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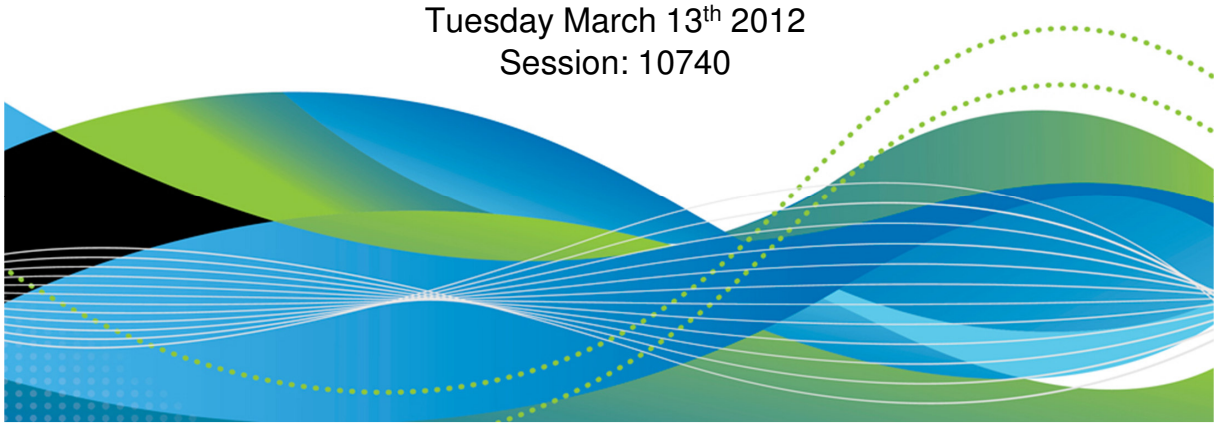
CICS, Rules and Events Perfect together

Introducing WebSphere Operational Decision Management for z/OS

Chris Backhouse
IBM Hursley

Tuesday March 13th 2012
Session: 10740



IBM BPM and IBM WebSphere Operational Decision Management on z/OS SHARE sessions – join us

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10736: Making zEnterprise Relevant to Line of Business
Monday, March 12, 2012: 1:30 PM-2:30 PM, International Ballroom E

10740: CICS and Decision Management: Perfect Together
Tuesday, March 13, 2012: 3:00 PM-4:00 PM, Dogwood A

11094: Decision Management for CICS: Optimizing CICS Infrastructure for Business Rules Execution - Lunch & Learn
Wednesday, March 14, 2012: 12:15 PM-1:15 PM, International Ballroom B

10742: Using Business Rules to Achieve Affordable Agility in System z Applications
Thursday, March 15, 2012: 8:00 AM-9:00 AM, International Ballroom E

10751: Modernization of Mainframe Applications with WebSphere Operational Decision Management for z/OS
Thursday, March 15, 2012: 9:30 AM-10:30 AM, International Ballroom E

10743: Why Business Rules and Business Process Management are Important to System z Apps (and to you)
Thursday, March 15, 2012: 4:30 PM-5:30 PM, International Ballroom E

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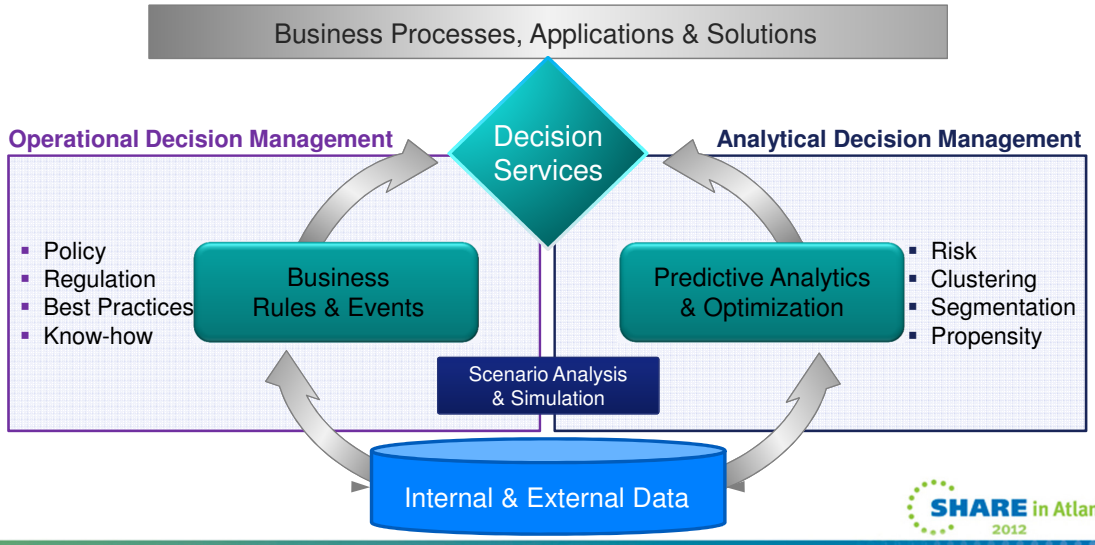
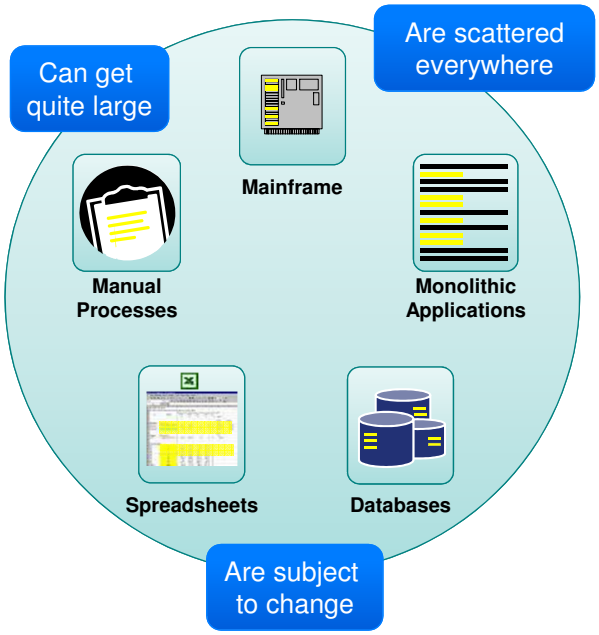
What is Decision Management?

Decision Management is a business discipline, supported by operational and analytics software, that enables organizations to automate, optimize and govern repeatable business decisions to improve the value of customer, partner and internal interactions.



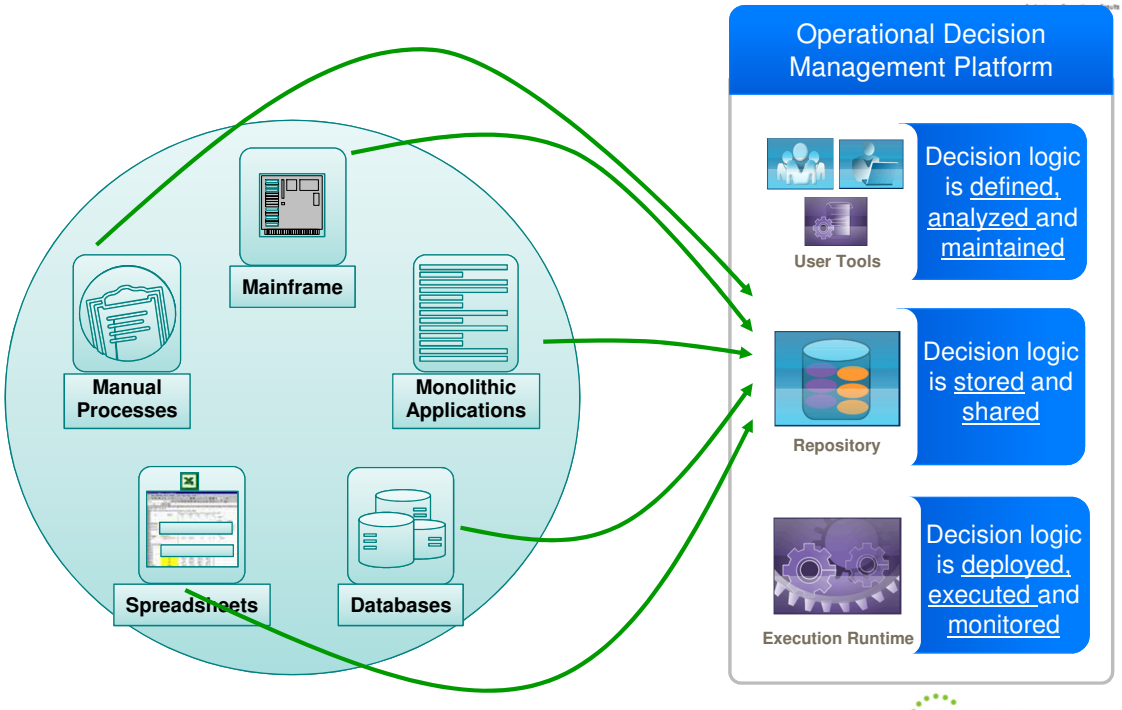
Operational decisions in organizations



Challenges for a Change Request

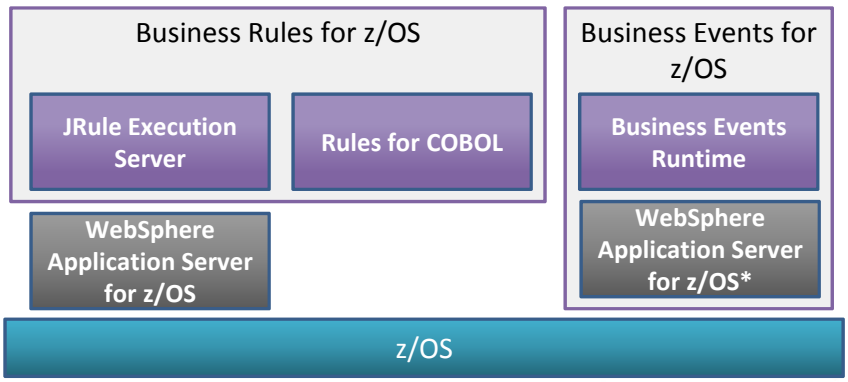
- Changes are costly, resource & time-intensive
  - **Hidden in code**
  - **Most changes have to be programmed – costly**
- Lack of consistency
  - **No central management**
  - **No reuse of decision logic**
- Gap between business analysts & IT administrators
  - **Knowledge fades over time**
- Lack of audit ability
- No easy way to test/simulate changes

Operational Decision Management Approach



IBM Business Rules for z/OS v7.1

- JRules Rule Execution Server
  - Port of the Distributed Code
  - Runs within a WAS JEE environment
  - No specific support for z artefacts
- Rules for COBOL
  - Extension to the Rule Studio eclipse environment
  - Generate COBOL code representation of the authored rules
- WebSphere Business Events for z/OS
  - Port of the Distributed code



*OEM

Business Rules vs Business Events

Business Rules

Primarily implements a decision model – given a snapshot view of data, determines best course of action at a specific point in a process or application

Main purpose is to automate a decision based on a combination of factors (business policies, regs, best practices)

If the Passenger is a gold frequent traveler and flight distance is more than 4000 miles and the flight destination is in Europe or Asia Then Add 10,000 points to the fidelity card of the Passenger

Business Events

Primarily implements a time-based pattern detection model – correlating events as data is in motion

Main purpose is to determine what of interest is transpiring and coordinate one or more responses by other systems or generate alerts to people

If more than 2 customer withdraws in an ATM are done in the same day and the 2 ATMs are from 2 foreign countries Then Investigate possible fraud Reduce cash redraw max amount to 100$

Gartner characterizes Rules and Complex Event systems as complementary notions. The combination being required to implement intelligent decision management programs.

