

IBM CICS and Events: Concepts and Event Specifications

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Topics

- **CICS and Event Processing**
 - Introduction to event processing
 - Why and How
 - A few example scenarios
- **Event Specifications**
 - Event Capture
- **Event Processing Adapters**
- **Event Binding Editor**
 - CICS EP Tooling
- **Using CICS Events**
 - Integration with WebSphere Business Monitor
 - Integration with WebSphere Business Events
- **Summarizing scenario, Summary and Q&A**

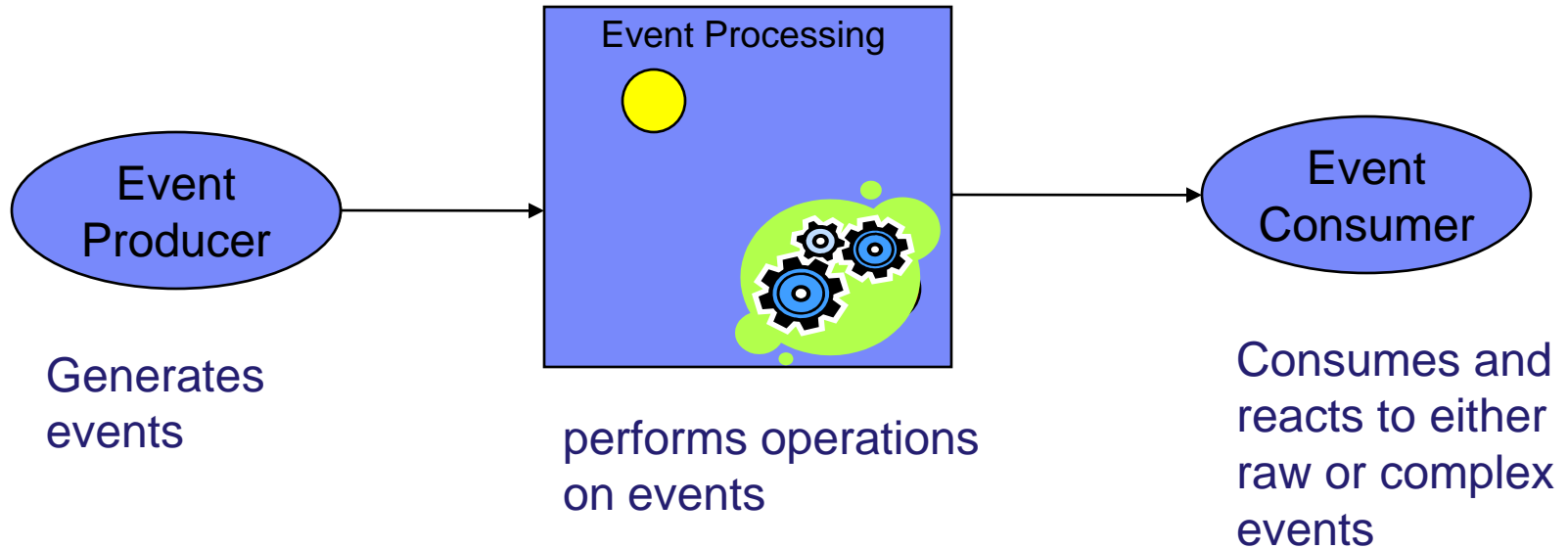
CICS and Event Processing

An introduction to CICS as a source of business events

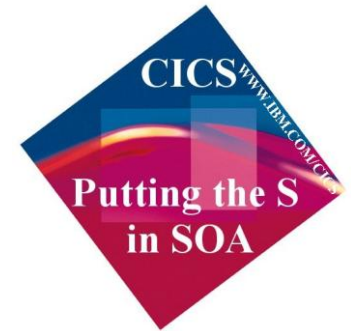
What is an event?

- **An event is**
 - *Anything that happens (or is contemplated as happening)*
 - An event has a name and usually some data (its payload)
 - Produced and responded to asynchronously
- **Simple event**
 - A single event, meaningful in itself
 - e.g. order placement; bank account update; stock trade
- **Complex event processing**
 - Detect and respond to patterns of events
 - e.g. three orders from customer A in 2 days; bank withdrawal after PIN change update; interesting pattern of stock trades
- **Business Event Processing**
 - Detect and respond to events that indicate business-impacting situations across the enterprise
 - Extends event processing capabilities to business users
 - e.g. IBM WebSphere Business Events provides complex event processing for business users

Event Processing in a Nutshell

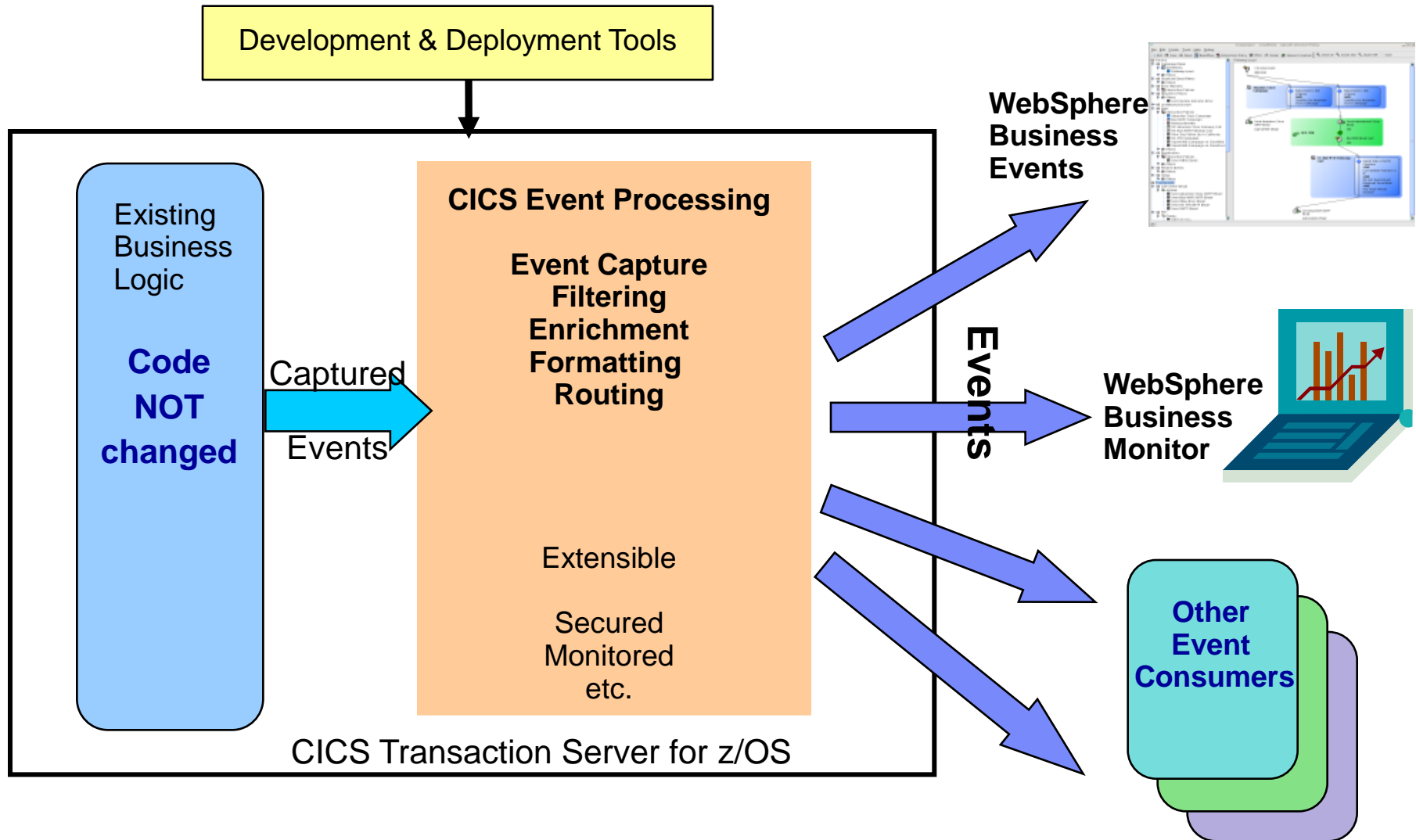


CICS and Business Events



- **Event processing addresses the need for agility**
 - Modern businesses must react quickly to circumstances
 - Decision makers need reliable, timely information
- **CICS systems run an enormous amount of existing business logic**
- **Using an Event-based approach, there is potential to gain insight into the processing in CICS and to introduce additional extensions to applications**
 - In a dynamic, de-coupled fashion
 - Without the need to change the applications
- **CICS Transaction Server for z/OS V4.1 allows you to emit business events from existing applications**
 - Supporting shifting corporate policies
 - Without having to modify the applications
 - And driving your choice of destination
 - WebSphere Business Monitor, WebSphere Business Events, CICS application, application through WebSphere MQ, ...

CICS and event processing Overview

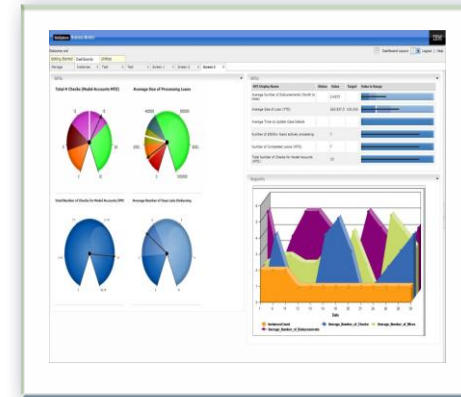


A few example uses of CICS events

EP Scenario 1 – Observe business processing

■ Identify key points in order processing business logic

- e.g. order requested, order placed, order confirmed, order dispatched, order cancelled
- Collect relevant contextual data associated with the event, including a way to correlate events for the same order, and emit event
- Events sent e.g. to WebSphere Business Monitor
 - Observe orders being received, processed, cancelled
 - Study KPIs – numbers of orders received per week, time to process and dispatch orders, etc.
 - Take action when thresholds exceeded, when value of a customer's orders exceeds a certain amount, etc.



■ Original application continues processing independently:

- Event instrumentation is 'non-invasive' to the application

EP Scenario 1 – KPIs and Dimensions in Business Space

Instances

Export ...

