WebSphere® software

IBM event processing solutions for Business Risk Management on System z with CICS and WebSphere Business Events.

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Abstract

Managing business risk is an increasing requirement for enterprise lines of business and for IT departments. IT managers, solution architects, business analysts and IBM CICS® specialists are often responsible for implementing governance and compliance solutions for enterprise business applications on the IBM System z® platform.

So what exactly are IT governance and compliance? IT governance is the area of corporate governance focused on the performance and risk management of information technology systems. Governance is an important topic nowadays, because it is easy for business exceptions to affect an organization's performance and bottom line. A governance approach defines a control framework for business and IT around which day-to-day business decisions can be made.

Compliance is ensuring that business processes, implemented as IT applications, can be demonstrated to adhere to the boundary criteria defined by the governance approach. Compliance addresses the enterprise, industry and government standards that define the tolerance thresholds within which business applications must perform.

Together, governance and compliance allow business and IT to manage enterprise risk by reacting swiftly and effectively to capitalize on opportunities and to mitigate exceptions.

Introduction

Business compliance and governance have become increasingly prominent in many industries. These terms cover a range of issues that are preoccupying the business and IT worlds—issues such as financial transparency, information privacy and process control. If you've heard of the Sarbanes-Oxley Act, the Health Insurance Portability and Accountability Act (HIPAA) or Basel II and their associated information requirements, then you're already aware of business compliance and governance.

Governance represents a formalization of the decision-making processes within an organization. It can encompass many aspects of business and depends on accurately maintaining and auditing which decisions can be freely made, which ones need specific approvals and who can make the decisions.

Compliance is about ensuring adherence to mandated standards and governance policy. This can encompass such aspects as the definition of information on which governance decisions are based and maintaining accurate operational control to ensure that business application execution meets the required enterprise, industry and government standards.

At the same time as governance and compliance have come to the fore, the mainstream adoption of service oriented architecture (SOA) has opened new opportunities for highly responsive business solutions. SOA brings great flexibility to business processes, and helps bring business and IT in line with each other.

Enterprises are challenged by seeking to maximize SOA solution advantages (such as speed to market and select-and-connect process building), while concurrently complying with business controls, industry standards and government legislation.

- *The emergence of new event technology enables solutions that allow enterprises to demonstrate good IT governance and maintain compliance with standards—while at the same time increasing business responsiveness by implementing SOA.*

Many enterprises implement line-of-business processes, such as CICS applications on the IBM System z platform. The combination of new event technology in IBM WebSphere® Business Events software and in IBM CICS Transaction Server (CICS TS) on System z opens the opportunity to increase the range and effectiveness of enterprise governance and compliance. It does so by making key business information immediately visible to business managers who are responsible for business-process governance and compliance.

Instrumenting business applications with events for responsive risk management

Event technology, when combined with line-of-business applications, creates an opportunity to build solutions that detect critical compliance and governance situations. Events can enable immediate awareness of compliance and governance exceptions and also initiate the appropriate responses. Compliance and governance information associated with events can also be logged and preserved for audit. Together with an implementation approach that avoids change to the business applications, this combination of technologies offers a powerful new style for building compliance and governance solutions that:

- *Reduce the risk of application disruption*

- *Increase the efficiency and speed of implementation*

- *Enhance responsiveness to business requirements*

Let's consider some of the technologies involved and their advantages.

Events: What are they?

An event is any electronic signal, or message, indicating a change in the state of the enterprise. For example, an event message can indicate the addition of a new customer, the sale of a product or receipt of a shipment. Event processing has evolved from addressing simple events and complex events to focusing on business events.

Simple events

The processing of simple events is not a new concept. For the last 40 years, organizations have been using a form of simple event processing to detect and respond to a single source, or homogeneous event type. Here is an example: if Event A occurs, then do B. A simple event process might specify that if a "shipment received" event occurs, add the quantity to an inventory database.

Complex events

In large organizations, tens of millions of events occur every day, but not all events are of equal importance. Providing insight means being able to determine when a pattern of related or seemingly unrelated events from one or more sources has occurred and then to coordinate the execution of the responses to that pattern of events. Recognizing the complexity, excessive time and cost that would be required to write custom code for such a solution, a software technology emerged that was specifically designed to address these requirements: complex event processing.

