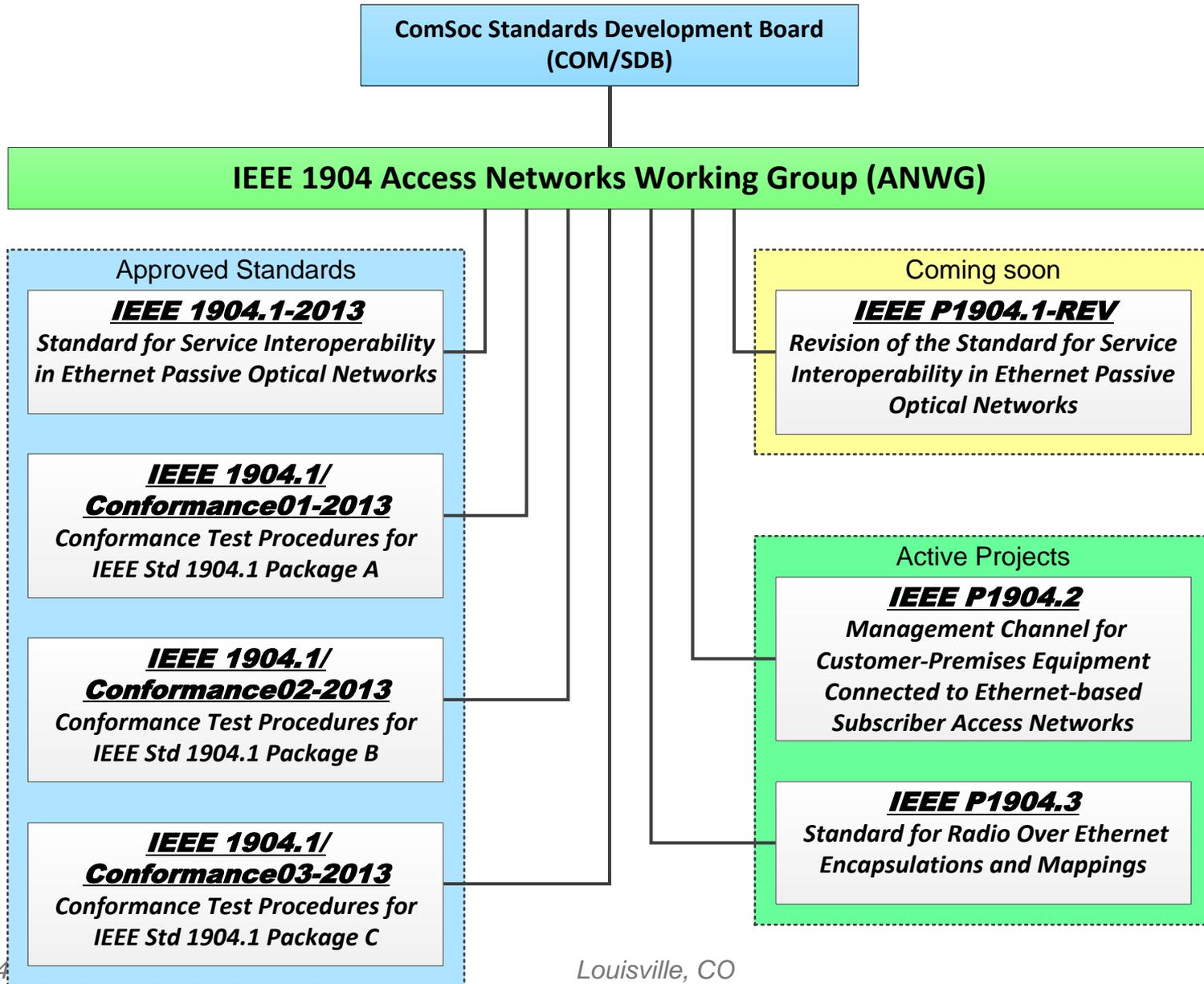




IEEE 1904 Access Networks Working Group

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ANWG Organization