🔍
Reset

| orderID | itemID | customer name | item price | item quantity | order duration | order start time | order end time | order price | order status |
|------------|--------|---------------|------------|---------------|----------------|-----------------------------|-----------------------------|-------------|----------------|
| +000012784 | 0001 | Steve | 20 | 20 | 24 m, 19.121 s | May 27, 2009 10:38:13 AM | May 27, 2009 11:02:32 AM | 400 | order canceled |
| +000012785 | 0002 | Lijia | 5 | 40 | 23 m, 25.009 s | May 27, 2009 10:39:24 AM | May 27, 2009 11:02:49 AM | 200 | order shipped |

KPIs

| KPI Name | Status | Value | Target | Actions | Value in Range |
|-------------------------------|--------|----------------|---------------|---------|---|
| average time on order shipped | | 23 m, 18.601 s | 1 h, 0 m, 0 s | 📅 🛠️ 📈 | <div style="width: 100%; height: 15px; background: linear-gradient(to right, #008000 10%, #ffff00 10% 20%, #ff0000 20% 100%);"></div> |
| percent of order cancelled | | 25.00% | 30.00% | 📅 🛠️ 📈 | <div style="width: 100%; height: 15px; background: linear-gradient(to right, #008000 25%, #ff0000 25% 100%);"></div> |

Dimensions

File Edit View Bookmarks Data Chart Tools Help

📄 📄 ↶ ↷ 📖 PDF EXL ?

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Measures

■ order canceled
 ■ order shipped

| order status dimension | average order price | sum order price | order count |
|-----------------------------------|---------------------|-----------------|-------------|
| All order status dimension | 280 | 1120 | 4 |
| order canceled | 400 | 400 | 1 |
| order shipped | 240 | 720 | 3 |

19

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EP Scenario 2 – Non-invasive change to business processing

- **Application extended by triggering new or existing separate program for extra, asynchronous processing**

- Examples:

- Extend governance practices by automatically updating an audit log or sending an alert when certain data is viewed or altered
- Asynchronously send details of special offers or discounts when large customer orders have been placed
 - This example may be seasonal and is easily enabled/disabled without application change. The interpretation of a large order can be changed outside the application.



- **Original program continues processing independently**

- **Consumer program can run within CICS or externally**

- Flexibility to use available skills and other resources
- Choice of processing platform depends on nature of processing, interaction with other subsystems

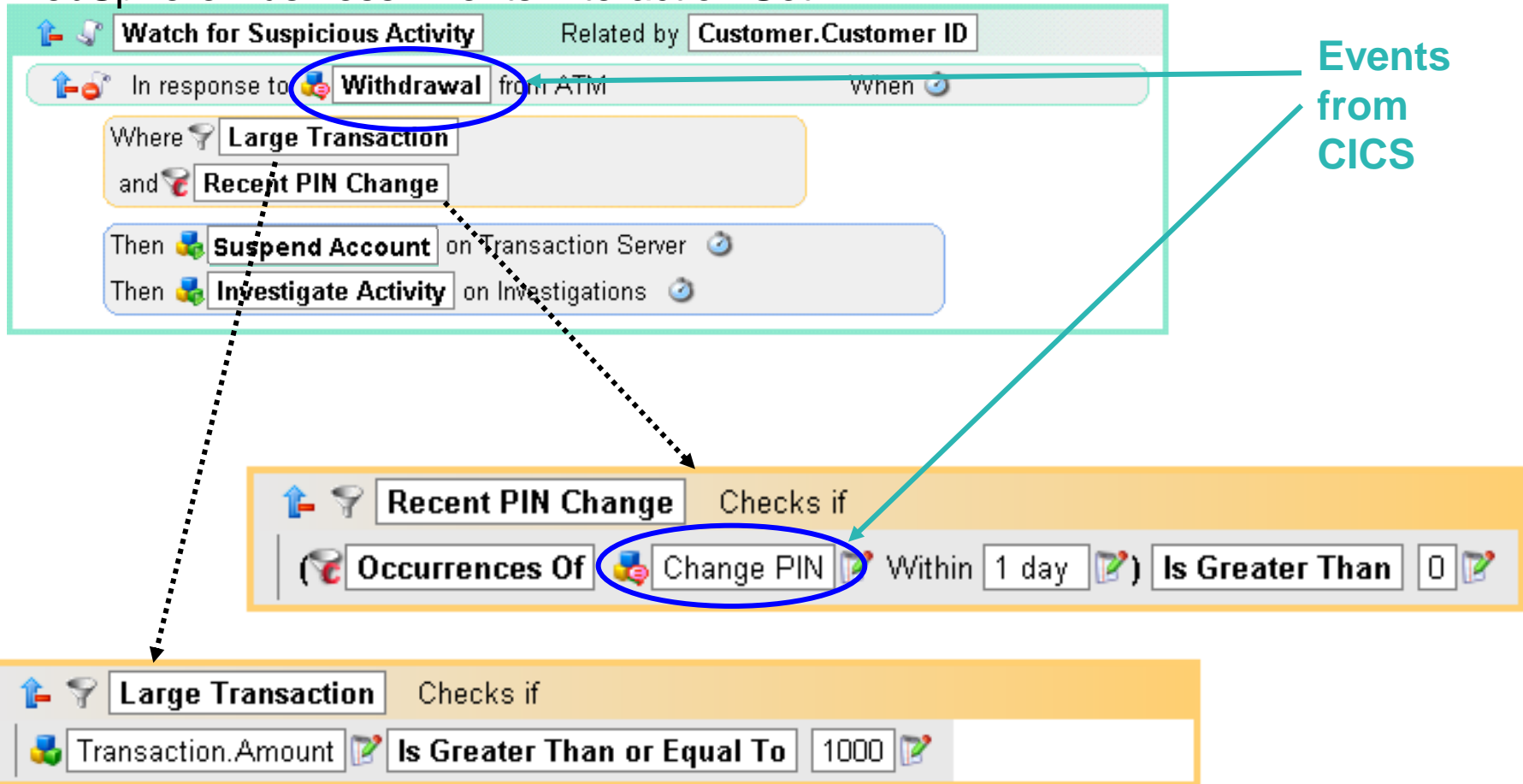
EP Scenario 3 – Event Combination



- **Collect events relating to credit and other bank card usage**
- **Check for unusual patterns of behaviour using WebSphere Business Events**
 - New card ordered within a week of an address change request
 - Several online purchases where none had been made before
 - 2 or more cash withdrawals in quick succession when withdrawals rare on this card, or normally for smaller amounts
 - Purchases in different geographical locations in short period of time
 - etc.
- **Specify actions to take in WebSphere Business Events e.g. confirm with cardholder that this change is expected**

EP Scenario 3 – Detecting event pattern using WebSphere Business Events

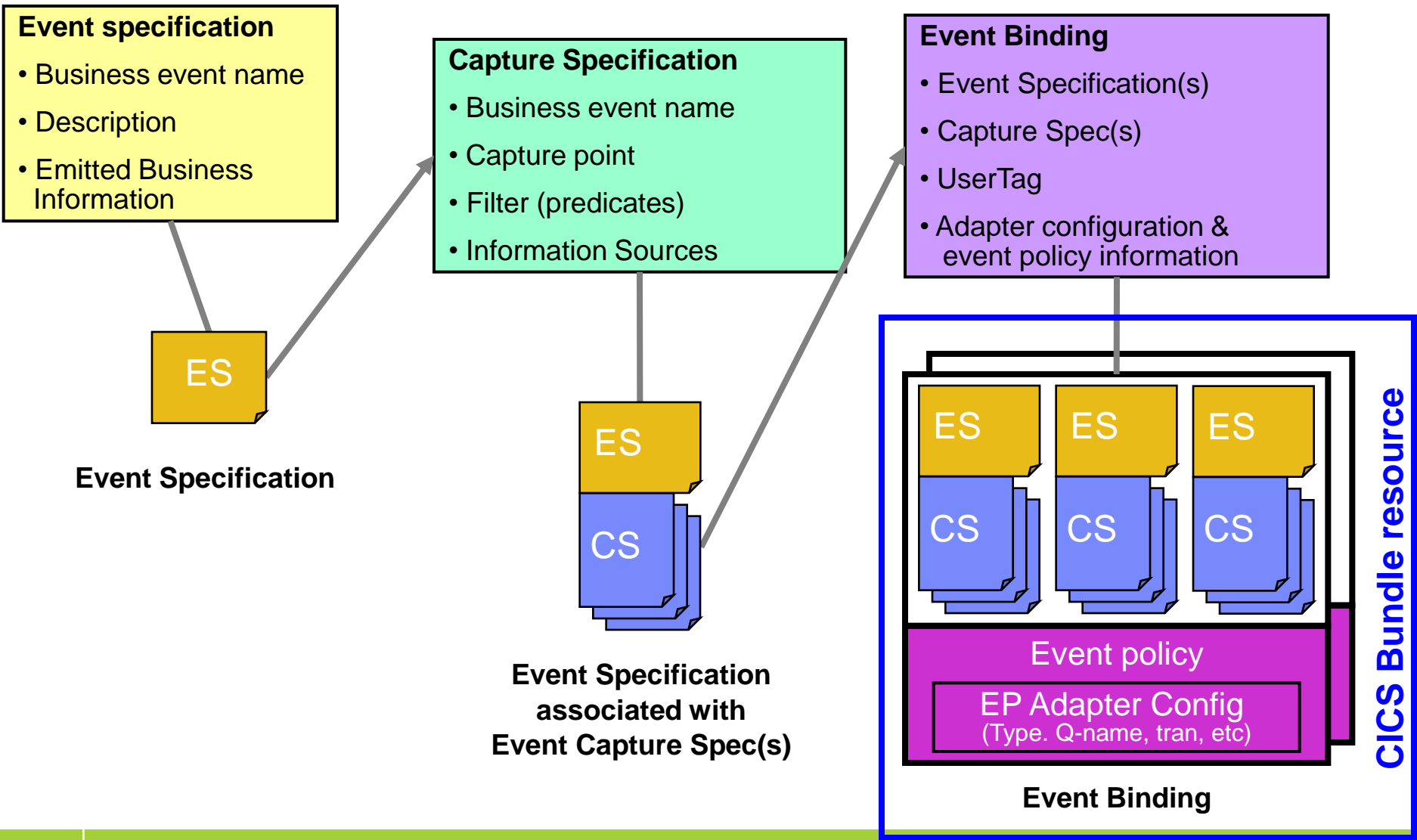
WebSphere Business Events Interaction Set



CICS Event Specifications

or... how CICS knows where the events occur

CICS Event Specification



CICS Event Specification Example

Event Specification:

Event name: order_OverTenThousand_Received

Event description: Whenever an order is processed that is for over 10 thousand, this event is triggered

Emitted business information: customer ID, OrderNumber

Capture Specification:

Before EXEC CICS LINK command

← Capture Point

to PROGRAM(OrderDB)

← Application Command Options Predicate

from current_program = OrderUI

← Application Context Predicate

where OrderVal > 10K

← Application Data Predicate

OrderVal is in the Commarea or channel passed on the LINK

How to provide event data from data available from application and context ← Information Sources (Captured Data)

Note: This identifies an EXEC CICS command and some filters, it does not 'point' directly at a specific location in the application code; the capture spec can be made more or less specific by use of filtering predicates

Event Binding:

order_OverTenThousand_Received,

order_FromMajorCustomer_Received, ...

