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## Revision Summary

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# Table of Contents

1 **Introduction** ........................................................................................................... 6
   1.1 Glossary ................................................................................................................ 6
1.2 References .................................................................................................................. 7
   1.2.1 Normative References ....................................................................................... 7
   1.2.2 Informative References .................................................................................... 8
1.3 Overview .................................................................................................................... 8
1.4 Relationship to Other Protocols .............................................................................. 8
1.5 Prerequisites/Preconditions ..................................................................................... 9
1.6 Applicability Statement ......................................................................................... 9
1.7 Versioning and Capability Negotiation ................................................................. 9
1.8 Vendor-Extensible Fields ........................................................................................ 9
1.9 Standards Assignments............................................................................................ 9

2 **Messages** ............................................................................................................... 10
   2.1 Transport .............................................................................................................. 10
   2.2 Message Syntax .................................................................................................... 10
      2.2.1 Message Object Properties ............................................................................ 10
         2.2.1.1 PidLidSpamOriginalFolder Property ..................................................... 10
         2.2.1.2 PidNameExchangeJunkEmailMoveStamp Property .............................. 10
         2.2.1.3 PidTagContentFilterSpamConfidenceLevel Property ...................... 10
      2.2.2 Junk Email Rule Properties ........................................................................... 10
         2.2.2.1 PidTagJunkAddRecipientsToSafeSendersList Property ...................... 10
         2.2.2.2 PidTagJunkIncludeContacts Property ............................................... 11
         2.2.2.3 PidTagJunkDeleteProperty ................................................................... 11
         2.2.2.4 PidTagJunkPhishingEnableLinks Property ......................................... 11
         2.2.2.5 PidTagJunkThreshold Property ........................................................... 11
         2.2.2.6 PidTagJunkMoveProperty .................................................................... 12
      2.2.3 Inbox Folder Properties .................................................................................. 12
         2.2.3.1 PidTagAdditionalRenEntryIds Property ............................................ 12
      2.2.4 Format of the Junk Email Rule ....................................................................... 12

3 **Protocol Details** .................................................................................................. 13
   3.1 Server Details ...................................................................................................... 13
      3.1.1 Abstract Data Model ..................................................................................... 13
         3.1.1.1 Per Mailbox ........................................................................................... 13
         3.1.1.2 Per Messaging Object ............................................................................ 13
      3.1.2 Timers ............................................................................................................. 13
      3.1.3 Initialization .................................................................................................. 13
      3.1.4 Higher-Layer Triggered Events .................................................................... 13
         3.1.4.1 Creating the Junk Email Rule .............................................................. 13
      3.1.5 Message Processing Events and Sequencing Rules ....................................... 15
         3.1.5.1 Executing the Junk Email Rule on a Message ...................................... 15
      3.1.6 Timer Events .................................................................................................. 16
      3.1.7 Other Local Events ...................................................................................... 16
   3.2 Client Details ....................................................................................................... 16
      3.2.1 Abstract Data Model ..................................................................................... 16
         3.2.1.1 Per Mailbox ........................................................................................... 16
         3.2.1.2 Per Messaging Object ............................................................................ 16
      3.2.2 Timers ............................................................................................................. 16
      3.2.3 Initialization .................................................................................................. 16
      3.2.4 Higher-Layer Triggered Events .................................................................... 17
         3.2.4.1 Obtaining or Creating the Junk Email Move Stamp ............................ 17
         3.2.4.1.1 Obtaining the Junk Email Move Stamp ........................................... 17
         3.2.4.1.2 Generating the Junk Email Move Stamp ........................................ 17
         3.2.4.2 Modifying the Junk Email Rule ............................................................ 17
3.2.4.3 Retrieval of Spam Preferences ......................................................... 18
3.2.4.4 User Changes Client Spam Preferences ........................................... 18
3.2.4.5 Server Junk Email Rule Changes ..................................................... 18
3.2.4.6 User Adds a New Contact to Their Contacts Folder ....................... 18
3.2.4.7 User Sends an E-Mail ..................................................................... 18
3.2.5 Message Processing Events and Sequencing Rules .......................... 18
3.2.5.1 Receiving an E-Mail Message ....................................................... 18
3.2.6 Timer Events ................................................................................. 18
3.2.7 Other Local Events ....................................................................... 18

4 Protocol Examples .................................................................................. 20
4.1 Adding a Sender to the Trusted Recipients List .................................... 20

5 Security ............................................................................................... 23
5.1 Security Considerations for Implementers ........................................... 23
5.2 Index of Security Parameters ............................................................. 23

6 Appendix A: Product Behavior ............................................................... 24

7 Change Tracking ................................................................................... 25

8 Index ...................................................................................................... 26
1 Introduction

The Spam Confidence Level Protocol enables the sharing of preferences for the filtering of unsolicited e-mail messages between the client and the server.

Sections 1.5, 1.8, 1.9, 2, and 3 of this specification are normative. All other sections and examples in this specification are informative.

1.1 Glossary

This document uses the following terms:

**action**: A discrete operation that is executed on an incoming Message object when all conditions in the same rule are TRUE. A rule contains one or more actions.

**contact**: A person, company, or other entity that is stored in a directory and is associated with one or more unique identifiers and attributes, such as an Internet message address or login name.

**Contacts folder**: A Folder object that contains Contact objects.

**domain**: A set of users and computers sharing a common namespace and management infrastructure. At least one computer member of the set must act as a domain controller (DC) and host a member list that identifies all members of the domain, as well as optionally hosting the Active Directory service. The domain controller provides authentication of members, creating a unit of trust for its members. Each domain has an identifier that is shared among its members. For more information, see [MS-AUTHSOD] section 1.1.1.5 and [MS-ADTS].

**entry ID**: See EntryID.

**extended rule**: A rule that is added to, modified, and deleted from a server by using a mechanism other than standard rules, but is otherwise functionally identical to a standard rule.

**folder associated information (FAI)**: A collection of Message objects that are stored in a Folder object and are typically hidden from view by email applications. An FAI Message object is used to store a variety of settings and auxiliary data, including forms, views, calendar options, favorites, and category lists.

**Folder object**: A messaging construct that is typically used to organize data into a hierarchy of objects containing Message objects and folder associated information (FAI) Message objects.

**Inbox folder**: A special folder that is the default location for Message objects received by a user or resource.

**Junk Email folder**: A special folder that is the default location for Message objects that are determined to be junk email by a Junk Email rule.

