



# JavaOne™

[java.sun.com/javaone](http://java.sun.com/javaone)

## Java™ Platform, Standard Edition: A Youthful Maturity

Danny Coward,  
Chief Architect, Client Software  
Sun Microsystems

TS-6271



# A brief survey of everything going on with the Java SE platform

**TS-6271**  
**Java SE Youthful Maturity**  
**Tue 10.50am**

GOAL

(and a few facts and figures as we go along)

# Agenda

**Java SE Technology Today**  
**New Developments in the Platform**  
**Multiple Languages**  
**Modularity**  
**Management and VisualVM**  
**Rich Clients**

# Agenda

## Java SE Technology Today

New Developments in the Platform

Multiple Languages

Modularity

Management and VisualVM

Rich Clients

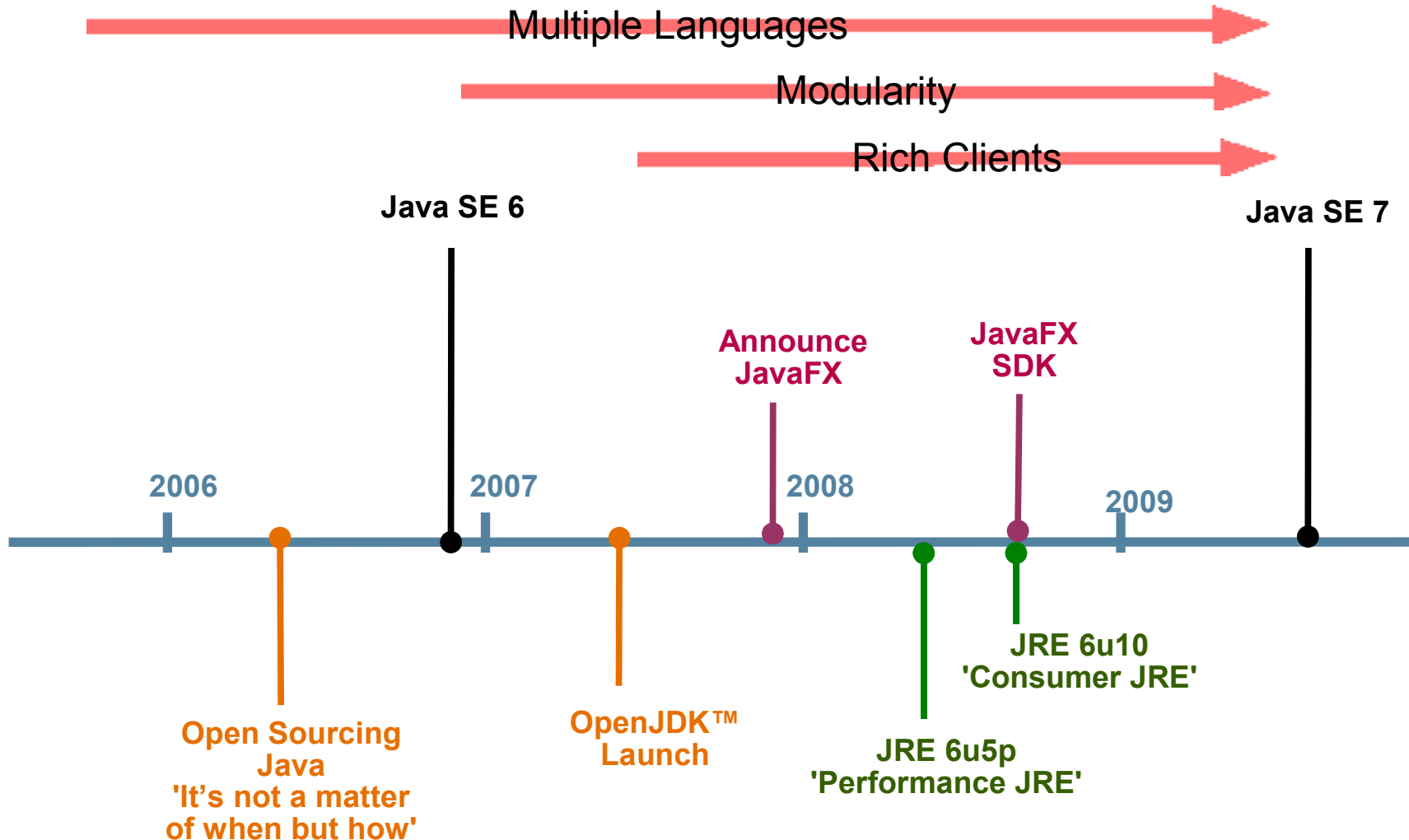
# Java SE 6 : Top 10 Features

- Web Service APIs
- Scripting language support
- Updated database APIs
- Swing enhancements
- Monitoring and Management
- Compiler APIs
- Pluggable Annotations
- Desktop deployment
- Integration with native security services
- Quality, compatibility and stability

**TS-6623**  
**More “Effective Java”**  
**Tue 12:10pm**

**BOF-5784**  
**Programming Tips and Tricks**  
**Tue 8.30pm**

# Java SE Platform Roadmap and Themes



# Java SE 6u5p “Performance Release”

- Performance tuned release of the JRE™
- 64bit architectures only
  - Solaris, Windows, Linux
- Large number of small optimizations
  - Crypto libraries, TreeMap, HashMap, XML Parsing
  - Escape analysis, depth-first copying, page sizes
- Optimizations seep into future JRE updates

**TS-6434**  
**Performance Case Studies**  
**Thu 2.50pm**

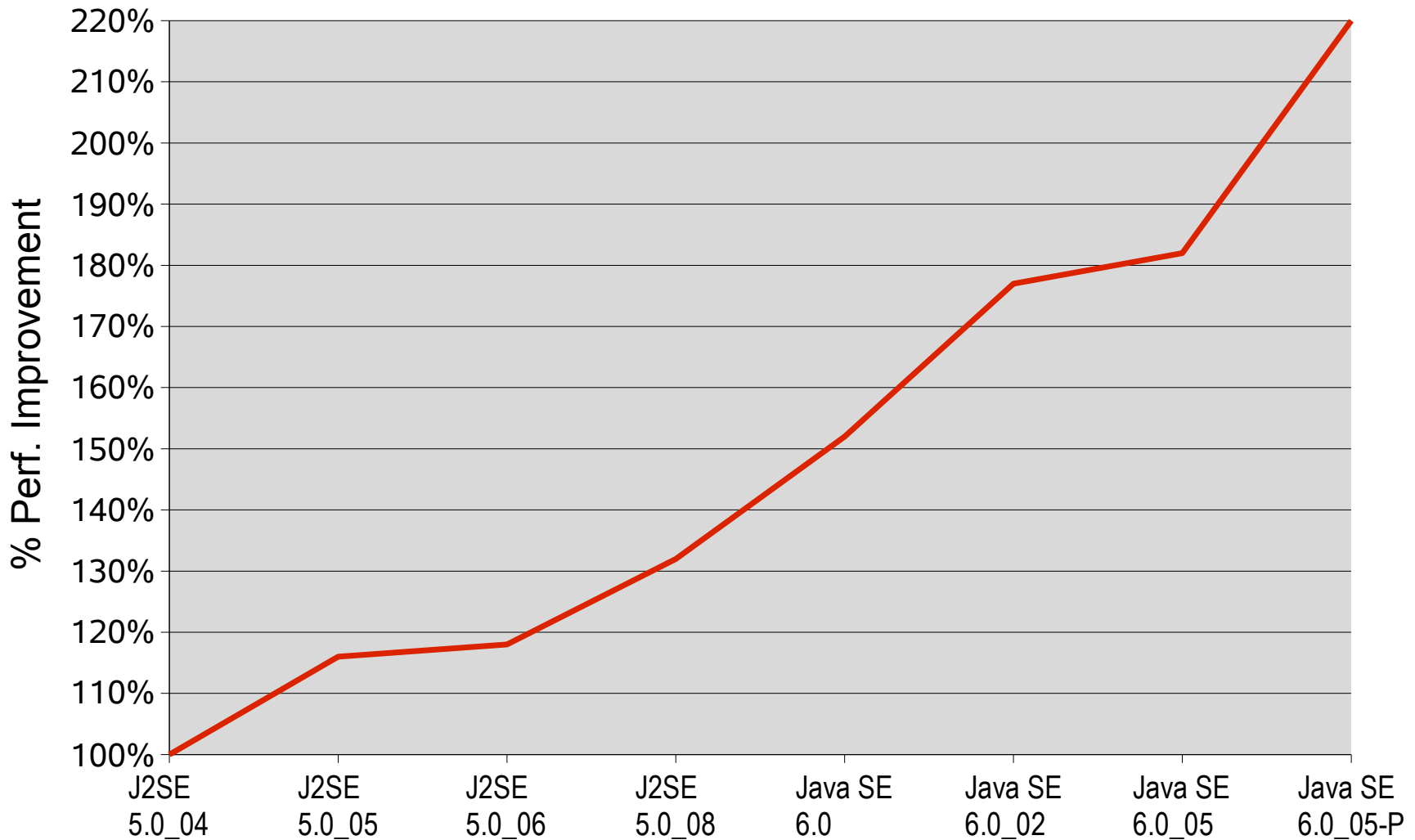
**BOF-5268**  
**Performance Q&A**  
**Tue 8.30pm**