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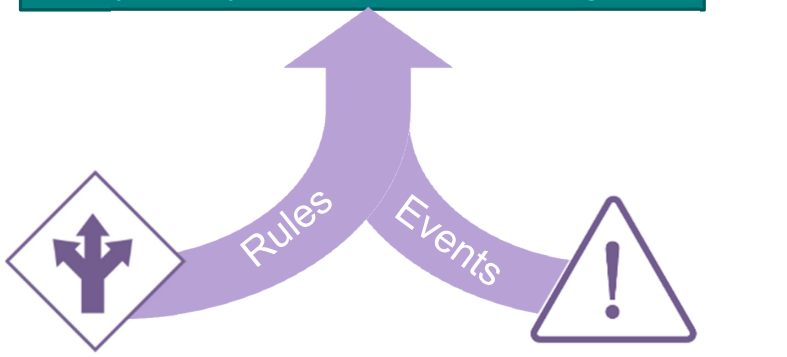
WebSphere Operational Decision Management

WebSphere Operational Decision Management



WebSphere ILOG BRMS

WebSphere Business Events

WebSpere Operational Decision Management Vision

- **Combined business rules and events management**
  - Common tools/interfaces/repository
  - Aligned concept of operations
- **Full decision life cycle management**
  - Business – IT alignment and collaboration
  - Unified governance

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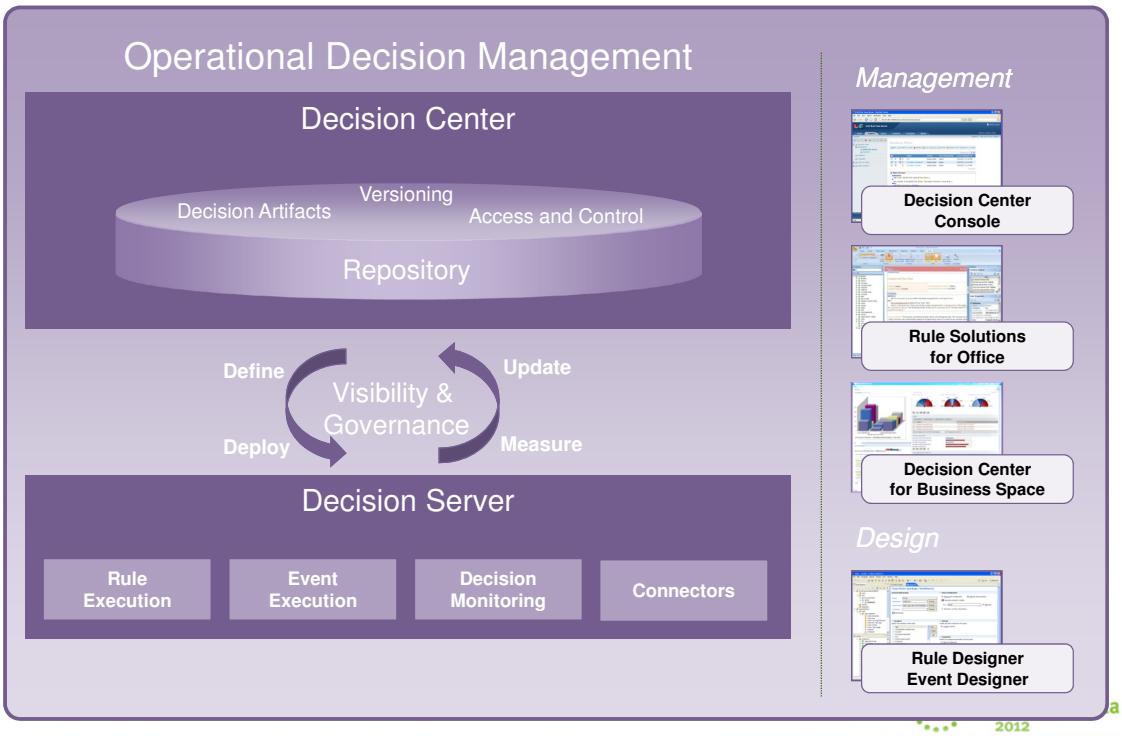
WODM: Components

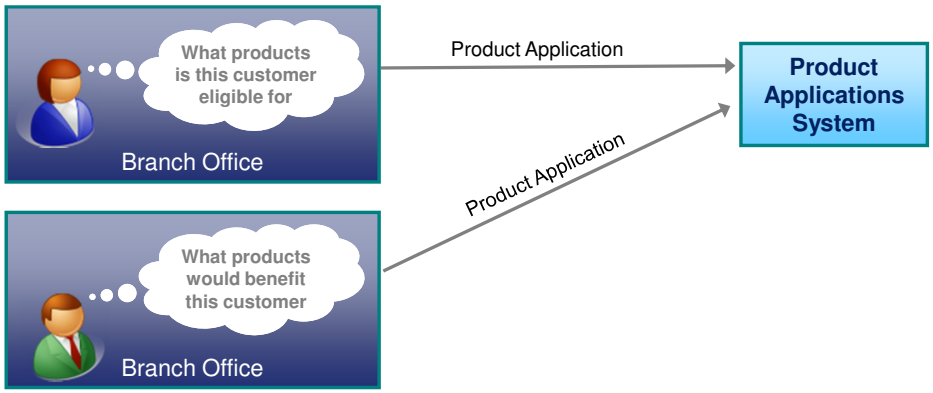


A Top 5 North American Bank

- One of the largest financial service providers in the world
- Over 18 million clients worldwide
- Nearly ¼ million mortgages
- Nearly ½ million loan products
- Prioritizes branch office networks to build personal ties with its clients

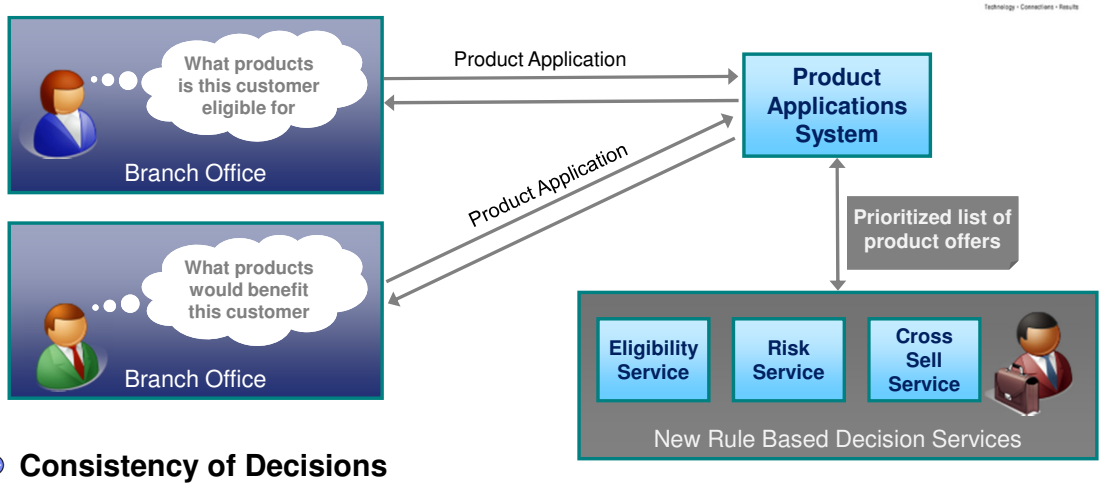
Large opportunity for the bank to cross sell / up sell financial products to existing customers

Existing Scenario



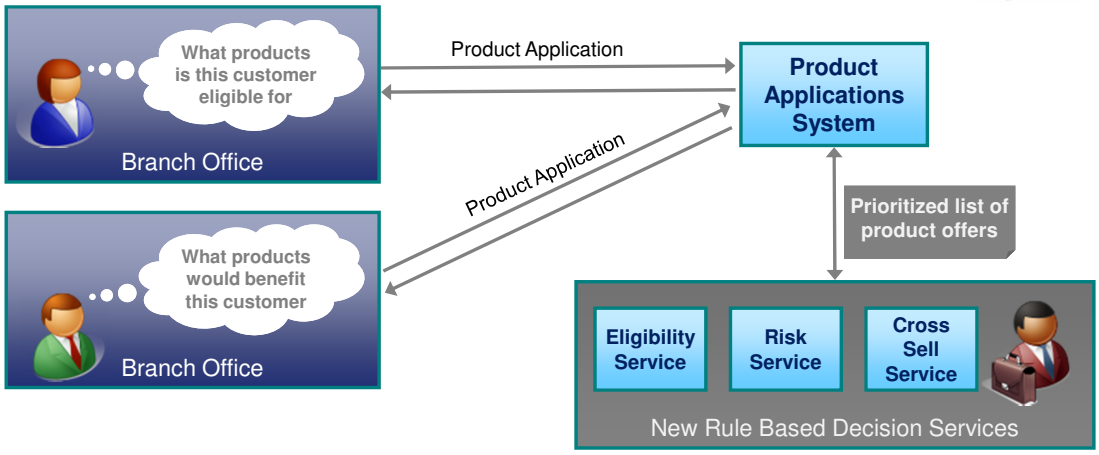
- **Poor customer experience**
  - Difficult to determine or identify who to cross sell or up sell to
  - Branch staff would sometimes try to cross-sell to clients who did not qualify
- **Inefficient use of customer service representative time**
  - Assessment times were too long
  - Separate application in order to know if client qualifies for an additional product

New Scenario



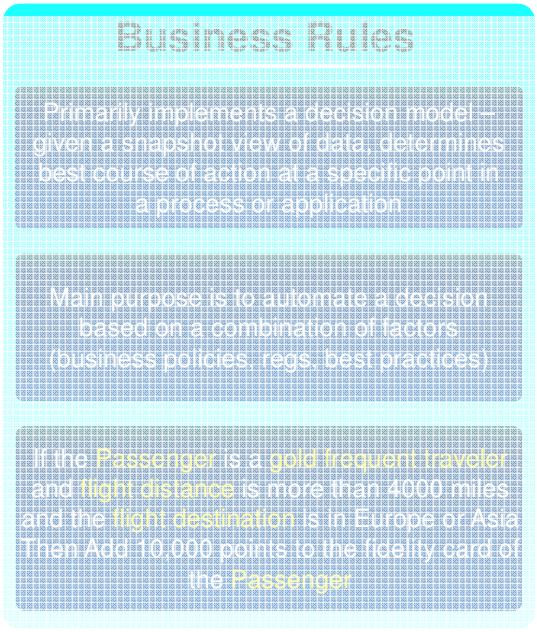
- **Consistency of Decisions**
  - Prioritized list of pre-approved product offers returned to customer service agent
  - New BRMS based decision services provides consistent decisions across branches
- **Improved time to market**
  - New policies can be introduced & managed across the company more effectively
- **Flexible solution enables incremental modernization**
  - Low development risk as new functionality incrementally added to existing application as new services

New Scenario



- **Employees equipped to make intelligent, consistent product recommendations in real time**
  - $14 million in new business in 2 ½ months
- **Customer experience enhanced with pre-approved offers that better match customer needs**
  - Offer acceptance increased from 3% to 20 – 30%

Business Rules vs Business Events



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Business Event Processing Defined

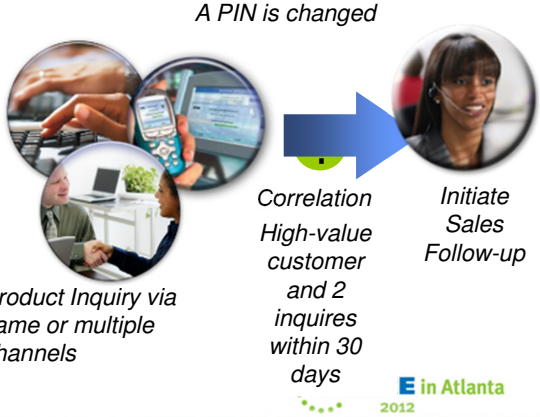
What is…

…a Business Event?

