WebSphere Operational Decision Management (WODM) Support

Name: Colette A. Manoni
Agenda

- Value of Business Rules Management System
- TPFUG Requirement
- Overview of component architecture
- New tooling
- Build environment changes
- APAR Details
Where Business Rules are Found

Processes
Mainframe Systems
Spreadsheets & Documents
Databases
Application Code

User Tools
Automate and test business policies using business rules, decision tables and decision trees

Rule Repository
Store, organize, report and audit harvested business policies

Rule Execution & Monitoring
Deploy and monitor automated business policies as they execute

The Major Components of a Business Rule Management System (BRMS)
Set of tools to enable definition and management of business rules

Environment to run and monitor the rules execution
Rule Designer
TPFUG SOA09001F – z/TPF Rules Engine

• Low latency, custom adapter for invoking IBM WODM rule execution server on WAS from z/TPF applications

• Tooling to generate code for marshaling/unmarshaling data between C (z/TPF) WODM
Terminology

- **Ruleset** – A set of rules that can be executed by the rule engine.
- **RuleApp** – A deployment and management unit containing one or more rulesets.
- **Rule Engine** – Executes a given ruleset against a set of objects.
- **Rule Execution Server (RES)** – A robust, scalable and secure engine for monitoring and managing deployment of rule-based applications.
- **Rule Request Server (RRS)** - Resource adapter that facilitates the requests and responses between z/TPF and the rule execution server.
Architecture of z/TPF infrastructure for WODM
Endpoint Group

- Defines a set of servers containing the same RuleApps
- Managed by common deployment.
  - Files loaded to TPF using E-type loader or image loader.
  - Automatically deployed
  - Files parsed once and results put into an in memory structure.
- TPF toolkit wizard provided to create an Endpoint Group file.
Endpoint Group file contents

- **Endpoint group**
  - Name
  - Threshold and max requests queued

- **One or more endpoints**
  - Server address and port
  - Initial and max number of sockets
  - TPF processor IDs that can access the endpoint
TPF Data Model

• **Object definitions**
  • Input and Output parameters to a ruleset execution
  • Data defined in a Business Event Specification

• **Managed by common deployment.**
  • Files loaded to TPF using E-type loader or image loader.
  • Automatically deployed
  • Files parsed once and results put into an in memory structure.

• **TPF toolkit wizard provided to create TPF Data Model file(s)**
Data Model file contents

- **Object List**
  - Name
  - Encoding (default IBM-1047)
  - One or more object definitions

- **Object**
  - Name, jName, aName
  - Total size
  - Comment
  - One or more member definitions

- **Member**
  - Name
  - Type
  - Repeat factor
  - Length
  - Description
Member Datatypes  (Fixed length)

<table>
<thead>
<tr>
<th>Data model type</th>
<th>C type</th>
<th>Java</th>
<th>HLASM</th>
</tr>
</thead>
<tbody>
<tr>
<td>binary</td>
<td>char[repeat][length]</td>
<td>byte[]</td>
<td>repeatXLlength</td>
</tr>
<tr>
<td>char</td>
<td>char[repeat][length]</td>
<td>List&lt;String&gt;(^1)</td>
<td>repeatCLlength</td>
</tr>
<tr>
<td>unsigned char</td>
<td>unsigned char[repeat][length]</td>
<td>List&lt;String&gt;(^1)</td>
<td>repeatCLlength</td>
</tr>
<tr>
<td>short</td>
<td>short[repeat]</td>
<td>List&lt;Short&gt;</td>
<td>repeatXL2</td>
</tr>
<tr>
<td>unsigned short</td>
<td>unsigned short[repeat]</td>
<td>List&lt;Short&gt;</td>
<td>repeatXL2</td>
</tr>
<tr>
<td>int</td>
<td>int[repeat]</td>
<td>List&lt;Integer&gt;</td>
<td>repeatXL4</td>
</tr>
<tr>
<td>unsigned int</td>
<td>unsigned int[repeat]</td>
<td>List&lt;Integer&gt;</td>
<td>repeatXL4</td>
</tr>
<tr>
<td>long</td>
<td>long[repeat]</td>
<td>List&lt;Long&gt;</td>
<td>repeatXL8</td>
</tr>
<tr>
<td>unsigned long</td>
<td>unsigned long[repeat]</td>
<td>List&lt;Long&gt;</td>
<td>repeatXL8</td>
</tr>
<tr>
<td>long long</td>
<td>long long[repeat]</td>
<td>List&lt;Long&gt;</td>
<td>repeatXL8</td>
</tr>
<tr>
<td>unsigned long long</td>
<td>unsigned long long[repeat]</td>
<td>List&lt;Long&gt;</td>
<td>repeatXL8</td>
</tr>
<tr>
<td>float</td>
<td>float[repeat]</td>
<td>List&lt;Float&gt;</td>
<td>repeatXL4</td>
</tr>
<tr>
<td>double</td>
<td>double[repeat]</td>
<td>List&lt;Double&gt;</td>
<td>repeatXL8</td>
</tr>
</tbody>
</table>
## Member Datatypes (Variable length)