Get it here

- [java.sun.com/performance.jsp](http://java.sun.com/performance.jsp)

# Java Platform Performance Trends on x64

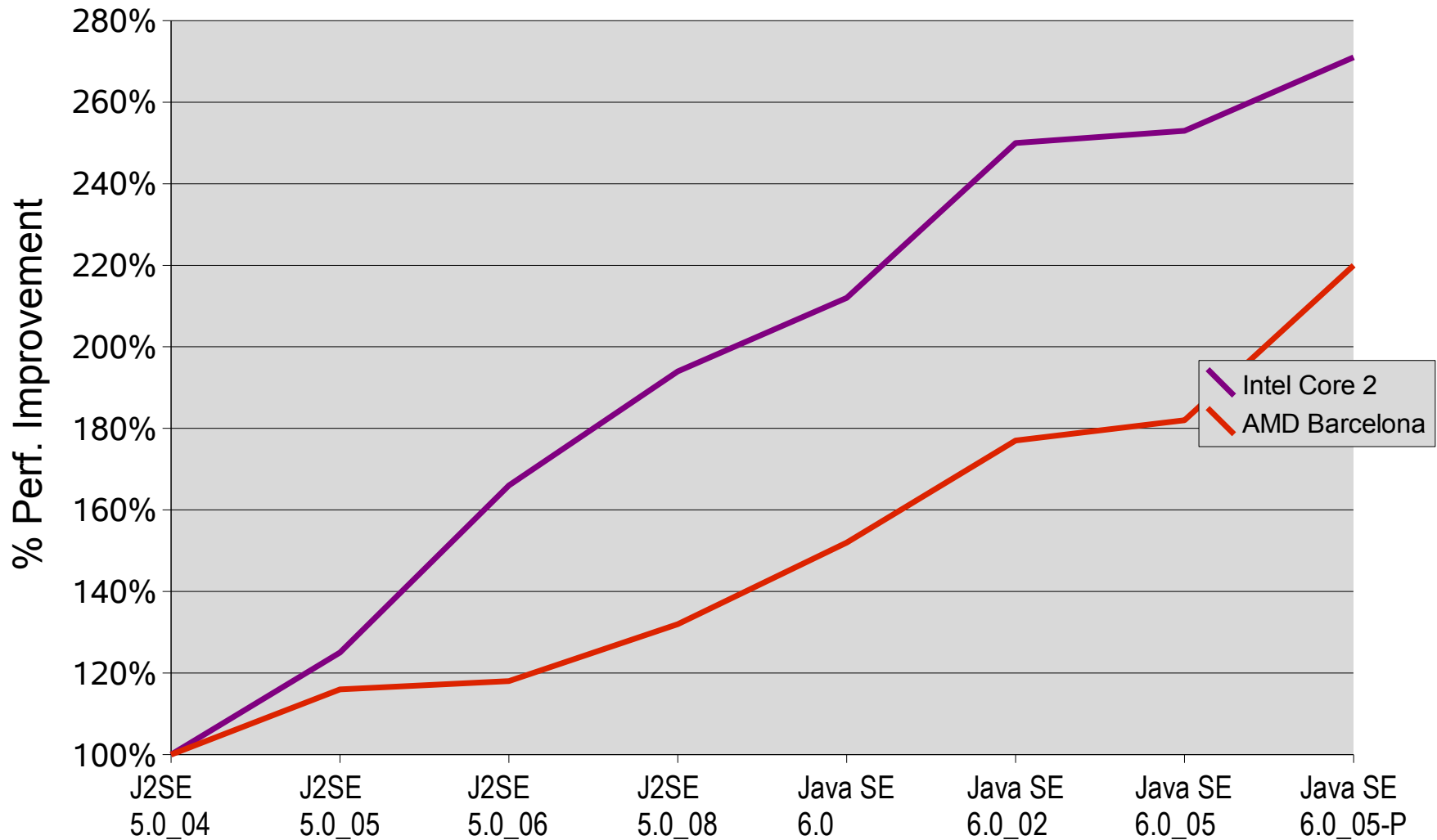
## SPECjbb2005 on Sun x64 Server





# Java Platform Performance Trends on x64

## SPECjbb2005 on Intel and AMD



# JDK™ version 6 – Filling in the distribution gaps



- OpenJDK-based Java SE 6 bundled in Ubuntu 8.04

**TS-5214**  
OpenJDK Community Update  
Wed 2.50pm



- Apple releases Java SE 6 for 64bit OS-X

# Agenda

Java SE Technology Today

**New Developments in the Platform**

**Multiple Languages**

Modularity

Management and VisualVM

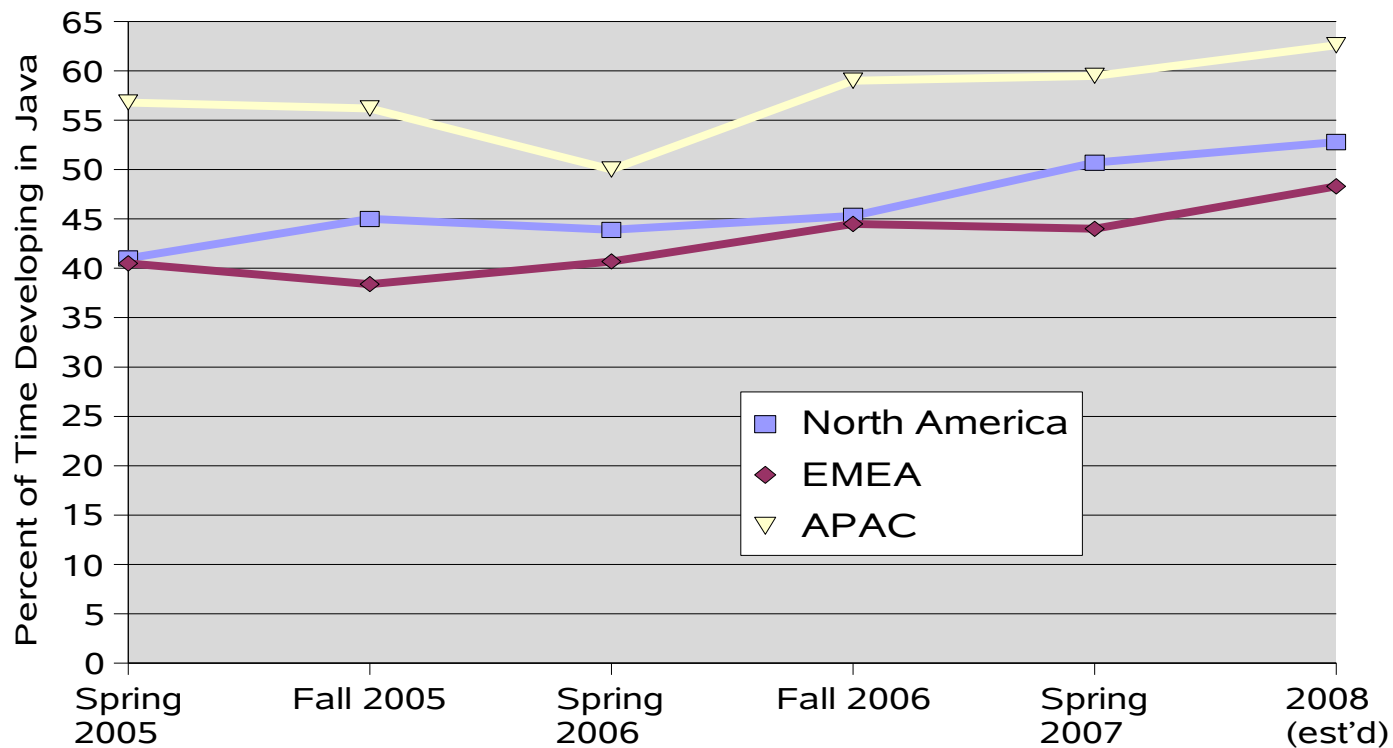
Rich Clients

# Languages on the VM: Past



# Language Usage For Java is Up

Evans Data Survey: Fall 2007



# Evolving the Java Programming Language

- Modules
- Extensions to the annotation syntax (JSR 308)
- Closures
- Small changes, including
  - Improved type inference
  - Strings in switch statements
  - Enum comparisons
  - Catching multiple exception types

**TS-5581**  
**Upcoming Language Changes**  
**Tue 3.20pm**

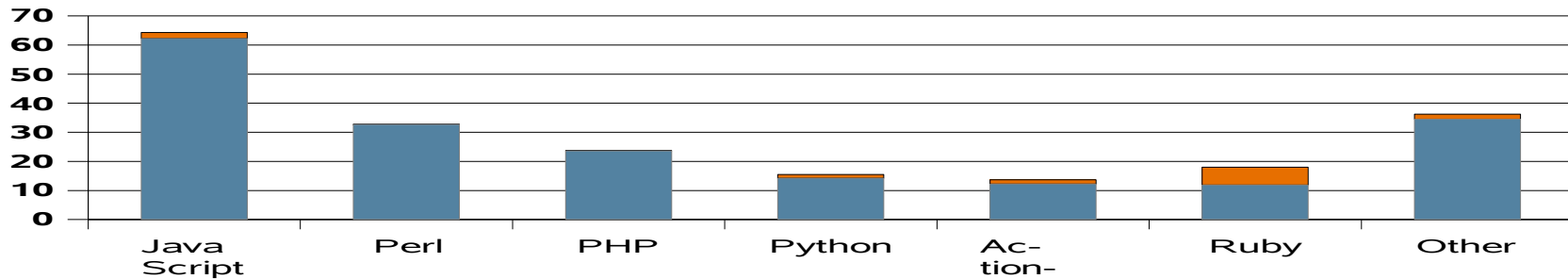
Experimentation Project

[openjdk.java.net/groups/compiler/ksl.html](http://openjdk.java.net/groups/compiler/ksl.html)

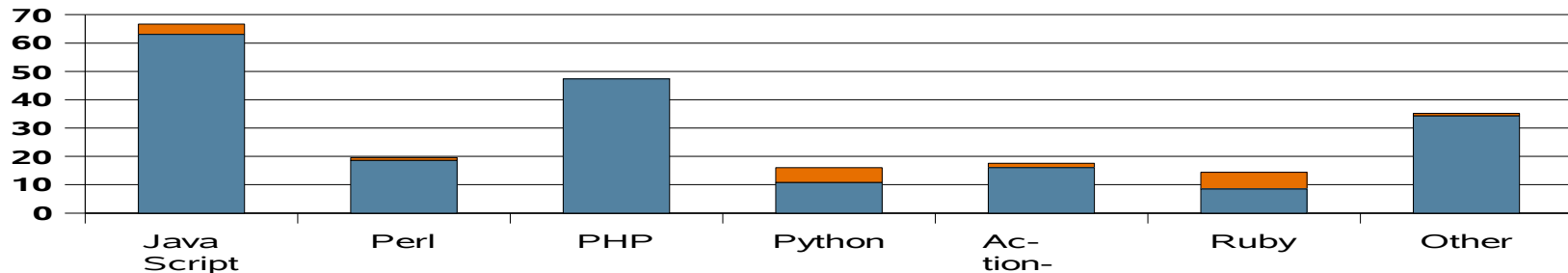
**TS-5579**  
**Closures Cookbook**  
**Wed 9.30am**

