BGP Update for 5G Edge Service Metadata

draft-dunbar-idr-5g-edge-compute-app-meta-data-13
draft-dunbar-idr-5g-edge-service-metadata-00

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Site Capacity Index – one or multiple routes
Site Preference Index – one or multiple routes
Load Index – Individual routes
BGP UPDATE for the Site Capacity Index: Sub-TLV

Capacity Index indicates the capacity value for the site that host the edge services

- Site ID: identifier for a group of routes whose capacity is indicated by the capacity value carried in the UPDATE. There could be more than one sites (or Pods) connected to the egress router (a.k.a. Edge DC GW)

- Site Capacity Index: represent the percentage of the site availability, e.g., 100%, 50%, or 0%. When a site goes dark, the Index is set to 0. 50 means 50% capacity functioning.
draft-raszuk-aggr-withdraw-00 allows a BGP speaker to withdraw multiple NLRIs that share a set of properties.

**MP_AGGREGATE_Wrapdraw Attribute**
- Address Family Identifier (2 octets)
- Subsequent Address Family Identifier (1 octet)
- Flags (2 octets)
- Total Attribute Length (2 octets)
- Attributes (variable length)
- TLVs (optional & variable length)

**TIME_TO_WRAPDRAW**

**MP_AGGREGATE_WRAPDRAW Capability**

**Aggregate Withdraw Extended Community Attribute**

The value is a locally significant 6 octet value assigned by bgp speaker to differentiate the routes based on various operator’s depended requirements.

**Current Approach:**
- The Site Capacity Sub-TLV can be used to de-prefer the paths for the group of the routes identified by the Site-ID.
  
- If the Site Capacity Index = 0 that equivalent to fiber cut. All the routes to this site would be un-reachable.
## Preference Index and Load Index values

The Preference Index sub-TLV has the following format:

<table>
<thead>
<tr>
<th>Type (TBD)</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Preference Index</td>
<td></td>
</tr>
</tbody>
</table>

---

Aggregated Load Index sub-TLV

<table>
<thead>
<tr>
<th>Type (TBD)</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measurement Period</td>
<td></td>
</tr>
<tr>
<td>Aggregated Load Index to reach the App Server</td>
<td></td>
</tr>
</tbody>
</table>

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Raw Load Measurement sub-TLV:

<table>
<thead>
<tr>
<th>Type (TBD)</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measurement Period</td>
<td></td>
</tr>
<tr>
<td>total number of packets to the AppServer</td>
<td></td>
</tr>
<tr>
<td>total number of packets from the AppServer</td>
<td></td>
</tr>
<tr>
<td>total number of bytes to the AppServer</td>
<td></td>
</tr>
<tr>
<td>total number of bytes from the AppServer</td>
<td></td>
</tr>
</tbody>
</table>

---

TLV has the following format:

```
Raw Load Measurement sub-TLV: 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
<table>
<thead>
<tr>
<th>Type (TBD)</th>
<th>Length</th>
</tr>
</thead>
<tbody>
<tr>
<td>Measurement Period</td>
<td></td>
</tr>
<tr>
<td>total number of packets to the AppServer</td>
<td></td>
</tr>
<tr>
<td>total number of packets from the AppServer</td>
<td></td>
</tr>
<tr>
<td>total number of bytes to the AppServer</td>
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</tr>
<tr>
<td>total number of bytes from the AppServer</td>
<td></td>
</tr>
</tbody>
</table>
```
**Metadata Path Attribute**

- New Metadata Path Attribute
  - Optional transitive BGP Path attribute to carry the Edge Service Metadata
  - The metadata are applicable to multiple NLRIs

```
+---------------+---------------+---------------+---------------+---------------+---------------+---------------+---------------+---------------+---------------+---------------+---------------+
<table>
<thead>
<tr>
<th>Service-Metadata Type</th>
<th>Length (2 Octets)</th>
<th>Value (multiple Metadata sub-TLVs)</th>
</tr>
</thead>
</table>
```

Three types of Edge Service Metadata sub-TLVs: the Capacity Index, the Site Preference Index, and the Load Measurement

- Why New Path Attribute, instead of attaching the metadata sub-TLVs to existing path attributes?
  - For ease of implementation
  - The metadata are applicable to all NLRIs
Next Step

➢ Solicit more comments from the WG
➢ Ask for WG Adoption