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## BGPv4 INFORM message

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**3. Abstract**

This document defines a new message type, the BGP INFORM message that communicates Informational data and operational warnings without resetting the peering session.

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## 5. Introduction

Currently there is no mechanism available for two peers to communicate the occurrence of an event other than through a BGP NOTIFICATION Message. The problem is that a NOTIFICATION message resets the peering session. If a peer wants to gracefully recover from an error or wants to warn its peer about the occurrence of a BGP-related event, there is no mechanism available to do that. The proposed BGP INFORM message is a mechanism to inform a remote peer of an event without resetting the session.

## 6. Definition of the BGP INFORM Message

The INFORM message is a BGP message with type TBD. An INFORM message may be sent to inform a peer of an error condition which is not serious enough to warrant the reset of the BGP peering session. Each INFORM message relates to a single event. To inform a peer about multiple events, multiple INFORM messages must be used.

The INFORM message contains a 2-octet Event Code followed by one or more Data TLVs of the following form:

```
+-----+
| Type (1 octet)      |
+-----+
| Length (2 octets)   |
+-----+
| Value (variable)    |
+-----+
```

This document defines TLVs summarized below:

Type	Name	Length	Value
-----	-----	-----	-----
1	Unspecified variable	Unspecified	Unspecified Data Type.
2	String	variable	A text string whose length is given by the length field. Not null-terminated.
3	PDU	variable	A copy of the PDU which triggered

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			the INFORM message. May be truncated.
4	Attribute	variable	A copy of the path attribute which triggered the INFORM message. May be truncated.
5	Integer	4	A four-byte integer

No TLV may appear in the INFORM message more than once.

### **6.1. Event Codes**

The Event Code provides structured information regarding the event which triggered the generation of the INFORM message.

Events 0-32767 are well-known and are defined here (TBD IANA document). Events 32768-65535 are reserved for vendor-specific use.

Well-known events are summarized in the table below, and subsequently described.

Code	Name
----	----
1	Unspecified event
2	Recoverable UPDATE attribute error -- attribute Discarded
3	Recoverable UPDATE attribute error -- attribute fixed
4	Too many routes -- routes discarded
5	Attribute Overflow
6	Dampening routes
7	All routes undampened
8	Graceful Restart purge timer expired

In the descriptions below, the inclusion of certain TLVs is specified -- for example, an unspecified event should include a string describing the event. These constitute a minimum set that should be included -- any other applicable or useful TLV may also be included.

#### **6.1.1. Unspecified event**

An event has occurred which is not described by any other event code. The String TLV should be included with a description of the event.

#### **6.1.2. Recoverable UPDATE attribute error -- attribute discarded**

The attribute which caused the INFORM to be generated should be included in the Attribute TLV. The reason it was considered an error should be included in the String field of the data port of the packet.

#### **6.1.3. Recoverable UPDATE attribute error -- attribute fixed**

The attribute which caused the INFORM to be generated should be included in the Attribute TLV. The reason it was considered an error and a description of the action taken to fix the problem should be included in the String field of the data port of the packet.

Care should be taken not to fix attributes unless it can be unambiguously determined that doing so will not compromise the protocol's correctness.

#### **6.1.4. Too many routes -- routes discarded**

The peer has sent more routes than the local BGP speaker's configured maximum. The local BGP speaker has discarded some of the routes received from the peer.

The configured maximum value which was exceeded should be included in the Integer TLV.

#### **6.1.5 Attribute Overflow**

This INFORM message may be sent any time a peer receives an UPDATE with an attribute value, e.g., community list [[RFC1997](#)] that must be truncated due to its length. The Attribute TLV should be included.

#### **6.1.6 Dampening routes**

The remote peer has announced and withdrawn some prefix or prefixes too frequently and the local peer has applied dampening to some set of prefixes announced by the remote peer. This INFORM message should not be sent each time a prefix is dampened. Instead it should only be sent when the boundary from no dampened routes to any dampened routes has been crossed.

