

# ***GMPLS extensions to communicate latency as a Traffic Engineering performance metric***

[draft-wang-ccamp-latency-te-metric-03.txt](#)

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# Changes since last version

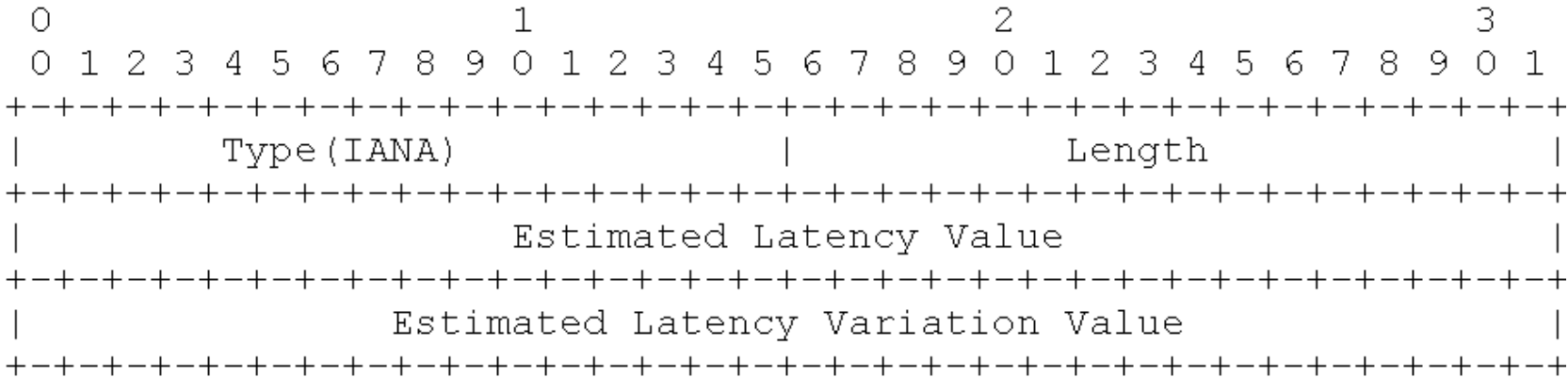
- Clarify the Requirement
- Modifications to following TLV
  - *Latency sub-TLV in OSPF-TE*
  - *Latency SLA Parameters subobject in RSVP-TE*
  - *Latency Accumulation Object in RSVP-TE*
- Adding a new object in RSVP-TE
  - *Required Latency Object*
- Modifications to the Signaling Procedures
- Editorial changes

# Requirement Identification

- Making Latency and variation as a Link attribute.
- Path computation with latency constraint.
- Component Link or FA selection/creation based on latency constraint.
- Latency accumulation and verification along one path across multi-domain.
- Some customers may insist on having the ability to re-route if the latency SLA is not being met.