**Junk Email rule**: An extended rule that describes a spam filter.

**mailbox**: A message store that contains email, calendar items, and other Message objects for a single recipient.

**Message object**: A set of properties that represents an email message, appointment, contact, or other type of personal-information-management object. In addition to its own properties, a Message object contains recipient properties that represent the addressees to which it is addressed, and an attachments table that represents any files and other Message objects that are attached to it.
**message store**: A unit of containment for a single hierarchy of Folder objects, such as a mailbox or public folders.

**phishing**: The luring of sensitive information, such as passwords or other personal information, from a recipient by masquerading as someone who is trustworthy and has a real need for such information.

**phishing message**: An email message that is designed to trick a recipient into divulging sensitive information, such as passwords or other personal information, to a non-trustworthy source.

**recipient**: An entity that can receive email messages.

**remote operation (ROP)**: An operation that is invoked against a server. Each ROP represents an action, such as delete, send, or query. A ROP is contained in a ROP buffer for transmission over the wire.

**restriction**: A filter used to map some domain into a subset of itself, by passing only those items from the domain that match the filter. Restrictions can be used to filter existing Table objects or to define new ones, such as search folder or rule criteria.

**ROP request**: See ROP request buffer.

**rule**: An item that defines a condition and an action. The condition is evaluated for each Message object as it is delivered, and the action is executed if the new Message object matches the condition.

**Simple Mail Transfer Protocol (SMTP)**: A member of the TCP/IP suite of protocols that is used to transport Internet messages, as described in [RFC5321].

**spam**: An unsolicited email message.

**spam filter**: A filter that checks certain conditions in a message to determine a spam confidence level.

**MAY, SHOULD, MUST, SHOULD NOT, MUST NOT**: These terms (in all caps) are used as defined in [RFC2119]. All statements of optional behavior use either MAY, SHOULD, or SHOULD NOT.

### 1.2 References

Links to a document in the Microsoft Open Specifications library point to the correct section in the most recently published version of the referenced document. However, because individual documents in the library are not updated at the same time, the section numbers in the documents may not match. You can confirm the correct section numbering by checking the Errata.

#### 1.2.1 Normative References

We conduct frequent surveys of the normative references to assure their continued availability. If you have any issue with finding a normative reference, please contact dochelp@microsoft.com. We will assist you in finding the relevant information.

[MS-OXCDATA] Microsoft Corporation, "Data Structures".


[MS-OXOMSG] Microsoft Corporation, "Email Object Protocol".

[MS-OXORULE] Microsoft Corporation, "Email Rules Protocol".
1.2.2 Informative References

- [MS-OXOSFLD] Microsoft Corporation, "Special Folders Protocol".

1.3 Overview

The Spam Confidence Level Protocol enables the client to process e-mail messages that are likely to be phishing messages or spam by doing the following:

- Blocking the delivery of messages to the Inbox folder that are from specific senders or classes of senders.
- Allowing the delivery of messages that are either from specific senders or to specific recipients, regardless of whether the messages are identified as spam or phishing messages.

The Junk Email rule, which is an extended rule, specifies the client's spam and phishing preferences. When an e-mail message is delivered to a server, the server applies the Junk Email rule against the properties of the e-mail message to determine whether to put the message in the Junk Email folder.

Clients can use the junk email move stamp to indicate that a message bypasses the client's spam filter. A common scenario in which this occurs is when the client's spam filter has already moved the message to the Junk Email folder once. If the user has retrieved a message from the Junk Email folder, it will not be reprocessed. Clients can also set this property to populate a message store with trusted Message objects that are never spam but might look like spam to a spam filter. The RSS Object Protocol, as described in [MS-OXORSS], is a practical example of this method.

1.4 Relationship to Other Protocols

The Spam Confidence Level Protocol relies on the following protocols:

- The Email Rules Protocol, as described in [MS-OXORULE], to create rules.
- The Message and Attachment Object Protocol, as described in [MS-OXCMSG], to create and access Message objects.
- The Folder Object Protocol, as described in [MS-OXCFOLD], to access Folder objects.
- The Property and Stream Object Protocol, as described in [MS-OXCPRPT], to get and set properties on Message objects and Folder objects.
For conceptual background information and overviews of the relationships and interactions between this and other protocols, see [MS-OXPROTO].

1.5 Prerequisites/Preconditions

This protocol assumes that a system is in place to set and retrieve the properties of Message objects and of Folder objects.

1.6 Applicability Statement

This protocol defines the properties and rules that are relevant to the processing of spam and phishing messages. This protocol does not specify the algorithm that determines the likelihood of a message being spam or a phishing message or whether to consider a sender safe or blocked.

1.7 Versioning and Capability Negotiation

None.

1.8 Vendor-Extensible Fields

None.

1.9 Standards Assignments

None.
2 Messages

2.1 Transport
The Spam Confidence Level Protocol uses the same underlying transport as that used by the Message and Attachment Object Protocol, as specified in [MS-OXCMMSG], and the Email Rules Protocol, as specified in [MS-OXORULE].

2.2 Message Syntax

2.2.1 Message Object Properties
The properties persisted on a Message object are listed in sections 2.2.1.1 through 2.2.1.3.

2.2.1.1 PidLidSpamOriginalFolder Property
Type: PtypBinary ([MS-OXCDATA] section 2.11.1)
The PidLidSpamOriginalFolder property ([MS-OXPROPS] section 2.302) specifies the folder that contained the message before the message was moved into the Junk Email folder. The value of this property is the entry ID of the folder.

2.2.1.2 PidNameExchangeJunkEmailMoveStamp Property
Type: PtypInteger32 ([MS-OXCDATA] section 2.11.1)
The PidNameExchangeJunkEmailMoveStamp property ([MS-OXPROPS] section 2.425), if present and valid, indicates that either the message was already processed or the message is safe. The value of this property is valid only if it matches the value at index 5 of the PidTagAdditionalRenEntryIds property (section 2.2.3.1).

If the PidNameExchangeJunkEmailMoveStamp property is not present or if the value of the PidNameExchangeJunkEmailMoveStamp property is not valid, the message MUST be processed by the client's spam filter.

