



| z/TPF V1.1

TPF Users Group - 2011

Breaking the rules on z/TPF application development

Integrating z/TPF and IBM WebSphere Operational Decision Management (WODM)

Jason Keenaghan
General Session

AIM Enterprise Platform Software
IBM z/Transaction Processing Facility Enterprise Edition 1.1.0

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Agenda

- **Defining business rules and a BRMS**
- **Introduction to WebSphere Operational Decision Management (WODM)**
 - Also known as ILOG JRules BRMS
- **Rules as a path to modernization and application agility**
- **Integrating z/TPF and JRules: Today**
- **Integrating z/TPF and JRules: Future**
 - Statement of direction and design preview

What is a business rule?

- **A Business Rule is a statement that has a *Condition* part and a *Conclusion/Action* part**
- **Derived from organizational policies, procedures and internal/external regulations**
- **Business Rules typically use business terms, and ones that are similar to a company's own terminology**

When (Condition)

the hour of the day of the date\time of 'the transaction' is 0
and the MCC of 'the transaction' is within 2 hours of the date\time of txn
and

Policy (Action, Conclusion)

set fraudulent to true
set reason to "Fraud Detected – ATM transactions either side of midnight"

Business needs are dynamic

We need to add a validation step to meet the requirements of the new regulation.

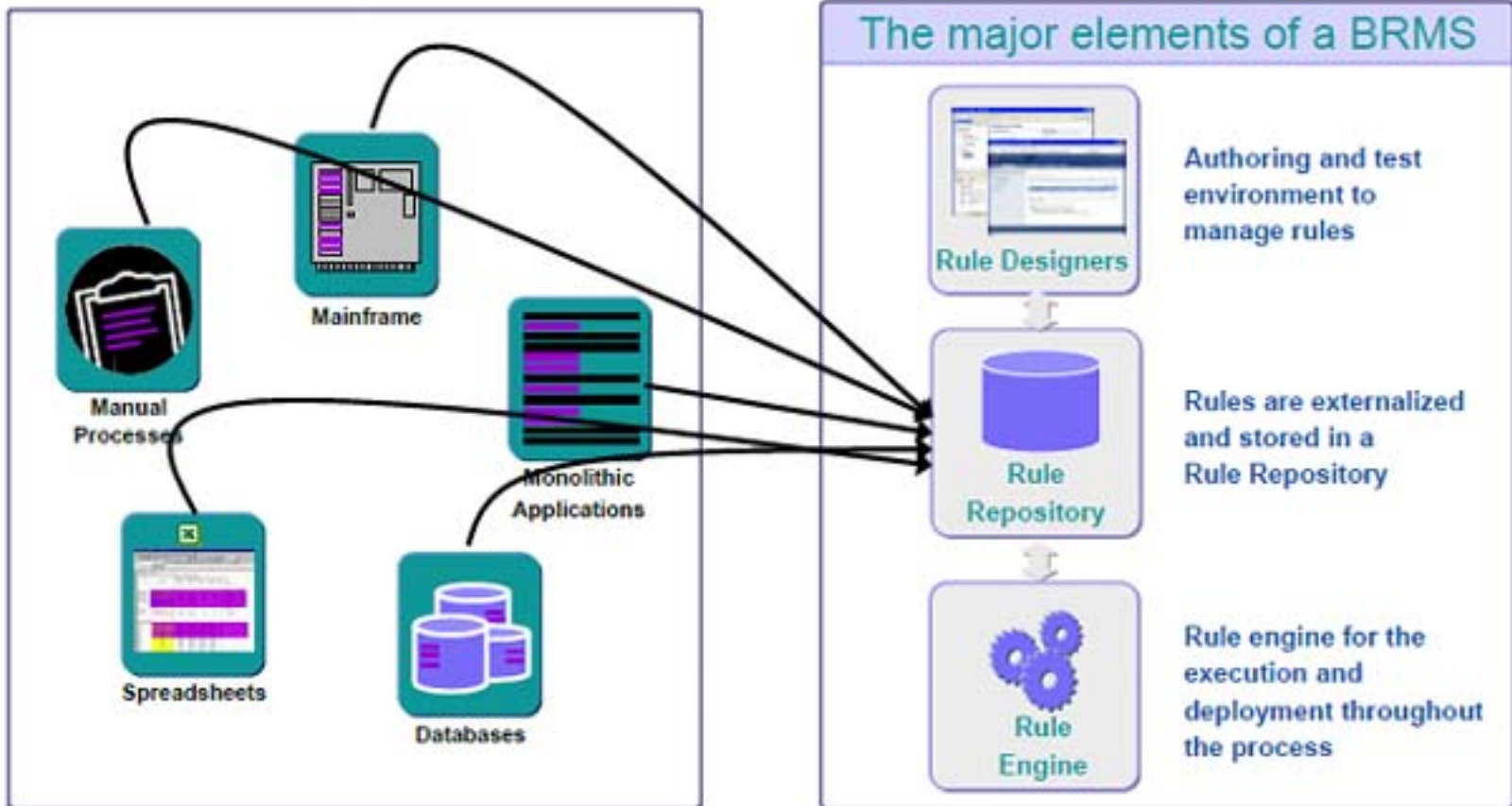
Let's create a special promotion for our best customers.

