MPLS Transport Framework on Composite Link

draft-so-yong-mpls-ctg-framework-01.txt

Ning So
Andrew Malis
Dave McDysan
Lucy Yong
Fredric Jounay
Yuji Kamite

ning.so@verizonbusiness.com
andrew.g.malis@verizon.com
dave.mcdysan@verizon.com
lucyyong@huawei.com
frederic.jounay@orange-ftgroup.com
y.kamite@ntt.com
Differences From Previous Work

Split the framework and Requirement draft into two drafts based on the group feedback in 75th IETF

- Requirement – composite link motivation/problem statement, and transport and operation requirements
- Framework – architecture of composite link and transport method, and applicability
CTG Framework (Revised)

- Composite link consists a set of component links that have the same end points.
- Component links may have different TE parameters.
- Composite link can carry LSP traffic and control plane packets.
- LSP traffic flows and CP packets first is mapped into a connection, then connections are mapped to a component link.
- Traffic volume measurement on a per connection basis.
  - enables bandwidth optimization over composite link.
  - makes the measurement scalable and manageable.
- Traffic mapping and connection mapping algorithm takes traffic and connection parameters into account.

Interior Functions: Data/forwarding, determination of component link. Management Control of these functions important for interoperability.

Exterior Functions: Routing and Signaling.
**Interior Functions**

- Implement locally on LSRs that are connected via a composite link directly
  - Mapping of traffic flows to connections
  - Mapping of connections to component links
  - Traffic volume measurement on a per connection
  - Component link failure recovery
  - Component link congestion prevention
  - Operator configuration
    - Composite link, component link, connection, LSP placement, etc
  - Management plane Support
    - Report which component link a LSP is assigned to
    - Alarm on component link failure

- Although interior functions are local, it is important for vendor device to be manageable in an interoperable way
**Interior Functions**

- **LSP flows with TE information**
  - Get LSP parameters from RSVP-TE messages

- **LSP flows without TE information**
  - LSP is signaled via LDP messages
  - Assign LDP LSP to pre-configured connection
  - Monitor connection BW and use it for BW optimization

- **Hybrid case- LSPs with TE and without TE info**
  - Obtains LSP parameters in different ways
  - Separate RSVP-TE LSP and LDP LSP into different connections
  - pre-empt the flows based on the priority when congestion happens
Exterior Functions

- Apply to MPLS routers via signaling or routing protocols
  - Protocol enhancement for further study
  - Requirements are in the separate draft
- Composite Link Advertisement
  - Advertise as a single virtual interface between connected routers within IGP
  - Possible to advertise multiple latency values or a range of values
- Component Link Setup
  - TE LSP may be signaled as a component link
  - TE LSP may be supported by MPLS(-TP) or GMPLS enabled transport network
Exterior Functions

- LSP Flows with TE information
  - RSVP-TE PATH and RESV messages are used for LSP establishment
  - LSR selects a label for LSP over a composite link
  - LSP parameters in PATH and RESV are used in LSP assignment

- LSP Flows without TE information
  - FEC is bound to a connection on a composite link
  - LDP Label Request message and Label Mapping message are used for LDP LSP establishment
  - Traffic volume measurement on a per connection

- Hybrid Case – LSPs with TE and without TE
  - Facilitate flow preemption on the capacity shortage
  - Provide soft preemption
Applicability

Composite link can apply between Ps, P and PE, and PEs
**Applicability**

- Component link may be a physical link or logical link
  - In single layer, physical link or TE LSP may be used as component link
    - In one IGP, R3 and R4 provides the segment of TE LSP
    - In different IGPs, R3 and R4 provides the connectivity between R1 and R2
  - In multi-layer, lower layer with GMPLS may provide a logical interface as a component link for the layer of composite link
Next Steps

- Agreement on requirements/ framework separation, scope and overall structure
- Adopt framework and requirement drafts into WG draft
  - Draft-so-yong-mpls-CTG-framework-00
  - Draft-so-yong-mpls-CTG-requirement-00
- Determine how best to organize this work and assign to appropriate working group(s).

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