PCEP Extensions for Stitching LSPs in Hierarchical Stateful PCE Model.

draft-lee-pce-lsp-stitching-hpce-00

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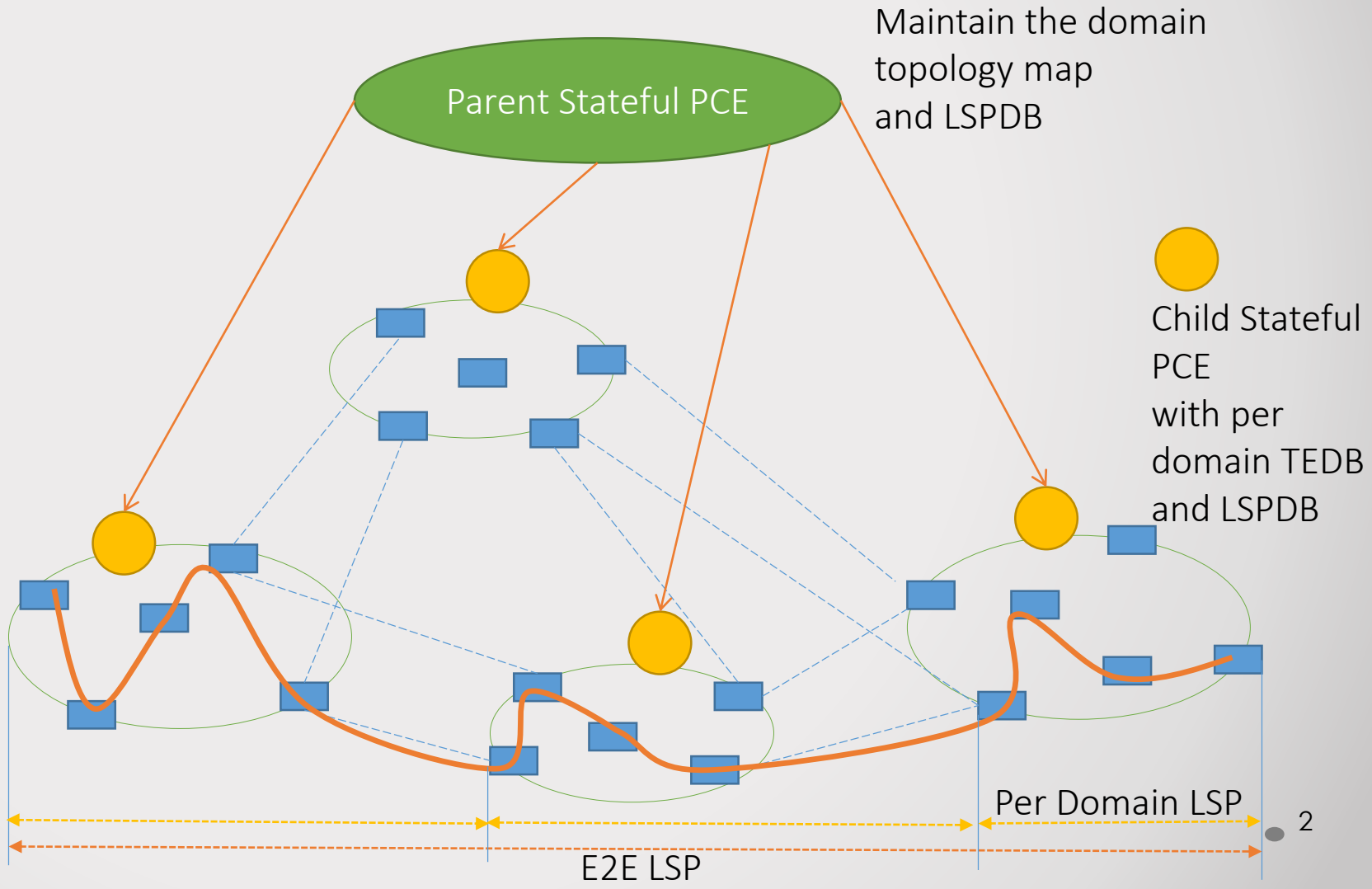
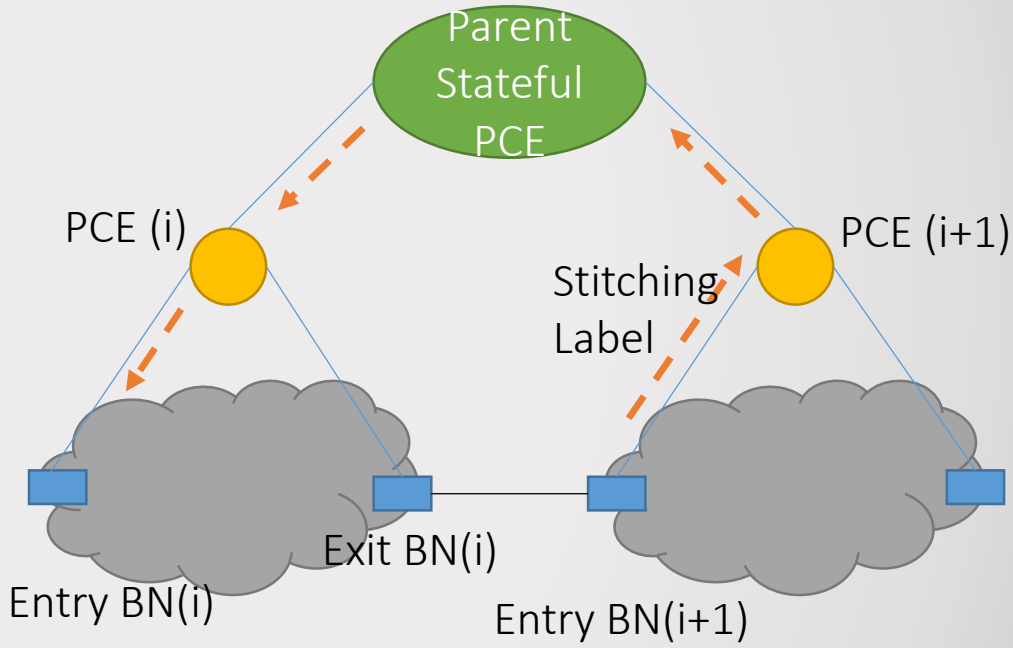
Context – Stateful H-PCE

