



JSR 135: Mobile Media API (MMAPI)

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Chapter 1. JSR 135: Mobile Media API (MMAPI)

What is MMAPI?

The Mobile Media API is a Java™ specification that defines the APIs that must be implemented on J2ME™ mobile devices so that applications can include multimedia capabilities independent of the OS or hardware of the device. In short, the MMAPI library allows Java access to multimedia capabilities on J2ME mobile devices.

MMAPI - The WCTME Implementation

The MMAPI Extension Library augments the MIDP 2.0 J9 Runtime, enabling multimedia capabilities to applications running in the **Workplace Client Technology, Micro Edition J9 Runtime Environment**. Also, application developers can use **WebSphere Studio Device Developer (WSDD)** to develop and test their MMAPI applications in a simulated environment.

MMAPI is included as a feature of WSDD. The feature will contain the following:

- **MMAPI.jar** contains the classes for all the platforms except Palm OS
- **MPEG4VideoDecoder.dll**, **MP3AudioDecoder.dll**, and **AudioRenderer.dll** are used on all the platforms except Palm OS
- **VideoRenderer.dll** is used on Windows Mobile 2003 based devices
- For Palm, native code is compiled as part of the VM and is located in **J9JavaVMMidp20.prc**. MMAPI Java classes are located in **MMAPI.prc**.

Note: A sample MIDlet (including source code) is also provided. This MIDlet is a simple media player built using MMAPI.

Supported platforms:

- Windows/x86
- Palm OS 5.2/ARM (palmOne Tungsten T3 and palmOne Tungsten C)
- Windows Mobile 2003, XScale

Supported media types:

- M4V (MPEG-4 video Simple Profile elementary stream)
- MP3 (MPEG-1 layer 3 audio)
- MP4 (containing M4V and MP3)

Supported streaming playback:

Note: Streaming playback means that media can be played while it is also being downloaded.

- **HTTP streaming** - supported for M4V, MP3, and short MP4 files.

Note: To use **HTTP streaming**, the media must be placed on a standard HTTP server and MMAPI should use an HTTP URL pointing to the media file.

Example: <http://www.myserver.com/media/mymedia.mp3>

- **RTP streaming via HTTP tunneling**- supported for MP4.

Note: **RTP streaming** is supported by using **VideoCharger from IBM®** as the streaming server and MMAPI should use an HTTP URL pointing to the media asset.

Example: <http://www.myserver.com:10578/mymedia> where *10578* is a dedicated port number and **mymedia** is the name of the asset that points to a hinted MP4 file.

Supported controls:

- VolumeControl
- VideoControl

Dependencies:

- The JSR-135 MMAPI Extension Library is dependent upon a **J9 MIDP 2.0 implementation** supporting the extension mechanism
- The specification and implementation classes are compiled against a **J9 CLDC 1.1 Runtime Environment**.
- The MMAPI implementation is known to work using a dynamic heap of 4096 KB. Using a device or simulator with a dynamic heap of less than 4096 KB than may not work.
- JSR-75 File Connector implementation

Palm OS Targets

Palm OS 5 devices

The MMAPI implementation has been tested for Palm OS 5.2 using the following criteria:

Category	Supported
Device	palmOne Tungsten C, T3* Note: * Although other Palm OS 5 devices may work, they have not been tested. Note: A critical factor affecting the viability of a device is the amount of available dynamic heap. The MMAPI sample application is known to run with 4 MB of available dynamic heap.
Operating System	Palm OS 5.2
File Formats	MP3, MP4
CODECs	MPEG-4 Video (Simple Profile), H.263, MP3
Streaming	HTTP, RTP via HTTP Tunneling
Local Media	Local media files can be played using an SD card. The media file must be copied to an SD card using an appropriate card reader and then inserted into the device.
Streaming Media	Streaming media can also be played on a device with network connectivity. Streaming media has been tested on palmOne's Tungsten C over Wi-Fi.

Installing MMAPI

The following procedures instruct you how to install MMAPI on:

- Windows Mobile 2003
- Windows
- palmOne Tungsten C/T3

Windows Mobile 2003

1. Create the MMAPI directory in the device's root directory.
2. Copy **MMAPIPlayer.jar** and **MMAPIPlayer.jad** to this directory.
- 3.
- 4.

5.

