Messaging Across Platforms

Asynchronous application integration across disparate platforms

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Messaging Across Platforms

- What is middleware?
- Message-oriented middleware
- Case Study: Integrating MQSeries with spreadsheets
- The future of middleware
- Middleware resources

Presenter

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  - Middleware architect with over four years of experience in middleware technology including MQSeries Integrator, NEONet, CORBA and TIB/Rendezvous.

What is middleware?

- Types of middleware
- When to use middleware
- When NOT to use middleware
- Common misconceptions about middleware

Middleware: A Definition

Middleware enables an application to:

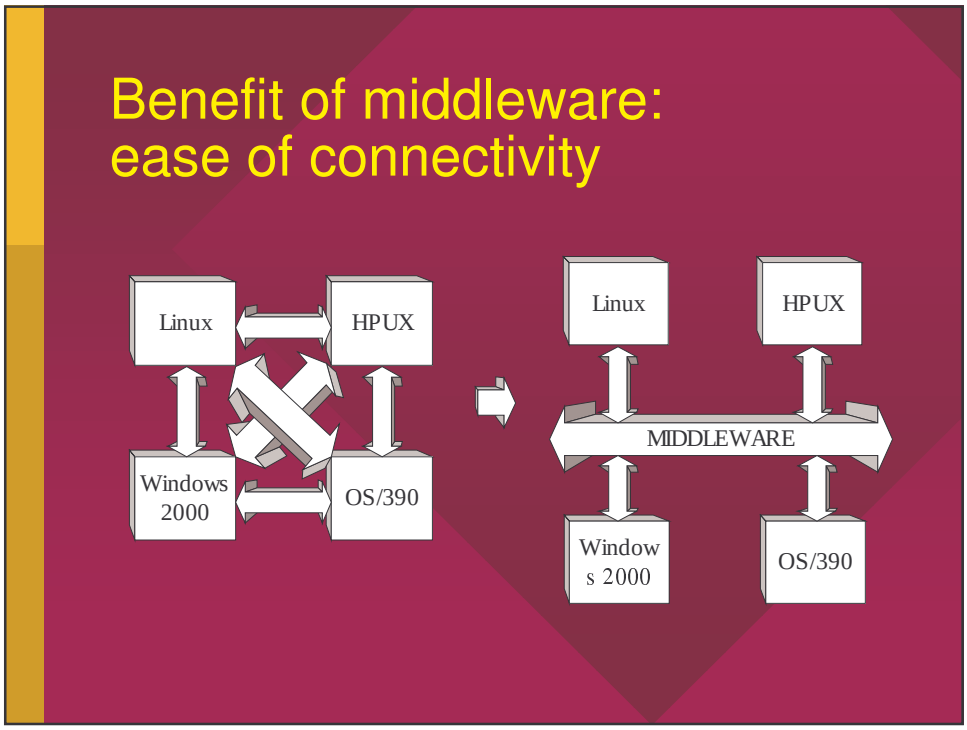
I. exchange information with another application, OR

