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Integrate banking services with IBM WebSphere DataPower Integration Appliance XI50 for zEnterprise

Synopsis

The IBM WebSphere® DataPower® Integration Appliance XI50 for IBM zEnterprise™ (DataPower XI50z) accelerates integration by providing ESB capabilities like connectivity, data transformation, protocol bridging and security. This article examines how these capabilities can be used by banks to simplify integration of banking services, lower costs and speed up time to market[1].

Introduction

Many banks have embarked on a core banking transformation strategy to gain flexibility and reduce cost. A service-oriented architecture (SOA) is normally the preferred architecture because it facilitates maximum reuse of existing assets. Service integration can be based on point-to-point connections, or it can provide the capability to mediate, transform, route, and transport service requests from the service requester to the correct service provider. An Enterprise Service Bus (ESB) allows a decoupling of the service requester from the service provider. This decoupling of service endpoints can greatly increase the flexibility of an SOA solution, for example, an application that is connected to other applications through an ESB can be upgraded, changed, moved, or replaced without necessarily requiring the connected applications themselves to be changed.

A banking example

Let's take the example of a bank that wants to extend some of its CICS® core banking services such as account transfers and posting inquiries to internal distributed systems and selected business partners. Web services can be used to enable integration based on a common set of standards covering message format, protocol and security. An ESB pattern provides the greatest flexibility, providing the ideal location for functions such as data transformation, protocol switching and enforcement of security policy. WebSphere DataPower provides these ESB capabilities with an ease of use and performance that is unmatched by other ESB solutions.

For our example, there are two basic ways of using DataPower with CICS (see Figure 1).

[1] This paper looks specifically at the value of the DataPower XI50z for banks, but the technical scenarios apply also to other industries.

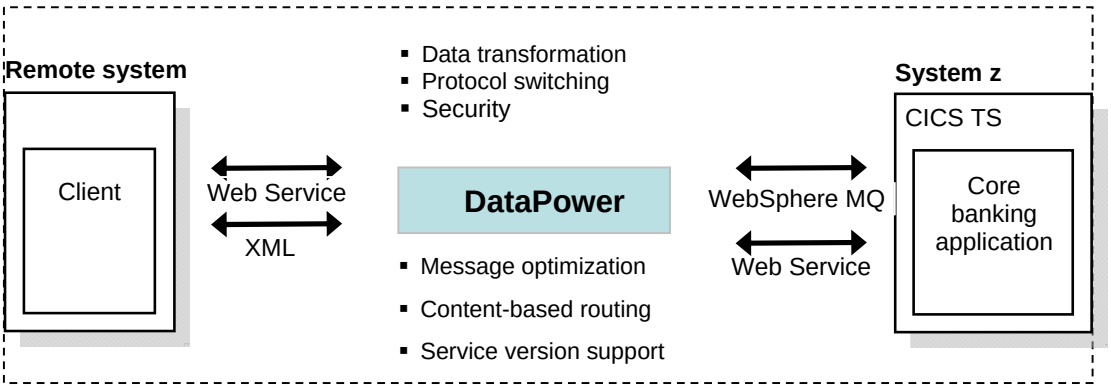

Figure 1:

- In the first scenario, DataPower provides Web service enablement of the CICS application by transforming the client's request message from XML format to the CICS binary COMMAREA format and transporting the COMMAREA to CICS using WebSphere MQ.
- In the second scenario, CICS provides a Web service interface but DataPower performs mediation services on the XML message before forwarding it to CICS. This can include security processing such as XML signature validation, XML to XML data transformation or message optimization in order to reduce the length and complexity of messages.

Whichever technique is used, the use of DataPower as an ESB simplifies the integration of the banking services and speeds the deployment of new products and offerings. Optionally WebSphere Transformation Extender can be used to provide a quick way to develop the data transformation mapping that is deployed to DataPower. And additional ESB functions such as content-based routing and service versioning support can also be implemented by DataPower.

Similar scenarios are available when using DataPower to enable service integration with IMS™, DB2® or other IBM System z® applications.

