Office of the Chief
Information Officer

BRITISH
COLUMBIA

Guidelines on the Implementation of Integration Broker Technology

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Architecture, Standards and Planning Branch

Introduction

The purpose for this Guideline is to assist BC government ministries and agencies with the selection and implementation of an Integration Broker.

An Integration Broker solution is intended for use by ministries and other government agencies that have a requirement for an application-to-application service that uncouples mainframe, server and desktop application dependencies, leverages common security, directory and portal services, and facilitates corporate data sharing.

In 2001, the BC Government selected webMethods® as the main integration platform for ministries and government agencies. While it remains highly regarded for on premise application integration, webMethods® does not meet current business needs. In response, the Office of the Chief Information Officer (OCIO) has developed a list of pre-approved Integration Brokers in Appendix A based on common requirements identified by ministries and government agencies. The OCIO aims to support technical innovation while limiting platform proliferation (along with the associated complexity and cost); ministries and government agencies interested in an Integration Broker are therefore advised to select a solution from the OCIO pre-approved list in Appendix A.

This document is intended to be read in conjunction with the Integration Broker Standard (the Standard).

Why Implement an Integration Broker?

The main reason for implementing an Integration Broker is to apply standards based services for facilitating information sharing between applications or organizations. While the specific interfaces and protocols may vary depending on the capabilities of the provider and consumer, most Integration Brokers use standard industry protocols (e.g. SOAP and REST for web based scenarios, and S/FTP for batch based scenarios).

Another reason for implementing an Integration Broker is to develop or leverage reusable services that can be consumed by multiple applications or organizations. Because the services are defined through a service contract, the implementation logic can be modified as required by the service provider without impact to the consumer (as long as the terms and conditions do not change). As a result, a service provider can issue documentation either through a WSDL for SOAP based services or other tool (such as Swagger for REST based service) that specifies to consumers how the service will behave. While the above objects could be established through point to point connections between parties, the insertion of a broker as a mediator allows for maximum reuse of service logic which can produce greater consistency and cost savings.

Additionally, many integration brokers provide capabilities for monitoring the services (including capture, alter and replay of messages), which can support service improvements.

Integration Broker Capabilities

Capabilities may vary from vendor to vendor but most Integration Brokers provide the following high level capabilities:

- Standards Based Implementation (e.g. SOAP, REST, WS-*, etc.)

- Message Transformation

- Message Routing

- Guaranteed Delivery

Individual vendors may offer Integration Brokers that specialize in:

- Business Process Management

- Data Integration and Replication

- Business to Business (B2B) structured document exchange

- Mainframe Integration

Challenges with Implementing and Operating an Integration Broker

Licencing Implications to Scalability: The licencing models of some integration products may be bound to the hardware upon which they run meaning that, as adoption of the Integration Broker grows, so will the licensing costs. It is recommended that future growth requirements are considered when selecting an Integration Broker technology.

Availability of Local Resources: Due to the specialized nature of these products the skillsets required to administer and develop on some integration platforms may be in short supply. Contractors (possibly from outside of the province) may be required, which will increase costs.

Ability to Support: Organizations should consider whether support for the Integration Broker will be provided in-house or by contractors. Staff training requirements should also be identified before selecting a tool.

Barriers to Knowledge: Access to knowledge and expertise on an Integration Broker varies from product to product.

Web communities and online message boards can be valuable tools for troubleshooting platforms. When evaluating Integration Brokers, the ability to gain knowledge about a specific tool should be considered.

BC Government Requirements for Integration Brokers

The OCIO has compiled the following requirements that should be considered when selecting an Integration Broker:

- **Meets Provincial Standards** – adheres to IM/IT Standards
- **Reliable messaging**
- **Standards based services**
- **Data integration**
- **Strong B2B integration** - capable of standards based B2B document interchange
- **Lightweight installation footprint**
- **Available for container deployment**
- **Cost effective**
- **Large public sector footprint**
- **Existing vendor relationship**- listed in Appendix A
- **Scalable without licencing implications**
- **Mainframe integration capability**
- **Business Process Management capabilities**

While a single product will not likely be able to meet all of these requirements, organizations should review and prioritize the requirements based on their business needs in order to evaluate the Integration Broker products (see Appendix B for a matrix of requirements and pre-approved products).

Principles for Selecting an Integration Broker

1. The pre-approved Integration Brokers listed in Appendix A should be given preferential consideration, including procurements.
2. Platform proliferation should be limited to maintain low complexity and costs, but not at the expense of the business.
3. The choice of an Integration Broker should be based on the business value proposition, and the ability to support the chosen platform.

