

A decorative graphic in the top left corner consists of several overlapping circles of various colors (yellow, orange, red, purple, blue) that are divided into segments, resembling stylized sunbursts or data points.

## **Operational Decision Manager for z/OS: Where applications are transformed**

Speaker Name and Title



## Abstract


Are you looking for more agility to adapt your application to changing business conditions? Are you being asked to make your business policies more transparent? Would you like to make your mainframe applications more relevant to your organization without giving up control?

- Learn how adoption of IBM Operational Decision Manager can address these questions while enabling flexibility throughout the entire enterprise. During this session you will learn how:
  - Business policy rules are enabling automation of frequently occurring decisions in your z/OS applications
  - Application owners can provide better visibility of the business policy embedded in their systems
  - Business policies can be changed quickly and accurately as the marketplace changes
  - Business policies can be shared and reused across your entire organization and channels

# Business Decisions are Everywhere

We need to add an eligibility check to meet the requirements of the new regulation.

Let's create a special promotion for our best customers.



Commissions / Royalties

Underwriting

Tax calculation

Up-sell/Cross-sell offer

Compliance Screening

Billing

Fraud assessment

Documentation Requirements

Configuration

Accounting Disposition

Eligibility

Pricing

Product Selection

Benefit calculation

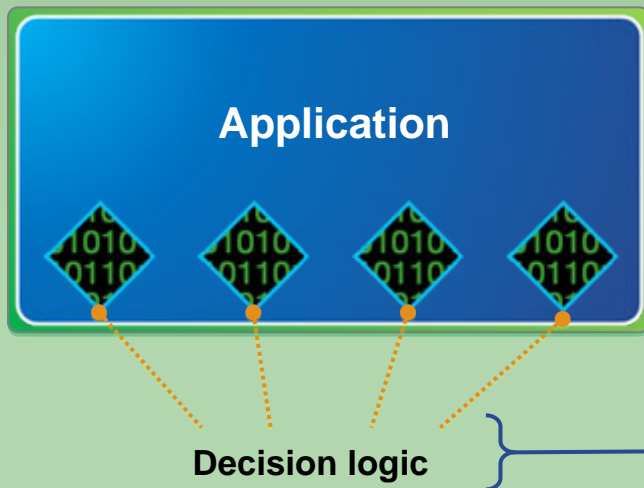
Can we automate approvals for this type of order?

## And They Change Frequently

# Externalize Decisions from Applications into Rules

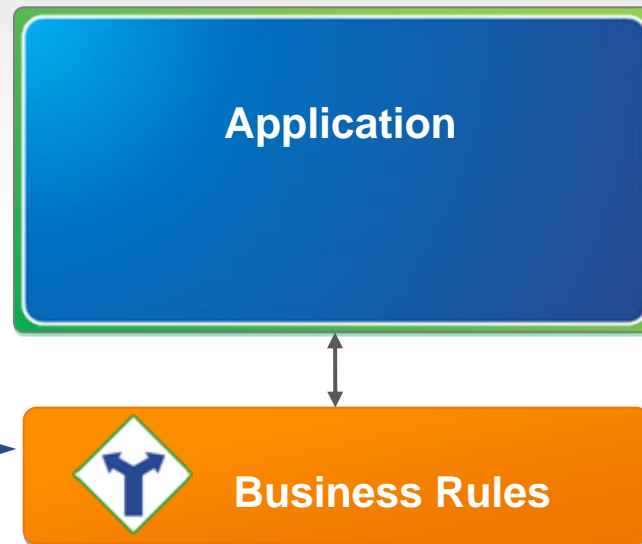
*Manage decision logic independently from applications*

*Without Decision Management*



- Rules written in software code cannot be read by business people
- Hard coded rules are difficult to change
- Rules intertwined within applications cannot be reused by other systems

*With Decision Management*

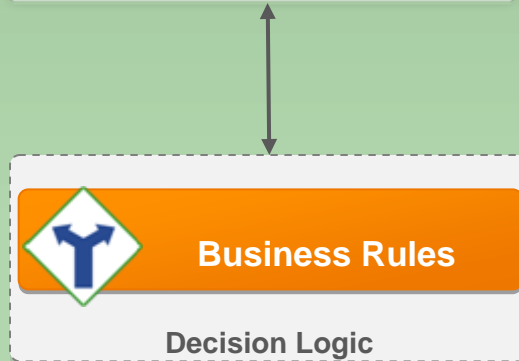


- Natural language rules can be easily read
- Externalized rules are easy to change
- Centralized rules enable reuse and consistency

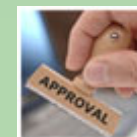
# Manage Decisions at the Speed of Business

*Major system updates are not required for decision logic changes*

- Customer searches for a price
- Insured members submit claims
- Brokers make trades



Determine pricing & bundling



Approve filed claim



Detect fraudulent trades

## Why Decisions Change?

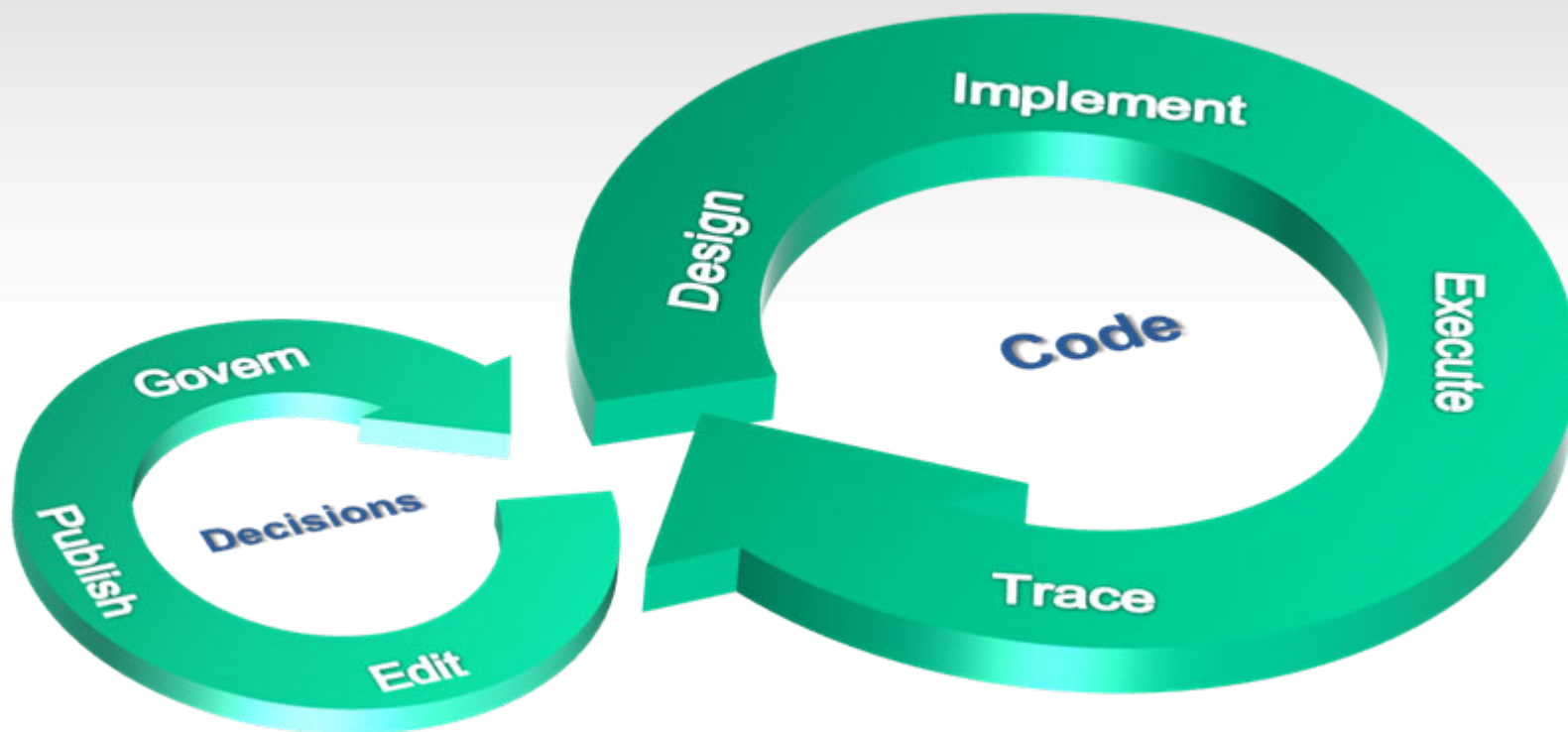
- Grow customer base
- Increase customer satisfaction
- Comply with regulatory changes



### Business Rule Updates

- New pricing promotion (*monthly*)
- Updated claims policies (*quarterly*)
- Tightened regulations on trading (*annually*)

# Redefined Application Change Cycle



*Business - IT*

Decisions / Policies

Days / Weeks

*Developer*

Functions / Tasks / Flow

Weeks / Months

# Separate Application and Rule Lifecycles

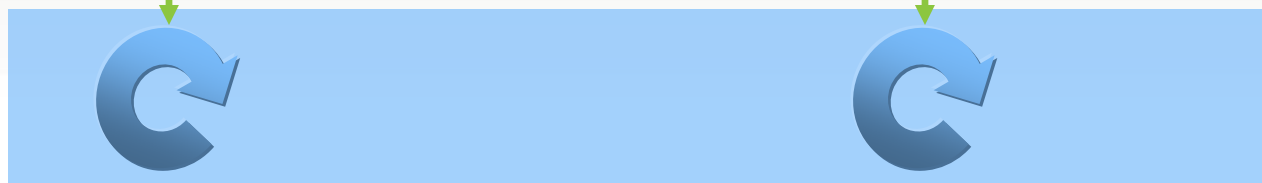
Functions / Tasks / Flow  
changes in Weeks / Months