Complex event processing

Complex event processing provides functions to detect and respond to event patterns among like or related events, missing events and aggregate events. It also enables users to relate the event pattern detected to a business context and apply a dimension of time to the pattern. For example, if event A and B occur and event C does not occur within <time frame>, then do X, Y and Z after <time frame>.

In addition, complex event processing supports the detection of multiple or aggregated patterns of events. For instance, detecting a "failed login" event pattern at a Web site might be defined as three incorrect password attempts within two minutes, and a "deny access" event pattern might be defined as two occurrences of the "failed login" event pattern.

Business event processing

Business event processing is the next generation of event processing. It extends the complex event processing capabilities to the business user to define real-time, actionable event patterns in business terms for rapid response to opportunities and threats.

Business event processing extends complex event processing capabilities by providing a graphical, nonprogrammatic user interface that allows business users to manage event processing logic themselves, resulting in a significant reduction in time to value and total cost of ownership (TCO).

Historically, event-processing capability was created and controlled at the IT level and required sophisticated IT skills to enable it. In contrast, business event processing allows the event patterns to be authored and managed directly by the business community by means of graphical, codeless authoring tools specifically designed to empower the business user. Additionally, the deployment of complex event processing had primarily been focused on niche application domains. (Stock trades are a good example of this.) In contrast, the processing of business events targets applications across industries and application domains, regardless of the type, time and order of events.

Business event processing is distinguished from complex event processing by being able to support a broader set of enterprise application requirements, including:

- *High volume of heterogeneous business event types from multiple sources*

- *Business events and complex patterns that occur in no particular time or order*

- *Frequent changes to event processing logic*

- *Event processing logic maintained by business users themselves*

Business event processing supports the need for increased responsiveness to change across industries and application domains. Here are some examples of applications that benefit from the capabilities supported by this approach:

- *Compliance*

- *Exception detection (alerts)*

- *Fraud detection*

- *Identity theft*

- *Application review and approval*

- *Case management*

- *Customer service*

- *Marketing and sales orchestration*

- *Supply-chain optimization*

Comparing business events with system events

All events in your enterprise can be seen as having a business consequence and so can be described as business events. Whether the event and event processing are specified by a line-of-business manager or an IT programmer, the event relates to the business application or system that is running—and therefore has business relevance. For example, an event that implies that the system running the order-processing application is about to fail could be considered relevant to the line-of-business manager. This manager might want to act on the impact of this system being unavailable. In general, however, the procedures that emit and consume business events are distinct from those that process IT infrastructure-related events.

System-level events generally have a technical focus and relate to monitoring operating system, application execution and middleware running on the system. The event data is usually equally technical, specifying in technical terms the identifiers of the resources under observation. Business events are generally related to higher-level business processes. Business events generally specify conditions in terms of what the application is doing for the business and the line of business. For example, a business event might be "a new order has been placed," as opposed to detecting the compute time for processing the order. Also, the consumers of business events are often required to be independent of the implementation specifics of the actual systems that are emitting the events. For example, it is possible for one event consumer to process events from several disparate ordering systems, maybe because of a merger, and provide a single consolidated view of the business application's state. In general, IT systems-management events and business-level events should be considered as distinct event types.

IBM's solution for processing IT system events for CICS is the IBM Tivoli® family of products, which are described later in this paper.

An event indicating that a new order has been placed doesn't fit the definition of a system event. There is a clear mismatch in the nature of event information compared to information that is monitored for IT system events. In contrast, an event indicating that the CICS system under observation is currently stressed and becoming short of storage is too fine-grained to be relevant from a business perspective. However, the combination of CICS being under continued stress plus other factors might have business relevance and could warrant the raising of a business-level event to inform those monitoring the business activity of the CICS system.

IBM solutions for integrated business event processing

The IBM software portfolio enables a range of options for processing business events.

WebSphere Business Events: IBM's business event engine

IBM WebSphere Business Events is an IBM software product specifically designed to support business event processing by meeting the high-volume demands and processing required across industries and application domains. Equally important is the extensive use of graphical, codeless user interfaces in WebSphere Business Events that greatly simplifies implementation and empowers business users to directly develop and maintain event processing logic.

WebSphere Business Events consists of these basic constructs:

- *Connectivity to business events*

- *An event processing engine for evaluating and correlating business events*

- *Initiation of business responses (actions)*

Business events can exist anywhere within the extended computing infrastructure, both inside and outside the firewall. Events can be communicated directly between systems or pushed into the communications backbone for use by any system. A message-based publish-or-subscribe or request-or-reply transport such as IBM WebSphere MQ is an ideal transport infrastructure for event processing.

