1904.2 Terminology

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Background

- For background discussion, see http://www.ieee1904.org/2/meeting_archive/2020/06/tf2_2006_kramer_1a.pdf

Proposal

- The Project title and internal sublayer do not have to use the same name.

- Project title:
  - **Standard for Control and Management of Virtual Links in Ethernet-based Subscriber Access Networks**

- In the body of the standard:
  - Virtual Link Control (VLC) Sublayer
  - Virtual Link Control Protocol (VLCP)
  - VLCPDU
  - VLC tunnel
  - Global replacement UMT ➔ VLC

Discussion on “Control and Management”

- Project title: **Standard for Control and Management of Virtual Links in Ethernet-based Subscriber Access Networks**
- The title now makes it clear that “*Control and Management*” refers to control and management of virtual links, and not the types of flows that are carried in the tunnels.
- “*Control*” part refers to all the manipulations that are performed on xPDUs to force them to enter or exit a tunnel within the Virtual Link Control (VLC) sublayer
  - VLC sublayer controls the data path. There exist several other sublayers that also control the data path, for example *MAC Control Sublayer* and *Logical Link Control (LLC) Sublayer*
- “*Management*” part refers to the methods and attributes used for managing virtual Links (reading statistics, provisioning and querying rules, etc.)
  - At the June meeting, there was a suggestion to add definitions of all the necessary management attributes to the 1904.2 draft, but to rely on existing protocols for attribute exchange (see slides 8-10 in http://www.ieee1904.org/2/meeting_archive/2020/06/tf2_2006_kramer_3a.pdf)
- “*Control and Management*” is used only in the project title. The body of the standard will use “VLC” everywhere and one clause would be called “Management”

“Link” vs. “Connection”

- IEEE 802 and 1904 use definitions from the OSI model (ISO 7498.1)
  - **Data Link Layer** provides node-to-node data transfer
  - **Data Link** is a physical connection between two directly-connected nodes.
  - **Data Connection** is build upon one or several links and provides the means of transferring data between network entities identified by data link addresses.
- The goal of 1904.2 is to make a connection appear as a (virtual) link, such that two network entities (or protocol end points) are tricked into believing that they have a direct physical link between them.
- ***Virtual Link*** is a more accurate term to use in title of 1904.2 standard, not connection.
- Tunnel or tunneling is simply a method we use to establish virtual links. Tunnel is not a goal, so no good reason to bring this term into the standard title.

“Virtual” vs. “Logical”

- ***Logical Links*** all use the same physical link, but isolate/segregate data to make it appear that there are separate links
  - For example, in EPON, multiple MACs in the OLT are linked to multiple MACs in ONUs using Logical Links, such that each pair of linked MACs is unaware of all the other such pairs, even though they all share the same physical link.
- ***Virtual Link*** makes an appearance of a link where no physical link exists.
  - Virtual link is the right term for 1904.2. The 1904.2 specifies how to build a virtual link between two nodes that do not have a direct physical connection.

“Virtual” vs. “Virtualized”

- Virtual – something that does not physically exists, but is made to appear so.
- “Virtualized” is something that underwent virtualization or is capable of creating/running a virtual instance of something.
  - For example, virtualization of the datacenter encompasses a massive change in how datacenters are designed, built, and operated (from SecurityWeek).
  - Virtualized data center ≠ virtual data center
- IEEE 1904.2 creates and controls virtual links, not virtualized links.

Conclusion

- "Virtual Link" is the most accurate term for what 1904.2 aims to accomplish
- The **purpose** of the 1904.2 project is to allow creation and operation of virtual links in subscriber access networks
- The **scope** of the 1904.2 project is to specify how to control and manage virtual links
  - Control – the behavior of the data path required to support virtual links
    - Receive and Transmit Processes (state diagrams)
    - Data classification and manipulation (CTE rules)
  - Management – methods used to create and destroy virtual links, as well as to perform diagnostics and to gather statistics.
    - Rule provisioning and deletion
    - Rule querying
    - Statistics attributes
- Proposed Project title:
  - **Standard for Control and Management of Virtual Links in Ethernet-based Subscriber Access Networks**

Thank You