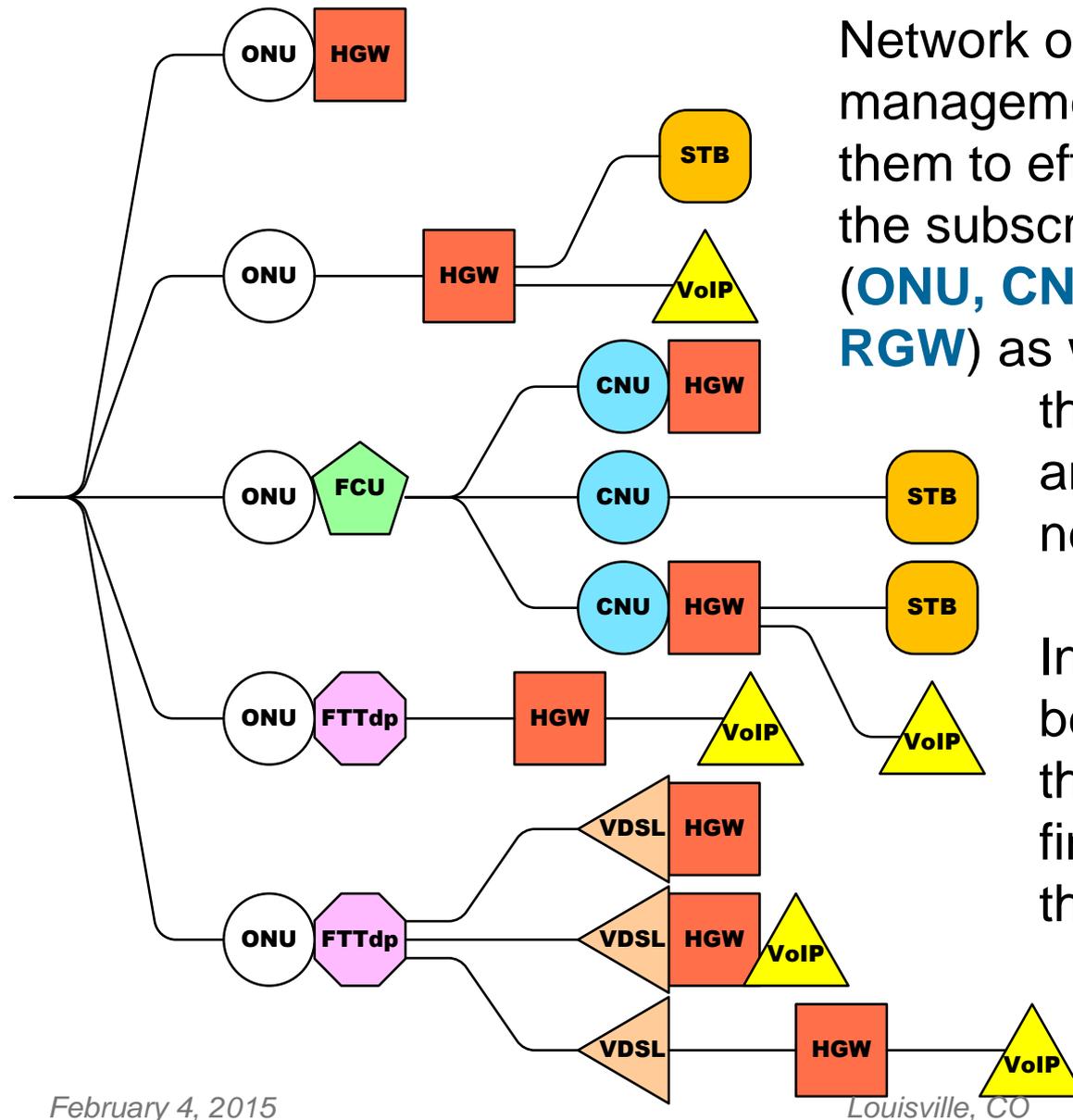




IEEE 1904.2

***Standard for Management Channel for
Customer-Premises Equipment Connected to
Ethernet-based Subscriber Access Networks***

