

GlassFish v2 Self Management

- **Sankara Rao Bhogi**

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- -Presentation to AS user experience meeting 11th Oct 2006

- -<http://glassfish.dev.java.net>

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Agenda

- Overview
- Tools Support
- GlassFish v2 planned features
- Resources

Define Self Management?

- JMX Standards based framework to automate the tuning/configuring/healing (Self Management) with in the appserver without user manual intervention at runtime

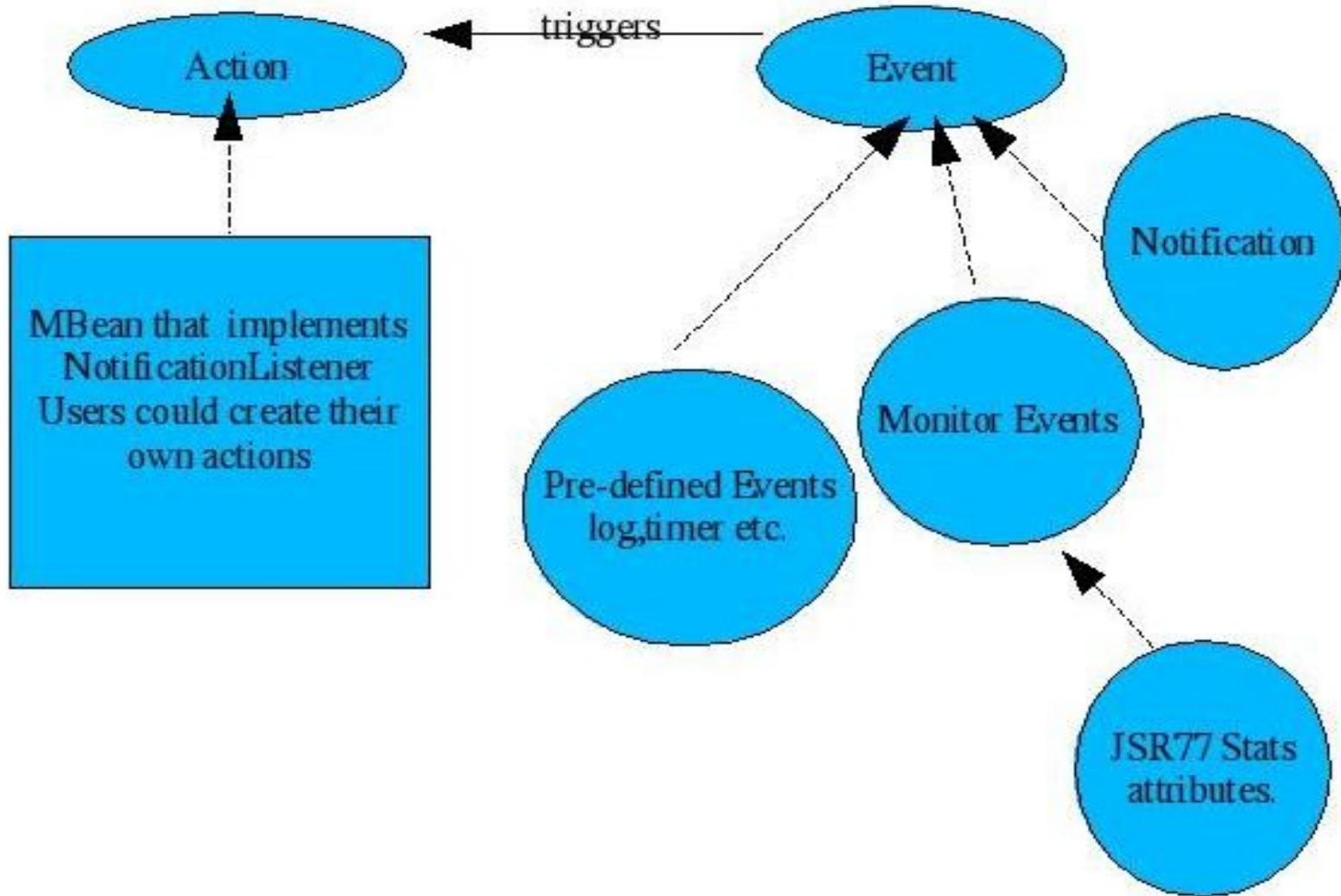
Framework Summary

- Built on JMX
- Custom MBean Support
- Based on the concept of management rules
- Set of Management Rules provided by default
- Admin GUI and CLI support to create and manage rules

Define Management Rule?

