

FlexE Usecases

draft-hussain-ccamp-flexe-usecases-01

IETF 96, Berlin, Germany

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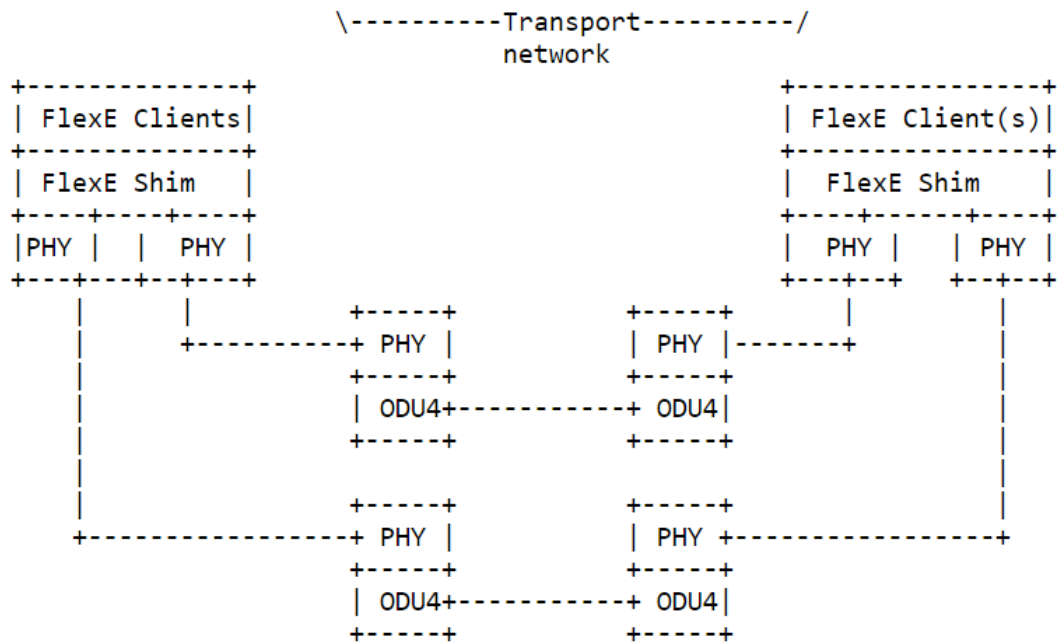
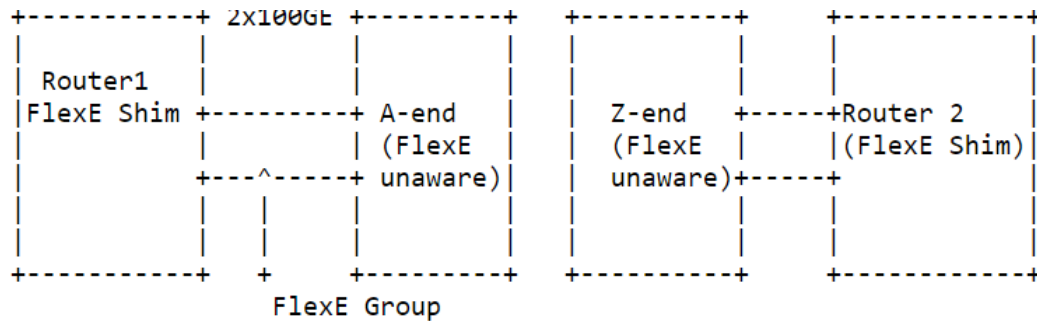
Radha Valiveti

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Draft - Summary

- FlexE Usecases
 - Describes various usecases involving transport of Flexible rate Ethernet client signal over OTN and DWDM networks
- Requirements
 - Describes a set of solution requirements for the aforementioned usecases to identify Routing and Signaling extensions that may be required

