Project GlassFish, Building a Java EE 5 Application Server

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http://java.sun.com/javaee/glassfish

TS-3274

Project GlassFish

Learn what is Project GlassFish,
its relationship to the Java$^{\text{TM}}$ Platform, EE 5
and how it will impact you and your group

Agenda

Introduction

The Community

Java EE 5

The Implementation

Future

Demo

Timeline

Project GlassFish

Open Source
Participatory
Enterprise-Quality
Java EE Standard
Community-Centered

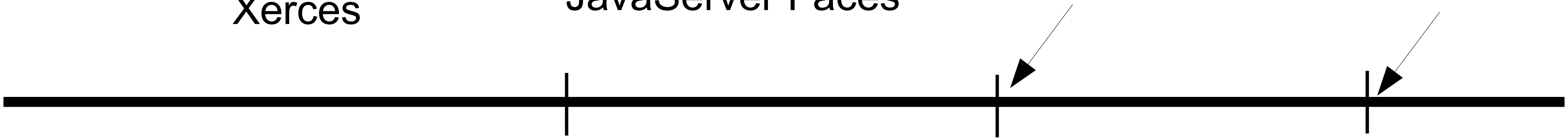
Tomcat
Jasper
Catalina
JSTL
Struts

Crimson
XSLTC
Xalan
Xerces

JAXB
JAX-RPC
JavaServer Faces

Project GlassFish
Launch

Progress
Report



J1 2004

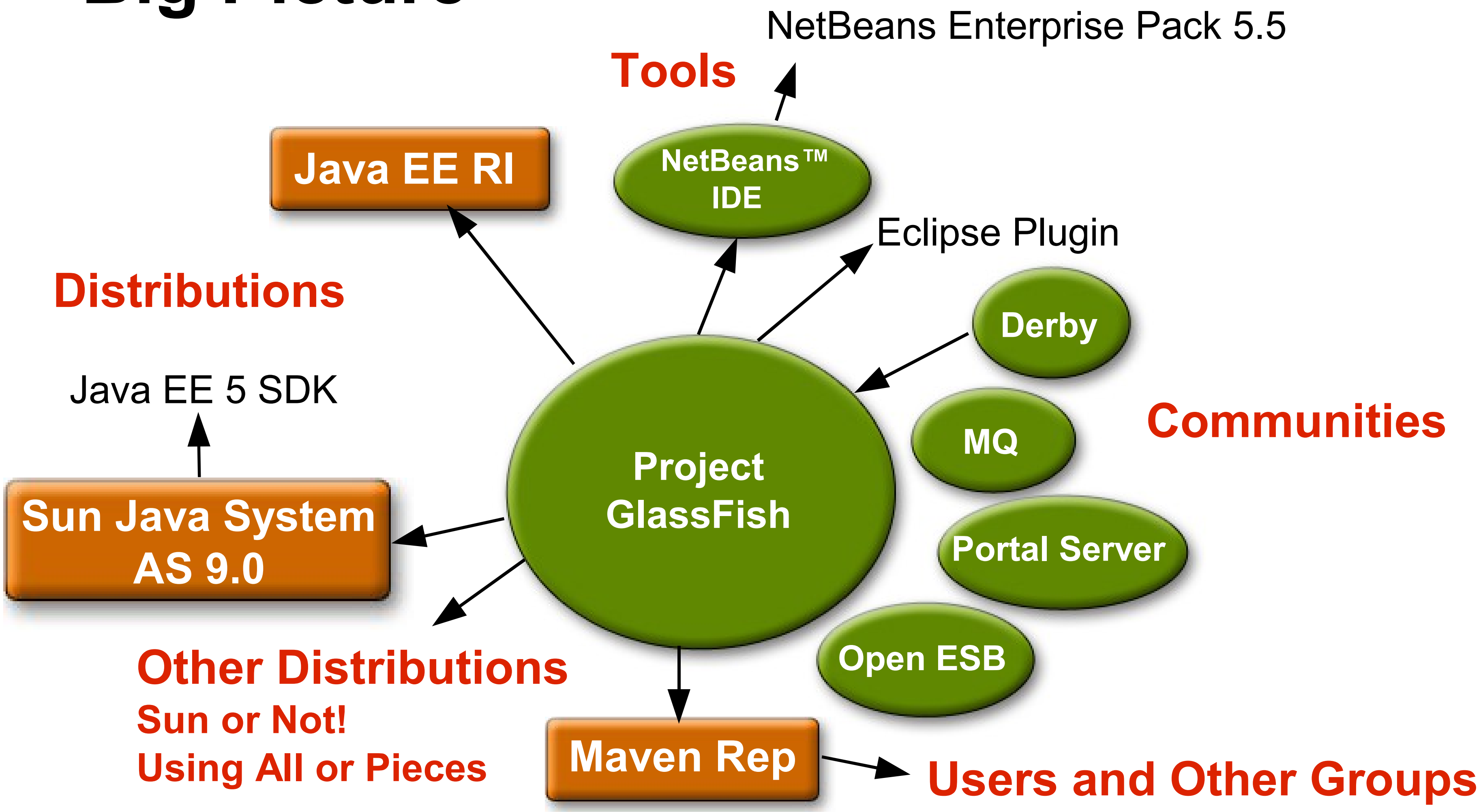
J1 2005

J1 2006

What Is Project GlassFish?

- Open Source of Java EE 5 code base
  - Production quality: All of Sun Java System Application System 9.0 PE
  - Included in Java EE 5 SDK
- Community at Java.Net—for real
  - CVS, bug DBs, discussions at Java.Net
  - Includes multiple projects: JAX*, Fast Infoset, JSF…
- OSI licenses
  - Mostly CDDL, some ASL
- Work in progress…

Big Picture



Tools

NetBeans Enterprise Pack 5.5

Java EE RI

NetBeans™ IDE

Eclipse Plugin

Distributions

Derby

Java EE 5 SDK

MQ

Communities

Project GlassFish

Sun Java System AS 9.0

Portal Server

Open ESB

Other Distributions

Sun or Not!

