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**Tunneling of SMTP Message Transfer Priorities**  
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Abstract

This memo defines a mechanism for tunneling of SMTP (Simple Mail Transfer Protocol) Message Transfer Priority values through MTAs (Message Transfer Agents) that don't support the MT-PRIORITY SMTP extension.

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## 1. Introduction

This document is an experimental extension to the SMTP Message Transfer Priorities extension [[SMTP-PRIORITY](#)]. It specifies application layer tunneling of message priority, to convey the priority of the messages through Message Transfer Agents (MTAs) that do not support the Message Transfer Priorities extension. The tunneling is done by adding a new message header field to Internet message format specified in [[RFC5322](#)].

A number of other header fields are already in use, mostly in Mail User Agents (MUAs), to convey meanings related to importance or priority of messages. Example of such header fields are Importance [[RFC2156](#)], Priority [[RFC2156](#)] and X-Priority (undocumented). Considering sometimes subtle and sometimes significant differences in the meaning of these header fields and widely different syntax, this document defines a new header field.

This document is motivated by 2 main deployment scenarios: (1) Mail User Agent (MUA) talking to a non MT-PRIORITY aware Message Submission Server (MSA), and (2) use of unextended MUA to talk to a MT-PRIORITY aware MSA. These 2 use cases are discussed in more details below.

The use case (1) is about a MT-PRIORITY capable MUA talking to a non MT-PRIORITY capable MSA [[RFC6409](#)], which in turn is talking to a MT-PRIORITY capable MTA [[RFC5321](#)]. Both MSA and MTA are within the same Administrative and Management Domain (ADMD) and are on a fast network, however some recipients are accessible via the MTA which is talking over a slow link to the next MTA. Communications over that slow link can benefit from use of MT-PRIORITY SMTP extension.

In the use case (2) a widely deployed client (such as a desktop client) is talking to MT-PRIORITY capable MSA. The client might be extendable via a plugin API provided by the client developers, however existing APIs frequently allow easy manipulation of email header fields, while not allowing for addition of SMTP protocol features. In such a case installing a plugin to the client that can set MT-Priority header field could provide easier and earlier deployment of MT-PRIORITY SMTP extension in an organization without requiring changes to desktop clients.

We note that the above use cases are not exhaustive and that other use cases, variations of the above, may exist. The purpose of this document is not to consider every scenario, but rather examples that reinforce the need to consider a tunneling mechanism that can deal with SMTP capable devices that do not support [[SMTP-PRIORITY](#)].



## 2. Conventions Used in This Document

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [\[RFC2119\]](#) when they appear in ALL CAPS. These words also appear in this document in lower case as plain English words, absent their normative meanings.

The formal syntax use the Augmented Backus-Naur Form (ABNF) [\[RFC5234\]](#) notation including the core rules defined in [Appendix B of RFC 5234](#) [\[RFC5234\]](#).

In examples, "C:" and "S:" indicate lines sent by the client and server respectively. Line breaks that do not start with a new "C:" or "S:" exist for editorial reasons and are not a part of the protocol.

This document uses the term "priority" specifically in relation to the internal treatment of a message by the server: messages with higher priorities may be given expedited handling, and those with lower priorities may be handled only as resources become available.

## 3. Handling of messages received via SMTP

The subsections of this section update the corresponding subsections of Section 4 of [\[SMTP-PRIORITY\]](#).

### 3.1. Handling of the MT-PRIORITY parameter by the receiving SMTP server

This specification inserts the following between steps 4 and 5 in Section 4.1 of [\[SMTP-PRIORITY\]](#):

- 4a. If the sending SMTP client hasn't specified the MT-PRIORITY parameter to the MAIL FROM command, but the message has a single syntactically valid MT-Priority header field (see [Section 4](#)), then the value of this header field is the message priority.
- 4b. In absence of both the MT-PRIORITY MAIL FROM parameter and the MT-Priority header field, other message header fields, such as Priority [\[RFC2156\]](#) and X-Priority, MAY be used for determining the priority under this "Priority Message Handling" SMTP extension. But note that the Importance [\[RFC2156\]](#) header field MUST NOT be used for determining the priority under this "Priority Message Handling" SMTP extension, as it has different semantics: the Importance header field is aimed at the user recipient and not at the nodes responsible for transferring the message.



### **3.2. Relay of messages to other conforming SMTP/LMTP servers**

This specification inserts the following between steps 1 and 2 in Section 4.2 of [[SMTP-PRIORITY](#)].

- 1a. Note that rule 1 also applies to messages which didn't have any priority explicitly specified using the MT-PRIORITY MAIL FROM parameter or the MT-Priority header field.