Fit for Purpose

What makes the DataPower XI50z different is the physical integration with System z and the additional qualities of service that this brings. A DataPower blade is installed as an optimizer within the IBM zEnterprise BladeCenter® Extension (zBX). This deployment therefore benefits from the private and secure 10 Gbps intraensemble[2] data network (IEDN) that connects the zBX to the z/OS® LPARs that run the core banking systems (see Figure 2).

[2] An *ensemble* is a collection of up to eight nodes, each composed of a z196 and optionally a zBX.

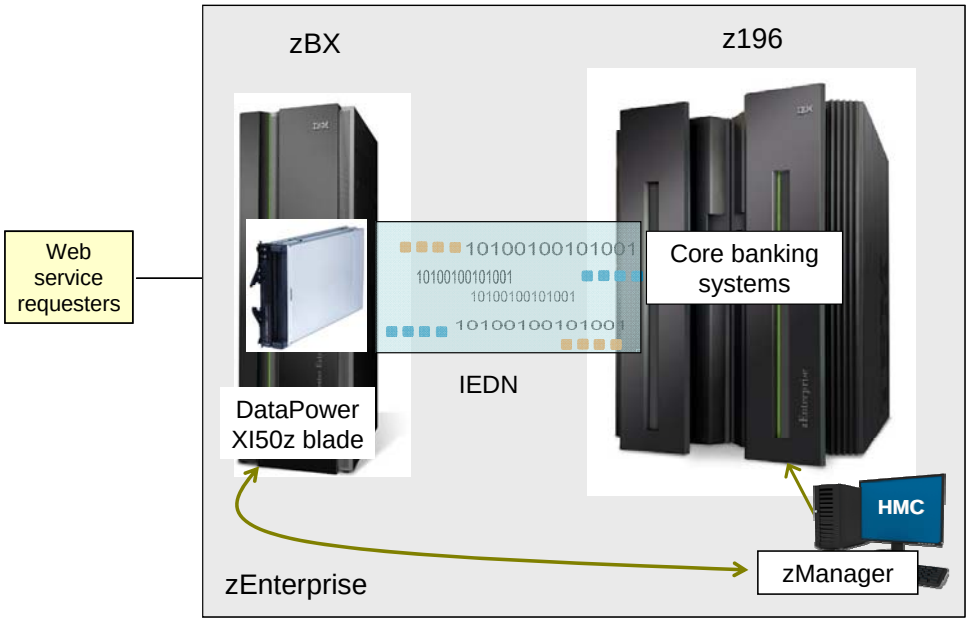

Figure 2:

Deploying the DataPower XI50z in this way fits well with the bank's strategy to deploy different components of workloads on the 'best fit' platform. DataPower is a clear best fit for heavy XML processing and security functions. For example;

- When DataPower is used to parse the SOAP body of very large messages this can reduce the CPU cost in CICS by up to 75%.

- Using DataPower to validate XML signatures can be more than 5 times more efficient than software-based solutions.

In addition, performing such processing in a special-purpose optimized blade has additional benefits in lowering power consumption, reducing overall cost and improving scalability.

It also fits with the bank's aim to minimize infrastructure management by managing different platforms in a consistent way. The zEnterprise Unified Resource Manager (zManager) simplifies platform management by providing a single operations console, increased security and virtual networking. And it simplifies problem determination by providing "call home" support for current or expected problems.

The end to end security challenge

The bank has to prepare for more stringent compliance regulations which dictate that all service invocations must be audited and that the originating user's identity must be included in the audited record. The current security model does not fulfill this requirement because when the distributed identity is mapped to a RACF® user ID, the originating user's identity is lost.

New identity propagation support available with DataPower V3.8.1, CICS TS V4.1 and z/OS V1.11 solves the bank's security challenge. DataPower authenticates the credentials supplied by the client and maps them to a z/OS specific identity token which contains the distributed identity of the user. The request is then forwarded to CICS over the secure IEDN and CICS passes the token to RACF so the client's identity can be mapped to a RACF user ID. The advantage of this solution is that the original caller's identity isn't lost; it's stored as an extension to the RACF identity.