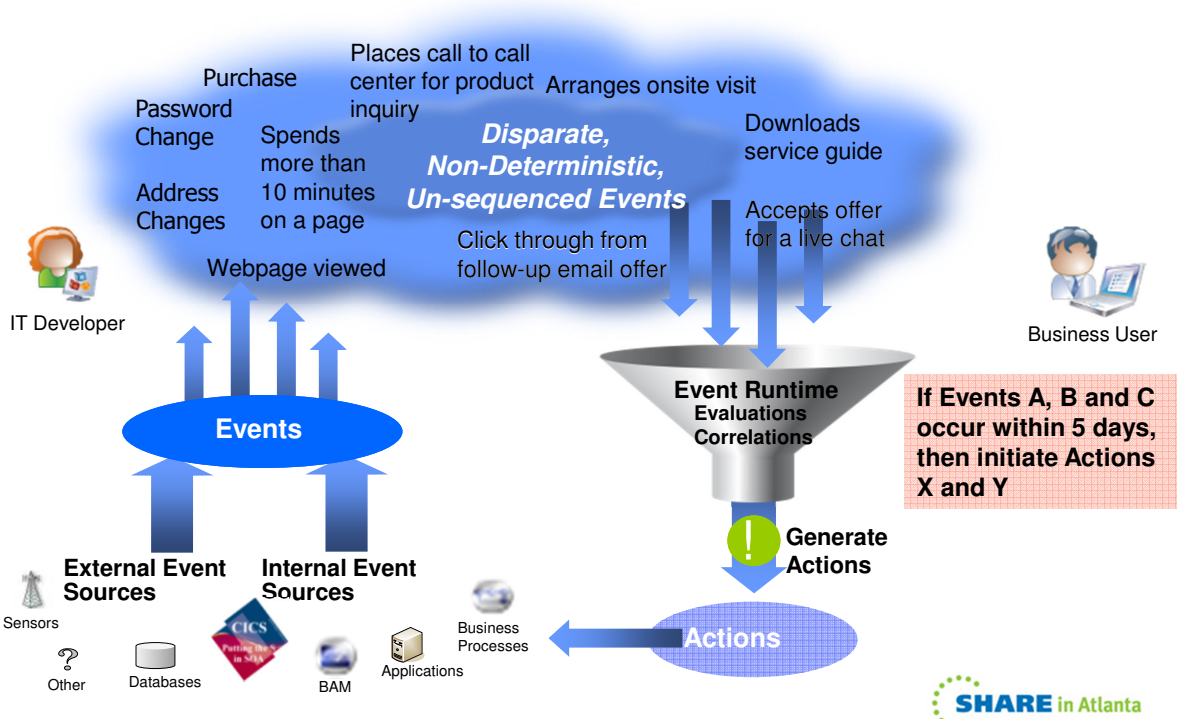
Any electronic signal (message) indicating a change in the state of the business has occurred or contemplated

…Business Event Processing?

The ability to sense when a business event or pattern of events, representing a user defined actionable business situation, has occurred (or not occurred) – and to coordinate the right response (action) at the right time



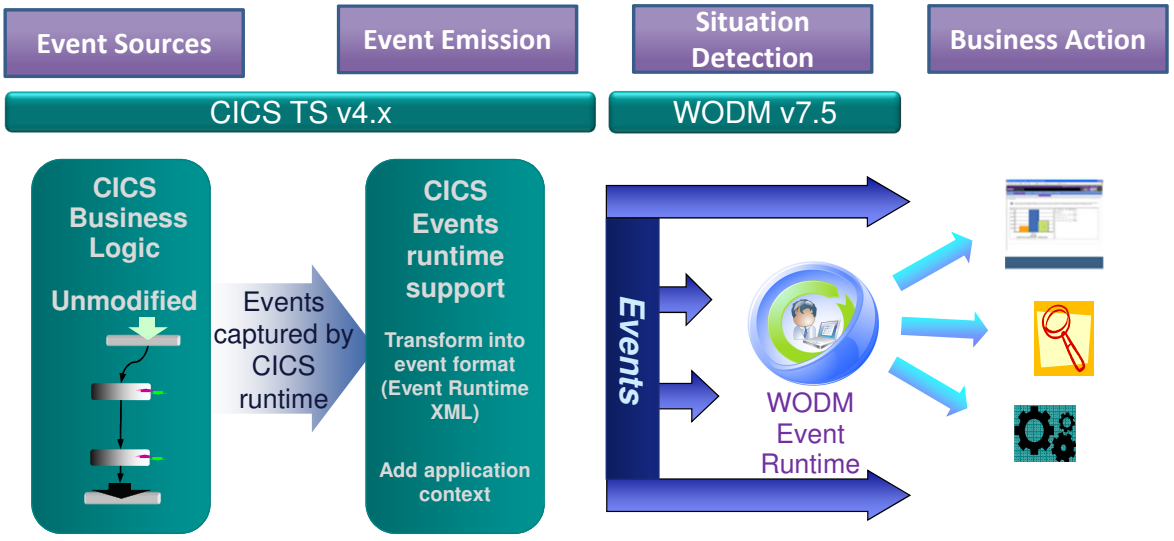
Business Event Processing



Business Events and System z

- Provide greater business agility for proven and trusted traditional System z applications
- Deliver new value and insight from legacy systems and transaction processing
- Enable the initiation of follow-on processing based on actionable patterns of transactions
- Provide means for coordinating information sharing across operational systems
- Increases efficiency and effectiveness providing faster time to value

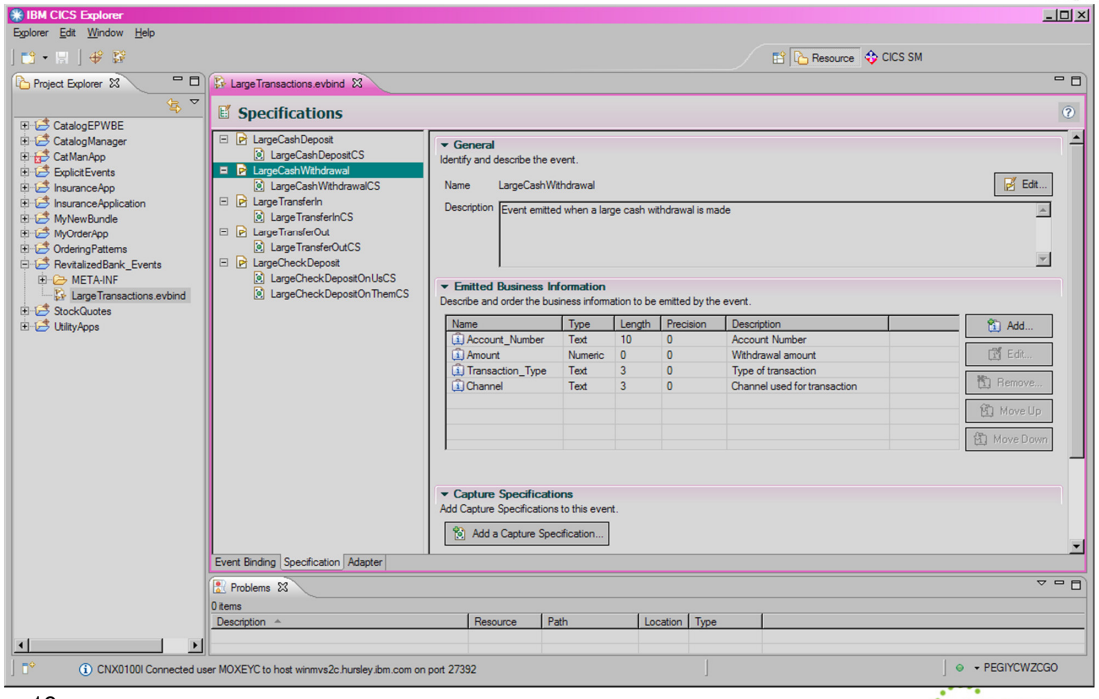
Event Emission from CICS Transaction Server



CICS Events with WODM 7.5 help you to

- *Observe business applications*
- *Recognize interesting or suspicious situations*
- *Drive new processing*

