CICS Transaction Server for z/OS V4.1

CICS in an SOA-centric environment

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CICS Transaction Server for z/OS V4.1

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Topics

- **CICS integration with WebSphere Service Registry and Repository**
  - WSRR overview
  - CICS support for WSRR
- **Developing CICS services using the Service Component Architecture (SCA)**
  - SCA overview
  - CICS support for SCA
- **Monitoring your business processing with CICS events**
  - WebSphere Business Monitor (WBM) overview
  - Integration with CICS
  - Example scenario
- **Combining business events and pattern matching**
  - Introduction to WebSphere Business Events (WBE)
  - Integration with CICS
  - Example scenario
- **Summary**

WebSphere Service Registry and Repository

SOA brings new emphasis to the governance challenges within organizations

How do I eliminate "rogue services" and ensure control of my SOA?

How do I govern services as part of my SOA?

How do I manage the services lifecycle?

How do I increase service reuse?

How do I enable enforcement of policies across all internal and external services?

How can I help my ESB execute in the right context?

How do I help services interact efficiently and dynamically with each other?

How do I optimize service interactions to be better aligned with business process?

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SOA brings new emphasis to the governance challenges within organizations

With the introduction of an SOA, come a number of governance challenges that need to be addressed. As mentioned on an earlier slide, the key to a successful SOA is to ensure that the right set of repeatable business tasks are made available as services. For this to happen, there needs to be a governance structure in place that ensures that the right people make the decisions as to which services will be available, which department will own the service, fund the service, maintain the service and so on.

Another area where governance is needed is around the service lifecycle. With services being shared across organizational boundaries, it is important that proposed changes to the service are well understood. Who has authority to use the service, who will the change affect, who needs to sign off the change?

How do we ensure that services are reused and not redeveloped? Where would a user look for the services that are available?

Without proper management and governance of your SOA…

This could become… **… like this**

The promise of SOA

A pile of services

… and so would go the promised benefits of SOA

CICS Transaction Server for z/OS V4.1

Without proper management and governance of your SOA…

Having a colleciton of services in your organisation does not necessarily mean that you have a service oriented architecture. The services need to be the right set in order for them to be of value across different business processes. Having the right SOA governance model helps to ensure this.

WebSphere Service Registry and Repository (WSRR)

Enables governance **through configurable service lifecycle, classifications and access controls**

Manages service metadata **while providing better search granularity than most UDDI-based products**

The "copy of record for service metadata".

User-friendly UI **to facilitate design time discovery**

Provides location transparency through *runtime access*

Stores all service artifacts, **not just WSDL**

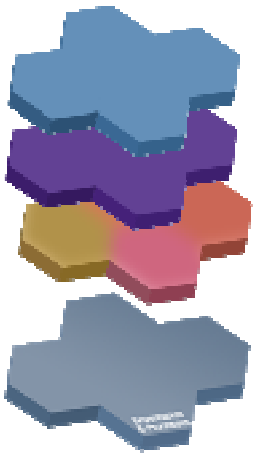
Provides fully configurable functionality to *classify services*

Supports *state model functionality* **to manage service lifecycles in a shared environment**

Service notification **to facilitate communication between service consumers and providers**

Enforces consumer access **to services**

Simple *version management* **functionality**



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WebSphere Service Registry and Repository (WSRR)

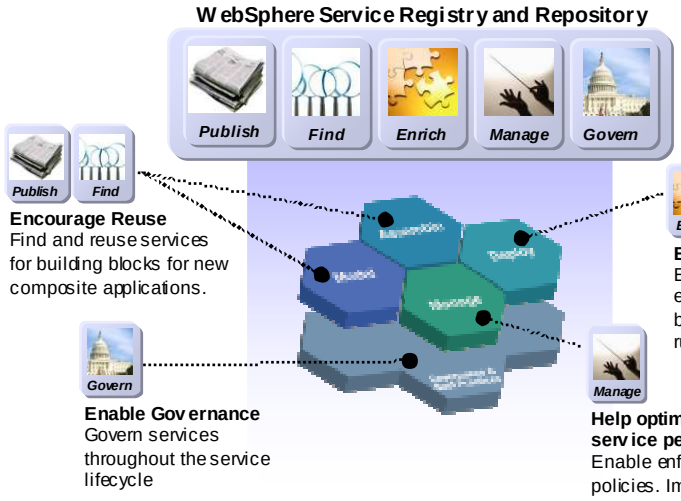
WebSphere Service Registry and Repostory provides a central repostory for storing service interfaces and associated meta-data.

It enables the management of services throughout their lifecycle, from concept through to retirement. The lifecycle is fully configurable using WebSphere Integration Developer. Thus, the SOA governance model for the service lifecycle can be represented by defining the lifecycle of the services in your organization and defining the authorization process for an application to move from one phase of the lifecycle to another. Once the lifecycle is defined, it can be installed into WSRR and used as the basis for managing the lifecycle of your services.

Another area in which WSRR enables governance is through the use of classifications. The classification systems defined as part of your organizations governance model can be imported into WSRR and used to classify the services described in it.

WSRR also enables documents to be tagged with properties and relationships to be defined between documents. The WSRR user interface is web based and provides search capabilities to enable services to be easily located.

The WebSphere Service Registry and Repository provides value throughout the SOA lifecycle



CICS support for WSRR in CICS TS 4.1

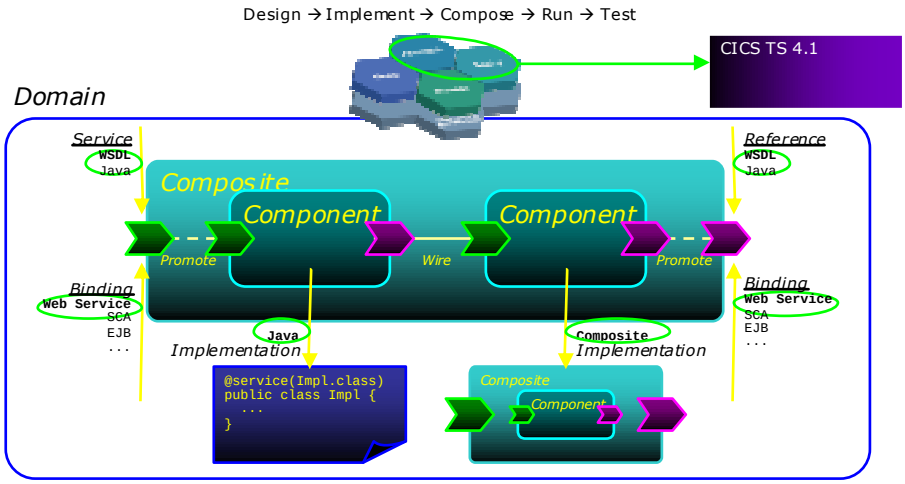
- **Use-Cases**
  - Publish WSDL representing CICS Web service providers
  - Retrieve WSDL representing Web services to be used by CICS requesters
- **Support for WSRR integrated into the CICS Web services assistant**
  - DFHLS2WS extension
    - Generate a WSDL file and WSBind file from copybooks and publish WSDL file to WSRR
  - DFHWS2LS extension
    - Extract a WSDL file from WSRR and generate copybooks and wsbind file

Service Component Architecture

SCA: What is it?

