Eclipse SDV Community Meetup – South Korea

Korea Ministry SDV Standardization Initiative

2025-12-04

Pusik Park / Mobility Platform Research Center

KETI Korea Electronics Technology Institute

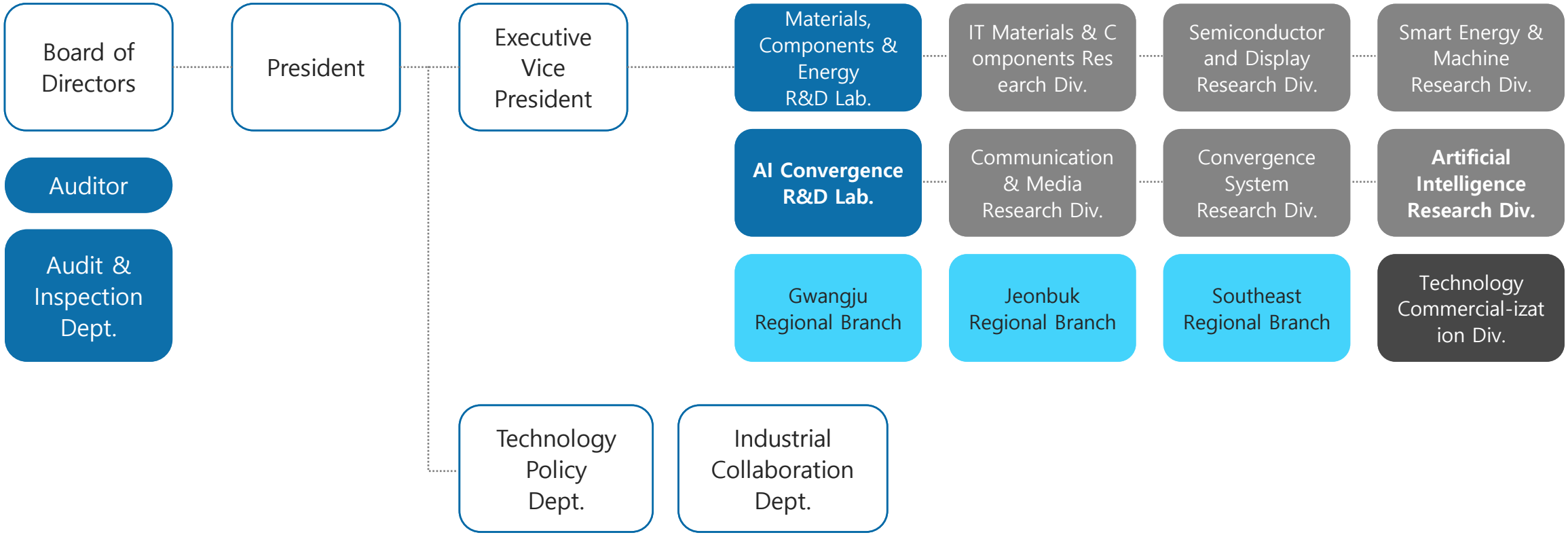
Agenda

- KETI Introduction
- Achievements and Future Consideration
- Korea SDV Standardization Landscape
- Closing

KETI Introduction

Substantial growth and boundary-breaking convergence

- Established in 1991
- Budget: KRW 372.6 billion (as of 2025)
- Organization: 2 research institutes, 6 research divisions, 3 regional divisions, and 3 administrative divisions
- Personnel: 1,372 employees in total, as of 2025