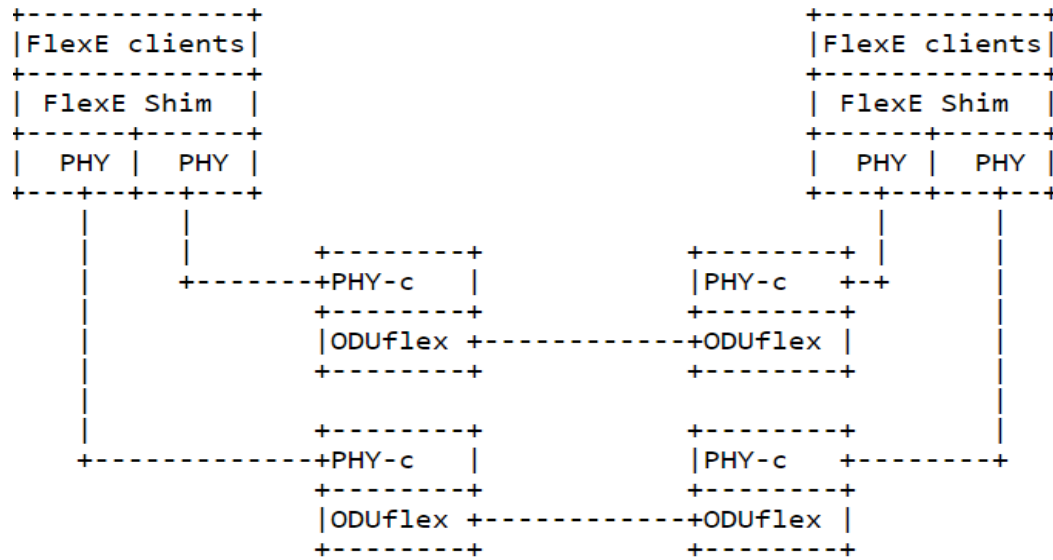
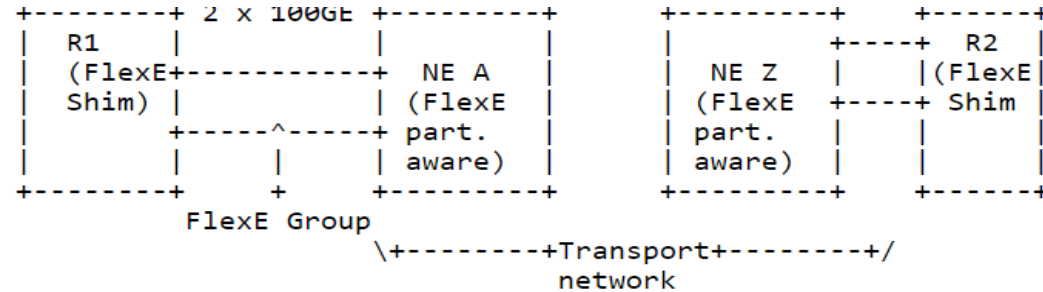
UC1: FlexE unaware transport



