

Java ME – Introduction

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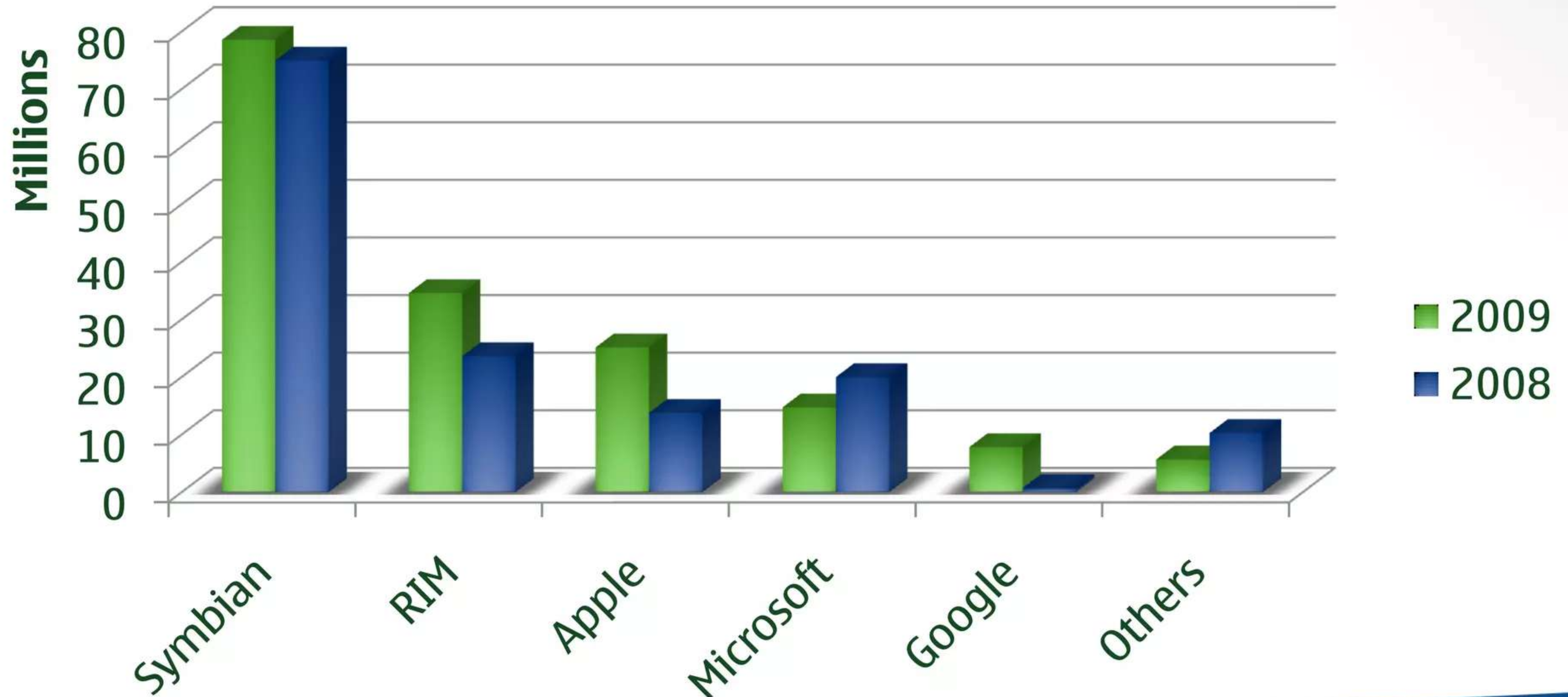
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V2.0.1

Phones vs. Smartphones

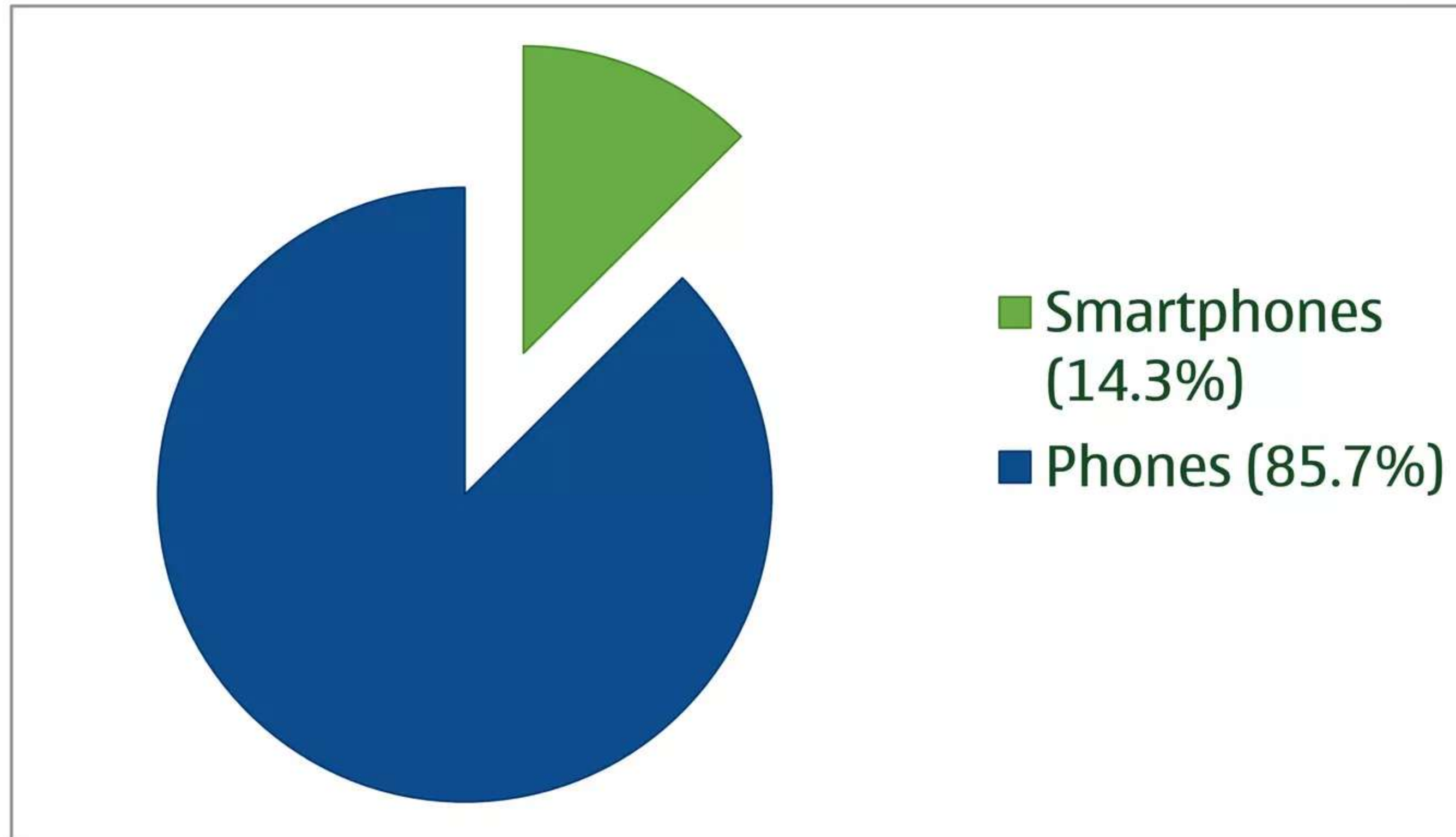
- **What's the difference?**
 - No industry standard definition
 - Has advanced features (email, music, Wifi, etc.)?
 - OS that allows 3rd party development?
 - Miniature computer with phone capability?
- **Where to draw the line?**