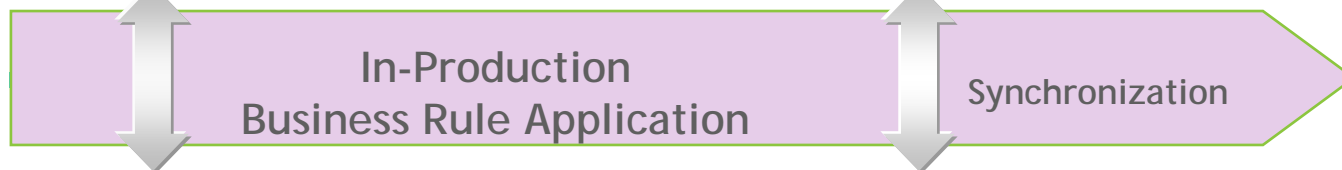
Application  
Developer

Functional  
Requirements

Functional  
Enhancements /  
Platform Upgrades



Application  
Development



Business Rule  
Management



Business  
policies

Business policy  
and rule  
changes

Business policy  
and rule  
changes

Business policy  
and rule  
changes

Business policy  
and rule  
changes



Business & IT

Decisions / Policies  
Changes in Days / Weeks

# What does ODM bring to z/OS?

## *Challenges for Most z Clients*

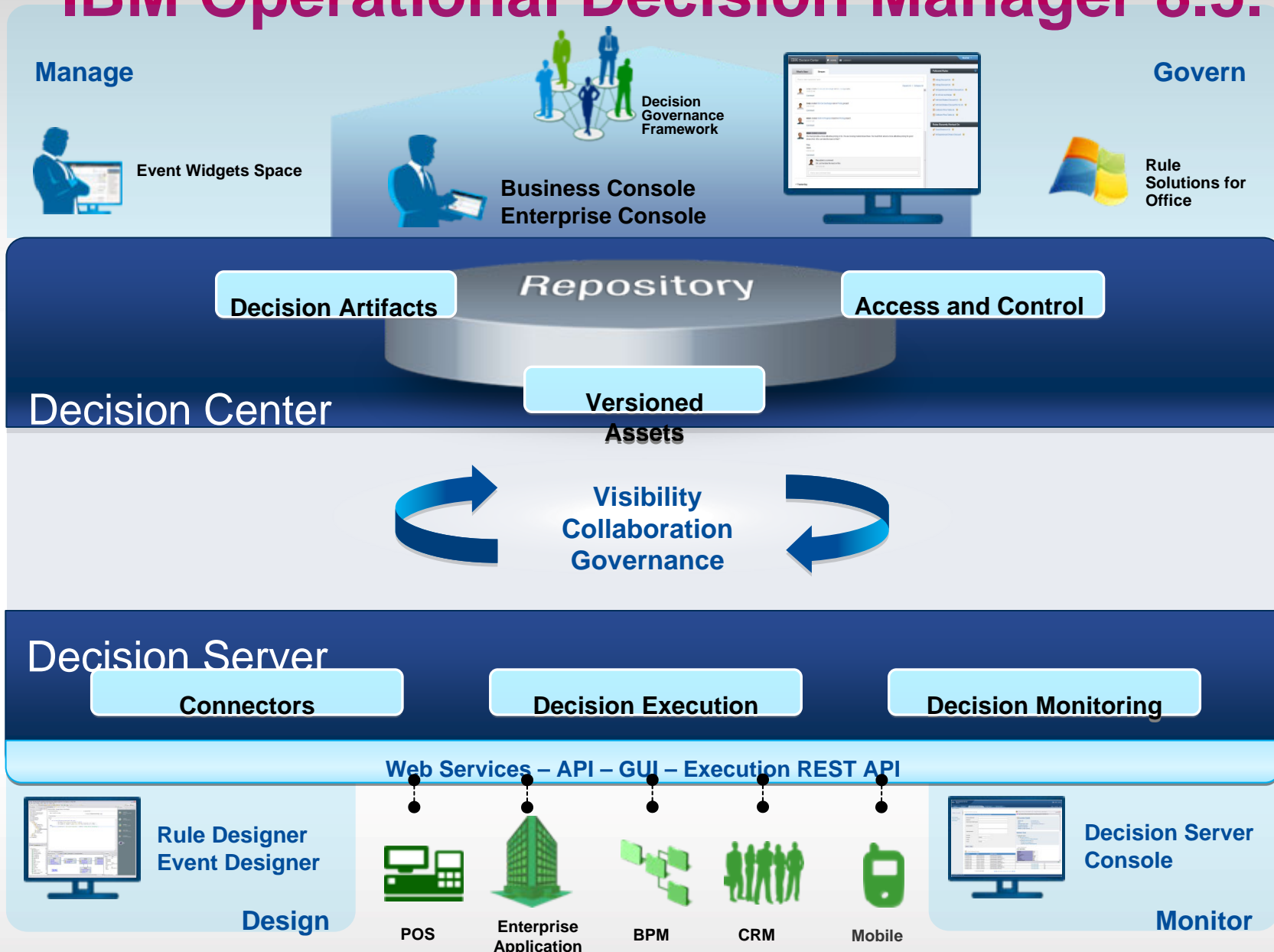
1. Consolidation, Isolation, Extension or Extinction of application portfolio
2. Be able to react to increasing variety and volume of change requests
3. Sharing business rules across platforms & channels
4. Ensuring seamless business experience in migration/ application evolution

## *Benefits of the ODM Approach*

- ✓ **Cost savings**
  - Shorter change cycle, without increased business risk
  - Rule engine processing is zAAP eligible
- ✓ **Improved agility**
  - Improved Time to Market
  - Manage business decisions in natural language
  - Decouple development and business decision change lifecycles
- ✓ **Single version of the Truth**
  - Consolidated and shared expression of business policy
  - Maintainable with a Center of Competency model
- ✓ **Incremental Adoption**
  - Deploy decision methodology one decision at a time
  - Focus on decisions that need to change often & quickly
  - Expand adoption of “market validated” decisions



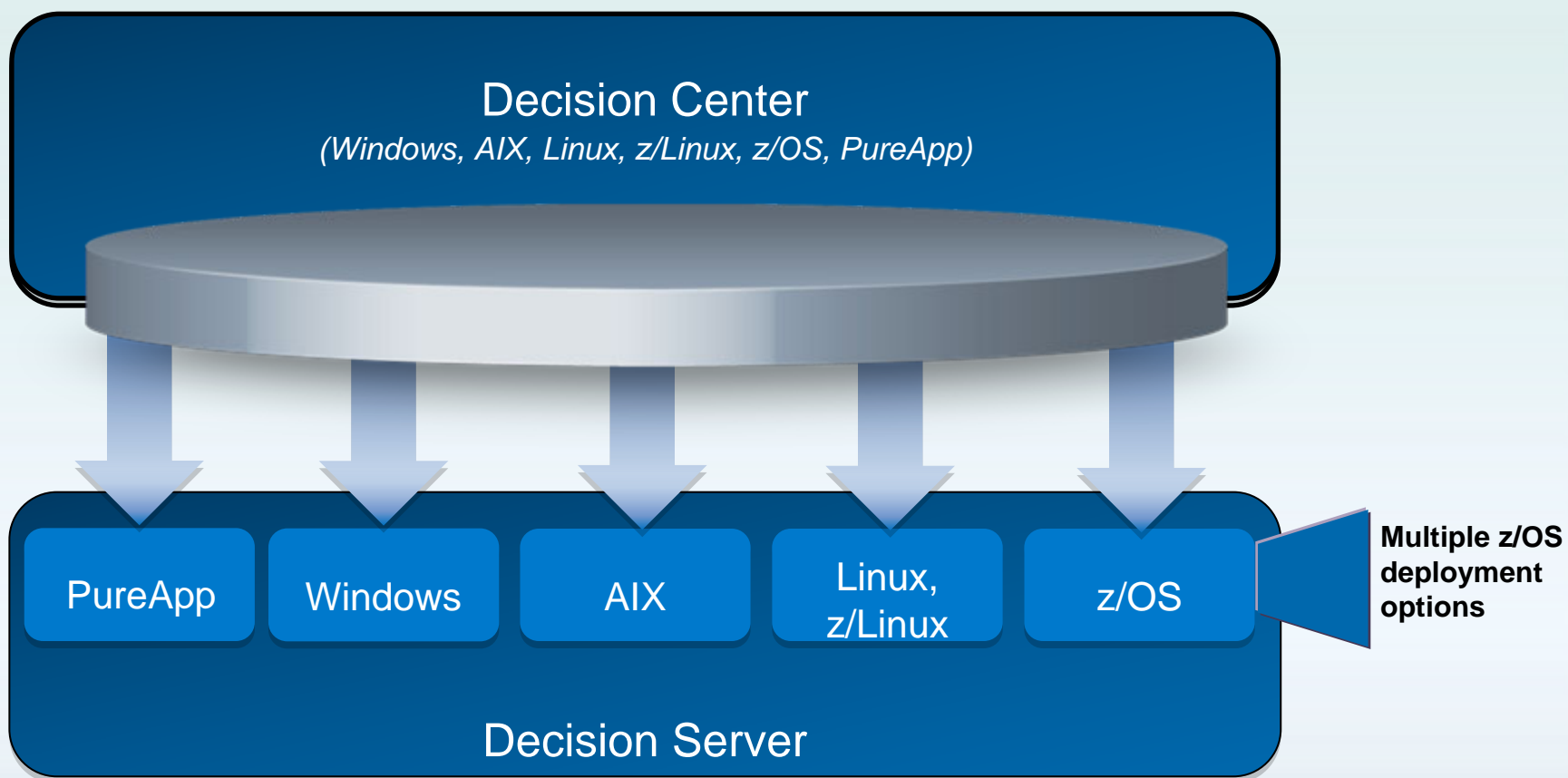
# IBM Operational Decision Manager 8.5.1



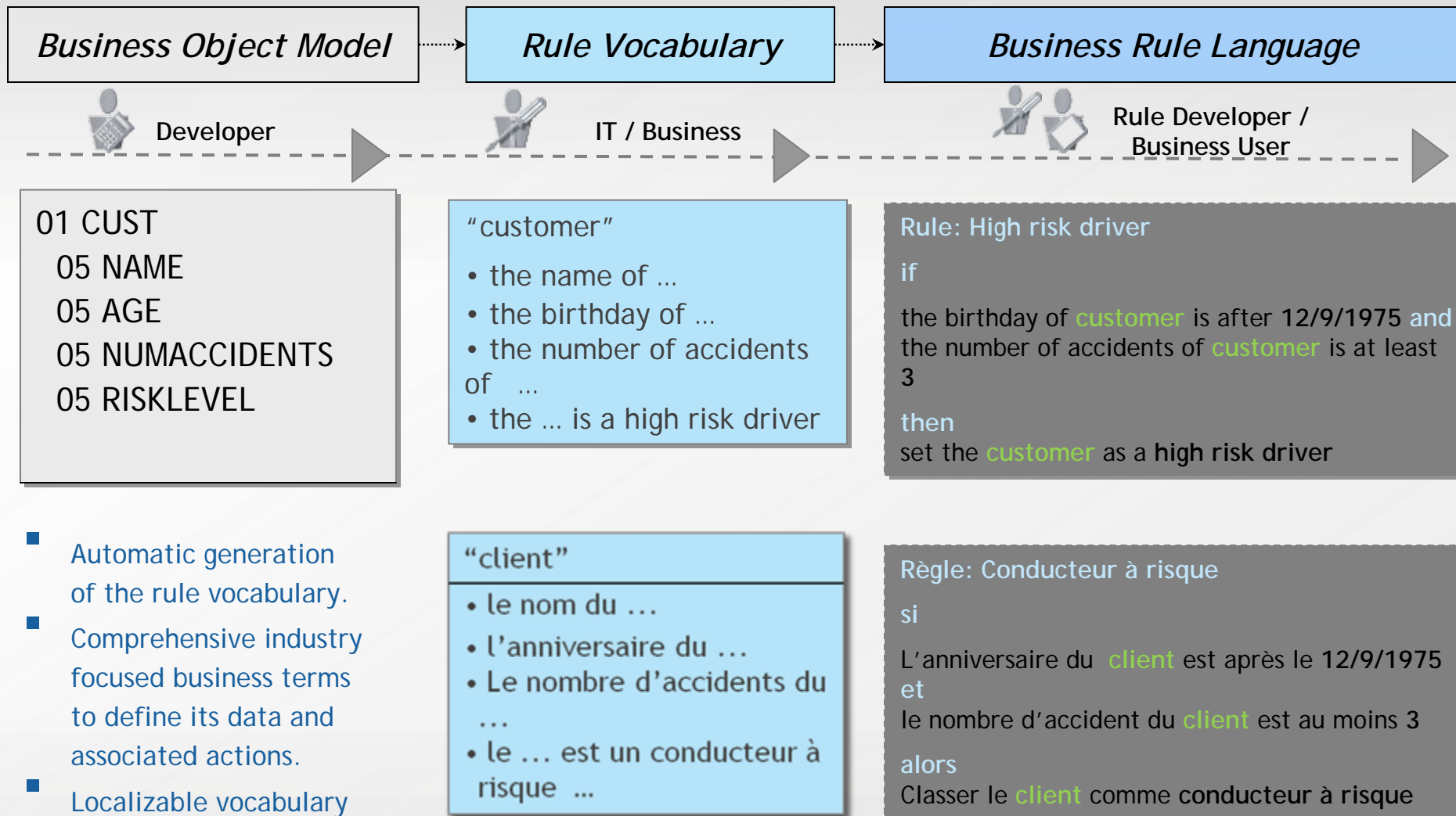
# IBM Operational Decision Manager

*Runtime support*

Leverage a wide range of platforms to meet the varying needs of enterprise architectures



# ODM Brings the IT and Business World together



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

# Rule and Event Designer

*Comprehensive technical environment*

## Design

- Rules and events business objects
- Vocabularies
- Projects structure and organization
- Rule Templates

## Test

- Step by step debugging
- Value inspectors
- Test and simulation suites
- Completeness reports

## Configure

- Business environment (Decision Center)

## Deploy

- Rules and events projects to their respective execution environments

The screenshot displays the Rule and Event Designer interface. On the left, a 'Rule Explorer' tree shows a project structure with folders like 'AutoInsuranceQuotingBOM', 'Customer Acquisition Discount', and 'Eligibility'. The main workspace shows a spreadsheet with columns for 'coverage item name', 'coverage type', 'deductible', 'max limit', and 'min limit'. A dropdown menu is open for 'coverage item 1', listing options like 'COLLISION', 'COMPREHENSIVE', 'LIABILITY', 'MECHANICAL\_BREAK', and 'THEFT\_AND\_FIRE'. In the foreground, an 'Import XOM' dialog box is open, with 'COBOL execution' selected. To the right, a 'Rule Completeness Report' is displayed, detailing gaps found in the rules and providing a missing rule definition for validation.

**Import XOM**

Import Execution Environment

- Java execution
- Dynamic execution
- COBOL execution
- PL/I execution

**Rule Completeness Report**

Report for Project: 'loanvalidation-rules' - Baseline: 'Current' generated on Jan 28, 2010 2:21:15 PM

Gaps found in the selected rules. Here are the rules you could create in order to fill them

Note: Not all missing rules may be relevant for your project. In some cases, although there are situations not handled by rules, the cases may not apply to your application

The following rule fills a gap which occurs in specific ruleflow tasks:

In order to close the gap, each rule must be included in the ruleflow task(s) listed. To do this, place the rule in a folder referenced by the ruleflow task. Some ruleflow tasks must be updated in Rule Studio to ensure the correct rules and folders are included

**Missing rule 1**

The following rule fills a gap which occurs in the ruleflow task 'validator' in ruleflow 'loanvalidation'

```

if
  the amount of 'the loan' is less than 1000000
  and the age of 'the borrower' is at least 0
  and the age of 'the borrower' is at most 100
  and the last name of 'the borrower' is not null
  and the length of the last name of 'the borrower' is not 0
  and the area number of the SSN of 'the borrower' is not one of { "000", "444" }
  and the length of the SSN of 'the borrower' is 9
  and the length of the SSN of 'the borrower' contains only digits
  and the length of the group code of the SSN of 'the borrower' is 1
  and the group code of the SSN of 'the borrower' contains only digits
  and the length of the serial number of the SSN of 'the borrower' is 4
  and the serial number of the SSN of 'the borrower' contains only digits
  and the zip code of the address of 'the borrower' is not null
  and the length of the zip code of the address of 'the borrower' is 5
then
  ...
  