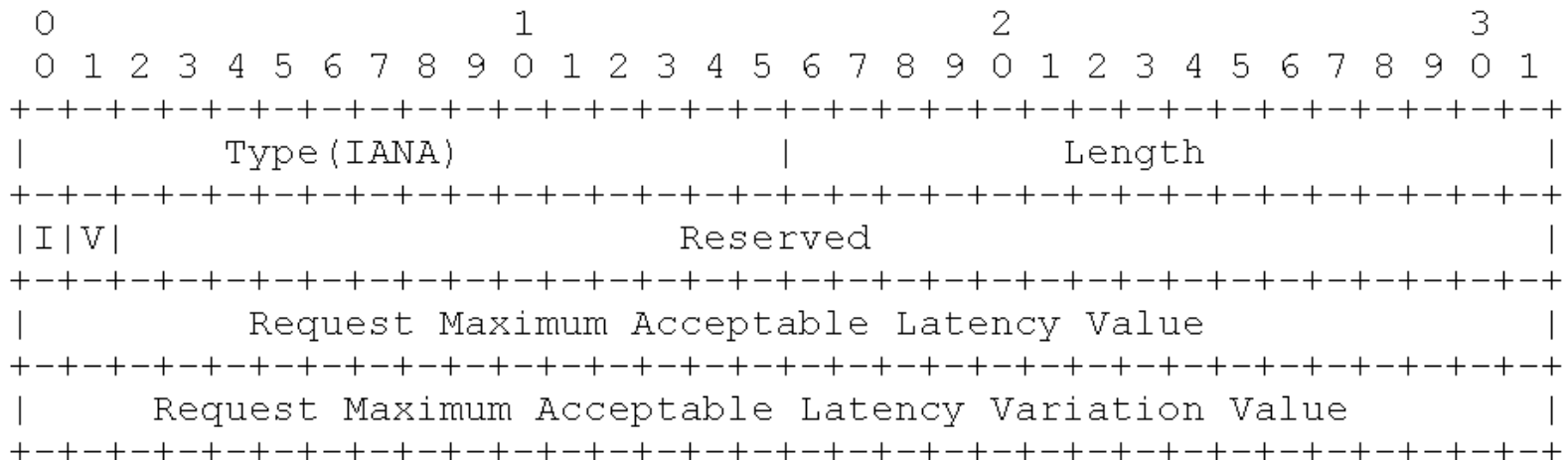
# Latency Advertisement

- Latency sub-TLV of TE Link
  - Merging node latency into the link latency attribute.*
  - When the latency calculation is done for paths traversing links on the same node then the node latency can be subtracted out.*



# Component Link or FA Selection/ Creation

- Latency SLA Parameters ERO subobject
  - It is added into the boundary node ERO of FA-LSP or Composite Link.
  - It explicitly conveys the latency SLA parameter used for component link or FA selection and creation based on the latency constraint.
    - *I bit: indicates whether a traffic flow shall select a component link or FA with the minimum latency value or not.*
    - *V bit: indicates whether a traffic flow shall select a component link or FA with the minimum latency variation value or not.*



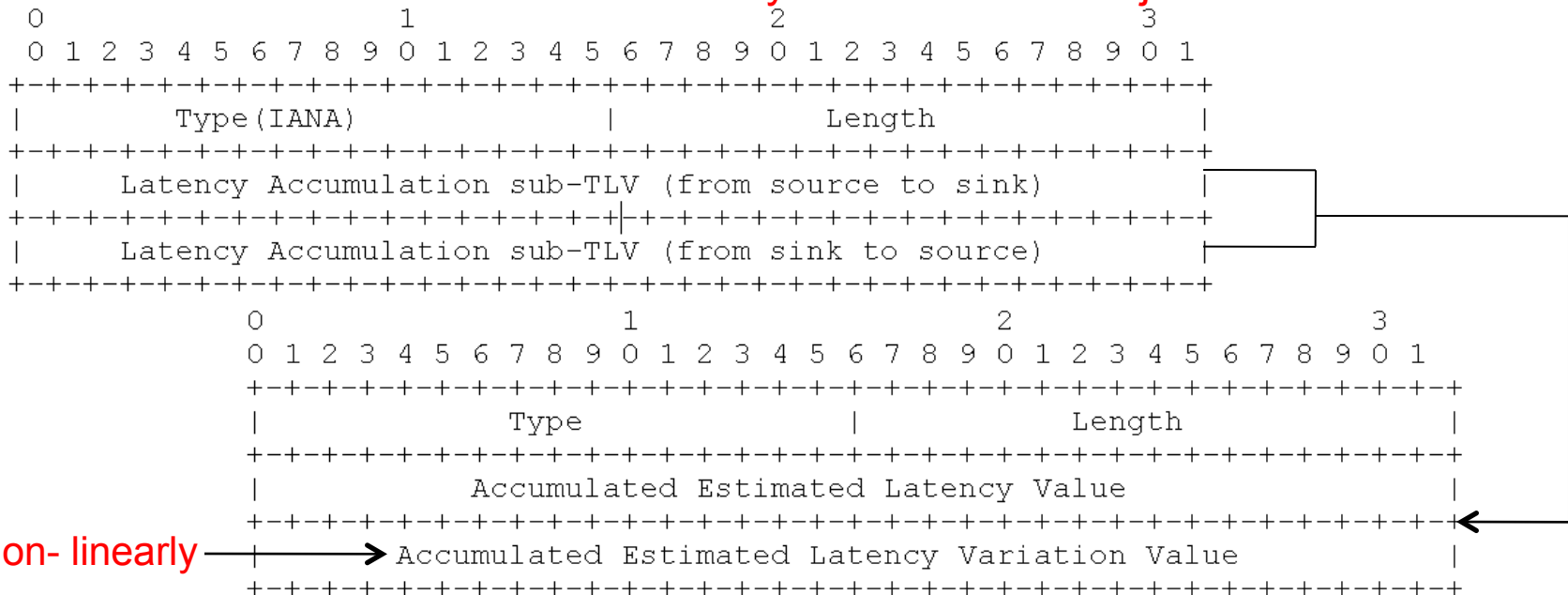
# Component Link or FA Selection/ Creation