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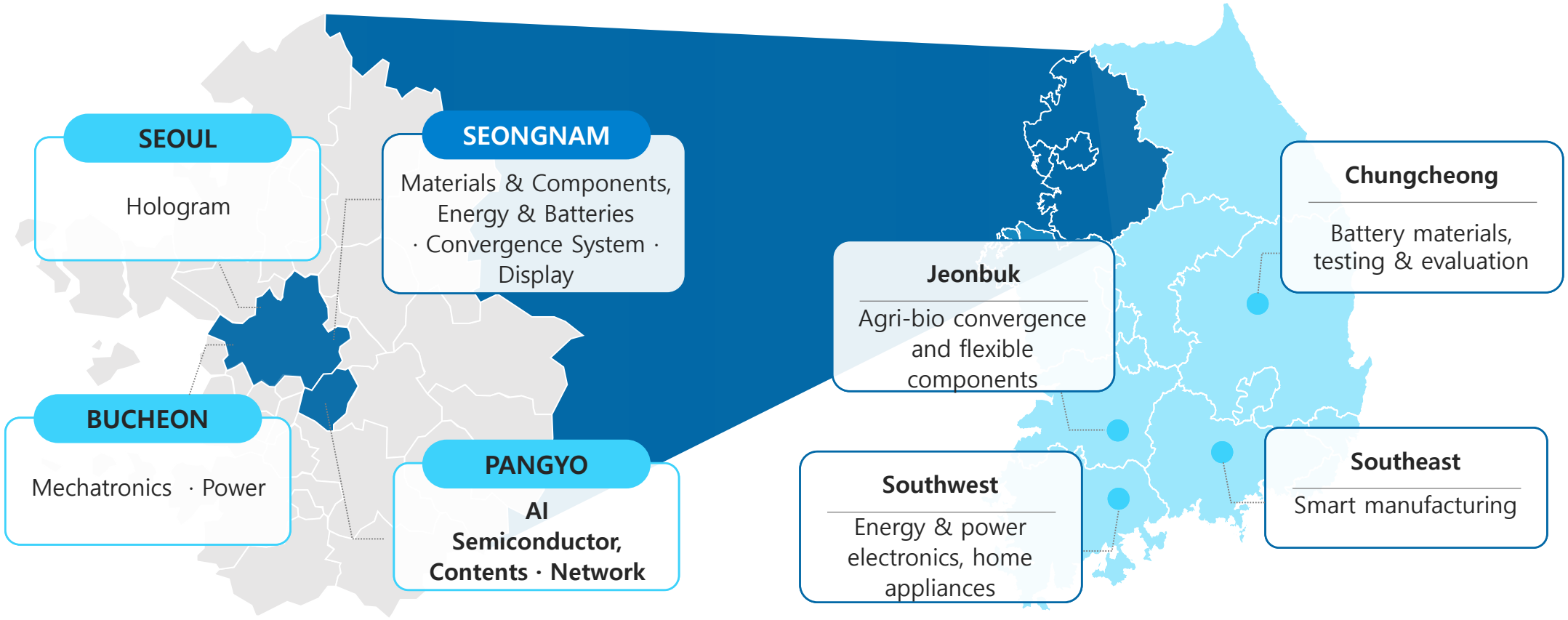


KETI Enabling Tech

METAVERSE | AI LIFECARE | FULL AUTOMATION | INDUSTRY 5.0 | NET-ZERO

KETI 주요뉴스 +

- [연구원 관련기사] 11월 05일(수) , KETI, … 2025-11-06
- "홀로그램이 되살린 독립의 현장" KETI-… 2025-11-05
- [연구원 관련기사] 10월 14일(화) , '메모… 2025-10-15
- [연구원 관련기사] 10월 14일(화) , KETI, '… 2025-10-15

공지사항 〉

채용공고 〉

전자입찰 〉

OCEAN
개방형IoT 오픈소스 연합체

브로셔 | 홍보동영상 | 페이스북

기업협력 플랫폼 바로가기

공동기술개발

KETI 기술이전

장비활용지원

교육지원

연구자카드

미세먼지 간이측정기 성능인증 바로가기 〉

KETI 한국전자기술연구원
Korea Electronics Technology Institute
주소 : (13509) 경기도 성남시 분당구 새나리로 25 (야탑동) KETI 한국전자기술연구원 대표전화 : 031-789-7000

Our Technical Achievements and Future Consideration

MOST

ARINC664 (AFDX™)

