



Overview of GlassFish

**Eduardo Pelegri-Llopart,
Distinguished Engineer**

Sun Microsystems, Inc





Agenda

- JavaEE 5
- GlassFish Community
- GlassFish v2
- Other Projects in the Community
- Adoption
- Futures



For More Information

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



A Taste of Java EE 5



J2EE 1.4

- J2EE is enormously powerful
 - The industry standard for robust enterprise apps
- But that power sometimes gets in the way
 - Too difficult to get started
 - Even simple apps need boring boilerplate
- Can we keep the power...
but make typical development tasks simpler?
- **YES...** and that is the focus of Java EE 5!



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 law*
- Resource Injection
- New APIs and frameworks



Specification Changes in Java EE 5

- JAX-WS 2.0 & JSR 181
- Java Persistence
- EJB 3.0
- JAXB 2.0
- JavaServer Faces 1.2 – new to Platform
- JSP 2.1 – Unification w/ JSF 1.2
- StAX – Pull Parser – new to Platform

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;  
    }  
}
```



Stateless Session Bean in Java EE 5.0

```
import javax.jws.WebService;  
import javax.ejb.Stateless;
```

```
@WebService
```

```
@Stateless
```

```
public class MySimpleWS {  
    public String sayHello(String s) {  
        return "Hello " + s;  
    }  
}
```



Java EE 5.0 Summary

- Java EE 5 Theme: Ease of Development
- Big Specification Improvements
