



| IBM Software Group

# IBM Event Publishing Products

CICS Business Event Publisher for MQSeries (CICS, DB2, IMS & VSAM)

WS Information Integrator Event Publishers for DB2, IMS, VSAM, etc.



## Session Objectives

- **Understand what Event Publishing is**
  - **How it enables business events within a SOA**
- **IBM Event Publishing solutions for z/OS**
  - **Different business needs drive different solutions**
    - **Understand product capabilities**
    - **Clarify perceived functional overlaps**
- **Product introductions**
  - **Architecture, unique strengths, customer scenarios**
- **Summary and Q & A**



# Enterprise Infrastructure Is Complex – Event Publishing and SOA remove the barriers of Inter-operability

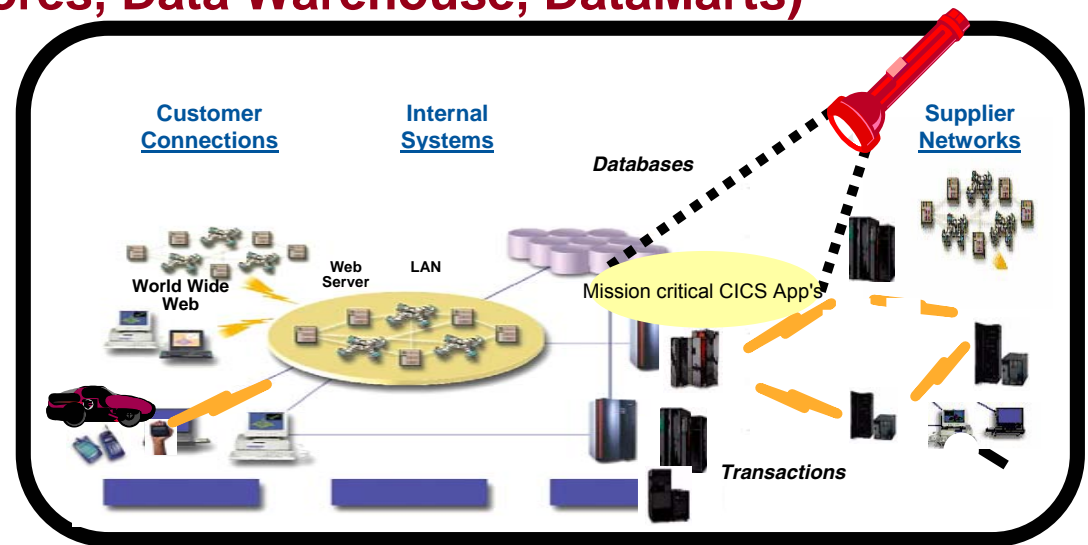
***Companies need to reuse their legacy applications and data***

**Companies want to:**

- Transform core applications from 'static' to 'real-time' scenarios
- Reuse their 'owned' data
- Improve audit control and fraud detection.
- Drive & Integrate Business Processes Based Upon Change Activity
- Maintain copies of Data ( DataStores, Data Warehouse, DataMarts)

**How:**

- ▶ Quickly
- ▶ Without changes to existing application code
- ▶ Within their technology infrastructure



# Event Publishing

***Event Detection and Publishing offers a new paradigm for driving business integration & 'reusing' information***

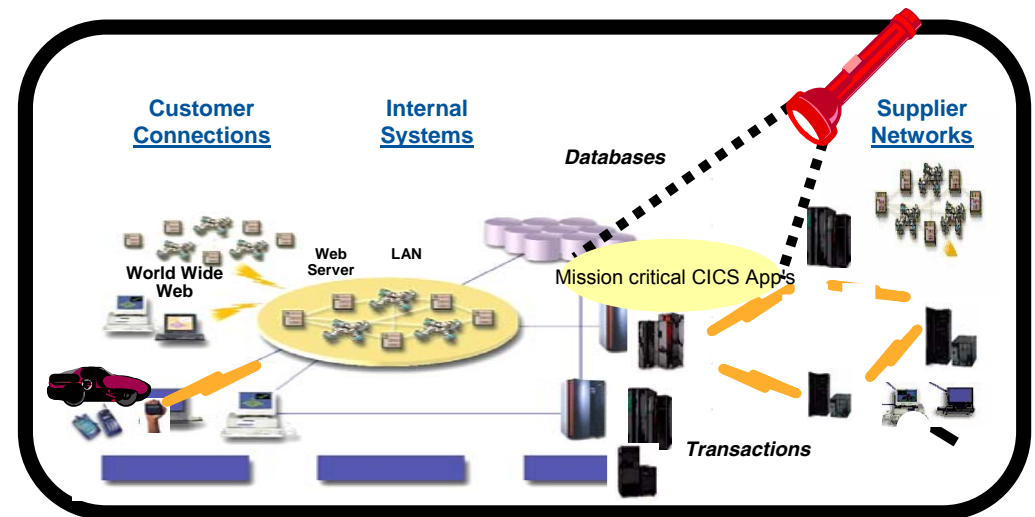
**Provides immediate detection of activity and data changes.**

**Enables immediate, real-time action to be taken.**

**Empowers improved audit control and fraud detection.**

**All:**

- ▶ ***Quickly and without changes to existing applications or data***



**✓ Provides for reliable and fast 'reuse' of information**



# IBM Event Publishers

## IBM offers two solutions

- **CICS Business Event Publisher for MQ**
  - **Single product -- CICS, VSAM, DB2 and IMS**
- **WebSphere Event Publishers**
  - **WS Data Event Publisher for z/OS ---- DB2 for z/OS only**
  - **WS Data Event Publisher ----- DB2 for LUW only**
  - **WS II Classic Event Publishers ----- VSAM, IMS, IDMS & Adabas**



## High Level Positioning

### **A P P L I C A T I O N Driven Events ...**

**CICS BEP to enable CICS and batch applications to detect VSAM, DB2, and IMS events that require an immediate 'push' to MQ**

### **D A T A Driven Events ...**

**WS II EP for near real time "push" data integration of DB2, IMS, VSAM, IDMS, ADABAS, UDB, etc ...**



# Application Event Monitoring & Publishing

## **CICS BEP:**

- Monitors events emanating from:
  - CICS Apps (VSAM, DB2, IMS events)
  - Active logging and recovery
  - DB2 and IMS via active logging or log files
  - VSAM (Read, browse, update, write)
    - Valuable for security and audit purposes
- Leverages “rules engine” to filter and create messages
- Publishes native z/OS data messages to MQSeries queue
- Option to generate XML message



# Data Event Monitoring and Publishing

## WebSphere Event Publishers:

- Captures changed-data events:
  - During active logging (real time mode)
  - From log files (background and recovery modes)
  - For DB2 (z/OS and distributed), IMS, CA-IDMS, Adabas & VSAM
- Reformats data into a consistent relational format based on metadata definitions
- Publishes data to MQSeries as XML or as delimited text
- Filters non-DB2 data via meta data definitions and views
- Integrated with other Information Integration solutions





# Product Ordering Info

<b>Product Information</b>			
<b>PRODUCT</b>	<b>VERSION</b>	<b>PID</b>	<b>S&amp;S PID</b>
CICS Event Publisher for MQ	V1.2	5655-J99	5655-J97

<b>Product Information</b>			
<b>PRODUCT</b>	<b>VERSION</b>	<b>PID</b>	<b>S&amp;S PID</b>
WS Data Event Publisher (DB2 LUW)	V9.1	5724-N99	
WS Data Event Publisher for z/OS (DB2 only)	V8.2	5655-M36	5655-M50
WS II Classic Event Publisher for VSAM	V8.2	5655-M35	5655-M51
WS II Classic Event Publisher for IMS	V8.2	5655-M38	5655-M49
WS II Classic Event Publisher for CA-IDMS	V8.2	5655-N56	5655-N55
WS II Classic Event Publisher for Adabas	V8.2	5655-P12	5655-P13



# How They Differ (in bold...)

## CICS BEP

- **Monitors:** -- Active and **Recovery**
  - IMS, DB2, **Application events**
- VSAM
  - **Captures read access**
  - **CICS execution and Batch**
- Publishes data in:
  - EBCDIC, XML
  - **Native** file/database format
  - Can **merge** data from multiple sources
- **Filter** by column/field and by row/record

## Completely Unique

- ✓ Rules can process data before publishing
  - Unlimited post-capture, pre-publish processing capabilities. For example:
    - Create a single user defined message from multiple sources
    - Unlimited integration potential using rules

## WebSphere Event Publishers

- **Monitors:** -- Active and **Recovery**
  - IMS, DB2, **IDMS, Adabas**
- VSAM
  - MVS forward **recovery logs**
  - VSAM **Autojournals**
- Publishes data in a consistent relational format
  - EBCDIC, XML, **Unicode**
  - **Relational** map of native file/database format so all data appears to come from same source
- **Filter** by column/field and by row/record

## Completely Unique

- ✓ Integration
  - WS DataStage & WS Q-Replication
  - Multiple packages based on user requirement
    - Low-cost, limited-use package for DataStage
    - Replication package for System z source to DB2, Oracle, Sybase, SQL Server, Informix



# Customer Scenarios with CICS BEP

## ■ **Authenticating usage based on access patterns - activity audits**

CICS BEP monitors who is accessing a secure database looking for unusual volumes, access patterns, access locations and so on. Based on the CICS BEP rules that can include an analysis of data read, it can post a message detailing suspicious behavior. This message is then picked up by a fraud detection application for further study.

## ■ **Detecting CICS Application errors earlier - error notification**

CICS BEP evaluates all 'Exec CICS Link' commands in order to understand if the command has been issued for an application error. If BEP detects an error, an "alarm message" is written to 2 MQ queues when a given threshold of errors in a time interval is exceeded. The 1<sup>st</sup> queue manager sends the message to an "alarm console" and the second is read by computer/telephony integration layer which sends a SMS message to a specified cell phone. All parameters (error codes, threshold, alarm and SMS messages, time interval, cellular number) are defined in CICS BEP's rules engine and the MQ message content through the CICS BEP administration workstation. They can be easily modified and tuned without any programming effort.

## ■ **Credit card limit approaching - threshold notification**

With CICS BEP, a bank offers a service whereby customers can be contacted by text message to their cell phones, when their card limit reaches a certain level – for example \$5000. The customers themselves decide on what this rule should be. CICS BEP monitors the account balance and as soon it reaches \$5000 (or whatever) an MQ message is generated, and sent to a telephony integration broker. This creates an SMS message which is then sent to the customer's cell phone.



# Customer Scenarios with WS EP

- **Synchronizing operational data store or data warehouse with z/OS operational data**  
(heterogeneous Extract-Transform-Load (ETL))

WS EPs monitor the changes made to key operational data stores and post designated changes to the message queue. Data is delivered in a standardized relational format. An ETL solution like IBM's WS DataStage or Informatica's pick up the changes, applying additional transformations and updating the ODS or data warehouse. Key to this scenario is that WS EP guarantees that should any component fail, no data is ever lost.

- **Order processing drives Siebel update**  
(data synchronization across application silos)

Buyer information in the Siebel CRM database is updated whenever new orders are processed. Orders can come from a legacy COBOL system or a new e-commerce system. WS EPs capture the updates to the order database, regardless of the application that drives the update, and post a message with this data so that WebSphere Business Integrator can pick it up and initiate a Siebel Connector to do the CRM database update.

- **Push CA-IDMS data to DB2**  
(heterogeneous synchronization)

WS Classic Replication monitor the changes made to key operational IDMS data stores and post designated changes to the message queue in a binary format specifically designed for consumption by WS Replication Server. WS Replication Server picks up those changes and posts them to DB2 on System z. This empowers legacy data movement into a DB2 (or other relational database system) for the next generation of applications.





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# IBM Event Publishing Products

## CICS Business Event Publisher – Product Overview

### Satish Tanna

**WebSphere** software



@business on demand software

# Agenda

- Application Interoperability and Integration using Business Events
- The role of CICS Business Event Publisher
- Types of Business Events currently supported
- Business Event Publisher Components
  - Workstation Client
  - Event Source Connectors
    - CICS Event Source Connector
    - DB2 Event Source Connector
    - IMS Event Source Connector
  - Message Server
  - Rules Database/ Engine
- Summary

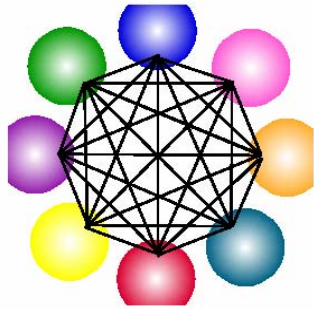


## Barriers to interoperability

- Legacy of heterogeneous application systems presents challenges in interaction
  - different programming languages, operating systems, and hardware platforms
  - different software vendors, in-house code
  - APIs and file formats that change because of evolving business requirements
- Historically, integration systems have been ad-hoc
  - programming language bridges, binary conversions lead to high maintenance costs and brittle infrastructure
  - multiple technologies, specialized for each integration connection, lead to increasing complexity
  - the expensive work of integrating two systems cannot be leveraged for integrating a third system
- Proprietary EAI solutions offer some relief internally
  - but integration with a different partner with different technology causes further integration problems

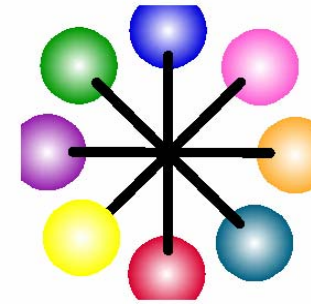


# SOA versus traditional integration



Traditional integration requires technology aware bridges between components. It is complex and expensive to implement and maintain.

Program bridges are typically based on APIs and file formats, but these change, leading to instability in the integrated system



In SOA, each component uses the same way of talking to other components, based on platform-neutral standards.

Anything that understands services can talk to other services, regardless of underlying implementation.

This approach greatly simplifies and strengthens integration effort.