- Encapsulates Self Management Intelligence
- Contains an Action to be taken when an Event occurs
- Loose Coupling between Event and Action
 - > Allows the life cycle of Event and Action to be different
- Event – Action association is 1 to 1 within a management rule

Management Rule Components



Events

- Event Source is an MBean which can emit `javax.management.Notification`
- Set of Useful events are provided out of box
- Extendable Event Dictionary
- Events can be further customized by customizing its properties
- There are total 7 event types (log, timer, monitor, cluster, trace, lifecycle, notification)

Predefined Event : Log Event

- Customizable properties/filters:
 - > loggerNames (comman separated logger names or *)
 - > level (valid log level)
- Example: When an EJB container logger logs a SEVERE message

Predefined Event : Monitor Event

- Declarative Support for javax.management.monitor JMX service
- Supports counter, gauge and string monitors
- Additional support for monitoring complex attributes
- When the number of max connections in a JDBC connection Pool exceeds the specified threshold

Predefined Event : Timer Event

- Declarative Support for javax.management.timer JMX service
- Supports user defined date format type
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Predefined Event : Trace Event

- Supported Events
 - > Request Start/End
 - > Web Component Method Entry/Exit
 - > EJB Component Method Entry/Exit

Predefined Event : LifeCycle Event

- Supported Events
 - > at server start
 - > at server shutdown
 - > at server termination

