

Java Technology for the Wireless Industry

Version 0.2, Draft



INFORMATION GUIDE

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About This Document

This document is a technical overview of Java Technology for the Wireless Industry (JTWI or JSR 185) specifications.

Scope:

This document is for novice users who want to know about the JTWI specifications.

Document History:

Date	Version	Comment
04/02/09	0.2	Draft

References:

1. About JTWI:

<http://developers.sun.com/mobility/midp/articles/jtwi/>

Abbreviations:

JTWI	Java Technology for Wireless Industry
CLDC	Connected Limited Device Configuration
MIDP	Mobile Information Device Profile
JSR	Java Specification Request
WMA	Wireless Messaging API
MMAPI	Mobile Media API
JAD	Java Application Descriptor
JAR	Java Archive
Java ME	Java Micro Edition
RMS	Record Management System

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Introduction

In the recent years, the key focus is on emerging Java ME technologies. Java ME is successful in the Wireless Industry. Many Java Specification Requests (JSRs) support these innovative technologies. Among them JSR 185 is the basic JSR for next generation of Wireless Java technology.

Overview

The Java Technology for the Wireless Industry (JTWI) specification, JSR 185, defines the industry-standard platform for the next generation of Java technology-enabled mobile phones. JTWI is defined through the Java Community Process (JCP) by an Expert Group (EG) of leading mobile device manufacturers, wireless carriers, and software vendors.

Goals and characteristics of JTWI

The goal of JTWI specification is to improve the compatibility, interoperability, and completeness of Java ME technology implementations in mobile phones. The specification specifies a set of component specifications that must or should be implemented by compliant devices. The specification mandates some of the optional sections of the component specifications to improve compatibility. The specification clarifies some portions of the component specifications.

Requirements:

In this JSR, there are three types of categories. They are:

1. Mandatory Specifications
2. Conditionally Required Specification
3. Minimum Configuration on which JTWI is built

Mandatory Specifications:

Here there are two JSRs. They are:

- Mobile Information Device Profile 2.0 (JSR-118)
- Wireless Messaging API 1.1 (JSR-120)

Conditionally Required Specification:

Mobile Media API 1.1 (JSR-135)

Minimum Configuration on which JTWI is built:

Connected Limited Device Configuration 1.0 (JSR-30)

The JSR 185 application environment is based on the following specifications:

Table 1: JTWI Specification

Specification	Required	Description
CLDC 1.0 (JSR 30)	Mandatory	The Connected, Limited Device Configuration provides basic language, networking, and utility APIs. CLDC 1.1 may be used instead.
MIDP 2.0 (JSR 118)	Mandatory	Version 2.0 of the Mobile Information Device Profile includes APIs for application life cycle, user interface, persistent storage, gaming, and multimedia.
WMA 1.1 (JSR 120)	Mandatory	The Wireless Messaging API is an optional package that provides access to wireless text messaging capabilities (usually SMS) from Java applications.
MM API 1.1 (JSR 135)	Optional	The Mobile Media API is a flexible and powerful set of APIs for rendering and recording media data. Possible features include audio and video playback and capture.

The following table shows the minimum requirements of JTWI specification:

Table 2: Minimum Requirements of JTWI

Resource	Minimum Requirements
Screen Width	125 pixels
Screen Height	125 pixels
Color depth	12 bit
Pixel aspect ratio	1:1
Volatile memory for runtime	256 KB
JAR size	64 KB (at least upto this size)
JAD size	5 KB (at least upto this size)
RMS data size	30 KB (at least upto this size)
Minimum application Thread Count	10
Minimum clock resolution	40ms (the least difference between two calls 80% of the time)
Record Stores	5 (at least)
Media Content Types	Hypertext Transfer Protocol (HTTP) 1.1
Image Formats	ISO/IEC JPEG or JFIF must be supported to be JTWI compliant. PNG must be supported to be MIDP 2.0 compliant
User Interface	Selection of phone numbers from a phone book for the TextField.PHONENUMBER
Timers	Timers 5 (at least)
Heap	256 KB

Preferred MIME names:

Implementations must support at least the preferred Multi purpose Internet Mail Extension (MIME) names as defined by Internet Assigned Number Authority (IANA) for the supported character encodings. Some examples are:

- United State American Standard Code for Information Interchange (US-ASCII)
- International Organization for Standardization 646 (ISO-646)
- Unicode Transformation Format 16 (UTF-16)

Compliant implementations must provide support at least “Basic Latin” and “Latin-1 Supplement” encoding. Other encodings may be supported optionally.

Table 3: Content Type

Content Type	MIME Name
JAR file	application/java-archive
JAD file	text/vnd.sun.j2me.app-descriptor
MIDI file	audio/midi
Tone Sequence	audio/x-tone-seq
MP3	audio/x-mpeg
AU	audio/basic
PNG	image/png
JPEG	image/jpeg
MPEG	video/mpeg
WML	text/vnd.wap.wml

JSR 185 includes the following CLDC-related clarifications:

- Support a minimum of 10 application-created threads.
- Minimum clock resolution: JSR 185-compliant implementations must record the elapsed time in increments not to exceed 40 milliseconds.
- Permit the use of custom time zones that adhere to the Greenwich Mean Time (GMT) time zone format.
- Support character properties and case conversions for characters in the Basic Latin and Latin-1 Supplement blocks of Unicode 3.0.

JSR 185 includes the following MIDP related clarifications:

- Should allow MIDlet Java Archive (JAR) files of up to 64 KB, with Java Application Descriptor (JAD) files up to 5 KB. Each MIDlet suite should be allowed to use up to 30 KB of Persistent storage, while correctly formed MIDlet suites should include an indication of the minimum amount of persistent storage needed to function.
- Heap (the amount of memory that is available to a running application) should be at least 256 KB.
- Should support screen sizes of 125x125 pixels with 12-bit color depth.
- Should provide mandatory support for ticklers, for example, the ability to wake MIDlets up at specific times.
- Support mechanisms for selecting a phone number from the device phone book.

- Support Joint Photographic Expert Group (JPEG) and Portable Networks Graphics (PNG) image file formats.
- Media content types must be accessible using the Hypertext Transfer Protocol (HTTP) 1.1 protocol.

The JSR 185 specification includes the following WMA-related clarifications:

- Devices on Global System for Mobile Communication (GSM) / Universal Mobile Telephone System (UMTS) networks must make Short Message Service (SMS) text messaging available via WMA.
- Support for SMS Push, which is the ability of the device to launch a MIDlet in response to an incoming SMS message.
- Access to GSM Cell Broadcast via Java APIs must follow the WMA 1.1 specification.

The JSR 185 specification introduces the following MMAPI-related clarifications:

- Support both Musical Instrument Digital Interface (MIDI) content and tone sequence content. MIDI support makes powerful and rich audio capabilities available to developers, using relatively small files.
- Support HTTP 1.1 for media file download in all supported media formats.
- Support 8-bit, 8-kHz mono Pulse Code Modulation (PCM) WAV format for audio capture and JPEG for video snapshots.

Devices are free to support other formats as appropriate, but the required formats give developers a baseline of expected behavior.

Security Policy

The JSR 185 specification introduces a number of clarifications for untrusted applications with regard to the "Recommended Security Policy for GSM/UMTS-Compliant Devices" defined in the MIDP 2.0 specification. It extends the base MIDlet suite security framework defined in MIDP 2.0, and defines the following areas:

- Required trust model for GSM/UMTS compliant devices.
- Capabilities of MIDlets based on permissions defined by the MIDP 2.0 and other JCP specifications.
- Utilization of user permission types.

- Guidelines on user prompts and notifications.