The IEDN is a physically isolated Layer 2 network that allows members of an ensemble to communicate securely. It allows for security and physical isolation from external networks. Additional security mechanisms of the virtual LANs (VLANS) enhance the security within the ensemble and allow virtual servers in an ensemble to be isolated from other ensemble members within the IEDN. This additional security means that the bank does not need to encrypt the messages that are passed between the DataPower blades and the CICS core banking systems.

Monitoring

Another challenge faced by the bank is to efficiently monitor the services that it provides to its business partners and internal systems, in particular, to monitor against a set of pre-defined response time goals, to be able to identify a problem when it occurs and quickly identify the location and root cause of the problem.

zManager monitors the health and energy consumption of the DataPower blade, and also consolidates error logging across the ensemble which consists of the DataPower blade and all resources (z196 and zBX components) that are part of the workload.

The bank has extended its existing IBM Tivoli® Monitoring infrastructure which provides the enterprise infrastructure dashboard through the IBM Tivoli Enterprise Portal (see Figure 3).

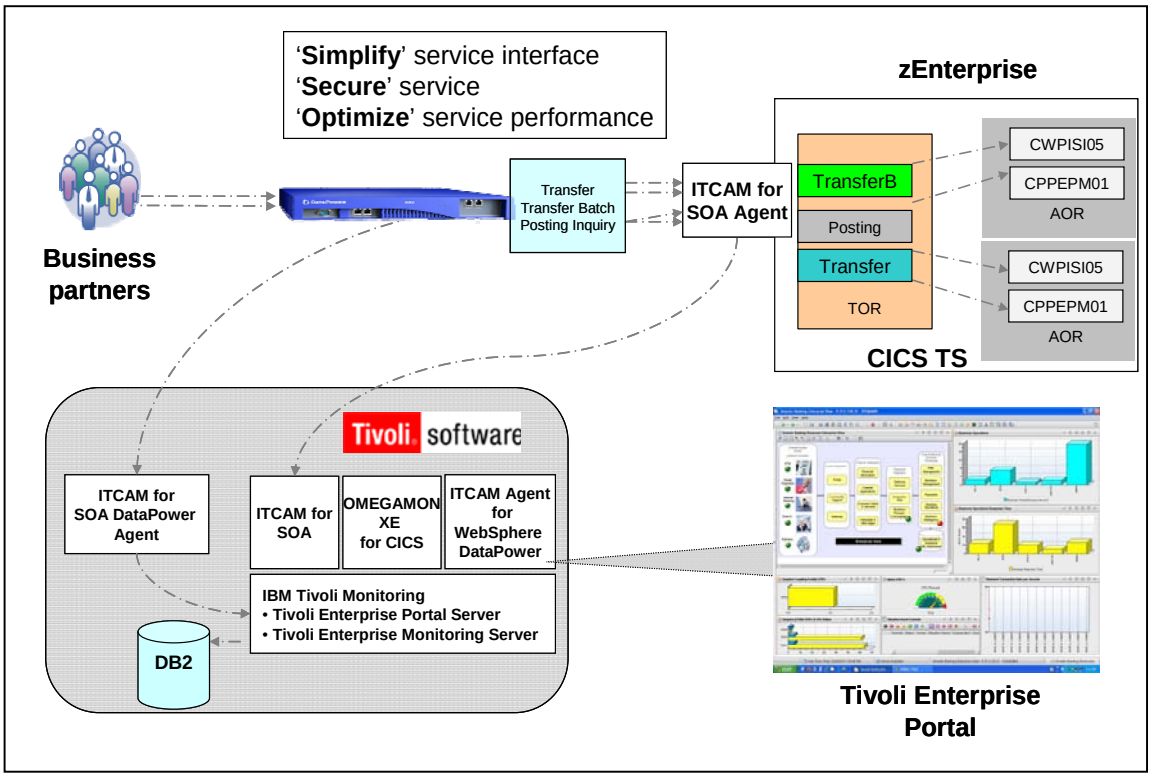

Figure 3:

- IBM Tivoli Composite Application Manager Agent for WebSphere DataPower Appliance is used to perform detailed monitoring of DataPower.
- IBM Tivoli OMEGAMON® XE for CICS is used for detailed analysis of Web services in CICS, including tracking against service response-time goals.
- IBM Tivoli Composite Application Manager for SOA is used to monitor the end to end performance of the Web services across both the CICS and DataPower runtime environments.