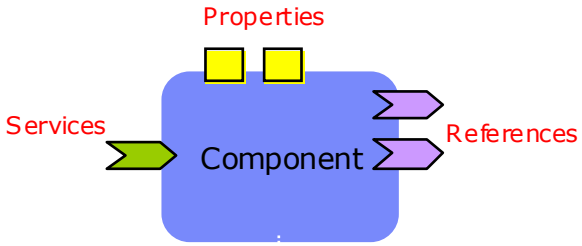
- **Service Component Architecture.**
- **A concrete manifestation of an SOA way of thinking.**
- **Designed for building agile service oriented applications.**
- **A framework for implementing, assembling, composing and deploying services.**
- **Supports loose or tight coupling of coarse or fine grained services.**
- **Extends, exploits and complements existing technologies and standards.**
- **Language, Application Environment, Framework and Vendor neutral.**
- **Supports Java and Web Services, and more**
- **An extensible set of:**
  - Protocol bindings (eg. SCA, WS, RMI, …)
  - Implementation languages (eg. Composite, Java, …)
  - Interface definitions (eg. WSDL, Java, …)
  - Pluggable Data bindings (eg. PoJo, JAXB, …)
  - Policies and Intents (eg. Integrity, Confidentiality).
- **"Classic SCA" refers to Service Component Architecture as it is defined and built by IBM supported in a variety of WebSphere Family products starting with V6.**
- **"Open SCA" refers to Service Component Architecture as defined by the industry at both the OSOA collaboration**

SCA Key Concepts



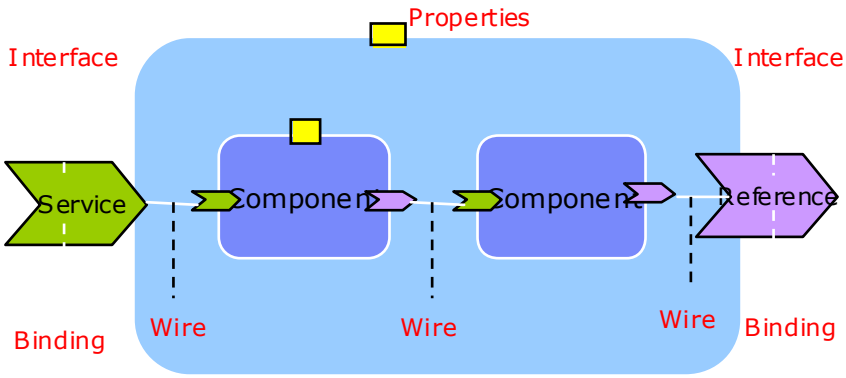
Reusability, Connectivity, Flexibility, Extensibility

SCA Component



Implementation
COBOL
PL/I
C/C++
Java

SCA Composite



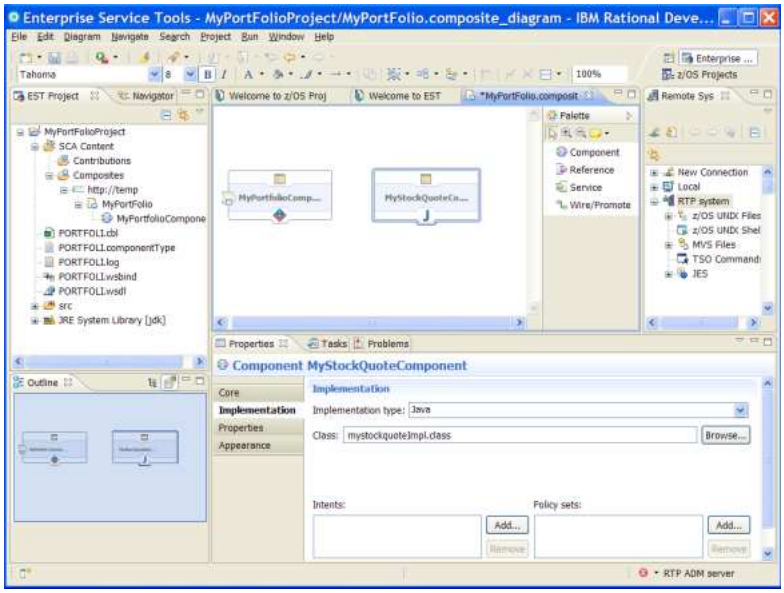
CICS TS v4.1 Component Architecture

- **Provide capability to easily develop flexible and reusable CICS application components**
  - Rapid assembly and deployment of new Services
  - Express existing applications as re-usable components
- **Separation of bindings from application code allows flexible infrastructure changes**
- **Reduce skills and effort required to view and manage business applications**

Component Architecture in CICS TS v4.1

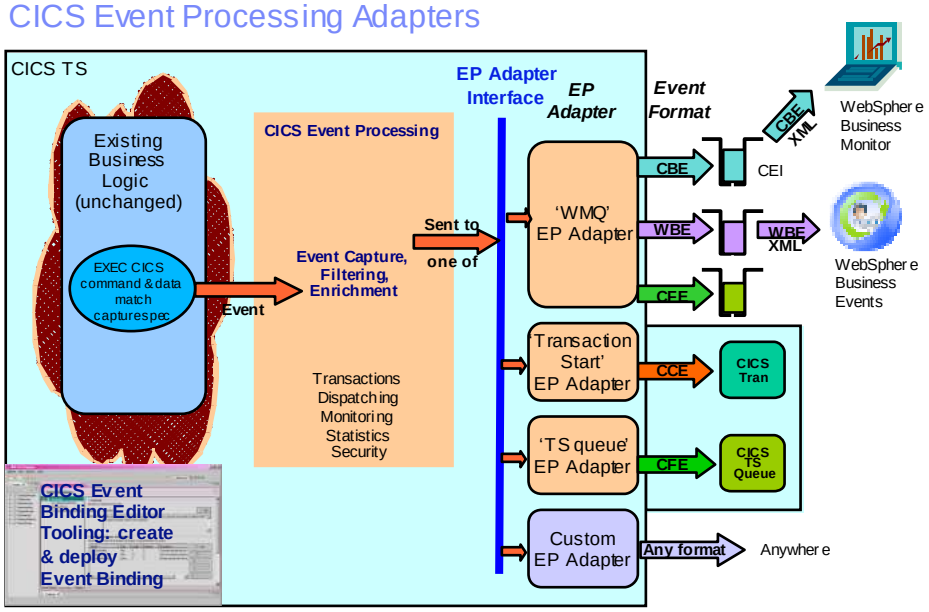
- **Ability to install and manage business applications as single CICS components**
  - Abstract away from programs, transactions, resources
- **Ability to describe CICS applications as SCA components (using SCDL)**
- **Application bindings provided by CICS and configured using SCDL**
  - Services and References
  - Invocation locally and via web services
  - EXEC CICS INVOKE SERVICE
- **RDz providing CICS component tooling to enable component definition, assembly and deployment**

