WebSphere MQ
for z/VSE V3.0
Exploitation and solutions

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Topics

- **Fundamentals of Message Queuing**

- **WebSphere MQ for z/VSE Version 3.0**

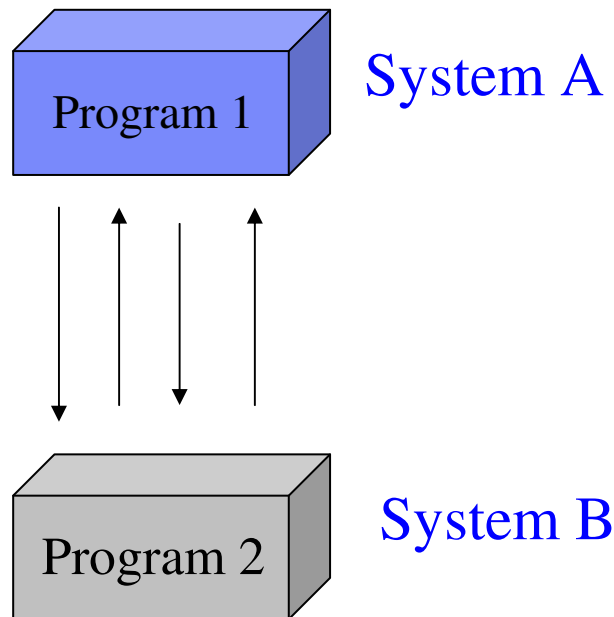- **Modern Solutions with WMQ for z/VSE**

Topics

➡ ▪ **Fundamentals of Message Queuing**

   ► **What is message queuing**

   ► **Types of implementations**

▪ **WebSphere MQ for z/VSE Version 3.0**

▪ **Modern Solutions with WMQ for z/VSE**
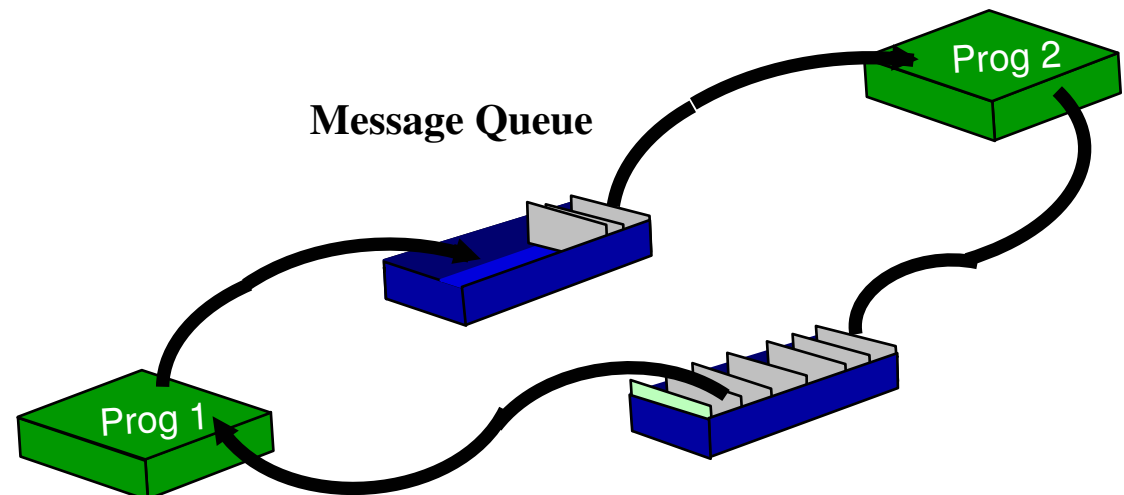
The Inter Program Communication Methods

Direct Communication

- Program Call / Response
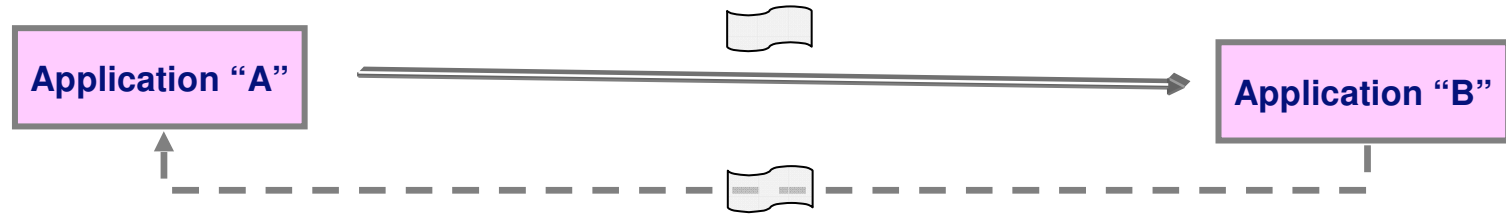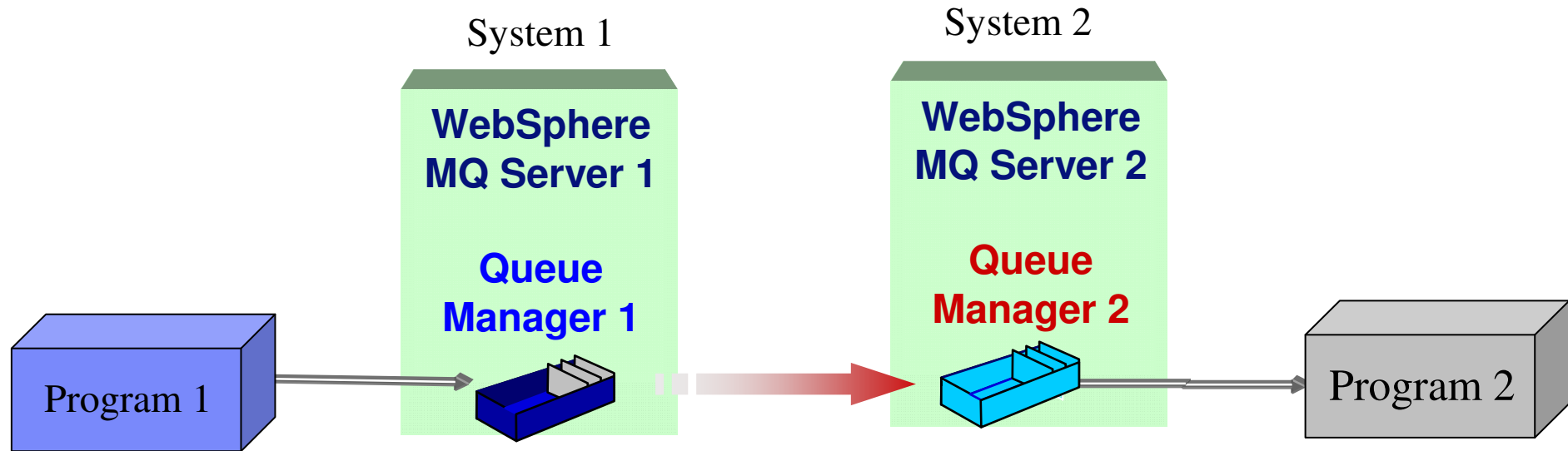- RPC Remote Procedure Call

