



GlassFish v2.1 & Enterprise Manager

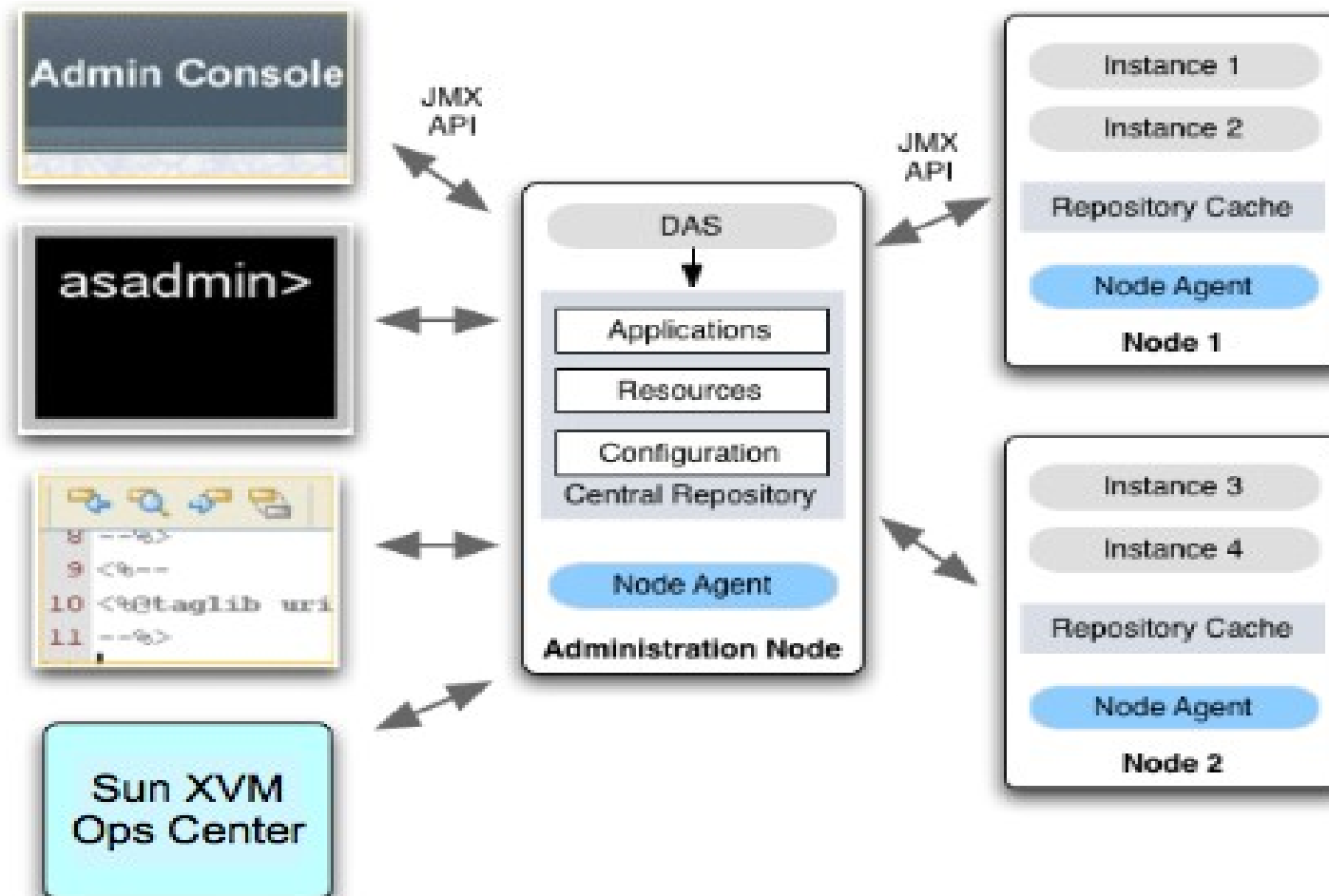
Alexis Moussine-Pouchkine
Sun Microsystems



Some vocabulary

- **Cluster** – a group a homogenous GlassFish instances administered as a whole
- **Load-Balancing** – a strategy and implementation to balance HTTP, IIOP, and other incoming requests. Enough to provide service continuity
- **High-Availability (HA)** – replication of stateful data to survive instance crash. All about session continuity

