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MIME Type Registration for MPEG-4

Status of This Memo

This document specifies an Internet standards track protocol for the Internet community, and requests discussion and suggestions for improvements. Please refer to the current edition of the "Internet Official Protocol Standards" (STD 1) for the standardization state and status of this protocol. Distribution of this memo is unlimited.

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Abstract

This document defines the standard MIME types associated with MP4 files. It also recommends use of registered MIME types according to the type of contents.

Table of Contents

1. Introduction	2
2. Selection of MIME Types for MP4 Files	3
3. IANA Considerations	3
3.1. MP4 File	4
3.2. MP4 File with Audio but without Visual Presentation	5
3.3. MP4 File with MPEG-4 System Stream and neither Visual nor Audio Presentation	6
3.4. Initial Object Descriptor (IOD) in Binary Format	7
3.5. Initial Object Descriptor (IOD) in Textual Format	8
4. Security Considerations	9
5. Acknowledgements	9
6. Normative References	9

1. Introduction

This document describes a standard definition of MIME types associated with MP4 files and the guidelines for using them.

MPEG-4 (ISO/IEC 14496) is a standard designed for the representation and delivery of multimedia information over a variety of transport protocols [1]. It includes interactive scene management and visual and audio representations, as well as system functionality like multiplexing, synchronization, and an object descriptor framework [2].

The historical approach for MPEG data has been to declare it under "video", and this approach is followed for ISO/IEC 14496. In addition, some MIME types are defined under "audio" and "application" for the streams not containing visual presentation.

Amendment 1 of the ISO/IEC 14496 standard (also known as version 2) introduced a standard file type, called MP4 files, for encapsulating ISO/IEC 14496 data. This is now separately specified as the MP4 file format [4], which in turn is based on the ISO base media file format [3]. A separate specification [5] covers the storage of Advanced Video Coding (AVC) (also known as H.264) [6] material in files based on the ISO base media file format. The MP4 file type can be used in a number of ways; perhaps the most important of these is its use as an interchange format for ISO/IEC 14496 data, as a content-download format, and as the format read by streaming media servers.

These first two uses will be greatly facilitated if there is a standard MIME type for serving these files (e.g., over HTTP).

The ISO/IEC 14496 standard is broad, and therefore the type of data that may be in such a file can vary. In brief, simple compressed video and audio (using a number of different compression algorithms) can be included; interactive scene information; meta-data about the presentation; references to ISO/IEC 14496 media streams outside the file and so on. Different top-level MIME types are used to identify the type of the contents in the file.

2. Selection of MIME Types for MP4 Files

The MIME types to be assigned to MP4 files are selected according to the contents. Basic guidelines for selecting MIME types are as follows:

- a) if the file contains neither visual nor audio presentations, but only, for example, MPEG-J or MPEG-7, use application/mp4;
- b) for all other files, including those that have MPEG-J, etc., in addition to video or audio streams, video/mp4 should be used; however:
- c) for files with audio but no visual aspect, including those that have MPEG-J, etc., in addition to audio streams, audio/mp4 may be used.

In any case, these indicate files conforming to the "MP4" specification, ISO/IEC 14496-1:2000, systems file format.

3. IANA Considerations

This section describes the MIME types and names to be used with various MPEG-4 contents. Sections from 4.1 to 4.5 register five new MIME types with the IANA.

3.1. MP4 File

MIME media type name: video

MIME subtype name: mp4

Required parameters: none

Optional parameters: none

Encoding considerations: base64 IS generally preferred; files are binary and should be transmitted without CR/LF conversion, 7-bit stripping, etc.

Security considerations: See section 5 of RFC 4337.

Interoperability considerations: A number of interoperating implementations exist within the ISO/IEC 14496 community, and that community has reference software for reading and writing the file format.

Published specification: ISO/IEC 14496-1:2001.

Applications: Multimedia

Additional information:

 Magic number(s): none

 File extension(s): mp4 and mpg4 are both declared at
 <<http://pitch.nist.gov/nics/>>.

 Macintosh File Type Code(s): mpg4 is registered with Apple.

Person to contact for info: David Singer, singer@apple.com

Intended usage: Common

Author/Change controller: David Singer, ISO/IEC 14496 file format chair

3.2. MP4 File with Audio but without Visual Presentation

MIME media type name: audio

MIME subtype name: mp4

Required parameters: none

Optional parameters: none

Encoding considerations: base64 IS generally preferred; files are binary and should be transmitted without CR/LF conversion, 7-bit stripping, etc.

Security considerations: See section 5 of RFC 4337.

Interoperability considerations: A number of interoperating implementations exist within the ISO/IEC 14496 community, and that community has reference software for reading and writing the file format.

Published specification: ISO/IEC 14496-1:2001.

Applications: Multimedia

Additional information:

Magic number(s): none

File extension(s): mp4 and mpg4 are both declared at
<<http://pitch.nist.gov/nics/>>.

Macintosh File Type Code(s): mpg4 is registered with Apple.

