

Some refinements to RFC8345

OPSAWG, IETF117

[draft-davis-opsawg-some-refinements-to-rfc8345](#)

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Summary of proposal in draft

- To improve capability to support multipoint structures (both unidirectional and bidirectional (uni-bi))
 - RFC8345 focusses on point to point unidirectional
 - RFC8345 suggest use of a pseudo-node to deal with multipoint
- There are many cases of both symmetric and asymmetric multipoint bidirectional and multipoint unidirectional network structures
 - Practical experience with both service and network solutions has led to extensive use of multipoint uni/bi structures
 - The digital map work has also led to a recognition of the need for multi-point uni/bi
- The new draft proposes enhancements to the YANG and provides a sketch of the YANG (two alternatives)
 - Considered to be backward compatible (needs validation)
 - Multipoint uni/bi covers all unidirectional and bidirectional cases

Experience and insight

- Services are very often bidirectional even if asymmetric in flow rates
 - Directional differences carried via properties of point and/or point pairs
- Many transport technologies are bidirectional between termination
 - There is often a return path or handshaking etc.
- Device, management and controller models from other bodies and within implementations take advantage of multipoint uni/bi
 - TMF MTNM, TL1, ONF TAPI, proprietary management solutions etc.
- Multipoint uni/bi emphasises atomic units and provides an efficient instance model

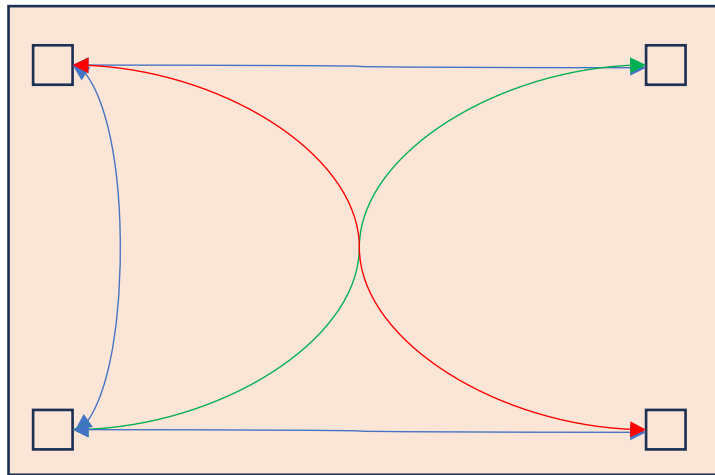
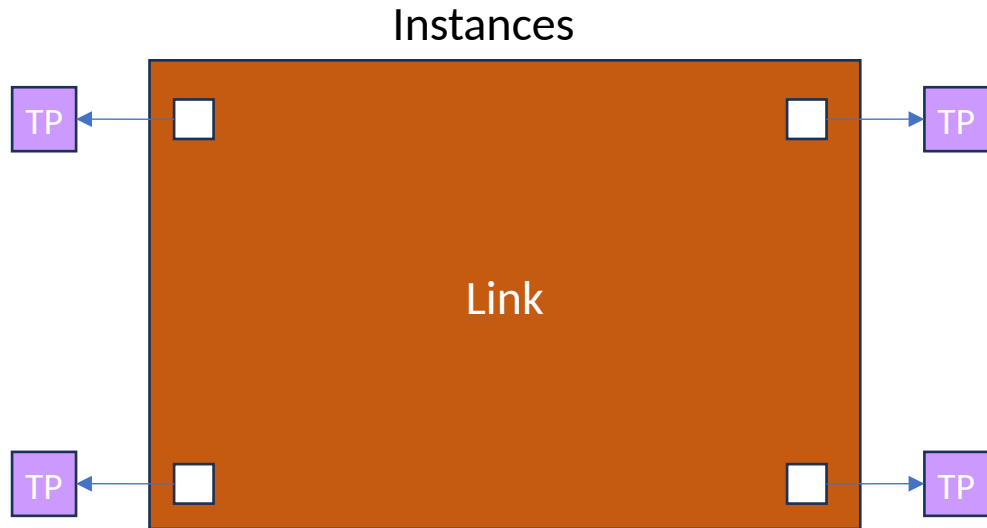
Basic enhancement (simple addition)

- Yang tree with additions shown in red
- Assumes two modes of operation
 - Unidirectional using source/destination
 - Multipoint uni/bi using point-list
- When using point-list
 - link-type references a spec
 - Link-direction provides summary of points
- In point-list
 - point-id is unique and references the spec
 - linked-node & linked-tp provides the same reference style as source/destination approach
 - point-role provides a summary of spec pattern detail
 - point-name may clarify role
 - point-direction indicates direction of use
- Note that a bidirectional tp may be connected to a unidirectional point (where half is used)
 - In this model, bidirectional usage of a unidirectional TP pair would require two points