4. A new integration broker should only be selected when a set of business capabilities has been identified that cannot be met through one of the existing Integration Brokers listed in Appendix A.

5. In the event that a new integration broker is selected by the Province to meet new capabilities these Guidelines will be updated.

Further Guidance

- Any proposed Integration Broker not listed in Appendix A will require review by the OCIO to ensure that no existing pre-approved product can fulfill the desired capabilities.
- All software selections should be suitable for integration with existing infrastructure investments, such as identity management.
- Core Policy Chapter 6 requires that all information technology procurement be done through Shared Services BC.

Glossary

Integration Broker – a third-party intermediary that facilitates interactions between applications. IBs minimally provide message transformation and routing services. They mostly communicate program to program; they integrate previously independent applications at the application-logic level of the software design.

Capability - refers to the ability for a product to perform a certain task. Capabilities can be either functional (e.g. reliable message delivery) or non-functional (e.g. cost effective).

References

Integration Broker Definition:
 http://www.gartner.com/it-glossary/ib-integration-broker/
HTTP 1.1 Standard
https://tools.ietf.org/html/rfc2616
Province of British Columbia IM IT Standards
http://www2.gov.bc.ca/gov/content/governments/services-for-government/policies-procedures/im-it-standards
Ministry of Labour, Citizen's Services and Open Government: Information Security Branch
http://www.cio.gov.bc.ca/cio/informationsecurity/index.page
Mulesoft Community Forum
https://forums.mulesoft.com/questions/

Questions about this document? Please e-mail ASB.CIO@gov.bc.ca

Appendix A: Integration Broker Products Approved by the BC Government

SoftwareAG WebMethods Product Suite	
Used by: Ministry of Technology Innovation and Citizens' Services Ministry of Justice Ministry of Children and Family Development	
Strengths - Large footprint with the BC Public Sector - Model-to-Execute Business Process Management - Excellent B2B and Mainframe Integration	**Challenges** - Processor Bound licencing has a negative impact on budget planning - Out of Province contractors required to augment local experience - Vendors providing Agile/DevOps unable to integrate their processes into the product
Oracle SOA Suite	
Used by: Ministry of Forests, Lands and Natural Resource Operations Ministry of Education	
Strengths - Best of breed integration product - Out of the box integration with other Oracle products - Large ecosystem of adapters and integration starters to speed up development	**Challenges** - Getting it to run in current hosting environment - Processor bound licencing - Escalation of Support Calls / Ability to Influence Product Direction
WS02 Enterprise Integrator and API Manager	
Used by: Ministry of Forests, Lands and Natural Resource Operations Ministry of Technology Innovation and Citizens' Services	
Strengths - Open source product suite - Medium size technical footprint - Strong API management capabilities	**Challenges** - Some functionality such as High Availability and Scalability not available out of the box - Limited experience in province other than with API Management capabilities - Tooling not as sophisticated as other offerings
Mule ESB	

Used by:	
Ministry of Justice	
Strengths	**Challenges**
- Lightweight technical footprint - Does not restrict developers to a single standard - Open Source Solution is cost effective	- No in-house skills to support and reliant on vendor - No BPM capabilities - Small footprint within BC Public Sector

JBoss Fuse / Fuse Integration Services

Used by:	
Ministry of Technology Innovation and Citizens' Services	
Strengths	**Challenges**
- Lightweight technical footprint - Open source solution that runs well on OpenShift - Majority of development done using Java tooling and open standards rather than proprietary languages	- Strong Java skills required to build and operate the platform - Most services will need to be developed manually without use of pre-built adapters - Small footprint within BC Public Sector

Appendix B: Matrix of BC Government Requirements and Integration Broker Products

Business Requirement	Integration Broker Products				
	WebMethods	SOA Suite	WS02	Mule ESB	Fuse / FIS
Meets Provincial Standards	X	X	X	X	X
Reliable Messaging	X	X	X	X	X
Standards based services	X	X	X	X	X
Data Integration	X	X	X	X	X
Strong B2B Integration	X	X			
Lightweight Footprint			X	X	X
Available for container deployment				X	X
Low Cost			X	X	X
Public Sector Footprint	X	X			
Vendor Relationship	X	X			
Scalable without licencing			X	X	X
Mainframe Integration	X				
Business Process Management	X	X	X		