Based on user definitions, the WebSphere Business Events processing engine detects and sifts though the mass of events occurring across the information infrastructure, identifying only those events and patterns of interest. Upon detecting a defined event or pattern (actionable situation), the engine initiates one or more business responses (actions).

Responses range from sending electronic alerts to initiating the execution of follow-on processes. These actions are communicated directly to systems (or over the communications backbone), indicating that an actionable event or pattern has been detected.

CICS Transaction Server as an event source

CICS already provides customers with all the basic capabilities to implement compliance and governance solutions. The robust security, authentication, logging and auditing capabilities delivered in CICS mean that you can specify the controls and collect the data that will enable you to meet your compliance governance obligations. At the same time, the format of this critical information is often CICS-specific, requiring interpretation into information that the business managers can use to manage risk.

IBM now provides support for interoperation between WebSphere Business Events Version 6 and CICS TS Version 3 through a new CICS TS SupportPac™ capability that is available for download from the CICS Web site for all licensed users of CICS TS Version 3. This new CICS SupportPac allows event points to be implemented in CICS applications. This capability positions CICS TS as a key source for emitting business events in a format suitable for consumption by WebSphere Business Events.

CICS TS Version 3 customers can use the new CICS SupportPac to emit events for WebSphere Business Events consumption with the confidence that this initial event support in CICS TS will be enhanced and integrated into the CICS TS platform.

CICS business applications are the main source of business information in most large enterprises. Discrete CICS business information events are interesting in isolation. When combined with other events sources within a business solution context, the combination of business information can become extremely telling. The combination of event capture and emission from key CICS business applications with the business event patterns and representation capabilities of WebSphere Business Events allows business managers to gain insight into a wealth of business behaviors and to accurately and immediately control critical business processes throughout the enterprise.

WebSphere Business Monitor—visualizing business events for business monitoring

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, events and operations. WebSphere Business Monitor aggregates and correlates events into metrics that provide objective measurements on the status of business processes.

WebSphere Business Monitor provides business users with real-time information about the performance of critical business processes. It offers user-friendly and customizable dashboards that enable complete insight into the business flowing through the system. It also 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, such as CICS TS with events processing. Business users can view these KPIs, metrics, events and alerts through various means, including lightweight Web interfaces, Smartphones, corporate portals, and on desktops. These options give business users immediate actionable information and insight into their business operations to mitigate risk and take advantage of opportunities.

WebSphere Business Monitor enables collection of real-time events from a wide variety of sources, including:

- *IBM Business Process Management (BPM) Suite and Connectivity portfolio: WebSphere Process Server, IBM FileNet® P8 Business Process Manager, WebSphere MQ Workflow, WebSphere Business Events, WebSphere Message Broker, WebSphere Enterprise Service Bus, WebSphere DataPower® Integration Appliance XI50 and WebSphere Partner Gateway*

- *Events and data from Oracle, SAP, Siebel and other enterprise resource planning (ERP) and CRM applications through the use of WebSphere Adapters and the IBM Connectivity portfolio*

- *Events from applications such as CICS and other third-party applications through the IBM Connectivity portfolio*

Rich analytics provide business users with additional insight into business operations and processes. With this information, business users can make more informed decisions based on historical and trend data. They can also be more proactive in response to business events by receiving advance warning of developing situations. This allows users to take advantage of market opportunities and prevent problems before they occur.

WebSphere Business Monitor offers business users real-time, business-relevant views into transactions. For example, Monitor can provide information on how many payments originated from a particular customer, whether any payments delayed and might potentially incur a penalty, and similar data. Traditionally, IT has provided this information, largely through manual mining of data logs and systems, leading to overloading of IT resources with routine data collection, and in delays in getting time-sensitive information to business users. However, WebSphere Business Monitor enables business users to get this information in real time without any IT involvement, making business users more responsive to changing conditions and reducing the load on IT.

