



Selecting a JMS Solution Provider

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INTRODUCTION

SUN published the JMS standard as a standard API to access enterprise messaging systems. Within a short time of the publishing of these standard vendors began to announce support for JMS. As the market for JMS increased and moved from early adopters to mainstream customers established vendors such as Tibco and Talarian joined the party.

In its formative stage the JMS providers worked the market touting speed as the differentiator and soon one saw that more than one solution was the "fastest" in its space. This period also saw vendors attacking each other in print discounting others claim, ample testimony to a space that needs maturing.

Enterprise messaging is not just about speed. Enterprise messaging is about a framework that provides a reliable solution that can be easily administered or monitored and easily mesh within the enterprise solution set. JMS as a specification is silent on enterprise class features:

- Administration and Monitoring
- Security
- Availability
- Scalability
- Balancing loads
- Error Management
- Topology and routing methods

The JMS standard is a rich API that can be used to integrate distributed applications at the core of an IT infrastructure or act as an edge store and forward system transmitting content to millions of users on the Internet. It has a wide applicability from low to large messaging needs. JMS is increasingly being used in implementing E Business architectures.

An implementation of JMS may involve high speed messaging needs, variable speed messaging needs, burst messaging, large sized messaging, low latency or transacted messaging.

CATEGORIZING VENDORS

The first step is to categorize vendors. There are many ways to do this:

- Categorize vendors by those with first generation release and those with a longer history of product release
- Categorize vendors by their Financial strength – are they public, do they have adequate financial backing
- Categorize vendors by their installed base and large scale deployments in mission critical applications
- Categorize vendors by their ability to provide 24x7 support
- Categorize vendors by their ability to provide Professional Services Support
- Categorize vendors by those that have *passed* Sun's J2EE Conformance Test suite

First generation JMS vendors include:

- Tibco
- Talarian

Their solutions are new. On the other hand both vendors have a history of providing messaging solutions that are proprietary. They are likely to bring some of this experience into their solutions over a period of time. They can provide

professional services support and are managing several large-scale mission critical installations.

Vendors who have more mature solutions include:

- Spirit-Soft
- Sonic Software
- Soft Wired
- Fiorano
- BEA
- IBM

Spirit Soft has a large investment from Reuters and its support. It also has some mission critical installations such as Instinet where it provides a 24x7 support. Sonic Software is a division of Progress Software and enjoys that sponsorship. It has some large installations such as GE and Commerce One. BEA and IBM also have solutions but are not as robust or efficient as other vendors. Fiorano and Soft Wired are small companies with good technologies but little financial support.

The next step is to differentiate vendors by their enterprise class features.

ADMINISTRATION AND MONITORING

- Does it support a centrally managed administrative console with a view into the network of message servers?
- Is the Administrative tool on Java – so that it has the same look and feel on ANY machine? Further a Java based solution can run on any hardware from an inexpensive Linux box to expensive workstations.
- The message server cluster will be geographic dispersed. Can they be centrally managed and administered? Can they be upgraded or configured from a remote administrative console?
- Will it allow a remote administrator to make changes, shutting routes, adding new ones, shutting or restarting servers?
- CONFIGURATION MANAGEMENT – How convenient is it to configure the system and users, administered objects (Topics and Queues), connection factories. What script level interfaces are available to set these programmatically? Can the entire network of message server cluster be administered and configured from ONE remote station.
- SECURITY – How convenient and comprehensive are the abilities to set Security policies? What tools are available to audit access? Can it display alarms and traces of unauthorized access attempts?

- PERFORMANCE MANAGEMENT – Does the tool provide insight into system usage, resource usage or network loads. Does it have tools to assist in tuning the message system or the topology?
- FAULT MANAGEMENT – Can a central administrator monitor faults from message brokers in the network? Can it receive alarms if brokers or hardware or hardware resources on a system collapse? Can the system link to Element Management systems such as SUN Net Manager or HP Open view or Network Management Systems such as CA – Unicenter? Is support for SNMP or RMON available?
- Does the software provide tools to analyze logs, trail and alarms? What type of analytical and reporting tools is included?
- What tools are available to recover queue and durable databases from systems that have died?

SECURITY

JMS does not define a security framework. Vendors have their own implementation for:

- Securing Queues and Topics from unauthorized access
- Securing Connection factories
- Securing User name and Passwords
- Securing and making access control lists tamper proof
- Securing Connections (SSL)
- Authentication (User Name Password, SecureID Challenge/Response, Kerberos, Tacacs and Radius authentications), Digital certificates
- Authorization (Access Control Lists)
- Message Encryption (MD5/DES; PKI, 128 bit encryption)
- Integrity checking- Cyclic redundancy check sums
- Non repudiation- electronic signatures
- Audit services
- Maintaining access logs
- Unauthorized access alarms

SCALABILITY

How well does the broker scale? Some solutions are fully meshed limiting scalability. True, connection management can increase the number of clients per message broker. However, increasing clients on one broker may not be an optimum solution, as each new client will take system resources and thread, queue and memory limits can be quickly reached. A scalable solution is a flexible solution where scaling does not affect performance.

BRIDGES TO OTHER MIDDLEWARE SOLUTIONS

Enterprises have different middleware solutions such as IBM MQ, MSMQ, Webmethods, Vitria. The solution becomes rich if it supports interoperability with as many middleware solutions as possible.