Smartphone OS Shipments



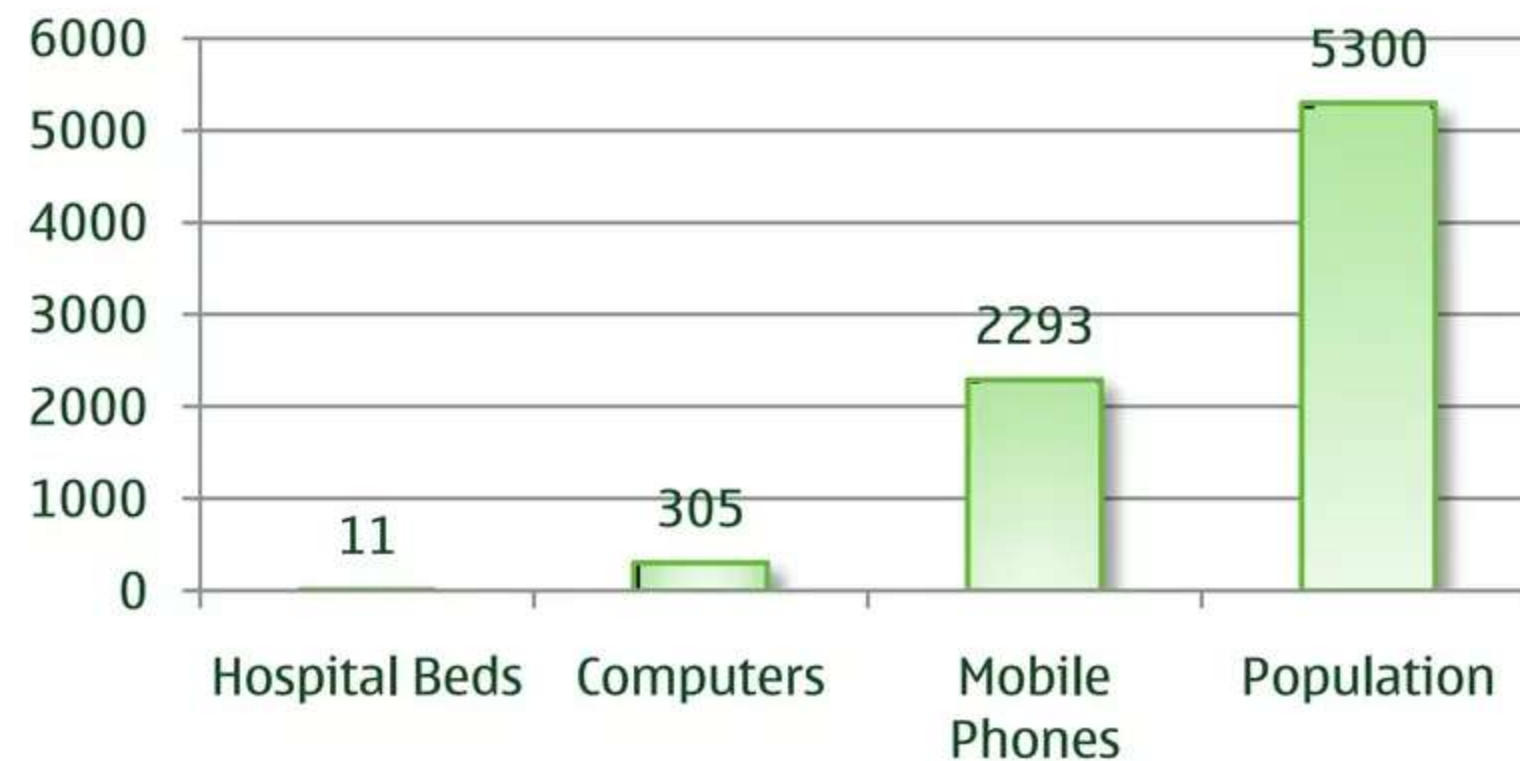
Worldwide Sales 2009



Source: Gartner, <http://techcrunch.com/2010/02/23/smartphone-iphone-sales-2009-gartner/>