Intelligent workload distribution

The bank uses Sysplex Distributor today to intelligently distribute TCP/IP connection requests across the different z/OS partitions that host the core banking systems. With the DataPower XI50z, Sysplex Distributor can also be used to distribute requests across the DataPower blades

within the zBX (see Figure 4). This simplifies workload management and improves service availability.

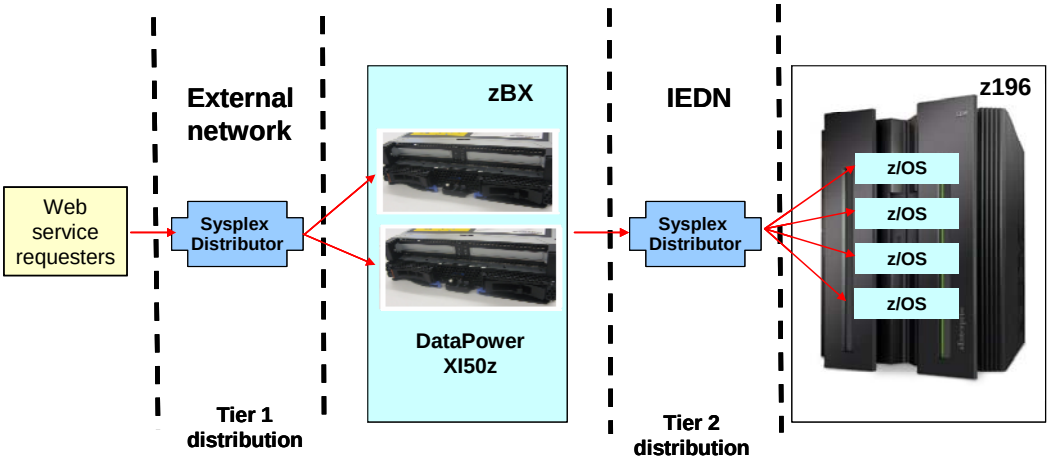

Figure 4:

Smarter Banking Showcase

The scenarios described in this article have been implemented in the IBM Smarter Banking Showcase**,** which is a live demonstration provided by IBM. The DataPower XI50z is used within the showcase to perform three main functions for banking services:

- To ease integration with the core banking applications. The DataPower XI50z provides a loose coupling capability which means that the service interface provided to business partners is not dictated by the interface supported by the existing applications. This allows us to use the 'meet-in-the-middle' approach to service enablement.
- To secure the banking services. The DataPower XI50z offers 'out of the box' security capabilities that increase the range of security models that the bank can support, allows us to secure our services quickly and offers an 'end to end' security solution for audit and compliance.
- To maximize performance and reduce cost. Highly CPU intensive tasks such as the parsing of very long messages and validation of XML signatures are offloaded to a special purpose optimizer.

To find out more about how the IBM WebSphere DataPower Integration Appliance XI50 for zEnterprise is used within the IBM Smarter Banking Showcase, please contact your IBM representative.

Summary

WebSphere DataPower now extends the zEnterprise platform by adding a special purpose optimizer that meets the typical SOA challenges faced by financial institutions as well as many other commercial and industrial sectors.

In addition to the integration, security and performance benefits of using the DataPower XI50z, the main additional advantages of having DataPower physically integrated within the zEnterprise are:

i. **Security:** The VLAN support provides enforced isolation of network traffic with a secure private network connecting the DataPower blade to the virtual servers within the zEnterprise system.

ii. **Scalability and TCO:** The use of a special-purpose optimized blade lowers power consumption, reduces overall cost and improves scalability.

iii. **Improved support:** zManager monitoring of the DataPower blade with automatic "call home" for problems enhances service availability.

iv. **System z packaging:** Quality is increased with pre-testing of the DataPower blade and zBX.

v. **Operational controls:** Start and stop operations, DataPower firmware upgrades and change management are rolled into the System z environment and controlled from a single console.

 

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