# Event Driven Applications

- *Event Driven Architecture* is, conceptually, part of *Service Oriented Architecture*, and consists of a set of constructs (run-time artifacts, tools, APIs) intended to support *event-driven behavior*
  - An *Event* is a significant instantaneous atomic occurrence
    - to somebody
    - happens at a specific point in time
    - happens completely or not at all
  - An *Event Type* is a specific kind of event, whose event message has a pre-defined structure
  - An *Event Topic* is a “data type channel” for all event messages of the same type.
  - An *Event Stream* is a sequence of events of the same topic.
  - An *Event Processing Network* is a directed graph of event processing operations connected through event topics.
  - *Event Processing Mediations* bridge the gap between “raw” events provided by external sources and “complex” events with added value derived from them

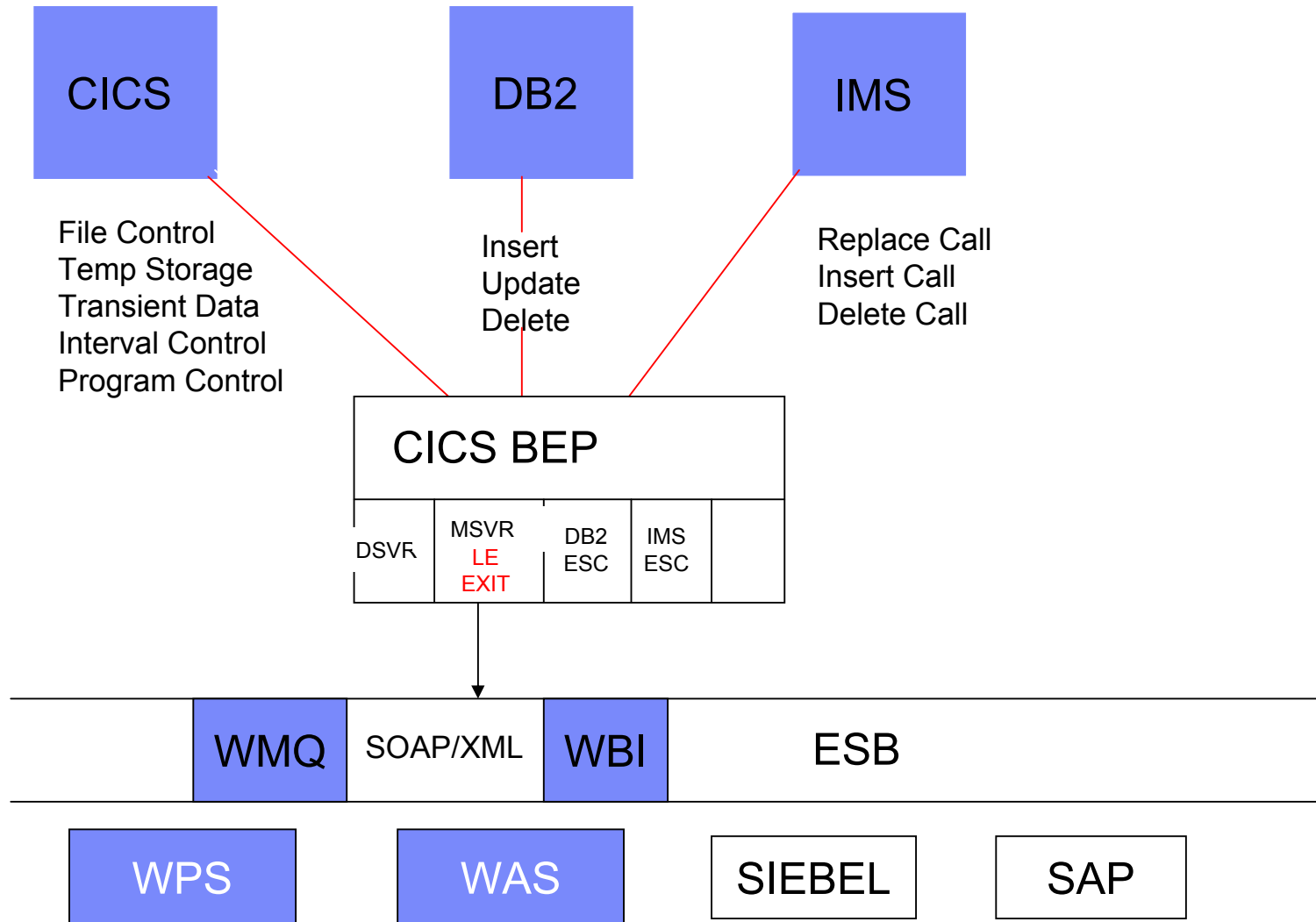


# The role of CICS Business Event Publisher

- Monitor application level events in CICS, DB2 and IMS
  - *based on user-specified selection criteria*
  
- Create messages from associated data
  - *based on user-specified message content rules*
  - *can be converted to XML using LE exit*
  
- MQPUT messages to WebSphere MQ queue
  - *user-specified*
    - queue name / queue manager name
      - can be dynamically created based on event data
    - MQSeries MQPUT options

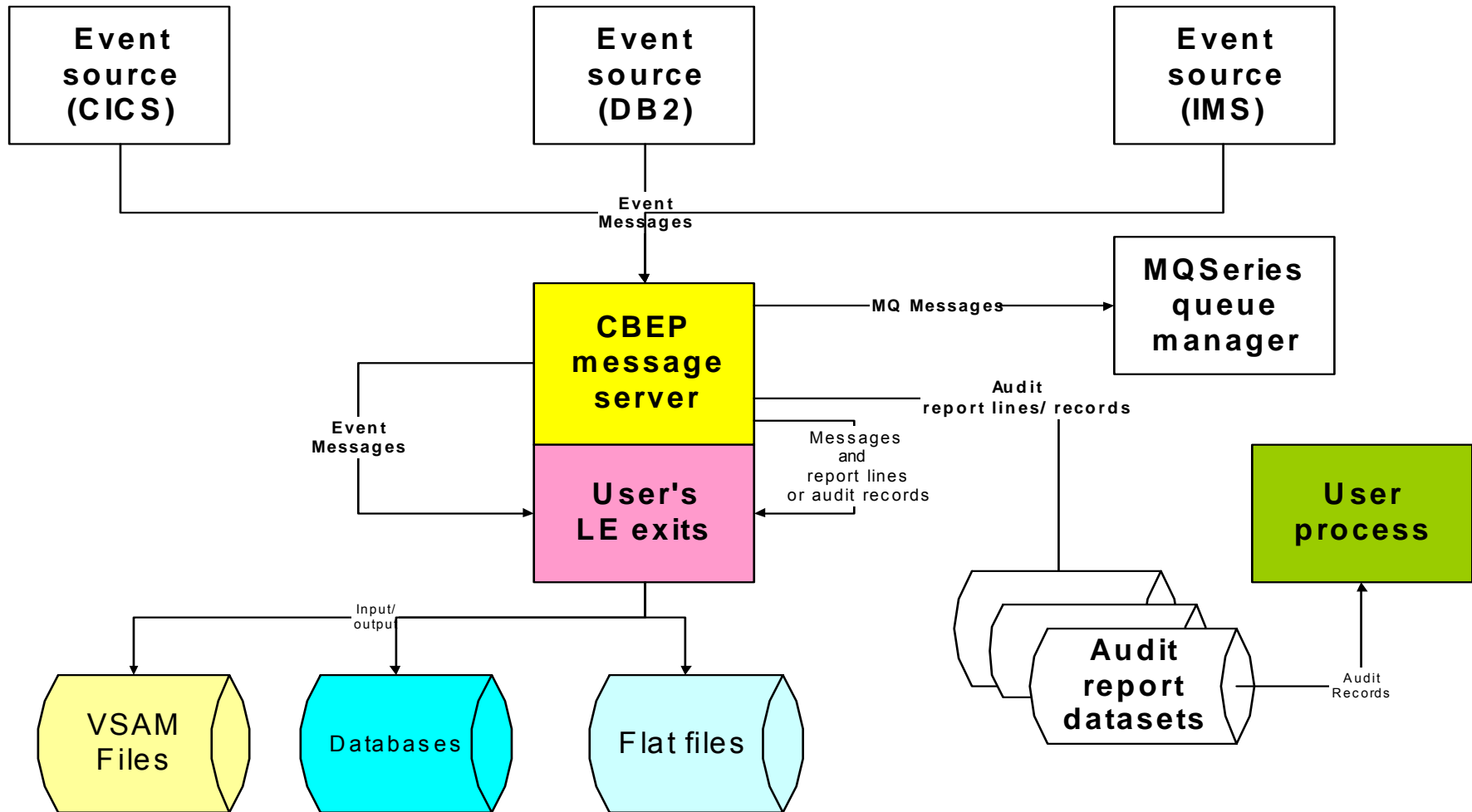


# Event Driven Applications within an SOA using CICS BEP



# LEExit support

## CBEP LE exit support Additional configurations



## LE exit audit reporting

- LE exits can be used to monitor activity in CICS, IMS or DB2
- Optionally report on these events and send a MQ message if required.
- An LE exit written to be an audit report program can format up to 10 report lines (or records) for each input event.
- Message server manages the writing and allocation/de-allocation of the audit report datasets.



# Types of Business Events currently supported

- **CICS event processing**
  - *File Control (VSAM)*
  - *Temporary Storage Queues (TSQs)*
  - *Transient Data Queues (TDQs)*
  - *Interval Control*
  - *Program Control*
- **DB2 event processing**
  - *Insert/ Update/ Delete for DB2 tables*
  - *from all sources (not just CICS)*
- **IMS/DB event processing**
  - *Insert/ Replace/ Delete for IMS data bases*
  - *Most database formats supported, including IMS Fastpath*
  - *from all sources (not just CICS)*
- **Support for CICS TS 3.1**
- **Program number: 5655-J99**
- **Minimum supported operating system releases**
  - *OS/390 2.10*
  - *z/OS 1.2*

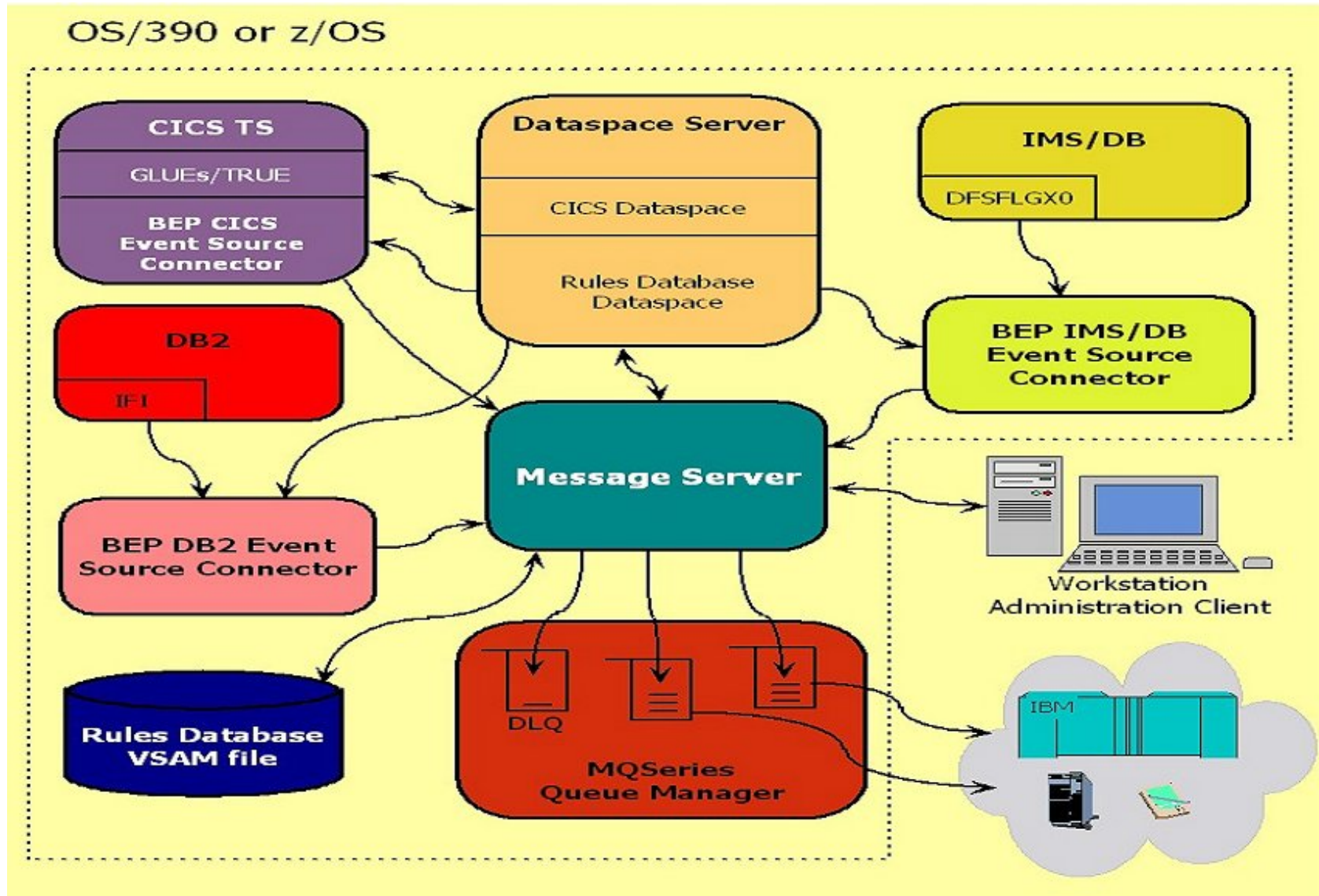


## Major Components of CICS BEP

- Workstation Administration client
- CICS Event Source Connector
- DB2 Event Source Connector
- IMS Event Source Connector
- Message Server
- DataSpace Server
- Rules Database/ Engine