- draft-ietf-pce-stateful-hpce-01
  - H-PCE + Stateful PCE
  - Hierarchy of Stateful PCE
  - WG Adopted
- E2E LSP
  - Contiguous LSP
    - setup at the head node
  - Per-domain LSP
    - Setup at the all in-border nodes
    - Need a mechanism to stitch the per-domain LSPs
    - Reuse concept of Stitching Label (SL) from draft-dugeon-brpc-stateful-00
- Applicable for ACTN



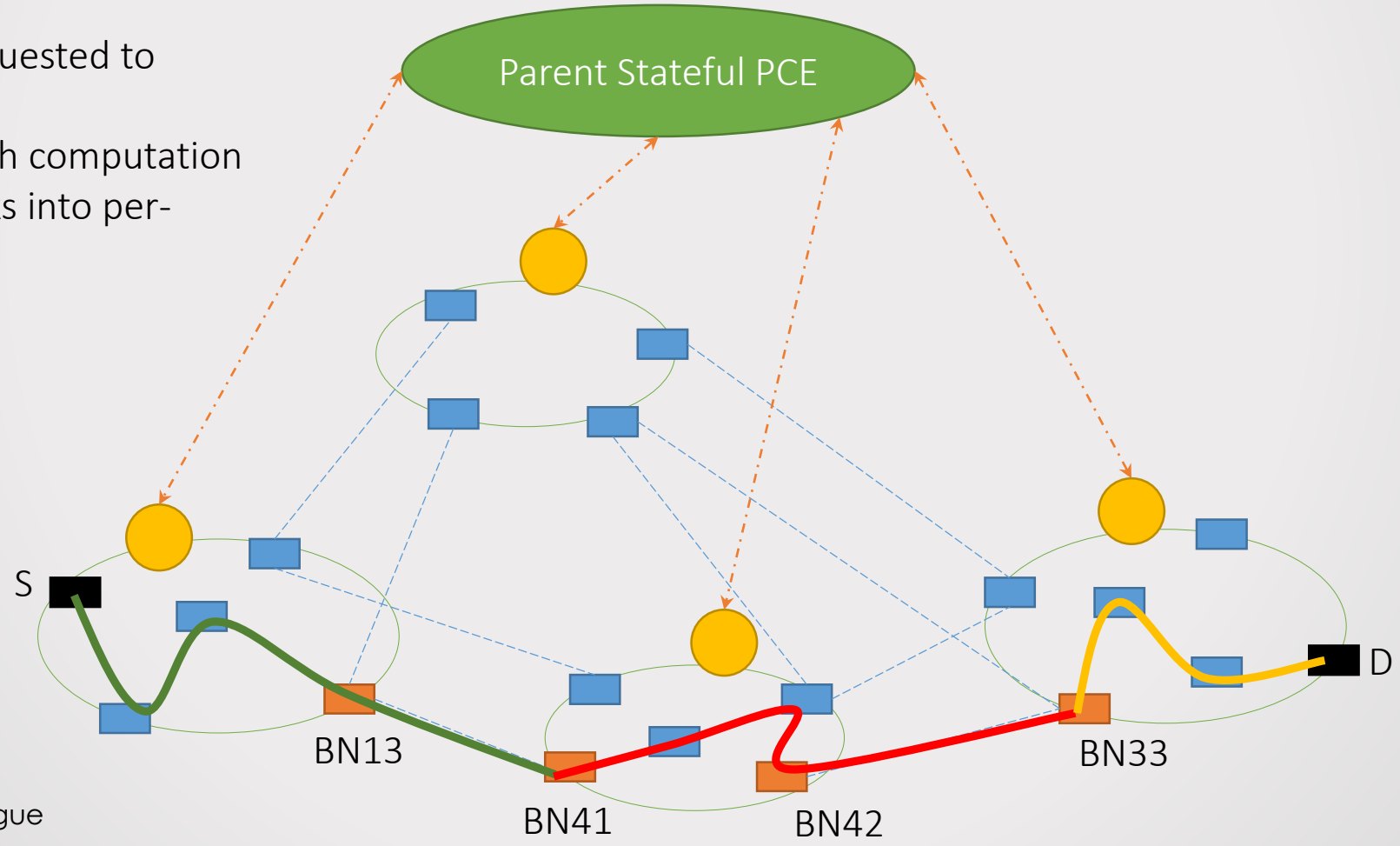
Stitching Label (SL)

