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Reconsidering iBGP Architecture

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State of the Art

- Current iBGP Solutions :
  - Full Mesh
  - Route Reflectors
  - Confederations
- All solutions have drawbacks
  - Incremental evolution of iBGP without fundamental reflexion on iBGP requirements
- What would be the requirements if we had to design a new iBGP architecture?

iBGP Requirements

- Requirements :

  - Scalability

    - The system should be able to handle a large number of routes and a large number of iBGP speakers

  - Path Diversity

    - Routers in the AS should have alternative routes in their Adj-Rib-Ins for fast convergence in case of failure

  - Correctness

    - The system should lead to a stable and correct routing (ex : no MED oscillation)

    - With different forwarding modes

      - Pervasive BGP
      - MPLS Tunnelling

iBGP Requirements

- Auto-Configuration
  - The system should be able to configure itself without intervention from the operator

- Robustness
  - The system should support removal or failure of some iBGP nodes/sessions
  - If the architecture uses centralized systems (Route Reflectors, Routing Control Platforms, etc.), the system should not be compromized if some or all of them fail.

- Support for maintenance operations
  - The system should allow establishment and shut down of sessions without any packet loss.

iBGP Requirements

- ## Tunability
  - Even if the system is able to configure itself, the operator shoud be have control on the way routes are received and propagated

- ## Monitoring
  - The operator should have easy access to the state of the iBGP system at any time

- ## Performance
  - Recovery and Convergence Time should be optimized by the system, as well as bandwith utilization on peering links

- ## Support for legacy systems
  - Legacy BGP speakers should be integrable within the system without harming too muchthe fulfillment of the others requirements

But... We are in the real world...

- Fulfilling all those requirements is probably impossible

- Need to find a tradeoff between them

- Our focus : iBGP Auto-Configuration

  - Needed in medium-size networks

  - Interest of router vendors

    - draft-raszuk-idr-ibgp-auto-mesh-00

- Work in progress