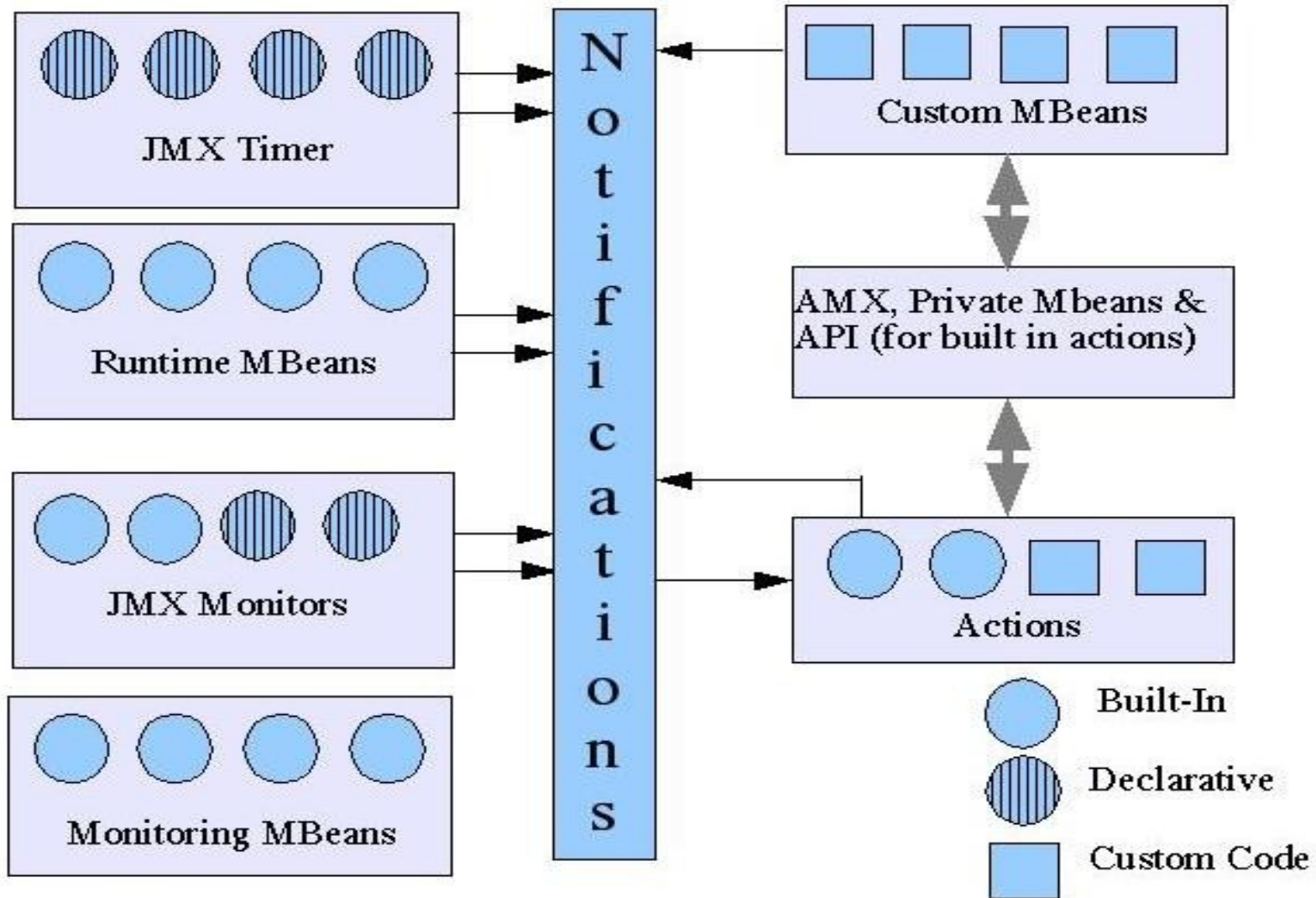
Predefined Event : Cluster Event

- Supported Events
 - > any server start in a given cluster
 - > any server shutdown in a given cluster

