Mobicents 2.0
The Open Source Communication Platform

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Mobicents Sip Servlets Lead

AGENDA

> VoIP Introduction & Examples

> VoIP Basics

> Mobicents 2.0 Overview
   - SIP Servlets Server
   - JAIN SLEE Server
   - Media Server
   - SIP Presence Service
   - Diameter

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VoIP Introduction & Examples

Introduction

> **Voice over Internet Protocol ?**

– Voice communications over IP networks

– Not limited to voice anymore

> **Converged VoIP & Web Applications?**

– Converged service was serving VoIP and traditional packet-switched networks.

– Now mixing traditional internet applications such as the web.

Home Security

Location Based Services

Interactive Voice Response

IT Monitoring

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Conference

Web Integration for convergence

CRM Integration

Banking

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The Sky Is The Limit !

VoIP Basics

VoIP Call

> SIP

    –   Negotiates RTP parameters (through SDP)

    –   Authentication

> RTP – carries audio stream in small packets
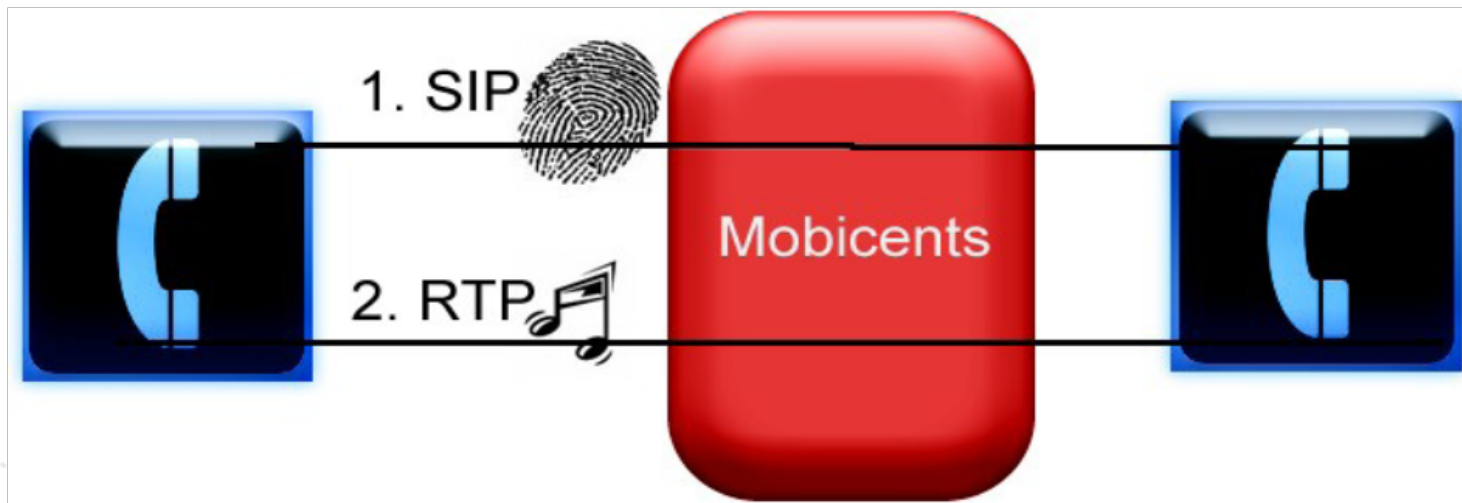
SIP Call Flow
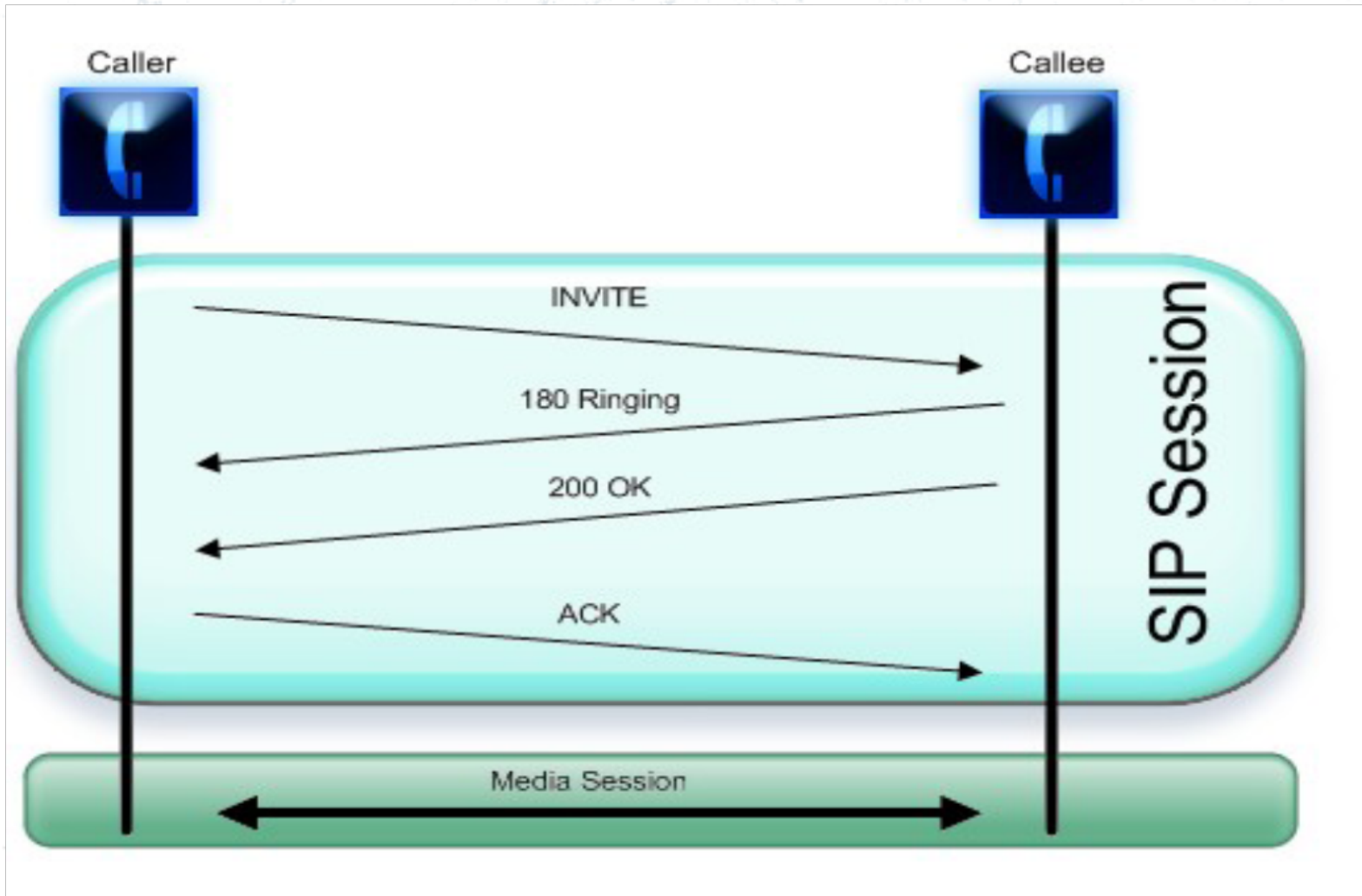
Mobicents Overview