- *Not your father's J2EE* – Bill Shannon



The GlassFish Community

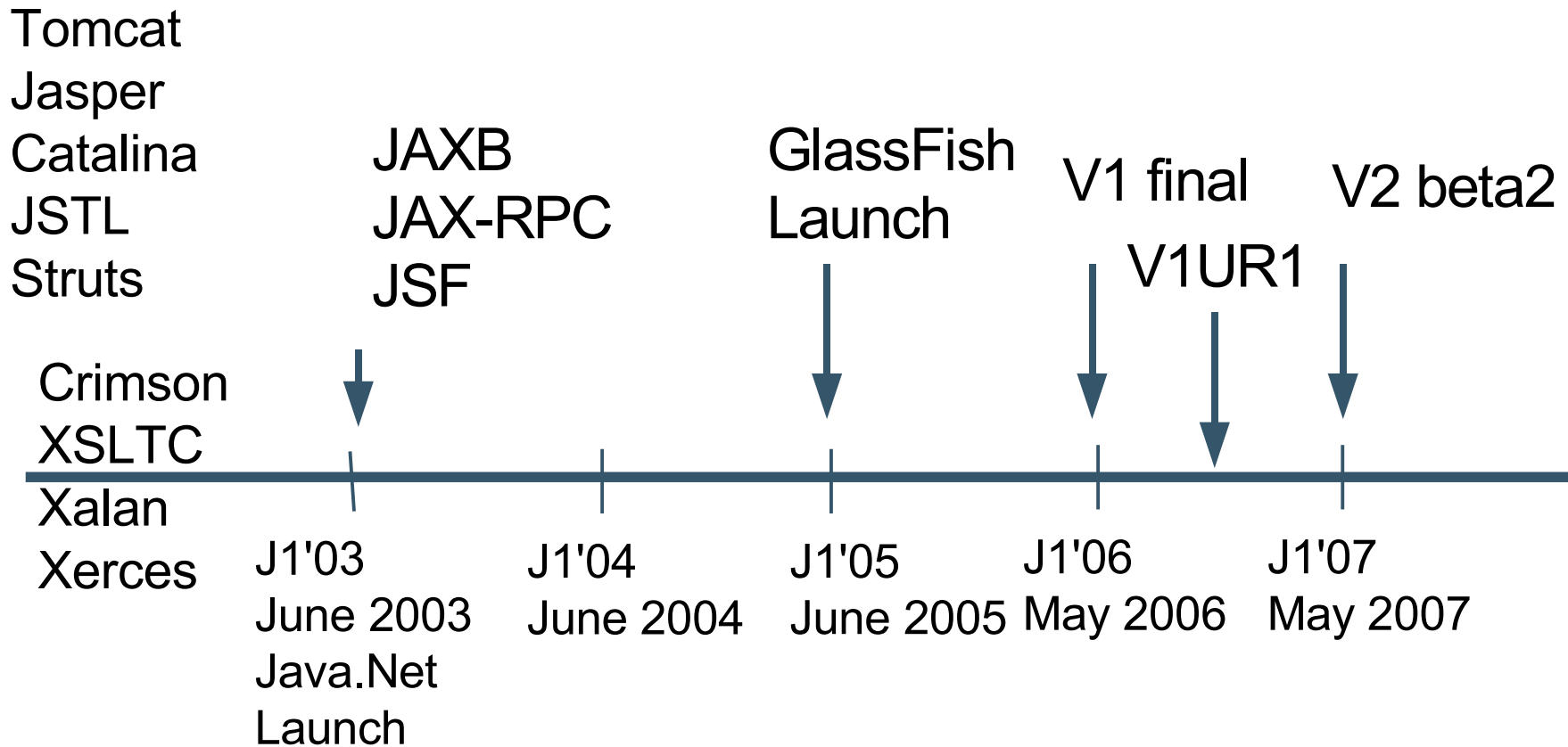


What Is Project GlassFish?

- Java EE 5 Reference Implementation
 - Included in Java EE 5 SDK
- Enterprise Quality
 - SJS AS 9.0 & 9.1 PE / SE
- Open Source
 - OSI license - CDDL (& GPLv2)
- Community at Java.Net
 - Sources, bug DBs, discussions, Roadmaps, Docs
- Expanding to Additional Projects
 - jMaki, Phobos, BlogApps, JAX-RS, Slynkr...



Timeline of Project GlassFish





Principles

- Industry-Leading Technology (no secret sauce)
- Want Adoption of Code Base
- Community Centered. Encourages Participation
- Transparency (bugs, roadmap); Clear Governance
- Continuous Improvements
- Participation (contributors, partners)
- Integrated and Integrateable
- Open Standards - JCP et al.
- OSI Licenses. CDDL (with a few others)
- Clear Copyright (SCA)



Open Source and Sun

- Why?
 - Ubiquity, Lower Barrier to Adoption
 - Better Products, Closer to Customer
 - More Know-How, Contributors, Components
 - Larger, Faster adoption of Java EE 5
- Revenue?
 - Training, Support, Consulting. Systems
- Sun gets Big Portion of Pie; Pie Gets Bigger
 - Sun's (and others!) final take home is *bigger*



Community Contributors

- Code donations
 - Sun Microsystems: SJS AS 8.x+
 - Oracle: Top Link Essentials
- Specification leadership
 - SUN, Oracle, BEA
- Participation from corporations