Envisaged RDz SCA Tooling Support



Integration using CICS Events

CICS Event Processing Adapters



CICS Event Processing Adapters – Notes

When an event is captured, CICS directs it to an EP adapter, based on what has been specified in the event binding. All adapters are invoked using a standard EP Adapter interface.

The EP adapters format the event and route it to the potential consumers, which include WebSphere Business Monitor, WebSphere Business Events, and a CICS transaction. More details are given on the next slide.

This slide also illustrates the customization options for CICS Event Processing support:

- The standard EP adapter interface allows users and IBM Business Partners to write custom EP adapters, to support formats and/or transports not provided by CICS
- The event bindings created by the CICS Event Binding Editor conform to a schema, and the schema files are shipped with CICS, providing opportunities to create pre-built event bindings, or different tooling interfaces
- The explicit SIGNAL EVENT API allows applications to be event-enabled, and could be used by application providers to include event opportunities within their applications at the places where events occur which might be of interest. These events could then be enabled as required, and tailored to the users needs.

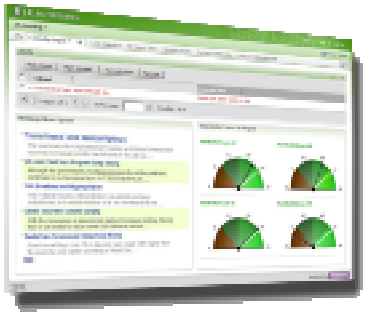
WebSphere Business Monitor

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

WebSphere Business Monitor (WBM) – Notes

- IBM WebSphere Business Monitor is comprehensive business activity monitoring (BAM) software that provides business users and managers with a real-time and end-to-end view of business processes and operations.
- WBM is a core part of the WebSphere Dynamic Process Edition foundational offering of the IBM Business Process Management (BPM) Suite, and is also available as a standalone product.
- It provides customizable business dashboards that calculate and display key performance indicators (KPIs) and metrics derived from business processes, business activity data, and business events from a wide range of information sources.
- WBM can monitor business events from any system which can emit events in the Common Base Event format.

Monitoring for insight into CICS

- **A great deal of business processing is encapsulated within CICS applications**
- **With CICS TS V4.1 you can produce events from the applications by creating and installing event specifications**
  - These events carry information about what is happening in CICS
- **By sending the events to a business monitor such as WebSphere Business Monitor you can immediately derive value from the event information**
  - Use the WMQ Queue EP adapter, specifying an event format of Common Base Event (CBE)

Monitoring for insight into CICS – Notes

This slide highlights the fact that events produced by CICS applications carry information about the processing within CICS, and that by consuming those events using WebSphere Business Monitor, or other event monitoring products, you can quickly and easily get value out of that information.

To produce events from CICS that can be consumed by WBM, the EP Adapter specified in the event binding should be the WMQ Queue EP adapter with the CBE format selected. Other configuration, such as the WMQ queue to which the event should be emitted, will also be specified.

Comprehensive Business Activity Monitoring Solution

- **IBM WebSphere Business Monitor (WBM)**
  - Comprehensive business activity monitoring (BAM) solution
  - Provides near real-time view of business performance
- **Provides visibility into performance of business activities by processing events, calculating business metrics and presenting key performance indicators through business dashboards**
- **Can use to identify business problems, correct exceptions, change processes to increase business competitiveness by improving process efficiencies**
- **Helps when something goes wrong: alerts delivered to make an organization aware of potential problems and proactively take directed action**
- **Monitors business events from any application that can transform the events into Common Base Events**

Comprehensive BAM Solution – Notes

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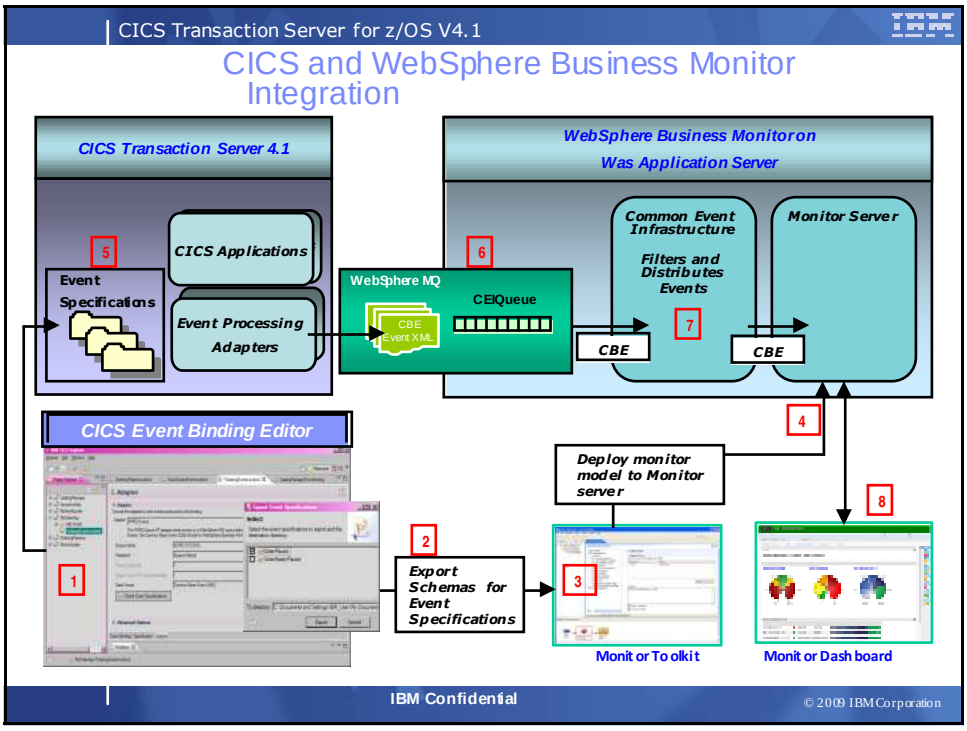

CICS Transaction Server for z/OS V4.1

CICS and Monitor Integration – Notes

This slide shows how events from CICS can be integrated with WebSphere Business Monitor using WebSphere MQ and the Common Event Infrastructure (CEI).

