Requirements for planned maintenance of BGP sessions

draft-dubois-bgp-pm-reqs-02.txt

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Context and objective

Context

Q Maintenance operations impacting forwarding plane

Q Back up paths are available

Objective

Q To ease the maintenance of BGP sessions and limit the amount of traffic that is lost during planned maintenance operations on routers, a solution is required in order to gracefully shutdown a router or a session.

No packet lost when doing BGP router maintenance

No operational burden in maintenance situations

Current BGP Behavior

S When reloading, upgrading cards, shutting down a router, BGP withdraws existing routes and then informs its peers.

    Q Packets are lost.

S Current behavior is the following:

1. Session is shut down.
2. Forwarding is interrupted.
3. Peers try to find an alternate route.
4. As a result packets are lost during a few seconds (if not minutes)

S One would prefer to have a "make before break" behavior

    Q Peer would find an alternate route before the session, link or router disappears.

Current BGP Behavior: Example

Test case	With 100 BGP routes	With 100 K BGP routes
Shutdown of R1	Green: **4s** interruption Blue: **3s** interruption	Green: **20s** perturbation Blue: **0s** interruption
Clear ip BGP R1	Green: **1,1s** interruption Blue: **1s** interruption	Green: **40s** perturbation Blue: **20s** perturbation

AS 25186

Route reflector

AS 5511
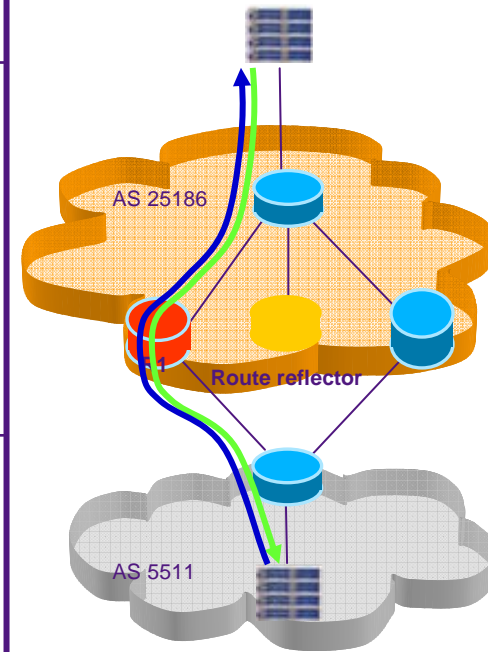
Requirement Highlights

- **S** The proposed solution SHOULD be applicable to all kinds of BGP sessions and any address family. The following cases are important:
  - The maintenance of one particular e-BGP/MP-eBGP session.
  - The reload/shutdown of one AS border router.
  - The shutdown of PE <-> CE links (Static & eBGP) in a MPLS-VPN environment.

- **S** Expected behavior

  Q Step 1: A mechanism is implemented on the router under maintenance to gracefully reroute packets towards and from the BGP next-hop that is about to be unavailable.

  Q Step 2: Once traffic is correctly rerouted, BGP sessions are shut down.

Deployment Considerations

S   The proposed solution SHOULD not change the BGP convergence behavior for the ASes exterior to the maintenance process

S   An incremental deployment on a per AS basis MUST be possible.

S   Transient routing loops
    Q Case of transient routing loops MAY be considered.

Pending Issues

S Interaction with other (new) BGP mechanisms

   QBGP multi-path, communities, ORF?

S Does the requirement imply protocol changes ?

   QCan we find best practices that are applicable to most peering situations ?

   Q Is it possible to use some existing extensions with a specific treatment in the router?

S Variety of situations to solve

   QIn the draft we listed a set of use cases where hitless maintenance should be possible: Is that the way to go?

Possible Next Steps

S   Interest for this work ?

S   Consensus for a new WG item ?

S   Please send your comments on the mailing list.

Thank you !