



# Java EE, GlassFish and Their Future

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# Java EE 5.0 = (J2EE 1.4).next

- Java EE 5 Theme: Ease of Development
- POJO-based programming
  - > More freedom, fewer requirements
- Extensive use of annotations
  - > Reduced need for deployment descriptors
  - > Annotations are the default
- Configure by exception
  - > Reasonable defaults wherever possible
- Resource Injection
- New APIs and frameworks
  - > EJB3, JAXB 2, JAX-WS, JSF, ...

# Using JAX-RPC 1.1

```
package endpoint;
import java.rmi.*;
```

```
public class HelloServiceImpl
    implements HelloServiceSEI {
```

```
    public String sayHello(String param)
        throws java.rmi.RemoteException {
        return "Hello " + param;
```

```
    }
}
```

```
package endpoint;
import java.rmi.*;
```

```
public interface HelloServiceSEI
    extends java.rmi.Remote {
    public String sayHello(String param)
        throws java.rmi.RemoteException;
```

```
}
```

```
<?xml version='1.0' encoding='UTF-8' ?>
<webservices xmlns='http://java.sun.com/xml/ns/j2ee' version='1.1'>
  <webservice-description>
    <webservice-description-name>
      HelloService</webservice-description-name>
    <wsdl-file>
      WEB-INF/wsdl/HelloService.wsdl</wsdl-file>
    <jaxrpc-mapping-file>
      WEB-INF/HelloService-mapping.xml
    </jaxrpc-mapping-file>
    <port-component xmlns:wsdl-port_ns='urn:HelloService/wsdl'>
      <port-component-name>HelloService</port-component-name>
      <wsdl-port>wsdl-port_ns:HelloServiceSEIPort</wsdl-port>
      <service-endpoint-interface>
        endpoint.HelloServiceSEI</service-endpoint-interface>
      <service-impl-bean>
        <servlet-link>WSServlet_HelloService</servlet-link>
      </service-impl-bean>
    </port-component>
  </webservice-description>
</webservices>
<?xml version='1.0' encoding='UTF-8' ?>
<configuration
  xmlns='http://java.sun.com/xml/ns/jax-rpc/ri/config'>
  <service name='HelloService'
    targetNamespace='urn:HelloService/wsdl'
    typeNamespace='urn:HelloService/types'
    packageName='endpoint'>
    <interface name='endpoint.HelloServiceSEI'
      servantName='endpoint.HelloServiceImpl'>
      </interface>
    </service>
  </configuration>
```

**OLD!** J2EE 1.4

# Using JAX-WS 2.0

```
import javax.jws.WebService;  
  
@WebService  
public class MySimpleWS {  
    public String sayHello(String s) {  
        return "Hello " + s;  
    }  
}
```



**NEW!** Java EE 5

# Stateless Session Bean in Java EE 5

```
import javax.jws.WebService;  
import javax.ejb.Stateless;  
  
@WebService  
@Stateless  
  
public class MySimpleWS {  
    public String sayHello(String s) {  
        return "Hello " + s;  
    }  
}
```

**NEW!** Java EE 5

# GlassFish



*“Various Interface21ers, including Costin and Juergen, have taken a look at GlassFish and given it the **thumbs up**.”*

Rod Johnson, Spring Framework Creator, Feb. 2007 [1]

[1]: [blog.interface21.com](http://blog.interface21.com), Feb. 2007

*“... we were seriously stressed when IBM declared war with Geronimo and then HP got in the game against us too. Red Hat and JOnAS didn't scare us at all (really – not at all), nor did we worry about Sun's foray into the market. Oddly enough, of that group **only Sun** has managed to mount **serious competition to JBoss.**”*

Marc Fleury, JBoss founder, August 2007 [2]

[2]: news.com, August 2007



*“Among major vendors, Sun Microsystems Inc., has **dramatically improved** its standing in this year’s evaluation of applications servers for service-oriented architecture (SOA) and business process management (BPM)”*

Forrester Research, August 2007 [3]

*Sun and the GlassFish open-source community have delivered the first production-scale open-source Java EE 5 application server. This challenges the dominance of market leaders like Red Hat and IBM.*

Gartner, September 2007 [4]

