Beyond Unix and Windows Agent Technology: Application Services and DB Agents

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Abstract

> This session discusses Agent technology that will be used by CA Workload Automation AE 11.3. Agent topics include the Database Agent, Application Services Agent, and System Agent.
Agenda

> Landscape
> Agent Architecture
> System Agent
> Application Services Agent
> Database Agent
Landscape
Does your Enterprise look like this?

- WCC
- UNIX
- z/OS
- J2EE App Server
- CA WA
- SAP

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Do You Need to Manage This?

**Legacy Jobs**
- z/OS Objects
  - z/OS dataset
  - z/OS manual
  - z/OS job
- File Trigger
- FTP Transfer
- Microfocus
- I5/OS
- Windows
- Unix/Linux

**ERP Jobs**
- Oracle Apps
  - Request Set
  - Single
  - PeopleSoft
- SAP
  - Batch Input Sessions
  - B/W Infopackages
  - B/W Process Chain
  - Data Archiving
  - SAP Event
  - SAP Job Copy
  - SAP Process Monitor
  - SAP R3

**Advanced/Emerging Tech**
- J2EE
  - EJB
  - JMS Publish
  - JMS Subscribe
- Database
  - Database Monitor
  - Database Stored Procedure
  - Database Trigger
- Monitoring
  - CPU Monitoring
  - Disk Monitoring
  - IP Monitoring
  - Process Monitoring
  - Text File Monitoring
  - Windows Eventlog Monitoring
  - Windows Service Monitoring
CA Enterprise WA Agent Support

> Operating Systems
  - Solaris, AIX, HP, Windows, Linux, zOS, i5OS, USS

> ERP Systems
  - SAP, PeopleSoft, Oracle E-Business

> Databases
  - Oracle, MSSQL, DB2

> New and Emerging Platforms
  - JAVA, JMX, J2EE, Web Services
Agent Architecture
General Agent Architecture

> Decentralized, Asynchronous Approach
> Core Component
> Plug-in Architecture
  ▪ Communications Plug-ins
  ▪ Execution Plug-ins
Agent Architecture

Communication Plug-in
Communication Plug-in
Communication Plug-in

Core

Execution Plug-in
Execution Plug-in
Execution Plug-in
Core Architecture

From Communication Plug-in

Communication plug-in manager

Message Arrived

Send to manager

Outbox

Ask Initiator Manager to submit a job

We have an initiator, submit

Initiator Manager

Release initiator? Can go to manager?

We’ve got a reply

Execution Plug-in Manager

To Execution Plug-in
Message Content

> AFM

- Language Agents Speaks
- Highly Customizable
- Hierarchical
- Text Based
- Format
  - 7 Mandatory Parameters
  - Optional Residual Values
  - `<date><time><to><from><WOB ID><verb><subverb><optional residual>`
Plug-Ins

> Piece of Agent Functionality
> Message Exchanges via AFM
> Core to Plug-in and vise versa
Persistence

> Every Message is Persisted
  - Queues
  - Maps

> Written Locally

> All Activities are Logged
  - Log Levels
  - Archiving Options
Communication Plug-in

> Adaptable
> Receiver
> Transmitter
Java Based

> Common Functionality Java Based
> Runner Plug-In
  - Has C++ code
  - OS Specific Component
System Agent
Execution Plug-Ins

> Provides Agent Functionality

- File Monitoring
- Object Monitoring
- Runner
- FTP
- Management
- File Browser
Installation

> System Agent Part of CA Workload Automation AE r11.3
> Stand Alone
  - CA Workload Automation AE
  - CA Workload Automation DE
  - CA Workload Automation EE
  - CA Workload Automation SE
> Additional Plug-Ins Stand Alone Install
  - Pak Files
Configuration

> Agentparm.txt
> Mib file
  ▪ MIB information
> Security.txt
  ▪ ACL
> Cryptkey.txt
  ▪ FIPS 140-2 Compliant
Security

