Route Distinguisher Outbound Route Filter (RD-ORF) for BGP-4

[ draft-wang-idr-rd-orf ]

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• Problems Description
• Proposed Solutions
• Further Action
**Problem Description**

- PE1 – PE4 maintain VPN route information in Virtual Routing Forwarding (VRF)
- RR do not maintain any VRF
- When the VRF of VPN1 in PE2 overflows, BGP Maximum-Prefix Features cannot be used to notify the source of the VPN routes this unexpected event.
Problem Description

VPN Routes Exchange via RR within one Single Domain

Existing solutions:
- Route Target Constraint (RTC) as defined in [RFC4684]
  - Can only specify which VPN routes it wants
  - Can’t be used to control the route limit within one specified VPN
- Address Prefix ORF as defined in [RFC5292]
  - Need to be preconfigured.
  - But the source of the overflow VPN can’t be decided in advance.

The Proposed Route Distinguisher Outbound Route Filter (RD-ORF) mechanism:
- Can control the VPN route limit based on source RD and originator
- Event-driven, does not need to be pre-configured
Solution – RD-ORF (single-domain scenario)

When the VRF of VPN1 in PE1 overflows:

1. PE1 generates a BGP ROUTE-REFRESH message contains a RD-ORF entry, and send it to RR;
   • RR checks the RD-ORF entry and **add** the RD-ORF entry into its Adj-RIB-out;
2. RR regenerates a BGP ROUTE-REFRESH message to send this RD-ORF entry to PE3;
   • PE3 checks the RD-ORF entry and **add** the RD-ORF entry into its Adj-RIB-out.

When the VRF of VPN1 in PE1 no longer overflows:

1. PE1 generates a BGP ROUTE-REFRESH message contains a RD-ORF entry, and send it to RR;
   • RR checks the RD-ORF entry and **remove** the associated RD-ORF entry from its Adj-RIB-out;
2. RR regenerates a BGP ROUTE-REFRESH message to send this RD-ORF entry to PE3;
   • PE3 checks the RD-ORF entry and **remove** the associated RD-ORF entry from its Adj-RIB-out.
**Solution – RD-ORF (Option B & Option C)**

When the VRF of VPN1 in PE1 overflows:

RD-ORF is sent from PE1 to PE3 via ASBR1 and ASBR2.

When the VRF of VPN1 in PE1 no longer overflows:

RD-ORF sends from PE1 to PE2 via RR1 and RR2.
Further Action

• Comments?
• Adopt as WG document?

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