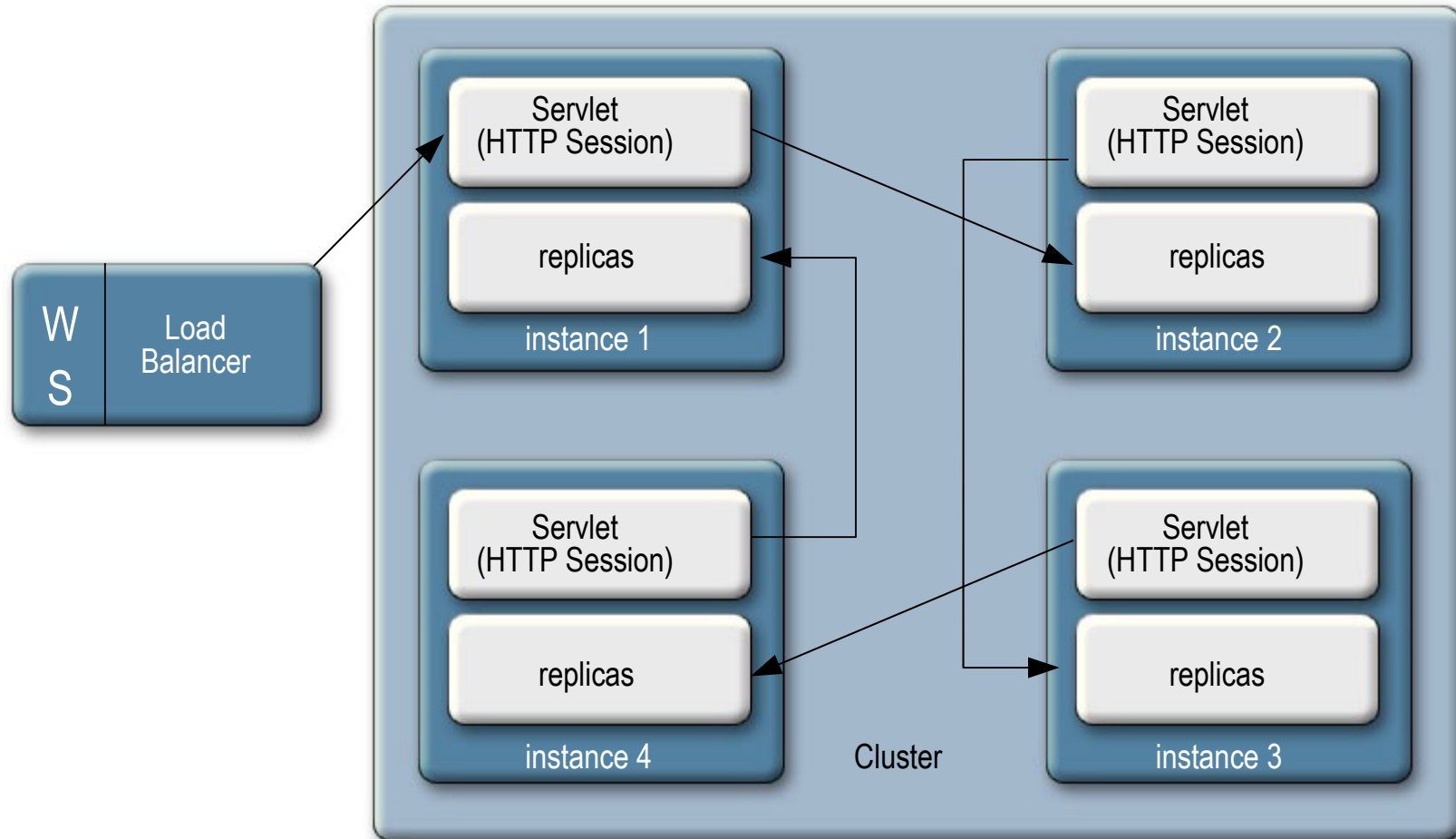
Clustering in GlassFish v2



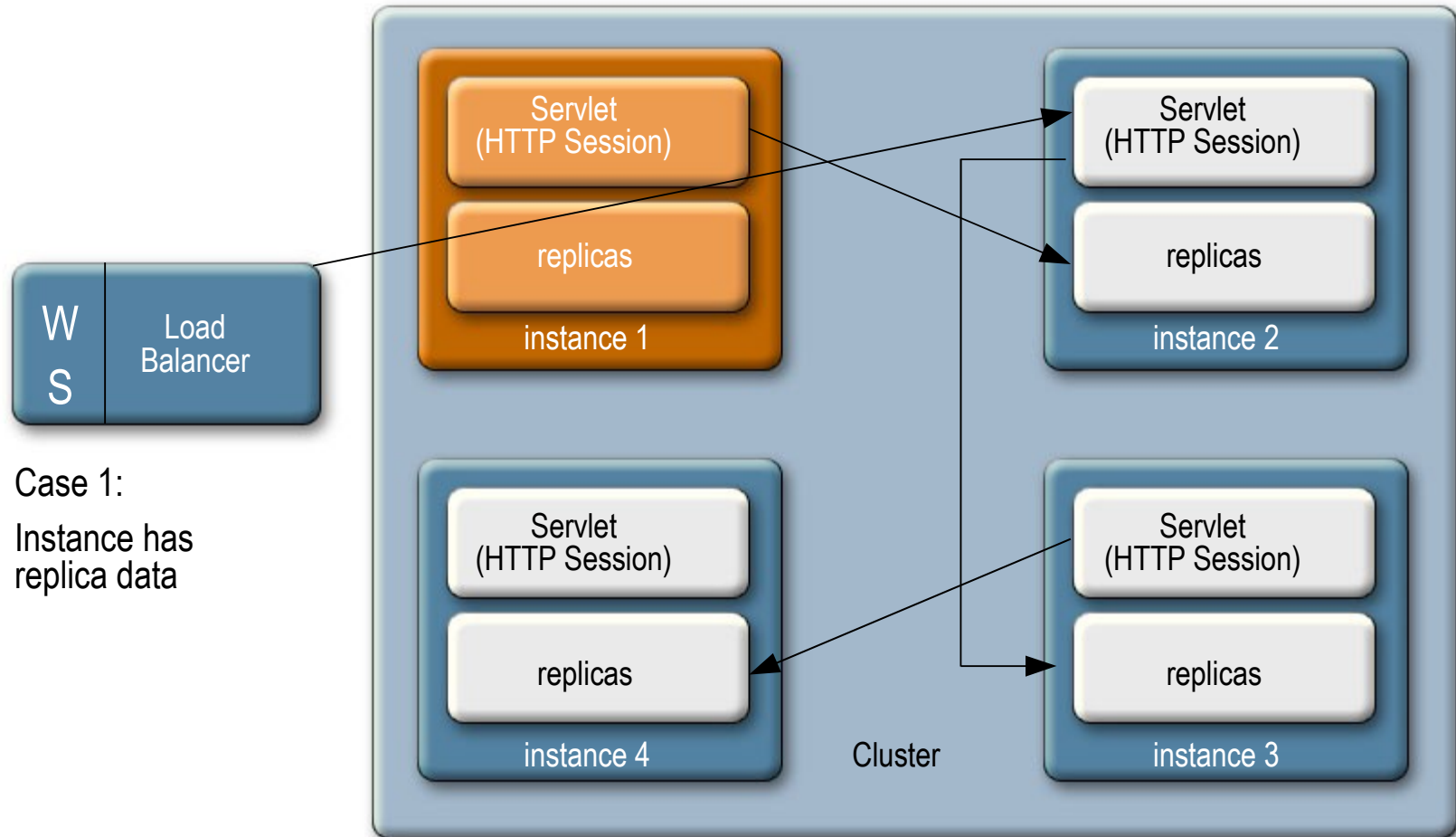
JMX = Java Management Extensions



HTTP Session State Failover