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Mobicents 2.0 Overview

> JBoss is the only vendor supporting both JSLEE and SIP Servlets

Java EE	JSLEE	SIP Servlets	Media Server	Presence Server

JBoss Microcontainer

Mobicents Deployment Scenario
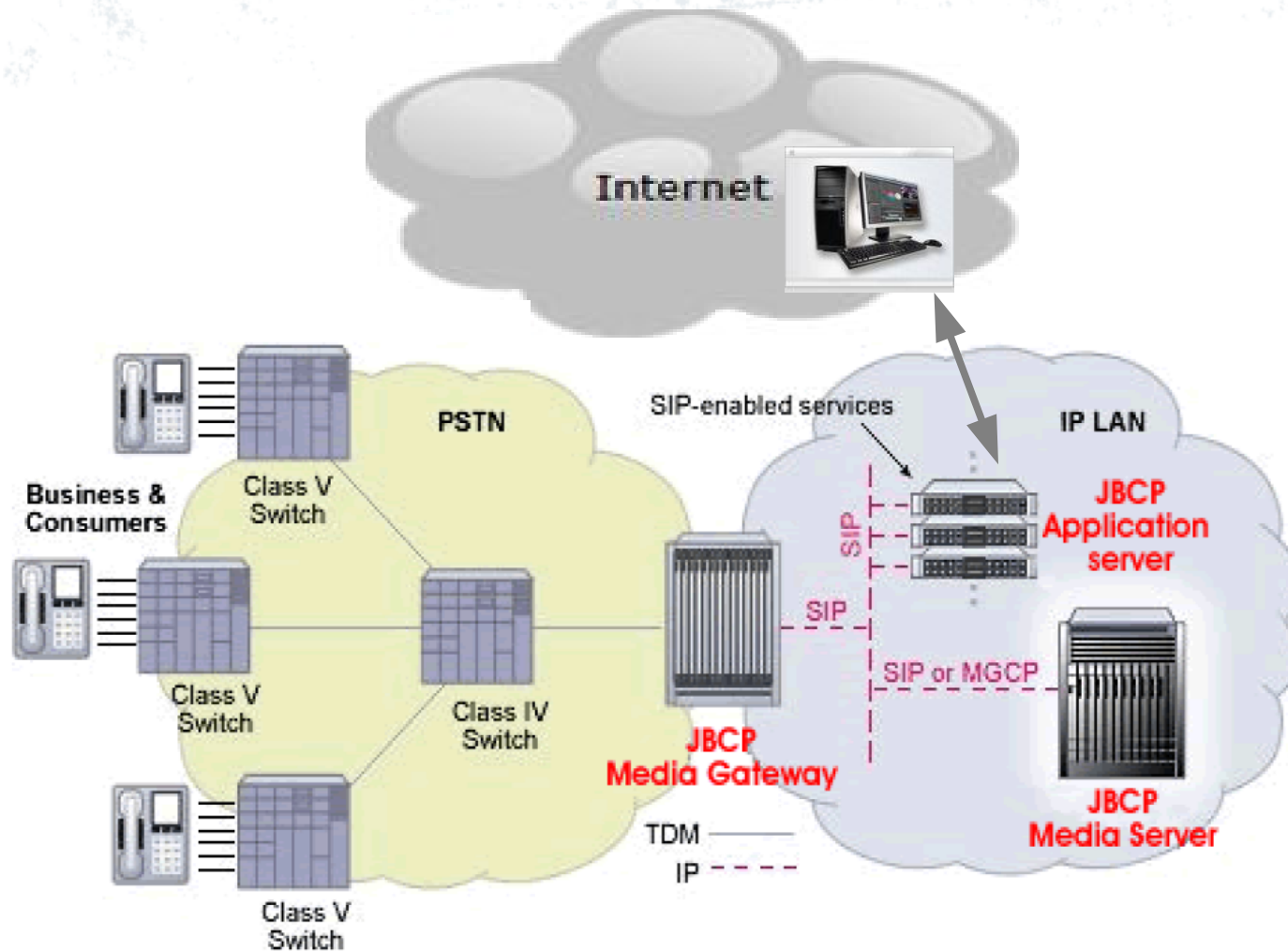
Market Segments