The Event Binding Editor is used to create event specifications

Once the events have been specified in the Event Binding Editor, the dynamic schema files can be exported which describes the event payload.

These schemas are imported into the WebSphere Business Monitor toolkit to create Monitor Model applications that will process the incoming events.

The monitor models are deployed to the Monitor server.

Event specifications, grouped together into event bindings, are deployed to the CICS system and enable event emission.

When the event binding is enabled, then events will be emitted each time the set of conditions defined by the event specification is matched, and will be sent over WebSphere MQ to the Common Event Infrastructure (CEI).

CEI will distribute the event to Monitor server.

The events are processed by the monitor server and can be displayed on a web-based dashboard.

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Order Processing Scenarios giving Visibility into Processing

Events emitted during order processing

- order received
- order dispatched
- order cancelled

Events sent to WebSphere Business Monitor (WBM)

- Create Monitor Model to allow WBM to provide insight into order processing
- 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.

Order Processing Scenario – Notes

This gives an overview of how events from CICS could be routed to WebSphere Business Monitor to gain greater insight into order processing being carried out in CICS.

Examples include simply observing the processing, using Key Performance Indicators (KPIs) to detect the success of the order processing against business requirements, or taking action when thresholds set in the Monitor are exceeded.

The figure shows a dashboard displaying this type of information.

Some more detailed examples follow of different types of monitoring based around this scenario.

Business Metrics

Business purpose

- See number of sales per customer this month
  - Report total number of items bought by Customer A in last 30 days
- See value of sales per customer this month
  - Report total value of items bought by Customer A in last 30 days

Events involved

- Order placed event, including information on value of order, and person who placed order

Business Metrics – Notes

Business monitoring can be used to gather useful business metrics.

This is an example of obtaining monitoring information from a sequence of single events. By producing an event from CICS whenever an order is placed, with information about the customer placing the order, the item being ordered, and the value of the order, it is possible to report information about the number of sales that each customer has been making, or about the value of each of that customers' sales, or to aggregate the information to see the total value of a customer's orders within the past month.

Business Monitoring dashboards provide a number of ways of displaying this information, from a simple counter which moves each time an order is placed, through to charts showing the value of orders placed by the various customers.

Business process performance and KPIs

Business purpose

- 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?

Events involved

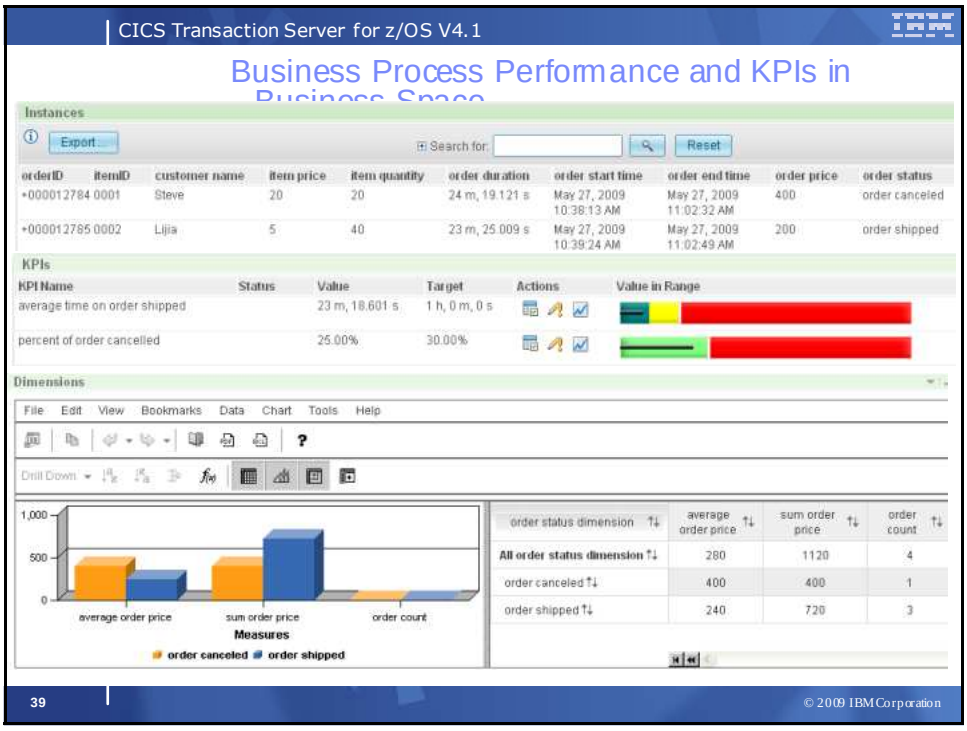
- Order placed, with customer ID & item ID
- Order fulfilled, with order ID
- Order shipped, with order ID
- Order cancelled, with order ID and customer ID

Business Process Performance and KPIs – Notes

Business monitoring can be used to gain insight into the business processing, and see whether Key Performance Indicators (KPIs) are being met.

This scenario gives an example of monitoring a business process using events that occur during the processing. By producing events from CICS whenever an order is placed, when it is fulfilled, when it is shipped, and when it is cancelled, it is possible to obtain insight into such things as

- How long it is taking to dispatch the orders for shipping? Consider a situation where orders are placed via a website, and the website states that the items will be shipped to the customer within 5 working days. In such a situation, it would be very useful to be able to see how easily that KPI is being met (are most orders dispatched within 2 days?) and generate alerts when it is missed.
- How often orders are cancelled? If the order processing system allows orders to be cancelled, then it would be useful to know how many orders are cancelled, or whether it is common for cancellation requests to come in after the order has been dispatched, incurring additional costs in arranging for return of the items.


