

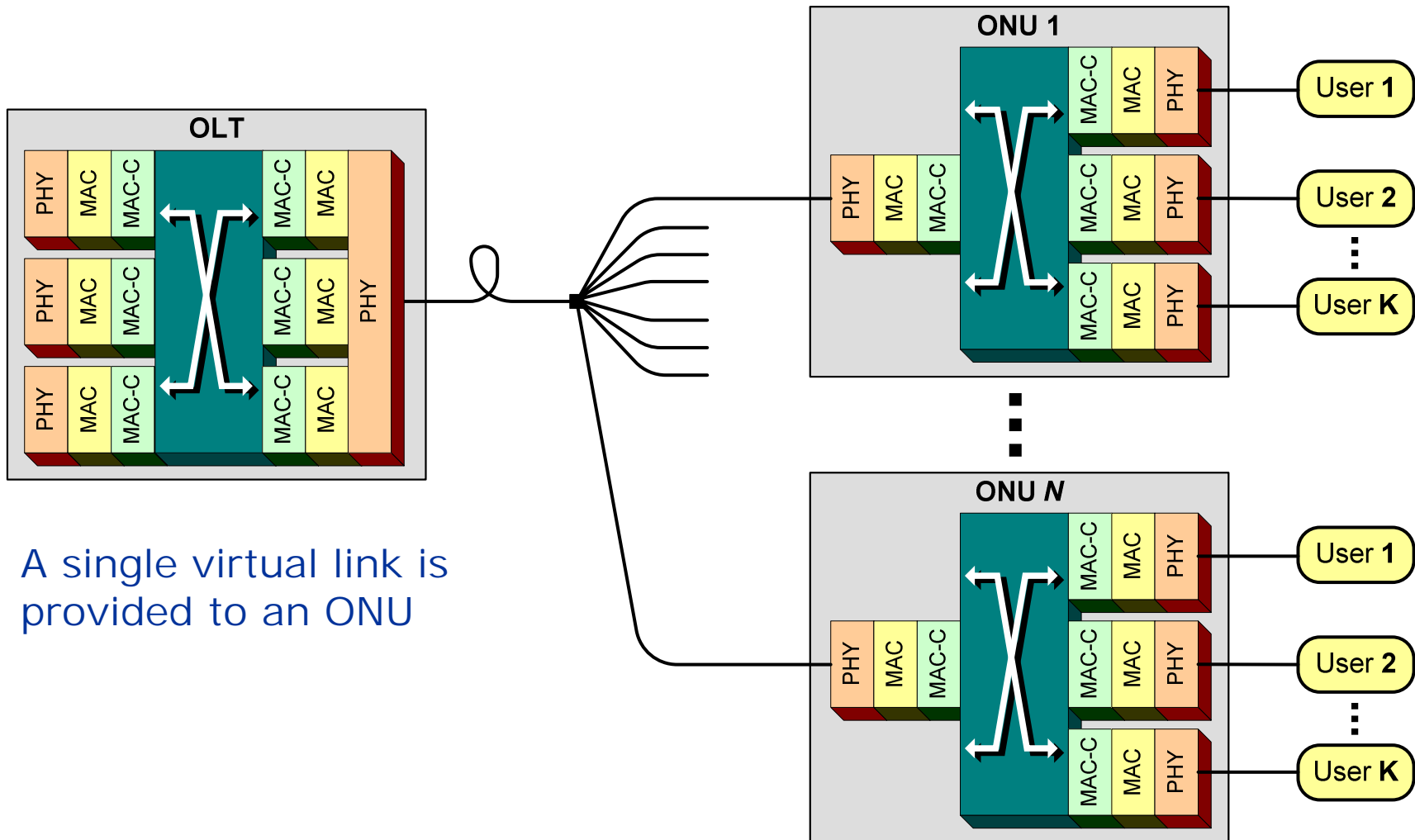
Single LLID/ONU vs. Multiple LLIDs/ONU

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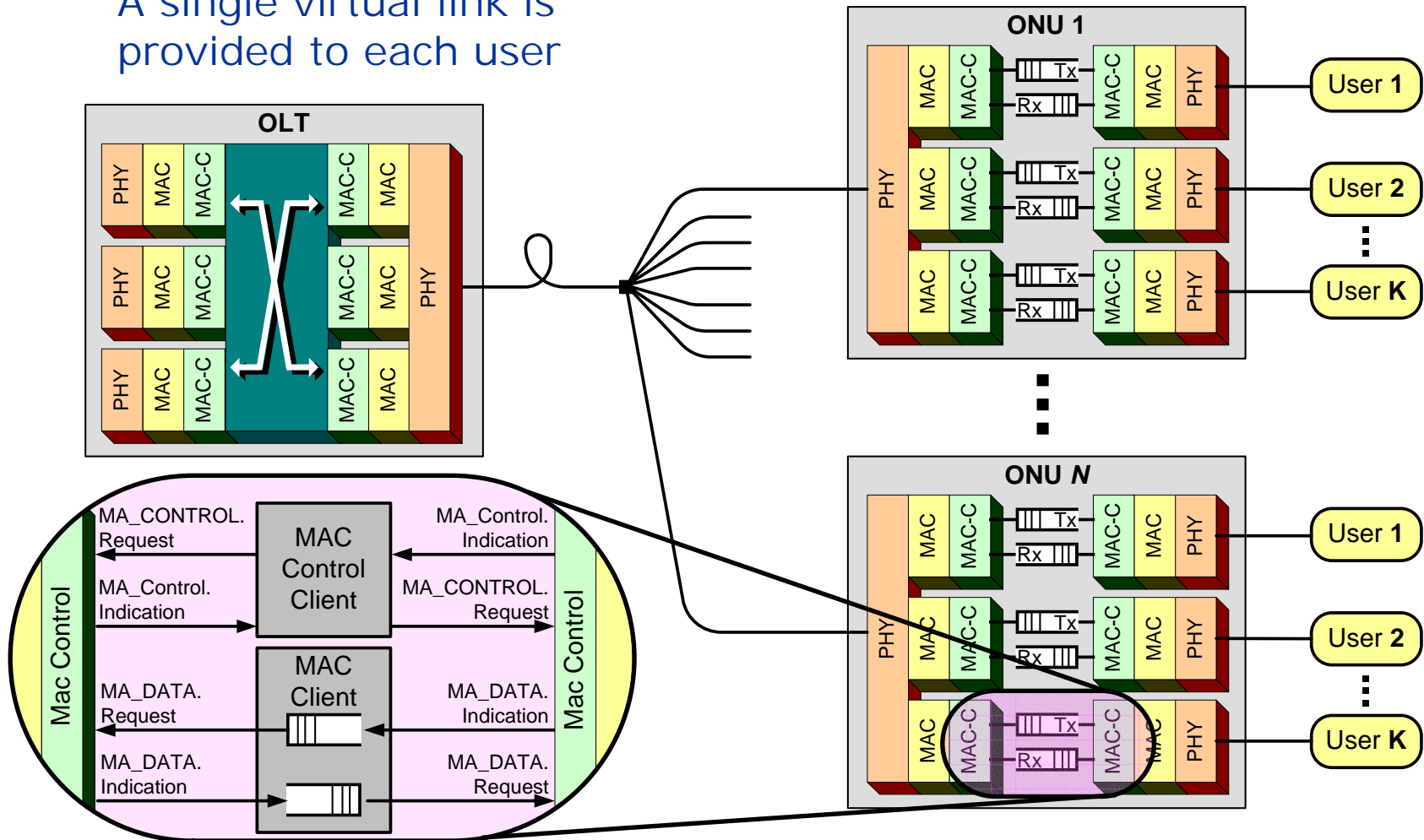
Single LLID/ONU



A single virtual link is provided to an ONU

Multiple LLIDs/ONU

A single virtual link is provided to each user



Problems with Single LLID/ONU

Single LLID/ONU model requires bridge/switch in the ONU

- Does it make ONU cheaper?
- How network operator may control/monitor traffic that is bridged between subscribers in the same ONU?

Performance monitoring

Example from <http://www1.worldcom.com/uunet/terms/sla/>:

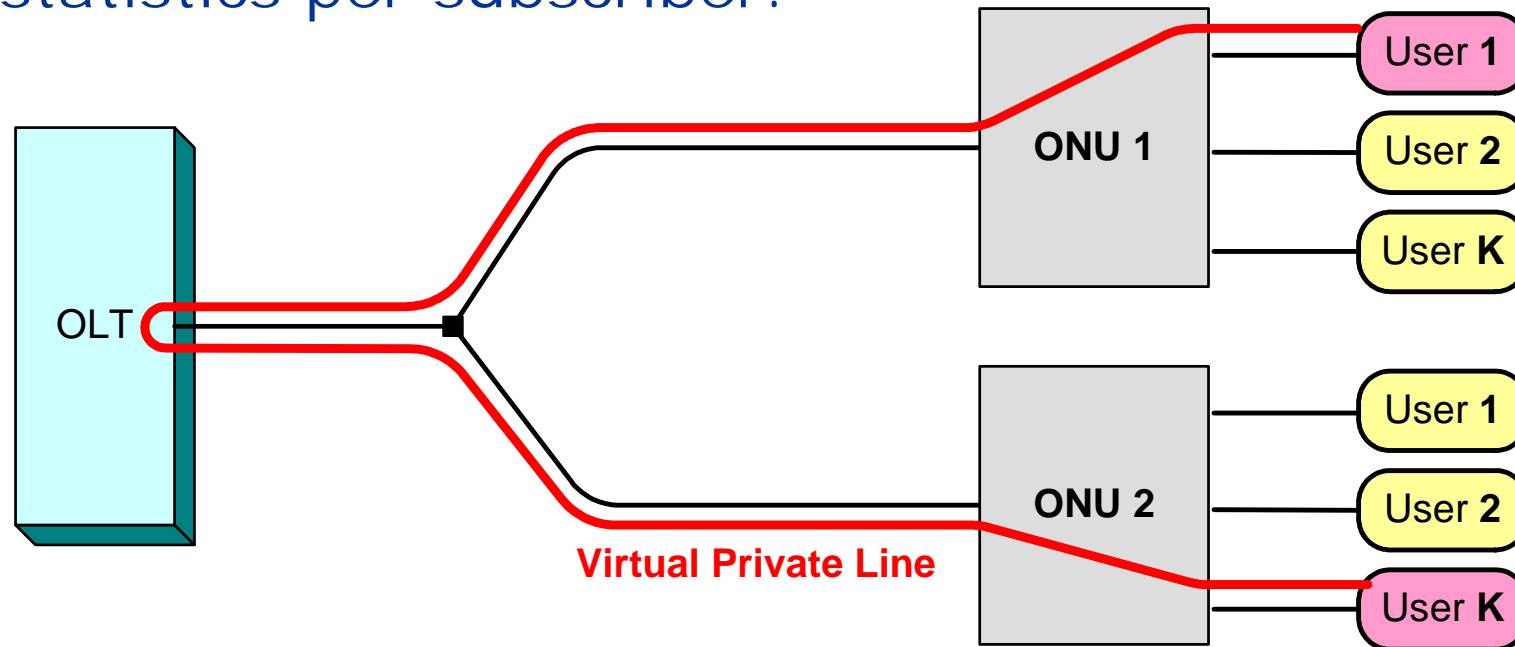
Network Packet Delivery Guarantee Remedy:

If UUNET fails to meet any Network Packet Delivery Guarantee in a calendar month, Customer's account shall be automatically credited for that month for the pro-rated charges for one day of the UUNET Monthly Fee for the service with respect to which a Network Packet Delivery Guarantee has not been met.

Traffic statistics must be maintained per subscriber. Traffic statistics is needed to be able to charge or credit individual customer's accounts