Predefined Event : Notification Event

- Any MBean which emits Notification
- Way to extend event dictionary

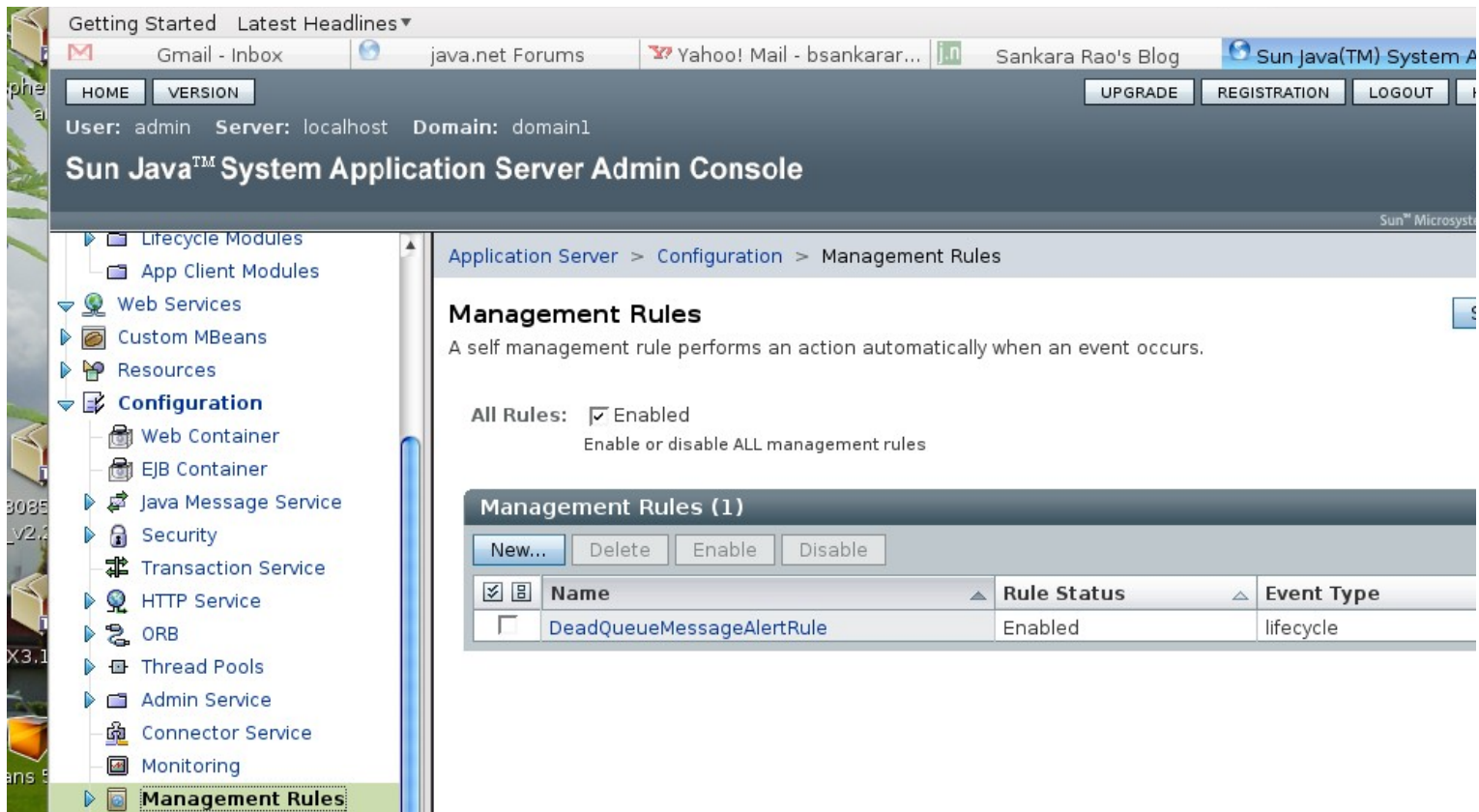
Rules subsystem overview



Admin CLI and GUI support

- Full Admin GUI Support for CRUD operations of management Rules
- CLI commands to Create, Delete and List Management Rules

Management Rules: Screen Shot



The screenshot shows the Sun Java System Application Server Admin Console. The breadcrumb navigation is "Application Server > Configuration > Management Rules".

Management Rules
 A self management rule performs an action automatically when an event occurs.

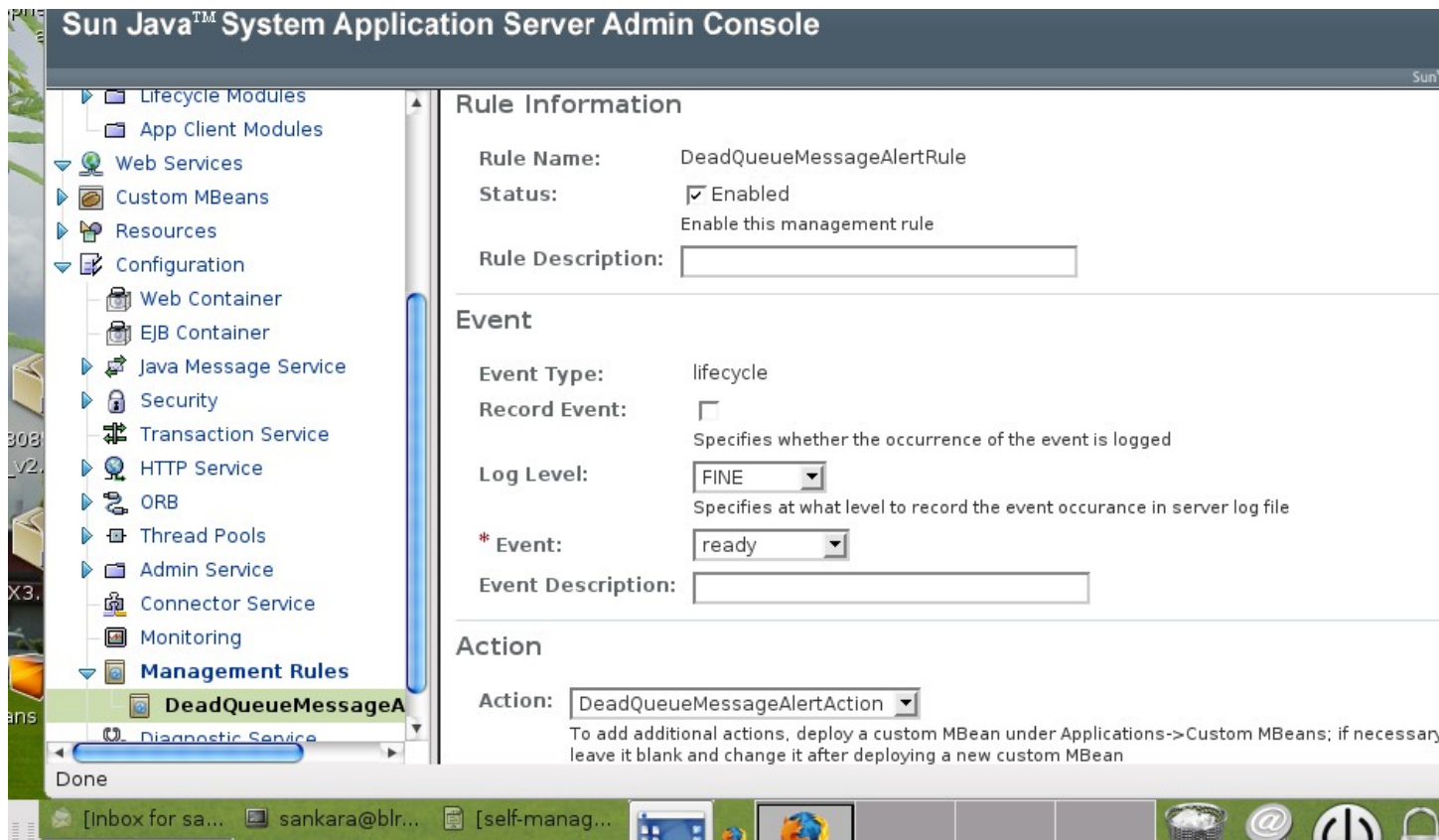
All Rules: Enabled
 Enable or disable ALL management rules

