BGP Data-Plane Benchmarking

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Current Status

- New version of BGP Data Plane convergence after WG adoption was posted 2 weeks ago

    - draft-ietf-bmwg-bgp-basic-convergence-00

        - Author team: Rajiv Papneja, Bhavani Parise, Sue Hares, Dean Lee, Ilya Varlashkin

    - Presented and solicited feedback from IDR at IETF-83

    - Performed Benchmarking tests based on the proposed methodology at Ixia labs. Presented the findings to BMWG group and also at MPLS Ethernet World Congress 2013, Paris

    - Current update include:

        - Published as a worked group item
        - Addressed comments from BMWG and IDR group members
        - Addressed all the comments received from IDR chair
        - Comments/extensions received by SP

    - Test vendors have implemented this draft/methodology as automated protocol suite – used the test suite to perform tests on different implementations

        - Presented results in MPLS & Ethernet World Congress 2013, Paris: highlights presented as part of this presentation
        - Applicable to VPNv4 route convergence benchmarking

Highlights from MPLS World Congress Presentation

- ## Test Environment

  - Involved testing in 1-2 node Black Box settings

  -Used tester to generate traffic, routes and routers emulation, packet sniffing, throughput and timestamp measurement

- ## Target Test Cases
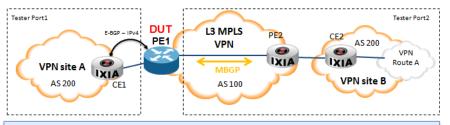
  -Address family convergence

  - -RIB-IN
  - -RIB-OUT

  -Attribute Change

  - -Comparing the impact of label stack

- ## Results – Analysis & Comparison

Test Setup used

RIB-IN Convergence

Objective - To measure the convergence time required to receive and install a VPN route in RIB using MBGP
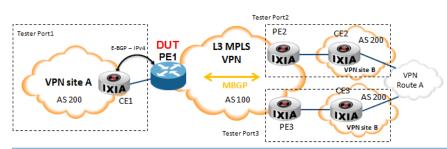
- Test steps –
  - CE1 sends traffic toward VPN route A
  - PE2 advertises VPN route A at RCV-Rt-time
  - PE2 receives traffic for VPN route A at DUT-XMT-Data-Time
  - RIB-IN Convergence time = DUT-XMT-Data-Time - RCV-Rt-time

RIB-OUT Convergence

Objective - This test measures the convergence time taken to receive, install and advertise a VPN route using eBGP

- Test steps –
  - PE2 advertises VPN route A at RCV-Rt-time
  - DUT-PE1 forwards VPN route A toward CE1 at DUT-XMT-Rt-Time
  - RIB-Out Convergence = (DUT-XMT-Rt-Time – DUT-RCV-Rt-Time)

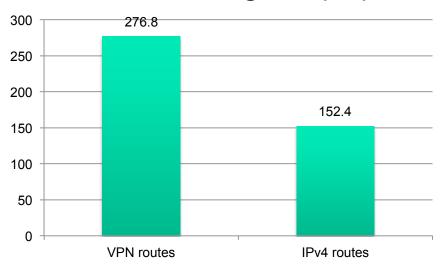## BGP Path Attribute Change Convergence

Objective - This test measures the convergence time taken by an implementation to service a MBGP Path Attribute Change

- Test steps –
  - PE3 advertises the VPN route A. PE3 is the optimal path
  - CE1 sends traffic toward VPN route A
  - PE2 advertises the same VPN route A with better attribute at "Path-Change-Event-Time"
  - PE2 receives traffic at "Path-Switch-Time"
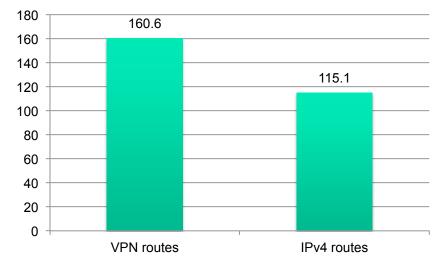 - BGP convergence time = "Path-Switch-Time" - "Path-Change-Event-Time"
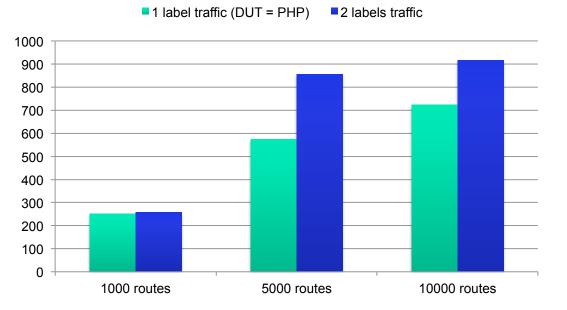
Address Family Convergences

RIB-IN Convergence (ms)

	RIB-IN Convergence (ms)
VPN routes	276.8
IPv4 routes	152.4

RIB-OUT Convergence (ms)

	RIB-OUT Convergence (ms)
VPN routes	160.6
IPv4 routes	115.1

Compare convergence performance of different BGP address families with repeatable test results

BGP Path Attribute Change Convergence - Results

	5.7 BGP Attribute Change Convergence	
Iteration	Time (ms)	
1	257.3	
2	256	
3	263	
4	253.2	
5	257.3	
Average	257.3	
Deviation	2.2	

Impact of attribute change on convergence performance with different label stack

Next Steps

- Solicit feedback from fellow BMWGers

- Progress the draft to informational RFC