Distribute Service Metric by BGP

draft-lin-idr-distribute-service-metric-02

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Motivation

**CATS:**
- As described in draft-ietf-cats-framework-02, a C-SMA is required to collect service metrics.
- Routing at the ingress-forwarder should be based on both network and service metrics.

**Problem:**
- Service metrics periodically change, unlike existing routing information.
- Services are identified by CS-ID and CIS-ID, and there are limitations in passing them through the existing address families.
- Periodic updates of service metrics need to avoid impacting existing routing.
- Periodic updates of service metrics require efficient mechanisms to improve transmission performance.

**Thoughts:**
- Use extended BGP to transmit computation metrics, leveraging BGP’s efficient and powerful extension capabilities.
- Extend an independent address family to transmit computation metrics without affecting the transmission of other routing information.
- Define flexible NLRI to efficiently achieve the transmission of service metrics.
- Implement on-demand subscription functionality to enable the on-demand transmission of service metrics.
Extend BGP with new service metric address families

- The format of the Service Metric NLRI
  1. Service Metric Register route
  2. Service Metric Subscribe route
  3. Service Metric Update route
Operational Mechanism

Register
- Egress send registration route to RR
- RR forwards the registration route to all Ingress nodes.

Subscribe
- Ingress receives a service request and sends a subscription route to the RR.
- The RR forwards the subscription route to the corresponding Egress nodes.
- Egress responds with an updated route to Ingress.

Period Update
- Egress send periodic Update service metric route to subscribers.

UnSubscribe
- Upon forwarding table aging, send a withdraw subscription route to RR.
- RR notifies corresponding Egress of the route withdrawal.
- Egress no longer sends periodic route updates to the Ingress.
Summary

Solution:

• Defined new BGP address families to convey computing service metric information.

• Introduced variable-length NLRIs that distinguish between key and non-key parts.

• Metrics that change periodically are placed in the non-key part.

• Set the next hop for service metrics routing to 0, and placed the service-associated location address in the non-key part.

• Established mechanisms for subscribing to and publishing service metrics.

Goal:

• Minimize the impact on existing route propagation.

• Service CSID identifiers are not limited to anycast IP addresses.

• Improve the efficiency of sending periodic service metric updates.

• Send on-demand and control the propagation scope of service metrics.
Use Case

1. Type 1 (Register) [RD: 200:1, CS-ID: 10.1.1.1]
2. Type 1 (Register) [RD: 300:1, CS-ID: 10.1.1.1]
3. Type 2 (Subscribe) [RD: 100:1, CS-ID: 10.1.1.1]
4. Type 3 (Update) [RD: 200:1, CS-ID: 10.1.1.1, CIS-ID: 1, Gateway: 100.1.1.1, Metric 1]
5. Type 3 (Update) [RD: 300:1, CS-ID: 10.1.1.1, CIS-ID: 2, Gateway: 200.1.1.1, Metric 2]
6. Type 3 (Update) [RD: 200:1, CS-ID: 10.1.1.1, CIS-ID: 1, Gateway: 100.1.1.1, Metric 1]
7. Type 3 (Update) [RD: 300:1, CS-ID: 10.1.1.1, CIS-ID: 2, Gateway: 200.1.1.1, Metric 2]
8. Type 3 (Update) [RD: 200:1, CS-ID: 10.1.1.1, CIS-ID: 1, Gateway: 100.1.1.1, Metric 1]
9. Type 3 (Update) [RD: 300:1, CS-ID: 10.1.1.1, CIS-ID: 2, Gateway: 200.1.1.1, Metric 2]

Note: RR will bundle multiple prefixes (NLRIs) with the same attributes into a single Update packet.
Next Steps

• Any questions or comments are Welcomed.
Thanks