```

OK Cancel

# Decision Tables

	Grade	Amount of loan		Insurance required	Insurance rate
		Min	Max		
0	A	< 100,000		false	⊘
1		100,000	300,000	true	0.001
2		300,000	600,000	true	0.003
3		≥ 600,000		true	0.005
4	B	< 100,000		false	⊘
5		100,000	300,001	true	0.0025
6		300,000	600,000	true	0.005
7		≥ 600,000		true	0.0075
8	C	< 100,000		true	0.0035
9		100,000	300,000	true	0.006
10		300,000	600,000	true	0.0085
11		≥ 600,000		true	0.0145
12	Otherwise			true	0.022

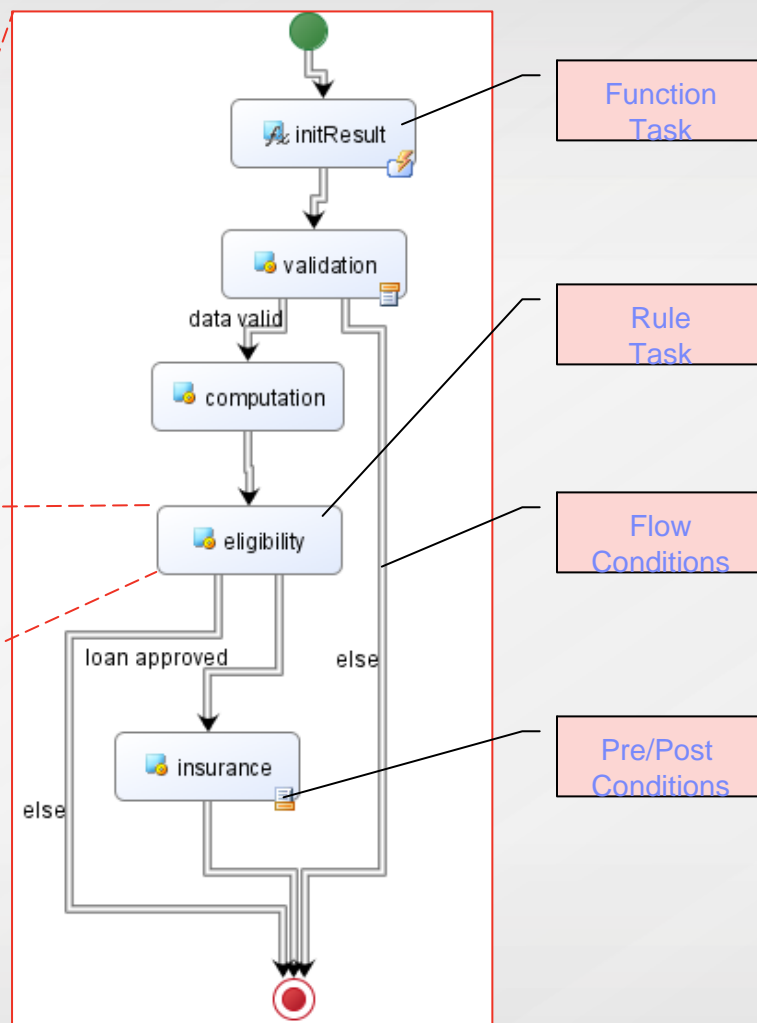
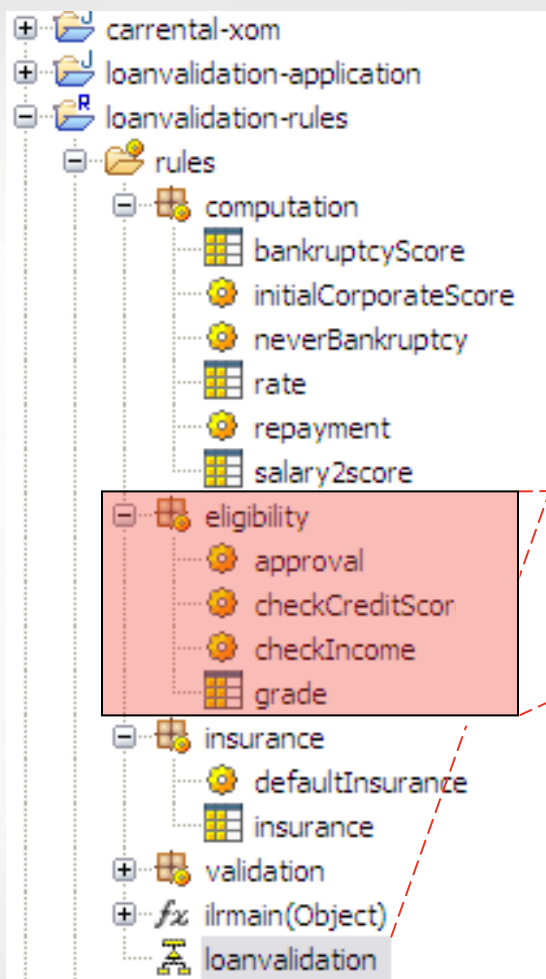
Built-in Gap/Overlap checking

Actions

Automatic Rule generation

*if*  
**all of the following conditions are true :**  
 - the loan grade in 'the loan report' is "C"  
 - the amount of 'the loan' is at least 600000 ,  
*then*  
 set insurance required in 'the loan report' to **true** ;  
 set the insurance rate in 'the loan report' to **0.0145** ;

# Rule Authoring: Visual Decision Flow



# Decision Center - Enterprise Console

Web-based Event and Rule 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 potential rule conflicts, redundancies
- See where rules are used across projects using queries
- Hot-deploy rule and event changes in minutes
- Secure, integrated with enterprise security facility including single sign-on
- Multiple release management supporting diff and merge

The screenshot shows the IBM Decision Center interface for configuring a rule. The breadcrumb path is: Business Rules > Pricing > Coverage Pricing > Base Premium > Collision. The main area displays a table for the 'Collision Price Table' rule, which is currently 'Deployable'. Below the table is a 'Decision Table Preview' section.

Vehicle Value	Lower	Upper	Deductible	Base Premium
1			\$250	\$ 120
2			\$500	\$ 110
3	\$ 0	\$ 5 500	\$1000	\$ 100
4			\$250	\$ 130
5			\$500	\$ 120
6	\$ 5 500	\$ 11 000	\$1000	\$ 110
7			\$250	\$ 150
8	\$ 11 000	\$ 20 000	\$500	\$ 145
9			\$1000	\$ 140
10			\$250	\$ 160
11	\$ 20 000	\$ 35 000	\$500	\$ 150
12			\$1000	\$ 140
13			\$250	\$ 170
14	\$ 35 000	\$ 55 000	\$500	\$ 160
15			\$1000	\$ 150
16			\$250	\$ 190
17	\$ 55 000	\$ 100 000	\$500	\$ 180
18			\$1000	\$ 165

The screenshot shows the IBM Decision Center interface displaying simulation results and key performance indicators (KPIs). The breadcrumb path is: Explore > Details > Run > Report > Compare with... > Compare Reports. The main area is titled 'Global eligibility results' and shows a comparison between 'Simulation as of this run' and 'Last year history - all rules - Report'.

**Simulation as of this run** (May 20, 2010 4:24:21 PM CEST):  
 - Run By: rtsAdmin  
 - Rules tested: All rules as of the baseline Current  
 - Starting Ruleflow Task: Default  
 - Server: Insdemo  
 - Summary: Number of scenarios: 400, Success Rate: 100%

**Last year history - all rules - Report** (May 5, 2010 5:57:18 PM CEST):  
 - Run By: Adam  
 - Rules tested: All rules as of the baseline Current  
 - Starting Ruleflow Task: Default  
 - Server: Insdemo  
 - Summary: Number of scenarios: 400, Success Rate: 100%

**Key Performance Indicators**  
 Insurance KPI: Global eligibility results  
 - Accepted: 77.0%, Rejected: 23.0% (Current Run)  
 - Accepted: 82.0%, Rejected: 17.0% (Last Year History)

**Eligibility results by states**  
 - CA: 81.0% Accepted, 19.0% Rejected (Current Run)  
 - NJ: 79.0% Accepted, 21.0% Rejected (Current Run)  
 - MA: 77.0% Accepted, 23.0% Rejected (Current Run)

# Decision Center – Business Console

*Social Media Style Collaboration*

- Built-in Decision Governance Framework methodology
- Maintain awareness across the team
- Ensure automatic notifications of changes
- Ensure team collaboration

The screenshot shows the 'What's New' stream in the IBM Decision Center Business Console. It features a 'Stream' tab and three main sections: 'New Business Rules', 'New Updates on Followed Rules', and 'New Comments in Activity Stream'. The 'New Business Rules' section lists items like 'An oil car surcharge' and 'Application Promotion for NJ'. The 'New Updates on Followed Rules' section lists updates for 'Collision Price Table NY', 'BUY Surcharge NJ', 'Arbitrage Discount NJ', 'Anti-lock Brakes Discount for NJ', 'Liability Price Table DE', 'Comprehensive Price Table VA', and 'Collision Price Table NY'. The 'New Comments in Activity Stream' section shows two comments from users Rachel and Adam regarding pricing adjustments for collision pricing discounts.

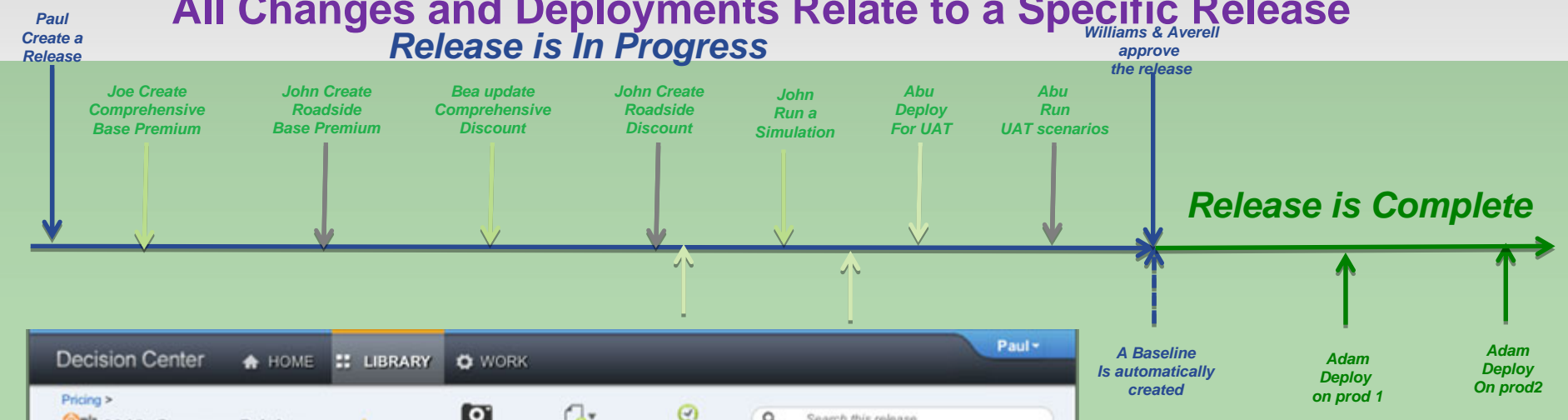
The screenshot shows a 'Comprehensive Price Table' comparison in the IBM Decision Center Business Console. It displays two versions of a pricing policy: 'version 3.0' (Created by Paul on Apr 12, 2013) and 'version 10.0 (current)' (Created by Deb on Apr 10, 2013). The table compares 'Vehicle Value', 'Deductible', and 'Base Premium' for various vehicle value ranges. The current version shows changes in the Base Premium column for several vehicle value ranges.