FlexE skew tolerance for end-to-end distance



UC2: Partially Aware FlexE - No Resizing

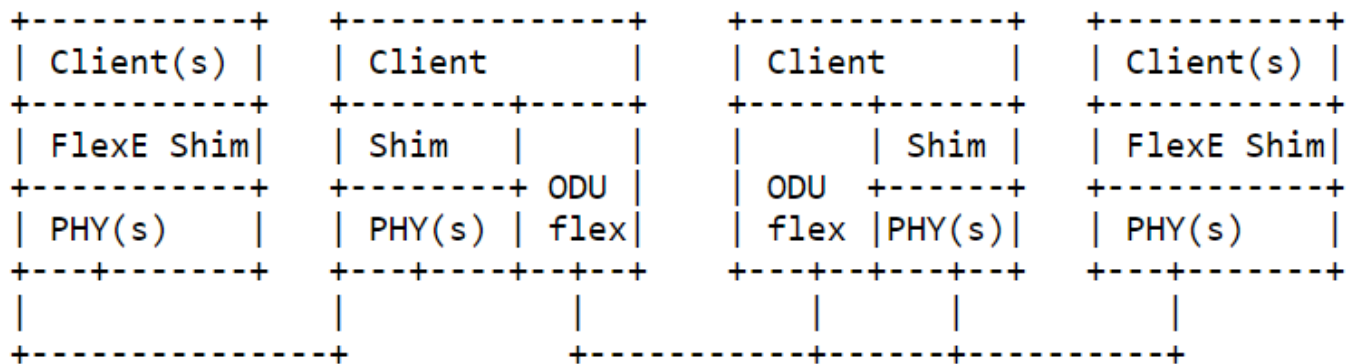
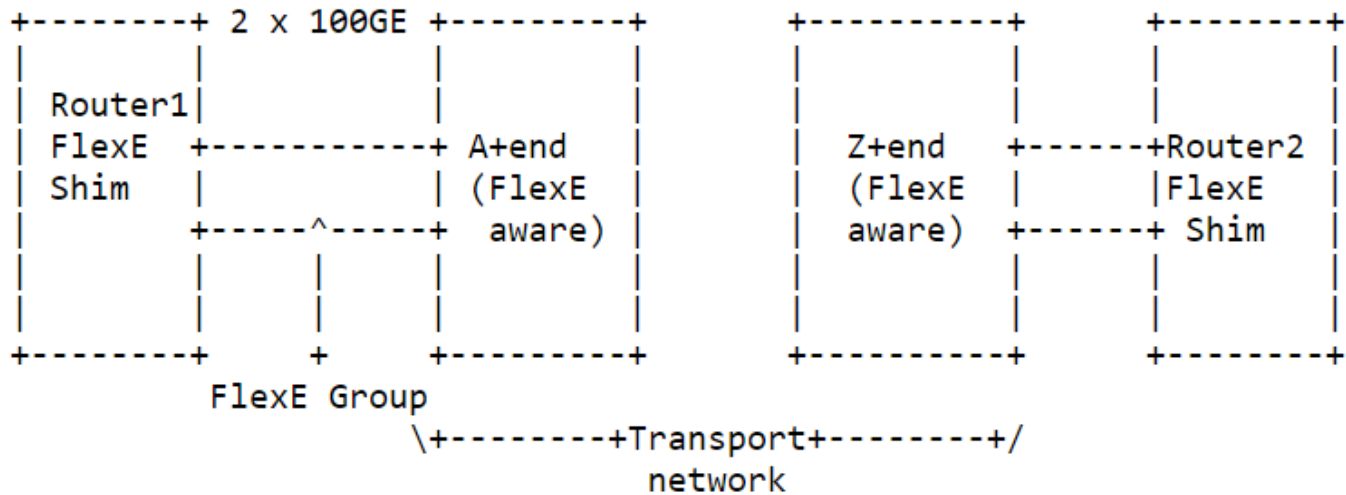


- Legend:
- | R1, R2 - Routers (supporting the FlexE clients)
 - | NE A, Z - Transport Network Edge nodes
 - | PHY-c - Crunched FlexE PHY(s)

