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Project SailFin: Architecture, Applications, and Roadmap

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TS-5866



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



Learn about the Architecture,
Applications and Roadmap of
Project SailFin.

A large, light blue graphic consisting of a stylized arrow pointing right, followed by the word "GOAL" in large, bold, sans-serif capital letters.

Agenda

- What is Project SailFin
- SailFin Architecture
 - Relationship with GlassFish project
 - SIP Container Architecture
 - High Availability
- Features
- Applications
- Road Map

What is Project SailFin(<http://sailfin.dev.java.net>)



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

- Part of GlassFish™ project on java.net
- Based on GlassFish project for Java™ EE platform
- Ericsson contributed SIP Servlet container
- Joint development by Sun and Ericsson Engineers
- Supports high availability for converged SIP and Java EE applications
- 47 Committers in the project
- Basis for Sun GlassFish Communications Server

Communications Landscape Is Morphing

(The future is not what it used to be)



SIP Technology

➤ Session Initiation Protocol

- Signaling protocol for Internet multimedia session initiation
- Defined by RFCs 3261(sip), 4566(sdp), 3550(rtp)
- Can be asynchronous and bi-directional
- Text-based request and response like HTTP

➤ SIP Servlets API (JSR 116 and 289)

- SIP Servlets process SIP message
- Based on the Generic Servlet model
- Defines Message, Request, Response, Sessions and Timers
- Packaged as .sar files

➤ SIP Servlets have different methods for handling each type of SIP message

- E.g.: doInvite() method processes an INVITE message

Role of Java EE Platform

- Platform continues to simplify development of portable and scalable services
 - Annotations, Java APIs for XML Web Services (JAX-WS), Java Persistence API, Enterprise JavaBeans™ (EJB™) 3.0 architecture, JavaServer™ Faces (JSF) components, Security, Transactions, Connectors
 - Big ecosystem means choice of vendors and IDEs
- IT targeted, fast finding applications in Telco Services
 - JSR-289 bridges Communications and Java EE application environment
 - Same app model for core network applications, OSS/BSS, SOA, and interactive consumer web applications. Use the right tools
- Java EE 6 is in progress
 - New JSRs and updates to existing standards

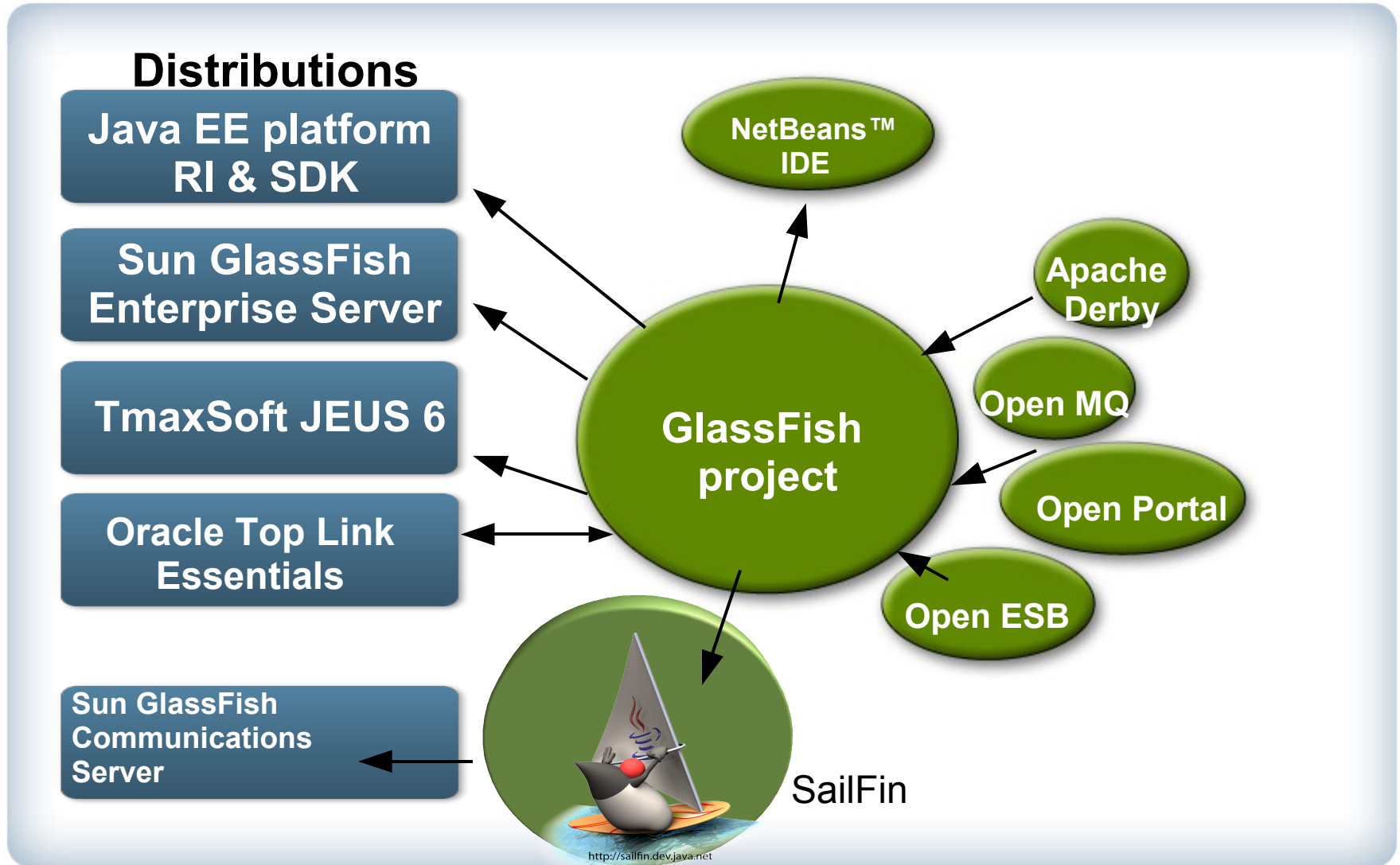
SIP Servlets 1.1(JSR 289)

- A significant update to SIP Servlets 1.0
- Convergence: combine Java Platform, Enterprise Edition (Java EE platform) and SIP
- Java EE platform services in SIP applications
 - Dependency injection and Annotations
 - Invoke Web Services
 - Transactions, Enterprise JavaBeans (EJB) technology, and Java Persistence API
 - Java EE platform Connectors and Message Driven Beans associated with SIP Sessions
- Initiate calls from Servlets and EJB beans
- Application Router to enable SIP Application Composition
 - External to SIP applications

What do you get with Project SailFin?