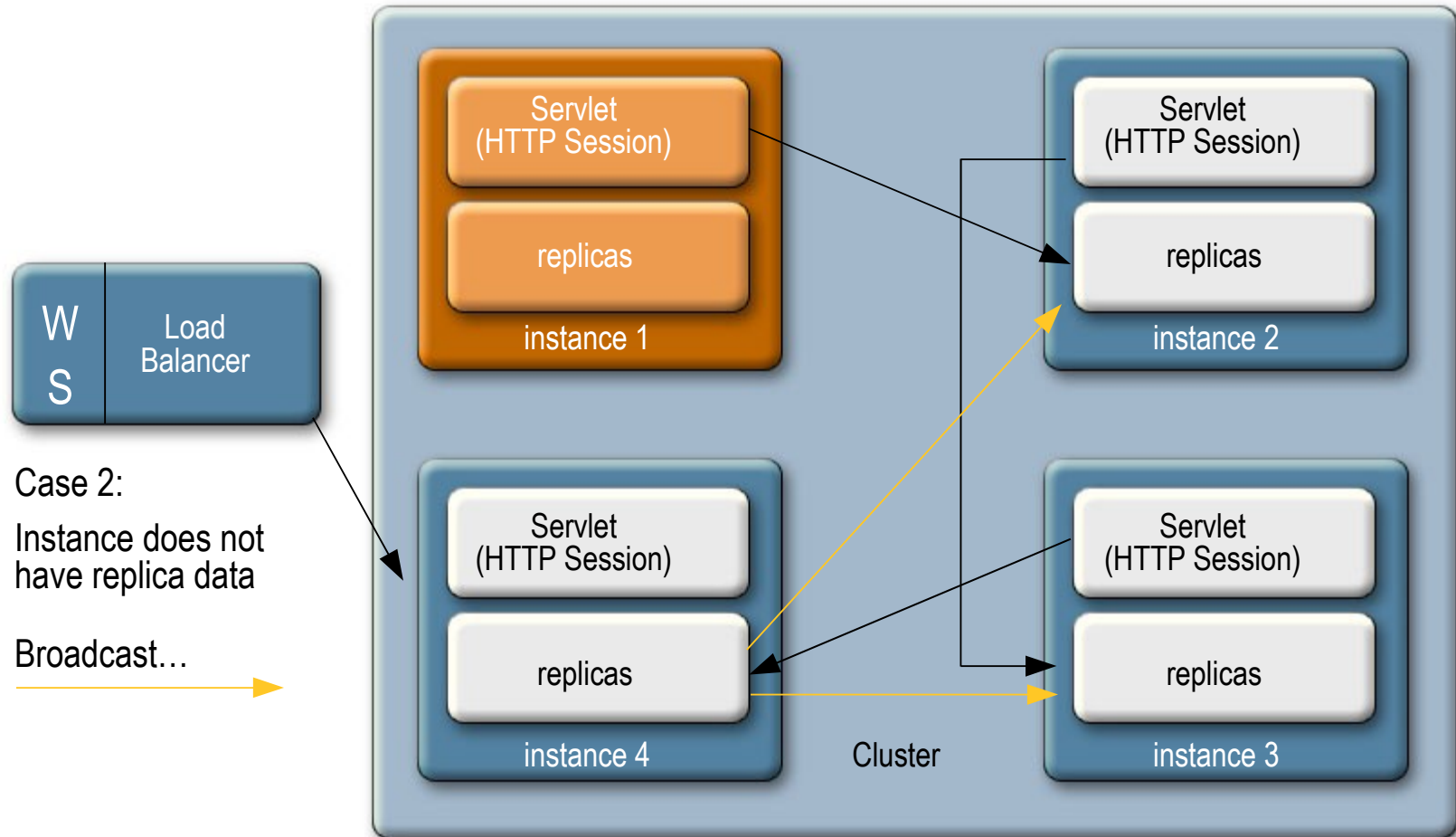


HTTP Session State Failover

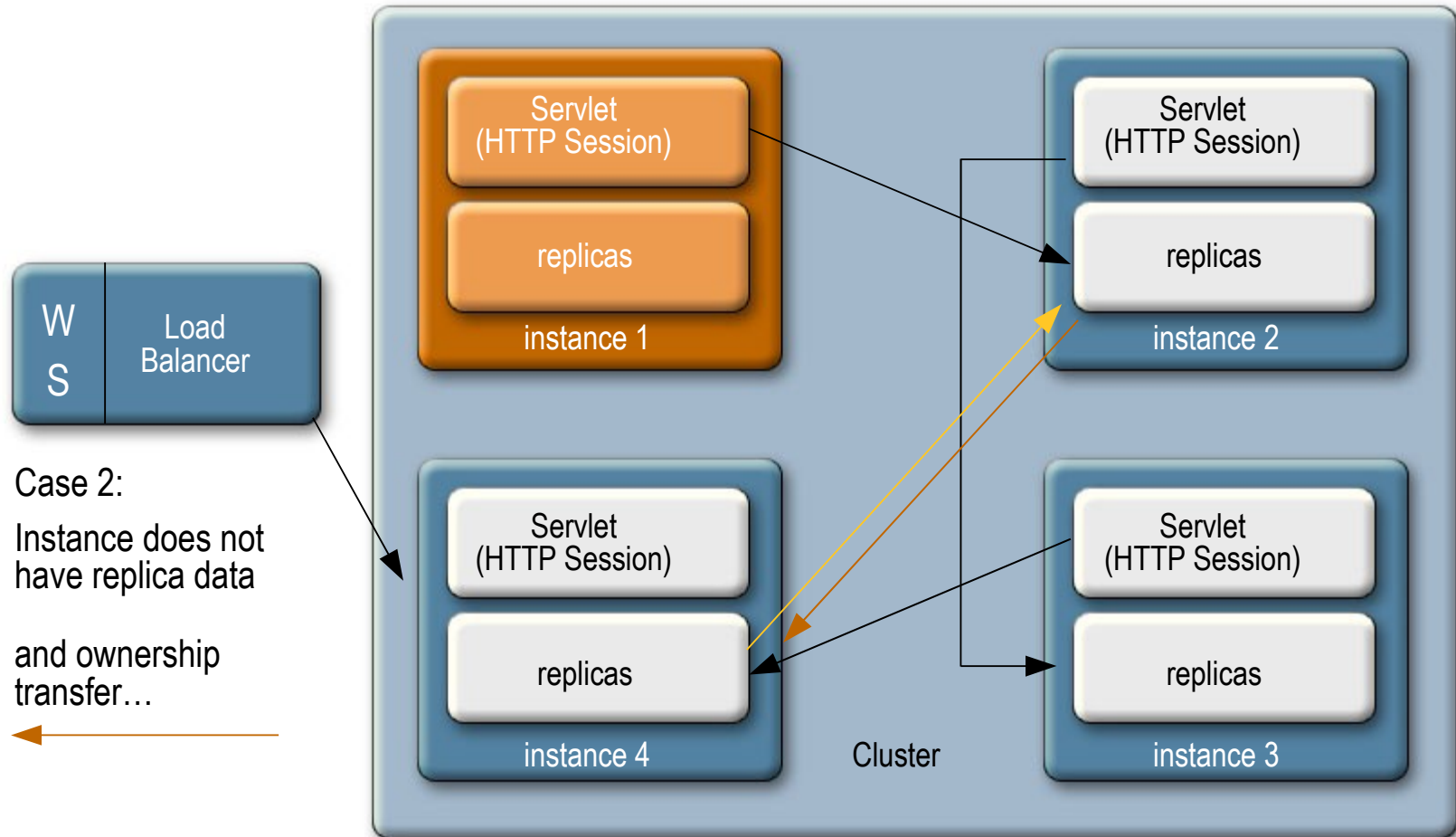


Case 1:
Instance has
replica data

HTTP Session State Failover

