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**Update to Internet Message Format to Allow Group Syntax in the "From:"  
and "Sender:" Header Fields  
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Abstract

The Internet Message Format ([RFC 5322](#)) allows "group" syntax in some email header fields, such as "To:" and "CC:", but not in "From:" nor "Sender:". This document updates [RFC 5322](#) to relax that restriction, allowing group syntax in those latter fields, as well as in "Resent-From:" and "Resent-Sender:", in certain situations.

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## **1. Introduction**

The Internet Message Format [[RFC5322](#)] allows "group" syntax in some email header fields, such as "To:" and "CC:", but not in "From:" nor "Sender:". As use cases for group syntax evolve, particularly with respect to email address internationalization issues, it is becoming clear that there is little value in forbidding that usage completely, and significant value in allowing it in certain situations. This document updates [RFC 5322](#) to relax that restriction, allowing group syntax in "From:", "Sender:", "Resent-From:", and "Resent-Sender:" for limited use (see [Section 3](#)).

### **1.1. Notational Conventions**

The notational conventions here are the same as those in [RFC 5322](#), and the following two subsections are copied directly from that document.

#### **1.1.1. Requirements Notation**

This document occasionally uses terms that appear in capital letters. When the terms "MUST", "SHOULD", "RECOMMENDED", "MUST NOT", "SHOULD NOT", and "MAY" appear capitalized, they are being used to indicate particular requirements of this specification. A discussion of the meanings of these terms appears in [[RFC2119](#)].

#### **1.1.2. Syntactic Notation**

This specification uses the Augmented Backus-Naur Form (ABNF) [[RFC5234](#)] notation for the formal definitions of the syntax of messages. Characters will be specified either by a decimal value (e.g., the value %d65 for uppercase A and %d97 for lowercase A) or by a case-insensitive literal value enclosed in quotation marks (e.g., "A" for either uppercase or lowercase A).

## **2. Allowing Group Syntax in "From:" and "Sender:"**

[Section 3.6.2 of RFC 5322](#) defines the "From:" header field as containing a <mailbox-list> syntax element. This changes that definition to use the <address-list> syntax element, as is used in other fields, such as "To:", "CC:", and "Reply-To:". This also changes the definition of the "Sender:" header field from the <mailbox> syntax element to the <address> syntax element. While the <address> element includes the <mailbox> element already, we have chosen to specify both in the updated syntax as a way of highlighting the limited use intended for the change (see [Section 3](#)).



The following normative section replaces [Section 3.6.2 of RFC 5322](#).

[[anchor5: RFC Editor (please remove this paragraph before publication): I know that the text in the following section is not consistent within itself nor with the rest of this document in how it refers to message header fields, sometimes putting the field name in quotation marks and sometimes not, sometimes capitalizing the field name and sometimes not, and sometimes including the final colon and sometimes not. It's the document editor's judgment that minimizing changes to the original text is more important, in this case, than attaining consistency. Please, therefore, hold back edits to the following section, 2.1, as well as to Sections [1.1.1](#) and [1.1.2](#) above. If you think there are editorial changes that you must make, let's please discuss them explicitly during AUTH48.]]

## **2.1. Replacement of [RFC 5322, Section 3.6.2. Originator Fields](#)**

In version -00, this section is unchanged from [RFC 5322](#), to make it easier to use DIFF to see the actual changes that this version contains. Compare this version with version -00. [[anchor6: RFC Editor: Please remove this paragraph before publication.]]

The originator fields of a message consist of the from field, the sender field (when applicable), and optionally the reply-to field. The from field consists of the field name "From" and a comma-separated list of one or more addresses (either mailbox or group syntax). If the from field contains more than one mailbox specification (including all mailboxes included in any groups), then the sender field, containing the field name "Sender" and a single address, MUST appear in the message. The from field and the sender field SHOULD NOT use group syntax; rather, the from field SHOULD use only the mailbox-list syntax and the sender field SHOULD use only mailbox syntax (see [Section 3](#)). If the sender field uses group syntax, the group MUST NOT contain more than one mailbox. In either case, an optional reply-to field MAY also be included, which contains the field name "Reply-To" and a comma-separated list of one or more addresses.

from = "From:" (mailbox-list / address-list) CRLF

sender = "Sender:" (mailbox / address) CRLF

reply-to = "Reply-To:" address-list CRLF

The originator fields indicate the mailbox(es) of the source of the message. The "From:" field specifies the author(s) of the message, that is, the mailbox(es) of the person(s) or system(s) responsible for the writing of the message. The "Sender:" field specifies the



mailbox of the agent responsible for the actual transmission of the message. For example, if a secretary were to send a message for another person, the mailbox of the secretary would appear in the "Sender:" field and the mailbox of the actual author would appear in the "From:" field. If the originator of the message can be indicated by a single mailbox and the author and transmitter are identical, the "Sender:" field SHOULD NOT be used. Otherwise, both fields SHOULD appear.

Note: The transmitter information is always present. The absence of the "Sender:" field is sometimes mistakenly taken to mean that the agent responsible for transmission of the message has not been specified. This absence merely means that the transmitter is identical to the author and is therefore not redundantly placed into the "Sender:" field.

