LDP extension for Inter-Area LSP

draft-decraene-mpls-ldp-interarea-01

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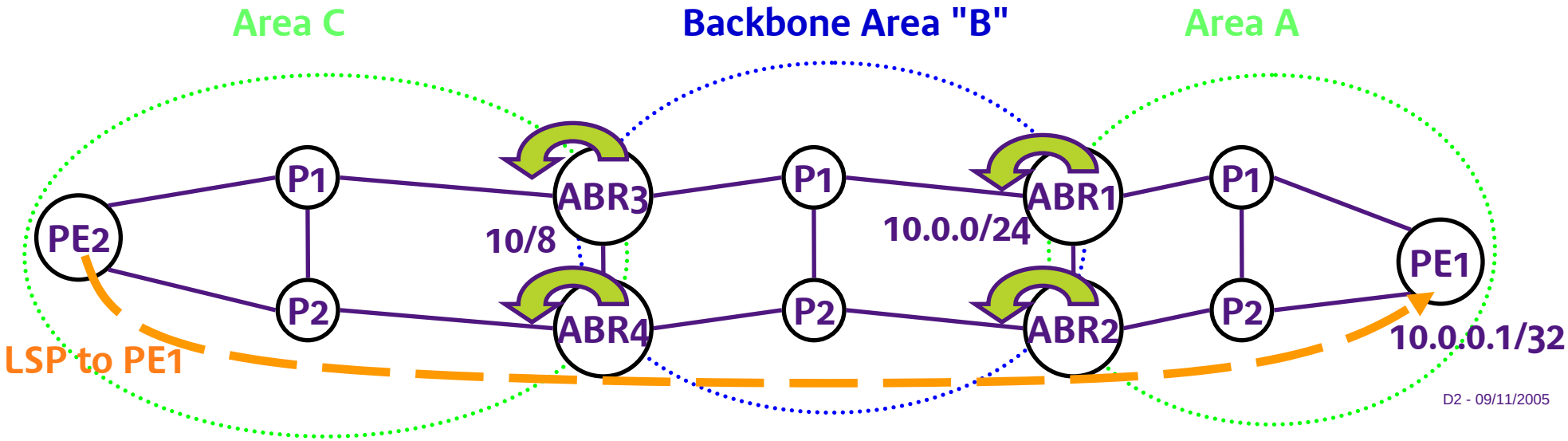
Context & objective

- **Multi areas IGP network with IP aggregation performed between areas.**
- **Objective: to set up inter area LDP LSPs without leaking all PE loopback addresses.**
  - No change on IP routing.
  - Potentially a large number of PE addresses that could impact IGP performances.
    - 1k PE (short term)
    - 10k – 30k PE (long term)



The problem

- LDP (RFC 3036) requires that the LDP FEC *exactly* match an entry in the IP RIB.
- This requires leaking all /32 loopbacks across area boundaries.
- Why should LDP impose such a rule on IP routing?

Non problems

- **LDP is not a routing protocol.**
- **LDP relies on routing protocols for its forwarding decisions.**
  - It's up to routing protocols to find the path to use and to advertise IP reachability.
- **This is not changed by this draft.**

A proposed solution

- **New LDP label mapping message procedure.**
- **Performing a *longest* match when searching the LDP FEC in the RIB.**
  - Currently an *exact* match is required
- **This is an optional behavior**
  - Controlled by a local policy configuration
  - Default is the current LDP label mapping message procedure.
    - As defined in [RFC 3036] section 3.5.7.1

Results

- **LSPs may be setup between IGP areas.**
  - Without leaking all /32 IP routes.
- **LDP still mandates that IP Routing advertise IP reachability for LDP FECs.**
- **Each LSP stills strictly follows the path chosen by IP routing protocols.**

Scaling considerations

- **LDP: no impact**
  - Still have to carry all the FECs
- **IGP: significant improvement**
  - No more needed to leak all /32 prefixes across areas
  - ➔ significantly reduce the size of IGP advertisements
    - Could be up to 10k routes for some deployments.

Document status?

- **"Exact match" is actually not a MUST**
  - RFC 3036 section 3.5.7.1: "An LSR receiving a Label Mapping message from a downstream LSR for a Prefix or Host Address FEC Element should not use the label for forwarding unless its routing table contains an entry that exactly matches the FEC Element."
- **Hence does the procedure defined in this draft override RFC 3036?**
- **Doc status?**
  - Informational?
  - BCP?
  - STD track?

Conclusion

- **Straightforward solution to solve an operational problem.**
- **Feedback is welcomed**
  - Please comment on the mailing list.
- **Is there interest for this work?**
- **WG doc?**

Thank you!