- You get all of the GlassFish project
 - Java EE 5 platform compatibility and looking forward
 - Industry standard Web Services Interoperability
 - Service Composition capabilities with OpenESB
 - Complete Administration
 - High Availability for all Java EE platform components
- Leading Performance & Quality
 - Measured with SPECjAppServer2004
 - 883.66 JOPS (1 chip, 8 cores, 32 HW threads)
 - 8439.36 JOPS (6 chips, 48 cores, 192 HW threads)
- *Plus, a deployment quality JSR-289 container*

GlassFish Community and Project SailFin

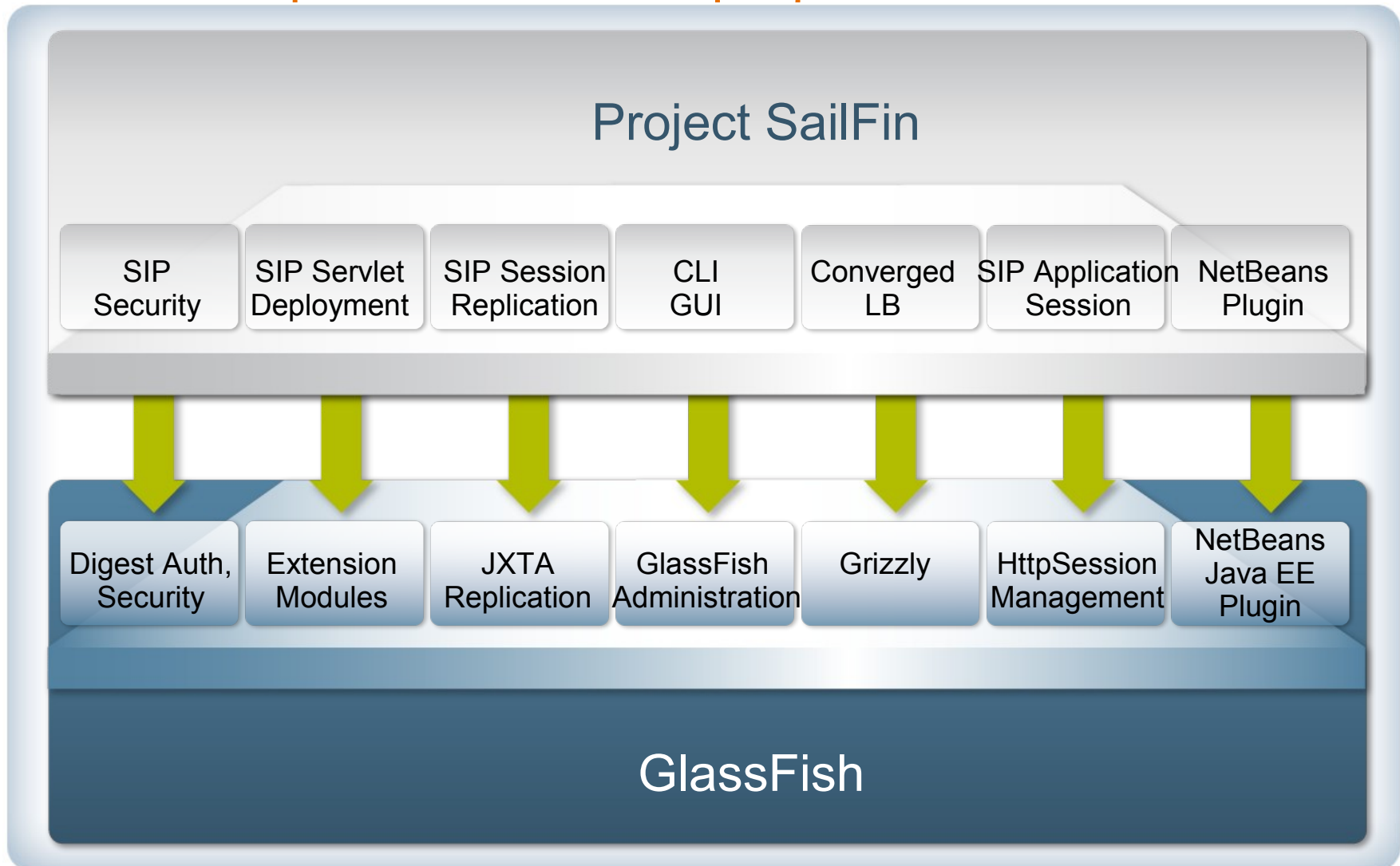


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SailFin Architecture

Relationship with GlassFish project



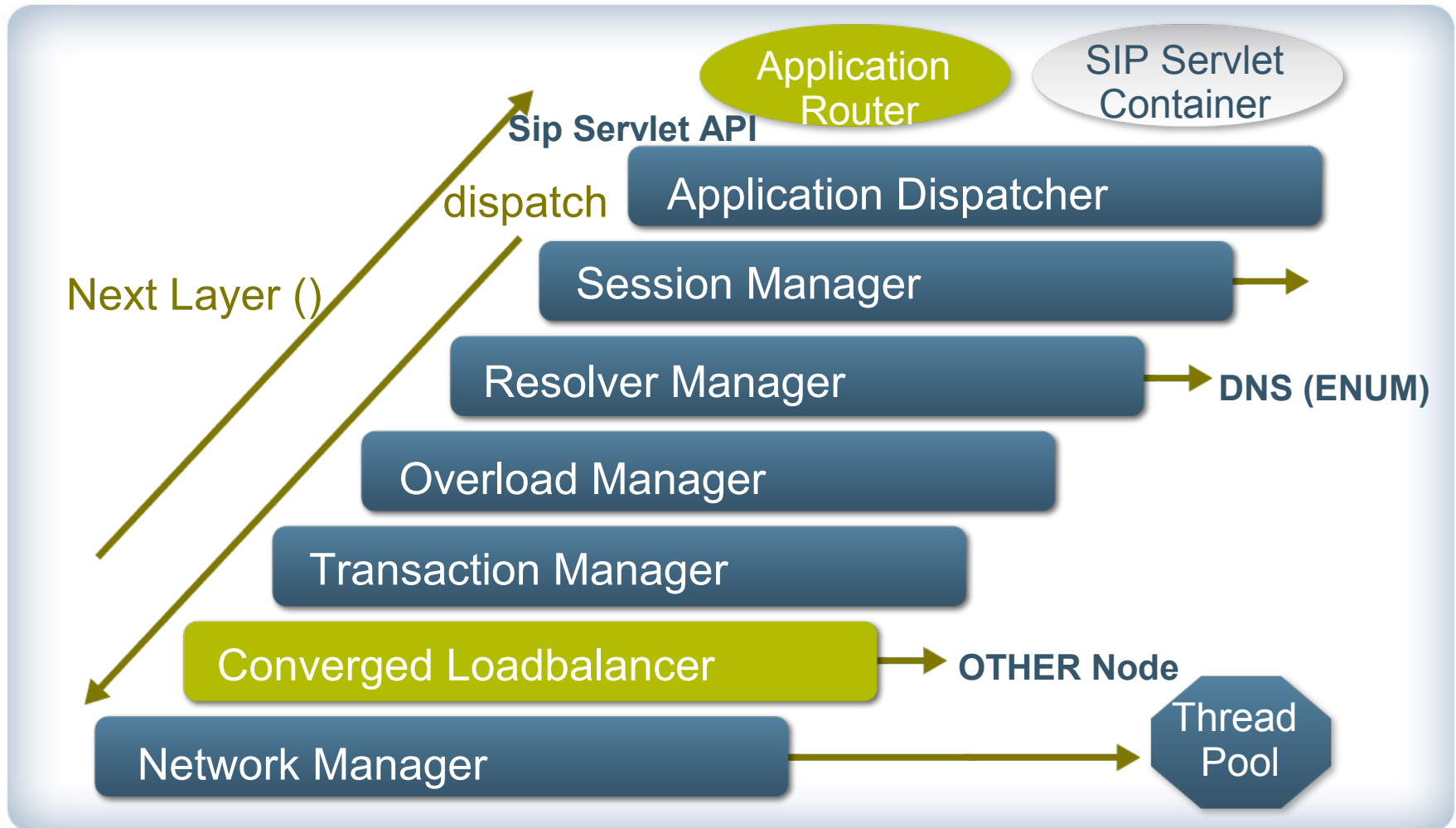
SailFin Architecture

Relationship with GlassFish project

- Project SailFin relies on GlassFish project for any infrastructure that is available
 - JXTA™ technology, Shoal, Replication, Security, are reused
- Leverages the GlassFish project update center
 - Any GlassFish V2 project based addons will work on Project SailFin also
 - Think adding Project Jersey to Project SailFin!
- Project Grizzly is used for both SIP and HTTP
- SPI model between GlassFish project and Project SailFin
 - Internal contract between GlassFish project and Project SailFin

