IEEE P1904.3 TF Radio over Ethernet update

Richard Maiden (IEEE1904.3TF Editor)

IEEE 802.1TSN @Budapest 2016

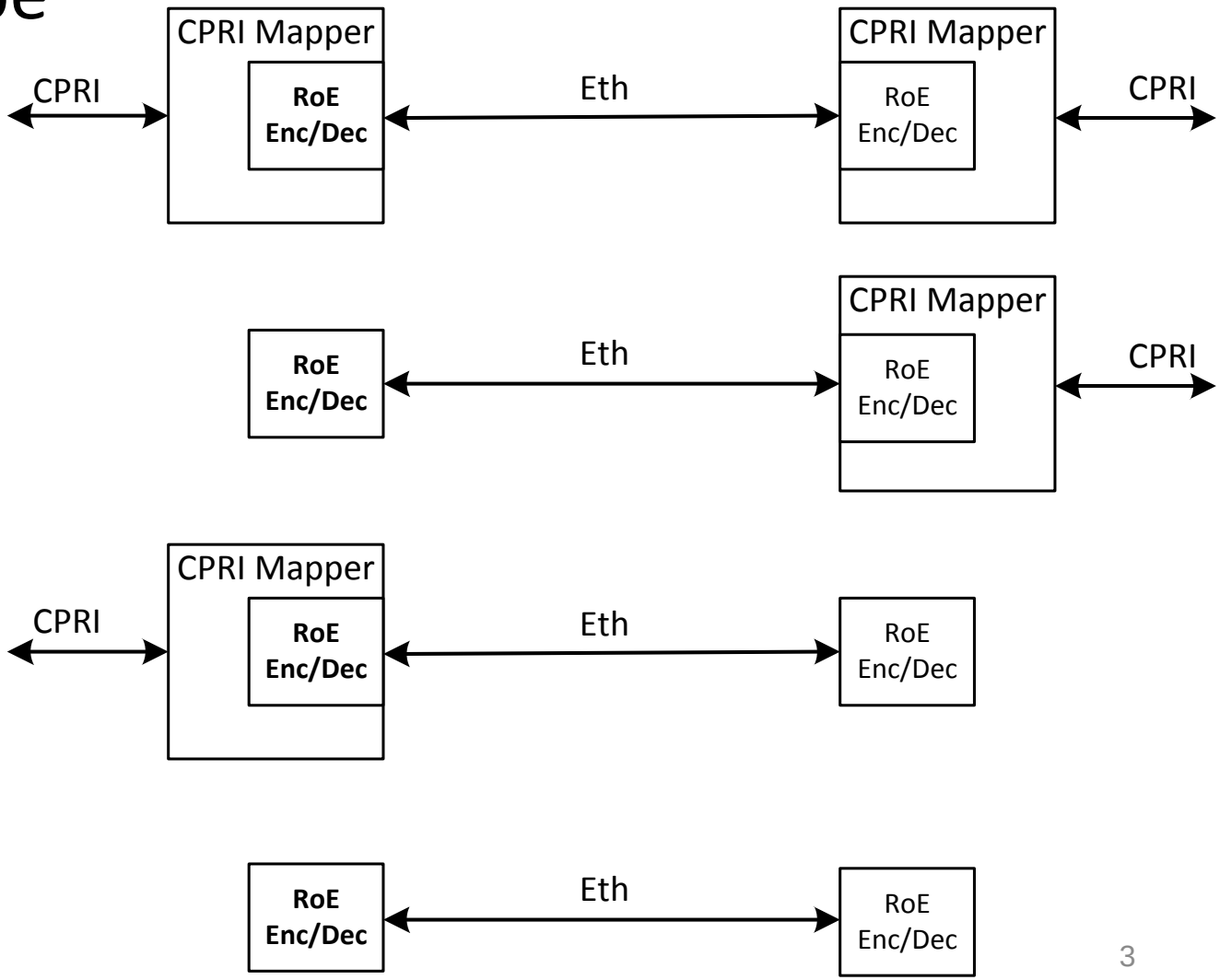
Disclaimer: This is not an official IEEE 1904 WG output; just an informal update what is happening regarding Radio over Ethernet in IEEE P1904.3