CICS Transaction Server for z/OS V4.1
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
percent of order cancelled 25.00% 30.00%
Dimensions
File Edit View Bookmarks Data Chart Tools Help
Drill Down
1,000
500
0
average order price
sum order price
order count
Measures
order canceled
order shipped
order status dimension
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sum order price
order count
All order status dimension 280 1120 4
order canceled 400 400 1
order shipped 240 720 3
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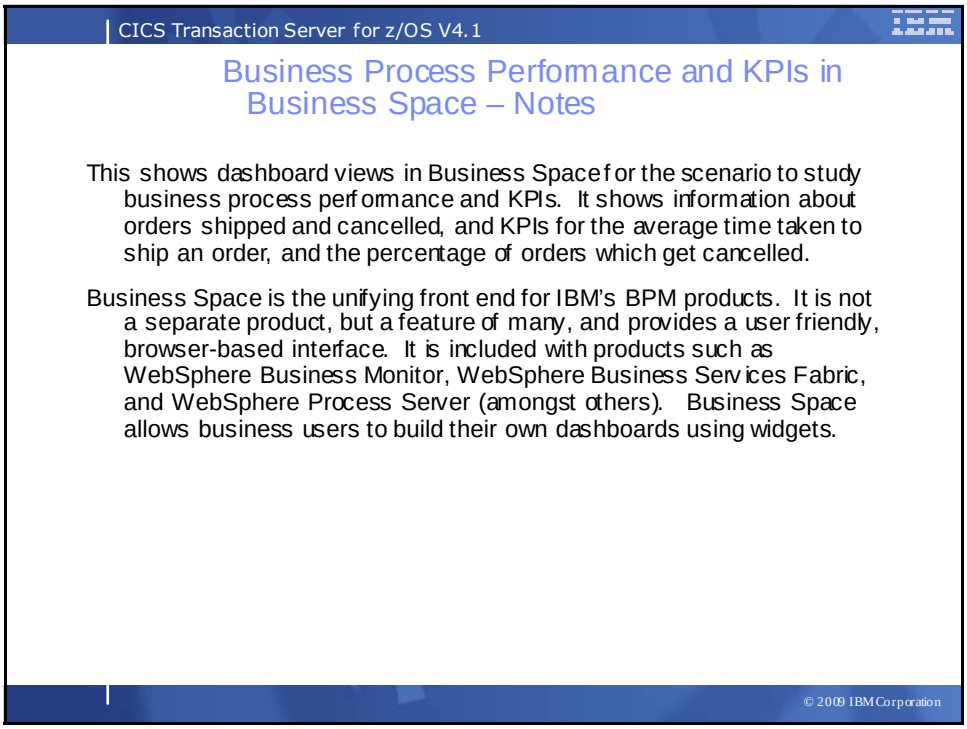
CICS Transaction Server for z/OS V4.1
Business Process Performance and KPIs in Business Space – Notes
This shows dashboard views in Business Space for the scenario to study business process performance and KPIs. It shows information about orders shipped and cancelled, and KPIs for the average time taken to ship an order, and the percentage of orders which get cancelled.
Business Space is the unifying front end for IBM's BPM products. It is not a separate product, but a feature of many, and provides a user friendly, browser-based interface. It is included with products such as WebSphere Business Monitor, WebSphere Business Services Fabric, and WebSphere Process Server (amongst others). Business Space allows business users to build their own dashboards using widgets.
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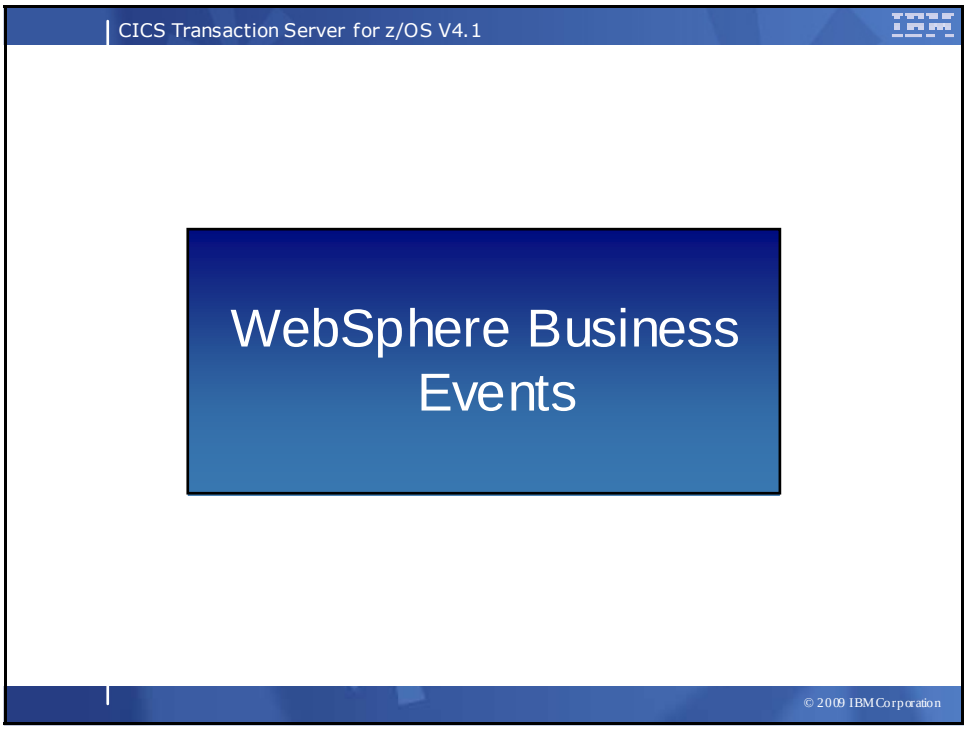
Monitoring Summary

- CICS non-invasive event emission together with WebSphere Business Monitor makes it quick and easy to
  - Monitor business processes, gaining insight into the processing within CICS
  - Obtain and display business metrics and KPIs
  - Raise alerts for out-of-line business situations
  - and more...

Monitoring Summary – Notes

This is a quick summary of the power of using CICS Events support in conjunction with WebSphere Business Monitor.


