ALTO Traffic Engineering Cost Metrics

draft-wu-alto-te-metrics-08

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Document Status

• Started with draft-wu-alto-json-te, and was first presented at IETF 87 Berlin, during ALTO re-chartering
  – A lot of interests from vendors and operators in this work.
• Consolidation with draft-lee-alto-app-net-info-exchange and draft-ietf-alto-multi-cost, renamed as draft-wu-alto-te-metrics-00, second presented at IETF90 Toronto
• Accept as Chartered item together with ALTO Cost Calendar to fulfill the Cost Property Extension milestone (May 2015)
Update since last version

- The changes in the latest version (draft-wu-alto-te-metrics-08):
  - Revised -08 to use template of RFC 6390 (Guidelines for Considering New Performance Metric Development) to describe performance cost metric.
  - Change the title as ALTO performance Cost Metric
  - Add IPv6 example to address Fred Baker’s comment on the list.
  - Highlight the metrics are end to end metrics. Hop Count property is clarified.
  - Clarified the validity period of each metric needs to be negotiated between the server and client
    - The validity period of a metric can be one or multiple of measurement interval on the metric.
  - Clear confusion on whether we redefine the metric and how is related to BGP-LS in routing area
    - Metric redefine Clarifications:
      - We are not redefine metric and we feed derive and aggregate TE metrics from routing protocol and feed them to ALTO server and provide them to ALTO client.
      - ALTO server may aggregate metric data gathered using various routing protocols or other management tool and provide them in an e2e sense.
    - Relationship with BGP-LS
      - This draft is complementary to BGP-LS since BGP-LS is used to collect TE metric and send it to ALTO server and then ALTO server aggregate these data and expose it to the ALTO client in the northbound interface.
# The Cost Metrics

- Delay (delay)
- Delay Jitter (jitter) -> delayjitter
- Packet Loss (pktloss)
- Hop Count (hopcount)
- Bandwidth

<table>
<thead>
<tr>
<th>Metric name</th>
<th>Metric Description</th>
<th>Relation to other metric</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Bandwidth (maxbw):</td>
<td>the maximum bandwidth that can be used; motivated from RFC 3630 Sec. 2.5.6.</td>
<td></td>
</tr>
<tr>
<td>Maximum Reservable Bandwidth (maxresbw):</td>
<td>the maximum bandwidth that can be reserved; motivated from RFC 3630 Sec. 2.5.7.</td>
<td>Maxresbw can be larger than maxbw if the link is oversubscribed</td>
</tr>
<tr>
<td>UnReserved Bandwidth (unresbw[x,y]):</td>
<td>the amount of bandwidth not yet reserved at each of the eight priority levels in IEEE floating point format, return an array, motivated from RFC 3630 Sec. 2.5.8</td>
<td>The initial value of unresbw for each priority can be maxbw.</td>
</tr>
<tr>
<td>Residue Bandwidth (residbw):</td>
<td>subtracts tunnel reservations from Maximum Bandwidth, motivated from [I-D. ietf-isis-te-metric-extensions], Sec.4.5.</td>
<td>Residbw = maxbw - tunnel reservation bw</td>
</tr>
<tr>
<td>Available Bandwidth (availbw):</td>
<td>subtracts the tunnel reservation and the measured bandwidth used for the actual forwarding of best effort traffic from Maximum Bandwidth, motivated from [I-D. ietf-isis-te-metric-extensions], Sec.4.6.</td>
<td>Availbw = residbw- measured bw for best effort traffic</td>
</tr>
<tr>
<td>Utilized Bandwidth (utilbw):</td>
<td>Actual measured bandwidth used for all traffic, motivated from [I-D. ietf-isis-te-metric-extensions], Sec.4.7.</td>
<td>Utilbw = measured bw for best effort traffic a+ bw for TE traffic</td>
</tr>
</tbody>
</table>
Why Propose new Cost Metric?

- Fulfill the Cost Property Extension milestone together with ALTO Cost Calendar
- Allow applications to determine "where" to connect based on end to end network performance criteria
- Fill the gap on Alto Server Network API Use case proposed in RFC7752, section 2.2 and draft-ietf-idr-te-pm-bgp-02, section3.2

- ALTO base protocol defines only a single cost metric, i.e., the generic "routingcost" metric
  - (Sec. 14.2 of ALTO base specification [ALTO])
Next Step

• WG adoption?