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Middleware Integration

Jagmohan Chopra[1], Rupal Gupta[2], Nilender Nath[3], Gunjan Chandwani [4]
Students[1, 2, 3], Assistant Professor[4]
Department of Computer Science & Engineering[1, 2, 3, 4]
Manav Rachna University, Faridabad, Haryana, India[1, 2, 3, 4]
Corresponding Authors' Email:*Jagmohanchopra99@gmail.com[1], rupal98gupta@gmail.com[2], nilendernath123,@gmail.com[3], gunjan@mru.edu.in[4]*

Abstract

Middleware Integration represents software systems that offer runtime services for communications, integration of application execution, monitoring and operations this connectivity means that an application can interact and exchange data with other applications in a flexible, dynamic, and extensible infrastructure. Middleware provides an enabling layer and the enterprise integration needed to connect systems of engagement like mobile with existing systems of record to yield systems of insight.

Keywords: - *Middleware, Software, Object request brokers (ORBs), Database*

INTRODUCTION

Middleware Integration is a concept that generates tools to integrate multiple applications with similar data requirements and to serve similar environment without multiple databases about same data. It can be used for heterogeneous applications to work within same software.

Middleware Integration is also known as middleware.

Middleware acts as glue for an application as it operates on the application and then transfers the outcome as well.

There are few standard categories of middleware as follows:

- Message passing
- Transaction processing (TP) monitors
- Distributed computing environment (DCE)
- Database access systems
- Object request brokers (ORBs)

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- Enterprise service buses (ESBs)
- Remote procedure call (RPC) systems

Middleware and Enterprise Application Integration is a practical introduction to the different forms of middleware (RPC, message queues, hub and spoke, CORBA and Java) and how they can be combined to produce complex architectures that are suited to business needs. The software layer that lies between the operating systems and applications on each side of a distributed computing system in a network Services that can be regarded as middleware include enterprise application integration, data integration, message oriented middleware (MOM), object request brokers (ORBs), and the enterprise service bus (ESB).

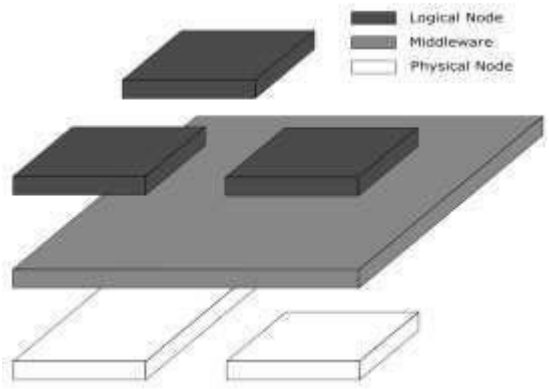


Figure: 1

BACKGROUND

Middleware concept has been used by IBM to create tools that implement the concept and is used vastly. These are the two softwares by IBM

1. **IBM MQ** which was earlier known as IBM Web sphere ESB (enterprise service bus) can transport any type of data as messages, enabling businesses to build flexible, reusable architectures such as service-oriented architecture (SOA) environments and micro service architectures. It works with a broad range of computing platforms, application environments and APIs, and communications protocols for security-rich message delivery. Web Sphere Message Broker is an enterprise service bus (ESB) providing connectivity and universal data transformation for service-oriented architecture (SOA) and non-SOA environments. Now businesses of any size can eliminate point-to-point connections and batch processing regardless of platform, protocol or data format. IBM MQ provides a communications layer for visibility and control of the flow of messages and data inside and outside your organization.

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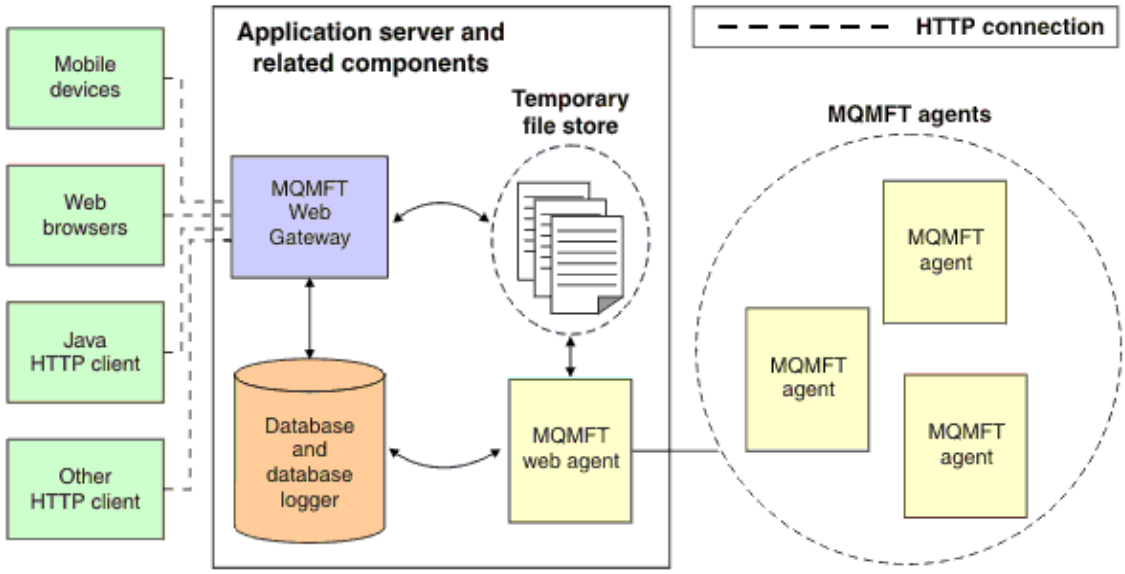