Automotive TSN

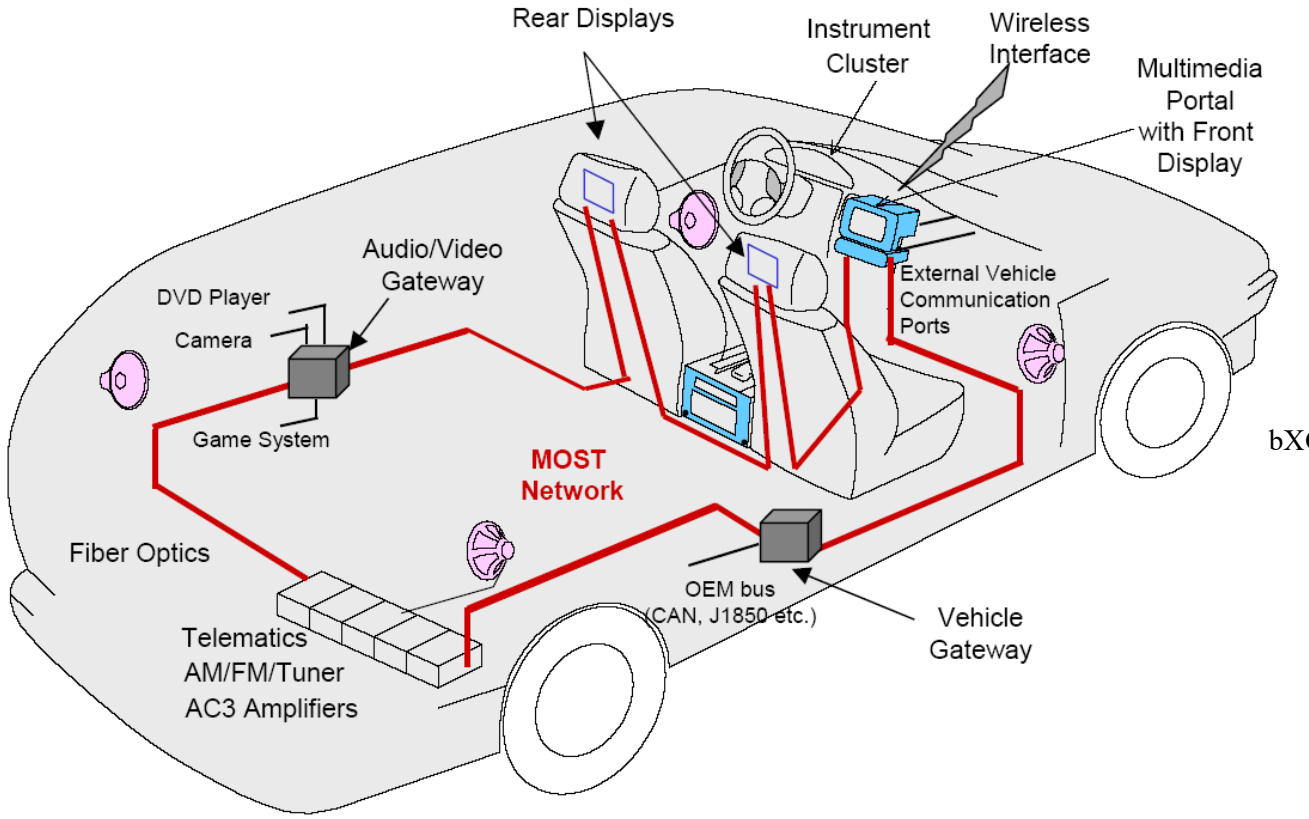
Mixed-Criticality

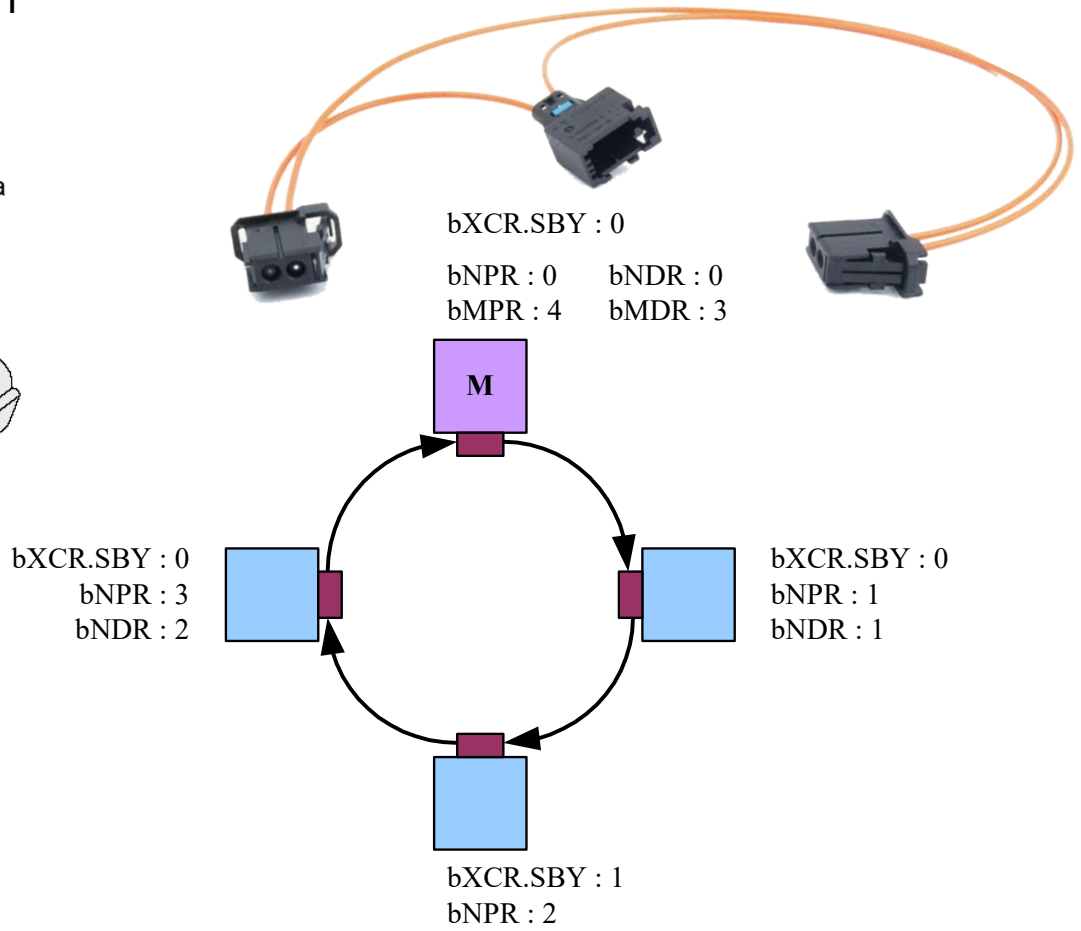
