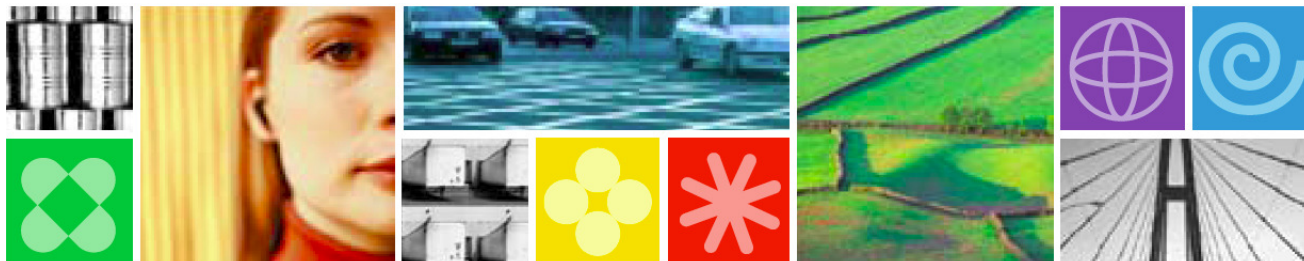




Transaction Server V4.1 and WebSphere Business Events



An Introduction to WebSphere Business Events for System z





AGENDA: An introduction to WebSphere Business Events for System z

1

Business Events Processing (BEP) Overview

- What is BEP?
- Introduction to WebSphere Business Events (WBE)
- Client Use Case Example

2

Creating and Emitting Events from CICS

- Overview of CICS Event Processing
- CICS Event Tooling

3

Demonstration – CICS Event Generation Editor

6

Questions



Sense and Respond to Actionable Situations Business Event Processing

...an Event?

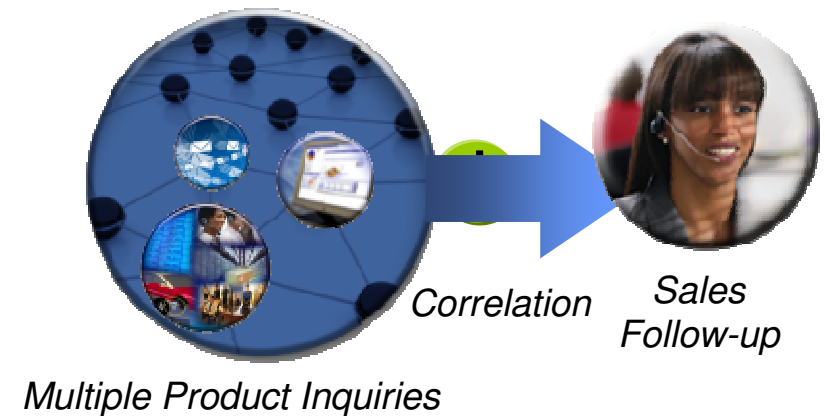
Any electronic signal (message) indicating a change in the state of something has occurred or contemplated

...a Business Event?

Any event occurring within a business context.

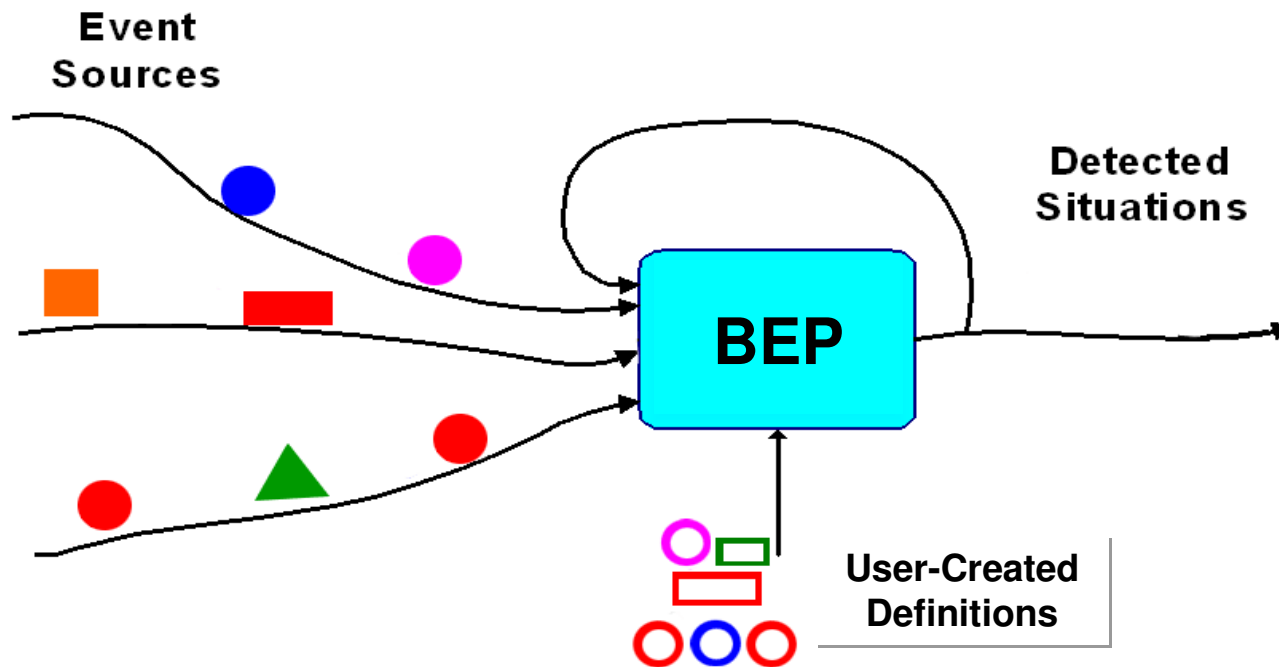
...Business Event Processing?

The ability to sense when a business event or event pattern has occurred (or not occurred) – indicating an actionable business situation – and to coordinate the right response (action) at the right time.





Correlate Business Events Over Any Source, Over Any Timeframe *with Business Event Processing (BEP) – Before it is Too Late*



“Events...pass silently back and forth...as unrelated pieces of communication. They are a source of great power, for when they are correlated, they yield a wealth of information.”
-Dr. David Luckham, Professor Emeritus, Stanford University



The event processing landscape has changed drastically in recent years and will continue to grow at a near exponential pace

