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Brian Haley
Hewlett-Packard
Sri Gundavelli
Cisco Systems
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**Generic Notification Message for Mobile IPv6
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Abstract

This document specifies a new Mobility Header message type that allows Mobile IPv6 entities to send and receive generic notification messages.

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 [RFC-2119](#) [1].

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1. Introduction

[RFC 3775](#) [2] contains no provision for Mobile IPv6 entities, such as a home agent or mobile node, to send and receive asynchronous notification messages during a mobility session.

This document describes a generic notification message protocol that can be used by Mobile IPv6 entities for sending and receiving simple notification events.

The document does not define any specific events, or the corresponding actions that the receiver is required to do upon receiving an event.

2. Generic Notification Messages

The messages described below follow the Mobility Header format specified in Section 6.1 of [2]:

[illegible]


```
|
|
|
|
|
+-----+
      Message Data
+-----+
```

The Generic Notification Request message is used by the home agent to notify the mobile node, or vice-versa, that there is an event that requires attention. This packet is sent as described in [Section 3](#).

[illegible]

The Acknowledge (A) bit is set by the sender to request a Generic Notification Acknowledgement ([Section 3.1](#)) be returned upon receipt of a Generic Notification Request.

These fields are unused. They MUST be initialized to zero by the sender, and MUST be ignored by the receiver.

An 8-bit unsigned integer used by the receiving node to sequence Generic Notification Requests and by the sending node to match a returned Generic Notification Acknowledgement with this Generic Notification Request.

8-bit unsigned integer indicating the disposition of the Signaling Request. Values of the Status field less than 128 indicate that the Signaling Request was accepted by the receiving node. Values greater than or equal to 128 indicate that the Signaling Request was rejected by the receiving node. The following Status values are currently defined:

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- 0 Notification Request accepted
- 128 Reason unspecified
- 129 Administratively prohibited
- 130 Insufficient resources
- 131 Unsupported mobility option
- 132 Not home agent for this mobile node

Sequence

An 8-bit unsigned integer used by the receiving node to sequence Generic Notification Requests and by the sending node to match a returned Generic Notification Acknowledgement with this Generic Notification Request. The sequence number in the Generic Notification Acknowledgement is copied from the sequence number field in the Generic Notification Request.

Mobility options

Variable-length field of such length that the complete Mobility Header is an integer multiple of 8 octets long. This field contains zero or more TLV-encoded mobility options. The encoding and format of defined options MUST follow the format specified in Section 6.2 of [2]. The receiver MUST ignore and skip any options with it does not understand.

This specification does not define any options valid for the Generic Notification Acknowledgement message.

If no options are present in this message, no padding is necessary and the Header Len field in the Mobility Header will be set to 0.

[3. Sending Generic Notification Messages](#)

[3.1 Sending Generic Notification Request Messages](#)

When sending a Generic Notification message, the sending node constructs the packet as it would any other Mobility Header, except:

- o The MH Type field MUST be set to (TBD).
- o The Acknowledge (A) bit MAY be set to indicate the receiver must send a Generic Notification Acknowledgement.

The Generic Notification Request message MUST use the home agent to mobile node IPsec ESP authentication SA for integrity protection.

3.2 Sending Generic Notification Acknowledgement Messages

A Generic Notification Acknowledgement message should be sent to indicate receipt of a Generic Notification Request as follows:

- o If the Generic Notification Request was discarded because it does not meet the requirements as specified in [\[2\]](#) described in [Section 4](#), a Generic Notification Acknowledgement MUST NOT be sent. Otherwise, the treatment depends on the below rule.
- o If the Acknowledgement (A) bit is set in the Generic Notification Request, a Generic Notification Acknowledgement MUST be sent. Otherwise, the treatment depends on the below rule.
- o If the Generic Notification Request was discarded for any other reason, a Generic Notification Acknowledgement SHOULD be sent.

If the Source Address field of the IPv6 header that carried the Generic Notification Request does not contain a unicast address, the Generic Notification Acknowledgement MUST NOT be sent, and the Generic Notification Request packet MUST be silently discarded. Otherwise, the acknowledgement MUST be sent to the Source Address.