> Agent Control List File
> FTP Server Information
> Encryption
System Agent Job Types

> Command Jobs
  - Distributed System (CMD)
  - i5/OS Job (I5)
  - z/OS Job (ZOS)

> File Monitoring and Transfer
  - File Transfer Protocol (FTP)
  - Secured Copy (SCP)
  - File Trigger (FT)

> SNMP Management
  - SNMP Get (SNMPGET)
  - SNMP Set (SNMPSET)

> Wake On LAN (WOL)
System Agent Job Types

> Object Monitoring

- Windows Event Log Monitoring (OMEL)
- Text file reading and Monitoring (OMTF)
- Process Monitoring (OMP)
- Windows Service Monitoring (OMS)
- CPU Monitoring (OMCPU)
- IP Monitoring (OMIP)
- Disk Monitoring (OMDK)
Application Services Agent

> Integrates with Java-based applications
  - Java Management Extensions (JMX)
  - Java Message Service (JMS)
  - Java Objects
    - POJO
    - RMI
  - Servlets
    - Using HTTP job
  - Enterprise Java Beans (EJB)
    - Entity Beans
    - Session Beans

> Building blocks of modern applications
Application Services Agent - Configuration

> Installation
  - Dedicated installer
  - Similar to system agent

> Proxy support
  - Properties in agentparm.txt
    - http.proxyHost, http.proxyPort
    - http.proxyUser, http.proxyPassword.encr

> HTTPS/SSL support
  - Properties in agentparm.txt
    - javax.net.ssl.trustStore
    - javax.net.ssl.trustStorePassword.encr
JMX - Java Management Extensions

> Java technology that supplies tools for managing and monitoring:
  - applications
  - system objects
  - devices (e.g. printers)
  - service oriented networks

> Resources are represented by objects called MBeans (for Managed Bean).

> Manage anything Java-enabled that has been instrumented for JMX
JMS - Java Message Service

> Reliable enterprise messaging
> Asynchronous
> Allows to:
  ▪ publish a message to a JMS queue or JMS topic
  ▪ subscribe to message queue or topic
> Connects to message brokers
  ▪ Such as: WebSphere MQ, WebLogic MQ Series
  ▪ On many platforms
    – Including z/OS
POJO - Plain Old Java Object

> Create a zero-argument java object instance
> Invoke a method on it
> Output goes to spool file by default
> Response: STATE COMPLETE
  - URI() points to the serialized Java output
  - Value() returns returnObject.toString()
RMI - Remote Method Invocation

> Create a zero-argument java object instance
> Invoke a method on it
> Output goes to spool file by default
> Response: STATE COMPLETE
  - URI() points to the serialized Java output
  - Value() returns returnObject.toString()
Servlet

> Java-based program that:
  - runs on a web server (servlet container)
  - receives a request
  - generates a response
> Adds dynamic content to a Web server
> Often used in conjunction with JSPs
> More efficient than CGI
  - CGI: a new process for each HTTP request
  - Servlet: a new thread per request
HTTP Job

> Agent Sends HTTP request
  ▪ similar to when using a browser
> Response: STATE COMPLETE
  ▪ URI() points to the serialized Java output
> Use filter to limit what is stored in the spool file
EJB - Enterprise Java Bean

> Component deployed in an application server
> Encapsulates the business logic of an application
> Application server provides various services
  - Persistence, Transaction processing, Concurrency control, Naming and directory services (JNDI), Security

> Supported types
  - Session Beans
  - Entity Beans
    - replaced by the Java Persistence API in EJB 3.0
Session Bean Job

> **Stateful session bean**
  - Been is created first
    - Create method name
    - Create parameters

> **Stateless**
  - Only Method and Parameters

> **Output destination**
  - By default, all output redirected to spool file
Application Services Agent Job Types