Can we automate approvals for this type of order?



Business rules management systems (BRMS)

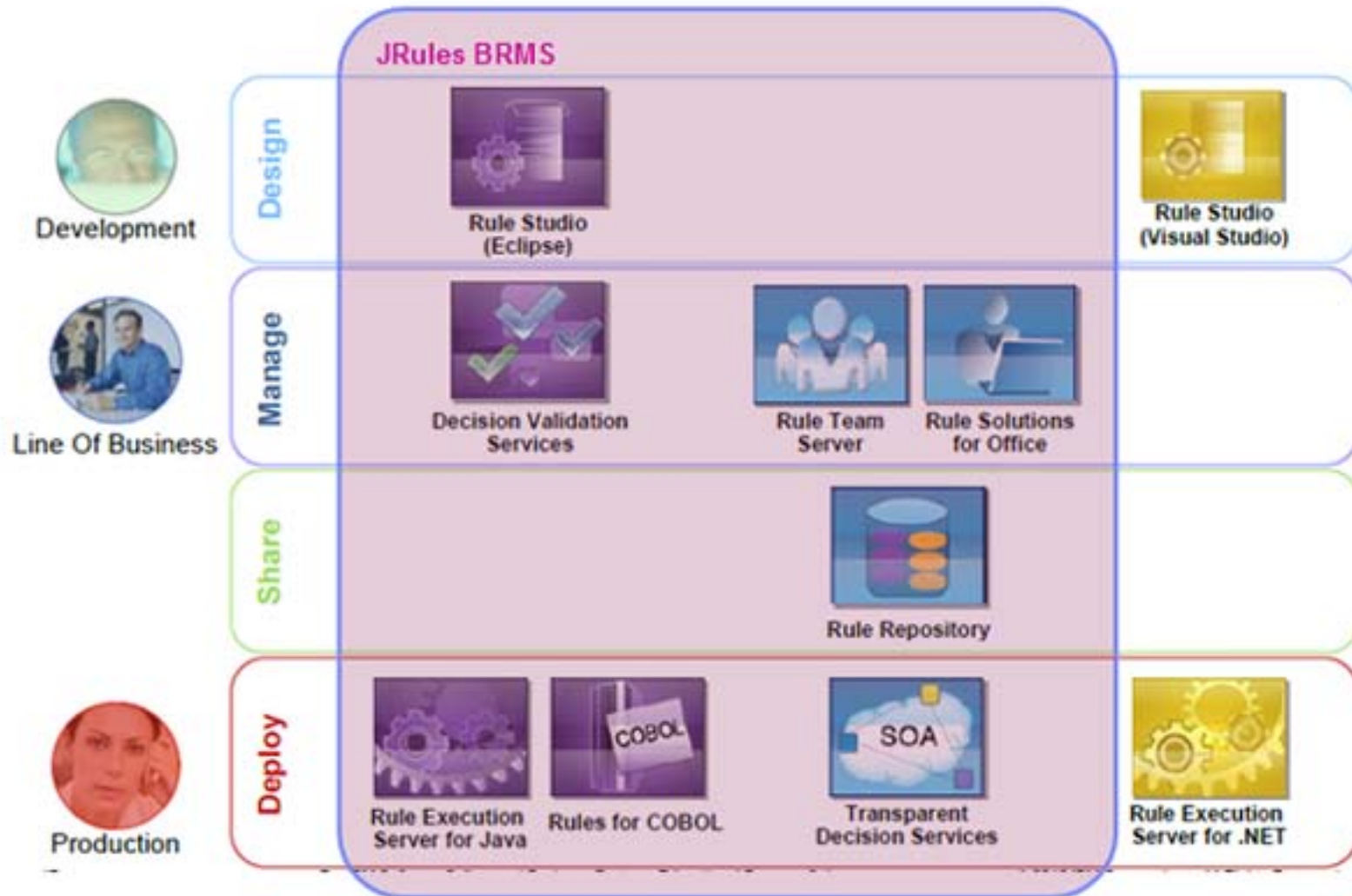
Externalization → Centralization → Agility



What types of decisions can benefit from a BRMS?

