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**Extended BGP Administrative Shutdown Communication**  
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Abstract

This document enhances the BGP Cease NOTIFICATION message "Administrative Shutdown" and "Administrative Reset" subcodes for operators to transmit a short freeform message to describe why a BGP session was shutdown or reset. This document updates [RFC 4486](#) and obsoletes [RFC 8203](#) by defining an Extended BGP Administrative Shutdown Communication to improve communication using multibyte character sets.

Requirements Language

The key words "MUST", "MUST NOT", "REQUIRED", "SHALL", "SHALL NOT", "SHOULD", "SHOULD NOT", "RECOMMENDED", "NOT RECOMMENDED", "MAY", and "OPTIONAL" in this document are to be interpreted as described in [BCP 14](#) [[RFC2119](#)] [[RFC8174](#)] when, and only when, they appear in all capitals, as shown here.

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## [1.](#) Introduction

It can be troublesome for an operator to correlate a BGP-4 [[RFC4271](#)] session teardown in the network with a notice that was transmitted via offline methods such email or telephone calls. This document updates [[RFC4486](#)] by specifying a mechanism to transmit a short freeform UTF-8 [[RFC3629](#)] message as part of a Cease NOTIFICATION message [[RFC4271](#)] to inform the peer why the BGP session is being shutdown or reset.

## [2.](#) Shutdown Communication

If a BGP speaker decides to terminate its session with a BGP neighbor, and it sends a NOTIFICATION message with the Error Code "Cease" and Error Subcode "Administrative Shutdown" or "Administrative Reset" [[RFC4486](#)], it MAY include an UTF-8 encoded string. The contents of the string are at the operator's discretion.



The Cease NOTIFICATION message with a Shutdown Communication is encoded as below:

```

      0               1               2               3
      0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
| Error code 6 | Subcode | Length | ... | \
+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+
\
/ ... Shutdown Communication ...
\
+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+---+

```

Figure 1

Subcode: the Error Subcode value **MUST** be one of the following values: 2 ("Administrative Shutdown") or 4 ("Administrative Reset").

Length: this 8-bit field represents the length of the Shutdown Communication field in octets. When the length value is zero, no Shutdown Communication field follows.

Shutdown Communication: to support international characters, the Shutdown Communication field **MUST** be encoded using UTF-8. A receiving BGP speaker **MUST NOT** interpret invalid UTF-8 sequences. Note that when the Shutdown Communication contains multibyte characters, the number of characters will be less than the length value. This field is not NUL terminated.

Mechanisms concerning the reporting of information contained in the Shutdown Communication are implementation specific but **SHOULD** include methods such as Syslog [[RFC5424](#)].

### 3. Operational Considerations

Operators are encouraged to use the Shutdown Communication to inform their peers of the reason for the shutdown of the BGP session and include out-of-band reference materials. An example of a useful Shutdown Communication would be:

"[TICKET-1-1438367390] software upgrade; back in 2 hours"

"[TICKET-1-1438367390]" is a ticket reference with significance to both the sender and receiver, followed by a brief human-readable message regarding the reason for the BGP session shutdown followed by an indication about the length of the maintenance. The receiver can



now use the string 'TICKET-1-1438367390' to search in their email archive to find more details.

#### **4. Error Handling**

If a Shutdown Communication with an invalid Length value, or an invalid UTF-8 sequence is received, a message indicating this event SHOULD be logged for the attention of the operator. An erroneous or malformed Shutdown Communication itself MAY be logged in a hexdump format.

#### **5. IANA Considerations**

Per this document, IANA is requested to reference this document at subcode "Administrative Shutdown", and at subcode "Administrative Reset" in the "Cease NOTIFICATION message subcodes" registry under the "Border Gateway Protocol (BGP) Parameters" group in addition to [\[RFC4486\]](#) and [\[RFC8203\]](#).

#### **6. Security Considerations**

This document uses UTF-8 encoding for the Shutdown Communication. There are a number of security issues with Unicode. Implementers and operators are advised to review Unicode Technical Report #36 [\[UTR36\]](#) to learn about these issues. UTF-8 "Shortest Form" encoding is REQUIRED to guard against the technical issues outlined in [\[UTR36\]](#).

As BGP Shutdown Communications are likely to appear in syslog output, there is a risk that carefully constructed Shutdown Communication might be formatted by receiving systems in a way to make them appear as additional syslog messages. To limit the ability to mount such an attack, the BGP Shutdown Communication is limited to 255 octets in length.