# Scripting Languages Usage 2007-2008

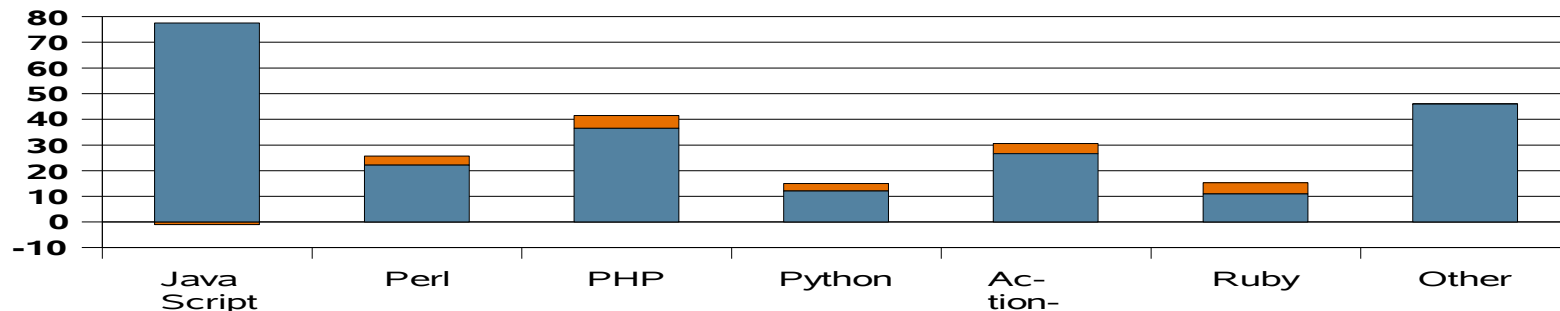
## North America



## Europe, Middle East and Africa



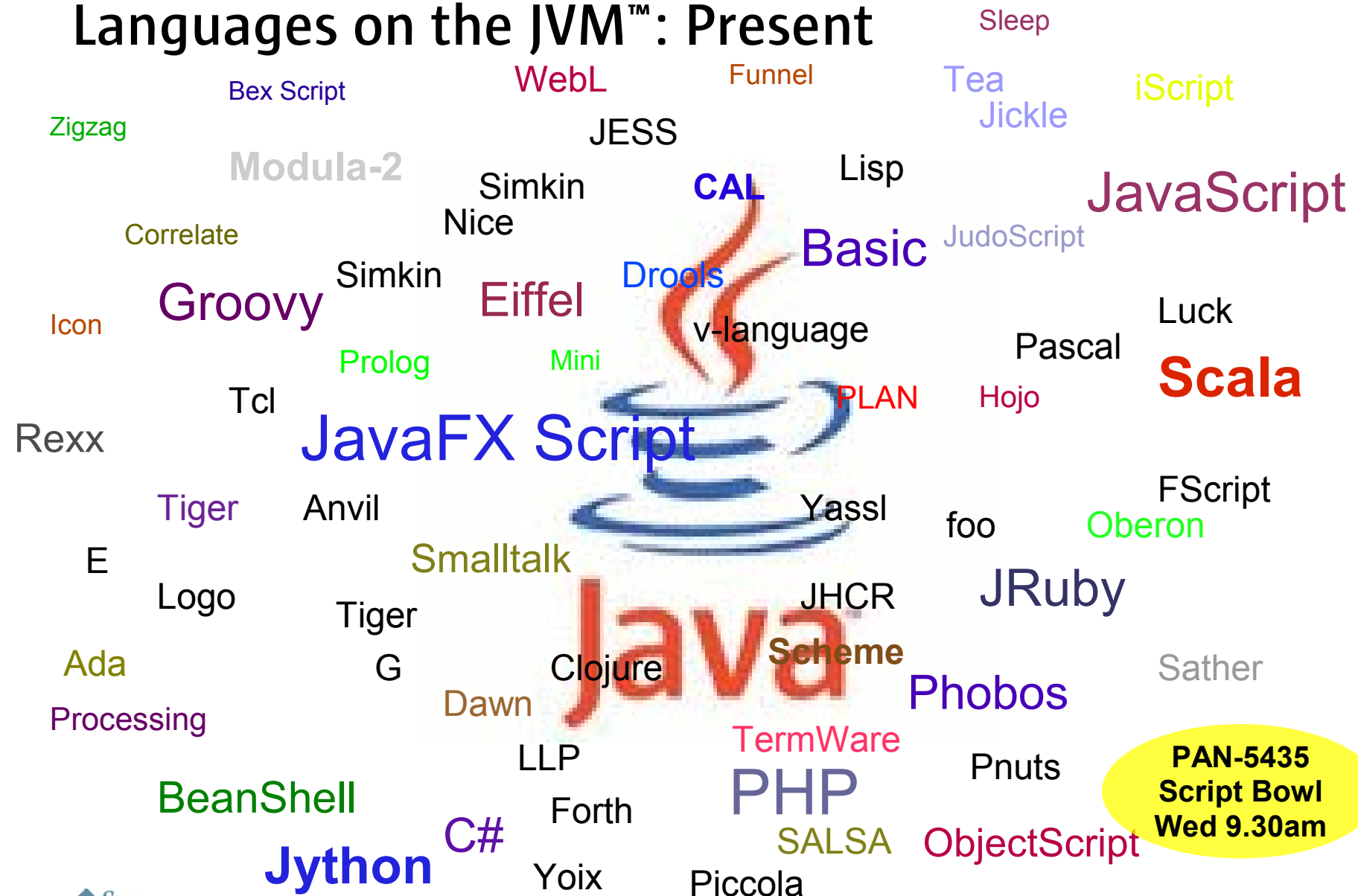
## Asia and Pacific Rim



2007 2008



# Languages on the JVM™: Present



PAN-5435  
Script Bowl  
Wed 9.30am



# Scripting on Java SE 6 Platform

```
// create a ScriptEngineManager & grab an engine
ScriptEngineManager m = new ScriptEngineManager();
ScriptEngine engine = m.getEngineByName("js");

// evaluate javascript directly....
jsEngine.eval("print('Hello, world!')");

// ...or from a script
InputStream is =
    this.getClass().getResourceAsStream("/scripts/hello.js");
Reader reader = new InputStreamReader(is);
engine.eval(reader);

// ...even call functions and methods in a script
engine.eval("function sayHello() {" +
    "    println('Hello, world!');" +
    "}");

Invocable invocableEngine = (Invocable) jsEngine;
invocableEngine.invokeFunction("sayHello");
```

# Languages on the JVM: Future

Java SE 7

- Broadening the (J)VM to accelerate runtimes
- Bytecode for dynamic invocation
  - Anonymous classloading
  - Lightweight method handles
  - Optimized dynamic invocation
  - Continuations and tail call optimizations
- DaVinci Project: [openjdk.java.net/projects/mlvm](http://openjdk.java.net/projects/mlvm)
  - Draft specification
  - Prototype available
- JRuby is the pioneer
- Plan to bundle other engines into JDK 7

**JVM Language Summit**  
<http://jvmlangsummit.com>  
 Sept 2008



# Agenda

Java SE Technology Today

**New Developments in the Platform**

Multiple Languages

**Modularity**

Rich Clients

Management and VisualVM

# Java SE 7 Modularity



## > Modularity

- When developing: better code reuse