← Event binding includes other related events

EP Adapter = CICSTransaction

← How events in this Binding are emitted

CICS Event Capture

CICS Event Capture options

- **Non-invasive**
 - Declare event points in application logic without opening up the application
 - Use application knowledge to map business event onto point(s) in the logic where the event occurs
- **Explicit API**
 - **EXEC CICS SIGNAL EVENT**
 - EVENT supplies an event identifier
 - Data can be supplied as either FROMCHANNEL or Data area and length
 - Identifier to be used in event specification
 - Explicit way of adding a capture point to an application
 - Allows exact pinpointing of the event point, and exact selection of relevant data
 - Use to “event-enable” the application
 - Once this is done, the instrumentation can be used for different purposes
 - Define as event within an event binding
 - Allows filtering and selection of data to use for different business events
 - Allows event to be enabled and disabled
 - ‘fast path’ in tooling to simplify specification of explicit events

Eventable CICS Commands – Principles

- **Focus is on events of interest in business terms, so commands relating to system activity not eventable**
 - e.g. not ABEND, DUMP TRANSACTION, HANDLE CONDITION, SPI commands
- **Anything that starts work has a good likelihood of mapping to business events**
 - e.g. START, START TRANSID, LINK, INVOKE WEBSERVICE
 - Also enable event capture for program initiation via whatever means (e.g. Web services pipeline, entering transid at a terminal)
- **Getting data into or out of CICS can be a good way of finding out about business events**
 - e.g. RECEIVE MAP, RECEIVE, SEND MAP
- **Writes to CICS data resources (files, queues) may often occur when processing business events**
 - e.g. WRITE FILE, WRITEQ TS
- **Reads of CICS data resources are also interesting, as events do not only occur when data is updated**
 - e.g. READ FILE, READQ TD
- **Do not (initially) plan to event enable data-oriented commands which can be evented in other ways (such as via the database)**
 - e.g. not RMI (DB2, MQ)
 - In a future release, might event enable these commands to get the additional application context
 - **but** only limited information about the command could be available to CICS & included in capture specs

Eventable CICS Commands

- **Channel commands**
 - PUT CONTAINER, START (TRANSID)
- **File Control**
 - WRITE, REWRITE, DELETE
 - READ, READNEXT, READPREV
- **Interval Control**
 - START, RETRIEVE
- **Program Control**
 - LINK, RETURN, XCTL
- **Scheduling Services**
 - START (ATTACH)
- **Temporary Storage**
 - WRITEQ TS, READQ TS, DELETEQ TS
- **Transient Data**
 - WRITEQ TD, READQ TD, DELETEQ TD
- **Web support**
 - INVOKE (WEB)SERVICE
 - WEB READ, WEB READNEXT
- **BMS**
 - RECEIVE MAP
 - SEND MAP
 - SEND TEXT
- **Terminal Control**
 - CONVERSE, RECEIVE, SEND
- **New APIs**
 - SIGNAL EVENT, INVOKE SERVICE
- **Program initiation**
 - Enable event when program starts

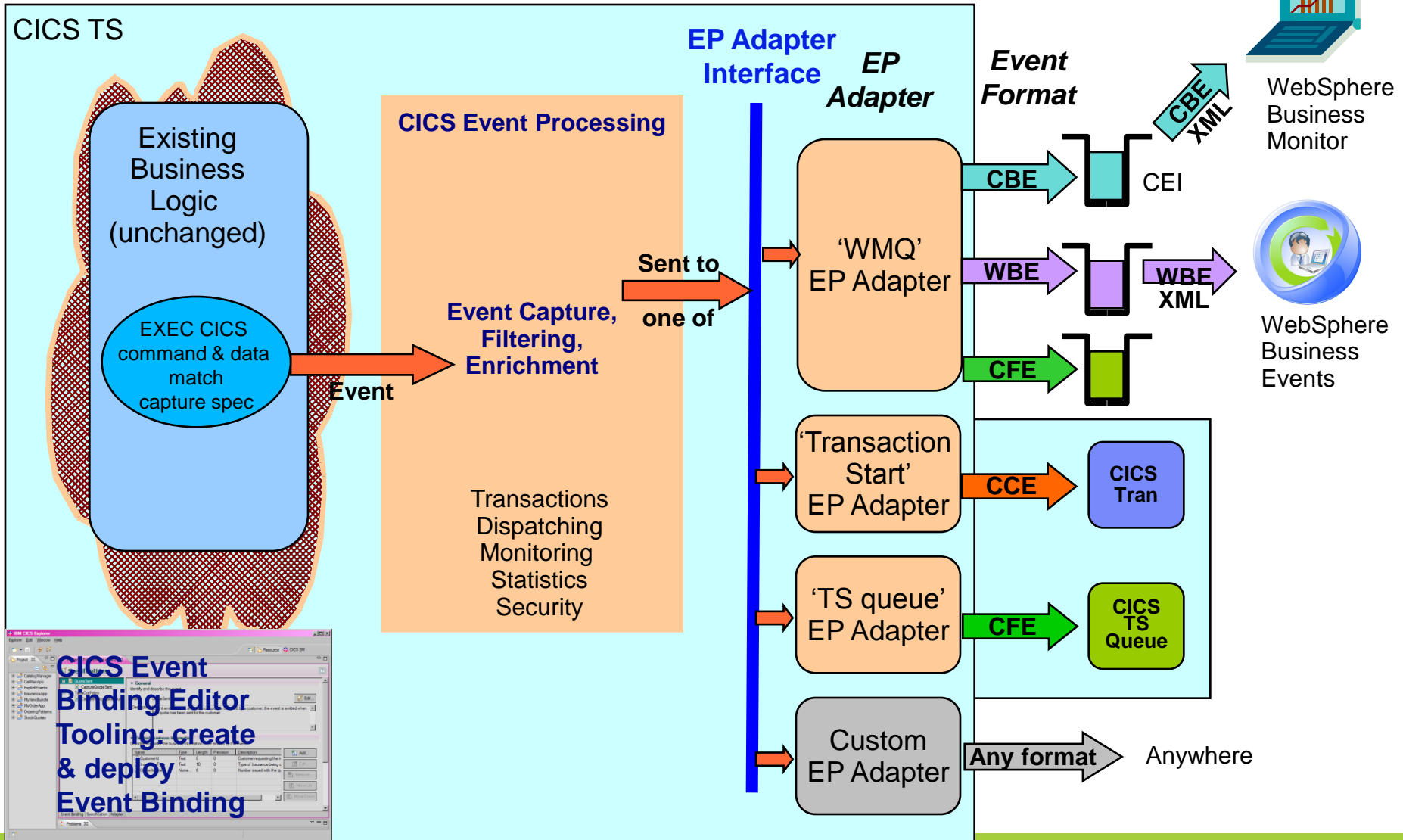
Filterable and Capturable Data

- **Application Context – applies to all commands**
 - Filterable (can be included in a **predicate**):
 - Tranid, Current program, Userid, Command response (OK/not OK)
 - Captured automatically:
 - UOWid, Network-qualified CICS applid, Date & time
 - also: Event name, Event binding name, User tag, Capture spec name
 - Capturable (can be information source for an item of emitted business information):
 - Tranid, Current program, Userid
- **Application command options and application data – Command-specific**
 - e.g. For RECEIVE MAP
 - Filterable and capturable: MAP*, MAPSET, EIBaid, EIBCposn
 - * **Primary Predicate** for each command is the data item on which filtering is *strongly recommended* for performance
 - e.g. For LINK
 - Filterable & Capturable: Program*, Data from channel or Commarea
- **Most commands captured *after* they occur, some offer option to capture *before* e.g. LINK**

CICS Event Processing Adapters

Formatting and Transport of CICS events

CICS Event Processing Adapters



Event Transactionality

- **Transactional option on the event definition**
 - Part of the advanced adapter options on an event binding
 - When set, causes CICS to wait for syncpoint completion before either emitting or discarding event (depending on syncpoint outcome)
 - For many events, will not want transactionality e.g. attempt to write to file could be as interesting as succeeding
- **Note**
 - Transactional events are not emitted until the UOW reaches syncpoint – for a long-running transaction, this could mean the events are not very close to real-time

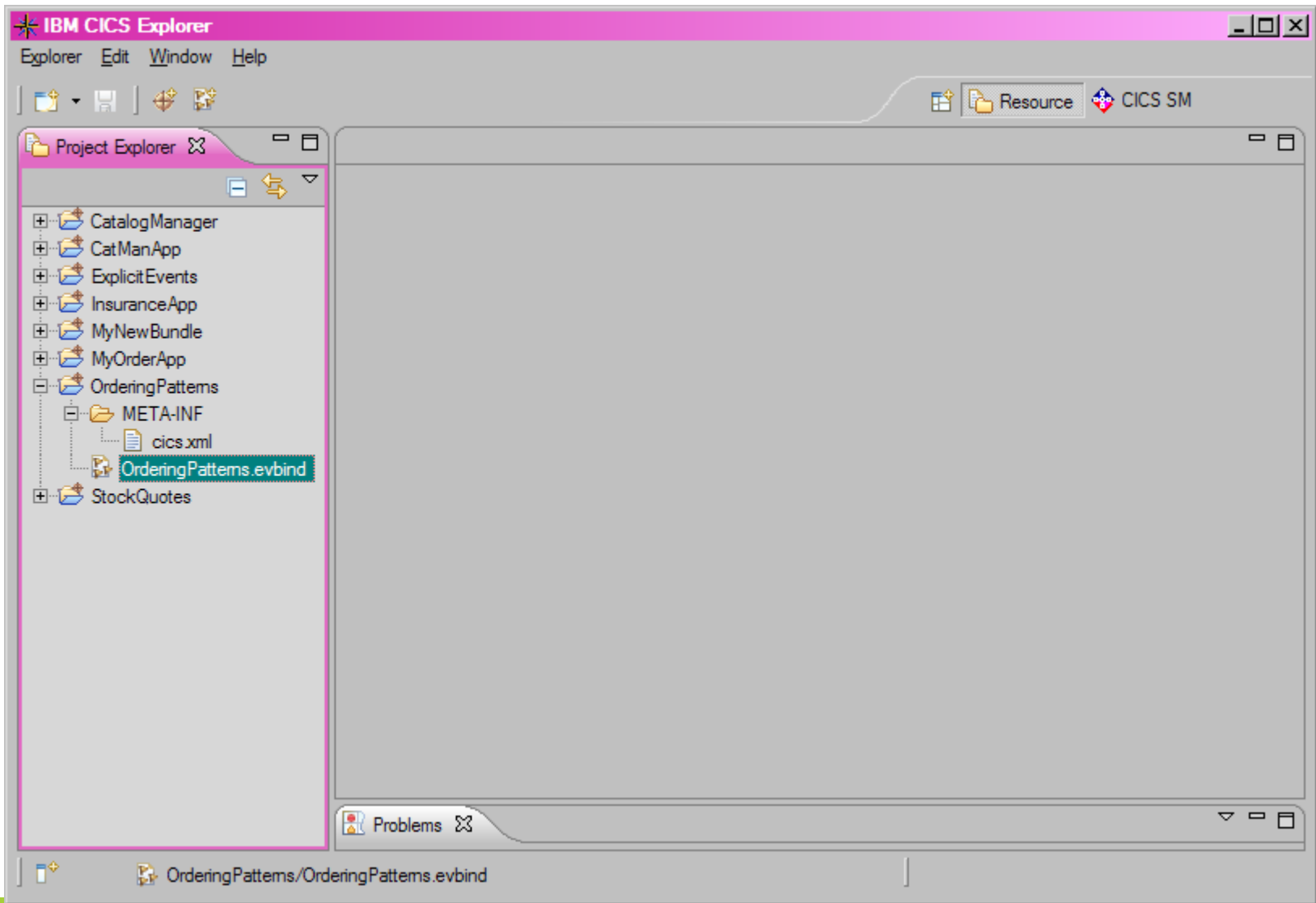
Other event processing policy attributes