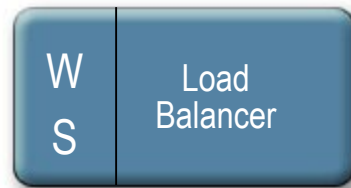


HTTP Session State Failover

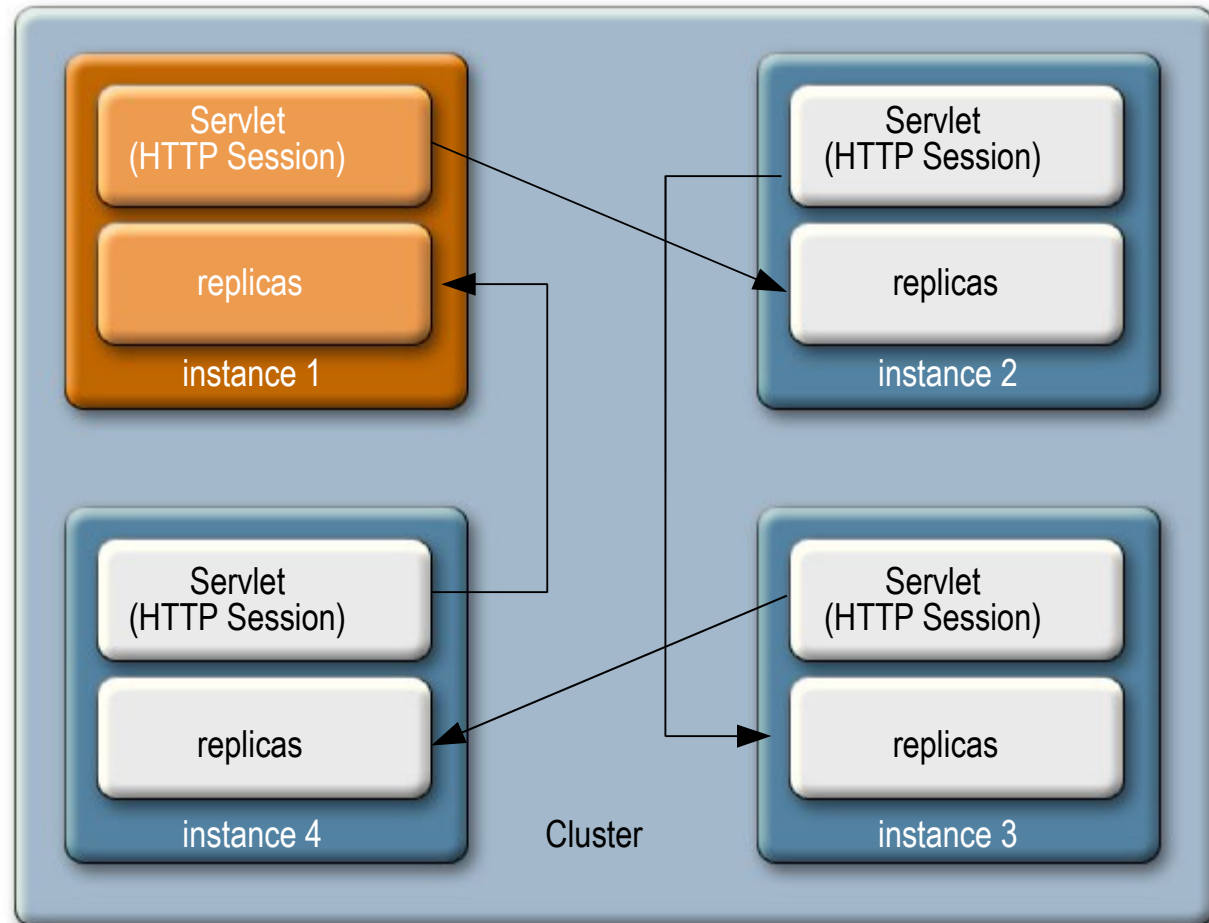


Case 2:
Instance does not
have replica data
and ownership
transfer...

