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What's New In Mobile & Embedded Java? A Technology Update

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Java Everywhere



Java™

1999

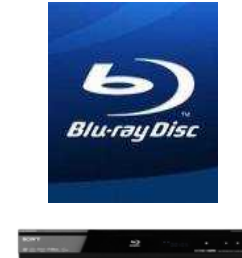


Java Metrics



- 7 billion Java Cards shipped
- 3 billion Java-based handsets
 - 800 million new phones shipped with Java annually
 - 5 of the top 5 mobile handset manufacturers ship Java
 - 45,000 Java ME applications
- 80 million Java-based TV devices
- All Blu-ray Disc players ship with Java
- Gazillions of embedded devices

Java Platform



APIs

Java EE

Java FX

Java SE

Java TV & Java ME

Java Card

Java VM

HotSpot Java VM

Lightweight Java VM

Language

Java Language

Java for Mobile & Embedded Devices

Objectives

- Modernize Java for mobile and embedded devices
 - Project Java ME.next
- Deliver Java + Web Apps to all consumer devices
 - Integrate HTML, JavaScript, CSS
- New device APIs to access hardware & OS features
 - Graphics, NFC, IMS, sensors, payment, telephony, location
- Small footprint, cpu-efficient Java for card, TV, mobile
 - Phones: Optimized for ARM7/ARM9 chips & limited memory
 - TVs: Optimized Blu-ray Java, DVB multimedia, Tru2way cable
 - Cards: Personal identity verification, National ID, Health Care
- Consistent tooling and emulation across Java devices



Project Java ME.next

Project Java ME.next

Highlights

- Oracle is committed to modernizing the ME platform
- A proposal has been discussed with the JCP EG
- Key elements:
 - Adopt features from JDK 1.6 (language, VM, runtime)
 - More compatibility between CDC and CLDC
 - Update or extend APIs in existing or new optional packages, as appropriate
 - Backward binary compatibility, no business disruption
- Oracle intends to support ME.next in future products

Project Java ME.next

Proposed Technology Update

CLDC

- Common enhanced language, VM features, libraries
- Retain equivalent level of functionality
 - Security model (same as CLDC 1.1.1)
 - No dynamic loading of classes
 - GCF for networking, etc

CDC

- Common enhanced language, VM features, libraries
- Combine CDC and FP
- Update from Java SE 6
 - Security
 - Unicode
 - New I/O
 - Networking
 - Logging (optional package)



Java for Embedded Devices

Java for Embedded

Java SE Embedded & CDC

SE Headful

- All Java SE APIs
- Browser plug-in

SE Headless

Java SE Hotspot

CDC Optional Packages

- **Embedded:**
Foundation, Security, AWT, AGUI/Swing, XML, media , JDBC, RMI
- **TV:**
Foundation and Personal Basis Profiles, Java TV / JMF

CDC-HI

Embedded Operating System

- Java SE Embedded
 - Full Java SE 5 and 6 + specific embedded features
 - Up-to-date with Java APIs and language
 - Targeted at mid/high-end embedded devices
- CDC
 - Core based on JDK 1.4 subset
 - Targets low/mid-range embedded devices
 - Wide range of optional packages
 - Basis of multiple embedded and TV industry standards

Java for Embedded

Platform Choice

Version	CPU	Operating System	Headful/Graphi cs Libs	RealTime
CDC 1.1.2	ARM, MIPS, PPC, X86	Linux Kernel 2.6	Headless	
	Intel CE3100	OCAP MPEOS 1.1.4	DirectFB	
	Broadcom MIPS 7420/7440	OCAP MPEOS 1.1.4	DirectFB	
SE 5u10	PPC, X86	Linux Kernel 2.6+	Headless	
	x86	XP Embedded	Windows	
SE 6u10	ARM v5/v6/v7 SoftFP/HardFP	Linux Kernel 2.6	Headless	
	ARM v5 SoftFP	Linux Kernel 2.6	X11 R6+	
	ARM v6/v7 HardFP	Linux Kernel 2.6	X11 R6+	
SE 5u20	x64, SPACR, SPARCv9	Solaris 10 Update 6,7,8	X11	
	x86	RedHat MRG 1.2: kernel version 2.6.24.7- 139.el5rt	X11	Yes
	x86	Novell SLERT (SP2) update 6: kernel version 2.6.22.19-0.35-rt	X11	Yes

