Updates and Discussion on RD-ORF Solutions

draft-wang-idr-rd-orf-06
draft-wang-idr-vpn-routes-control-analysis-03

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Motivation of This Presentation

✓ Describes the scenarios and solutions to control excessive VPN routes
  ➢ Intra-AS, Unique RD, One RT
  ➢ Intra-AS, Unique RD, Multiple RT
  ➢ Intra-AS, Universal RD
  ➢ Inter-AS

✓ Reaches consensus on the proposed solutions

✓ Forwards the updated solution draft (if necessary, also the scenario draft)
Scenario-1 and Solution
(Intra-AS, Unique RD, one RT)

1. Shared BGP session between RR and PE for VRFs
   ① RD is allocated per VPN/per PE
   ② PE3 send excessive VPN routes with RT1

2. PE/RR should have some mechanisms to identify and control the advertisement of specified excessive VPN routes.

Proposed Solution:

① On PE1, it detects the VPN1 VRF is overflowed, and:
   ✓ The RD of excessive VPN routes is RD31, associated with RT1
   ✓ No other VRFs on it to import the VPN routes with RT1
   PE1 triggers the RD-ORF message to RR(RD field is set to RD31)

② On PE2, it detects the VPN1 VRF is overflowed, and:
   ✓ The RD of excessive VPN routes is RD31, associated with RT1
   ✓ There is other VRF on it to import the VPN routes with RT1
   PE2 triggers the RD-ORF message to RR(RD field is set to RD31) only when all the VRFs that import RT1 are overflowed. Else, it discards the overflowed VPN routes locally.
Scenario-2 and Solution
(Intra-AS, Unique RD, Multiple RTs)

① RD is allocated per VPN/per PE
② Multiple RTs are associated with such VPN routes, and be imported into different VRFs in other devices (PE1)
③ PE3 send excessive VPN routes with RT1, RT2.

Proposed Solution:

① On PE1, it detects the VPN1 VRF is overflowed, and:
  ✓ The RD of excessive VPN routes is RD31, associated with RT1, RT2
  ✓ There are different VRFs on it import the VPN routes respectively with RT1, RT2
  ✓ PE1 will not trigger the RD-ORF message because other VPN that imports such routes is not overflowed; it discards the overflowed VPN routes locally.
② Only PE2 will trigger RD-ORF(RD31) in this example.
Scenario-3 and Solution (Intra-AS, Universal RD)

① RD is allocated per VPN
② One/Multiple RTs are associated with such VPN routes, and be imported into different VRFs in other devices (PE1)
③ PE3 send excessive VPN routes with RD1 and attached RT1, RT2.

Proposed Solution:

① Based on previous principle, PE2 triggers the RD-ORF message (RD1) in this example.
② RR withdraws and stops to advertise such excessive VPN routes to PE2
③ The communication among PE2 with other PEs (PE1, PE3) for VPN1 will be influenced.
④ It is acceptable.
Scenario-4 and Solution (Inter-AS)

1. Shared BGP session (PE/ASBR and ASBR1/ASBR2)
2. RD allocation:
   - Unique RD (VPN1)
   - Universal RD (VPN2/VPN3)
3. RT association: One or Multiple

Proposed Solution:

1. Excessive VPN routes are from VPN1/VPN2 on PE3
2. On PE1, based on previous principle, it will trigger RD-ORF(RD31) to ASBR1.
3. On PE2, it will trigger RD-ORF(RD31), RD-ORF(RD2) respectively.
4. On ASBR1, once receives such RD-ORF message, it checks:
   - If all its downstream peers sent the same message, or the process of excessive VPN routes have exceed its capabilities, it will send such message to upstream peer (ASBR2)
   - Or else, it will filter the excessive VPN routes on its side, on behalf of the trigger device (PE1)
   - In this example, it will trigger RD-ORF(RD31) to ASBR2.
Solution Summary

① RD-ORF message is triggered automatically upon the excessive VPN routes

② RD-ORF message is sent out on the following conditions:
   ➢ PE: all the VRFs on it don’t want to process it
   ➢ RR: all its BGP clients don’t want to process it
   ➢ ASBR: all its BGP peers within one AS don’t want to process it
   ➢ Or for all of them: the process of such excessive routes has exceed its own capability.

③ The removal of RD-ORF message is manual to avoid the possible flapping advertisement.

④ RD information is enough, no need to add RT.
   ➢ The same RT may be imported by several VRFs.
   ➢ Within one PE device, RT can’t uniquely identify one VPN. RD can accomplish this.
Further Action

- Comments?
- Is this clear to describe the problem and solution?
- If so, forward the draft (adopt directly or second WG adoption call?)

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