- Introduced in draft-dugeon-brpc-stateful-00
- Stitching Label (SL) is defined as a dedicated label that is used to stitch two LSPs (RSVP-TE or SR).
- This label is exchanged between exit BN(i) and entry BN(i+1) via PCEP.
- In case of H-PCE, the SL is conveyed from entry BN(i+1) to the child PCE(i+1) to the parent PCE, and then to child PCE(i) to the entry BN(i).
- The exit BN(i) learns the SL via the per-domain LSP setup technique (RSVP-TE etc).
- The entry BN chooses a free label for the Stitching Label SL and add a new entry in its MPLS LFIB with this SL label.
- The SL from the destination domain is propagated to adjacent transit domain, towards the source domain at each step.
- In case of RSVP-TE, the entry BN further propagates the SL label to the exit BN via RSVP-TE.
- In case of SR, the SL label is pushed as part of the SR label stack.

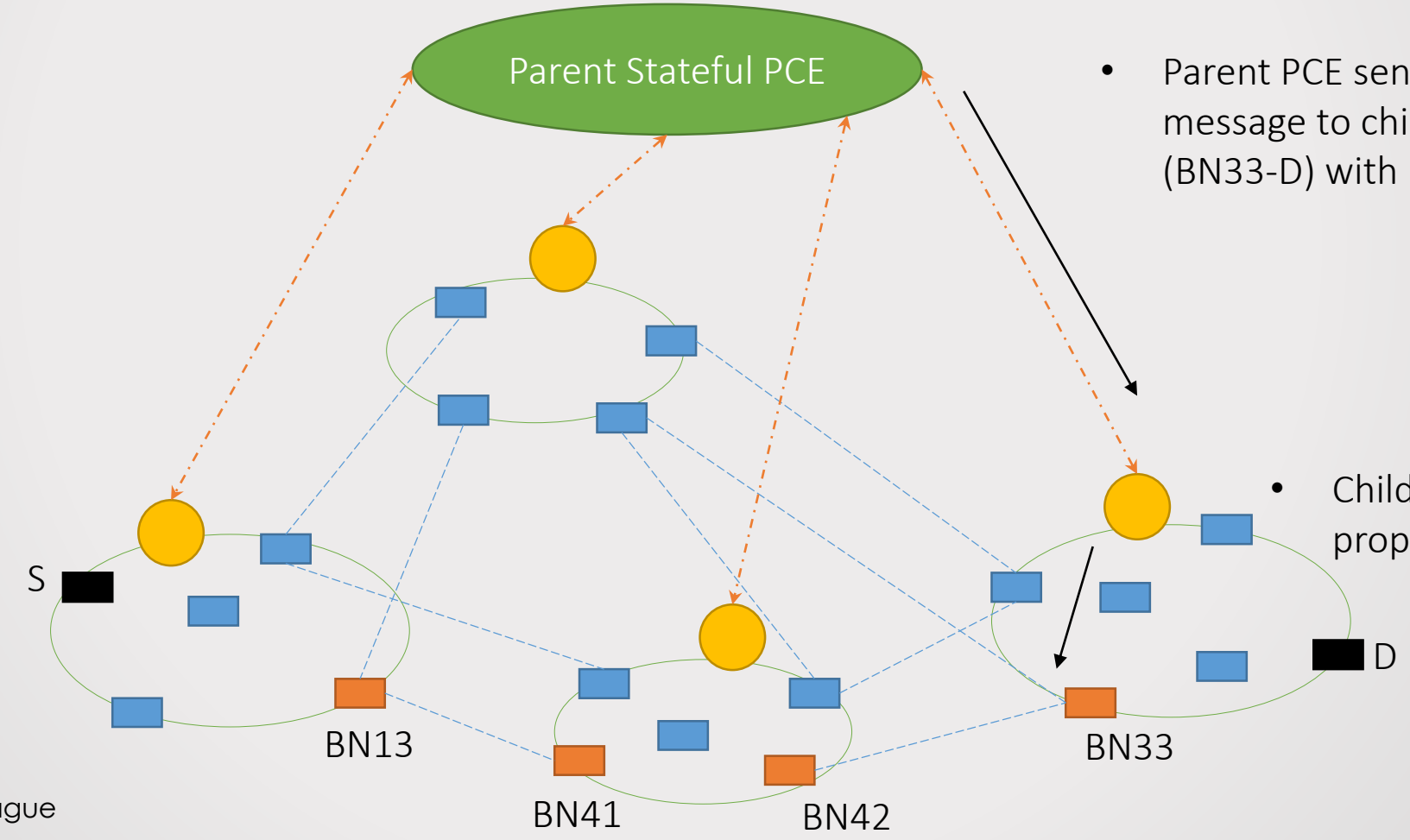


Procedures

- Parent PCE is requested to initiate a LSP
- Based on the path computation parent PCE breaks into per-domain LSPs
  - S-BN41
  - BN41-BN33
  - BN33-D