> Big mobile and landline telecoms adopting IP/IMS infrastructure (performance, HA, service exposure)

> Call centers (HA, UI convenience, BPM)

> Classic web applications (easy development)

– Web shopping and customer service

– Social, banking, security, etc

> Enterprises (integration, customization)

– PBX and unified communications

– Office application integration

Mobicents SIP Servlets

SIP Servlets in Java EE Architecture
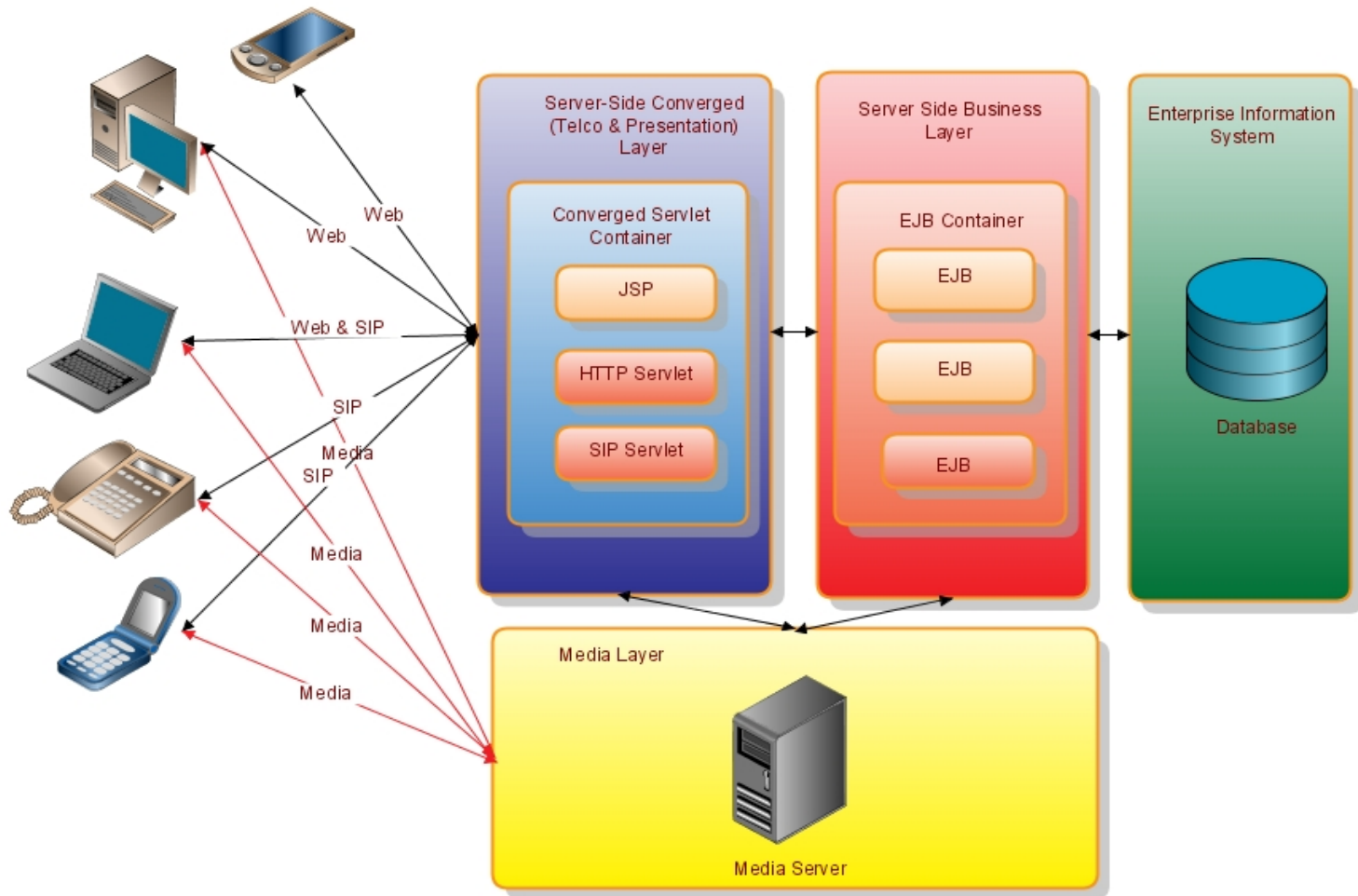
SIP Servlets Source Code

```
public class UasSipServlet extends SipServlet {

    protected void doInvite(SipServletRequest request) throws ServletException,<

IOException {

        // Send the ringing

        request.createResponse(SipServletResponse.SC_RINGING).send();

        sipServletResponse = request.createResponse(SipServletResponse.SC_OK) ;

        //should get the SDP from media server (for media negotiation) and set it

        sipServletResponse.send();

    }

    protected void doBye(SipServletRequest request) throws ServletException,

IOException {

        request.createResponse(SipServletResponse.SC_OK).send();

    }

}
```

