BGP Bestpath Selection Additional Criteria
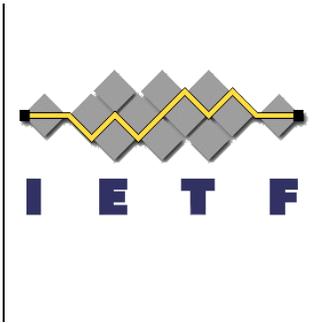
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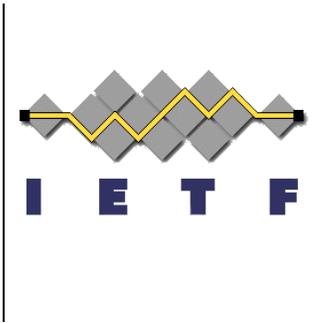
Rajiv Asati

I E T F

IETF 76, Hiroshima

Agenda

- Background / Motivation
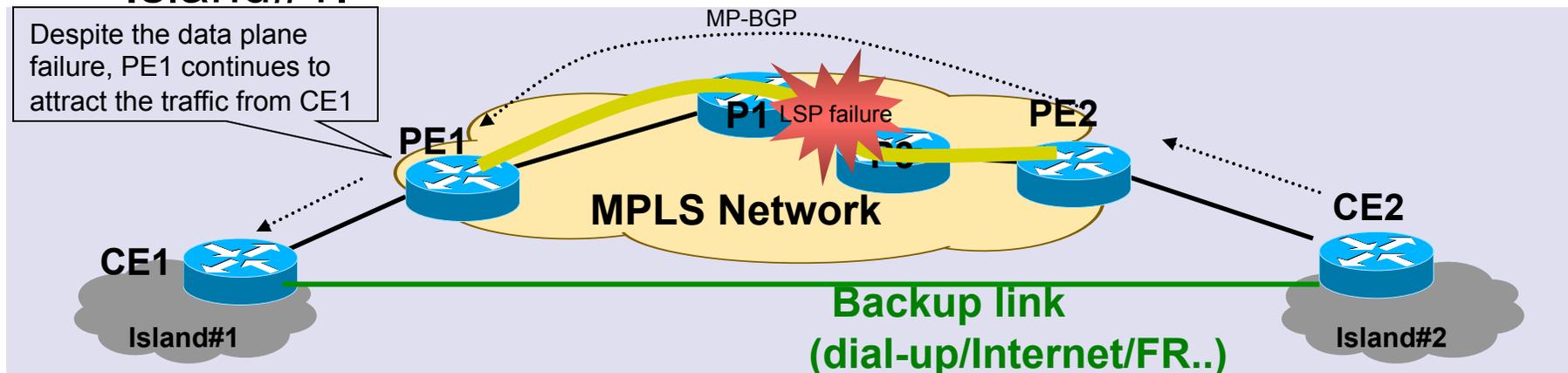
- Problem Statement

- Solution

- Next Steps

Background / Motivation

- This draft is a result of WG feedback to 'draft-asati-bgp-mpls-blackhole-avoidance-00' that was presented at IETF68 last yr.
  - The feedback was that the problem was a generic BGP issue, not MPLS specific.
  - The feedback was that short/concise draft was needed.

- Ilya Varlashkin (Easynet), Chandra Appanna and John Scudder made the case for this draft.

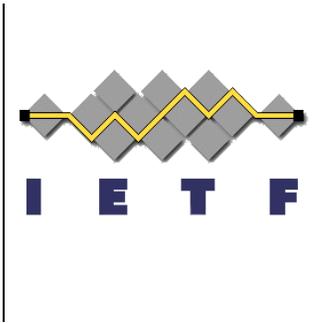- Yakov Rekhter helped out with extensive critical review.
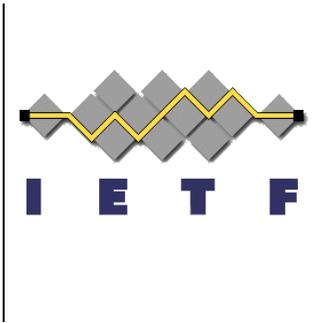
Background / Motivation

- Deployment Scenario – Island#1 and #2 are connected via the MPLS network.