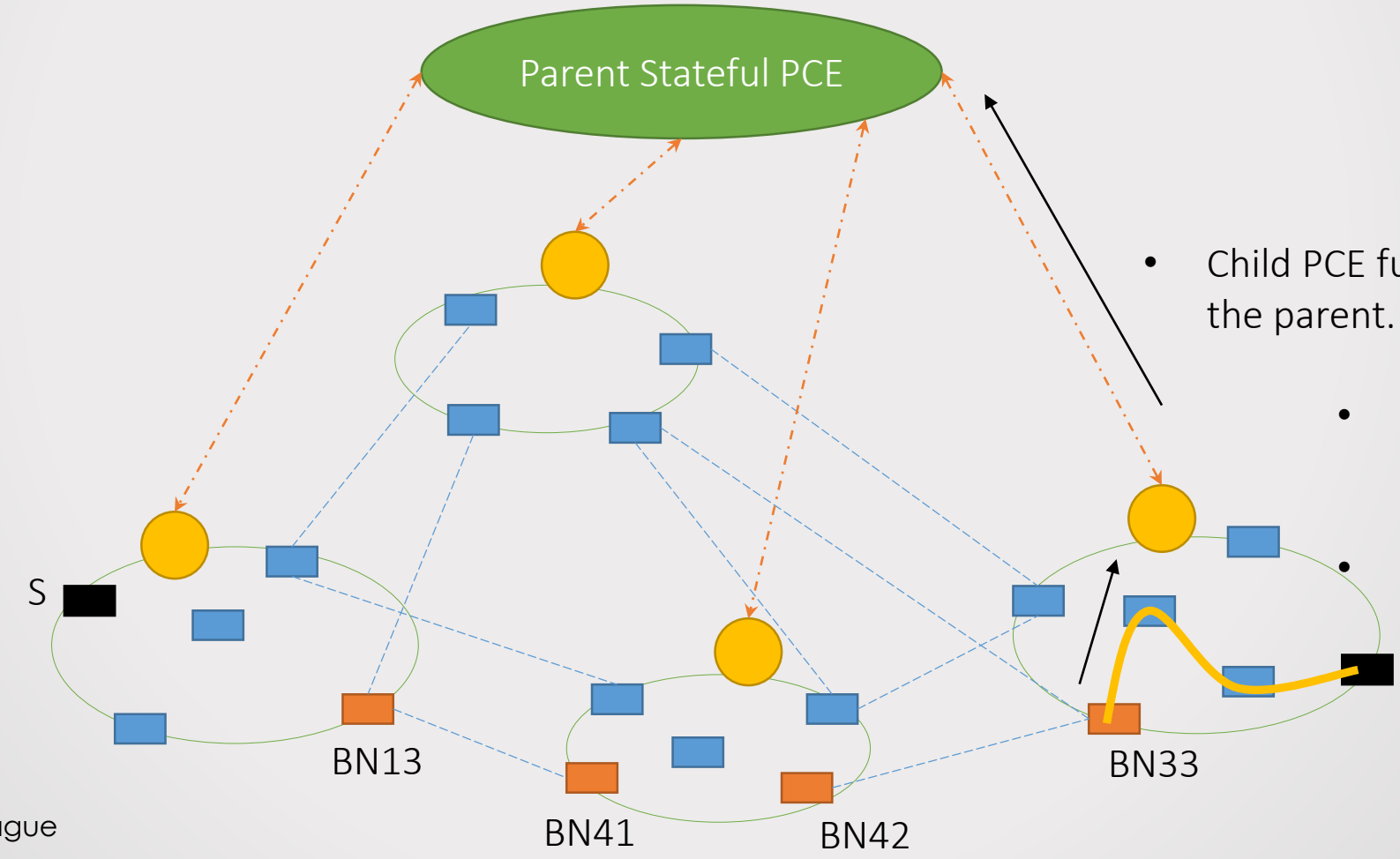


Procedures (BN33-D)



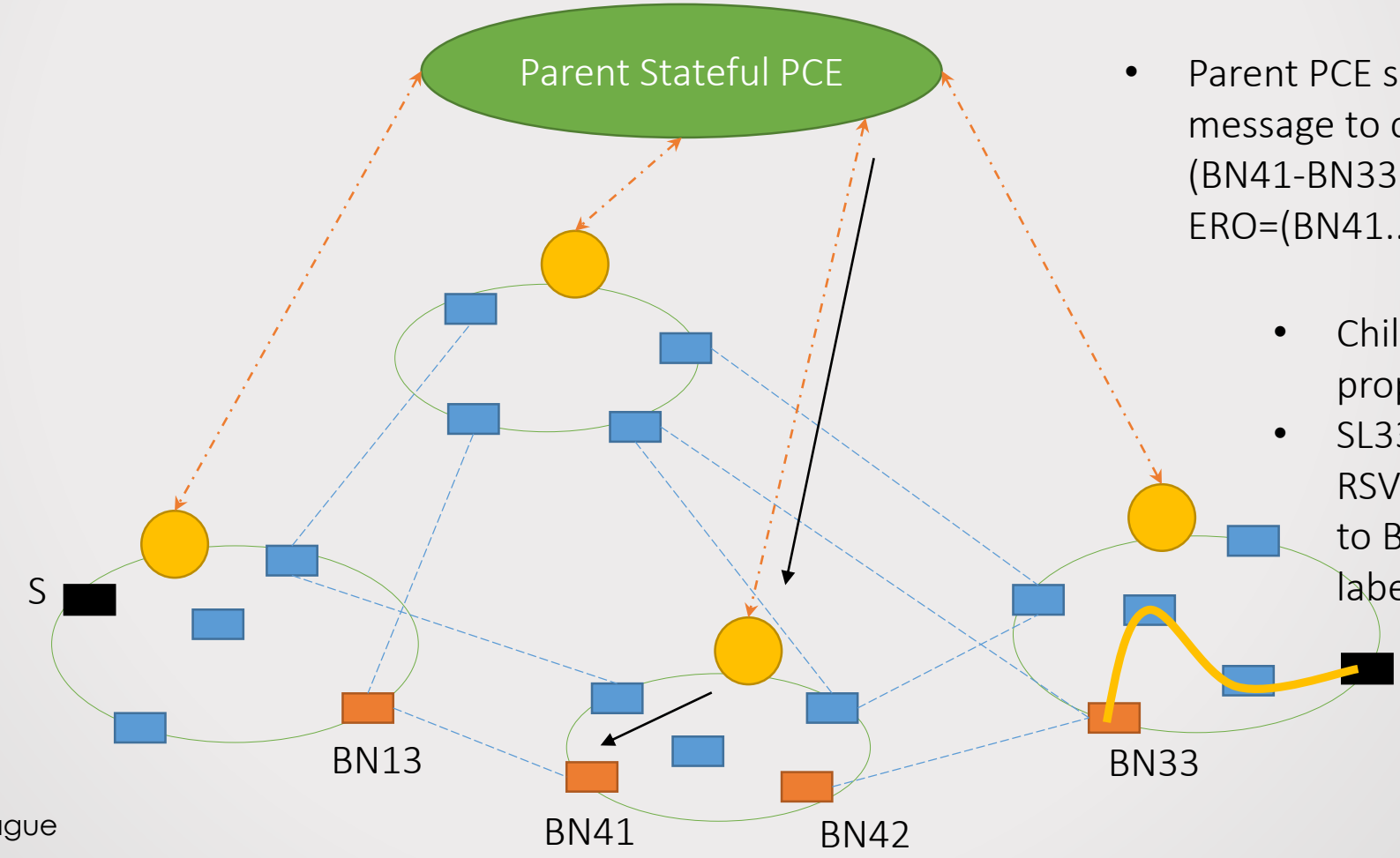
- Parent PCE sends initiate message to child PCE for LSP (BN33-D) with ERO=(BN33..D)
- Child PCE further propagates to BN33

