Advertising Unreachable Links in OSPF
draft-gong-lsr-ospf-unreachable-link-03

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Overview

• There is currently no effective way to advertise unreachable links in OSPF. This draft aims to address it.

• Presented at interim-2022-lsr-01 and 115 meeting.

• Updates:
  
  • New co-author: Acee Lindem.
  
  • Only the solution based on Maximum Link Metric is retained.
  
  • Add "Management Considerations" section.
  
  • Some text optimization
Solutions

Solution A: Maximum Link Metric ✔

• Use MaxLinkMetric (0xffff) to advertise unreachable links.

Solution B: Unreachable Link Flag

• A new-defined OSPF Link Flags sub-TLV carried in OSPFv2 Extended Link TLV and OSPFv3 Router-Link TLV

<table>
<thead>
<tr>
<th>Type</th>
<th>Length</th>
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– U-Flag: Unreachable Link Flag. The associated link MUST be treated as unreachable during SPF calculation.
Advantages of Solution A

• For OSPF prefixes, the maximum metric is already defined as infinity.

• Solution B requires the advertising and accessing of OSPFv2 Extended Link TLV for the OSPF SPF calculation. But solution A does not.

• IS-IS defines the maximum link metric as infinity

• Implementation would be cleaner.
Extensions for MaxLinkMetric

• A new Bit in Router Functional Capabilities TLV [RFC7770]:

```
+----------------+-----------------+----------------+-----------------+----------------+-----------------+
|              Type |             Length |              Type |             Length |              Type |             Length |
+----------------+-----------------+----------------+----------------+----------------+----------------+
|      ...       |            M     |      ...       |            M     |      ...       |            M     |
```

M-bit: MaxLinkMetric support

• MaxLinkMetric is applicable for TLVs/LSAs:
  • The Router-LSA
  • The OSPFv2 Extended Link TLV of OSPFv2 Extended Link Opaque LSA
  • The Router-Link TLV of OSPFv3 E-Router-LSA

• All routers supporting the MaxLinkMetric feature must advertise the capability.

• If detecting the presence of a reachable Router-LSA/Extended Link Opaque LSA/E-Router-LSA without a companion RI LSA that has the M-bit set, all routers MUST recalculate routes without considering MaxLinkMetric.
Management Considerations

• Support of the MaxLinkMetric capability SHOULD be configurable. In some networks, the operator may still want links with maximum metric to be treated as reachable. For example, the auto-costing of links is used and there is a mix of low- and high-speed links. In such cases, the updated routers can disable that capability and still treat links with maximum metric as reachable.

• It is also RECOMMENDED that implementations supporting this document and auto-costing limit the maximum cost to MaxLinkMetric - 1.
Next Steps

• Any questions and comments are Welcome
• Ask for WG adoption.