Developing Countries

- **Massive uptake of mobile phones**
 - Only way to access internet
 - Enormously successful new services



NFC for pension payment in India

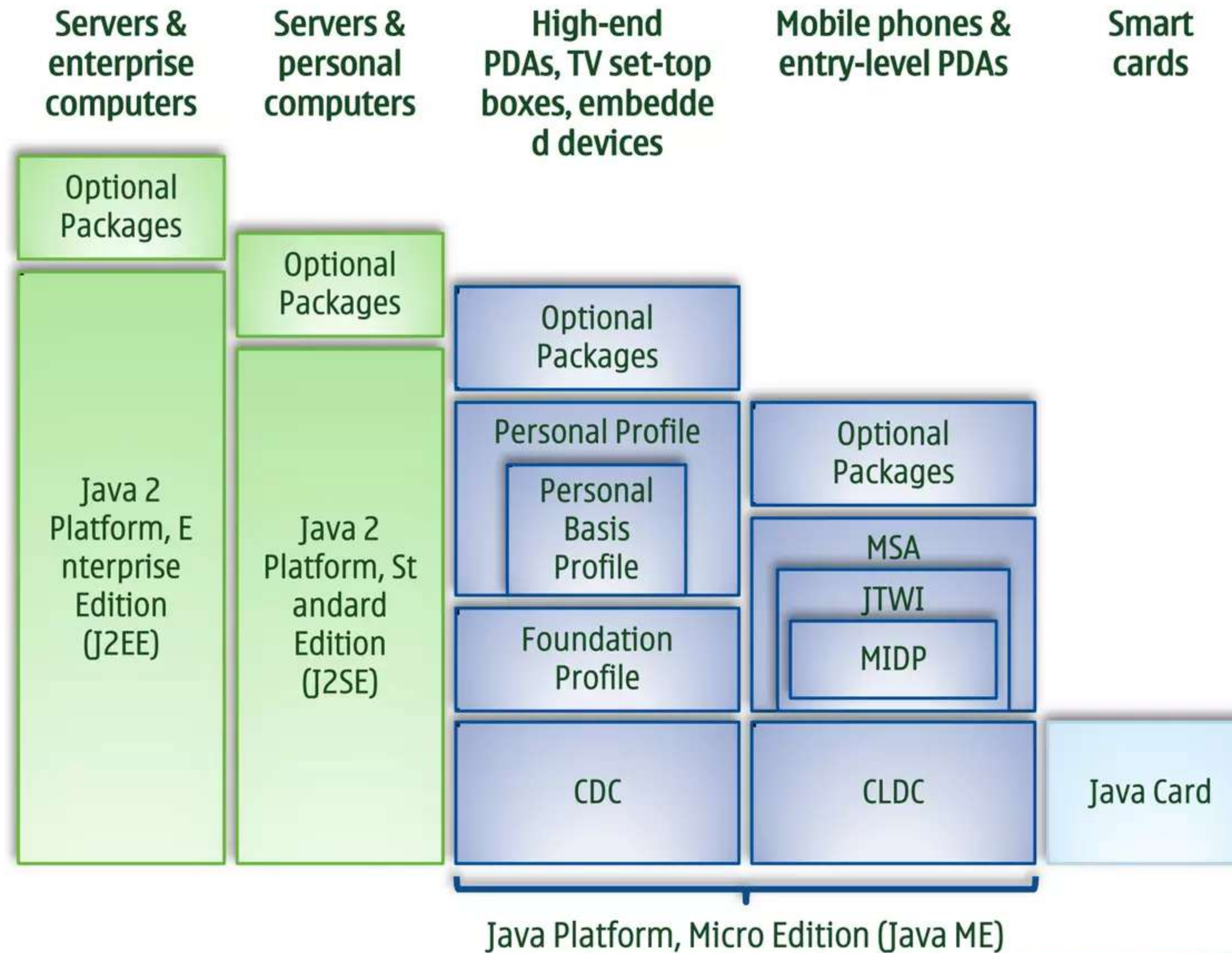


Java?

- **In numbers:**
 - > 6 Billion Java-enabled devices
 - **2.6 Billion Java-enabled phones
(8 out of 10 shipped in 2008)**
 - 3.5 Billion Java Cards
 - 20 Million Java set-top boxes
 - 800 Million Java desktops
 - **180 Operators deploying Java content**
 - 6 Million developers