2.2.1.3 PidTagContentFilterSpamConfidenceLevel Property
Type: PtypInteger32 ([MS-OXCDATA] section 2.11.1)
The PidTagContentFilterSpamConfidenceLevel property ([MS-OXPROPS] section 2.647) indicates the likelihood that the e-mail message is spam. The value MUST be in the range -1 to 9 (inclusive). The value -1 indicates that the message is not spam, and a value greater than -1 indicates that the message likely is spam. The greater the number, the higher the likelihood that the message is spam, with 9 indicating the highest likelihood. This property SHOULD be set by the server's spam filter before the Junk Email rule is executed.

2.2.2 Junk Email Rule Properties
The properties persisted on the Junk Email rule are listed in sections 2.2.2.1 through 2.2.2.6.

2.2.2.1 PidTagJunkAddRecipientsToSafeSendersList Property
Type: PtypInteger32 ([MS-OXCDATA] section 2.11.1)
The **PidTagJunkAddRecipientsToSafeSendersList** property ([MS-OXPROPS] section 2.757) MUST be set to either 0 (zero) or 1. The value 1 indicates that the mail recipients are to be added to the safe senders list. The value zero indicates that the mail recipients are not to be added to the safe senders list. The safe senders list is a collection of e-mail addresses that represent senders whose messages are never marked as **spam**.

2.2.2.2 **PidTagJunkIncludeContacts Property**

Type: **PtypInteger32** ([MS-OXCDATA] section 2.11.1)

The **PidTagJunkIncludeContacts** property ([MS-OXPROPS] section 2.758) indicates whether e-mail messages from contacts can be treated as junk.

If this property is set to 1, the **Junk Email rule** MUST specify conditions such that e-mail messages from contacts are never treated as junk. If this property is set to 0 (zero), the Junk Email rule MUST specify conditions such that e-mail messages from contacts can be treated as junk. The conditions of the Junk Email rule are specified in the **PidTagExtendedRuleMessageCondition** property ([MS-OXORULE] section 2.2.4.1.10). For details about creating the Junk Email rule, see section 3.1.4.1.

2.2.2.3 **PidTagJunkPermanentlyDelete Property**

Type: **PtypInteger32** ([MS-OXCDATA] section 2.11.1)

The **PidTagJunkPermanentlyDelete** property ([MS-OXPROPS] section 2.759) indicates whether spam messages can be permanently deleted. If this property is set to 1, messages identified as spam can be permanently deleted. If this property is set to 0 (zero), messages identified as spam cannot be permanently deleted.

2.2.2.4 **PidTagJunkPhishingEnableLinks Property**

Type: **PtypBoolean** ([MS-OXCDATA] section 2.11.1)

The **PidTagJunkPhishingEnableLinks** property ([MS-OXPROPS] section 2.760) indicates whether the phishing stamp on the message can be ignored. If the value is nonzero (TRUE), the phishing stamp, as specified in [MS-OXPHISH] section 2.2.1.1, can be ignored. If the value is zero (FALSE), the phishing stamp on the message cannot be ignored.

2.2.2.5 **PidTagJunkThreshold Property**

Type: **PtypInteger32** ([MS-OXCDATA] section 2.11.1)

The **PidTagJunkThreshold** property ([MS-OXPROPS] section 2.761) indicates how aggressively the client is to send incoming mail to the **Junk Email folder**. When the value is 0xFFFFFFFF, spam filtering SHOULD NOT be applied; however, the blocked sender domains clause of the **Junk Email rule** MUST still be applied. A value of 0x80000000 indicates that all mail is spam except those messages from senders on the trusted senders list or sent to recipients on the trusted recipients list.

The following table lists the valid values for this property.

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<tr>
<td>0x00000006</td>
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</tr>
<tr>
<td>0x0000003</td>
<td>High spam filtering</td>
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<td>0x80000000</td>
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2.2.2.6 PidTagReportTime Property

Type: PtypTime ([MS-OXCDATA] section 2.11.1)

The PidTagReportTime property ([MS-OXPROP] section 2.928) indicates the last time the contact list that is controlled by the PidTagJunkIncludeContacts property (section 2.2.2.2) was updated.

2.2.3 Inbox Folder Properties

The property listed in section 2.2.3.1 is on the Inbox folder.

2.2.3.1 PidTagAdditionalRenEntryIds Property

Type: PtypMultipleBinary ([MS-OXCDATA] section 2.11.1)

The PidTagAdditionalRenEntryIds property ([MS-OXOSFLD] section 2.2.4) is persisted on the Inbox folder of a message store. The value at zero-based index five of this property is used to validate the PidNameExchangeJunkEmailMoveStamp property (section 2.2.1.2), as specified in section 3.1.4.1.

2.2.4 Format of the Junk Email Rule

The Junk Email rule stores preferences regarding how spam filtering is applied.

The format of the preferences is a server-side extended rule that follows the Email Rules Protocol, as specified in [MS-OXORULE]. This format is convenient for a server that implements the Email Rules Protocol, because executing the rule on a message will apply the spam filtering preferences to the message and move it to the Junk Email folder if it fits the condition for spam.

The restriction that makes up the condition of the Junk Email rule, as specified in [MS-OXORULE] section 2.2.1.3.1.9, contains several interdependent clauses. These clauses are essentially lists of Simple Mail Transfer Protocol (SMTP) e-mail addresses and several categories of e-mail domains.

The clauses are listed in the following table.

<table>
<thead>
<tr>
<th>Blocked sender addresses</th>
<th>E-mail addresses of senders (who the message was sent from) to be blocked</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blocked sender domains</td>
<td>E-mail domains of senders that can be blocked.</td>
</tr>
<tr>
<td>Trusted sender domains</td>
<td>E-mail domains of senders that are trusted.</td>
</tr>
<tr>
<td>Trusted recipient domains</td>
<td>E-mail domains of recipients (who the message was sent to) that are trusted.</td>
</tr>
<tr>
<td>Trusted sender addresses</td>
<td>E-mail addresses of senders that can be trusted.</td>
</tr>
<tr>
<td>Trusted recipient addresses</td>
<td>E-mail addresses of recipients that can be trusted.</td>
</tr>
<tr>
<td>Trusted contact addresses</td>
<td>E-mail addresses of contacts from the mailbox Contacts folder.</td>
</tr>
</tbody>
</table>

There is also a clause that checks the value of the PidTagContentFilterSpamConfidenceLevel property (section 2.2.1.3) in the event that this property was applied to the message during delivery.