- **Dispatch Priority**
 - Specify priority of events in the event binding as Normal or High
- **Userid the EP Adapter is to run under**
 - Specify a userid under which the EP adapter will run
 - e.g. might be needed to allow access to required WMQ queue, or for actions carried out by custom EP adapter
 - ‘Use context userid’ will run EP adapter under the same userid as that running when the event was captured
 - By default, EP adapters run under CICS region userid
- **Transaction ID the EP adapter is to run under**
 - Normally runs under a default tranid
- **Can specify a different tranid or userid for charging**
- **Some performance implications of specifying tranid or userid**

Event Binding Editor

The CICS event specification tooling

CICS Explorer Resource Perspective



Event Binding Editor – Event Binding

The screenshot displays the IBM CICS Explorer Event Binding Editor. On the left, the Project Explorer shows a tree view of the project structure, with 'OrderingPatterns.evbind' selected. The main editor area is titled 'Event Binding' and contains the following sections:

- General Information:**
 - Description: Events to do with ordering for pattern matching by WBE
 - User Tag: V2_0
- Event Specifications:**
 - Event specifications contained in this binding:
 - Order_Placed
 - About_to_place
 - Order_Dispatched
 - Buttons: Add..., Edit Details..., Remove...

At the bottom, a navigation bar contains three tabs: 'Event Binding', 'Specification', and 'Adapter'. The 'Event Binding' tab is circled in blue. Below the navigation bar is a 'Problems' view showing 0 items.

| Description | Resour... | Path | Loc... | Type |
|-------------|-----------|------|--------|------|
| | | | | |

Event Binding Editor – Event Specification

The screenshot shows the IBM CICS Explorer interface. The Project Explorer on the left shows a project structure with 'OrderingPatterns.evbind' selected. The main window displays the 'Specifications' for 'Order_Dispatched'. The 'General' section shows the event name 'Order_Dispatched' and its description 'Event indicating an order has been dispatched.'. The 'Emitted Business Information' section contains a table with columns for Name, Type, Precision, Length, and Description. The 'Capture Specifications' section has an 'Add a Capture Specification...' button, and the 'Automatic Capture Specification' section has an 'Add an Automatic Capture Specification...' button. At the bottom, the 'Event Binding Specification Adapter' tab is selected.

| Name | Type | Precisi... | Le... | Description |
|-------------|-------|------------|-------|----------------------------|
| Customer | Text | 0 | 8 | Customer who place... |
| ItemOrdered | Nu... | 0 | 4 | Identifier of item orde... |
| Order_ID | Text | 0 | 8 | Identifier of the order |

Event Binding Editor – Capture Specification

The screenshot displays the IBM CICS Explorer interface. On the left, the Project Explorer shows a tree view of the project structure, including 'OrderingPatterns.evbind'. The main workspace is titled 'OrderingPatterns.evbind' and shows a 'Specifications' view. Under the 'Specifications' view, a tree view lists several capture specifications, with 'Capture_Order_Dispatch' selected. The right-hand pane shows the configuration for this selected specification, with tabs for 'Capture Point', 'Filtering', and 'Information Sources'. The 'Capture Point' tab is active and contains the following information:

- General:** Identify and describe the capture specification.
 - Name: Capture_Order_Dispatch (with an 'Edit...' button)
 - Description: Capture the point where the order is dispatched
 - Remove Capture Specification... button
- Capture Point:** Choose the capture point.
 - Capture Point: LINK PROGRAM (highlighted with a blue oval)
 - Radio buttons: Capture before, Capture after
 - Next: Filtering → link

At the bottom of the interface, there is a 'Problems' view showing 0 items and a table with columns: Description, Resour..., Path, Loc..., and Type.

Event Binding Editor – Capture Specification Filtering

The screenshot displays the IBM CICS Explorer interface. On the left, the Project Explorer shows a tree view of the project structure, including 'OrderingPatterns.evbind'. The main window is titled 'OrderingPatterns.evbind' and shows the 'Specifications' view. The 'Filtering' tab is selected, and the 'Application Context' section is expanded. Below it, the 'Application Command Options' section is also expanded, showing a table with the following entries:

| Name | Operator | Value |
|----------|----------|----------|
| PROGRAM* | Equals | DFH0XSOD |
| CHANNEL | All | |

The 'PROGRAM*' entry is circled in blue. Below this table is the 'Application Data' section, which includes a table for defining predicates for application data. The table has columns for Source, Container, Offset, Length, Operator, and Value. The first row contains 'Source Variable Data Item' in the Source column. There are 'Add...', 'Edit...', and 'Remove' buttons to the right of the table. At the bottom of the window, there are navigation links: '← Back: Capture Point' and 'Next: Information Sources →'. The bottom status bar shows 'Event Binding Specification Adapter' and a 'Problems' window with '0 items'.

Event Binding Editor – Information Sources

The screenshot shows the IBM CICS Explorer interface. The main window is titled 'OrderingPatterns.evbind' and displays the 'Specifications' view. The 'Information Sources' tab is selected and circled in blue. Below the tab, a table defines the information sources for the capture specification.

Information Sources
Define where emitted business information is obtained by this capture specification

| Name | Type | Format Length | Source | Container | Offset | Capture Length | Capture Type |
|--------------|--------|---------------|----------|-----------|--------|----------------|---------------|
| Customer | Text | 8 | COMMA... | | 94 | 8 | Character |
| ItemOrder... | Num... | 4 | COMMA... | | 87 | 4 | Zoned Decimal |
| Order_ID | Text | 8 | COMMA... | | 102 | 8 | Character |

At the bottom of the window, there is a 'Problems' pane showing 0 items.

Event Binding Editor – Information Sources Import

The screenshot displays the Event Binding Editor interface. The main window shows a tree view of capture specifications on the left and a table of information sources in the center. Two dialog boxes are open: 'Information Source for Customer' and 'Language Structure: dfh0disp.copy'.

Information Sources Table:

| Name | Type | Format Len... | Source | Con... | Offset | Capture Len... | Capture Type |
|--------------|-------|---------------|----------|--------|--------|----------------|---------------|
| Customer | Text | 8 | COMMAREA | | 94 | 8 | Character |
| ItemOrder... | Nu... | 4 | COMMAREA | | 87 | 4 | Zoned Decimal |
| Order_ID | Text | 8 | COMMAREA | | 110 | 4 | Zoned Decimal |

Information Source for Customer Dialog:

Edit Information Source
Choose the source of business information for this capture specification

Available Data:

- Application Context
 - USERID
 - PROGRAM
 - TRANSID
- Application Command Option
 - PROGRAM
 - CHANNEL
- Application Data
 - COMMAREA**
 - CHANNEL

Language Structure: dfh0disp.copy Dialog:

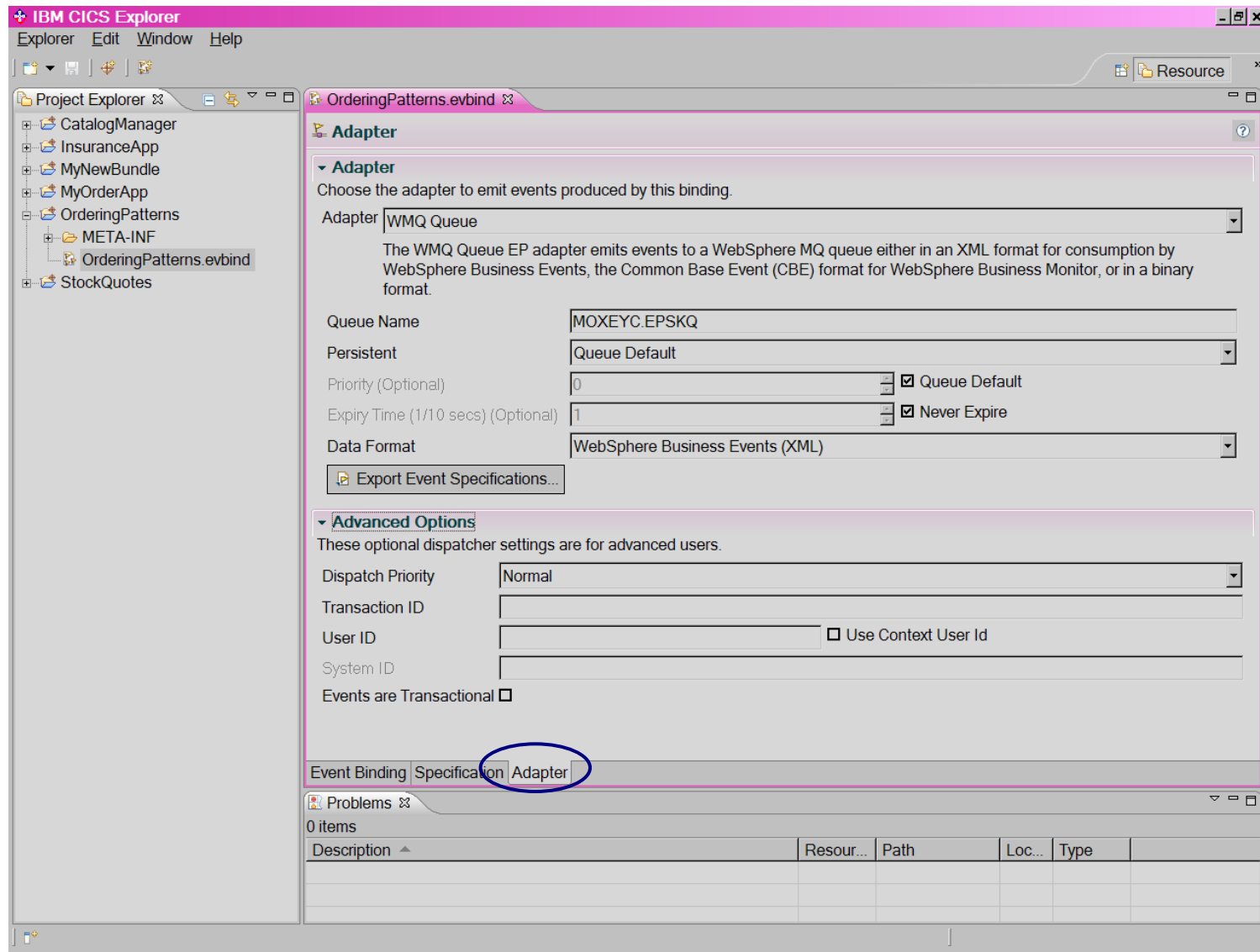
Obtain data format from imported language structure
Import a language structure and choose an item to obtain formatting information