 - TmaxSoft, BEA, JBoss, Jetty
- Individual contributors



The GlassFish AppServer



Releases in Project GlassFish

- GlassFish v1
 - Released! – Victory! Java EE 5 Compliance!
 - UR1 - bug fixes
- GlassFish v2
 - New WS stack, performance, startup time
 - Load balancing, cluster management, failover
 - Some scripting support
 - Community, Transparency, Adoption
- GlassFish v3
 - Better modularization, better scripting support



Releases in Project GlassFish

- GlassFish v1 - SJS AS 9.0
 - Platform Edition (no clustering, failover)
 - Final, in Deployment Support
 - Deployed in many sites
- GlassFish v2
 - SJS AS 9.1 – beta2
 - Final around September (2007)
- GlassFish v3
 - Not yet mapped into Sun's products



GlassFish v2

- Clustering Management
- Failover w/ HADB and Memory Replication
- New WS Stack w/ Performance and WSIT
- Overall Performance
- Multiple Profiles (Developer, Cluster, Enterprise)
- Bug Fixes
- Spec Updates
 - JSF, JSP, JSR196, JBI, JSTL, Servlet, JAXB, JAX-WS



Usage Profiles

- Out of the box support for usage profiles
- Developer/administrator chooses profile at the time of domain creation
- Improve user experience based on the profile chosen
- GlassFish v2 will support
 - Developer profile
 - Cluster profile
 - Enterprise profile

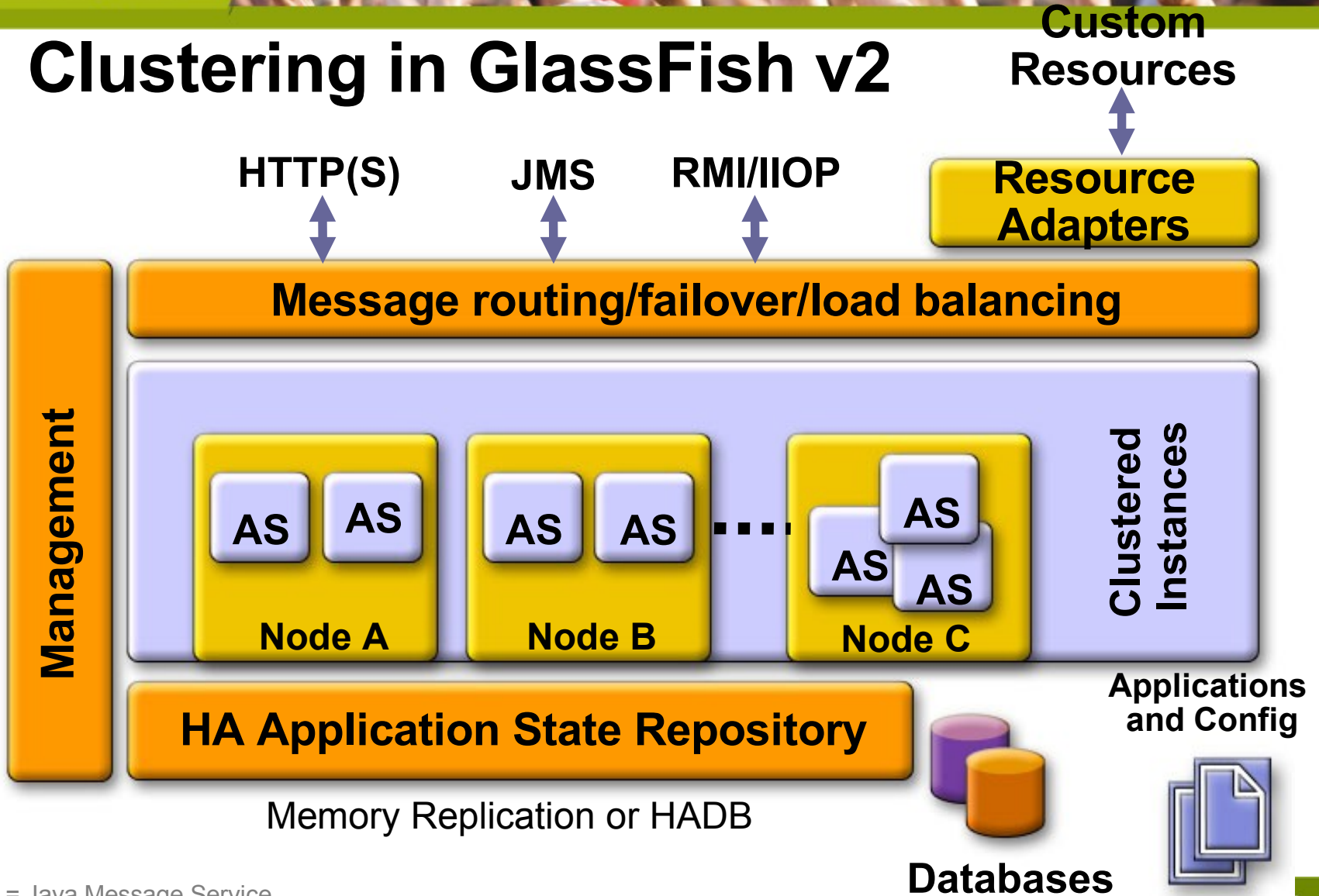


Availability in AppServer

- HADB provides high availability for
 - Http session state