Using All or Pieces

Maven Rep

Users and Other Groups

Community Contributors

- Code donations
  - Sun Microsystems: Sun Java System Application System 8.x+
  - Oracle: Top Link Essentials
- Specification leadership
  - SUN, Oracle, BEA
- Participation from corporations
  - TmaxSoft (JEUS 6), BEA (WS Stack),...
- Individual contributors
  - Bugs, fixes, RFEs, documentation, ports
  - Evangelism, blogs, community support

Global Community

Jean-Francois

Tom,
Gordon

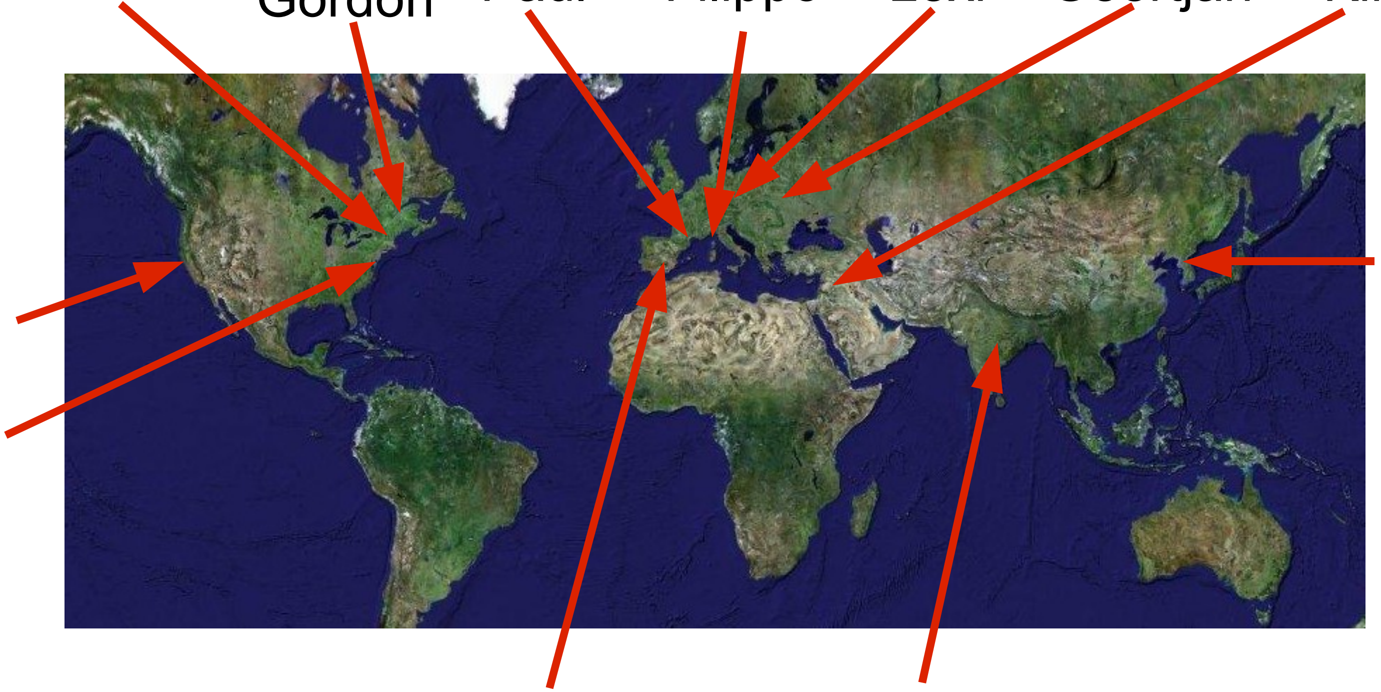
Paul

Filippo

Lexi

Geertjan

Kirill



Kohsuke

Cheng

Ias,
Wonseok

Jaime

Sahoo

Frameworks and Applications

AtLeap

RIFE

blojsom

RAILS

OSWorkFlow

Lucene

AppFuse

php

OSCache

iBATIS

JIVE SOFTWARE
What's next in collaboration

Integration ORB

Project Tango

Apache Httpd

CONFLUENCE

JIRA

CJUG-Classifieds

Struts

Open ESB

DOJO

Facelets

ROME
ALL FEEDS LEAD TO ROME

netBeans.org

BIRT

jBPM

OpenSSO

APACHE PLUTO

MyFaces

eclipse

ADF

SiteMesh

WebDAV

Shale

Derby

maven

Roller

JSPwiki

AJAX

jasperreports

Tapestry

Spring

Dalma

PostgreSQL

MC4J

Hudson

HIBERNATE

StringBeans Portal

java XML

BlogTrader

WebSphere MQ

Wicket

Equinox

Java WSDP

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Introduction

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Java EE 5

- Java EE 5 theme: Ease of development
- Java Persistence API
  - Interoperable with EJB™ 2.1 specification
- EJB 3.0 specification
  - Ease of development
- JavaServer Faces 1.2
  - AJAX
- Web services enhancements
  - Java API for XML Binding 2.0
  - Java API for XML-based Web Services 2.0

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!