“We have all this data, but no information” – CEO of a major US company

Large companies can experience up to **800 Billion** business events daily

Nearly **4 Trillion** RFID events are emitted each day



Over **190 Billion** emails are sent daily





Business Event Processing Turns Insight into Action





BEP Sense and Respond

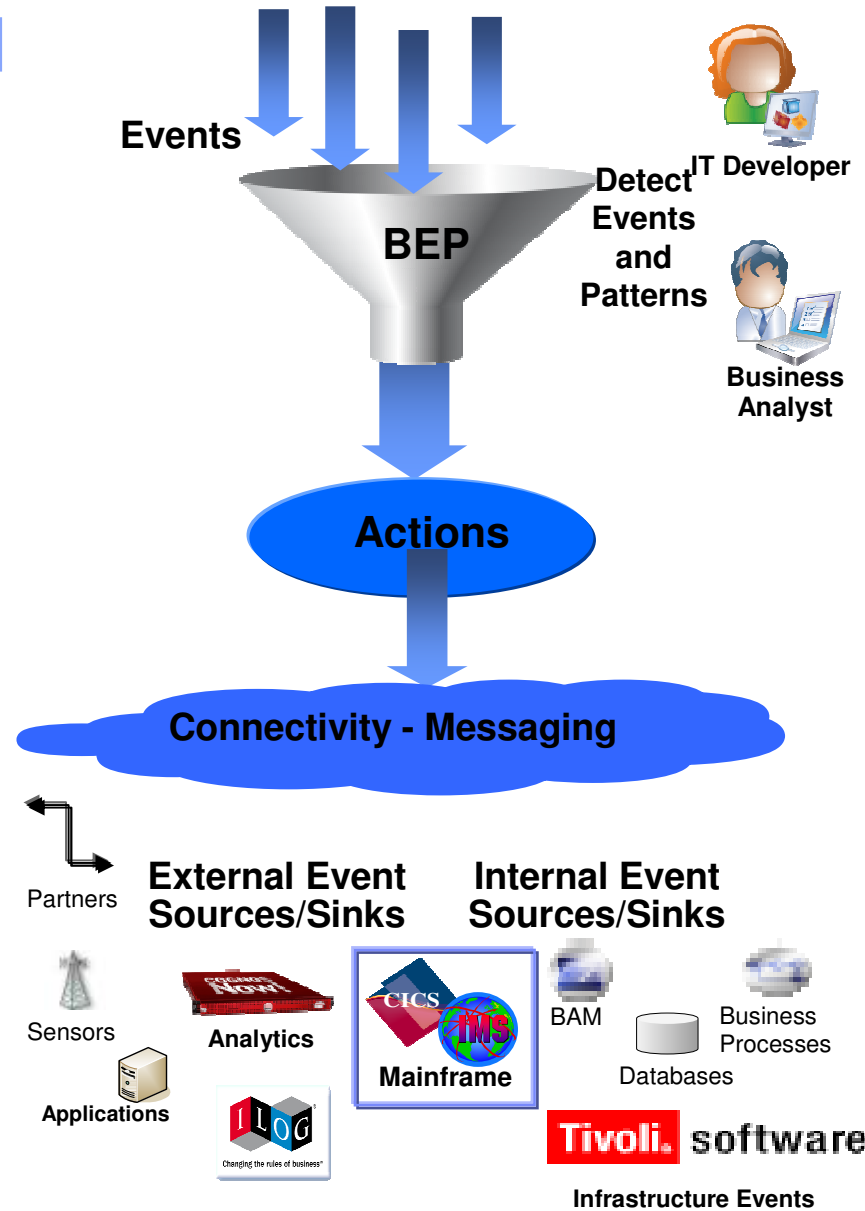
Turning Insight into Action

Event Processing is About Determining “When”

- WBE detects “when” an event or event pattern occurs (actionable situation) and generates one or more messages (actions) alerting the infrastructure

Knowing “when” Allows Coordination of “What”

- When any application or process, operating in the IT infrastructure, receives an alert message (posted by WBE) indicating an actionable situation has occurred, it will determine “what” to do” I.e. do nothing, execute and when finished create a new event message or *not*





Real world client example...

Turning Insight into Action

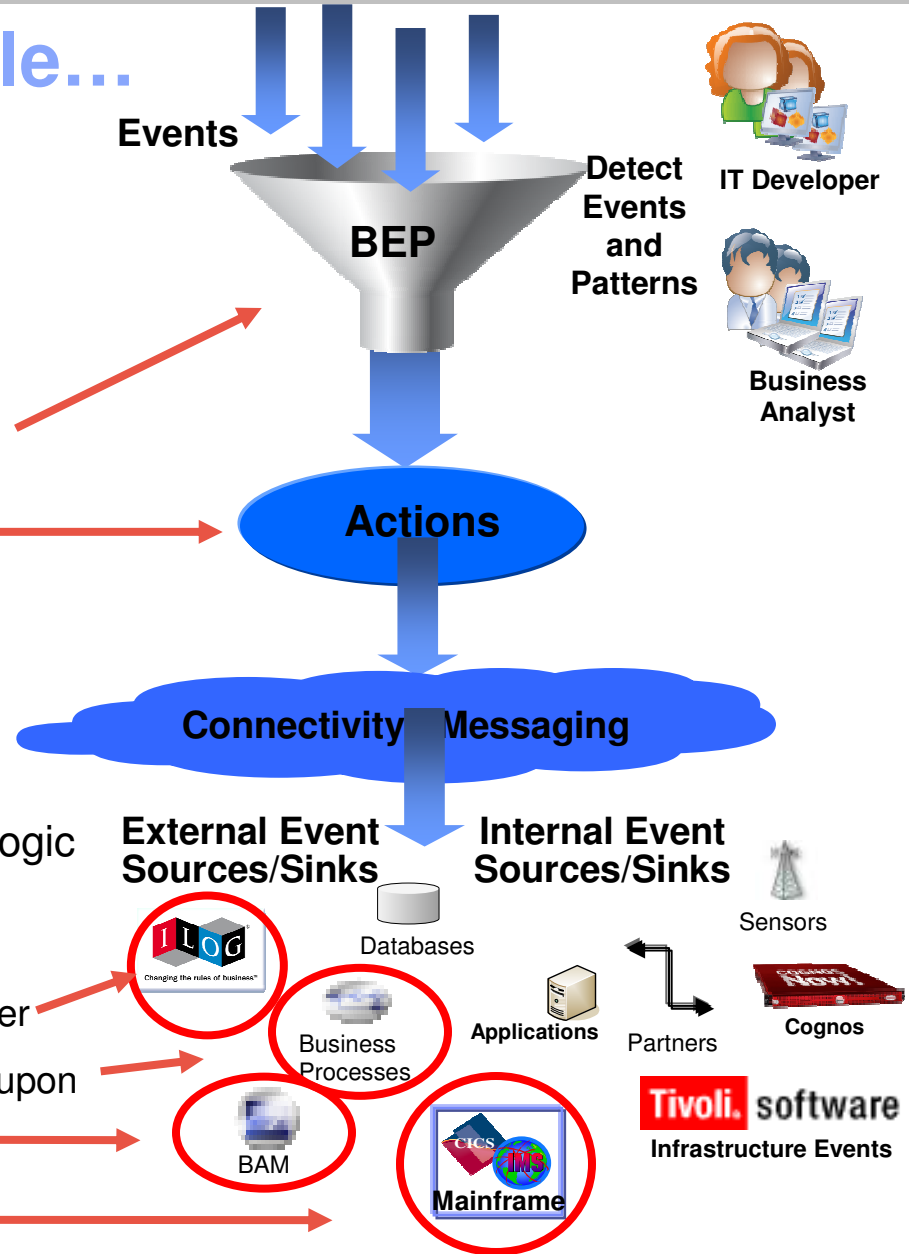
Event Processing is About Determining "When"

- Detect whenever a customer completes >2 purchases at the web, within 30 days
- Create Action (Alert) when detected

Knowing "when" Allows Coordination of "What"

