MPLS Entropy Label capability: BGP signaling.

BGP Next-Hop dependent Capabilities

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Recaps: MPLS Entropy Label

- Entropy Label improve load-balancing in MPLS.
  - also applicable to MPLS Segment Routing.

- Defined by the MPLS WG in RFC 6790.

- LSP egress required to first signal its capability to process EL.
  - signaling defined for LDP, BGP, RSVP-TE
  - for BGP, defines a specific transitive attribute (Entropy Label Capability Attribute)

- RFC 7447 deprecates this BGP attribute.
  - because a transitive BGP Attribute can’t fulfill the EL signaling requirements
  - and calls a future replacement.
Goal 1: signal EL capability.

Re-specify the BGP control plane signaling.
  – to signal the capability to receive EL as egress LSR

In short: copy/paste from RFC 6790 but using a non-transitive BGP attribute.
Goal 2: make it generic.

At no cost, we can define capability values to allow the advertisement of future features.

Provides a generic BGP tool to signal NLRI/path capabilities which are BGP Next-Hop dependent.

Useful for incremental deployment of future features.
  – non-transitive attribute required to enforce the signaling behavior (reset when NH change)
  – non-transitive attribute are more painful to deploy (limited incremental deployment)
  – by using a existing non-transitive BGP attribute, we benefit from pre-existing implementations of this attribute. Ease incremental deployment.
BGP Next-Hop dependent Capabilities Attribute

- New optional non-transitive BGP Attribute.

- Generic tool to advertise next-hop dependent capabilities.
  - typically forwarding plane capabilities.

- Attribute operation:
  - Propagated while BGP Next-Hop is unchanged;
  - Removed (possibly modified) when BGP Next-Hop is changed;
  - (removed if not supported/unknown as per RFC 4271).

- Encoding borrowed from RFC 3392 (BGP (session) capability):

```
+-------------------------------+
<table>
<thead>
<tr>
<th>Capability Code (1 octet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capability Length (1 octet)</td>
</tr>
<tr>
<td>-------------------------------</td>
</tr>
<tr>
<td>Capability Value (variable)</td>
</tr>
<tr>
<td>~</td>
</tr>
</tbody>
</table>
+-------------------------------+
```
Entropy Label capability.

- **Encoding:**
  - BGP Next-Hop dependent Capabilities Attribute;
  - Entropy Label Next-Hop Capability type code 1.

```
+--------------------------+
| Capability Code: .......1........|
+--------------------------+
| Capability Length: ....0.....|
+--------------------------+
```

- **Operation:**
  - When advertised, EL labels may be sent to the BGP Next-Hop, for the labelled NLRI advertised in the BGP Update.
  - Specific EL rules copy/pasted from RFC 6790 (EL RFC)
IETF WGs

- Feedback & comments welcomed.

- Presented twice:
  - IDR WG during IETF 92 (Dallas)
  - MPLS WG during IETF 93 (Prague)
    - IDR would be the preferred hosting WG as per MPLS & IDR chairs feedback.

- Would like to ask for IDR WG adoption.
Thank you