J2EE 1.4 Web Service

Code Written by Developer/Deployer

```
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>
```

WebService in Java EE 5.0

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

Java API for XML-Based Web Services 2.0

- Use of Annotations
  - Improved Ease of Development
  - WSDL to Java technology generates fully annotated Java technology
  - Annotations are the law
- JAXB 2.0 now does Data Binding
- Multiple encodings (XML, MTOM/XOP, Fast Infoset)
- Multiple transports (HTTP, others)
- Multiple protocols (SOAP 1.1, SOAP 1.2, XML)

JAXB 2.0

- 1.0: Schema ➜ Java technology only
  - JAXB is for compiling schema
  - Don’t touch the generated code
- 2.0: Java technology ➜ XML + schema compiler
  - JAXB is about persisting POJOs to XML
  - Annotations for controlling XML representation
  - Schema compiler as an initial skeleton generator
  - Modify the generated code to suit your taste

Drastically Simplified Generated Code

In 1.0.x, We Generated This:

```
//
// This file was generated by the JavaTM Architecture for XML Binding(JAXB) Reference Implementation, v@@BUILD_VERSION@@
//                          See <a href="http://java.sun.com/xml/jaxb">http://java.sun.com/xml/jaxb</a>
//                          Any modifications to this file will be lost upon recompilation of the source schema.
//                          Generated on: 2005.04.21 時刻 10:37:56 PDT
//


package generated.impl;

public class PointTypeImpl implements generated.PointType, com.sun.xml.bind.JAXBObject, generated.impl.runtime.UnmarshallableObject, generated.impl.runtime.XMLSerializable, generated.impl.runtime.ValidatableObject
{

    protected boolean has_Y;
    protected float _Y;
    protected boolean has_X;
    protected float _X;
    public final static java.lang.Class version = (generated.impl.JAXBVersion.class);
    private static com.sun.msv.grammar.Grammar schemaFragment;

    private final static java.lang.Class PRIMARY_INTERFACE_CLASS() {
        return (generated.PointType.class);
    }

    public float getY() {
        return _Y;
    }

    public void setY(float value) {
        _Y = value;
        has_Y = true;
    }

    public float getX() {
        return _X;
    }

    public void setX(float value) {
        _X = value;
        has_X = true;
    }

    public generated.impl.runtime.UnmarshallingEventHandler createUnmarshaller(generated.impl.runtime.UnmarshallingContext context) {
        return new generated.impl.PointTypeImpl.Unmarshaller(context);
    }

    public void serializeBody(generated.impl.runtime.XMLSerializer context)
        throws org.xml.sax.SAXException
    {
        if (!has_Y) {
            context.reportError(com.sun.xml.bind.serializer.Util.createMissingObjectError(this, "Y"));
        }
        if (!has_X) {
            context.reportError(com.sun.xml.bind.serializer.Util.createMissingObjectError(this, "X"));
        }
        context.startElement("", "x");
        context.endNamespaceDecls();
        context.endAttributes();
        try {
            context.text(javax.xml.bind.DatatypeConverter.printFloat(((float) _X)), "X");
        } catch (java.lang.Exception e) {
            generated.impl.runtime.Util.handlePrintConversionException(this, e, context);
        }
        context.endElement();
        context.startElement("", "y");
        context.endNamespaceDecls();
        context.endAttributes();
        try {
            context.text(javax.xml.bind.DatatypeConverter.printFloat(((float) _Y)), "Y");
        } catch (java.lang.Exception e) {
            generated.impl.runtime.Util.handlePrintConversionException(this, e, context);
        }
        context.endElement();
    }

    public void serializeAttributes(generated.impl.runtime.XMLSerializer context)
        throws org.xml.sax.SAXException
    {
        if (!has_Y) {
            context.reportError(com.sun.xml.bind.serializer.Util.createMissingObjectError(this, "Y"));
        }
        if (!has_X) {
            context.reportError(com.sun.xml.bind.serializer.Util.createMissingObjectError(this, "X"));
        }
    }

    public void serializeURIs(generated.impl.runtime.XMLSerializer context)
        throws org.xml.sax.SAXException
    {
        if (!has_Y) {