Event Binding Editor Tooling



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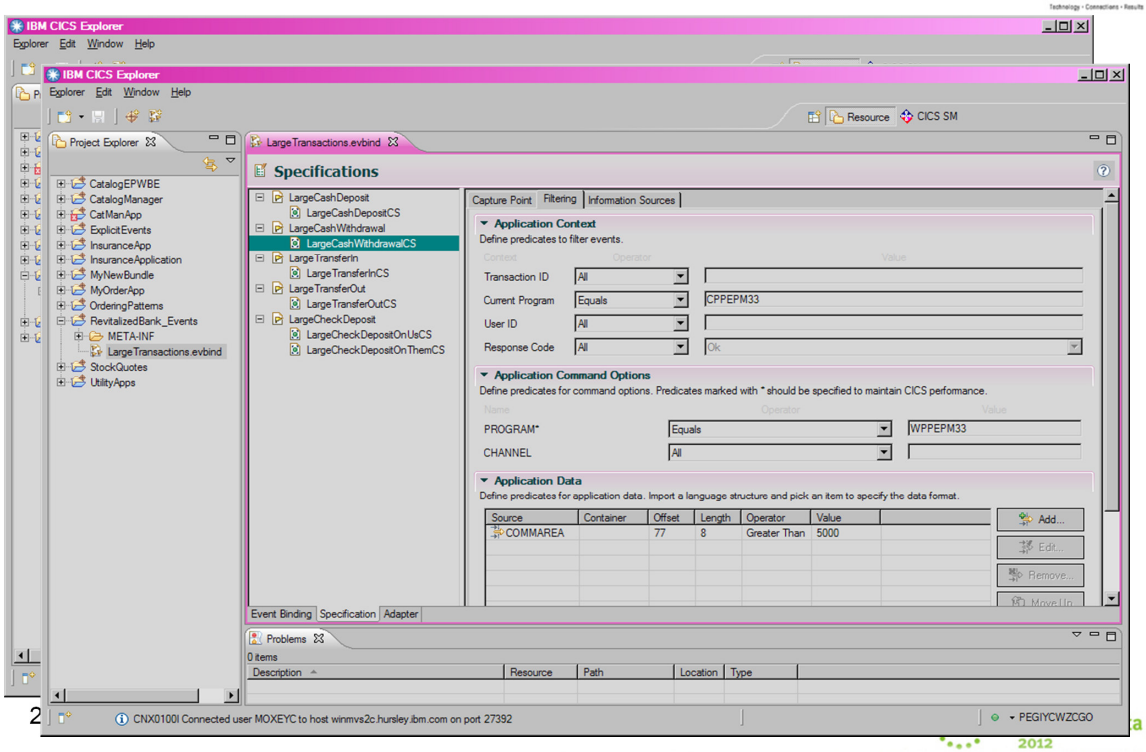
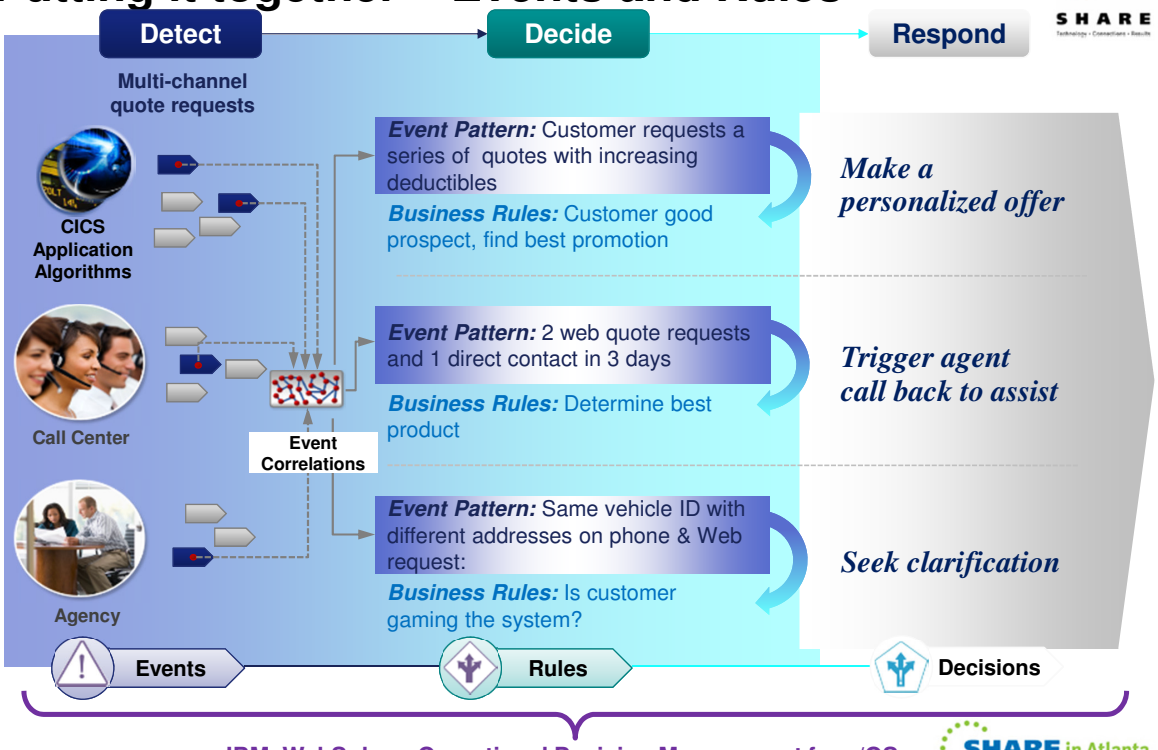


Putting it together – Events and Rules



IBM WebSphere Operational Decision Management for z/OS

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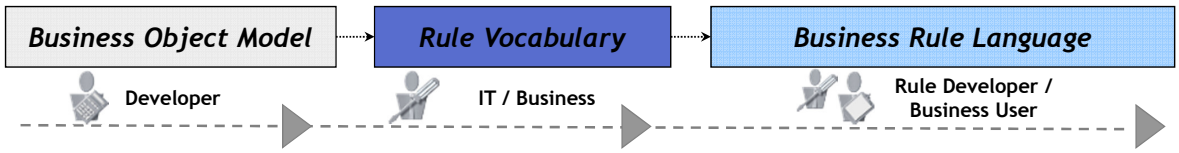
Data Model - Verbalization




```
01 CUST
  05 NAME
  05 AGE
  05 NUMACCIDENTS
  05 RISKLEVEL
```

"customer"
- the name of …
- the birthday of …
- the number of accidents of …
- the … is a high risk driver

Rule: High risk driver

if

the birthday of customer is after **12/9/1975** and the number of accidents of customer is at least **3**

then
set the customer as a **high risk driver**

- Automatic generation of the rule vocabulary.
- Comprehensive industry focused business terms to define its data and associated actions.
- Localizable vocabulary

"client"
- le nom du …
- l'anniversaire du …
- Le nombre d'accidents du …
- le … est un conducteur à risque …

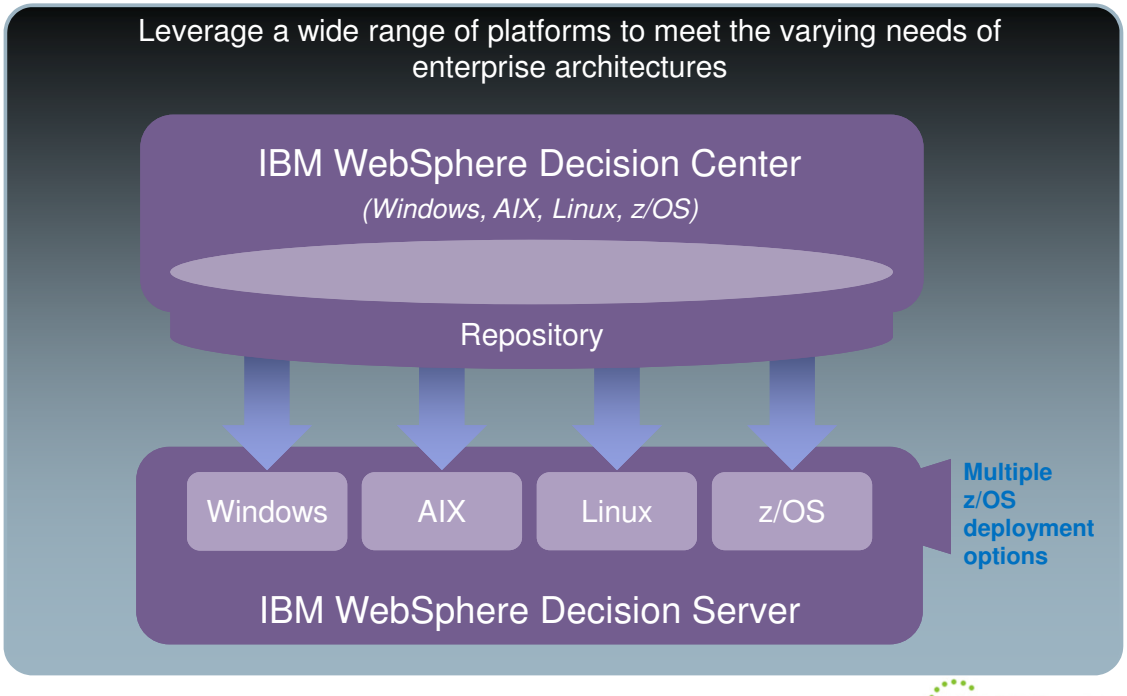
Règle: Conducteur à risque

si

L'anniversaire du client est après le **12/9/1975**
et
le nombre d'accident du client est au moins **3**

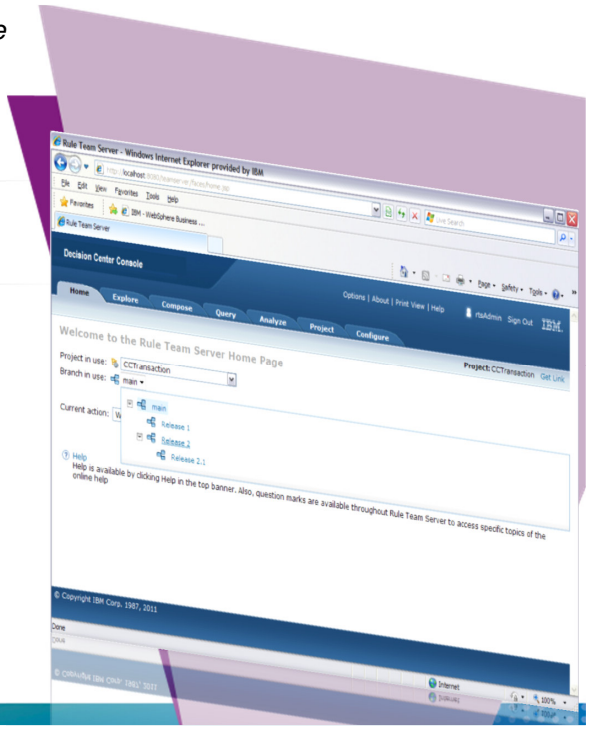
alors
Classer le client comme **conducteur à risque**

WODM: Runtime Support

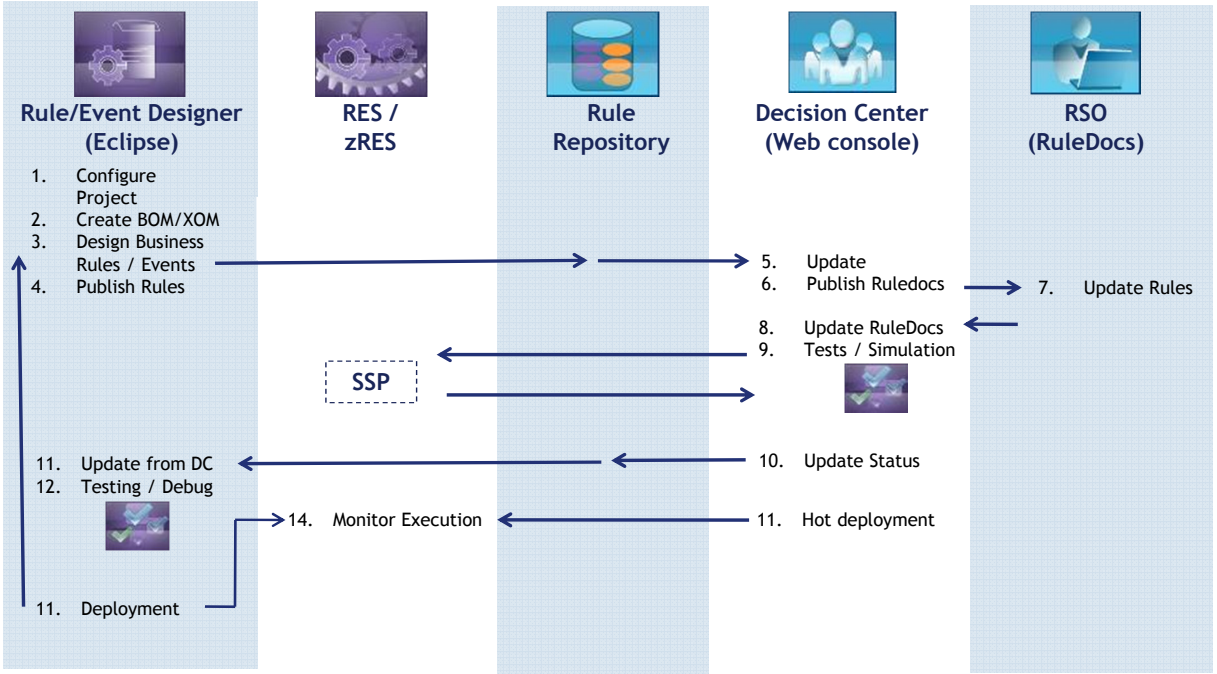


The Value to your CICS Applications

- *WebSphere Operational Decision Management enables organizations in every industry to make their business rules and business decisions clear, consistent and **expressed in business language** to be able to change when the business needs.*
- *Transformation or **modernization** of z/OS applications*
- *Ability to **react to change** (timely reaction to market and competitive changes)*
- *Overcome IT and Business mis-alignment – keep up and service **business requests***
- *Eliminate resource drain on application maintenance – **reuse of business decisions** across applications and platforms*