# V1R2 architecture





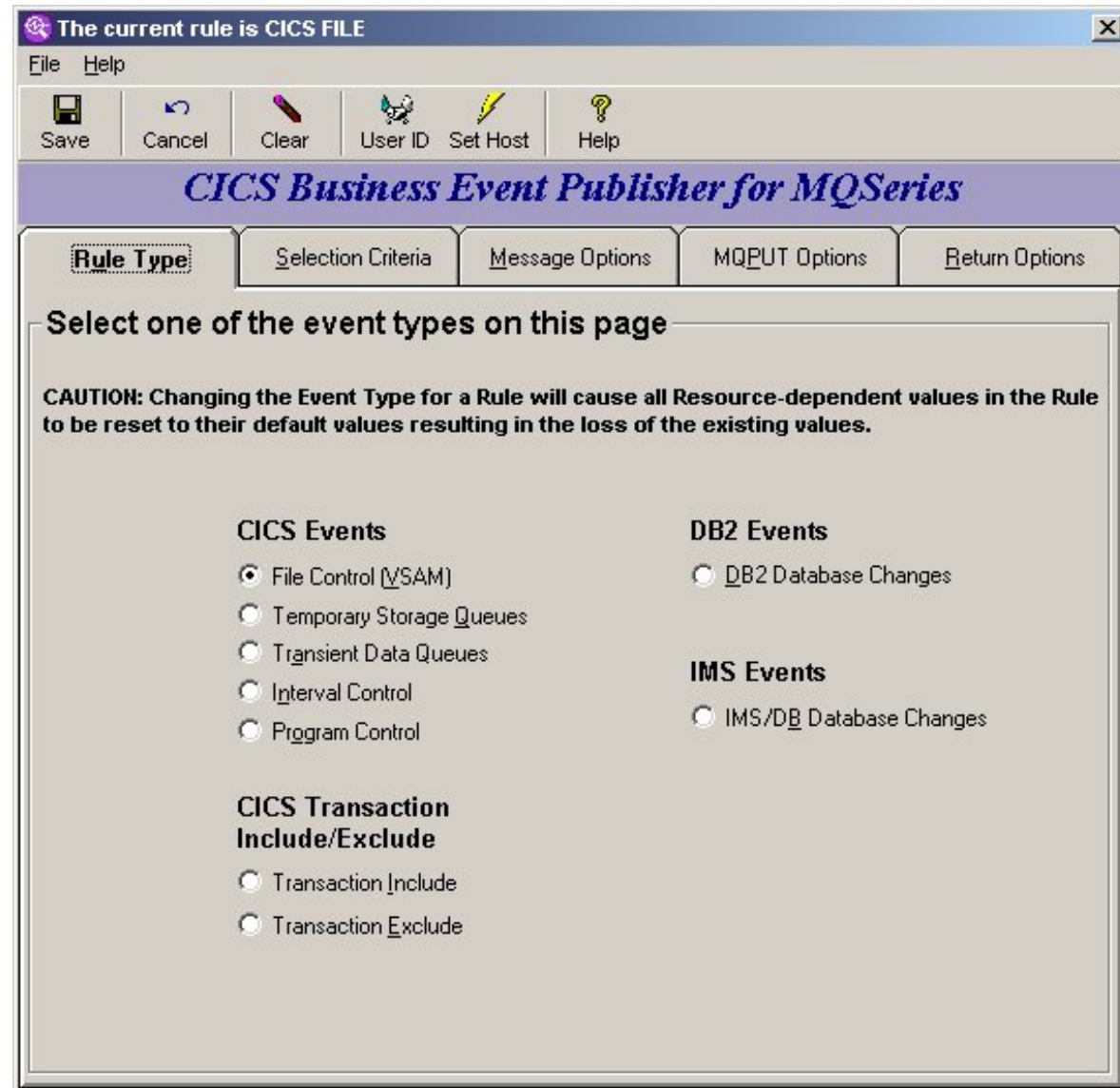
## Event Source Connectors

- OS/390 subsystem dependent
  - CICS TS, DB2, IMS
- Monitors events within subsystem
  - documented interfaces
    - Applies selection criteria to determine eligibility of event
- Builds messages for selected events
- Calls user exit, if defined. User exit can:
  - suppress message
  - defer message
  - alter message
  - “accumulate” messages
  - change destination queue and/or queue manager
  - change MQSeries MQPUT options
  - access other data sources (in some situations)
- Hands message to Message Server



## Rule Type Tab

- User should select from the list of Events
  - CICS
  - DB2
  - IMS
  
- Then click on
  - Selection Criteria
  - Message Options
  - MQ\_PUT Options
  - Return Options
  
- Details for each Connector follows



## Selection Criteria tab

- User specifies resource name
- User specifies filters
- Can target specific CICS API statements like FC WRITE, READ etc..
- Advanced Selection Criteria allows you to select at the field level

The current rule is NEW ORDER

File Help

Save Cancel Clear UserID Set Host Help

**CICS Business Event Publisher for MQSeries™**

Rule Type **Selection Criteria** MQPUT Options Message Options Return Options

File Name ORDRFILE

**Enter Selection Criteria**

Selection Criteria Enabled

All fields below are case sensitive

Select by Transaction ID

Include  Exclude ORDA

Select by User ID

Include  Exclude

Select by Terminal ID

Include  Exclude

Select by APPLID

Include  Exclude

Advanced Selection Criteria

**Intercept These Request Types**

WRITE

REWRITE

READ

READ With Update

STARTBR

RESETBR

READNEXT

READNEXT With Update

READPREV

READPREV With Update

ENDBR

DELETE

UNLOCK



**Advanced Selection Criteria for TEST**

Resource Name:  Resource Type:

**Current Selection Criteria**

And/Or	Field Name/Type	Index	Offset	Length	OP	Compare to
	CARDSDO			1	GE	2

Buttons: Move Up, Remove and Edit Message Field, Move Down, Remove from List

**Datamap Fields**

Level	Field name	Occurs	Type	Picture	Usage	Length
02	AUTH2DO		Alphanumeric	X(32)	Display	32
02	AUTH3DO		Alphanumeric	X(32)	Display	32
02	AUTH4DO		Alphanumeric	X(32)	Display	32
02	CARDSDO		Alphanumeric	X	Display	1
02	IMODO		Alphanumeric	X(3)	Display	3

Datamap Name:

Buttons: Download Datamap, Remove Datamap from Criteria List

**Field Selection**

Field Name:  Length:  Index:  Operator:  Compare to Data Type:  Compare to:

Add to Criteria

**Fields by Offset/Length**

Offset:  Compare to Data Type:  Length:  Operator:  Compare to:

Add to Criteria

Create a message on these conditions: Conditions Selected:

NORMAL  
 ERROR  
 CHANGED

Action:

Enable Advanced Selection Criteria

Buttons: ,

Host: zShow50.pdl.pok.ibm.com:51577 CP: UK English / Gaelic - 285 (P) Normal Mode



# Message Options Tab

- Custom Message Layout dialogs use data map fields like the Advanced Selection Criteria does

The screenshot shows a dialog box titled "The current rule is CICS FILE" with a menu bar (File, Help) and a toolbar (Save, Cancel, Clear, User ID, Set Host, Help). The main area is titled "CICS Business Event Publisher for MQSeries" and contains several tabs: Rule Type, Selection Criteria, Message Options (selected), MQPUT Options, and Return Options.

**Message Layout Options**

Select one of the options below to designate the method to be used to create the message.

- Include all of the data associated with the request.
- Build custom message layout from copybook or offsets/lengths.

Include BEP Standard Message Header

**User Exits**

Exit program to be used in addition to option(s) chosen above

**Message Delivery Options**

- Do not accumulate -- send immediately
- Accumulate until next syncpoint
- Delay until syncpoint but do not accumulate



# Build Custom Message

- Enables customized message to be built to include event data and literal values

**Build Custom Message Layout for NEW ORDER**

**Current Message Layout**

Field Name/Type	Offset	Length	Literal Value	Literal Type
Literal Value		24	New Order	Character
ORDER-NUMBER				
ITEM-NUMBER				
ITEM-QUANTITY				
ITEM-ON-HAND				
Resource Data	100	256		

**Datamap Fields**

Level	Field name	Occu...	Type	Picture	Usage	Length
01	CBEP-DUMMY-01		Group		Display	570
02	ORDER-NUMBER		Numeric: zoned	9(9)	Display	9
02	CUSTOMER-NUMBER		Numeric: zoned	9(6)	Display	6
02	ORDER-DATE		Group		Display	8
03	ORDER-DATE-YEAR		Numeric: zoned	9(4)	Display	4
03	ORDER-DATE-MON		Numeric: zoned	9(2)	Display	2
03	ORDER-DATE-DAY		Numeric: zoned	9(2)	Display	2
02	ORDER-TIME		Group		Display	6

**Fields by Offset/Length**

Get Data From:  Offset:  Length:  Literal Type:  Literal Value:

Buttons: Move Up in Layout, Move Down in Layout, Add to Layout, Remove and Edit Message Field, Remove from Layout, Datamap Name (ORDRFILE), Download Datamap, Remove Datamap from Layout, OK, Cancel





## DB2 Event Source Connector

- Monitors events occurring in DB2 applications
- Creates messages from associated data
- MQPUTs messages to designated MQSeries queues
- Supports DB2 V6, V7 and V8
- DB2 Rules:
  - The DB2 events monitored are changes to DB2 databases
  - The resource name is a logical DB2 table (generic or esoteric)
  - Can designate to monitor INSERTs, UPDATEs and/or DELETEs to a table
  - Rules are applied at the table row level
  - The columns for a DB2 table are used instead of data maps
  - Selection criteria is DB2 specific (plan name, DB2 subsystem name, etc..)



## CICS BEP Message Server

- Responsible for putting messages to queue
  - Ensures transactional unit-of-work integrity
  - Co-ordinates automated recovery for all event sources
  - Multi-tasking, multi-threaded
- Can support multiple Message Servers per MVS image
  - Load balancing
  - Production/test
  - Public/private
  - Security
- Supports multiple connectors per message server





## Rules Database/ Engine

- Resides on VSAM file on the zSeries host
- Populated/ maintained by Windows-based GUI
- Rule/ Group/ List heirarchical structure
- May be shared by multiple Message Servers
- Dynamically refreshable
  - add/ alter/ delete rules
  - maintain unit of work integrity



# Customer Uses

## Legacy Integration with new processes

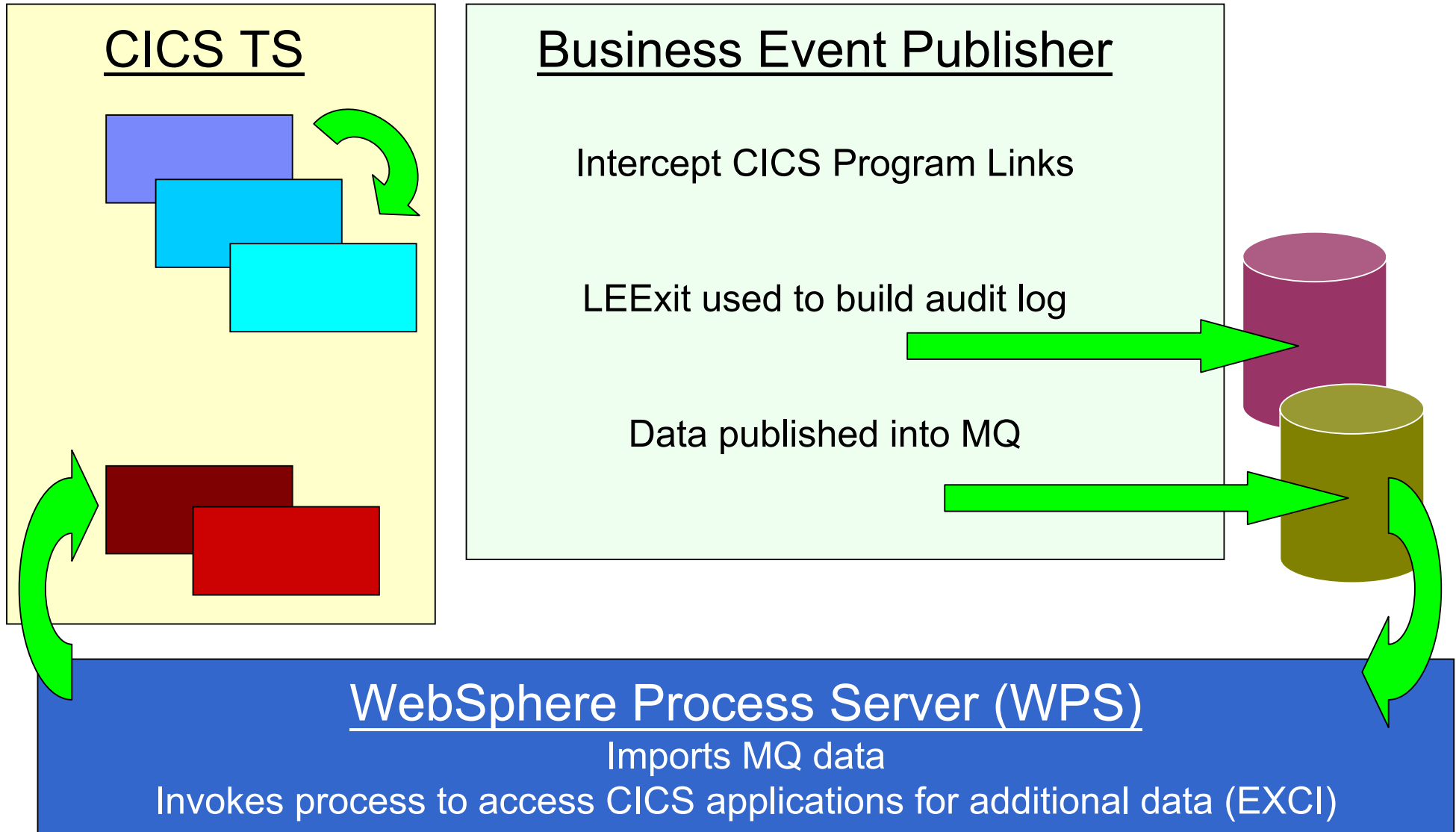
- ▶ **Event driven**
  - Event Examples
    - Price change to product or services
    - Bank account changes
    - Credit card account changes
    - Stock Triggers
    - Trading Volumes
    - Address changes
    - Name changes
    - Name add/delete
    - Date detection
- ▶ **Integration Enabler** – WebSphere MQ
  - Link with new business process
    - e-mail, text, phone etc.
- ▶ Improve customer satisfaction
- ▶ Improve audit control
  - Event logging for Sarbanes Oxley compliance