Asynchronous Communication

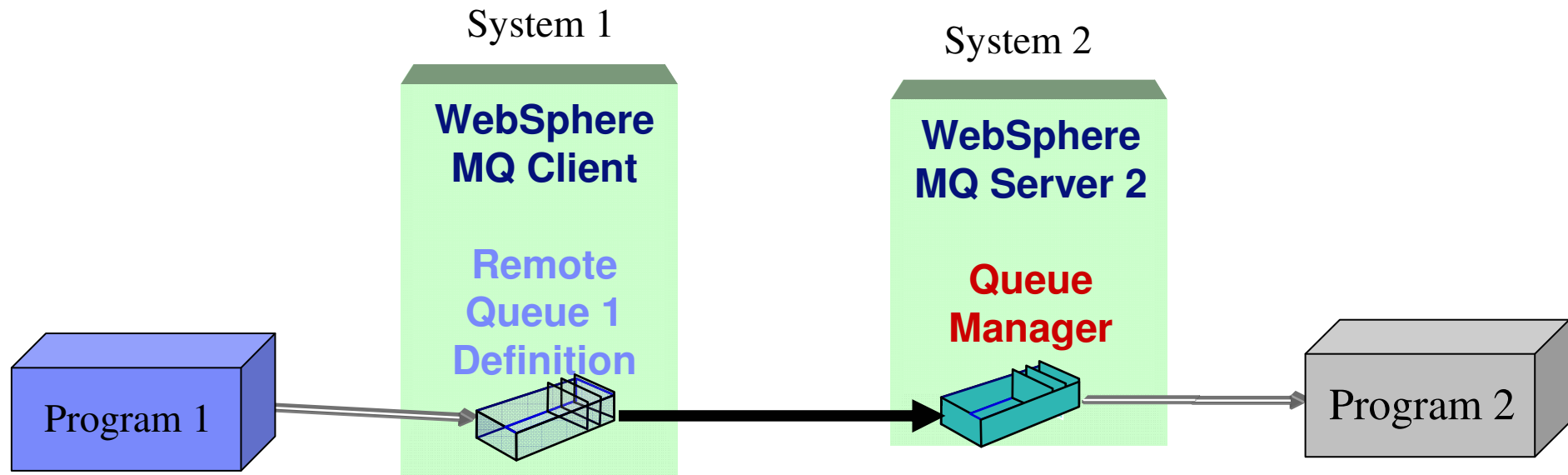- Using **Message Queuing**
  (no direct program invocation)

System A

Program 1

System B

Program 2

Message Queue

Prog 2

Prog 1

Message Queuing Overview
(1) WebSphere MQ Server – Server scenario

System 1

System 2

**WebSphere
MQ Server 1**

**Queue
Manager 1**

**WebSphere
MQ Server 2**

**Queue
Manager 2**

Program 1

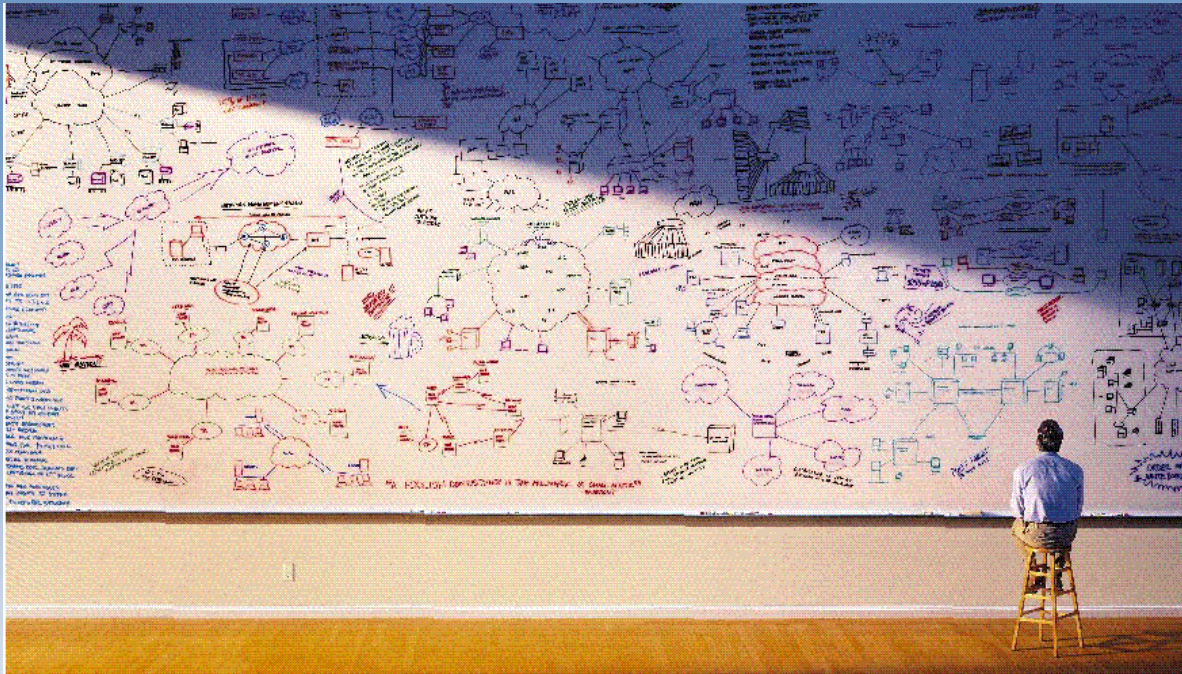Program 2

Application "A"

Application "B"

Message Queuing Overview
(2) WebSphere MQ Client – Server scenario

Why are interfaces so expensive to build and maintain?

- Application interface logic is intertwined with business logic.

- The more tightly integrated the interface the more difficult the application is to change.

- The more interfaces that exist within a set of programs, the more complex the application becomes -- interface logic may, in many cases, exceed business logic.

- In such circumstances, re-use becomes difficult and impractical.

WebSphere MQ Series Characteristics.

- Helps to integrate platforms like CICS, DB2®, Microsoft® .NET and J2EE™ environments

- The most reliable method of program communications with:
  - ► asynchronous and synchronous communication mode
  - ► guaranteed delivery between WebSphere MQ Servers
  - ► ensured, only once delivery

- Support for more than 80 platform configurations, including native z/VSE and z/OS support
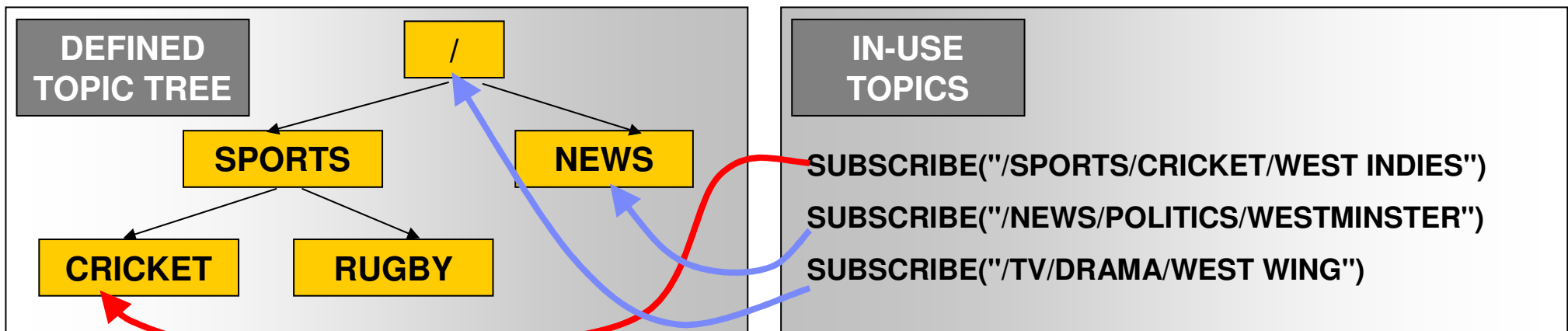
WebSphere MQ Series Characteristics.

- Supports both de facto standard interfaces for message queuing:

  ► Message Queue Interface (MQI) interface,

  ► Java Messaging Services (JMS) interface,

- Supports secure communication with standard Secure Sockets Layer (SSL)

- Integrated publish-and-subscribe support

- Includes Eclipse tooling to configure WebSphere MQ network remotely

- Integrated support for Web services, to bring reliability, visibility and audit ability to SOAP interactions

- Provides a messaging backbone for deploying an Enterprise Service Bus (ESB) as the connectivity layer of an Service Oriented Architecture (SOA)

Publish / Subscribe - Enabling Flexible Delivery

Publish-and-Subscribe

- ► **Dynamic and flexible way of determining where messages are sent**

- ► **Helps reduce the cost, time and skills when changes are required**

- ► **Helps define new paths of information flow in an ad hoc manner**

DEFINED TOPIC TREE

/

SPORTS   NEWS

CRICKET   RUGBY

IN-USE TOPICS

SUBSCRIBE("/SPORTS/CRICKET/WEST INDIES")

SUBSCRIBE("/NEWS/POLITICS/WESTMINSTER")

SUBSCRIBE("/TV/DRAMA/WEST WING")

Centralized Configuration & Administration

- **Logically centralized configuration of remote, distributed backbone**

- **Remotely view & configure entire backbone – including z/VSE**

SOA MESSAGING BACKBONE

- **Visual display at a glance**

- **Eclipse-based environment**

- **Extensible and customizable**

- **Remote connection from Linux x86 and Windows**

- **SSL secured connections**

Topics

- **Fundamentals of Message Queuing**

- **WebSphere MQ for z/VSE Version 3.0**

- **Modern Solutions with WMQ for z/VSE**

What's new in WebSphere MQ for z/VSE V3R0

- **New Version:**
  - ► **available since 19 of December 2008**
  - ► **The program number is: 5655-U97-00-300**

- **Rebranded:**
  - ► **WebSphere MQ for z/VSE V3.0**

- **Compatibility**
  - ► WebSphere MQ for z/VSE V3.0 can participate in distributed queuing solutions with all currently supported V5, V6, and V7 WebSphere MQ products on all supported platforms, and with the existing MQSeries for VSE/ESA V2.1.2 product.