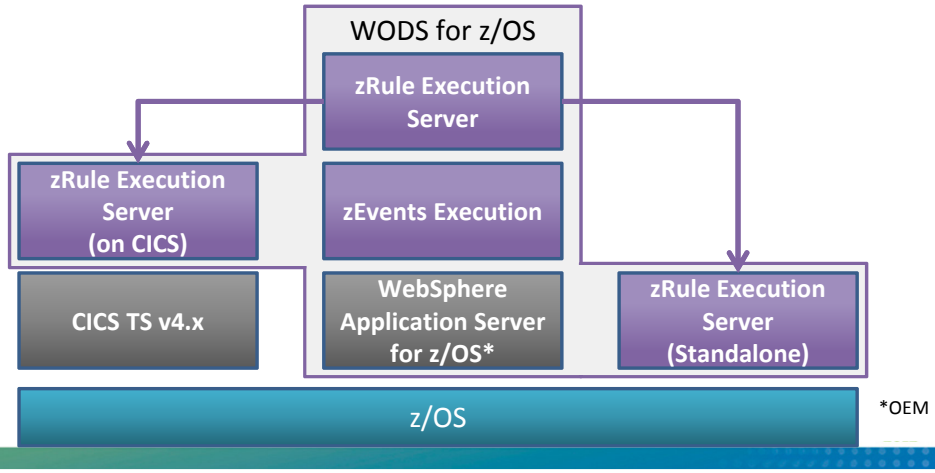


WODM: Concept of Operations



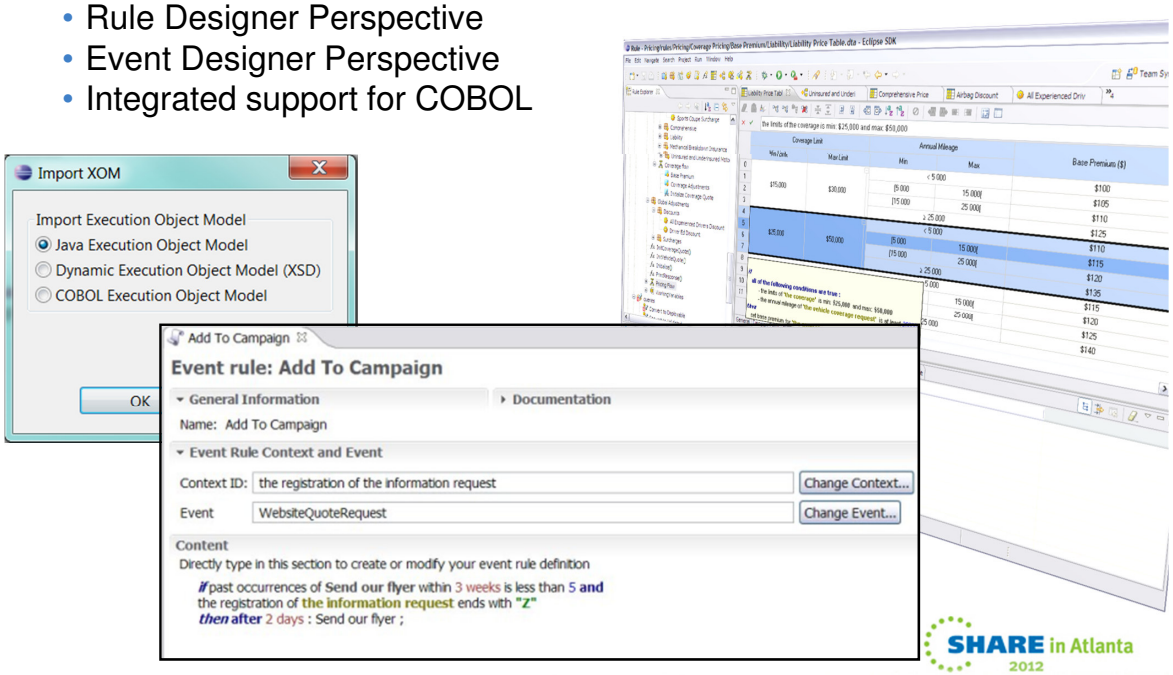
Decision Server for z/OS

- Decisions can be invoked from existing CICS and batch applications
- Runtime support for COBOL data types
- Flexible runtime deployment to fit any System z environment:
  - Deployed on WebSphere Application Server for z/OS
  - Deployed standalone to z/OS
  - Deployed in CICS TS 4.x JVMServer environment

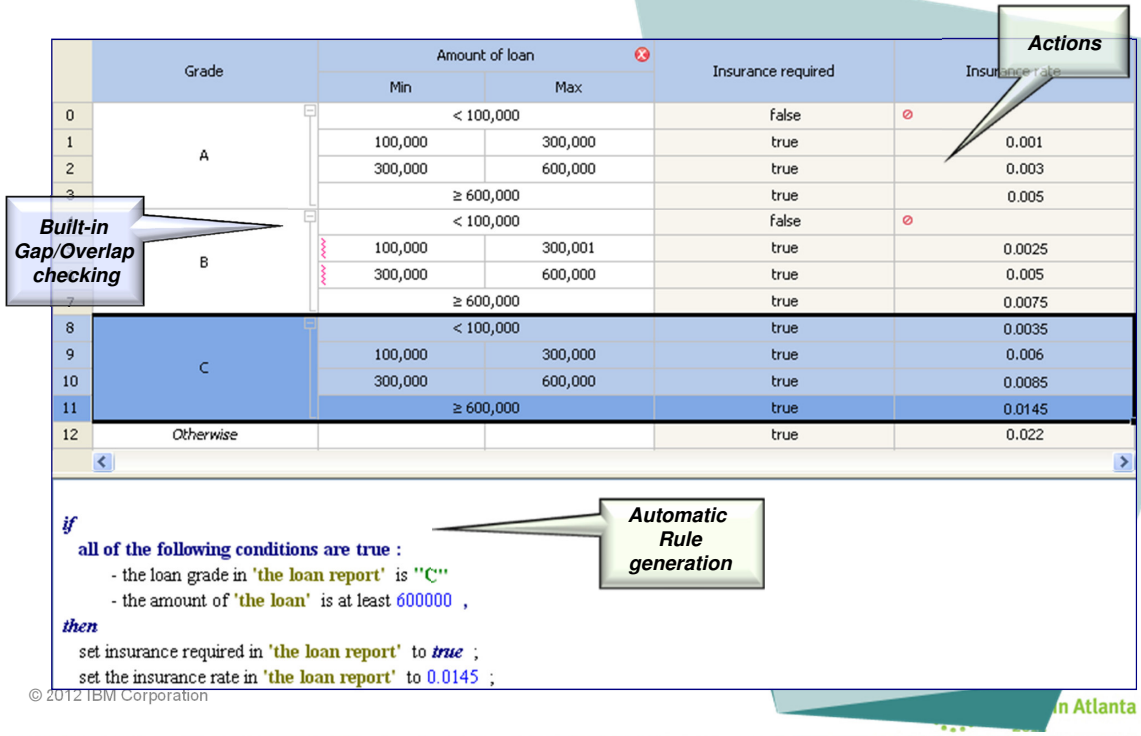


Rule and Event Designer

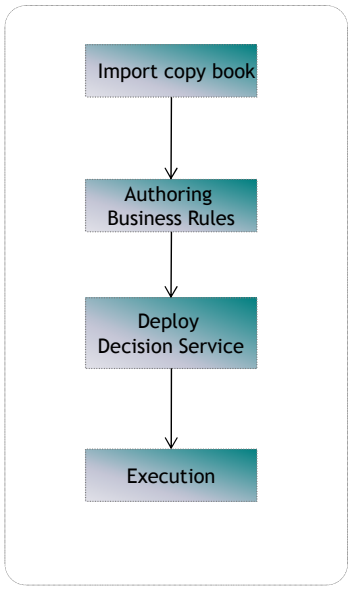
- Eclipse-based Development Environment
  - Rule Designer Perspective
  - Event Designer Perspective
  - Integrated support for COBOL



Decision Tables



Starting from a COBOL Copybook



Scenario

- Existing COBOL containing business rules
- Data model defined in COBOL copybook
- Use BRMS to modernize the business policy

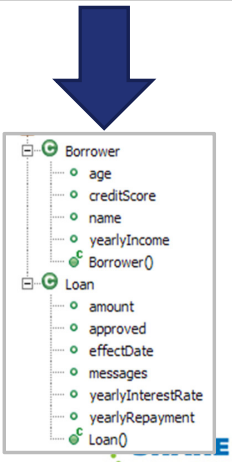
Benefits

- Modernize business policies in BRMS
- Rules can be invoked 'naturally' from existing application
- Business policy/rule lifecycle detached from application lifecycle

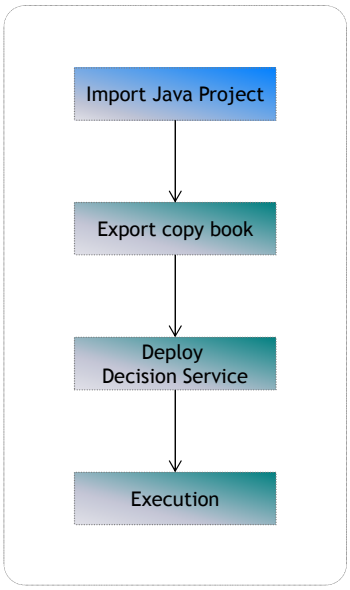
Rule Authoring – COBOL Copybook XOM

- Support Enterprise COBOL 3.4, 4.1 & 4.2
- A Java is created from the copybook structure
  - Java XOM & Java code to marshal between COBOL <-> Java
  - 01 level structures mapped to class in BOM
- Redefines statements supported
  - Select which redefines structure to import
- COBOL Table support
  - Mapped to Java `List<type>` structures
- COPY statements supported
- Level 88 supported
  - Mapped to methods in BOM

```
01  Borrower.
    05  name                PIC  X(20).
    05  creditScore         PIC  S9(10).
    05  yearlyIncome        PIC  9(10).
    05  age                 PIC  9(3).
01  Loan.
    05  amount              PIC  9(10).
    05  yearlyInterestRate  PIC  99.
    05  yearlyRepayment     PIC  9(10).
    05  effectDate          PIC  X(8).
    05  approved            PIC  X.
    05  messageCount        PIC  9(2).
    05  messages            PIC X(60)
                            OCCURS 0 TO 99 TIMES
                            DEPENDING ON messageCount.
```