> Entity Bean (ENTYBEAN)
> JMS Publish (JMSPUB)
> JMS Subscribe (JMSSUB)
> Java Session Bean (SESSBEAN)
> Invoke HTTP (HTTP)
> Run POJO (POJO)
> Run RMI (JAVARMI)
Application Services Agent Job Types

> Get JMX MBean Attribute (JMXMAG)
> Set JMX MBean Attribute (JMXMAS)
> Create MBean in JMX Server (JMXMC)
> Remove MBean from JMX Server (JMXMREM)
> Invoke JMX MBean Operation (JMXMOP)
> Subscribe for JMX MBean Notifications (JMXSUB)
> Invoke Web Service (WEBSVC)
Entity Bean Job Attributes (ENTYBEAN)

> provider_url
> operation_type
> initial_context_factory
> bean_name
> create_name
> create_parameter
> finder_name
> finder_parameter
> modify_parameter
> j2ee_user
JMS Publish Job Attributes (JMS PUB)

- connection_factory
- destination_name
- initial_context_factory
- message_class
- j2ee_parameter
- provider_url
- use_topic
- j2ee_user
JMS Subscribe Job Attributes (JMSSUB)

- connection_factory
- destination_name
- destination_file
- initial_context_factory
- provider_url
- use_topic
- j2ee_user
- filter
- continuous
Session Bean Job Attributes (SESSBEAN)

- provider_url
- operation_type
- initial_context_factory
- bean_name
- create_method
- create_parameter
- destination_file
- j2ee_user
HTTP Job Attributes (HTTP)

> provider_url
> method_name
> invocation_type
> j2ee_parameter
> j2ee_conn_domain
> j2ee_conn_origin
> j2ee_authentication_origin
> j2ee_proxy_domain
> j2ee_proxy_host
> j2ee_proxy_port
Plain Old Java Object Job Attributes (POJO)

- class_name
- method_name
- j2ee_parameter
- destination_file
JAVA Remote Method Invocation Job Attributes (JAVARMI)

> remote_name
> method_name
> j2ee_parameter
> destination_file
JMX MBean Attribute Get Job Attributes (JMXMAG)

> URL
> mbean_name
> mbean_attr
> jmx_user
> success_pattern
JMX MBean Attribute Set Job Attributes (JMXMAS)

> URL
> mbean_name
> mbean_attr
> jmx_parameter
> jmx_user
> success_pattern
JMX MBean Create Job Attributes (JMXMC)

> URL
> class_name
> mbean_name
> jmx_parameter
> jmx_user
> success_pattern
JMX MBean Remove Job Attributes (JMXMREM)

> URL
> mbean_name
> jmx_user
JMX MBean Operation Job Attributes (JMXMOP)

- URL
- mbean_name
- mbean_operation
- jmx_parameter
- jmx_user
- success_pattern
JMX Subscribe Job Attributes (JMXSUB)

> URL
> mbean_name
> mbean_attr
> jmx_user
> filter
> filter_type
> continuous
Web Services Job Attributes (WBSVC)

- target_namespace
- wsdl_operation
- wsdl_url
- port_name
- endpoint_url
- service_name
- web_parameter
- success_pattern
- one_way
- web_user

- return_namespace
- return_class_name
- return_xml_name
Database Agent
What would you like to automate?

- CA WA Database Agent
  - SQL Updates and Queries
  - Stored Procedures
  - Table Monitor
  - Data Triggers
Database SQL Command Job Attributes (SQL)

- sql_command
- connect_string
- user_role
- success_criteria
- destination_file
Database Stored Procedure Job Attributes (DBPROC)

> sp_name
> sp_arg
> connect_string
> user_role
> success_criteria
> result_type
Database Monitor Job Attributes (DBMON)

> monitor_type
> monitor_cond
> connect_string
> user_role
> tablename
> continuous
Database Trigger Job Attributes (DBTRIG)

- trigger_cond
- trigger_type
- connect_string
- user_role
- tablename
- continuous
- dbtype
Questions?