For more details about executing the Junk Email rule on a message, see section 3.1.5.1.
3 Protocol Details

3.1 Server Details

3.1.1 Abstract Data Model

This section describes a conceptual model of possible data organization that an implementation maintains to participate in this protocol. The described organization is provided to facilitate the explanation of how the protocol behaves. This document does not mandate that implementations adhere to this model as long as their external behavior is consistent with that described in this document.

The following common abstract data model (ADM) types are defined in this document:

Mailbox

Messaging Object

3.1.1.1 Per Mailbox

Mailboxes are represented by the Mailbox ADM type. The following ADM elements are maintained for each Mailbox ADM type:

Mailbox.JunkEmailRule: A server-side extended rule that moves all spam messages to the Junk Email folder.

3.1.1.2 Per Messaging Object

Message objects are represented by the MessagingObject ADM type.

3.1.2 Timers

None.

3.1.3 Initialization

When the user first interacts with the mailbox, the server SHOULD create the Junk Email rule in the Inbox folder.

3.1.4 Higher-Layer Triggered Events

3.1.4.1 Creating the Junk Email Rule

The Junk Email rule is a server-side extended rule that follows the syntax specified in [MS-OXORULE] section 2.2.4.

The Junk Email rule is represented by a folder associated information (FAI) message. The Junk Email rule is created or modified by adding or modifying an FAI message as specified in [MS-OXORULE] section 3.1.4.2.2.

The FAI Message object MUST have properties set as follows.

The PidTagRuleMessageName property ([MS-OXORULE] section 2.2.4.1.1) MUST be set to "Junk Email rule".
The PidTagSubject property ([MS-OXCMSG] section 2.2.1.46) MUST be set to "Junk E-mail rule".

The PidTagRuleMessageProvider property ([MS-OXORULE] section 2.2.4.1.7) MUST be set to "JunkEmailRule".

The PidTagRuleMessageState property ([MS-OXORULE] section 2.2.4.1.4) MUST be set to ST_ENABLED | ST_EXIT_LEVEL | ST_SKIP_IF_SCL_IS_SAFE.

The PidTagRuleMessageSequence property ([MS-OXORULE] section 2.2.4.1.3) MUST be set to 0 (zero).

The PidTagRuleMessageUserFlags property ([MS-OXORULE] section 2.2.4.1.5) MUST be set to 0 (zero).

The PidTagRuleMessageLevel property ([MS-OXORULE] section 2.2.4.1.6) MUST be set to 0 (zero).

The PidTagExtendedRuleMessageActions property ([MS-OXORULE] section 2.2.4.1.9) MUST contain the following two actions in the format specified for the PidTagExtendedRuleMessageActions property:

- An OP_MOVE action to move the message to the Junk Email folder.
- An OP_TAG action to set the PidNameExchangeJunkEmailMoveStamp property (section 2.2.1.2) on the message that is moved to the Junk Email folder.

The PidTagReportTime (section 2.2.2.6), PidTagJunkIncludeContacts (section 2.2.2.2), and PidTagJunkThreshold (section 2.2.2.5) properties are set as specified. The PidTagExtendedRuleMessageCondition property ([MS-OXORULE] section 2.2.4.1.10) MUST contain the following restrictions. The formats of the restriction structures are specified in [MS-OXCDATA] section 2.12.1 through [MS-OXCDATA] section 2.12.12. All e-mail addresses MUST be of the SMTP address type.

A RES_AND restriction with two subclauses:

1. A RES_OR restriction with two subclauses:
   1. A RES_OR restriction with zero or more subclauses, one for each bad sender e-mail address. Each subclause MUST be a RES_CONTENT restriction with the FuzzyLevelLow field set to FL_FULLSTRING and the FuzzyLevelHigh field set to FL_IGNORECASE comparing the value of the PidTagSenderEmailAddress property ([MS-OXOMSG] section 2.2.1.49) with a string that contains the e-mail address of a bad sender.

2. A RES_AND restriction with two subclauses:
   1. A RES_EXIST restriction for the PidTagContentFilterSpamConfidenceLevel property (section 2.2.1.3).
   2. A RES_PROPERTY restriction for the PidTagContentFilterSpamConfidenceLevel property, with a relative operation of RELOP_GT against a value of -1.

   - A RES_OR restriction with zero or more subclauses, one for each bad sender domain. Each subclause MUST be a RES_CONTENT restriction with the FuzzyLevelLow field set to FL_SUBSTRING and the FuzzyLevelHigh field set to FL_IGNORECASE comparing the value of the PidTagSenderEmailAddress property with a string that contains the domain of a bad sender.
2. A **RES_NOT** restriction with a **RES_OR** restriction that has two subclauses:

   1. A **RES_OR** restriction with zero or more subclauses, one for each trusted sender domain. Each subclause MUST be a **RES_CONTENT** restriction with the **FuzzyLevelLow** field set to FL_SUBSTRING and the **FuzzyLevelHigh** field set to FL_IGNORECASE comparing the value of the **PidTagSenderEmailAddress** property with a string that contains the domain of a trusted sender.

   2. A **RES_SUB** restriction for the **PidTagMessageRecipients** property ([MS-OXCMGS] section 2.2.1.47), with a **RES_OR** restriction with zero or more subclauses, one for each trusted recipient domain. Each subclause MUST be a **RES_CONTENT** restriction with the **FuzzyLevelLow** field set to FL_SUBSTRING and the **FuzzyLevelHigh** field set to FL_IGNORECASE comparing the value of the **PidTagEmailAddress** property (section 2.2.3.14) with a string that contains the domain of a trusted recipient.

2. A **RES_NOT** restriction with a **RES_OR** restriction that has three subclauses:

   1. A **RES_OR** restriction with zero or more subclauses, one for each trusted sender e-mail address. Each subclause MUST be a **RES_CONTENT** restriction with the **FuzzyLevelLow** field set to FL_FULLSTRING and the **FuzzyLevelHigh** field set to FL_IGNORECASE comparing the value of the **PidTagSenderEmailAddress** property with a string that contains the e-mail address of a trusted sender.

   2. A **RES_SUB** restriction for the **PidTagMessageRecipients** property, with a **RES_OR** restriction with zero or more subclauses, one for each trusted recipient e-mail address. Each subclause MUST be a **RES_CONTENT** restriction with the **FuzzyLevelLow** field set to FL_FULLSTRING and the **FuzzyLevelHigh** field set to FL_IGNORECASE comparing the value of the **PidTagEmailAddress** property with a string that the e-mail address of a trusted recipient.

