

LDP Extension for FRR Edge Node Protection in BGP-Free LDP Core

draft-bashandy-mpls-ldp-bgp-frr-00

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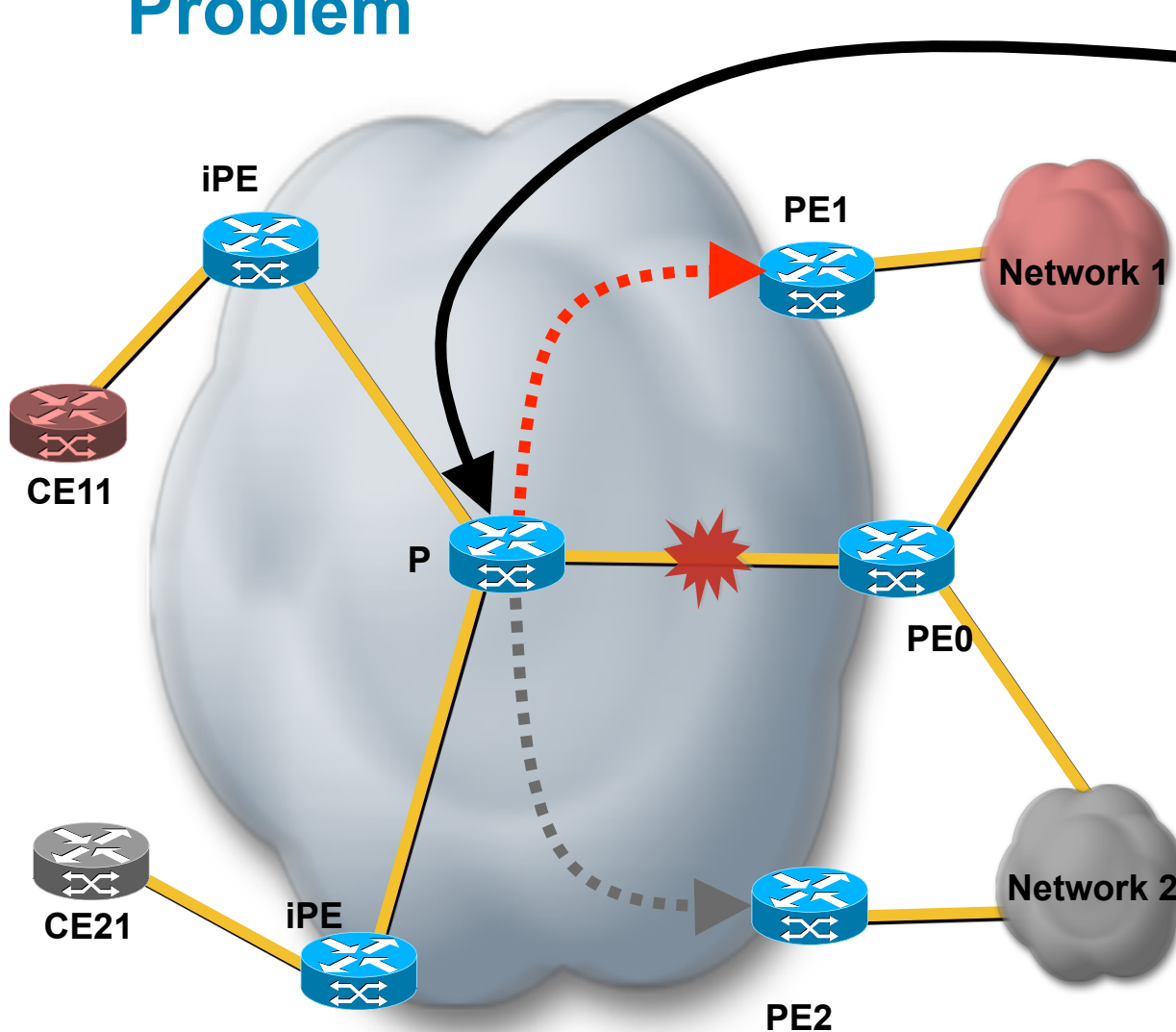
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Agenda