Project SailFin Architecture

SIP Container



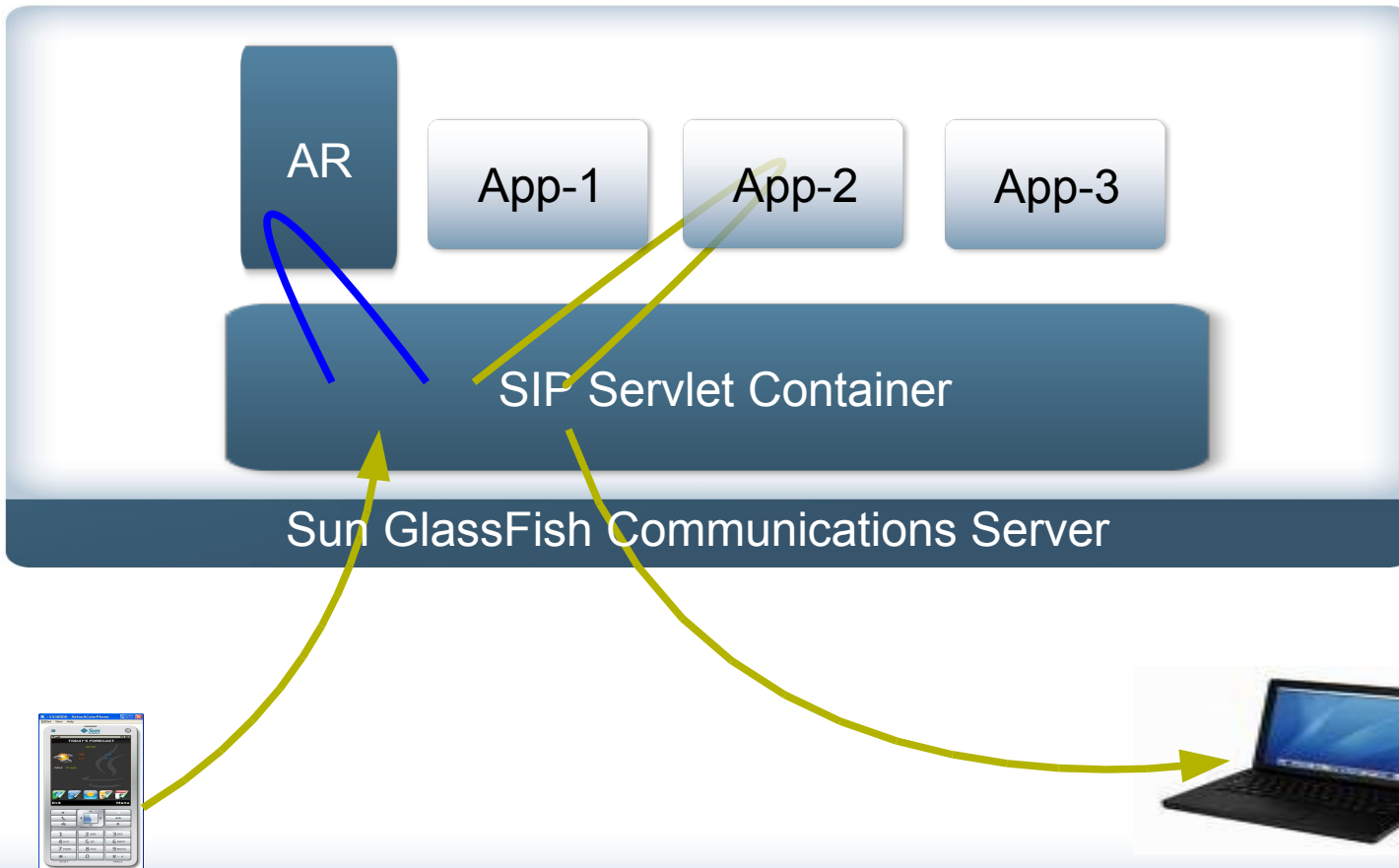
Project SailFin Architecture

SIP Container

- Layered Architecture
- Uses Project Grizzly NIO framework as the network manager
- Over Load Protection
 - Ability to reject requests if the load on the server is high
 - Both for HTTP and SIP
- Uses DNSJava for DNS resolution and ENUMs
- Support SIP Application Router as defined by JSR 289
- Supports JSR 289 and relevant SIP RFCs