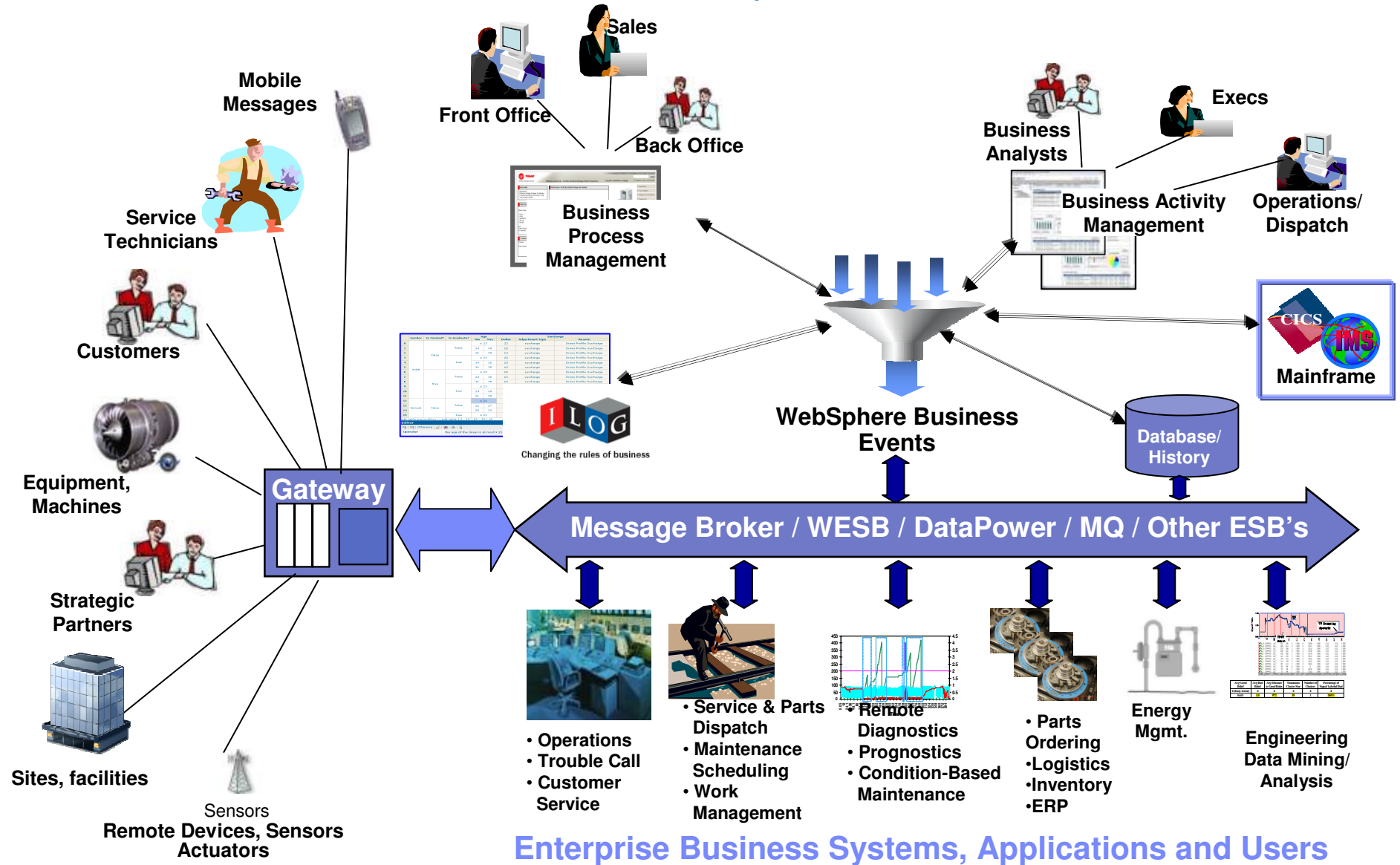
Applications and processes containing logic for responding to repeat purchases will respond (execute) to the Action (alert)

- Determine if and what level of discount to offer
- Execute process for sending the discount coupon
- Track results of the promotion
- Update Customer record in Mainframe





Event Driven Architecture for the Enterprise...





WebSphere Business Events Delivers BEP

Role-based User Interfaces Empower the Business

WebSphere Business Events Puts Power in the Hands of the Business User...

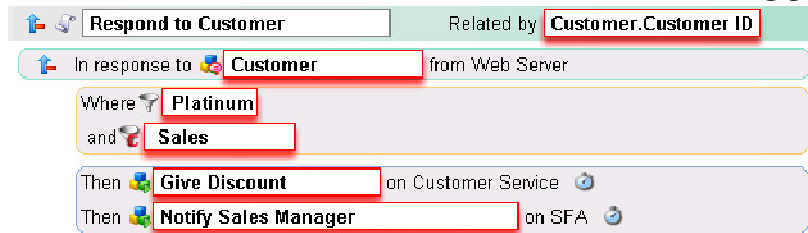
- Define business situations and responses
- All tasks performed via intuitive GUI

Condition Block



Business User

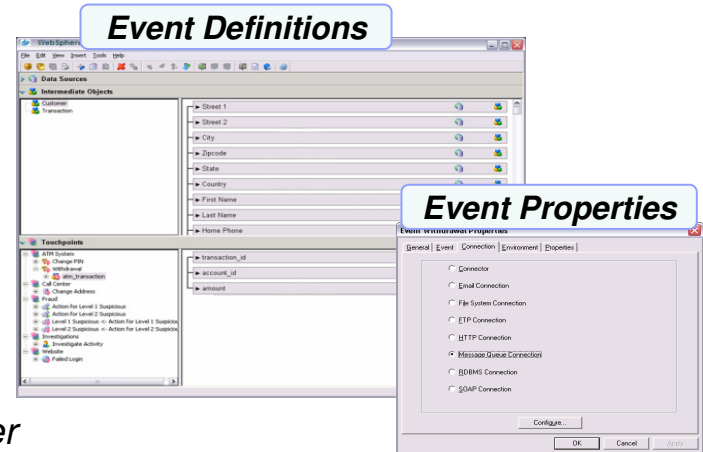
Event Interaction Block



 Point and click from drop-down lists

...Through Collaboration with IT, Allowing IT to Manage Resources

- Defines available events and properties
- Provides connectivity to event sources



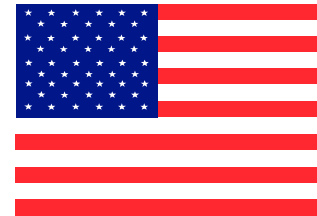
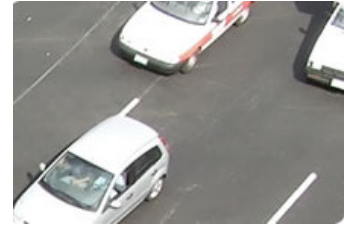
IT Developer



Client Use Case Example

About the Customer

- *Customer is in the US Property and Casualty Insurance market*
 - Offers auto, motorcycle, ATV, RV, boat, homeowners, renters, condo, mobile home, co-op, flood, life, overseas, commercial, umbrella and identity theft insurance policies
- *Customer is in the top 10 in the US market*
 - More than 9 million policyholders
 - More than 15 million vehicles insured





Challenges to Overcome

Growth Challenge

- Competition gaining market share through online customer acquisition
- Needed an effective way to turn “browsers” into “buyers”

Agility Challenges

- IT unable to respond to new Marketing Campaign requirements in a timely fashion



