

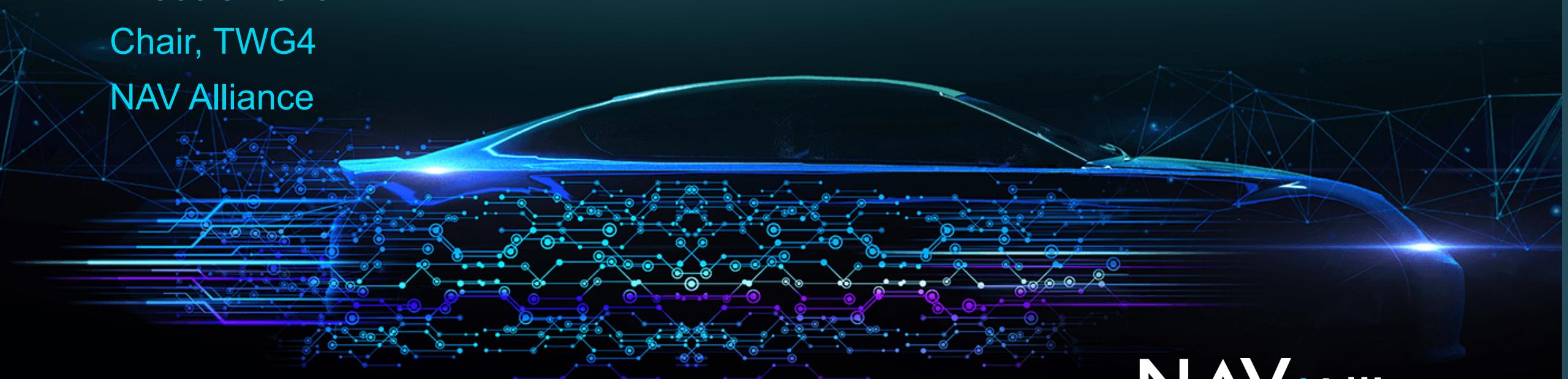
# TWG4 Protocol Encapsulation for Ethernet WG presentation to IEEE 1722 WG