More Problems with Single LLID/ONU

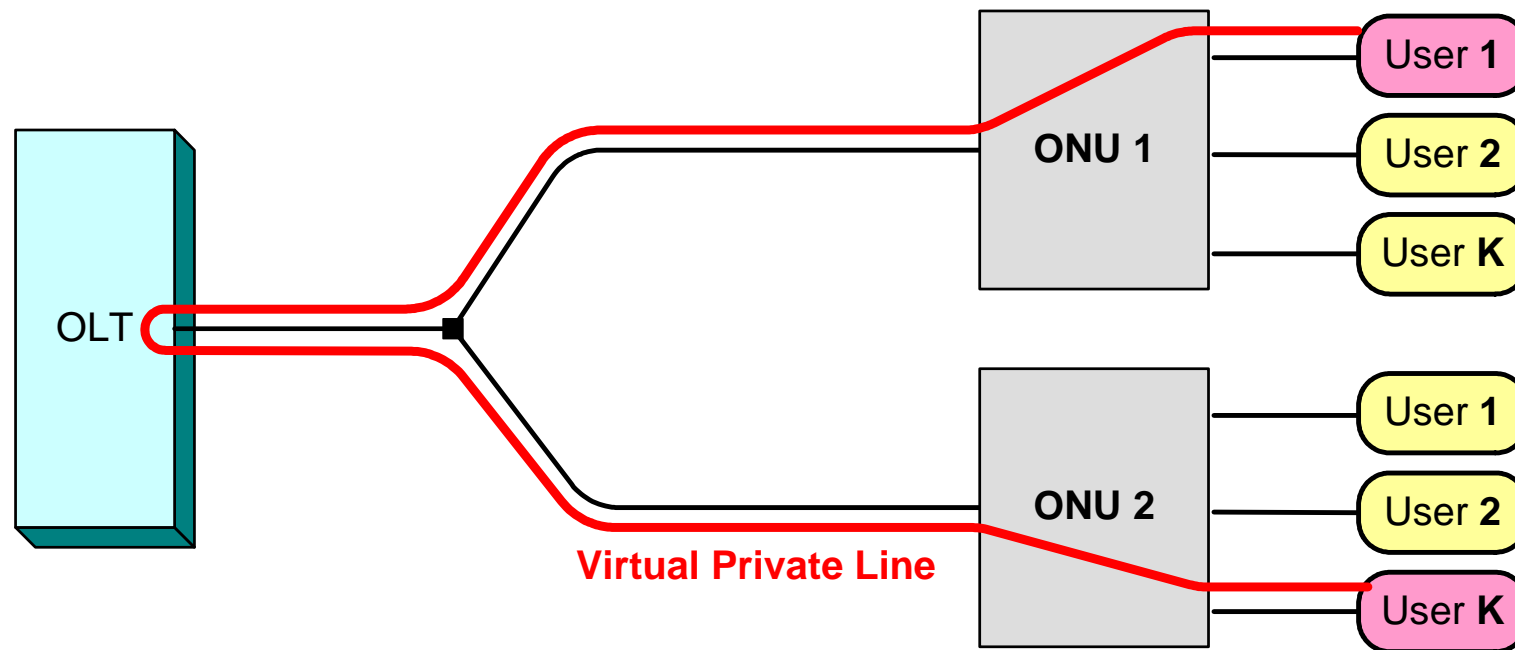
With single LLID/ONU the error counters are per ONU as well. There is no way to maintain statistics per subscriber.



How many frames in given VPL were corrupted?

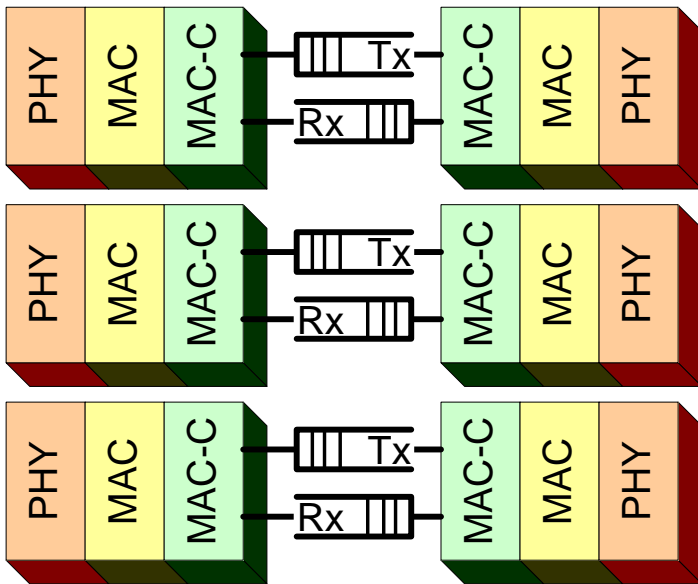
Use of VLANs in P2MP is problematic

VPL users must be able to use full range of VLAN tags. How is segregation done in this case? (VLAN stacking? – Blah)

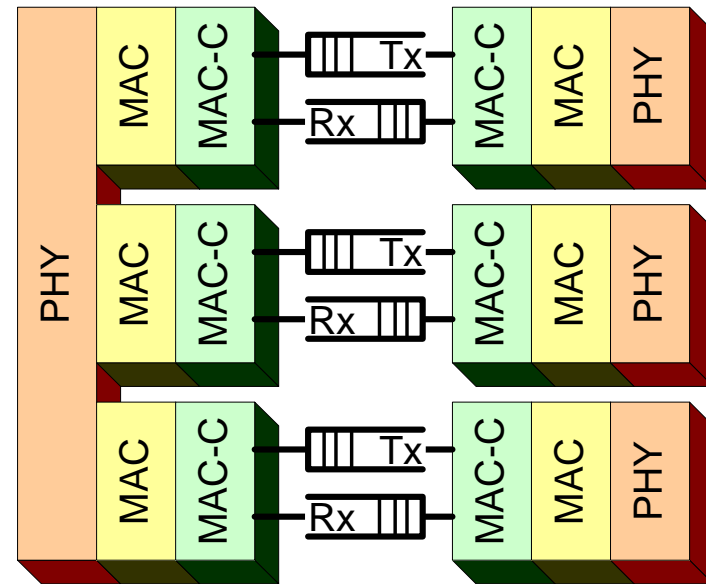


A case for multiple LLIDs/ONU

- The goal of having multiple LLIDs per ONU is to make multi-subscriber ONU behave as multiple single-subscriber ONUs (sharing a laser).