Procedures (BN33-D)



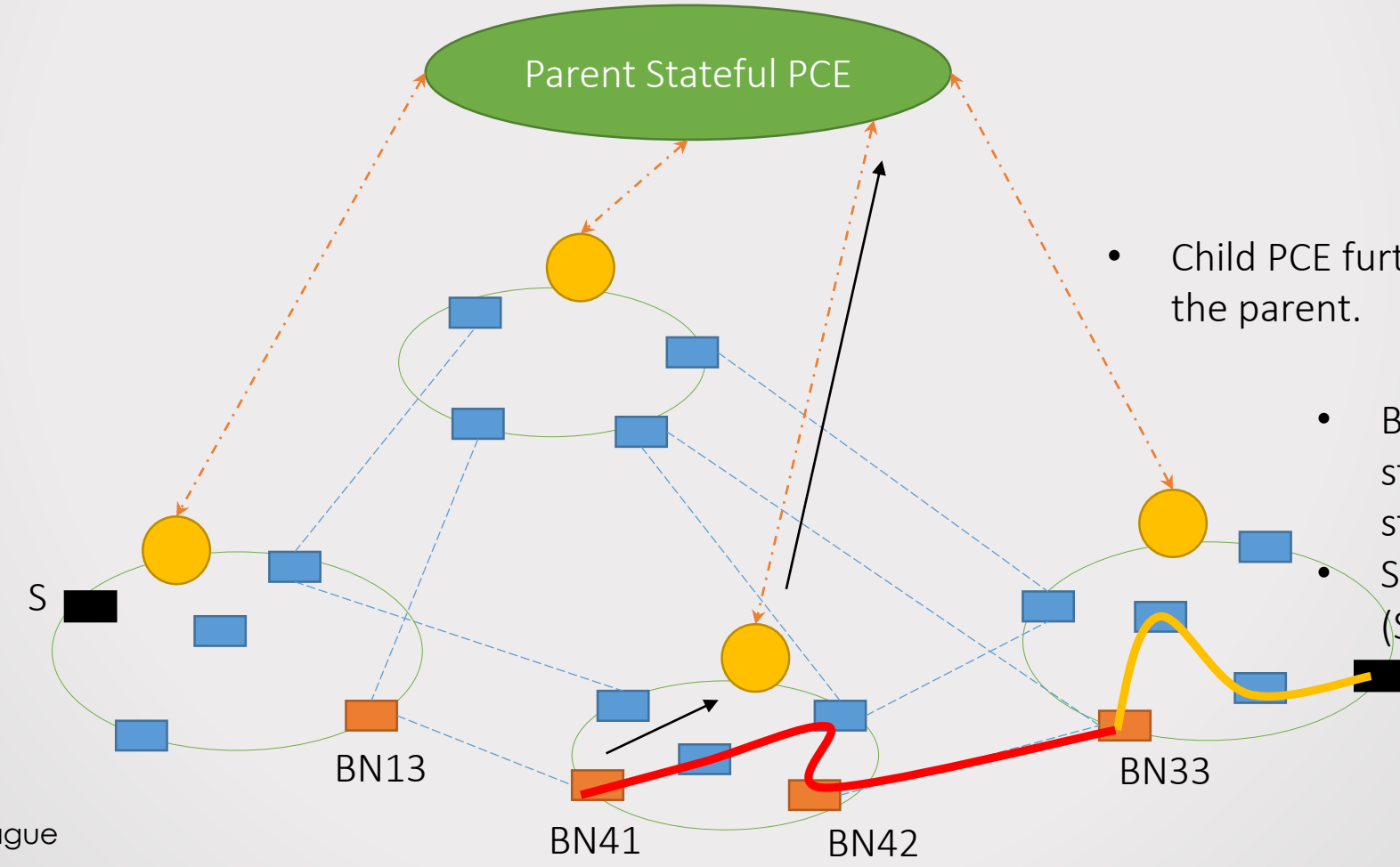
- Child PCE further propagates to the parent.
- BN33 reports the LSP status and allocate a stitching label (SL33).
- SL is carried in RRO as (SL33, BN33..D)