Note: GAPI (GameAPI) is a required component for MMAPI. If your device does not include GAPI, you can obtain a copy of the runtime from the Microsoft web site (<http://www.microsoft.com/downloads/details.aspx?FamilyID=d9879b0e-4ef1-4049-9c61-e758933d84c4&DisplayLang=en>)

Windows

Use the sample MMAPIMIDLet and run it within WSDD.

palmOne Tungsten C/T3

1. Install the following PRCs files on your device:
 - <WSDD install directory>\wsdd5.0\ive-2.2\ruintimes\palmos50\arm\midp20\prc-mmapi\MMAPI.prc
 - <WSDD install directory>\wsdd5.0\ive-2.2\ruintimes\palmos50\arm\midp20\prc-mmapi\J9JavaVMMidp20.prc
 - <WSDD install directory>\wsdd5.0\ive-2.2\ruintimes\palmos50\arm\midp20\prc\fileconnect.prc
2. After the install is finished install <WSDD install directory>\wsdd5.0\ive-2.2\ruintimes\palmos50\arm\midp20\prc-mmapi\PalmMidp20_22.prc separately.
3. Open the Pref application on the Palm.
4. Scroll down to the "Other" section and click "IBM Java VM".
5. Scroll down and change "Memory Maximum" to at least 4MB and "Stack Size" to at least 4KB.

MMAPI Example Screen Reference

Execute the MMAPIPlayer.

The following table shows the functions you can access through the user interface:

Note: On a Palm device, click "..." for more commands.

If you want...	Then do this...
To play a media file	<ol style="list-style-type: none">1. Enter the URL in "Enter media URL (file or http):".2. Press "Play".
To restart from the beginning	Press "Replay".
To pause	Press "Pause". Note: Press "Play" or "Replay" to continue.
To play another media file	<ol style="list-style-type: none">1. Press "Close"2. Enter a new URL.3. Press "Play".
To play the media infinitely	Press "Close" and then press "Loop".
To "seek"	Press "Actions" to reach the audio related controls (volume and seek): <ul style="list-style-type: none">• Use "Xsec->" to move X seconds forward.• Use "<-Xsec" to move X seconds backward.
To mute playback	Pressing "Mute" will mute the audio device. Note: Any changes to the volume level will not unmute the sound. Press "Unmute" to unmute the sound.

If you want...	Then do this...
To play a song you played previously	Press " Go " to access your Play History and get the URL for a previously played song. Note: Each successfully played URL is added to a history file, which is loaded when the application launches. Pressing one of these URLs only updates the media URL info. To play it, you must press " Play " (or, if you are already playing another media file, press " Close ", and then " Play ".)

Note: In the case of MP3 file playback, MMAPI displays the current media time.

Creating media files for MMAPI

To use the MMAPI implementation, media files must be formatted and encoded correctly:

Creating MP3 files

You can create MP3 files with tools such as **AVOne** or **WAV to MP3**.

Creating MP4 files

In order to create MP4 files, 3rd party tools need to be used. It is noted that the MMAPI supports MP4 files containing only MP3 as the audio track (and not AAC).

Therefore, to create sample MP4 files, we followed these steps:

1. Convert the **MPEG-1** or **AVI** file to an uncompressed **AVI** using **VirtualDub**.
 Note: Choose **RGB** and **video format** when prompted.
2. Use an **AVI to YUV** utility.
3. Use a third party **MPEG-4** video encoder to generate an **MPEG-4** elementary stream.
4. Use an **AVI to YUV** utility.
5. Convert the original **AVI** or **MPEG** into **MP3**.
6. Use the the IBM MPEG-4 toolkit from **alphaWorks** to combine the **MPEG-4** video and the MP3 audio into an **MP4** file.

Using WebSphere Everyplace Technology Libraries

WSDD includes WebSphere Everyplace Technology Libraries that can be used with your Java class libraries. This section describes how the libraries are integrated with the tools.

Follow these steps to create a new project and add a new J2ME project with the WebSphere Technology Library **MMAPI**.

1. Click **File | New | Project** to open the **New Project Wizard** in workbench toolbar.
2. In the left pane, select **J2ME**. In the right pane, select, **J2ME Project**. Then click **Next**.
3. Enter the following name for the new project: **My WTL Project**
4. Click **Next**.
5. Select the primary feature library configuration, for example **JCL MIDP 2.0**, then click **Next**.
6. Select the **Libraries** tab.
7. Click **Add Library** (on the right), then WebSphere Everyplace Technology Library, then **Next**.

8. Select the WTL library that you would like to incorporate in your project, for example **WTL MMAPI**, then click **Finish**.

Note: MMAPI also requires WTL PDAP-FC

9. Click **Finish**, to create the J2ME project with the additional WTL library.
10. In the workbench, expand the + sign to the left of **My WTL Project**. Notice that the additional **WTL MMAPI** library has been added.

Chapter 2. Additional Information

Further Information

If you need more information or have questions about our implementation of this JSR:

In the United States and Canada, call 1-800-IBM-CALL (1-800-426-2255)

In all other countries, you can submit your questions on the web at:
<http://www.ibm.com/software/pervasive/support/questions.shtml>

You might also find helpful information at the following websites:

<http://www.ibm.com/software/data/videocharger/>

You can get **VirtualDub** from: <http://www.virtualdub.org/>

You can get the IBM MPEG-4 toolkit from **alphaWorks** from:
<http://www.alphaworks.ibm.com/tech/tk4mpeg4>

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