Vehicle Value	Deductible	Base Premium
1   \$ 0 - \$ 5,000	\$250	\$43
2   \$ 0 - \$ 5,000	\$500	\$40
3   \$ 0 - \$ 5,000	\$1000	\$28
4   5,000 - \$ 10,000	\$250	\$48
5   5,000 - \$ 10,000	\$500	\$42
6   5,000 - \$ 10,000	\$1000	\$33
7   10,000 - \$ 20,000	\$250	\$52
8   10,000 - \$ 20,000	\$500	\$45



# Decision Governance Framework

All Changes and Deployments Relate to a Specific Release  
*Release is In Progress*



Release objectives are documented

Release has

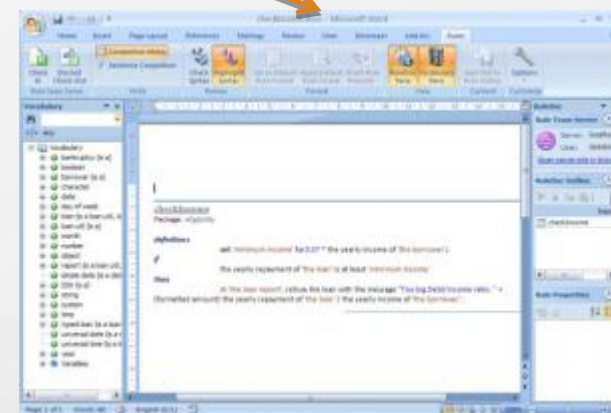
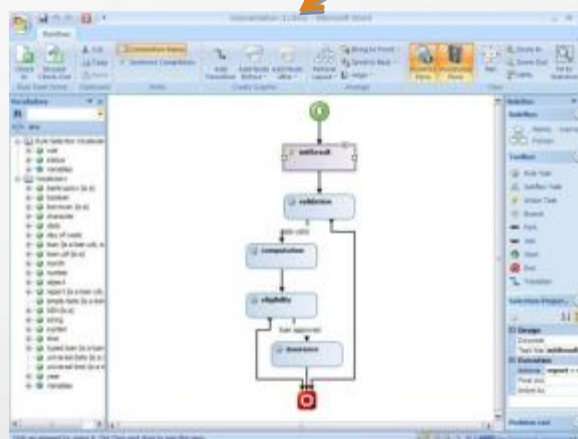
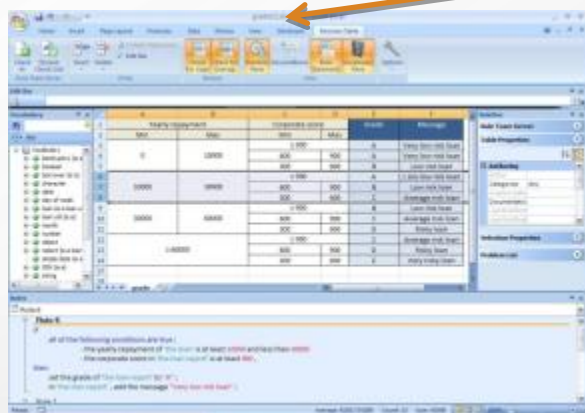
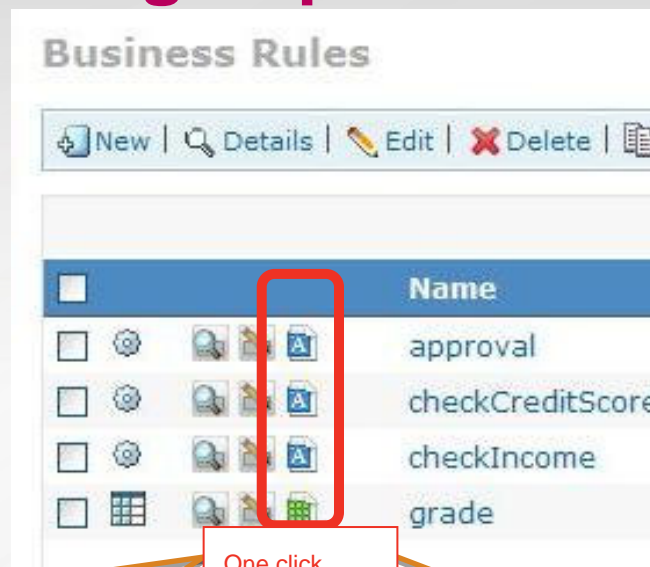
- A due date
- A status
- An owner

To complete, a Release must be reviewed and approved

Rule management activities occur in the context of a release

# Extended Rule Authoring Experience

- Direct access to MS editing
- Ruleflow editing thru Word
- Automatic synchronization
- Automatic lock of edited elements



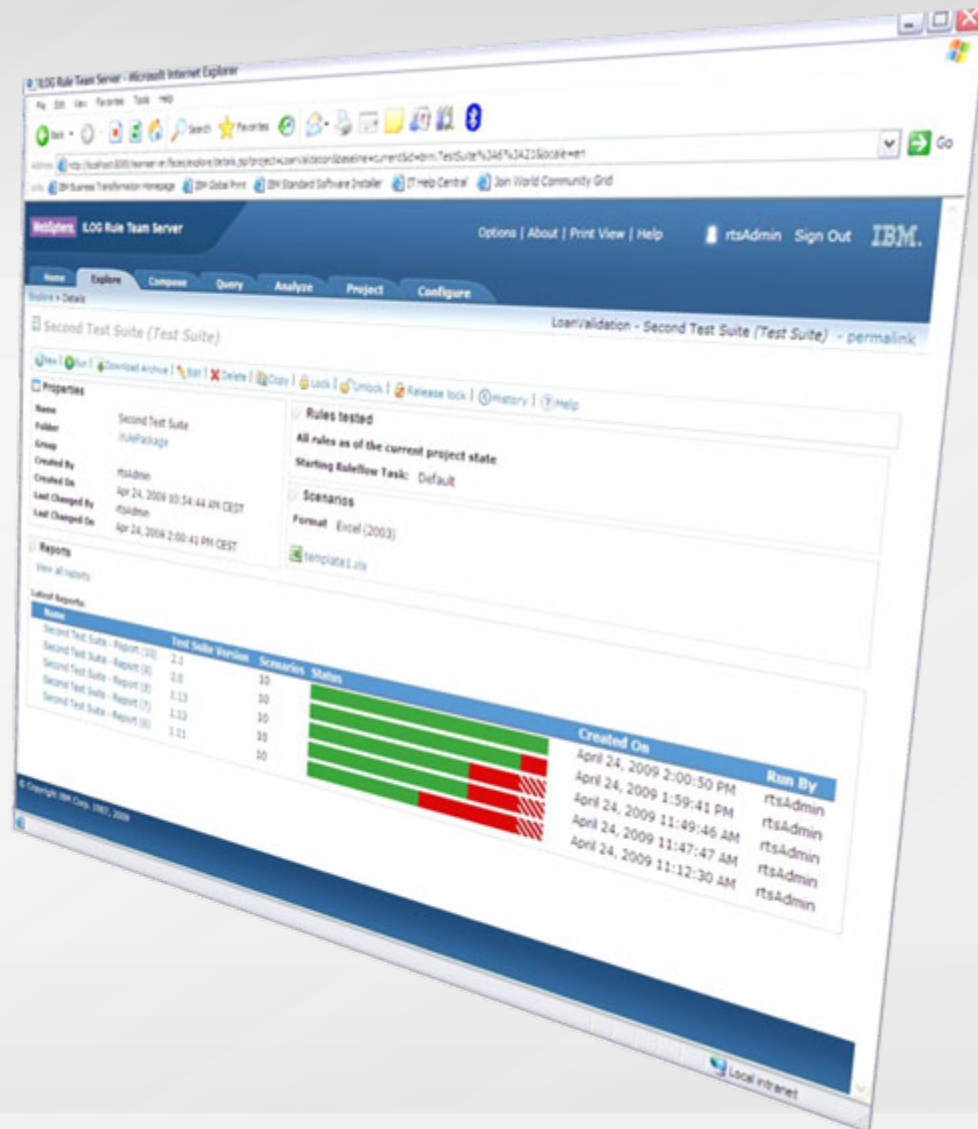
Decision Table in MS Excel

Rule Flow in MS Word

Action rules in MS Word

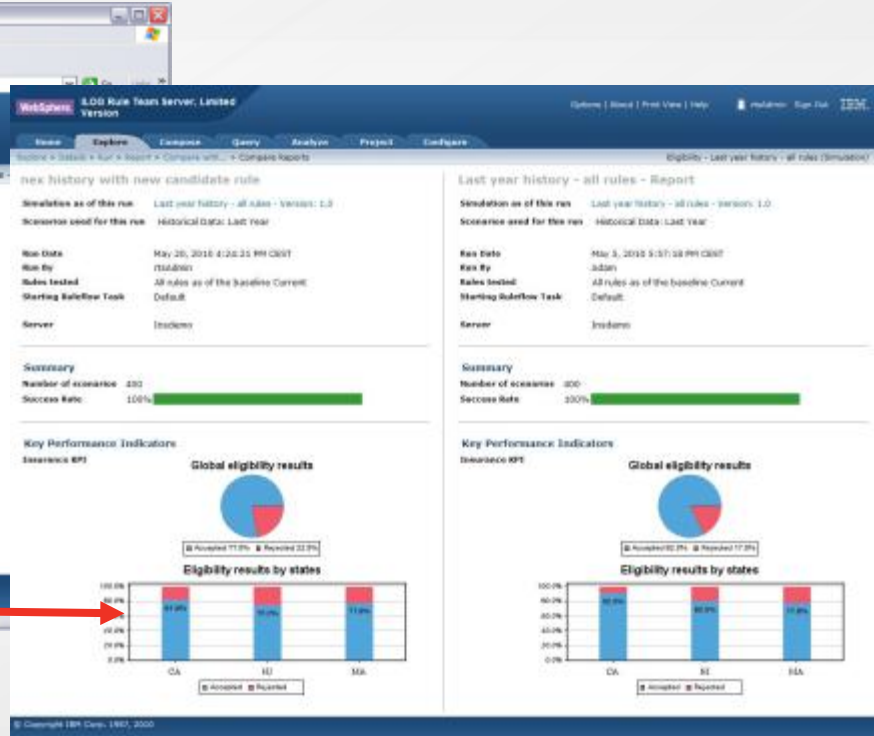
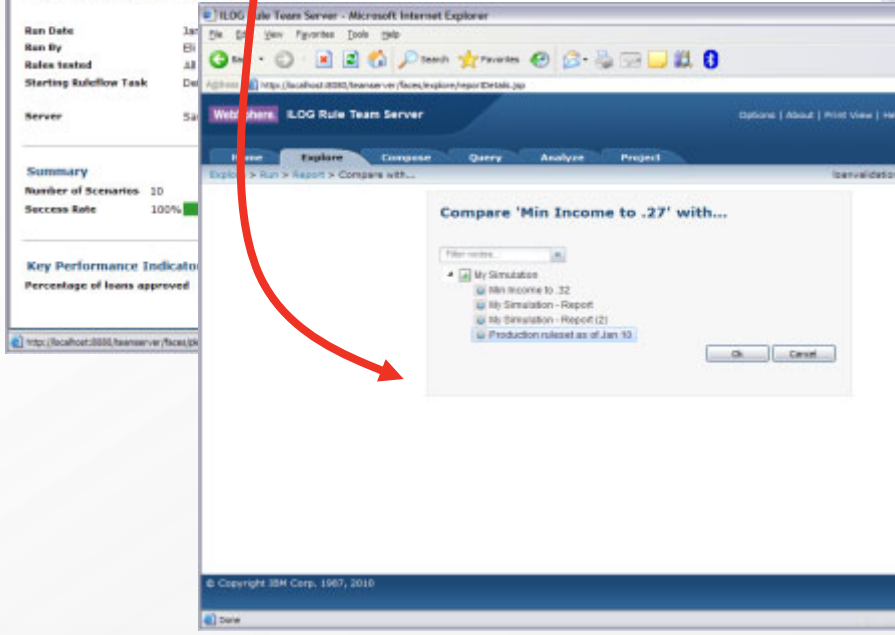
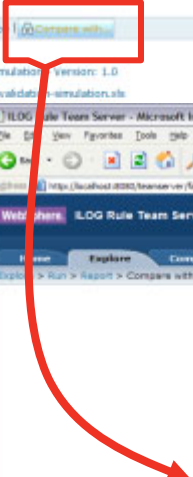
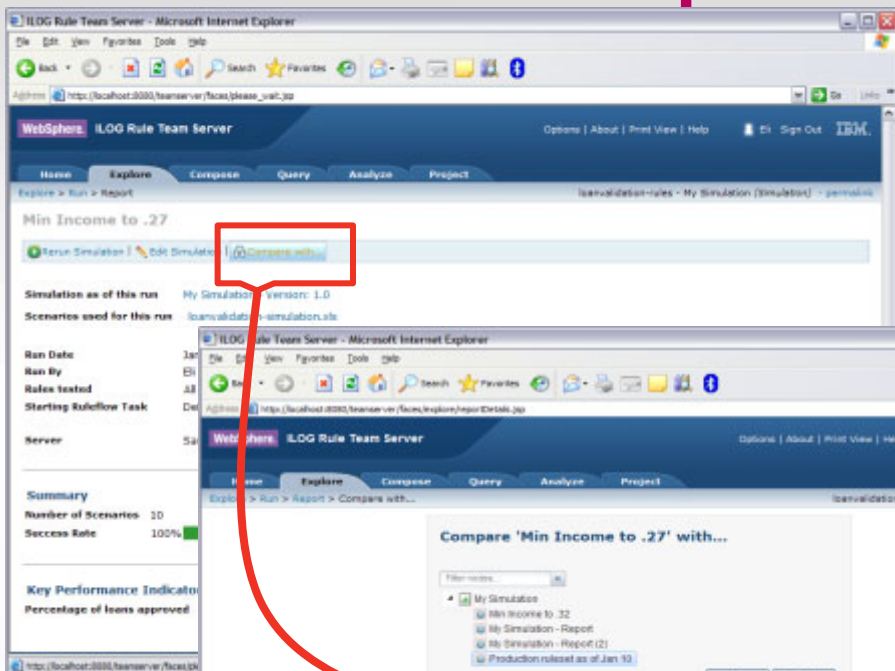
# Testing and Simulation