            context.reportError(com.sun.xml.bind.serializer.Util.createMissingObjectError(this, "Y"));
        }
        if (!has_X) {
            context.reportError(com.sun.xml.bind.serializer.Util.createMissingObjectError(this, "X"));
        }
    }

    public java.lang.Class getPrimaryInterface() {
        return (generated.PointType.class);
    }

    public com.sun.msv.verifier.DocumentDeclaration createRawValidator() {
        if (schemaFragment == null) {
            schemaFragment = com.sun.xml.bind.validator.SchemaDeserializer.deserialize((
 "\u00ac\u00ed\u0000\u0005sr\u0000\u001fcom.sun.msv.grammar.SequenceExp\u0000\u0000\u0000\u0000\u0000\u0000\u0000\u0001\u0002\u0000\u0000xr\u0000\u001dcom.su"
+"n.msv.grammar.BinaryExp\u0000\u0000\u0000\u0000\u0000\u0000\u0000\u0001\u0002\u0000\u0002L\u0000\u0004exp1t\u0000 Lcom/sun/msv/gra"
+"mmar/Expression;L\u0000\u0004exp2q\u0000~\u0000\u0002xr\u0000\u001ecom.sun.msv.grammar.Expressi"
+"on\u00f8\u0018\u0082\u00e8N5~O\u0002\u0000\u0002L\u0000\u0013epsilonReducibilityt\u0000\u0013Ljava/lang/Boolean;L\u0000\u000b"
+"expandedExpq\u0000~\u0000\u0002xpppsr\u0000\'com.sun.msv.grammar.trex.ElementPatt"
+"ern\u0000\u0000\u0000\u0000\u0000\u0000\u0000\u0001\u0002\u0000\u0001L\u0000\tnameClasst\u0000\u001fLcom/sun/msv/grammar/NameClass;"
+"xr\u0000\u001ecom.sun.msv.grammar.ElementExp\u0000\u0000\u0000\u0000\u0000\u0000\u0000\u0001\u0002\u0000\u0002Z\u0000\u001aignoreUndecl"
+"aredAttributesL\u0000\fcontentModelq\u0000~\u0000\u0002xq\u0000~\u0000\u0003pp\u0000sq\u0000~\u0000\u0000ppsr\u0000\u001bcom.s"
+"un.msv.grammar.DataExp\u0000\u0000\u0000\u0000\u0000\u0000\u0000\u0001\u0002\u0000\u0003L\u0000\u0002dtt\u0000\u001fLorg/relaxng/dataty"
+"pe/Datatype;L\u0000\u0006exceptq\u0000~\u0000\u0002L\u0000\u0004namet\u0000\u001dLcom/sun/msv/util/String"
+"Pair;xq\u0000~\u0000\u0003ppsr\u0000\"com.sun.msv.datatype.xsd.FloatType\u0000\u0000\u0000\u0000\u0000\u0000\u0000\u0001\u0002"
+"\u0000\u0000xr\u0000+com.sun.msv.datatype.xsd.FloatingNumberType\u00fc\u00e3\u00b6\u0087\u008c\u00a8|\u00e0\u0002\u0000\u0000"
+"xr\u0000*com.sun.msv.datatype.xsd.BuiltinAtomicType\u0000\u0000\u0000\u0000\u0000\u0000\u0000\u0001\u0002\u0000\u0000xr\u0000"
+"%com.sun.msv.datatype.xsd.ConcreteType\u0000\u0000\u0000\u0000\u0000\u0000\u0000\u0001\u0002\u0000\u0000xr\u0000\'com.sun"
+".msv.datatype.xsd.XSDatatypeImpl\u0000\u0000\u0000\u0000\u0000\u0000\u0000\u0001\u0002\u0000\u0003L\u0000\fnamespaceUrit\u0000"
+"\u0012Ljava/lang/String;L\u0000\btypeNameq\u0000~\u0000\u0014L\u0000\nwhiteSpacet\u0000.Lcom/sun/"
+"msv/datatype/xsd/WhiteSpaceProcessor;xpt\u0000 http://www.w3.org/"
+"2001/XMLSchemat\u0000\u0005floatsr\u00005com.sun.msv.datatype.xsd.WhiteSpac"
+"eProcessor$Collapse\u0000\u0000\u0000\u0000\u0000\u0000\u0000\u0001\u0002\u0000\u0000xr\u0000,com.sun.msv.datatype.xsd.W"
+"hiteSpaceProcessor\u0000\u0000\u0000\u0000\u0000\u0000\u0000\u0001\u0002\u0000\u0000xpsr\u00000com.sun.msv.grammar.Expre"
+"ssion$NullSetExpression\u0000\u0000\u0000\u0000\u0000\u0000\u0000\u0001\u0002\u0000\u0000xq\u0000~\u0000\u0003ppsr\u0000\u001bcom.sun.msv.ut"
+"il.StringPair\u00d0t\u001ejB\u008f\u008d\u00a0\u0002\u0000\u0002L\u0000\tlocalNameq\u0000~\u0000\u0014L\u0000\fnamespaceURIq\u0000~\u0000"
+"\u0014xpq\u0000~\u0000\u0018q\u0000~\u0000\u0017sr\u0000\u001dcom.sun.msv.grammar.ChoiceExp\u0000\u0000\u0000\u0000\u0000\u0000\u0000\u0001\u0002\u0000\u0000xq\u0000"
+"~\u0000\u0001ppsr\u0000 com.sun.msv.grammar.AttributeExp\u0000\u0000\u0000\u0000\u0000\u0000\u0000\u0001\u0002\u0000\u0002L\u0000\u0003expq\u0000"
+"~\u0000\u0002L\u0000\tnameClassq\u0000~\u0000\u0007xq\u0000~\u0000\u0003sr\u0000\u0011java.lang.Boolean\u00cd r\u0080\u00d5\u009c\u00fa\u00ee\u0002\u0000\u0001Z\u0000"
+"\u0005valuexp\u0000psq\u0000~\u0000\u000bppsr\u0000\"com.sun.msv.datatype.xsd.QnameType\u0000\u0000\u0000\u0000"
+"\u0000\u0000\u0000\u0001\u0002\u0000\u0000xq\u0000~\u0000\u0011q\u0000~\u0000\u0017t\u0000\u0005QNameq\u0000~\u0000\u001bq\u0000~\u0000\u001dsq\u0000~\u0000\u001eq\u0000~\u0000)q\u0000~\u0000\u0017sr\u0000#com."
+"sun.msv.grammar.SimpleNameClass\u0000\u0000\u0000\u0000\u0000\u0000\u0000\u0001\u0002\u0000\u0002L\u0000\tlocalNameq\u0000~\u0000\u0014L"
