Carrying SID Algorithm information in PCE-based Networks

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Motivation

- A PCE can compute SR-TE paths using 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.

- An operator may also want to constrain the path computed by the PCE to a specific SID Algorithm.

- SID Algorithm covers:
  - SPF (Algo 0)
  - Strict SPF (Algo 1)
  - Flex-Algo (Algo 128-255)

- Computing path with a fewer SIDs
Current state

• SR-ERO and SRv6-ERO sub-objects extended with Algorithm field to encode SID-algorithm in ERO

• SID Algorithm TLV in LSPA object to specify SID algorithm constraint
  • PCE is allowed to use only SIDs with specified algorithm
  • L (loose) flag – PCE to prefer SIDs with specified algorithm

• Even if specified SID Algorithm is Flex-algo, PCE is not enforced to use constraints from Flex-algo Definition (FAD)
Problem definition

• For Flex-algo
  • If additional constraints or metric-type are specified in FAD, then PCE will not respect them
  • Computed path may be unusable, because traffic forwarding by IGP may follow different path

SR-TE Policy
  SID-algorithm 128
  Metric-type IGP

Flex-algo Definition – Algo 128
  Admin Group
    Exclude “red”

Computed path:
  10002
  10004

```
R1
IGP=100
Prefix SID 10003
Algo 128

R2
IGP=10
Prefix SID 10002
Algo 128

R3
Prefix SID 10003
Algo 128

R4
IGP=100
Prefix SID 10004
Algo 128
```
Proposed solution

• Consider constraints and metric-type from FAD in path-computation if Flex-algo constraint was specified
• FAD is already available in PCE topology from IGP or BGP-LS
• Other constraints from PCRpt SHOULD be ignored by PCE considering other flags in PCEP object
• PCE implementation can decide to honor additional constraints
• If combination of constraints is not supported PCE SHOULD respond with empty ERO
• New flag in SID-algorithm TLV to control if FAD SHOULD be considered
Next steps

• Comments and discussion are welcome
• Update draft based on the discussion on this call and based on any other comments received