and existing data formats. The device is a true drop-in B2B integration point for such environments, reducing the time and cost of integrations and speeding the time to market for services.

Innovative enablement of existing infrastructure for XML and Web services
For accelerated, security-rich integration capabilities, WebSphere DataPower B2B Appliance XB60 provides transport mediation, routing, and transformations among binary, text, and XML message formats. Visual tools can be used to describe data formats, create mappings between different formats, and define message flows. With native connectivity to IBM DB2® and IBM System z® technology, the device offers an innovative solution for security-rich XML enablement of existing systems and mainframe connectivity.

Policy-driven approach to Web services management and SOA governance
By centralizing management tasks and policy enforcement for Web services, and decoupling them from applications, your SOA infrastructure increases in flexibility and scalability while simultaneously offering you improved insight, visibility, and control. By moving certain
functions onto WebSphere DataPower B2B Appliance XB60 (such as protocol bridging, AS2/AS3 message processing, profile management, Web services management, security processing, and policy enforcement), IT architects and operations, security, and business personnel can decouple these functions from core business applications. This helps to simplify development, deployment, and manageability. (See Figure 1 on page 4).

Integration with registry and repository, security, identity, and service management software

WebSphere DataPower B2B Appliance XB60 integrates with a variety of registry and repository, security, identity, and service management software. (See Figure 2 on page 8.) Coupled with access-control software, such as IBM Tivoli® Access Manager, the device enforces fine-grained access controls. Working with IBM Tivoli Federated Identity Manager, the device provides federated identity and policy management for Web services between organizations and enterprises. Using a registry and repository, such as IBM WebSphere Services Registry and Repository, your organization can discover and reuse services and configure new services for policy and security enforcement performed by WebSphere DataPower B2B Appliance XB60. The combination of these applications and the robust XB60 security features provides the comprehensive capabilities for B2B/SOA security and Web services management that enterprises increasingly require.

Support for advanced Web services standards and interoperability

IBM recognizes that SOA must address the need to integrate heterogeneous environments both within and outside the enterprise. The WebSphere DataPower SOA appliance portfolio has a long-standing history of support for key and advanced standards, including WS-Security, WS-Policy, WS-ReliableMessaging, SOAP, Web Services Distributed Management (WSDM), WS-I Profiles, WS-Addressing, eXtensible Access Control Markup Language (XACML), Security Assertion Markup Language (SAML), Secure Socket Layer (SSL), and proprietary Single Sign-on (SSO) tokens. In addition, WebSphere DataPower SOA appliances support interoperability with Universal Description, Discovery, and Integration (UDDI) registries, and databases such as Oracle® and Sybase.

Integration across the IBM SOA Foundation for Smart SOA deployments

WebSphere DataPower B2B Appliance XB60 has broad and deep integration across the IBM SOA Foundation. As a result, it contributes to what IBM calls the Smart SOA approach, a set of guiding principles that benefit both business and IT, eliminating unnecessary complexity while building a strong foundation for future growth. Integration of WebSphere DataPower B2B Appliance XB60 with popular integrated development environments, such as the IBM Rational® portfolio, reduces the time that you must spend in development and debugging. In addition to interoperability, the device also features deep integration with such products as IBM WebSphere MQ, IBM WebSphere Enterprise Service Bus, IBM WebSphere Message Broker, and IBM DB2 to help process SOA transactions in a faster, more secure, simplified way. Additionally, the XB60 enables you to take advantage of IBM self-management capabilities for autonomic computing, creating infrastructures that require minimal intervention, which can help lower cost of ownership and improve service availability.
IBM WebSphere DataPower B2B Appliance XB60

IBM WebSphere DataPower B2B Appliance XB60 simplifies, helps secure, and accelerates your B2B trading partner connectivity. The XB60 is a purpose-built B2B Gateway for simplified deployment and hardened security. This 1U (1.75" thick) rack-mountable network device is powered by a unique technology to help your business:

- Easily manage and connect to trading partners using industry standards.
- Extend integration beyond the enterprise with a securely deployed B2B Gateway in the demilitarized zone (DMZ).
- Improve the performance and scalability of B2B interfaces.
- Govern B2B integration points through consolidated trading partner management.

See Figure 1. Refer to “Technical detail” on page 5 for more product highlights.