Extra SIP Servlets features outside of the spec

> (Mobicents-specific beyond JSR-289)

– **Media** – playback, record, conferencing, IVR, TTS and others, JSR 309 support (JSR 309)

– **Diameter** – Base, Sh, Ro, Rf

– **Tooling** - JBCP Developer Studio SIP Servlets Plugin

– **Integrated with Rich Web UI frameworks** for Desktop-like experience – support for Ajax and Comet-enabled frameworks – Seam, Richfaces, GWT, Tomcat AIO, Jruby/Rails

– **Telco Frameworks** - Seam Telco Framework, Jruby Torquebox Telco Framework, Echarts For Sip Servlets Framework, JAIN SLEE Interoperability Patterns

> Need anything else? It's on a case-by-case basis, but JAIN SLEE is the general solution.

Production Features

> **IMS & Diameter support**

> **Congestion Control**

> **Concurrency Control**

> **Enterprise Monitoring with JBoss ON (Sip Servlets Plugin)**

> **HA Support**

– Converged Load Balancer bundled with Mobicents

– IP Load Balancer support with Red Hat Cluster Suite or any other IP LB

– SIP Session & Application Session Clustering nicely integrated with existing HTTP clustering

– Fine-grained control replication options

– Support for Mid Call Failover with bundled SIP LB or early dialog with IP LB

– Support for Converged Failover with apache http + Mod_jk

# Mobicents JAIN SLEE

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JAIN SLEE - Concepts

> Geared towards Telco

> SLEE = Service Logic Execution Environment

– High throughput, low latency event processing

– High performing platform for event driven applications

> Asynchronous & Event Orientated

> Network Abstraction Layer

JAIN SLEE Example
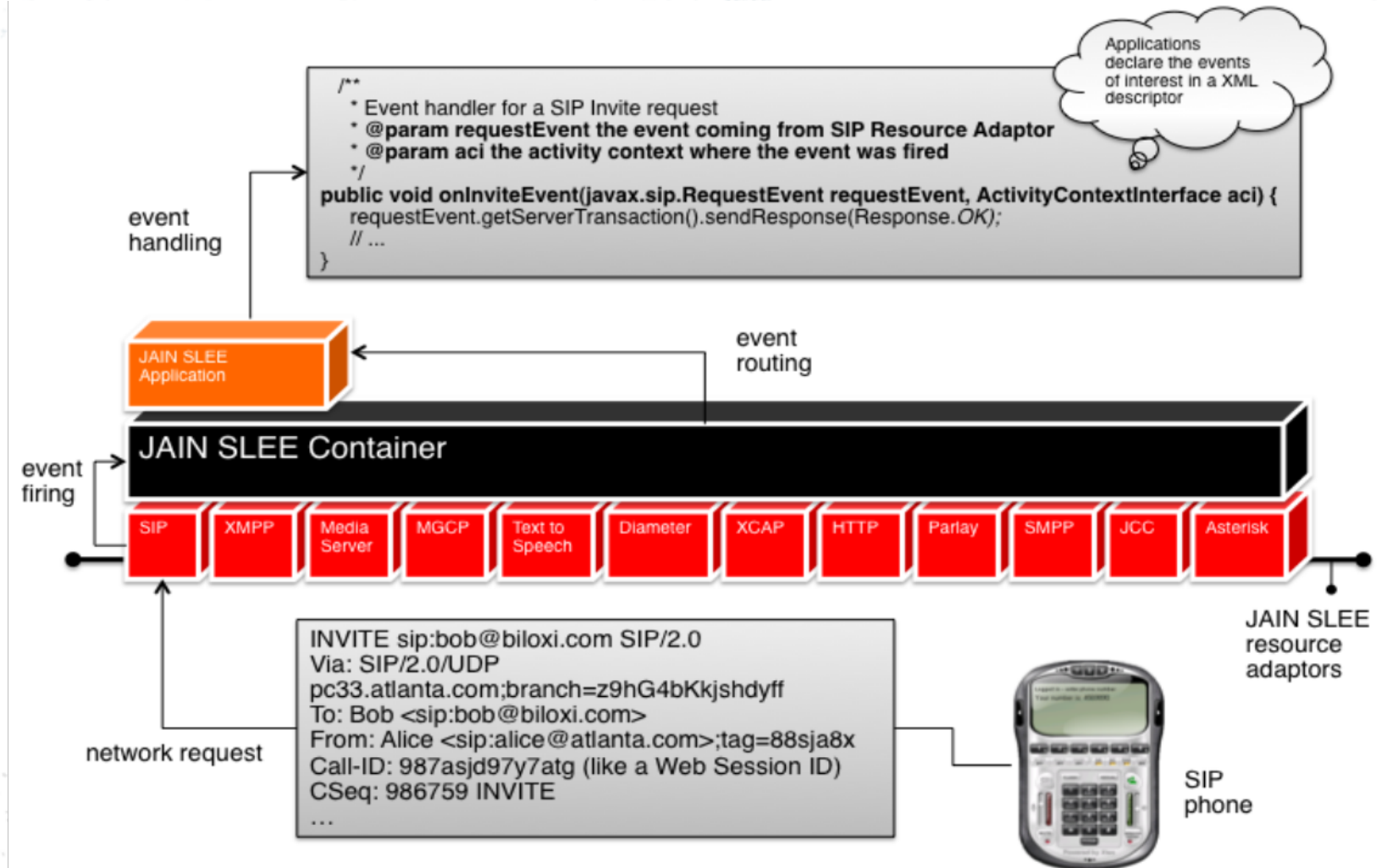
Mobicents **JAIN SLEE Server**

