Extensions to RT-Constrain for Hierarchical RR Scenario

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Problem Review

- RFC 4684 specifies rules for RT membership info advertisement
  - To build a VPN route distribution graph

- In hierarchical RR scenario, with current rules, the route distribution graph can not be built correctly

Typical Scenario

RTC info of RT-1
- Route #1 from RR2 (best)
- Route #2: from RR3

Cluster-1

RR1

Cluster-2

Cluster-3

RTC info of RT-1
- Route #1 from PE1

RR2

RR3

RTC info of RT-1
- Route #2 from PE3 (best)
- Route #3 from PE4

PE1 **PE2** **PE3** **PE4**

RT-1 RT-1 RT-1
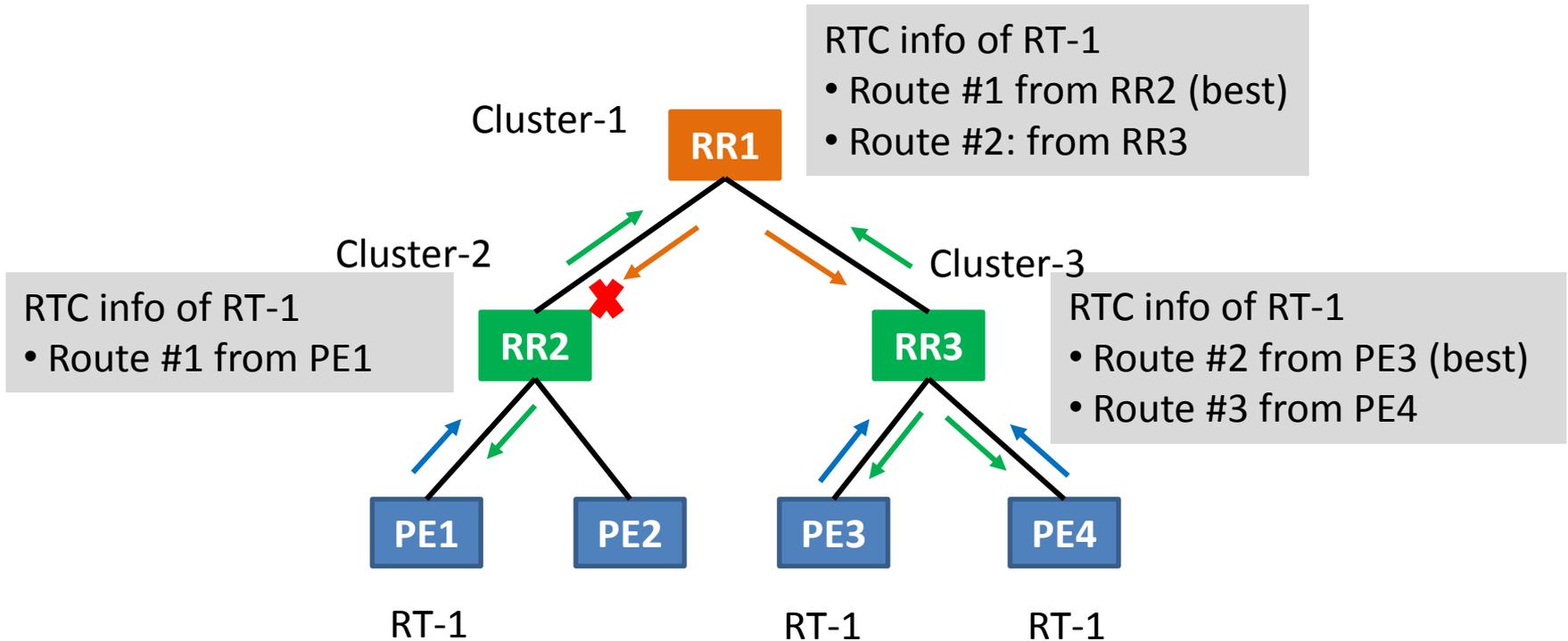
- RR1 selects the best RTC route (route #1 from RR2) and advertise to RR2 and RR3

- RR2 detects its own CLUSTER_ID in the RTC route, discard it

- RR2 will not advertise VPN routes with RT-1 to RR1

Another Scenario

RTC info of RT-1
- Route #1 from RR2
- Route #2 from RR3
- Route #3 from RR4 (best)