   3. A **RES_OR** restriction with zero or more subclauses. Each subclause MUST be a **RES_CONTENT** restriction with the **FuzzyLevelLow** field set to FL_SUBSTRING and the **FuzzyLevelHigh** field set to FL_IGNORECASE comparing the value of the **PidTagSenderEmailAddress** property with a string that contains the e-mail address of a contact from the mailbox's contact list. If the **PidTagJunkIncludeContacts** property (section 2.2.2.2) is set to 0 (zero), this restriction MUST be empty (NULL); if the **PidTagJunkIncludeContacts** property is set to 1, then there SHOULD be one of these restrictions for each trusted contact e-mail address.

### 3.1.5 Message Processing Events and Sequencing Rules

None.

#### 3.1.5.1 Executing the Junk Email Rule on a Message

When the server executes the Junk Email rule on a message, it applies the spam filtering preferences to the message and then handles the message according to the value of the **PidTagExtendedRuleMessageCondition** property ([MS-OXORULE] section 2.2.4.1.10) on the Junk Email rule (as specified in section 3.1.4.1).

If the **PidTagExtendedRuleMessageCondition** property on the Junk Email rule evaluates to true, then the server does the following:

1. Moves the message to the **Junk Email folder**.

2. Sets the **PidNameExchangeJunkEmailMoveStamp** property (section 2.2.1.2) on the message.
If the `PidTagExtendedRuleMessageCondition` property on the Junk Email rule evaluates to false, the server routes the message to the **Inbox folder**.

### 3.1.6 Timer Events

None.

### 3.1.7 Other Local Events

None.

### 3.2 Client Details

#### 3.2.1 Abstract Data Model

This section describes a conceptual model of possible data organization that an implementation maintains to participate in this protocol. The described organization is provided to facilitate the explanation of how the protocol behaves. This document does not mandate that implementations adhere to this model, as long as their external behavior is consistent with that described in this document.

The following common ADM types are defined in this document:

- **Mailbox**
- **Messaging Object**

##### 3.2.1.1 Per Mailbox

Mailboxes are represented by the `Mailbox` ADM type. The following ADM elements are maintained for each `Mailbox` ADM type:

- **Mailbox.MessagingObject**: An abstract representation of a **Message object**.

##### 3.2.1.2 Per Messaging Object

**Message objects** are represented by the `MessagingObject` ADM type. The following ADM elements are maintained for each `MessagingObject` ADM type:

- **MessagingObject.JunkEMailStamp**: A client-generated code that prevents a Message object from being flagged as **spam** by the server's **Junk Email rule**.

#### 3.2.2 Timers

None.

#### 3.2.3 Initialization

The client SHOULD create the junk email move stamp on the first interaction of the user with a **mailbox** that requires it.
3.2.4 Higher-Layer Triggered Events

3.2.4.1 Obtaining or Creating the Junk Email Move Stamp

The **PidNameExchangeJunkEmailMoveStamp** property (section 2.2.1.2) is set by the client on every message that is moved by the **Junk Email rule** or is otherwise trusted content.

The value of the **PidNameExchangeJunkEmailMoveStamp** property is valid only if it matches the value in the **PidTagAdditionalRenEntryIds** property (section 2.2.3.1), as specified in section 3.2.4.1.1.

The client MUST obtain or create the junk email move stamp as specified in sections 3.2.4.1.1 and 3.2.4.1.2.

3.2.4.1.1 Obtaining the Junk Email Move Stamp

To obtain the junk email move stamp, the client MUST read the **PidTagAdditionalRenEntryIds** property (section 2.2.3.1) from the **Inbox folder** and do one the following:

- If there is a value at zero-based index 5 of the array, this value is the value of the **PidNameExchangeJunkEmailMoveStamp** property (section 2.2.1.2), stored as an unsigned **PtypInteger32** ([MS-OCXDATA] section 2.11.1). The client MUST use this value for the **PidNameExchangeJunkEmailMoveStamp** property when creating the **Junk Email rule**.

- If there is no value at zero-based index 5, the client MUST generate a value for the **PidNameExchangeJunkEmailMoveStamp** property, as described in section 3.2.4.1.2.

3.2.4.1.2 Generating the Junk Email Move Stamp

If there is no value at zero-based index 5 of the **PidTagAdditionalRenEntryIds** property (section 2.2.3.1) of the **Inbox folder**, the client MUST generate an arbitrary **PtypInteger32** value ([MS-OCXDATA] section 2.11.1) and store it as an unsigned **PtypInteger32** to the zero-based index 5 of the **PidTagAdditionalRenEntryIds** property of the Inbox folder. For security details, see section 5.1.

The client MUST set the value of the **PidNameExchangeJunkEmailMoveStamp** (section 2.2.1.2) to the **PtypInteger32** value that is stored in the zero-based index 5 of the **PidTagAdditionalRenEntryIds** property of the Inbox folder.

3.2.4.2 Modifying the Junk Email Rule

To store user preferences regarding how spam filtering occurs for a **mailbox**, the client modifies the **Junk Email rule** created on the server. The **rule** itself is executed only on the server.

Clients interpret properties on the message and data in the **PidTagExtendedRuleMessageCondition** property ([MS-OCXORULE] section 2.2.4.1.10) of the Junk Email rule as specifying preferences and lists of data that are used to control the client spam filter and user interface elements.

The rule contains a **PidTagContentFilterSpamConfidenceLevel** property (section 2.2.1.3) that can be used to determine the user preference for how aggressively spam is filtered.

The rule contains various lists of **SMTP** e-mail addresses that are stored in the **PidTagExtendedRuleMessageCondition** property, as specified in section 2.2.4. The client MUST format the Junk Email rule as specified in section 3.1.4.1.
3.2.4.3 Retrieval of Spam Preferences

After clients log on to the messaging server, they SHOULD retrieve preferences from the server Junk Email rule, as specified in [MS-OXORULE] section 3.1.4.1, before they apply any spam filtering on messages.

3.2.4.4 User Changes Client Spam Preferences

When users change their spam preferences, messaging clients SHOULD update the server Junk Email rule, as specified in [MS-OXORULE] section 3.1.4.2, to match these new preferences.