PON-based Access Architectures

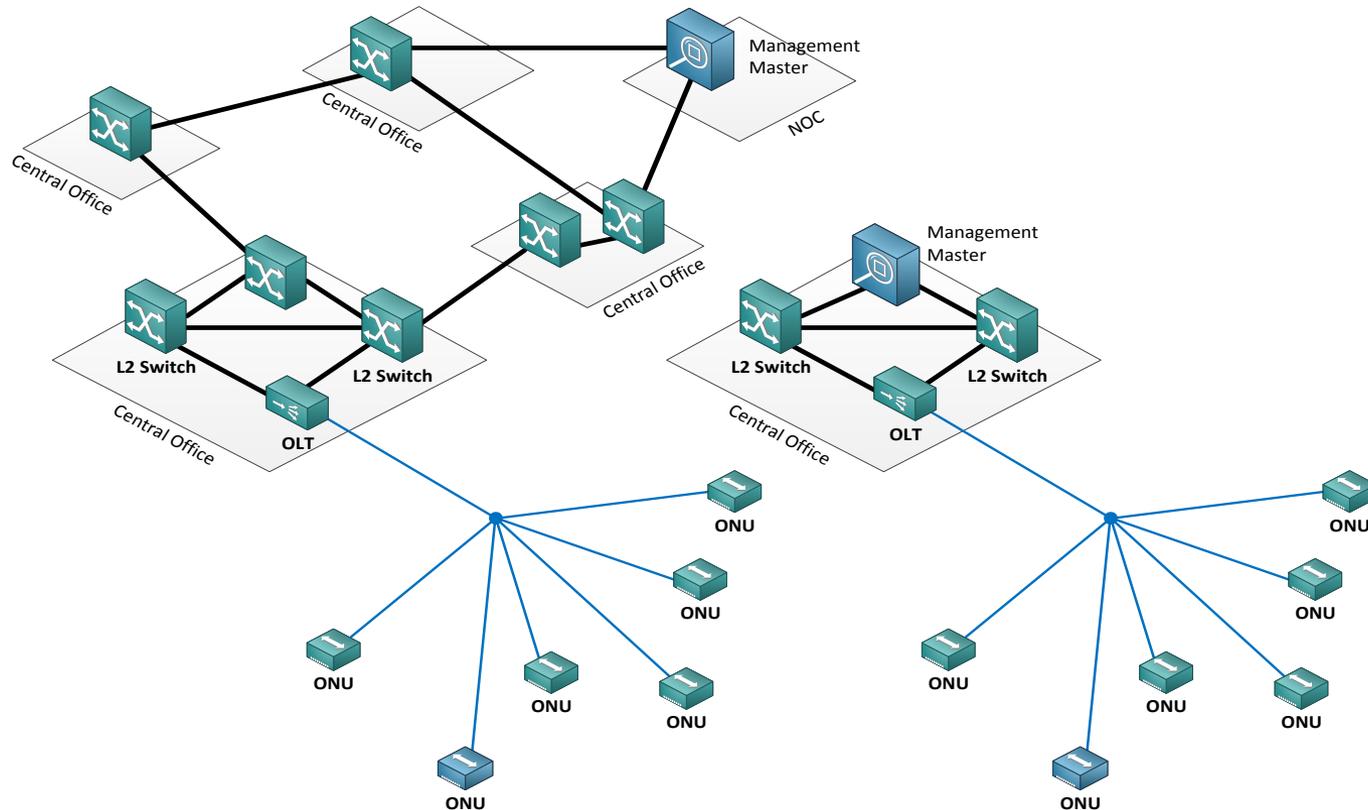


Network operators require a management system that would allow them to efficiently access and manage the subscriber demarcation device (**ONU, CNU, CM, DSL modem, or RGW**) as well as the various devices that interconnect their optical and copper sections of the network (**DPU or FCU**).

In addition, to achieve the best-possible service quality, the access network operators find it necessary to extend their management domains past the typical demarcation device.

NMS/NOC Consolidation

- There is a trend to consolidate management services within a CO, or even among multiple COs.



- Management traffic may need to traverse multiple hops to reach managed clients

1. Allow multiple L2 management channels (tunnels) reaching various levels of network hierarchy
 - Devices within CO (aggregation switches, OLT, CLT)
 - Devices in the access area (FCU, ONU/ONT, demark devices)
 - Operator-managed devices in customer premises (HGW, Firewalls, VOIP phones, STBs)

2. Allow L2-only devices to identify and exclude the management traffic from subscriber's SLA quotas

3. Impose minimal burden on the intermediate nodes
 - The solution shall not require specialized hardware or software to process management frames in the intermediate nodes.