IBM has now enabled a bidirectional flow of events between WebSphere Business Monitor and WebSphere Business Events. Now, customers can use one single dashboard to view the performance of the processes via KPIs, and view any alerts to business situations generated by WebSphere Business Events to get more complete real-time insight into what's happening within the organization and the ecosystem. Similarly, the bidirectional event flow enables customers to feed any alerts on processes or business generated by WebSphere Business Monitor to WebSphere Business Events for detecting patterns within those alerts which might otherwise go undetected and initiating follow-on processing. Business users can thus receive better information to help them respond faster to their business needs.

IT system event processing with IBM Tivoli OMEGAMON XE for CICS on z/OS

IBM's solution for processing IT system events for CICS is the Tivoli family of products. IBM Tivoli OMEGAMON® XE for CICS on z/OS® enables monitoring and management of CICS transactions and resources. It quickly detects and isolates problems when they occur on your complex CICS systems to minimize or eliminate any impact to your customers and your business.

Using IBM Rational Developer for System z for changes to application code

When a change is needed to existing CICS application code to adapt an application for new business function, IBM Rational® Developer for System z provides the necessary support. For developing complex, composite and SOA applications on System z, this workstation-based integrated development environment (IDE) helps developers create or update their applications, including support of all of the different languages—from COBOL and PL/I to C and C++ and Java™, and target environments from CICS to IBM DB2® and IBM IMS™ to IBM WebSphere Application Server. IBM System z tools include development tools and problem-determination tools to support the development and testing of all System z applications, and the CICS tools family, which can help to support application transformation and SOA implementation that is based on CICS.

With Rational Developer for System z, developers can rapidly create and update well-structured enterprise applications that integrate WebSphere software and traditional transactional environments. Development productivity is enhanced by the integration of Rational Developer for System z with other System z tools, such as tools for source-level debugging and problem determination tools for analysis of faults (such as abnormal termination of a CICS transaction) or system-dump analysis of a CICS region. In addition, Rational Developer for System z works with IBM File Manager to help developers create, edit, print and format data files.

Designing business-application event solutions for System z

Event sources

A business event is simply a message that has a business context. The event is generally defined in business terms by someone such as an IT specialist or a business analyst. The event usually contains information that indicates its business context, such as an event type identifier and other relevant information. For example, a "new product purchase" event might include information describing the customer, product, quantity, date, price and so on.

To source a business event, we must have a point at which business activity and relevant information is known for constructing the event, such as during application execution. It is at this point that you have the greatest degree of business and contextual information about the business event that is occurring. While processing a new customer purchase, the application has all of the business context and associated information necessary to create and emit an event indicating a new product order being added to the system. An example of this information is the exact time that the order was created.

In addition to business context information, other useful contextual information available might be relevant, such as the user ID of the operator who initiated the order. Detail about the transaction state is often available only at the time the event is created and so might be useful to include in the event information.

Often there are many points in the application business logic that can be the source of a particular event. For example, adding a new order is an event that can be sourced from various points, as shown in Figure 1.

1. The initial entry point to the business application
- *"A new order request has been received"*
2. The entry point to the module that hardens the new customer's information
- *"A new order request is accepted and being processed"*
3. The point in the new customer module where the data is actually hardened
- *"A new order record has been created"*
4. The exit point from the module that hardens the new customer information
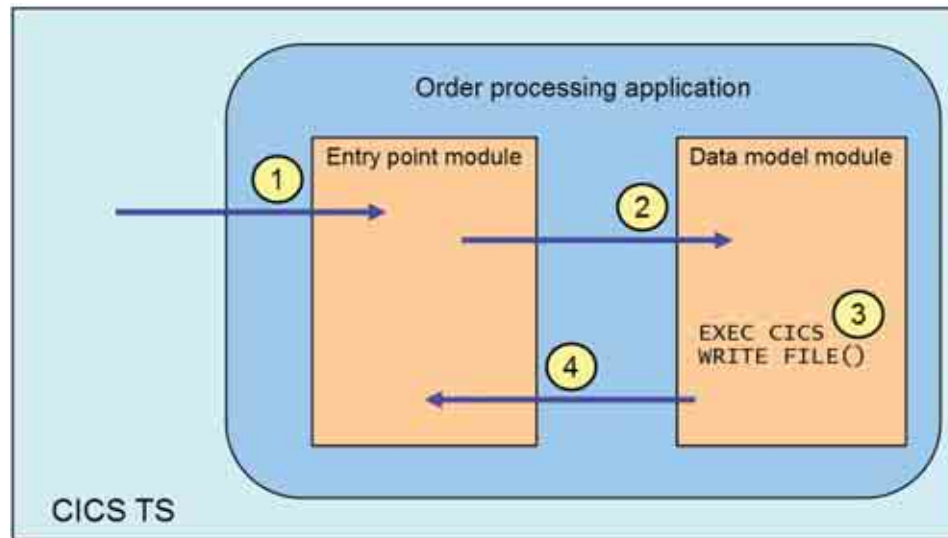- *"A new order request has been processed"*