| Name | Format | Offset | Length | Precision |
|-------------------------|------------------|-----------|----------|-----------|
| ca_ord_request_id | Character | 0 | 6 | |
| ca_ord_return_code | Zoned Dec... | 6 | 2 | 0 |
| ca_ord_response_message | Character | 8 | 79 | |
| ca_dispatch_order | | 87 | 23 | |
| ca_ord_item_ref_number | Zoned Dec... | 87 | 4 | 0 |
| ca_ord_quantity_req | Zoned Dec... | 91 | 3 | 0 |
| ca_ord_userid | Character | 94 | 8 | |
| ca_ord_charge_dept | Character | 102 | 8 | |

Event Binding Editor – EP Adapter

EP Adapter specification, showing the configuration details for WMQ Queue EP adapter, with Queue name and other WMQ parameters.

The Advanced Dispatcher Options are shown, but nothing other than the defaults have been selected.



Events in CICS Explorer

The screenshot displays the IBM CICS Explorer interface. The main window shows two panes: 'Event Bindings' and 'Capture Specifications'. The left pane shows the 'CICSplex Explorer' tree with the region 'IYCWZCGO (1/1)' selected. The top pane, 'Event Bindings', shows a table of event bindings for context IYCWZCGO and resource EVNTBIND. The bottom pane, 'Capture Specifications', shows a table of capture specifications for context IYCWZCGO and resource EVCSPEC.

Event Bindings Table:

| Region | Name | Status | Bundle |
|----------|--------------------|-----------|----------|
| IYCWZCGO | CatalogSample | ✓ ENABLED | catbundl |
| IYCWZCGO | ExplicitEventSpecs | ✓ ENABLED | explicit |
| IYCWZCGO | EPSOLINKEvent | ✓ ENABLED | explicit |
| IYCWZCGO | OrderingEvents | ✓ ENABLED | MyOrderA |
| IYCWZCGO | OrderingPatterns | ✓ ENABLED | WBEBundl |

Capture Specifications Table:

| Region | Capture Specification | Event Binding | Capture Type | Capture Point | Event Name |
|-----------|----------------------------------|--------------------|--------------|---------------|----------------------------|
| IYCWZC... | Check_stock_status_on_rewrite | CatalogSample | POSTCOMMAND | REWRITE | Catalog_stock_status_check |
| IYCWZC... | CECISigEventCapture | ExplicitEventSpecs | POSTCOMMAND | SIGNAL_EVENT | CECICommand |
| IYCWZC... | EPSOrder_Event_Capture | EPSOLINKEvent | POSTCOMMAND | SIGNAL_EVENT | Order_Event |
| IYCWZC... | OrderNearlyCapture | OrderingEvents | POSTCOMMAND | READ | OrderNearlyPlaced |
| IYCWZC... | OrderPlaceCapture | OrderingEvents | POSTCOMMAND | REWRITE | OrderPlaced |
| IYCWZC... | Capture_customers_about_to_order | OrderingPatterns | POSTCOMMAND | READ | About_to_place |
| IYCWZC... | Capture_order_placing | OrderingPatterns | POSTCOMMAND | REWRITE | Order_Placed |
| IYCWZC... | Capture_Order_Dispatch | OrderingPatterns | POSTCOMMAND | LINK_PROGRAM | Order_Dispatched |

Using CICS Events

Integration with WebSphere Business Monitor and
WebSphere Business Events

Value from CICS Events

- **Use CICS events to**
 - Monitor what is happening in the system
 - Drive additional processing as a result of events
 - Detect interesting patterns amongst events
- **to enable**
 - Business insight
 - Business flexibility and innovation
 - Regulatory compliance and management of business risk

CICS and WebSphere Business Monitor

WebSphere Business Monitor (WBM)

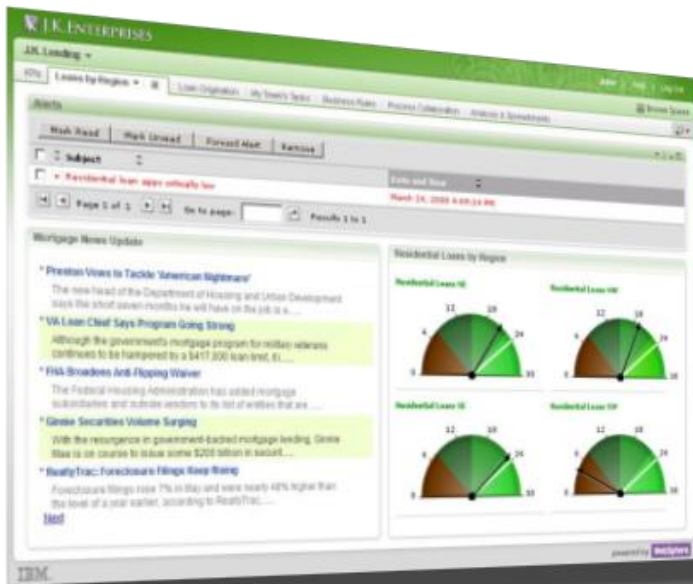
– a Business Activity Monitoring Solution

Business activity monitoring (BAM) provides process visibility

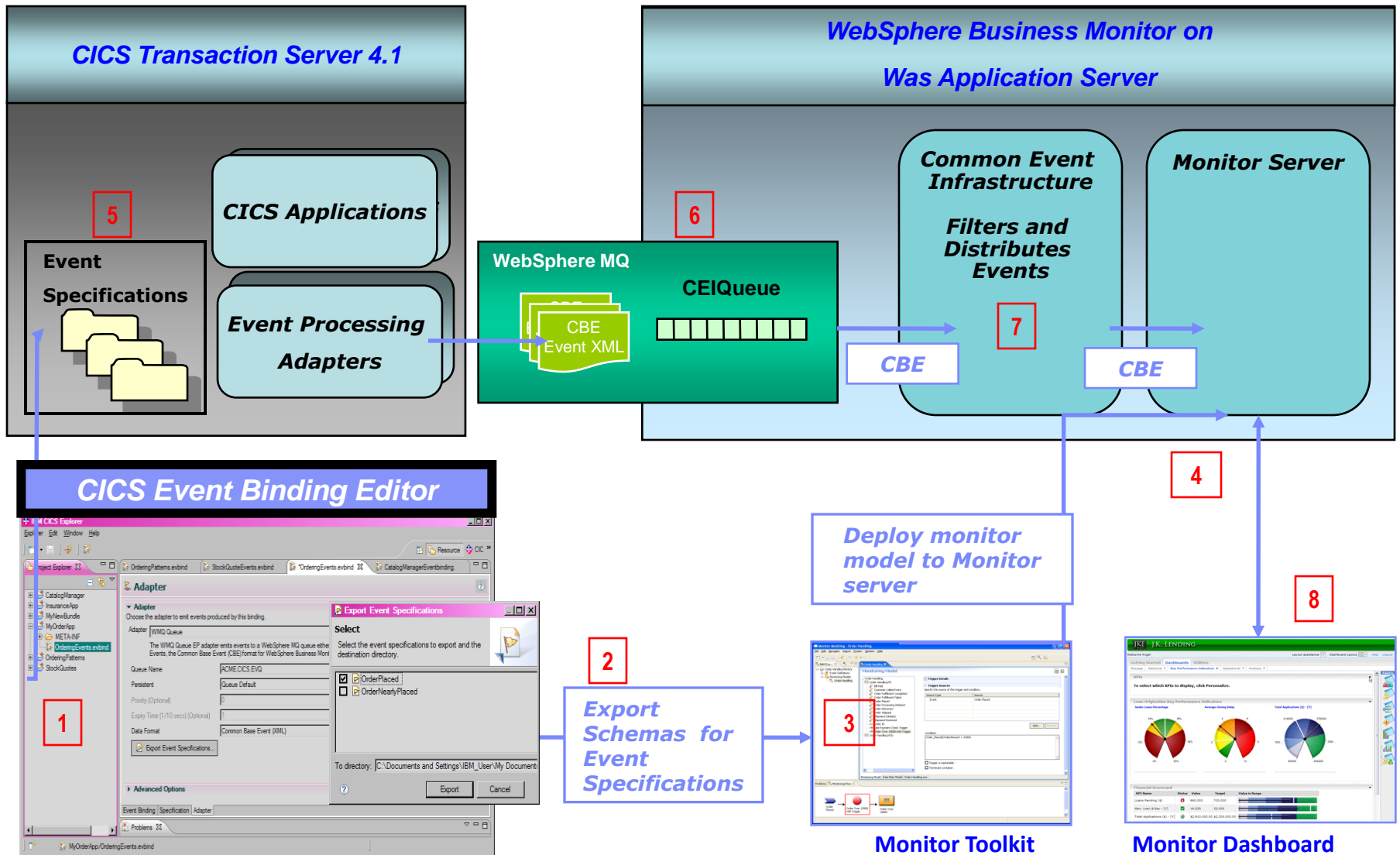
Business leaders gain real-time visibility and actionable insight into processes