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NAV Alliance



**NAV**:Alliance™  
Networking for Autonomous Vehicles

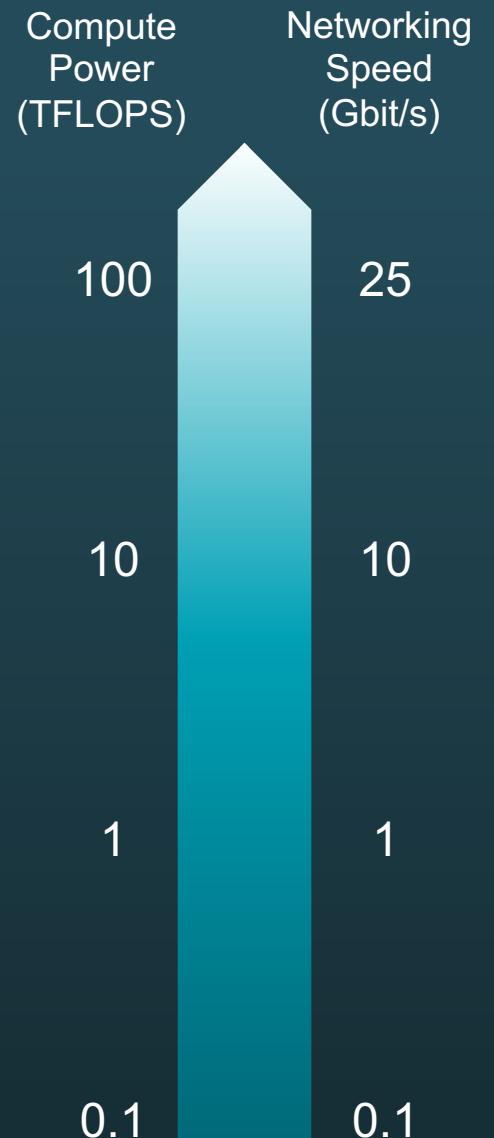
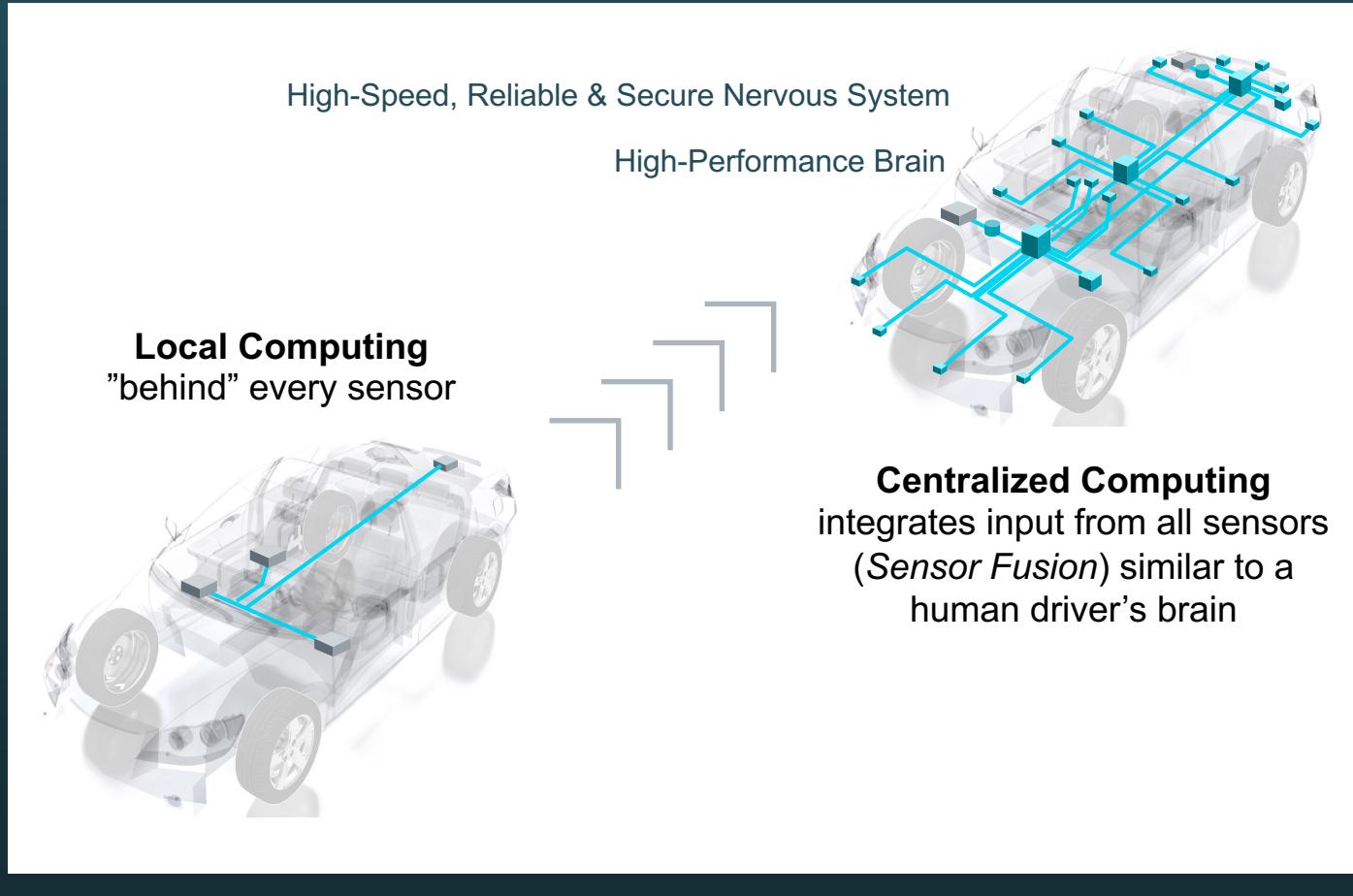
# Agenda

