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Sieve Notification Mechanism: mailto

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Abstract

This document describes a profile of the Sieve extension for notifications, to allow notifications to be sent by electronic mail.

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1. Introduction

1.1. Overview

The [Notify] extension to the [Sieve] mail filtering language is a framework for providing notifications by employing URIs to specify the notification mechanism. This document defines how [mailto] URIs are used to generate notifications by email.

1.2. Conventions Used in This Document

Conventions for notations are as in Section 1.1 of [Sieve], including the use of [Kwds].

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 [Kwds].

2. Definition

The mailto mechanism results in the sending of a new email message (a "notification message") to notify a recipient about a "triggering message".

2.1. Notify Parameter "method"

The mailto notification mechanism uses standard mailto URIs as specified in [mailto]. mailto URIs may contain header fields consisting of a header name and value. These header fields are called "URI headers" to distinguish them from "message headers".

2.2. Test notify_method_capability

The notify_method_capability test for "online" may return "yes" or "no" only if the Sieve processor can determine with certainty whether or not the recipients of the notification message are online and logged in. Otherwise, the test returns "maybe" for this notification method.

2.3. Notify Tag ":from"

The ":from" tag overrides the default sender of the notification message. "Sender", here, refers to the value used in the [RFC5322] "From" header. Implementations MAY also use this value in the [RFC5321] "MAIL FROM" command (the "envelope sender"), or they may prefer to establish a mailbox that receives bounces from notification messages.

2.4. Notify Tag ":importance"

The ":importance" tag has no special meaning for this notification mechanism, and this specification puts no restriction on its use. Implementations MAY use the value of ":importance" to set a priority or importance indication on the notification message (perhaps a visual indication, or perhaps making use of one of the non-standard but commonly used message headers).

2.5. Notify Tag ":options"

This tag is not used by the mailto method.

2.6. Notify Tag ":message"

The value of this tag, if it is present, is used as the subject of the notification message, and overrides all other mechanisms for determining the subject (as described below). Its value SHOULD NOT normally be truncated, though it may be sensible to truncate an excessively long value.

2.7. Other Definitions

Because the receipt of an email message is generating another email message, implementations MUST take steps to avoid mail loops. The REQUIRED inclusion of an "Auto-Submitted:" field, as described in the message composition guidelines, will also help in loop detection and avoidance.

Implementations SHOULD NOT trigger notifications for messages containing "Auto-Submitted:" header fields with any value other than "No".

Implementations MUST allow messages with empty envelope senders to trigger notifications.

Because this notification method uses a store-and-forward system for delivery of the notification message, the Sieve processor should not have a need to retry notifications. Therefore, implementations of this method SHOULD use normal mechanisms for submitting SMTP messages and for retrying the initial submission. Once the notification message is submitted, implementations MUST NOT resubmit it, as this is likely to result in multiple notifications, and increases the danger of message loops.

Implementations SHOULD consider limiting notification messages. In particular, they SHOULD NOT sent duplicate notifications to the same address from the same script invocation. Batching of notifications

within a short time to the same address might also be useful. Different implementations, different administrative domains, and different users may have different needs; configuration options are a good idea here.

The overall notification message is composed using the following guidelines (see [RFC5322] for references to message header fields):

- If the envelope sender of the triggering message is empty, the envelope sender of the notification message MUST be empty as well, to avoid message loops. Otherwise, the envelope sender of the notification message SHOULD be set to the value of the ":from" tag to the notify action, if one is specified, has email address syntax, and is valid according to the implementation-specific security checks (see Section 3.3 of [Notify]). If ":from" is not specified or is not valid, the envelope sender of the notification message SHOULD be set either to the envelope "to" field from the triggering message, as used by Sieve, or to an email address associated with the notification system, at the discretion of the implementation. This MUST NOT be overridden by a "from" URI header, and any such URI header MUST be ignored.