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



# Simulation Capabilities

- Test suite comparison
- Simulation suite comparison
- Champion and challenger scenario
- Allows what if analysis



Side by side comparison

Today

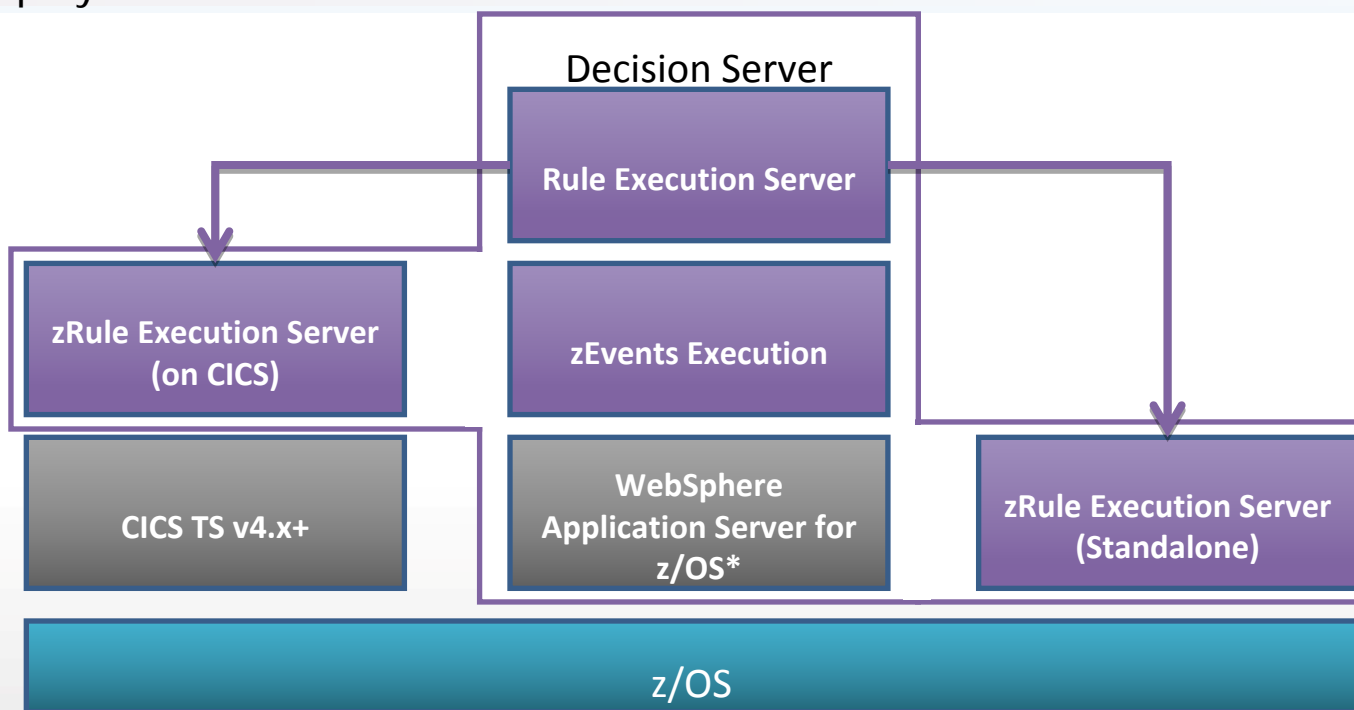
Tomorrow



# Rule Execution Server Options on z/OS

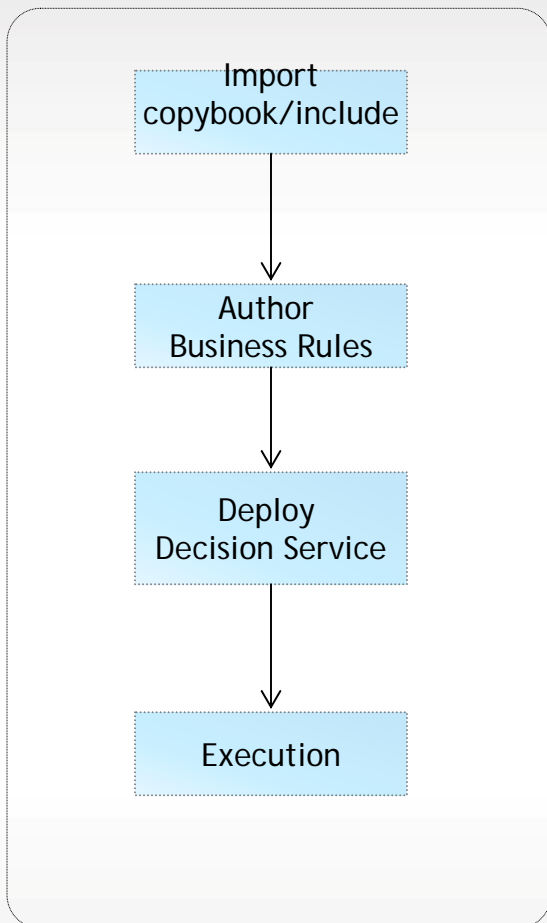
# Decision Server Runtime Options

- Decisions can be invoked from existing CICS, batch and IMS applications
- Runtime support for COBOL and PL/I data types
- Flexible runtime deployment to fit any z/OS environment:
  - Deployed on WebSphere Application Server for z/OS
  - Deployed standalone to z/OS
  - Deployed in CICS TS 4.2 and above JVMServer environment



\* limited use entitlement included with Decision Server

# Starting from a COBOL copybook or PL/I Include



## Scenario

- Existing application containing business rules
- Data model defined in COBOL copybook or PL/I Include file
- Use ODM to modernize the business policy

## Benefits

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

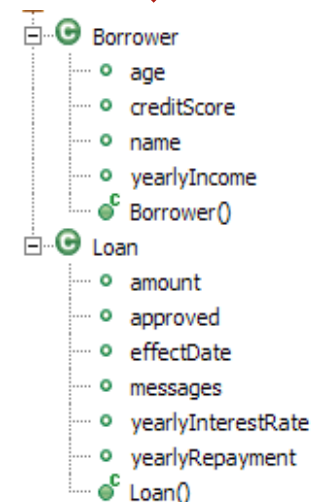
Note: The PL/I Include to XOM tooling is not available until V8.5

# Rule Authoring COBOL & PL/I -> XOM

- Support Enterprise COBOL & PL/I
- Java is created from the copybook or include structure
  - Java XOM & Java code to marshal between COBOL or PL/I <-> Java
  - 01 level structures mapped to class in BOM
- Redefines statements supported
  - Select which redefines structure to import