 - Stateful EJB session state
 - Single sign-on state
 - But overkill in *some* applications
- Alternative is Memory Replication
 - Good performance
 - Almost zero Configuration
- **Inventory** – Project Shoal
 - GMS facility based on JXTA
 - Reusable



Clustering in GlassFish v2





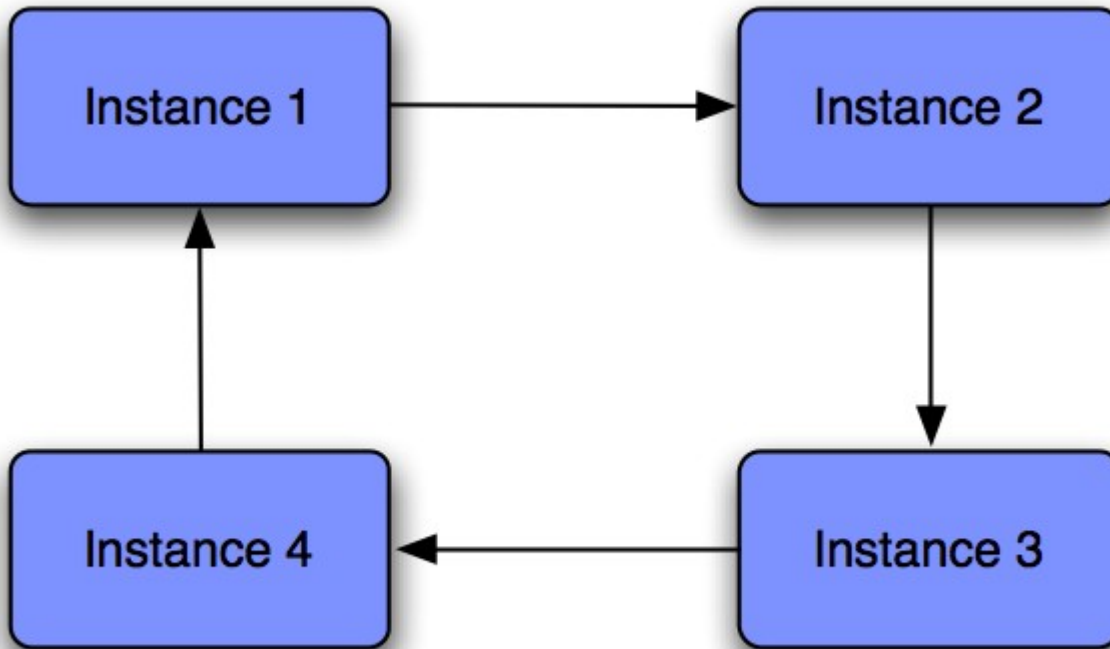
Memory Replication

- HADB provides high availability for
 - Http session state
 - Stateful EJB session state
 - Single sign-on state
- HADB - still available; still right solution for some problems
 - enables proven “5 – nines” availability
 - more complex to administer
 - not (currently) open source
- Alternative: Memory Replication



Memory Replication

Typical Cluster Topology

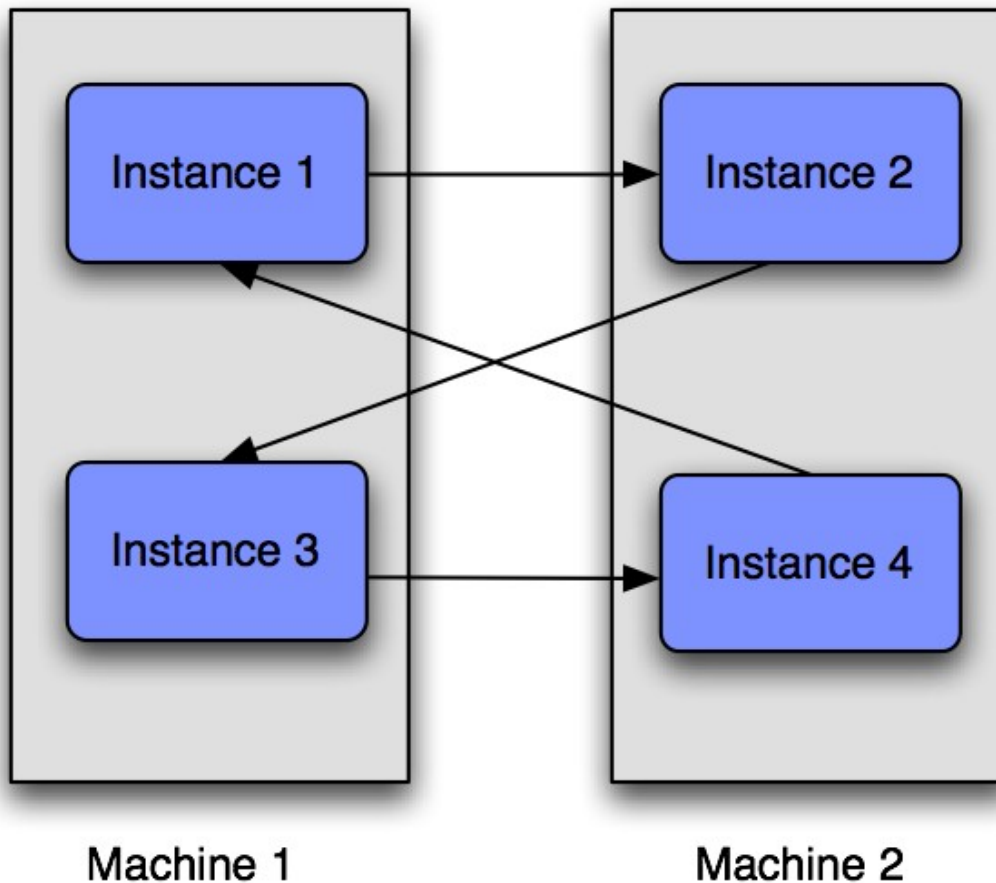




Memory Replication

Typical Cluster Topology

Example: Maximize Availability on 4 node cluster on 2 machines





Memory Replication Configuration

Out of the box ...

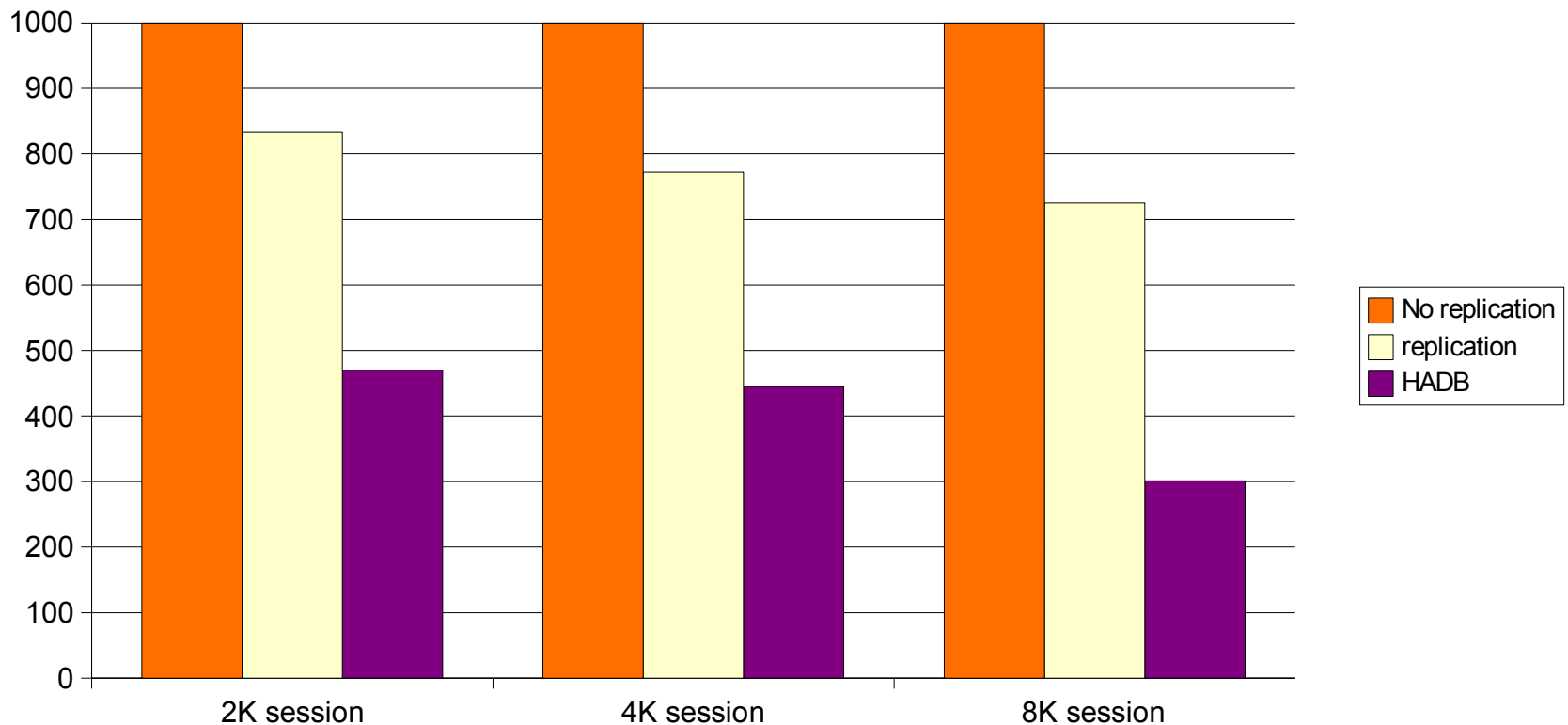
- Create a domain
 - Use the 'cluster' admin profile – defaults for replication are handled
 - Enables GMS – heartbeat enabled
 - persistence-type = “replicated”
- Create a cluster & instances
- Deploy your application with availability-enabled=true
- That's it



Memory Replication Performance

Cost of replication

Hits/Sec ~17-25% throughput degradation





Memory Replication Implementation

Based on JXTA technology and Project Shoal/GMS