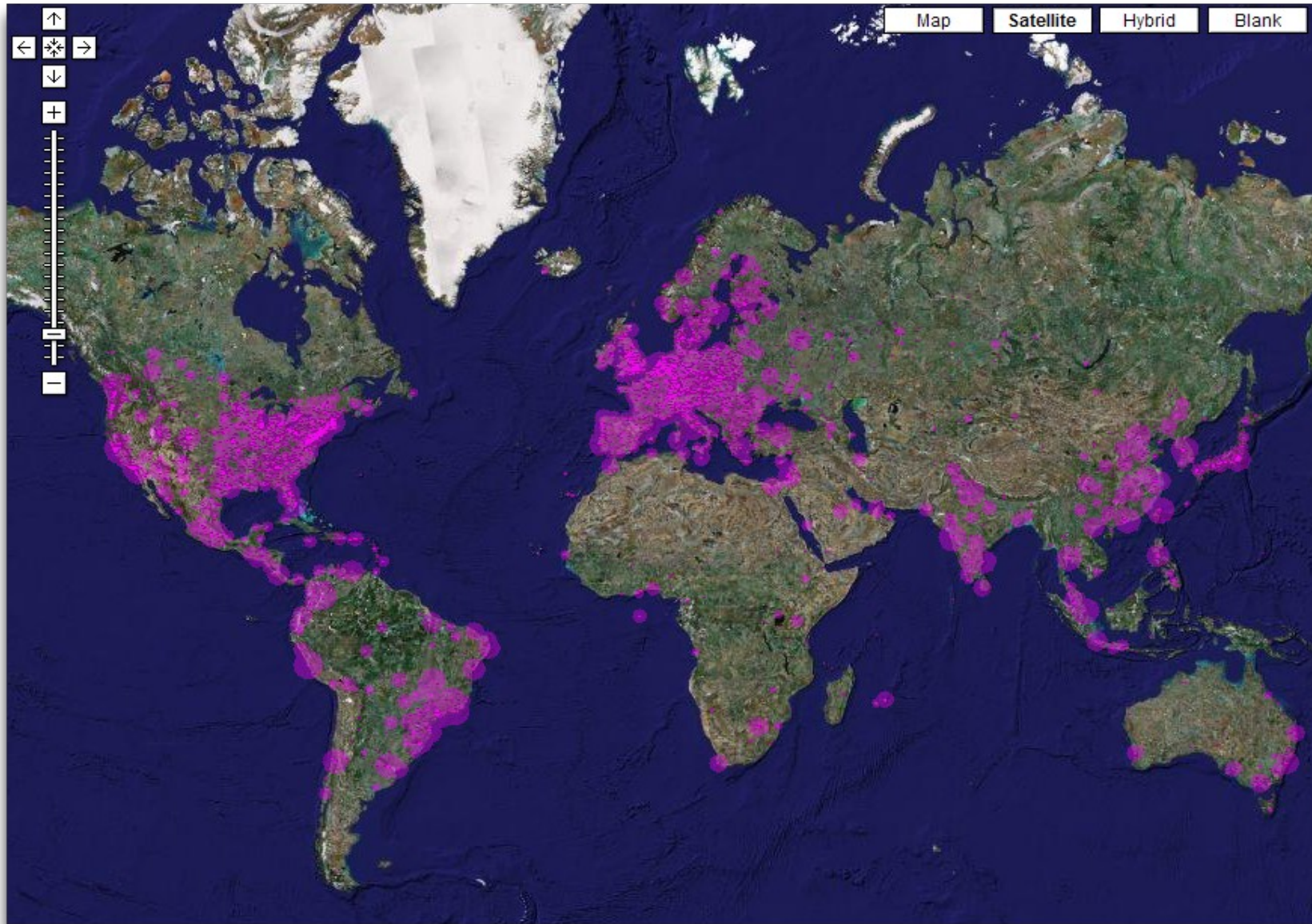
[3]: <http://www.forrester.com/Research/Document/0,,37138,00.html>, August 2007

[4]: [http://www.gartner.com/DisplayDocument?doc\\_cd=152044&ref=g\\_rss](http://www.gartner.com/DisplayDocument?doc_cd=152044&ref=g_rss), September 2007

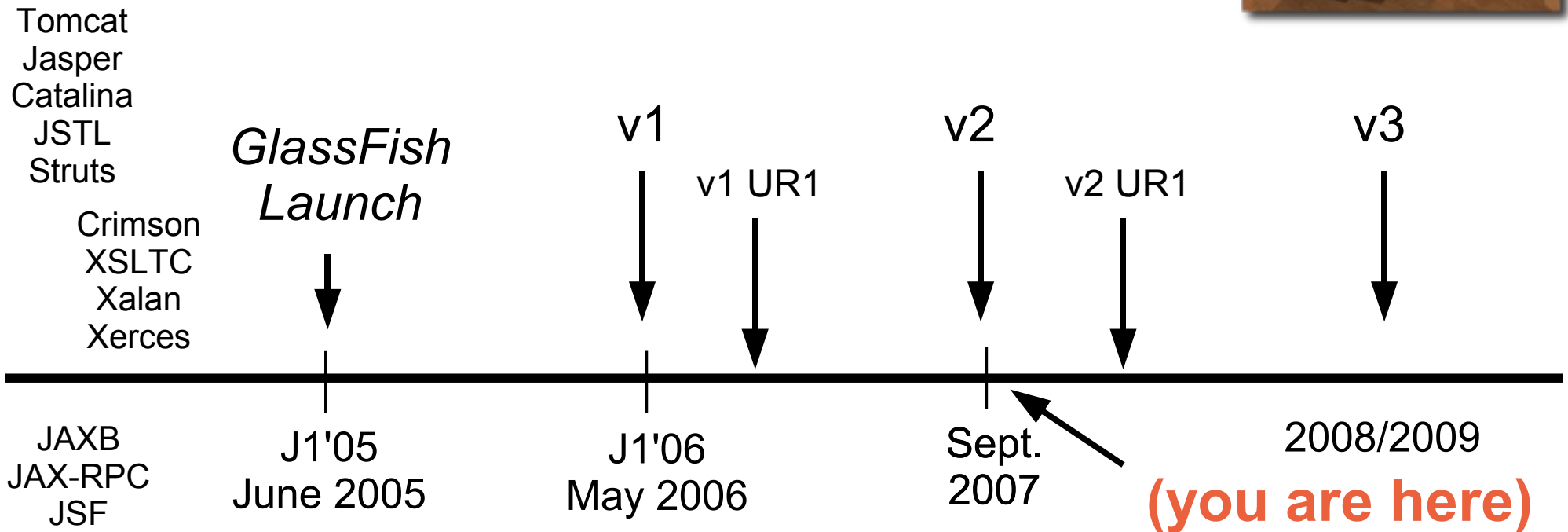
# What Is GlassFish?