- **Up-sell/cross-sell offer**
- **Commissions/royalties**
- **Compliance screening**
- **Underwriting**
- **Tax calculation**
- **Document requirements**
- **Billing**
- **Fraud assessment**
- **Accounting disposition**
- **Configuration**
- **Pricing**
- **Program eligibility**
- **Benefit calculation**
- **Product selection**

WebSphere ILOG business rules product family



Flexible rule authoring

Graphical representations



Scorecards

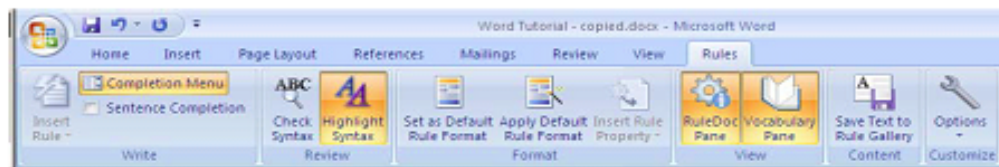
Gender	Is Married?	Is Single?	Age	Salary	Adjustment Type	Scorecard	Reason
			0-20	10	increase	Driver Profile	Driver Profile
			21-30	15	increase	Driver Profile	Driver Profile
			31-40	20	increase	Driver Profile	Driver Profile
			41-50	25	increase	Driver Profile	Driver Profile
			51-60	30	increase	Driver Profile	Driver Profile
			61-70	35	increase	Driver Profile	Driver Profile
			71-80	40	increase	Driver Profile	Driver Profile
			81-90	45	increase	Driver Profile	Driver Profile
			91-100	50	increase	Driver Profile	Driver Profile
			101-110	55	increase	Driver Profile	Driver Profile
			111-120	60	increase	Driver Profile	Driver Profile
			121-130	65	increase	Driver Profile	Driver Profile
			131-140	70	increase	Driver Profile	Driver Profile
			141-150	75	increase	Driver Profile	Driver Profile
			151-160	80	increase	Driver Profile	Driver Profile
			161-170	85	increase	Driver Profile	Driver Profile
			171-180	90	increase	Driver Profile	Driver Profile
			181-190	95	increase	Driver Profile	Driver Profile
			191-200	100	increase	Driver Profile	Driver Profile

Text-based (point-and-click + guided editing)

Point & Click

```
[definitions]
if
the driver is full time student
and the driver has been convicted of a DUI ✗
then
set high risk driver to true [and/or] ✗
add eligibility error: <enter a value> [±] ✗
add eligibility error: <a string>
for each ...
print message: <a string>
reject this application with reason: <a string>
set <variable> to ...
```

Decision Tables



Rule management services

rule organization and smart views

- Business Rules
 - Pricing
 - Coverage Pricing
 - Base Premium
 - Discounts
 - Surcharges
 - Global Adjustments
 - RuleFlows
 - Templates
 - Rules by Status
 - Defined
 - Deployable
 - New
 - Rejected
 - Validated

security and permissions

	PERMISSION	TYPE	PROPERTY	VALUE
<input type="checkbox"/>	▲ ▼ Create	Action Rule	-	Yes
<input type="checkbox"/>	▲ ▼ Create	Smart View	-	Yes
<input type="checkbox"/>	▲ ▼ Create	Folder	-	Yes
<input type="checkbox"/>	▲ ▼ New	Action Rule	-	Yes
<input type="checkbox"/>	▲ ▼ Update	Action Rule	*	Group
<input type="checkbox"/>	▲ ▼ Update	Action Rule	Status	No

rule properties

Properties

Name: GoldenPric Table

Status: Deployable

Priority:

Category: DeltaBusinessPolicy

Expiration Date: None

Effective Date: None

Active:

Folder: PricingCoveragePricingBasePrem

Group: claims

history and versioning

Explore > Details > History

Explore Version Details | Compare 2 Versions | Restore Version

Display by 10

<input type="checkbox"/>	Version	Changed By	Comment	Date
<input checked="" type="checkbox"/>	1.0	Adam		3/6/06 5:44 PM
<input type="checkbox"/>	1.1	Adam		3/6/06 5:44 PM

reporting and consistency checking

Consistency Checking Report

Type of check:

- conflicting rules
- rules with unsafe recursion
- rules with equivalent conditions
- equivalent rules
- redundant rules
- lower applicable rules

rule queries

Find all business rules such that the status of each business rule is deployable and the expiration date of each business rule is before * 3/3/2006 *

Do set the status of each business rule to rejected *

The science of better decisions



How to best allocate aircrafts and crews?



inventory cost vs. customer satisfaction?



What to build, where and when?

Optimization helps businesses:

- create the best possible plans
- explore alternatives and understand trade-off
- respond to changes in business operations



Risk vs. potential reward?



Cost vs. carbon emission?