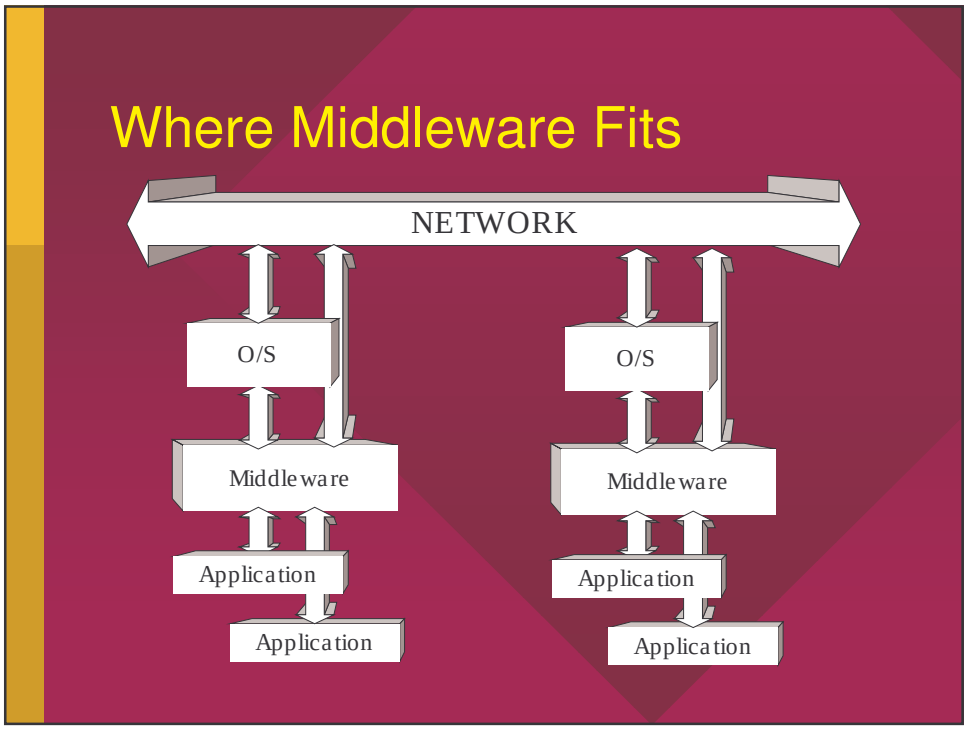
II. invoke a procedure implemented by another application

across disparate platforms using a common API or framework.

Middleware Provides…

- Common API or framework
- Abstraction
- Decoupling
- Location transparency
- Fault tolerance


Benefit of middleware:
ease of connectivity
Linux
HPUX
Windows 2000
OS/390
Linux
HPUX
MIDDLEWARE
Windows 2000
OS/390


Where Middleware Fits
NETWORK
O/S
Middleware
Application
Application
O/S
Middleware
Application
Application

Types of Middleware

- Object-based middleware
- Message-based middleware

Object-based Middleware

- Object-oriented
  - CORBA
  - DCOM/ActiveX
  - Java RMI
- RPC
  - ONC (Sun)
  - DCE (OSF)
  - Courier (Xerox Research Parc)

Message-based Middleware

- Database-oriented
  - Databases
- Message-oriented
  - MQSeries, NEONet, TIBCO.
- Transaction-oriented
  - CICS, MTS, Tuxedo.

Types of message-oriented middleware

- Push Technology
  - Publish/Subscribe
  - TIB/Rendezvous, MQSeries Publish-Subscribe
- Pull Technology
  - Queue-based
  - NEONet, MQSeries, MessageQ

When to use message-oriented middleware

- For real-time message delivery between disparate platforms
- Scenarios:
  - Real-time stock data delivery to subscribers
  - Banking and insurance transactions
  - Accountability: back office needs to audit front office transactions
  - Integrating legacy applications or platforms with current ones
  - Delivery of price information or research to traders

Common Misconceptions

- ODBC and JDBC are middleware.
  - These are APIs, as is OCI on Oracle.
- JMS (Java Messaging Service) is middleware
  - JMS is an API, not middleware!
- Message-oriented middleware is better than RPC.
  - NO! These are two different middleware flavors that cannot be compared.

Messaging with MQSeries

- Queue based messaging
- MQSeries objects
  - Queue Manager
  - Queues
  - Channels
- MQI: A common API

MQSeries Messages

- Message composition
  - Header and Data
- Message types
  - Persistent / Non-persistent
  - Datagram / Request-Reply / Report
- Segmentation
- Grouping messages
- Prioritisation