> Integrated Java EE + JAIN SLEE environment

> Network abstraction layer - SIP, XMPP, Diameter, Media/MGCP, HTTP, SMPP

> Tooling - JBCP Developer Studio JAI N SLEE Plugin

> Enterprise Monitoring with JBoss ON (JAIN SLEE Plugin)
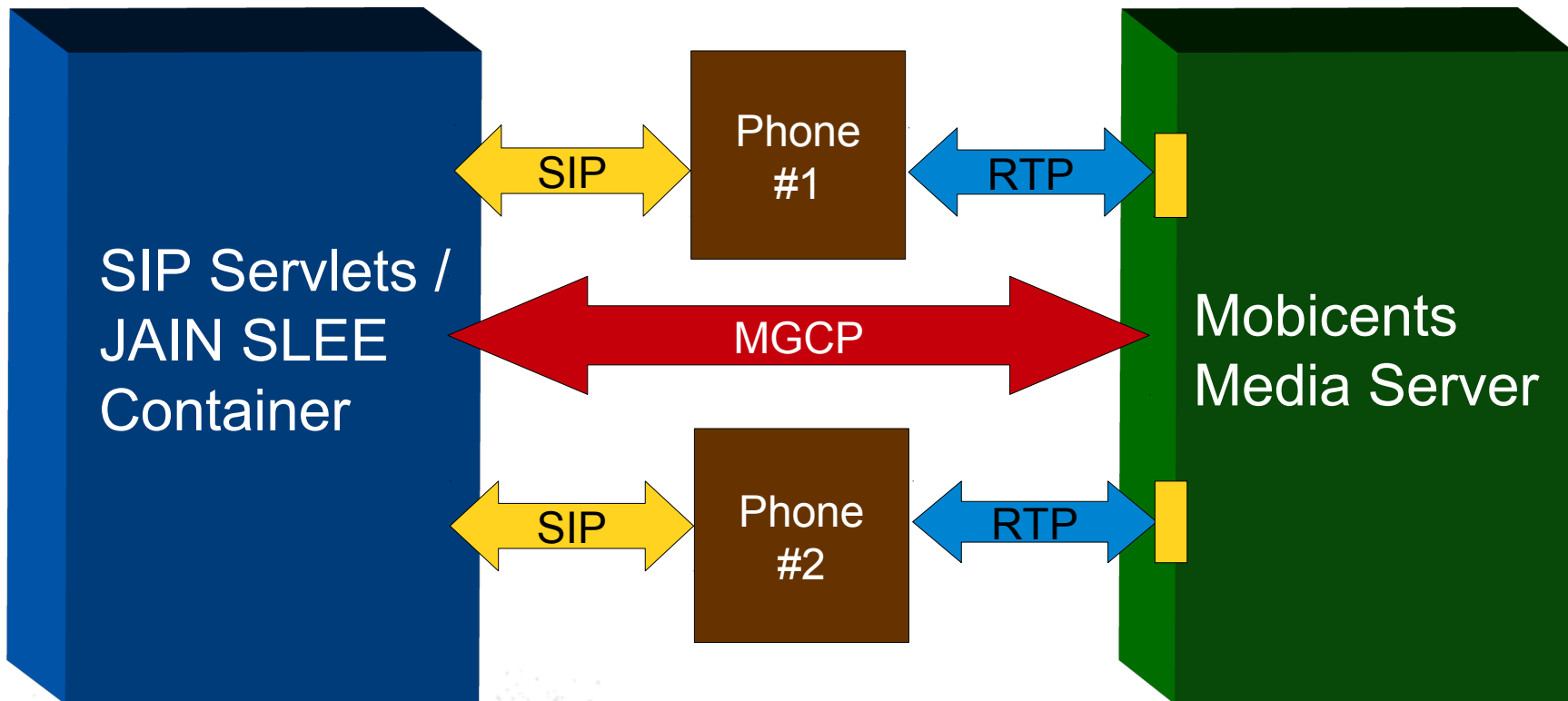
> High Performance and High Availibility
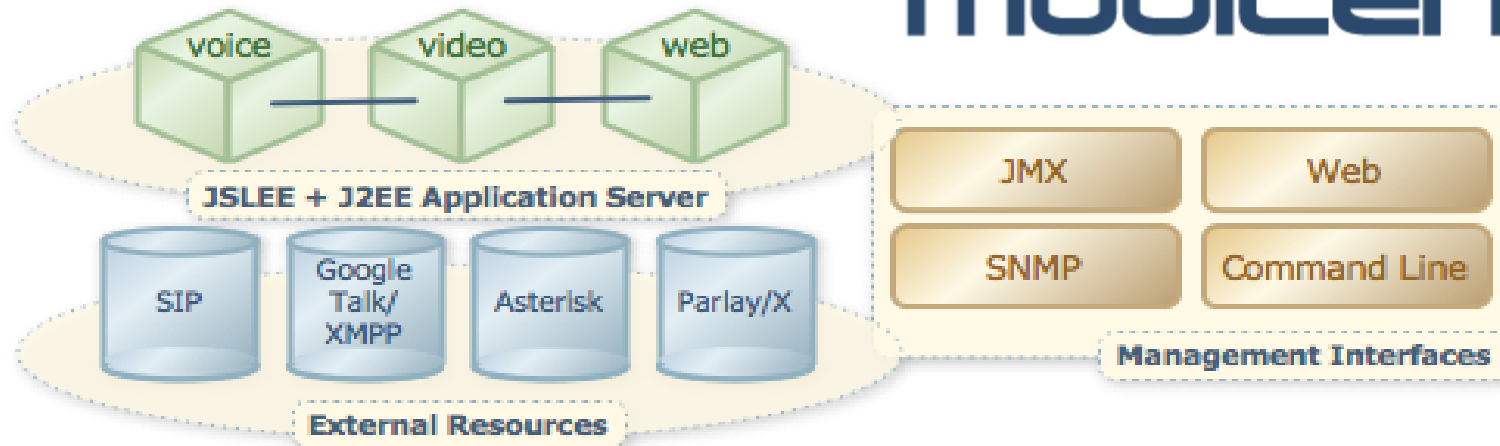
Mobicents Media Server