- A Java EE 5 compliant Application Server
- Enterprise Quality
  - > Sun Java System Application Server 9.x
  - > Use it in production!
- Open Source
  - > CDDL (like OpenSolaris, NetBeans)
  - > GPLv2 (like Java and NetBeans)
  - > Use it in production!
- Community at <http://glassfish.java.net>
  - > Sources, bug DBs, discussions at Java.Net
  - > Roadmaps, Architecture Documents

# GlassFish around you



# Timeline of Project GlassFish



# GlassFish v2

## SJS Application Server 9.1

- Metro Web Services Stack
  - > Performance, Microsoft interoperability
- Clustering, Load-Balancing, HA
  - > Advanced Management
- JBI support (OpenESB 2.0)
- Better user experience
  - > Single, smaller, download
  - > Multiple User Profiles
  - > Better startup time
  - > Update Center
  - > New admin console: JSF, AJAX, Charts
- World Record Performance

**Available!**



# GlassFish Support Pricing

- **Yes!** GlassFish is totally free to use
- The business model for Sun is that of services
  - > Support subscription starting from \$4 500 for 4 sockets
  - > Premium support and volume pricing available
  - > Support from the source to secure your projects
- Also Consulting & Training
- All from Sun & Partners
- We want our partners, our customers to be successful (and Sun too in the process)

## Global Specials

### Sun Java System Application Server 9.1 Subscriptions

Select Currency ▾

The Sun Java System Application Server is a world class Java Enterprise Edition (Java EE) 5 compatible platform for developing and delivering server side Java applications and web services. Based on Project GlassFish, the application server is the result of an active community that is delivering an enterprise quality deployment platform with advanced clustering, centralized administration and record-breaking performance. NetBeans integration enables rapid development of web applications leveraging multiple languages including Java, JRuby and JavaScript.

With Sun Java System Application Server 9.1 subscriptions, you get one stop shop for product and service with immediate web access to software support with full indemnification, updates and upgrades, production and code support, training, and much more.

Our 3 levels of support give you the flexibility to choose the subscription that best fits the needs of your production system:

- Standard Support provides extended local business hours coverage 12 hours a day, 5 days a week.
- Premium Support provides support coverage around the clock, seven days a week with SunVIP Interoperability Support.
- Premium Plus Support enhance Premium support with Customer Advocate and Customer Focused Support Team.

Subscriptions	Standard	Premium	Premium Plus
1 Year - 4 socket Units	\$4,500	\$6,750	Contact Sun
1 Year - 4 socket Units HADB (1)	\$2,250	\$3,375	Contact Sun

#### Note:

(1) In order to purchase the HADB module, customer will need to purchase the 1 year subscription with a valid support contract.

Standard HADB Subscription sold per 4 socket units - 1 year - Requires purchase of Standard subscription: **\$2,250.00**

Premium HADB Subscription sold per 4 socket units - 1 year - Requires purchase of Premium subscription: **\$3,375.00**

Standard Subscription sold per 4 socket units - 1 year: **\$4,500.00**

Premium Subscription sold per 4 socket units - 1 year: **\$6,750.00**

I agree to the Sun Java System Application Server 9.1 Subscriptions Terms and Conditions.

Quantity

# GlassFish v2: Grizzly & JSP Containers

- JSP Container
  - > 10x perf. improvement in JSP compilation (JSR-199)
- Grizzly
  - > Improved over GlassFish v1
  - > Very Flexible and Customizable
  - > Non-blocking SSL, Quality of Service constraints
  - > Scalable Async Req Processing (ARP)
  - > Supports *Comet* (long-term HTTP connections)
- Hosting features
  - > Alternate docroots
  - > Webcontainer dynamically reconfigurable
  - > ..

# jMaki

- 'j' stands for JavaScript. Maku means to wrap in Japanese
- Framework for encapsulating AJAX libraries and widgets from Dojo, Yahoo!, scriptaculous, Google, and more
- Usable with JSP, JSF, PHP and Ruby on Rails
- Easy to build your own widget
- Common event model and proxy architecture
- Automatic handling of JavaScript resource files
- V 1.0 released yesterday!
- <http://ajax.dev.java.net> and <http://widget.dev.java.net>



# Metro

## JAX-WS, WSIT, and JAXB implementations

- Dynamic JAX-WS Runtimes
- JAXB 2.0 fully support XML Schema
  - > A lot of reuse of GlassFish's JAXB implementation
- GlassFish JAX-WS 2.x
  - > Simple annotated POJO model
  - > WS Separation of Transport and Encoding
    - > HTTP, JMS, SMTP, TCP/IP
    - > MTOM, Fast Infoset (binary), Textual, Others
- WSIT (Project Tango)
  - > Microsoft Interoperability and Quality of Service
  - > Same (old) JAX-WS programming model

See “Metro and REST” presentation today @ 2:10

# Top Link Essentials / JPA

- JPA now a separate JSR
  - > 1.0 very well accepted
  - > Does not require a container
- Oracle Contribution to GlassFish
  - > Fully JPA-compliant and open source
- Very Active Community
  - > Oracle, Sun, TmaxSoft, independents
  - > Mail: [persistence@glassfish.dev.java.net](mailto:persistence@glassfish.dev.java.net)
- Pluggable (per spec)
  - > In GlassFish, JEUS, JOnAS, Tomcat, Geronimo, JBoss, Oracle
  - > Converse is true also: Hibernate & OpenJPA run on GlassFish