Starting with an existing Java based project



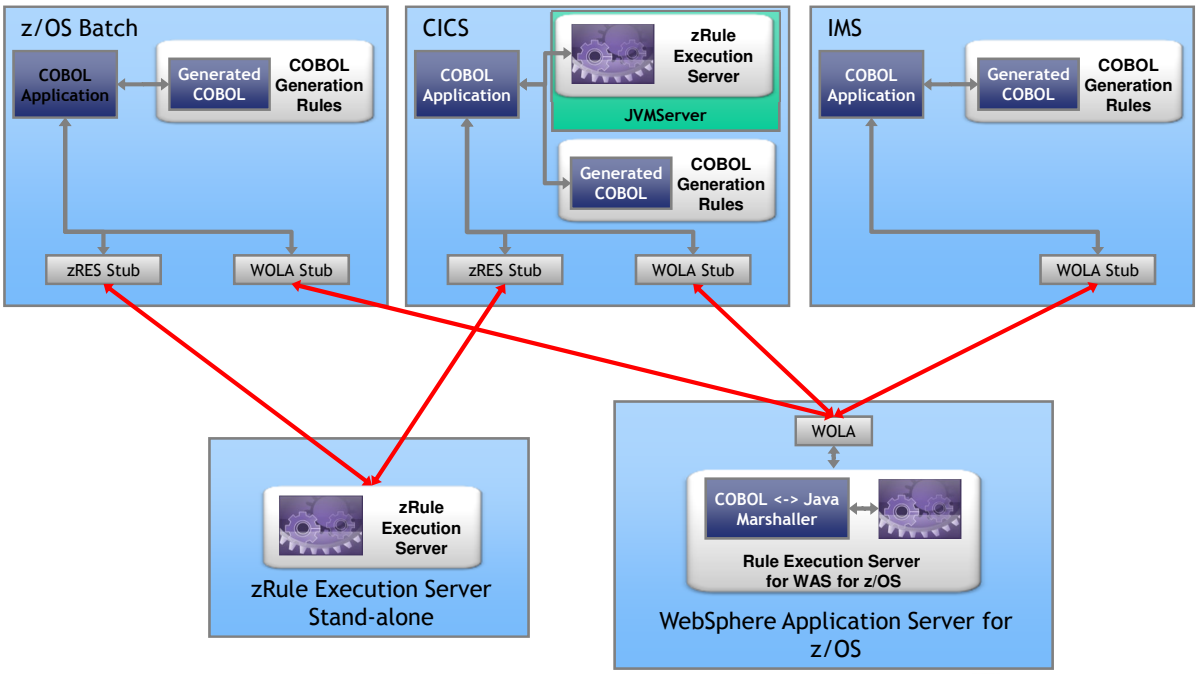
Scenario

- Existing Rule projects exist that are currently in use on distributed platforms
- Concurrent execution of rules required on System z

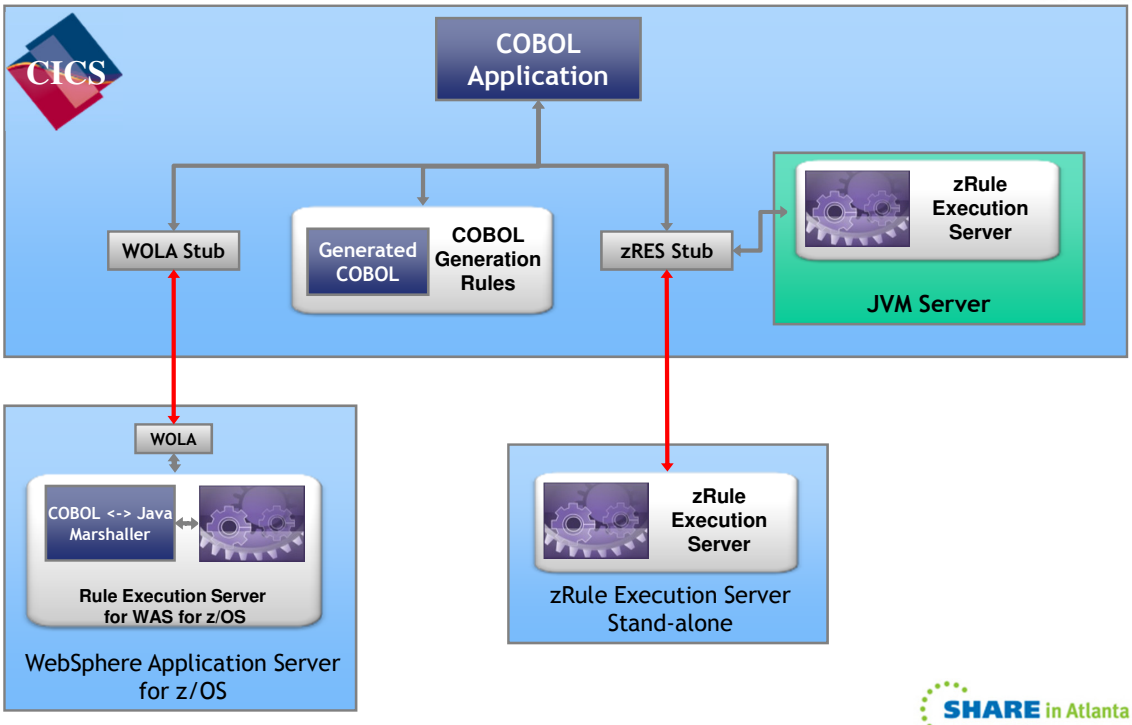
Benefits

- Consistent decision rules where ever executed
- Rules can be invoked 'naturally' from existing applications on all platforms
- Enables central rule management across System z and distributed execution
- Business policy/rule lifecycle detached from application lifecycle