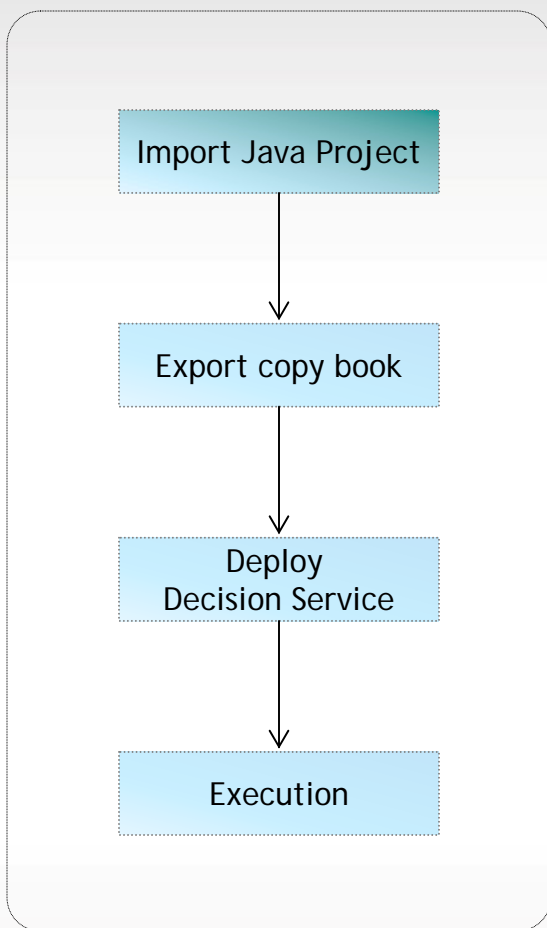
```

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 Project



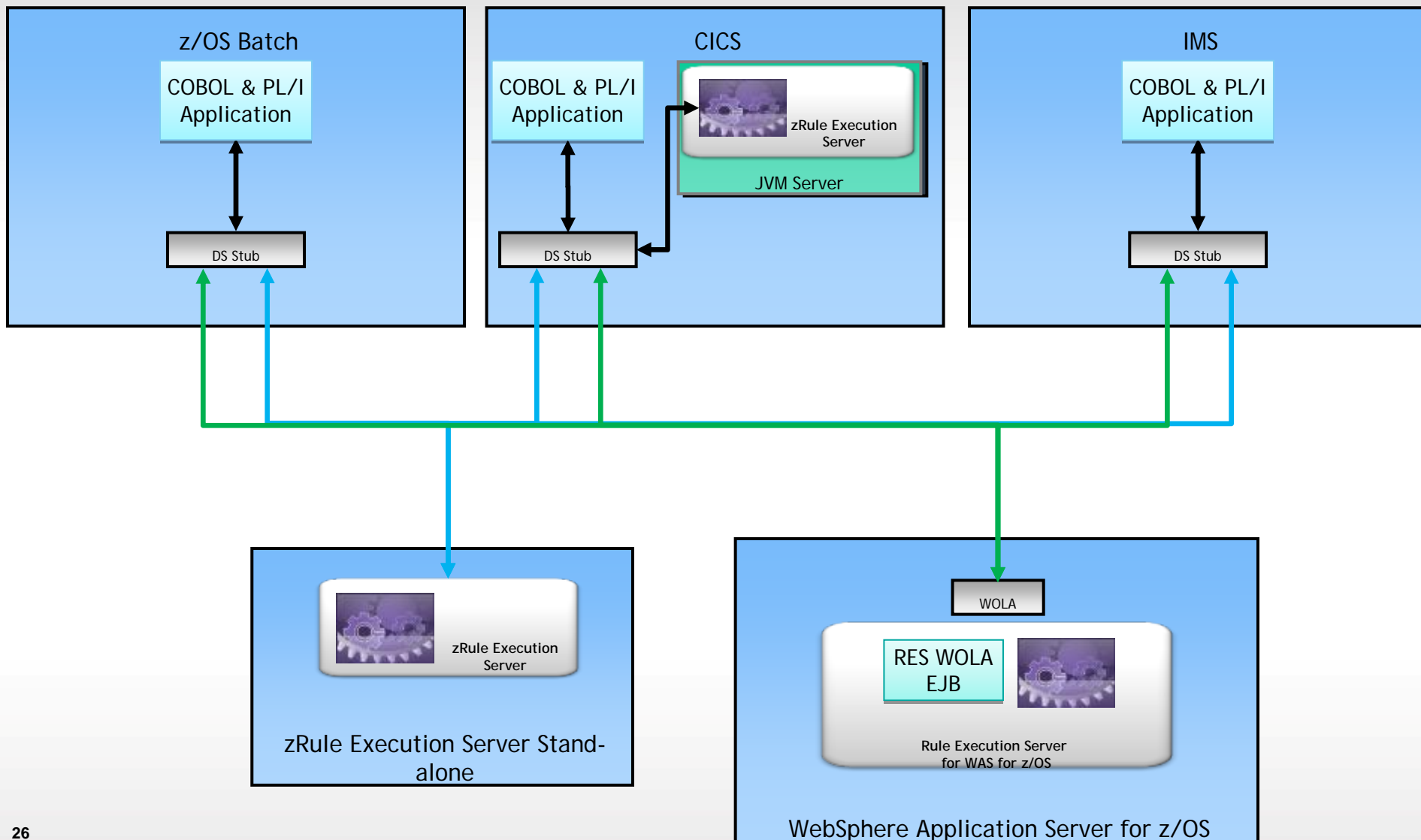
## Scenario

- Existing Rule projects exist that are currently in use on distributed platforms
- Concurrent execution of rules required on z/OS from COBOL applications

## Benefits

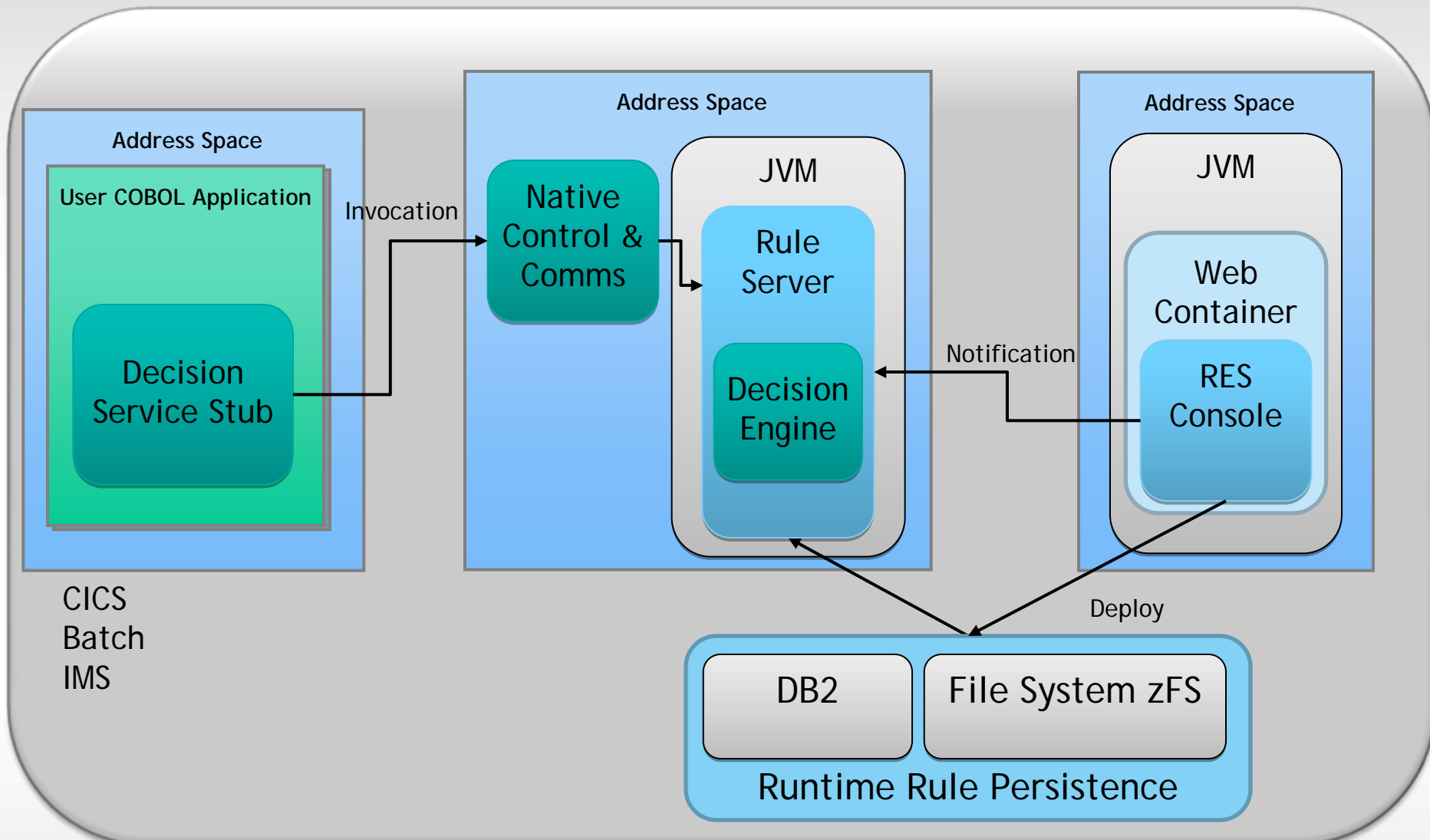
- Consistent decision rules wherever executed
- Rules can be invoked 'naturally' from existing applications on all platforms
- Enables central rule management across System z and distributed execution
- Business policy/rule lifecycle detached from application lifecycle

# Decision Invocation Options on z/OS

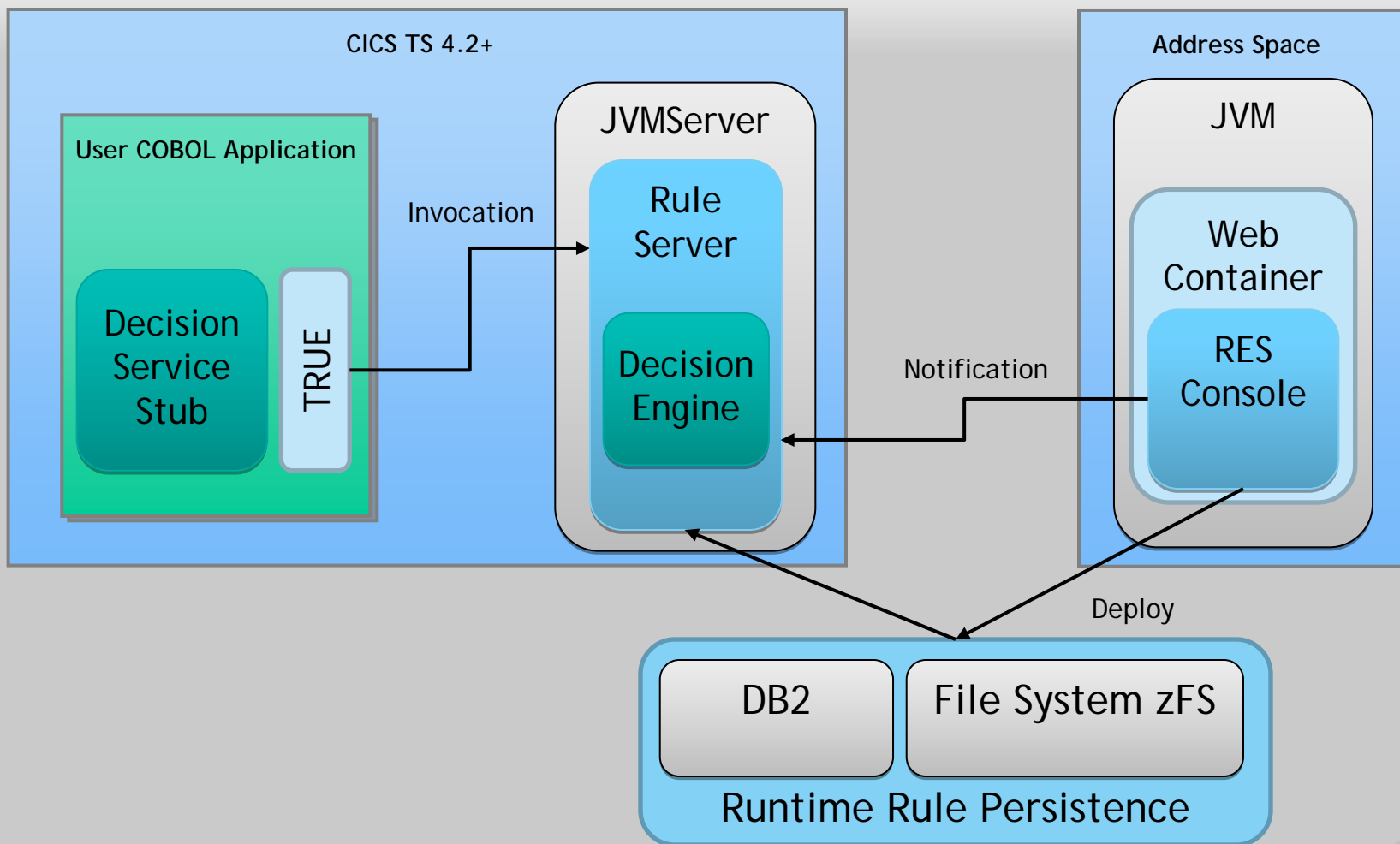




# zRule Execution Server – Stand Alone

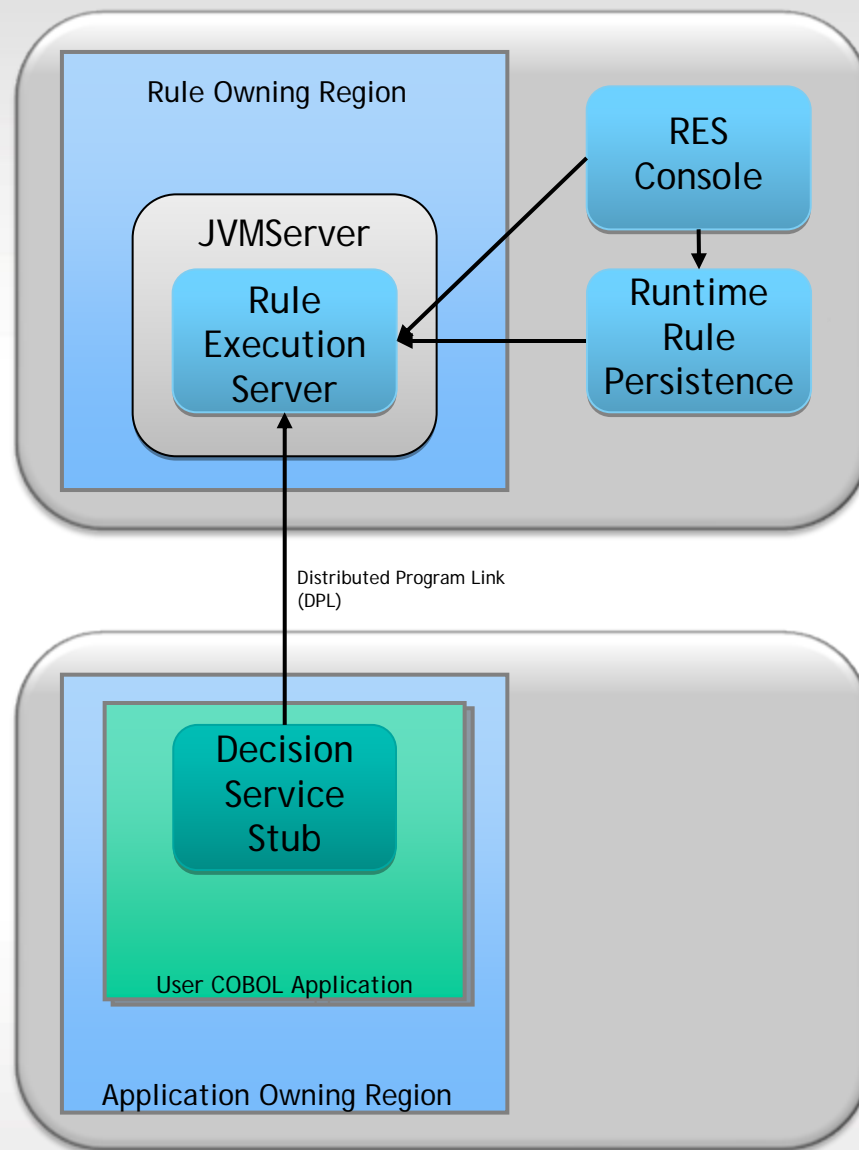


# zRule Execution Server for z/OS – CICS 4.2 & 5.1

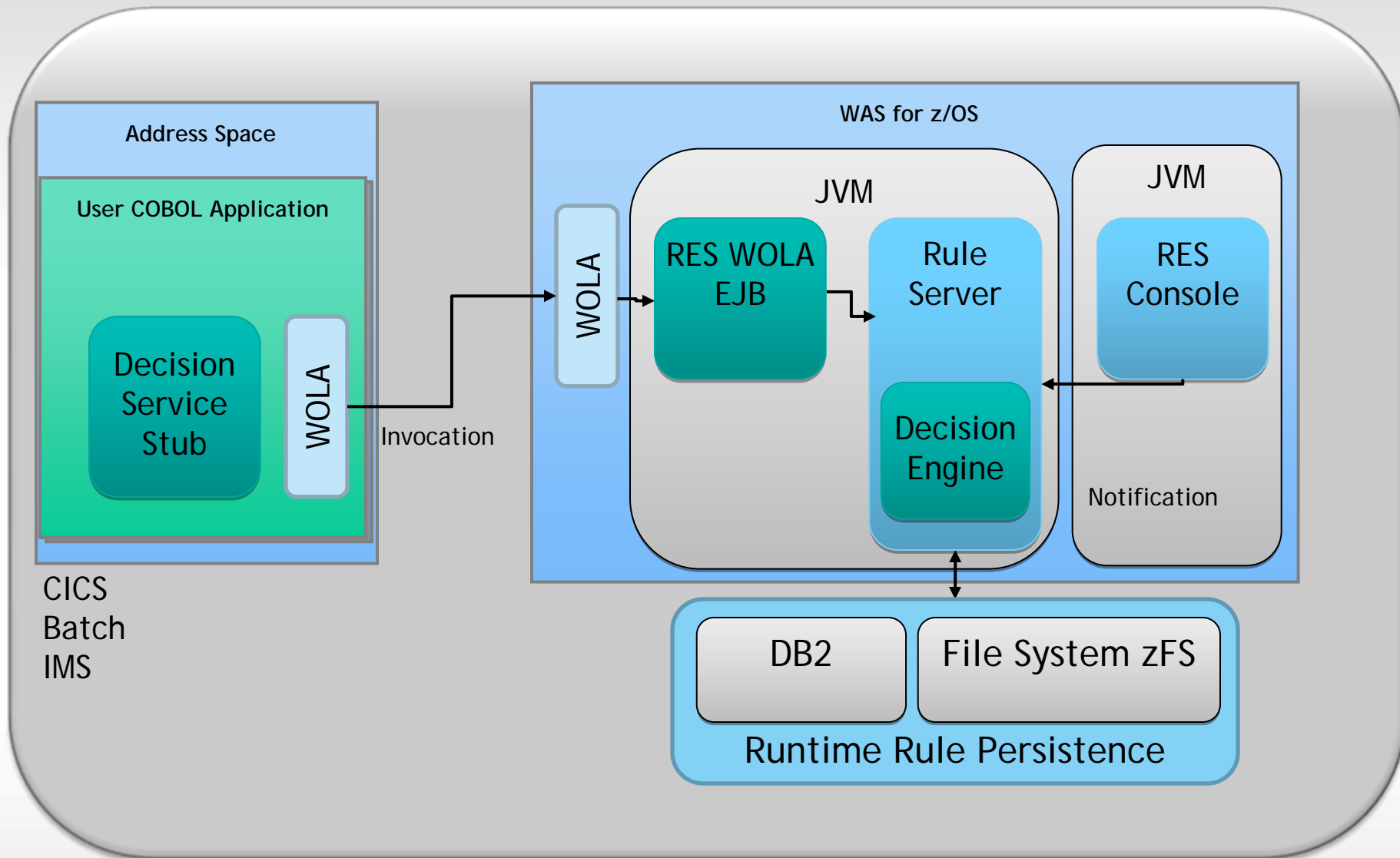


# CICS Rule-Owning Regions (ROR)

- A CICS rule-owning region allows centrally hosted rules to be called by multiple CICS regions
- The rule-owning region hosts a zRule Execution Server for z/OS instance that runs locally in the CICS JVM server
- The application-owning region uses a CICS Distributed Program Link (DPL) to run rules in a rule-owning region
- CICS DPL supports the ability for CICS to work load balance by having multiple rule-owning regions



# zRule Execution Server for z/OS for WAS on z/OS



# New Decision Engine Support

- **Increased Performance**
  - More transactions per seconds (up to +60% for very big projects)
  - Reduced ruleset loading time (up to 17 times)
- **Enhanced Scalability**
  - Ability to better leverage technical resources
  - Decisions can now involve thousands of rules with confidence and performance
- **Reduced Consumption**
  - Requires less memory even for big rulesets
  - Up to 30 times less memory required in very large decisions
- **Compatibility**
  - Decision Engine is compatible with existing rulesets
  - Classical rule engine remains the default execution engine

*Disclaimer: All figures measured during IBM internal benchmarks made on June 2013 comparing v8.0 legacy engine with the new v8.5.1 Decision Engine installed on similar configurations. Figures are for information purpose only and are not contractual.*

# Decision Engine z/OS Performance Highlights

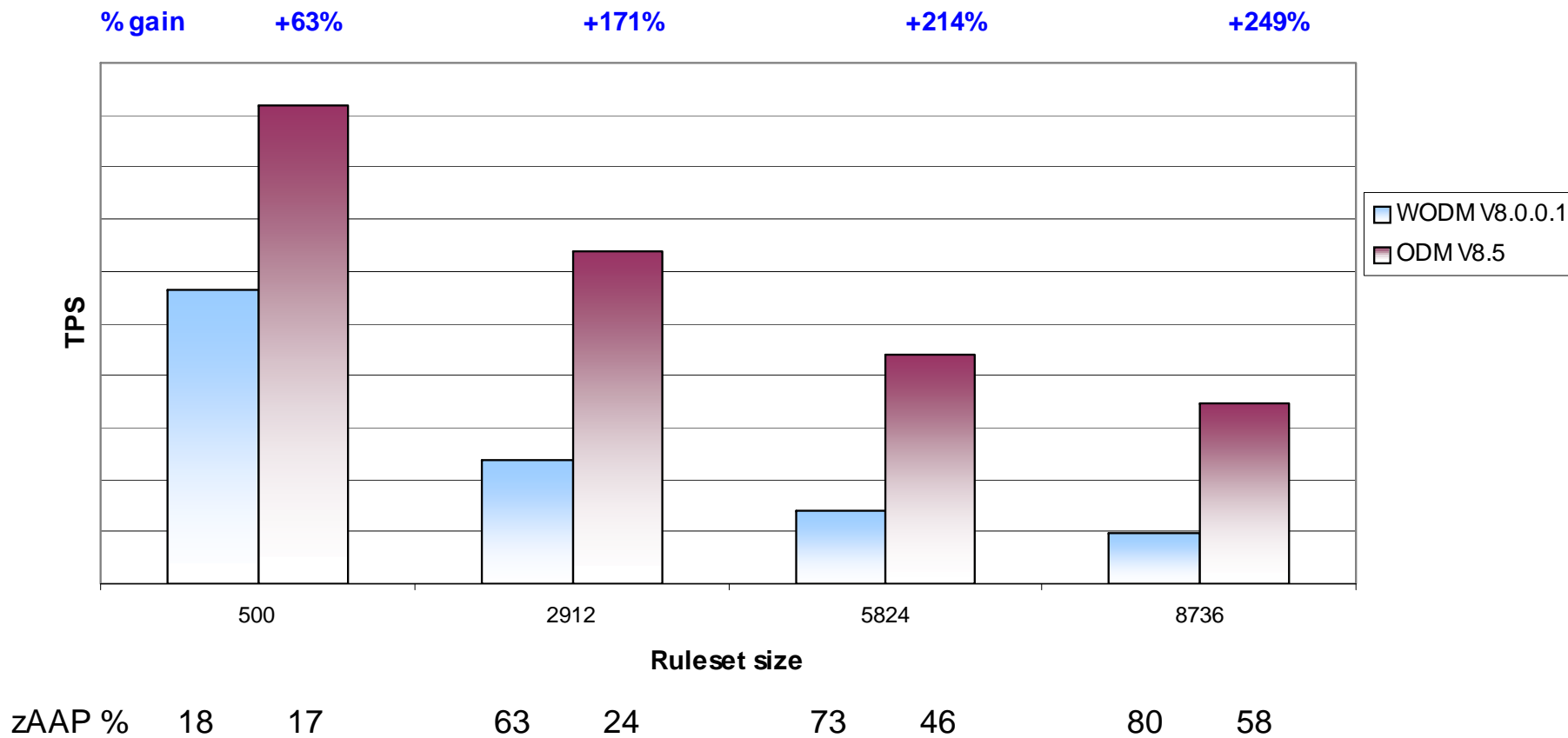
- zRES Stand Alone
  - The examples have shown throughput increased 103% - 348%
- zRES memory requirement significantly reduced
  - The examples have shown all performance benchmarks were able to run in 32MB heap
- zRES on CICS