Java for Embedded

Current Activities

- Java SE Embedded and CDC platform support
 - Ported to a variety of ISAs, OSes, and graphics adapters
- New CDC release
 - Many VM enhancements, better portability, bug fixes, performance improvements, additional platforms
- TV Solutions
 - Oracle Java Media Client
- Embedded solutions
 - More information in Oracle's Embedded Website
 - Off-the-shelf, downloadable embedded binaries and eval versions



Java for Mobile Devices

Java for Mobile Devices

Mobile Developer Challenges

- Leverage web content from Java
 - Rendering of web content within Java apps
- Access device capabilities from JavaScript
 - Get to PIM, location, accelerometers, Bluetooth, etc
- Integration between Java and JavaScript
 - Use language best suited for the task
- Manage multiple runtimes, content types, and development environments
 - Java apps
 - Web apps & web widgets
 - Blended (Java + web technologies)
 - Integrated application management system (AMS)

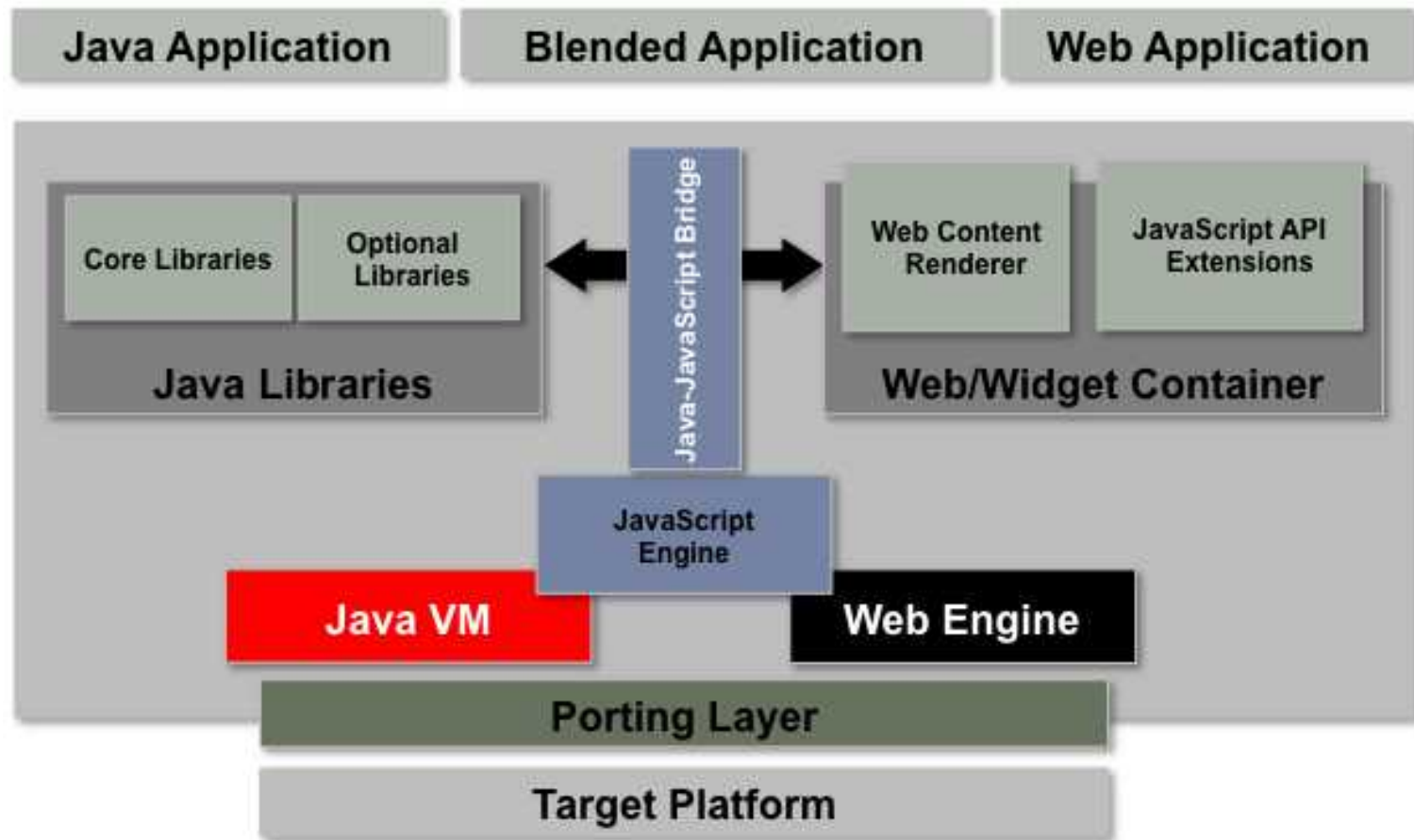
Java ME + Web

Technology Options

	LWUIT xHTML Component	Java ME with JSR 290	Java ME + Web
Description	UI Library with xHTML rendering component	Optional APIs for Java ME	Integrated Java ME / Web runtime solution
Application Model & Packaging	UI Library bundled with Java Midlet	Java Midlet	Blended App (W3C Widget + JAR)
Web UI representation	Java / xHTML	Java / HTML	HTML