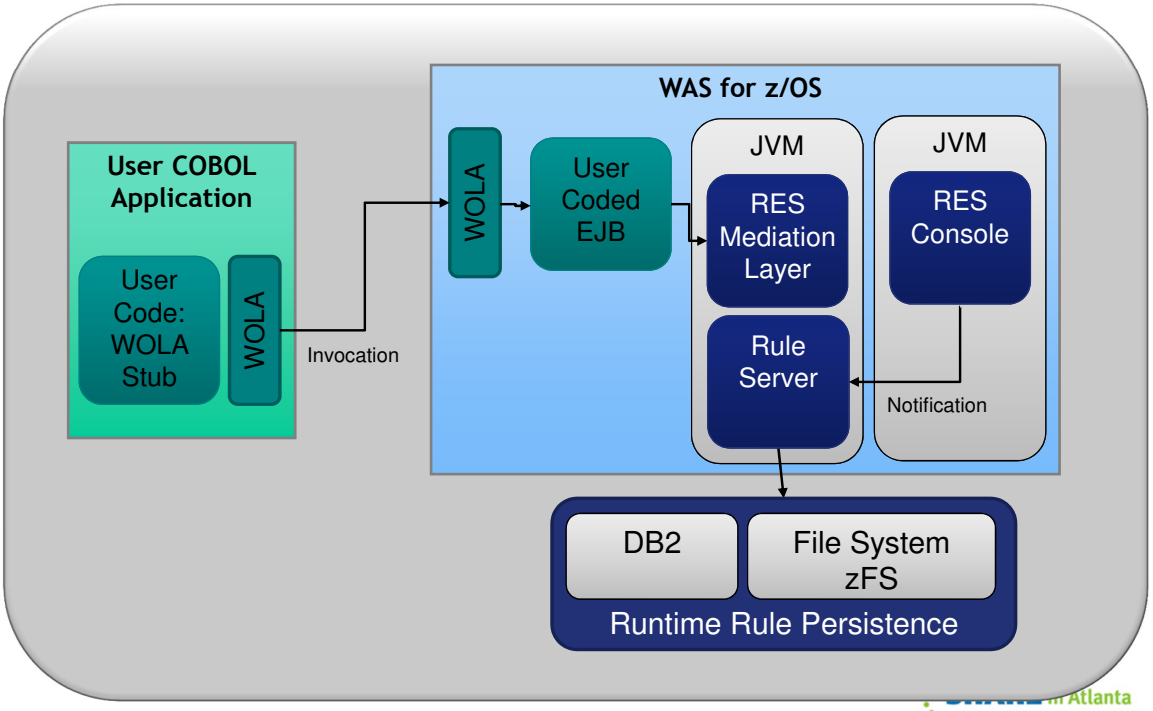
Rule invocation options for System z



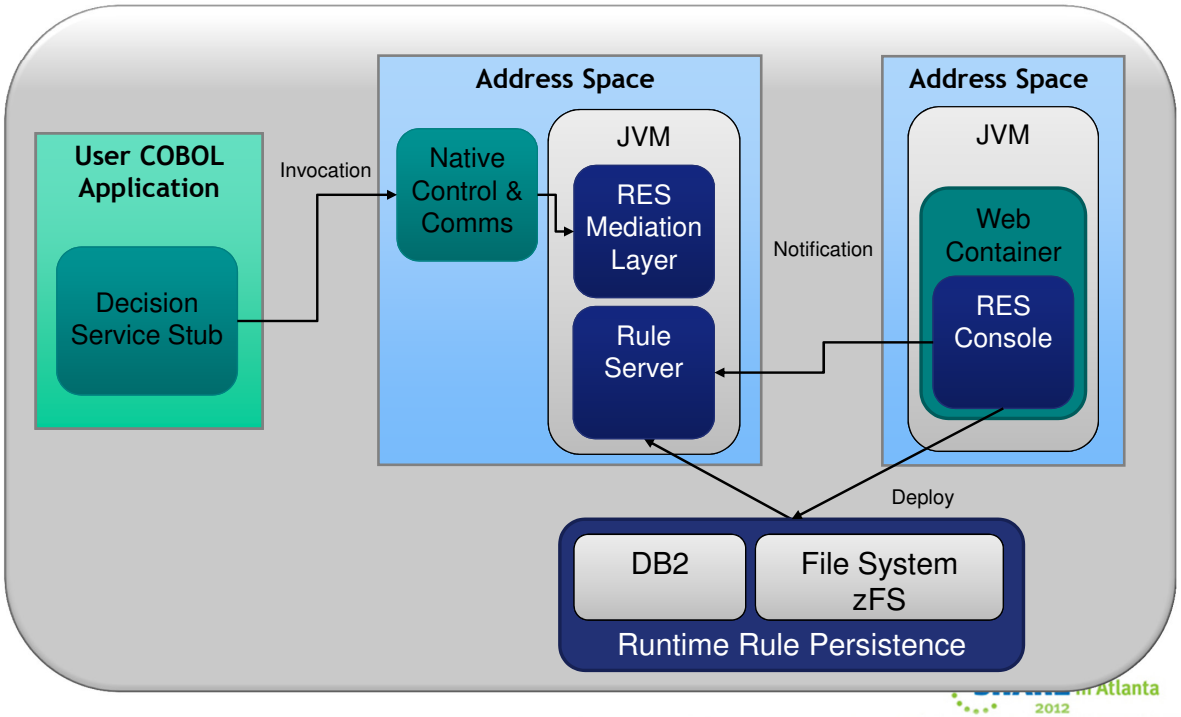
Rule invocation options for CICS



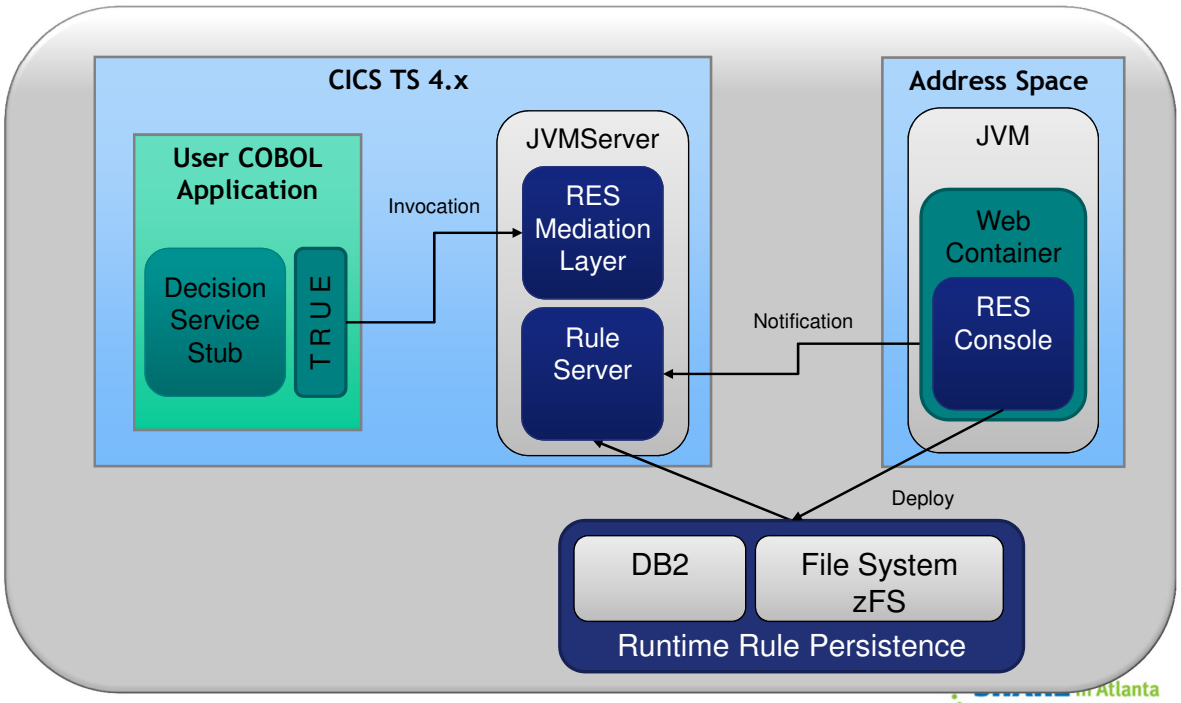
Rule Execution Server for WAS on z/OS



zRule Execution Server for z/OS – Stand Alone



zRule Execution Server for z/OS – CICS TS 4.x



zRES : Business Rule Execution

Runtime enablement

- Write the Decision Service invocation in COBOL
- COBOL code remains independent of the Business Rules lifecycle on a stable decision service signature

```
01 HBRA-CONN-AREA.
     10 HBRA-CONN-EYE              PIC X(4)  VALUE 'HBRC'.
     10 HBRA-CONN-LENTH            PIC S9(8) COMP.
     10 HBRA-CONN-VERSION          PIC S9(8) COMP VALUE +1.
     10 HBRA-CONN-RESERVED01       PIC X(8).
     10 HBRA-CONN-FLAGS            PIC S9(8) COMP VALUE +1.
     10 HBRA-CONN-INSTANCE         PIC X(24).
     10 HBRA-CONN-RETURN-CODES.
       15 HBRA-CONN-COMPLETION-CODE  PIC S9(8) COMP.
       15 HBRA-CONN-REASON-CODE      PIC S9(8) COMP.
     10 HBRA-CONN-RULEAPP-NAME      PIC X(256).
     10 HBRA-RA-PARMS  OCCURS 32.
       15 HBRA-RA-PARAMETER-NAME     PIC X(48).
       15 HBRA-RA-DATA-ADDRESS       USAGE POINTER.
       15 HBRA-RA-DATA-LENGTH        PIC 9(8) BINARY.
     10 HBRA-RESPONSE-AREA.
       15 HBRA-RESPONSE-MESSAGE      PIC X(256).
     10 HBRA-RESERVED.
       15 HBRA-RESERVED02            PIC X(128).
```

Decision Service Hot Deployment

- New decision version ‘instantly’ available
- From Rule Designer & Decision Center
- Versioned service made ready for execution from COBOL
- Let running executions complete

```
SELLERCP  SELLER01.cbl  SELLER02.cbl  HBRACNWS  HBRC
 Line 33      Column 27     Insert
----+-*A-1-B--+----2----+----3----+----4----+----5----+----6----+---
      PROCEDURE DIVISION.
     * Read input
     *
          EXEC CICS READ FILE(SCENARIO)
               INTO(SELLER-Data)
               RIDFLD(WS-SCENARIO-RID)
               RESP(WS-RESP)
               END-EXEC.
          IF WS-RESP NOT = DFHRESP(NORMAL) THEN
             EXEC CICS RETURN END-EXEC.
     PROCESS-DATA.
          MOVE "/Seller/SellerEvaluate" TO
                        HBRA-CONN-RULEAPP-NAME
          MOVE LENGTH OF SELLER-Data to HBRA-RA-DATA-LENGTH(1)
          MOVE "sellerData" to  HBRA-RA-PARAMETER-NAME(1)
          SET  HBRA-RA-DATA-ADDRESS(1) to address of SELLER-Data
     * Invoke the rule
          call 'HBRRULE' using
                        HBRA-CONN-AREA.
     * Check return code
          IF HBRA-CONN-COMPLETION-CODE = HBR-CC-OK THEN
               DISPLAY 'Successful call'
```

zRES : New programming API

* Connect to Execution Region
call 'HBRCONN'
using HBRA-CONN-AREA

* Populate Header with parameter data

* Connect to Execution Server
call 'HBRRULE'
using HBRA-CONN-AREA
IF HBRA-CONN-COMPLETION-CODE = HBR-CC-OK
THEN
. . .

* Disconnect from Execution Region
call 'HBRDISC'
using HBRA-CONN-AREA

```
01 HBRA-CONN-AREA.
  10 HBRA-CONN-EYE              PIC X(4)  VALUE 'HBRC'.
  10 HBRA-CONN-LENTH            PIC S9(8) COMP.
  10 HBRA-CONN-VERSION          PIC S9(8) COMP  VALUE +2.
  10 HBRA-CONN-RETURN-CODES.
    15 HBRA-CONN-COMPLETION-CODE PIC S9(8) COMP.
    15 HBRA-CONN-REASON-CODE    PIC S9(8) COMP.
  10 HBRA-CONN-FLAGS            PIC S9(8) COMP  VALUE +1.
  10 HBRA-CONN-INSTANCE         PIC X(24).
  10 HBRA-CONN-RULE-COUNT       PIC S9(8) COMP.
  10 HBRA-CONN-RULE-MAJOR-VERSION PIC S9(8) COMP.
  10 HBRA-CONN-RULE-MINOR-VERSION PIC S9(8) COMP.
  10 HBRA-CONN-RULEAPP-NAME     PIC X(256).
  10 HBRA-RESPONSE-AREA.
    15 HBRA-RESPONSE-MESSAGE    PIC X(512).
  10 HBRA-RA-PARMETERS.
    15 HBRA-RA-PARMS  OCCURS 32.
      20 HBRA-RA-PARAMETER-NAME   PIC X(48).
      20 HBRA-RA-DATA-ADDRESS     USAGE POINTER.
      20 HBRA-RA-DATA-LENGTH      PIC 9(8) BINARY.
  10 HBRA-RESERVED.
    15 HBRA-RESERVED02          PIC X(12).
    15 HBRA-RESERVED03          PIC X(64).
    15 HBRA-RESERVED04          PIC X(64).
    15 HBRA-RESERVED05          PIC X(128).
    15 HBRA-RESERVED06          PIC X(128).
```

SHARE in Atlanta 2012

zRES : New programming API within program

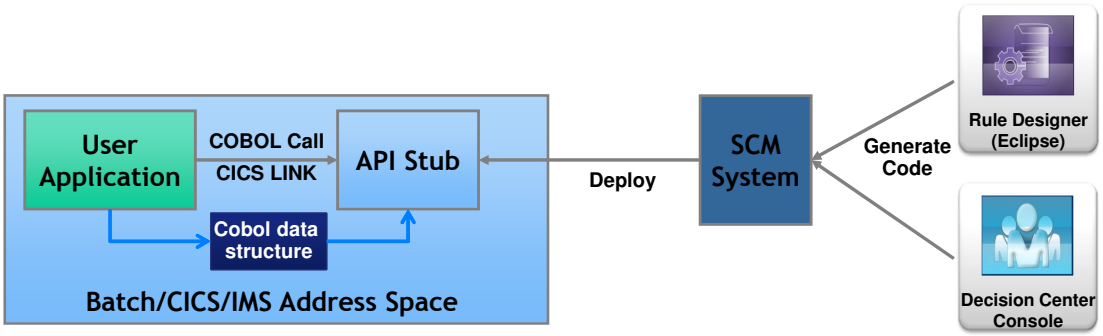
```
Line 33      Column 12    Insert   139 changes
----+-*A-1-B--+----2----+----3----+----4----+----5----+----6----+----7--
      IDENTIFICATION DIVISION.
      PROGRAM-ID. HBRMINC.
      ...

      WORKING-STORAGE SECTION.
      ...
      * Parameter Data
      COPY MINILOAN.
      * Return Code definitions
      COPY HBRC.
      * HBR Header structure
      COPY HBRWS.
      ...

      PROCEDURE DIVISION.

      * Connect to zRES
           call 'HBRCONN' using HBRA-CONN-AREA

           IF HBRA-CONN-COMPLETION-CODE NOT EQUAL HBR-CC-OK THEN
               perform onFailedCall
           END-IF

      * Initialize call parameters
           MOVE ALL SPACES TO Borrower Loan
           MOVE ALL LOW-VALUES TO HBRA-RA-PARMETERS
           MOVE "/zRulesMiniLoanDemoRuleApp/zRulesMiniLoanDemo" TO
                        HBRA-CONN-RULEAPP-NAME

           move LENGTH OF Borrower to HBRA-RA-DATA-LENGTH(1)
           move "borrower"         to  HBRA-RA-PARAMETER-NAME(1)
           set HBRA-RA-DATA-ADDRESS(1) to address of Borrower

           move LENGTH OF Loan         to HBRA-RA-DATA-LENGTH(2)
           multiply length of messages by 10 giving WS-maxMessageLen
           add WS-maxMessageLen to HBRA-RA-DATA-LENGTH(2)
           move "loan"                 to HBRA-RA-PARAMETER-NAME(2)
           set HBRA-RA-DATA-ADDRESS(2) to address of Loan

           move 'F' to approved
```

```
Line 81      Column 12    Insert   144 changes
----+-*A-1-B--+----2----+----3----+----4----+----5----+----6----+----7--
      * Read scenario data
           MOVE ALL LOW-VALUES TO WS-IN
           UNSTRING SCENARIO-DATA DELIMITED BY ','
                    INTO
              WS-IN-data(1) WS-IN-data(2) WS-IN-data(3)
              WS-IN-data(4) WS-IN-data(5) WS-IN-data(6)
      * Populate the borrower from scenario data
           move WS-IN-data(1) to name
           Compute creditscore       = Function numval(WS-IN-data(2))
           Compute yearlyIncome      = Function numval(WS-IN-data(3))
      * Populate the loan from scenario data
           Compute amount            = Function numval(WS-IN-data(4))
           Compute yearlyRepayment   = Function numval(WS-IN-data(5))
           Compute yearlyInterestRate = Function numval(WS-IN-data(6))

      * Invoke the rule
           call 'HBRRULE' using HBRA-CONN-AREA

           EXEC CICS SUSPEND END-EXEC

      * Display rule responses, or error code, as appropriate
           if HBRA-CONN-COMPLETION-CODE = HBR-CC-OK then
               display 'HBR CALL Sucessful'

      * Disconnect
           call 'HBRDISC' using HBRA-CONN-AREA

           IF HBRA-CONN-COMPLETION-CODE NOT EQUAL HBR-CC-OK THEN
               perform onFailedCall
           END-IF

           perform prtDemoText

           EXEC CICS RETURN END-EXEC
           GOBACK.
```