- **Hardware Requirements**
  - ► All Hardware for supported z/VSE Releases
    - IBM System z10 EC and BC
    - IBM System z9 EC and BC,
    - zSeries 890 and 990, zSeries 800 and 900,
    - S/390® Multiprise 3000
    - S/390 Parallel Enterprise Server™—Generation 5 and 6

What's new in WMQ for z/VSE V3R0

- **Software Requirements**

  - ► z/VSE 3.1 or later

    - CICS/VSE 2.3 or CICS TS 1.1, or later
    - VTAM for z/VSE 4.2 or
    - TCP/IP for z/VSE 1.5F (or equivalent), or later
    - Language Environment for z/VSE 1.4.4 Runtime library, or later

  - ► WebSphere MQ Clients:

    - WebSphere MQ for z/VSE V3.0 supports clients that connect using TCP/IP.

  Note:- The latest maintenance for these requirements is strongly recommended

   - As prerequisite software levels become out-of-service, it is strongly recommended that customers upgrade to supported levels of all prerequisite software.

What's new in WMQ for z/VSE V3R0

- Server and Requester channels

  - ► **additional channel types to request messages from remote systems, rather than wait for those systems to activate the flow.**
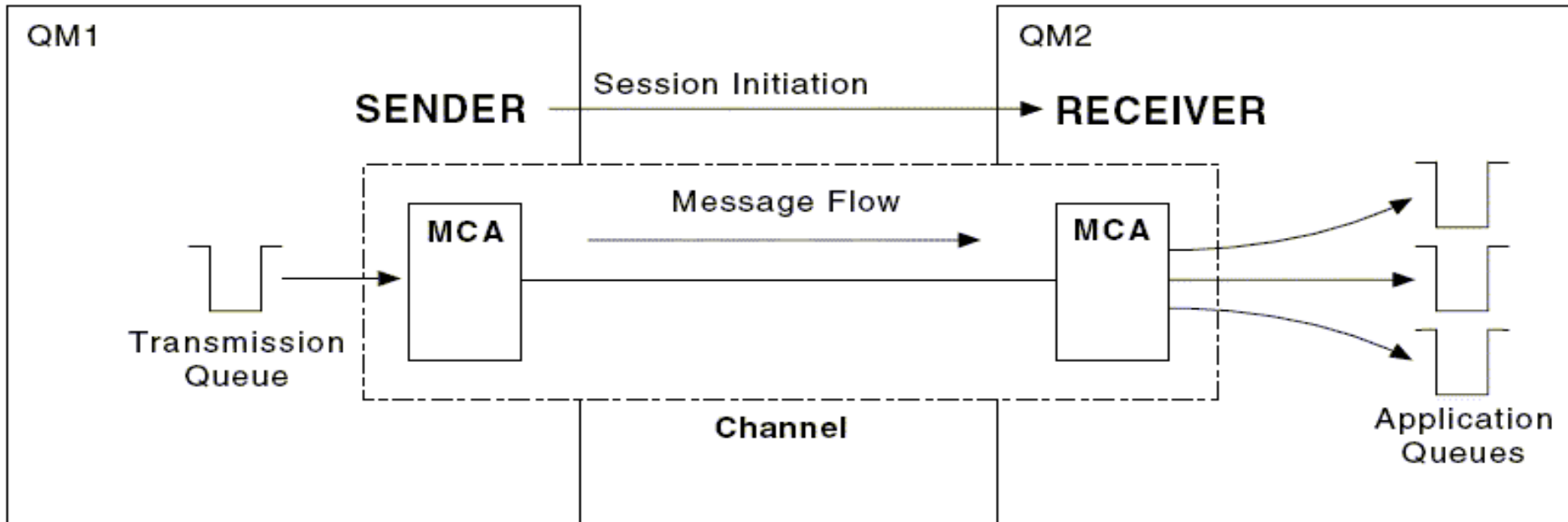
The following combinations of channels are valid:

Sender	**->**	**Receiver**
Sender	**->**	**Requester**
Server	**->**	**Receiver**
Server	**->**	**Requester**
Requester	**->**	**Sender**
Requester	**->**	**Server**
Client	**->**	**Server-connection**

What's new in WMQ for z/VSE V3R0
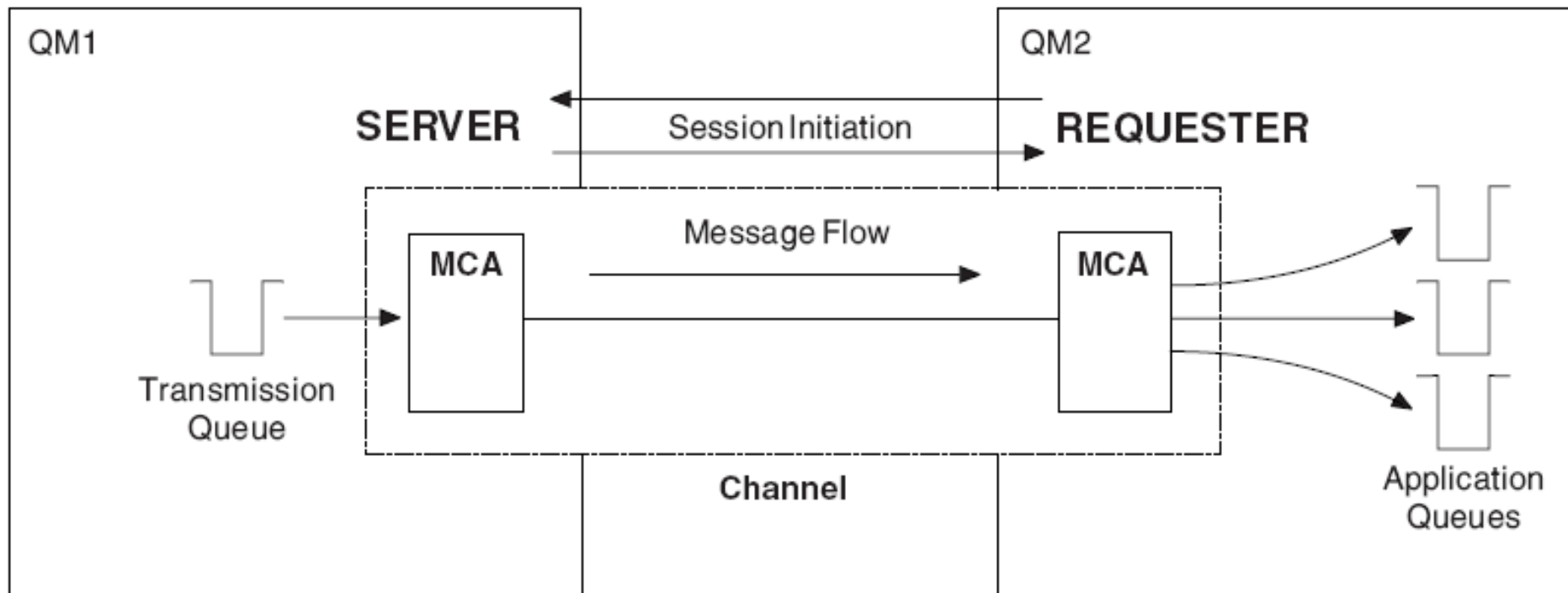
Server and Requester channels

