Carrying SID Algorithm information in PCE-based Networks

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Motivation

• A PCE can compute SR-TE paths using prefix SIDs with different Algorithms depending on the use-case, constraints, etc. While this information is available on the PCE, there is no method of conveying this information to the headend router

• The headend can also compute SR-TE paths using different Algorithms, and this information also needs to be conveyed to the PCE for collection or troubleshooting purposes

• An operator may also want to constrain the path computed by the PCE to a specific SID Algorithm. For example, in order to only use SID Algorithms for a low-latency path
Prefix-SID Algorithm

- Described in Segment Routing Architecture RFC
  - RFC 8402 - Section 3.1.1
  - Two algorithms defined
    - Shortest Path First (SPF) = 0
    - Strict Shortest Path First (Strict-SPF) = 1
- IGP Algorithm Types in IANA registry
  - Two existing algorithms and Flexible Algorithms range
TLV for the LSPA Object - changes

- Removed F flag

| Type=TBD | Length=4 |

| Reserved | Flags | Algorithm |

- F (Fallback): If set to 1 and the PCE is unable to compute a path using only prefix SIDs with the specified Algorithm, the PCE MAY compute an alternate fallback path without constraining to the specified Algorithm.

- L (Loose): If set to 1, the PCE MAY insert prefix SIDs with a different Algorithm, but it MUST prefer the specified Algorithm whenever possible.
TLV for the LSPA Object - clarification

• SID Algorithm is not replacing Objective Function
  • Specified algorithm acts as filter restricting, which SIDs can be used
• Algorithm constraint in LSPA is specifying end-to-end algorithm
  • Applicable only if L flag is not set
• Different algorithms can be used in one path if L flag is set
  • Loop avoidance is implementation specific
Next steps

• Comments and discussion are welcome