+"\u0000\fnamespaceURIq\u0000~\u0000\u0014xr\u0000\u001dcom.sun.msv.grammar.NameClass\u0000\u0000\u0000\u0000\u0000\u0000\u0000\u0001"
+"\u0002\u0000\u0000xpt\u0000\u0004typet\u0000)http://www.w3.org/2001/XMLSchema-instancesr\u00000"
+"com.sun.msv.grammar.Expression$EpsilonExpression\u0000\u0000\u0000\u0000\u0000\u0000\u0000\u0001\u0002\u0000\u0000x"
+"q\u0000~\u0000\u0003sq\u0000~\u0000$\u0001psq\u0000~\u0000+t\u0000\u0001xt\u0000\u0000sq\u0000~\u0000\u0006pp\u0000sq\u0000~\u0000\u0000ppq\u0000~\u0000\u000esq\u0000~\u0000 ppsq\u0000~"
+"\u0000\"q\u0000~\u0000%pq\u0000~\u0000&q\u0000~\u0000-q\u0000~\u00001sq\u0000~\u0000+t\u0000\u0001yq\u0000~\u00005sr\u0000\"com.sun.msv.gramma"
+"r.ExpressionPool\u0000\u0000\u0000\u0000\u0000\u0000\u0000\u0001\u0002\u0000\u0001L\u0000\bexpTablet\u0000/Lcom/sun/msv/gramma"
+"r/ExpressionPool$ClosedHash;xpsr\u0000-com.sun.msv.grammar.Expres"
+"sionPool$ClosedHash\u00d7j\u00d0N\u00ef\u00e8\u00ed\u001c\u0003\u0000\u0003I\u0000\u0005countB\u0000\rstreamVersionL\u0000\u0006par"
+"entt\u0000$Lcom/sun/msv/grammar/ExpressionPool;xp\u0000\u0000\u0000\u0005\u0001pq\u0000~\u0000\u0005q\u0000~\u0000!"
+"q\u0000~\u00008q\u0000~\u0000\nq\u0000~\u00007x"));
        }
        return new com.sun.msv.verifier.regexp.REDocumentDeclaration(schemaFragment);
    }
    public class Unmarshaller
        extends generated.impl.runtime.AbstractUnmarshallingEventHandlerImpl
    {


        public Unmarshaller(generated.impl.runtime.UnmarshallingContext context) {
            super(context, "-------");
        }

        protected Unmarshaller(generated.impl.runtime.UnmarshallingContext context, int startState) {
            this(context);
            state = startState;
        }
```

```
        public java.lang.Object owner() {
            return generated.impl.PointTypeImpl.this;
        }

        public void enterElement(java.lang.String ___uri, java.lang.String ___local, java.lang.String ___qname, org.xml.sax.Attributes __atts)
            throws org.xml.sax.SAXException
        {
            int attIdx;
            outer:
            while (true) {
                switch (state) {
                    case  3 :
                        if (("y" == ___local)&&("" == ___uri)) {
                            context.pushAttributes(__atts, true);
                            state = 4;
                            return ;
                        }
                        break;
                    case  0 :
                        if (("x" == ___local)&&("" == ___uri)) {
                            context.pushAttributes(__atts, true);
                            state = 1;
                            return ;
                        }
                        break;
                    case  6 :
                        revertToParentFromEnterElement(___uri, ___local, ___qname, __atts);
                        return ;
                }
                super.enterElement(___uri, ___local, ___qname, __atts);
                break;
            }
        }

        public void leaveElement(java.lang.String ___uri, java.lang.String ___local, java.lang.String ___qname)
            throws org.xml.sax.SAXException
        {
            int attIdx;
            outer:
            while (true) {
                switch (state) {
                    case  2 :
                        if (("x" == ___local)&&("" == ___uri)) {
                            context.popAttributes();
                            state = 3;
                            return ;
                        }
                        break;
                    case  6 :
                        revertToParentFromLeaveElement(___uri, ___local, ___qname);
                        return ;
                    case  5 :
                        if (("y" == ___local)&&("" == ___uri)) {
                            context.popAttributes();
                            state = 6;
                            return ;
                        }
                        break;
                }
                super.leaveElement(___uri, ___local, ___qname);
                break;
            }
        }

        public void enterAttribute(java.lang.String ___uri, java.lang.String ___local, java.lang.String ___qname)

        }

    }

}
```