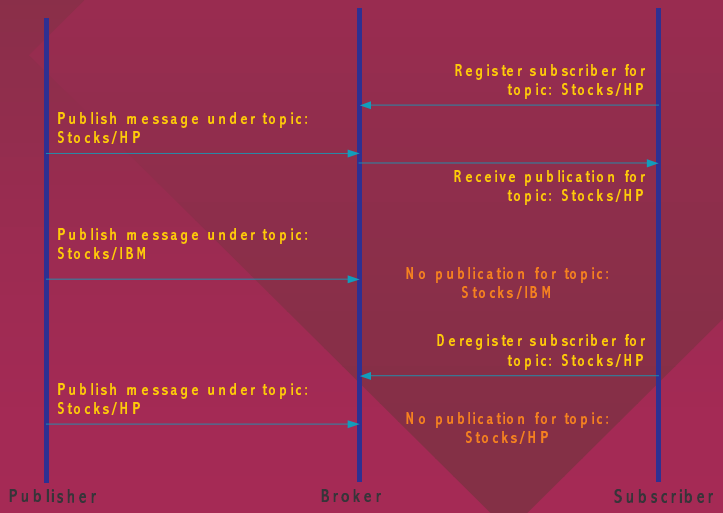
MQSeries Queues

- Local queues
- Alias queues
- Remote queues
- Transmission queues
- Initiation queues
- Dynamic queues
- Model queues
- Cluster queues

MQSeries Publish/Subscribe

- Brokers
  - Each queue manager associated with a broker
- Subscribers
  - Subscriber queues
- Publishers
  - Publisher queues

How subscribers receive published messages

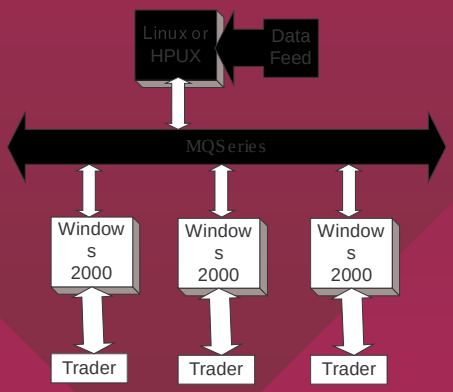


Case Study: Integrating MQSeries with Spreadsheets

- Problem definition
  - Traders use spreadsheets on their Windows 2000 workstations, but need information of stock prices in real-time. However, the data-feed is on a Linux or HPUX platform.
- Solution
- Implementation

Case Study: Solution

- Use MQSeries with MQAX
- Spreadsheets can read or browse messages from the queue manager
- Queue manager routes messages to the relevant queues



Case Study: Implementation

```
Dim mqS As MQSession          ' used as 'handle' to the session
Dim qm As MQQueueManager      ' accesses the queue manager
Dim q As MQQueue              ' accesses the queue

Dim gMsg As MQMessage         ' message received
Dim gData As String           ' IBM stock price data received

On Error GoTo end_error
   ' create the first object to access MQAX code
   Set mqS = CreateObject("MQAX200.MqSession")

   ' access the queue manager
   Set qm = mqS.AccessQueueManager("SUN.QMGR")

   ' access the subscriber queue that should be there
   Set q = qm.AccessQueue("STOCKS.IBM.SUBQ", _MQOO_INPUT_AS_Q_DEF)

   ' get subscription message
   Set gMsg = mqS.AccessMessage()

   ' get the message back off the MQSeries queue
   q.Get gMsg

   ' now read the data from the input message, and display in Excel
   gData = gMsg.ReadString(gMsg.MessageLength)
   Range("output").Value = gData

   ' leave: no need to clean up -
   ' all necessary closes, disconnects etc are automatic
Exit Sub
```

Future of Middleware

- New frameworks
  - UDDI
  - eSpeak
- New protocols
  - JMS
  - SOAP
- Improvements
  - GRYPHON
- Web-based
  - iProxy

Resources: Web

- General
  - http://www.middleware.org
  - http://www.omg.org
- MQSeries
  - http://www-4.ibm.com/software/ts/mqseries
  - http://www.software.ibm.com/ts/mqseries/integrator
  - http://www.messageq.com
  - http://www.blue-crow.com
  - List server: listserv@akh-wien.ac.at

Resources: Books (1)

- MQSeries
  - MQSeries Messaging, by Nayan Ruparelia. To be published by late summer, 2001. Publisher: Manning. ISBN: 1-884-77798-8
  - Distributed Computing with IBM MQSeries, by Leonard Gilman, et al. Published: 1996. Publisher: John Wiley. ISBN: 0-471-14934-9

Resources: Books (2)

- CORBA
  - The CORBA Reference Guide, by Alan Pope. Published by Addison Wesley, 1998. ISBN 0-201-63386-8
  - Advanced CORBA Programming with C++, by Michi Hennig and Steve Vinoski. Published by Addison Wesley, 1999. ISBN 0-201-37927-9