- The envelope recipient(s) of the notification message SHOULD be set to the address(es) specified in the URI (including any URI headers where the hname is "to" or "cc").

- The header field "Auto-Submitted: auto-notified" MUST be included in the notification message (see Section 2.7.1). This is to reduce the likelihood of message loops, by tagging this as an automatically generated message. Among other results, it will inform other notification systems not to generate further notifications. mailto URI headers with hname "auto-submitted" are considered unsafe and MUST be ignored.

- The "From:" header field of the notification message SHOULD be set to the value of the ":from" tag to the notify action, if one is specified, has email address syntax, and is valid according to the implementation-specific security checks (see Section 3.3 of [Notify]). If ":from" is not specified or is not valid, the "From:" header field of the notification message SHOULD be set either to the envelope "to" field from the triggering message, as used by Sieve, or to an email address associated with the notification system, at the discretion of the implementation. This MUST NOT be overridden by a "from" URI header, and any such URI header MUST be ignored.

- The "To:" header field of the notification message SHOULD be set to the address(es) specified in the URI (including any URI headers where the hname is "to").

- The "Subject:" field of the notification message SHOULD contain the value defined by the ":message" tag, as described in [Notify]. If there is no ":message" tag and there is a "subject" header on the URI, then that value SHOULD be used. If the "subject" header is also absent, the subject SHOULD be retained from the triggering message. Note that Sieve [Variables] can be used to advantage here, as shown in the example in Section 3.

- The "References:" field of the notification message MAY be set to refer to the triggering message, and MAY include references from the triggering message.

- If the mailto URI contains a "body" header, the value of that header SHOULD be used as the body of the notification message. If there is no "body" header, it is up to the implementation whether to leave the body empty or to use an excerpt of the original message.

- The "Received:" fields from the triggering message MAY be retained in the notification message, as these could provide useful trace/history/diagnostic information. The "Auto-Submitted" header field MUST be placed above these (see Section 2.7.1). URI headers with hname "received" are considered unsafe, and MUST be ignored.

- Other header fields of the notification message that are normally related to an individual new message (such as "Message-ID" and "Date") are generated for the notification message in the normal manner, and MUST NOT be copied from the triggering message. Any URI headers with those names MUST be ignored. Further, the "Date" header serves as the notification timestamp defined in [Notify].

- All other header fields of the notification message either are as specified by URI headers, or have implementation-specific values; their values are not defined here. It is suggested that the implementation capitalize the first letter of URI headers and add a space character after the colon between the mail header name and value when adding URI headers to the message, to be consistent with common practice in email headers.

2.7.1. The Auto-Submitted Header Field

The header field "Auto-Submitted: auto-notified" MUST be included in the notification message (see [RFC3834]). The "Auto-Submitted" header field is considered a "trace field", similar to "Received"

header fields (see [RFC5321]). If the implementation retains the "Received" fields from the triggering message (see above), the "Auto-Submitted" field MUST be placed above those "Received" fields, serving as a boundary between the ones from the triggering message and those that will be part of the notification message.

The header field "Auto-Submitted: auto-notified" MUST include one or both of the following parameters:

- owner-email - specifies an email address, determined by the implementation, of the owner of the Sieve script that generated this notification. If specified, it might be used to identify or contact the script's owner. The parameter attribute is "owner-email", and the parameter value is a quoted string containing an email address, as defined by "addr-spec" in [RFC5322]. Example:
  Auto-Submitted: auto-notified; owner-email="me@example.com"

- owner-token - specifies an opaque token, determined by the implementation, that the administrative domain of the owner of the Sieve script that generated this notification can use to identify the owner. This might be used to allow identification of the owner while protecting the owner's privacy. The parameter attribute is "owner-token", and the parameter value is as defined by "token" in [RFC3834]. Example:
  Auto-Submitted: auto-notified; owner-token=af3NN2pK5dDXI0W

See Section 5 for discussion of possible uses of these parameters.

