

A Backward Recursive
PCE-initiated Inter-domain
LSP Setup

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draft-dugeon-brpc-stateful-00

Inter-Domain LSP Challenges

- Control and setup of inter-domain LSPs is still a big challenge
 - Peering points are becoming the bottlenecks
 - Overprovisioning is no longer a viable solution
 - A clear demands from providers, especially for end-to-end and Cloud interconnectivity
- Several requirements must be addressed to setup inter-domain LSPs
 - Let each operator manage independently their local LSP
 - Enforce route selection at the peering point
 - Avoid scalability issue to limit RSVP-TE refresh messages

Today's Tunnel Setup

- Contiguous tunnel is not recommended
 - Security issues
 - Risk to put constraints the following network in the AS chain
- Tunnel stitching or nesting are preferred
 - Allow independent tunnel configuration in each domain
 - Tunnel hierarchy solve scalability issues and allow smoother management
- How to exchange label at inter-domain to stitch / nest tunnels ?
 - RSVP-TE is not used between ASBR mostly for security reasons
 - Same problem with Segment Routing
- Proposed solution: stateful BRPC

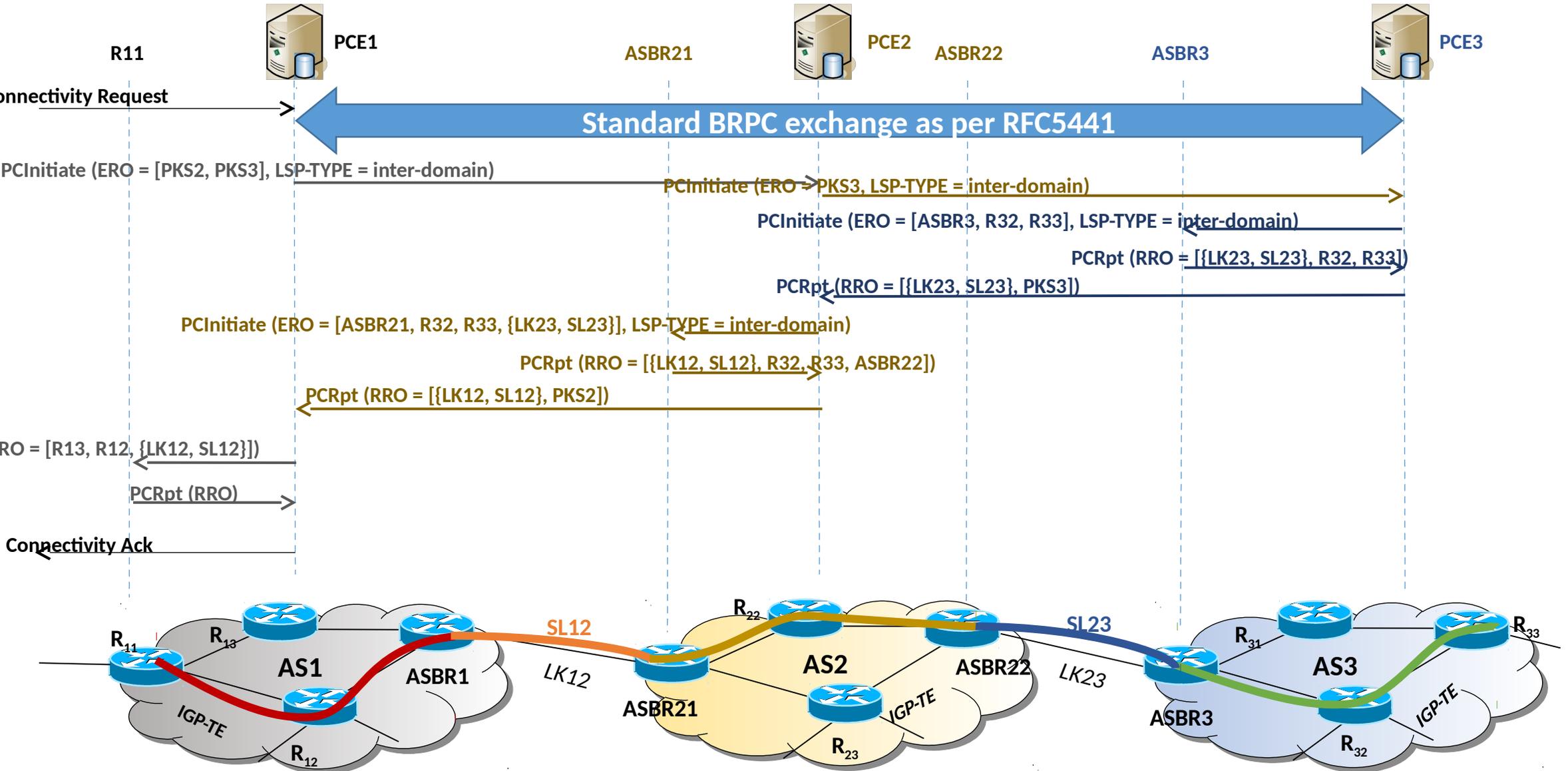
Stateful BRPC

- Take benefit of recent stateful PCE enhancement
 - Use PCInitiate message for each domain to setup the tunnel as usual
 - Use PCInitiate message between PCE to stitch / nest the tunnels
 - PCReport message maintains the synchronisation between the PCEs
 - PCUpdate message could be used to modify the end-to-end tunnel
- Smooth exchange of label at the inter-domain between PCEs
 - Done through a dedicated 'Stitching Label'
 - Conveyed in ERO and RRO as label sub-object (RFC 3473/4003)
 - Introduced new LSP-TYPE code points
 - Defined in draft-ietf-pce-lsp-setup-type
 - For PCE to PCC LSP setup to request the Stitching Label from the ASBR
 - For PCE to PCE LSP setup to propagate the Stitching Label between ASes

3 Domains

- PKS2: ERO for the AS2 part mask with Path Key
- PKS3: ERO for the AS3 part mask with Path Key

- SL12: Stitiching Label used by ASBR21 to identify the traffic coming from ASBR1 that stich the 2 tunnels
- SL23: Stitiching Label used by ASBR3 to identify the traffic coming from ASBR22 that stich the 2 tunnels



Conclusion

- Proposal to extend LSP-TYPE to inter-domain
 - To exchange Stitching Label between PCEs and PCE / PCCs
 - To automatically stitch / nest local LSP to form inter-domain LSP
 - Add new value for LSP-Type errors to manage error cases
- Applicability
 - Per domain LSP setup may be based on RSVP-TE or Segment Routing
 - Allow stitching of Segment Routing paths and RSVP-TE LSP
- Improvement for 01 version
 - Management of PLSP-ID for inter-domain LSP identification
 - Add procedure for Hierarchical PCE
 - Enhance handling of error cases
 - Add Local LSP modification procedure through PCUpd message
 - Add inter-layer scenario
 - Discuss scenario of PCE-allocated stitching label
 - Discuss with others draft on inter-domain LSP