

# Mobile Media Framework for Mobile Devices

*IBM's Mobile Media API (JSR-135)*

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## Introduction

The mobile phone market has traditionally targeted voice services. With the advancement of the capabilities and infrastructure for these devices, new mobile services and devices have emerged. Many new services involve multimedia, including images, video, audio, and 3D graphics. These new devices and capabilities are expected to provide new revenue streams for mobile operators.

In order to provide mobile media services, the device and infrastructure must be capable of supporting the advanced features. The device should be able to play—and perhaps capture—both video and audio. Additionally, the infrastructure must be able to transfer the relatively large amount of data required for multimedia services.

Furthermore, specific middleware needs to be developed in order to offer a complete and adequate end-to-end solution for the mobile operator's needs. This middleware should incorporate control, billing information, security, and content protection. With the wide variety of emerging devices, along with their different operating systems and capabilities, the deployment of these services becomes more and more complex while increasing development costs.

"The technical diversity of mobile devices will make Java (particularly J2ME) a preferred client-side technology"

- Theresa Lanowitz,  
"2003 Wireless Access, Mobile Business Solution Conference"  
Gartner Group,  
Feb 2003

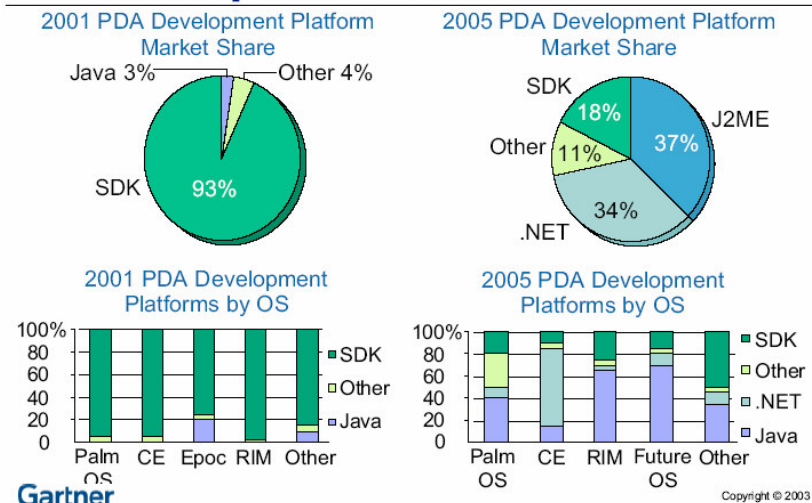
Take, for example, a mobile operator who wants to introduce a media download service. This service would enable mobile device users to enter a query for their favorite music and play it on the device, either by download or by streaming. This service necessitates the development of an application that will authenticate the user, ensure that the service is available, send the query to the server, generate billing data, and play the returned streamed media. Developing this kind of application for a specific

device and platform means the mobile operator cannot accommodate new devices without first investing in further development efforts.

## Java 2 Micro Edition

Java 2 Micro Edition (J2ME™) is a cross-platform language and a cross-platform mobile environment. The J2ME Mobile Information Device Profile (MIDP) has penetrated the mobile phone and PDA markets and is currently recognized as a reliable development platform. According to Gartner<sup>1</sup>, by 2005, 68 % of wireless phones will be Java-enabled, and J2ME will become the dominant development technology for handheld computers (Figure 1).

### PDA Software Development Platforms



**Figure 1 - PDA Software Development Platforms**

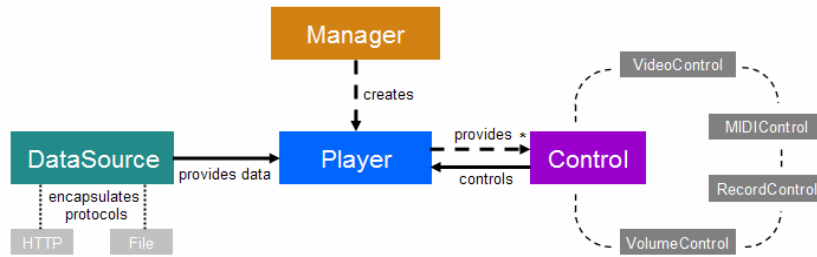
<sup>1</sup> "Mobile Application Development I: The Play for J2ME and Java", Gartner Group's 2003 Wireless Access, Mobile Business Solutions Conference.

MIDP has greatly facilitated the development of solutions and services and has enabled cross-platform deployment for these developments. However, MIDP does not encompass the area of multimedia applications. When it comes to multimedia, developers still need to use proprietary solutions, which inevitably result in device-specific solutions. This gap has been thwarting the deployment of Java-based multimedia services and has generated a diverse collection of nonstandard solutions.