3. Examples

Triggering message (received by recipient@example.org):

```
Return-Path: <knitting-bounces@example.com>
Received: from mail.example.com by mail.example.org
  for <recipient@example.org>; Wed, 7 Dec 2005 05:08:02 -0500
Received: from hobbies.example.com by mail.example.com
  for <knitting@example.com>; Wed, 7 Dec 2005 02:00:26 -0800
Message-ID: <1234567.89ABCDEF@example.com>
Date: Wed, 07 Dec 2005 10:59:19 +0100
Precedence: list
List-Id: Knitting Mailing List <knitting.example.com>
Sender: knitting-bounces@example.com
Errors-To: knitting-bounces@example.com
From: "Jeff Smith" <jeff@hobbies.example.com>
To: "Knitting Mailing List" <knitting@example.com>
Subject: [Knitting] A new sweater

I just finished a great new sweater!
```

Sieve script (run on behalf of recipient@example.org):

```
require ["enotify", "variables"];

if header :contains "list-id" "knitting.example.com" {
  if header :matches "Subject" "[*] *" {
    notify :message "From ${1} list: ${2}"
        :importance "3"
        "mailto:0123456789@sms.example.net?to=backup@example.com";
  }
}
```

Notification message:

```
Auto-Submitted: auto-notified; owner-email="recipient@example.org"
Received: from mail.example.com by mail.example.org
  for <recipient@example.org>; Wed, 7 Dec 2005 05:08:02 -0500
Received: from hobbies.example.com by mail.example.com
  for <knitting@example.com>; Wed, 7 Dec 2005 02:00:26 -0800
Date: Wed, 7 Dec 2005 05:08:55 -0500
Message-ID: <A2299BB.FF7788@example.org>
From: recipient@example.org
To: 0123456789@sms.example.net, backup@example.com
Subject: From Knitting list: A new sweater
```

Note that:

- Fields such as "Message-ID:" and "Date:" were generated afresh for the notification message, and do not relate to the triggering message.

- Additional "Received:" fields will be added to the notification message in transit; the ones shown were copied from the triggering message. New ones will be added above the Auto-Submitted: header field.

- If this message should appear at the mail.example.org server again, the server can use the presence of a "mail.example.org" received line to recognize that. The Auto-Submitted header field is also present to tell the server to avoid sending another notification, and it includes an optional owner-email parameter for identification.

4. Internationalization Considerations

This specification introduces no specific internationalization issues that are not already addressed in [Sieve] and in [Notify].

5. Security Considerations

Sending a notification is comparable with forwarding mail to the notification recipient. Care must be taken when forwarding mail automatically, to ensure that confidential information is not sent into an insecure environment.

The automated sending of email messages exposes the system to mail loops, which can cause operational problems. Implementations of this specification MUST protect themselves against mail loops; see Section 2.7 for discussion of this and some suggestions. Other possible mitigations for mail loops involve types of service limitations. For example, the number of notifications generated for a single user might be limited to no more than, say, 30 in a 60-minute period. Of course, this technique presents its own problems, in that the actual rate-limit must be selected carefully, to allow most legitimate situations in the given environment. Even with careful selection, it's inevitable that there will be false positives -- and false negatives.

Ultimately, human intervention may be necessary to re-enable notifications that have been disabled because a loop was detected, or to terminate a very slow loop that's under the automatic-detection radar. Administrative mechanisms MUST be available to handle these sorts of situations.

Email addresses specified as recipients of notifications might not be owned by the entity that owns the Sieve script. As a result, a notification recipient could wind up as the target of unwanted notifications, either through intent (using scripts to mount a mail-bomb attack) or by accident (an address was mistyped or has been reassigned). The situation is arguably no worse than any other in which a recipient gets unwanted email, and some of the same mechanisms can be used in this case. But those deploying this extension have to be aware of the potential extra problems here, where scripts might be created through means that do not adequately validate email addresses, and such scripts might then be forgotten and left to run indefinitely.