Most vendors provide bridges to MSMQ or IBM MQ. Spirit-Soft provides drivers to TIBCO, Talarian, WebMethods and other middleware in addition.

FIREWALL ACCESS

Internet based solutions require messages to penetrate corporate firewalls. Do the solutions support HTTP tunneling? Is their support for both Client sides as well as server side firewall tunneling? The features needed include HTTP, HTTPS and SOCKS.

All vendors now do support Client as well as server side firewall tunneling. Are all browsers and versions supported? Do some browsers compromise or restrict security?

LOAD BALANCING

Most JMS providers support load balancing by clustered servers. Load balancing schemes can be primitive such as random or round robin or more sophisticated such as "least busy", or least loaded (resource wise).

DYNAMIC ROUTING

What happens if a network failure occurs? Some brokers use primitive mechanisms such as pinging frequently waiting for the network to come up before resuming message transfers. Other solutions provide for adaptive routing. Algorithms such as Open Shortest Path First help to identify an adaptive shortest route to the destination.

TOPOLOGY AND CLUSTERING

Solutions are implemented with different topologies and Clustering architectures:

- Hub and Spoke
- Bus
- Arbitrary clustering
- Fully connected mesh clustering
- A combination of fully connected and arbitrary clustering

Enterprise class messaging requires good clustering that could lead to high scalability and good fail over characteristics. Fully connected meshes do not scale well.

AVAILABILITY AND RELIABILITY

A messaging system in enterprise integration is like a heartbeat. A failure to this system can bring the enterprise to its knees.

Failure can come to the network, software, hardware and the message database. An **available** system is one that can withstand any kind of failure - network, hardware or software and continue to seamlessly function without disrupting service. A user on such a system will not notice failure. An available system is always on and incorporates redundancy at every level including destinations (Queues and Topics).

A **highly available** system will support:

- Redundancy of software, queues, databases and Topics
- Full fail over capability to backup systems and databases – this includes log files, traces and alarms
- Remote monitoring and fault management
- System capacity and resource management – Queues filling to capacity, Durable messages reaching disk capacity, system running out of resources such as threads or memory
- Adaptive routing of messages in the event of network failure
- Automatically restart failed brokers
- Automatic upgrades to new software versions without disrupting or bringing down the system for maintenance
- There is no single point of failure in the solution

Full fail over is not easy and vendors have their own approaches to solve this problem:

- Some vendors will move a client from a failed message server to another message server seamlessly, but all non durable messages are lost and durable messages and queues become unavailable until the failed system comes up again
- Some vendors provide fail over capabilities for non-durable messages duplicating software on other servers in the cluster. However, they cannot support fail over for queues and Durable messages. These become available only when the failed system comes up

- Some vendors support client reconnection to another server but the cluster control software that implements this function can itself be a single point of failure

A system may be **reliable** even if it is not highly available. Reliability deals with the ability to ensure that messages are sent to destinations without any problems. The number of messages that need to be redelivered or for non-durable messages the number of messages that are dropped by the server and not delivered to a subscriber under heavy message loads can measure the degree of reliability.

Another measure of reliability is the **stability of code**. How often does a vendor release patches? Does it maintain a history of version releases and intermediate releases? Does a vendor maintain a history of known bugs? How many of these are fatal, how many are routine, how many have a workaround?

FOOTPRINT

The footprint of the solution can be a good measure to the ideal hardware platform required to host the solutions. This has a bearing on the overall cost of the solution. However, larger footprint software may also be Multi thread multi process enabled taking advantage of the hardware platform. A low footprint on the other hand may well be an immature solution.

The footprint has to be weighed in the context of the solution set and the features it brings with it. Even if the footprint may be large it may bring a lot of needed enterprise class functionality.

PLATFORM SUPPORT

In our view a solution that is platform agnostic is the best solution of choice. With that in mind a pure Java implementation has the best advantage to a user.

Finally evaluate vendors on the speed of messaging, scalability and features supported.

SPEED TESTS

When evaluating for speed look at your intended application. Do you require variable messaging or burst messaging. A button click on an E Commerce system can create a short burst of messages. Some brokers cannot handle short bursts of messages very well. Some brokers are known to freeze.

The tests should include:

- Speed tests for variable size messages (including at least 2 times the maximum size that you intend to ever send) with single publishers and multiple subscribers both for Durable and Non durable non-persistent messaging.
Persistent and non persistent Queues tests with multiple senders and multiple receivers
- Persistent and non persistent transacted messages tests
- Flow control tests – slow down receivers in any of the above tests and see how it affects publishers / other subscribers
- Latency tests
- Burst Message tests
- Failure tests – test the limit of queues, durable stores to see how brokers respond

Vendors have implemented subtle features to help spike performance (which is why every vendor has the “fastest” broker) – turn these off. Pre-fetch queue caches may work well with benchmarks but can be a source of problems in real life E Commerce situations. Turn the subscriber off for different periods of time to check durable subscriptions. Randomly introduce durable subscribers. JMS is a standard API and yet it leaves scope to vendors to create proprietary offerings. The wire protocol is not standard, so vendors implement message composition differently. The Administration and security system is not standard and vendors introduce APIs that can make the solution proprietary.

Companies have their own criteria to make vendor selection for some the maturity of the vendor and its financial strengths are more important than technical merits of the solution.



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