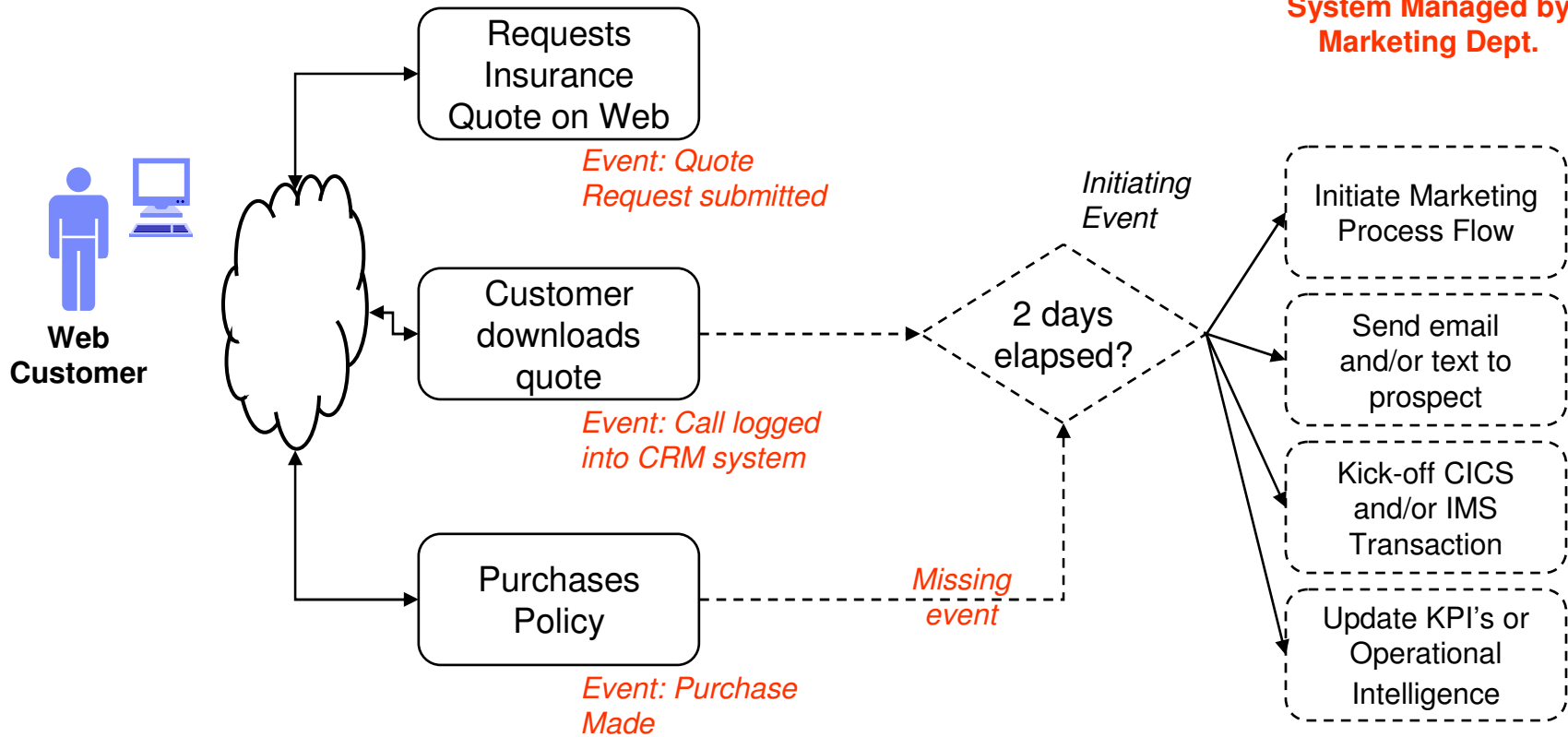


WBE Delivers Smarter Insurance

Online "Browser" to "Buyer" Conversion



System Managed by Marketing Dept.

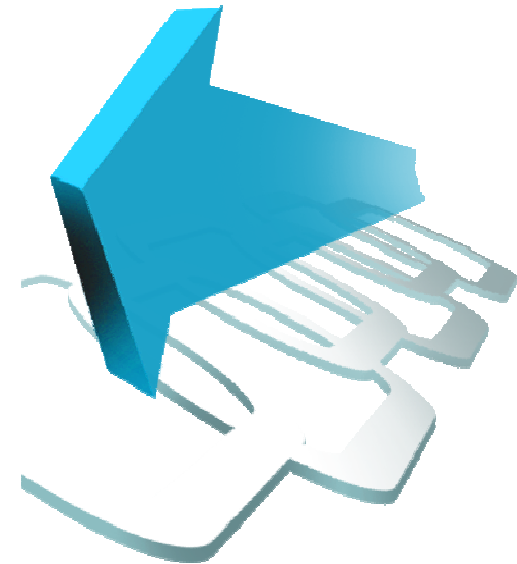




BEP Delivers Smarter Insurance

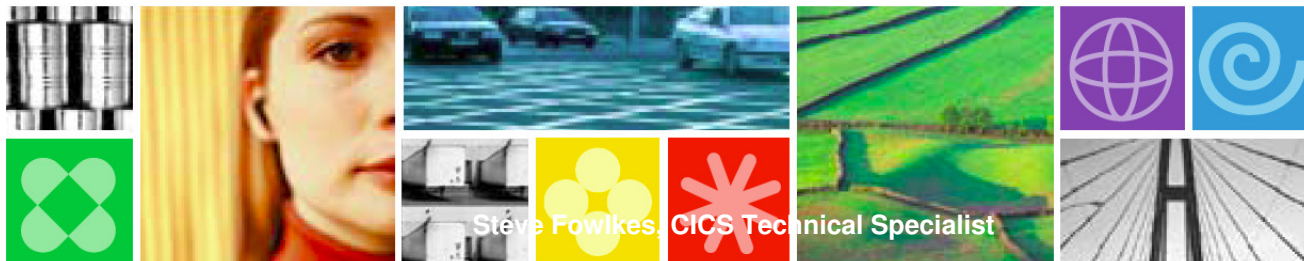
Results

- **Implemented in 4 weeks**
- **New customer acquisition from online leads dramatically improved**
- **ROI in 1 month**
- **Time to implement ongoing online Sales and Marketing Campaigns reduced from 6 weeks to less than a day**
- **Marketing team is responsible for the on going management of the solution**





Creating and Emitting Events from CICS



Steve Fowlkes, CICS Technical Specialist





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 (WBE) provides complex event processing for business users



Business Event Processing Bridges the Gap

Puts power in the hands of the business user

- No coding required for defining business event patterns
- Tasks performed via tooling



Business User



Provides unique convergence of power, flexibility, and ease of use

- IT configures endpoints and payloads
- Leverages SOA infrastructure





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**
 - 950,000 programmers earn their living from CICS
 - CICS handles more than 30 billion transactions/day valued at over \$1 trillion/week for 30 million end users of CICS Apps
- **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 TS 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 or TSQ
 - Application through WebSphere MQ

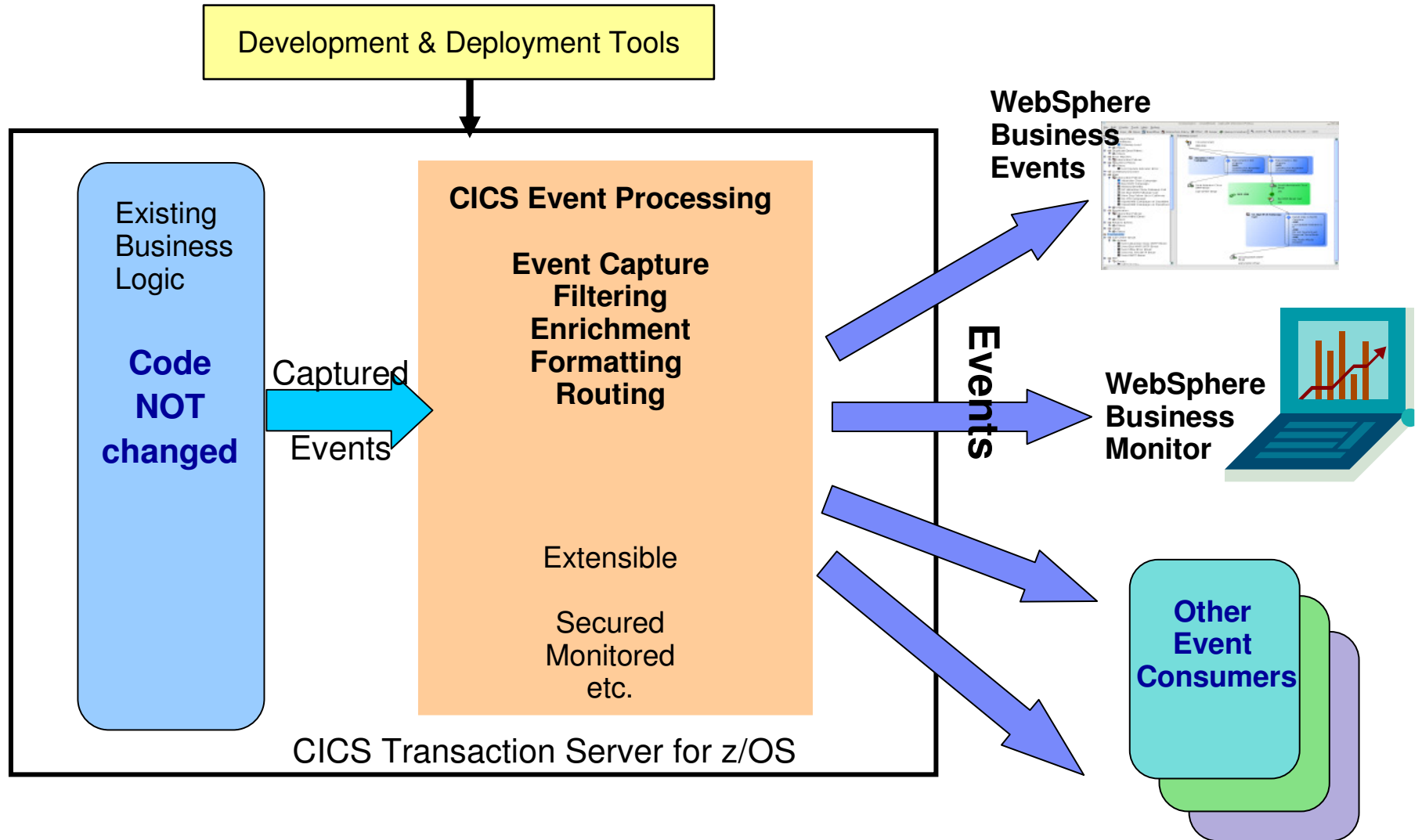


The Event Solution for CICS

- **Events can be emitted *without change to existing business logic* by defining existing EXEC CICS calls (from the supported subset) as candidates to trigger events**
- **Events triggered when the predefined conditions are met:**
 - Specified EXEC CICS Command, and
 - Specified file/program/service (for example), and/or
 - Running under specified transaction or program (for example)
- **Filter conditions or predicates relating to event data can also control the event capture**
 - for example “account balance must be less than 100 dollars”
- **Once conditions are met, CICS will**
 - Capture application data specified for the event payload
 - Apply any policy relating to the event
 - Emit the event through its associated Event Processing Adapter
- **Events are specified using the Event Binding Editor tooling, under the CICS Explorer**
- **The CICS Explorer is used to deploy the events to CICS**