Project SailFin Architecture

SIP Application Router



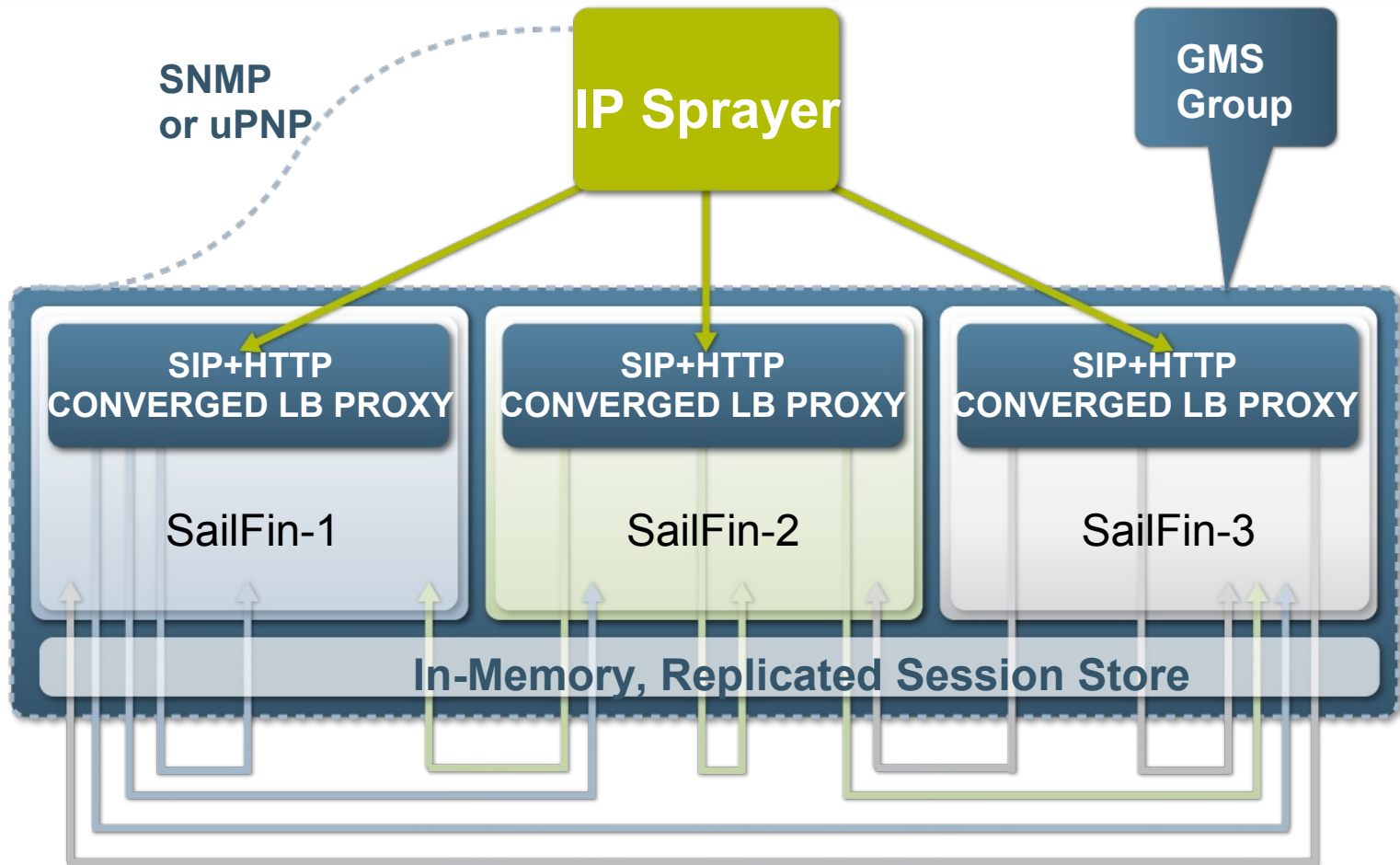
Project SailFin Architecture

SIP Application Router

- SIP Container Queries Application Router
 - Initial Requests
 - B2BUA/Proxy
- Application Router
 - Examines the SIP request
 - Selects which application need to be executed
 - Does not modify Request or Response
 - Packaged as a Jar file as defined by JSR 289
- In Project SailFin
 - Application Router can be deployed
 - Default is Alphabetical Application Router
- *Compose Applications using an Application Router*

Project SailFin Architecture

High availability



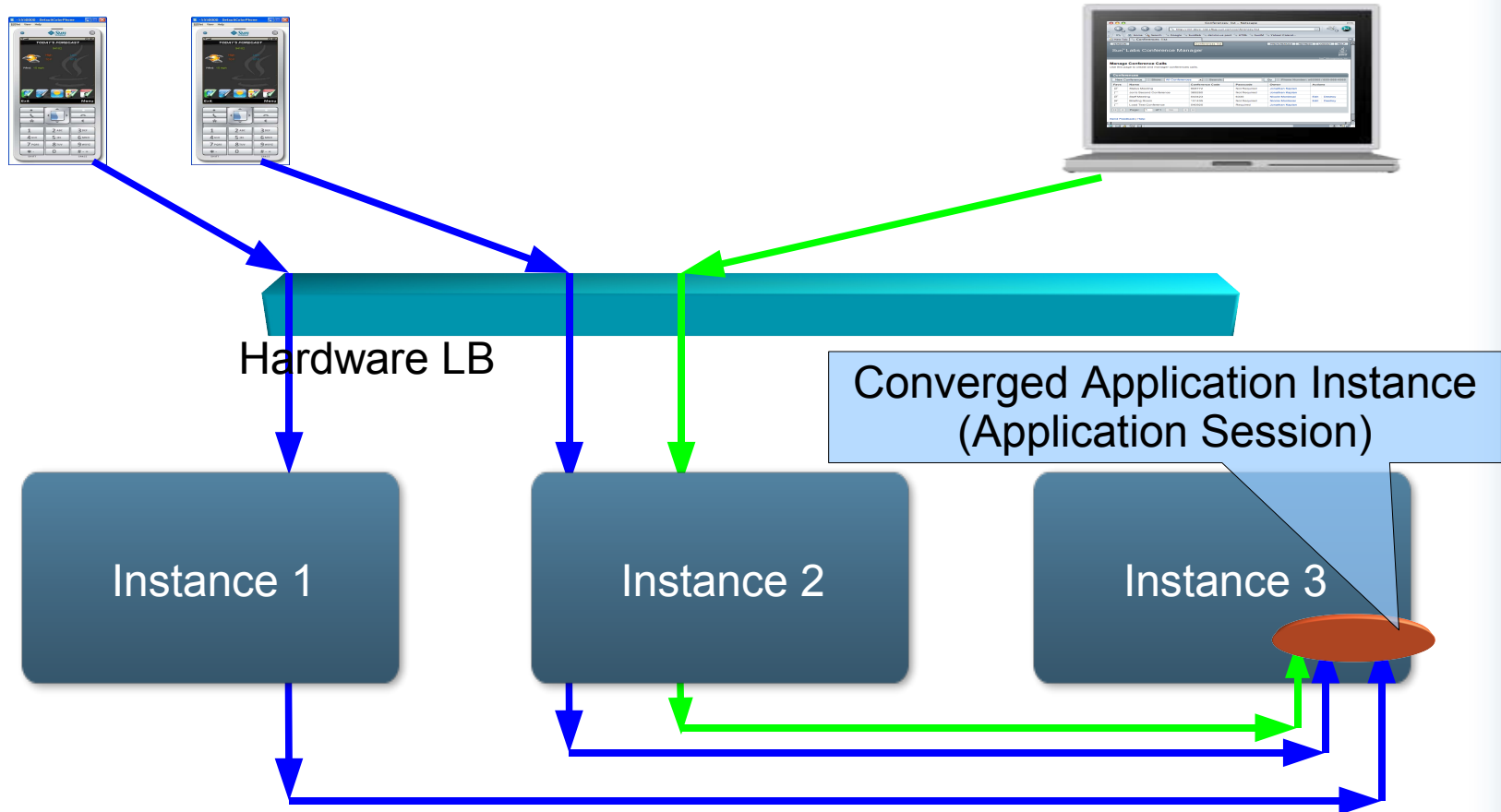
Project SailFin Architecture

High availability

- JSR 289 defines SIP Application Session
 - A SIP Application Session contains multiple protocol sessions (SIP or HTTP)
 - One SIP Application Session represents a converged application instance
- Project SailFin maintains co-location of sessions in a SIP Application Session
 - Each Instance contains a load balancing proxy
 - Routes the requests to appropriate instance
 - Based on Consistent Hashing of Message Header contents
- SIP Application Sessions (and hence their protocol children) are replicated