## 24X7 Operations Automating existing processes

- ▶ Event Detection and Notification (to MQ)
- ▶ Provide ability to re-route to target solution source immediately
  - e.g. support/maintenance personnel
- ▶ Provide capability to remove batch operations
- ▶ Provide capability to remove manual or latent processes
- ▶ Achieve automation
- ▶ Improve efficiency of company
- ▶ Reduce costs



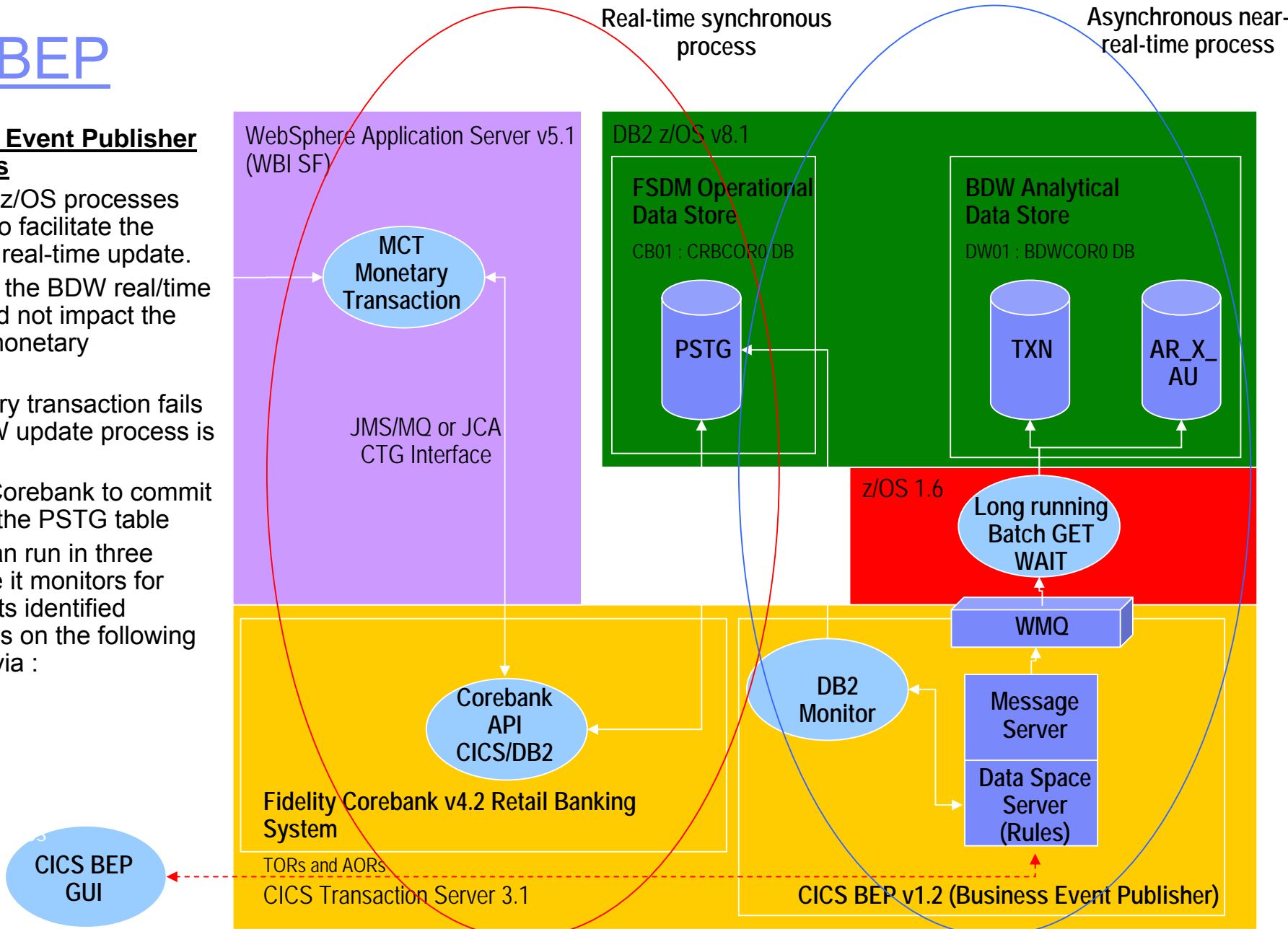
# Customer Scenario – Insurance Policy Administration



# CICS BEP

## CICS Business Event Publisher for MQSeries

- Here we use z/OS processes within CICS to facilitate the asynchronous real-time update.
- As with WAS the BDW real/time update should not impact the operational monetary transaction.
- If the monetary transaction fails then the BDW update process is not started
- We wait for Corebank to commit its update to the PSTG table
- CICS BEP can run in three modes where it monitors for specific events identified business rules on the following subsystems via :
  - CICS
  - DB2
  - IMS.



# Summary

- CICS BEP is an event driven processor
  - ❖ Detection
    - Controlled by rules generated with easy to use GUI
  - ❖ Notification
    - Creates MQ messages
    - Optionally create an Event audit log
- CICS, IMS and DB2 support
  - ▶ IMS and DB2 support do not need CICS to be installed
- Provides powerful capabilities to enable existing applications to participate in new Event Driven business processes as part of a Service Oriented Architecture
- Highly scalable, performance oriented and fully recoverable
- ✓ Allows capability to automate operations
- ✓ Allows capability to improve audit control
- ✓ No Application changes
- ✓ Cost and time to market saving over application development effort

**Further details: [www.ibm.com/cics/bepub/](http://www.ibm.com/cics/bepub/)**



# CICS TOOLS Try-n-Buy



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IT organizations are under constant pressure from business to improve platform efficiency, maximize system availability, and make the most of staff skills. The pressure is even more acute with CICS® because it's also recognized as a critical component of future Web services implementations. IBM offers a suite of CICS tools that can help support application transformation and CICS technology-based SOA implementations; enable easier CICS version-to-version upgrades (especially to CICS Transaction Server for z/OS V3.1); reduce the complexity and cost of CICS system and application management; improve CICS application and data availability; and, comply with regulations such as the U.S. Sarbanes-Oxley Act.

- **CICS Batch Application Control** – Simplify and automate management of resource allocation between online CICS and batch
- **CICS Business Event Publisher for MQSeries®** – Drive new business processes from CICS applications and DB2® and IMS™ data to new environments, via WebSphere® MQ, without the need to change the original applications or data
- **CICS Configuration Manager** – Manage resource definitions in the multiple CICS systems, from a single interface, with comprehensive reporting and optional change management control facilities
- **CICS Interdependency Analyzer** – Understand your active application inventory for efficient maintenance, upgrades and help in building new applications
- **CICS Performance Analyzer** – Comprehensive offline performance reporting and analysis for tuning and capacity planning
- **CICS VSAM Copy** – Create point-in-time copies of VSAM files concurrent with business-critical online processing activity
- **CICS VSAM Recovery** – Automate recovery of lost and damaged CICS and batch VSAM data

Download your free CICS Tools trial code today at [ibm.com/software/os/zseries/trials/cicstools/](http://ibm.com/software/os/zseries/trials/cicstools/)

Find more information, visit [ibm.com/software/http/cics/tools/](http://ibm.com/software/http/cics/tools/)

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## WebSphere Data Event Publishers

**WebSphere** software



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**ON DEMAND BUSINESS™**

# Agenda



**WebSphere Information Integrator**

# Data Event Publishing

- **The Basics**
  - ▶ **WHAT** is it
  - ▶ **WHY** do you use it
  - ▶ **IBM's WebSphere Data Event Publishers**
    - **HOW** do they work
      - The Basics
      - Components
      - VSAM
      - IMS
      - CA-IDMS
      - ADABAS

- **IMPLEMENTATION SCENARIOS**

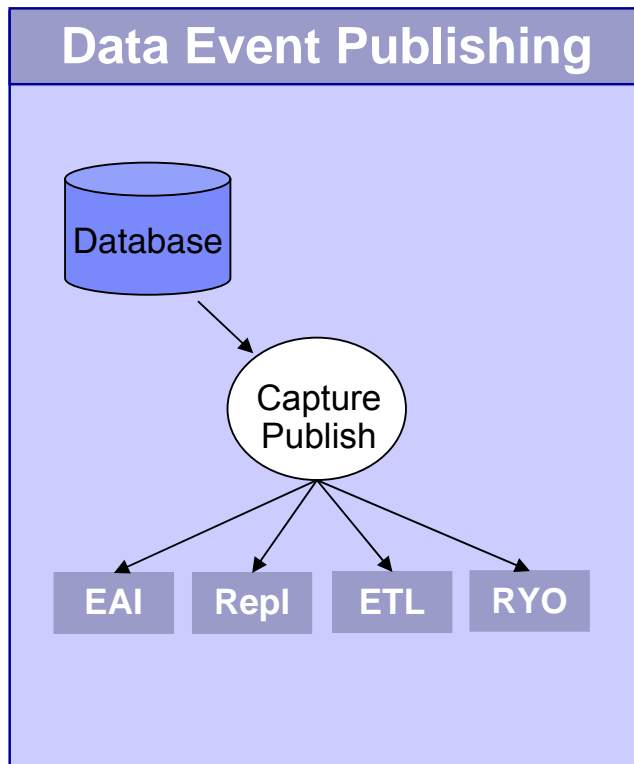
- **INTEGRATION**





# WHAT: Data Event Publishing

- ✓ **Message-based publishing driven by event capture from a database**
- ✓ **Add-on to ETL, Replication or EAI**



- **Warehouse / Business Intelligence**

- ▶ Integrate captured changed data with an ETL tool
- ▶ Perform very complex transformations
- ▶ Use a specific transaction format to update target

- **Application to Application Messaging**

- ▶ Drive downstream applications or APIs based on transactional data events
- ▶ Reduce application development and maintenance
- ▶ Reduce performance impact to source applications
- ▶ Reduce availability impact to source applications

- **Event Notification**

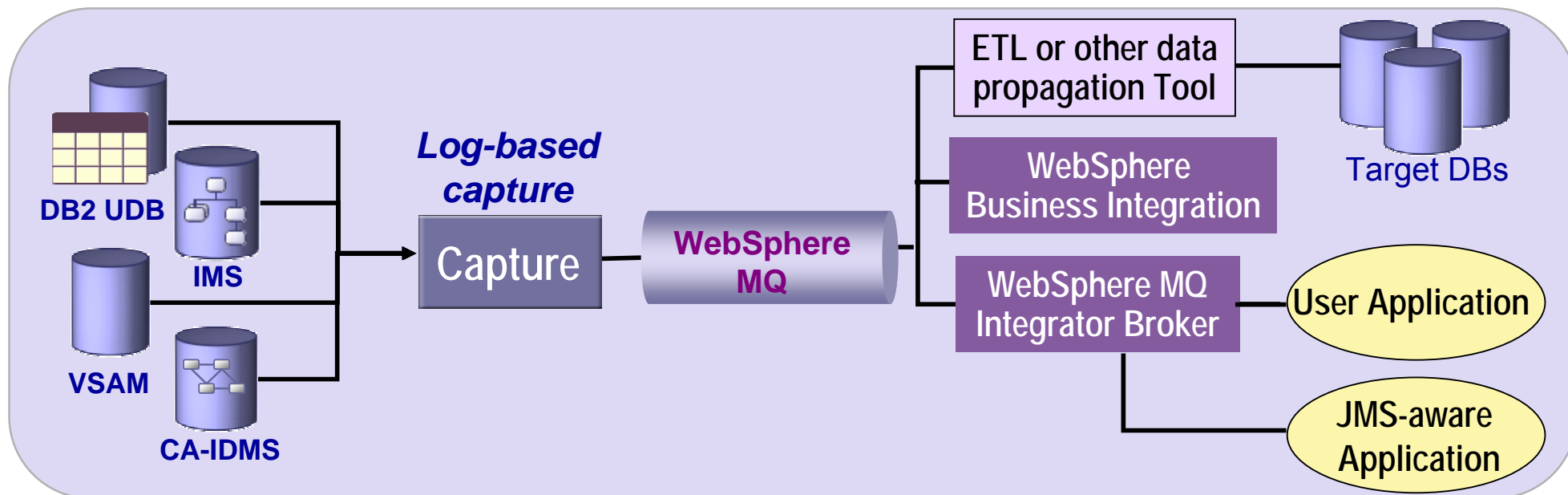
- ▶ Stream changed data information to Web interfaces
- ▶ Stream only particular events of interest (filter data)



# WHY: Data event publishing ... facilitating integration

## Function

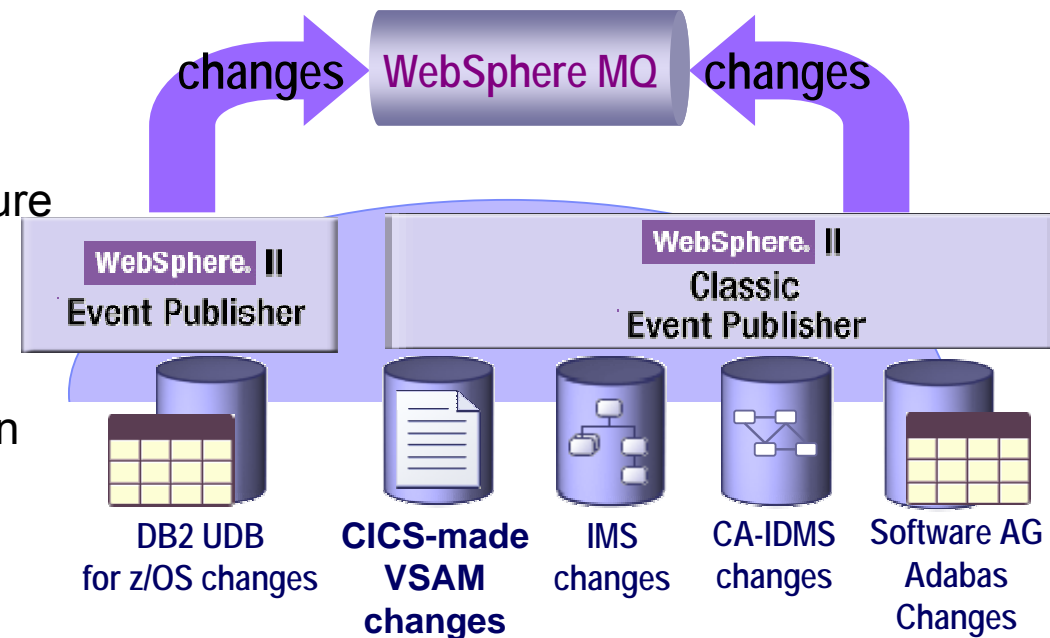
- **Capture data events in real time**
- **Publish these data events:**
  - ▶ to a message queue for widespread delivery
  - ▶ in XML or delimited values format for widespread use