<table>
<thead>
<tr>
<th>Data model type</th>
<th>C type</th>
<th>Java</th>
<th>HLASM</th>
</tr>
</thead>
<tbody>
<tr>
<td>binaryString²</td>
<td>char[]</td>
<td>byte[]</td>
<td>0XL1</td>
</tr>
<tr>
<td>charString²</td>
<td>char[]</td>
<td>String¹</td>
<td>0CL1</td>
</tr>
<tr>
<td>vbinaryString</td>
<td>TPF_DM_GET</td>
<td>byte[]</td>
<td>_LENGTH XL4</td>
</tr>
<tr>
<td></td>
<td>TPF_DM_SET</td>
<td></td>
<td>_DATA 0XL1</td>
</tr>
<tr>
<td>vcharString</td>
<td>TPF_DM_GET</td>
<td>String¹</td>
<td>_LENGTH XL4</td>
</tr>
<tr>
<td></td>
<td>TPF_DM_SET</td>
<td></td>
<td>_DATA 0CL1</td>
</tr>
</tbody>
</table>

**Notes:**
Java strings use encoding value for code page translation to UTF-8
TotalSize required, repeat attribute not allowed
RuleApp

• Defines the input and output objects to a ruleset and where the ruleset is deployed (end point group)

• Managed by common deployment.
  • Files loaded to TPF using E-type loader or image loader.
  • Manually deployed
  • Files parsed once and results put into an in memory structure.

• TPF toolkit wizard provided to create a RuleApp descriptor file.
RuleApp file contents

• **Rule Application**
  • Name
  • Version
  • One or more end point group names
  • One or more rulesets

• **Rulesets**
  • Name
  • Version
  • Timeout
  • Input/Output definitions
    • Name of parameter
    • TPF Data Model object name
Architecture of Rule Request Server

Rule Request Server

Connection Manager

Java Request Unmarshal Stub

Java Response Marshal Stub

Ruleset Invoker

Rule Execution Server

RuleApp

Ruleset

Ruleset

Ruleset

IBM supplied
User written
WODM
Ruleset specific generated components

Request from z/TPF
Customizing the rule request server (-rrs)

TPF Data Model (.tdm.xml)
- ObjectA
- ObjectB
- ObjectC

Java Classes (.java)

Rule Request Server (.ear)
- Server.jar
- XOM1.jar
- XOM2.jar

tpfObjectConverter

Rule Designer
Producing DSECTs and C Headers

TPF Data Model (.tdm.xml)

<table>
<thead>
<tr>
<th>ObjectA</th>
</tr>
</thead>
<tbody>
<tr>
<td>ObjectB</td>
</tr>
<tr>
<td>ObjectC</td>
</tr>
</tbody>
</table>

tpfObjectConverter

- Headers (.h)
- Macros (.mac)

- StructA
- DsectA
Build Environment Changes

• MakeTPF tools enhanced to support TPF Data Model (XML) file processing
  • bldtpf -tdmdd option added
  • Enables integration of rule request server EAR file and artifact generation into the build process

• New control files added
  • tpf.cntl_tdmdd and user.cntl_tdmdd
  • These contain an entry for each TPF Data Model (XML) file to be processed by the tpfObjectConverter and define which artifacts are produced: macros, headers, classes, rule request server EAR
APAR Details

- **PJ40403 - z/TPF adapter for WODM**
  - The rule request server requires either WAS 7.0 or WAS 8.0
  - The z/TPF adapter for WODM requires Websphere Operational Decision Management v8.0

- **PJ40248 - tpfObjectConverter**
  - Requires Java Runtime Environment (JRE) to run
  - Requires Java Software Development Kit (SDK) to update the rule request server

- TPF Toolkit V.next scheduled for release in 4Q2012
Questions?
Thank you
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