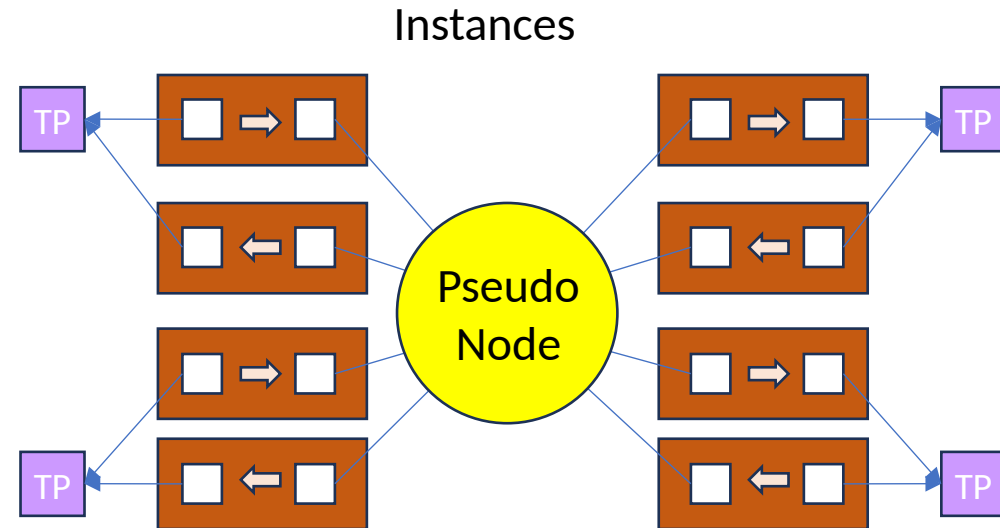
```
+--rw link* [link-id]
    +--rw link-id          link-id
    +--rw source
    | +--rw source-node?  -> ../../../../nw:node/node-id
    | +--rw source-tp?    leafref
    +--rw destination
    | +--rw dest-node?    -> ../../../../nw:node/node-id
    | +--rw dest-tp?     leafref
    +--rw point-list
    | +--rw points*      [point-id]
    |   +--rw point-id    string
    |   +--rw linked-node? -> ../../../../nw:node/node-
id
    |   +--rw linked-tp?  leafref
    |   +--rw point-role?  role-of-point
    |   +--rw point-name?  string
    |   +--rw point-direction? direction-of-point
    +--rw link-type?      type-of-link
    +--rw link-direction? direction-of-link
    +--rw supporting-link* [network-ref link-ref]
        +--rw network-ref
        |   -> ../../../../nw:supporting-network/network-
ref
    +
```

Note that the YANG tree is not in the draft
(the corresponding YANG is)

Multi-point Uni/Bi compared to Pseudo Node



Spec - showing 10 legal flows



Pseudo node still needs spec to explain flows (this is not discussed in RFC8345).

Alternative is to overlay 10 unidirectional links. BUT this does not explain contention at TPs

Spec can explain protection and sharing.

Other areas for improvement mentioned but not covered by the draft

- Termination direction (simple addition of optional direction property)
- Specification of capability (complex challenging area, but insight from other work)
- Links between networks (relatively simple with insights from other work)
- Richness of navigation (requires refinement of statement of purpose)
- Relationship roles (complex area, but insight from other work)
- Generalized model of flow (challenging area, but insights from other work)
- Layering and sub-layering (complex area, but insight from other work)

Next Steps

- Seek support for the draft and understand how to progress to making the adjustment to RFC8345
- Consider the other areas for improvement mentioned in the draft and develop further drafts etc.

Thank you!

Abstract

<https://datatracker.ietf.org/doc/draft-davis-opsawg-some-refinements-to-rfc8345/>

This draft provides a brief analysis of the current unidirectional point-to-point approach to modeling of the link in RFC8345, highlights why this is not sufficient and makes a proposal to enhance RFC8345 YANG to support multipoint uni/bi links. The two alternative enhancement approaches proposed are backward compatible. The enhancement is such that it provides a uniform solution to modeling all links that could, over time, replace the current unidirectional point-to-point approach. The rationale for the change is based on many years of practical experience, including challenges using RFC8345 in actual solution development, and insight gained through other standardisation efforts and deployments.