

## Capabilities Negotiation with BGP-4

[draft-ietf-idr-bgp4-cap-neg-00.txt](#)

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### **2. Abstract**

Currently BGP-4 [[BGP-4](#)] requires that when a BGP speaker receives an OPEN message with one or more unrecognized Optional Parameters, the speaker must terminate BGP peering. This complicates introduction of new capabilities in BGP.

This document defines new Optional Parameter, called Capabilities, that is expected to facilitate introduction of new capabilities in BGP by providing graceful capability negotiation.

The proposed parameter is backward compatible - a router that supports the parameter can maintain BGP peering with a router that doesn't support the parameter.

### **3. Overview of Operations**

When a BGP speaker that supports capabilities negotiation sends an OPEN message to its BGP peer, the message includes an Optional Parameter, called Capabilities. The parameter lists the capabilities supported by the speaker. The speaker can mark a listed capability as "Required", which means that if the peer doesn't recognize/support the capability, the BGP peering shall be terminated.

When the peer receives the OPEN message, if the message contains the Capabilities Optional Parameter, the peer checks whether it supports all of the listed capabilities marked as R, and if not, sends a NOTIFICATION message, and terminates peering. The Error Subcode in the message is set to Unsupported Capability. The message should contain all the capabilities marked as R that are not supported by the peer. If the peer doesn't support a capability that is not marked as R, the peer should not use this as a reason to terminate peering.

A BGP speaker may use a particular capability when peering with another speaker if both speakers support that capability. A BGP speaker determines the capabilities supported by its peer by examining the list of capabilities present in the Capabilities Optional Parameter carried by the OPEN message that the peer sends to the speaker.

A BGP speaker determines that its peer doesn't support capabilities negotiation, if in response to an OPEN message that carries the Capabilities Optional Parameter, the speaker receives a NOTIFICATION message with the Error Subcode set to Unsupported Optional Parameter.

### **4. Capabilities Optional Parameter (Parameter Type 2):**

This is an Optional Parameter that is used by a BGP speaker to convey to its BGP peer the list of capabilities supported by the speaker.

The parameter contains one or more triples <Capability Code, Capability Length, Capability Value>, where each triple is encoded as shown below:

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



+-----+

The use and meaning of these fields are as follows:

**Capability Code:**

Capability Code is a one octet field that unambiguously identifies individual capabilities.

The high-order bit of this field is used to mark the capability as "Required" (if the bit is set to 1).

**Capability Length:**

Capability Length is a one octet field that contains the length of the Capability Value field in octets.

**Capability Value:**

Capability Value is a variable length field that is interpreted according to the value of the Capability Code field.

## **5. Extensions to Error Handling**

This document defines new Error Subcode - Unsupported Capability. The value of this Subcode is 7. The Data field in the NOTIFICATION message lists the set of capabilities that are marked as Required, but are either unsupported or unrecognized by the BGP speaker that sends the message. Each such capability is encoded the same way as it was encoded in the received OPEN message.

## **6. Security Considerations**

Security issues are not discussed in this document.



## **7. Acknowledgements**

To be supplied.

## **8. References**

[BGP-4]

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