### Mobile Media API (JSR-135)

In order to address the lack of multimedia support in J2ME, a Java Specification Request (JSR) was initiated. A JSR is the process in which companies can participate in the definition of new specifications for Java. Once a JSR is established, an Expert Group is formed to define its specification. Mobile Media API (MMAPI) is a result of the work done in JSR-135 to address multimedia in J2ME. The Expert Group comprises leading companies such as Nokia, NTT DoCoMo, Philips, Symbian, Motorola, Siemens, Sun, and more. Using MMAPI, J2ME developers can include multimedia capabilities in their applications, without worrying about the underlying hardware or software. MMAPI brings new cross-platform capabilities, previously available only on desktops, to the pervasive arena.

MMAPI includes a factory mechanism (*Manager*) for creating *Players*. The *Player* gets its data from a *DataSource*, which encapsulates the origin of the data. This enables developers to seamlessly add new protocols and sources to applications. A *Player* exposes *Controls*, which can be used by the application to set and get various parameters. For example, a *Player* can expose a *VolumeControl* to set the volume or to mute the audio. Figure 2 illustrates the relationship between the various Java interfaces and the MMAPI classes.



**Figure 2 - MMAPI Architecture**

## Mobile Media Framework

IBM has developed a leading edge mobile media framework for mobile devices. The framework enables developers to easily create and deploy multimedia applications. The framework is based on Java technology and can be quickly accommodated on different mobile devices. It uses an innovative media component architecture that enables support for any media type, format, or protocol. The framework also enables developers to use a common and standard API to develop specific applications. The exposed API is an implementation of the standard MMAPI specifications.

## IBM's Mobile Media API

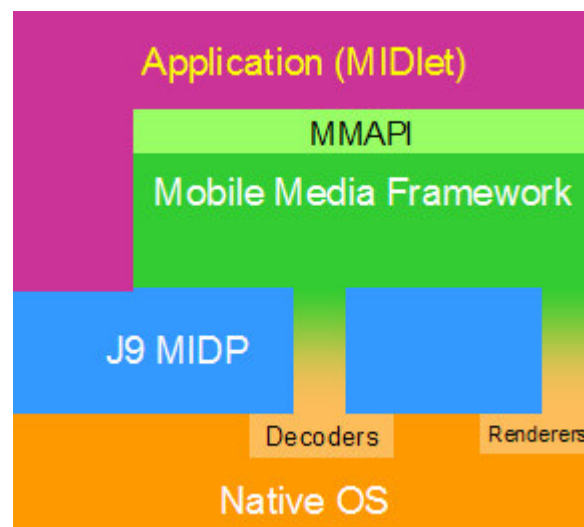
The IBM MMAPI leverages the underlying Mobile Media Framework to enable seamless integration of CODECs (MPEG-4, H.264, MP3, AAC, AMR, etc.) either in software or in hardware.

This powerful solution leverages hardware acceleration, where available, and makes use of Java/native components to reduce device costs. Because the Mobile Media Framework is a pure Java implementation, it significantly reduces the costs involved in making MMAPI available for different platforms. The IBM MMAPI provides excellent multimedia performance in-line with other native based solutions, while providing key cross-platform benefits.

The MMAPI offering will be part of the IBM Workplace Client Technology, Micro Edition 5.7, scheduled for release in the summer of 2004. This integrated offering includes both WebSphere® Studio Device Developer and WebSphere Everyplace Micro Environment, which represent a platform and tools for building, deploying, testing, and maintaining MIDP applications on small devices.

- WebSphere Studio Device Developer is an integrated development environment (IDE). It provides tools that allow Java developers to create, test, and deploy MIDP applications to small devices.
- WebSphere Everyplace Micro Environment, also referred to as J9, is IBM's J2ME runtime environment that combines the power of WebSphere with the convenience of devices.

Figure 3 illustrates the architecture and benefits of the IBM MMAPI offering.



**Figure 3 - Mobile Media Framework**

IBM's MMAPI enables mobile operators to guarantee a robust multimedia solution based on Java and standard APIs. Operators can develop Java-based media services and ease the deployment of these services. The ability of the framework to accommodate new media formats and CODECs reduces its dependency on specific formats. Mobile operators can keep using their existing media

formats while progressing to MMAPI-based solutions. MMAPI can be used for almost any format, whether standard or proprietary, giving maximum flexibility to mobile operators.

## Features

- Pluggable architecture: Can support any file format, CODEC, or protocol
- Local playback and streaming support
- Can leverage platform CODECs (hardware or software)
- Performance: Up to 30FPS video playback
- Existing file formats: MP4, 3GPP
- Existing CODECs: MPEG-4 video, H.263, MPEG-1 Layer 3 (MP3)
- Streaming: HTTP, RTSP/RTP

## Contact Information

For more information on the IBM MMAPI offering, please contact your local IBM sales representative or visit our Website at:  
[www.ibm.com/pervasive](http://www.ibm.com/pervasive)



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