# JBI – Java Business Integration

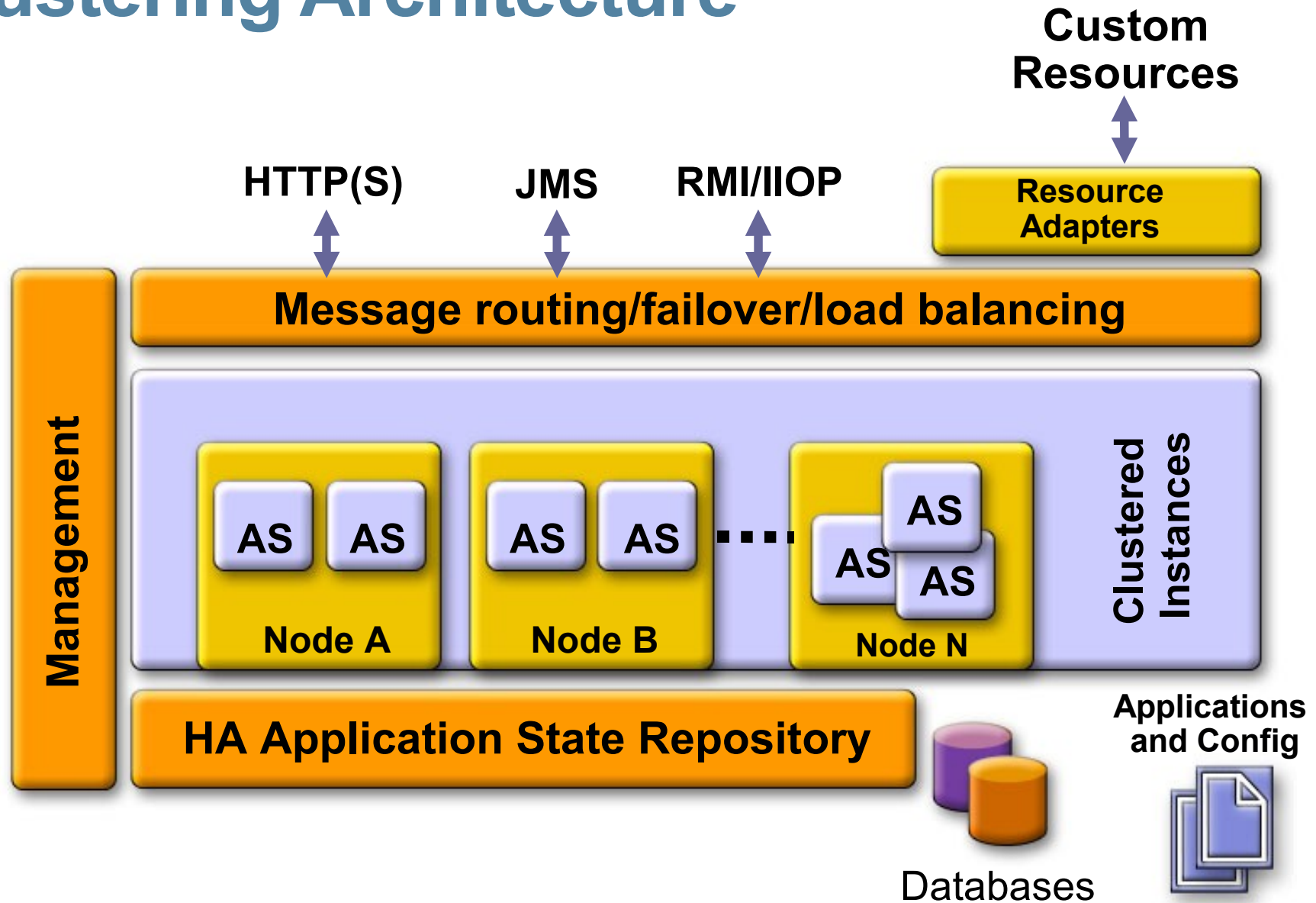
- OpenESB 2.0 implementation
  - > Included in GlassFish v2
  - > Integrated as a life-cycle module
  - > Integrated admin tools (Web and CLI)
- Many components available from [openesb.org](http://openesb.org)
  - > Binding Components: HTTP, File, FTP, JMS, TCP, CICS, HL7, ...
  - > Service Engines: BPEL, XSLT, ETL, SQL, Scripting, Worklist, ...
  - > <https://open-esb.dev.java.net/Components.html>
- Tools support
  - > NetBeans SOA 6.0 Beta
- Possible to plug ServiceMix into GlassFish v2
  - > Support wider JBI story