FlexE skew tolerance for end-to-end distance



UC3: FlexE Termination - FlexE Clients at Both endpoints



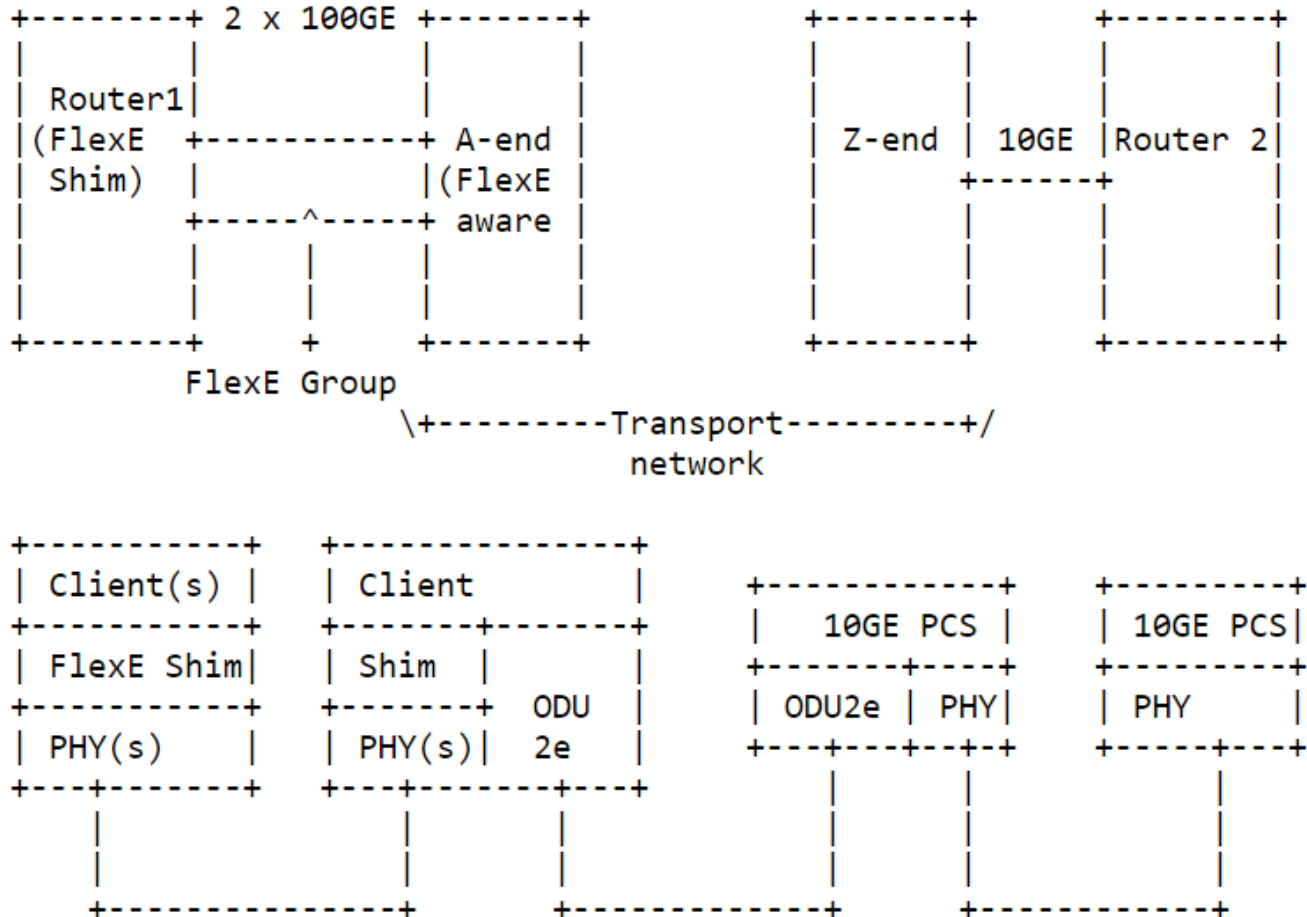
FlexE skew tolerance distance



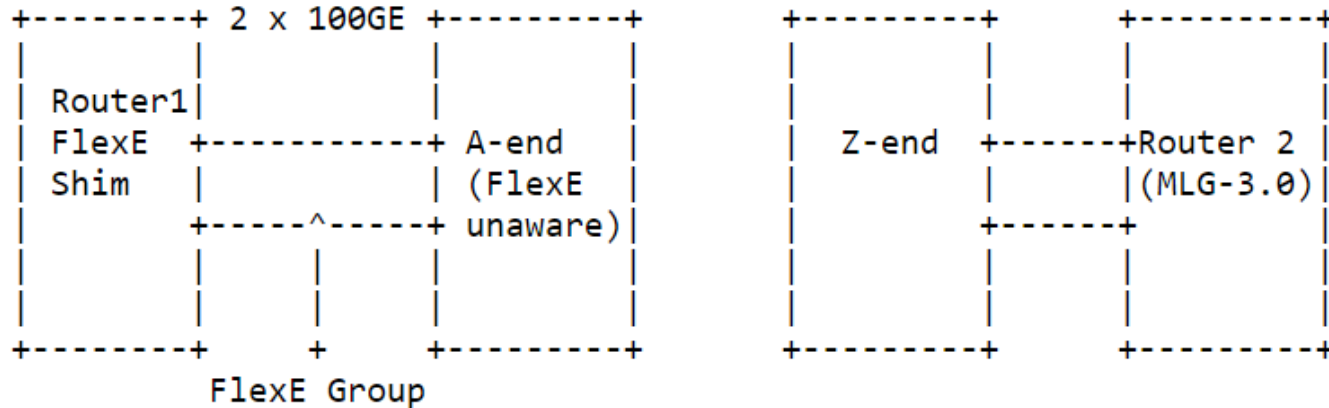
FlexE skew tolerance distance



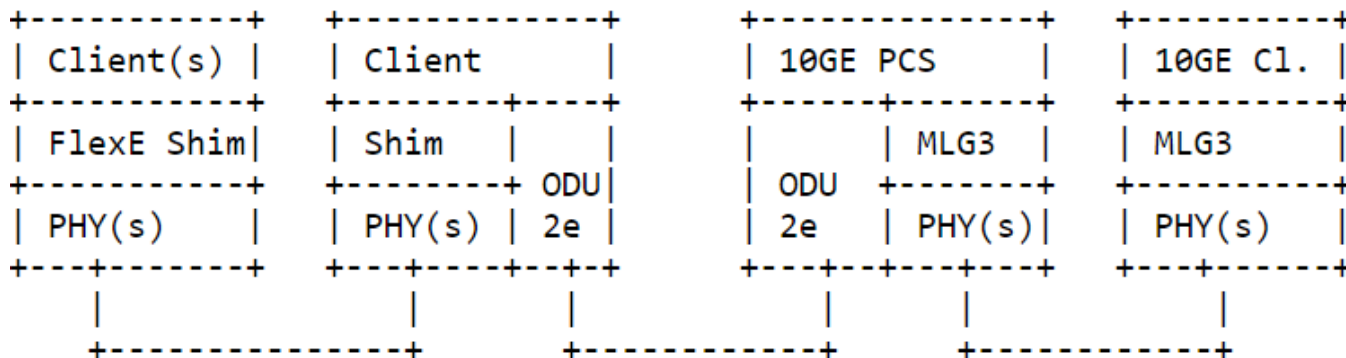
UC4: FlexE Termination – IW of a FlexE Client with a Native Ethernet Client



UC5: FlexE Termination – IW of a FlexE Client with an OIF_MLG Client



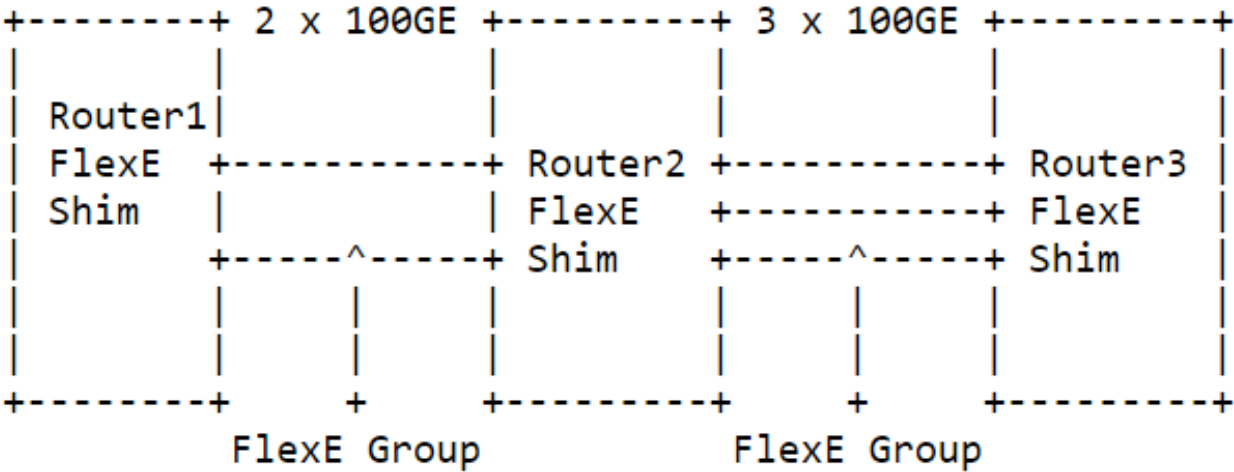