Figure 1. Potential points in CICS for event sources

Any one of these points can create a valid business event for processing by the event-processing engine. Choosing which to use must largely be based on the need of the business for detection and response to actionable situations. This requirement helps to define the contextual information that is required to flow with the event. If the business requirement is simply to note the number of orders being placed through a particular channel, any of these event capture points can be used. However, if the requirement is to keep an audit of all the orders being written to the order file, event capture point 3 is the most logical, because at that point we can also capture additional data about the file being written.

After determining an appropriate point to specify a particular occurrence of the event, it is necessary to ensure that the required business information is also available at that point. In the preceding example, we might need to include the following additional contextual information:

- *The customer number of the person placing the order*

- *The order reference number*

- *The value of the order being placed*

- *The user ID of the operator taking the order*

The first three of these items are directly part of the application logic and are be sourced from the working variables within the application program. The final item, however, is not known by the application itself but by the system running the application. This item must be obtained from contextual information available to the application from another source, such as the CICS Execute Interface Block (EIB).

After the event information has been provisioned and a source capture point has been created, an infrastructure must be put in place to create and process this event. Figure 2 shows a simplified event-processing infrastructure.
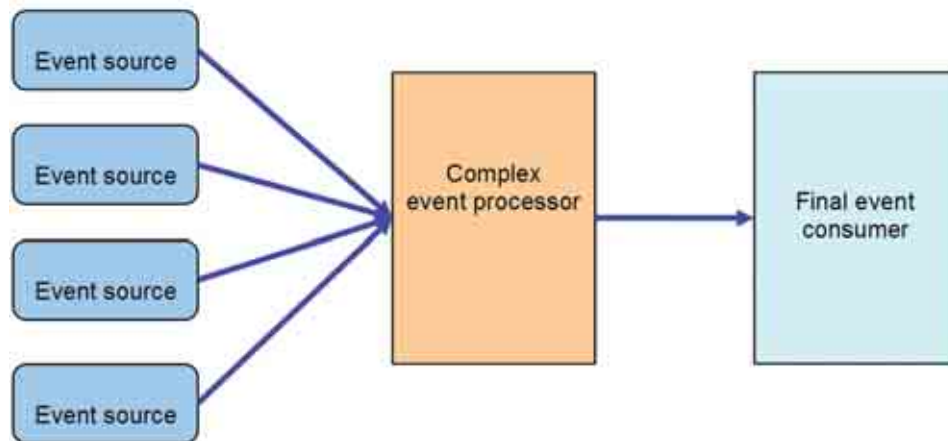

Figure 2. Simplified event-processing infrastructure

Up to this point we have been discussing event sources, the initial locations to capture the data required to satisfy a business event. The other systems in this architecture must also contain an event consumer and optionally a complex event-processing engine. The event-processing engine is optional depending on the complexity of the original requirement for the event and how easily this can be mapped onto the existing business application.

Our example is a simple event-processing scenario. The requirement was to provide a business event when an order has been placed in the system. Unless a level of message mediation is required, this event can be consumed directly by the final event consumer (any other application). This event pattern is referred to as *simple event processing*. The pattern might need to be extended to help detect and respond to event patterns between like or related events, missing events and aggregate events. As described previously, we would then need to use complex event processing.

For instance, in our simple example, we might need to address a requirement to recognize and provide incentives to customers whose cumulative order value for orders placed within a specified time period is greater than the promotion level. In this case, the complex event processor is the target for the simple event sources, and it applies specific business criteria to identify when the complex event pattern has occurred. An additional event, a business action, is then emitted from the event-processing engine. This event can be directed to the ultimate event consumers (for example, the billing system) to inform them that the particular business situation has occurred or back to the business event-processing engine to be part of a larger interaction for detecting event processing patterns.