CICS and event processing – overview





EP Scenario – 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



LOB optionally configures a dashboard



**LoB
Manager**

Identify
Business
Events

Specify
Business
Actions

Optionally
Configure
Dashboard or
Interaction Set



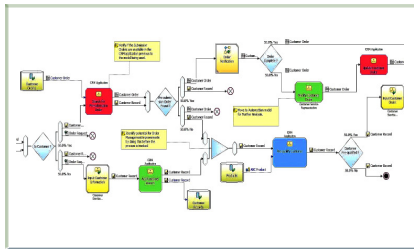
**Application
Analyst**

Create Event
Capture
Specification

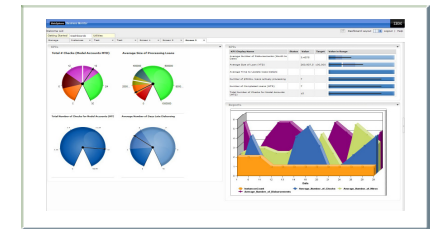
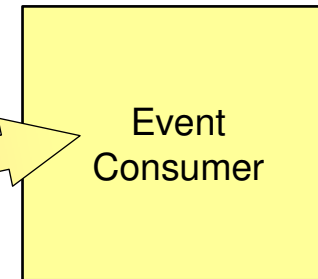
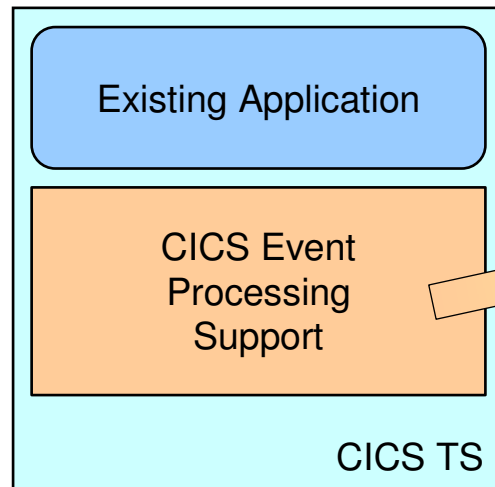


**Systems
Programmer**

Deploy
Events



Business Modeler



Business Dashboard



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

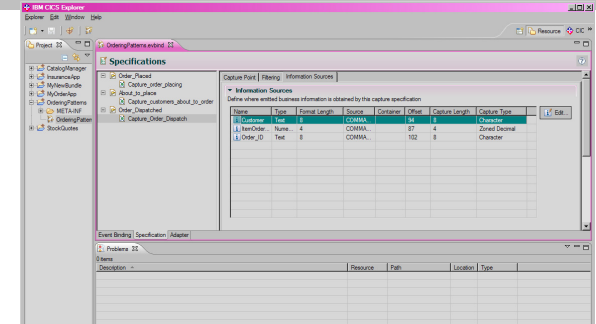


Eventable CICS Commands

- 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



CICS Event Tooling



- **Event Binding Editor**

- Eclipse editor feature , operating on event binding files (type .evbind)

- **Event Binding Editor is a plug-in to the CICS Explorer**

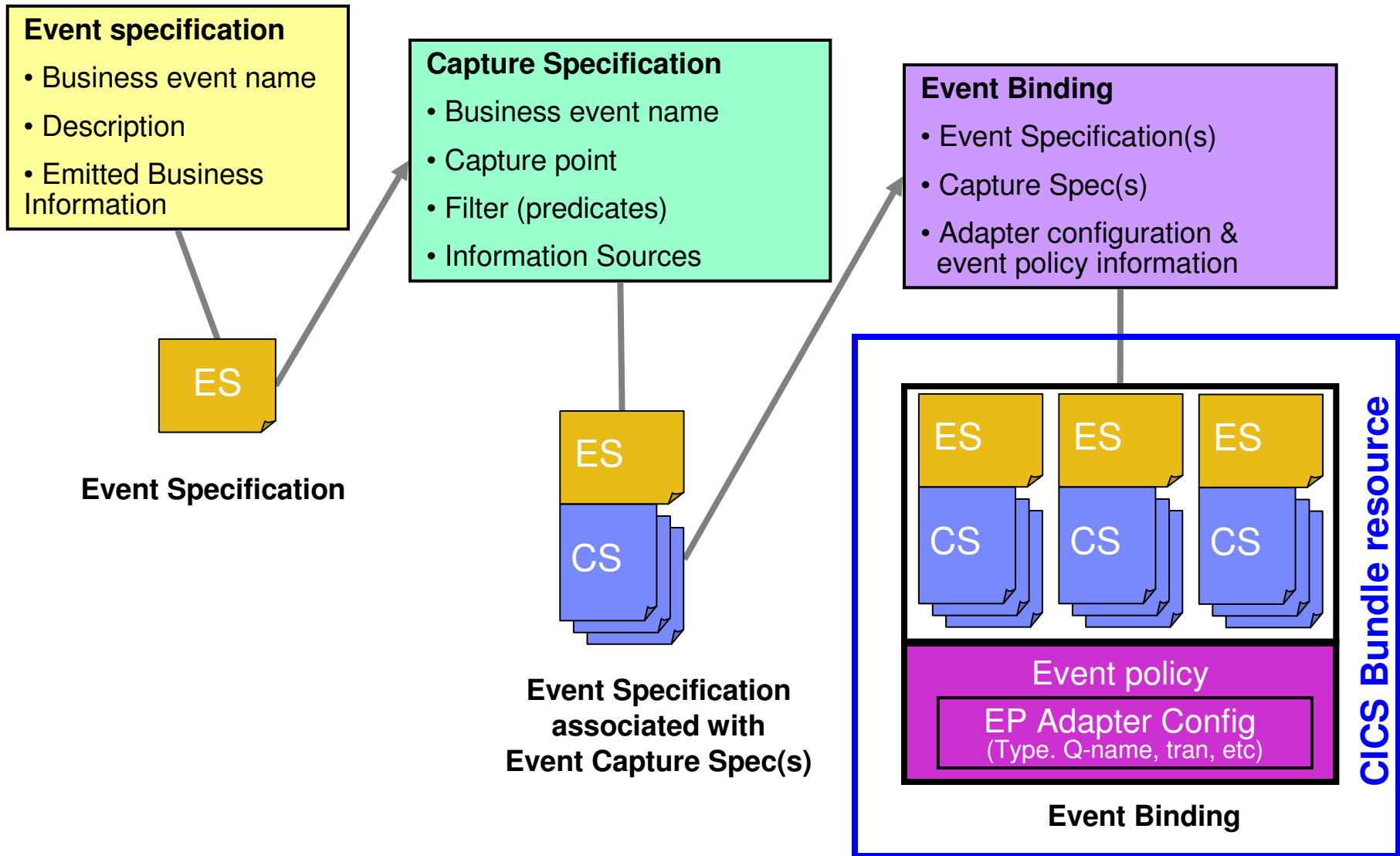
- Create event binding(s) within a **Bundle Project**
 - CICS Explorer provides support to deploy bundles containing event bindings