# HOW: WebSphere II Event Publishers for z/OS

- **Real-time &/or background capture and publishing of data changes made to:**
  - ▶ DB2 UDB
  - ▶ VSAM through CICS (Batch in plan)
  - ▶ IMS database
  - ▶ CA-IDMS database
  - ▶ Software AG Adabas database

- **Two Event Publisher infrastructures:**
  - ▶ DB2 Universal Database for z/OS  
-- based on WebSphere Replication Q Capture
  - ▶ IMS, VSAM, CA-IDMS and Adabas  
-- based on WebSphere II Classic Federation



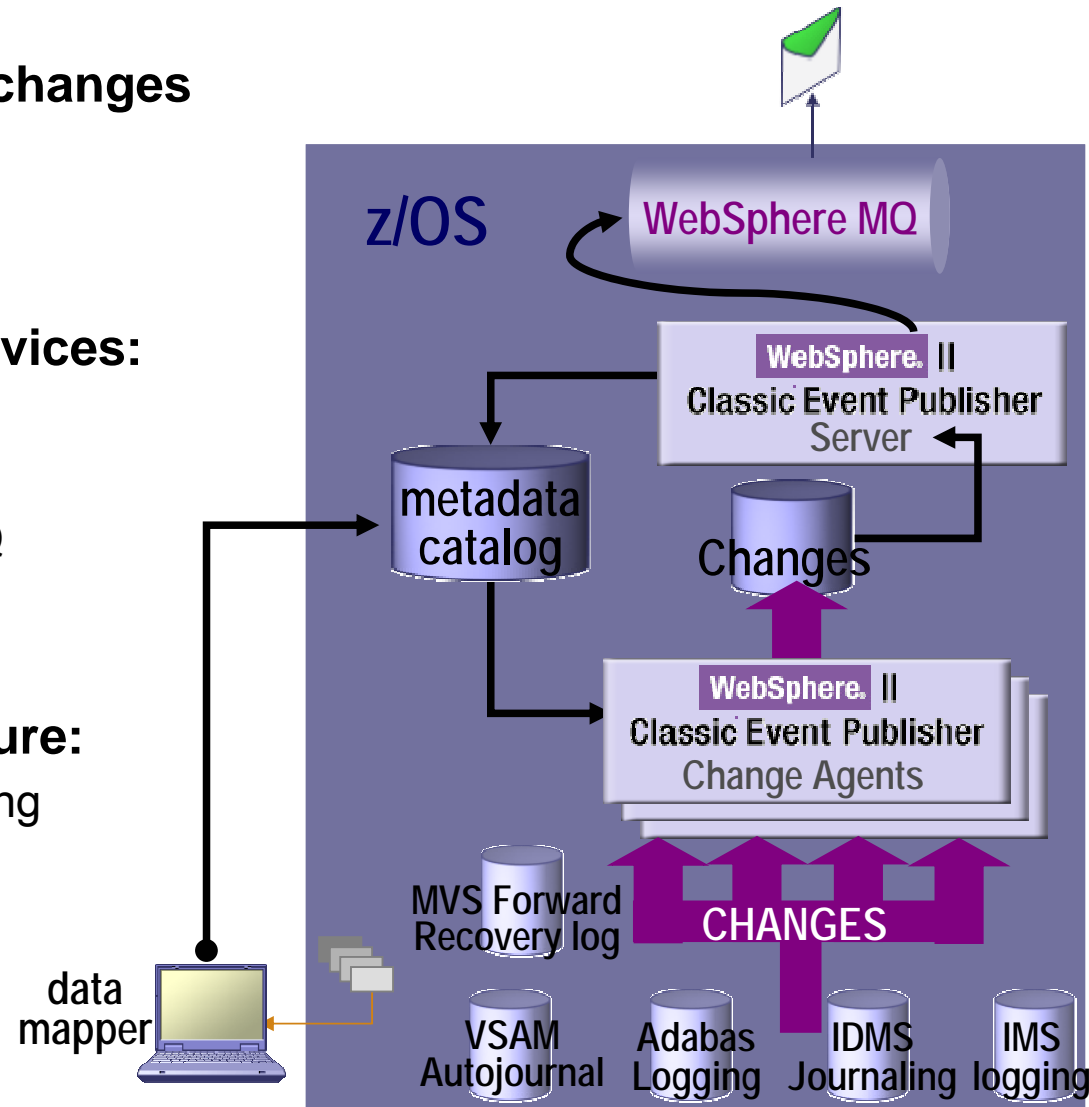
# HOW: WebSphere II Event Publishers for z/OS

- **Log-based & recoverable:**
  - ▶ Log exits for active processing
  - ▶ Log files and spills for BOTH recovery processing and non-real time implementations
  
- **XML or Delimited-Values message output:**
  - ▶ Self-describing XML message format for easy integration
  - ▶ Consistent "relational" format across all sources, regardless of native structure
  
- **WebSphere MQ publishing:**
  - ▶ Publish once – read any number of times
  - ▶ Common, high performance, guaranteed delivery mechanism spanning platforms
  - ▶ Dominant mainframe messaging infrastructure
  - ▶ Broad set of IBM & 3rd party solutions can “read” WebSphere MQ queues
  
- **Custom interfaces for more seamless integration**
  - ▶ DataStage "Stage" for change-only Extract-Transform-Link (ETL)

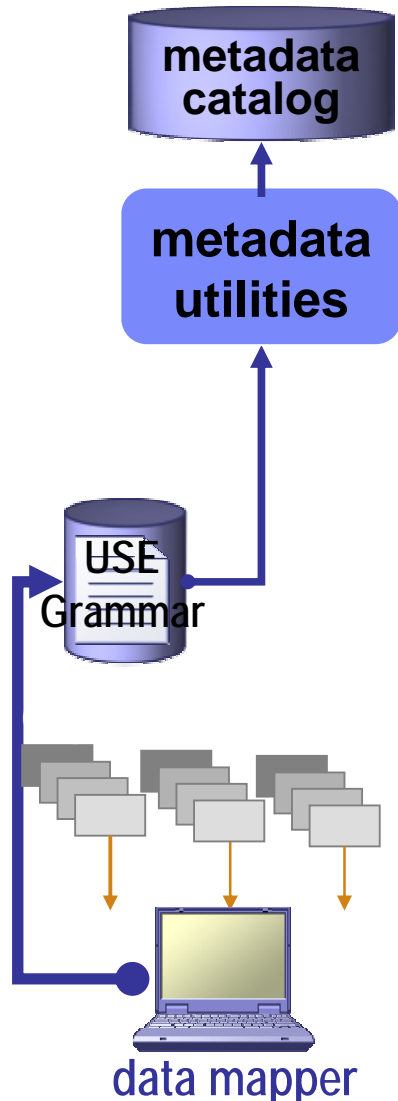


# HOW: “Classic” Event Publisher Implementations

- **Change capture agents monitor data changes**
  - ▶ Active Capture via logging exits
  - ▶ Recovery Capture via log/journal files
  
- **Server’s correlation & distribution services:**
  - ▶ Reformat data into relational model
  - ▶ Are transaction aware
  - ▶ Publish XML messages to WebSphere MQ
  - ▶ Handle recovery
  
- **Shares Classic Federation infrastructure:**
  - ▶ Metadata management & catalog processing
  - ▶ Server infrastructure



# HOW: Classic Metadata Management



- **Metadata defines relational mappings & data to capture**
  - ▶ Import COBOL copybooks, IDMS schemas, IMS DBDs
  - ▶ Generate logical relational table definitions
  - ▶ Define "column filtering" by removing fields from logical tables
  - ▶ Define "row filtering" by adding SQL view statements
  - ▶ Metadata "alter flag"
    - Identifies the changes to be captured
  
- **Simulated RDBMS catalog**
  - ▶ RDBMS-like catalog support: systables, syscolumns, etc.
  - ▶ Query-able by ODBC tools
  
- **Metadata Utilities**
  - ▶ Create and update metadata catalog entries
  - ▶ Verify metadata against physical (e.g. VSAM index checks)
  
- **Data mapper**
  - ▶ Metadata customization and visual administration

# HOW: CICS-VSAM Event Publishing Process

- **Forward Recovery Log Capture agent monitors starting with:**

- ▶ OLDEST: beginning of log
- ▶ STARTUP: most recent CICS startup
- ▶ YOUNGEST: start from right now
- ▶ TIME: specify a date-time

- **VSAM Autojournal Capture provides an alternative**

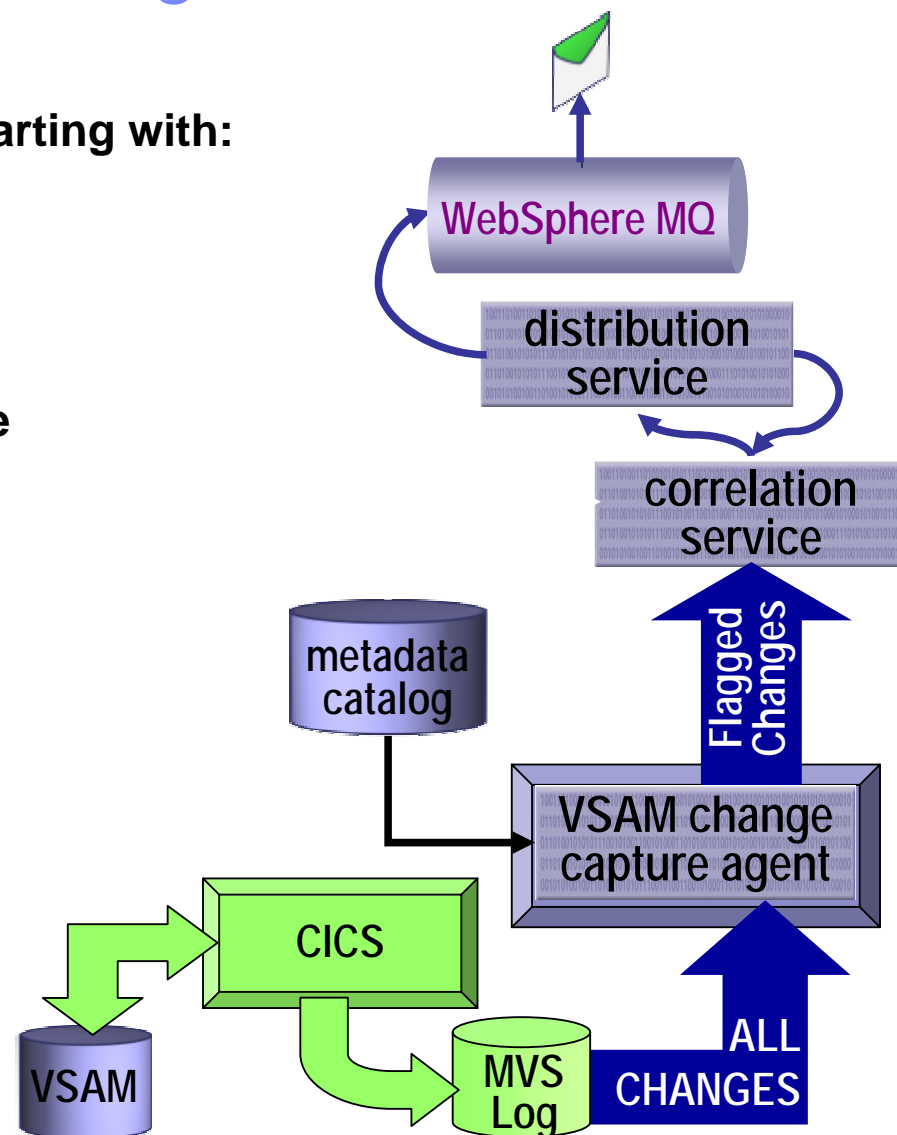
- ▶ Less resource intensive
- ▶ No Recovery feature

- **Correlation Service:**

- ▶ Transaction-aware data traffic cop:
  - Committed changes continue
  - Rollback changes are flushed