The originator fields also provide the information required when replying to a message. When the "Reply-To:" field is present, it indicates the address(es) to which the author of the message suggests that replies be sent. In the absence of the "Reply-To:" field, replies SHOULD by default be sent to the mailbox(es) specified in the "From:" field unless otherwise specified by the person composing the reply.

In all cases, the "From:" field SHOULD NOT contain any mailbox that does not belong to the author(s) of the message. See also [\[RFC5322\]](#) [Section 3.6.3](#) for more information on forming the destination addresses for a reply.

## **2.2. Update to [RFC 5322, Section 3.6.6](#). Resent Fields**

This updates [RFC 5322, Section 3.6.6](#), to allow groups (via the address-list ABNF production) in the "Resent-From:" and "Resent-Sender:" fields, to parallel the change to "From:" and "Sender:" above. The ABNF for those fields is changed as follows:

resent-from = "Resent-From:" (mailbox-list / address-list) CRLF

resent-sender = "Resent-Sender:" (mailbox / address) CRLF

## **3. Applicability Statement**

Mailbox syntax is the normal use in the "From:" and "Sender:" header fields; the address syntax defined in [Section 2.1](#), which allows the specification of a group, is only for Limited Use (see [\[RFC2026\]](#), [Section 3.3](#), item (d)) for the reasons described below.





Very many Internet email procedures and software assume that the addresses in "From:" and "Sender:" fields can be replied to and are suitable for use in mail organizing and filtering. The use of groups instead of mailboxes can disrupt those uses. Consequently, while this specification legitimizes the use of groups, it does so only to enable circumstances when that use is necessary, and it is important that its use be limited to those circumstances and that it be used with caution. In particular, user agents SHOULD NOT permit the use of groups in those fields in outgoing messages, much as they also do not permit the use of a null address ("<>").

#### **4. Security Considerations**

See the Internet Message Format specification [[RFC5322](#)] for general discussion of security considerations related to the formatting of email messages.

The "From:" address is special, in that most user agents display that address, or the "friendly" text associated with it, to the end user, and label that so as to identify it as the origin of the message (as implied in [Section 3.6.2 of RFC 5322](#)). Group syntax in the "From:" header field can be used to hide the identity of the message originator. It is as easy to use a fabricated "From:" address to accomplish the same thing, so allowing groups there does not exacerbate the security problem.

Some protocols attempt to validate the originator address by matching the "From:" address to a particular verified domain (see Author Domain Signing Practices (ADSP) [[RFC5617](#)] for one such protocol). Such protocols will not be applicable to messages that lack an actual email address (whether real or fake) in the "From:" field. Local policy will determine how such messages are handled, and senders, therefore, need to be aware that using groups in the "From:" might adversely affect deliverability of the message.

Because groups have previously not been allowed in the "From:" and "Sender:" header fields, it is possible that some implementations that conform to [RFC 5322](#) might not be prepared to handle that syntax, and, indeed, might not even recognize that group syntax is being used. Of those implementations, some subset might, when presented with group syntax in those header fields, behave in a way that is exploitable by an attacker. It is deemed unlikely that this will be a serious problem in practice: address field parsing is generally an integral component of implementations, and address field parsers are required to understand group syntax. In addition, if any implementations should be exploitable through this mechanism, it is already possible for attackers to do it by violating [RFC 5322](#), and



other [RFC 5322](#) violations are commonly used by malefactors.

## 5. IANA Considerations

IANA is asked to update the Permanent Message Header Field Names registry ( <http://www.iana.org/assignments/message-headers/perm-headers.html> ) as follows:

OLD

From	mail	standard	[ <a href="#">RFC5322</a> ]
Sender	mail	standard	[ <a href="#">RFC5322</a> ]
Resent-From	mail	standard	[ <a href="#">RFC5322</a> ]
Resent-Sender	mail	standard	[ <a href="#">RFC5322</a> ]

NEW

From	mail	standard	[ <a href="#">RFC5322</a> ] [[this RFC]]
Sender	mail	standard	[ <a href="#">RFC5322</a> ] [[this RFC]]
Resent-From	mail	standard	[ <a href="#">RFC5322</a> ] [[this RFC]]
Resent-Sender	mail	standard	[ <a href="#">RFC5322</a> ] [[this RFC]]

## 6. References



### **6.1. Normative References**

- [RFC2026] Bradner, S., "The Internet Standards Process -- Revision 3", [BCP 9](#), [RFC 2026](#), October 1996.
- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), March 1997.
- [RFC5234] Crocker, D. and P. Overell, "Augmented BNF for Syntax Specifications: ABNF", STD 68, [RFC 5234](#), January 2008.
- [RFC5322] Resnick, P., Ed., "Internet Message Format", [RFC 5322](#), October 2008.

### **6.2. Informative References**

- [RFC5617] Allman, E., Fenton, J., Delany, M., and J. Levine, "DomainKeys Identified Mail (DKIM) Author Domain Signing Practices (ADSP)", [RFC 5617](#), August 2009.

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