IEEE1904.3TF PAR

- Title: Standard for Radio Over Ethernet (RoE) Encapsulations and Mappings
- Working Group: IEEE1904 Access Networks
- Scope
  - **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.
- Last month, both IEEE1904 WG and IEEE1914 WG voted to merge IEEE1904.3TF into IEEE1914 WG (probably as IEEE1914.2TF)

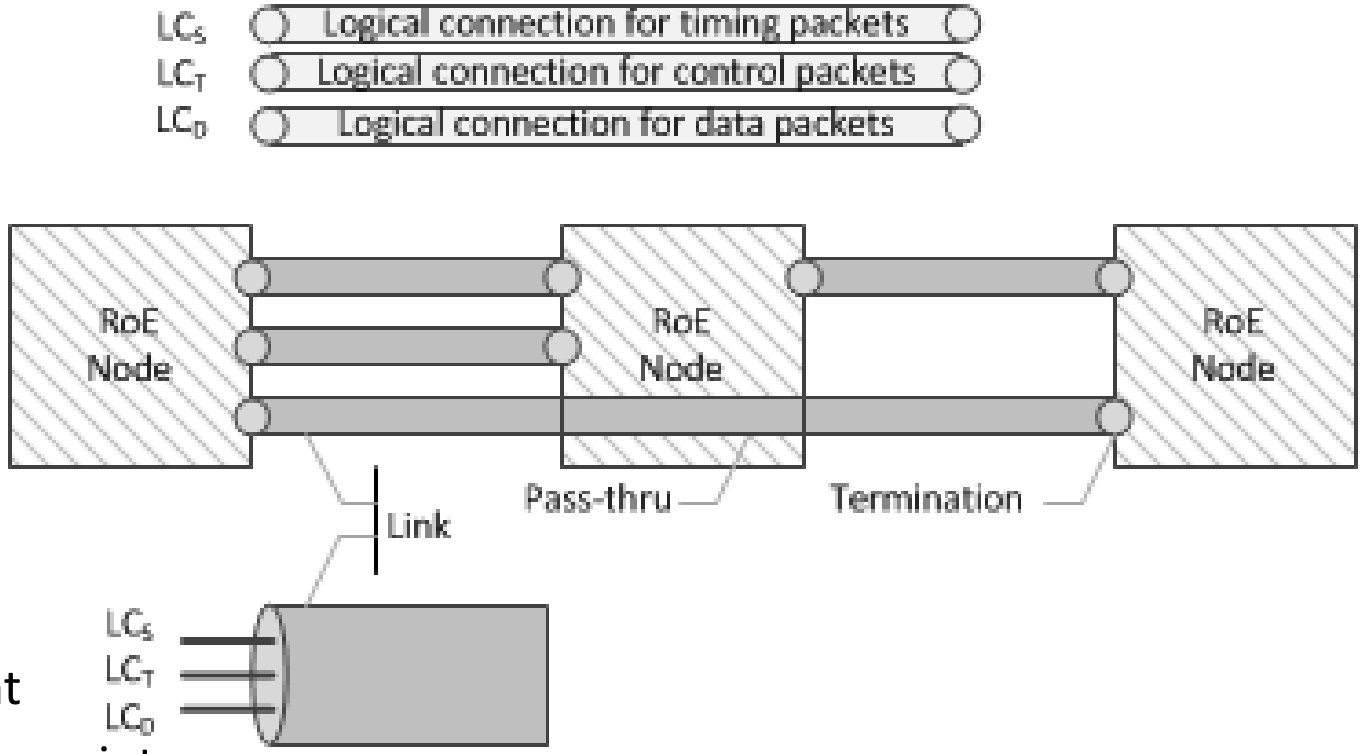
IEEE1904.3 Nodes

- Nodes can be
  - CPRI
  - RoE aware
  - Both

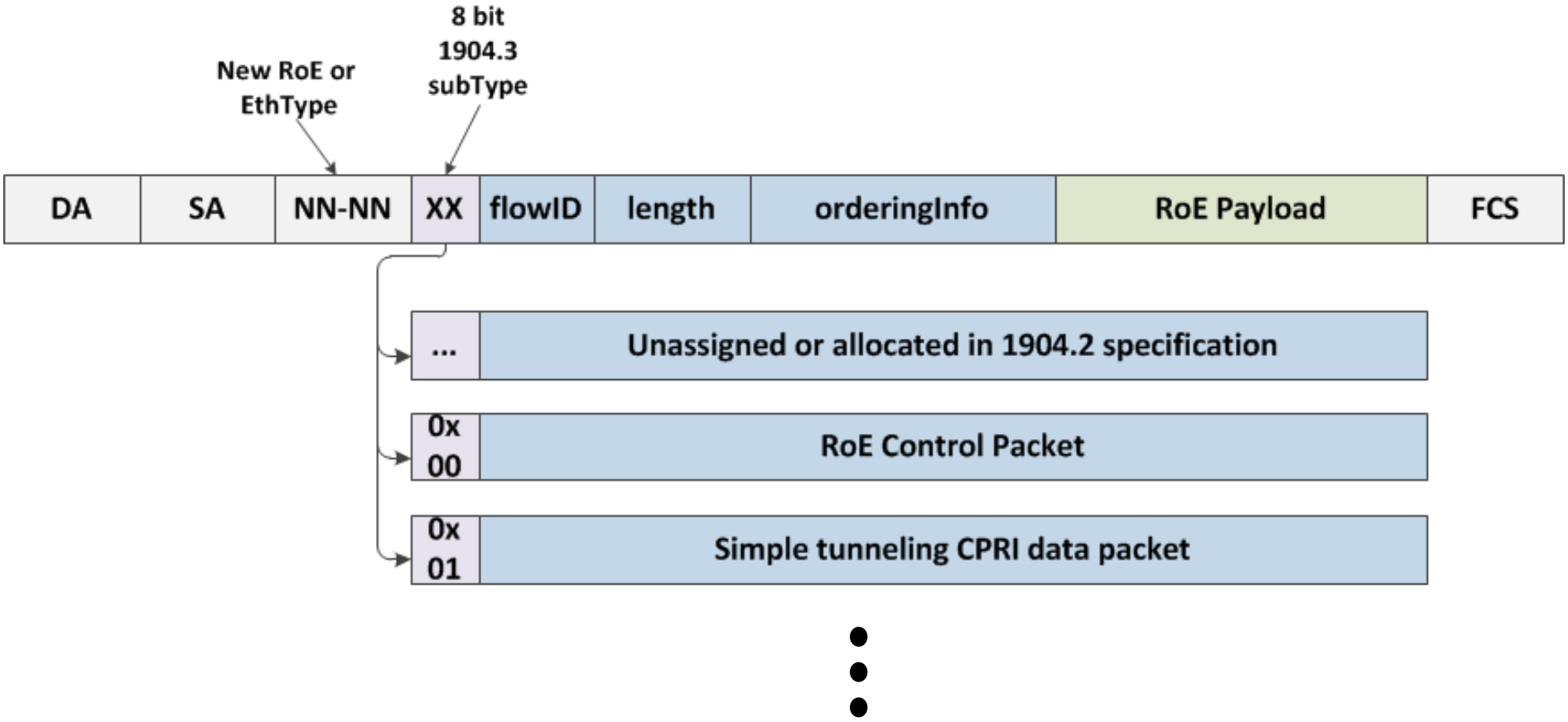


Connection information

- Packet types
  - Timing
  - Control
  - Data
- Node types
  - Pass-thru
  - Termination
- Topologies
  - Point to point
  - Multi-point to point
  - Chain
  - Ring
  - Star
  - Tree