- Introduction
  - NAV Alliance
  - TWG4
- Encapsulation Proposal
- Request to IEEE 1722 WG
- Next steps

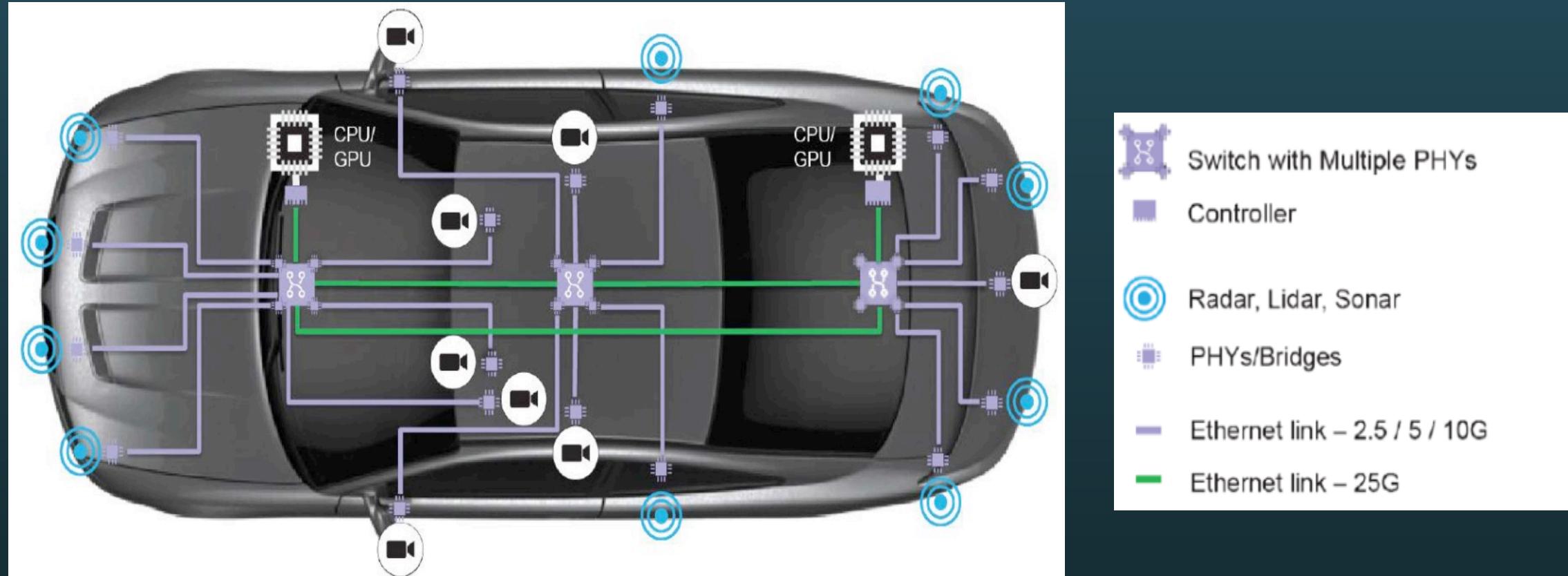
# Introduction

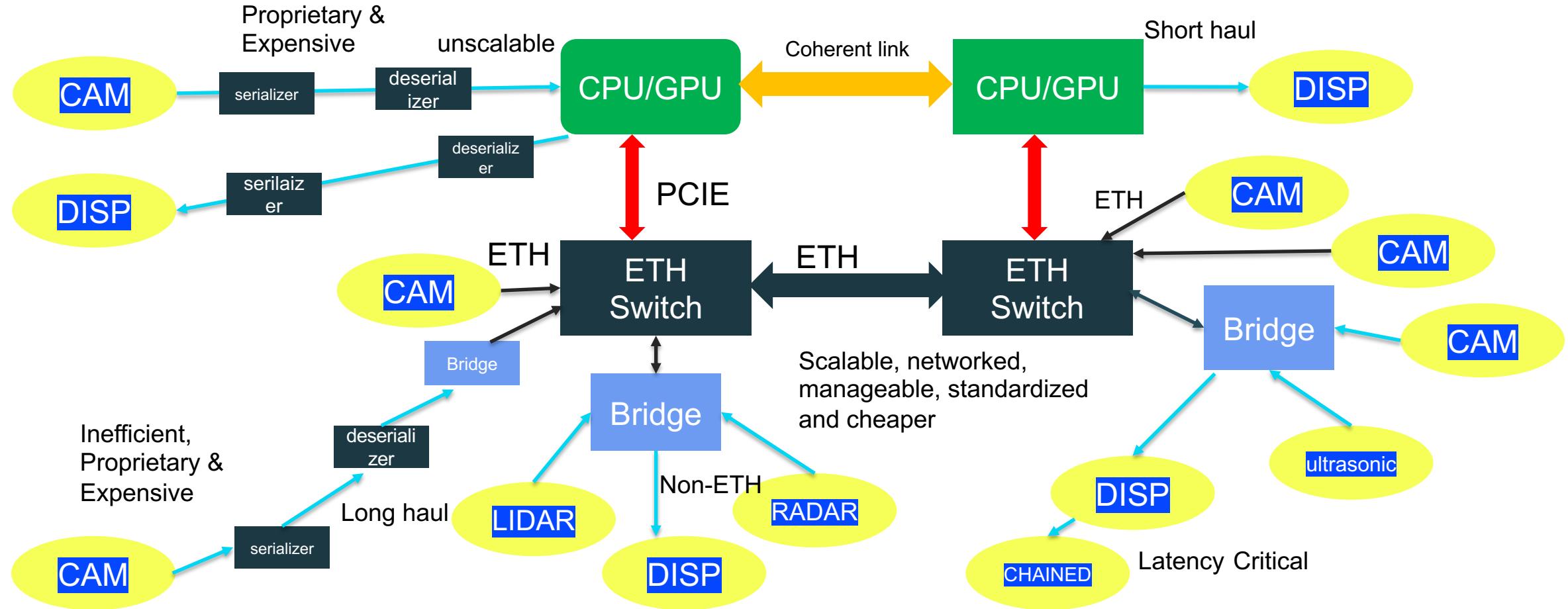
- Networking for Autonomous Vehicles Alliance was announced in July of 2018 with a goal to standardize networking interfaces (and components) within an Autonomous system
- Founding Members: Volkswagen, Continental, Bosch, Nvidia and Aquantia (now Marvell)
- NAV currently has the following 5 WGs:
  - TWG1: 25G and 50G Automotive Ethernet PHY
  - TWG2: EMC requirements and limits (on hold)
  - TWG3: Physical layer system and component integration
  - TWG4: Protocol Encapsulation over Ethernet
  - TWG5: System Controls and Management
- RAND IPR policy (similar to IEEE)
  - Open to making the encapsulation spec (to be published by TWG4) public for a ‘reasonable’ fee.
- More info can be found here: <https://nav-alliance.org/>

