

BGP Flexible Color-Based Tunnel Selection

draft-shen-idr-flexible-color-tunnel-selection-00

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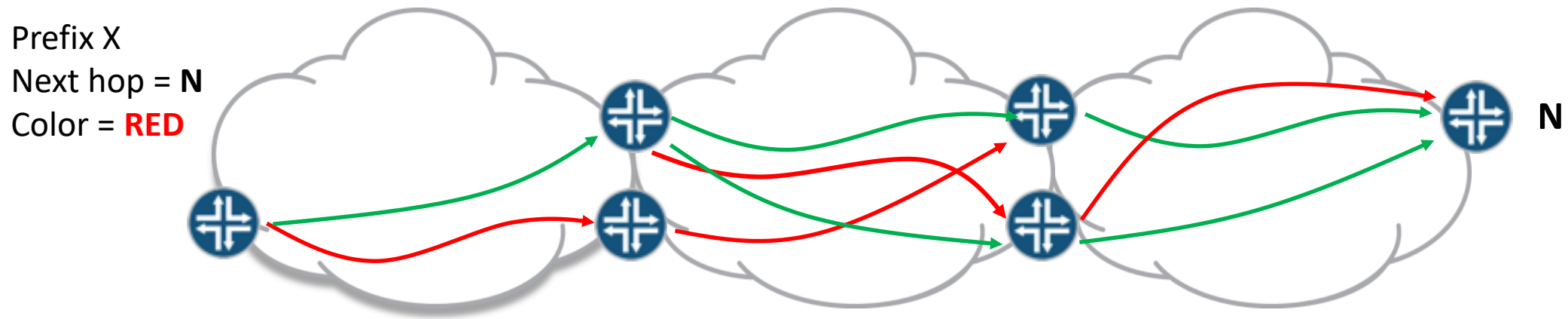
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Color as Criterion in Tunnel Selection

- Payload prefix with BGP next hop **N** and color **RED** → **RED** tunnel to **N**
- Use cases: inter-domain TE, SR, etc.



Color-Based Tunnel Selection

- Color provides a generic notion for network attributes:
 - TE characteristic
 - Virtual topology
 - Network slice
 - Path computation algorithm
- Color Extended Community can be signaled across AS, and from controller to routers.
- A generic service mapping mechanism based on TE, slicing, virtualization, flex-algo, etc., suitable for inter-domain and controller-driven environments.

Extended Mapping Modes and Flexible Selection Scheme

Extended mapping modes

- IP-color, with optional fallback colors
- Color-only, with optional fallback colors
- IP-any-color
- IP-only
- Converted-IPv6
- Converted-IPv6-color, with optional fallback colors
- Converted-IPv6-any-color
- Color-profile

Flexible selection scheme

- Consists of a sequence of extended mapping modes
- Falls back from one mode to next mode in the specified order

Example: payload prefix with next-hop **N** and color **RED**.

Flexible selection scheme:

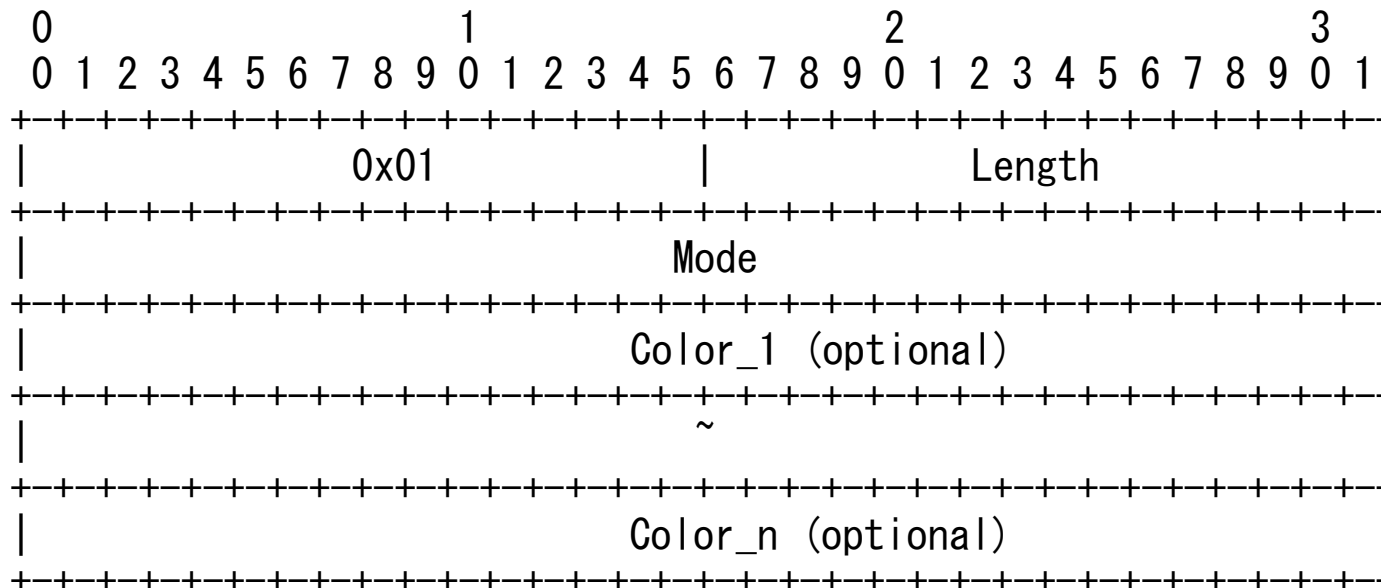
- (1) IP-color, fallback = {**BLUE**, **GREEN**}
 - Attempt **RED** tunnel to **N**
 - Fall back to **BLUE** tunnel to **N**
 - Fall back to **GREEN** tunnel to **N**
- (2) Converted-IPv6-color, fallback = {**BLUE**}
 - Attempt **RED** tunnel to **N'**
 - Fall back to **BLUE** tunnel to **N'**
- (3) IP-only
 - Attempt uncolored tunnel to **N**

Provisioning Modes of Flexible Selection Scheme

- Ingress router
 - Configure as a policy
 - Apply to payload prefixes
- Egress router
 - Signal via a new **Flexible Color Tunnel Selection** Path Attribute to ingress routers
 - Apply to payload prefixes on each ingress router
- Controller
 - Signal via a new **Flexible Color Tunnel Selection** Path Attribute to ingress routers
 - Apply to payload prefixes on each ingress router

BGP Flexible Color Tunnel Selection Path Attribute

- Carries the information of a tunnel selection scheme.
- Comprises a sequence (in the fallback order) of Extended Mapping Mode TLVs.



Relationship with Color-Only Bits of Color Extended Community

- *draft-filsfils-spring-segment-routing-policy* and *draft-previdi-idr-segment-routing-te-policy* defines two “Color-Only” bits in the Color Extended Community, and three fallback modes.
- This draft supports user-defined flexible selection schemes
 - Fully supports the fallback modes pre-defined by the CO bits
- If flexible selection scheme and the CO bits co-exist:
 - Local policy > received CO bits > received Flexible Color Tunnel Path Attribute

Next Steps

- Request review
- Welcome comments and suggestions