#### **6.1.7 All routes undampened**

At some point in the past, the remote peer announced and withdrawn some prefix or prefixes too frequently and the local peer had applied dampening to some set of prefixes announced by the remote peer. This INFORM message should not be sent each time a prefix is undampened. Instead it should only be sent when the boundary from dampened routes to no dampened prefixes has been crossed.

#### **6.1.8 Graceful Restart Purge Timer Expired**

This INFORM message is to be sent during a Graceful Restart event [[BGP-GR](#)] and the purge timer has expired, thus causing all routes from the remote peer to be purged from the forwarding table of the local peer.

### **7. Operation**

The following rules apply to the generation of INFORM messages:

#### **7.1.1. Sending an INFORM Message**

A router may send an INFORM message to a peer upon detecting a normal or abnormal, non-critical condition during operation which needs to be communicated to the peer and which does not necessitate a session reset.

A router SHOULD NOT send an INFORM message for a condition which requires a session reset. It SHOULD NOT be sent in conjunction with a NOTIFICATION message.

The rate at which INFORM messages are generated must be rate-limited. A suggested default limit is 60 messages per minute.

#### **7.1.2. Receiving an INFORM message**

On receiving an INFORM Message from a peer, the INFORM message should be logged and via locally determined means and brought to the attention of the router's operator. The means to do this are, however, outside the scope of this draft.

Under all circumstances an implementation SHOULD NOT take any automated action upon receiving an INFORM message (other than

logging or alerting the operator).

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An implementation must be prepared to receive INFORM messages containing unrecognized TLVs or TLV subcodes. An implementation should handle recognized TLVs as normal and may log, silently drop, or otherwise handle unrecognized TLVs. It is not recommended that the reception of a malformed INFORM message be cause to generate a reply of an INFORM message. An implementation must not reset the session due to a malformed INFORM message.

#### **7.1.3. Implementation notes**

An implementation must not assume that its generation of an INFORM message will result in any state change on the part of its peer. It is axiomatic that the INFORM message is for the peer's information only.

Implementors should refrain from sending INFORM messages without good cause. Although use of an INFORM message is not as serious as sending a NOTIFICATION, nonetheless an INFORM should only be generated in response to a protocol error or other serious problem. Normal, expected protocol events should not be INFORMed. Examples of events for which generation of an INFORM would be inappropriate include the dampening of an individual flapping route, the impending expiration of a holdtime, or the suppression of a component of an aggregate.

The INFORM should not be used as a blanket replacement for sending a notification and terminating the BGP session. The BGP protocol's correctness generally assumes that protocol errors will be handled by terminating the session. The decision not to terminate a session in response to an error condition should not be taken lightly or without careful and sober consideration. It is noted that it is possible for a NOTIFICATION message to carry arbitrary data, so if the session is to be terminated, any relevant data may be carried in the NOTIFICATION message itself.

#### **7.1.4. Capability**

A new Capability [[BGP-CAP](#)] code (TBD) is defined for interoperability with software that does not recognize the

INFORM message. The INFORM message can be sent only to peers that have advertised this capability.

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## **8. Security Considerations**

This extension to BGP does not change the underlying security issues.

## **9. Acknowledgements**

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## **10. References**

[BGP-4] Rekhter, Y. and T. Li (editors), "A Border Gateway Protocol 4 (BGP-4)", Internet Draft [draft-ietf-idr-bgp4-17.txt](#), January 2002.

[BGP-CAP] Chandra, R., Scudder, J., "Capabilities Advertisement with BGP-4", [draft-ietf-idr-rfc2842bis-02.txt](#), April 2002.

[BGP-GR] Chandra, R., Scudder, J., "Graceful Restart Mechanism for BGP", [draft-ietf-idr-restart-05.txt](#), June 2002.

[RFC1997] Chandra, R., Traina, P., Li, T., "BGP Communities Attribute", [RFC1997](#), August 1996.

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#### **14. Expiration Date**

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