3.2.4.5 Server Junk Email Rule Changes

Clients SHOULD periodically retrieve the server Junk Email rule, as specified in [MS-OXORULE] section 3.1.4.1, and compare the Junk Email rule settings with the client spam filter settings to determine whether the server Junk Email rule has changed. If the Junk Email rule settings do not match the client spam filter settings, the client SHOULD update its spam filter settings to match the server Junk Email rule settings. The interval at which the client retrieves the server Junk Email rule and compares the settings is implementation-dependent.

3.2.4.6 User Adds a New Contact to Their Contacts Folder

If the PidTagJunkIncludeContacts property (section 2.2.2.2) is present with a value of 1, the client MUST determine whether the added contact has e-mail addresses that are not yet included in the trusted contacts section of the Junk Email rule. If the added contact's e-mail addresses are already included in the trusted contacts section of the Junk Email rule, no action is required. If the added contact has e-mail addresses that are not yet included in the trusted contacts section of the Junk Email rule, the client MUST update the server Junk Email rule (as specified in section 3.1.4.1 and in [MS-OXORULE] section 3.1.4.2.2) to add those e-mail addresses to the restriction.

If the value of the PidTagJunkIncludeContacts property is 0 (zero), no action is required.

3.2.4.7 User Sends an E-Mail

If the PidTagJunkAddRecipientsToSafeSendersList property (section 2.2.2.1) is present with a value of 1, the client MUST update the server Junk Email rule (as specified in section 3.1.4.1 and in [MS-OXORULE] section 3.1.4.2.2) to add the SMTP addresses of the e-mail recipients to the trusted senders clause of the Junk Email rule condition.

If the value of the PidTagJunkAddRecipientsToSafeSendersList property is 0 (zero), no action is required.

3.2.5 Message Processing Events and Sequencing Rules

3.2.5.1 Receiving an E-Mail Message

If the client receives an e-mail message that has the PidNameExchangeJunkEmailMoveStamp property (section 2.2.1.2) set by another client, that property MUST be validated against the PidTagAdditionalRenEntryIds property (section 2.2.3.1), as specified in section 3.2.4.1.2. If the value matches, the client MUST NOT run a spam filter against the e-mail message. Validating the PidNameExchangeJunkEmailMoveStamp property ensures that malicious messaging applications cannot easily circumvent a client's spam filters.

If the client runs a spam filter to determine whether the e-mail message is spam, the client SHOULD use the preferences specified in the Junk Email rule to control the spam filter.
If the client spam filter determines that the e-mail message is spam, the client uses the value of the PidTagJunkPermanentlyDelete property (section 2.2.3) on the Junk Email rule to determine whether to permanently delete the e-mail message. The client SHOULD set the PidLidSpamOriginalFolder property (section 2.2.1) on each message that is moved to the Junk Email folder.

The client can use the PidTagJunkPhishingEnableLinks property (section 2.2.4) on the Junk Email rule to determine whether to enable links within the message.

3.2.6 Timer Events

None.

3.2.7 Other Local Events

None.
4 Protocol Examples

4.1 Adding a Sender to the Trusted Recipients List

Jim consistently receives mail from a mailing list that his spam filter moves to the Junk Email folder. Jim trusts all mail sent to the mailing list SMTP address "recip2@example.com" and so adds the mailing list SMTP address list to his trusted recipients list.

The client first opens the Junk Email rule by using the RopOpenMessage ROP ([MS-OXCROPS] section 2.2.6.1).

The client retrieves the PidTagExtendedRuleMessageCondition property ([MS-OXPROPS] section 2.693) of the Junk Email rule by using the RopGetPropertiesSpecific ROP ([MS-OXCROPS] section 2.2.8.3). The response contains the following data:

```
0000: 00 00 00 00 02 00 00 00 01-02 00 00 00 01 03 00 00
0010: 00 03 00 00 01 00 0F 00-1F 0C 1F 00 1F 0C 62 00
0020: 6C 00 6F 00 63 00 6B 00-65 00 64 00 32 00 40 00
0030: 65 00 78 00 61 00 0D 00-0E 00 0C 00 6C 00 0E 00
0040: 63 00 6F 00 0D 00 0C 00 00-03 00 00 01 00 1F 00 1F
0050: 0C 1F 00 01 0F 0C 62 00 6C-00 6F 00 63 00 0B 00 0F
0060: 00 04 00 33 00 40 00 65-00 6F 00 0B 00 63 00 06
0070: 00 6C 00 6F 00 0D 00 2E 00 63-00 0F 00 6D 00 00 03
0080: 00 00 01 00 0F 00 1F 00 0C-00 1F 0C 00 62 00 06 00
0090: 00 6F 00 63 00 6B 00 65 00-64 00 40 00 65 00 78 00
00A0: 61 00 6D 00 70 00 0C 00 6C-00 6F 00 63 00 0E 00 0F
00B0: 6D 00 00 00 00 00 02 00 00-00 01 02 00 00 00 00 02
00C0: 00 00 00 00 08 03 00 76 40-04 02 03 00 76 40 03 00
00D0: 76 40 0F FF FF FF FF 01 00 00 00 00 00 01 02 00 00
00E0: 00 01 01 00 00 00 03 01-00 01 01 0F 00 1F 0C 1F
00F0: 00 1F 0C 40 00 65 00 6F-00 0D 00 61 00 6D 00 07 00
0100: 0E 00 6C 00 6F 00 0D 00 63-00 06 00 6D 00 00 09 00
0110: 12 0E 01 00 00 00 00 02-01 03 00 00 00 01 01 00
0120: 00 00 03 00 00 01 00 01-0F 00 1F 0C 1F 00 1F 0C
0130: 00 61 00 66 00 65 00 40-00 65 00 78 00 61 00 6D
0140: 00 70 00 0C 00 66 00 65-00 2E 00 63 00 0F 00 6D 00
0150: 00 09 0D 00 12 0E 01 01-00 00 00 00 03 00 00 01 00
0160: 1F 00 03 30 1F 00 03 30-72 00 65 00 63 00 69 00
0170: 70 00 40 00 65 00 78 00-61 00 6D 00 70 00 6C 00
0180: 65 00 2E 00 63 00 6F 00-6D 00 00 00 01 00 00 00
0190: 00
```

The following table lists the spam lists that this data corresponds to. In the "C-style string representation" column, the letter "L" that precedes each string literal indicates that the string is a wide-character string literal (that is, an array of wchar_t).