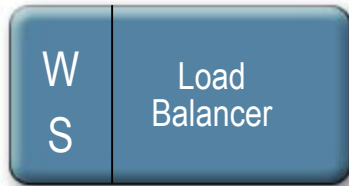
Cluster Dynamic Shape Change



Shape Change
instance1 fails

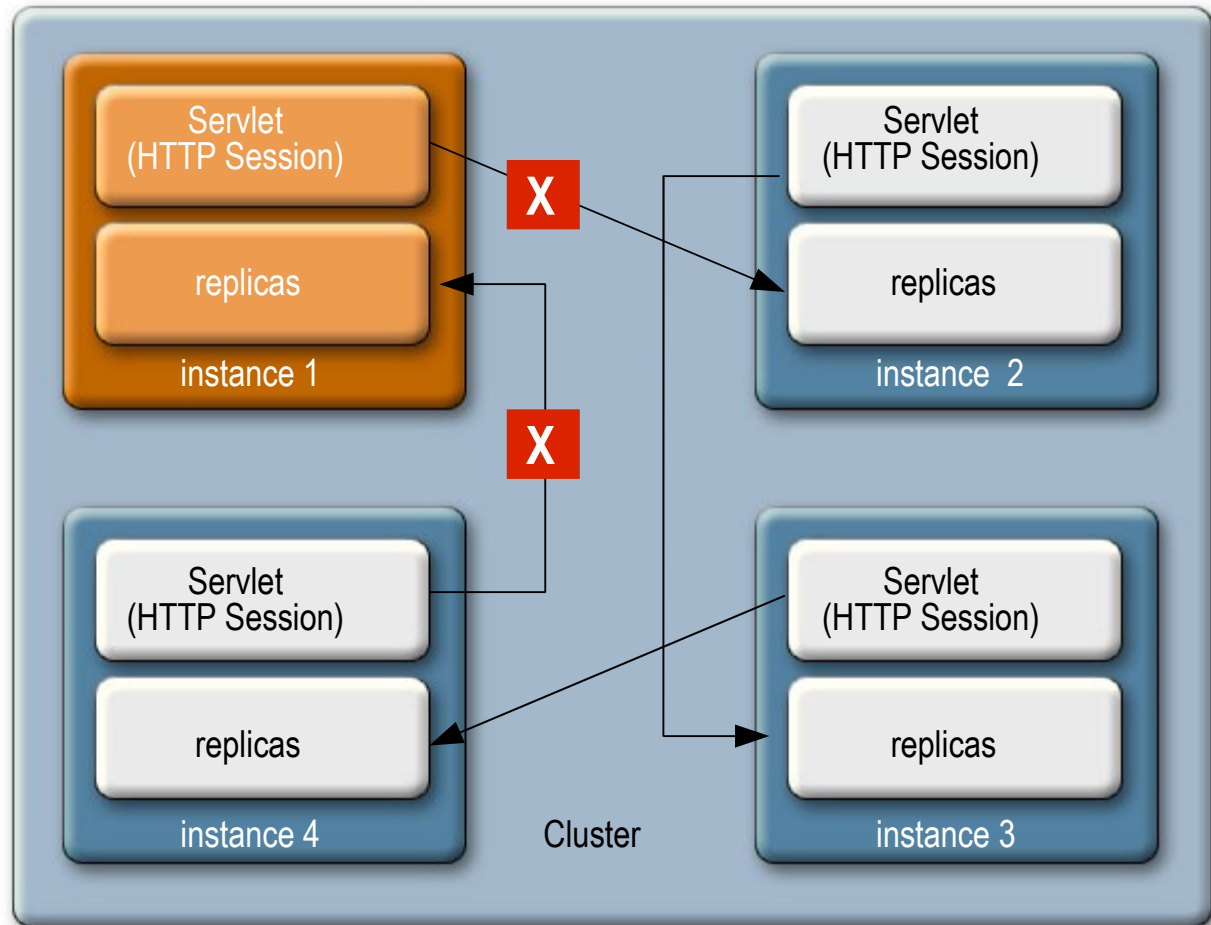


Cluster Dynamic Shape Change

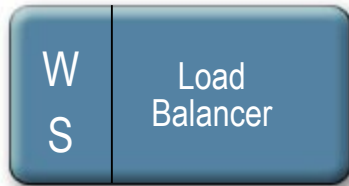


Shape Change
instance1 fails

Instance2 and 4
see the failure



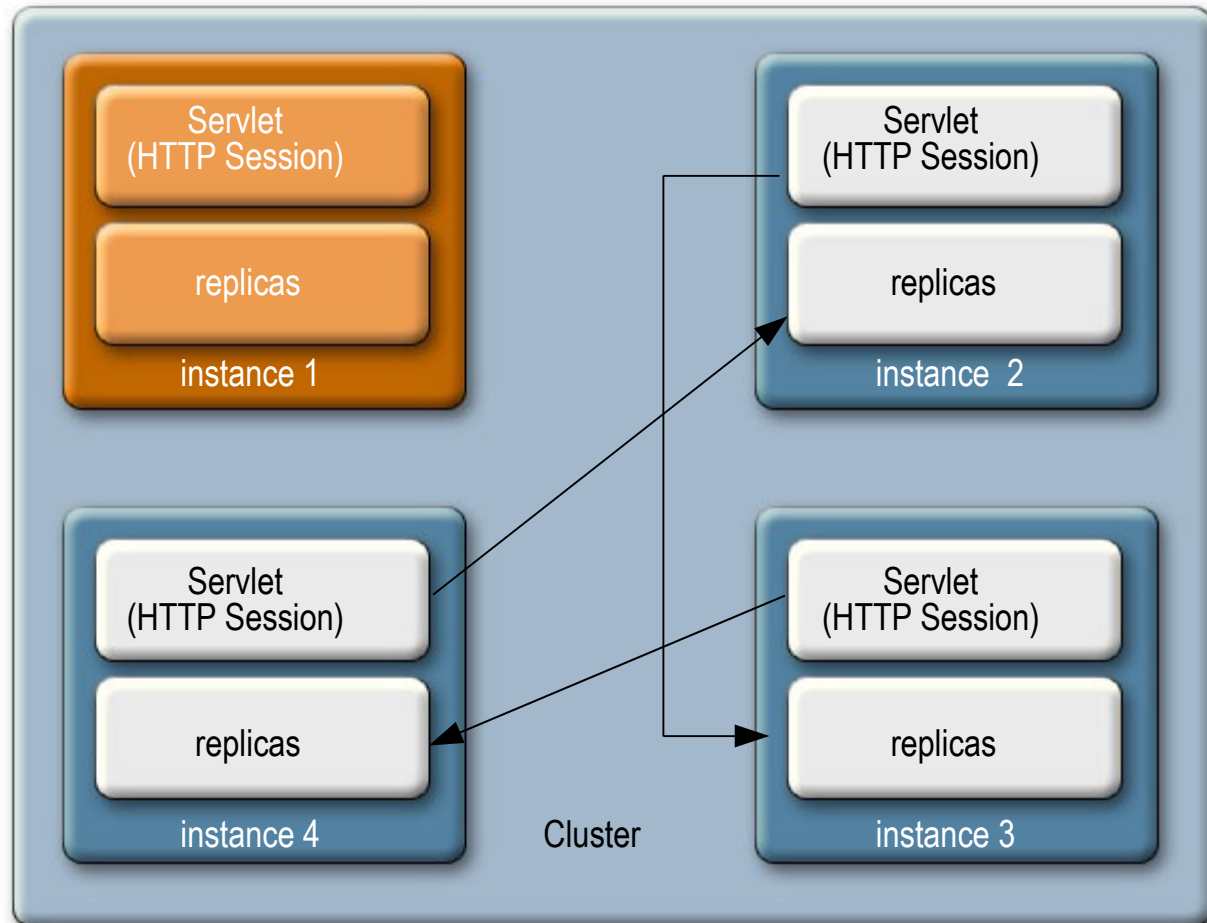
Cluster Dynamic Shape Change



Shape Change
instance1 fails

Instance2 and 4
see the failure

Instance4 selects
Instance2 as new
partner—new
connections
established



the reverse happens when an instance joins or re-joins the cluster

Memory Replication Configuration

Making your app distributable

- **<distributed/>** element
 - > Required in **web.xml**
 - Indicates you believe your application is ready to run in a cluster
- **Serializable objects required**
 - > HTTP Session state
 - > EJB technology Stateful Session Bean state

Demo

From Zero to GlassFish Cluster

Configuring the availability service

Configurations > default-config > Availability Service

| | | | |
|----------------------|-----------------------------------|----------------------------|------------------|
| Availability Service | Web Container Availability | EJB Container Availability | JMS Availability |
|----------------------|-----------------------------------|----------------------------|------------------|

Web Container Availability Save

Availability for the web container
Load Defaults

Availability Service: **Enabled**
 Enable instance-level availability service; use the Web/EJB/JMS tabs to override default HADB availability settings