2012

COBOL Generation Rules

- COBOL module generated to contain the implementation of the rules
- Simple integration with existing COBOL applications
- Core benefits of Decision Management
- Sub-set of the Rules Language enabled
- Integrates with standard code management processes

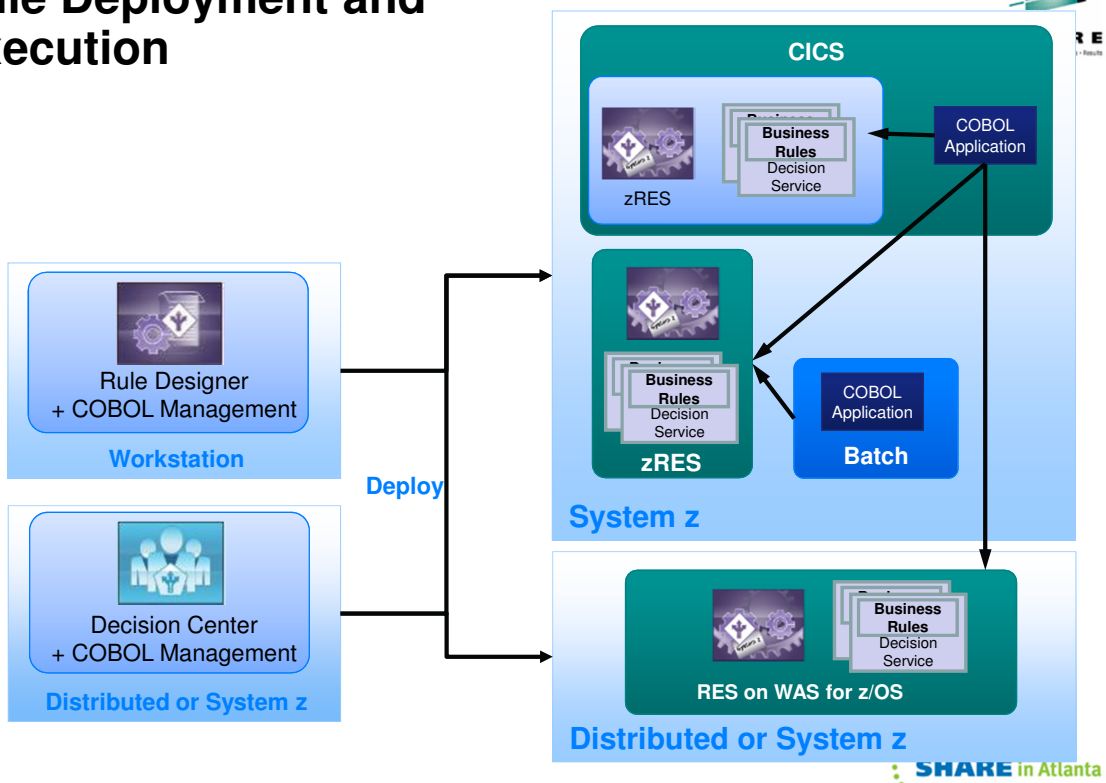


Decision Server Options Summary

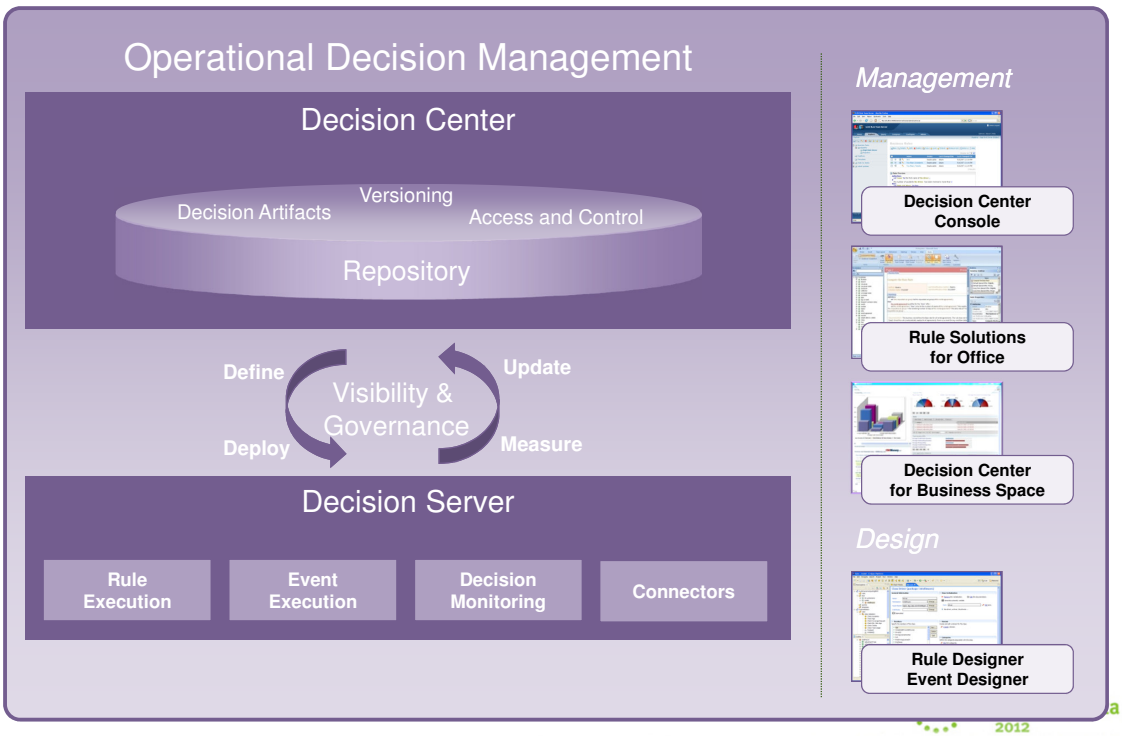
	zRule Execution Server deployed in WebSphere Application Server for z/OS	zRule Execution Server deployed as a Standalone environment	zRule Execution Server deployed in CICS TS v4.x JVMServer environment	COBOL Generation Rules
OTTB integration with COBOL applications		✓	✓	✓
Full support for all rule authoring constructs	✓	✓	✓	
Business Event Execution Support	✓			
Hot deployment support for new decision versions	✓	✓	✓	
Integration with Decision Center business tooling	✓	✓	✓	✓
Testing and simulation support	✓	✓*	✓*	
Decision Warehousing rule auditing support	✓			
Easy sharing of rules with distributed deployments	✓	✓	✓	
Local execution support for CICS TS v4.x			✓	✓
Full HA & transactional support	✓		✓	

*Requires Rule Execution Server deployed in JEE environment for actual decision execution

Rule Deployment and Execution



WODM: Components

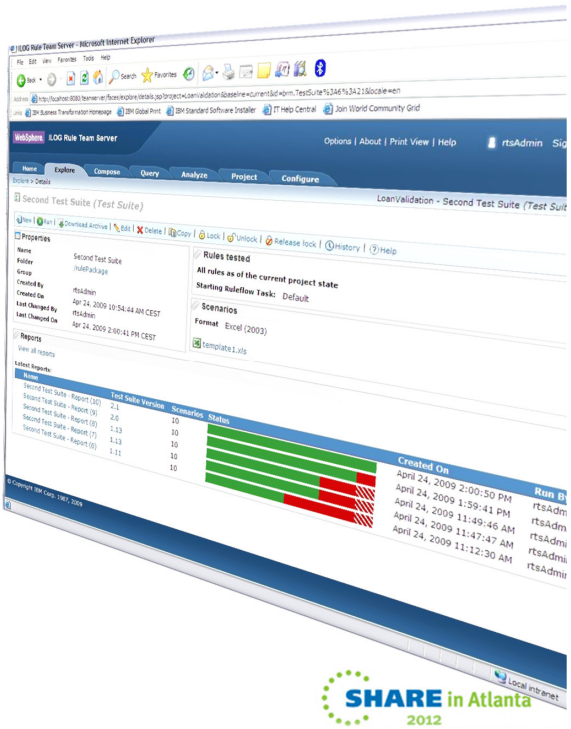


Decision Center: Web Based Console for Decision Maintenance

- Access rule artifacts concurrently without conflict or delay
- Represent complex policies using rule overrides and hierarchies
- Take control of very large rulebases with Smart Views, easy search and reporting
- Get automatic notification of rule conflicts, redundancies
- See where rules are used across projects using queries
- Hot-deploy rule changes in minutes
- Secure, integrated with enterprise security facility including single sign-on

Testing and Simulation

- The feature formally know as Decision Validation Services
- Functionality Overview
  - Out-of-the-box ruleset testing in Rule Team Server
  - Business impact simulation in Rule Team Server
  - Scenario configuration and customization in Rule Studio
  - Audit - Decision Warehouse in Rule Execution Server



Runtime Pre-reqs

- z/OS 1.11, 1.12, 1.13
- WebSphere Application Server for z/OS 7.0
- DB2 for z/OS 9.1, 10.1
- Java Runtime Environment 6.0.1
- Enterprise COBOL for z/OS 3.4 +
- CICS TS 3.2 (zRES stand alone mode and code generation only)
- CICS TS 4.1(PTF Required for Java 6.0.1)
- CICS TS 4.2
- IMS 11, 12 (code generation only)

WODM for System z enables smart organizations to capitalize on modernization and innovation

- *Faster Time to Market:*
  New products or changes implemented in days vs. months
  - Ability to react to changes in a fast pace competitive marketplace
- *Lower cost of maintenance*
  - Leading to improvement operational efficiency and total cost of ownership
- *Better visibility and control*
  - Leading to improvement to better corporate governance
- *Ability to implement the best decisions for the best changes and for the best outcome*
  - Business users can see, understand and have the appropriate tools to support the needs of the organization by maximizing their IT investment
- *Ability to manage and document business decisions executed in System z applications*
  - Ability to generate native COBOL from rules within the JRules BRMS
  - Authoring rules for COBOL in business terminology
  - Ability to share business rules with Java and other COBOL applications