- ◆ Problem and requirement
- ◆ Proposed Solution

Problem



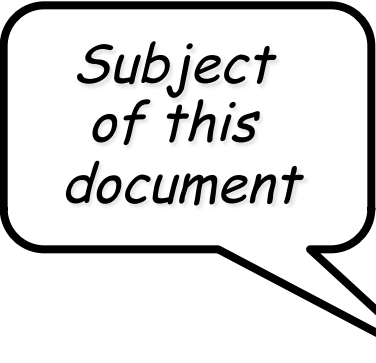
- PE0 is primary for both **Red** and **Gray**.
- PE0 *fails* !!
- P router redirects traffic to the **correct** repair PE
 - PE1 for **Red**
 - PE2 for **Gray**
- Correct **BGP label** must exist for correct forwarding on repair PE

What we are trying to Achieve

- ◆ Packet must be forwarded to correct repair PE on primary PE failure
- ◆ Correct BGP label must be pushed when repairing
- ◆ Core remains BGP free
- ◆ Minimal provisioning
- ◆ Loop-free during repair

How to Satisfy the Requirements

- ◆ Choose the repair PE
- ◆ Assign and Advertise the next-hop for protected prefixes
- ◆ ***Inform repairing core routers about primary to repair path mapping***
- ◆ Programming the forwarding plane on the repairing routers

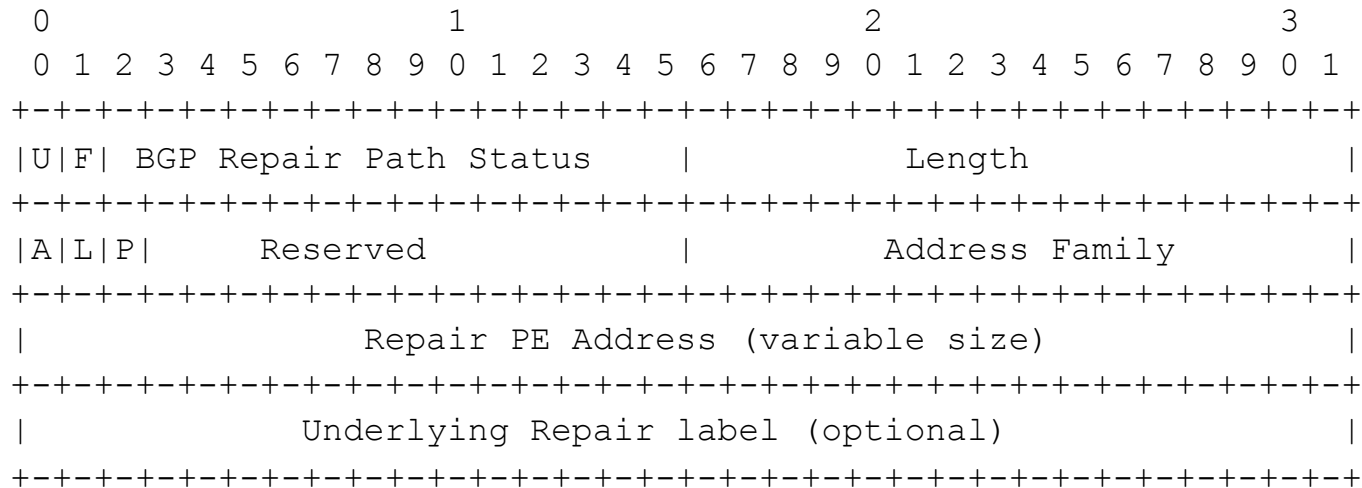


*Subject
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Informing Needed by Repairing Core Routers