- JXTA technology
 - Not just for peer-to-peer!
 - Streamlined for high volume and throughput
 - Benefited from collaboration with Grizzly Project
- JXTA works well for us
 - Simplified api's made near zero-config story possible

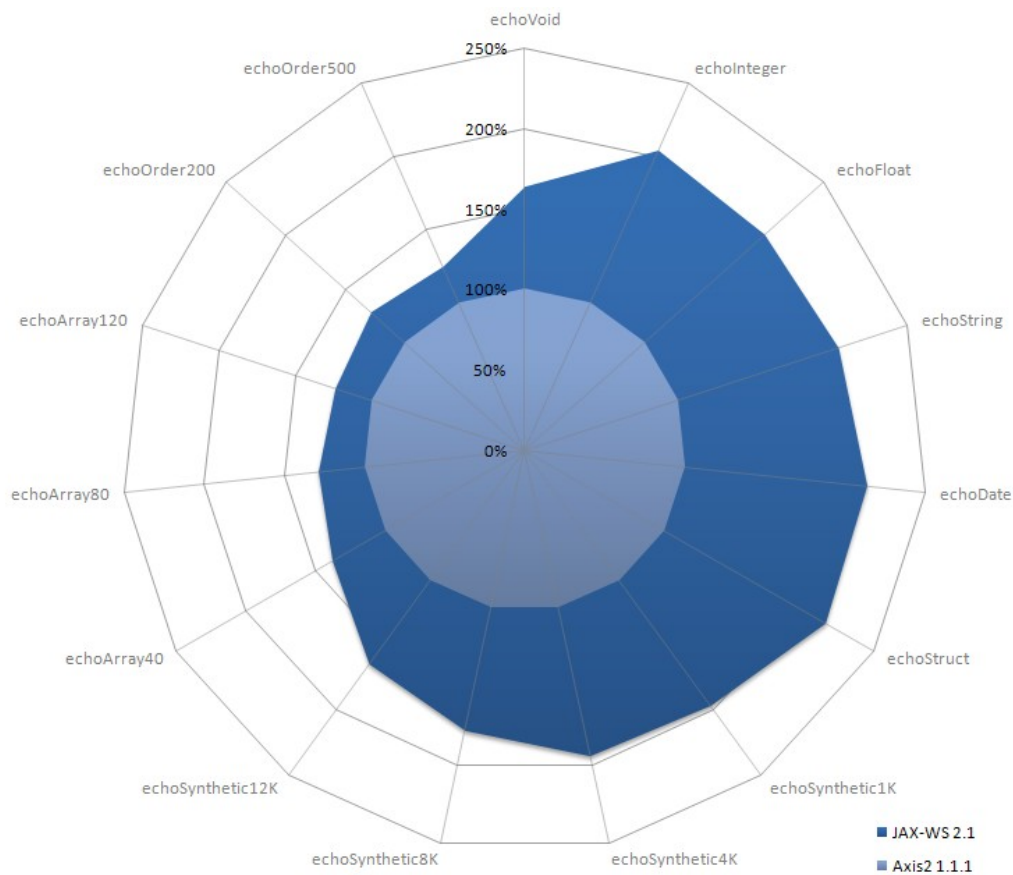


JAX-WS and JAXB Implementations

- Dynamic Runtimes
- Industry-Leading Implementations
 - JAXB RI is de-facto *Industry Standard*
 - JAX-WS is *much faster* than Axis
- WS Separation of Transport and Encoding
 - HTTP, JMS, SMTP, TCP/IP, Fast Infoset, SOAP, XML.
- *Project Tango/WSIT* – MS Interop.
- Growing # of extensions: JSON, Spring support
- **Great** Performance so far... & getting better



JAX-WS RI vs Axis2





Web Services Interoperability Technologies (WSIT)

- Enables Interop between Java and .NET 3.0
- Plugins to JAX-WS RI to provide:
 - Bootstrapping, optimizing communication, reliable messaging, atomic transactions, security and trust
 - WS-MEX, WS-Transfer, WS-Policy, WS-SecureConversation, WS-ReliableMessaging, WS-Coordination, WS-AtomicTransactions, WS-Security, WS-Trust
- Check TS-4865—“Takes Two to Tango...”



Java Business Integration (JBI)

- Built in support for JBI (JSR -208)
- JBI runtime (OpenESB) and system components are bundled and integrated in GlassFish v2
 - <https://open-esb.dev.java.net>
- Administration GUI
- CLI enhanced for running JBI commands



Web Container - JSP, Servlet, Grizzly