Mobicents Media Server

> Handles Media processing to **Deliver competitive, complete, best-of-breed, high quality media gateway**

> Provides a very flexible Component model

Architecture

> **Ann(ouncement) Endpoint:** Allows playback for announcements in *wav* files.

> **Interactive Voice Response:** Allows playback for announcements and tones, *listen* for DTMF events or voice messages. Allows recording.

> **Conference Bridge:** provide access to a specific conference where calls are mixed.

> **Packet Relay:** specific form of conference bridge with only two sockets

> **SS7 endpoints** for interface with legacy networks

> **Custom Endpoint** : Flexibility to define your own media path

> **Pure Java** Implementation

> **Control the Media Server** – MGCP, JSR-309 API (uses MGCP under the covers)
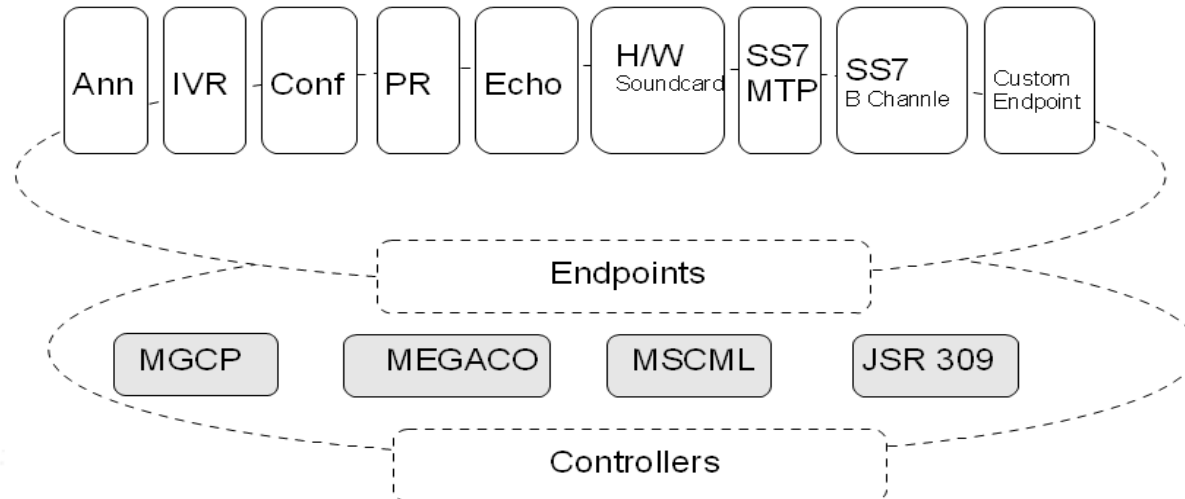
Features

- **Media bearing/Audi Codecs**

  – RTP formats: G711, G729, GSM, SPEEX, PCM 16bit 8-44kHz (Mono/Stereo)