Sender -> Receiver is unchanged

What's new in WMQ for z/VSE V3R0
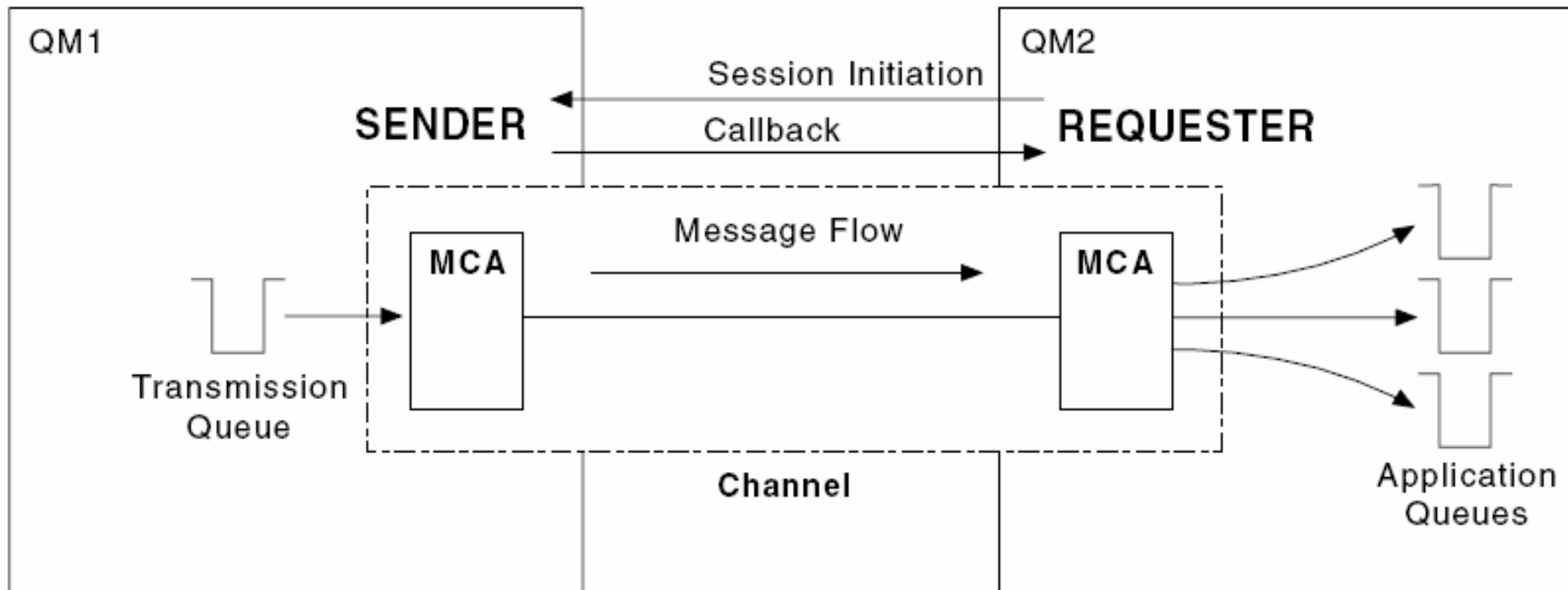
Server and Requester channels

Server -> Requester can be started in either direction; the messages flow from server to requester

What's new in WMQ for z/VSE V3R0

Server and Requester channels

A Requester can start a Sender channel

What's new in WMQ for z/VSE V3R0

- Chained channel exits

  ►Channel-exit programs for Message Channel Agent (MCA) programs. These communications facilitate remote queuing and client connectivity. WebSphere MQ for z/VSE supports a chain of up to eight send, receive, and message exits.

- API exits

  ►Allow to change the behaviour of WebSphere MQ API calls, before or immediately after those calls. WebSphere MQ for z/VSE supports a chain of up to eight API exits.

What's new in WMQ for z/VSE V3R0

API exits

- Need to be configured in WMQ for z/VSE.
- Are called when an application issues an MQCONN call

- Each exit is expected to use the supplied MQXEP() call to register functions that are to be called before and/or after relevant MQI calls.

- An API exit environment exists for each active connection and is released when the application issues an MQDISC call.

What's new in WMQ for z/VSE V3R0

- Channel batch interval

  ▶ The batch interval is a period of time, in milliseconds, during which the channel will keep a batch open even if there are no messages on the transmission queue.

- Performance improvements

  ▶ Performance improvements were done specifically in the area of MQI operation. Logic paths and the use of resources have been reduced to improve message throughput.

- WMQ Explorer support

  ▶ A graphical tool to perform administration tasks. It is in an style based on the Eclipse framework. This interface support now remote administration of both MQSeries for VSE V2.1.2 and WebSphere MQ for z/VSE V3.0.

What's new in WMQ for z/VSE V3R0

Graphical administration of WebSphere MQ for z/VSE Queues with WMQ Explorer

You can use Explorer to administer the z/VSE queue manager, its queues, channels and namelists, including create, delete, modify and display.

WebSphere MQ for z/VSE V3R0

MQ Explorer Software prerequisites

WebSphere MQ Explorer support requires one of:

> WebSphere MQ Explorer V6.0.2.6, or later
> WebSphere MQ Explorer V7.0.0.1, or later
> WebSphere MQ Explorer supportpac MS0T

WebSphere MQ Explorer V6.0.2.6 is scheduled for release 1Q2009. Customers who need this support before 6.0.2.6 is released can order:

> APAR IC59067

For Explorer to function with MQSeries for VSE V2.1.2:

> APAR PK73136

Compatibility and migration

WebSphere MQ for z/VSE V3.0 can participate in distributed message queuing solutions with all supported V5, V6, and V7 WebSphere MQ products and with the existing MQSeries for VSE V2.1.2 product.

WebSphere MQ interfaces for z/VSE applications:
- CICS MQI (this is the normal interface usable by CICS applications)
- Batch Interface (this is usable by applications running in a local non-CICS environment)
- MQ Client (this is usable by LE VSE applications running in CICS or non-CICS)
- MQ Client Bridge (this is for non-LE VSE applications running in a non-CICS environment)

Note:
- Applications from MQSeries for VSE/ESA V2.1.2 can be migrated without change.
- Configurations from V2.1.2 can be used with V3, however, you must run the MQJSETUP.Z job followed by the MQSU transaction after installation of the V3 product.

Integration of VSE Programs with MQ Series
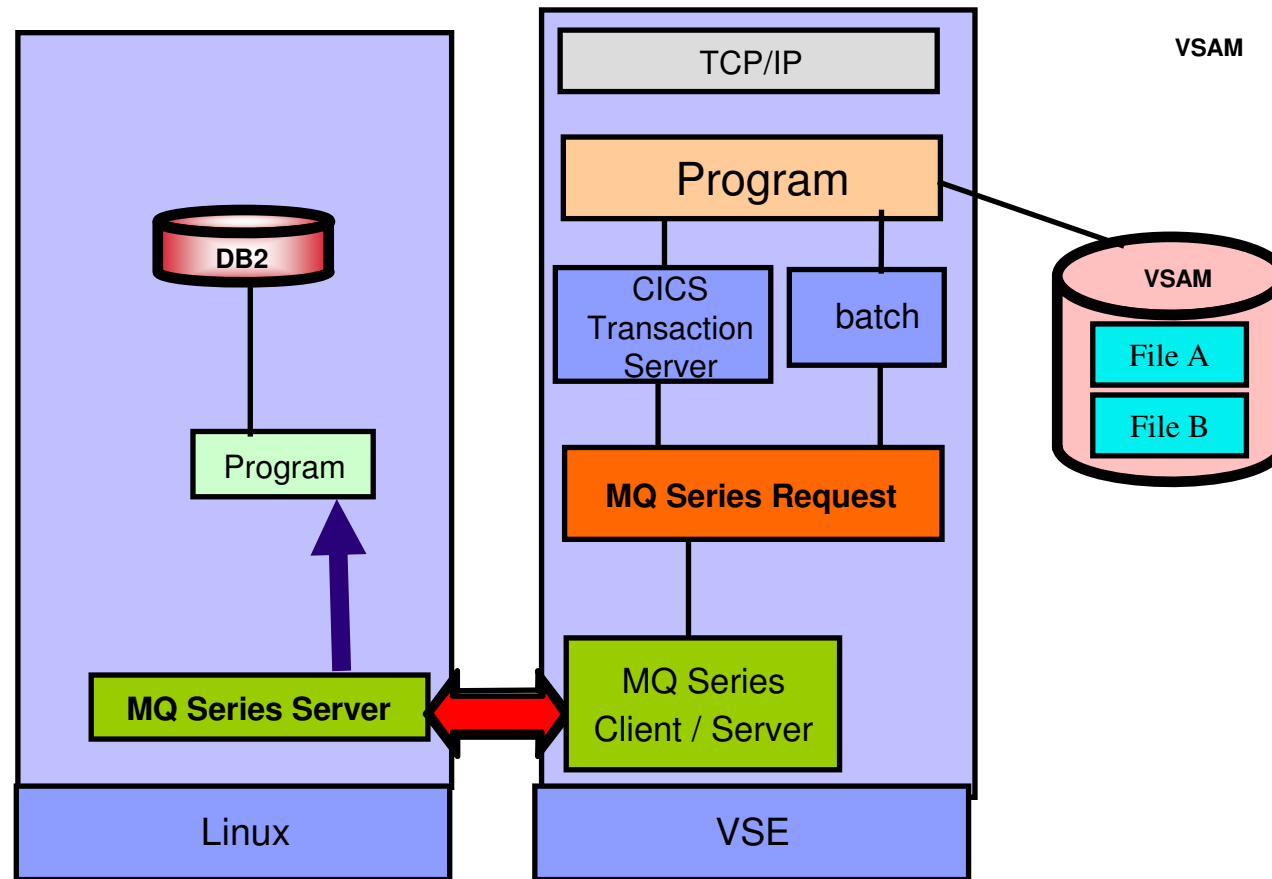
► Data distribution via MQ Series technology