Person to contact for info: David Singer, singer@apple.com

Intended usage: Common

Author/Change controller: David Singer, ISO/IEC 14496 file format chair.

3.3. MP4 File with MPEG-4 System Stream and neither Visual nor Audio Presentation

MIME media type name: application

MIME subtype name: mp4

Required parameters: none

Optional parameters: none

Encoding considerations: base64 IS generally preferred; files are binary and should be transmitted without CR/LF conversion, 7-bit stripping, etc.

Security considerations: See section 5 of RFC 4337.

Interoperability considerations: A number of interoperating implementations exist within the ISO/IEC 14496 community, and that community has reference software for reading and writing the file format.

Published specification: ISO/IEC 14496-1:2001.

Applications: Multimedia

Additional information:

Magic number(s): none

File extension(s): mp4 and mpg4 are both declared at
<<http://pitch.nist.gov/nics/>>.

Macintosh File Type Code(s): mpg4 is registered with Apple.

Person to contact for info: David Singer, singer@apple.com

Intended usage: Common

Author/Change controller: David Singer, ISO/IEC 14496 file format chair

3.4. Initial Object Descriptor (IOD) in Binary Format

MIME media type name: application

MIME subtype name: mpeg4-iod

Required parameters: none

Optional parameters: none

Encoding considerations: base64 is generally preferred; files are binary and should be transmitted without CR/LF conversion, 7-bit stripping, etc.

Security considerations: See section 5 of RFC 4337.

Interoperability considerations: A number of interoperating implementations exist within the ISO/IEC 14496 community, and that community has reference software for reading and writing the file format.

Published specification: ISO/IEC 14496-1:2001

Applications: Multimedia

Additional information:

Magic number(s): none

File extension(s): none mp4 and mpg4 are both declared at
<<http://pitch.nist.gov/nics/>>.

Macintosh File Type Code(s): mpg4 is registered with Apple.

Person to contact for info: David Singer, singer@apple.com

Intended usage: Common

Author/Change controller: David Singer, ISO/IEC 14496 file format chair

3.5. Initial Object Descriptor (IOD) in Textual Format

MIME media type name: application

MIME subtype name: mpeg4-iod-xmt

Required parameters: none

Optional parameters: none

Encoding considerations: none

Security considerations: See section 5 of RFC 4337.

Interoperability considerations: A number of interoperating implementations exist within the ISO/IEC 14496 community, and that community has reference software for reading and writing the file format.

Published specification: ISO/IEC 14496-1:2001 AMD2.

Applications: Multimedia

Additional information:

 Magic number(s): none

 File extension(s): mp4 and mpg4 are both declared at
 <<http://pitch.nist.gov/nics/>>.

 Macintosh File Type Code(s): mpg4 is registered with Apple.

Person to contact for info: David Singer, singer@apple.com

Intended usage: Common

Author/Change controller: David Singer, ISO/IEC 14496 file format chair

4. Security Considerations

It is possible to inject non-compliant MPEG streams (Audio, Video, and Systems) in the MP4 file to overload the receiver/decoder's buffers. This might compromise the functionality of the receiver or even crash it. This is especially true for end-to-end systems like MPEG, where the buffer models are precisely defined.

An MP4 file supports the storage of stream types, including commands that are executed on the terminal such as OD command and BIFS commands, and programmatic content such as MPEG-J (Java(TM) Byte Code) and ECMAScript. It is possible to use one or more of the above in a manner non-compliant to MPEG to crash the receiver or temporarily make it unavailable.

Authentication mechanisms can be used to validate of the sender and the data to prevent security problems due to non-compliant malignant MP4 files.

A security model is defined in ISO/IEC 14496 Systems MP4 files containing MPEG-J contents that comprises Java(TM) classes and objects. MPEG-J defines a set of Java(TM) APIs and a secure execution model. MPEG-J content can call this set of APIs and Java(TM) methods from a set of Java packages supported in the receiver within the defined security model. According to this security model, downloaded byte code is forbidden to load libraries, to define native methods, to start programs, to read or write files, or to read system properties.

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6. Normative References

- [1] Schulzrinne, H., Casner, S., Frederick, R., and V. Jacobson, "RTP: A Transport Protocol for Real-Time Applications", STD 64, RFC 3550, July 2003.
- [2] ISO/IEC 14496-1 "Information technology - Coding of audio-visual objects - Part 1 : Systems", 3rd ed. 2004.

- [3] ISO/IEC 14496-12 "Information technology - Coding of audio-visual objects - Part 12 : ISO Base Media File Format", December 2003.
- [4] ISO/IEC 14496-14 "Information technology - Coding of audio-visual objects - Part 14 : MP4 File Format", January 2004.
- [5] ISO/IEC 14496-15 "Information technology - Coding of audio-visual objects - Part 15 : AVC File Format", 2004.
- [6] ISO/IEC 14496-10:2004 "Information technology -- Coding of audio-visual objects -- Part 10: Advanced Video Coding", 2nd edition, 2004.

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