- 308 lines for <point><x>1</x><y>2</y></point>
- 38 files
- 219KB of code in total

Drastically Simplified Generated Code

In 2.0, We Generate This:

```
@XmlAccessorType(FIELD)
@XmlType(name = "", propOrder = {"x","y"})
@XmlRootElement(name = "point")
public class Point {

    protected float x;
    protected float y;
    public float getX() {
        return x;
    }

    public void setX(float value) {
        this.x = value;
    }
    public float getY() {
        return y;
    }

    public void setY(float value) {
        this.y = value;
    }
}
```

- 62 lines for <point><x>1</x><y>2</y></point>
- 2 files
- 3KB of code in total

Agenda

Introduction

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The Implementation

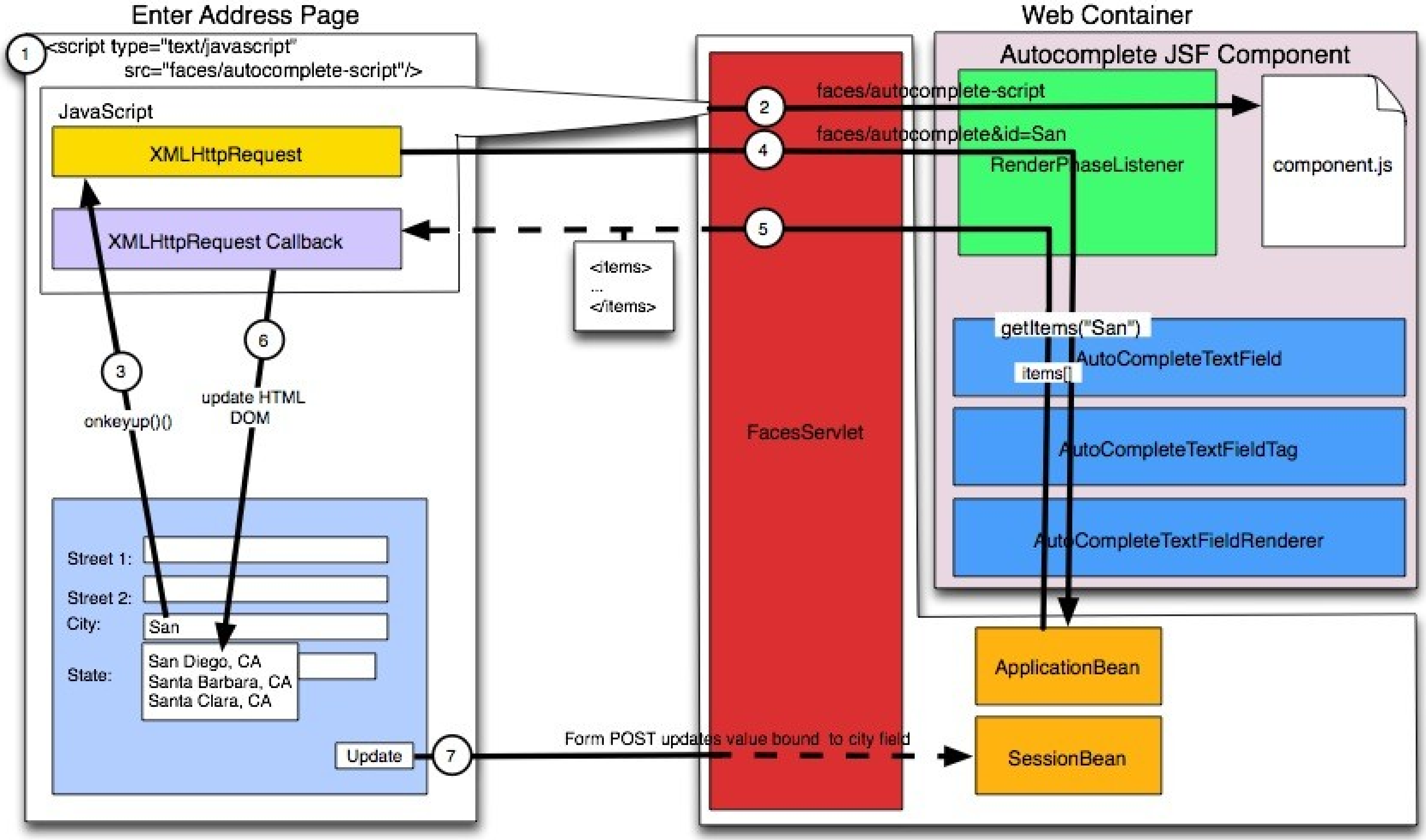
Future

Demo

JavaServer Faces Technology and AJAX

- AJAX is built into the life cycle
- Everything is handled by the JavaServer Faces environment
- JavaServer Faces environment with a phase listener used to return initial JavaScript™ technology
- JavaServer Faces environment with a phase listener processes AJAX requests
- View state from a page may also be accessed

AJAX Processing With a JavaServer Faces-Based Component



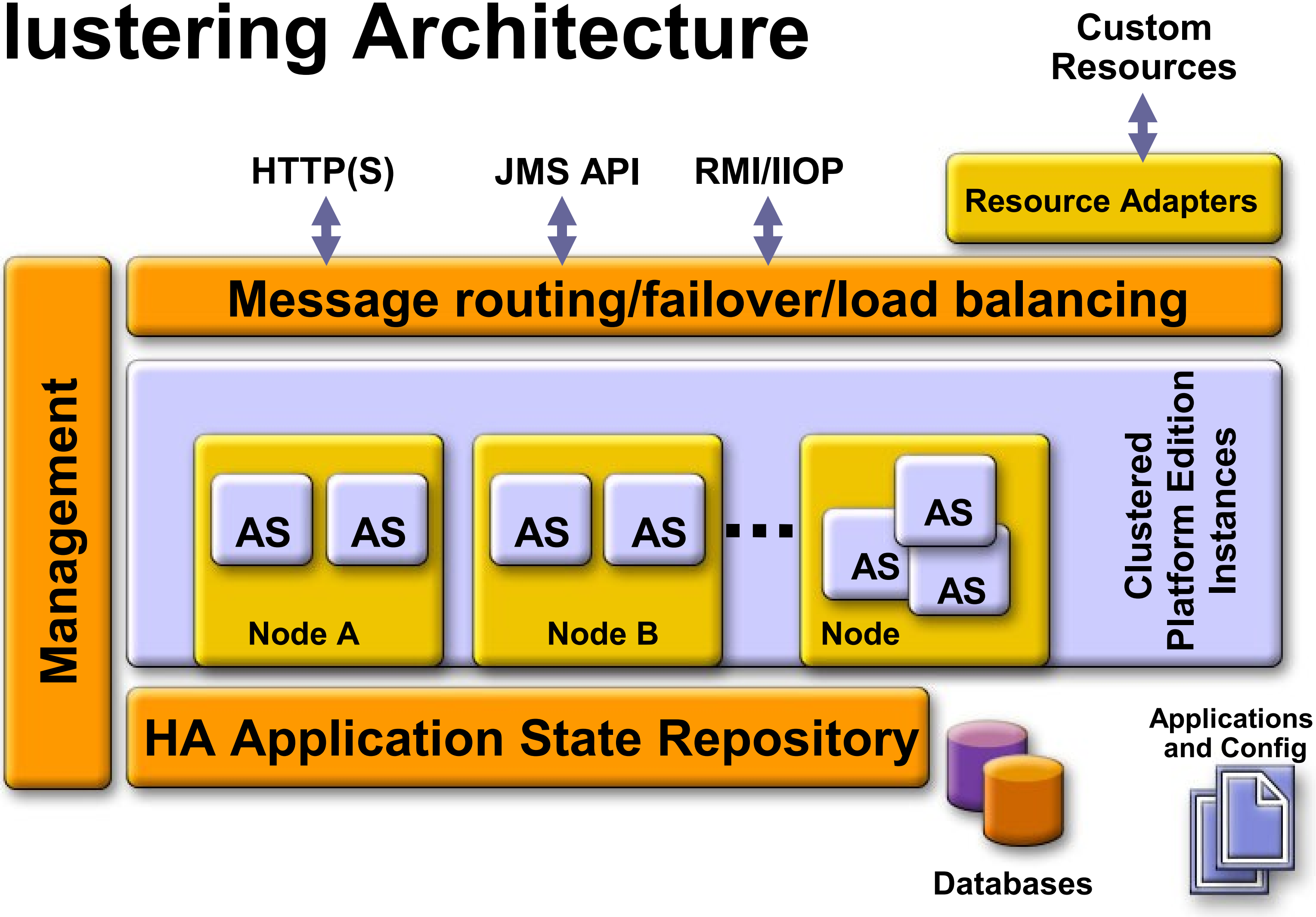
Management Features

- Centralized, secure, remote access to functionality
  - 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

