



Extensions for QoS Support in Transparent VLAN Services over MPLS

`draft-lau-ppvvpn-qos-tls-mpls-00.txt`

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Background and Overview

- [draft-martini-l2circuit-encap-mpls-03.txt](#), July 2001, defines encapsulation formats for Layer 2 frames for transport over MPLS
- [draft-martini-l2circuit-trans-mpls-07.txt](#), July 2001, defines LDP-based signaling extensions for setting up **point to point** layer2 [**best effort**] transport trunks over an MPLS network
- [draft-lasserre-vkompella-ppvvpn-vpls-00.txt](#), Nov. 2001, extends Martini to support **point to multipoint** Layer 2 Transparent VLAN (TVLAN) services over MPLS (**still no QoS**)
- **This draft** defines two extensions to facilitate provisioning and support of **QoS in TVLAN's over MPLS**
- There are more QoS-related issues that we are going to address by the next meeting



Extension 1: Identification of Endpoints

- draft-lasserre-vkompella-ppvvpn-vpls-00.txt use VCID as defined in Martini to identify VPN
 - In Martini, endpoints can be inferred, because there are only two
 - Hide multiple VPN endpoints within a PE, both during signaling and forwarding
 - Require local bridging at destination PE
- **Identification of endpoints needed** for “automatic” QoS provisioning in both hose and pipe model
 - QoS requirements are expressed in terms of individual endpoint (hose) or pair of endpoints (pipe)
 - Need to identify, reference, discover endpoints
- Also, with **two or more endpoints residing in the same PE**
 - Aggregation of resource is desirable or necessary
 - If endpoints can be identified, can use existing automatic discovering and signaling mechanism without change
- Extend the use of the VCID field to refer to the VPN endpoint rather than the VPN (use VPNid for the VPN)
 - Can coexist with the other use (still useful for best effort traffic)
 - New VC type VPN Endpoint VPLS, codepoint 0x000C



Extension 2: One VC Label per VPN endpoint pair

- With QoS, multiple outer tunnels may be established between a pair of PE's (same for load balancing, traffic engineering, fault tolerance, etc.)
 - Martini and Lasserre-Vkompella assume the existence of one outer tunnel between two PE's
 - Lasserre-Vkompella use one VC-label per pair of PE's
- Binding needs to be created between each VC-label and its transport outer tunnel
 - To be used for VC-label provisioning and resource reservation at the destination PE
 - Otherwise, resources have to be reserved all the potential ingress ports of the destination PE
 - Also needed for automatic restoration
- One VC Label per each endpoint pair facilitates this binding



Extension 2: One VC Label per VPN endpoint pair (cont.'d)

- With multiple outer tunnels
 - Mapping of packets into outer tunnel should be done on a per destination VPN endpoint basis (just to maintain order of the packets)
 - One VC-label per destination VPN endpoint to all sources is not feasible
- Different VC-label for each ordered pair of source and destination endpoints
 - Resource management at the destination is simplified (QoS requirements are specified in a VPN-endpoint-to-VPN endpoint basis).
 - Eliminates resource aggregation among QoS guaranteed traffic flows sharing the same VC-label
 - Need to perform local bridging at the destination is removed
- Drawback: increase in the number of VC-labels used
- The downstream unsolicited mode of VC-label distribution in Lasserre-Vkompella cannot support the distribution of one VC-label per source/destination VPN endpoint
 - No provision for the destination PE to distribute multiple VC-labels for different VPN endpoints hosted by the same source PE



More QoS Issues

- Automatic VPN discovery with QoS
- Signaling extensions for binding inner and outer label
- Automatic QoS provisioning of both outer and inner tunnel
 - Need to advertise source and destination VPN endpoints
 - Several ways to do it
- More...
 - QoS of the VPN
 - QoS within the VPN