Options for implementing solutions for business event processing on System z

IBM has announced that capability for emitting events from CICS to be consumed by WebSphere Business Events for business event processing is initially being introduced by a SupportPac in 2008. This initial capability enables the interoperation of CICS Transaction Server and WebSphere Business Events to address simple, complex and business event processing solution needs.

Introduction to the CICS Events for WebSphere Business Events SupportPac

The *CICS Events for WebSphere Business Events* SupportPac introduces the concept of CICS as an emitter of events, for consumption by WebSphere Business Events. It allows CICS application specialists to start identifying the event points in their CICS applications, and to discover how they can harness the power of WebSphere Business Events to derive responses (follow-on processing) from detecting patterns of these events. The SupportPac enables events to be emitted from CICS TS in a format directly consumable by WebSphere Business Events, allowing CICS to participate in enterprise-wide event processing.

CICS SupportPac CB11 runs in CICS TS V3.1 and V3.2, and requires a small change to existing CICS application code in order to emit events.

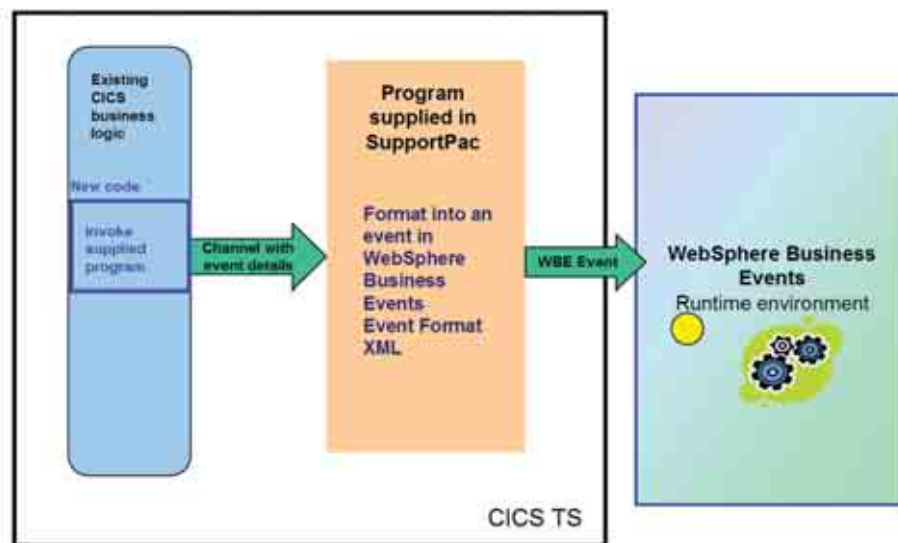Figure 3 illustrates use of the CICS Events for WebSphere Business Events SupportPac.

Figure 3. The CICS events for WebSphere Business Events SupportPac

Specifically, existing CICS business logic in the application code must be updated at the place the event is to be emitted, to invoke the program supplied by the SupportPac, passing event details in a channel. The SupportPac code formats the event information into XML conforming to WebSphere Business Events format and emits the event for consumption by WebSphere Business Events (or other consumer program) through the WebSphere MQ transport. WebSphere Business Events can then include the CICS event as it would other events from various sources across the enterprise for pattern detection and other functions and trigger actions—messages for initiating follow-up processing.

The announcement of IBM WebSphere Business Events Version 6.2 included a statement of direction for additional new capability to enable business analysts and developers to instrument CICS business logic with WebSphere Business Events—without changing the existing CICS applications to complement the SupportPac capability.

Scenarios for CICS events with WebSphere Business Events

Events from CICS can be used in event-processing rule logic defined in WebSphere Business Events. For example, interaction patterns can be defined within WebSphere Business Events to "Watch for a Suspicious Activity," which specifies that when a "Withdrawal" event occurs, check whether this is a large transaction (as defined by a "Large Transaction" filter or condition). If it is a large transaction, then also check whether there has been an occurrence of a "Change Pin" event for this customer recently (within one day). If so, this is a suspicious activity pattern. The WebSphere Business Events logic also specifies the actions to be taken if a suspicious activity pattern occurs. First, action messages are sent to the bank's back-office transaction processing system to suspend the account. Another action message is sent to the fraud department requesting they investigate.

The "Withdrawal" and "Change PIN" events might not occur in CICS Transaction Server. The WebSphere Business Events Design Data tool is used to define the incoming events, associated data and the event processing logic.