Real-time information consolidated into customizable, role-based dashboards

Business leaders monitor process **KPIs** and receive alerts



CICS and Monitor Integration



CICS CBE format event for WBM

```

<cbe:CommonBaseEvent xmlns:cbe="http://www.ibm.com/AC/commonbaseevent1_0_1"
  xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" version="1.0.1"
  creationTime="2009-02-11T02:42:06+00:00"

  <cbe:sourceComponentId component="IBM CICS TS#4.1.0" componentIdType="ProductName"
    executionEnvironment="IBM z/OS"
    instanceId="GBIBMUVW.IYK1X2YZ" location="MV2C" locationType="Hostname"
    subComponent="CICS EP" componentType="http://www.ibm.com/xmlns/prod/cics/eventprocessing"/>
  <cbe:situation categoryName="OtherSituation">
    <cbe:situationType xsi:type="OtherSituation" reasoningScope="EXTERNAL">
      <CICSApplicationEvent/>
    </cbe:situationType>
  </cbe:situation>

  <cics:event xmlns:cics="http://www.ibm.com/xmlns/prod/cics/events/CBE">
    <cics:context-info>
      <cics:eventname>Order_Placed</cics:eventname>
      <cics:usertag>V0_9</cics:usertag>
      <cics:networkapplid>GBIBMUVW.IYK1X2YZ</cics:networkapplid>
      <cics:timestamp>2009-02-11T02:42:06+00:00</cics:timestamp>
      <cics:bindingname>Order_Processing</cics:bindingname>
      <cics:capturespecname>Order_PlacedCapture</cics:capturespecname>
      <cics:UOWid>1A11C7C2C9C2D4C9E8C14BC9E8C3E6E3C3F9F9BABD6C7A0D35000A</cics:UOWid>
    </cics:context-info>
    <cics:payload-data>
      <data:payload xmlns:data="http://www.ibm.com/prod/cics/V0_9/Order_Placed">
        <data:Customer>Customer1</data:Customer>
        <data:Item_Ordered>0030</data:Item_Ordered>
        <data:Number_Ordered>4</data:Number_Ordered>
      </data:payload>
    </cics:payload-data>
  </cics:event>

</cbe:CommonBaseEvent>
  
```

CBE Envelope

xs:any slot

Example – Business process performance and KPIs

- **Order Processing application**
 - Events emitted during order processing
 - Order Placed
 - Order Shipped
 - Order Cancelled
- **Business information required**
 - How long on average does it take to dispatch orders?
 - Are we meeting our “shipped in 5 working days” SLA?
 - How often are orders cancelled?
 - How often are orders cancelled after they have been shipped?
 - etc.

Exporting Dynamic Schema for CBE

The screenshot displays the IBM CICS Explorer interface. On the left, the Project Explorer shows a tree view with folders like CatalogManager, InsuranceApp, MyNewBundle, MyOrderApp, META-INF, and subfolders OrderingEvents.evbind, OrderingPatterns, and StockQuotes. The main window shows the configuration for the 'Adapter' of 'OrderingEvents.evbind'. The 'Adapter' dropdown is set to 'WMQ Queue'. Below it, the 'Queue Name' is 'ACME.CICS.EVQ' and 'Persistent' is 'Queue Default'. The 'Data Format' is set to 'Common Base Event (XML)'. A button labeled 'Export Event Specifications...' is circled in blue. An arrow points from this button to a dialog box titled 'Export Event Specifications'. The dialog box has a 'Select' section with three checked items: 'Order_Placed', 'About_to_place', and 'Order_Dispatched'. At the bottom, the 'To directory:' field is set to 'C:\Documents and Settings\IBM'. Buttons for 'Export' and 'Cancel' are at the bottom right.

Authoring the Monitor Model in WID

The screenshot displays the IBM WebSphere Integration Developer 6.2 interface. The main window is titled 'Monitor Details Model' and shows the configuration for an inbound event named 'orderPlacedEvent'.

Monitor Details Model

▼ Inbound Event Details
 Edit the details of the inbound event, which references an event that is generated by the monitored application.

ID: [Edit...](#)

Name:

Description:

▼ Event Type Details
 Specify the event type or the XML schemas that together describe the structure of this inbound event. You can specify an extension name, event parts, or both.

Extension name: [Browse...](#) [Clear](#)

Event parts:

| ID | Name | Type | Path |
|---------|---------|-------------|---|
| static | static | cics:event | cbe:CommonBaseEvent/cics:event |
| dynamic | dynamic | tns:payload | cbe:CommonBaseEvent/cics:event/cics:... |
| | | | |
| | | | |
| | | | |

[Add](#) [Remove](#)

▼ Filter Condition
 Define a condition based on the event attributes to identify whether to accept an event of this type.

▼ Correlation Expression
 Define an expression to identify the monitoring context instance or instances that receive the event at runtime.

If no instances are found [Create new instance](#)

The left sidebar shows a project tree for 'cicsMM4' with sub-items: 'cicsMM4 MC', 'itemID', 'Month', 'Year', 'itemNumber', 'OrderNumber', 'orderPlacedTrigger', and 'orderPlacedEvent'.

The bottom status bar shows the current project is 'cicsMM4/cicsMM4 DMM/cicsMM4 MC Cube'.

Business Process Performance and KPIs in Business Space

Instances

Export ...
Search for:
Reset

| orderID | itemID | customer name | item price | item quantity | order duration | order start time | order end time | order price | order status |
|-----------------|--------|---------------|------------|---------------|----------------|-----------------------------|-----------------------------|-------------|----------------|
| +000012784 0001 | | Steve | 20 | 20 | 24 m, 19.121 s | May 27, 2009 10:38:13 AM | May 27, 2009 11:02:32 AM | 400 | order canceled |
| +000012785 0002 | | Lijia | 5 | 40 | 23 m, 25.009 s | May 27, 2009 10:39:24 AM | May 27, 2009 11:02:49 AM | 200 | order shipped |

KPIs

| KPI Name | Status | Value | Target | Actions | Value in Range |
|-------------------------------|--------|----------------|---------------|---------|---|
| average time on order shipped | | 23 m, 18.601 s | 1 h, 0 m, 0 s | | <div style="width: 100%; height: 15px; background: linear-gradient(to right, #008000 10%, #ffff00 10% 20%, #ff0000 20% 100%);"></div> |
| percent of order cancelled | | 25.00% | 30.00% | | <div style="width: 100%; height: 15px; background: linear-gradient(to right, #008000 25%, #ff0000 25% 100%);"></div> |

Dimensions

File Edit View Bookmarks Data Chart Tools Help

?

Drill Down

| order status dimension | average order price | sum order price | order count |
|-----------------------------------|---------------------|-----------------|-------------|
| All order status dimension | 280 | 1120 | 4 |
| order canceled | 400 | 400 | 1 |
| order shipped | 240 | 720 | 3 |

Measures

■ order canceled
 ■ order shipped

Other monitoring opportunities

- **Follow the end-to-end processing of orders**
 - Events at all stages in the process
 - Catalog request, inquiry on item, request for price quote, place order, confirm order, order dispatched, invoice issued, payment received, stock replenished, etc.
 - Might involve a process choreographed by **WebSphere Process Server**, but with some processing carried out within CICS
 - CICS event processing support opens up the 'black box' that hitherto has been the processing in CICS

Business Flexibility with CICS Events

Using CICS events to extend applications

- **CICS event can start new CICS transaction**
 - Transaction Start EP Adapter
 - Run new program, passing event information
- **CICS event can be written to WMQ queue**
 - WMQ Queue EP Adapter
 - Program can read event from queue and carry out new processing
 - Events can be sent to WebSphere Business Events, where they might be combined with other events, and result in actions which drive new processing

Example of application extension

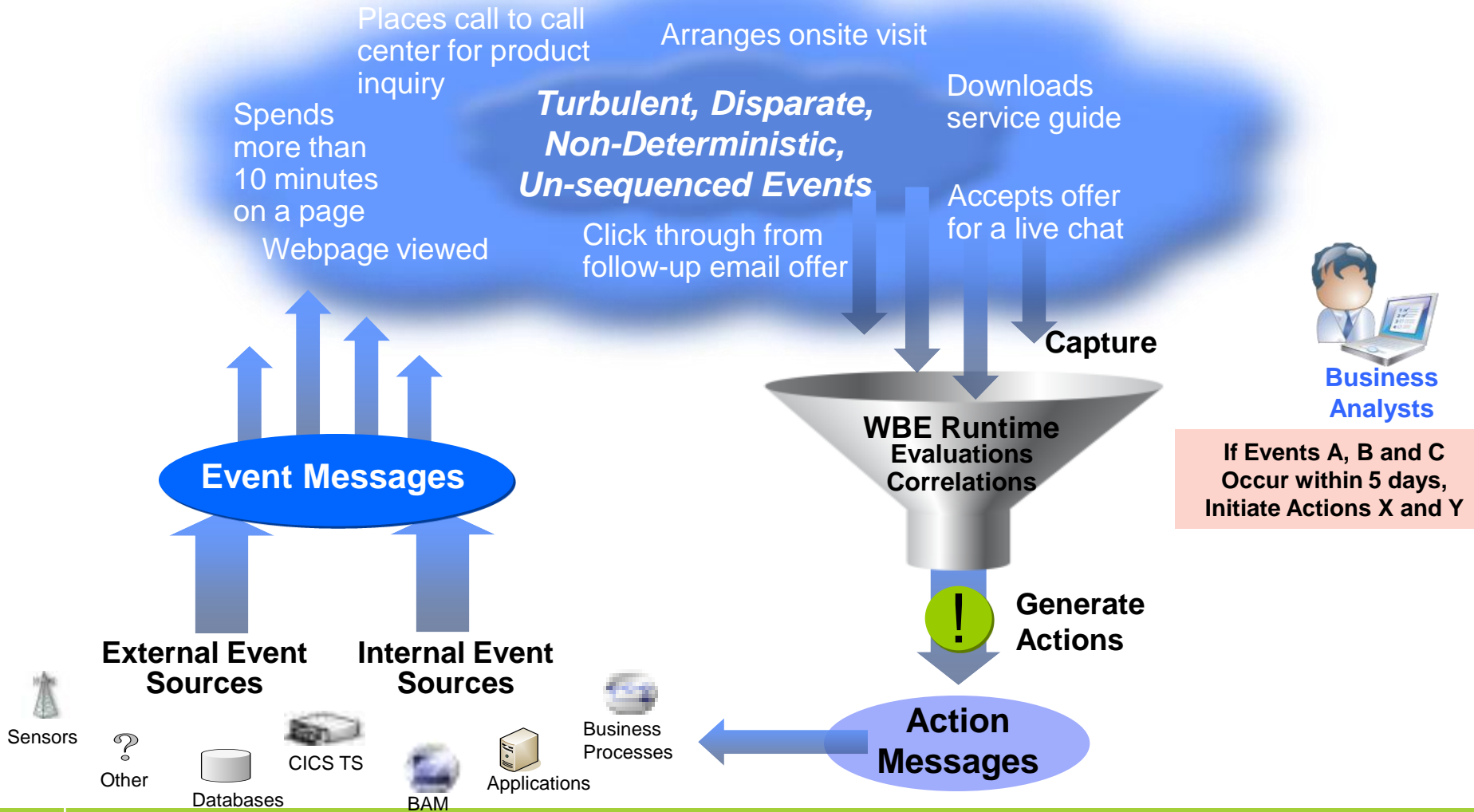
- **Copy of bank account details have fallen into wrong hands**
- **Bank needs to immediately detect activities on those accounts**
- **Events captured at all places where**
 - Money withdrawn from accounts
 - Contact details updated
 - New check (cheque) book requested
- **Drive CICS transaction which does lookup against account details in Shared Data Table**



CICS Events and WebSphere Business Events

WebSphere Business Events

Correlation of business events from any source, over any time frame



CB11: CICS Events for WBE SupportPac

- CICS SupportPac CB11 provides a taster of CICS acting as a source of events to WebSphere Business Events
- The SupportPac runs on CICS TS V3.1 and V3.2, and was made available December 2008 (refreshed May 2009 to run on CICS TS V4.1)
- Requires a small change to existing CICS application code
 - Invoke the program supplied by the SupportPac, passing event details in a channel
- The SupportPac formats the event information into XML conforming to WBE format and emits the event for consumption by WebSphere Business Events (or other consumer program) via the WebSphere MQ transport
- WebSphere Business Events can include the event in interaction blocks to carry out pattern matching etc.