Cluster-1   **RR1**

Cluster-2   **RR2**

RR3   **RR4**   Cluster-3

PE1

RT-1

PE2

RT-1
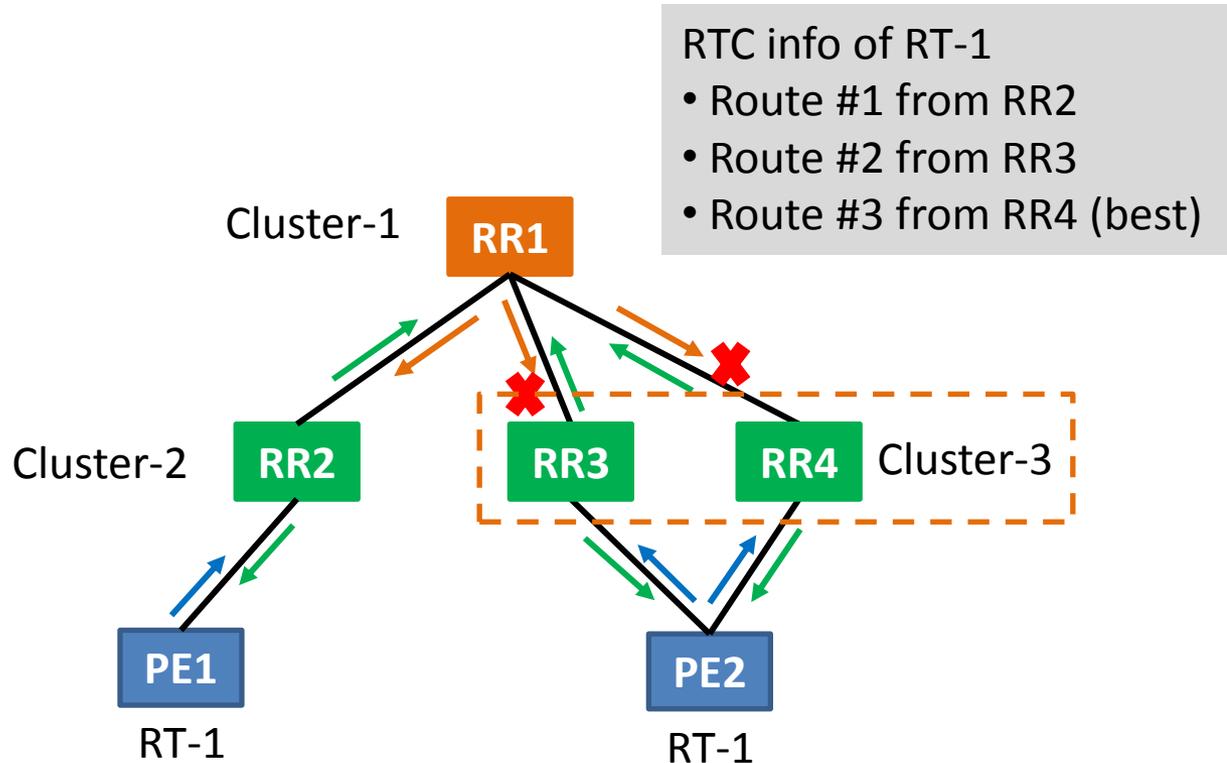
- RR1 selects the best RTC route (route #3 from RR4) and advertises it to RR2, RR3 and RR4

- RR3 and RR4 detect their own CLUSTER_ID in the route, discard it

- Even if RR1 advertises the alternate route #2 (from RR3), RR3 and RR4 would still discard it

Candidate Solution #1

- Revise the advertisement rules for RTC routes
  - When advertising an RT membership NLRI to an RR peer (**either client or non-client**), if the best path is received from this peer, and there are alternative paths received from other peers, the **most disjoint alternative path** SHOULD be advertised to this peer
  - Most disjoint alternate path:
    - The CLUSTER_LIST and ORIGINATOR_ID attributes are diverse from those of the best path

Candidate Solution #2

- Use add-path for RTC routes between hierarchical RRs
  - Identify RR clients which are lower layer RRs
    - Enable add-path for RTC AFI/SAFI, ensure that sufficient RTC routes are advertised to pass the BGP loop detection on the receiving RR.
    - Normal BGP path advertisement rules SHOULD be applied. (No change of ORIGINATOR_ID)

  - For RR clients which are NOT lower layer RRs
    - follow the advertisement rules defined in 3.2 of RFC 4684

Next Steps

- Need WG's opinion:

  – Accept this as WG document?

  – Choose one solution, or go with the two candidates (for now)?