- Asynchronous Request Processing (ARP) and Comet
- Non-blocking SSL
- Apache AJP protocol
- In-memory (JSR 199) style JSP compilations
- All webcontainer aspects dynamically reconfigurable
- Alternate docroots for virtual servers and web apps
- Startup and request processing optimizations
- Nice adoption for Grizzly
 - Generic NIO framework (Grizzly 1.5)



Top Link Essentials / JPA

- Oracle Contribution
- Very Active Community
 - Oracle, Sun, TmaxSoft, independents
 - Mail: persistence@glassfish.dev.java.net
- Pluggable
 - In GlassFish, JEUS, Jonas, Tomcat, Geronimo, Jboss, Oracle
- Converse is true also
 - Hibernate & Kodo / OpenJPA run on GlassFish



Management Features

- Centralized, secure, remote access
 - Accessible as GUI, CLI, IDEs, Java-based programs
- Off-line configuration
- Industry-standard infrastructure
 - Java Management Extensions, JMX™ API
- Custom ANT tasks
- Management and Monitoring API
 - Application Server Management eXtensions, AMX
- Can be monitored through *jConsole* and others



New Admin Console

- Admin console re-implemented using JSF Templating, JavaServer™ Faces technology for creating Pages and Components
- jMaki Charting
- Ajax (breadcrumbs, tree, restart)
- Support for Cluster Management
- One step Deployment with Server-side Browsing
- Integrated JBI Administration



Specification Updates

- JSR 196 (Authentication SPI)