  - The examples have shown throughput increased 25% - 253%
- In test runs we have achieved 27,424 rule invocations per second
  - 4 CPU EC12 (500 rule ruleset, using fastpath algorithm)





# Decision Engine z/OS Performance Highlights

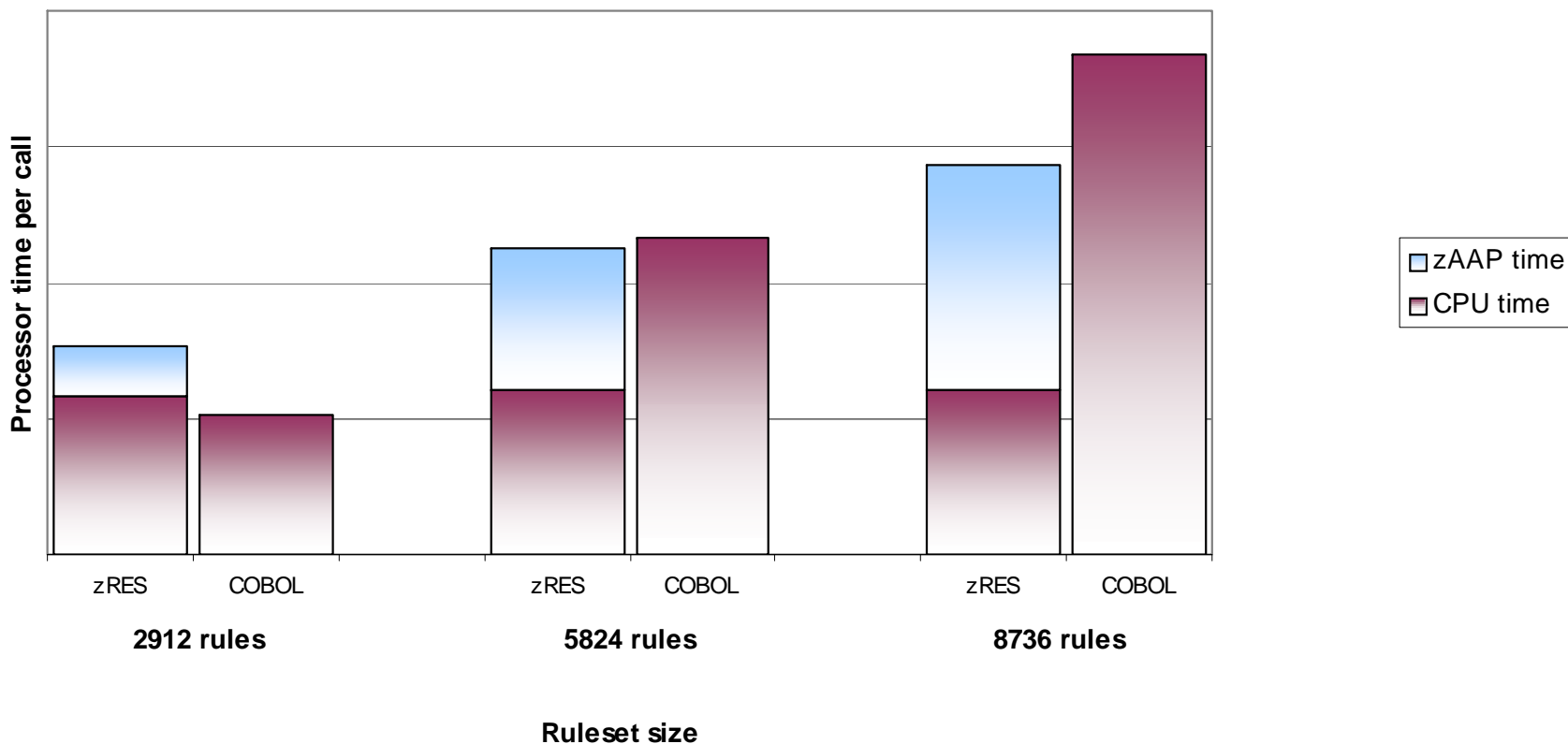
**zRES performance  
V8.0.0.1 Vs V8.5**





# Decision Engine z/OS Performance Highlights

Comparison of zRES execution with a  
COBOL rule subprogram  
CPU/zAAP time



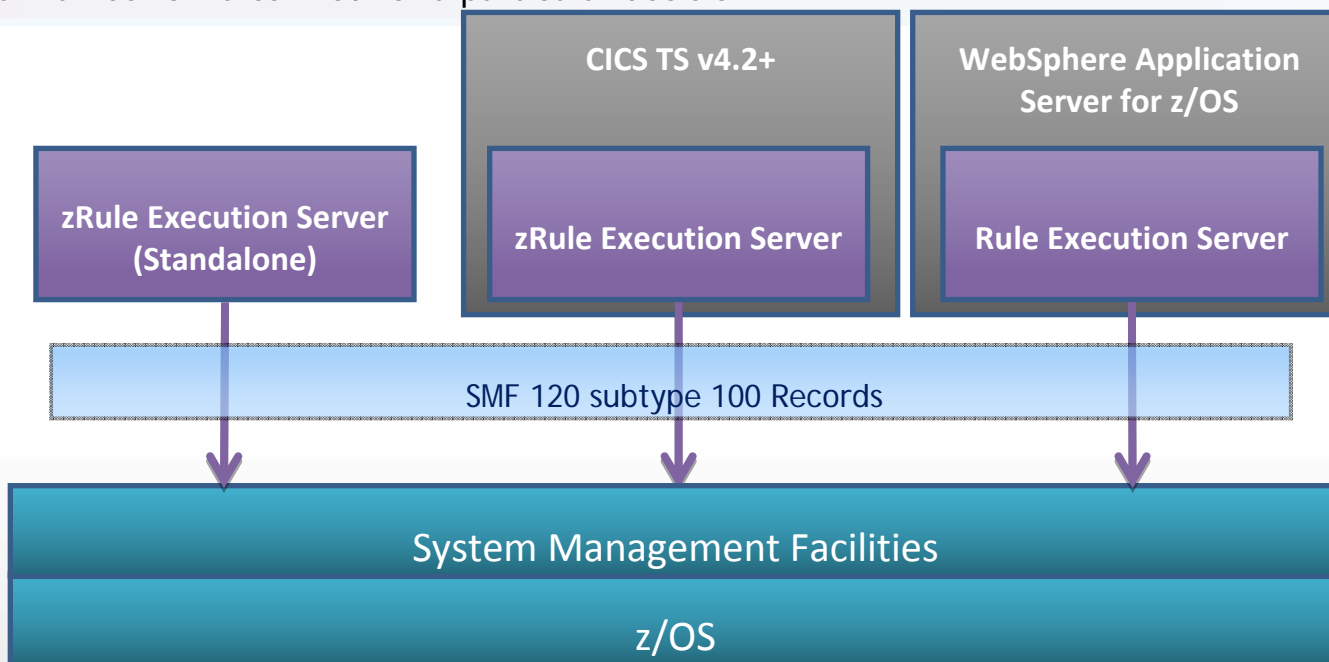
# Decision Engine Feature Comparison

	Supported Features		
	Rule Classic Engine	Decision Engine v8.0.1	Decision Engine v8.5.1
Available for zRES stand alone and CICS deployments	✓	✓	✓
Available for RES in WebSphere AS for z/OS deployments	✓		✓
Develop Rule Projects in Rule Designer	✓	✓	✓
Testing and simulation support	✓	★	★
Support for Web Service invocation (HTDS & MTDS)	✓		✓
Integration with Decision Center business tooling	✓		✓
Build and deploy rulesets from Decision Center	✓		✓
Decision Warehousing rule auditing support	✓		✓
Remote and local debugging of ruleset execution	✓		✓
Full support for low level programming in native IRL	✓		

★ Testing converts ruleset back to Classic engine support.  
Decision engine architected to give same results as Classic engine

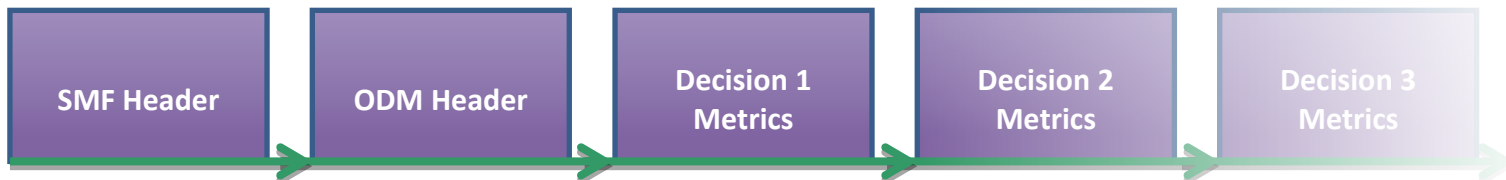
# Monitoring Decision Execution

- Decision monitoring can be enabled for all z/OS environments including:
  - zRule Execution Server stand alone deployments
  - zRule Execution Servers deployed in a CICS TS Environment
  - Rule Execution Servers deployed in a WebSphere Application Server for z/OS
- Usage records written as standard z/OS SMF 120 subtype 100 records
- Can be used to track
  - Number of times a particular decision is invoked
  - Total number of rules fired for a particular decision



# ODM execution data – SMF 120 Subtype 100 structure

- Each record contains
  - Standard SMF Header
  - ODM Header
  - Zero to many Execution Segments Records
- Execution segment record contains data collected for each decision defined by a unique ruleset path
  - E.g. /MiniLoanDemoRuleApp/1.0/MiniLoanDemo/2.0



- The SMF record structures are provided as a sample with ODM 8.5.1
  - ++HBRHLQ++.SHBRXLCH(HBRSMF)

## Execution Segment Layout

- One segment is created for each unique ruleset path
  - Decision must have been invoked during the interval
- Contains
  - The unique ruleset path that identifies the decision
  - Number of times the decision has been successfully invoked
  - The number of times the decision has been invoked but execution has failed
  - The sum of the rules fired for this decision