\+-----+Transport+-----+/
network



UC6: FlexE Termination – FlexE Client BW Resizing

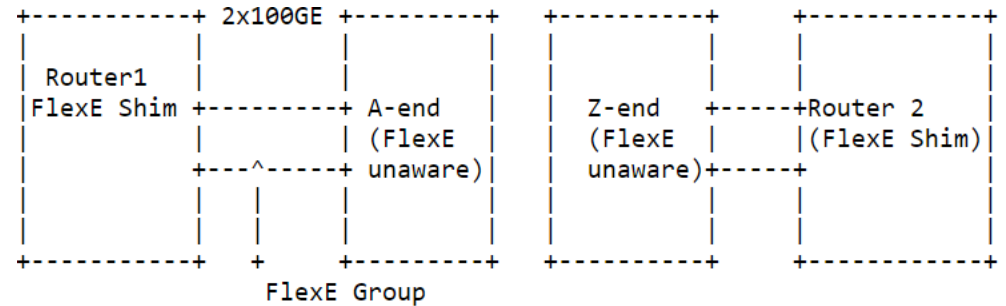
- The OIF implementation agreement defines two calendars:
 - currently active
 - the future calendar to which the sender wants to transition to
- This capability can be used to coordinate a synchronized switchover of calendars between the two FlexE Shim functions:
 - one located in the customer edge device (typically a router),
 - and the transport network edge