Supported Web Standard	<ul style="list-style-type: none"> • xHTML MP 1.0 • WCSS 	<ul style="list-style-type: none"> • DOM / XML / HTML • CSS • JavaScript 	<ul style="list-style-type: none"> • DOM / XML / HTML • CSS • JavaScript • W3C widgets
Target devices	<ul style="list-style-type: none"> • Any Java ME device 	<ul style="list-style-type: none"> • Any Java ME device with JSR 290 implementation 	<ul style="list-style-type: none"> • Device with Java + Web integrated solution

Java ME + Web

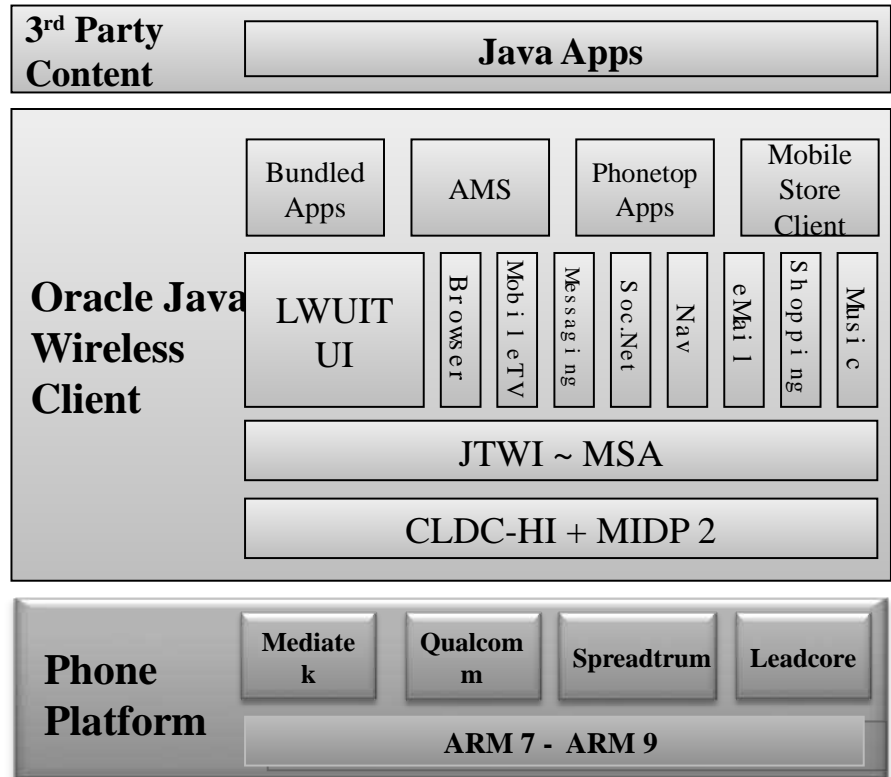
Proposed Architecture



Oracle Java Wireless Client

Best-In-Class Java ME runtime for mobile market

- Latest Java ME platform evolution
- Product highlights
 - Expressive apps with LWUIT, optimized
 - Path to app monetization with mobile store client
 - Catalog of leading apps, optimized
 - Bundled with major feature phone OS and chipsets
 - Best-in-class multitasking, performance, and footprint
 - Dynamic skins, touchpad, screen rotation support
 - ... and much more



Summary: Java ME + Web

LWUIT xHTML

- Render rich text locally
- Offer dynamic UI representation
- Embed mobile sites or web flow e.g. m.twitter.com)



Available
today

Java ME + JSR 290

- Web view in Java apps
- Leverage XML based-standards for UI design
- Embed HTML-based web sites



Products in
2011

Java ME + Web

- Access Java APIs from JavaScript
- Allow business logic to be used in web apps
- Manage Java & widget content



Stay
tuned



Lightweight UI Toolkit (LWUIT)

What is LWUIT?

