

Nokia 9210i/9290 Communicators and PersonalJava™ Application Development

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1. DIFFERENT JAVA TECHNOLOGIES

The term 'Java™', applies to two related but distinct concepts: a programming language and a runtime environment in which programs written in the Java language can be executed. Java is available in several different forms and versions. (Figure 1. below)

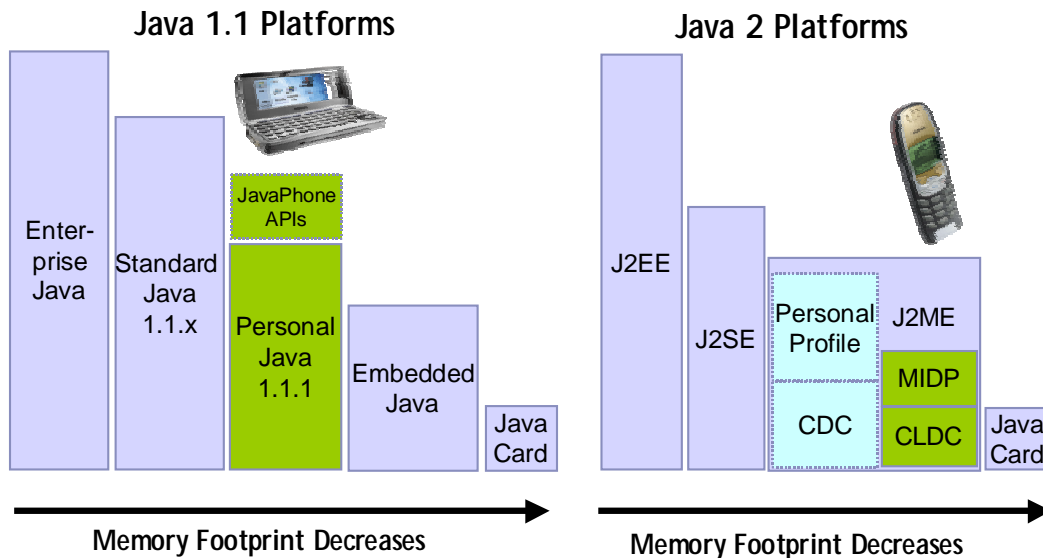


FIGURE 1. Java platforms.

The green boxes (Figure 1, above) demonstrate Java platforms currently supported in Nokia devices. The Nokia 9200 Communicator Series supports PersonalJava™ 1.1.1 with JavaPhone™ API support, and the Nokia 6310i supports the J2ME/MIDP platform.

2. NOKIA 9200 COMMUNICATOR SERIES JAVA IMPLEMENTATION

Java implementation in the Nokia 9200 Communicator Series includes the PersonalJava Application Environment v.1.1.1 and JavaPhone 1.0 APIs. The Nokia 9210 Communicator is Nokia's first Java-capable phone. The new Nokia 9290 and 9210i Communicator versions offer the same Java implementation, allowing the same developer tools to be used.

In writing Java code for the Nokia 9200 Communicator Series, customization is only required for the "look and feel" of the Symbian OS. The implementation for PersonalJava is similar to a standard Java implementation, with additional APIs for the Nokia 9200 UI. For example, there are APIs for handling the Nokia 9200 Communicator Series' command buttons. Currently, the Nokia 9210 Communicator's web browser does not support applets, however an appletviewer application is included.

The JavaPhone API is included in the Nokia 9200 Communicator Series' Java implementation. It is a vertical extension to the PersonalJava platform.

Nokia 9200 Communicator Series supported JavaPhone APIs

- Java Telephony API

- Addressbook API
- Calendar API
- Network Datagram API
- Power Monitor API
- User Profile API

Example applications using JavaPhone APIs are included in the Nokia 9200 Communicator Series SDK for the Symbian Platform.

2.1 Nokia 9200 Series Communicator's MIDP Implementation

Developers can also download the MIDP Software for Nokia 9210/9290 Communicators from Forum Nokia web site. This software provides an environment for J2ME/MIDP applications, i.e. MIDlets to run. Forum Nokia does not offer technical support for this software, providing it for testing purposes only and on "as is" basis.

3. NOKIA 9210i COMMUNICATOR AND NOKIA 9290 COMMUNICATOR

3.1 Nokia 9210i Communicator

The Nokia 9210i Communicator provides email, Internet, video, Sheet, Word Processor, fax and phone and a big, full color display.

Compared to Nokia 9210 Communicator, the new Nokia 9210i Communicator has a faster internal memory and improved web-browser supporting JavaScript™. It supports video and audio streaming, allowing video and audio content to play faster and while loading.

Nokia 9210i Communicator offers mobile multimedia including: video and audio streaming, Macromedia Flash support (animation etc) and a full-color screen.

Because the internal memory is faster and larger, usability is improved. And with PersonalJava files now in the faster memory, the Java application loading/starting times are reduced noticeably.

For downloading Web pages and receiving email, The Nokia 9210i Communicator works at speed up to 43.2 kbps and offers users a great web browsing experience.

3.2 Nokia 9290 Communicator

The Nokia 9290 Communicator is a fully integrated mobile terminal combining phone, fax, e-mail, calendar and imaging functionality. Internet access is possible via both a WAP (Wireless Application Protocol) and a HTML-based WWW browser supporting frames. Additionally, word processing and spreadsheet applications offering support for many of the most used PC applications--including viewing and editing of Microsoft Word and Excel documents and a PowerPoint viewer--are built in to the Nokia 9290 Communicator. Included SyncML support allows for seamless synchronization of contact, calendar and to-do information across SyncML enabled PC's, PDA's, mobile phones and other devices.