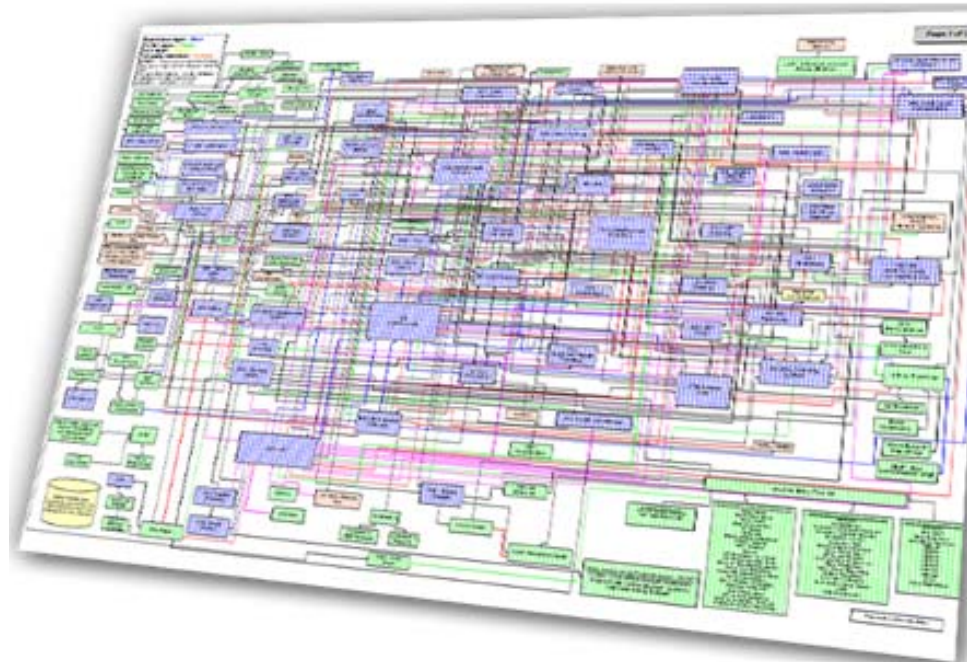
Optimization and analytics



Source: Davenport, "Competing on Analytics"

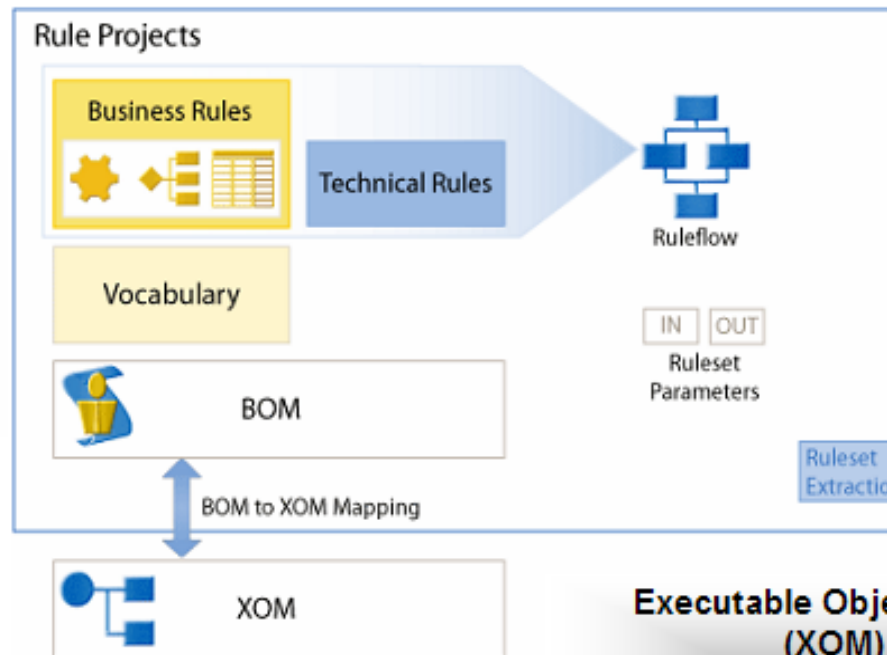
Providing application agility through business rules

- **Business rule engine (BRE) integration – allowing TPF applications to expose portions of their business logic in the form of rules that can be easily analyzed, modeled and changed by a business user**
- **Open TPFUG requirement to be able to utilize a business rule engine within a mainline z/TPF transaction (SOA09001F)**
- **Little known fact: Today you can integrate with WODM via web services**



XOMs, BOMS, and WSDLs (oh my!)

Business Object Model (BOM)
Defines the data and methods available to the rule execution server at runtime



Web Service Description Language (WSDL)

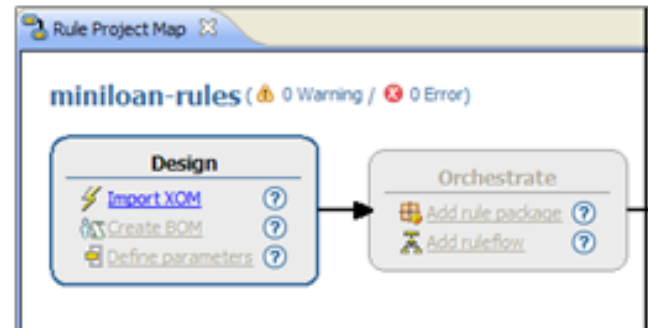
Export ruleset as a transparent decision service (i.e., web service) and generate a WSDL that describes it