- Assume there are following component links within one composite link.
  - Component link1: latency = 5ms, latency variation = 15 us
  - Component link2: latency = 10ms, latency variation = 6 us
  - Component link3: latency = 20ms, latency variation = 3 us
  - Component link4: latency = 30ms, latency variation = 1 us
- Assume there are following SLA Parameters for component link selection. Only Component link2 could be qualified.
  - I bit = **TRUE**
  - V bit = **FALSE**
  - Maximum Acceptable Latency Value= 35 ms
  - Maximum Acceptable Latency Variation Value = 10us
- Assume there are following SLA Parameters for component link selection. There may be no any qualified component links. **Priority may be used for latency and variation.**
  - I bit = **TRUE**
  - V bit = **TRUE**
  - Maximum Acceptable Latency Value= 35 ms
  - Maximum Acceptable Latency Variation Value = 10us

# Latency Accumulation and Verification

- Latency Accumulation Object
  - It is carried in Path/Resv message in order to accumulate the latency of each links and nodes along the path which is across multi-domain.
  - When the source node desires to accumulate (i.e., sum) the total latency of one end-to-end LSP, the "Latency Accumulating desired" flag should be set in the LSP\_ATTRIBUTES object of Path/Resv .

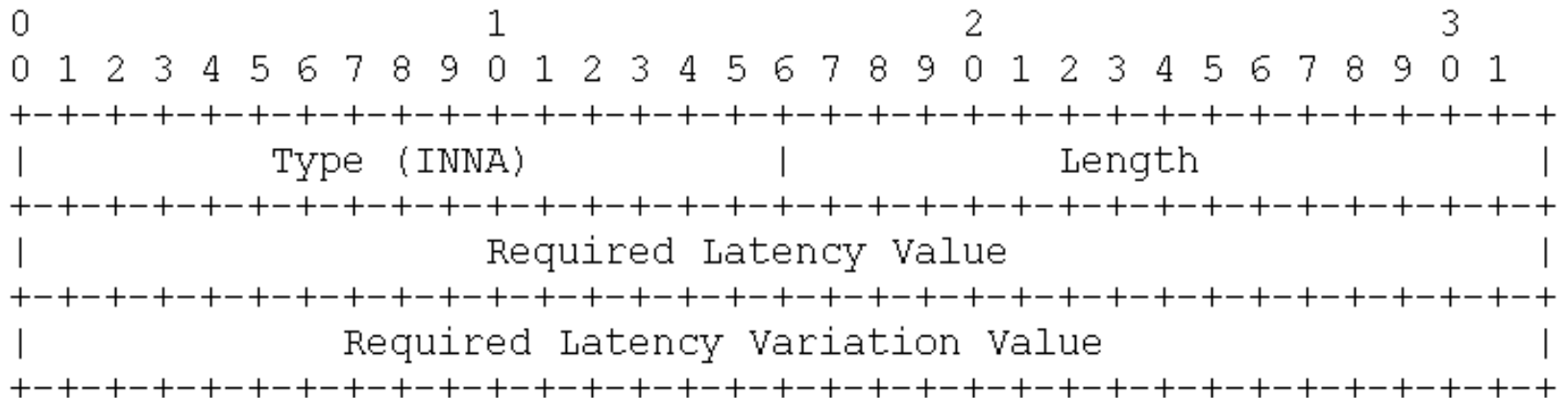
## Latency Accumulation Object



## Latency Accumulation sub-TLV

# Latency Accumulation and Verification

- Required Latency Object
  - It is carried in the LSP\_ATTRIBUTES object of Path/Resv message.
  - If the source node makes the intermediate node have the capability to verify the accumulated latency, the "Latency Verifying desired" flag should be set in the LSP\_ATTRIBUTES object of Path/Resv.
  - Intermediate nodes could reject the Path or Resv if the accumulated latency exceeds required latency value in this object.





# Next steps

- Refine the document according to the feedback of meeting and mailing list.
- Suggestion:
  - Make it as a framework document in CCAMP
  - Make RSVP-TE extension as individual document in CCAMP
  - Make routing TE extension as individual document in OSPF-TE/IS-IS-TE
    - Latency is always combined with bandwidth, SRLG and other traffic engineering parameters.