Lightweight User Interface Toolkit

- Advanced, lightweight **UI library**
- Compelling UI
 - Consistent across different devices
- For **today's** handsets (and more ...)
- Portable
 - MIDP, Blackberry, Android, CDC, SE, TV, ...
- Inspired by Swing
- Tools support
- Open Source!
 - GPLv2 + Classpath Exception, **free for commercial use**
 - Active community



Demo

Rich Mobile Java with LWUIT



LWUIT

Key Benefits

- Rapid development
 - Familiar API
 - Clean & simple
- Easy deployment
 - One jar, many devices
- Consistent & flexible
 - Customizable, extendable
- “Filthy Rich” UI
- Brand-able
- Designed for mass market devices
 - Tested on broad range of hardware



LWUIT

Key Features

- Swing-like MVC
- Layouts
- Fonts
- Rich widgets
- 3D & SVG integration
- Touch screen support
- Animations & transitions
- Pluggable Look & Feel, theming
- I18N/L10N support
- ... *more*



Cross-Platform Content

LWUIT handles many device-specific details

- Identical application code, multiple platforms



Mobile Emulator



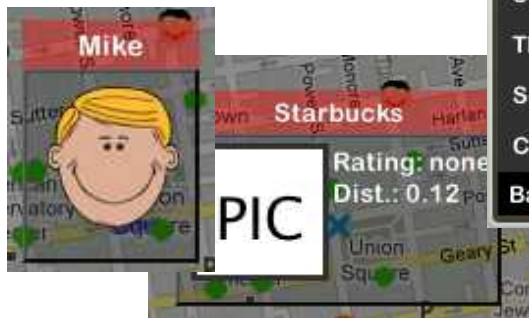
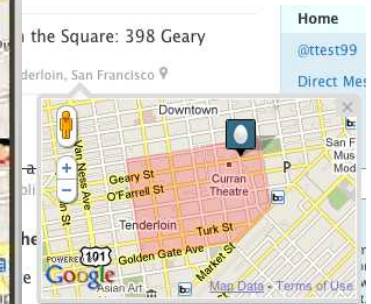
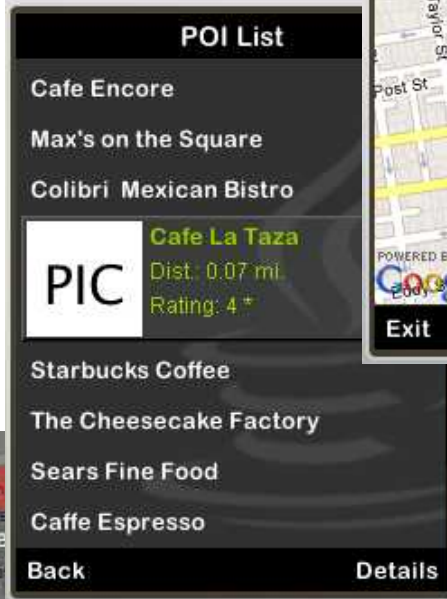
Sony Ericsson G705



HTC Touch Diamond

Demo

Device & Web Services Mash-Up



LWUIT

Where To Find More

- Comprehensive LWUIT article:
<http://tinyurl.com/2erwc3x>
- Mash-Up application to be published soon in source.
Check my blog:
<http://terrencebarr.wordpress.com>

Summary

- Oracle is
 - Committed to upgrading Java ME
 - Moving forward on making it easier for web developers and Java developers to work in a common environment
 - Increasing investment for embedded use of Java

URLs

Java ME roadmap details:

oracle.com/technetwork/java/javame

Java Embedded home:

oracle.com/technetwork/java/javame/overview/index.html

Java ME home:

oracle.com/technetwork/java/embedded/overview/index.html

Thank You!

Q & A





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