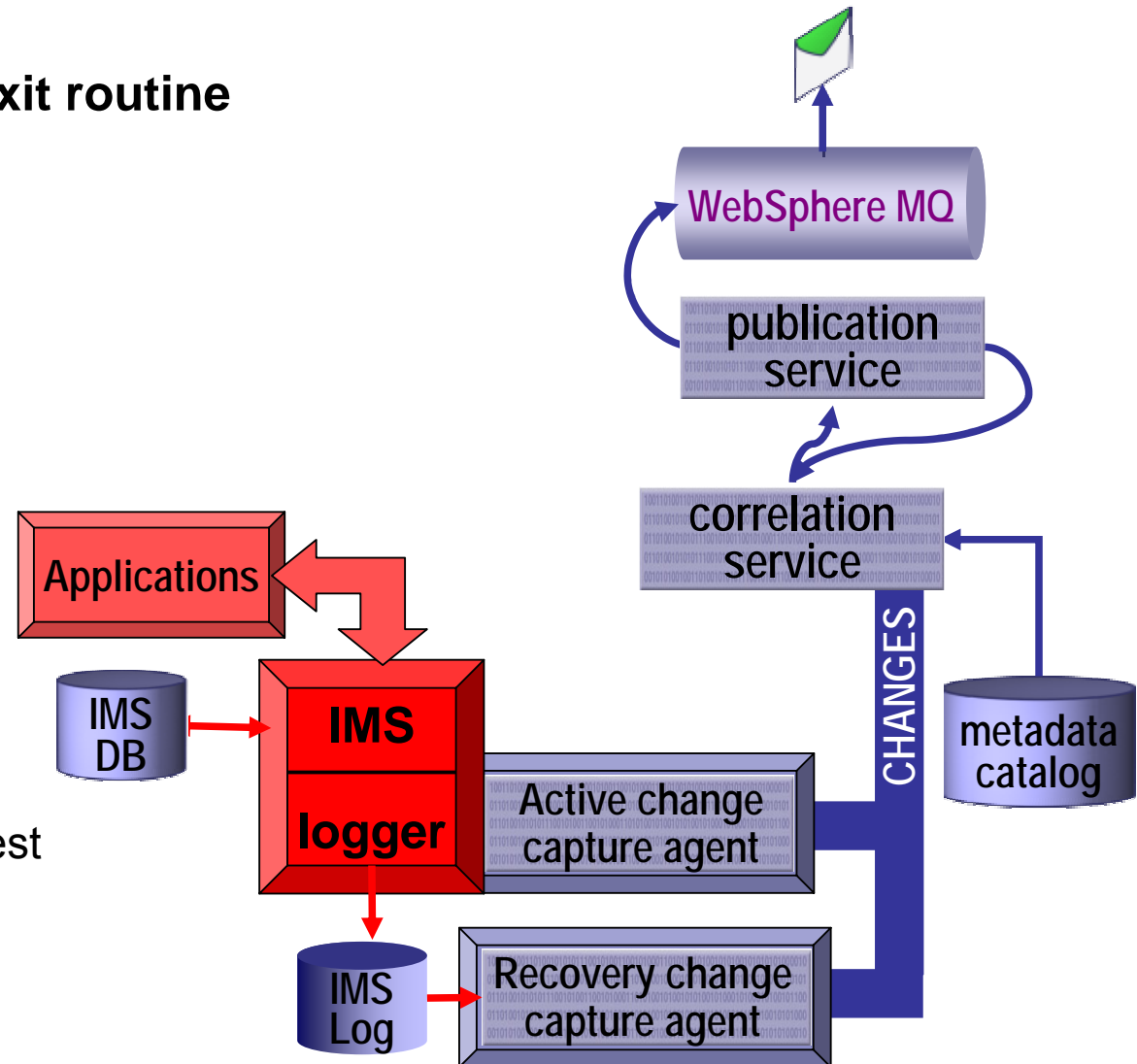
- **Distribution Service:**

- ▶ Reformats data based on metadata mapping
  - Relational format for consistency in published data regardless of source
- ▶ Delivers data to WebSphere MQ
- ▶ Confirms delivery for recovery



# HOW: IMS Change Capture in Action

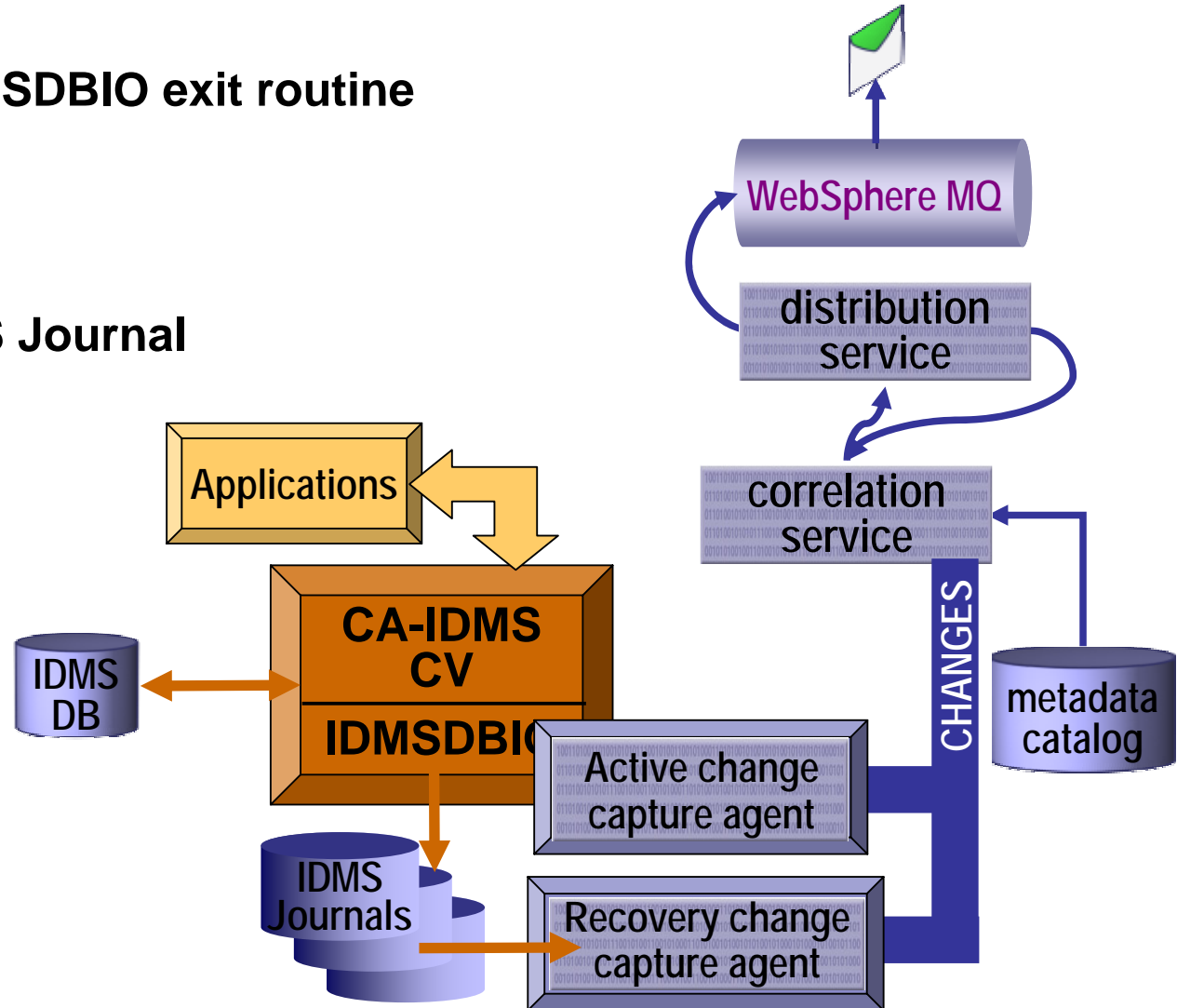
- **Active Agent runs as a Logger Exit routine**
  - ▶ Runs within IMS
  - ▶ Does add some overhead
  - ▶ Requires expanded log records
- **Recovery Agent reads log files**
  - ▶ Independent of IMS
  - ▶ Non-real time alternative
- **Correlation service**
  - ▶ Provides all standard processing **PLUS**
  - ▶ Filters changes to find those of interest
    - Minimizes processing in IMS





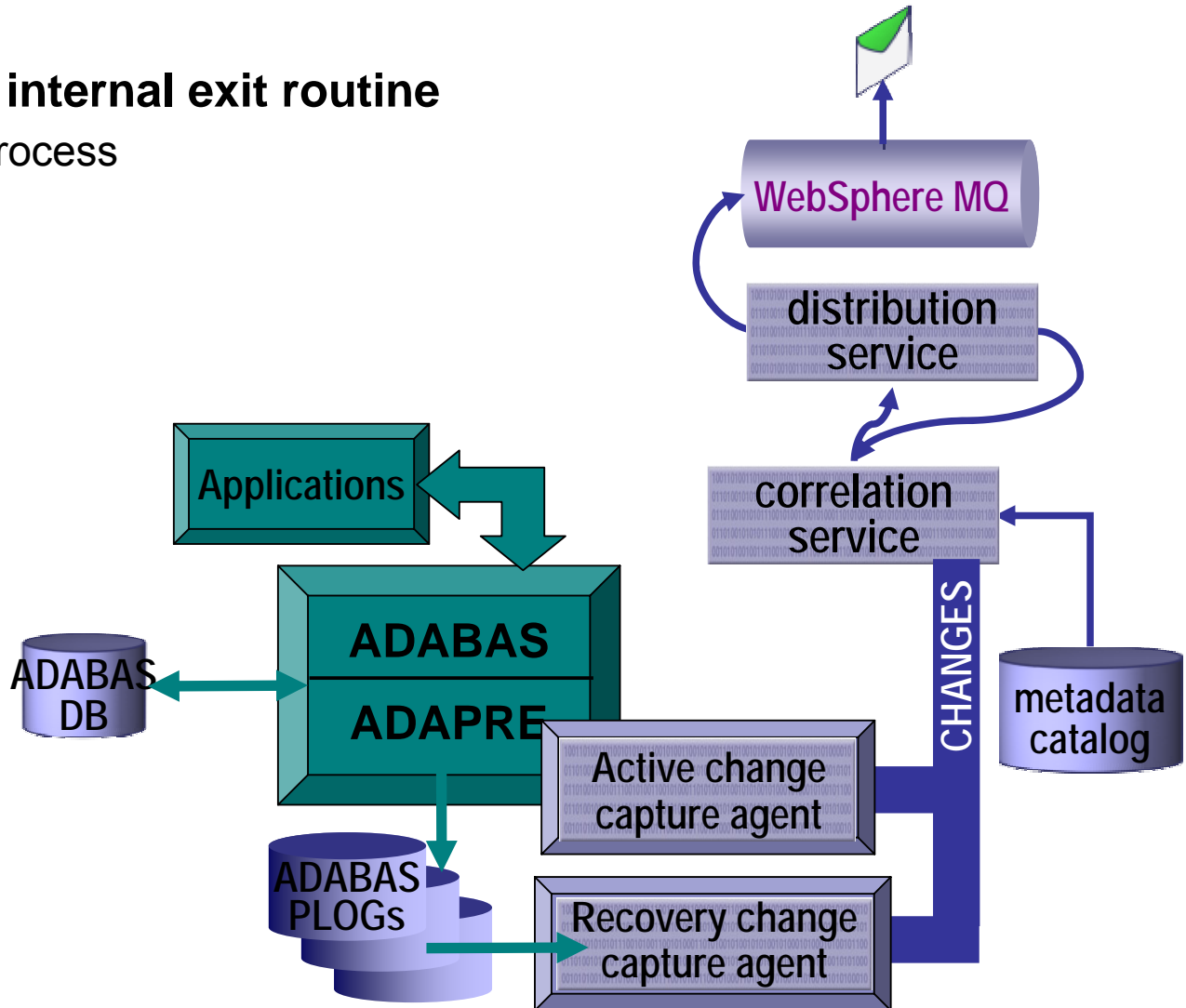
# HOW: CA-IDMS Change Capture in Action

- **Active Agent used as an IDMSDBIO exit routine**
  - ▶ Runs within IDMS CV
  - ▶ Does add some overhead
  
- **Recovery based on CA-IDMS Journal**
  - ▶ Recovery agent reads journals
  - ▶ Non-real time alternative



# HOW: Adabas Change Capture in Action

- **Active Agent uses a custom internal exit routine**
  - ▶ Runs within ADABAS logging process
  - ▶ Built for IBM by Software AG
  
- **Recovery based on PLOGs**
  - ▶ Recovery agent reads PLOGs
  - ▶ Non-real time alternative



# Agenda



**WebSphere Information Integrator**

# Data Event Publishing

- **The Basics**
  - ▶ **WHAT** is it
  - ▶ **WHY** do you use it
  - ▶ **IBM's WebSphere Data Event Publishers**
    - **HOW** do they work
      - The Basics
      - Components
      - VSAM
      - IMS
      - CA-IDMS
      - ADABAS

## ❖ IMPLEMENTATION SCENARIOS

- **INTEGRATION**



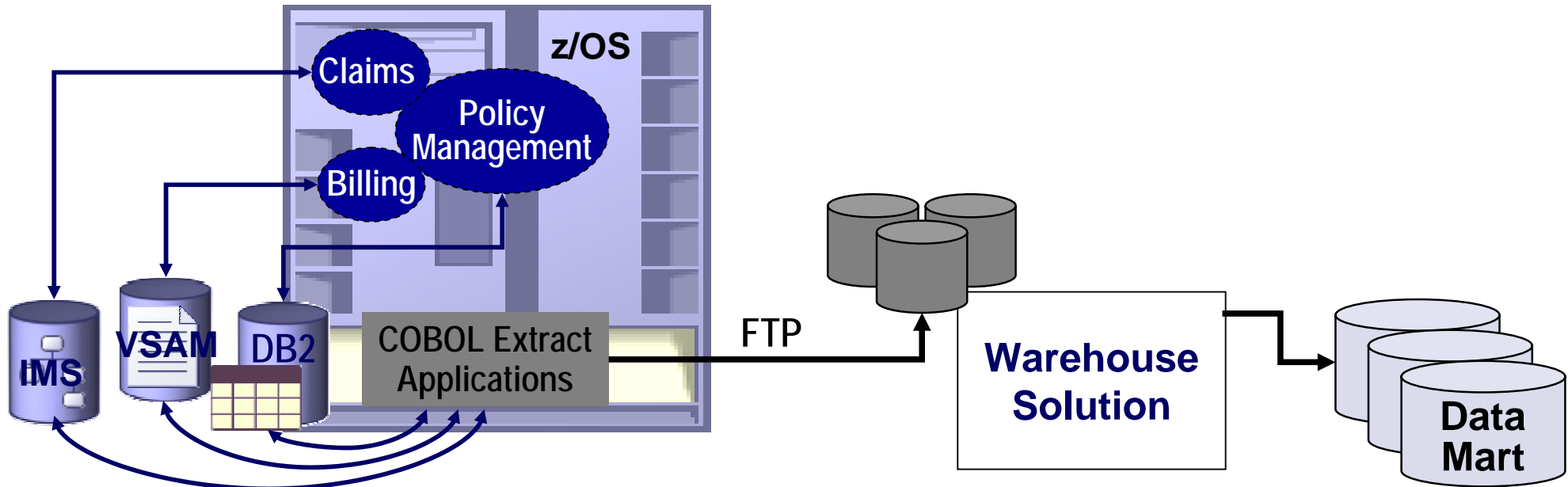
# Usage scenarios for data event publishing

