

# 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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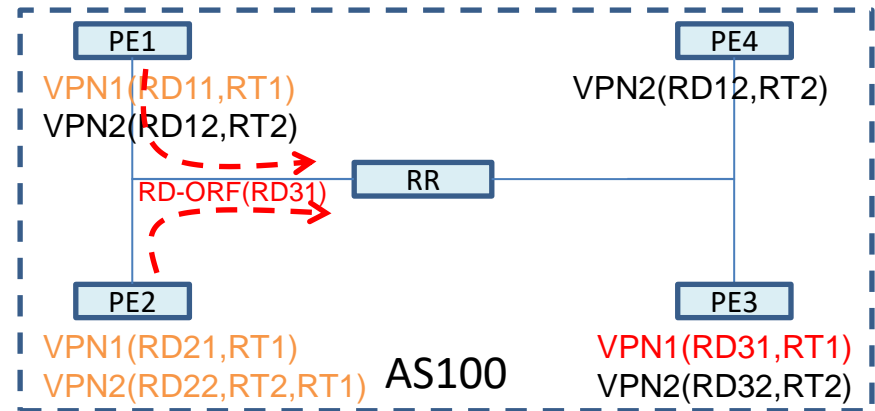
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# Motivation of This Presentation

- ✓ 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.



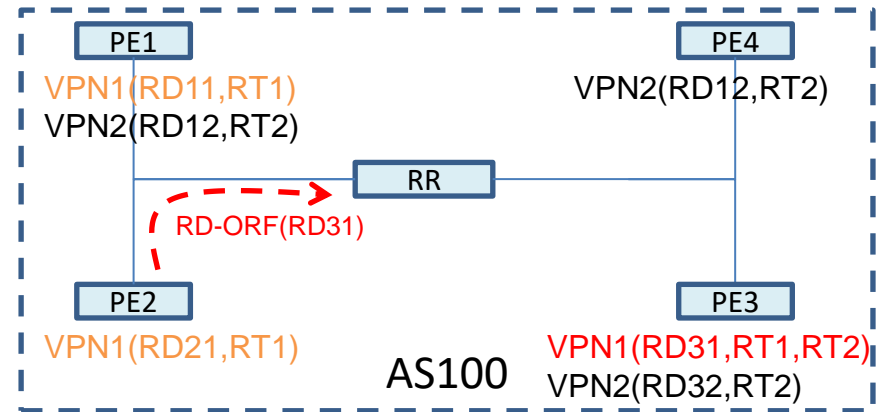
## Proposed Solution:

- 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 RT1PE1 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 RT1PE2 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.**

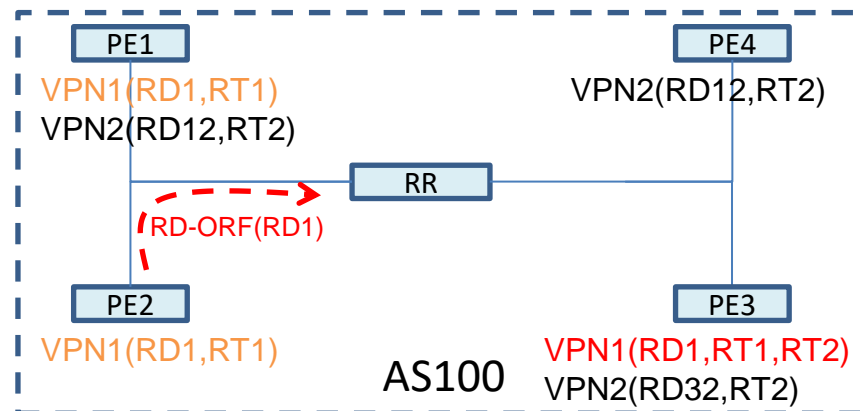


### Proposed Solution:

- 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.

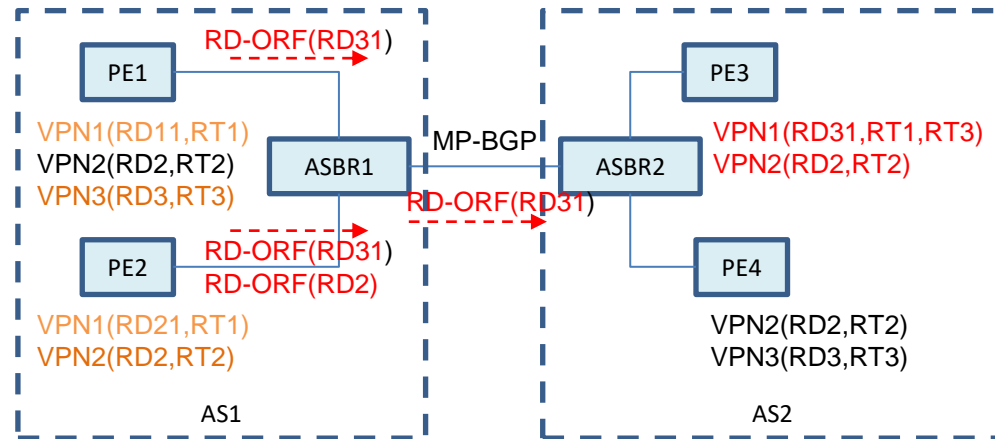


## Proposed Solution:

- 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 exceeded 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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