See “SOA using OpenESB” presentation tomorrow @ 4:30

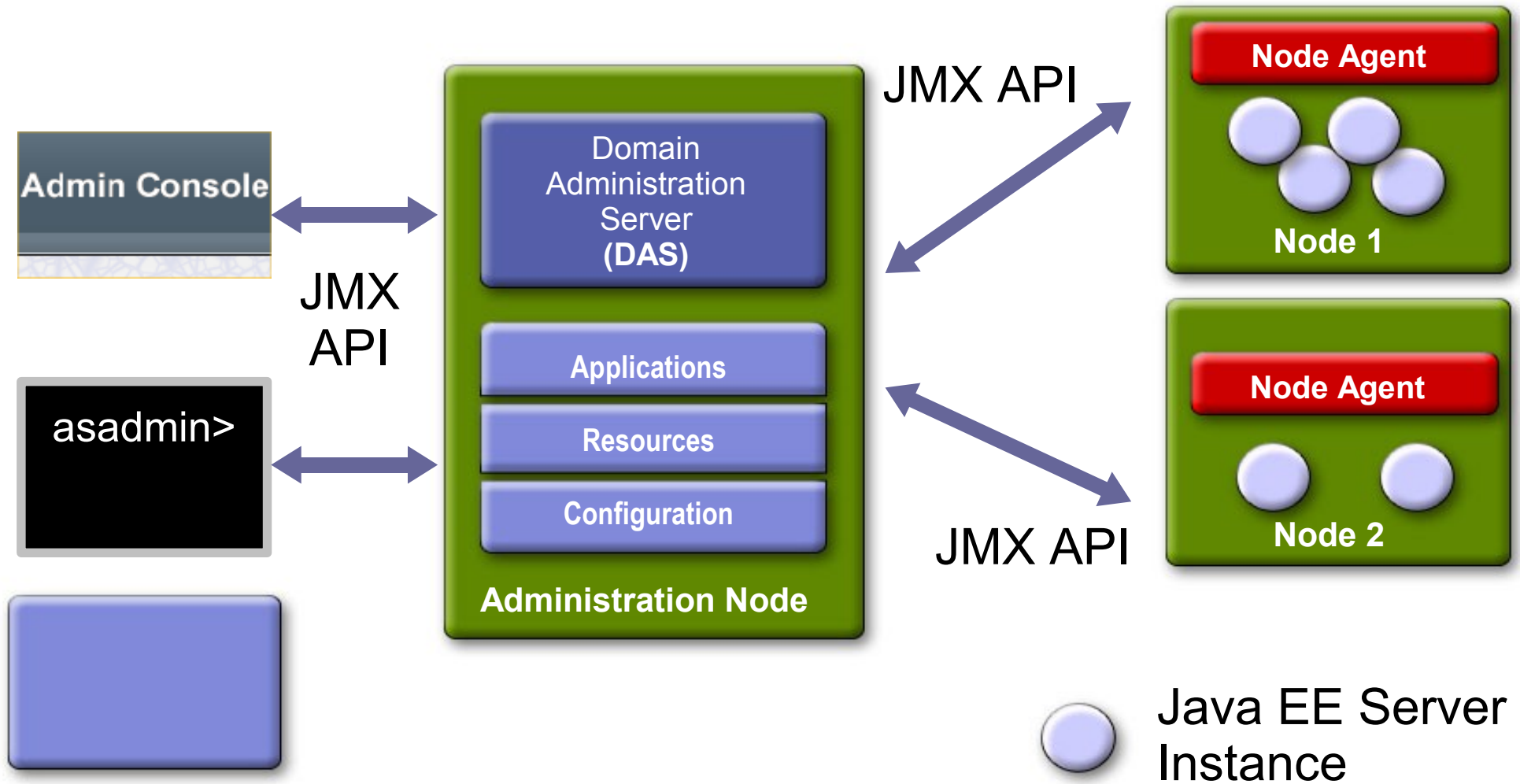
# Management Features

- Centralized, secure, remote access
  - > Accessible as GUI, CLI, IDEs, Java-based programs
  - > Also available via provided ANT tasks
  - > JMX & Application Server Management eXtensions, AMX
  - > Can be monitored through *jConsole* and others
- Per-service monitoring levels
- Call Flow
- Self Management
- Resource consumption management

# Clustering Architecture



# Clustering in GlassFish v2



JMX = Java Management Extensions



# Dynamic Clustering and In-Memory Replication

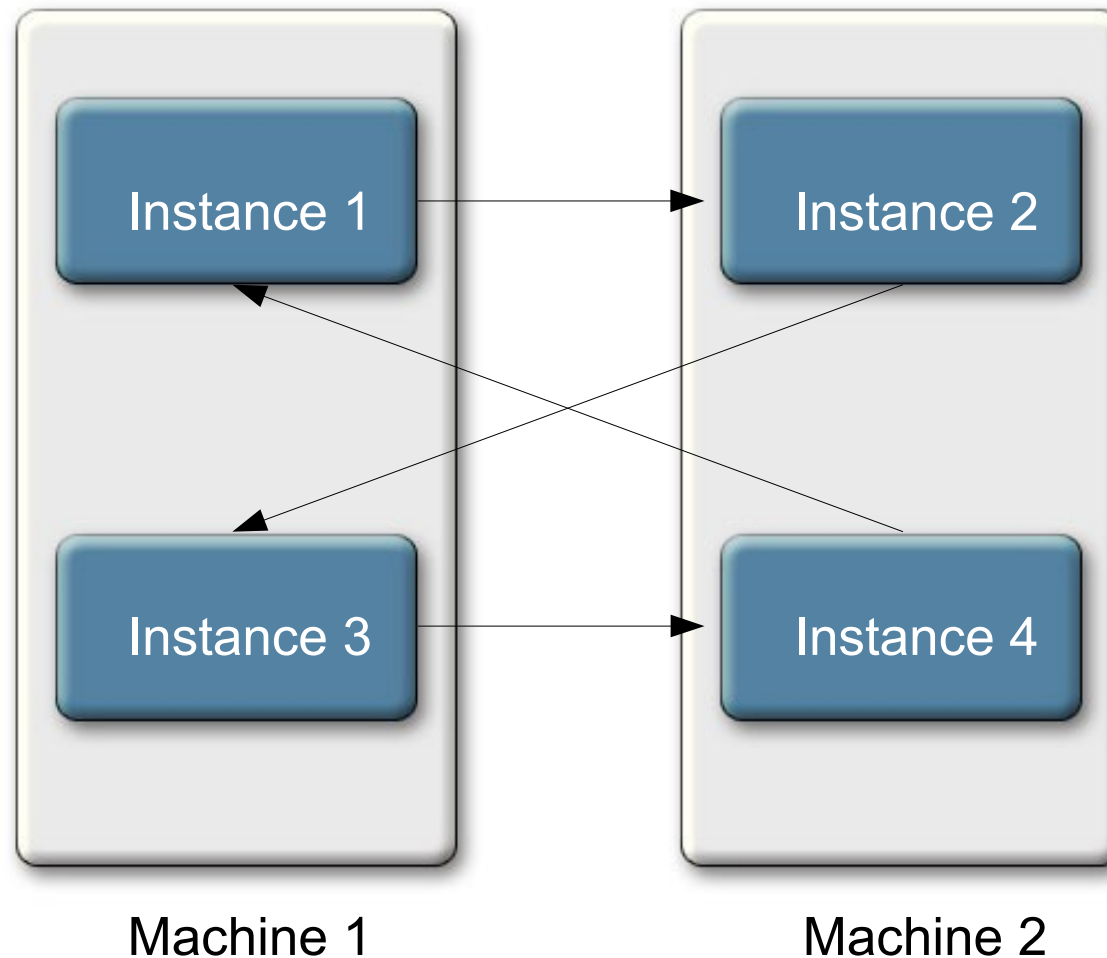
- GMS with Project Shoal
  - > <http://shoal.dev.java.net>
  - > Dynamic clusters implemented with JXTA by default
  - > Extreme ease of use in cluster setup
- Replication
  - > What?
    - > HTTP session state
    - > Stateful EJB session state
    - > Single Sign-On state
    - > Container state (timers, ...)
  - > How?
    - > Default is In-Memory replication with JXTA
    - > Can still use HADB for 99.999% uptime (higher perf degradation)