► VSE programs have to write MQ messages

► WebSphere MQ Series Client for VSE – cost effective enablement for MQ environments and modern solutions

Topics

- **Fundamentals of Message Queuing**

- **WebSphere MQ for z/VSE Version 3.0**

- **Modern Solutions with WMQ for z/VSE**

  - ▶ **DB2 Replication**

  - ▶ **VSAM Replication with WebSphere MQ**

  - ▶ **SOA Backbone solutions**

Application Integration with WebSphere MQ Series Solutions

Linux on System z

AIX / Linux SAP ORACLE / DB2
MQ

WebSphere MQ Series server

DB2 UDB

Connection via HiperSockets

z/VSE Production Environment

+ CICS
+ COBOL
+ VSAM
+ DB2

+ WebSphere MQ Client or Server

z/VSE Test Environment

+ CICS
+ VSAM
+ COBOL

OS/400 Linux DB2
MQ

z/VM V5	LPAR or z/VM
IFL Engine	**Standard Engine**
IBM System z	
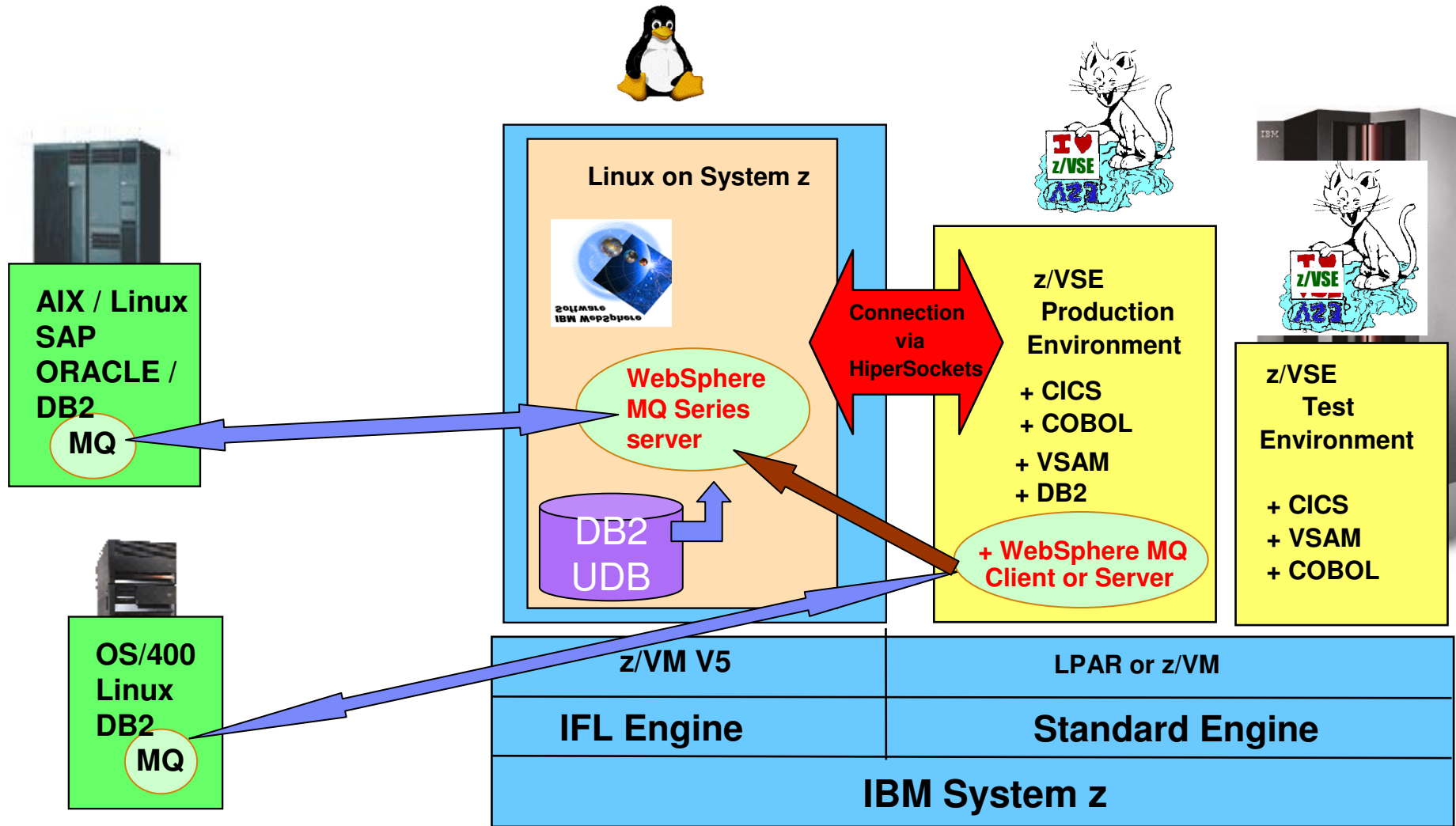
Solution 1:
DB2 Replication with WMQ using Queue Subscription
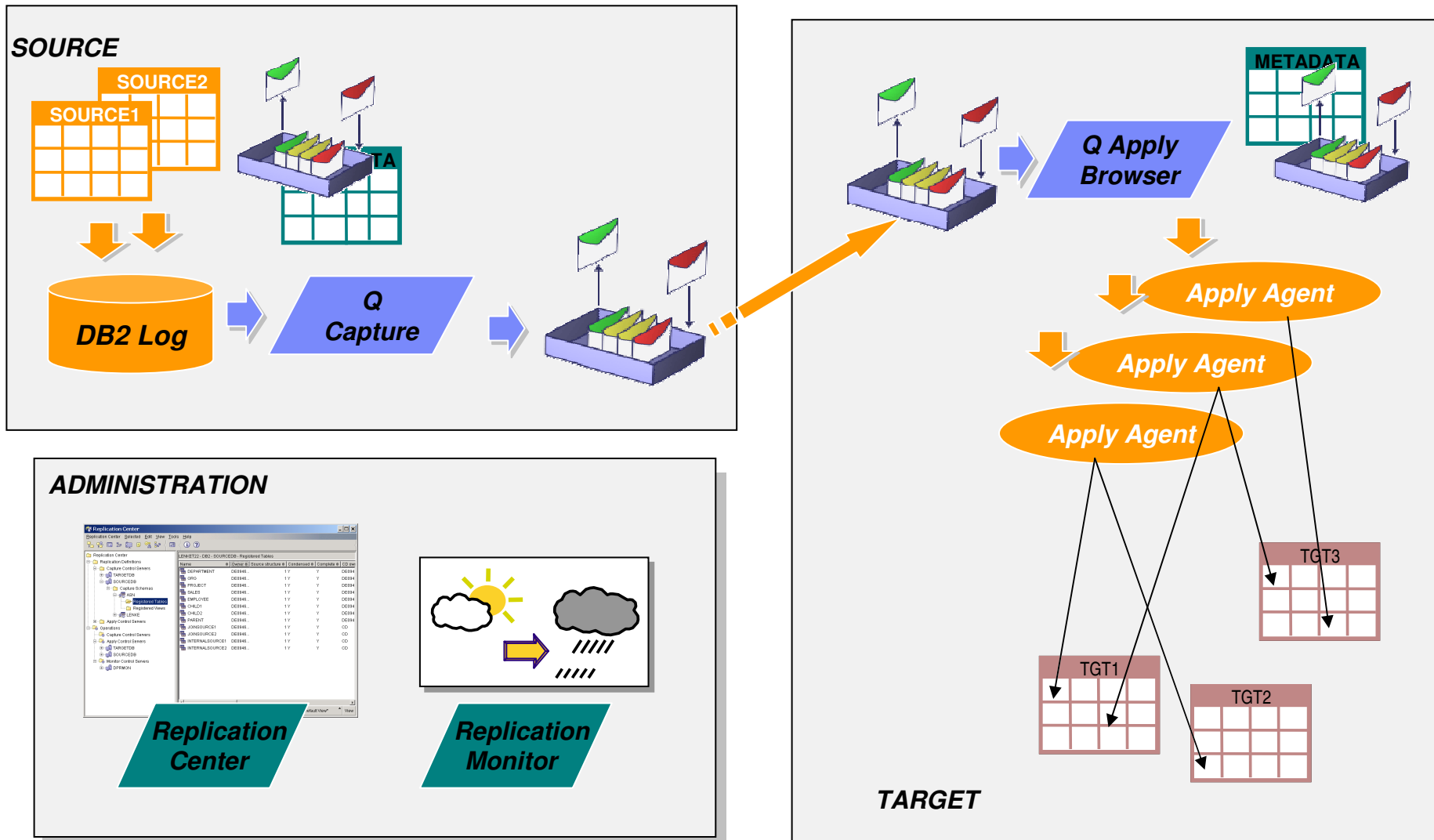
Solution 2: VSAM Programs enablement for MQ solutions