Project SailFin Architecture

High availability: Converged Application



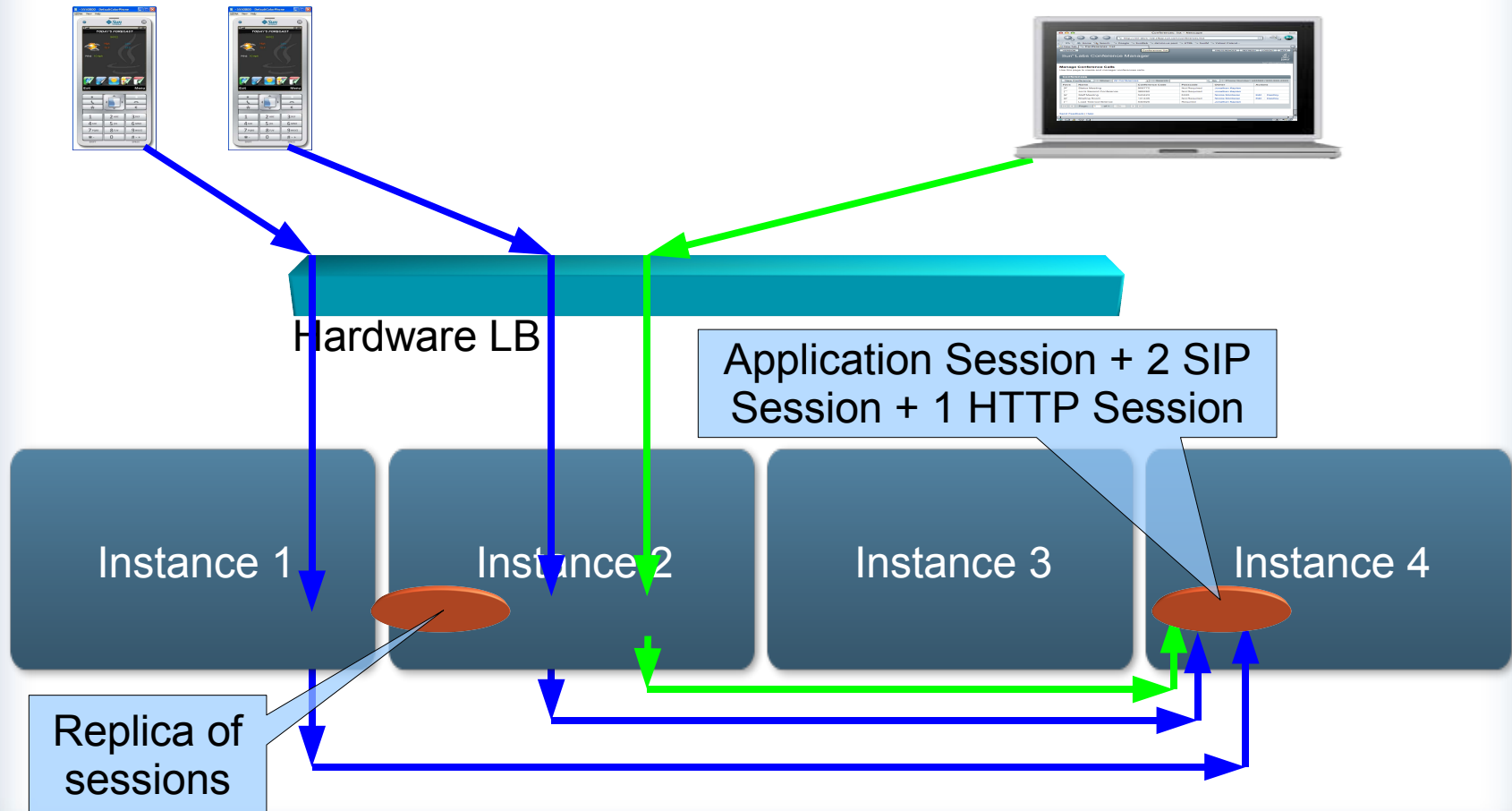
Project SailFin Architecture

High availability: Converged Load Balancer

- A Project SailFin cluster is typically fronted by a HW load balancer
- The HW load balancer routes the traffic to any random Project SailFin instance
 - Traffic from SIP User Agent and HTTP browser might reach any instance
 - The converged LB proxy in each instance then does a consistent hashing on the configured headers (eg: Conference ID) of the messages
 - Thus traffic for a particular application instance (a particular conference) always reach the same instance

Project SailFin Architecture

High availability: Replication



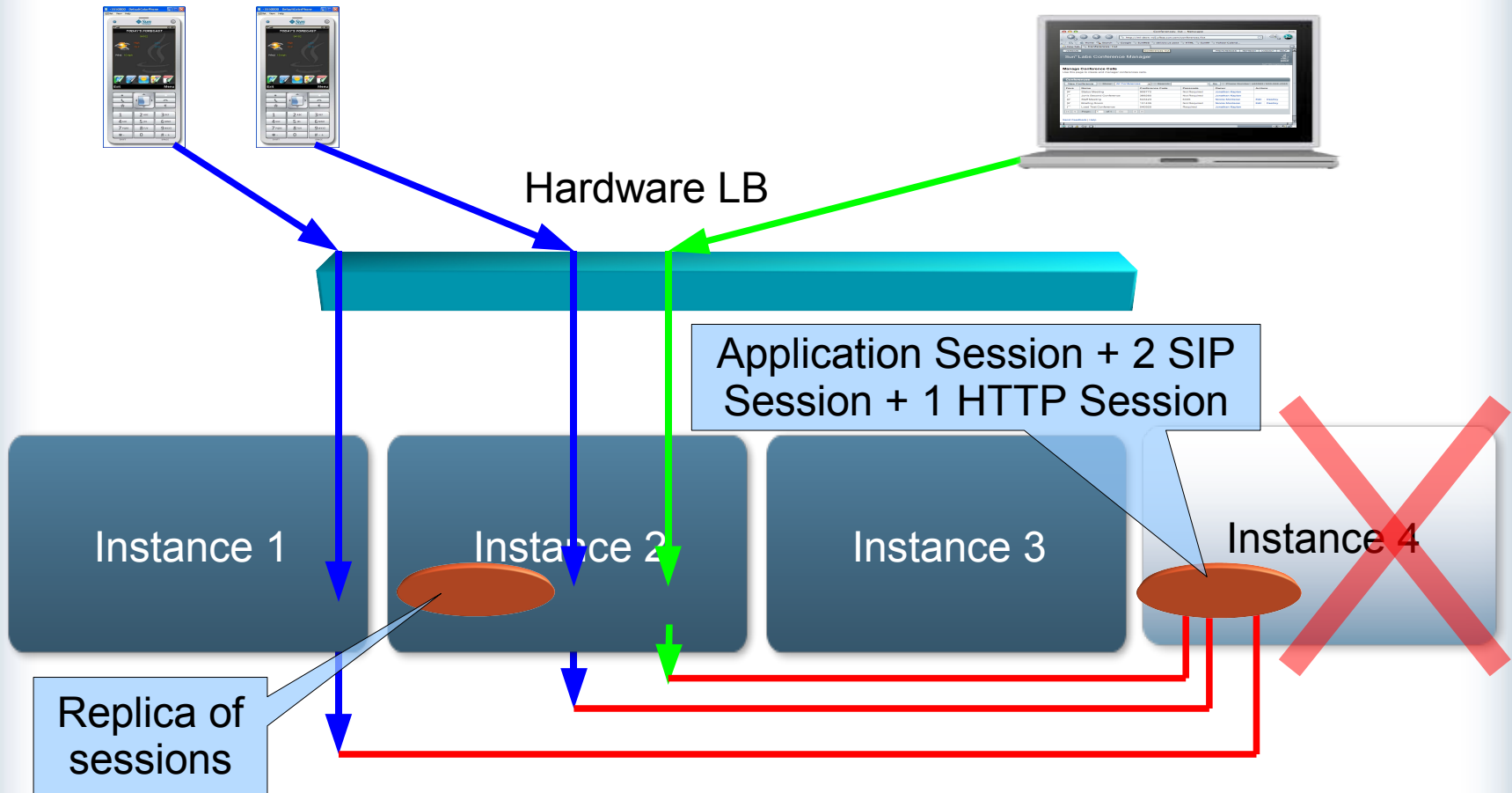
Project SailFin Architecture

High availability: Replication

- Reuses GlassFish project In-memory Replication Framework
 - Enhanced to support SIP use cases also
 - Failure notifications are based on Shoal/JXTA technology (<http://shoal.dev.java.net>)
 - Supports Planned/Unplanned Failures
 - Supports HW/SW failures
- SIP application Session, child protocol sessions and dialog fragments are replicated to a buddy in the Project SailFin cluster
 - Buddy is selected based on a Ring Topology
- If the instance fails, the session from the replica buddy will be reused