Eclipse SDV Community Meetup – South Korea
04 Dec. 2025, Seoul, Korea

MOST (Media Oriented Systems Transport)

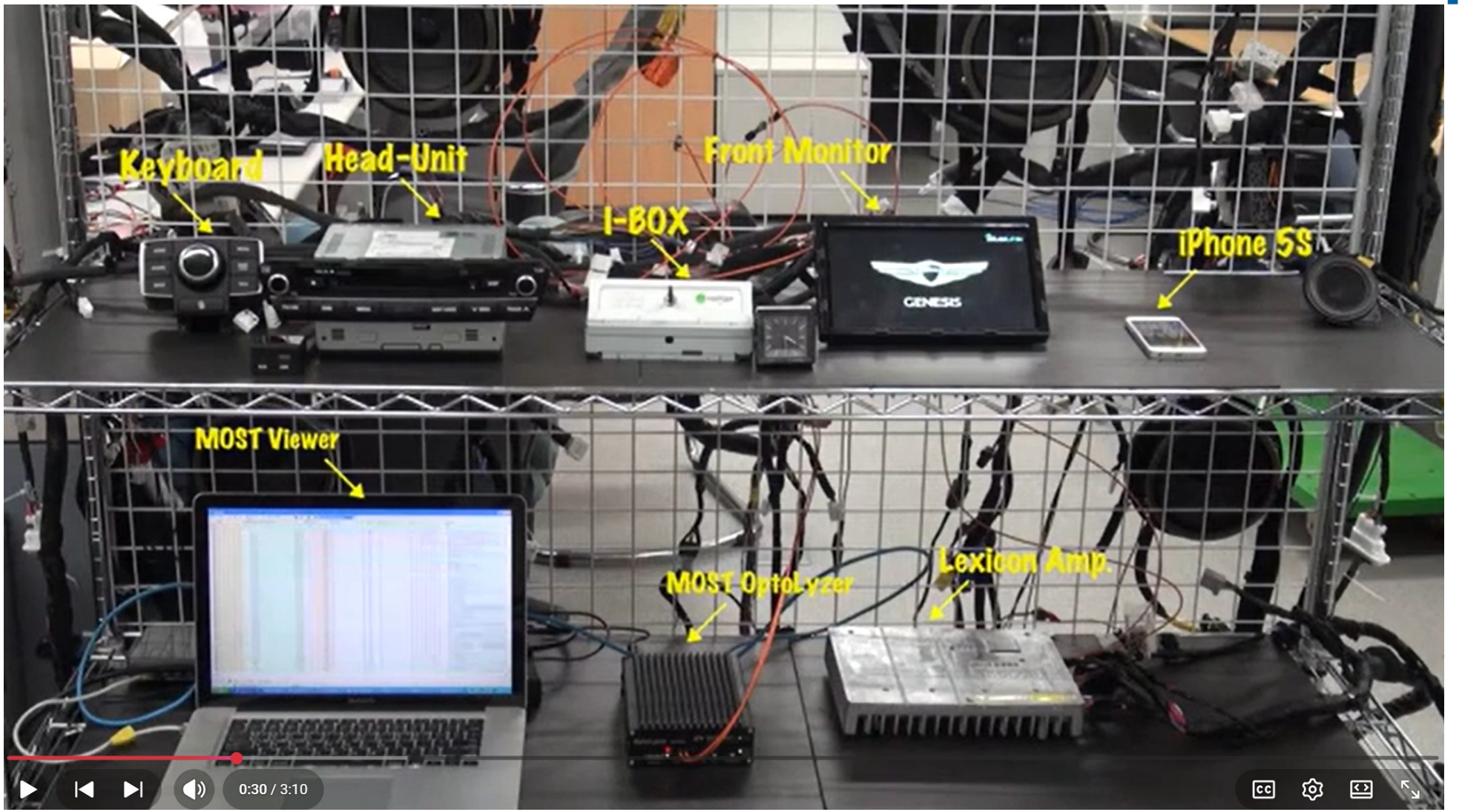
In-Vehicle Multimedia Network using POF with Ring-Topology