### **3.3. Relay of messages to non-conforming SMTP/LMTP servers**

This specification appends the following after step 1 in Section 4.3 of [[SMTP-PRIORITY](#)]:

2. The relaying MTA MUST first remove any and all existing MT-Priority header fields from the message. (Please see [Section 7](#) for additional considerations related to removal of the MT-Priority header field.)
3. If the incoming message had a MT-PRIORITY parameter specified in the MAIL FROM command \*or\* there was an MT-Priority header field removed in the above step 2, then the relaying MTA MUST add its own MT-Priority header field with the value determined by the procedure in [Section 3.1](#). Syntax of the MT-Priority header field is specified in [Section 4](#).

### **3.4. Mailing lists and Aliases**

This specification makes no changes to Section 4.4 of [[SMTP-PRIORITY](#)].

### **3.5. Gatewaying a message into a foreign environment**

This specification inserts the following between steps 1 and 2 in Section 4.5 of [[SMTP-PRIORITY](#)].

- 1a. Note that if the destination environment doesn't support transport of arbitrary header field, the requirement in [Section 3.3](#) to add an MT-Priority header field doesn't apply.

### **3.6. Interaction with DSN SMTP Extension**

This specification makes no changes to Section 4.6 of [[SMTP-PRIORITY](#)].

#### 4. Header field: MT-Priority

Applicable protocol: mail [[RFC5322](#)]

Status: standard

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Specification document(s): [[anchor7: this document]]

The MT-Priority header field conveys message transfer priority when relaying a message through MTAs which don't support the MT-PRIORITY SMTP extension.

ABNF for this header field is defined as follows:

```
priority-header-field = "MT-Priority:"  
                        [CFWS] priority-value [CFWS] CRLF
```

where "priority-value" is defined in [[SMTP-PRIORITY](#)].

Example:

MT-Priority: -3

Example:

MT-Priority: 4 (ultra)

#### 5. Example

An SMTP transaction with 2 recipients. Note that the example is also making use of the STARTTLS [[RFC3207](#)] and DSN [[RFC3461](#)] SMTP extensions, even though there is no requirement that these other extensions are to be supported when the MT-PRIORITY SMTP extension is implemented.



```
S: 220 example.net SMTP server here
C: EHLO example.com
S: 250-example.net
S: 250-DSN
S: 250-STARTTLS
S: 250 MT-PRIORITY STANAG4406
C: STARTTLS
[...TLS negotiation...]
C: MAIL FROM:<eljefe@example.com> ENVID=QQ314159
    MT-PRIORITY=3
S: 250 <eljefe@example.com> sender ok
C: RCPT TO:<topbanana@example.net>
S: 250 <topbanana@example.net> recipient ok
C: RCPT TO:<Dana@Ivory.example.net> NOTIFY=SUCCESS,FAILURE
    ORCPT=rfc822;Dana@Ivory.example.net
S: 250 <Dana@Ivory.example.net> recipient ok
C: DATA
S: 354 okay, send message
C: (message goes here)
C: .
S: 250 message accepted
C: QUIT
S: 221 goodbye
```

Here the receiving SMTP server supports the "STANAG4406" Priority Assignment Policy [[SMTP-PRIORITY](#)] with 6 priority levels, so it will use the priority value 4 internally (the next supported priority higher or equal to 3) and will communicate the priority value 3 when relaying it to the next hop (if necessary). When relaying the message to the next hop which doesn't support the MT-PRIORITY SMTP extension the transaction might look like this:

```
S: 220 example.org SMTP server here
C: EHLO example.net
S: 250-example.org
S: 250-DSN
S: 250-STARTTLS
S: 250 SIZE
C: STARTTLS
[...TLS negotiation...]
C: MAIL FROM:<eljefe@example.com> ENVID=QQ314159
S: 250 <eljefe@example.com> sender ok
C: RCPT TO:<topbanana@example.net>
S: 250 <topbanana@example.net> recipient ok
C: RCPT TO:<Dana@Ivory.example.net> NOTIFY=SUCCESS,FAILURE
    ORCPT=rfc822;Dana@Ivory.example.net
S: 250 <Dana@Ivory.example.net> recipient ok
C: DATA
S: 354 okay, send message
C: MT-Priority: 3
C: (the rest of the message goes here)
C: .
S: 250 message accepted
C: QUIT
S: 221 goodbye
```

## 6. IANA Considerations

IANA is requested to add the following list of header field names to the "Permanent Message Header Field Names" registry (in <http://www.iana.org/assignments/message-headers/perm-headers.html>):

