Loop prevention for route import between protocols


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Problem Statement

Route import causes the loss of the anti-loop attribute of the protocol. As a result, the anti-loop fails.

- RA: RA advertises the routes to the R2. (1)

- RB: RB advertises the routes to RC and RD through an BGP peer. (2)

- RC: OSPF imports BGP routes and advertises the routes to RD. In this case, the anti-loop information is lost. (3)

- RD: BGP imports IGP routes. After selection, advertises the route to RB. (4)

- RB: selects the route from RD, advertises the route update to R3. As a result, a routing loop occurs. (5)
Problem Statement (Cont.)

The same problem exists after the protocol swap.

- RA: RA advertises the routes to the R2. (1)

- RB: RB advertises the routes to RC and RD through an IGP peer. (2)

- RC: BGP imports IGP routes and advertises the routes to RD. In this case, the anti-loop information is lost. (3)

- RD: IGP imports BGP routes, After selection, advertises the route to RB. (4)

- RB: selects the route from RD, advertises the route update to R3. As a result, a routing loop occurs. (5)
Proposed Extensions to BGP Attribute

Route Origin Site List Attribute Definition

- Optional and Transitive
- Contains one or more sub-TLVs
- Each sub-TLV indicates a site where the route was imported into the BGP or IGP routing-table for the first time
- The route receiver should use local site information to compare with the attribute contents to determine whether a loop occurs

Sub-TLVs:
- BGP Route Origin Site sub-TLV indicates that the route is imported to BGP from other protocols at the site.
- OSPF Route Origin Site sub-TLV indicates that the route is imported to BGP from other protocols at the site.
- To be defined
RA: RA advertises the routes to the RB. (1)

RB: RB advertises the routes to RC and RD through an BGP peer. (2)

RC: OSPF imports BGP routes and advertises the routes to RD. (3)

- Route Attributes: \([0, 100]\). 100 is protocol site ID.
- \([0, 100]\) is added by OSPF

RD: BGP imports OSPF routes and advertises the route to RB. (4)

- imports routes that carry \([0, 100]\) attribute.
- Advertises to RB. Route Attributes: \([0, 200], [0, 100]\)
- \([0, 200]\) is added by BGP.

RB: advertises the route update to RC. (5)

- Route Attributes: carrying \([0, 200], [0, 100]\)

RC receives the route, OSPF imports BGP routes.

- imports routes that carry \([0, 200], [0, 100]\) attribute
- OSPF compares \([0,100]\) with \([0, 200], [0, 100]\), and finds that a loop occurs in the route.

If there are no other route on RC. After RC advertises route to RD, BGP finds that a loop occurs in the route and reduce the Route selection priority. (6)
Next steps

• Welcome more comments and discussion
Thank you!