

Requirements for the graceful shutdown of BGP sessions

[draft-ietf-grow-bgp-graceful-shutdown-requirements-01](#)

Bruno Decraene

Pierre Francois

Cristel Pelsser

Zubair Ahmad

A. J. Elizondo Armengol

Tomonori Takeda

France Telecom

UCL

IJ

Orange Business Services

Telefonica I+D

NTT

Problem statement

- Currently, **shutting down or setting up a BGP session creates loss of connectivity** even when a redundant session/path exist in the AS.
- **Some applications** require tighter SLA, especially regarding **network availability**.
 - e.g., VoIP, online gaming, corporate mission critical applications
- This document defines **requirements for procedures to gracefully set up or shutdown BGP session(s)**.
 - E.g make-before-break

Graceful shutdown ?

- Graceful shutdown is not something new in general:
 - Link state IGP: link max metric, node overload (IS-IS), loop free convergence (draft-ietf-rtgwg-lf-conv-frmwk)
 - MPLS, GMPLS: "Graceful Shutdown in MPLS and Generalized MPLS"
 - draft-ietf-ccamp-mpls-graceful-shutdown-12.txt
- Currently no agreed procedure for BGP
 - although BGP is widely used: Internet, BGP/MPLS VPN services
 - although BGP routing convergence could be "long"
 - Path vector protocol, back up paths may be hidden, number of routes (RIB, FIB)
 - more difficult as it requires bi/multi lateral agreements between ASes
 - Cannot be done by an ISP on its own.

BGP Graceful shutdown requirements

- Minimal / no packet loss when shutting down a BGP session or an ASBR. (provided an alternate path is available in the AS)
- Idem when setting up a BGP session
- Should handle common iBGP topologies:
 - iBGP full mesh, iBGP Route Reflector, BGP confederation
 - combinations of above techniques
- Regarding eBGP topologies, the target use case is two ASes interconnected through multiple ASBRs
 - Typically a customer dual attached to a provider.
 - Out of scope: topologies involving BGP convergence in more than these 2 ASes (sharing the eBGP session)

Goals & metrics

- Goals and metrics to design and evaluate solutions are:
 1. Duration of loss of connectivity
 2. Applicability to a wide range of networks, BGP topologies
 3. Duration of transient forwarding loop
 4. Additional load introduced in BGP

Next steps

- Comments on the requirement draft are welcomed
 - Please post on the GROW Mailing List
 - Draft is now quite old and stable so WG last call is expected soon
- Contributions on the solutions are welcomed
 - Graceful shutdown: draft-ietf-grow-bgp-gshut
 - Add path: draft-ietf-idr-add-paths, draft-vvds-add-paths-analysis, draft-pmohapat-idr-fast-conn-restore
 - ...

thank you

Back up

Applicability of Graceful Restart, Non Stop Routing, In Service Software Upgrade (ISSU)

- Pro:
 - applicable to single attached AS/customers
- Con:
 - not applicable when the forwarding plane / BGP session need to be shutdown
 - significant dependencies (software, possibly hardware, possibly peers' software).

Applicability BGP graceful shutdown solution

- draft-ietf-grow-bgp-gshut:
 - low local pref on iBGP, IANA FCFS BGP community on eBGP
 - BGP external best, tunnels between ASBRs
- Pro:
 - 0 packet loss achievable
 - incremental deployment with incremental benefits.
 - no new protocol extension
- Con:
 - requires configuration of BGP policies
 - delay maintenances for some 10s seconds

Applicability BGP add path

- Pro:
 - Also improve convergence time in case of failures
 - 0 packet loss achievable when shutting down eBGP session(s)
 - Provided the additional use of: BGP external best, right backup path advertised, tunnels between ASBRs

- Con:
 - shutdown of the whole ASBR probably still requires some g-shut procedure
 - no incremental benefits with incremental deployment
 - software dependency
 - currently not (widely) available
 - scalability to be studied.