Header field: MT-Priority

Applicable protocol: mail

Status: standard

Author/change controller: Alexey Melnikov / IESG ([iesg@ietf.org](mailto:iesg@ietf.org)) on behalf of the IETF

Specification document(s): [[anchor9: this document]]

## 7. Security Considerations

This document allows a message priority to be tunneled through MTAs which don't support the MT-PRIORITY SMTP extension by specifying how it can be represented in the message itself (using the MT-Priority header field). Thus it is important to ensure that an MTA receiving a message containing the MT-Priority header field can trust that it was set by an authorized agent. Use of technologies such as DKIM [[RFC6376](#)] or S/MIME to sign the MT-Priority header field value can enable the recipient to verify whether the specified priority value



was generated by a trusted agent.

Message Submission Agents ought to only accept message transfer priorities (whether by using the MT-PRIORITY parameter to the MAIL FROM command or the MT-Priority header field in the message itself) from users (or only certain groups of such users) who are authenticated and authorized in some way that's acceptable to the MSA. As part of this policy, they can also restrict maximum priority values that different groups of users can request, and can override the priority values specified by MUAs. Such MSAs are required to strip any MT-Priority header field values that don't satisfy this policy, when relaying to non MT-PRIORITY capable SMTP/LMTP servers. See [Section 7.1](#) for more details on when violation of this requirement is warranted.

Similarly, MTAs ought to only accept message transfer priorities (whether by using the MT-PRIORITY parameter to the MAIL FROM command or the MT-Priority header field in the message itself) from senders (or only certain groups of such senders) who are authenticated and authorized in some way that's acceptable to the MTA. As part of this policy, they can also restrict maximum priority values that different groups of senders can request, and can override the priority values specified by them. Such MTAs are required to strip any MT-Priority header field values that don't satisfy this policy, when relaying to non MT-PRIORITY capable SMTP/LMTP servers. See [Section 7.1](#) for more details on when violation of this requirement is warranted.

In the absence of the policy enforcement mentioned above an SMTP server (whether an MSA or an MTA) implementing the MT-PRIORITY SMTP extension might be susceptible to a Denial of Service attack. For example, malicious clients (MUAs/MSAs/MTAs) can try to abuse this feature by always requesting Priority 9.

To protect MT-Priority header field from modification or insertion, MUAs, MSAs and MTAs inserting it into messages SHOULD use message header protection mechanism such as DKIM [[RFC6376](#)]. But see [Section 7.1](#).

### **[7.1](#). Modification of MT-Priority header field and DKIM**

A MSA/MTA that receives a message with an MT-Priority header field protected by DKIM, that wants to change the message priority due to its policy is forced to choose between

- a. breaking DKIM signatures (by replacing the MT-Priority header value),



- b. leaving the message as is (and using the MT-PRIORITY MAIL FROM parameter), relying on the fact that all downstream MTAs are compliant with this specification,
- c. rejecting the message.

Each of these choices is not perfect and work in a particular situation, so these choices should be carefully considered during implementation and deployment.

If the MSA/MTA decides to alter the message, it SHOULD re-sign the message with DKIM.

## **8. References**

### **8.1. Normative References**

- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), March 1997.
- [RFC3461] Moore, K., "Simple Mail Transfer Protocol (SMTP) Service Extension for Delivery Status Notifications (DSNs)", [RFC 3461](#), January 2003.
- [RFC5321] Klensin, J., "Simple Mail Transfer Protocol", [RFC 5321](#), October 2008.
- [RFC5322] Resnick, P., Ed., "Internet Message Format", [RFC 5322](#), October 2008.
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- [RFC6409] Gellens, R. and J. Klensin, "Message Submission for Mail", STD 72, [RFC 6409](#), November 2011.
- [SMTP-PRIORITY] Melnikov, A. and K. Carlberg, "Simple Mail Transfer Protocol extension for Message Transfer Priorities", [draft-melnikov-smtp-priority-21](#) (work in progress), 2012.

### **8.2. Informative References**

- [RFC2156] Kille, S., "MIXER (Mime Internet X.400 Enhanced Relay): Mapping between X.400 and [RFC 822](#)/MIME", [RFC 2156](#), January 1998.

- [RFC3207] Hoffman, P., "SMTP Service Extension for Secure SMTP over Transport Layer Security", [RFC 3207](#), February 2002.
- [RFC6376] Crocker, D., Hansen, T., and M. Kucherawy, "DomainKeys Identified Mail (DKIM) Signatures", [RFC 6376](#), September 2011.

## **[Appendix A](#). Acknowledgements**

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