4. PERSONALJAVA APPLICATION DEVELOPMENT

4.1 Nokia 9200 Communicator Series SDK for Symbian Platform

Developers can order the SDK from Forum Nokia web site: www.forum.nokia.com

The SDK includes:

- Emulator
- Documentation, examples and tools for development
- Support for native method development using JNI

The SDK does not include:

- Java compiler (no JDK 1.1.8 included, just JRE 1.2.2!)
- IDE

Free JDK 1.1.8 + pJava compatibility classes are available via download from Sun. Also note, that the Nokia 9200 Communicator Series C++ SDK and MS Visual C++ 6 is needed for JNI development.

Whole application development can be accomplished by using the application development tools included in the SDK-- from writing and testing code, to creating and installing the package. Additionally, Nokia offers more sophisticated tools for this purpose that can be integrated to JBuilder 5 and Sun Forte for Java 3 IDEs.

5. NOKIA DEVELOPER'S SUITE FOR PJAE

Nokia Developer's Suite (NDS) for PJAE integrates Borland JBuilder 5 and the Nokia 9200 Communicator Series SDK for Symbian OS. It features services and tools designed for mobile application developers to create and install next generation applications to the Nokia 9200 Communicator Series.

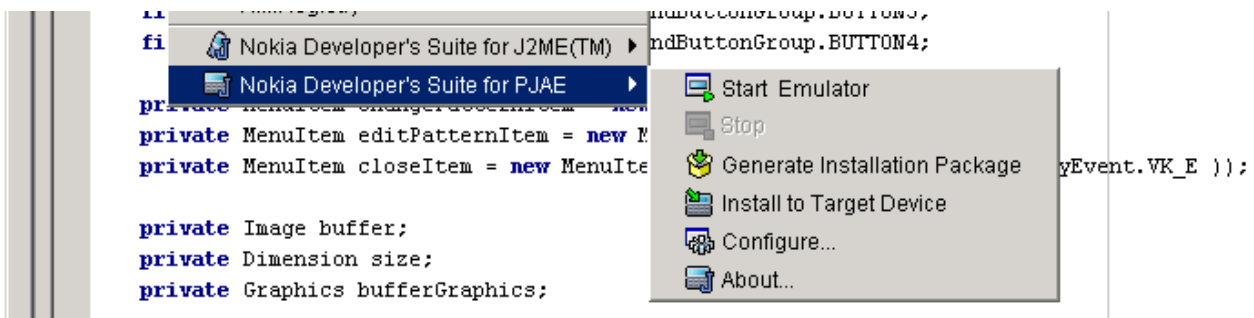


FIGURE 2. Nokia Developer's Suite for PJAE

The NDS for PJAE simplifies Java development and enables mobile application creation for the Nokia 9200 Communicator series by guiding developers through application development, run-

time emulation, and final installation of the application to the target device. This free toolkit, "Nokia Developer's Suite for PJAE," is available at Forum Nokia web site.

6. HOW TO DEVELOP JAVA APPLICATION FOR NOKIA 9200 COMMUNICATOR SERIES

STEP 1. Order the Nokia 9200 Communicator Series SDK from Forum Nokia web site, www.forum.nokia.com, and install it.

STEP 2. Download the JDK1.1.8 from Sun's Java™ web site <http://java.sun.com>.

STEP 3. Download IDE like JBuilder5 or Sun's Forte for Java 3.

STEP 4. Download Nokia Developer's Suite for PJAE from Forum Nokia web site.

Completing Steps 1-4 provides all the tools necessary for PersonalJava application development. Install the SDK, JDK, Java IDE and the NDS for PJAE. Download detailed documents about writing PersonalJava applications with these tools from Forum Nokia web site.

STEP 5. Write your code.

STEP 6. Configure the emulator settings from the NDS for PJAE menus and run your application in the emulator (see the FIGURE 2.).

STEP 7. Make the needed configurations according to the SDK and Forum Nokia documentation and create an installation package for your application.

STEP 8. Install your application in the target device.

7. FORUM NOKIA DEVELOPER SERVICES

Forum Nokia is dedicated web site to developers. You can find there all the tools and resources needed to develop and market applications using technologies supported by Nokia. Registration is free of charge.

- Download documents, toolkits, SDKs
- Discuss technical issues with other developers and Nokia experts
- Test your application by using Nokia OK program
- Utilize Nokia sales channels for your applications

8. LIST OF TERMS AND ABBREVIATIONS

Term or abbreviation	Description
API	Application Programming Interface
Applet	Applets are Java programs that require a browser or appletviewer to run. The <applet> tag is embedded in a Web page and names the program to be run.
CDC	Connected Device Configuration
CLDC	Connected Limited Device Configuration
IDE	Integrated Development Environment
J2ME	Java 2 Micro Edition
Java	The term 'Java' applies to two related but distinct concepts: it describes a programming language and a runtime environment in which programs written in the Java language can be executed.
JNI	Java Native Interface
MIDP	Mobile Information Device Profile
MMC	MultiMediaCard
PersonalJava™	The PersonalJava™ addresses the software needs of networked applications running on personal consumer devices such as set-top boxes and smart phones rather than desktop computers.
PJAE	PersonalJava Application Environment
SDK	Software Developer Kit