- When deploying: better binary reuse

## > Java already has modularity, but

- Public is too public
- Java Archive (JAR) is limited

## > Proliferation of

- JAR based formats
- Module systems

# Java Module System

- First class module support in the Java language
  - New module keyword
- Repository framework for multiple module systems
  - Interoperability with existing module systems
- JAM file format and JAM repository implementation
  - Address difficulties of using JAR distribution format
- Mechanism for modularizing the JDK itself

# Modules in the Java language

```
// org/netbeans/core/Debugger.java
module org.netbeans.core;
package org.netbeans.core;
public class Debugger {
    ... new ErrorTracker() ...
}
```

```
// org/netbeans/core/utils/ErrorTracker.java
module org.netbeans.core;
package org.netbeans.core.utils;
module class ErrorTracker {
    module int getErrorLine() { ... }
}
```

```
// org/netbeans/core/module-info.java
@Version("7.0")
@ImportModule(name="java.se.core", version="1.7+")
module org.netbeans.core;
```

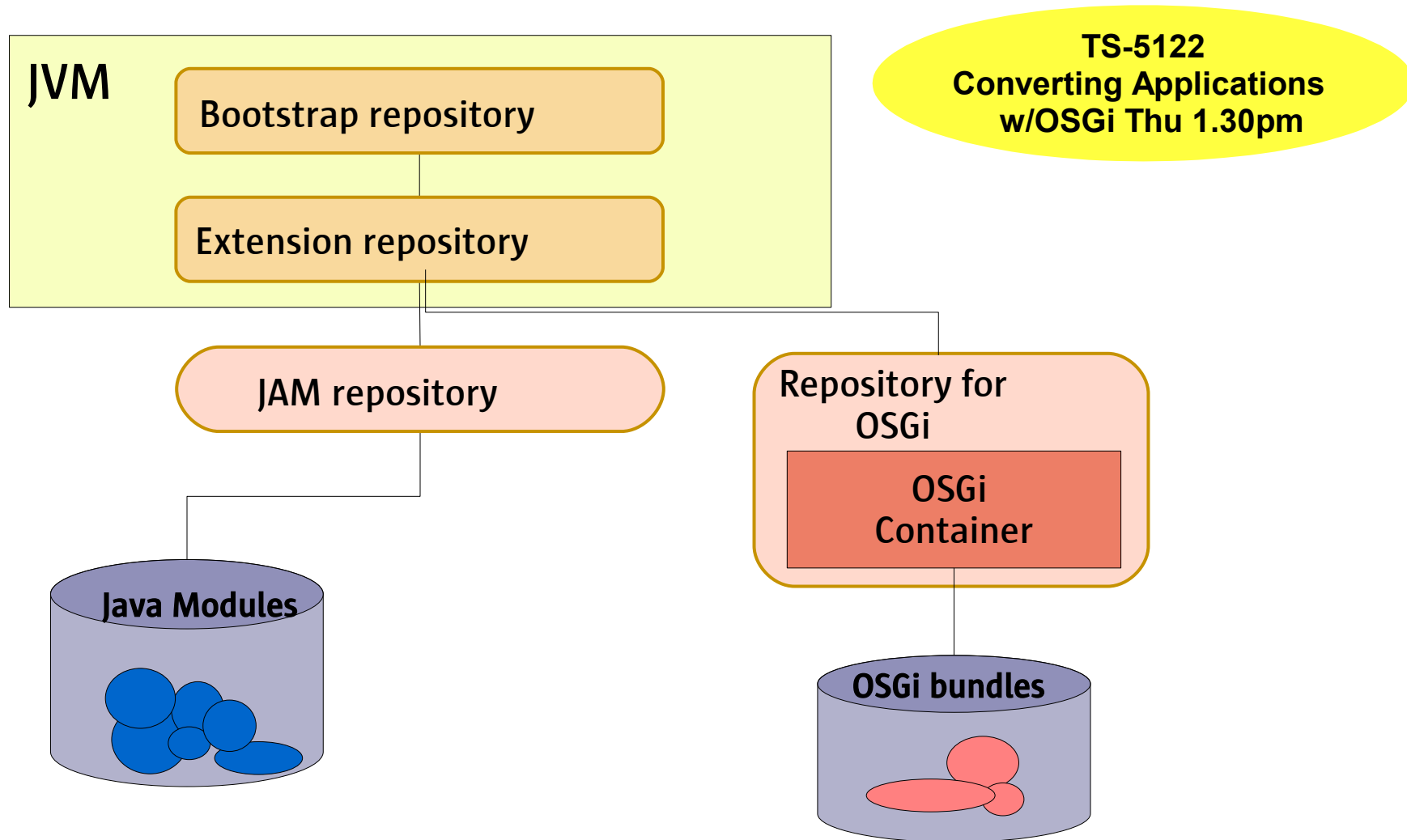
# Module Packaging Metadata in the JAM

```
// org/netbeans/core/module-info.java
@Version("7.0")
@MainClass("org.netbeans.core.Main")
@Attribute(name="IDE", value="Netbeans")

@ImportPolicyClass("org.netbeans.CustomPolicy")
@ImportModules{
    @ImportModule(name="java.se.core",
                  version="1.7+",
    @ImportModule(name="org.foo.util",
                  version="1.0", reexport=true)
})
@ModuleInitializerClass("org.netbeans.core.Init")

@PlatformBindings(os="solaris", arch="sparc")
@ExportResources({"icons/**"})
module org.netbeans.core;
```

