

Dynamic Capability for BGP-4

[draft-ietf-idr-dynamic-cap-04.txt](#)

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2. Abstract

This document defines a new BGP capability termed "Dynamic Capability", which would allow the dynamic update of capabilities over an established BGP session. This capability would facilitate non-disruptive capability changes by BGP speakers.

3. Introduction

Currently BGP capabilities [[BGP-CAP](#)] are only advertised in the OPEN message during the session initialization. In order to enable a new capability or remove an existing capability (such as an Address Family support [[BGP-MP](#)]), an established session needs to be reset, which may disrupt other services running over the session.

This document defines a new BGP capability termed "Dynamic Capability", which would allow the dynamic update of capabilities over an established BGP session. This capability would facilitate non-disruptive capability changes by BGP speakers.

4. Dynamic Capability

The Dynamic Capability is a new BGP capability [[BGP-CAP](#)]. The Capability Code for this capability is specified in the "IANA Considerations" section of this document. The Capability Length field of this capability is one octet. The Capability Value field consists of a list of capability codes (one-octet for each) for which the dynamic revision is supported by a BGP speaker.

By advertising the Dynamic Capability to a peer in the OPEN, a BGP speaker conveys to the peer that the speaker is capable of receiving and properly handling the CAPABILITY message (as defined in the next Section) from the peer after the BGP session has been established.

5. Capability Message

The CAPABILITY Message is a new BGP message type with type code 6. In addition to the fixed-size BGP header [[BGP-4](#)], the CAPABILITY message contains one or more of the following tuples:

```
+-----+
| Action (1 octet)          |
+-----+
| Capability Code (1 octet)  |
+-----+
| Capability Length (1 octet)|
+-----+
| Capability Value (variable)|
+-----+
```

The value of the Action field is 0 for advertising a capability, and

1 for removing a capability.

The triple <Capability Code, Capability Length, Capability Value> is the same as defined in [[BGP-CAP](#)], and it specifies a capability for which the "Action" shall be applied.

6. Operation

A BGP speaker that is willing to receive the CAPABILITY message (for one or more capability codes) from its peer should use BGP Capabilities Advertisement [[BGP-CAP](#)] to advertise the Dynamic Capability for these capability codes.

A BGP speaker may send to its peer a CAPABILITY message that contains one or more capability codes only if these capability codes are listed in the Dynamic Capability of the OPEN message received from its peer.

Upon receiving a CAPABILITY message from its peer, if a capability code in the message is listed in the Dynamic Capability advertised by the speaker to the peer, the BGP speaker shall update the capability previously received from that peer based on the "Action" in the message, and then function in accordance with the revised capability for the peer. The procedures specified in the "Error Handling" section should be followed when an error is detected in processing the CAPABILITY message.

The Dynamic Capability itself can not be revised dynamically via a CAPABILITY message. The lifetime of the Dynamic Capability is the duration of the BGP session in which the capability is advertised.

It is also noted that the dynamic capability revision may not be feasible and should be disallowed for some capabilities. One example is the four-byte AS number capability [[BGP-4BYTE-AS](#)] as its dynamic update could introduce ambiguity in parsing the UPDATE messages.

7. Error Handling

This document defines a new NOTIFICATION error code:

Error Code	Symbolic Name
7	CAPABILITY Message Error

The following error subcodes are defined as well:

Subcode	Symbolic Name
1	Invalid Action Value
2	Invalid Capability Length
3	Malformed Capability Value
4	Unsupported Capability Code

If a BGP speaker detects an error while processing a CAPABILITY message, it MUST send a NOTIFICATION message with Error Code CAPABILITY Message Error. If any of the defined error subcode is applicable, the Data field of the NOTIFICATION message MUST contain the erroneous tuple <Action, Capability Code, Capability Length, Capability Value> that causes the speaker to send the message.

If the Action field in the CAPABILITY message is other than 0 or 1, then the error subcode is set to Invalid Action Value.

If the Capability Length field in the CAPABILITY message is incorrect for a Capability Code, then the error subcode is set to Invalid Capability Length.

If the Capability Value field in the CAPABILITY message is malformed (the definition of "malformed" depends on the Capability Code), then the error subcode is set to Malformed Capability Value.

If the Capability Code in the CAPABILITY message is not any of the capability codes advertised in the Dynamic Capability by the speaker, then the error subcode is set to Unsupported Capability Code.

8. IANA Considerations

This document uses a BGP capability code to indicate that a BGP speaker supports the Dynamic Capability. The capability code has been assigned by IANA per [RFC 2842](#).

9. Intellectual Property Considerations

This section is taken from [Section 10.4 of \[RFC-2026\]](#).

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10. Security Considerations

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

11. Acknowledgments

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12. References

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