![DataPower B2B XB60 Diagram](image-url)
Features and benefits

IBM WebSphere DataPower B2B Appliance XB60 is a unique IBM B2B appliance, delivering secure trading partner data integration tracking, routing, and security functions in a network device, cutting operational costs and improving performance. The XB60 is a nondisruptive technology that allows organizations to extend their existing B2B implementations and internal integration infrastructure, thus delivering rapid return on investment and reduced total cost of ownership. The benefits are:

► Trading partner management for B2B governance:
  – B2B protocol policy enforcement
  – Access control
  – Message filtering
  – Data security


► Full featured user interface for B2B configuration and transaction viewing. Correlate documents and acknowledgments displaying all associated events.

► Simplified deployment, configuration, and management, providing a quicker time to value by establishing rapid connectivity to trading partners.

► Full hardware ESB capability, including:
  – Acceleration of existing integration hubs
  – Mainframe modernization and Web services
  – Any-to-any transformation
  – Integrated message level security
  – Sophisticated multi-step message routing, filtering, and processing
  – Multiple synchronous and asynchronous transport protocols
  – Configurable quality of service
  – Detailed logging and audit trail
  – Standards-based interfaces
  – Agile, highly flexible underlying scripting/configuration support
  – XML enablement and wirespeed application integration
  – Metadata-based integration

Technical detail

IBM WebSphere DataPower B2B Appliance XB60 extends your ESB beyond the enterprise by supporting the following B2B functionality:

► B2B Gateway service
  – AS2 and AS3 packaging/unpackaging
  – Non-repudiation of origin and receipt
  – Message Disposition Notifications (MDNs)
  – EDI, XML, and binary payload routing
  – Front-side protocol handlers
  – Trading partner profile management
  – Multiple destinations (back-side protocol handlers)
  – Certificate management (security)
  – Hard drive archive/purge policy
> B2B transaction viewer
  > Transaction viewing
  > Transaction resend capabilities
  > Acknowledgement correlation
  > Transaction event correlation
  > Role-based access

> Persistent storage
  > Encrypted with a box-specific key
  > B2B document storage

> Persistent transaction store
  > B2B metadata storage
  > B2B state management

Customer deployment scenarios

In this section we outline two common B2B scenarios and how the XB60 can be used to
address them. For demonstration purposes we use additional IBM SOA products to round out
the scenarios where appropriate.

AS2 with XML transformation use case

This section provides an example of how to use the XB60 as a B2B integration gateway that
uses the application integration functions of the box to validate and transform XML to SAP®’s
IDOC format that can then be consumed by SAP.

Scenario description
In this scenario the manufacturer wishes to receive their purchase orders from their
customers securely over the Internet and automate the routing of the files into their SAP
accounting system where the accounting clerk can check that the order was delivered and
then issue an invoice that can be sent out to the partner. The first trading partner that they
want to connect to uses the XML standard for their purchase orders and has the ability to
provide data security using the AS2 B2B messaging standard. The manufacturer has the
following requirements:

> They must have the ability to verify partner information in the DMZ.
> They require support for receiving AS2 B2B messages.
> All AS2 data must be signed and encrypted.
> AS2 MDNs must be received asynchronously and must be signed.
> They must be able to transform XML documents to and from IDoc format.
> They require the ability to validate XML documents against their supported schema.
> Any payload data stored on the appliance must be encrypted.
> They require the ability to allow partners to view the status of their own transactions in the
  manufacturer’s gateway but have no access to other partners’ transactions.

Solution
This section provides information about how the XB60 can be used to meet the
manufacturer’s B2B requirements.
The XB60 is suitable for DMZ deployments. The customer can deploy it at the edge of the network where it can provide B2B Governance through profile management and industry standards B2B messaging data security. Utilizing the trading partner information that is stored on the appliance, customers can verify partner credentials and trading partner agreement attributes before the inbound data reaches the trusted network. After terminating the partner in the DMZ the payload can either be routed as is to a system in the trusted network or optionally it can be validated against a schema (XML), transformed into any format, and routed into the trusted network. If so desired, the data can be parsed and routed dynamically based on content.

The XB60 supports AS2 and AS3 B2B messaging standards and protects the data utilizing S/MIME security for signing and encryption as defined by the applicability statement (AS) specifications. The system provides full support for both async and sync requests, as well as MDN redirection and automatic document retry if MDNs are not received in a timely fashion.

By using the ESB functions built into the XB60 we can route data from the B2B Gateway service into a Multi-Protocol Gateway where we can apply a multi-step process to the data flow and can perform many actions on the payload. Payload actions include but are not limited to parsing, validation, transformation, and content-based routing.