Procedures (BN41-BN33)



- Parent PCE sends initiate message to child PCE for LSP (BN41-BN33) with ERO=(BN41..BN42,SL33,BN33)
  - Child PCE further propagates to BN41.
  - SL33 is encoded in ERO in RSVP-TE and propagated to BN42; SL33 is part of label stack in case of SR

Procedures (BN41-BN33)

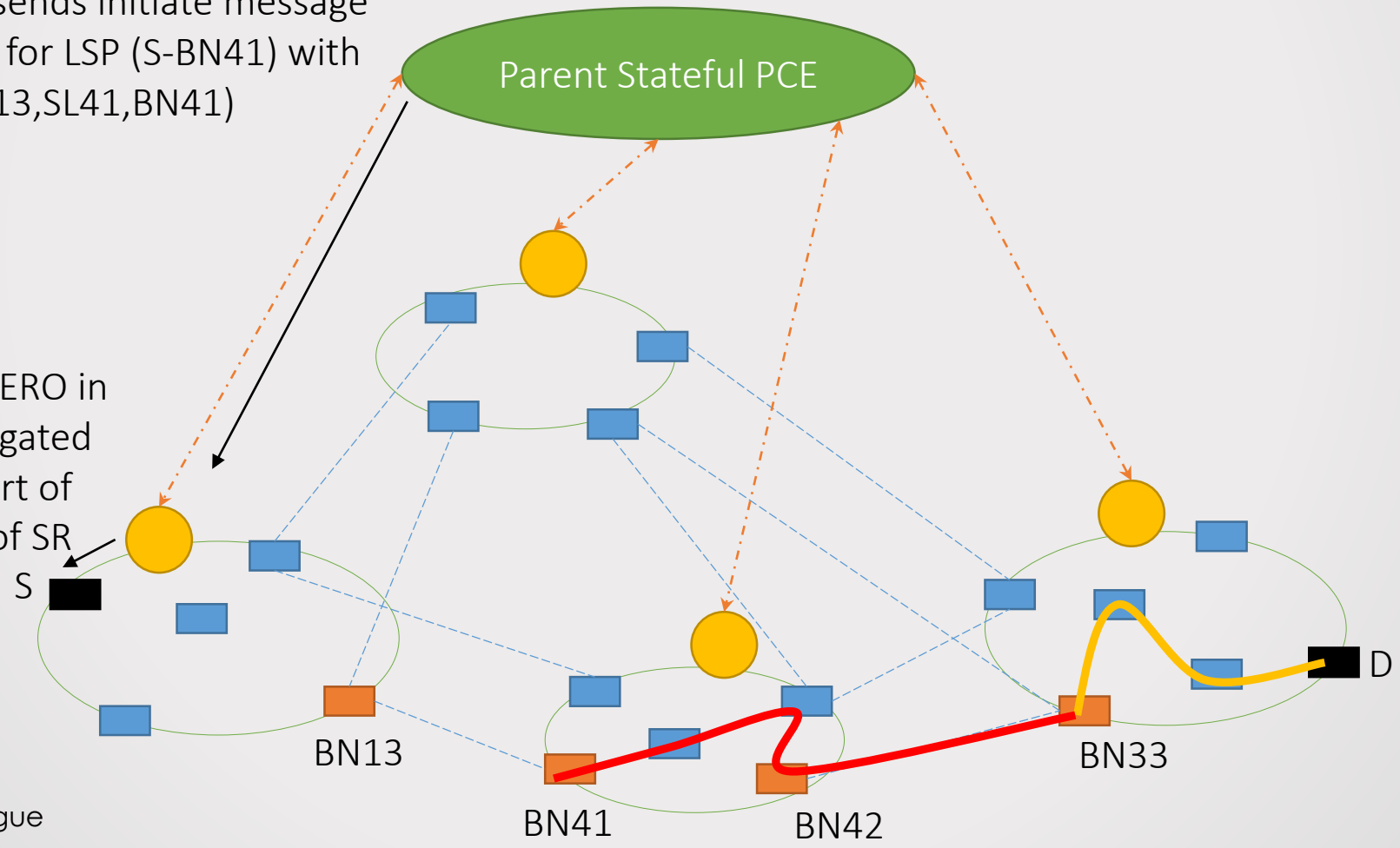


- Child PCE further propagates to the parent.
- BN41 reports the LSP status and allocate a stitching label (SL41).
- SL is carried in RRO as (SL41,BN41..BN33)