In particular, note that the Auto-Submitted header field is required to include a value that a recipient can use when contacting the source domain of the notification message (see Section 2.7.1). That value will allow the domain to track down the script's owner and have the script corrected or disabled. Domains that enable this extension MUST be prepared to respond to such complaints, in order to limit the damage caused by a faulty script.

Problems can also show up if notification messages are sent to a gateway into another service, such as SMS. Information from the email message is often lost in the gateway translation; and in this case, critical information needed to avoid loops, to contact the script owner, and to resolve other problems might be lost. Developers of email gateways should consider these issues, and try to preserve as much information as possible, including what appears in email trace headers and the Auto-Submitted header field.

Additional security considerations are discussed in [Sieve] and in [Notify].

6. IANA Considerations

6.1. Registration of Notification Mechanism

The following template specifies the IANA registration of the Sieve notification mechanism specified in this document:

To: iana@iana.org
Subject: Registration of new Sieve notification mechanism
Mechanism name: mailto
Mechanism URI: RFC2368
Mechanism-specific options: none
Permanent and readily available reference: RFC 5436
Person and email address to contact for further information:
Michael Haardt <michael.haardt@freenet.ag>

This information should be added to the list of Sieve notification mechanisms available from http://www.iana.org.

6.2. New Registry for Auto-Submitted Header Field Keywords

Because [RFC3834] does not define a registry for new keywords used in the Auto-Submitted header field, we define one here, which has been created and is available from http://www.iana.org. Keywords are registered using the "Specification Required" policy [IANA].

This defines the template to be used to register new keywords. Initial entries to this registry follow in Section 6.3.

To: iana@iana.org
Subject: Registration of new auto-submitted header field keyword
Keyword value: [the text value of the field]
Description: [a brief explanation of the purpose of this value]
Parameters: [list any keyword-specific parameters, specify their meanings, specify whether they are required or optional; use "none" if there are none]

Permanent and readily available reference: [identifies
the specification that defines the value being registered]
Contact: [name and email address to contact for further information]

6.3. Initial Registration of Auto-Submitted Header Field Keywords

The following are the initial keywords that have been registered in the "Auto-Submitted Header Field Keywords" registry, available from http://www.iana.org.

Keyword value: no
Description: Indicates that a message was NOT automatically generated, but was created by a human. It is the equivalent to the absence of an Auto-Submitted header altogether.
Parameters: none
Permanent and readily available reference: RFC3834
Contact: Keith Moore <moore@network-heretics.com>

Keyword value: auto-generated
Description: Indicates that a message was generated by an automatic process, and is not a direct response to another message.
Parameters: none
Permanent and readily available reference: RFC3834
Contact: Keith Moore <moore@network-heretics.com>

Keyword value: auto-replied
Description: Indicates that a message was automatically generated as a direct response to another message.
Parameters: none
Permanent and readily available reference: RFC3834
Contact: Keith Moore <moore@network-heretics.com>

Keyword value: auto-notified
Description: Indicates that a message was generated by a Sieve notification system.
Parameters: owner-email, owner-token. At least one is required; both refer to the owner of the Sieve script that generated this message. See the relevant RFC for details.
Permanent and readily available reference: RFC 5436
Contact: Michael Haardt <michael.haardt@freenet.ag>

7. References

7.1. Normative References

[IANA] Narten, T. and H. Alvestrand, "Guidelines for Writing an IANA Considerations Section in RFCs", BCP 26, RFC 5226, May 2008.

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[RFC5322] Resnick, P., Ed., "Internet Message Format", RFC 5322, October 2008.

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[mailto] Hoffman, P., Masinter, L., and J. Zawinski, "The mailto URL scheme", RFC 2368, July 1998.

7.2. Informative References

[RFC5321] Klensin, J., Ed., "Simple Mail Transfer Protocol", RFC 5321, October 2008.

[Variables] Homme, K., "Sieve Extension: Variables", RFC 5229, January 2008.

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