- JSR 208 (JBI)
- JavaServer Faces 1.2 MR
- JavaServer Pages™ (JSP™ pages) 2.1 MR
- JSP Standard Tag Library (JSTL) 1.2 MR
- Servlet 2.5 MR
- JAX-WS MR
- Java Architecture for XML Binding (JAXB) MR



Other Projects in GlassFish



What's in GlassFish Community

- GlassFish Application Server
 - Reusable Components
 - Available Separately
- *Friends and Relatives*
 - Growing Number, much beloved...
- Latest Addition – SIP Servlet



Reusable Components

- JSF
- Grizzly (as Generic NIO framework)
- JSP, Servlet
- Reusable JBI – open-esb project
- JSFTemplating
- Woodstock – JSF Components



More Components

- TopLink Essentials
- Open Message Queue – Enterprise-class JMS
- IIOP/CORBA
- XML Processing
 - JAXP, sxsxp (STAX), FI (Fast Infoset), XWSS (security)



Friends and Relatives

- SPENGO (GregL/RonM) / Kerberos
- Hudson (Kohsuke) – Continuous Integration
- Japex (Santiago) – WS Performance
- jMaki (GregM, CarlaM ...) – AJAX widgets
- Phobos (RobertoC ...) - Server-side Scripting
- BlogApps (DaveJ ...) REST
- Rome (DaveJ, Ramesh...) Atom
- WADL (Marc) REST
- JAX-RS (PaulS, Marc)
- Slynkr (Jamey) - Social Tagging



NEW! SIP Servlet Contribution

- Project SailFin
 - Code available, not yet fully integrated?
- Ericsson contribution

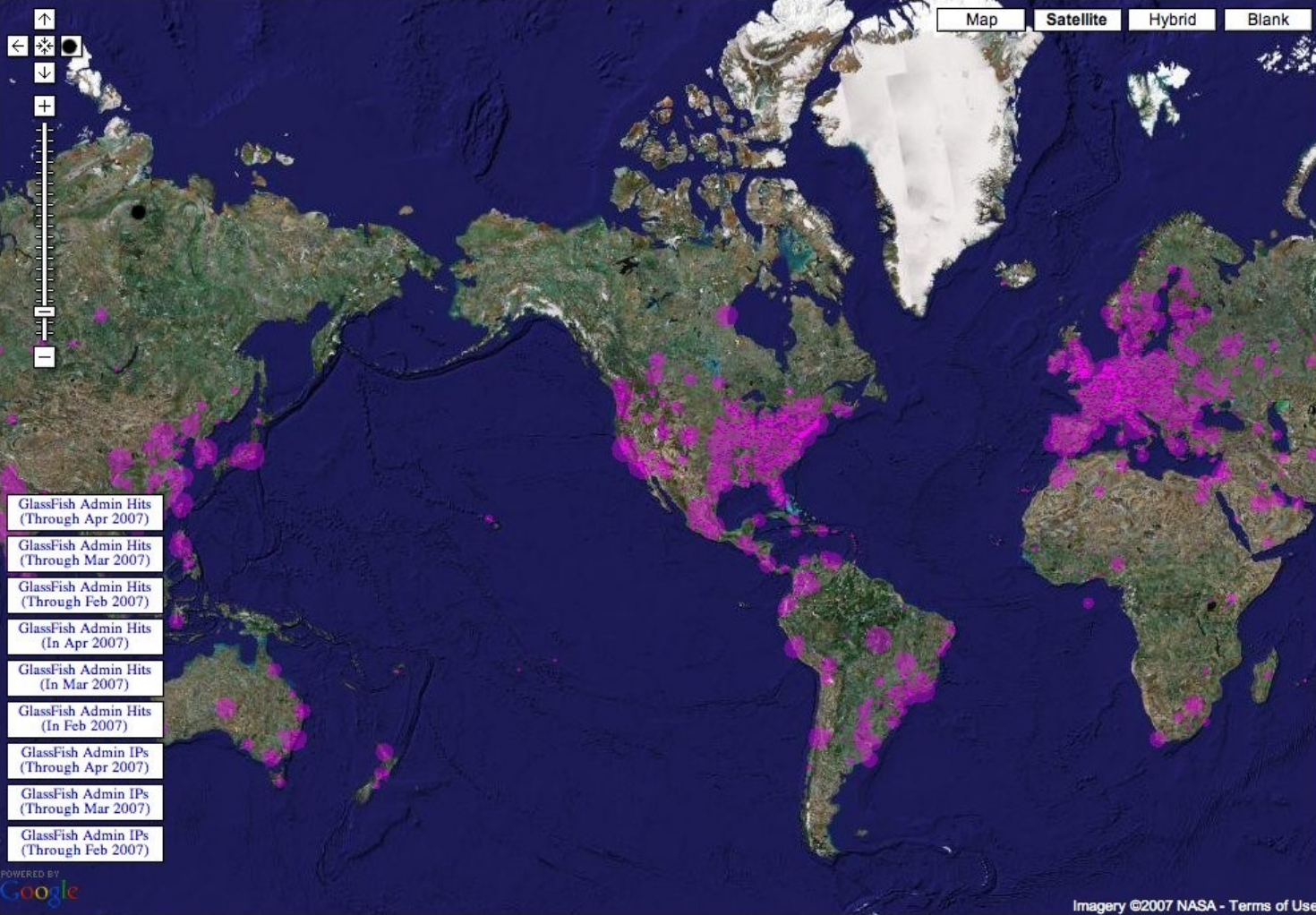


Adoption for GlassFish



Adoption

- 2.7M downloads
- All anecdotal data show adoption
- Stories blog (blogs.sun.com/Stories)