Figure: 2

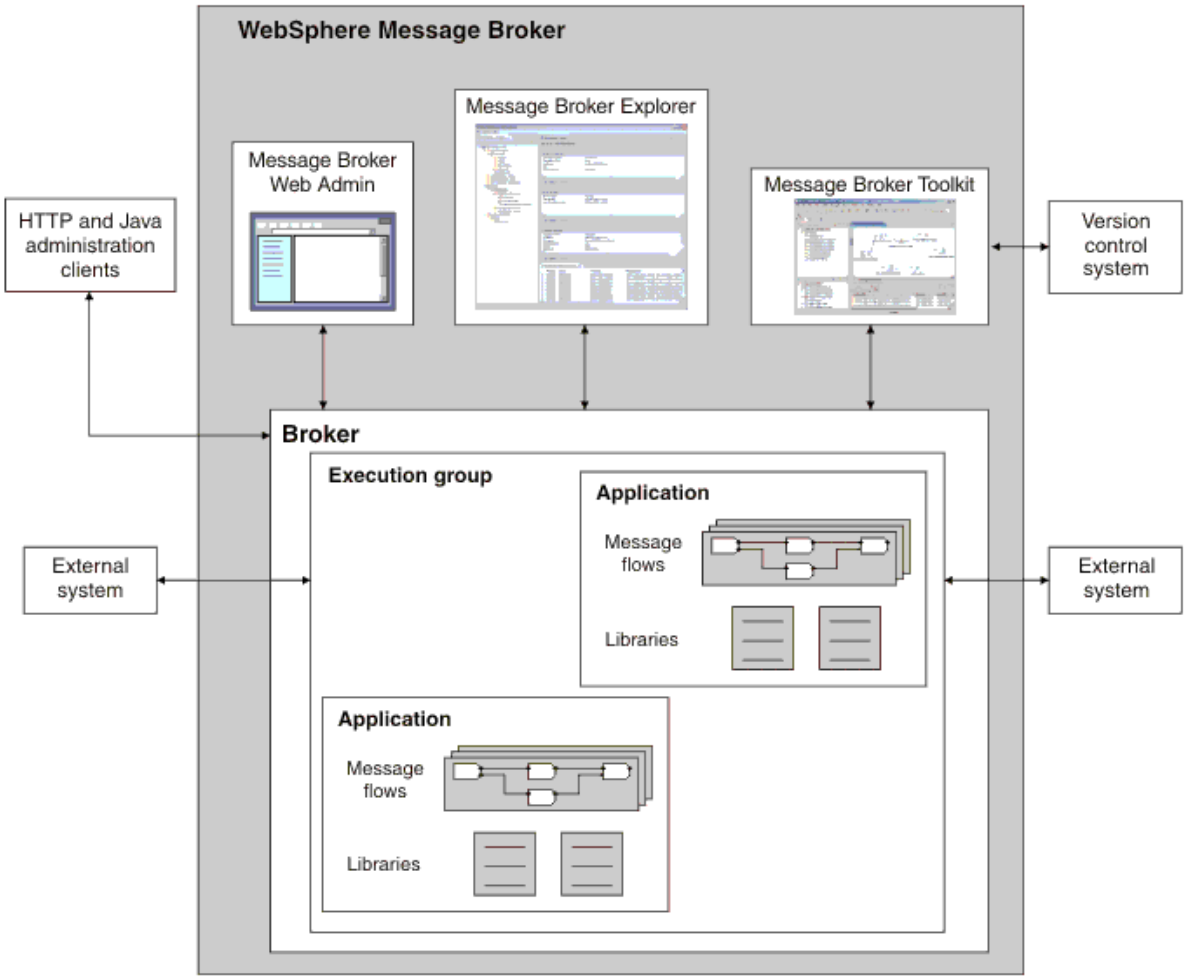


Figure: 3

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2. ***IIB(IBM Integration Bus)***

It is an upgraded version of IBM MQ with some additional features to reduce the size and complexity of messages transfer with many more extra features.