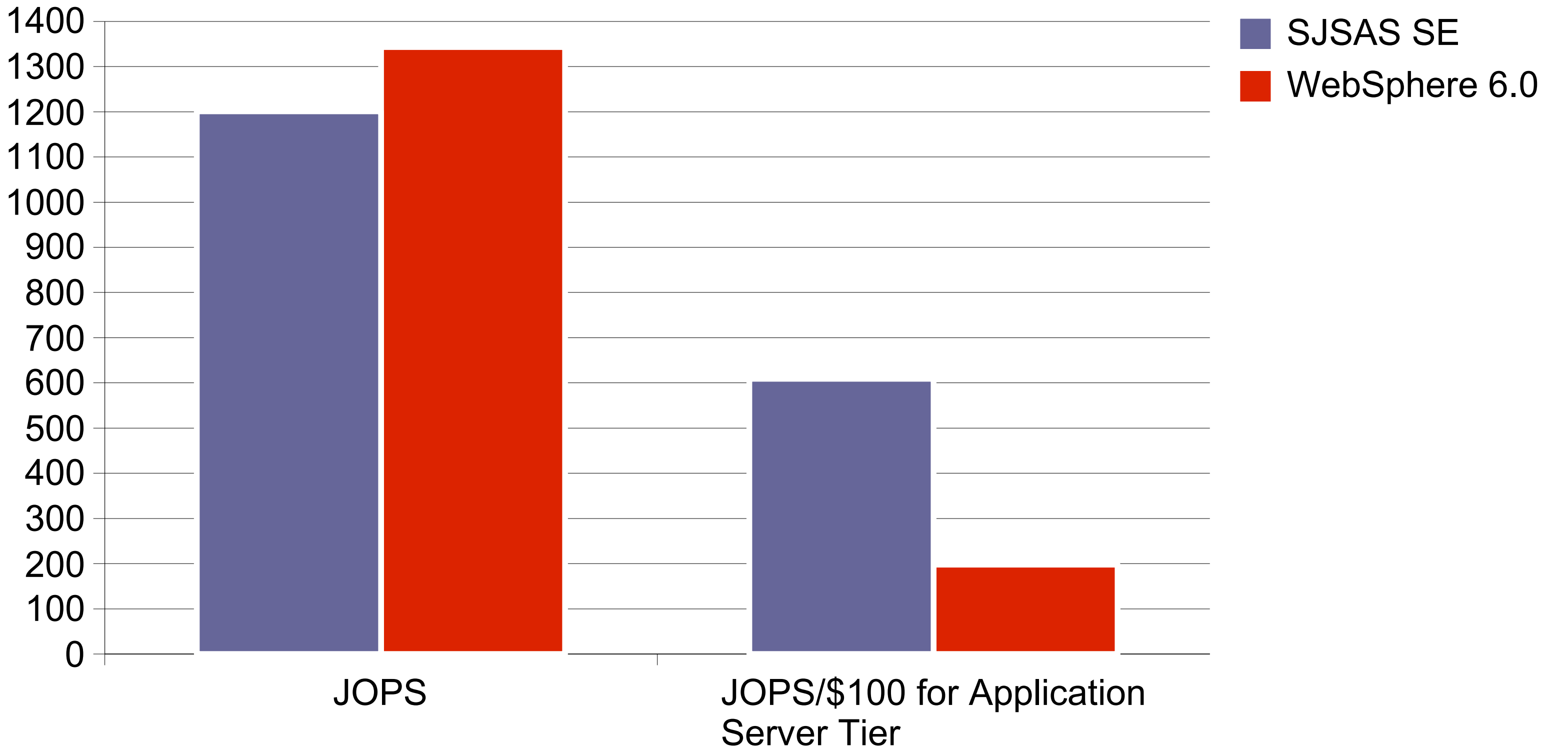
Sun Java System Application Server

- Platform Edition: fast and lightweight
  - Project GlassFish
  - Basis for Java EE SDK
  - Free for development, deployment, (re)distribution
  - Integrates with NetBeans™ technology, Sun Java Studio Enterprise, Sun Java Studio Creator, and Eclipse
- Standard Edition
  - Advanced security, out-of-the-box
  - Self-managing and self-healing
  - Clustering and multi-machine administration
- Enterprise Edition supports 99.999% availability
  - Very small downtime, no data loss, full recovery

Clustering Architecture



The Only Free Application Server to Publish SPECjAppServer Numbers!



Tools

- NetBeans Enterprise Pack 5.5
  - Supports Java EE 5 Applications
  - Java Persistence API in Web, EJB specification and standalone
  - Includes many wizards
  - XML Schema tools
  - Web Services Orchestration
  - UML Modelling
- SOA Extensions (BPEL Engine, Java Business Integration)
- Samples, documentation, how-to
- Plugin for Eclipse

