

# J2ME CLDC/KVM Palm Release

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*Release Notes / CLDC 1.0*



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# Introduction

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These release notes provide information about Sun's Palm implementation of the *Connected, Limited Device Configuration* (CLDC). The CLDC implementation runs on top of Sun's K Virtual Machine (KVM) that is provided as part of this release.

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## About This Release

This release package is a supplementary, "add-on" release that is intended to complement the *J2ME CLDC Reference Implementation* release package. The *J2ME CLDC Reference Implementation* package is available separately, and it runs on Windows 98/NT (Win32) and Solaris platforms.

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**Note** – This release package is not a complete, standalone package. For instance, even though the source code for the Palm-specific parts of CLDC/KVM is provided as part of this release, you cannot build the Palm CLDC/KVM binaries from the source files provided in this package alone. If you want to build the Palm binaries from source code, please install this package on top of the *J2ME CLDC Reference Implementation*, and follow the instructions provided in that package.

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## About CLDC

CLDC is the result of a Java Community Process effort (JSR-30) whose goal is to define a standard, portable Java™ platform for small, resource-constrained, connected devices. The CLDC specification effort has been done in collaboration with 18 companies representing different industries. Target devices for CLDC are characterized generally as follows:

- 160 to 512 kilobytes of total memory, including both RAM and flash or ROM, available for the Java platform.
- Limited power, often battery powered operation.
- Connectivity to some kind of network, often with a wireless, intermittent connection and with limited (often 9600 bps or less) bandwidth.
- User interfaces with varying degrees of sophistication down to and including none.

Cell phones, two-way pagers, personal digital assistants (PDAs), organizers, home appliances, and point of sale terminals are some, but not all, of the devices that might be supported by CLDC.

Note that CLDC is intended to serve as the lowest common denominator for various kinds of resource-constrained, Java-powered devices. As such, CLDC is not a complete, self-sufficient solution, but it needs to be complemented by *profiles*. For instance, all the user interface aspects are outside the scope of CLDC Specification. A parallel Java Community Process effort (JSR-37) called *Mobile Information Device Profile* (MIDP) is currently underway to define the necessary remaining Java platform features and libraries for a specific vertical market/device category. Other profiles for other vertical markets or device categories may be defined later.

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## Supported Platforms

The *J2ME CLDC Reference Implementation* (available separately) runs on Windows 98/NT (Win32) and Solaris platforms.

A CLDC-compatible port for the Palm Connected Organizer is provided as part of this release package. The Palm release package can be installed on top of *J2ME CLDC Reference Implementation*. The Palm port is not considered to be a reference implementation of the CLDC.

## Installation Notes

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### Unzipping the Distribution

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**Note** – Please keep in mind that this release package is not a standalone release. Rather, it is intended that you install this package on top of the *J2ME CLDC Reference Implementation* package that is available separately.

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Unzip (using the *overwrite* option) the distribution into the same directory in which you have previously unzipped the *J2ME CLDC Reference Implementation*. This will create the directory `j2me_cldc` with the following subdirectories:

- `api`
- `bin`
- `build`
- `docs`
- `jam`
- `kvm`
- `samples`
- `tools`

Please refer to the *KVM Porting Guide*, Sun Microsystems, Inc. for further information on the contents of these directories. The porting guide is provided as part the *J2ME CLDC Reference Implementation* package.

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## Building the Source Release

Refer to instructions provided in the release notes of the *J2ME CLDC Reference Implementation* package on how to build the source code release. In order to build the Palm version of CLDC/KVM, a Metrowerks Codewarrior project file is provided.

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## Running Sample Applications

The directory `samples` contains several demonstration programs that can be run on the Palm platform.

### The Palm-like GUI

The Connected, Limited Device Configuration itself does not define any GUI (graphical user interface) functionality. For testing purposes, this release includes a number of GUI classes that were originally written for the Palm implementation of KVM. These classes can be found in directory `api/classes/com/sun/kjava/`.

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**Note** – The GUI classes provided in package `com.sun.kjava` are *NOT* part of the Connected Limited Device Configuration (CLDC). Official GUI classes for Java 2 Micro Edition will be defined separately through the Java Community Process and included in *J2ME profiles*.

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### Running the demo apps on Palm

If you have installed the additional Palm release package on top of this release, you can run the sample applications on a real Palm device. Demo applications are provided as ‘prc’ (Palm executable) files. Once you have installed the ‘KVM.prc’ and ‘KVMutil.prc’ executables on your Palm device, simply install these application files on your Palm device, and launch them from the Palm application launcher.



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# Building Sample Applications from Source Code

Application development for CLDC usually takes place on a desktop computer. At the high level, the procedure for building Java applications for CLDC is as follows:

1. compile the Java application using a Java compiler (not provided as part of this release.)
2. preverify the Java classfiles with the `preverify` tool provided in the *J2ME CLDC Reference Implementation* package.
3. use the `jar` tool to create a JAR file that contains all the Java classes belonging to your application (the `jar` tool is not provided as part of this release.)
4. use the `MakePalmApp` tool to convert the Java classfiles or a JAR file into a 'prc' (Palm executable) file (if you intend to run your application on the Palm platform.)

Sample command line operations:

- Compilation:

```
javac -g:none -d tmp -classpath tmp:../lib/classes
-bootclasspath ../lib/classes src/Pong.java src/PongBall.java
```

- Preverification:

```
../bin/preverify -d classes -classpath ../lib/classes tmp
```

- JAR creation:

```
jar cvf Pong.jar Pong.class PongBall.class ...more classes...
```

- Building a Palm executable:

```
java -classpath ../lib/classes palm.database.MakePalmApp -v
-version "1.0" -icon icons/pong.bmp -bootclasspath
../lib/classes -classpath classes Pong
```

Refer to `docs/tools.html` for further instructions on how to build the sample applications.

## Quality Assurance

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### Testing

JCK compatibility tests version 1.3, Tonga regression and stress tests and CLDC 1.0 TCK compatibility tests have been run on a regular basis on emulators and on the following platforms:

- Palm IIIx
- Palm V
- Palm VII

The Palm implementation passes all the 4357 test cases included in CLDC TCK 1.0. The TCK compatibility toolkit performs comprehensive regression testing of various Java language, virtual machine and library features supported by CLDC.

Components that are outside the scope of CLDC (e.g., packages `com.sun.kjava` and `com.sun.cldc.io`) have not undergone similar regression tests. Various demo programs have been used for testing those components.

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**Note** – The Palm release includes support for wireless HTTP access for Palm VII. Wireless HTTP support is known to work only under PalmOS version 3.2 on Palm VII.

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## Known Bugs

A number of bugs have been dispatched for re-engineering but remain open at the time of this release. For a definitive reference on open bugs and feature requests, log in to the Java Developer Connection (JDC) web site:

<http://developer.java.sun.com/developer/>.

Bugs related to the K Virtual Machine and CLDC can be found in:

<http://developer.java.sun.com/developer/bugParade/index.jshtml>,  
under the bug category “K Virtual Machine”.