PCE support for Domain Diversity

draft-dwpz-pce-domain-diverse-00

Dhruv Dhody	Qin Wu
Udayasree Palle	Xian Zhang

Motivation

Domain Diversity is defined in [RFC6805].

- A pair of paths are domain-diverse if they do not traverse **any of the same transit domains** (apart from ingress and egress domains).

Maximizing Domain diversity

- Domain diversity may be maximized for a pair of paths by selecting paths that have **the smallest number of shared domains**.

Why domain diversity?

- Selection of domain diverse paths as a way to reduce the risk of shared failure and automatically ensure path diversity.

Thank Qilei Wang for starting this discussion in the mailing list.

Examining Domain Diversity

Per Domain
- **Non-Synchronized:** After primary path setup, signal a domain diverse path by encoding the transit domain identifiers in XRO or EXRS in RSVP-TE.

BRPC
- **Non-Synchronized:** After primary path computation, request a domain diverse path by encoding the transit domain identifiers in XRO or EXRS in PCEP. Or use a domain-diverse domain sequence in IRO.

H-PCE (E2E or Domain-Sequence)
- **Non-Synchronized:** After primary path computation, request a domain diverse end to end path or domain-sequence by encoding the transit domain identifiers in XRO or EXRS in PCEP.
- **Synchronized:** a dependent and synchronized domain diverse end to end paths or domain-sequences from parent PCE.

Examining Domain Diversity

Per Domain

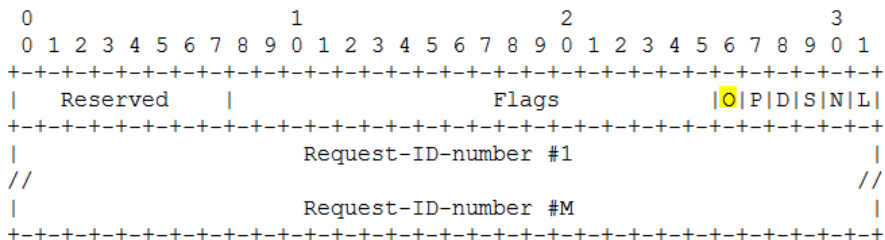Ingress aware of the transit domains of the primary path to **signal** a domain diverse path.

BRPC

PCC aware of transit domains of the primary path to **request** a domain diverse path.

H-PCE

+ a new bit in SVEC object.

Proposed PCEP Extension

SVEC

```
0                   1                   2                   3
0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1 2 3 4 5 6 7 8 9 0 1
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|    Reserved    |             Flags             |O|P|D|S|N|L|
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
|                  Request-ID-number #1                        |
//                                                            //
|                  Request-ID-number #M                        |
+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+-+
```

- O (Domain diverse) bit: when set, this indicates domain diversity requirement.

- Can be used in conjunction with other bits (N, L …).

Minimize Shared Domains

- Synchronized
  - OF: Minimize the number of common transit domains (MCTD).

- Non-Synchronized
  - X bit in XRO or EXRS set as 1 indicates that the domain specified should be excluded but may still be included in the absence of a viable path.
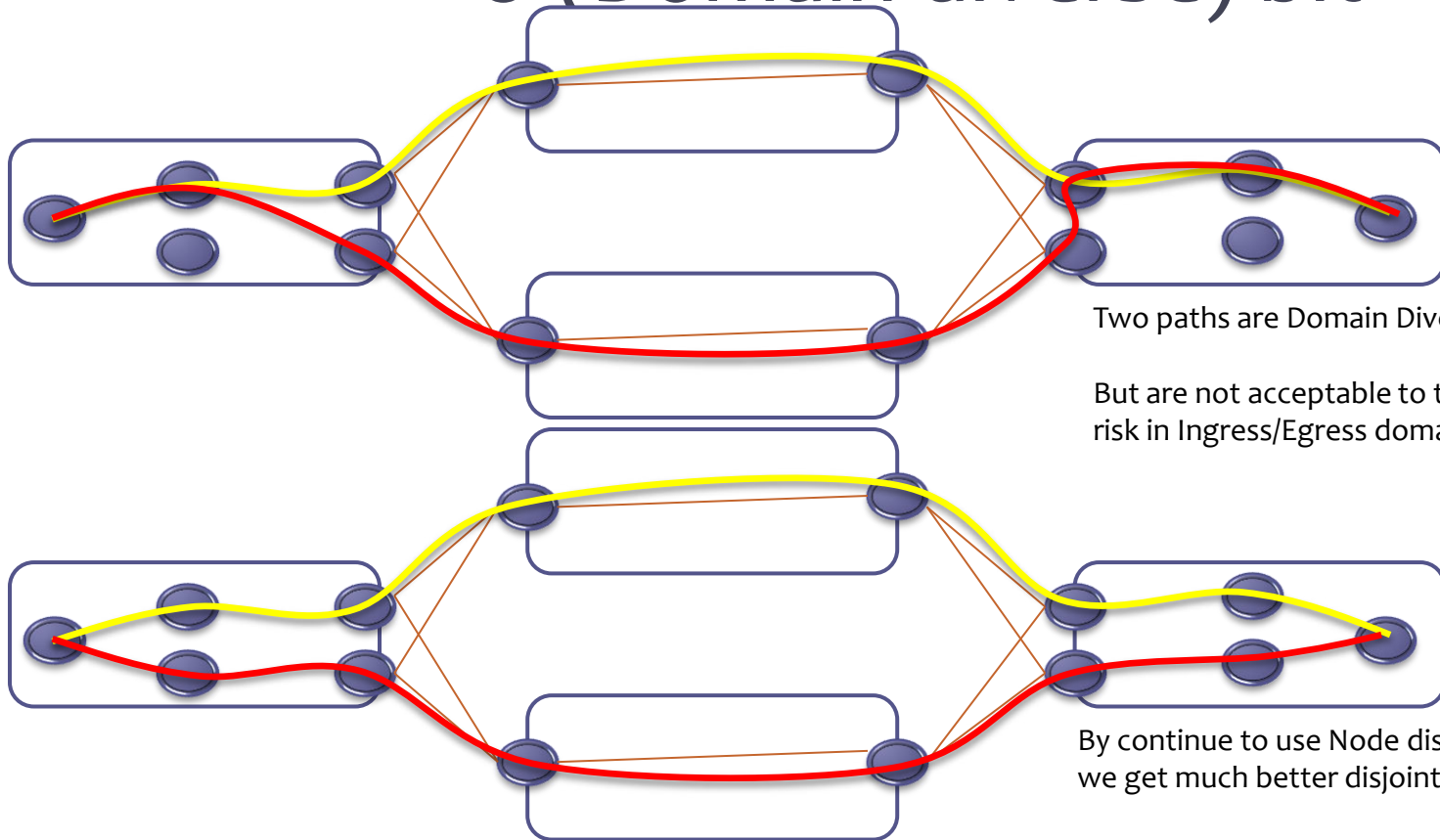
Next Steps!

- Some text can be moved to the WG's H-PCE ext.
  - A domain diverse bit in SVEC object
  - OF Minimize the number of common transit domains (MCTD).

- Thoughts?

Questions
&
Comments?

Thanks!

Backup Slides

O (Domain diverse) bit

Two paths are Domain Diverse!

But are not acceptable to the end-user because of shared risk in Ingress/Egress domain

By continue to use Node disjoint in Ingress/Egress domain, we get much better disjoint path!