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MIME Content Type for BinHex encoded files

1. Status of this Memo

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This specification is intended as an Informational document for transmission of files with the use of Macintosh specific encoding using BinHex4.0. For maximal interoperability, it is recommended that MIME-based **application/applefile** be used instead.

2. Abstract

This memo describes the format to use when sending BinHex4.0 files via MIME [BORE93]. The format is compatible with existing mechanisms for distributing Macintosh files. Only when available software and/or user practice dictates, should this method be employed. It is recommended to use **application/applefile** for maximum interoperability.

3. Introduction

Files on the Macintosh consists of two parts, called forks:

DATA FORK: The actual data included in the file. The Data fork is typically the only meaningful part of a Macintosh file on a non-Macintosh computer system. For example, if a Macintosh user wants to send a file of data to a user on an IBM-PC, she would only send the Data fork.

RESOURCE FORK: Contains a collection of arbitrary attribute/value pairs, including program segments, icon bitmaps, and parametric values.

Additional information regarding Macintosh files is stored by the Finder has in a hidden file, called the ”Desktop Database”.

Because of the complications in storing different parts of a Macintosh file in a non-Macintosh filesystem that only handles consecutive data in one part, it is common to convert the Macintosh file into some other format before transferring it over the network.

AppleDouble file format [APPL90], encoded in MIME as **multipart/appledouble** and **application/applefile** is the preferred format for a Macintosh file that is to be included in an Internet mail message, because it provides recipients with Macintosh computers the entire document, including Icons and other Macintosh specific information, while other users easily can extract the Data fork (the actual data).

However, this specification provides for use of the currently popular BinHex4.0 encoding schemes, as a convinience to the installed base of users.

4. MIME format for BinHex4.0

MIME-base Apple information is specified by:

MIME type-name:	APPLICATION
MIME subtype name:	MAC-BINHEX40
Required parameters:	none
Optional parameters:	NAME, which must only consist of seven-bit US-ASCII characters excluding SPACE, CTLS, and “`tspecials`” as defined in RFC-1521 [BORE93].
Encoding considerations:	none
Security considerations:	See separate section in the document
Published specification:	Appendix A
Rationale:	Permits MIME-based transmission of data with Apple Macintosh file system specific information using a currently popular, though platform specific, format.

4a. Detail specific to MIME-based usage

Macintosh documents do not always need to be sent in a special format. Those documents with well-known MIME types and non-existent or trivial resource forks can be sent as regular MIME body parts, without use of AppleSingle, AppleDouble or BinHex4.0.

Documents which lack a data fork should always be sent as **application/applefile**.

All other documents should normally sent as **multipart/appledouble**. This includes documents with non-trivial resource forks, and documents without corresponding well-known MIME types.

It may be valuable in some cases to allow the user to choose one format over another, either because he disagrees with the implementor's definition of "trivial" resource forks, or for reasons of his own.

Only when available software and/or user practice dictates, should **application/mac-binhex40** be employed.

5. BinHex

BinHex 4.0 is a propular means of encoding Macintosh files for archiving on non-Macintosh file systems and for transmission via Internet mail. (See Appendix A for a brief description of the BinHex 4.0 format.)

The content-type **application/mac-binhex40** indicates that the body of the mail is a BinHex4.0 file. Even though the BinHex encoding consists of characters which are not the same as those used in Base64 (those regarded as safe according to RFC-1521 [BORE93]) a transportation encoding should not be done.

Even though a BinHex file includes the original Macintosh filename, it is recommended that a name parameter be included on the Content-Type header to give the recipient a hint as to what file is attached. The value of the name parameter must consist of seven-bit US-ASCII characters excluding SPACE, CTLS, and ”tspecials” as defined in RFC- 1521 [BORE93].

5a. BinHex example

```
Content-Type: application/mac-binhex40; name="car.hqx"

    [The BinHex4.0 file goes here]
```

6. References

APPL90 AppleSingle/AppleDouble Formats for Foreign Files Developer's Note, Apple Computer, Inc., 1990

BORE93 Borenstein N., and N. Freed, MIME (Multipurpose Internet Mail Extensions): Mechanisms for Specifying and Describing the Format of Internet Message Bodies, RFC 1521, Bellcore, Innosoft, September 1993.

7. Security Considerations

To the extent that **application/mac-binhex40** facilitates the transmission of operating-system sensitive data, it may open a door for easier relaxation of security rules than is intended either by the sender of the administrator of the sender's system.

8. Acknowledgements

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Appendix A. The BinHex format

Here is a description of the Hqx7 (7 bit format as implemented in BinHex 4.0) formats for Macintosh Application and File transfers.

The main features of the format are:

1) Error checking even using ASCII download
2) Compression of repetitive characters
3) 7 bit encoding for ASCII download

The format is processed at three different levels:

1) 8 bit encoding of the file:

Byte:	Length of FileName (1->63)
Bytes:	FileName (”Length” bytes)
Byte:	Version
Long:	Type
Long:	Creator
Word:	Flags (And $F800)
Long:	Length of Data Fork
Long:	Length of Resource Fork
Word:	CRC
Bytes:	Data Fork (”Data Length” bytes)
Word:	CRC
Bytes:	Resource Fork (”Rsrc Length” bytes)
Word:	CRC

2) Compression of repetitive characters.

($90 is the marker, encoding is made for 3->255 characters)

00 11 22 33 44 55 66 77	-> 00 11 22 33 44 55 66 77
11 22 22 22 22 22 22 33	-> 11 22 90 06 33
11 22 90 33 44	-> 11 22 90 00 33 44

The whole file is considered as a stream of bits. This stream will be divided in blocks of 6 bits and then converted to one of 64 characters contained in a table. The characters in this table have been chosen for maximum noise protection. The format will start with a ”:” (first character on a line) and end with a ”:”. There will be a maximum of 64 characters on a line. It must be preceded, by this comment, starting in column 1 (it does not start in column 1 in this document):

```
(This file must be converted with BinHex 4.0)
```

Any text before this comment is to be ignored.
The characters used is:

```
!"#$%&'()*+,- 012345689@ABCDEFGHIJKLMNPQRSTUVXYZ[`abcdefhijklmpqr
```