Editions

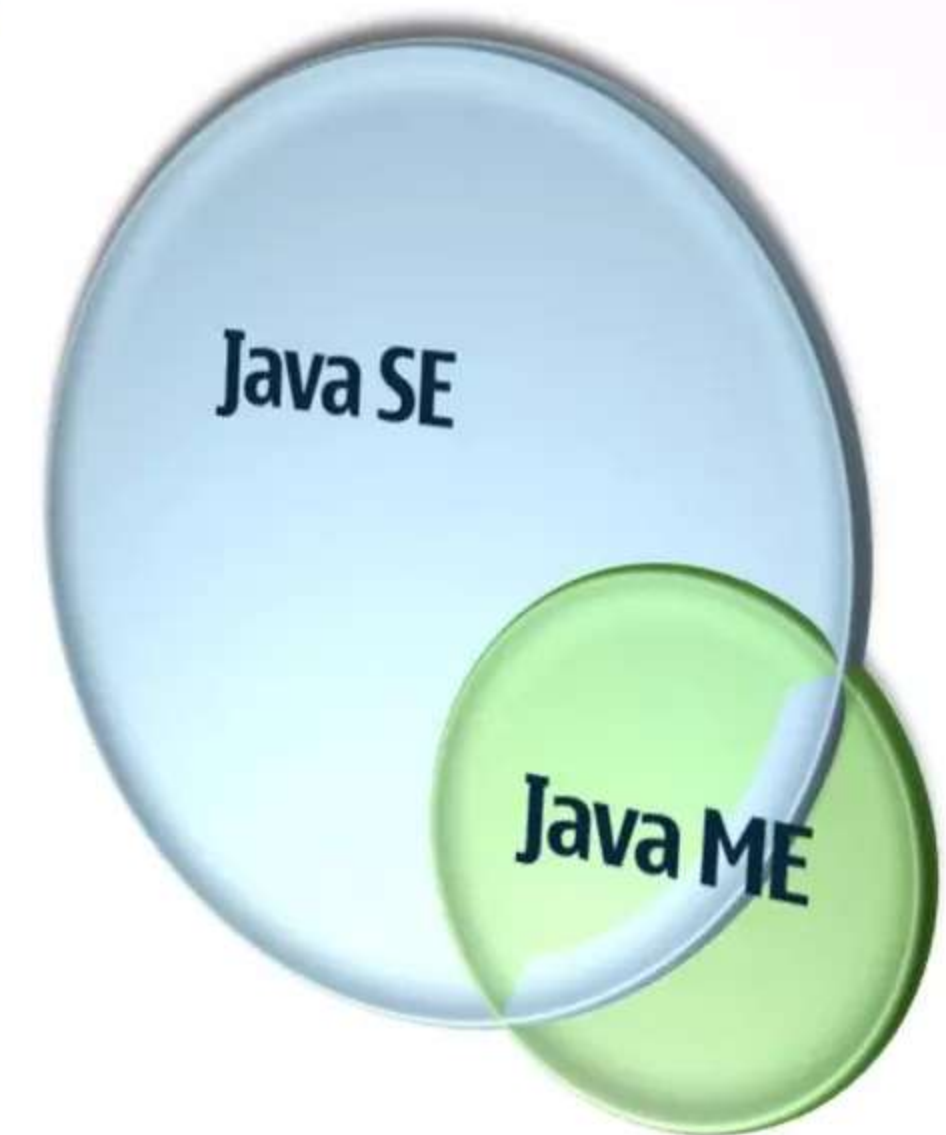


MSA ...
JTWI ...
MIDP ...
CDC ...
CLDC ...

Mobile Service Architecture (JSRs 248 and 249)
Java Technology for the Wireless Industry, JSR 185
Mobile Information Device Profile
Connected Device Configuration
Connected Limited Device Configuration

Java SE vs. Java ME

- **Java ME is mainly a subset of J2SE**
 - But **different UI- and event handling** functionality
 - **Less utility classes**
(only Vector and Hashtable, no LinkedLists, ...)
- **Code runs on both platforms?**
 - → general algorithms: yes
 - But the whole application needs porting



Targets



+ RIM / Blackberry
+ SonyEricsson
+ Motorola

Basic Terms – Configuration

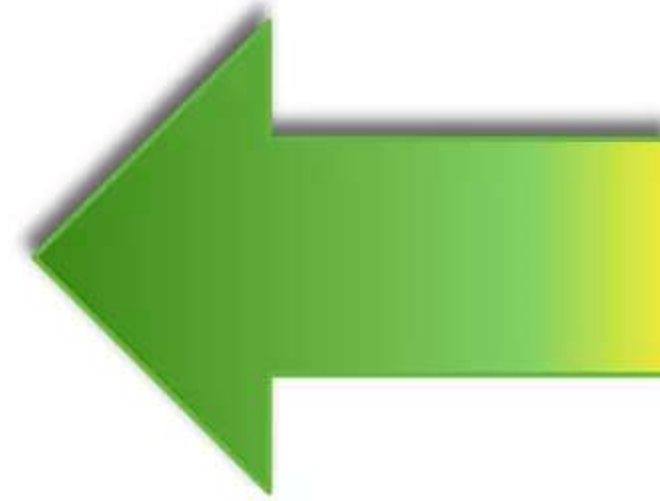
- **Defines Java platform for different device classes**

- **CLDC**

- Limited UI
 - Low computing power,
 - Limited connectivity

- **CDC**

- High bandwidth network connection
 - larger memory requirements



Currently used in
most phones:
CLDC 1.1

Basic Terms – Profile

- **Extension and more detailed specification for a configuration**
 - Contains APIs for UI, event handling, data storage, networks, timers, ...
 - Minimum requirements for devices (screen size, input possibilities, ...)
- **For mobile phones:**
 - Mobile Information Device Profile (MIDP)
 - Currently used: **MIDP 2.1**