Management Rules (1)

Buttons: New... Delete Enable Disable

<input checked="" type="checkbox"/>	Name	Rule Status	Event Type
<input type="checkbox"/>	DeadQueueMessageAlertRule	Enabled	lifecycle

Management Rules: Screen Shot II



Sun Java™ System Application Server Admin Console

Management Rules

- DeadQueueMessageAlertRule

Rule Information

Rule Name: DeadQueueMessageAlertRule

Status: Enabled

Rule Description: Enable this management rule

Event

Event Type: lifecycle

Record Event: Specifies whether the occurrence of the event is logged

Log Level: FINE Specifies at what level to record the event occurrence in server log file

* Event: ready

Event Description:

Action

Action: DeadQueueMessageAlertAction

To add additional actions, deploy a custom MBean under Applications->Custom MBeans; if necessary, leave it blank and change it after deploying a new custom MBean

Predefined Rules

- Predefined Rules are not enabled by default
- Rules can be enabled by the user
- All the Rules audit the actions they take

Proposed predefined Rules for v2

- Self Configuring/Self tuning of JDBC Connection pools
- Self Healing/Diagnosing
 - > Out of memory detection, cleanup and alert notification
 - > Hang detection and recovery: Instance and thread hangs
 - > Dead queue Message Alert
 - > Disk full detection and server logs cleanup
- Few More..

DeadQueueMessageAlert Rule

- When ever a message can't be successfully delivered, MQ would put that message into a dead queue and administrator would be interested in knowing when that happens.
- Management Rule detects this event and would send a mail to the configured user. Threshold, Offset, Recipients are configurable.

Future

- Actions as scripts
- Direct Support for Multiple Actions with the Same Event
- Simple Event Composition such as 'and' and 'or'
- More Default Rules

Resources

- GlassFish Project : Self Management home
 - > <https://glassfish.dev.java.net/javaee5/selfmanagement/selfmanagementhome.html>
- Blog: "Self Management Framework in GlassFish"
 - > http://weblogs.java.net/blog/sankara/archive/2006/02/self_management.html
- Blog: "GlassFish : Self Management Rules"
 - > http://blogs.sun.com/roller/page/technical?entry=self_management_rules

Q & A

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