# Memory Replication

Typical cluster topology

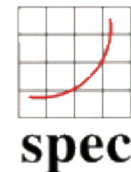
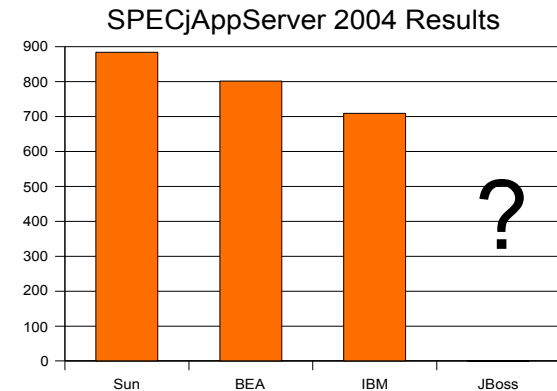
**Example: Maximize  
Availability on 4 node  
cluster on 2 machines**





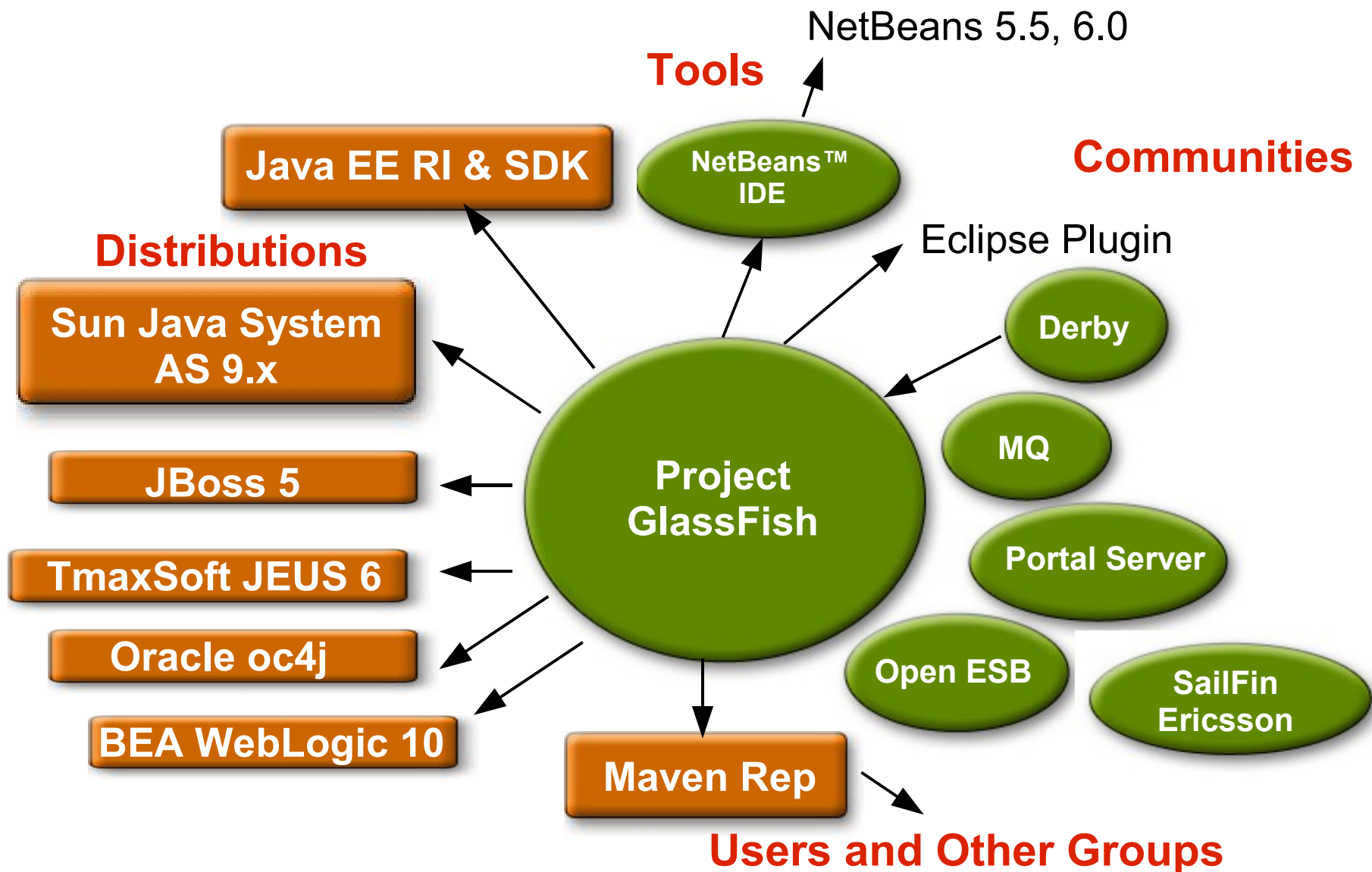
# Performance

- SPECjAppServer Benchmark
  - > July 2007: #1 score on T2000
    - > 883.66 JOPS@Standard for GlassFish v2
    - > 10% faster than BEA WebLogic
    - > 30% faster than IBM WebSphere 6.1
  - > July 2007: Best \$/perf. on full Open Source stack
    - > 813.73 JOPS@Standard
    - > GlassFish v2, OpenSolaris, Java 6, PostgreSQL
    - > 3x the price/perf vs. Oracle on HP score
  