IBM Integration Bus provides a universal integration capability that addresses a wide range of integration scenarios. These scenarios include web services such as SOAP and REST, messaging, database, file, ERP systems, mobile, physical devices, email, custom systems and more. IBM IIS lets business information to flow between multiple hardware and software platform for efficient output.

- V8 and earlier versions were used as Web sphere Message Broker while,
- V9 and afterward version were used as IIB

It helps one achieve business value, minimize IT complexity, and save funds. It is designed to enable users to get started with IT asset integration quickly with a ready-to-use, cloud-based environment hosted in IBM cloud data centers and managed by IBM. Integration Bus on Cloud delivers an environment that is both highly scalable and protected by IBM cloud security so you can develop and deploy integrations that are ready when you are.

Moreover, to use this tool one does not need any extra hardware. The tool can be used freely without any cost for one and a half month as well but after that it becomes a paid service.

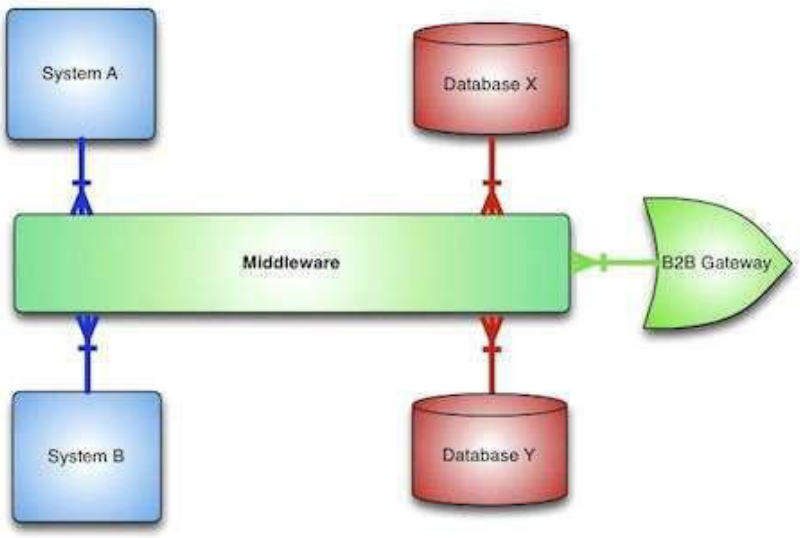


Figure: 4

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Comparative Study

There has come another tool in market implementing middleware named MULESOFT but is still lacking the market position due to IIB's long stand market.



Figure:-5



Figure: 6

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Figure:-7

Though, Mule soft is better than IIB in many different ways still it would take time to make a market for itself.

PROPOSED WORK/ METHODOLOGY

Now as we know that middleware can work as a really important tool in saving time, redundancy , and many other anomalies , so we are going to learn IBM IIB tool and try to create a web application that can be used as middleware integration tool in many more fields.

Data presentation/ collection:

Message routing

Messages can be routed from sender to recipient based on the content of the message.

The message flows that you design control message routing. A message flow describes the operations to be performed on the incoming message, and the sequence in which they are carried out.

Each message flow consists of the following parts:

- A series of steps used to process a message; see Message flow nodes.
- Connections between the nodes, defining routes through the processing; see Message flow connections.

IBM® supplies built-in nodes and samples for many common functions. If you require additional functions, you can write

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your own user-defined nodes; see User-defined extensions overview.

You create message flows in the Web Sphere Message Broker Toolkit.

Message transformation

- Messages can be transformed before being delivered:

- They can be transformed from one format to another, perhaps to accommodate the different requirements of the sender and the recipient.

- They can be transformed by modifying, combining, adding, or removing data fields, perhaps involving the use of information stored in a database. Information can be mapped between messages and databases. More complex manipulation of message data can be achieved by writing code, for example in Extended SQL (ESQL) or Java™, within configurable nodes.

- Transformations can be made by various nodes in a message flow. Before a message flow node can operate on an incoming message, it must understand the structure of that message.

- Some messages contain a definition of their own structure and format. These messages are known as self-defining messages, which you can handle without the need for additional information about structure and format.

- Other messages do not contain information about their structure and format. To process them, you must create a model of their structure.

- Like message flows, you create message models in the Web Sphere Message Broker Toolkit. They can contain two types of information:

- The logical structure: the abstract arrangement and characteristics of the data, represented as a tree structure.

- One or more physical formats: the way the data is represented and delimited in the physical bit stream.

CONCLUSION

Middleware has been wildly used so far, and will keep increasingly popular in the later stage. People from different communities have made many

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contributions to take the middleware architecture to a new generation. We realize that the whole evolution process is eventually an approach to build "system of systems", which is more or less a model-driven development.

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