JMAP extension for S/MIME signing and encryption

Abstract

   This document specifies an extension to JMAP for sending S/MIME
   signed and/or S/MIME encrypted messages, as well as automatic
   decryption of received S/MIME messages.

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   provisions of BCP 78 and BCP 79.

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   material or to cite them other than as "work in progress."

   This Internet-Draft will expire on 4 February 2024.

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1. Introduction

[RFC8621] is a JSON based application protocol for synchronising
email data between a client and a server.

This document describes an extension to JMAP for sending S/MIME
signed and/or encrypted messages, as well as automatic decryption of
received S/MIME messages. It allows JMAP server to sign/encrypt
messages on user's behalf.

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].

3. Addition to the capabilities object

The capabilities object is returned as part of the standard JMAP
Session object; see the JMAP spec. Servers supporting _this_
specification MUST add a property called
"urn:ietf:params:jmap:smime-advanced" to the capabilities object.

The value of this property is an empty object in both the JMAP
session _capabilities_ property and an account's
accountCapabilities property.

4. **Extension to Email/set for S/MIME signing and/or encryption**

   [RFC8621] defines Email/set method for creating new email messages.
   This document defines the following additional request arguments
   that can be used to create S/MIME signed and/or encrypted messages:

   *smimeSign: "Boolean" (default: false). If included and has the
    value "true", this requests the JMAP server to create an S/MIME
    signed message from the message constructed according to other
    specified arguments (the "original message"). This is done by
    encapsulating the original message either inside application/
    pkcs7-mime [RFC8551] or multipart/signed [RFC1847] container.
    (smimeSignOpaque argument (see below) controls which of the two
    mechanisms is used.) The signature's private key/certificate is
    associated with the email address in the Sender header field, if
    present; otherwise, it is associated with the email address in
    the From header field, if present.

    If multiple addresses are present in one of these header fields,
    or there is more than one Sender/From header field, the server
    SHOULD reject the Email/set as invalid with the "invalidEmail"
    error code; otherwise, it MUST take the first address in the last
    Sender/From header field. If JMAP account is not authorized to
    sign message as the selected sender (as above), it SHOULD return
    "signedSenderNotAllowed" error code.

   *smimeEncrypt: "Boolean" (default: false). If included and has the
    value "true", this requests the JMAP server to create an S/MIME
    encrypted message from the constructed message. This is done by
    encapsulating the message inside application/pkcs7-mime [RFC8551]
    media type. The message MUST be encrypted to the sender and all
    To/Cc/Bcc recipients. This extension assumes that there is some
    kind of per user or organizational addressbook, that can be used
    to lookup public keys of recipients. If lookup of a particular
    public key fails, or results in an expired or revoked
    certificate, the Email/set operation MUST fail with the
    "validEncryptionKeyNotFound" error code.

   *smimeHeaderProtect: "Boolean" (default: true). If has the value
    "true", this requests the JMAP server to use S/MIME header
    protection as specified in [draft-ietf-lamps-header-protection]
    when at least one of smimeEncrypt/smimeSign is true.

   *smimeSignOpaque: "Boolean" (default: true). If has the value
    "true", this requests the JMAP server to use application/pkcs7-
    mime media type for S/MIME signing, otherwise multipart/signed
    media type.

If both "smimeSign" and "smimeEncrypt" are set to true, the message is first signed and then the signed version is encrypted (in that order).

(Note that this extension doesn't allow management of private keys/certificates. How private keys are managed or configured for a particular user is out of scope for this document.)

```
[[ "Email/set", {
  "accountId": "ue150411c",
  "create": {
    "k192": {
      "mailboxIds": {
        "2ea1ca41b38e": true
      },
      "keywords": {
        "$seen": true,
        "$draft": true
      },
      "from": [{
        "name": "Joe Bloggs",
        "email": "joe@example.com"
      }],
      "subject": "World domination",
      "receivedAt": "2021-07-07T01:03:11Z",
      "sentAt": "2021-07-10T11:03:11+10:00",
      "smimeSign": true,
      "smimeEncrypt": true,
      "bodyStructure": {
        "type": "text/plain",
        "partId": "bd48",
        "header:Content-Language": "en"
      },
      "bodyValues": {
        "bd48": {
          "value": "I have the most brilliant plan.  Let me tell
            you all about it.",
          "isTruncated": false
        }
      }
    }
  }
}, "0" ]]
```

This will result in the following response:

```
[[ "Email/set", {
  "accountId": "ue150411c",
  "oldState": "780823",
  "newState": "780839",
  "created": {
    "k192": {
      "id": "Mf40b5f831efa7233b9eb1c7f",
      "blobId": "Gf40b5f831efa7233b9eb1c7f8f97d84eeeee64f7",
      "threadId": "Td957e72e89f516dc",
      "size": 5096
```

```
      }
    },
    ...
  }, "0" ]]
```

Figure 1: Example 1:

5. Extension to Email/get and Email/query for S/MIME decryption

[RFC8621] defines Email/get method for retrieving information about
email messages. This document defines the following additional
request arguments of the "bodyProperties" object that can be used to
facilitate decryption of S/MIME encrypted messages:

*smimeBlobId: "Id|null". The id representing the raw octets of the
decrypted contents of the part. When processing this request
argument, the server first removes the Content-Transfer-Encoding
(see then "blobId" request argument in RFC 8621). If the Content-
Transfer-Encoding is supported by the server, the content is then
S/MIME decrypted. The resulting Id can be used in Email/parse
method to import the decrypted message. If the body part is not
encrypted, the returned smimeBlobId attribute has the same value
as the "blobId" attribute.

```
    [[ "Email/get", {
        "ids": [ "f123u986" ],
        "properties": [ "threadId", "mailboxIds", "from", "subject",
          "receivedAt", "htmlBody" ],
        "bodyProperties": [ "partId", "smimeBlobId", "size", "type" ]
      }, "#1" ]]
```

This will result in the following response:

```
    [[ "Email/get", {
     "accountId": "abc",
     "state": "41234123231",
     "list": [
       {
         "id": "f123u986",
         "threadId": "cb1314a",
         "mailboxIds": { "da123c": true },
         "from": [{ "name": "Mice Ace", "email": "mike@example.com" }],
         "subject": "Dinner on Saturday?",
         "receivedAt": "2023-03-09T14:12:00Z",

         "htmlBody": [{
           "partId": "1",
           "smimeBlobId": "B841623871",
           "size": 120537,
           "type": "text/html"
         }]
       }
     ]
    }, "#1" ]]
```

Figure 2: Example 2:

[RFC8621] defines Email/query method for searching for email
messages. This document defines the following additional request
arguments to the *FilterCondition* object that can be used to search
for S/MIME encrypted messages:

  *isEncrypted: "Boolean" (default: false) If isEncrypted is true,
   then an Email matches this condition if its top level body part
   has content type "application/pkcs7-mime" with smime-type
   parameter that has the case-insensitive value "enveloped-data" or
   "authEnveloped-data". [[Alexey: Do we want to limit this to S/
   MIME encryption and not OpenPGP?]]

  *isNotEncrypted: "Boolean" (default: false) If isNotEncrypted is
   true, then an Email matches this condition if its top level body
   part has any content type other than "application/pkcs7-mime", or
```

its top level body part has content type "application/pkcs7-mime"
but the smime-type parameter has the case-insensitive value other
than "enveloped-data" or "authEnveloped-data". [[Alexey: what if
smime-type is absent? It is defined as optional! Shall we make
compliant server implementations test the inner CMS structure
type?]]

## 6.  IANA Considerations

### 6.1.  JMAP capability registration for "smime-advanced"

IANA is requested to register the "smime" JMAP Capability as
follows:

Capability Name: "urn:ietf:params:jmap:smime-advanced"

Specification document: this document

Intended use: common

Change Controller: IETF

Security and privacy considerations: this document, Section 7

### 6.2.  JMAP Error Codes Registry Updates

### 6.2.1.  signedSenderNotAllowed error code

JMAP Error Code: signedSenderNotAllowed

Intended use: common

Change controller: IETF

Reference: This document, Section 4

Description: JMAP account is not authorized to S/MIME sign message
as the specified sender.

### 6.2.2.  validEncryptionKeyNotFound error code

JMAP Error Code: validEncryptionKeyNotFound

Intended use: common

Change controller: IETF

Reference: This document, Section 4

Description: S/MIME encrypted message can't be generated because no valid certificate (non expired and non revoked) can be found for one of recipients.

## 7.  Security Considerations

This JMAP extension assumes trust between the user and the JMAP server for purposes of signing and encrypting messages on user's behalf.

This JMAP extension also relies on access to user's (or organization's) addressbook which contain up-to-date certificates for recipients.

This JMAP extension doesn't support management of user's private keys and corresponding certificates.

## 8.  Normative References

[RFC1847]   Galvin, J., Murphy, S., Crocker, S., and N. Freed, "Security Multiparts for MIME: Multipart/Signed and Multipart/Encrypted", RFC 1847, DOI 10.17487/RFC1847, October 1995, <https://www.rfc-editor.org/info/rfc1847>.

[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/info/rfc2119>.

[RFC8550]   Schaad, J., Ramsdell, B., and S. Turner, "Secure/Multipurpose Internet Mail Extensions (S/MIME) Version 4.0 Certificate Handling", RFC 8550, DOI 10.17487/RFC8550, April 2019, <https://www.rfc-editor.org/info/rfc8550>.

[RFC8551]   Schaad, J., Ramsdell, B., and S. Turner, "Secure/Multipurpose Internet Mail Extensions (S/MIME) Version 4.0 Message Specification", RFC 8551, DOI 10.17487/RFC8551, April 2019, <https://www.rfc-editor.org/info/rfc8551>.

[RFC8620]   Jenkins, N. and C. Newman, "The JSON Meta Application Protocol (JMAP)", RFC 8620, DOI 10.17487/RFC8620, July 2019, <https://www.rfc-editor.org/info/rfc8620>.

[RFC8621]   Jenkins, N. and C. Newman, "The JSON Meta Application Protocol (JMAP) for Mail", RFC 8621, DOI 10.17487/RFC8621, August 2019, <https://www.rfc-editor.org/info/rfc8621>.

**[draft-ietf-lamps-header-protection]**
                              Gillmor, D. K., Hoeneisen, B.,
           and A. Melnikov, "Header Protection for Cryptographically
           Protected E-mail", Work in Progress, Internet-Draft,
           draft-ietf-lamps-header-protection-13, 10 March 2023,
           <https://datatracker.ietf.org/doc/html/draft-ietf-lamps-
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