Consider a situation in which a CICS application carries out PIN processing and processing of withdrawals from ATMs, and the SupportPac has been installed. Where the PIN processing transaction writes a new PIN to a CICS file, code is added to invoke the SupportPac program, passing information about the customer making the PIN change.

When this event occurs, the SupportPac program causes a "Change PIN" event to be emitted to WebSphere Business Events. Where the program that processes ATM withdrawals carries out withdrawal processing, code is added to invoke the SupportPac program, passing information about the withdrawal transaction and the customer making the withdrawal.

The SupportPac causes a "Withdrawal" event to be emitted to WebSphere Business Events. WebSphere Business Events consumes all events independently as they occur. If WebSphere Business Events detects a large withdrawal and PIN change event pattern occurring within a one-day period, it creates and emits action messages for suspicious activity and fraud investigation.

The first action associated with a suspicious activity is to suspend the customer's account pending further investigation. A request (such as a Web service invocation) is made to CICS to carry out this action.

There are a wide range of scenarios in which the capabilities of WebSphere Business Events can derive useful business information and actions from events arising during processing within CICS, across all industries and application domains.

The following examples illustrate that CICS events can be used to provide both responsiveness and business flexibility—as well as detecting fraudulent situations and satisfying governance and compliance regulations.

- *An insurance company can detect events occurring in CICS that relate to obtaining quotes for various types of policies. The company can then correlate these in WebSphere Business Events with events indicating that a policy has been taken out—or with an absence of events to take out the policy. This represents an opportunity to sell other policies to the customer, for example, by sending a targeted offer.*

- *Events from CICS can be used to ensure that regulations that require banks and insurance companies to detect potentially fraudulent situations are satisfied. Suspicious behavior relating to bank and credit card usage can be detected using the pattern-detection capabilities of WebSphere Business Events. Examples of these patterns include a new card ordered within a week of an address change request, several online purchases where none had been made before, or two or more cash withdrawals in quick succession when withdrawals are rare on this card, or normally for smaller amounts. A number of regulations require such situations to be detected in real time. An example is the U.S. Fair and Accurate Reporting Credit Transactions Act, or "red flag" act. This requires organizations to have systems in place for detecting "red flag" situations.*

- *Event patterns detected during order processing (order received, order dispatched, order cancelled and so on) can trigger action messages from WebSphere Business Events to WebSphere Business Monitor. These messages provide insight into order processing, such as studying KPIs of numbers of orders received per week, time to process and dispatch orders, and others.*

- *A student registration and course management system running in CICS can be extended to send e-mail messages to students when classes are cancelled or relocated at short notice. This can be done by emitting events to WebSphere Business Events and using the embedded e-mail action connector in WebSphere Business Events to notify students of the changes.*

Details of the CICS Events for WebSphere Business Events SupportPac

The interface to the SupportPac is through a channel-based EXEC CICS LINK command. A specific named channel is passed to the SupportPac on the LINK command, with a set of containers within that channel that are expected by the SupportPac. These containers are used to provide the following information:

- *The name to be given to the event (which normally indicates its business significance)*
- *The event payload, provided in sets of containers that include the following information for each item of data:*
  - *The name of the data item*
  - *The value of the data item*
  - *Optionally, the type of the data item, in terms of whether WebSphere Business Events is to regard it as string data or integer data*

  These pieces of information are connected by a suffixed number in the container name.
- *Configuration information indicating the WebSphere MQ queue to which to emit the event*
- *An error container to receive error information from the SupportPac program, such as "WebSphere MQ not configured for this CICS," "queue name does not exist," and "mismatch between the number of name and data containers"*

The coding required to set up the containers and channel and to invoke the SupportPac program uses standard EXEC CICS commands, and can be inserted into existing logic written in any of the CICS-supported programming languages.

The CICS Events SupportPac emits an event from CICS, in the format recognized by WebSphere Business Events, to a WebSphere MQ queue specified in the configuration container. The queue named in the configuration container must be set up on the z/OS system where CICS runs (and CICS must be set up to use WebSphere MQ). The queue must then be configured to allow WebSphere Business Events to receive the event on the system where it is running. There are various options for achieving this. Here is one example:

- *Define the queue on z/OS as a remote queue.*
- *Configure WebSphere MQ to send messages to WebSphere Application Server platform messaging (using the WebSphere Application Server installed with WebSphere Business Events).*
- *Set up WebSphere Business Events to read messages from the messaging queue for the WebSphere Application Server platform.*

A WebSphere Business Events connector should be defined in the event definition to receive the event from the queue.