Persistence Type: replicated
 HTTP session persistence mechanism

Persistence Frequency: web-method
 Frequency at which the HTTP session is stored

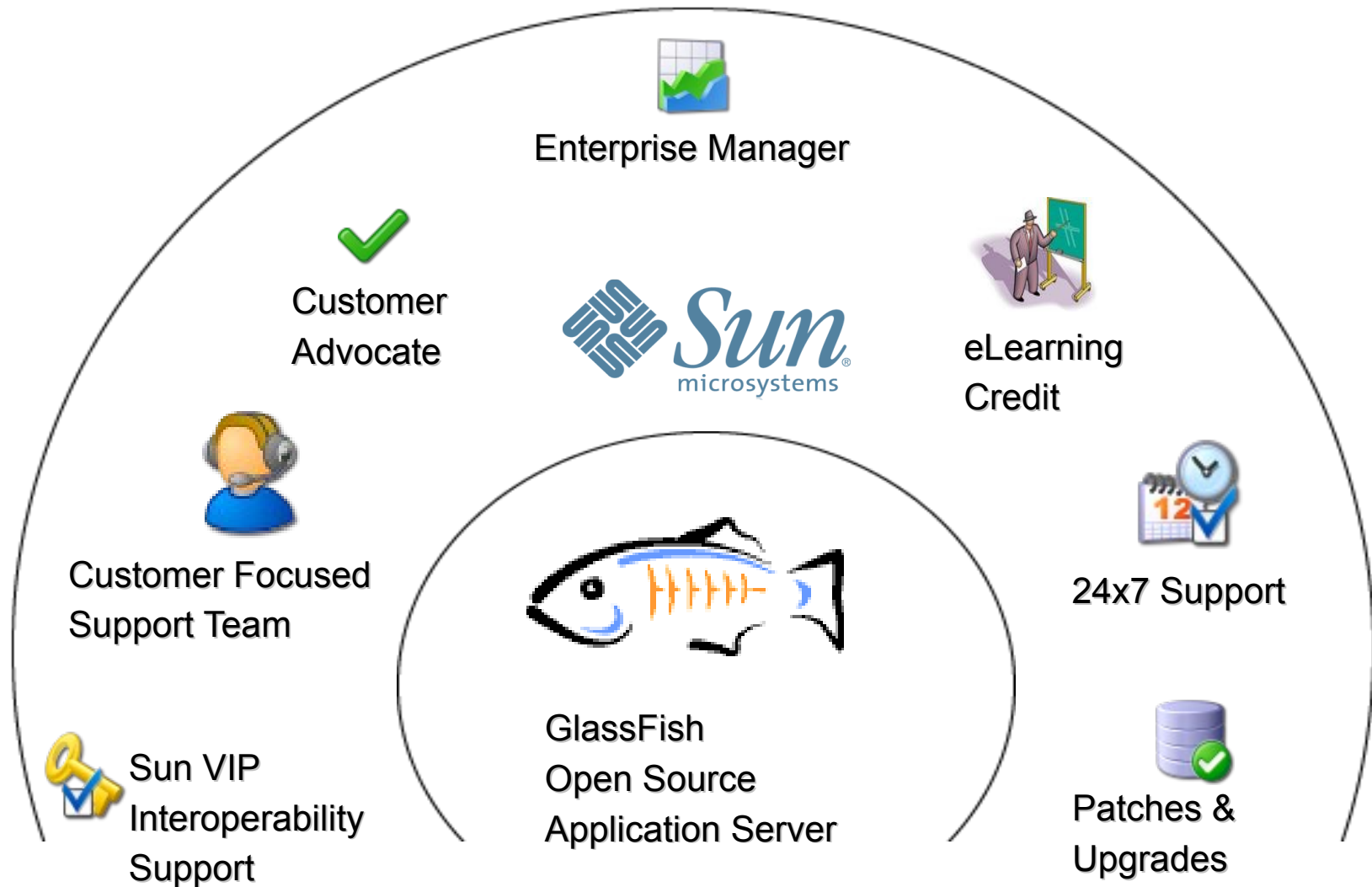
Persistence Scope: session
 Scope of HTTP session changes required for storage to occur

Single-Sign-On State: **Enabled**
 Controls whether the single sign-on state is available for failover

HTTP Session Store:
 JNDI name for the JDBC resource of the high-availability database; must contain only alphanumeric, underscore, dash, or dot characters

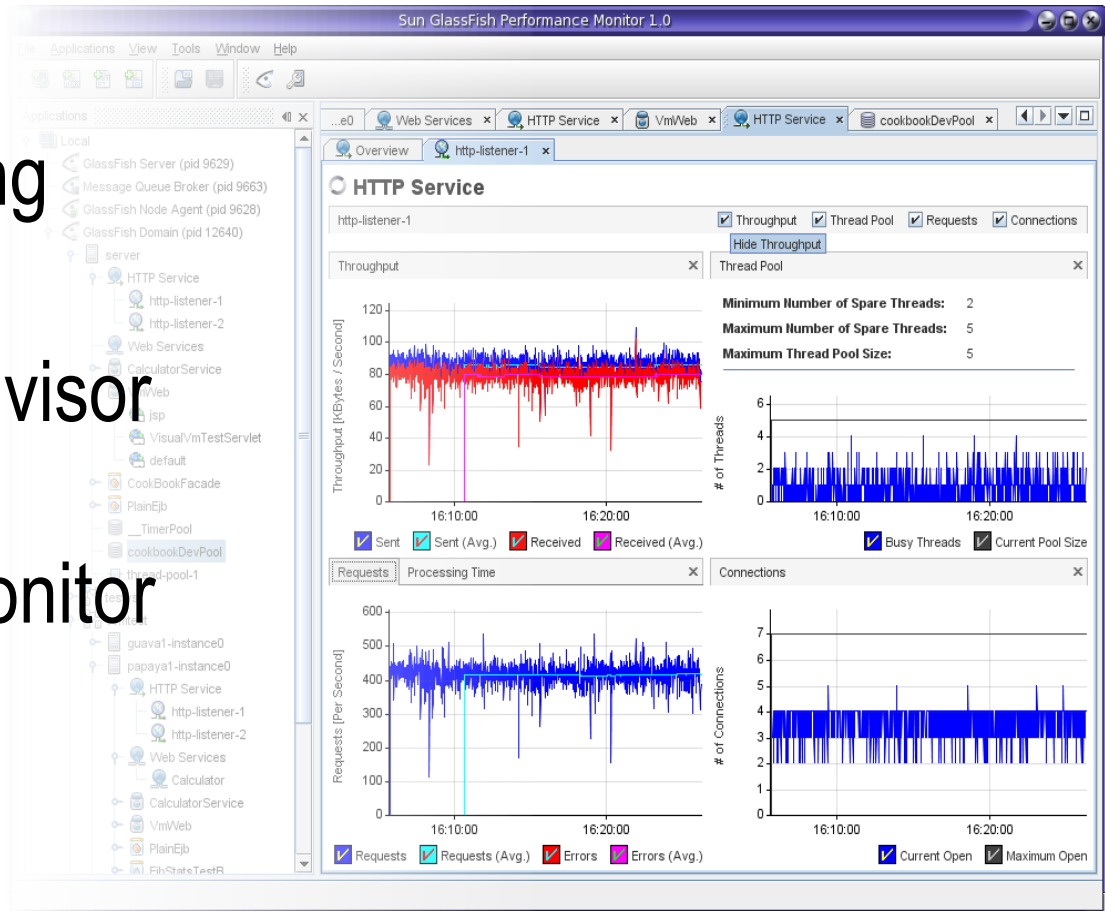
Persistence Store Health Check: **Enabled**

Sun GlassFish Enterprise Server



Enterprise Manager

- SNMP Monitoring
- Performance Advisor
- Performance Monitor



Enterprise Manager

- Requires GlassFish Enterprise v2.1 subscription
- Download via SunSolve
 - > SNMP Monitoring: 140750
 - > Performance Advisor: 140751
 - > Performance Monitor: 140749
 - > GlassFish v3: will be available in Update Center
- SunSolve click-through license
 - > No license keys
- Evaluation bundles in development