# Loading OSGi bundles in JDK version 7





# Java Module System - Status

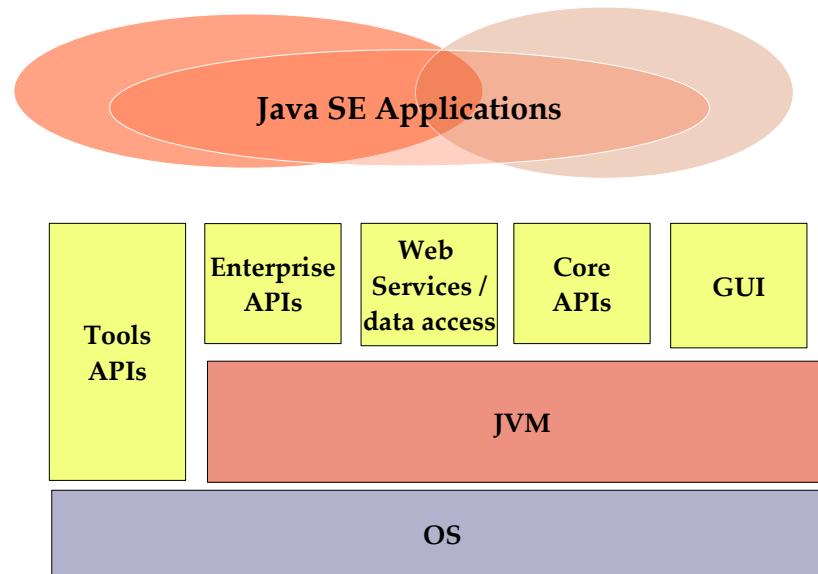
- JSR 277 Draft 2 is in progress
  - OSGi Interoperability spec is out !
- OpenJDK™ Modules project
  - [openjdk.java.net/projects/modules/](http://openjdk.java.net/projects/modules/)

**TS-6185**  
**Modularity in Java Platform**  
**Wed 10.50am**

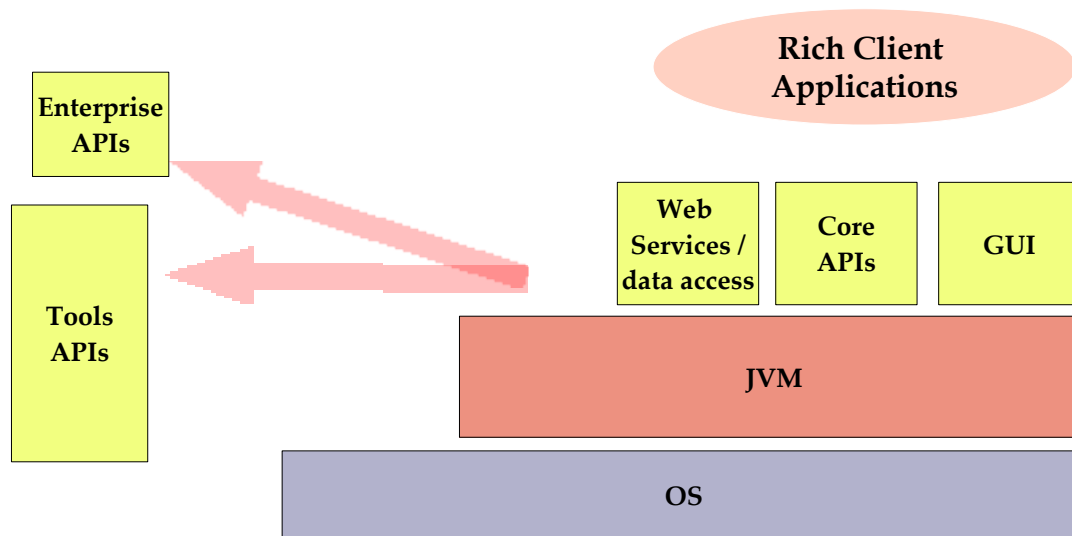
# Modularizing Java SE itself

- Java SE has grown very large
- Divided into two main classes of applications
  - Server applications and application servers
  - Desktop applications
- Introducing Java SE Profiles in Java SE 7
  - A *formal* subset of Java SE, defined in the JCP
  - Plus optional packages not part of Java SE
  - Formal == Compatible == Reference Implementation and Test Suite

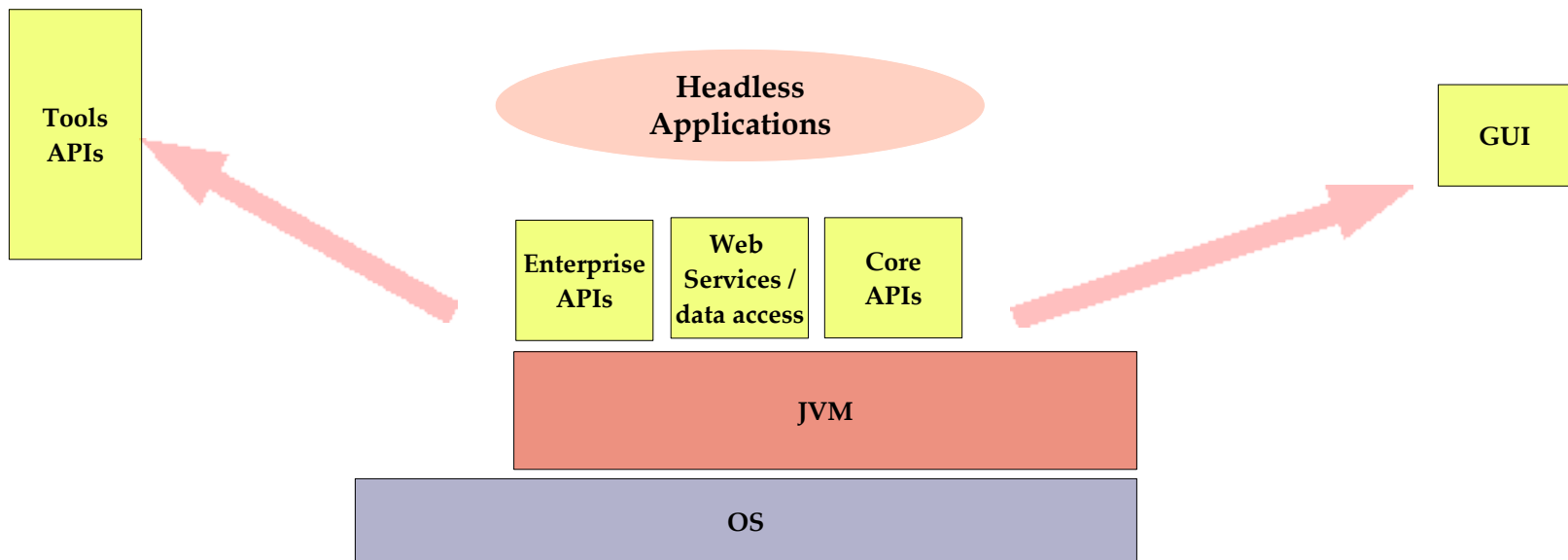
# The (full) Java SE Platform



# Java SE Rich Client Profile



# Java SE Headless Profile



# Agenda

Java SE Technology Today

**New Developments in the Platform**

Multiple Languages

Modularity

**Management and VisualVM**

Rich Clients

# Important Updates

## > More New I/O APIs

- New filesystem API
- Revised socket channel functionality
- Asynchronous I/O

## > Draft stage

- [openjdk.java.net/projects/nio/](http://openjdk.java.net/projects/nio/)
- Spec, code, samples