- **Event binding can be built up in stages**

- Validated against schema each time it is saved, other validation as information added
- A problems pane keeps a running record of all errors



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
to PROGRAM(OrderDB)
from current_program = OrderUI
where OrderVal > 10K

← Capture Point

← Application Command Options Predicate

← Application Context Predicate

← 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, ...
EP Adapter = CICSTransaction

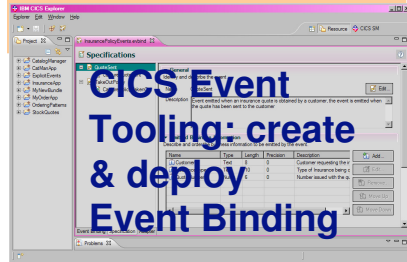
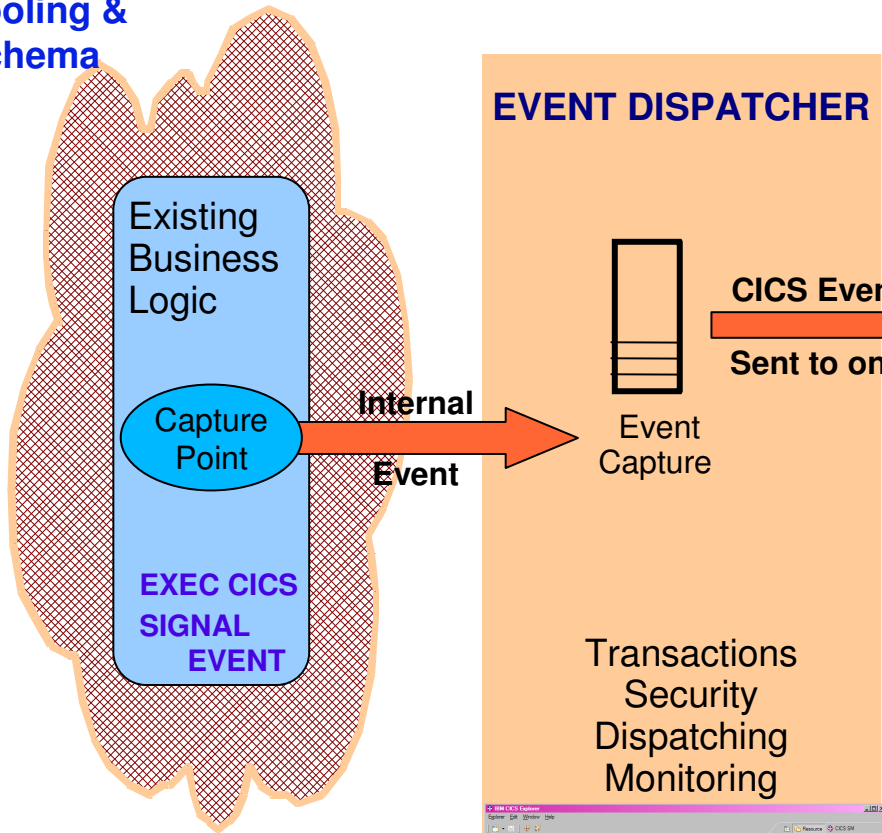
← Event binding includes other related events

← How events in this Binding are emitted



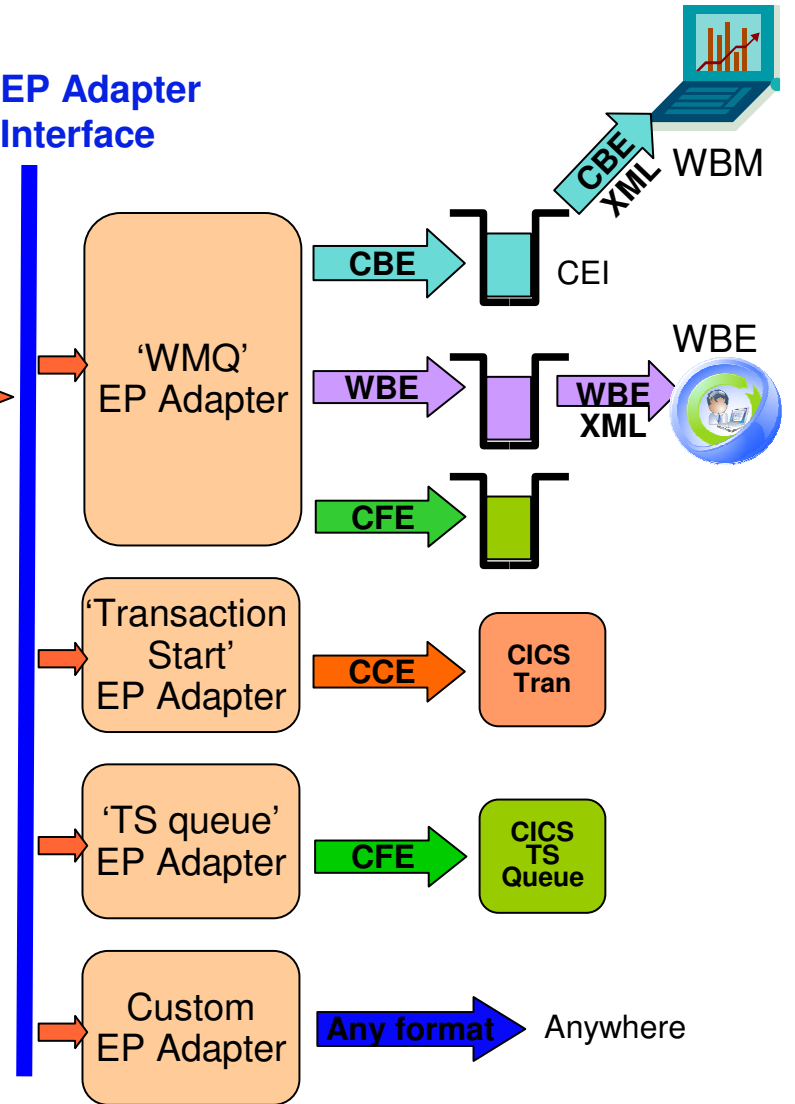
CICS Event Processing Adapters

CICS Event Tooling & Schema



CICS Event Tooling: create & deploy Event Binding

EP Adapter Interface





Common Language Specifications from LOB

- **Deposit Event:**
 - Transaction Code
 - Date
 - Time
 - Account Number
 - Previous Balance
 - Deposit Amount (Transaction Amount)

- **Withdrawal Event:**
 - Transaction Code
 - Date
 - Time
 - Account Number
 - Previous Balance
 - Withdrawal Amount (Transaction Amount)



Discovery from the Application Analyst

- **CICS Region: CICSPR02**
- **TransID: BNKW / BNKD**
- **Prog Name: EBPROGW / EBPROGD / EBPROGU**
- **COmmArea: BNKACTCA**
- **CopyBook: BNKACTCA.cpy**