  - PE1->PE2 data plane failure (LSP failure, say) may result in blackholing of the island#1 to island#2 traffic.

- PE1 continues to advertise the Island#2 reachability to Island#1.

Despite the data plane failure, PE1 continues to attract the traffic from CE1

MP-BGP

P1 LSP failure

PE2

PE1

MPLS Network

CE2

CE1

Backup link
(dial-up/Internet/FR..)

Island#1

Island#2

PE1->PE2 LSP
Routing Protocol

Background / Motivation

- The BGP network <u>pretends</u> to have the reachability to the remote BGP prefixes.

- It is <u>not fair</u> to attract the (customer) traffic and blackhole it inside the BGP network.

  - Not fair or plain WRONG!!
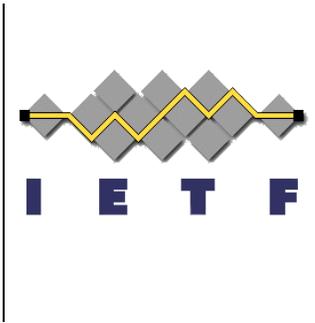
Problem Statement

- RFC4271 section 9.1.2 defines the BGP decision process aka bestpath selection, in which the 'Route Resolvability Condition' specifies checking for NEXT_HOP route availability in the IP routing table.

- This condition is not granular enough, particularly for BGP networks that utilize data plane protocol other than IP.

- The draft specifies two criteria for bestpath selection for further granularity.
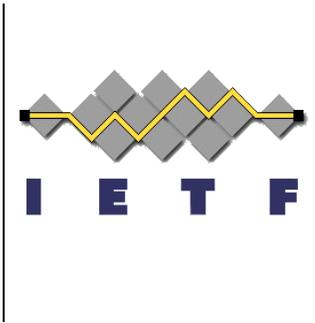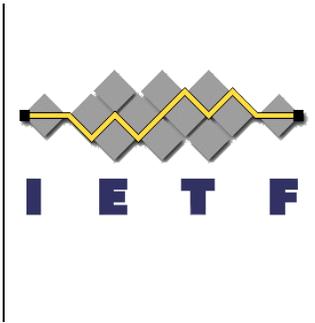
Solution

- Expand the route resolvability condition with the following two criteria –

1. The <u>reachability</u> for the BGP next-hop SHOULD be resolved in a particular data plane protocol.

2. The <u>path availability</u> check for the BGP next-hop MAY be performed.

- Draft has more text on this in the section 2.

Solution – Criterion 1

The reachability for the BGP next-hop SHOULD be
   resolved in a particular data plane protocol.

- The selection of particular data plane is a matter of a policy; Outside the scope of this document.

- Example :: if a BGP IPv4/v6 or VPNv4/v6 path wants to use MPLS data plane to the next-hop, as determined by the policy, then the BGP 'next-hop reachability' should be resolved using the MPLS data plane.

Solution – Criterion 2

The path availability check for the BGP next-hop MAY be performed.

- This checks for the functioning path to the next-hop in a particular data plane protocol.

- The selection of particular data plane and the means to perform the path availability check are a matter of a policy; Outside the scope of this document.

- Example :: if a BGP VPNv4 path wants to use the MPLS as the data plane protocol to the next-hop, then liveness of MPLS LSP to the next-hop should be validated.

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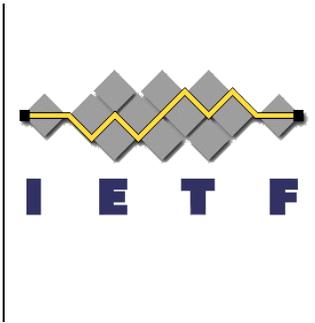
Solution

- With these criteria, a BGP path may become the bestpath only if its NEXT_HOP is reachable (and available) in the <u>chosen data plane</u>.

- Hence, the BGP speaker can either <u>advertise</u> or <u>withdraw</u> a BGP path.

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* LHD=LSP Health Database

Next Step

- Get more WG feedback
- Assess WGLC.