```
typedef struct {  
    uint32_t RULEXNUM;    /* Ruleset successful execution count */  
    uint32_t RULEXBAD;   /* Ruleset failed execution count */  
    uint32_t RULEXFSUM;  /* Ruleset sum of fired rules */  
    char RULEXPATH[256]; /* Ruleset execution path */  
} HBRSMF120ST100RecordExec;
```

# Printing ODM Execution Data

- ODM 8.5.1 provides a sample utility for printing the SMF 120 subtype 100 records
- Sample source for the utility
  - ++HBRHLQ++.SHBRXLCS(HBRSMFP)
  - ++HBRHLQ++.SHBRXLCH(HBRSMF)
- Sample JCL to run the utility
  - ++HBRHLQ++.SHBRJCL(HBRSMFP)

```

*****
* SMFRecordHeader *
*****
SMF120RTY = 120
SMF120SID = MYGA
SMF120STY = 100
SMF120HDV = 1
SMF120HDO = 36
SMF120HDL = 140
SMF120HDN = 1
SMF Header

*****
* HBRSMF120ST100RecordHeader *
*****
SMF120VER = 8.5.1.0
SMF120XUL = BRAV
SMF120XUT = zRule Execution Server
SMF120SDT = 10/11/13
SMF120STM = 1:22:00 PM
SMF120EDT = 10/11/13
SMF120ETM = 1:33:00 PM
SMF120EXO = 172
SMF120EXL = 536
SMF120EXN = 2
ODM Header

*****
* HBRSMF120ST100RecordExec *
*****
RULEXNUM = 6
RULEXBAD = 0
RULEXFSUM = 5
RULEXPATH = /MiniLoanDemoPLIRuleApp/1.0/MiniLoanDemoPLI/1.0
Execution Segment

*****
* HBRSMF120ST100RecordExec *
*****
RULEXNUM = 6
RULEXBAD = 0
RULEXFSUM = 5
RULEXPATH = /MiniLoanDemoRuleApp/5.0/MiniLoanDemo/1.0

```

# zRES 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).
  
```



# zRES API Within a Program

```

Line 33      Column 12      Insert      139 changes
-----*A-1-8-----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-1-8-----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 Successful'

* 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.
  
```

# Rule Execution Server Deployment Options

- ✓ Since v7.5
- ✓ New in v 8.0
- ✓ **New in v 8.5**

	<i>zRule Execution Server deployed in WebSphere Application Server for z/OS</i>	<i>zRule Execution Server deployed as a Standalone environment</i>	<i>zRule Execution Server deployed in CICS TS v4.x JVMServer environment</i>
Full support for all rule authoring constructs	✓	✓	✓
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	✓		✓
Support for new optimized Decision Engine	✓	✓	✓

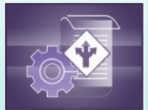


# Decision Management: Comprehensive Flexibility




  
Architect,  
Application  
Developer

  
Business Analyst,  
Business Manager

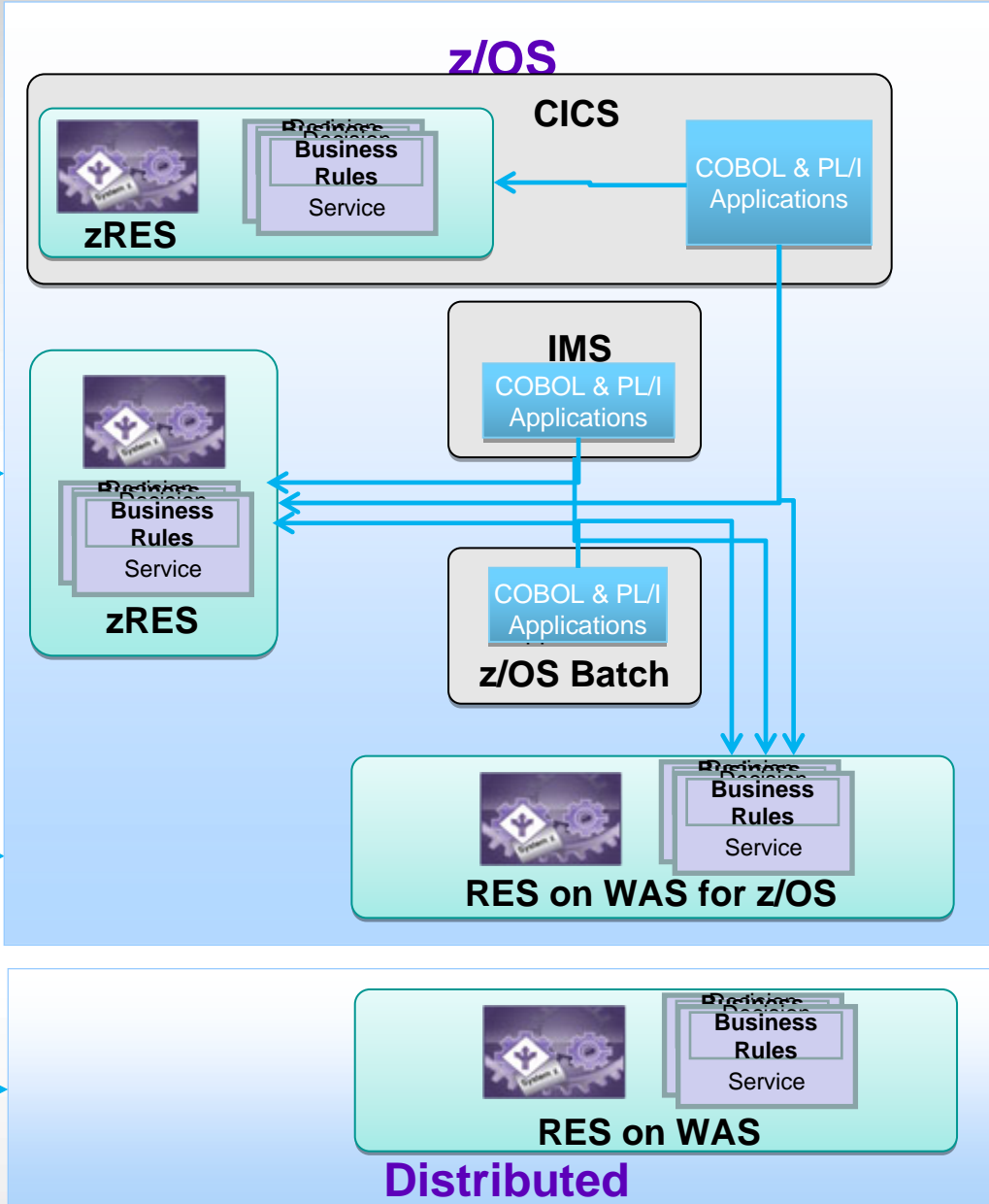
  
**Rule Designer**  
+ COBOL & PL/I Management  
**Workstation**

  
**Decision Center**  
+ COBOL & PL/I Management

  
**Decision Center  
Repository**

**Distributed or  
System z**

**Deploy**



# ODM for z/OS enables smart organizations to capitalize on modernization and innovation

- Faster Time to Market:
  - Ability to react to changes in a fast paced competitive marketplace though Business events and rules
- Lower cost of maintenance
  - Leading to improved operational efficiency and total cost of ownership
- Better visibility and control
  - Leading to improved corporate governance
- Ability to implement the best rules 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
  - Authoring rules for COBOL & PL/I applications in business terminology
  - Ability to share business rules with Java and other COBOL & PL/I applications
  - Integrate seamlessly with existing COBOL & PL/I applications



## Where can I find out more?

- <http://www.ibm.com/operational-decision-management>
  - Shortcut: <http://ibm.com/ibmodm>
  - [IBM Operational Decision Manager for z/OS](#)
- White papers & tech docs
  - [WebSphere z/OS – The Value of Co-Location](#)
  - [Brief introduction to WebSphere Optimized Local Adapters](#)
  - [WebSphere for System z Prescriptive Use Cases \(Oct. 28, 2011 Addendum\)](#)
- Redbooks
  - [Flexible Decision Automation for Your zEnterprise with Business Rules and Events](#)
  - [Batch Modernization on z/OS](#)
  - [Patterns: Integrating WebSphere ILOG JRules with IBM Software](#)
- [IBM Operational Decision Management YouTube demo](#)
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- [Good Decision! Decision Management blog](#)

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- [IBM Academic Initiative System z](#)
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