Create Artifacts Using the CICS Explorer

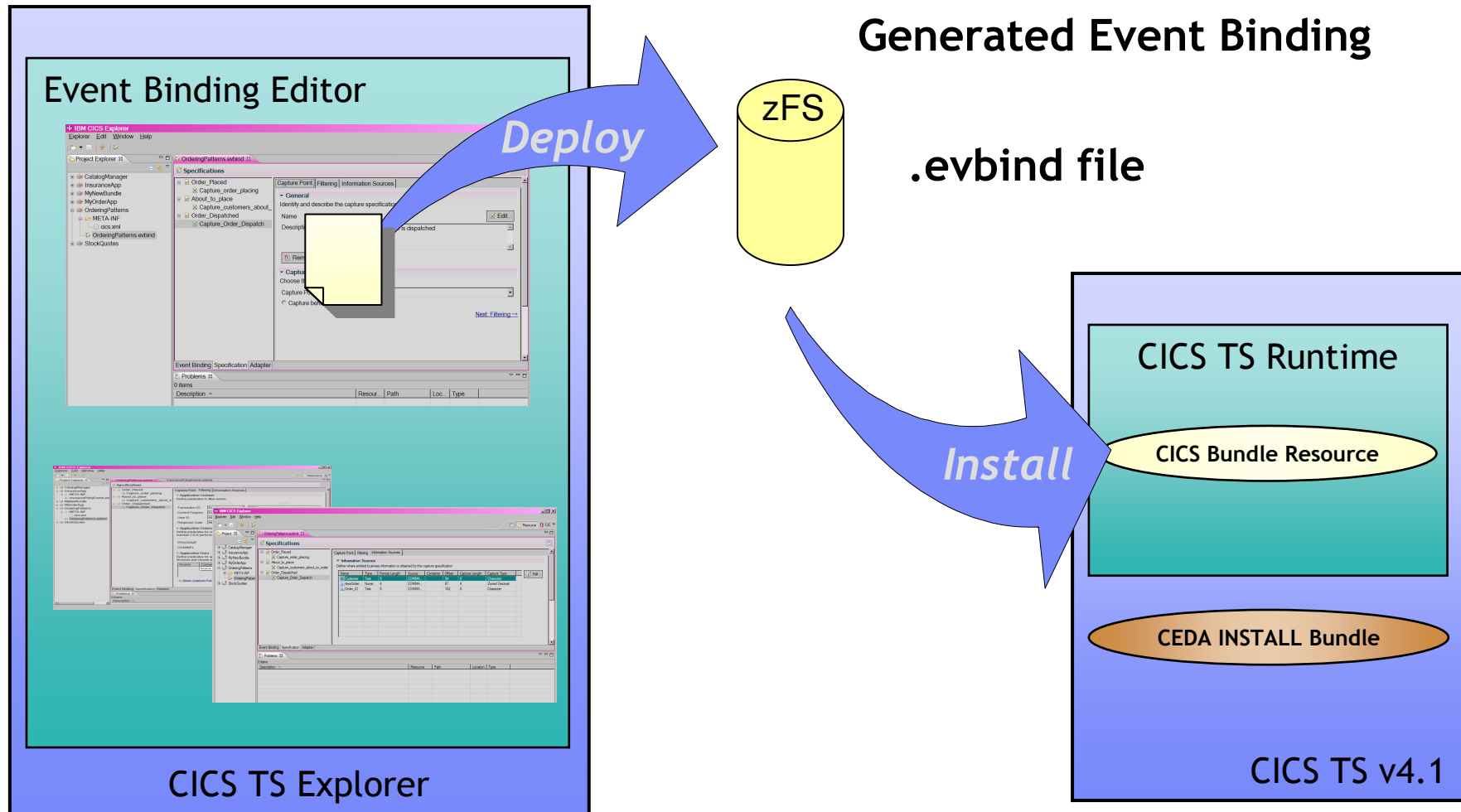
- **zSummitDemo -- Project**
 - zSummitDemo_EventBinding
 - zSummitDemo_Event_spec
 - zSummitDemo_Capture_SpecD
 - zSummitDemo_Capture_SpecW
 - > SUMMITDEMO (TSQ)

- **zFS - /u/dds0577/zSummitDemo**

- **BUNDLE(ZSUMMITB) G(EBGRP)**



Deploy an Events Bundle ...





CB11: CICS Events for WBE SupportPac

- CICS SupportPac CB11 provides a taster of CICS acting as a source of events to WBE
- The SupportPac runs on CICS TS V3.1 and V3.2
 - Made available December 2008 (refreshed May 2009 to run on CICS TS V4.1)
- Requires a 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
 - Emits the event for consumption by WBE (or other consumer program) via the WebSphere MQ transport
- WBE can include the event in interaction blocks to carry out pattern matching etc.

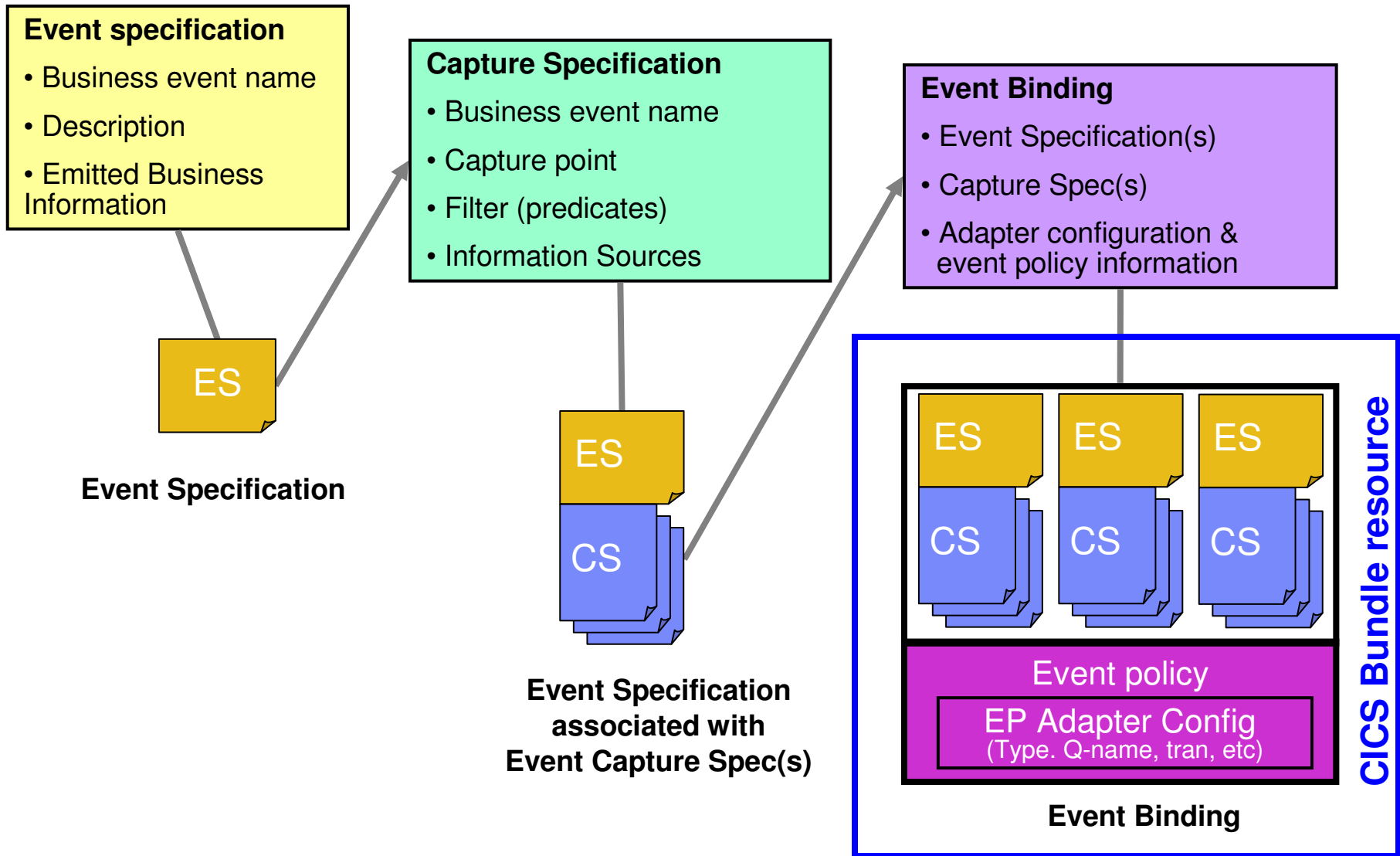


Finding Capture Points – CICS Interdependency Analyzer

- Use CICS IA to discover
 - Which transactions update which resources
 - e.g. where is my PIN number file updated?
 - where are order numbers read from the TS queue?
 - The runtime flow
 - e.g. which program is linked to when an insurance quote is requested?
- Ensure capture specification filters are sufficiently specific
 - How many programs use this resource?
- Can also use CICS IA Plugin to CICS Explorer