Scope of 1904.2 Standard

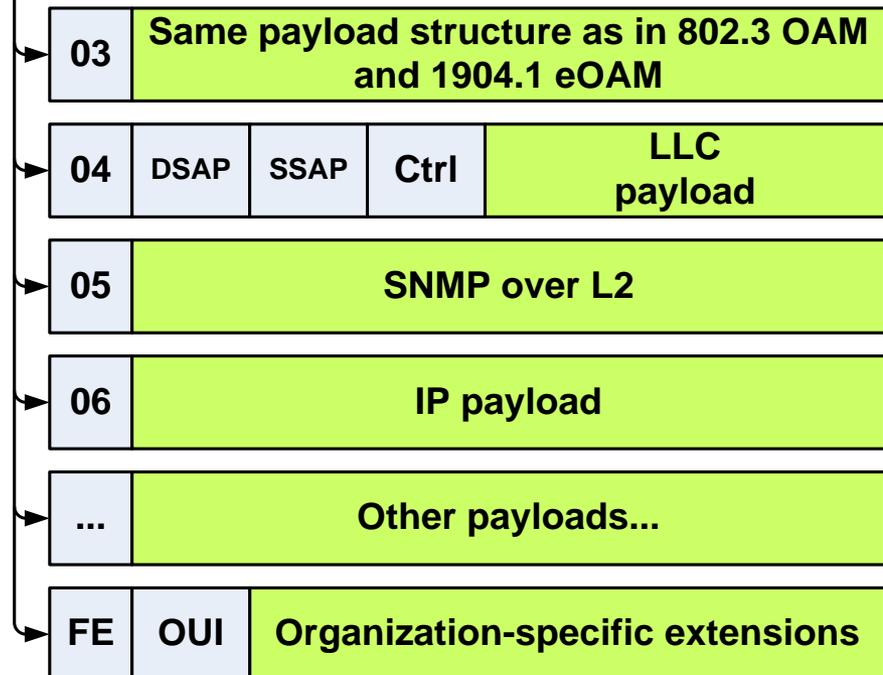


- ❑ This standard will describe a management channel for customer-premises equipment (CPE) connected to Ethernet-based subscriber access networks. The key characteristics of the specified management channel are:
 - Multi-hop capabilities to allow management of various CPE devices located behind an Optical Network Unit (ONU), a Coaxial Network Unit (CNU), a Residential Gateway (RGW), etc.
 - Extensibility to accommodate new management protocols and/or new types of CPE devices.
 - Broadcast/multicast capabilities to allow simultaneous (synchronized) configuration of multiple devices.
 - Encryption capabilities to ensure secure access to managed CPE devices by the network operators.
- ❑ The standard will describe the message format as well as processing operations and forwarding rules at the intermediate nodes.

Extension of Ethernet Payload Type



□ 1904.2 will define a new Ethertype and will allocate subtype codes to carry various higher-layer protocols





IEEE 1904.3

Standard for Radio Over Ethernet Encapsulations and Mappings

- ❑ Today's platforms cannot scale to meet the next generation cellular architecture requirements:
 - 10Gbps uplink per base station
 - 6+ sectors with channel bandwidths >200MHz per base station.
 - >100 antennas per sector

- ❑ A networked solution is required to enable:
 - Load balancing / resource pooling.
 - Cooperative-mode operation (multiple antenna systems, beam-steering)
 - Dynamic power management
 - Flexible mapping of the Radio over Ethernet (RoE) traffic between baseband unit (BBU) pools and remote radio unit

- ❑ The Radio over Ethernet (RoE) project will take advantage of the Ethernet's ubiquity, cost and power efficiency, and scalability to specify a scalable and streamlined solution that complements the existing CPRI radio transport specification based on fixed time division-multiplexing.

This standard will specify:

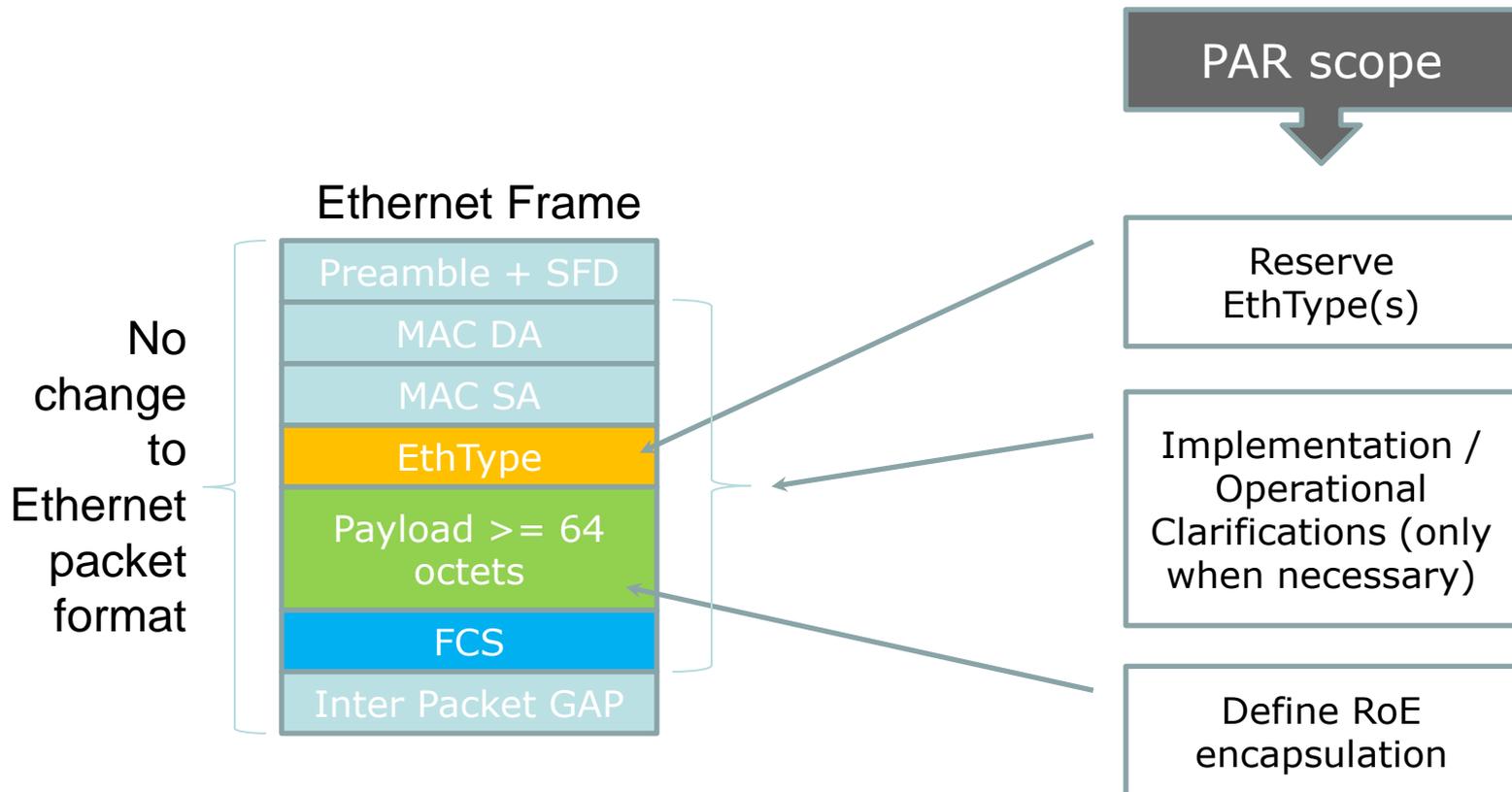
- ❑ The encapsulation of digitized radio In-phase Quadrature (IQ) payload, possible vendor-specific and control data channels/flows into an encapsulating Ethernet frame payload field.
- ❑ The header format for both structure-aware and structure-agnostic encapsulation of existing digitized radio transport formats.
 - The structure-aware encapsulation has detailed knowledge of the encapsulated digitized radio transport format content.
 - The structure-agnostic encapsulation is only a container for the encapsulated digitized radio transport frames.
- ❑ A structure-aware mapper for Common Public Radio Interface (CPRI) frames and payloads to/from Ethernet encapsulated frames. The structure-agnostic encapsulation is not restricted to CPRI.

What is not part of the PAR

- ❑ No changes to Ethernet Packet format
- ❑ No changes to MAC
- ❑ No normative queuing, timing and synchronization definitions. Only ensure that:
 - Desired RoE traffic fits into the available link capacity with the encapsulation overhead.
 - Desired RoE traffic (structure aware or agnostic flows) have a realistic chance to meet their respective timing requirements.

RoE encapsulation overview

Ethernet packet remains unchanged



❑ **1904 WG Website**

- URL: <http://www.ieee1904.org>
- All contributions are public

❑ **1904 WG Reflector**

- Used for general discussions/announcements
- Archive is public: http://www.ieee1904.org/wg_pub_archive.shtml
- Subscription instructions: http://www.ieee1904.org/wg_reflector.shtml

❑ **1904.2 TF Reflector**

- Used for Used for 1904.2 technical discussions
- Archive is public: <http://www.ieee1904.org/2/email/index.html>
- Subscription instructions: http://www.ieee1904.org/2/tf2_reflector.shtml

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Thank You