❑ Reliable Audio, Video, and Control Data Transmission





MOST (Media Oriented Systems Transport)



https://youtu.be/BupZj86-xNE?si=9Zmz4PnwMReIYcKY

ARINC664 Part 7 (AFDX™)

In-Aircraft Deterministic Ethernet for Avionics

- ❑ Avionics-specific MAC features
- ❑ QoS Support by Traffic-Shaping for each Virtual Link


Airbus A350


Airbus A380


Airbus A400M


Boeing B787

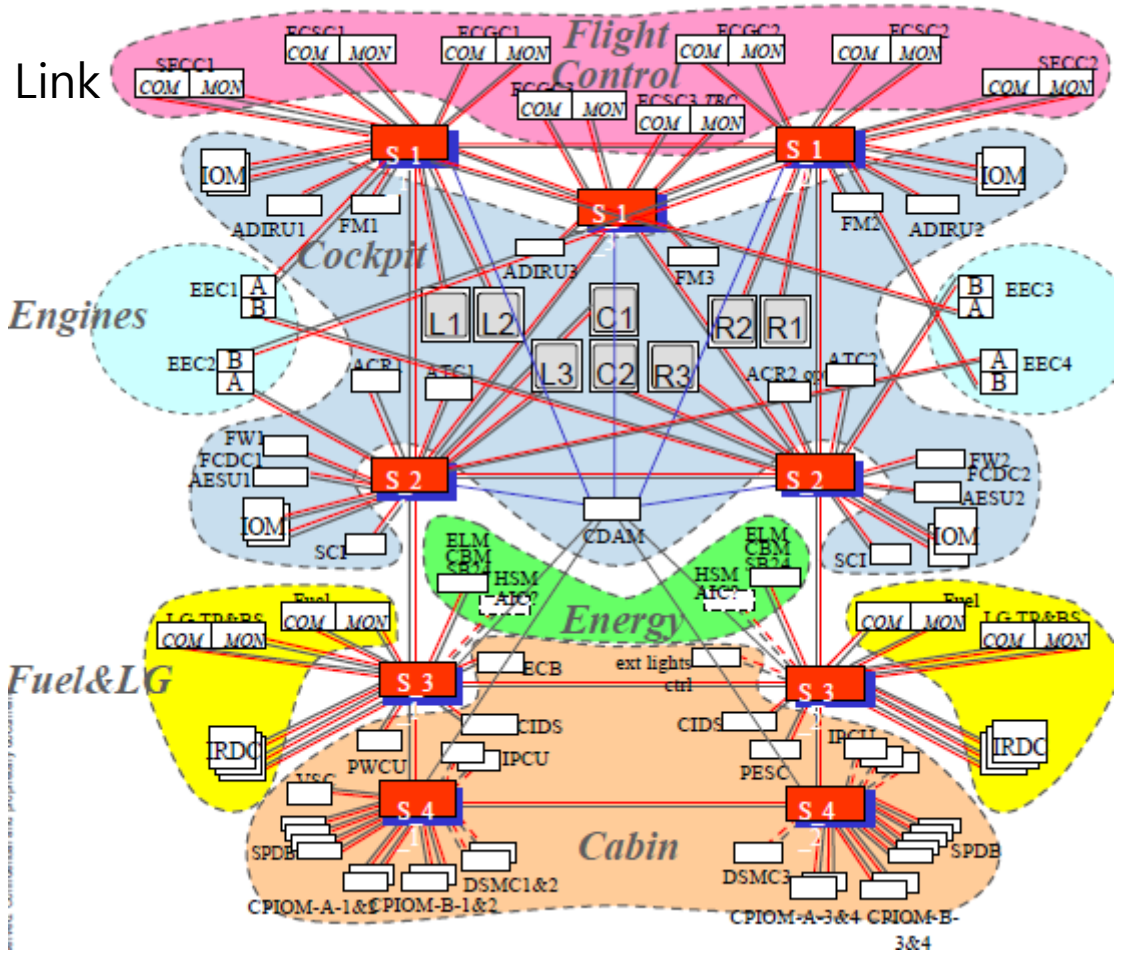

Bombardier CSeries


Irkuk MC-21


Comac ARJ21


AW-101

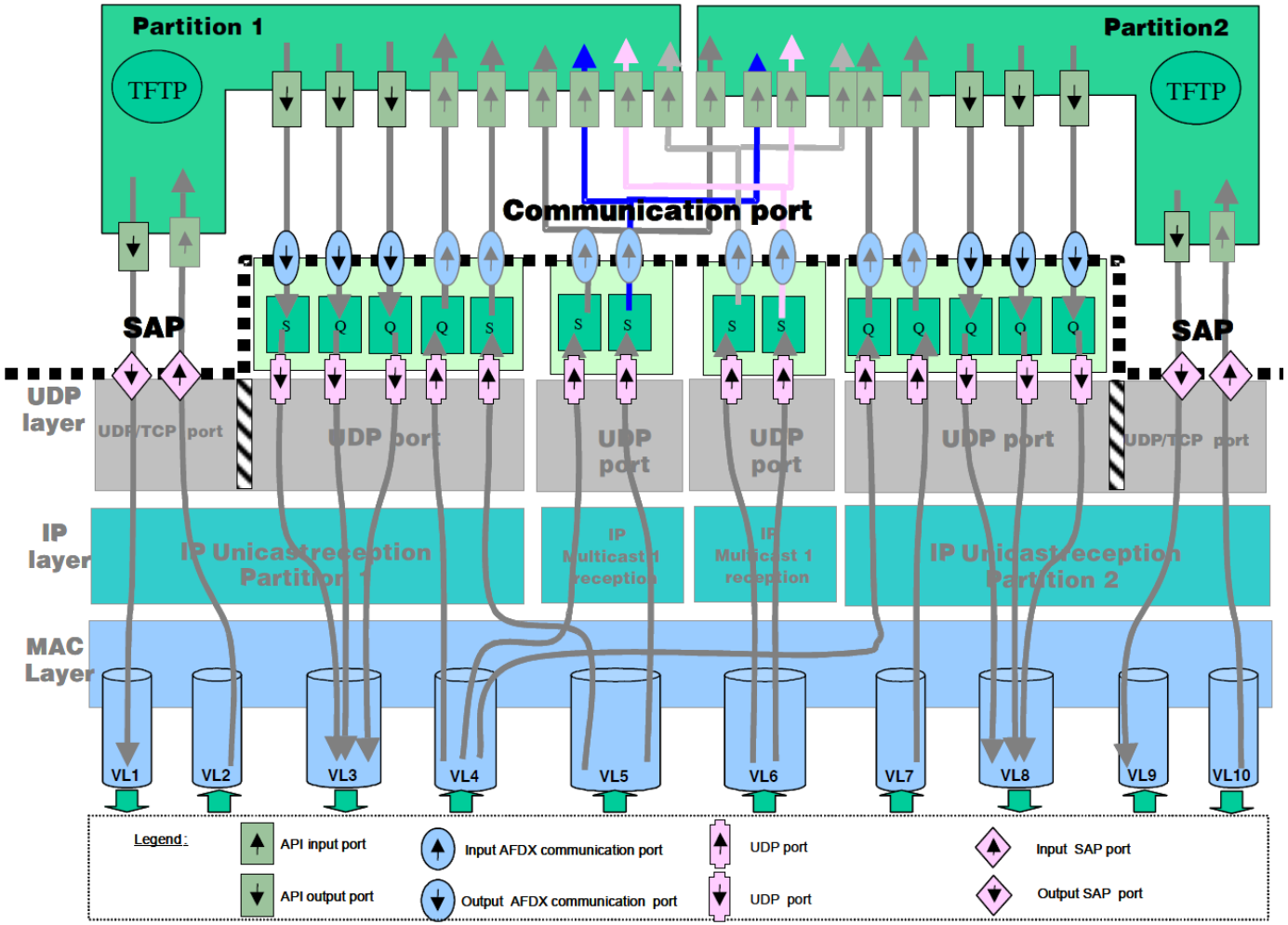

LAH



ARINC664 Part 7 (AFDX™)

Multiple Virtual Links on Partitioning OS

- ❑ Up to 128 Tx Virtual Links
- ❑ Up to 1024 Rx Virtual Links
- ❑ Up to 4096 Switching Virtual Links
- ❑ Deterministic QoS
  on Data Link Layer
- ❑ No Reservation Required
- ❑ Multiple Service Access Point



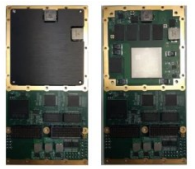
ARINC664 Part 7 (AFDX™)

Exclusive Provider in Korea

- ❑ FPGA RTL-based IP Available
  Provides synthesizable RTL IP
- ❑ OS-Compatible Device Drivers
  Supports VxWorks 7,
  VxWorks 653, and Linux
- ❑ Easy-to-Use Virtual Interface
  Simplifies integration and
  testing

XMC Specification — AFDX-XMC — Revision 1.0 — COTS Technology

Features



Form factor
- Standard VITA 42 XMC Type

FPGA
- Xilinx Kintex-7 Series XC7K325T-2FFG676I
- Logic Cells: 326,080
- Block RAM Memory: 16,404,480 Bits

Memory
- 2048MB DDR3L Memory (64-bit I/F)

AFDX IP
- Fully compliant ARINC-664 part 7
- Virtual Link
  - Up to 128 Output VLs, Up to 128 Input VLs
- Sampling Port
  - Up to 128 sampling/queuing ports for Output VLs
  - Up to 128 sampling/queuing ports for Input VLs
- SNMP/ICMP Support
- BAG Configuration : Down to 0.5msec

Ethernet Interface
- Two 100/1000Base-T full-duplex Ports (DP83867IRPAPT with GMII I/F)