Insurance Scenario Involving a Business Opportunity

- **Customer has obtained insurance quotes for three or more of car, house, belongings and travel insurance**

- CICS application code which processes insurance quotes could emit an event when a quote is processed, including a customer name or identifier and the type of insurance policy

Customer has purchased only one of these insurance policies

- CICS can emit event when purchase of insurance policy is processed, with customer identifier and policy type

- **WebSphere Business Events can detect this pattern**

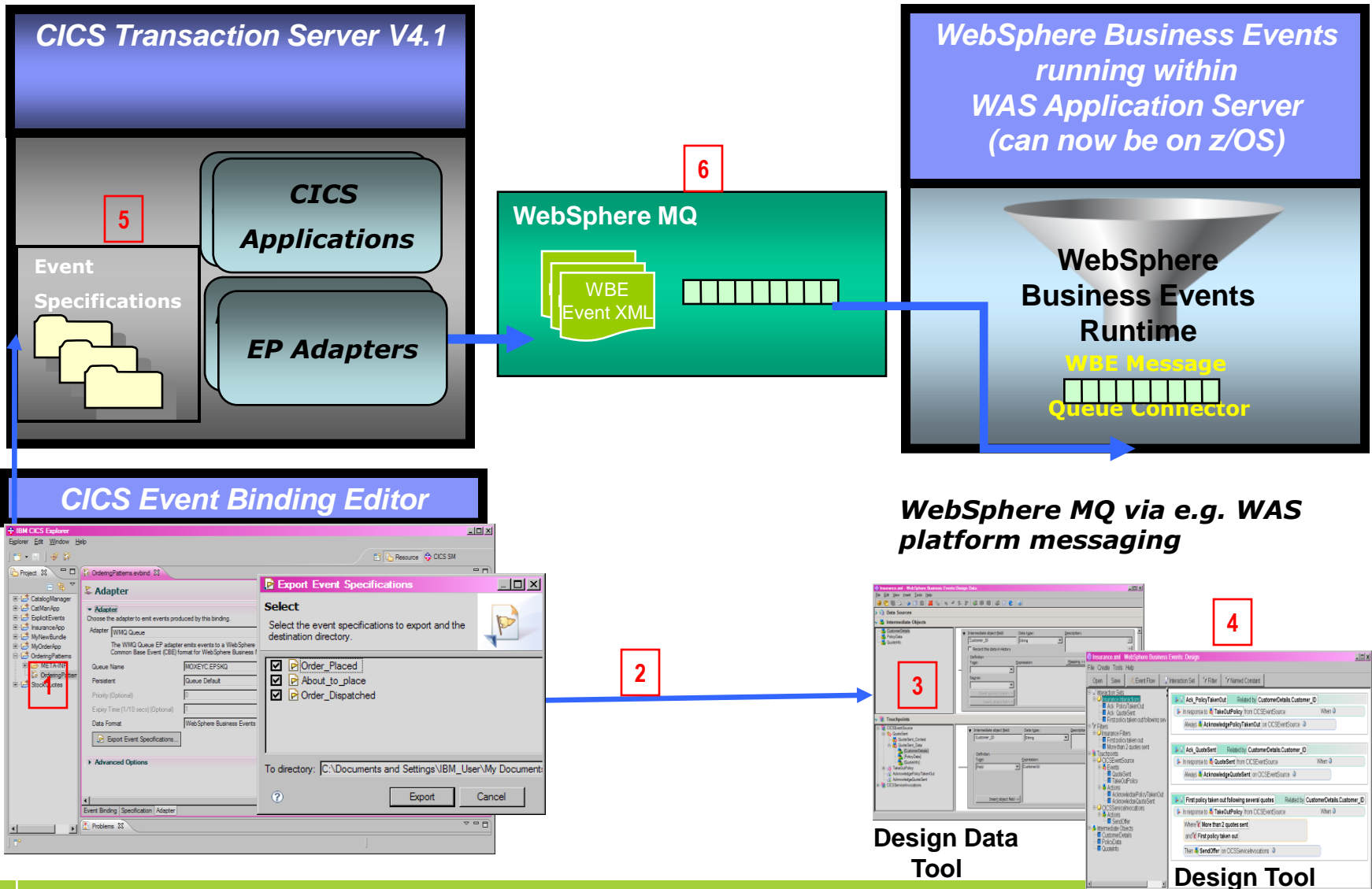
- When quotes for these types of policy received but not all have matching purchase (correlated by customer), then take action

- **Send offers to the customer for the other insurance for which quotes were requested**

- Better targetting than sending offers for all types of insurance available



CICS and WebSphere Business Events Integration

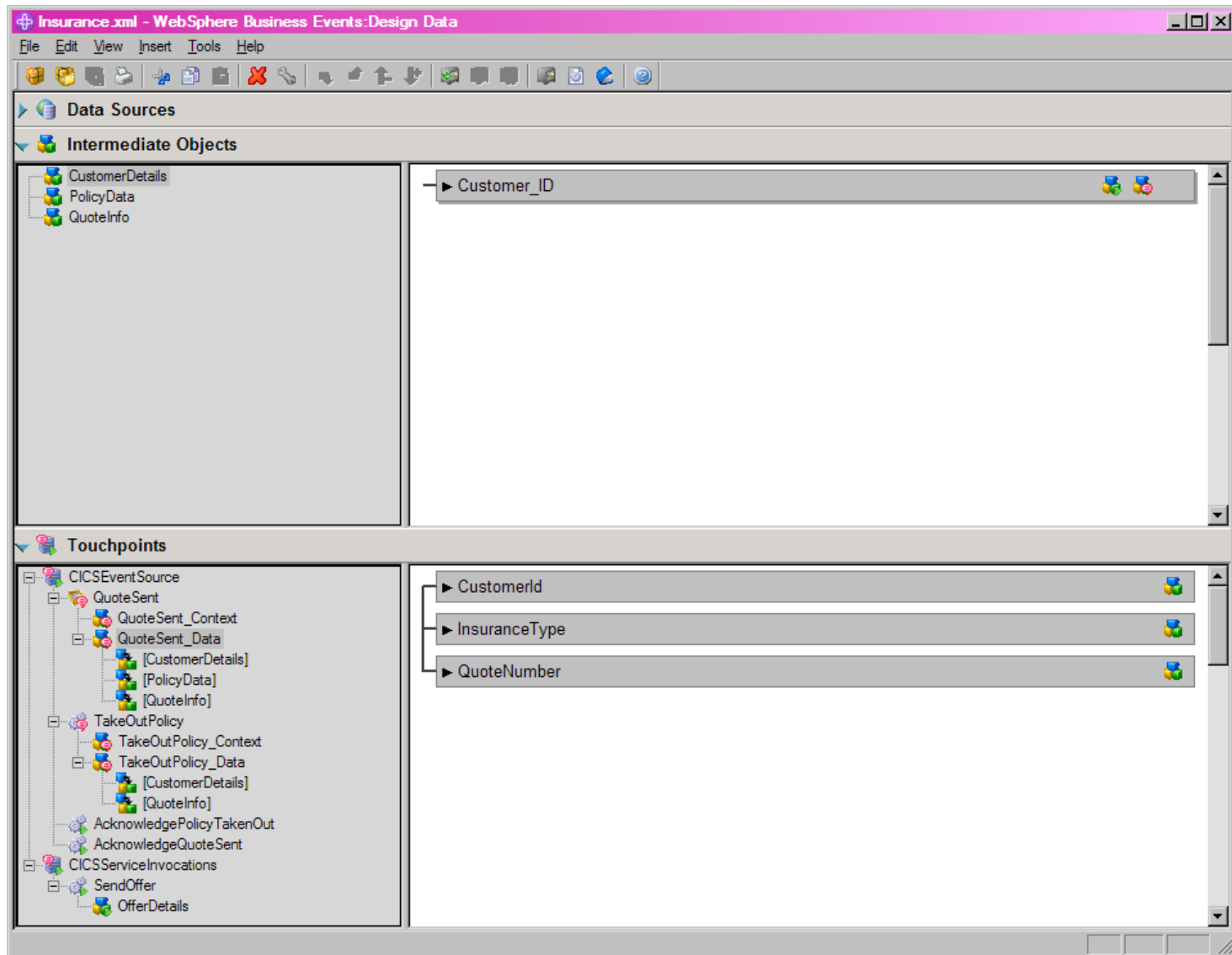


EP Adapter and Exporting Event Specifications for WebSphere Business Events

The screenshot displays the IBM CICS Explorer interface. On the left, the Project Explorer shows a tree view of project components, including 'OrderingPatterns.evbind'. The main workspace shows the configuration for the 'Adapter' of this binding. The 'Adapter' dropdown is set to 'WMQ Queue'. Below this, the 'Queue Name' is 'MOXEYC.EPSKQ', 'Persistent' is 'Queue Default', 'Priority (Optional)' is '0', and 'Expiry Time (1/10 secs) (Optional)' is '1'. The 'Data Format' is set to 'WebSphere Business Events (XML)'. A blue arrow points from the 'Export Event Specifications' button in the 'Data Format' section to the 'Export Event Specifications' dialog box.

The 'Export Event Specifications' dialog box is open, showing a 'Select' section with the instruction: 'Select the event specifications to export and the destination directory.' Three event specifications are listed with checked boxes: 'Order_Placed', 'About_to_place', and 'Order_Dispatched'. The 'To directory:' field is set to 'C:\Documents and Settings\IBM_User\My Documents\Sus'. The dialog has 'Export' and 'Cancel' buttons at the bottom.