Procedures (S-BN41)

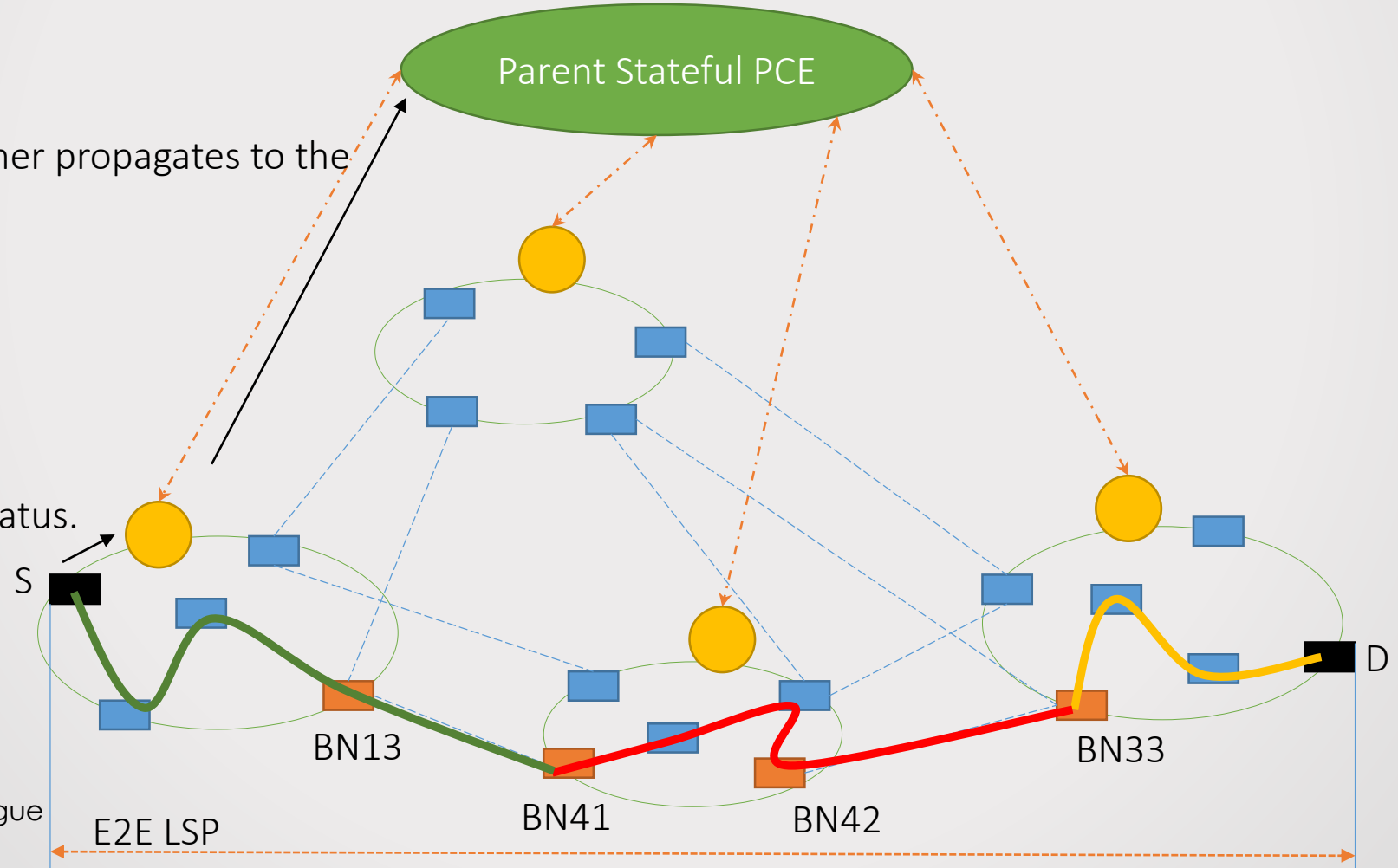
- Parent PCE sends initiate message to child PCE for LSP (S-BN41) with ERO=(S..BN13,SL41,BN41)

- Child PCE further propagates to S.
- SL41 is encoded in ERO in RSVP-TE and propagated to BN13; SL33 is part of label stack in case of SR



Procedures (S-BN41)

- Child PCE further propagates to the parent.
- S reports the LSP status.



Next Step

- Key part of the PCE's applicability for ACTN.
- Work with authors of
  - draft-dugeon-brpc-stateful-00
  - draft-sivabalan-pce-binding-label-sid-03
  - Others, to check if a common solution can be agreed on!
- Reviews are welcome!

THANK YOU!