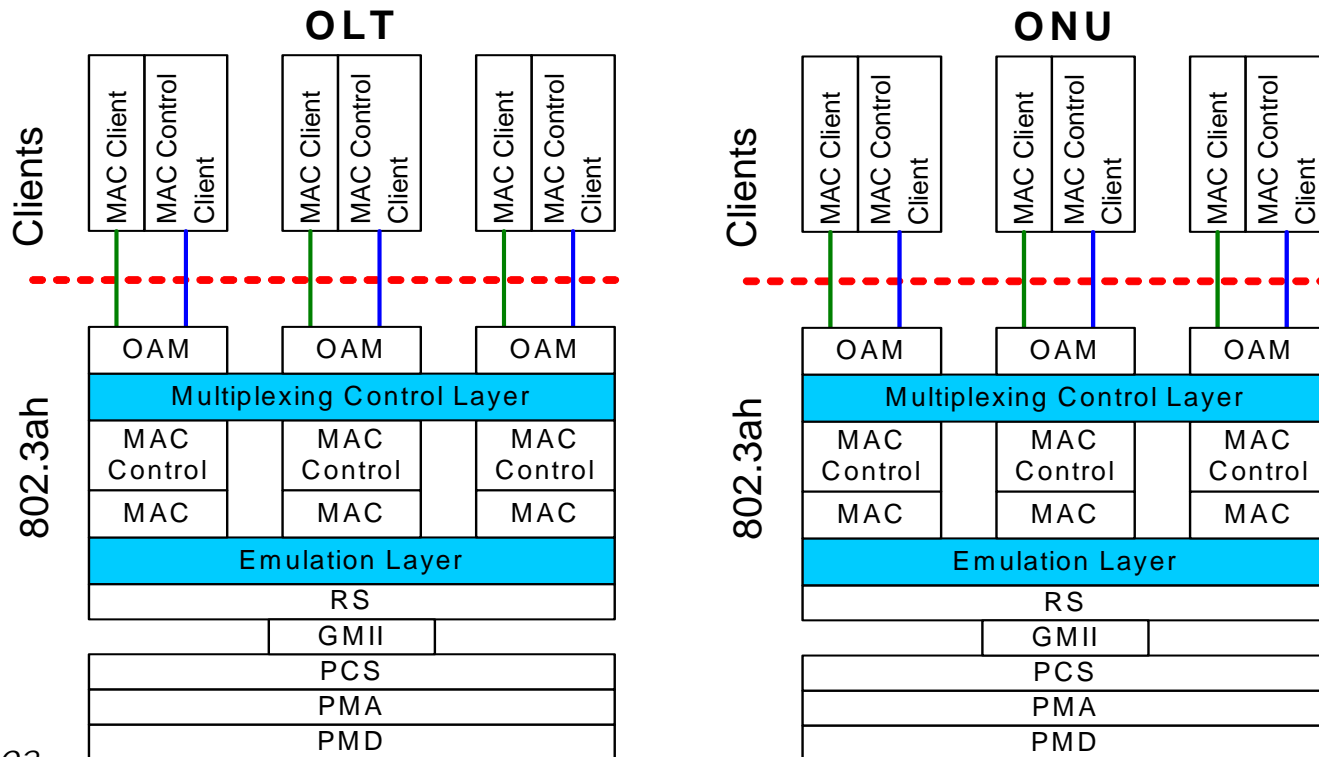
Multiple Single-Subscriber ONUs



Single Multi-Subscriber ONU

Multiple LLIDs/ONU is a simple solution

- Having multiple LLID/ONU does not complicate the layering diagram. On the contrary, it makes ONU and OLT layering identical.
- No reason for standard to allow multiple LLID in the OLT and not allow them in ONUs.



The standard should not mandate the number of LLIDs

- The 802.1D standard does not specify the number of ports in a bridge/switch.
- The 802.3 standard does not specify the number of links to use with Link Aggregation.
- Why should the standard specify the number of virtual links provisioned to an ONU?
- Allowing multiple LLIDs per ONU covers a special case of single LLID/ONU.