Definitions within WebSphere Business Events to process CICS events

The Design Data tool in WebSphere Business Events is intended for use by skilled IT personnel to define events, actions and associated attributes and for business analysts to later define the event processing logic.

Events from CICS can be defined and actions taken when events, or particular patterns of events, occur. For example, an event named OrderReceived can be defined representing events from CICS order processing. Actions can be defined to be taken when particular orders or order patterns are detected, such as a large order from a particular group of customers within a certain time frame. The Design Data tool also includes the concept of *intermediate objects*, which decouples the raw event from WebSphere Business Events processing. This allows for a level of indirection between incoming events and processing logic defined by the business analyst. In our example, when WebSphere Business Events receives an order event, it maps the event data to an intermediate object. WebSphere Business Events then processes information in the intermediate object.

In order for WebSphere Business Events to receive events emitted through the CICS Events for WebSphere Business Events SupportPac, a connection should be set up for the OrderReceived event in the Design Data tool. Using the WebSphere Business Events Event Properties dialog, IT personnel can define the connection protocol and properties. This is done simply by selecting the "Message Queue Connection" option and configuring details specifying the format as Connector Packet, the queue type as JMS Queue, and the queue name as that to which these events will be written.

The Design Data tool, which is intended for use by business analysts and line-of-business users, can be used to define event processing logic constructed as event name, conditions and actions, for example:

- *In response to "Order Received" from CICS MQLink*

- *Where "Large Order Value"*

- *Always "Send Offer" on CICS MQLink*

Here's how this logic is interpreted: When an "Order Received" event occurs under the CICS MQLink touchpoint (that is, the event that we described earlier as coming over the Message Queue Connection from CICS), check whether the filter "Large Order Value" is true. If so, take the action "Send Offer." It is also possible to define more elaborate interaction sets, for example, to send offers only to particular groups of customers or those placing several orders.

On October 1, 2008, IBM announced the CICS Events for WebSphere Business Events SupportPac, together with WebSphere Business Events V6.2.0 and WebSphere Business Event eXtreme Scale V6.2.0 (Announcement 208-295). This announcement includes a statement of direction to extend the SupportPac capability and integrate it into CICS TS. This new capability will enable business analysts and developers to instrument CICS business logic with events without changing existing CICS applications.

This more flexible and powerful "noninvasive" approach will be the mechanism for emitting events from CICS applications. A noninvasive event-emission technology is desirable because it reduces the real or apparent risk of altering application code.

Events emitted from CICS applications will continue to be single events. WebSphere Business Events will perform event evaluation and correlation. With this approach, events from multiple CICS regions, and from event sources other than CICS, can be included in cross-enterprise event evaluation, pattern detection processing solutions. The event formats used in this approach are directly consumable by WebSphere Business Events, and can be mediated for other consumers such as WebSphere Business Monitor.

Licensed CICS users can apply to participate in a CICS beta program to gain early insight into this capability by sending an e-mail to cicsep@uk.ibm.com.

Summary

Enterprises are under increased scrutiny to demonstrate compliance with both industry standards and central government legislation. Demonstration of sound governance of business practice together with precise and accurate reporting of business operations is a necessity for an enterprise to preserve confidence and integrity and to protect share holder value.

Throughout the enterprise business implementation owners in many different roles such as IT managers, business analysts, solution architects and CICS specialists are now required to implement governance and compliance solutions for core enterprise business applications that run on CICS.

CICS and WebSphere Business Events are synergistic technologies supporting cross-enterprise business event processing. With CICS operating as an event source to WebSphere Business Events, there is an opportunity to construct powerful, new application architectures that can be used more easily by business owners to manage business risk and to immediately and accurately report on business operations.

For more information

For more information, take the first step by downloading the CICS Events for WebSphere Business Events SupportPac from **ibm.com**/cics.

If event processing is relevant to your industry, you might find an independent view from the analyst firm Lustratus a valuable read. You can download its paper "Upgrading risk and compliance management on System z" from lustratus.com.

Additionally, IBM Global Financing can tailor financing solutions to your specific IT needs. For more information on great rates, flexible payment plans and loans, and asset buyback and disposal, visit **ibm.com**/financing.

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