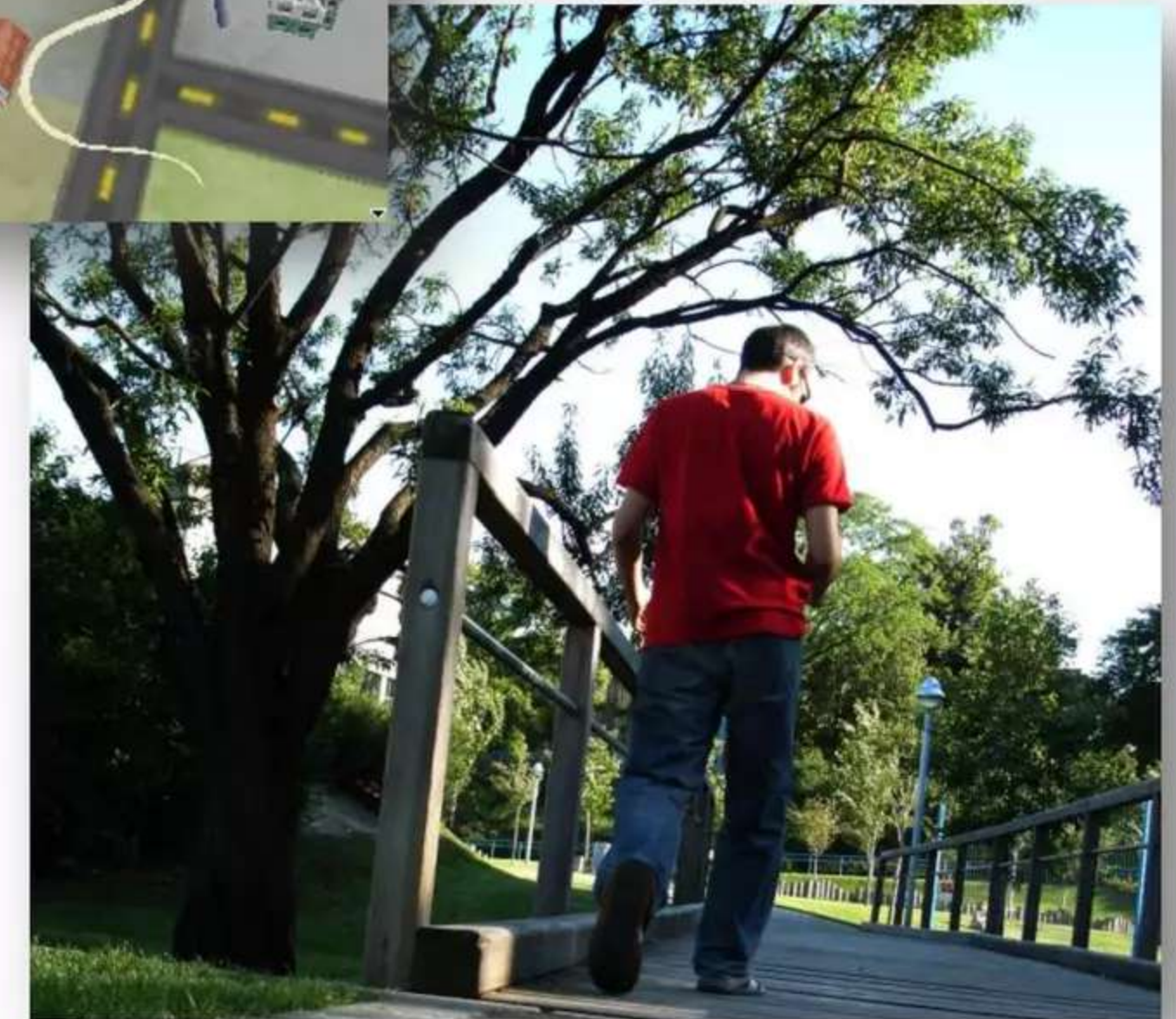
Basic Terms – JSR

- **Java Specification Request (JSR)**
 - Describe specifications and technologies
 - Mobile space: APIs, standards
- **Examples:**
 - JSR 82: Bluetooth APIs
 - JSR 179: Location API
 - JSR 184: Mobile 3D API
 - JSR 226: Scalable 2D Vector Graphics API

*Tornado Mania! 3D
(Digital Chocolate)*



*RealReplay
(Mopius)*



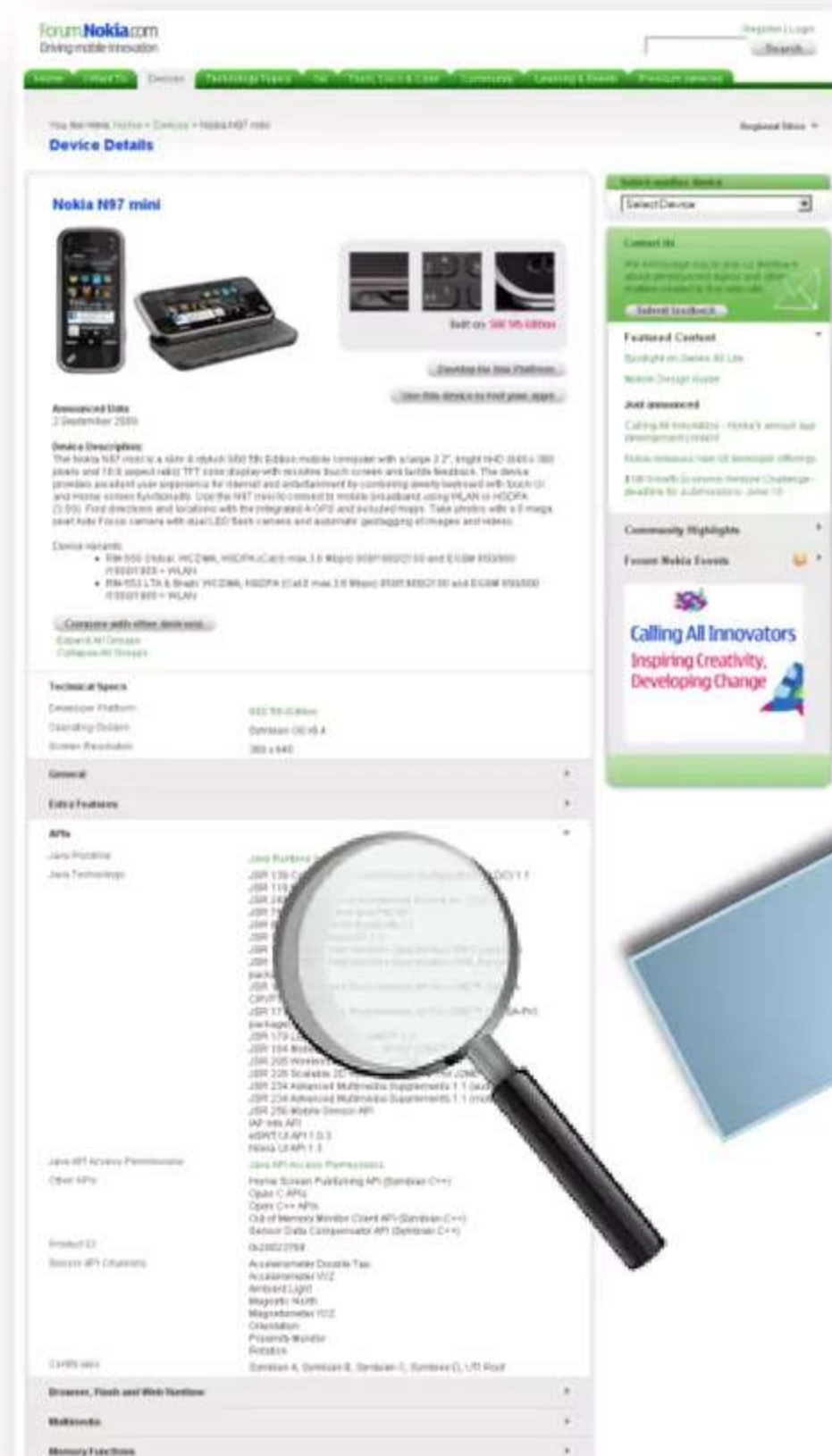
What JSRs could be required?