4. Receiving Generic Notification Messages

Upon receiving a Generic Notification message, the Mobility Header MUST be verified as specified in [\[2\]](#), specifically:

- o The Checksum, MH type, Payload Proto and Header Len fields MUST meet the requirements of Section 9.2 of [\[2\]](#).
- o The packet MUST be covered by the home agent to mobile node IPsec ESP authentication SA for integrity protection.

If the packet is dropped due to the above tests, the receiving node MUST follow the processing rules as Section 9.2 of [\[2\]](#). For example, it MUST send a Binding Error message with the Status field set to 2 (unrecognized MH Type value) if it does not support the message type.

Subsequent checks depend on the current mode of operation of the node.

4.1 Receiving Generic Notification Request Messages

If the Generic Notification Request message is valid according to the tests in [Section 4](#), then it is processed further as follows:

- o If the receiving node does not allow Generic Notification Request messages, it MUST reject the request and SHOULD return a Generic Notification Acknowledgement to the sender in which the Status field is set to 129 (administratively prohibited).
- o If the receiving node does not support the type of Mobility Option in the Generic Notification Request message, it MUST reject the request and SHOULD return a Generic Notification Acknowledgement to the sender in which the Status field is set to 131 (unsupported mobility option).

Subsequent checks depend on the current mode of operation of the node.

4.1.1 Mobile Node Operation

If the mobile node rejects the Generic Notification Request message for any other reason than specified in [Section 4](#), it SHOULD return a Generic Notification Acknowledgement to the home agent in which the Status field is set to 128 (reason unspecified).

4.1.2 Home Agent Operation

If the receiving node is a home agent, it MUST perform these additional checks:

- o If the home agent has no entry marked as a home registration in its Binding Cache for this mobile node, then this node MUST reject the request and SHOULD return a Generic Notification Acknowledgement to the mobile node in which the Status field is set to 132 (not home agent for this mobile node).
- o If the home agent cannot process the Generic Notification Request message because it is over-utilized, it MUST reject the request and SHOULD return a Generic Notification Acknowledgement to the mobile node in which the Status field is set to 130 (insufficient resources).

If the home agent rejects the Generic Notification Request message for any other reason, it SHOULD return a Generic Notification Acknowledgement to the mobile node in which the Status field is set to 128 (reason unspecified).

4.1.3 Retransmissions

If the sender has set the Acknowledge (A) bit in the Generic Notification Request, but does not receive a Generic Notification Acknowledgement, then it MAY retransmit the message, until a response is received. The initial value for the retransmission timer is INITIAL_MH_NOTIFICATION_TIMEOUT. The retransmissions by the sender MUST use an exponential back-off mechanism, in which the timeout period is doubled upon each retransmission, until either the sender gets a response from the target node, or the timeout period reaches the value MAX_MH_NOTIFICATION_TIMEOUT.

5. Protocol Constants

INITIAL_MH_NOTIFICATION_TIMEOUT	5 seconds
MAX_MH_NOTIFICATION_TIMEOUT	20 seconds

6. IANA Considerations

A new Mobility Header type is required for the following new message described in [Section 2](#):

(TBD) Generic Notification Request Message
(TBD) Generic Notification Acknowledgement Message

7. Security Considerations

As with other messages in [\[2\]](#), the Generic Notification message MUST use the home agent to mobile node ESP encryption SA for confidentiality protection, and MUST use the home agent to mobile node ESP authentication SA for integrity protection.

The Generic Notification message MAY use the IPsec ESP SA in place for Binding Updates and Acknowledgements as specified in Section 5.1 of [\[2\]](#), in order to reduce the number of configured security associations. This also gives the message authenticity protection.

8. References

8.1 Normative Reference

- [1] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), March 1997.
- [2] Johnson, D. Perkins, C., and Arkko, J., "Mobility Support in IPv6", [RFC 3775](#), June, 2004

8.2 Informative references

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Author's Addresses

Brian Haley
Hewlett-Packard Company
110 Spitbrook Road
Nashua, NH 03062, USA
Email: brian.haley@hp.com

Sri Gundavelli
Cisco Systems
170 W.Tasman Drive
San Jose, CA 95134, USA
Email: sgundave@cisco.com

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