**TS-5686**  
**New I/O APIs**  
**Thu 9.30am**

# Management Updates

- JSR 255: Java Management Extensions (JMX™) Specification, version 2.0
  - Query language
  - Federated JMX technology servers
  - mBean annotations
  - Get code: [opendmk.dev.java.net](http://opendmk.dev.java.net)
- JSR 262: Web Services Connector for JMX Agents
  - Based on web service management standards
  - In Public draft, early access connector
  - Get code: [ws-jmx-connector.dev.java.net](http://ws-jmx-connector.dev.java.net)

**TS-5199**  
**JMX Update**  
**Wed 4.10pm**





# Demo: Visual VM

## Java™ VisualVM

Java™ VisualVM Java™ VisualVM Java™ VisualVM Java™ VisualVM Java™ VisualVM

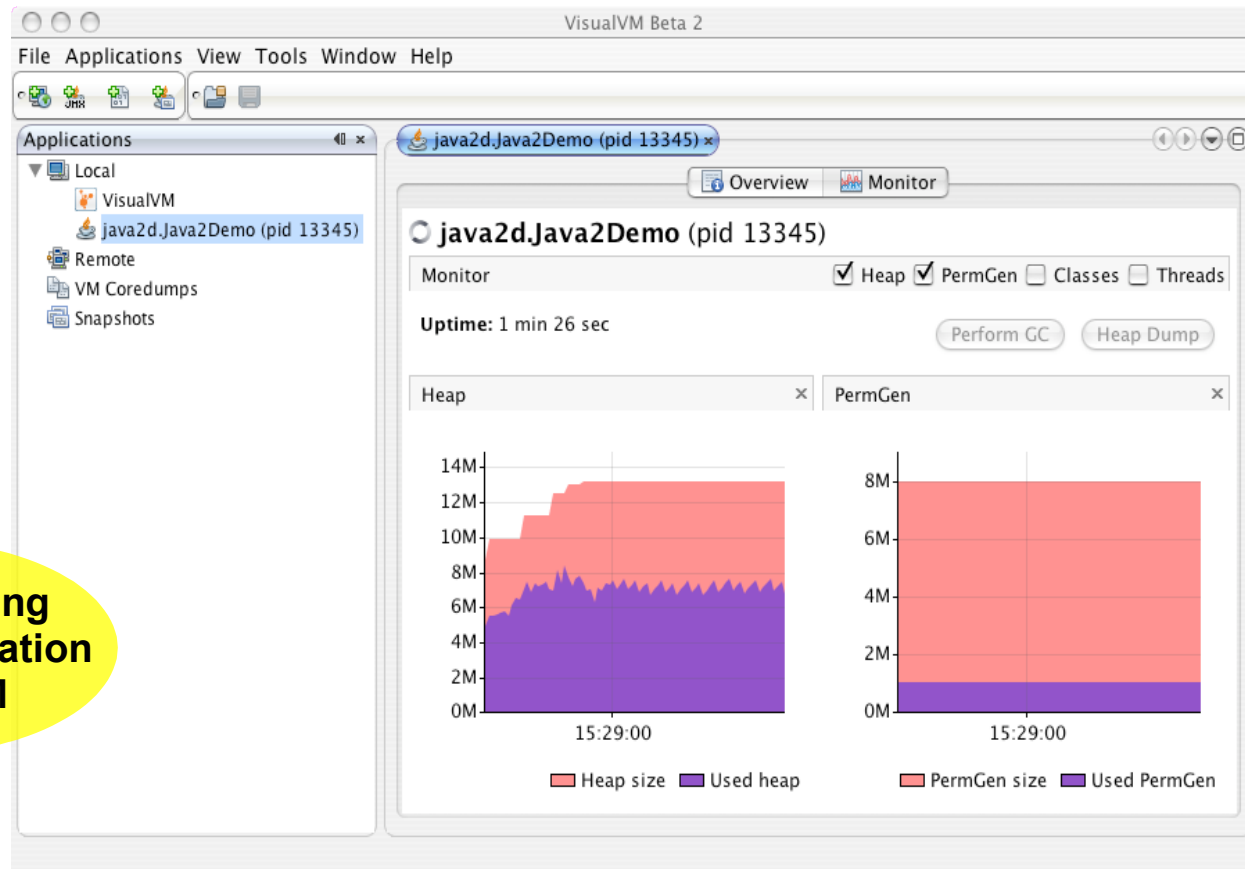
Luis Miguel-Alventosa  
Java SE JMX & VisualVM



# VisualVM for Sun's JDK

- Get the release candidate today
  - [visualvm.dev.java.net](http://visualvm.dev.java.net)