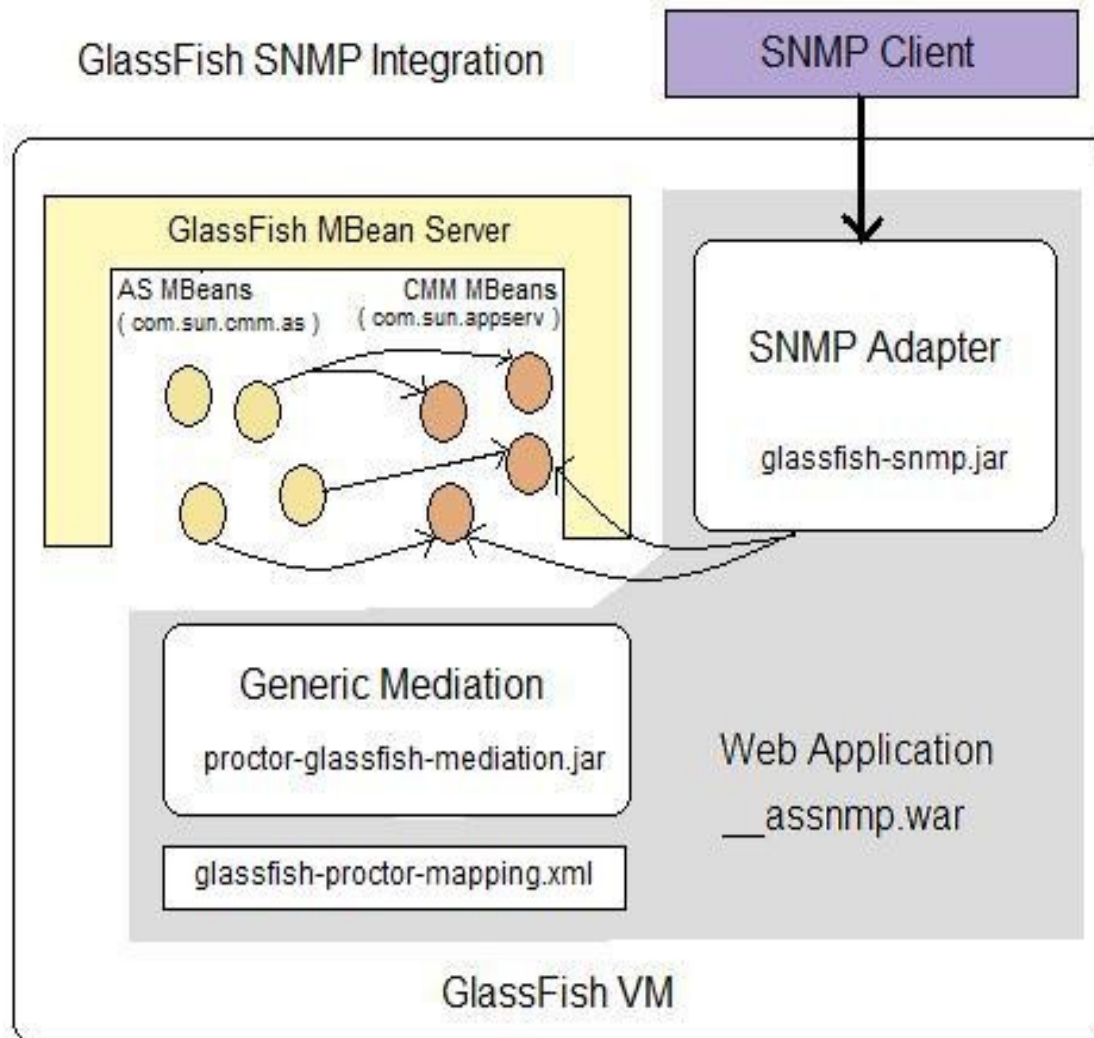
Enterprise Manager

SNMP Monitoring

- Leverage existing enterprise management tools
- SNMP v1, v2c adapter
 - > JSR 77/J2EE MIB
 - > Exposes JMX attributes via SNMP
- Deploys as a war file
- Can monitor instances through DAS or directly
- Configured via GlassFish properties

```
asadmin set standalone-instance1.property.snmp-adapter-port=10162
asadmin set clustered-instance1.property.snmp-adapter-port=10163
asadmin set clustered-instance2.property.snmp-adapter-port=1016
```

GlassFish SNMP Architecture



Enterprise Manager

Performance Advisor - Tuning

- Common Question
“How do I tune GlassFish?”
- More important question ...
“How do I tune GlassFish for my deployment?”
- Asks qualifying questions
 - > # CPU Cores? CMT Servers?
 - > Allocation time in Database?
 - > Garbage Collection strategy? Latency? Throughput?
- Optionally apply recommendations

Enterprise Manager

Performance Advisor - Tuning

Home | Version
User: admin | Domain: domain2 | Server: localhost

Sun GlassFish™ Enterprise Server v2.1

- Application Client Modules
- Web Services
- JB1
 - Service Assemblies
 - Components
 - Shared Libraries
- Custom MBeans
- Resources
 - Clusters
 - Stand-Alone Instances
 - HTTP Load Balancers
- Node Agents
- Performance Advisor
 - Management Rules
 - Physical Memory Alert
 - Memory Leak Alert
 - CPU Usage Trend Alert
 - Throughput Alert
 - GC Pause Time Alert
 - Log Entry Alert
 - Log Rotation Manager
 - JDBC Pool Manager
 - Tuner**
- Configurations

Performance Advisor > Tuner

Server Performance Tuner (Step 1 of 2)

This step gathers information about your server instance(s), which is used to present you with proposed changes to your configuration in the next step.

Configuration to Tune: server

Select the configuration to be tuned. Changing this selection reloads this page.

Number of Cores: * 1

The number of cores each server instance can utilize.

Maximum Heap Memory Available: * 1024 MB

Heap memory for the JVM in which the server instance(s) run.

Allocation Time for Database Access: Medium (10% - 20%)

Allocation time for database access.

Garbage Collection Strategy: Maximum Peak Throughput (Higher GC Pause)

Garbage collection strategy.

Disable Security Manager? **Yes**

If this box is checked, the Java Security Manager is disabled.

Disable Access Logger? **Yes**

If this box is checked, access logging is disabled.

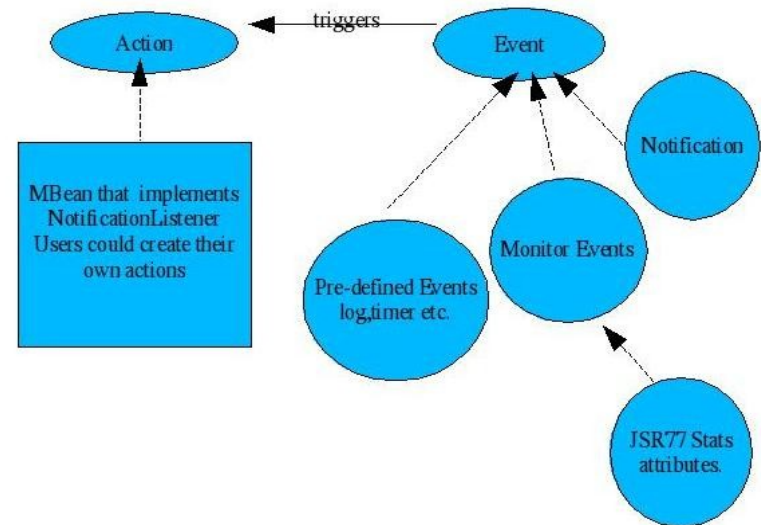
Running on CMT (Niagara)? **Yes**

Check this box if the server instances are running on CMT.