- Performance: Startup Speed
  - > Start as little as possible in v2 (see also v3)



*You no longer need to chose between Open Source and performance*

# (Some) Distributions & Contributors



# Tools Support

- NetBeans 5.5.1, 6.0
- Best integration with :
  - > full Java EE 5 support
  - > resource creation
  - > remote debug
  - > incremental deployment
  - > profiling
  - > wizards, etc...
- Additional features (SOA, UML, jRubyOnRails, ...)



- GlassFish (v1, v2, v3) plugin for Eclipse 3.3 (Europa)



- Genuitec's MyEclipse offers greater integration between IDE and GlassFish



- CodeGear JBuilder 2007
- IDEA IntelliJ 6.0, 7.0



# Frameworks and Applications



**OSWorkFlow**



AppFuse



**OSCache**



**Integration ORB**

**iBatis**

Project Tango

**Apache Httpd**



**CJUG-Classifieds**

**Struts**



**BIRT**

**JBPM**

**DOJO**  
**Facelets**



MyFaces

**OpenSSO**  
Open Access . Open Federation



**Shale Derby**

ADF **SiteMesh**

**WebDAV**



JSPwiki



MC4J

**Tapestry**

**Hudson**



**StringBeans Portal**



**AJAX**



Java WSDP

**BlogTrader**



Wicket

**Equinox**

**Dalma**



**WebSphere MQ**

**EHCache**

# GlassFish Adoption Stories

<http://blogs.sun.com/stories>



- PeerFlix
  - > GlassFish v1 on Solaris 10 / x2100
  - > MySQL, Kodo JDO
- Wotif.com
  - > Large # hits, ehCache / Horizontal Scaling
  - > Spring and Hibernate
  - > 3<sup>rd</sup> largest commercial site in Australia
- Harvard University
  - > On-line archive for sharing data within and across universities
  - > Lucene, PostgreSQL, Apache Shale
- More (small and large)
  - > Help us collect these
  - > [stories@sun.com](mailto:stories@sun.com)



# Java EE 6 – JSR 316

- Extensibility
  - > Embrace and support popular frameworks and technologies developed in external communities
  - > Layer these technologies cleanly on top of Java EE platform
- Profiles
  - > Rules for referencing Java EE platform technologies in Java EE Profiles
  - > A profile may include a subset of Java EE platform technologies, additional JCP technologies, or both
- Pruning
  - > Define process of removing technologies from platform
- Goal is to deliver a final version by the end of 2008

# Java EE 6 – Proposed New JSRs\*

- JSF 2.0 (JSR 314)
- JAX-RS (JSR 311)
  - > RESTful web services
- WebBeans 1.0 (JSR 299) – led by JBoss
- Servlets 3.0 (JSR 315)
- Enterprise Java Beans 3.1
  - > Singletons, Asynchrony, Concurrency options, ...
  - > JavaBeans Validation framework (JSR 303)?
- Java Persistence API 2.0
  - > Criteria API, hierarchies in embeddables
- Java EE Connector 1.6

\*The exact set of technologies to be included will be determined by the expert group

# GlassFish v3

- Small & Fast
  - > Less than 1.0 sec startup
- Totally Modular, kernel is <100K
  - > Based on a module sub-system: HK2
  - > Can run in a phone, in a desktop application or in-process
- An ideal Container for Web 2.0
  - > Java and Scripting applications
  - > Support for upcoming Java EE 6 profiles
- A container that can do Java EE and more
  - > A good fit for SOA/ESB solutions
- Code and documentation available today



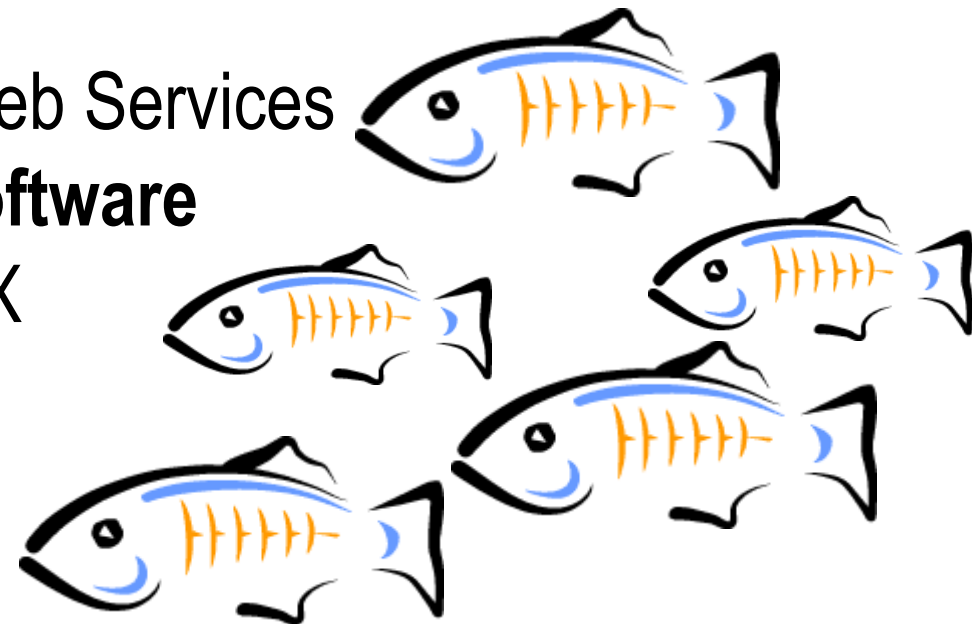


# GlassFish v3 – Work in Progress

- Sample Containers
  - > Java Web Container
  - > JRuby (no GoldSpike required)
  - > PHP (via Quercus)
  - > JavaScript (via Phobos)
  - > Whatever you decide!
- Plans & Roadmap
  - > Java Web profile likely in 1H2008
  - > *More tbd*