System p

AIX / Linux SAP

MQ

DB2

Linux on zSeries

Software IBM WebSphere

WebSphere MQ Series server

Connection via HiperSockets

z/VSE Production Environment
+ CICS
+ COBOL
+ VSAM

+ VSAM Redirector*

MQ Exit

WebSphere MQ Client or Server

z/VSE Test Environment

+ CICS
+ VSAM
+ COBOL

System i

OS/400 Linux

MQ

DB2

LPAR or z/VM	
IFL Engine	**Standard Engine**
IBM System z	

(*) VSAM Redirector – with MQ Exit – an MQ Solution without changes to VSAM programs

SOA Solutions:
# IBM delivers *the* SOA Messaging Backbone

- **Via messaging portfolio of standalone and embedded services**

▶ **Core is WebSphere MQ family**

▶ **Continually evolving and expanding**

▶ **Extensive IT environment coverage**

▶ **Provides "MQ inside" SOA portfolio**

▶ **Offers an integrated JEE experience**

▶ **Shared within stack of SOA products**

WebSphere MQ
- *for z/OS*
- *for z/VSE*
- *Extended Security*
- *Everyplace/Mobile*
- *Telemetry Transport*
- *Low Latency Messaging*

WebSphere Transformation Extender

WebSphere ESB

WebSphere Application Server

WebSphere MQ family | **Embedded Messaging**

SOA MESSAGING BACKBONE
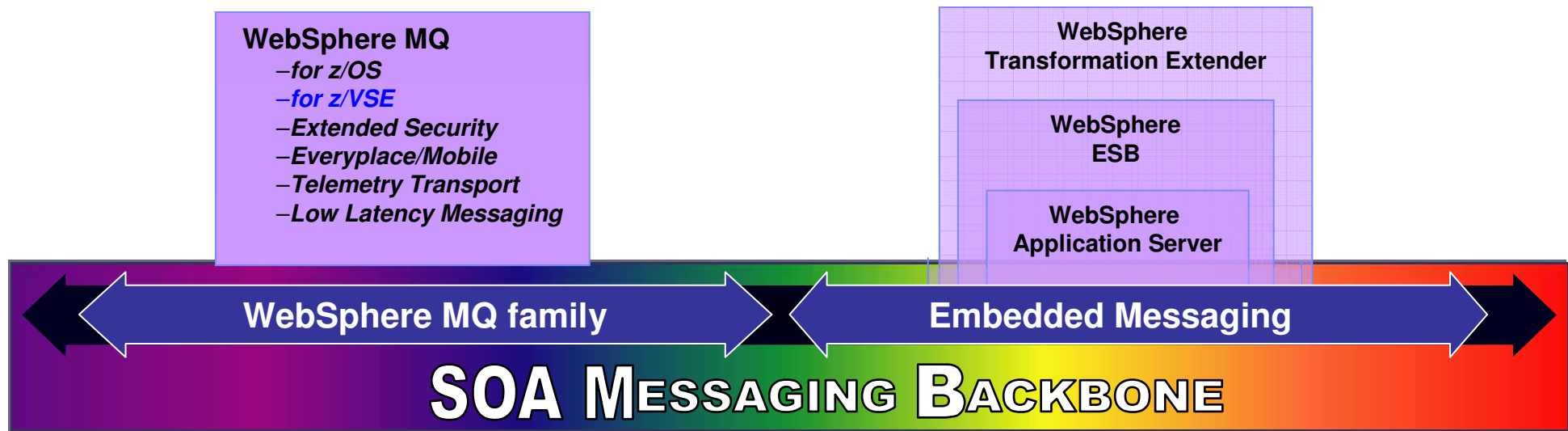
- **Seamless bridging and native links within messaging portfolio**

  ▶ **Preserving reliability, transactionality and publish-and-subscribe spaces**

Solution 3: Message Workflow handling
The Message Broker

- Distributes information and data generated by business events in real time to applications, and devices throughout your enterprise and beyond.

- Using WebSphere Message Broker decouples the applications.

  ▶ Application A writes a message into a queue QA.

  ▶ Application B reads its messages from the queue QB and application C reads its messages from the queue QC.