XML schema: Easier to create if you know XML but not Java

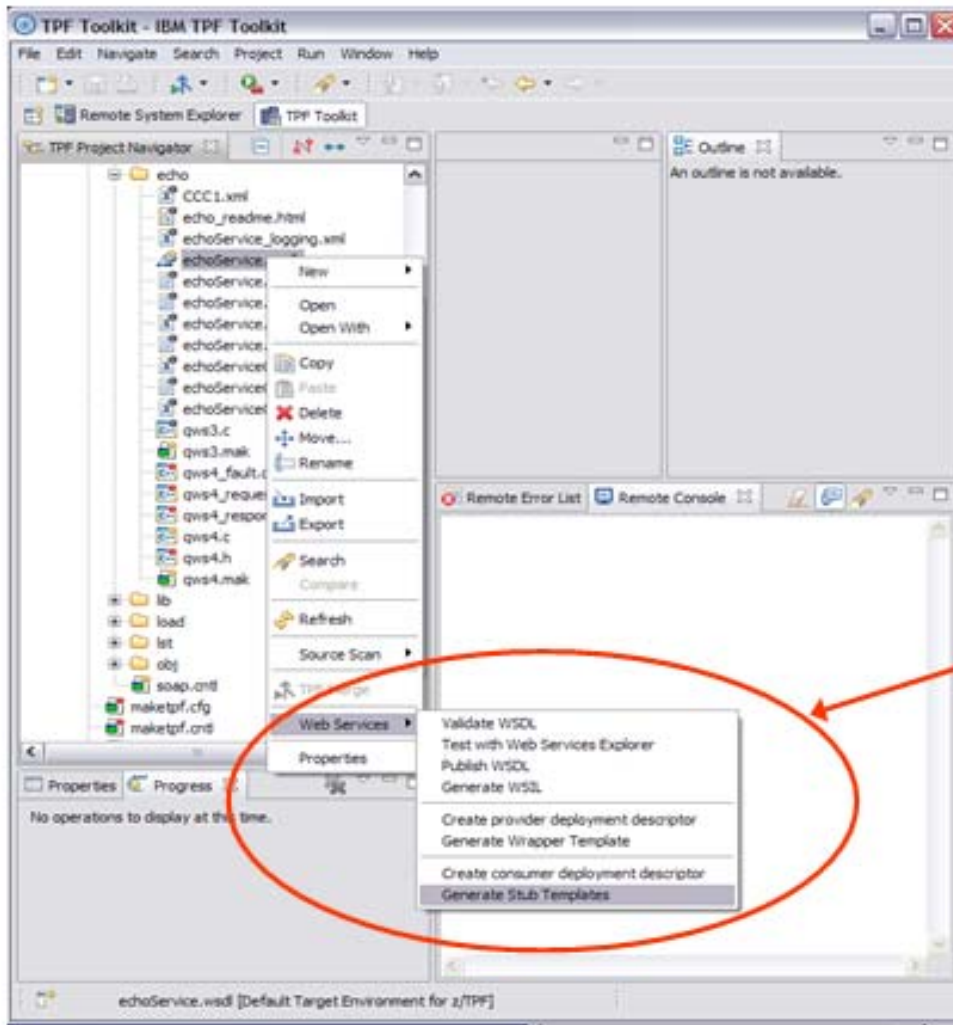
Java: Highest performing option

Creating a Transparent Decision Service for WODM

1. Start Rule Studio
2. Create a rule project
3. Attach the Java project (import the XOM)
4. Create the BOM
5. Declare ruleset parameters
6. Author and test the rules
7. Create a RuleApp (package one or more rulesets)
8. Generate WSDL that corresponds to ruleset
9. Deploy RuleApp to Rule Execution Server (RES)



Making the decision service available from z/TPF



Consumer web service support provides tooling and a runtime infrastructure for invoking web services from z/TPF applications

1. Import WSDL into TPF Toolkit
2. Generate template code for consumer web service stub
3. Define structure(s) for input and output data that will be passed from/to application
4. Update stub code to build SOAP request (XML) from input data structure(s) and extract return data from SOAP response

Deploy the consumer web service and application

New Consumer Web Service Deployment Descriptor Wizard

Deployment Descriptor
Specify consumer web service details

URI: /Calculator

Stub: QZZ7

Description: This is a consumer calculator service

Provider Code Page: UTF-8

Consumer Code Page: IBM-500

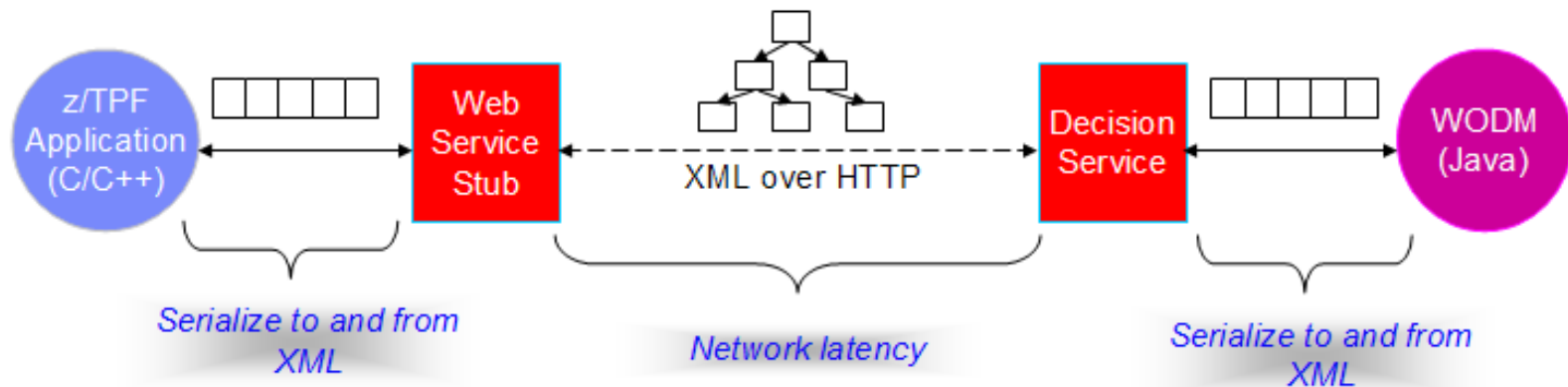
SOAP Message Handlers
Specify the SOAP message handlers to invoke when a SOAP request is received:

Name	Required
logging	true
security	false
billing	true

Verify SOAP headers

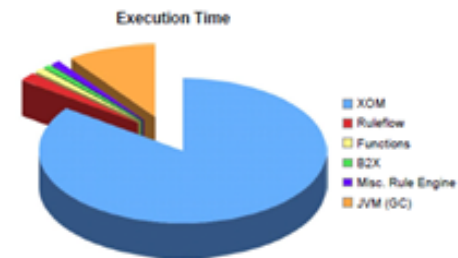
5. Create the consumer web service deployment descriptor using WSDL
6. Build and load stub code
7. Deploy consumer web service deployment descriptor using ZWSAT or remote management from TPF Toolkit
8. Create an application to invoke web service using tpf_soap* APIs
9. Build and load application
10. Run application
11. Enjoy your new found business agility

How well does it perform? Um, it depends...



Things to remember:

1. XML is designed for interoperability...not performance
2. Networks are faster than they used to be...but it is still not as fast as a local call
3. Data size matters...affects both XML and network overhead
4. Many factors affect rule execution time (e.g., number of rules, complexity, concurrency, etc.)



Rule Execution Server

The majority of the time spent in rule execution time is spent processing within the XOM code

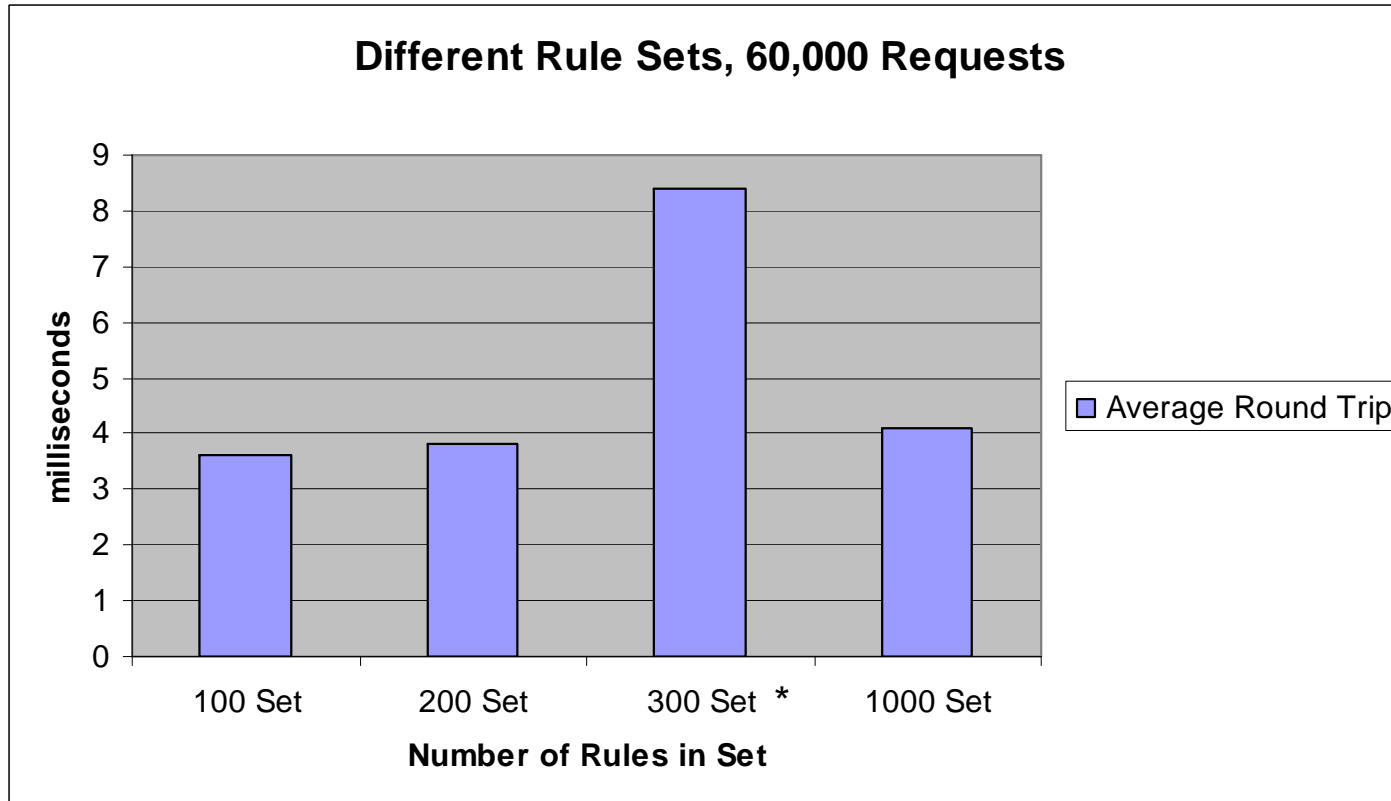
Disclaimer

Performance is based on measurements and projections using standard IBM benchmarks in a controlled environment. The actual throughput that any user will experience will vary depending upon considerations such as the amount of multiprogramming in the user's job stream, the I/O configuration, the storage configuration, and the workload processed. Therefore, no assurance can be given that an individual user will achieve throughput equivalent to the performance stated here.

Performance test system environment



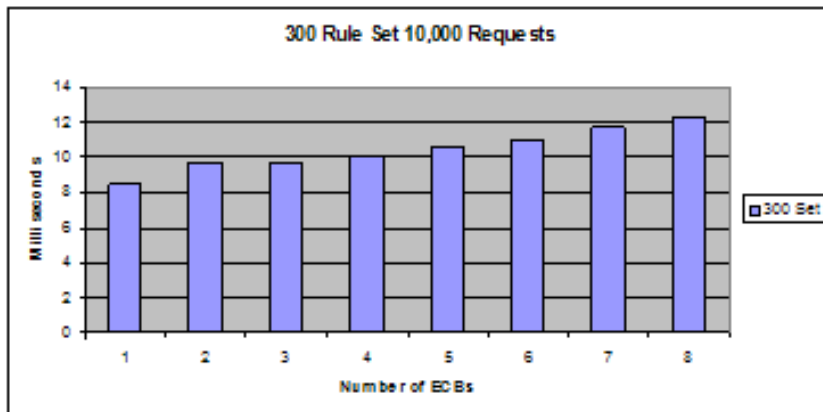
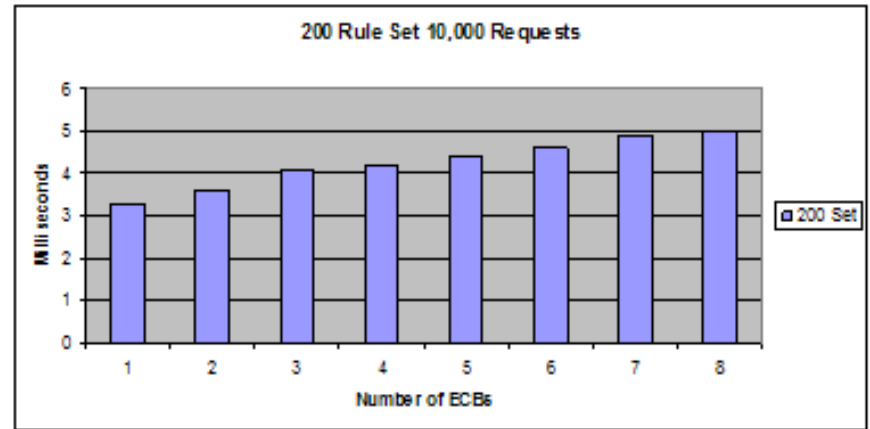
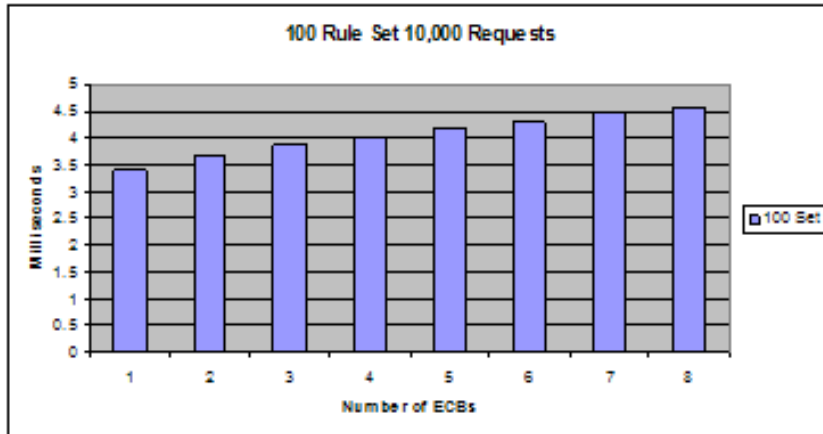
How does the ruleset size affect performance?



Average response times below 10 ms (4 – 9 ms)

* 300-rule ruleset has additional complexity over other rulesets

How does concurrency affect performance?