CICS Transaction Server for z/OS V4.1
WebSphere Business Events
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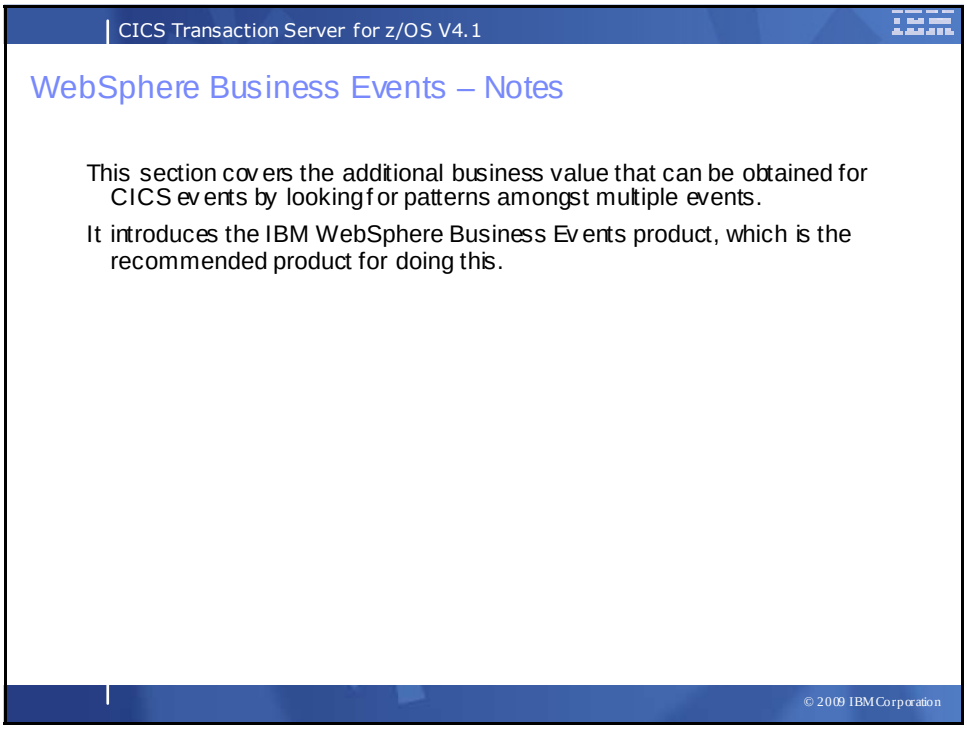
CICS Transaction Server for z/OS V4.1
WebSphere Business Events – Notes
This section covers the additional business value that can be obtained for CICS events by looking for patterns amongst multiple events.
It introduces the IBM WebSphere Business Events product, which is the recommended product for doing this.
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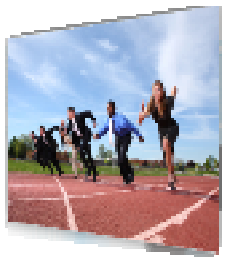
Goal: Sense and Respond to Actionable Situations at the Right Time

Mitigate Risk and Identify Opportunities

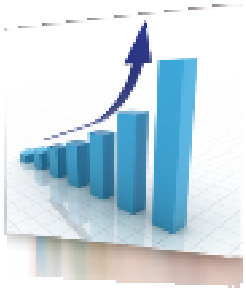
Through earlier and more intelligent insight

Greater Agility



Real-time Discovery and Response to Actionable Situations

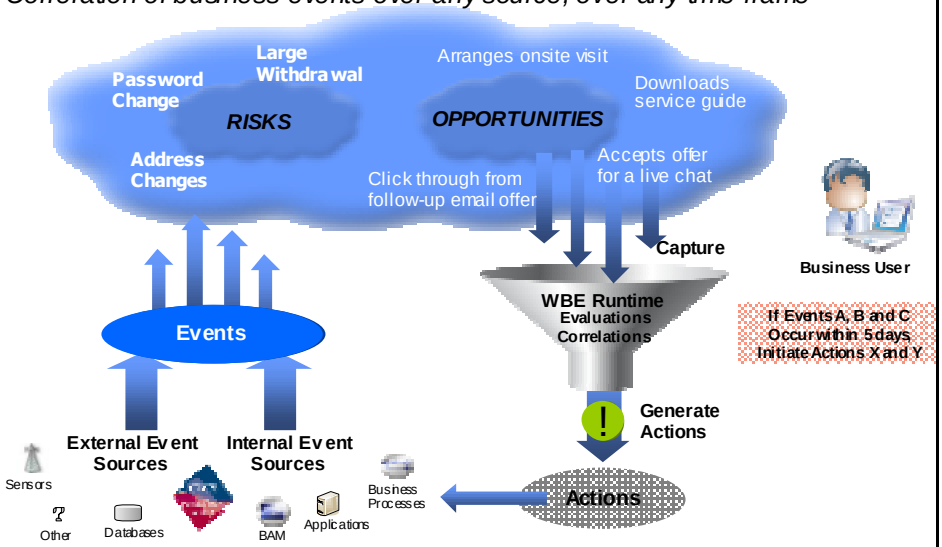
Faster Time to Value



Reduced time to Implement Sense and Response Process

WebSphere Business Events

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



WebSphere Business Events – Notes

In large organizations, tens of millions of events occur every day, but not all events are of equal importance. WebSphere Business Events provides the ability to determine when a pattern of related, or seemingly unrelated, events from one or more sources has occurred and coordinate the execution of the responses to that pattern of events.

Disparate event messages flow from virtually any source (systems, devices or human interactions), from both inside and outside the enterprise, into the IT communication network (represented here as the "event cloud"). WebSphere Business Events (WBE) determines actionable situations by detecting, evaluating and correlating the events based on user defined logic. When an actionable situation is discovered, the WebSphere Business Events runtime coordinates the appropriate follow-on processing by generating and communicating one or more **actions** back through the IT network.

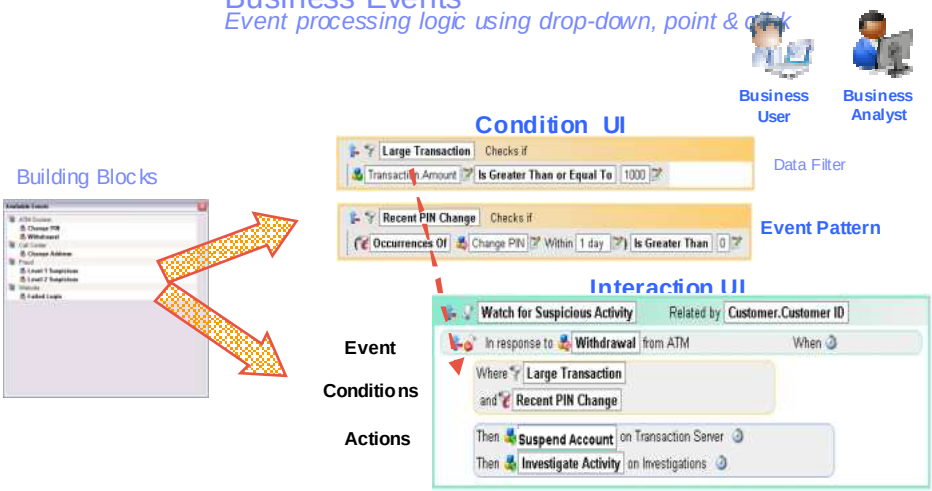
In the example illustrated on the slide, the business user has defined logic that instructs the runtime to detect and take specific action when a complex pattern of events indicating a customer's level of interest in a particular product occurs.