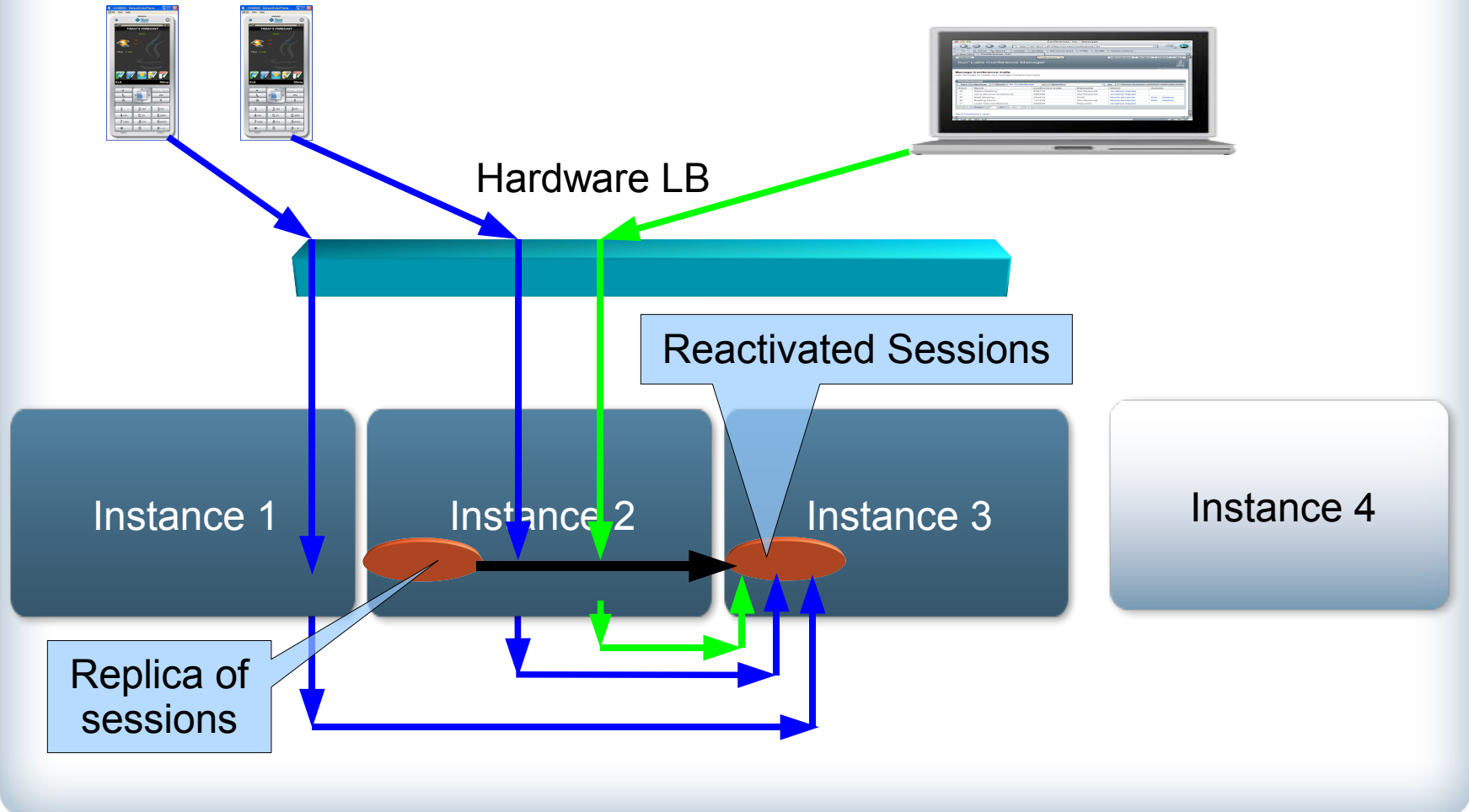
Project SailFin Architecture

High availability: Replication



Project SailFin Architecture

High availability: Replication



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Features

Security

- Confidentiality and Integrity of SIP messages using TLS
- User Authentication
 - GlassFish project Digest Authentication
 - Algorithm : MD5
 - Realms supported by default : JDBC™ API
 - P-Asserted-Identity
- Authorization
 - Based on Java EE roles, group and principle mapping.
 - Uses JACC (Java Authorization Contract for Containers)
- Configuration to define trust domains, e.g.: trusted SIP entities(host-name,IP-address)