<table>
<thead>
<tr>
<th>List</th>
<th>C-style string representation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blocked sender addresses</td>
<td>L&quot;<a href="mailto:blocked@example.com">blocked@example.com</a>&quot;</td>
</tr>
<tr>
<td></td>
<td>L&quot;<a href="mailto:blocked2@example.com">blocked2@example.com</a>&quot;</td>
</tr>
<tr>
<td></td>
<td>L&quot;<a href="mailto:blocked3@example.com">blocked3@example.com</a>&quot;</td>
</tr>
<tr>
<td>Blocked sender domains</td>
<td>None</td>
</tr>
<tr>
<td>Trusted sender domains</td>
<td>L&quot;@example.com&quot;</td>
</tr>
<tr>
<td>Trusted recipient domains</td>
<td></td>
</tr>
<tr>
<td>Trusted sender addresses</td>
<td>L&quot;<a href="mailto:safe@example.com">safe@example.com</a>&quot;</td>
</tr>
</tbody>
</table>
The client constructs the new restriction, including recip2@example.com as a trusted recipient. The client sets the new property value on the message. Because this condition can be large, the client chooses to set the property by calling the following ROPs:

- **RopOpenStream** ([MS-OXCROPS] section 2.2.9.1)
- **RopSetStreamSize** ([MS-OXCROPS] section 2.2.9.7)
- **RopWriteStream** ([MS-OXCROPS] section 2.2.9.3)
- **RopCommitStream** ([MS-OXCROPS] section 2.2.9.5)
- **RopRelease** ([MS-OXCROPS] section 2.2.15.3)

The **RopWriteStream** ROP sets the following data:

```
0000: 00 00 00 02 00 00 00 01-02 00 00 00 01 03 00 00
0010: 00 03 00 00 01 01 0F 00-1F 0C 1F 00 0F 0C 62 00
0020: 06 00 06F 00 63 00 6B 00-65 00 64 00 32 00 40 00
0030: 65 00 78 00 61 00 6D 00-70 00 6C 00 65 00 2E 00
0040: 63 00 6F 00 6D 00 00 03 00 00 01 00 1F 00 1F 00
0050: 0C 1F 00 1F 0C 62 00 6C-00 6F 00 63 00 6B 00 65
0060: 00 64 00 33 00 40 00 65-00 78 00 61 00 6D 00 70
0070: 00 6C 00 65 00 2E 00 63-00 6F 00 63 00 6B 00 65
0080: 00 00 01 00 1F 00 1F 0C-1F 00 1F 0C 62 00 6C 00
0090: 0F 00 63 00 6B 00 65-00 64 00 40 00 65 00 78 00
00A0: 61 00 6D 00 70 00 6C-00 63 00 6E 00 6F 00 00
00B0: 6D 00 00 00 00 00 02 00 00-01 01 02 00 00 00 00
00C0: 00 00 00 00 00 00 00-76 40-04 02 03 00 76 40 03
00D0: 76 40 FF FF FF FF FF 01 00-00 00 00 02 01 02 00 00
00E0: 00 01 01 00 00 00 00 03-01 00 01 00 1F 00 1F 0C 1F
00F0: 00 1F 0C 40 00 65 00 78-00 61 00 6D 00 70 00 6C
0100: 00 65 00 2E 00 63 00 6D-00 6F 00 63 00 00 00 00
0110: 12 0E 01 00 00 00 00 02-01 03 00 00 00 01 01 00
0120: 00 00 00 00 00 00 00 01-00 00 00 00 01 0F 00 1F
0130: 00 61 00 66 00 65 00 40-00 65 00 78 00 61 00 6D
0140: 00 70 00 6C 00 65 00 2E-00 63 00 6F 00 6D 00 00
0150: 00 09 0D 00 12 0E 01 02-00 00 00 03 00 00 01 00
0160: 1F 00 03 30 1F 00 03 30-30 72 00 65 00 63 00 69
0170: 70 00 32 00 40 00 65-00 78 00 61 00 6D 00 70 00
0180: 6C 00 65 00 2E 00 63-00 6F 00 6D 00 00 00 00
0190: 00 01 00 1F 00 03 30 1F-00 03 30 72 00 65 00 63
01A0: 00 69 00 70 00 40 00 65-00 78 00 61 00 6D 00 70
01B0: 00 6C 00 65 00 2E 00 63-00 6F 00 6D 00 00 00 01
01C0: 00 00 00 00
```

This data corresponds to the spam lists in the following table.

<table>
<thead>
<tr>
<th>List</th>
<th>C-style string representation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trusted recipient addresses</td>
<td>L&quot;<a href="mailto:recip@example.com">recip@example.com</a>&quot;</td>
</tr>
<tr>
<td>Trusted contact addresses</td>
<td>None</td>
</tr>
<tr>
<td>Blocked sender addresses</td>
<td>L&quot;<a href="mailto:blocked@example.com">blocked@example.com</a>&quot; L&quot;<a href="mailto:blocked2@example.com">blocked2@example.com</a>&quot; L&quot;<a href="mailto:blocked3@example.com">blocked3@example.com</a>&quot;</td>
</tr>
<tr>
<td>Blocked sender domains</td>
<td>None</td>
</tr>
</tbody>
</table>
Finally, the client sends a **RopSaveChangesMessage ROP request** ([MS-OXCROPS] section 2.2.6.3) to persist the object on the server and a **RopRelease ROP request** to release the object.

<table>
<thead>
<tr>
<th>List</th>
<th>C-style string representation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trusted sender domains</td>
<td>L &quot;@example.com&quot;</td>
</tr>
<tr>
<td>Trusted recipient domains</td>
<td>None</td>
</tr>
<tr>
<td>Trusted sender addresses</td>
<td>L&quot;<a href="mailto:safe@example.com">safe@example.com</a>&quot;</td>
</tr>
<tr>
<td>Trusted recipient addresses</td>
<td>L&quot;<a href="mailto:recip@example.com">recip@example.com</a>&quot;</td>
</tr>
<tr>
<td></td>
<td>L&quot;<a href="mailto:recip2@example.com">recip2@example.com</a>&quot;</td>
</tr>
<tr>
<td>Trusted contact addresses</td>
<td>None</td>
</tr>
</tbody>
</table>
5 Security

5.1 Security Considerations for Implementers

The `PidNameExchangeJunkEmailMoveStamp` property (section 2.2.1.2) is used to bypass content protection offered by client spam filters. If the valid junk email move stamp can be determined by an outside party, that party might discover a clever way to exploit the protocol such that untrusted and potentially malicious content could bypass protective filters.

