

Network Working Group  
Internet-Draft  
Intended status: Informational  
Expires: 3 September 2026

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2 March 2026

Additional Extensions for the More Instant Messaging Interoperability  
(MIMI) Content Format  
draft-mimi-content-more-extensions-00

## Abstract

This document defines some new useful extensions for the MIMI content format.

## About This Document

This note is to be removed before publishing as an RFC.

The latest revision of this draft can be found at <https://rohanmahy.github.io/mimi-content-more-extensions/draft-mimi-content-more-extensions.html>. Status information for this document may be found at <https://datatracker.ietf.org/doc/draft-mimi-content-more-extensions/>.

Source for this draft and an issue tracker can be found at <https://github.com/rohanmahy/mimi-content-more-extensions>.

## Status of This Memo

This Internet-Draft is submitted in full conformance with the provisions of BCP 78 and BCP 79.

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## 1. Introduction

This document defines a set of new fields for the MIMI content [I-D.ietf-mimi-content] format extensions map. These particular extensions were chosen to provide functionality already in some other messaging systems, so that they can carry this information safely with the MIMI content format.

## 2. Conventions and Definitions

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in BCP 14 [RFC2119] [RFC8174] when, and only when, they appear in all capitals, as shown here.

## 3. Sender Timestamp Extension

This extension represents the sender asserted sending timestamp. It is a map containing the whole number of seconds since the start of the UNIX epoch, and optionally the number of additional milliseconds, microseconds, or nanoseconds.

```
/senderTimestamp/ 3: {  
  /seconds since UNIX epoch/ 1: 1762760377,  
  /microseconds/              -6: 462917  
}
```

The Concise Data Definition Language (CDDL) [RFC8610] description of the extension is below.

```
$$otherKnownExtensions //= (  
  &(senderTimestamp: TBD1) ^ => {  
    1: uint,  
    ? fractional  
  }  
)  
fractional = ( -3: millisecs // -6: microsecs // -9: nanosecs)  
millisecs = 0..999  
microsecs = 0..999999  
nanosecs = 0..999999999
```

TBD1 = 3 ; recommended value for IANA

## 4. External Message ID Extension

While the MIMI content format has its own message ID derived from a hash of its content, many messaging systems already have a native message ID format. This extension allows this "external" message ID to also be included in the MIMI content extensions map.

It consists of an array of two parts, a byte string for the native message ID, and a scope. The scope could be be an Internet domain name (represented as a text string), a tagged URI, or an IANA-registered Private Enterprise Number (PEN), which is a positive integer. The PEN option allows for a concise, but unambiguous scope in many organizations.

```
4: [h'08bbeeb8175c4a64a8926a5a23bb2811', 311]
```

The CDDL description is below.

```
$$otherKnownExtensions //= (
    &(externalMessageId: TBD2) ^ => ExtMessageId
)
ExtMessageId = [ bstr, scope ]
scope = pen / domain / uri
pen = uint .gt 0      ; IANA Private Enterprise Number
domain = tstr         ; Internet domain name
```

```
TBD2 = 4
```

## 5. Subject Extension

The subject extension allows messaging systems which already have a Subject field to carry a text string of up to 4096 octets of legal UTF-8.

```
5: "This space intentionally left blank"
```

The CDDL description is below.

```
$$otherKnownExtensions //= (
    &(subject: TBD3) ^ => tstr .size (1..4096)
)
```

```
TBD3 = 5
```

## 6. Message Ordering via lastSeen

The lastSeen data field indicates the latest message(s) the sender was aware of in the group. It is a list of MIMI message IDs, or a list of external message IDs.

If the sender recently joined the group and has not yet seen any messages, the list is empty.

If the sender identifies a single message as unambiguously the latest message in the group, the lastSeen list contains a single message id from that message.

Imagine however that two users (Bob and Cathy) see a message from Alice offering free Hawaiian pizza, and reply at the same time. Bob and Cathy both send messages with their lastSeen including a single message id (Alice's message about pizza). Their messages don't need to be replies or reactions. Bob might just send a message saying he doesn't like pineapple on pizza. Now Doug receives all these messages and replies as well. Doug's message contains a lastSeen including the message id list of both Bob's and Cathy's replies, effectively "merging" the order of messages.

The next message after Doug's message contains a lastSeen containing only the message id of Doug's message.

The CDDL description is below.

```
$$otherKnownExtensions //= (  
  &(lastSeen: TBD4) ^ => [ * MessageId ] / [ * ExtMessageId ]  
)
```

TBD4 = 256

## 7. Security Considerations

The Security Consideration of MIMI content apply.