# The Path Towards Full Autonomy



# Use case – Top View





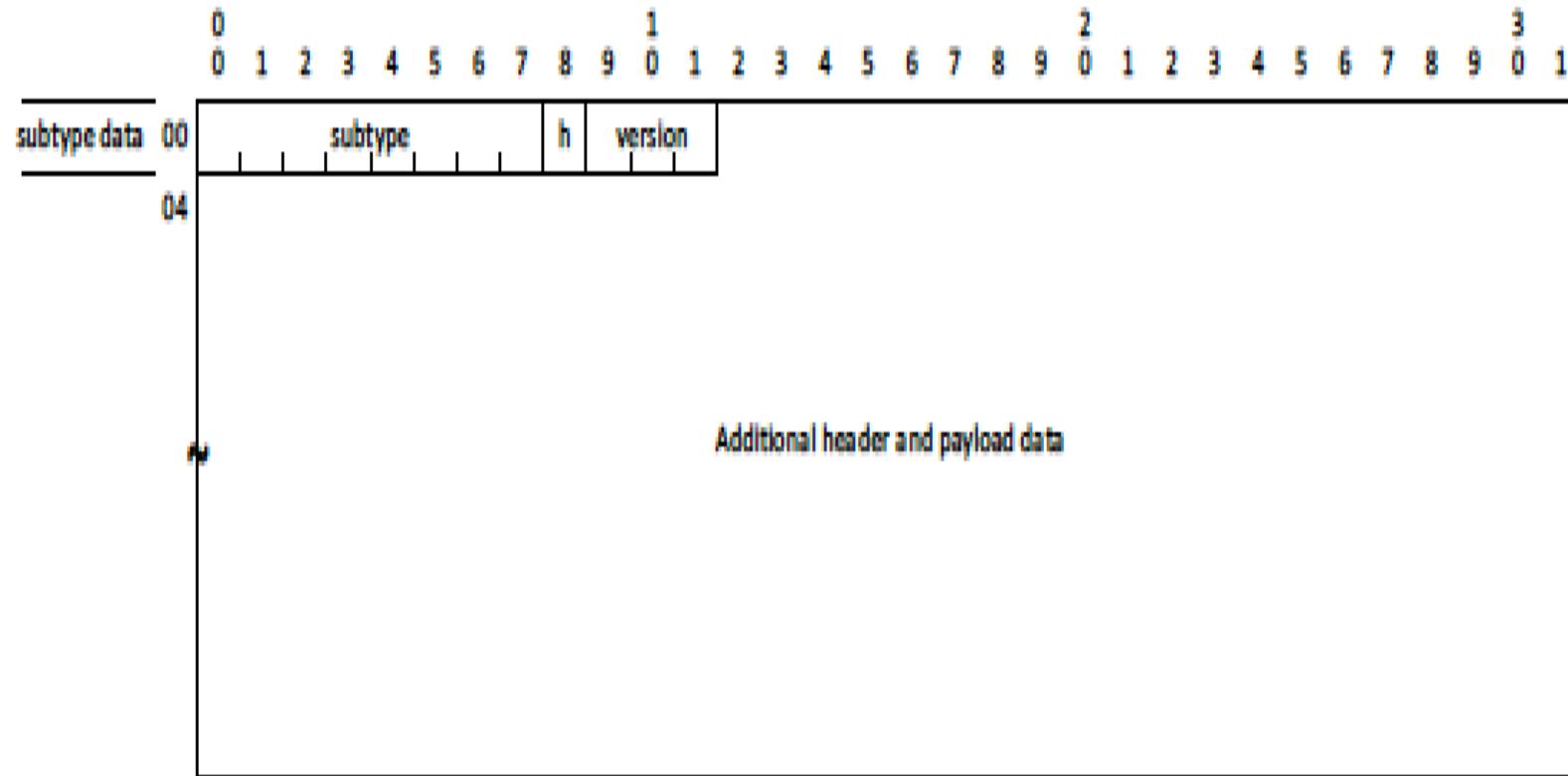
# Why Standardize?

- Bridges/Switches are already encapsulating cross-domain traffic today
- Proprietary methods leading to non-standard encapsulation
- Proprietary HW, SW and debug methods make system integration difficult
- Encapsulation in a generic manner means more complex HW and SW
  - Identifying and differentiating the encapsulated protocol allows for efficient HW offloads

TWG4 does not intend to define a transport protocol using the 1722 subtype. The idea is to standardize encapsulation of the existing ‘protocols’ in/out of the Ethernet domains using the existing transport mechanisms.

We are unaware of any standards body doing this work at this time.