All payload data stored directly on the XB60 is stored on a RAID1-mirrored pair of drives and is encrypted with a secret key that is unique to the specific appliance. This ensures that outside access to the data is not possible and even if someone physically removes the drives, the unique encryption prevents the drives from being placed in a different appliance for seeing the data. Optionally, the customer can store payload B2B data off box on a Network File System (NFS) mount point or on an attached Small Computer System Interface (iSCSI) device. When using external drives the customer is responsible for protecting the data that is stored there.

The final requirement can be met by using the XB60’s role-based management mechanism to restrict user account access in the B2B viewer to only allow the user to see transaction forms associated with specific partner profiles. You can further restrict the user to see only specific columns in the viewer as well.
Figure 2 depicts the flow of the inbound and outbound transactions followed by a detailed explanation of each step of the flow.

The purchase order (inbound flow) process is:
1. An AS2 message carrying an XML purchase order payload is sent by the buyer to the supplier’s B2B hub.
2. The AS2 message is received at the supplier’s B2B Gateway service at the AS2 front-side handler, the partner information is validated, and security processing takes place. The XML payload is passed to a multiprotocol gateway service where it is validated against the XML schema and then transformed to an SAP IDoc file.
3. The IDoc file is sent to SAP utilizing one of the many back-side handlers available in the supplier partner profile destination configuration.
4. The B2B Gateway service creates a MDN based on the results of the message processing status. If successful it creates a positive MDN response. If there is a processing error it creates a negative MDN response.
5. The B2B Gateway service sends the MDN to the buyer as confirmation that the file was processed.
6. The buyer receives the MDN and marks the transaction as complete.

The invoice (outbound flow) process is:
1. An IDoc file is sent from the supplier’s SAP to one of the many available front-side protocol handlers available in the XB60’s multiprotocol gateway service.
2. The IDoc is transformed to the XML invoice format used by the buyer. The XML is validated against its schema and is routed to the B2B Gateway service. The B2B Gateway
service parses the XML and finds the sender and receiver information using XPath. The outbound XML invoice is packaged with AS2 based on the buyer's partner profile information using the AS attributes defined in the profile destination.

3. The buyer receives the XML invoice and processes the file.

4. The buyer creates a MDN based on the results of the message processing status. If successful it creates a positive MDN response. If there is a processing error it creates a negative MDN response.

5. The buyer sends the MDN to the supplier as confirmation that the file was processed.

6. The supplier receives the MDN at the B2B Gateway service on the AS2 front-side handler, the partner information is validated, and security processing takes place. The MDN is correlated to the original outbound message to allow the user to look in the B2B transaction viewer and see at a glance the status of the transaction and the returned MDN.

**HIPAA integration over AS2 use case**

In this section we provide a scenario that shows Health Insurance Portability and Accountability Act (HIPAA) integration over AS2.

**Scenario description**

In this scenario an insurance provider wishes to send a health care eligibility request in EDI format (EDIX12-270) to a health care payer securely over the Internet. The provider has the following requirements:

- The B2B document format to be used must be HIPAA EDI X12 Version 5010.
- All X12 data must be validated by the payer and a functional acknowledgement must be returned with the validation status.
- Data sent over the Internet must be signed and encrypted.
- Data sent over the Internet must have a mechanism of verifying delivery of the message before closing the connection (sync acknowledgement).
- Data sent over the Internet must use connection security (Secure Sockets Layer, or SSL).
- They must have the ability to view the status of transactions in the gateway.
- They must have the ability to resend failed transactions from the gateway.

**Solution**

This section provides information about how the XB60 can be used to meet the insurance provider's B2B requirements.

The XB60 provides the ability to route HIPAA EDI data but not fully process and transform that data. However, in order to process the many versions of HIPAA that are available today, IBM has a SOA product called WebSphere Transformation Extender (WTX) that utilizes a component called Launcher to process (validate, transform, and create function acknowledgements) HIPAA data. Additionally, IBM offers an optional HIPAA Industry Pack that provides customers with pre-built WTX type trees and sample maps for all HIPAA transaction sets. The XB60 can sit in the DMZ to provide a B2B messaging front-end to the HIPAA processing application that is sitting in the trusted network. The customer can then take advantage of having their B2B governance at the edge of the network where it belongs.

Much like the first scenario, the data security and MDN requirements can be met using either AS2 or AS3 B2B messaging standards. For the purposes of this scenario we use AS2 over
SSL as the protocol of choice to provide the connection needed as part of the customer requirements.

The XB60’s B2B transaction viewer provides the customer with the ability to see the status of their transactions and MDNs. If any transactions fail to be sent outbound to the trading partner they show up as failed in the viewer. The user can select the failed transactions and manually resend them to the trading partner.
Figure 3 depicts the HIPAA health care eligibility inquiry and response flow followed by a detailed explanation of each step of the flow.

