

INTERNET-DRAFT

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IP over MIME

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<draft-eastlake-ip-mime-10.txt>

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Abstract

The MIME encoding of IP packets is specified so they can conveniently be sent via MAIL, HTTP, etc. This may be convenient for transmitting

packets for analysis, debugging, monitoring, or creating application level tunnels.

Acknowledgement

Helpful suggestions from Matt Crawford, Mike Ditto, Stanislav Shalunov, and Mark Allman have been incorporated herein.

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1. Introduction

The Internet Protocol (IP [[RFC 791](#)]) has been profiled for transmission over a wide variety of media including Ethernet [[RFC 894](#)], point to point circuits [[RFC 1661](#)], FDDI [[RFC 1390](#)], and even avian carriers [[RFC 1149](#)]. One of the most popular encoding and labeling (AKA, tagging and bagging) techniques defined for the TCP/IP protocol suite is the MIME encoding [[RFC 2045](#), [2046](#)] used, for example, in email, the web, and net news. This document specifies how to transmit IP over MIME.

An unambiguous MIME encoding for IP datagrams is useful in their transmission for monitoring, analysis, debugging, or illustrative purposes.

In addition, IP over MIME can be used as one component in creating application level tunnels.

2. MIME Type Specification

MIME media type name: APPLICATION

MIME subtype name: IP

Required parameters: version

version=n

This parameter exposes the IP Version number [[RFC 791](#)] in the MIME Content-Type.

Optional parameters: dilation, address

dilation=nnn

Typically IP packets will be MIME labeled for transmission over email or other application level protocols. Such transmission is generally much slower than lower level network protocols. While this is not usually a concern if a packet is just being communicated for analysis, if such transmission is used to establish a tunnel, the sender of a datagram may wish to advise the recipient of the estimated rough time dilation factor. For example, if datagrams typically take around a second and occasionally up to ten seconds end-to-end but it is more like a minute and occasionally up to ten minutes if they are MIME encoded in email, a "dilation=60" parameter would be reasonable. (Since it is a ratio of times, the dilation parameter is dimensionless.)

Note: Although IP and TCP are defined as protocols only loosely

dependent on time. The IPv4 TTL [[RFC 792](#)], although originally defined in terms of seconds, is usually implemented as a hop count which is how the corresponding IPv6 field is defined [RFC 1752]. TCP requires a retransmission timer but has no specified "time out" after which an unresponsive connection must be torn down although all practical implementations have such a time out. In the event that IP in MIME encapsulation is being used for actual connectivity, it might be desirable to scale all such timing by the dilation value if it has been provided and is reasonable.

address=xxx

Full, if slow, IP connectivity via an application level protocol such as SMTP [RFC 2821, 2822] might require that routing, tunneling, and/or interface entries be installed at each end. Routing entries would be best created or updated by routing protocol messages and the establishment of tunnels is beyond the scope of this MIME type specification. However, the "address=" parameter enables the sender to optionally indicate an IP address for return traffic to itself. This may only be useful in cases where the sender knows an address that is available for itself in the recipient's addressing environment. It can be viewed as a replacement for ARP [[RFC 826](#)] on the

possible path to the source of the APPLICATION/IP object via the same application level protocol. (A receiver of an APPLICATION/IP object with an "address=" parameter might reasonably require that it be authenticated as meeting their policy as to from whom they would accept such information. For example, they could ignore "address=" parameters unless the APPLICATION/IP object was wrapped in an acceptable MULTIPART/SIGNED [[RFC 1847](#)] authentication, although that implies some trust relationship between the parties.)

Examples:

address="192.0.2.123"

address="2001:DB8::123"

Encoding considerations: Because of the binary nature of the body, BASE64 transfer encoding should normally be used on transports that do not support binary.

Security considerations: Care should be taken under any circumstance where APPLICATION/IP content could be treated as a "live" packet. MULTIPART/ENCRYPTED and MULTIPART/SIGNED [[RFC 1847](#)] may be used to further secure and/or authenticate MIME packaged IP traffic.

Interoperability considerations: See [[draft-eastlake-ip-mime-*.txt](#)].

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MULTIPART/MIXED [[RFC 2046](#)] may be used to package multiple IP datagrams together.

Published specification: See [[draft-eastlake-ip-mime-*.txt](#)].

Applications which use this media type: Not yet in use.

Additional information: (none)

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Intended usage: LIMITED USE

Author/Change controller: IETF

[3.](#) Security Considerations

See security considerations in [Section 2](#) above.

[4.](#) IANA Considerations

This document registers and specifies the APPLICATION/IP MIME type.

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