UC6: FlexE Termination – Back-to-Back FlexE

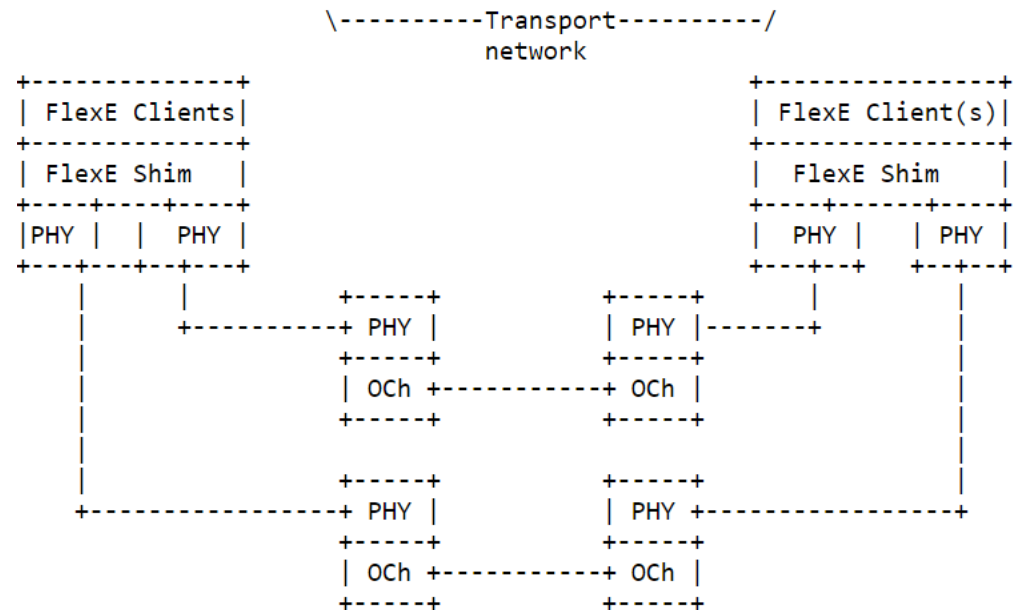


FlexE Transport over Wavelength(s)

- The list of all aforementioned FlexE usecases can also be supported by mapping FlexE directly over one or more wavelengths.



- See a FlexE unaware transport over wavelength usecase example



FlexE unaware transport over wavelength

Requirements

- Summary
 - Support a flexible mechanism for configuring a FlexE group
 - Support the ability to add/remove Ethernet PHYs to/from a FlexE group
 - Allow adding or removing a FlexE client to a FlexE group without affecting traffic on other clients
 - Allow resizing of FlexE client BW through coordination of calendar updates

Next Steps

- Solicit feedback and discuss collaboration opportunities with other FlexE contributions