- **Warehouse / Business Intelligence**  
Change-only updating of a data warehouse, data mart or operation data store
  - **Application to Application Messaging**  
Drive downstream applications or APIs based on transactional data events
  - **Event Notification**  
Stream changed data information to Web interfaces
1. **Change-only updating minimizes data latency and bandwidth load –  
Update the data warehouse with changes... real time or staged**
  2. **Push critical data events to external and internal audiences –  
Inventory changes trigger restocking  
Account balance changes initiate credit review**



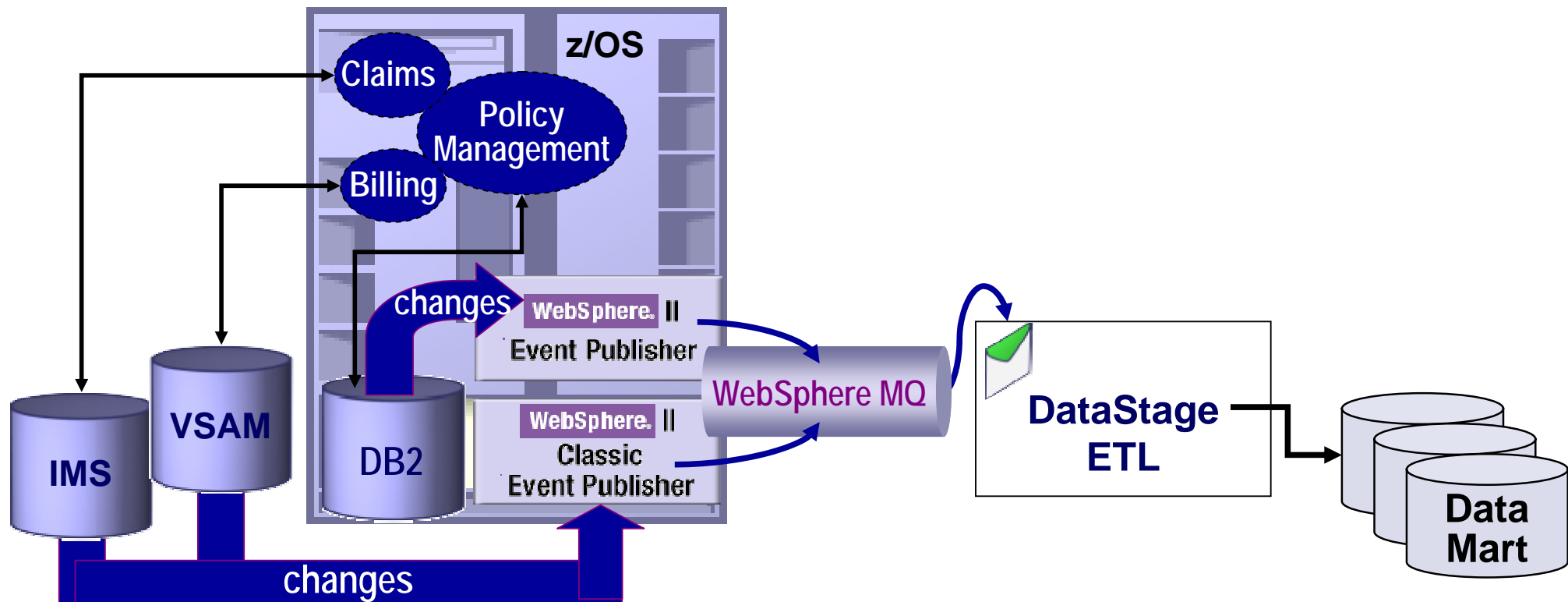
# Traditional ETL needs help finding legacy data changes

- **ETL environments can't keep up with the data**
  - ▶ Shrinking batch windows demand ever larger “pipes” – no time for errors
  - ▶ Full data pulls are too large
- **Difficult to find only “the changes”**
  - ▶ Legacy data stores may not have date/time stamps
    - Wasted machine cycles searching legacy data stores
    - Wasted man-hours building legacy application hooks



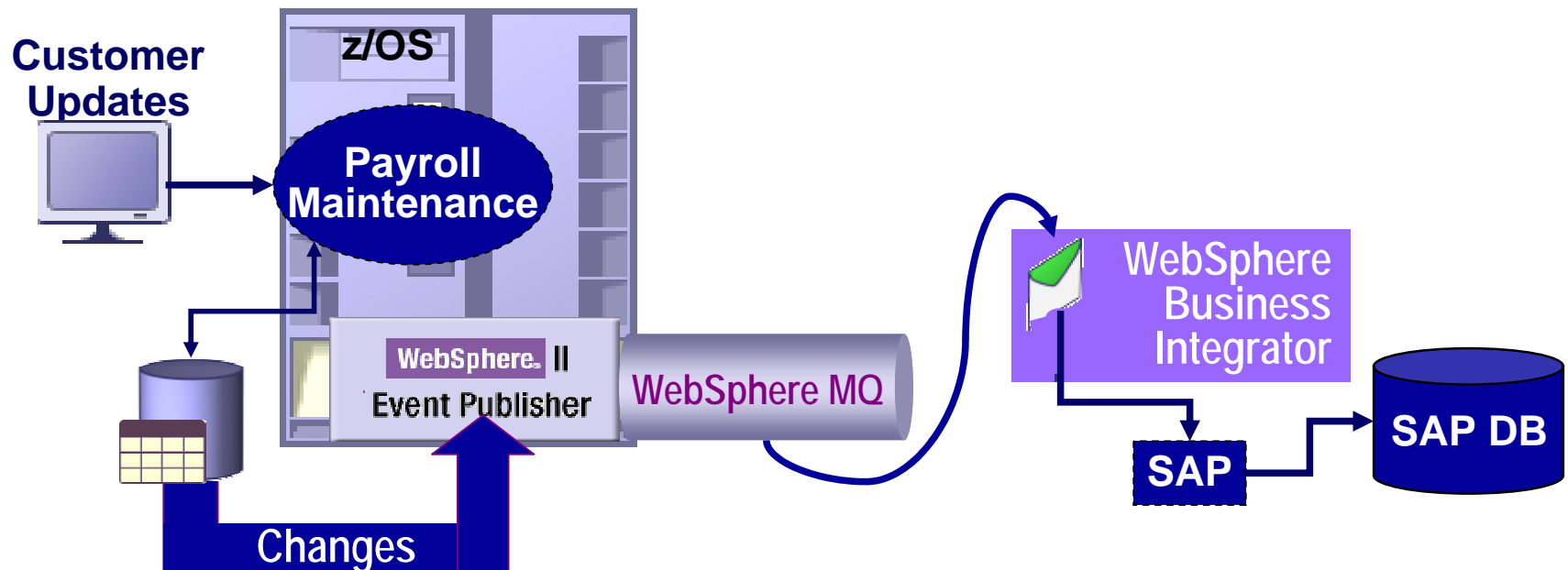
# Data events feed only the changes to data marts

- **Dynamic, changed-data feed**
  - ▶ Maximize data currency while minimizing & stabilizing bandwidth utilization
- **Reliable and recoverable**
  - ▶ Recoverability built-in and WebSphere MQ assures high performance delivery



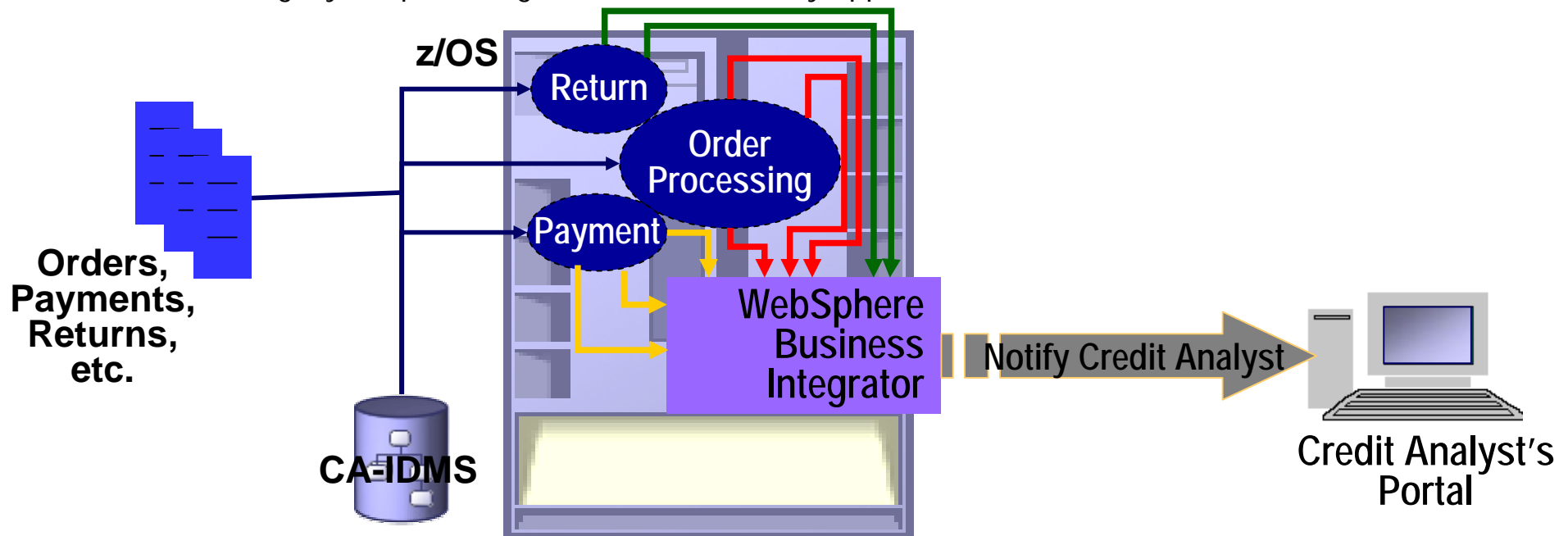
# Feed only the changes to a packaged application

- **Near real-time cross-silo data synchronization**
  - e.g. New order data is automatically pushed to a CRM application
  - e.g. VSAM employee data updates are pushed to SAP payroll
    - ▶ Loosely coupled integration
    - ▶ Minimizes development effort
    - ▶ Simplifies maintenance



# A “traditional” application-driven integration

- **Business integration using application hooks**
  - ▶ **Frequently complex**
    - One hook for each process involved
    - Many processes can impact the same data
  - ▶ **Can be maintenance intensive**
    - Application changes can impact integration
    - Tightly-coupled integration built in to every application