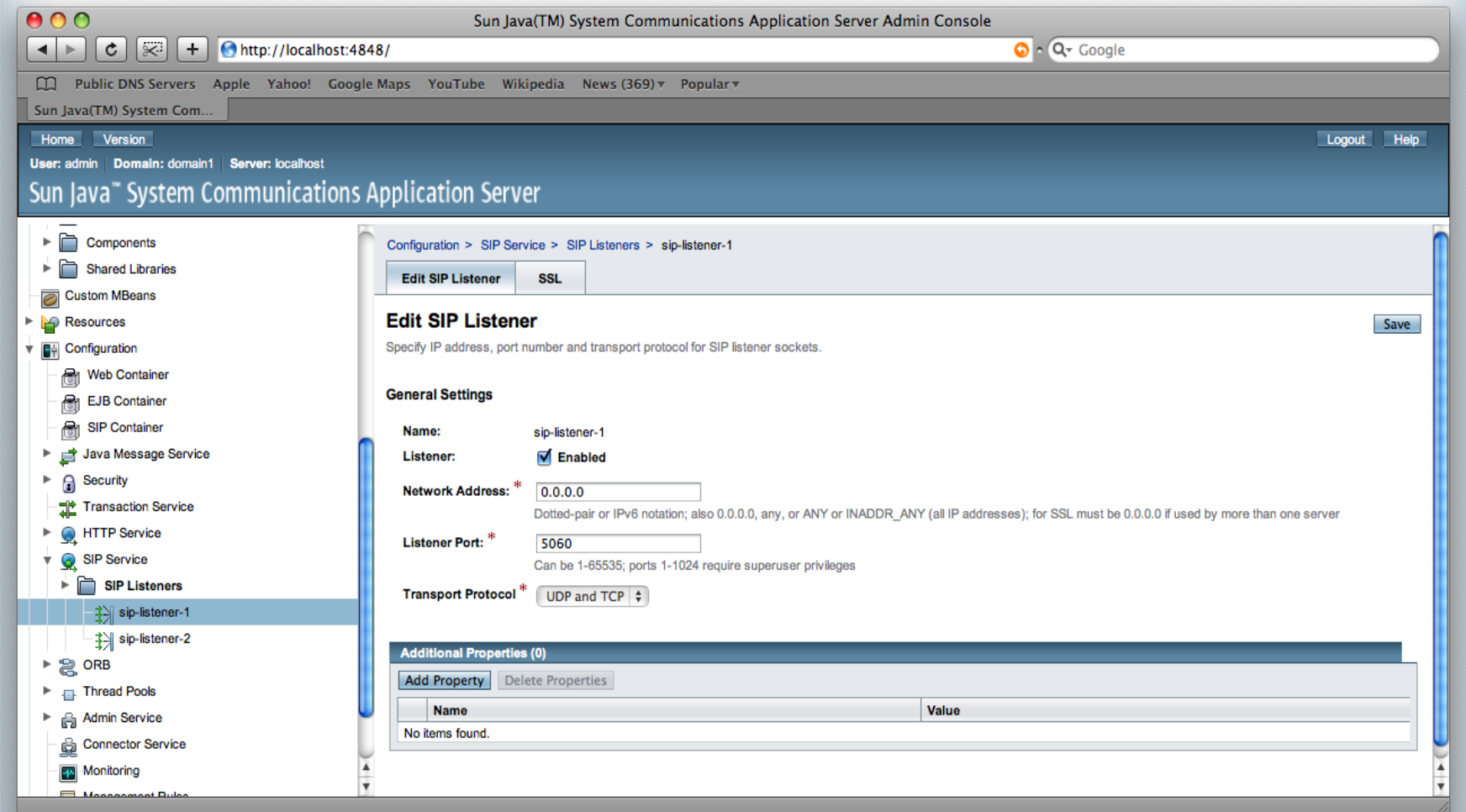
Features

Full fledged Administration Support

- GUI and Command Line Administration support for all the features in Project SailFin
 - Administration support for HA
 - Create/Delete SIP listeners
 - Configure TLS/Security
- Monitoring support for SIP Container
- CallFlow Support for SIP traffic
 - HTTP, MDB, etc. are already available in GlassFish project
- Dynamic Reconfiguration

Features

Web Console Supports SIP

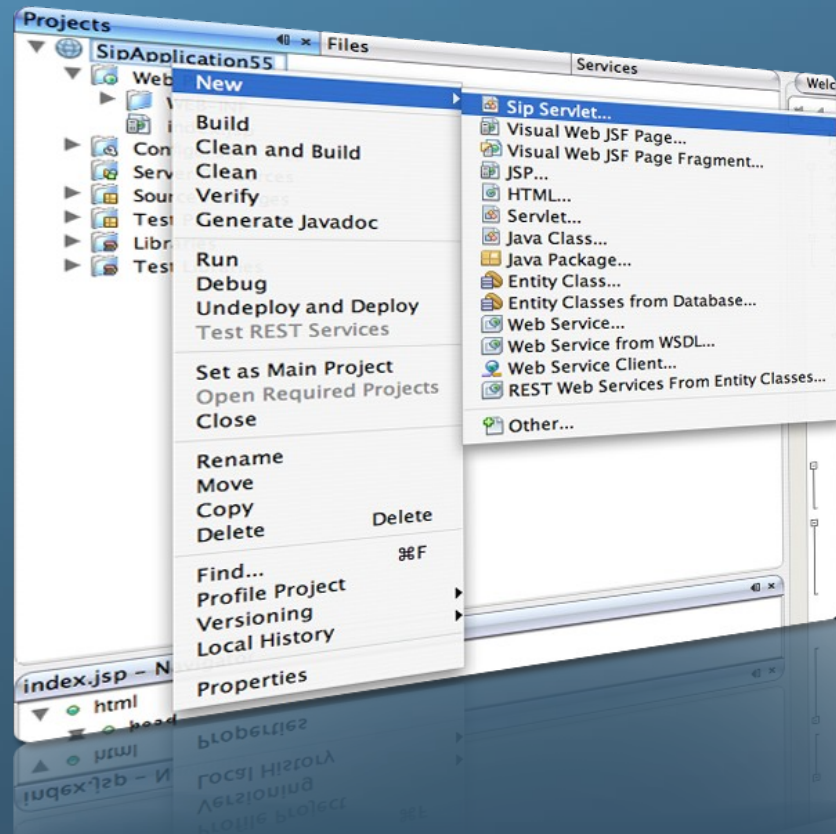


The screenshot displays the Sun Java(TM) System Communications Application Server Admin Console in a web browser. The browser's address bar shows `http://localhost:4848/`. The console's navigation pane on the left lists various components, with the 'SIP Listeners' folder expanded and 'sip-listener-1' selected. The main content area shows the 'Edit SIP Listener' configuration page for 'sip-listener-1'. The page includes a breadcrumb trail: 'Configuration > SIP Service > SIP Listeners > sip-listener-1'. Below the breadcrumb, there are tabs for 'Edit SIP Listener' (active) and 'SSL'. The 'Edit SIP Listener' tab contains a 'Save' button and a description: 'Specify IP address, port number and transport protocol for SIP listener sockets.' Under the 'General Settings' section, the following fields are visible: 'Name' (sip-listener-1), 'Listener' (checked 'Enabled'), 'Network Address' (0.0.0.0), 'Listener Port' (5060), and 'Transport Protocol' (UDP and TCP). A note below the port field states: 'Can be 1-65535; ports 1-1024 require superuser privileges'. At the bottom, there is an 'Additional Properties (0)' section with 'Add Property' and 'Delete Properties' buttons, and a table with columns 'Name' and 'Value' showing 'No items found.'

Features

Tooling Support

- NetBeans 6 Plugin
 - JSR 289 support
 - Deploy and debug pure and converged Applications
 - Wizard based SIP Application authoring
 - SIP Testing Client



Features

What is in the download?

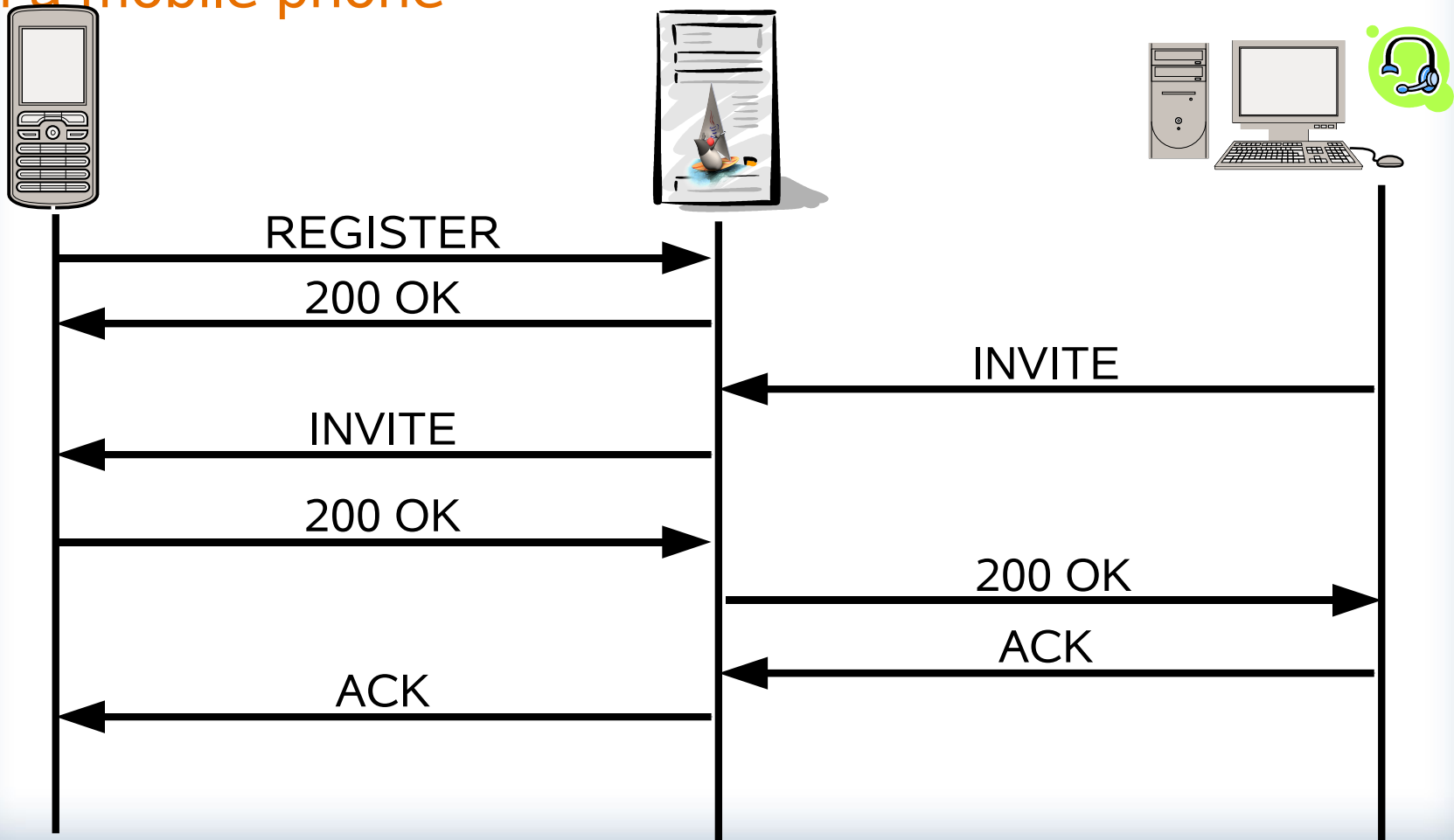
- Solaris™ Operating System, SuSE, RedHat
 - Windows and Mac for Development
- GUI and Jar based Installers
 - Silent Install available
 - GUI installer contains JDK™ version 1.6
- Two installation Profiles
 - Developer and Cluster
- Samples
 - CallSetup
 - OnlineBank