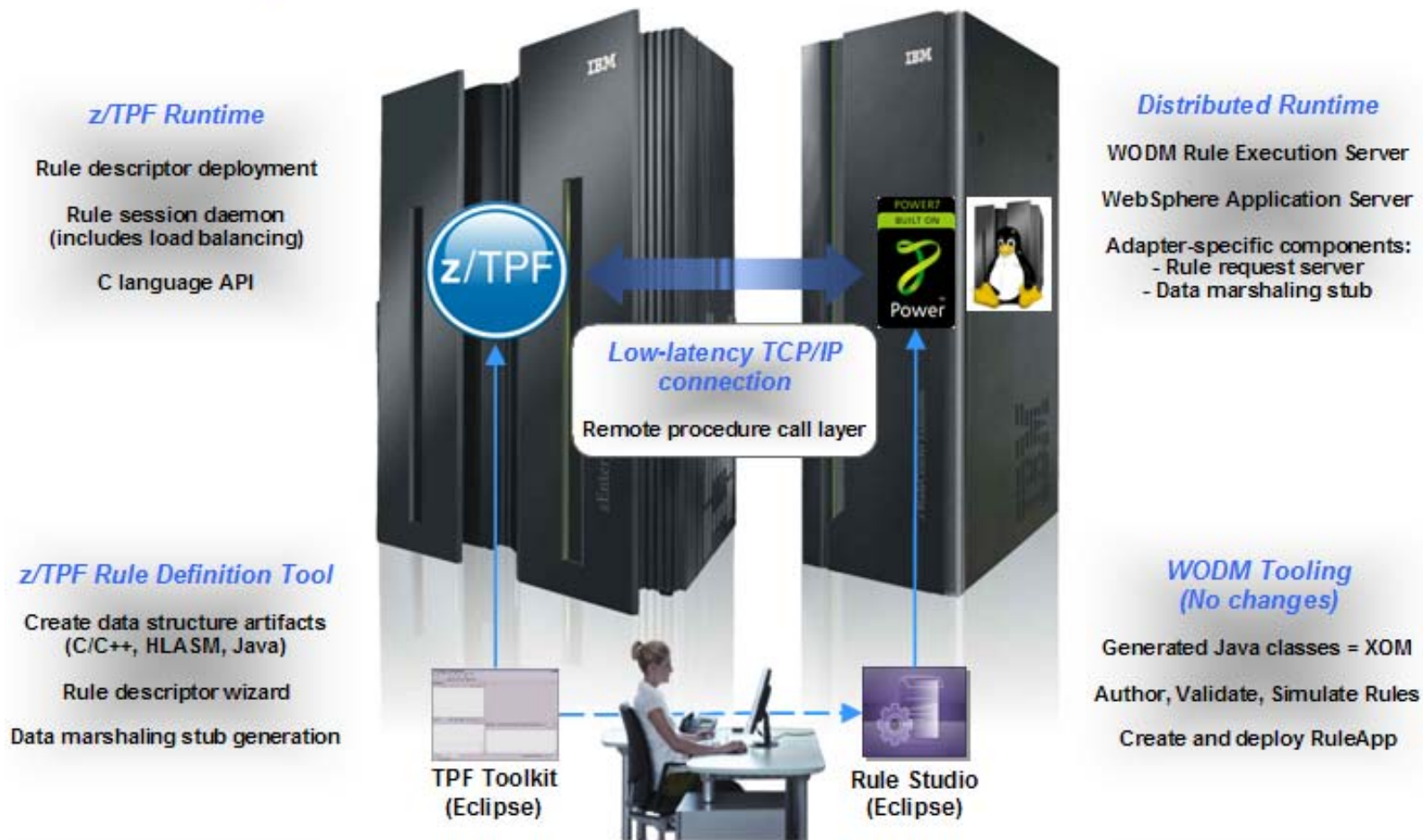


Average increase in response time of 2-10% for each additional concurrent execution thread

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z/TPF Adapter for WODM



Creating a WODM RuleApp to be invoked from z/TPF

- 1. Start TPF Toolkit**
- 2. Define input and output structures using GUI wizard**
- 3. Generate input and output C structures, HLASM DSECTs, and Java classes (XOM)**
- 4. Start Rule Studio**
- 5. Create a rule project**
- 6. Attach the Java project (import the XOM)**
- 7. Create the BOM**
- 8. Declare ruleset parameters**
- 9. Author and test the rules**
- 10. Create a RuleApp (package one or more rulesets)**
- 11. Deploy RuleApp to Rule Execution Server (RES)**
- 12. Generate z/TPF RuleApp deployment descriptor**
- 13. Deploy RuleApp deployment descriptor on z/TPF**
- 14. Create an application to invoke rulesets using z/TPF Rule APIs and generated input and output data structures**
- 15. Build and load application**
- 16. Run application**
- 17. Enjoy your new found business agility**

Summary

- **Use of a business rules management system (BRMS) can help your business become more flexible and more reactive to changing business needs**
 - Rule engines are nice...but they are only one part of the story. Authoring, validation, simulation, and management are all equally important aspects of BRMS.
 - Puts the power of rule management closer to those who make the business decisions
- **You can begin using consumer web services support today in z/TPF to invoke transparent decision services on WODM**

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