  ▶ These applications do not have to be aware of each other and their used format. The message mediation, routing and transformation is done by the WebSphere Message Broker.
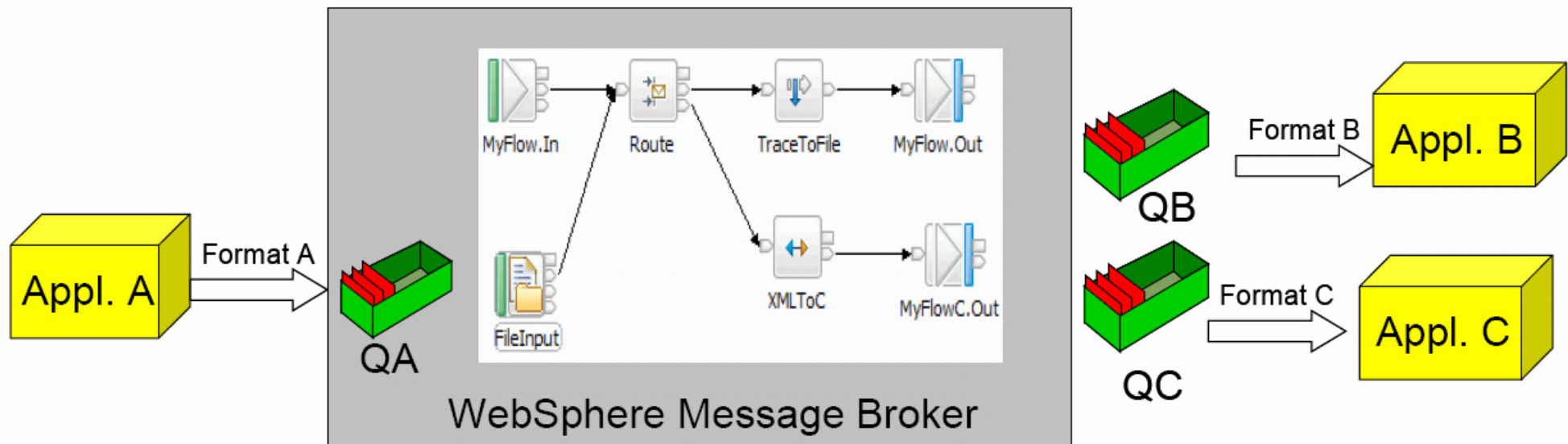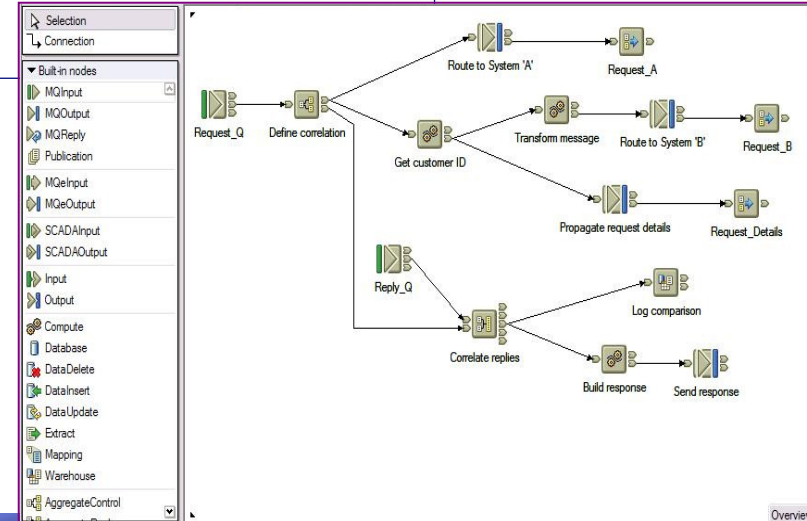
WebSphere Message Broker Flow
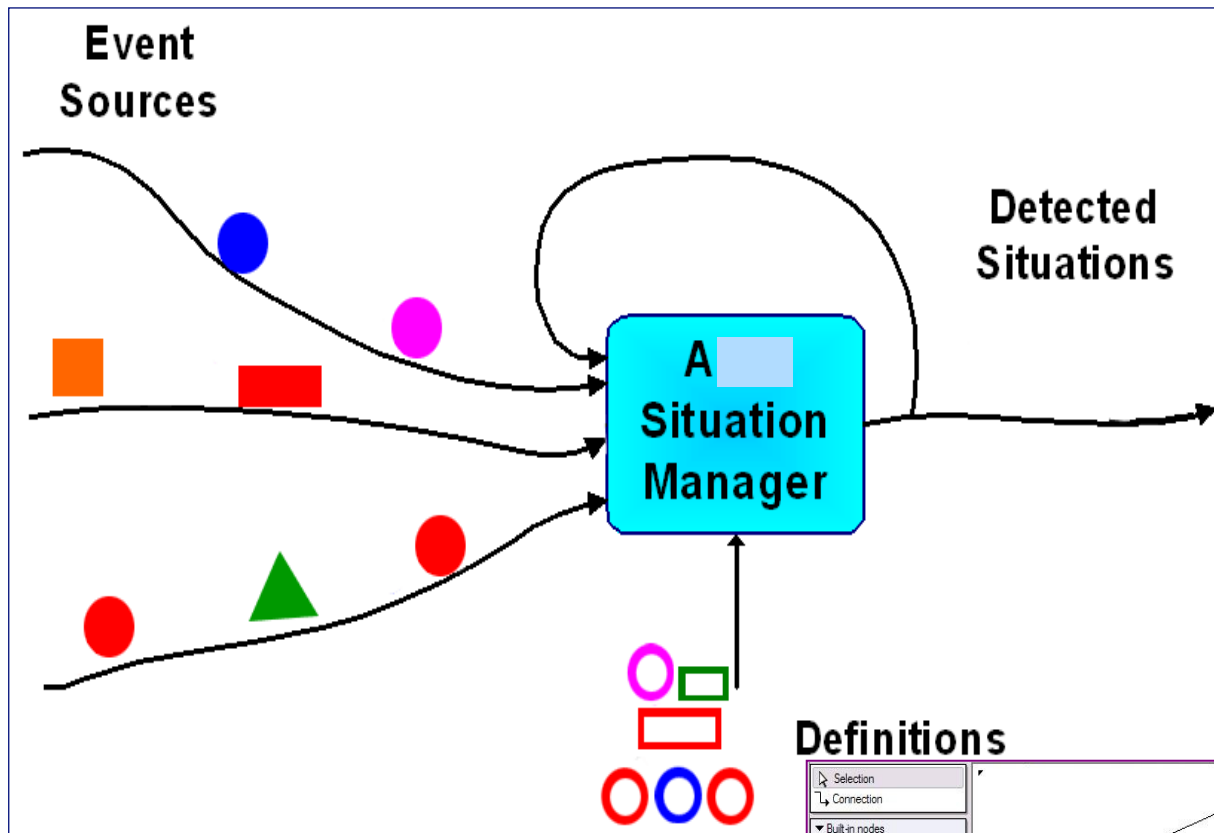
1. **A framework for processing MQ messages**

2. **A robust hosting environment for:**

   ✓ Transforming data
   ✓ Enriching data
   ✓ Interacting with databases
   ✓ Routing messages based on content
   ✓ Detecting complex combinations of messages
   ✓ Interacting existing applications with Web Services

Solution 4: WebSphere ESB and WebSphere Message Broker

Challenge: Retail Stores, Inc. faced three integration headaches:
- Integration efforts at the corporate data center,
- a new store system scheduled for introduction required integration at the store level,
- each of the over 500 store locations had to be seamlessly linked to the corporate data center.

Corporate Data Center

WebSphere Message Broker at corporate data center
- Connectivity hub for distributing information to the store locations
- Transforms messages between various applications and systems
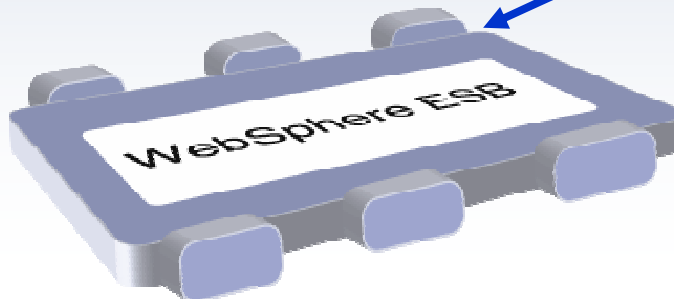
WebSphere ESB at each store location
- Links multiple J2EE applications in addition to linking to Point of Sale terminals
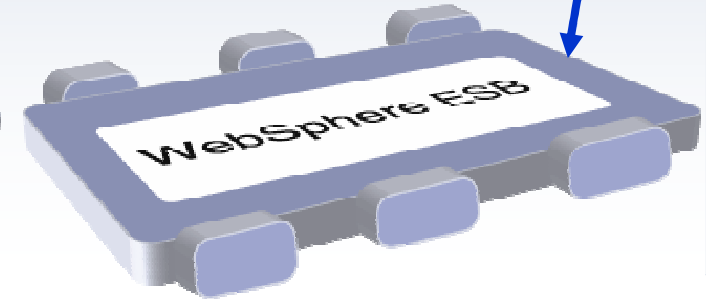
**Store Location 1**   **Store Location 2**   **Store Location 3**

Solution 5: Publish / Subscribe - Enabling Flexible Routing and Delivery on IBM's SOA Messaging Backbone