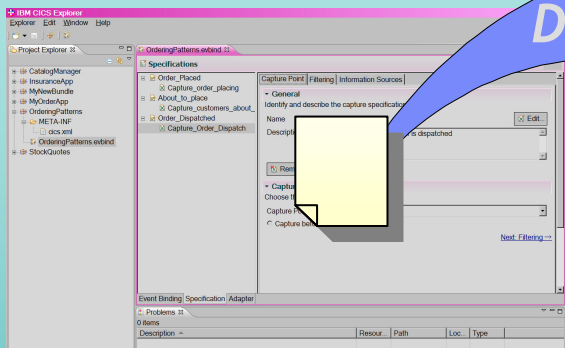


Demo - Defining events via the Event Binding Editor

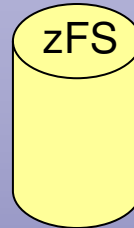


Deployment to z/OS

Event Binding Editor



Deploy



Generated Event Binding

.evbind file

CICS TS Runtime

CICS TS Explorer

CICS TS v4.1



Session A - DemoMVS - [32 x 80]

File Directory Special_file Tools File_systems Options Setup Help

Session A - DemoMVS - [32 x 80]

File Directory Special_file Commands Help

Session A - DemoMVS - [32 x 80]

File Directory Special_file Commands Help

Select one or more files with / or action codes. If / is used also select an action from the action bar otherwise your default action will be used. Select with S to use your default action. Cursor select can also be used for quick navigation. See help for details.

EUID=2473 /u/dds0577/Demo/

Type	Filename	Row
Dir	.	1 of 4
Dir	..	
File	DemoEvent.evbind	
Dir	META-INF	

Command ==>

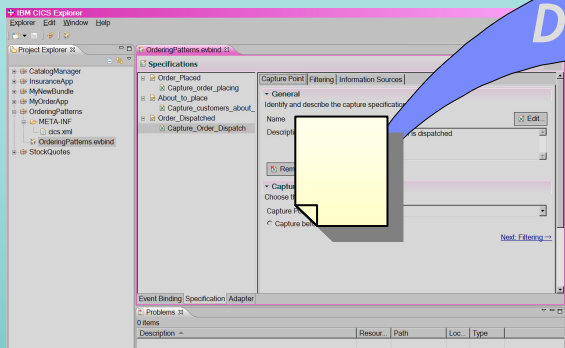
32/015

Connected to remote server/host demomvs.demopkg.ibm.com using lu/pool TCP00060 and port 23

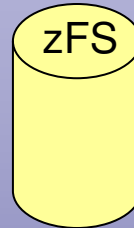
hpj deskjet 5600 series on USB001

Deployment into CICS

Event Binding Editor



Deploy



Generated Event Binding

.evbind file

Install

CICS TS Runtime

CICS Bundle Resource

CEDA INSTALL Bundle

CICS TS v4.1

CICS TS Explorer

```
Session B - DemoMVS - [24 x 80]
File Edit View
Session B - DemoMVS - [24 x 80]
File Edit View
Session B - DemoMVS - [24 x 80]
File Edit View
Session B - DemoMVS - [24 x 80]
File Edit View Communication Actions Window Help

I EVENTBINDING
-----
RESULT - OVERTYPE TO MODIFY
Eventbinding (DemoEvent)
Enablestatus ( Enabled )
Usertag (V1_0)
Installtime (11/12/09 13:31:55)
Installusrid (DDS0577)
Installagent (Bundle)
Definesource (DEMOBUN)
Definetime (11/12/09 13:31:13)
Changetime (11/12/09 13:31:13)
Changeusrid (DDS0577)
Changeagent (Csdapi)
Changeagrel (0660)

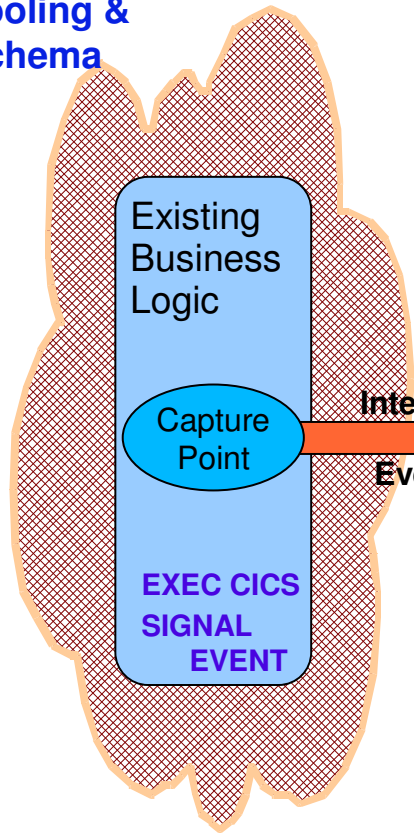
SYSID=WRKS APPLID=CICWKS96
TIME: 13.34.40 DATE: 11/12/09
PF 1 HELP 2 HEX 3 END 5 VAR 7 SBH 8 SFH 10 SB 11 SF

MA b
MA Connected to
MA Connected to
MA Connected to
MA Connected to
MA b
01/018
MA Connected to remote server/host demomvs.demopkg.ibm.com using lu/pool TCP00083 and port 23
hp deskjet 5600 series on USB001
```

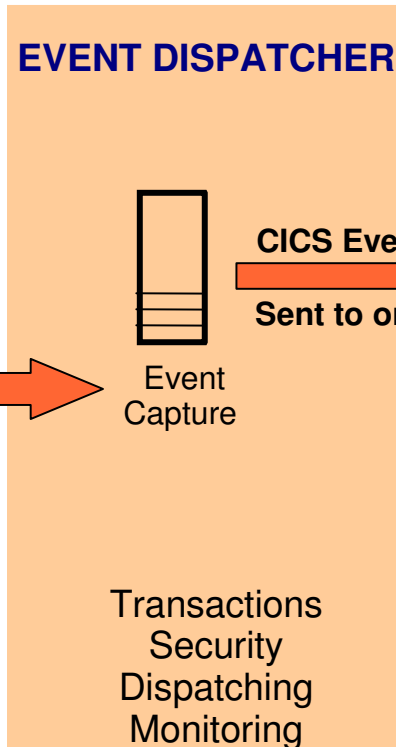


Our Event is now Active

CICS Event Tooling & Schema

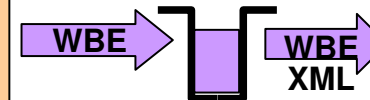
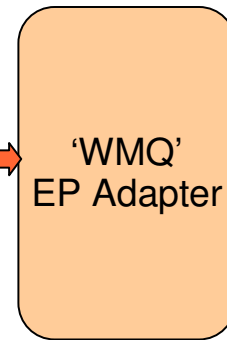


Internal Event

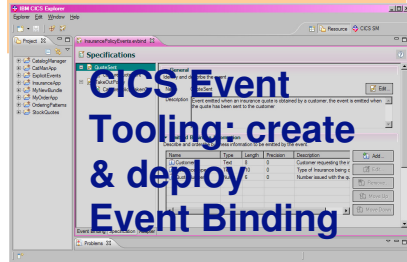


CICS Event Sent to one of

EP Adapter Interface



WBE





CICS and Events 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 WBE and WBM**
 - CICS-provided EP adapters plus capability for custom EP adapters



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Let's Build a Smarter Planet on System z





Resources

- **CICS Event Processing SupportPac - CB11:**
 - <http://www-01.ibm.com/support/docview.wss?rs=1083&uid=swg24021039>
- **YouTube - CICS Events and WebSphere Business Events providing Insight in to Action**
 - <http://www.youtube.com/watch?v=S0orwDxSOvM>
- **IBM Redbook - Implementing Event Processing with CICS**
 - <http://www.redbooks.ibm.com/redbooks/pdfs/sg247792.pdf>
- **IBM Whitepaper - Implementing Event Processing with CICS**
 - [Implementing Event Processing with CICS](#)
- **How to use event processing in CICS: Part 1 & Part 2**
 - [Part 1](#) [Part 2](#)
- **WebSphere Business Events**
 - <http://www-01.ibm.com/software/integration/wbe/library/>
- **Explorer download**
 - <http://www-01.ibm.com/software/http/cics/explorer/>

While you're out surfing the net





THANK
YOU