BGP Colorful Prefix Routing (CPR) for SRv6 based Services

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Haibo Wang, Jie Dong, Jingrong Xie, Xinjun Chen

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Recap of CPR

- Different SRv6 sub-locators are assigned to represent different “color” or “intent”
  - SRv6 Service SIDs are allocated from the SID space of the corresponding Colorful locators
  - These colorful SRv6 locators are treated as **Colorful Prefixes** by BGP

- Colorful prefix routing (CPR) is a mechanism to establish inter-domain intent-aware paths for SRv6 based services **based on existing BGP technologies**
  - IPv6 Unicast address family is used for the advertisement of Colorful Prefix Routes
  - Color extended community is used to indicate the intent associated with the Colorful Prefix in each network domain
  - Resolution of CPR routes to intra-domain intent-aware paths is based on (NextHop, Color) tuple

- CPR also provides **optimized data plane** for inter-domain SRv6 services
  - Takes advantage of the IP reachability of SRv6 SIDs (they are routable in the network)
  - IP longest prefix matching is used for service SID to CPR route steering
  - Dedicated SRv6 transport SIDs are not required, thus encapsulation efficiency is improved
Recent Updates

• Version -01
  • Clarifies the mechanism and procedures when some of the transit domains are MPLS-based
  • Add reference to the SRv6-MPLS interworking draft
  • Editorial changes

• Version -02
  • Clarifies the data plane optimization with longest prefix matching of SRv6 Service SIDs
  • Revises the operational considerations to clarify the relationship with the BGP “route with color” extension mechanisms (BGP CT and CAR)
  • Editorial changes
Next Steps

• The CPR mechanism is straightforward, stable and well documented

• It is considered complementary to the BGP extension mechanisms of “Route with Color”
  • Provides an alternative approach for better interoperability and incremental deployment required in some network scenarios
  • BGP extensions with new BGP SAFI/NLRI and new attributes could be introduced when required for other network scenarios, while the data plane operations for SRv6 could be aligned

• Document is ready for WG adoption
Thank You
SRv6 Service SID and Colorful Locator Prefix

• An SRv6 SID consists of: Locator, Function and optional Argument

<table>
<thead>
<tr>
<th>LOC</th>
<th>FUNCT (ARG)</th>
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• SRv6 Service SIDs are routable according to its locator prefix

• On each node, different SRv6 sub-locators can be allocated for different intent
  • These locators are called Colorful Locators

<table>
<thead>
<tr>
<th>Base LOC</th>
<th>C-LOC 1</th>
<th>C-LOC 2</th>
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• SRv6 service SIDs with specific intent are allocated using the corresponding Colorful Locators as the covering prefix

Service SID with low latency: C-LOC 1  FUNCT (ARG)
Service SID with high bandwidth: C-LOC 2  FUNCT (ARG)