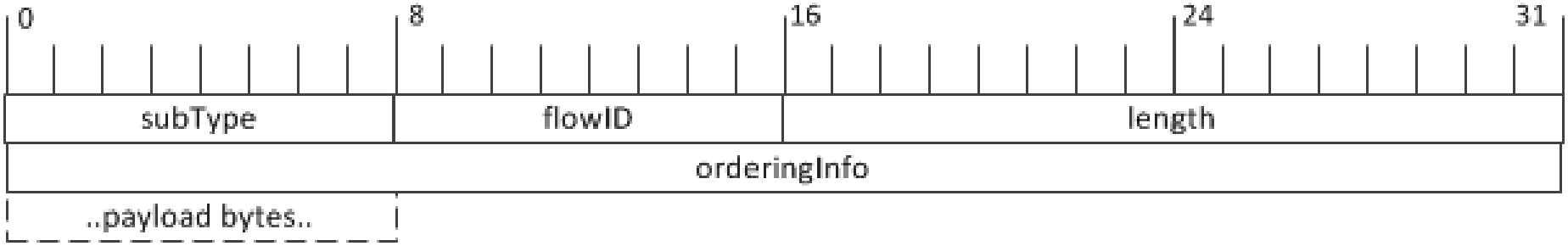


RoE Packet type



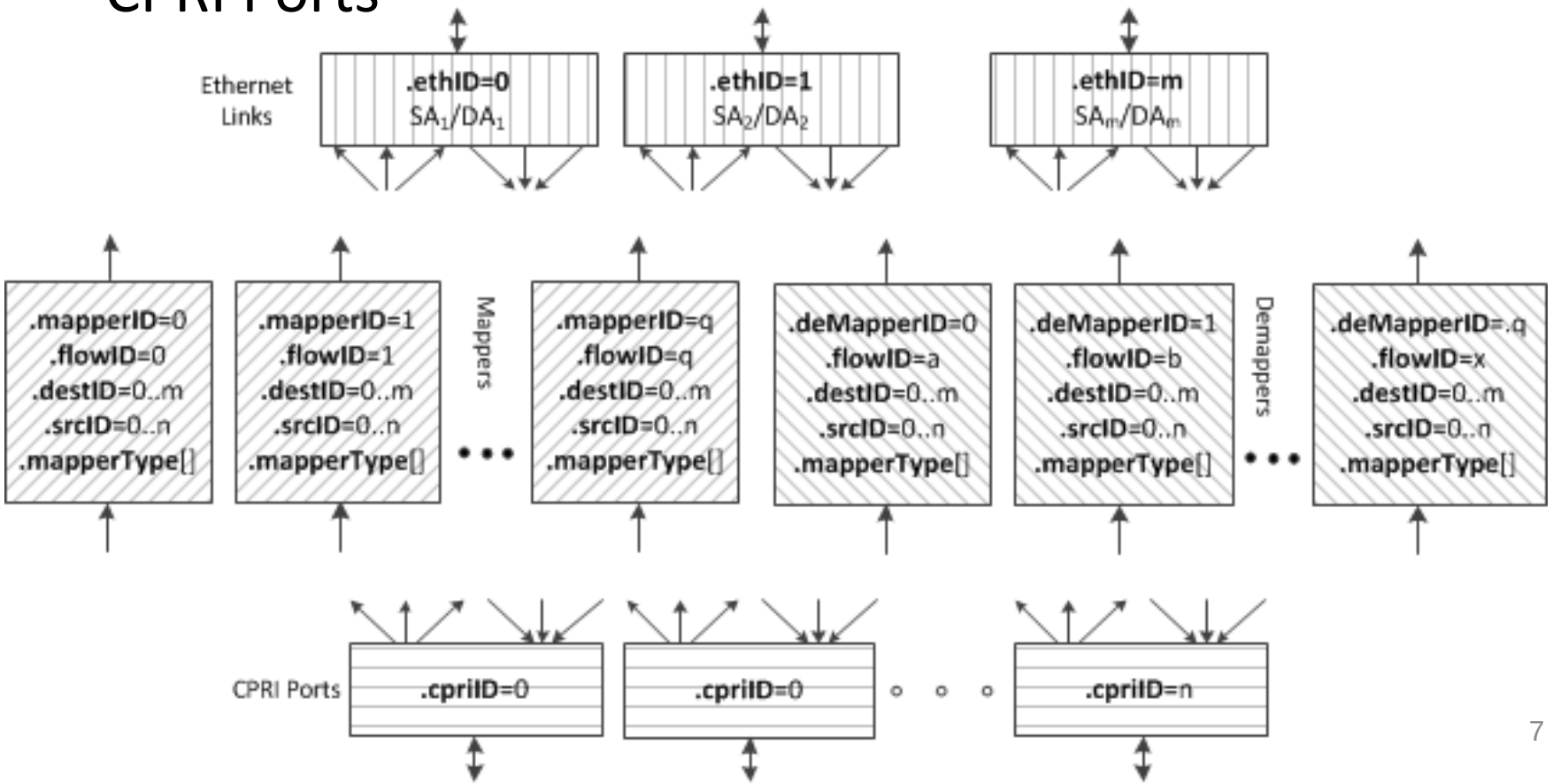
RoE Common header format

- subType – Packet type
  - Control, simple tunneling, structure agnostic, structure aware, native & slow C&M packet types are defined
- flowID – Flows allow SA/DA pairs to distinguish connections
- length – Payload size
- orderingInfo – Sequence number or timestamp
- Payload – The IQ data / control information



Hierarchy & Parameters

- Ethernet Links
- Flow (de)mappers
- CPRI Ports



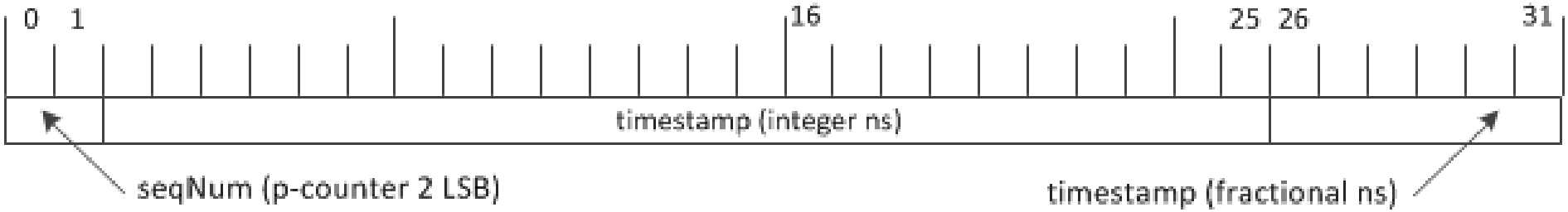
IEEE1904.3 Mappers

- Simple tunneling mapper
  - Allow for native CPRI to be tunneled over RoE
  - No information about CPRI content required
- Agnostic mapper
  - Strips off line coding (8b10b) only
  - Timing info used to transport frame structure
- Structure aware mapper
  - CPRI frames are dismantled and restructured as RoE packets based on information know apriori
- Native RoE (TBD)

orderingInfo

- Sequence number
  - Variable bit width p and q counters

- Timestamp
  - Integer ns (up to 16ms)
  - Fractional ns (down to 1/32ns)
  - Sequence number (to detect missed packets)



Status

- Header format and basic packet formats are stable.
- orderingInfo baseline finalized
  - Bit shifts may be coming to timestamp
- Parameter encapsulation (control packets) required
- D1.0 Due this week
  - http://www.ieee1904.org/private/3/drafts/tf3_drafts.shtml