# Data Events simplify the integration implementation

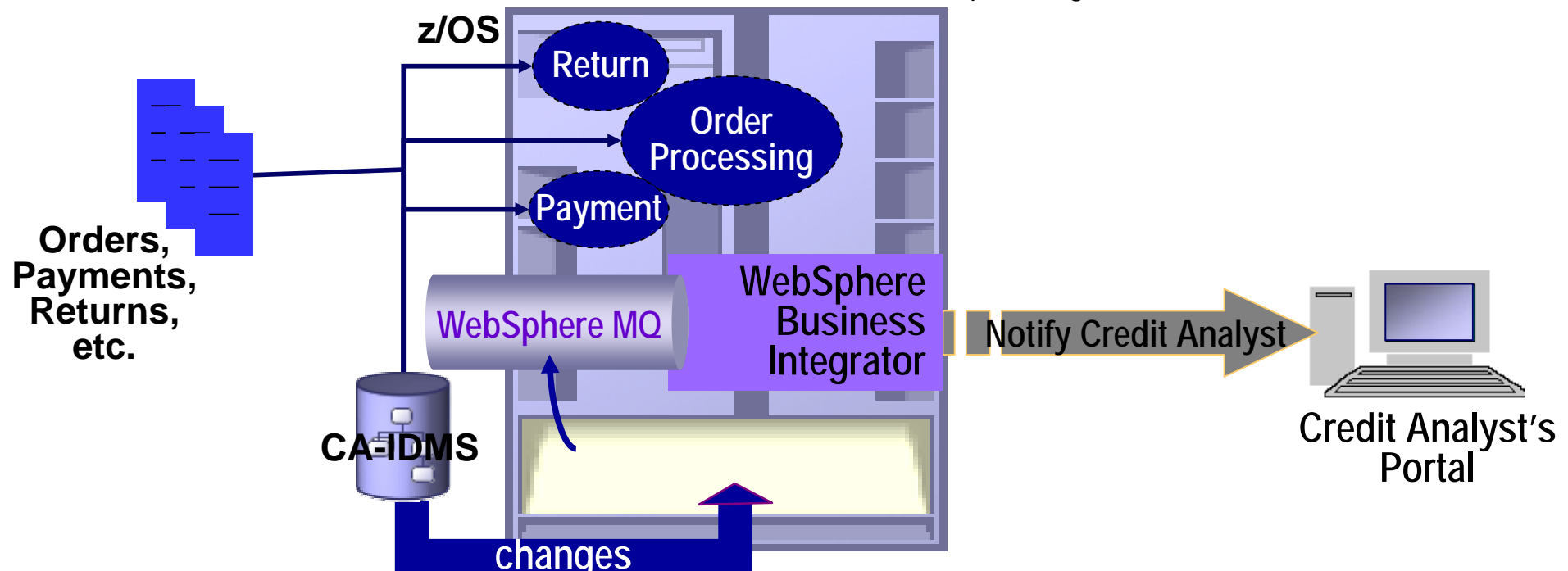
- **Data Event Notification**

- ▶ **Simplified implementation**

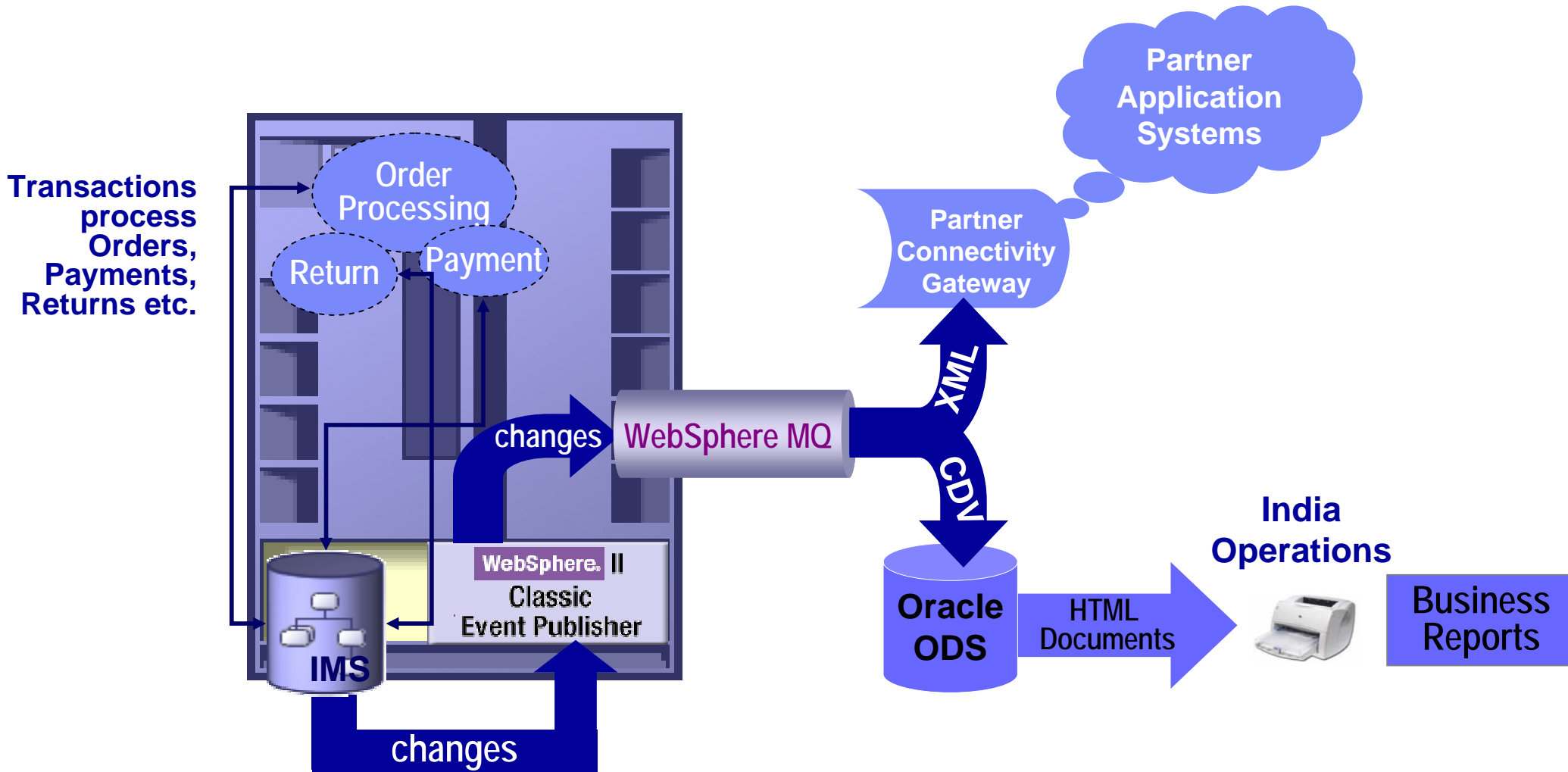
- Centralized data used to drive event notification

- ▶ **Simplified maintenance**

- Loosely-coupled – application changes rarely impact integration
    - Data-events are reusable – one event can drive multiple integrations



# Data Event Publishing at a Major Technology Reseller



# Agenda



**WebSphere Information Integrator**

# Data Event Publishing

- **The Basics**

- ▶ **WHAT** is it
- ▶ **WHY** do you use it
- ▶ **IBM's WebSphere Data Event Publishers**
  - **HOW** do they work
    - The Basics
    - Components
    - VSAM
    - IMS
    - CA-IDMS
    - ADABAS

- **IMPLEMENTATION SCENARIOS**

❖ **INTEGRATION**



# Event Publishing, EAI or ETL?

## Event Publishing and/or EAI

- **Both can accomplish the same task:**
  - ▶ Capture an event
  - ▶ Place a message about the event onto a queue
- **Reasons to use event publishing**
  - ▶ Messages are created asynchronously, reducing the performance impact on that application
  - ▶ Application is similarly shielded from any loss of availability of the message queue or service
  - ▶ New or existing applications can be built and maintained without special coding for application messaging
- **Reasons to use EAI :**
  - ▶ Event not written to a database – process or read-only
  - ▶ Database does not contain sufficient information – additional message context is required
  - ▶ Message routing is based on message content

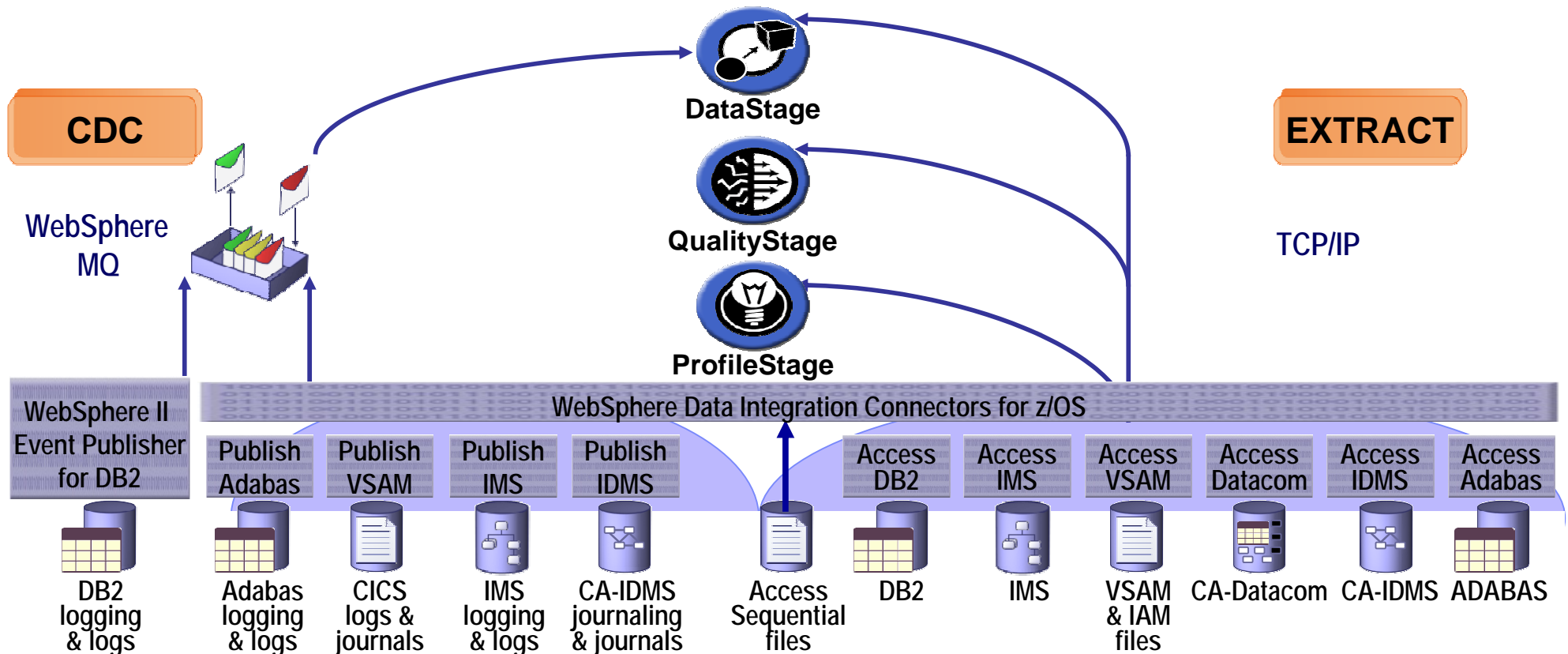
## Event Publishing and ETL

- Deliver changes to transformation engine and data flow**
- **Empowers change-only updating**
    - ▶ More efficient resource consumption
    - ▶ Eliminates demands on batch windows
    - ▶ Consistent use of communication pipe
  - **Enables real-time & staged updating**
    - ▶ Apply changes as received for near real-time updating
    - ▶ Stage changes for aggregation and other scheduled transforms



# WebSphere Data integration Connector for z/OS

- **WebSphere Data Event Publishers** provide near-real-time or background **Change-Only ETL**
- **Extract functionality** shares "Classic" infrastructure & metadata



# SUMMARY: The Value of Data Event Publishing

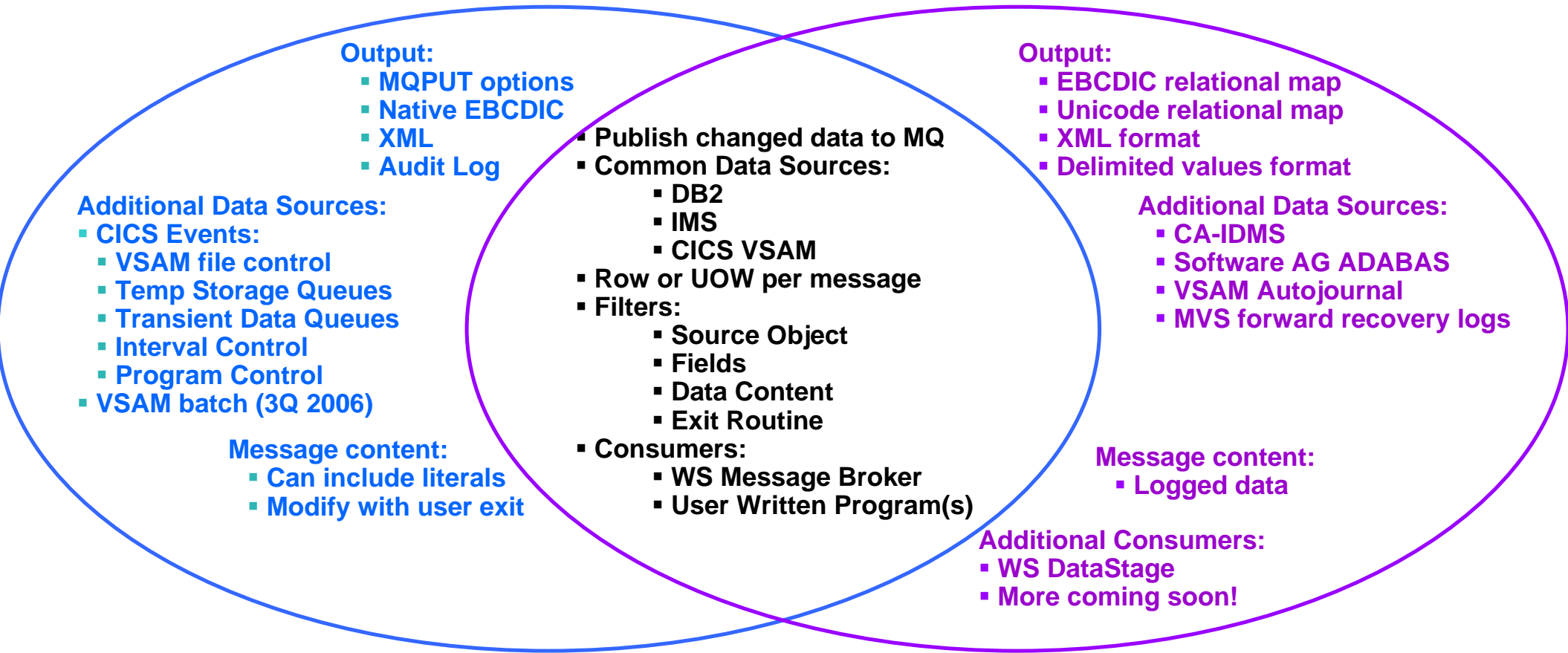
- **Extend the value of existing mainframe investments**
  - ▶ Leverage operational data to drive business processes
  - ▶ Loosely coupled integration maintains application independence
  - ▶ One consistent published data format regardless of source
  
- **Accelerate time-to-value of integration projects**
  - ▶ Fast and easy to implement
  - ▶ Reduces integration complexity
  - ▶ Leverages IBM & 3rd party tooling through WebSphere MQ
  
- **Complements traditional integration approaches**
  - ▶ Extends the value of EAI solutions like WebSphere Business Integrator
  - ▶ Feeds data to ETL solutions from IBM (DataStage) & 3rd parties like Business Objects



# Product Capabilities and Reference

- CICS Business Event Publisher for MQSeries
  - ▶ VSAM, DB2, IMS, & CICS application events

- WS II Event Publishers
  - ▶ VSAM, DB2, IMS, CA-IDMS, and Adabas



## Polling Questions

- Did you find today's information on Event Publishing useful?
  - ▶ 1 – No
  - 2 – Yes**
  
- Do you see a role for Event Publishing in your organization?
  - ▶ 1 – No
  - 2 – Yes**
  
- Would you like more information on IBM's Event Publisher Tools?
  - 1 – No**
  - 2 – Yes - CICS Business Event Publisher for MQ**
  - 3 – Yes - WebSphere II Event Publishers**
  - 4 – Yes - Both CICS Business Event Publisher and WebSphere II Event Publishers**





**Thank You - we'll now take  
any Questions**