Implement the procedure in section 3.2.4.1.2 in such a way that the value of the zero-based index 5 of the `PidTagAdditionalRenEntryIds` property (section 2.2.3.1) of the Inbox folder cannot be guessed.

5.2 Index of Security Parameters

<table>
<thead>
<tr>
<th>Security parameter</th>
<th>Section</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>PidNameExchangeJunkEmailMoveStamp</code></td>
<td>2.2.1.2</td>
</tr>
</tbody>
</table>
6 Appendix A: Product Behavior

The information in this specification is applicable to the following Microsoft products or supplemental software. References to product versions include updates to those products.

- Microsoft Exchange Server 2003
- Microsoft Exchange Server 2007
- Microsoft Exchange Server 2010
- Microsoft Exchange Server 2013
- Microsoft Exchange Server 2016
- Microsoft Office Outlook 2003
- Microsoft Office Outlook 2007
- Microsoft Outlook 2010
- Microsoft Outlook 2013
- Microsoft Outlook 2016
- Microsoft Exchange Server 2019
- Microsoft Outlook 2019
- Microsoft Outlook 2021

Exceptions, if any, are noted in this section. If an update version, service pack or Knowledge Base (KB) number appears with a product name, the behavior changed in that update. The new behavior also applies to subsequent updates unless otherwise specified. If a product edition appears with the product version, behavior is different in that product edition.

Unless otherwise specified, any statement of optional behavior in this specification that is prescribed using the terms "SHOULD" or "SHOULD NOT" implies product behavior in accordance with the SHOULD or SHOULD NOT prescription. Unless otherwise specified, the term "MAY" implies that the product does not follow the prescription.
7 Change Tracking

No table of changes is available. The document is either new or has had no changes since its last release.
8 Index

A

Abstract data model
  client 16
  server 13
Abstract data model - server
  Junk Email rule 12
Adding a sender to the trusted recipients list
  example 20
Applicability 9

C

Capability negotiation 9
Change tracking 25
Client
  abstract data model 16
  initialization 16
  other local events 19
  timer events 19
  timers 16
Client - higher layer triggered events
  retrieval of spam preferences 18
  user adds a new contact to their Contacts folder 18
  user changes client spam preferences 18
  user sends an e-mail 18
Client - higher-layer triggered events
  creating the Junk Email rule 17
  obtaining or creating the junk email move stamp 17
  server Junk Email rule changes 18
Client - message processing
  receiving an e-mail message 18
Client - sequencing rules
  receiving an e-mail message 18

D

Data model - abstract
  client 16
  server 13

E

Example
  adding a sender to the trusted recipients list 20

F

Fields - vendor-extendible 9
Format of the Junk Email Rule message 12

G

Glossary 6

H

Higher layer triggered events - client
  retrieval of spam preferences 18
  user adds a new contact to their Contacts folder 18
  user changes client spam preferences 18
user sends an e-mail 18
Higher-layer triggered events - client
  creating the Junk Email rule 17
  obtaining or creating the junk email move stamp 17
  server Junk Email rule changes 18
Higher-layer triggered events - server
  creating the Junk Email rule 13

I

Implementer - security considerations 23
Inbox folder properties
  PidTagAdditionalRenEntryIds property 12
Inbox Folder Properties message 12
Index of security parameters 23
Informative references 8
Initialization
  client 16
  server 13
Introduction 6

J

Junk Email rule properties
  PidTagJunkAddRecipientsToSafeSendersList property 10
  PidTagJunkIncludeContacts property 11
  PidTagJunkPermanentlyDelete property 11
  PidTagJunkPhishingEnableLinks property 11
  PidTagJunkThreshold property 11
  PidTagReportTime property 12
Junk Email Rule Properties message 10

M

Message object properties
  PidLidSpamOriginalFolder property 10
  PidNameExchangeJunkEmailMoveStamp property 10
  PidTagContentFilterSpamConfidenceLevel property 10
Message Object Properties message 10
Message processing
  server 15
Message processing - client
  receiving an e-mail message 18
Message processing - server
  executing the Junk Email rule on a message 15
Messages
  Format of the Junk Email Rule 12
  Inbox Folder Properties 12
  Junk Email Rule Properties 10
  Message Object Properties 10
  transport 10

N

Normative references 7

O
Other local events
  client 19
  server 16
Overview (synopsis) 8

P

Parameters
  - security index 23
  - PidLidSpamOriginalFolder Message object property 10
  - PidNameExchangeJunkEmailMoveStamp Message object property 10
  - PidTagAdditionalRenEntryIds Inbox folder property 12
  - PidTagContentFilterSpamConfidenceLevel Message object property 10
  - PidTagJunkAddRecipientsToSafeSendersList Junk Email rule property 10
  - PidTagJunkIncludeContacts Junk Email rule property 11
  - PidTagJunkPermanentlyDelete Junk Email rule property 11
  - PidTagJunkPhishingEnableLinks Junk Email rule property 11
  - PidTagJunkThreshold Junk Email rule property 11
  - PidTagReportTime Junk Email rule property 12
Preconditions 9
Prerequisites 9
Product behavior 24

R

References 7
  - informative 8
  - normative 7
Relationship to other protocols 8

S

Security
  - implementer considerations 23
  - parameter index 23
Sequencing rules
  - server 15
Sequencing rules - client
  - receiving an e-mail message 18
Sequencing rules - server
  - executing the Junk Email rule on a message 15
Server
  - abstract data model 13
  - initialization 13
  - message processing 15
  - other local events 16
  - sequencing rules 15
  - timer events 16
  - timers 13
Server - abstract data model
  - Junk Email rule 12
Server - higher-layer triggered events
  - creating the Junk Email rule 13
Server - message processing
  - executing the Junk Email rule on a message 15
Server - sequencing rules
  - executing the Junk Email rule on a message 15
Standards assignments 9

T

Timer events
  - client 19
  - server 16
Timers
  - client 16
  - server 13
Tracking changes 25
Transport 10
Triggered events - client
  - creating the Junk Email rule 17
  - obtaining or creating the junk email move stamp 17
  - retrieval of spam preferences 18
  - server Junk Email rule changes 18
  - user adds a new contact to their Contacts folder 18
  - user changes client spam preferences 18
  - user sends an e-mail 18
Triggered events - server
  - creating the Junk Email rule 13

V

Vendor-extensible fields 9
Versioning 9