FlexE GMPLS Signaling Extensions

draft-hussain-ccamp-flexe-signaling-extensions-00

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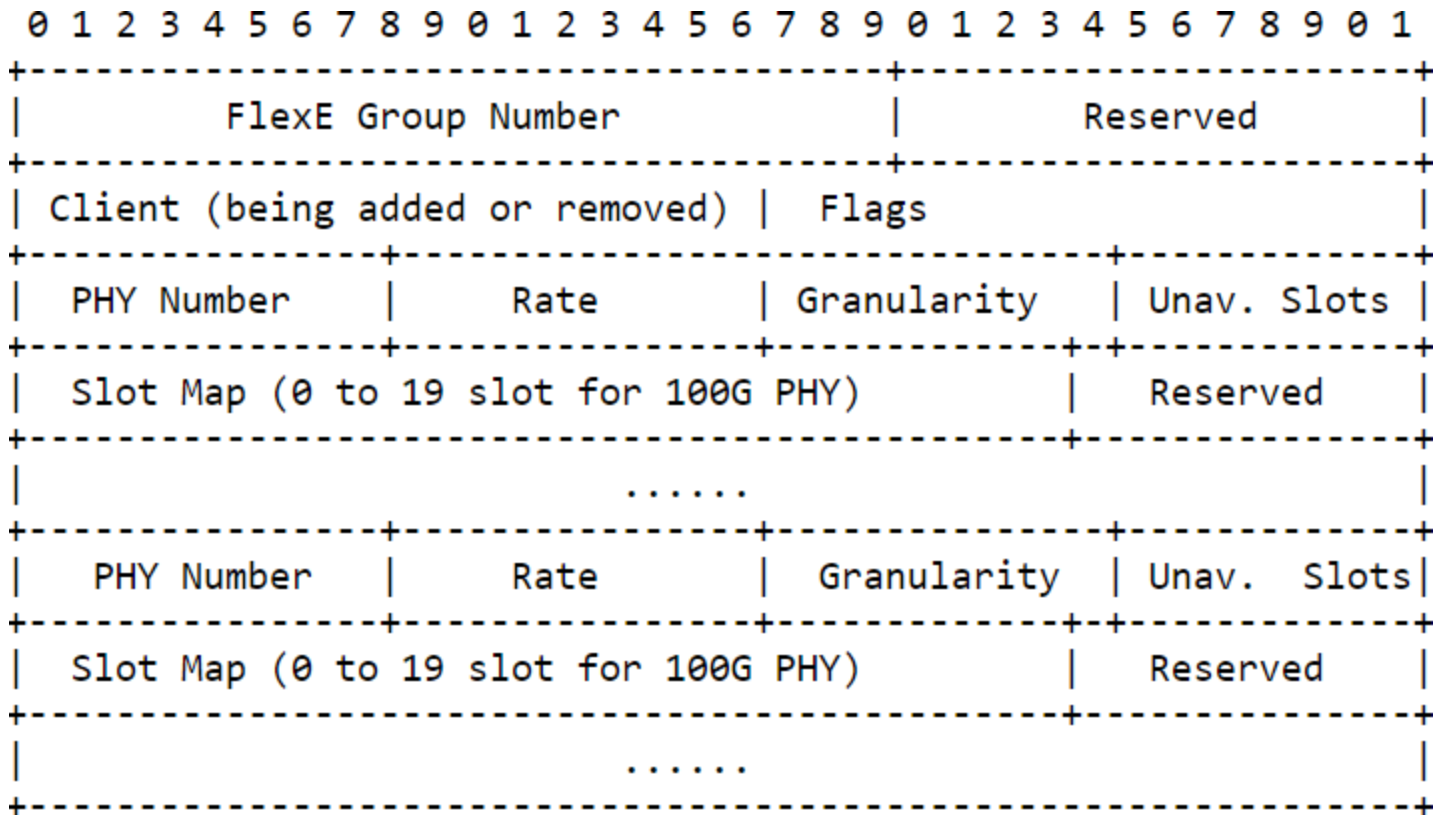
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Proposal - Summary

- Extends [RFC3471]
 - Describes a new generalized label format for
 - configuring a FlexE group
 - and adding or removing FlexE client(s) to a FlexE group
 - Proposes a new LSP Encoding type
 - Flexible Ethernet (FlexE) (a new value of 15)
 - Proposed a new Generalized PID (G-PID)
 - FlexE (a new value of 71)
 - Reuses switching type
 - Layer-2 Switch Capable (L2SC) (as defined in [RFC3471])

FlexE Label Format



Related Work

- The generalized label described in [draft-wang-ccamp-flex-signaling] is limited to 100G PHY only
- The proposed generalized label is applicable to PHY rates beyond 100G.
 - Carries per PHY Rate and Granularity
 - Allows to drive per PHY calendar size information in the face of calendar granularity and/or calendar size changes that might be required for PHY rates beyond 100G (e.g., 400G)

Next Steps

- Solicit feedback and discuss collaboration opportunities with other FlexE contributions