WebSphere Business Events detects event patterns as they happen…

- Across different event types and disparate event sources…
- Where events may not be ordered…
- Where the absence of an event is significant…
- Where the actionable event needs to be derived from physical events…
- Where processing is composed of multiple, asynchronous steps…
- Involving systems, humans or both…

Define Business Interactions in WebSphere Business Events

Event processing logic using drop-down, point & click



With building blocks defined, Business takes over

Define Business Interactions in WebSphere Business Events – Notes

WebSphere Business Events provides tooling for IT users to define building blocks which represent the events to be received and processed by the system, and their data. Previously defined Building Blocks can then be used by business users in the definitions that they create for **Conditions** and **Interactions**.

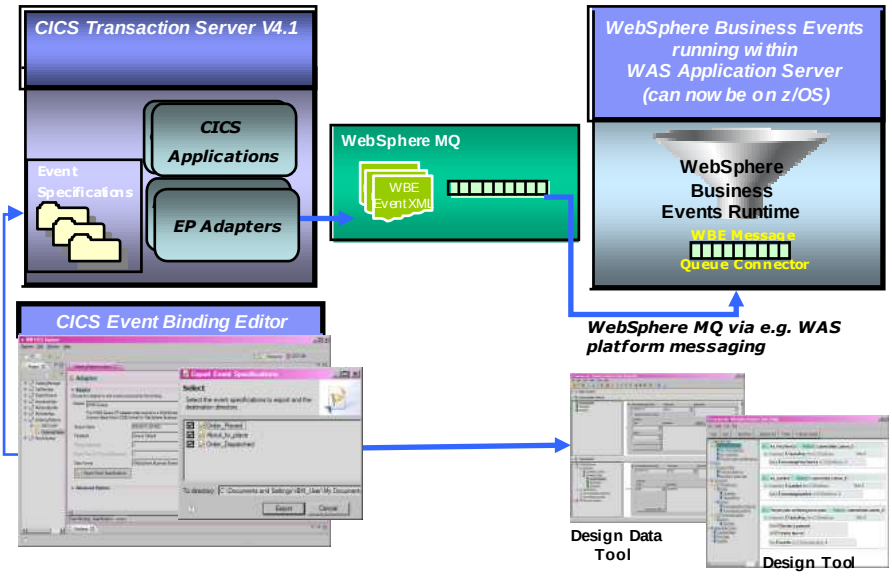
Conditions are basically **Filters**. Conditions can express: (1) a simple data filter, such as the Large Transaction Condition shown on the slide, (2) a test to identify that an event occurred, such as the PIN Change Condition shown, or (3) identify a complex pattern of events such as a suspicious fraud scenario where the Condition would be defined to test for a pattern of event occurrences.

Filters and other information from the Building Blocks are used for constructing Interactions.

Defining Interactions (event processing logic) involves defining the *event – conditions – actions* groupings. The example on this slide specifies that when a Withdrawal event occurs, if it is a Large Withdrawal and there has been a Recent Pin Change (both Conditions also defined on the slide), then coordinate 2 actions: (1) send an action to the Transaction Server indicating that the account should be suspended, and (2) send an action to the Investigation System indicating this Withdraw Transaction should be reviewed.

The Interaction UI and its supporting Condition UI use a drop-down, point & click approach usable by both business and IT users.

CICS and WebSphere Business Events Integration



CICS and WebSphere Business Events Integration – Notes

This slide shows how CICS events are integrated with WebSphere Business Events, which provides the ability to detect patterns between multiple events over time.

The figure shows the CICS Event Binding Editor used to create event specifications which can then be installed in CICS TS V4.1. When events are captured from CICS applications, they are processed by the appropriate Event Processing Adapter. For WebSphere Business Events, the EP adapter puts the event in the XML format recognised by WebSphere Business Events onto a WMQ queue on z/OS, which is configured to be received by the WebSphere Business Events runtime. The connection could, for example, use the WAS platform messaging provided by the WAS in which WebSphere Business Events runs. The figure also shows that the WebSphere Business Events Design Data tooling can create event definitions from event schemas exported from the event binding editor, and these event definitions can be used in the Design tooling to indicate the patterns or interactions to be detected. The event definitions specify a Message Queue connection in order to receive the events over MQ.

A version of WebSphere Business Events has recently been made available that runs on z/Os.

Insurance Scenario Involving a Business Opportunity

Customer has obtained insurance quotes for two or more of car, house and belongings 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 targeting than sending offers for all types of insurance available

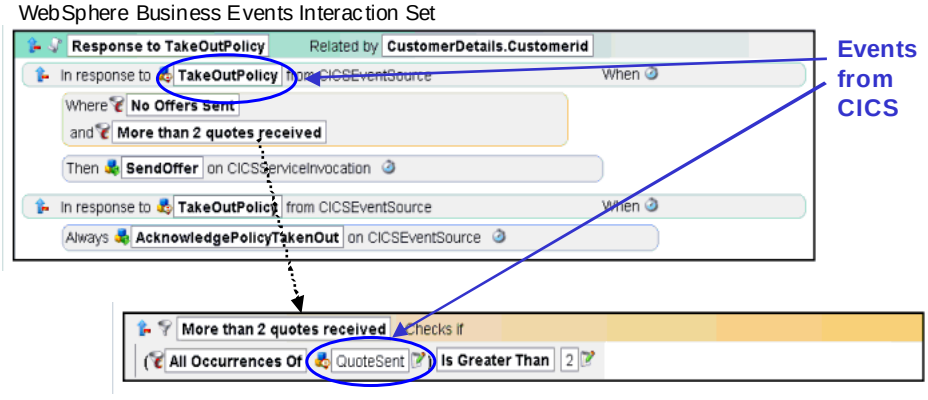
Insurance Scenario – Notes

This scenario shows how an insurance company could detect events occurring in CICS relating to obtaining quotes for policies, and then correlate these in WebSphere Business Events with events indicating that a policy has been taken out. This represents an opportunity to sell the other policies to the customer, which could be responded to by sending a targeted offer (for example).

The slide shows how this could be achieved using a combination of emitting the events from CICS and defining appropriate conditions and interactions, with associated action, in WebSphere Business Events.

Scenario: CICS events with WebSphere Business Events – 1

WebSphere Business Events Interaction Set



Scenario: CICS events with WebSphere Business Events – 1 – Notes

Events from CICS can be used in interaction sets and conditions (filters) defined in WebSphere Business Events

This and the following slide illustrate this with a scenario.

The scenario shows an interaction defined using WebSphere Business Events tooling, for 'Response to Take Out Policy'.

When a TakeOutPolicy event occurs, check whether an offer has been sent to this customer yet.