Figure 3  AS2 EDI X12 - 270/271 flow: HIPAA health care eligibility inquiry and response
The eligibility request (270) process flow is:

1. An AS2 message carrying an X12 (270) payload is sent by the provider to the payer's B2B Gateway (XB60).

2. The AS2 message is received at the payer's B2B Gateway service at the AS2 front-side handler, the partner information is validated, and security processing takes place. The X12 payload is passed to WTX over one of the many back-side protocols allowed in the payer's profile destination. The preferred method to integrate between XB60 and WTX is over WebSphere MQ (not displayed in the flow).

3. The XB60 creates a MDN based on the results of the message processing status. If successful it creates a positive MDN response. If there is a processing error it creates a negative MDN response. The WTX application processes the 270 and transforms it into a format that the health care application can process and then sends it to the health care application.

4. The XB60 sends the MDN to the provider as confirmation that the AS2 message was processed. The payer's health care application receives the transformed eligibility request.

5. The provider receives the MDN for the AS2/270 message at their B2B Gateway and marks the message as complete.

The functional acknowledgement for the 270 (999) process is:

4. The payer's WTX application validates the 270 payload and creates a functional acknowledgement (999).

5. The WTX application sends the functional acknowledgement (999) to the XB60 for routing to the provider.

6. The XB60 packages the functional acknowledgement (999) in AS2 and sends it to the provider's B2B Gateway.

7. The provider's B2B Gateway receives the AS2 message carrying the functional acknowledgement (999) from the XB60 and processes the message.

8. The provider's B2B Gateway creates a MDN based on the results of the message processing status. If successful it creates a positive MDN response. If there is a processing error it creates a negative MDN response. The provider's B2B Gateway sends the MDN to the payer as confirmation that the AS2/999 message was processed.

9. The XB60 receives the MDN for the AS2/999, correlates it to the original message, and marks the transaction as complete.

The eligibility response (271) process is:

5. The payer's health care system responds with an eligibility response (271).

6. The WTX application transforms the custom response to an EDI X12 271, builds the EDI X12 envelope around the file, and sends the 271 to the XB60 for routing to the trading partner.

7. The XB60 packages the 271 in AS2 and sends it to the provider's B2B Gateway.

8. The provider's B2B Gateway receives the AS2 message carrying the eligibility response (271) from the XB60 and processes the message.
9. The provider’s B2B Gateway creates a MDN based on the results of the message processing status. If successful it creates a positive MDN response. If there is a processing error it creates a negative MDN response. The provider’s B2B Gateway sends the MDN to the payer as confirmation that the AS2/271 message was processed.

10. The XB60 receives the MDN for the AS2/271 message, correlates it to the original message, and marks the transaction as complete.

The functional acknowledgement for the 271 (999) process is:

9. An AS2 message carrying an X12 (999) payload is sent by the provider to the payer’s B2B Gateway (XB60).

10. The AS2 message is received at the payer’s B2B Gateway service at the AS2 front-side handler, the partner information is validated, and security processing takes place. The X12 payload is passed to WTX over one of the many back-side protocols allowed in the payer’s profile destination. The preferred method to integrate between XB60 and WTX is over WebSphere MQ (not displayed in the flow).

11. The WTX application receives the functional acknowledgement for the 271 (999), correlates it to the originating document, and marks the document flow as complete. The XB60 creates a MDN based on the results of the message processing status. If successful it creates a positive MDN response. If there is a processing error it creates a negative MDN response.

12. The XB60 sends the MDN to the provider as confirmation that the AS2/999 message was processed.

13. The provider receives the MDN for the AS2/999 file at their B2B Gateway and marks the message as complete.

Summary

As a core part of the IBM SOA Foundation, the WebSphere DataPower B2B appliance offers easy configuration and operation to reduce operational complexity and to decrease the time required to connect to your trading partners. With the WebSphere DataPower B2B appliance, IBM can help you simplify, accelerate, and secure your B2B deployments to increase your flexibility and the ability to extend your business processes beyond the enterprise.

The team that wrote this Redguide publication

This Redguide publication was produced by a specialist from IBM.

Richard Kinard is a WebSphere DataPower Product Line Manager and a B2B Subject Matter Expert for IBM Software Group.

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Matt McLarty, IBM Sales and Distribution, Software Sales, Worldwide Technical Sales Manager - WebSphere Connectivity and Datapower
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