4. Publish-and-Subscribe

- ► **Dynamic and flexible way of determining where messages are sent**
- ► **Helps reduce the cost, time and skills when changes are required**
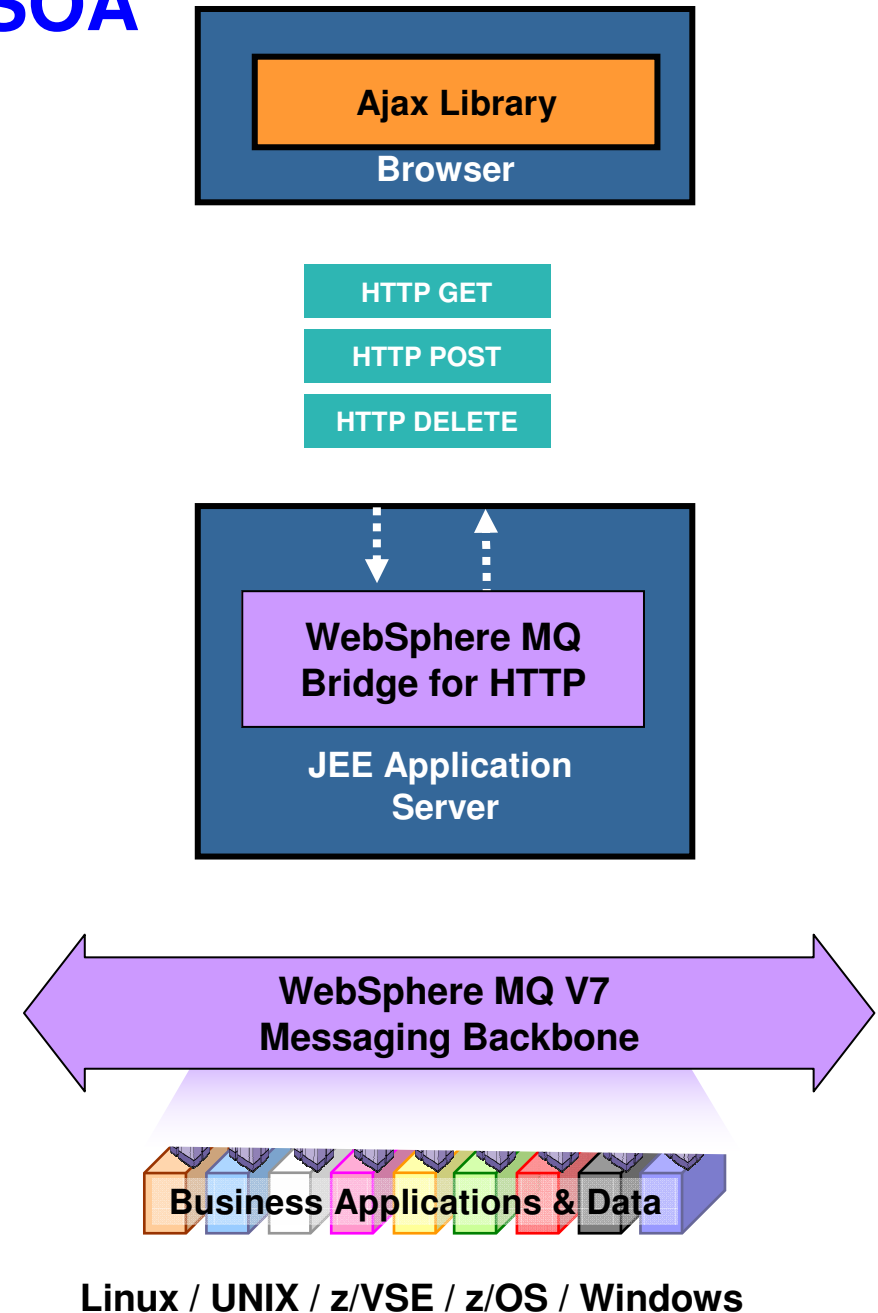- ► **Helps define new paths of information flow in an ad hoc manner**
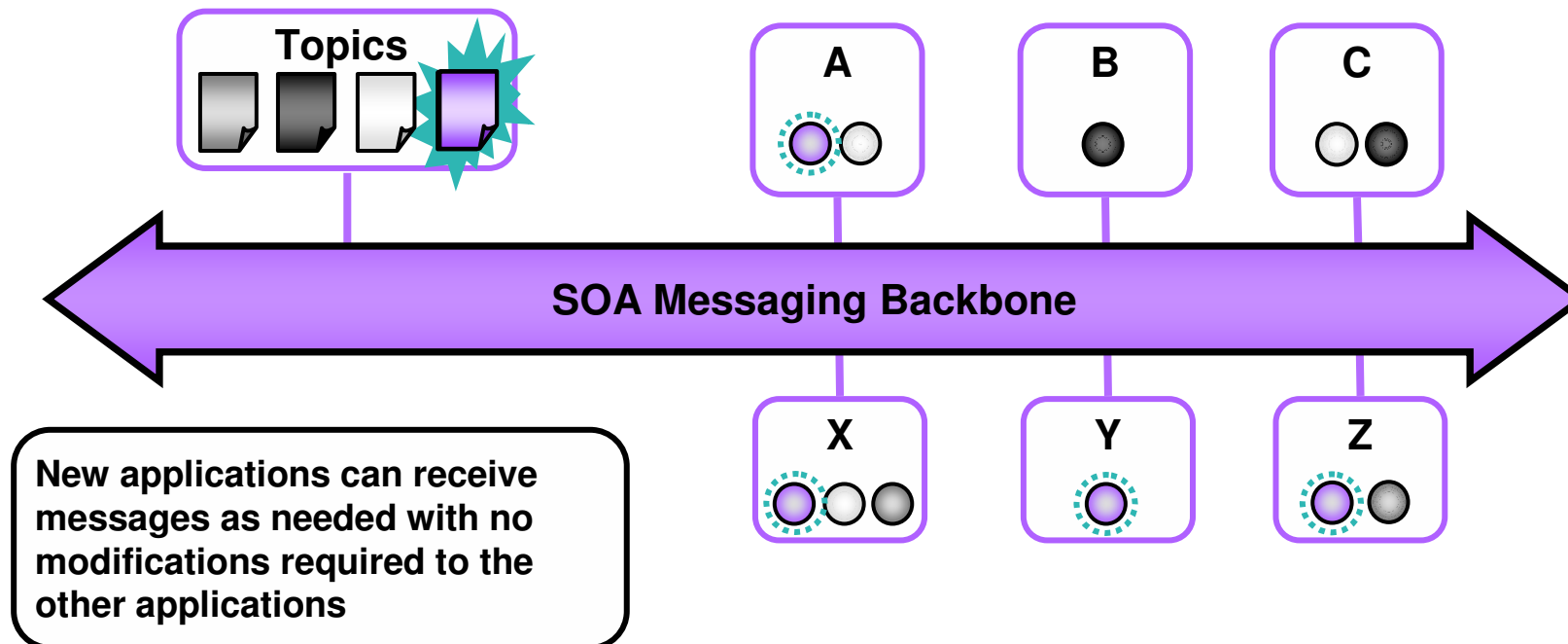
Web 2.0 Connectivity for IBM's SOA

WebSphere MQ goes Web 2.0!

- ► **Helps enrich Web 2.0 applications with real business data**
  - **Distributed and z/VSE platforms**

- ► **Developer needs no MQ skills**
  - **Uses Ajax and simple interface to access data by URIs**

- ► **Helps simplify deployment and maintenance of large scale distributed applications**
  - **Enables simple access to MQ without need to install MQ clients**

Ajax Library

Browser

HTTP GET

HTTP POST

HTTP DELETE

WebSphere MQ Bridge for HTTP

JEE Application Server

WebSphere MQ V7 Messaging Backbone

Business Applications & Data

Linux / UNIX / z/VSE / z/OS / Windows

Customer Conferences in 2009 for z/VSE, z/VM and Linux

- **IBM System z Technical Conf. in Brussel (Belgium), May 4-8, 2009**
  - ► Approx 500 attendees, mainly from Europe, thereof approx 80-100 for VM and VSE

- **WAVV in Orlando (Florida), May 15-18, 2009**
  - ► Approx 250 attendees, mainly from the US
  - ► This is the prime conference for z/VM, z/VSE and Linux within AG

- **IBM System z EXPO in Orlando (Florida) , 5-9 Oct, 2009**
  - ► Expect approx 1000 attendees, worldwide, thereof approx 100-200 for VM and VSE

- **GSE European Working Group in Dresden (Germany), 26-28 Oct., 2009**
  - ► Expect approx 200+ attendees, mainly from Europe
  - ► This is going to become the prime conference on VM/VSE and Linux within Europe

More Information

➢WebSphere MQ Application Integration
   ➢http://www-01.ibm.com/software/websphere/products/appintegration/

➢How to install and setup WebSphere MQ for z/VSE with Security
   ➢ftp://ftp.software.ibm.com/eserver/zseries/zos/vse/pdf3/How_to_setup_SSL_with_MQ.pdf

➢Product Documentation for WMQ for z/VSE V3:

   ➢   WMQ for z/VSE System Management Guide (GC34-6981-00)

   ➢   Using MQSeries for VSE Redbook (SG24-5647-01)

   ➢   PSP Bucket (WMQVSE 300)

Note: WMQ for z/VSE V3.0 does not have a Program Directory. Chapter 2 of the System Management Guide contains installation instructions, and is shipped with the V3 product.