Agenda

Introduction

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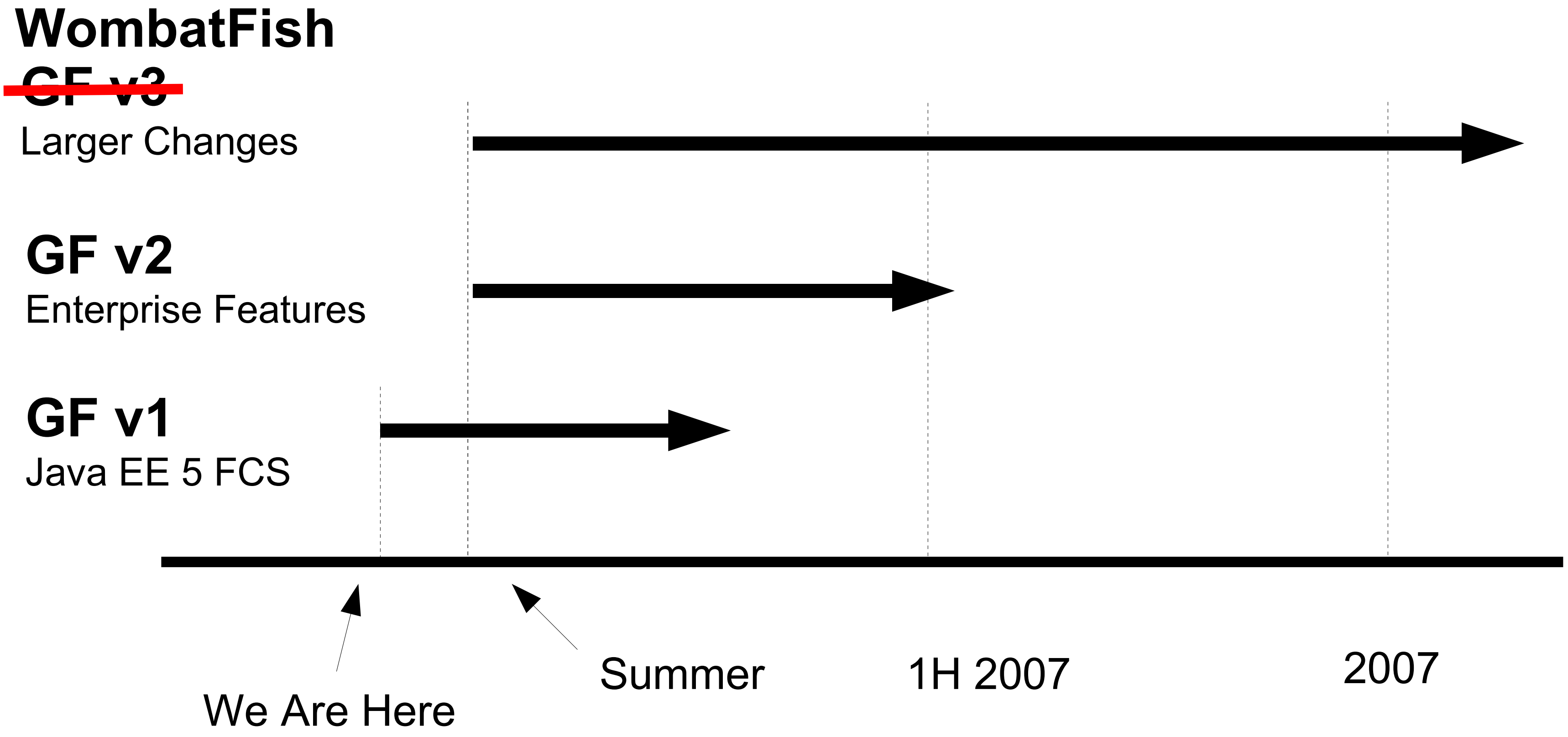
OpenJava EE

~~Project GlassFish~~ Trains

Tentative Schedules



OpenJava EE Trains

Tentative Content

- Common to all
  - More Open Source, more community, more quality, …
- Project GlassFish v1—bug fixes
- Project GlassFish v2
  - New WS stack, performance, startup time
  - Load balancing, cluster management
  - Some scripting support
  - Unified test framework
- Project WombatFish
  - Larger architectural changes
  - Better modularization, better scripting support

New Web Service Stack (Project GlassFish v2)

- Separation of transport and encoding
  - HTTP, JMS, SMTP
  - FI, Textual, others
- Optimized across layers
  - StAX, SAAJ, JAX-WS, JAXB
- Project Tango for MS interoperability
- Great performance so far
- BOF-2526: Tuesday 9:30pm, Esplanade 307-310

Unified Test Framework (Project GlassFish v2)

- Based on TestNG
- Provide standard ways of developing EJB, Web, and Web Services tests
- For more info/participation
  - Quality wiki http://wiki.java.net/bin/view/Projects/GlassFishQuality
  - Mailing List: quality@glassfish.dev.java.net

Scripting on the Server Side (GF v2)

- Allow users to use dynamic languages like JavaScript technology/Ruby and others
- Scripting engines plugged in Project GlassFish using standard JSR 223 APIs
- Project Phobos: New way of building web applications with dynamic languages
  - Still provide access to Java SE and EE APIs
  - Based on Rhino today
- BOF-2526: Tuesday 9:30pm, Esplanade 304-306

DEMO

Recap of Announcements

- Project GlassFish v1, v2, WombatFish
- New Java.Net projects in community
  - wsit.dev.java.net (Project Tango)
  - ajax.dev.java.net (jMaki)
  - shoal.dev.java.net (clustering)
  - phobos.dev.java.net (scripting)
- Renewed commitment to community
  - More activities (how-tos, town halls,…)
  - More documentation (architecture, features,…)
  - Clearer governance documents

We Need You!

- As users
  - What’s working? What’s missing?
- As contributors
  - Bug reports
  - Documents, localization
  - Evangelism! Talk to your friends
  - Contribute bug fixes
  - Contribute new code!

Summary

- Java EE 5 is not your father's J2EE (1.4)
- OpenJava EE Community is building the best Java EE 5 AS
- Help Us!
  - Spread the word
  - Participate
- Stay in Touch!
  - http://blogs.sun.com/theaquarium
  - http://java.sun.com/javaee/glassfish

Q&A

See you at...

BOF 0251: Tuesday, 8:30pm, Argent Hotel
Community Meeting: Wednesday, 5:00pm, Argent Hotel
Booth 706

Project GlassFish, Building a Java EE 5 Application Server

Karen Tegan-Padir, Vice President
Eduardo Pelegrí-Llopart, Distinguished Engineer
Jerome Dochez, Senior Staff Engineer

Sun Microsystems, Inc.
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