# FOSS Middleware Components

- GlassFish – AppServer, JavaPersistence, Web Tier
- OpenPortal – Container, WSRP, Portlet, Portlet Rep
- OpenESB, OpenJBI – JBI, BPEL
- OpenSSO – Access & Federation Manager
- OpenDS – Directory Server
- Jersey – JAX-RS for RESTful Web Services
- **Hudson – Continuous build software**
- Phobos, jMaki... – Web 2.0/AJAX
- **Open MQ – MessageQueue**
- WoodStock – JSF Components
- Apache Derby – JavaDB
- **Social Software – Apache Roller, Slynkr**



# The SailFin Project

- Ericsson SIP Servlet Contribution is available at:
  - > <http://sailfin.dev.java.net>
- Visit, Download, Try, Join
  - > Milestone 1 available
- Not just for telco operators!
  - > Bridging the HTTP and SIP protocols
- Built on GlassFish v2 and expected first half of 2008



<http://sailfin.dev.java.net>

# OpenDS

[opends.dev.java.net](http://opends.dev.java.net)

- Next generation Directory Services
  - > Designed to meet the needs of the Telco market
  - > High-Performance, highly extensible and VERY large deployments
- Brand-new Code Base
  - > Java-based, Very High Performance Goals
  - > Not Based on DSEE (2B-entry deployments, market leader)
- Full Fledged
  - > Full LDAPv3, replicas
  - > Virtual Directory, Proxies, Caching, etc...
- Schedule
  - > v1.0 before year's end



Open ESB  
The *Open* Enterprise Service Bus

# OpenESB

[open-esb.dev.java.net](http://open-esb.dev.java.net)

- Based on JBI (Java Business Integration) Standard
- Already Released
  - > JBI Implementation
  - > BPEL
  - > Many binding components
- More Components to be Released
- Integrated within GlassFish V2
- *Distributed in*
  - > NetBeans 6.0 SOA/BPEL features
  - > Future of Sun Composite Application Platform Suite (CAPS)

# OpenSSO

[opensso.dev.java.net](http://opensso.dev.java.net)

- Access Manager, Single Sign-On, Federation
  - > SAML, XACML, Liberty Standards
- Already Released
  - > Access Manager
  - > Many Policy Agents
  - > Federation Manager
- To be Released
  - > More Policy Agents
- *Distributed in*
  - > Sun Java System Access Manager & Federation Manager

# OpenPortal

portal.dev.java.net



## OpenPortal

Open Source. Open Standards. Open Portal Server.

- Enterprise-class Portal Server
  - > Basis for the commercial product from Sun
  - > Next release is Sun Java System Portal Server 7.2
- Sub-projects
  - > portlet-container.dev.java.net (JSR168 / JSR 286)
  - > portlet-repository.dev.java.net
  - > wsrp.dev.java.net (WSRP 1.0, 2.0)
  - > portalpack.netbeans.org / eclipse-portalpack.dev.java.net
  - > saw.dev.java.net (Workflow/SOA)
  - > mirage.dev.java.net (CMS)
  - > jsfportletbridge.dev.java.net
- Get more information from <http://blogs.sun.com/portal>

# JAX-RS & Jersey

<http://jsr311.dev.java.net>

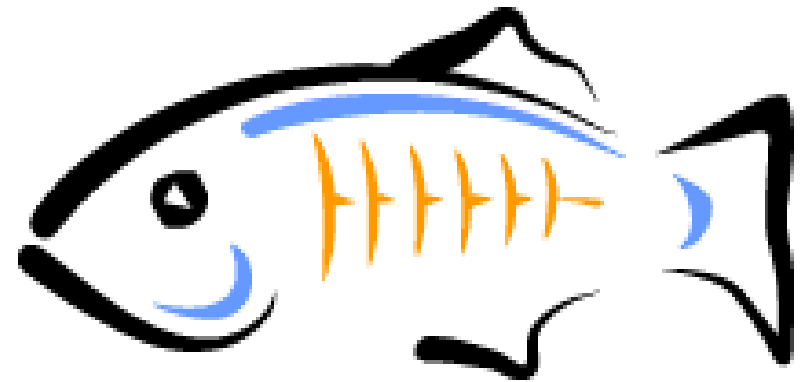


- POJO-based RESTful Web Services
  - > JSR 311, and also part of Java EE 6 (JSR 316)
  - > High-level declarative programming model
  - > Flexible typing, runtime takes care of common conversions
  - > Pluggable support for types, containers, and resolvers
- Reference Implementation
  - > <http://jersey.dev.java.net> (also from GlassFish via update center)
  - > Flexible JSON / XML MIME types based on JAXBObjects
  - > Deployment options: JAX-WS endpoint (per JSR), *Grizzly*, *Java 6 lightweight HTTPd*
- Roadmap
  - > JSR and Reference Implementation final by 2H2008



# Resources

- <http://glassfish.java.net>
- <http://wiki.glassfish.java.net>
- <http://blogs.sun.com/theaquarium>





# Questions ?

alexis.mp@sun.com  
<http://blogs.sun.com/alexismp>



# SUN TECH DAYS 2007-2008

A Worldwide Developer Conference