- **A mapping application could require:**
 - **JSR 226 (Vector Graphics)**
 - Map visualization
 - **JSR 179 (Location)**
 - Where am I?
 - **JSR 172 (Web Services)**
 - Requesting data
 - **JSR 75 (File and PIM)**
 - Map an address



RealReplay
<http://realreplay.mopius.com/>

What does my phone support?



Java Runtime 1.4 for S60

JSR 139 Connected, Limited Device Configuration (CLDC) 1.1
 JSR 118 MIDP 2.1
 JSR 248 Mobile Service Architecture Subset for CLDC
 JSR 75 FileConnection and PIM API
 JSR 82 Java™ APIs for Bluetooth 1.1
 JSR 135 Mobile Media API 1.1
 JSR 172 J2ME™ Web Services Specification (RPC package)
 JSR 172 J2ME™ Web Services Specification (XML Parser package)
 JSR 177 Security and Trust Services API for J2ME™ (SATSA-CRYPTO package)
 JSR 177 Security and Trust Services API for J2ME™ (SATSA-PKI package)
 JSR 179 Location API for J2ME™ 1.0
 JSR 184 Mobile 3D Graphics API for J2ME™ 1.1
 JSR 205 Wireless Messaging API 2.0
 JSR 226 Scalable 2D Vector Graphics API for J2ME™ 1.1
 JSR 234 Advanced Multimedia Supplements 1.1 (audio3d)
 JSR 234 Advanced Multimedia Supplements 1.1 (music)
 JSR 256 Mobile Sensor API
 IAP Info API
 eSWT UI API 1.0.3
 Nokia UI API 1.3