FlexE GMPLS Routing Extension

draft-pithewan-ccamp-flexe-routing-extensions-00

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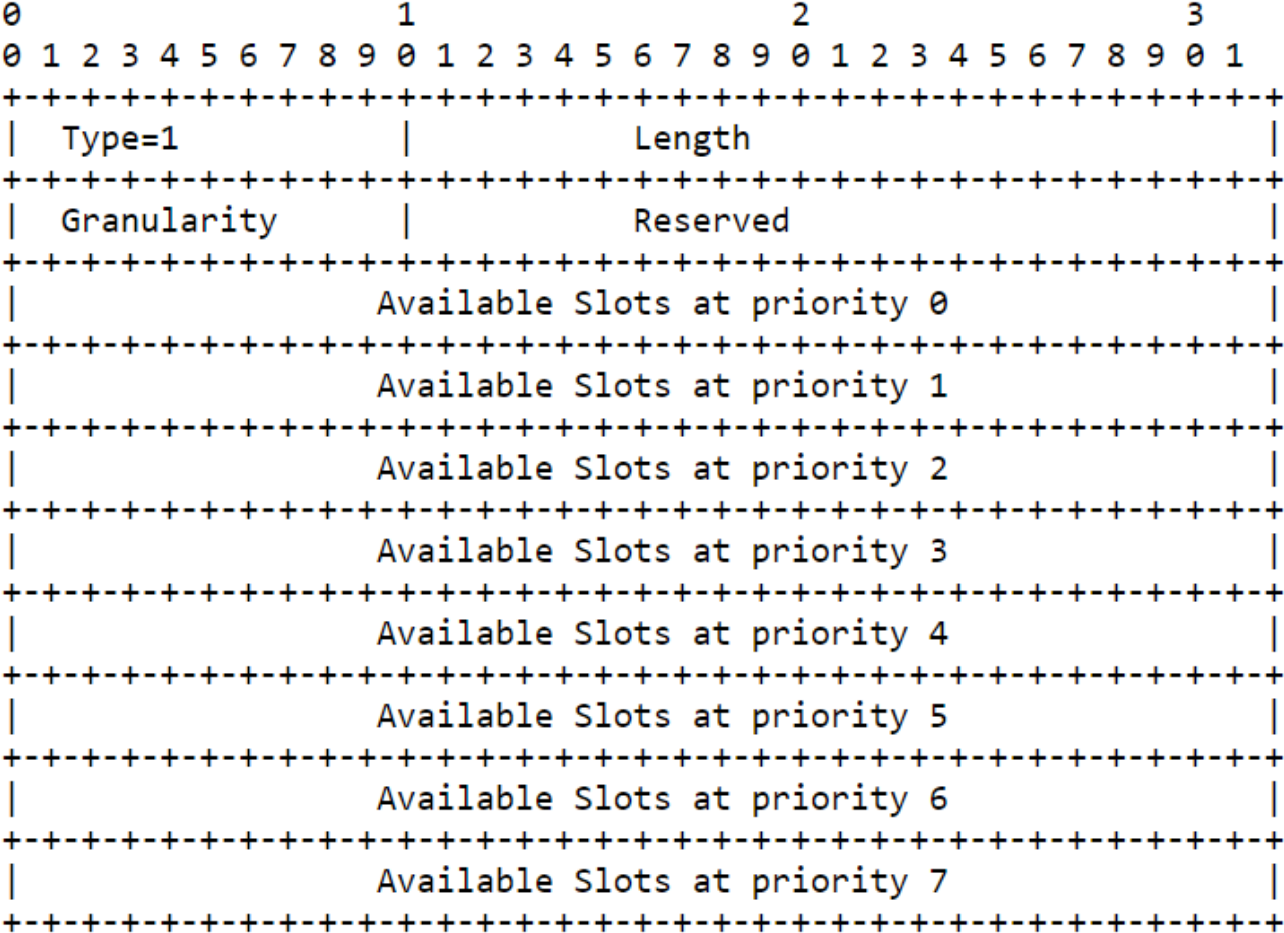
Radha Valiveti

Proposal - Summary

- Simple extensions to ISCD [RFC 4202]
 - Switching type (L2SC [as defined in RFC4202])
 - New Encoding type (FlexE as defined in this draft)
 - The FlexE SHIM nominal rate (in kbps)
- FlexE Routing extensions summary
 - Models the effective bandwidth between two FlexE group (or interfaces) with a FlexE TE Link
 - Represents the BW of a FlexE TE link by number of slots and size of the slots
 - Advertises 'Available Slots' availability and 'Granularity'
 - Support for BW advertisement per priority
 - Support for Min & Max BW use per LSP

FlexE - Switch Capability Specific Information

TLV Format



Next Steps

- Solicit feedback and discuss collaboration opportunities with other FlexE contributions