These extensions are most likely to be used for interoperability with messaging systems other than MIMI. The security of the MIMI content format needs to be considered in combination with the properties of the messaging system that carries the messages.

The situations listed below are considered anomalies and could indicate a malicious sender. When they are encountered the receiver MAY reject the MIMI message.

When the senderTimestamp extension:

- \* dates from before the start of the UNIX epoch,
- \* dates from before the first known message exchanged in the target messaging system,
- \* is from a time dramatically in the future (ex: hundreds of years),  
or

- \* jumps more than expected for the target messaging system. For example, a messaging system designed to deliver messages no more than one month old, could reject messages more than 32 days in the past or future.

Note that occasionally out-of-order messages are a consequence of normal operations in most messaging systems.

When the externalMessageId extension:

- \* is a duplicate of another external message ID already encountered, or
- \* is from a completely unexpected scope.

When the subject extension:

- \* is not a string of legal UTF-8 characters.

When the lastSeen extension:

- \* is empty, but the sender has previously sent messages in the room,
- \* results in a loop,
- \* contains a mix of both native MIMI MessageId and external message IDs,
- \* contains external message IDs from a completely unexpected scope, or
- \* refers to an excessive number of lastSeen messages simultaneously (ex: contains more than 65535 message IDs).

Note that a popular message sent in a large group can result in thousands of reactions in a few hundred milliseconds.

## 8. IANA Considerations

IANA is requested to add the following entries to the MIMI Content Extension Keys registry.

### 8.1. senderTimestamp MIMI Content Extension Key

The following completed registration template is provided:

- \* Key: TBD1 (suggested value 3)

- \* Name: senderTimestamp
- \* Type: map
- \* Recommended: N
- \* Reference: Section 3 of this document

#### 8.2. externalMessageId MIMI Content Extension Key

The following completed registration template is provided:

- \* Key: TBD2 (suggested value 4)
- \* Name: externalMessageId
- \* Type: array of 2 items
- \* Recommended: N
- \* Reference: Section 4 of this document

#### 8.3. subject MIMI Content Extension Key

The following completed registration template is provided:

- \* Key: TBD3 (suggested value 5)
- \* Name: subject
- \* Type: tstr
- \* Recommended: N
- \* Reference: Section 5 of this document

#### 8.4. lastSeen MIMI Content Extension Key

The following completed registration template is provided:

- \* Key: TBD4 (suggested value 256)
- \* Name: lastSeen
- \* Type: array
- \* Recommended: N

\* Reference: Section 6 of this document

## 9. References

### 9.1. Normative References

- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, DOI 10.17487/RFC2119, March 1997, <<https://www.rfc-editor.org/rfc/rfc2119>>.
- [RFC8174] Leiba, B., "Ambiguity of Uppercase vs Lowercase in RFC 2119 Key Words", BCP 14, RFC 8174, DOI 10.17487/RFC8174, May 2017, <<https://www.rfc-editor.org/rfc/rfc8174>>.
- [RFC8610] Birkholz, H., Vigano, C., and C. Bormann, "Concise Data Definition Language (CDDL): A Notational Convention to Express Concise Binary Object Representation (CBOR) and JSON Data Structures", RFC 8610, DOI 10.17487/RFC8610, June 2019, <<https://www.rfc-editor.org/rfc/rfc8610>>.

### 9.2. Informative References

- [I-D.ietf-mimi-content] Mahy, R., "More Instant Messaging Interoperability (MIMI) message content", Work in Progress, Internet-Draft, draft-ietf-mimi-content-07, 7 July 2025, <<https://datatracker.ietf.org/doc/html/draft-ietf-mimi-content-07>>.

## Appendix A. Complete CDDL Schema



```
$$otherKnownExtensions //= (
  &(senderTimestamp: TBD1) ^ => {
    1: uint,
    ? fractional
  }
)
fractional = ( -3: millisecs // -6: microsecs // -9: nanosecs)
millisecs = 0..999
microsecs = 0..999999
nanosecs = 0..999999999

$$otherKnownExtensions //= (
  &(externalMessageId: TBD2) ^ => ExtMessageId
)
ExtMessageId = [ bstr, scope ]
scope = pen / domain / uri
pen = uint .gt 0 ; IANA Private Enterprise Number
domain = tstr ; Internet domain name

$$otherKnownExtensions //= (
  &(subject: TBD3) ^ => tstr .size (1..4096)
)

$$otherKnownExtensions //= (
  &(lastSeen: TBD4) ^ => [ * MessageId ] / [ * ExtMessageId ]
)

TBD1 = 3
TBD2 = 4
TBD3 = 5
TBD4 = 256
```

Figure 1: A complete CDDL description of the new extensions

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