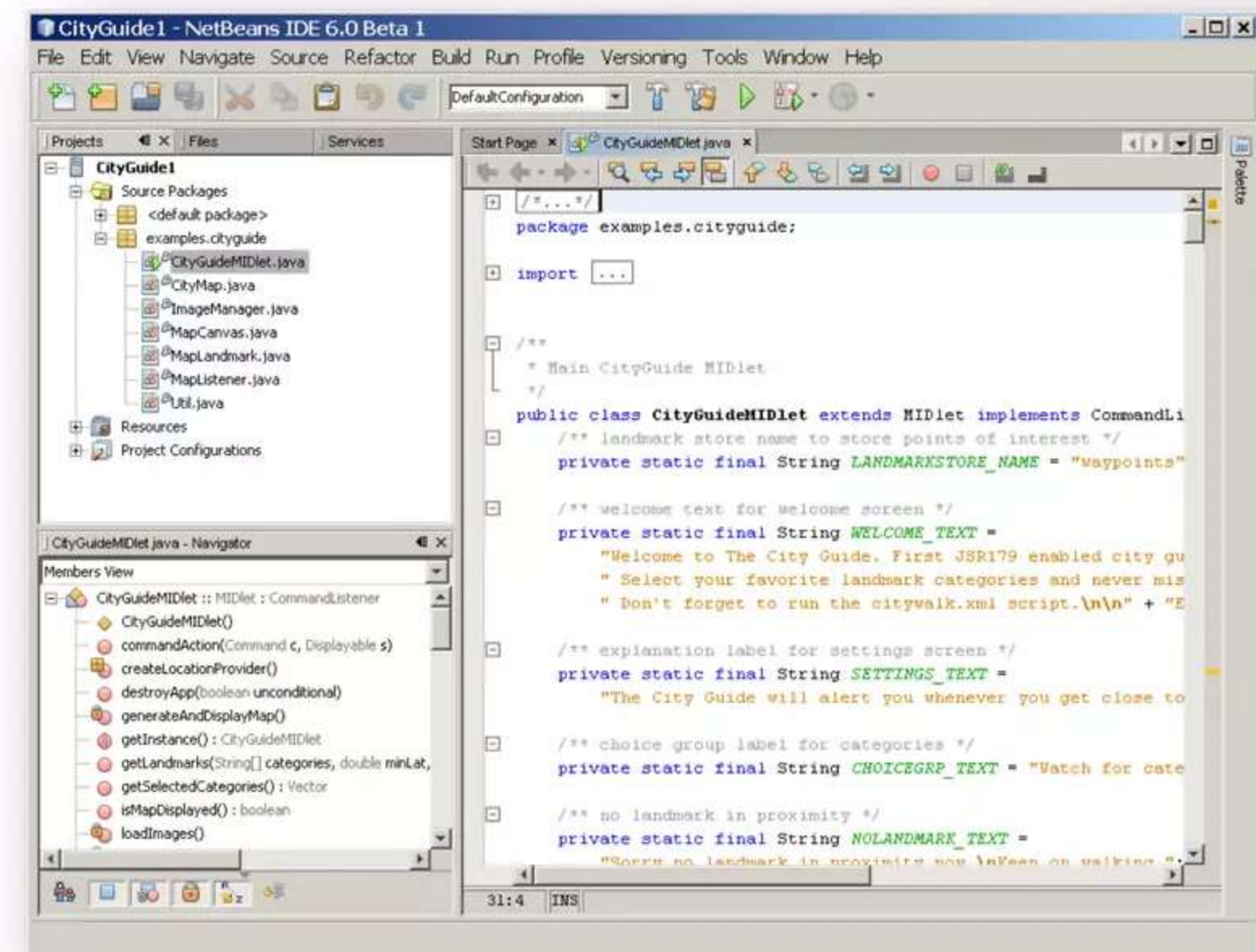
<http://www.forum.nokia.com/devices/>

Development – NetBeans IDE

- **Fully integrated solution**
 - Integrates all aspects of mobile development
 - Visual UI Designer
 - Game Builder
 - Localization, Preprocessing
 - Web access
 - Automated deployment
 - Comes with generic emulator
- **Maintained by Oracle (Sun)**
 - <http://www.netbeans.org/>



NetBeans



NetBeans (+ Java ME module)

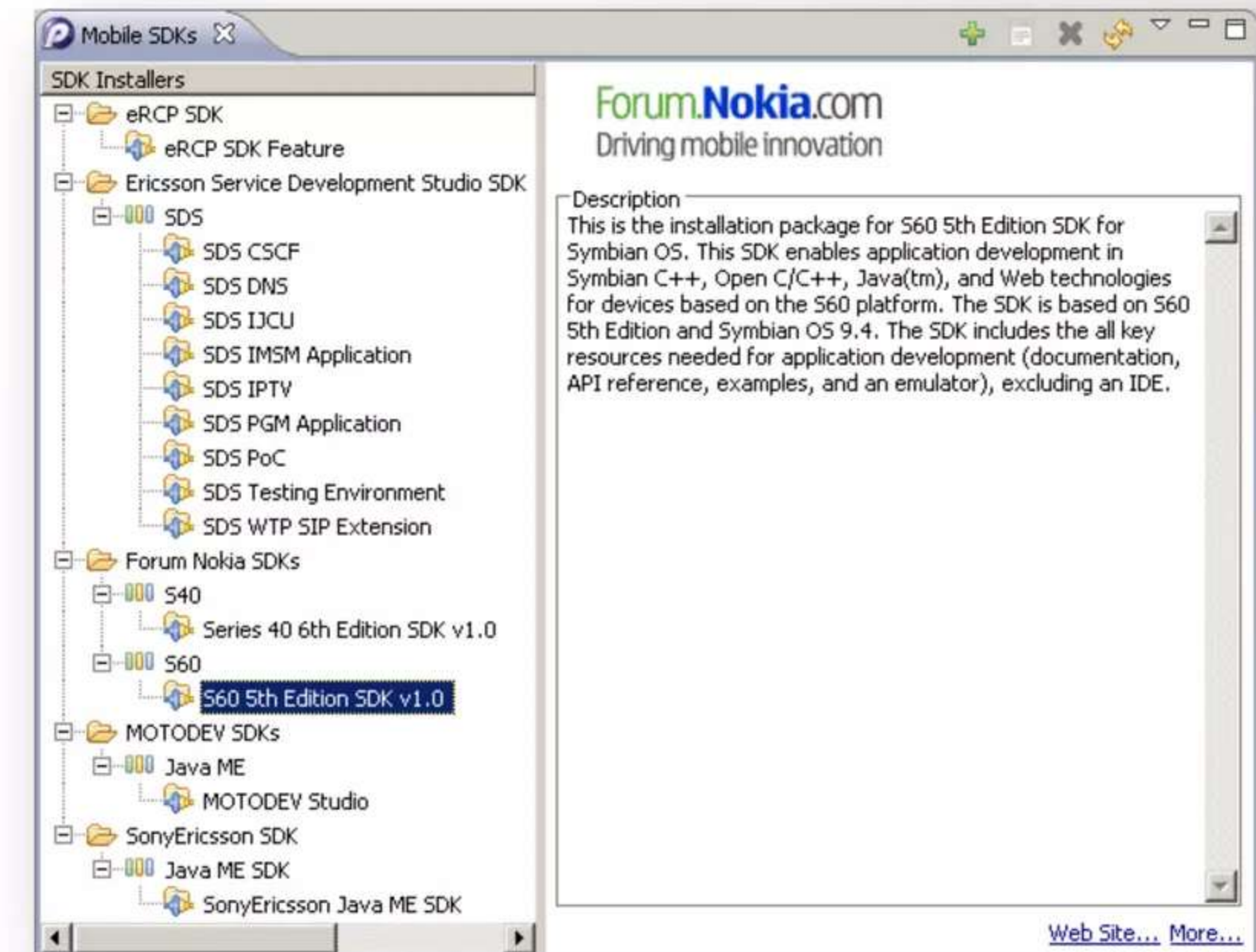
Development – Eclipse IDE

- **Mobile Tools for Java (MTJ)**
 - Targets Java ME development
 - Supports MIDlets
 - Adds project type and Java ME perspective to Eclipse
 - Templates for common projects (games, etc.)
 - Localization, Preprocessing
 - Creates .jad/.jar packages
 - Originally based on EclipseME plug-in
- **Pulsar**
 - Combined tools set – includes Eclipse, MTJ and other tools
 - <http://eclipse.org/pulsar/>