- **Video**

  – any ISO Based format (.3GPP, ...), H263

- **SS7 support - ISUP : Signaling and Voice, INAP, MAP, CAMEL**
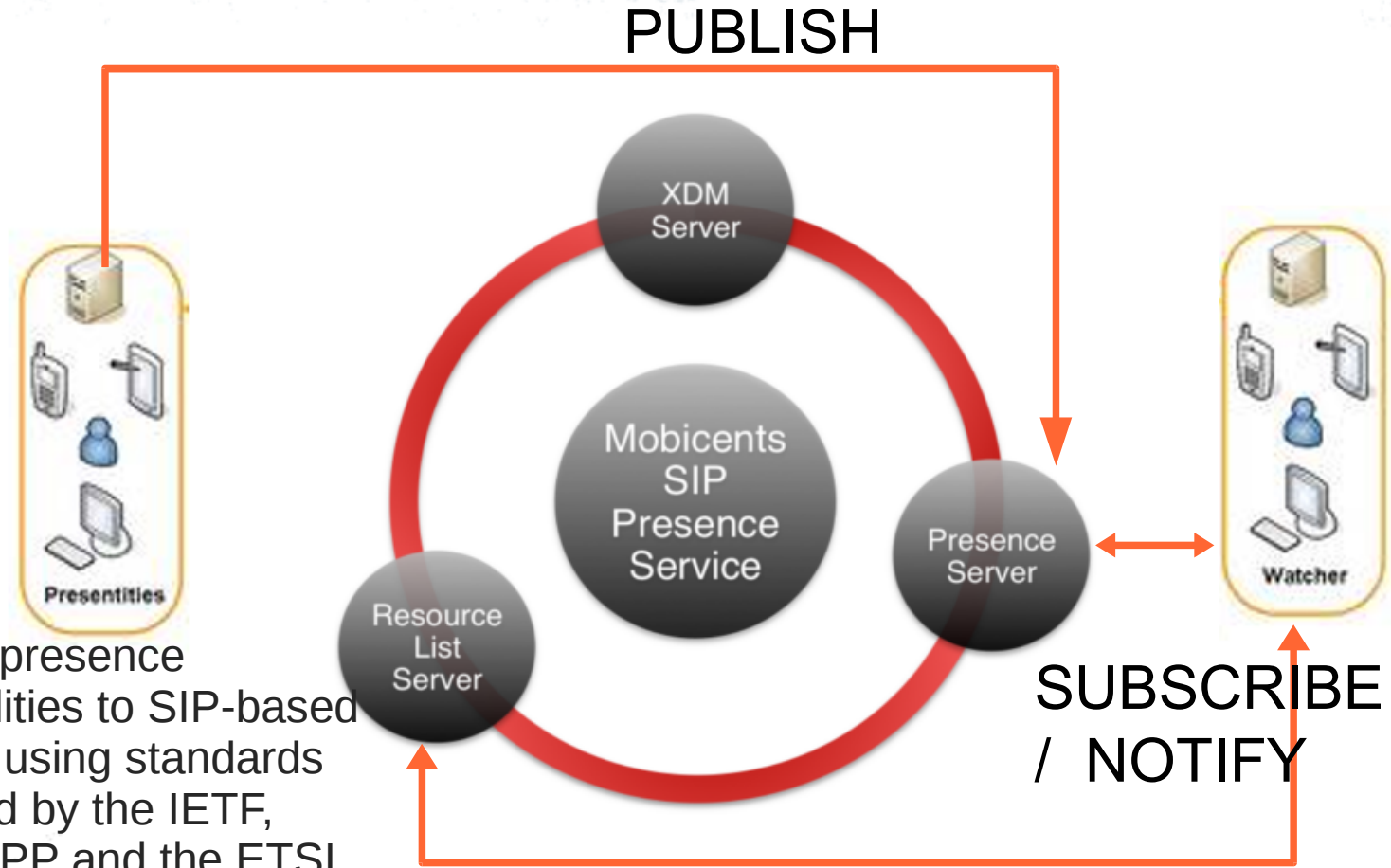
- **Text To Speech**

- **DTMF Recognition**

- **Performance**

  – 200 Full Duplex connections: CPU usage less than 15% and maximum jitter less than 6ms
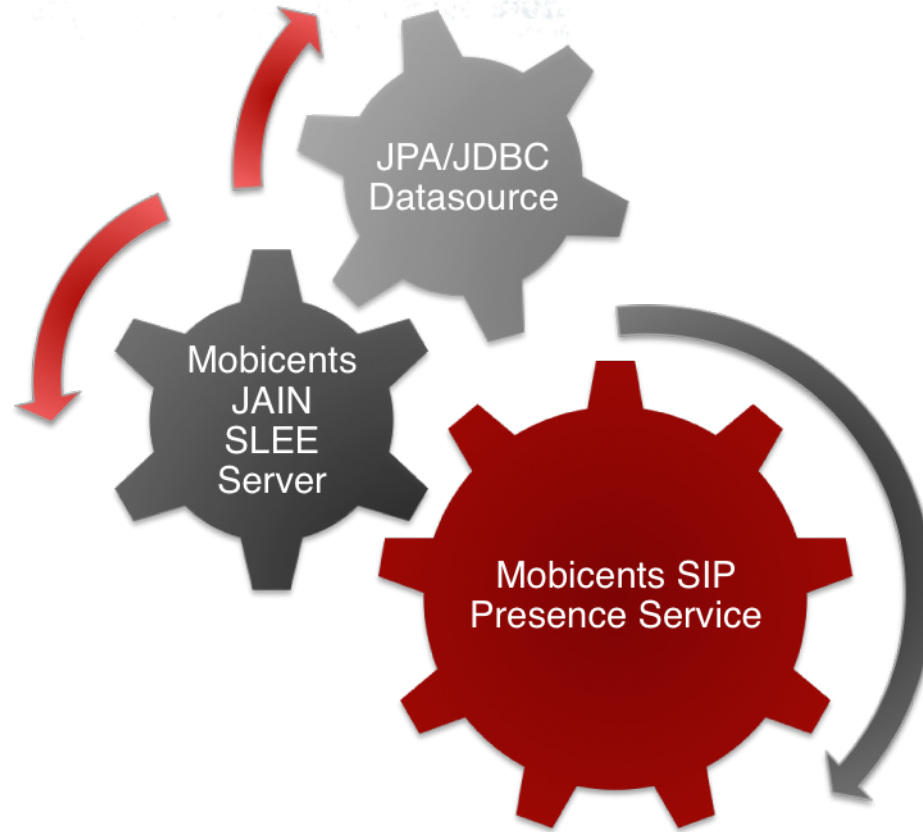
Mobicents SIP Presence