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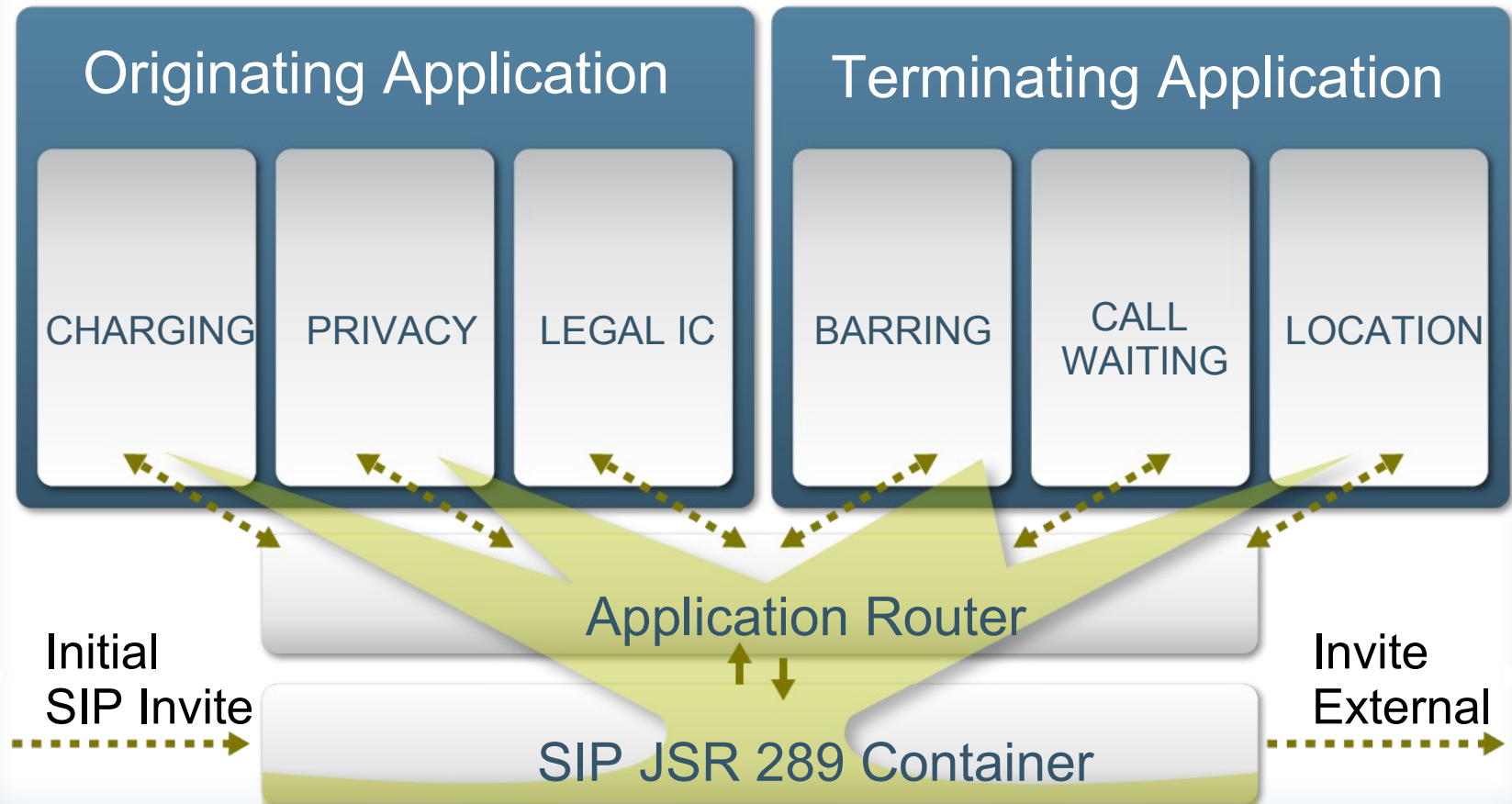
Use Cases

A Call Invite from a SIP UA in a computer to a SIP UA in a mobile phone



Use Cases

Application Server executes a number of applications while forwarding the INVITE request



DEMO

- A Converged Application Demo

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Road Map

Release Schedule

Sun GlassFish Communications Server Roadmap

1.0

- SGCS 1.0
- JSR 289 Support
- High availability

Q4 2008

1.1

- SGCS 1.1
- Update Release
- Diameter

Q2 2009

2.0

- SGCS 2.0
- GlassFish V3
- OSGi Module
- Java EE 6 Communications Profile

Q4 2009

Road Map

Project SailFin Future Plans

- Geographic Redundancy
- Better Diameter Support
- JSR 309
- Other Telecom Protocol Adapters
- More sophisticated Application Composition Tools
- Align with GlassFish project V3 modularization

Related Sessions/Lab

➤ TS-5802

- Mobile End-to-End Communication Services with the Java™ Platform, Micro Edition (Java ME Platform) and Java Platform, Enterprise Edition (Java EE Platform)
- 12.10 Friday, Esplanade 303.

➤ LAB-3400

- Adding Convergence of media to your Java EE Application using NetBeans
- 09.30 Thursday, Hall E 130/131

➤ LAB-3420

- Adding performance to your SIP based applications
- 13.00 Thursday, Hall E 130/131

Resources

- SailFin Website
 - <http://sailfin.dev.java.net>
- SailFin Wiki
 - <http://wiki.glassfish.java.net/Wiki.jsp?page=SailFin>
- Ericsson Mobility World
 - www.ericsson.com/mobilityworld
- GlassFish Website
 - <http://glassfish.dev.java.net>

THANK YOU

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