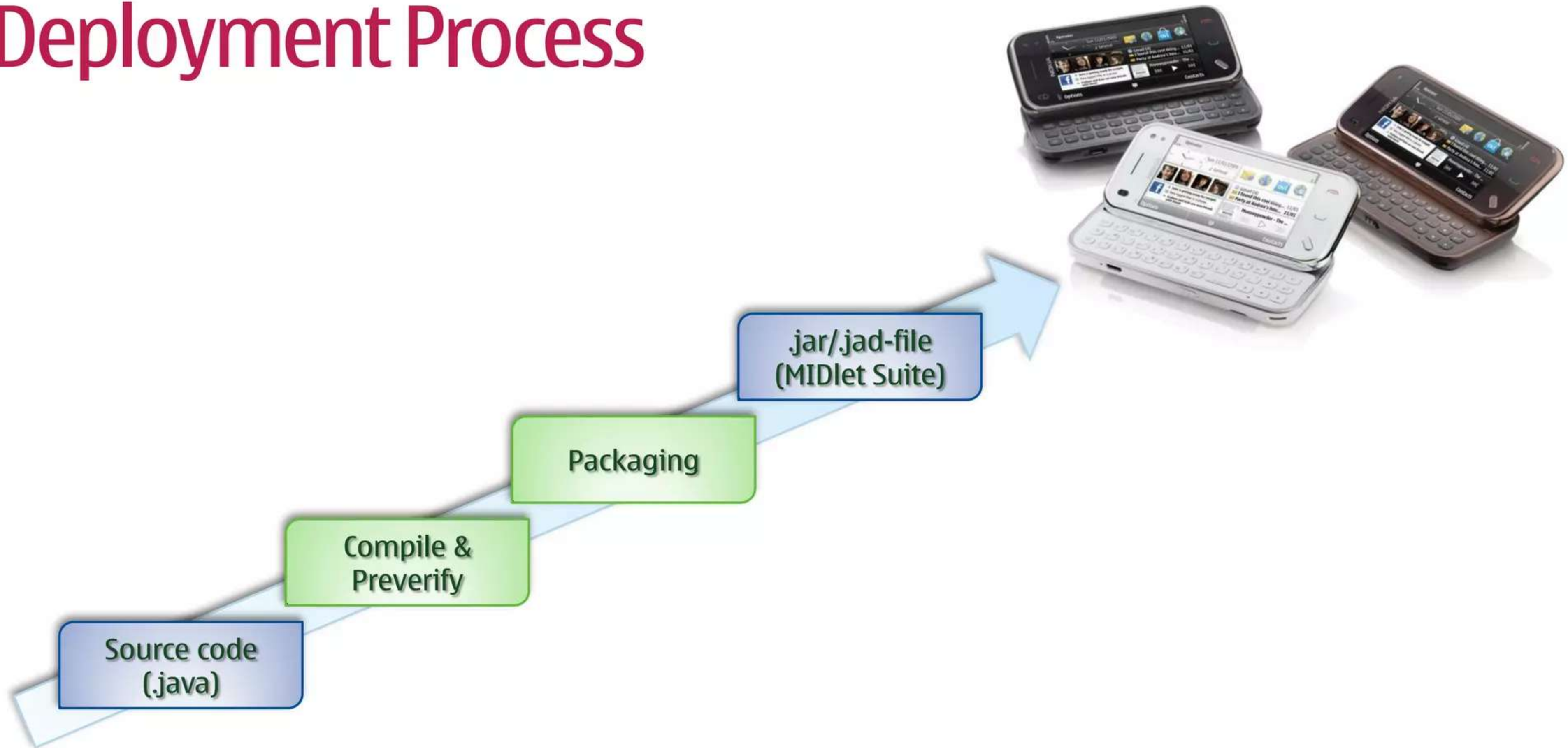


SDKs

- **Device vendor specific SDKs**
 - Simulate target more accurately
 - Support proprietary APIs
 - Include device skins
- **Generic SDK from Sun**
 - Fine enough for initial development
 - <http://java.sun.com/javame/downloads/sdk30.jsp>



Deployment Process



Future of Java ME

- **Roadmap**

- Nokia makes its Java ME implementation open source
 - Contribution to Symbian Foundation
- Next version: Java Runtime 2.1 (JRT)
 - Faster startup
 - Easier installation
 - Beta: <https://betalabs.nokia.com/apps/java-runtime-for-Symbian>
- Future
 - Migration to Qt based UI ongoing
 - Hardware acceleration, haptics, etc.
- <http://blogs.forum.nokia.com/blog/java-runtime-for-s60-blog>



More Information

- **Java Developer's Library**
 - <http://library.forum.nokia.com>
- **Mobile Hands-On Labs**
 - http://www.forum.nokia.com/document/Mobile_Hands-on_Labs/
- **Training courses**
 - Slides for courses covering the basics, games, networking & messaging, multimedia and security
 - <http://www.forum.nokia.com/Develop/Java/Documentation/>
- **Java ME course**
 - <http://www.symbianresources.com/tutorials/javame.php>

Thank You.

Want to learn more?

www.forum.nokia.com/Develop/Java/