If not, check whether there have already been at least 2 instances of a QuoteSent event for this customer.

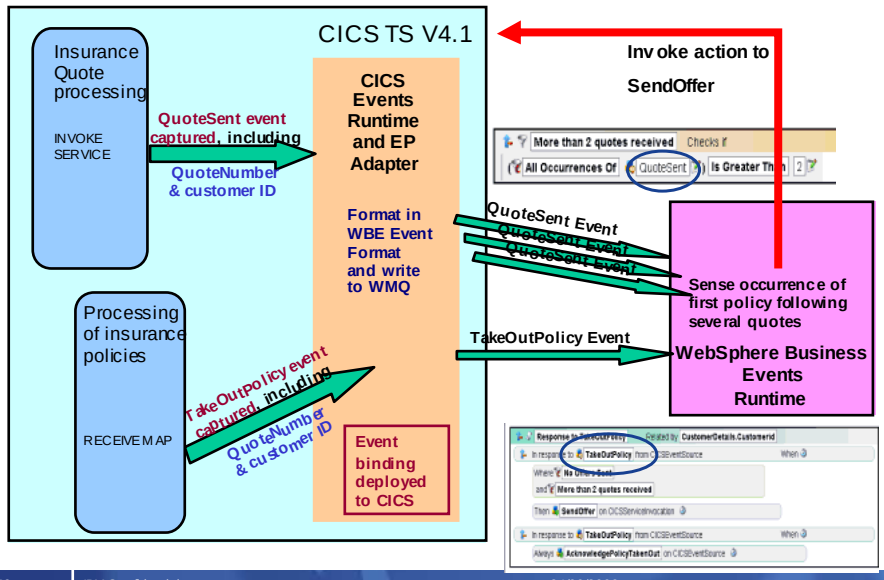
If there have been more than 2 quotes and no offer sent, then send an offer to the customer (to encourage them to take out more policies).

The WebSphere Business Events Design tool has been used to specify the interactions and conditions shown on the slide.

The events that are being checked for are events that occur in CICS. The WebSphere Business Events Design Data tool is used to define the incoming events and their data, to be used in the Design tool to define the interaction set i.e. the event-conditions-actions grouping.

This could be made more sophisticated, adding an interaction set to cover the situation where a policy is taken out before more than 2 quotes have been sent, but we still want to send an offer to the customer, and also potentially sending out offers relevant to the quotes.

Scenario: CICS Events with WebSphere Business Events - 2



Scenario: CICS events with WebSphere Business Events – 2 – Notes

In this scenario, CICS carries out processing of insurance quotes, and handles taking out of insurance policies. An event binding is installed and enabled in CICS which contains capture specifications for QuoteSent and TakeOutPolicy events, and indicates that these events should be processed by the WMQ queue EP adapter and formatted in WBE format.

The insurance quote processing writes the new QuoteNumber to a file when the quote has been calculated, and the capture specification in the event binding uses this to detect a quote being sent, so that a QuoteSent event is captured when this happens, along with information about the customer, policy, and quote.

The WMQ Queue EP adapter formats the captured 'QuoteSent' event in WBE format, and emits the event to the WMQ queue specified in the event binding. This queue has been configured to emit the event to the WebSphere Business Events runtime.

The program which processes insurance policies carries out the processing for a customer taking out a policy when it receives a MAP with a particular name, and this is specified in a capture specification which also specifies how to capture information about the customer making taking out the policy.

The WMQ EP adapter formats the 'TakeOutPolicy' event in WBE format and emits it to WebSphere Business Events.

The occurrence of the TakeOutPolicy event causes WebSphere Business Events to check for two or more previous QuoteSent events for the same customer, and if found this triggers an occurrence of the interaction.

The action associated with this is to send an offer to the customer concerning other insurance policies. A request is made to CICS (such as a Web Service invocation) to carry out this action.

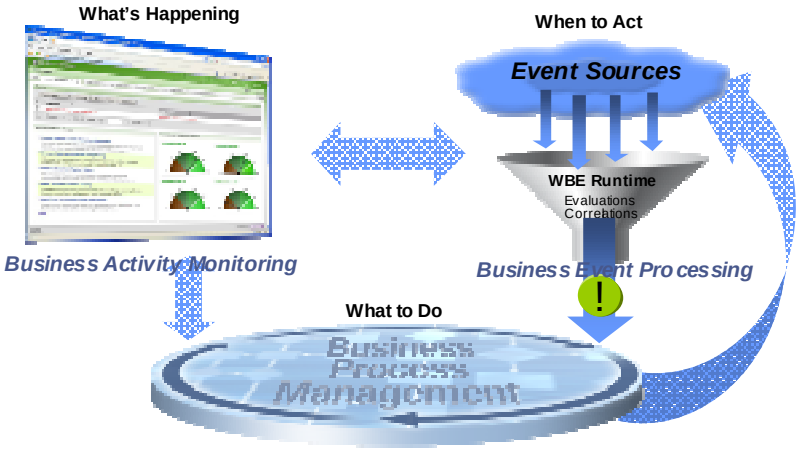
CICS Events and WebSphere Business Events Summary

CICS non-invasive event emission and WebSphere Business Events provide the power to easily

- Help ensure compliance to industry or government regulations
- Detect fraudulent or out-of-line situations
- Spot business opportunities
- and more…

Turning Insight Into Action

Leveraging Business Event Processing, BPM and BAM



Know What's Happening, When to Act, and What to Do

Turning Insight Into Action – Notes

This slide shows the combination of Business Activity Monitoring, Business Event Processing, and Business Process Management in the same closed-loop system, providing the ability to act or intervene based on the information available in the system.

The result is a comprehensive system of capturing, aggregating and analyzing information. This combines the best of the value propositions for Business Activity Monitoring (*understand what is happening*), Business Process Management (*the actions to take*) and Business Event Processing (*when to take action*).

Aggregating across events, processes, applications and historical data provides a complete business picture.

Business event processing provides unparalleled ability to act or intervene based on information, via automated response, human decision support, or ongoing process optimization.

Summary

- **WebSphere Service Registry and Repository**
  - Keep control of the services in your SOA by using WSRR
  - CICS service definitions can be published to and retrieved from WSRR
- **Service Component Architecture (SCA)**
  - Develop a service from re-usable components
  - Graphical user interface
  - Design a service by wiring together components
- **WebSphere Business Monitor**
  - Gain insight into your business processes using WBM
  - Understand how the business is performing
  - Give yourselves the knowledge to make important business decisions
- **WebSphere Business Events**
  - Gain extra business advantage by recognising and reacting to important patterns of events

Thank You !

Any questions?