GlassFish Enterprise Server

Self Management

- Objective
 - > Manage complexity through self-configuration
 - > Automating repeatable tasks
 - > Self-Tuning, Self Healing
- Management Rules
 - > JMX-based
 - > Receive event, take action
- Built in to GlassFish v1
 - > Little marketing
 - > Little engineering investment (no out-of-the-box rules)



Enterprise Manager

Performance Advisor - Alerts

- Proactive notification of “events of interest”
 - > Physical memory alert
 - > Memory leak alert
 - > CPU Usage trend alert
 - > JVM Throughput alert
 - > GC Pause Time alert
 - > Log entry alert
- Alert notification methods
 - > Written to log file
 - > Optionally sent to email address(es)

Enterprise Manager

Performance Advisor - Alerts

[Home](#) | [Version](#)
 User: admin | Domain: domain2 | Server: localhost
 Sun GlassFish™ Enterprise Server v2.1

- Connector Modules
- Lifecycle Modules
- Application Client Modules
- Web Services
- JB1
 - Service Assemblies
 - Components
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- Custom MBeans
- Resources
- Clusters
- Stand-Alone Instances
- HTTP Load Balancers
- Node Agents
- Performance Advisor
 - Management Rules**
 - Physical Memory Alert
 - Memory Leak Alert
 - CPU Usage Trend Alert
 - Throughput Alert
 - GC Pause Time Alert
 - Log Entry Alert
 - Log Rotation Manager
 - JDBC Pool Manager

Performance Advisor > Management Rules > Physical Memory Alert

Edit Physical Memory Alert

Sends an alert when the percentage of physical memory that is free goes below a user-defined threshold.

Email Notifications: Enabled
 If checked, email notifications are sent. If not checked, notifications are logged only.

User Threshold: * Percentage
 Percentage of free physical memory above which an alert is sent.

Sampling Frequency: Seconds
 Frequency at which physical memory is checked.

Targets

| Available Targets: | | Selected Targets: |
|--------------------|--|-------------------|
| cluster1 server | <input type="button" value="Add >"/> <input type="button" value="Add All >>"/> <input type="button" value="< Remove"/> <input type="button" value="<< Remove All"/> | |

Enterprise Manager

Performance Monitor

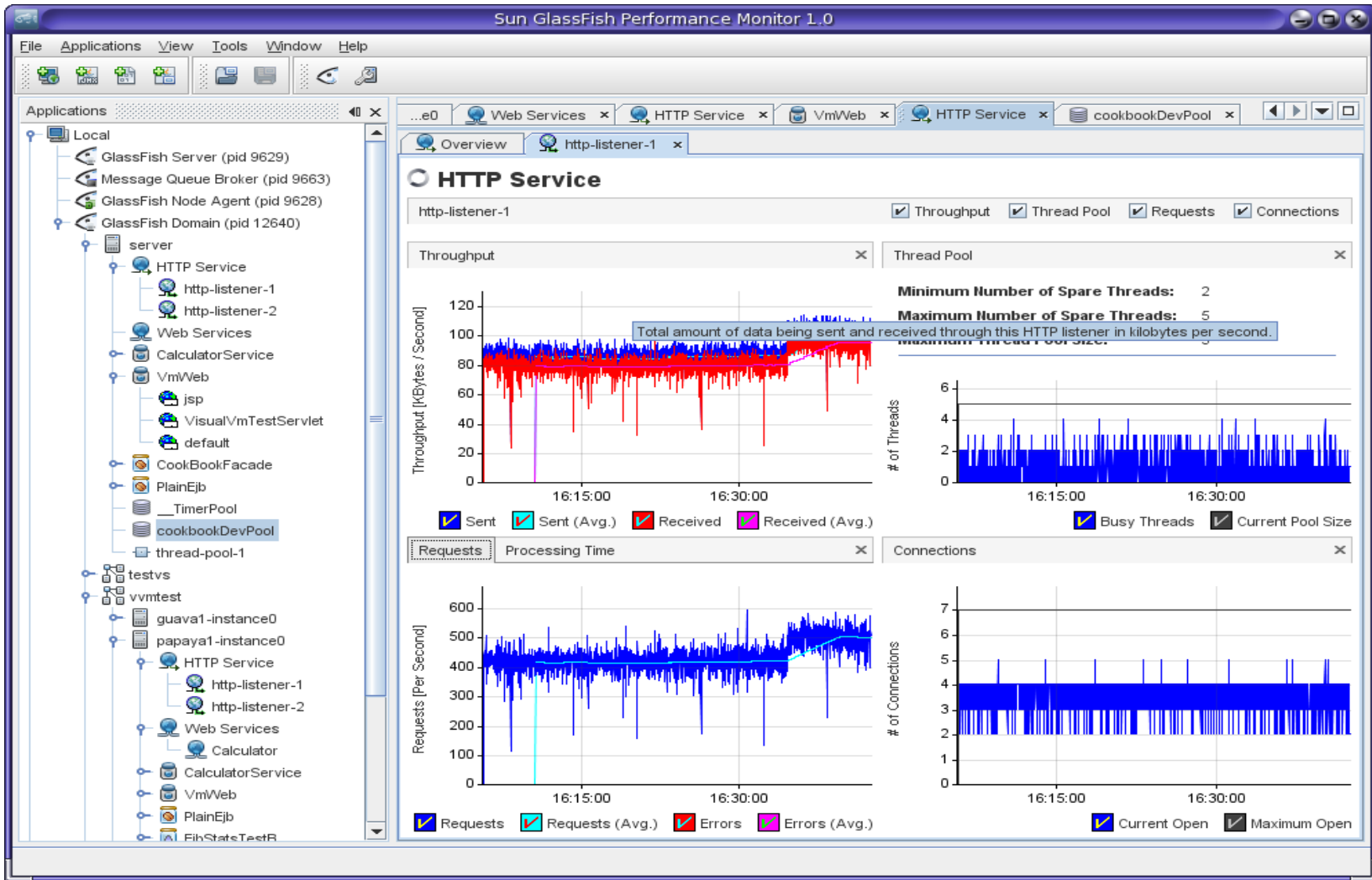
- Diagnose and monitor GlassFish and JVM performance
- Rich GUI application
 - > VisualVM distribution with integrated GlassFish plugin
- Chart performance over time
- Read-only tooling (vs. admin console)
- Local and (secure) remote monitoring

Enterprise Manager

Performance Monitor

- GlassFish observability
 - > HTTP Service view
 - > Web View
 - > EJB View
 - > JDBC View
 - > Web Services View
 - > Cluster View
 - > Node Agent View
 - > Pool monitoring (JDBC, EJB, MDB)
- Heap View
- GC View

Enterprise Manager Performance Monitor





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