**BOF-5223**  
**VisualVM**  
**Thu 7.30pm**



**James Gosling**  
**Extreme Innovation**  
**Fri 8.30AM**

# Agenda

Java SE Technology Today

**New Developments in the Platform**

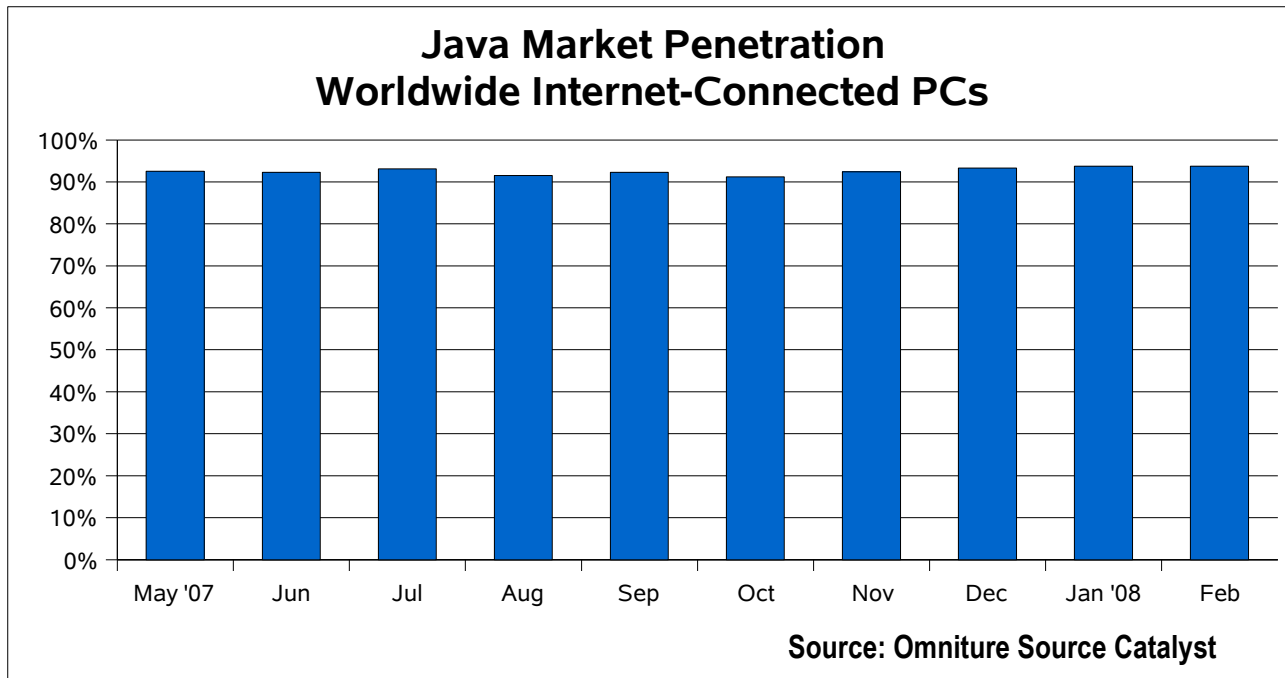
Multiple Languages

Modularity

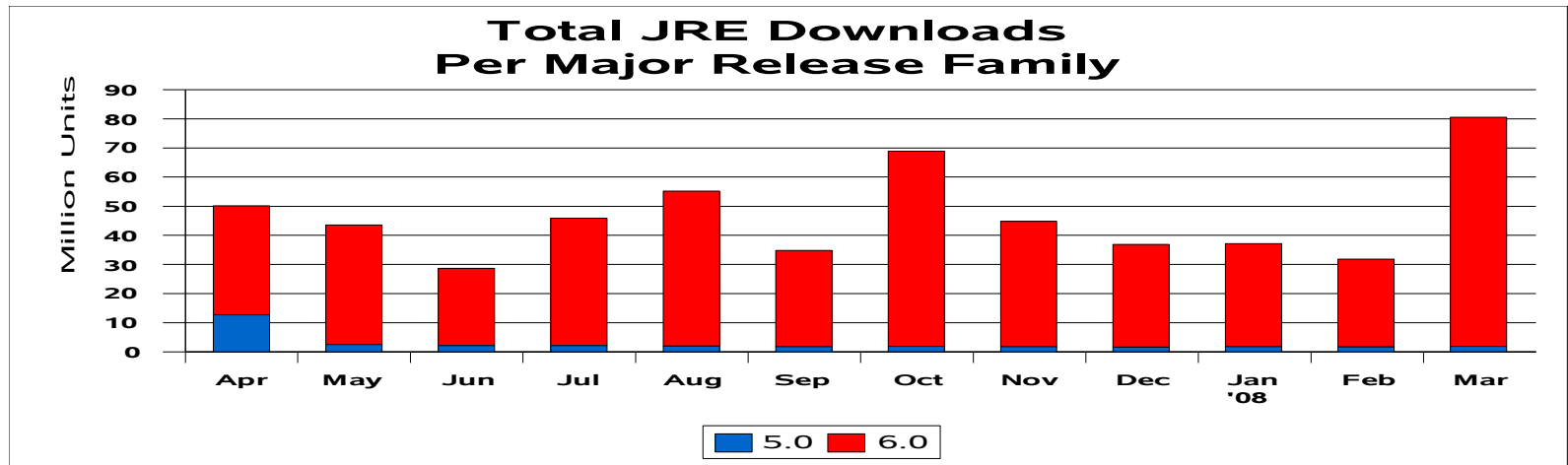
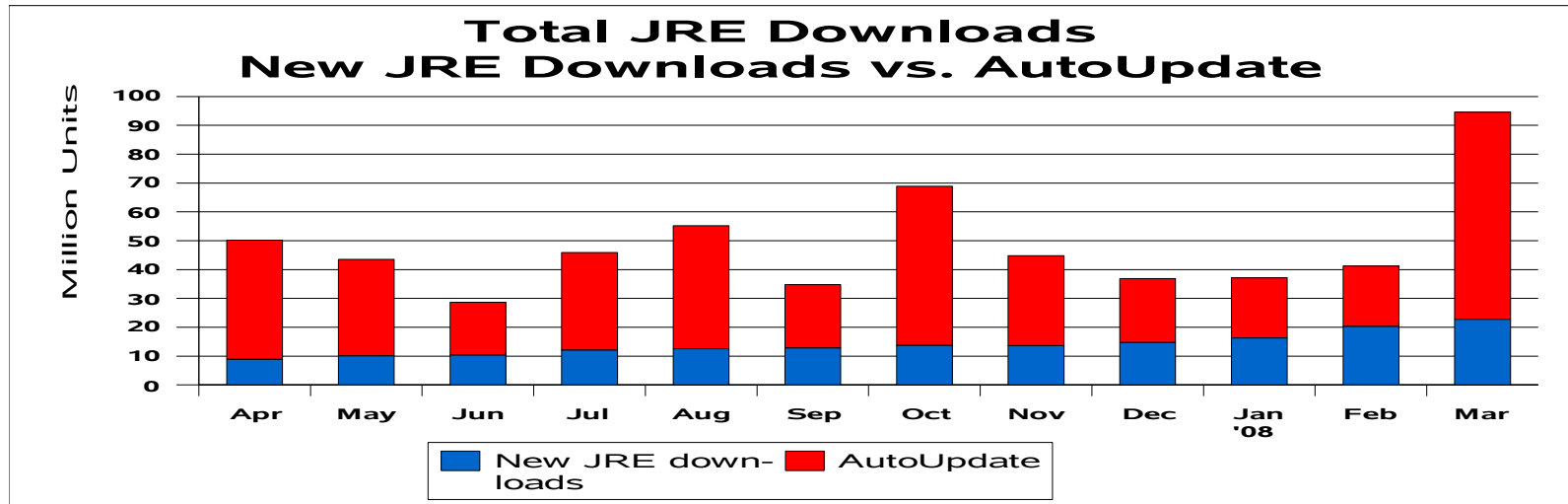
Management and VisualVM

**Rich Clients**

# JRE Deployments Strong

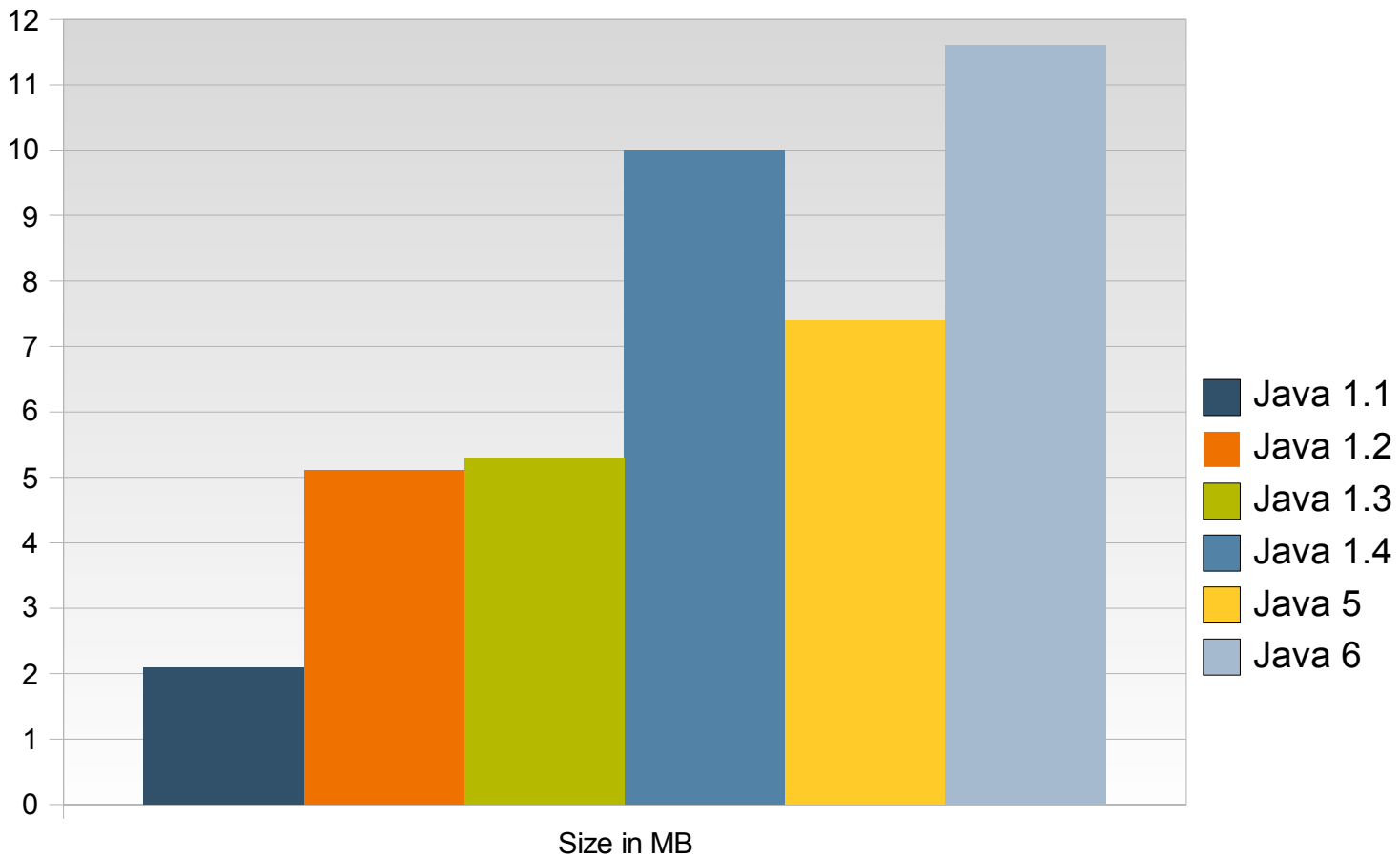


# JRE Downloads



# Bigger isn't better

## JRE download size



# Java SE 6u10 “Consumer JRE”

- Updated Java Runtime environment for the desktop
- Recharge use of Java for rich client applications
  - Small, fast download (Java Kernel)
  - Unified Java applet / application deployment with JNLP
  - Quick applet startup time (Java Quick Starter)
  - JavaFX ready
- Get the beta
  - [jdk6.dev.java.net/6u10ea.html](http://jdk6.dev.java.net/6u10ea.html)