 - Peerflix, Wotif.com, Dataverse,...
- Growing Google/Yahoo! hits, Blogs, Searches
- Hard to measure deployments



[Link To: Default View](#) | [This View](#)

Current Zoom: 2 (details at 14+)

[What is This Map?](#)

Stats For Visible Area

GlassFish: 305260





GlassFish Partnership Program

- Interface21 (Spring)
- Genuitec (myEclipse)
- Webtide (Jetty)
- Caucho (Quercus)
- Noemax (.NET WS client)
- Terracotta (Clustering JVM)

- Talk with us... Just starting
- Check this afternoon's session



Futures



Building the GlassFish Ecosystem

- Open For Business!
 - Commercial Support / Training
 - Fully Tested with rest of Java Enterprise System
 - Partnership Programs – SI's, ISVs, ...
- Outreach
 - GlassFish Days
 - Local events
 - Partners



Community Governance

- Plan to define Governance
 - Capture properly Interim practices
 - Create Interim Governance Board w/ 5 members
 - Propose new governance rules
 - Elect new Governance Board
- Similar to that of OpenJDK
- Planned for Summer



SailFin

- SIP Servlet Implementation
- Contributed by Ericsson
- Early Release later in 2007
- Final Release in 2008



GlassFish V3

- Modular : you only load what you use
- Open: support all types of managed applications.
- Starts in 0.5s on the best PC, 0.7 on my laptop.
- Can run in a phone !
 - And will scale up to the enterprise!
- **GlassFish V3 is the meta-container for Web 2.0**