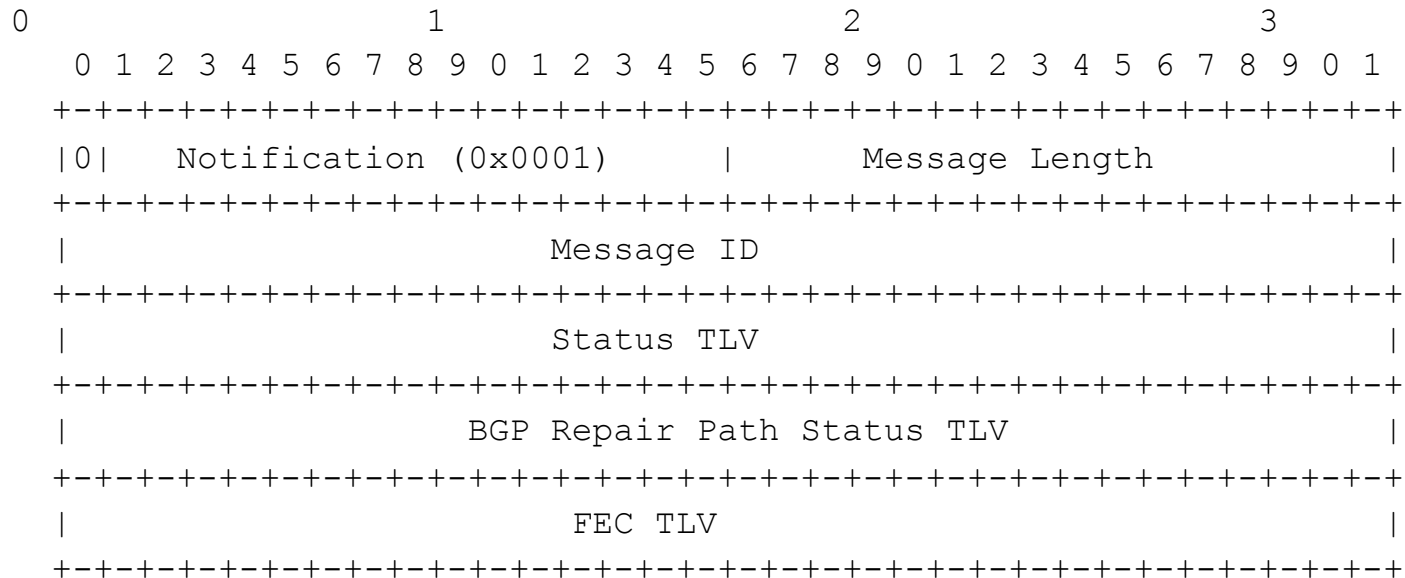
- ◆ As specified in draft-bashandy-bgp-edge-node-fr-02, an egress PE calculates
 - Protected next-hop: *pNH*,
 - Repair PE address: *rNH*, and possibly
 - Repair label: *rL*
- ◆ Egress PE needs to inform core routers about repair info: *pNH*, *rNH*, and *rL*
 - *pNH* is advertised into IGP
 - *rNH* is an IP address for the repair PE → it is advertised into IGP as usual
 - What is left is mapping of *pNH* to *rNH* and (possibly) *rL*
- ◆ New TLV “**BGP Repair Path Status TLV**”
- ◆ Carried in the LDP **Notification** message

BGP Repair Path Status TLV



- ◆ U/F: Must be set to 1/0 respectively so that this TLV can be ignored if not known or not supported.
- ◆ A bit Indicates if Repair Path information is being “announced” or “withdrawn”. MUST be set to 1 to signal “announcement” of the information
- ◆ L Bit: Indicates whether optional "Underlying Repair Label" [6] field is present or not.
- ◆ P Bit: If set, then the label in the "Underlying Repair label" sub field MUST be pushed instead of swapped*
- ◆ Repair PE Address: This is “*rNH*”
- ◆ Underlying Repair Label: This is “*rL*”

Sending BGP Repair Path Status TLV



- ◆ Status TLV: status code is set to "BGP Repair Path status".
- ◆ FEC TLV: Encodes ***pNH*** (in an Prefix FEC Element)

Notes

- ◆ No need for new capability
 - Sent unsolicitedly by edge LSR
 - Only user control
- ◆ New TLV should only be sent to LSRs that support “Unrecognized Notification” capability [RFC5919]
 - Ensures predictable behavior if the LSR does not recognize the new TLV.
- ◆ This draft specified an LDP-based implementation of the repair path defined in `draft-bashandy-bgp-edge-node-frr-02`

Q & A