Users of this mechanism should be aware that unless a transport that provides integrity is used for the BGP session in question, a Shutdown Communication message could be forged. Unless a transport that provides confidentiality is used, a Shutdown Communication message could be snooped by an attacker. These issues are common to any BGP message but may be of greater interest in the context of this proposal since the information carried in the message is generally expected to be used for human-to-human communication. Refer to the related considerations in [\[RFC4271\]](#) and [\[RFC4272\]](#).

Users of this mechanism should consider applying data minimization practices as outlined in [Section 6.1 of \[RFC6973\]](#) because a received Shutdown Communication may be used at the receiver's discretion.



## **7. Implementation status - RFC EDITOR: REMOVE BEFORE PUBLICATION**

This section records the status of known implementations of the protocol defined by this specification at the time of posting of this Internet-Draft, and is based on a proposal described in [RFC7942](#). The description of implementations in this section is intended to assist the IETF in its decision processes in progressing drafts to RFCs. Please note that the listing of any individual implementation here does not imply endorsement by the IETF. Furthermore, no effort has been spent to verify the information presented here that was supplied by IETF contributors. This is not intended as, and must not be construed to be, a catalog of available implementations or their features. Readers are advised to note that other implementations may exist.

As of today these vendors have produced an implementation of the Shutdown Communication:

o ...  
o ...  
o ...

## **8. References**

### **8.1. Normative References**

- [RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", [BCP 14](#), [RFC 2119](#), DOI 10.17487/RFC2119, March 1997, <<https://www.rfc-editor.org/info/rfc2119>>.
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- [RFC4271] Rekhter, Y., Ed., Li, T., Ed., and S. Hares, Ed., "A Border Gateway Protocol 4 (BGP-4)", [RFC 4271](#), DOI 10.17487/RFC4271, January 2006, <<https://www.rfc-editor.org/info/rfc4271>>.
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- [RFC8174] Leiba, B., "Ambiguity of Uppercase vs Lowercase in [RFC 2119](#) Key Words", [BCP 14](#), [RFC 8174](#), DOI 10.17487/RFC8174, May 2017, <<https://www.rfc-editor.org/info/rfc8174>>.





- [RFC8203] Snijders, J., Heitz, J., and J. Scudder, "BGP Administrative Shutdown Communication", [RFC 8203](#), DOI 10.17487/RFC8203, July 2017, <<https://www.rfc-editor.org/info/rfc8203>>.

## **8.2. Informative References**

- [RFC4272] Murphy, S., "BGP Security Vulnerabilities Analysis", [RFC 4272](#), DOI 10.17487/RFC4272, January 2006, <<https://www.rfc-editor.org/info/rfc4272>>.
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- [UTR36] Davis, M. and M. Suignard, "Unicode Security Considerations", Unicode Technical Report #36, August 2010, <<http://unicode.org/reports/tr36/>>.

## **Appendix A. Acknowledgements**

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## **Appendix B. Changes to [RFC 8203](#)**

Feedback from operators based in regions which predominantly use multibyte character sets, showed that messages similar in meaning to what can be send in other languages in using single-byte encoding, failed to fit within the Length constraints as specified by [[RFC8203](#)]. For example, the phrase: 'Planned work to add switch to stack. Completion time - 30 minutes' has length 65 bytes. Its



translation in Russian

'&#1055;&#1083;&#1072;&#1085;&#1086;&#1074;&#1099;&#1077;  
&#1088;&#1072;&#1073;&#1086;&#1090;&#1099; &#1087;&#1086; &#1076;&#10  
86;&#1073;&#1072;&#1074;&#1083;&#1077;&#1085;&#1080;&#1102; &#1082;&#  
1086;&#1084;&#1084;&#1091;&#1090;&#1072;&#1090;&#1086;&#1088;&#1072;&  
#1074;  
&#1089;&#1090;&#1077;&#1082;.&#1042;&#1088;&#1077;&#1084;&#1103; &#10  
79;&#1072;&#1074;&#1077;&#1088;&#1096;&#1077;&#1085;&#1080;&#1103; -  
30&#1084;&#1080;&#1085;&#1091;&#1090;' (See PDF for non-ASCII  
character string) has length 139 bytes.

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