# Old Java Plugin Architecture



- Applets in browser process
- Same VM
  - Same lifecycle
  - Same resources
  - Different deployment from Java Applications

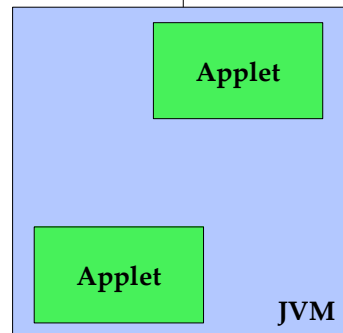
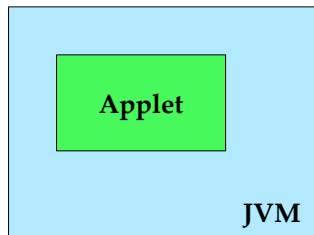


# New Java Plugin Architecture

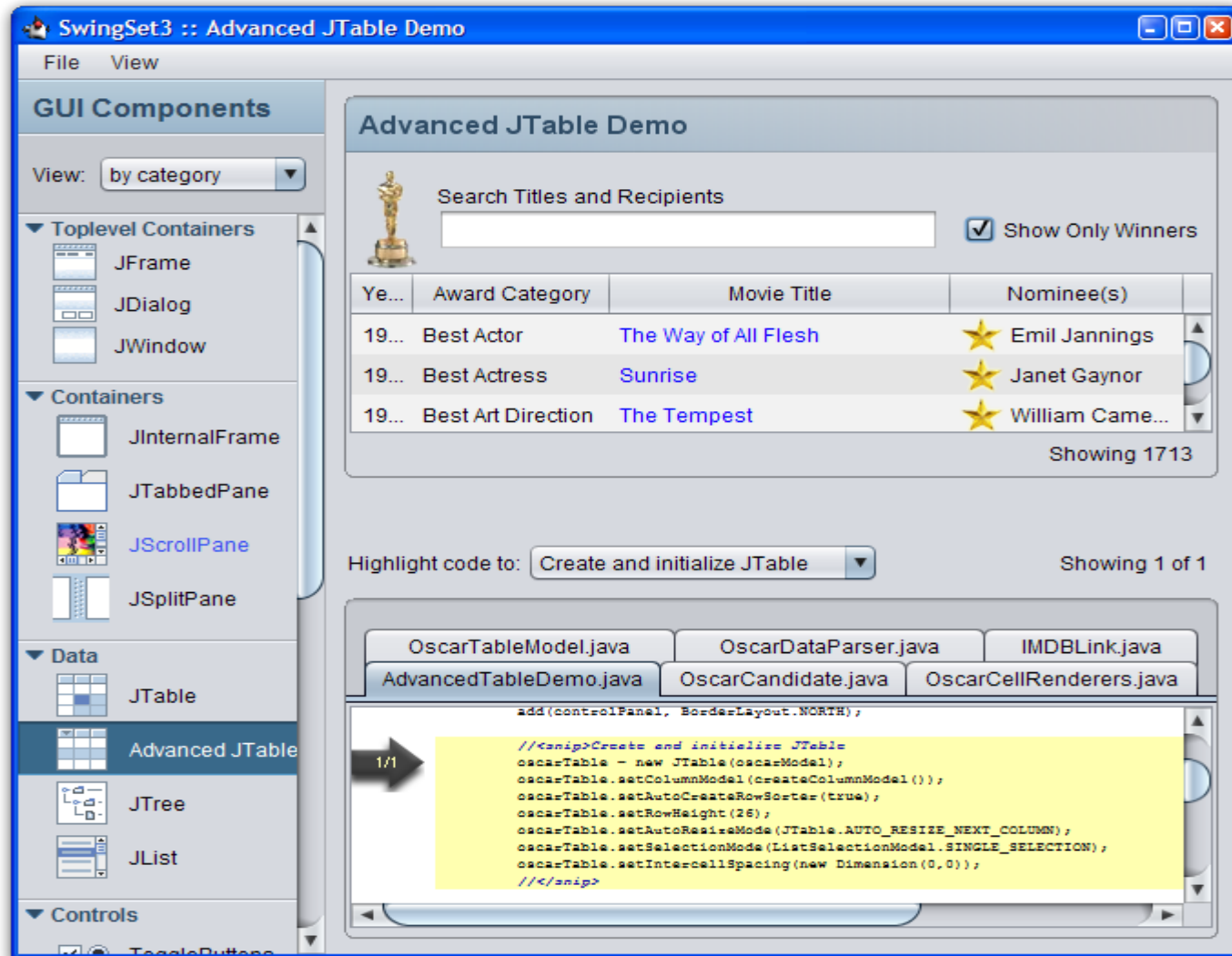
- Applets have own process
  - Choose the VM they want
  - Live outside browser
  - Live beyond the browser
  - Same deployment as Java Applications



**TS-6290**  
**Applets Reloaded**  
**Tue 12.10pm**



# Nimbus Look and Feel



# Proposed Technologies for Java SE 7 Platform

Specification	Stage	Implementation
JSR 277: Java Module System	Draft	<a href="http://openjdk.java.net/projects/modules">openjdk.java.net/projects/modules</a>
JSR 294: Improved Modularity Support in the Java Programming Language	Draft	<a href="http://openjdk.java.net/projects/modules">openjdk.java.net/projects/modules</a>
JSR 295: Beans Binding	Draft API	<a href="http://beansbinding.dev.java.net">beansbinding.dev.java.net</a>
JSR 296: Swing Application Framework	Draft API	<a href="http://appframework.dev.java.net/">appframework.dev.java.net/</a>
JSR 203: NIO.2	Draft	<a href="http://openjdk.java.net/projects/nio2">openjdk.java.net/projects/nio2</a>
JSR 292: Supporting Dynamically Typed Languages	Draft	<a href="http://openjdk.java.net/projects/mlvm">openjdk.java.net/projects/mlvm</a>
JSR 220: Java Persistence Architecture	Final Spec	<a href="http://glassfish.dev.java.net">glassfish.dev.java.net</a>
JSR 255: JMX Specification, version 2.0	Draft	<a href="http://opendmk.dev.java.net">opendmk.dev.java.net</a>
JSR 262: Web Services Connector for JMX	Draft	<a href="http://ws-jmx-connector.dev.java.net/">ws-jmx-connector.dev.java.net/</a>
JSR 260: Javadoc Tag Technology Update	-	-
JSR 308: Annotations on Java Types	Draft	<a href="http://pag.csail.mit.edu/jsr308/">pag.csail.mit.edu/jsr308/</a>
JSR 310: Date and Time API	Draft API	<a href="http://jsr-310.dev.java.net/">jsr-310.dev.java.net/</a>
<i>JSR(s) TBD Java Language changes</i>	-	<a href="http://ksl.dev.java.net">ksl.dev.java.net</a>

# More Information

- Java SE platform
  - [java.sun.com/javase](http://java.sun.com/javase)
- OpenJDK
  - [openjdk.java.net](http://openjdk.java.net)
- JavaFX technology
  - [javafx.com](http://javafx.com)
- Java SE and JavaFX Blogs
  - [planetjdk.org](http://planetjdk.org)

# THANK YOU



Danny Coward,  
Chief Architect, Client Software  
Sun Microsystems