SIP Presence Service
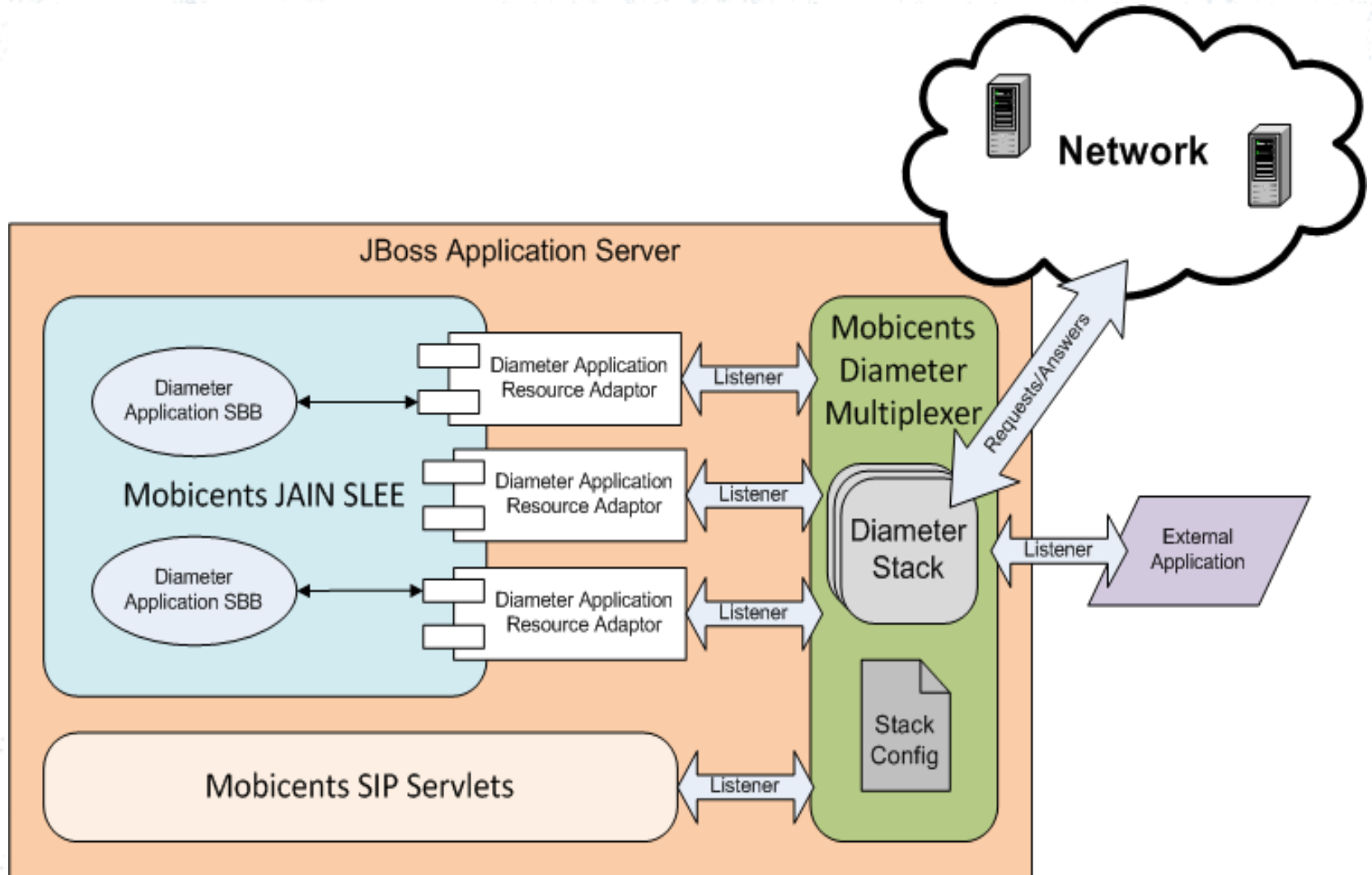
PUBLISH

SUBSCRIBE / NOTIFY

> Provides presence functionalities to SIP-based networks using standards developed by the IETF, OMA, 3GPP and the ETSI

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Implementation

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Mobicents Diameter

Mobicents Diameter Architecture

Features

> **Core**

 – Stack : Own fork of JDiameter open source stack

 – Multiplexer + Customizable Validator (message validation) + Customizable Dictionnary (provide dictionnary of AVP to applications)

> **Interfaces**

 – Base : responsible for managing connection between peers and provide basic Authentication, Accounting and Session Management

 – Sh (Client/Server) : managing User Data in HSS

 – CCA: enable credit session management, and convey sufficient information for applications to perform charging activities.

 – Ro/Rf : Online/Offline charging

 – Cx/Dx : interaction between SIP IMS Proxies and HSS

> **Example applications (both for JSLEE and J2EE)**

 – Base and Mobicents SIP Servlets Event Call Charging

 – Sh (Client/Server) and OpenIMS Integration

 – Ro/Rf example

> **Enterprise Monitoring with JBoss ON (Diameter Plugin)**

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