# 1722 Common Header Format



# Evaluating two possible options using the common header format

Preamble /SFD	MAC DA	MAC SA	802.1Q (optional)	1722 Ethertype	1722 NAV subtype	h/ver	NAV header	NAV Payload	CRC
8B	6	6	4	2	1	0.5	?	variable	4

1722 Payload

Preamble /SFD	MAC DA	MAC SA	802.1Q (optional)	1722 Ethertype	1722 NAV subtype	h/ver	NAV type	NAV Payload	CRC
8B	6	6	4	2	1	0.5	?	variable	4

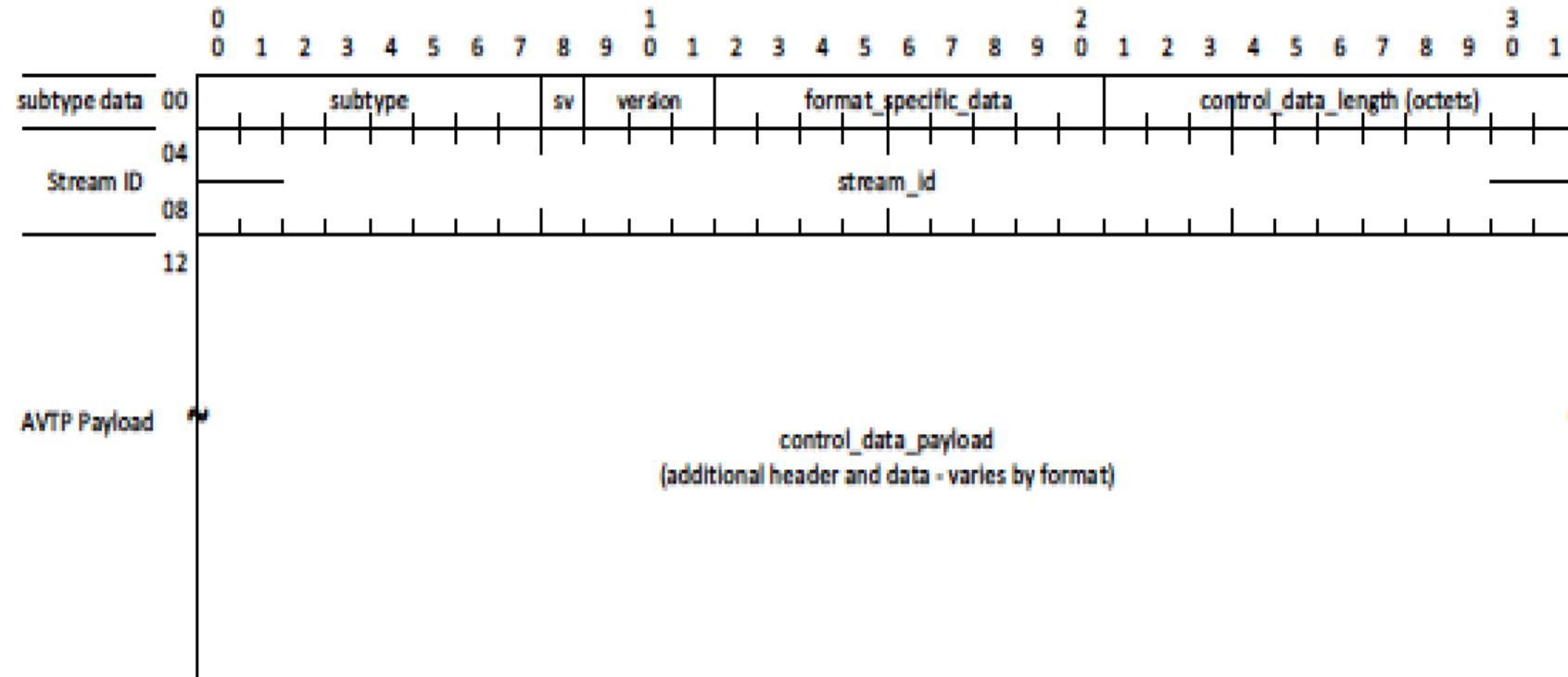
# Request to the IEEE 1722 WG

- NAV requests assignment of a 1722 subtype to TWG4 for the protocol encapsulation over Ethernet work

Thank you

backup

# 1722 Control Header Format



# 1722 Streaming Header Format