Design Data : Events and Intermediate Objects



Design Data : Event Connection Specification

The screenshot displays the IBM Design Data environment for 'Insurance.xml - WebSphere Business Events:Design Data'. The main workspace shows a tree view of 'Intermediate Objects' and 'Touchpoints'. The 'QuoteSent' event is selected, and its properties are shown in the 'Event QuoteSent Properties' dialog. The 'Connection' tab is active, and 'Message Queue Connection' is selected with a blue oval. The 'Message Queue Event Connection' sub-dialog is open, showing the 'Format' set to 'Connector Packet', 'Queue Type' as 'JMS Queue', and 'Name' as 'jms/MQCICSEventQ'. The 'Selector expression' field is empty.

Event QuoteSent Properties

- Connector
- Email Connection
- File System Connection
- FTP Connection
- HTTP Connection
- Message Queue Connection
- RDBMS Connection
- SOAP Connection

Message Queue Event Connection

Format: Connector Packet

XSLT Style Sheet: [Configure...]

Queue

Type: JMS Queue Name: jms/MQCICSEventQ [Provider...]

Selector expression (An empty expression selects all messages.):

[OK] [Cancel] [Advanced...]

Insurance Quote Example – 1

WebSphere Business Events Interaction Set

Response to TakeOutPolicy Related by **CustomerDetails.Customerid**

In response to **TakeOutPolicy** from **CICSEventSource** When

Where **No Offers Sent**
and **More than 2 quotes received**

Then **SendOffer** on **CICSServiceInvocation**

In response to **TakeOutPolicy** from **CICSEventSource** When

Always **AcknowledgePolicyTakenOut** on **CICSEventSource**

Events from CICS

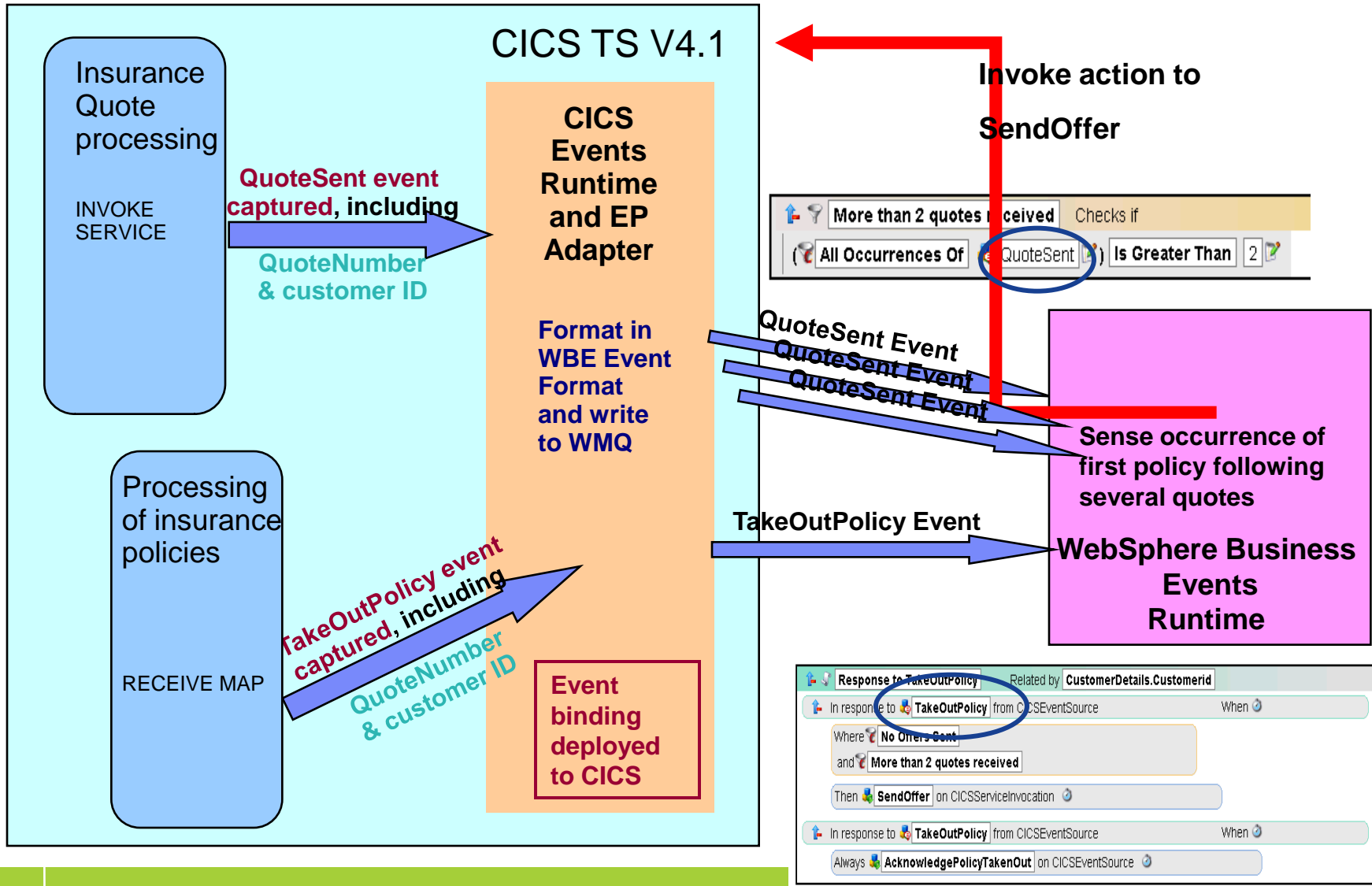
More than 2 quotes received Checks if

(**All Occurrences Of** **QuoteSent** **Is Greater Than** 2)

Policy taken out Checks if

(**All Occurrences Of** **AcknowledgePolicyTakenOut** **Is Greater Than** 0)

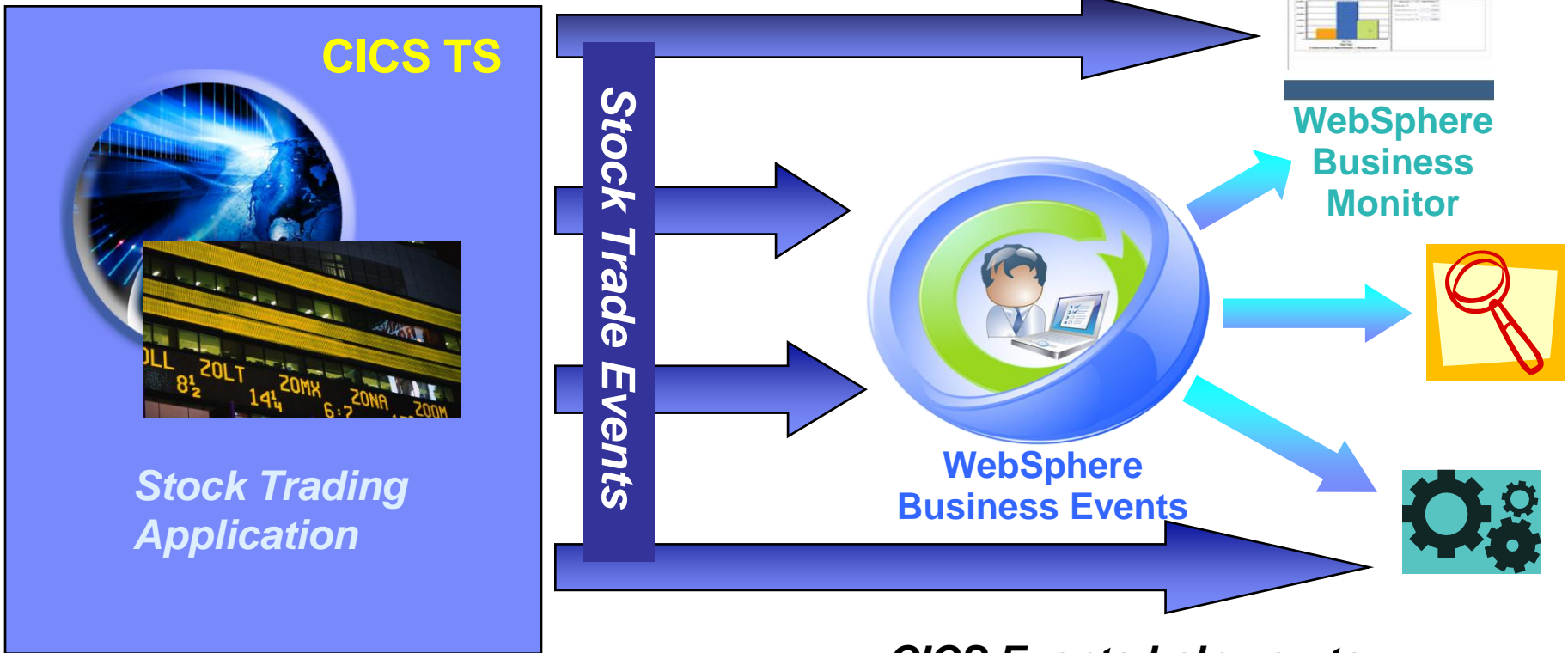
Insurance Quote Example - 2



Summary, References and Q&A

Including a summarising scenario

Visibility, Compliance, and Business Flexibility with CICS Events



CICS Events help you to

- Observe business processes***
- Recognize suspicious activity***
- Drive new processing***

References for CICS Event Processing Support

- [CICS TS V4.1 Announcement Letter](#)
- [CICS TS V4.1 Information Center](#)
- [CB11: CICS Events for WBE](#)
- CICS Event Processing on YouTube
 - [CICS Events with WebSphere Business Events High-level](#)
 - [CICS Events 5 minute demo](#)
- CICS and Events white papers
 - [IBM event processing solutions \(CB11 introduction\)](#)
 - [Gaining insight with IBM CICS and business events](#)
- WebSphere Business Monitor
 - [WBM Introduction](#)
 - [WBM V6.2 InfoCenter](#)
- WebSphere Business Events
 - [WebSphere Business Events Introduction](#)
 - [WebSphere Business Events V6.2 InfoCenter](#)

CICS Event Processing Summary

- **Non-invasive** emission of business events from CICS applications *without need to change* existing business logic
- **SIGNAL EVENT API** for explicit instrumentation of events
- **Event Binding Editor** tooling within CICS Explorer to create event specifications
- Event specifications deployed to CICS via bundles containing event bindings
 - Specifies event and the emitted business data, and how it can be detected and captured by the CICS runtime
 - Specify event capture points as EXEC CICS command (a subset of the EXEC CICS API) plus filtering on command parameters and data
- Events dispatched to specified EP adapter for formatting and emission to event consumer consumers including **WebSphere Business events** and **WebSphere Business Monitor**
 - CICS-provided EP adapters plus capability for custom EP adapters

Thank You !
Any further questions?