Operating System
- VxWorks 653 3.x, VxWorks 7.0

Operating Temperature
- Operating : -40℃ ~ +71℃
- Non-operating : -54℃ ~ +95℃

Ruggedization
- Conduction Cooled Support

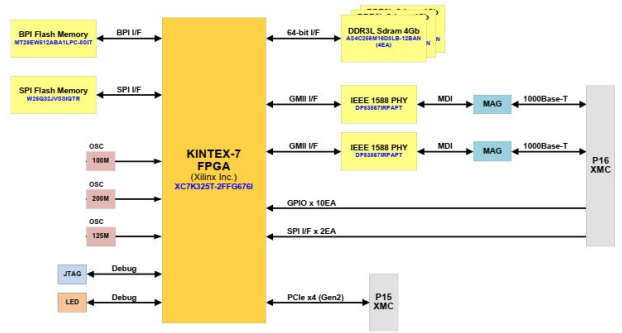
Weight
- Under 130g

Power
- Supply Voltage (VPWR) : +5VDC
- Max <18 Watt Consumption

Learn More
Web / www.cotstech.com
Email / cots@cotstech.com
COTS Technology

XMC Specification — AFDX-XMC — Revision 1.0 — COTS Technology

Block Diagram



Order Information

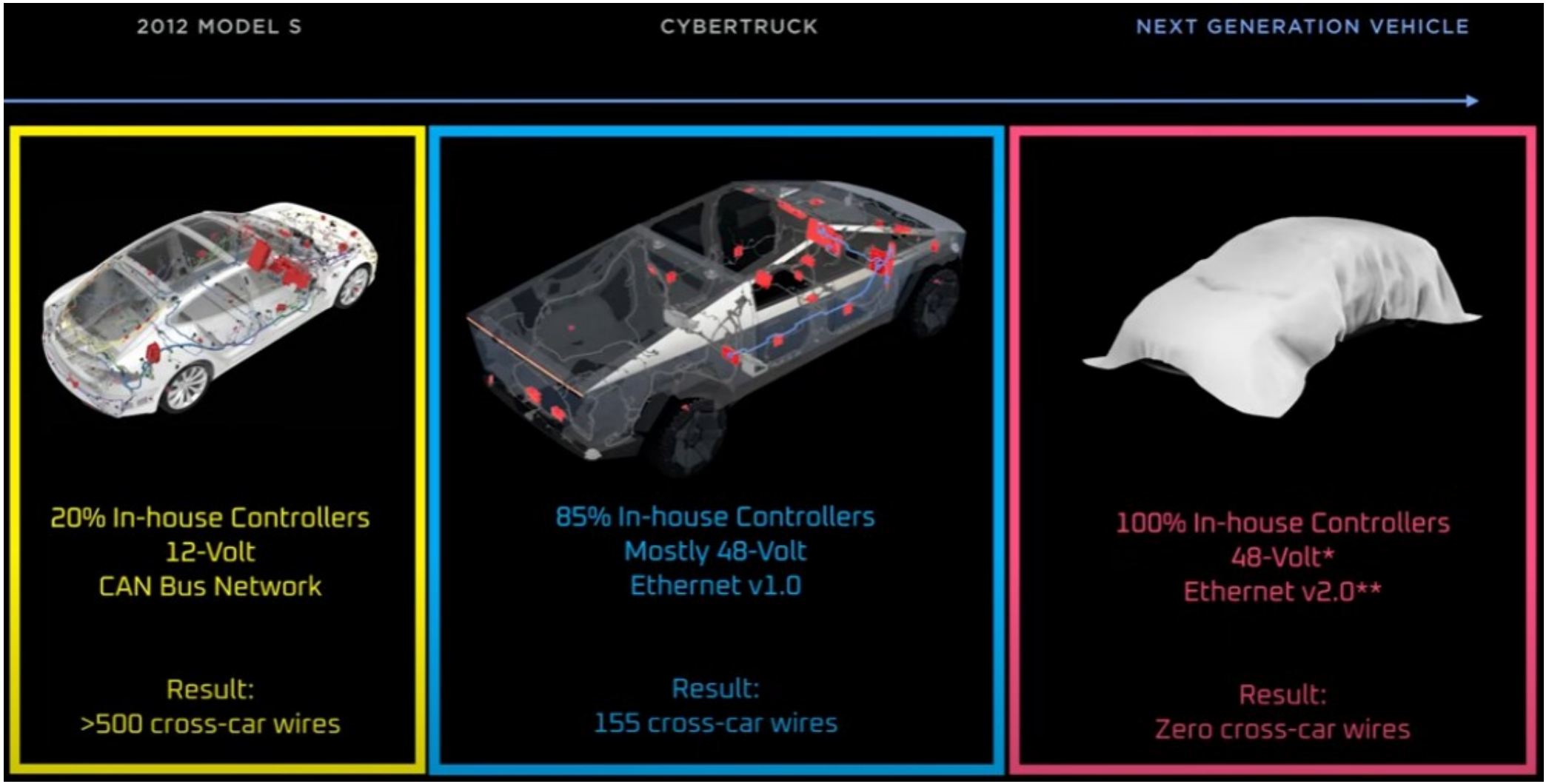
AFDX-XMC- □ □

Operating System
0 = VxWorks 653 3.1.3
1 = VxWorks 7.0
2 = Linux 4.X (TBD)
3 = S/W 미포함

SBC
0 = VPX3-C2 (T2080)
1 = TBD

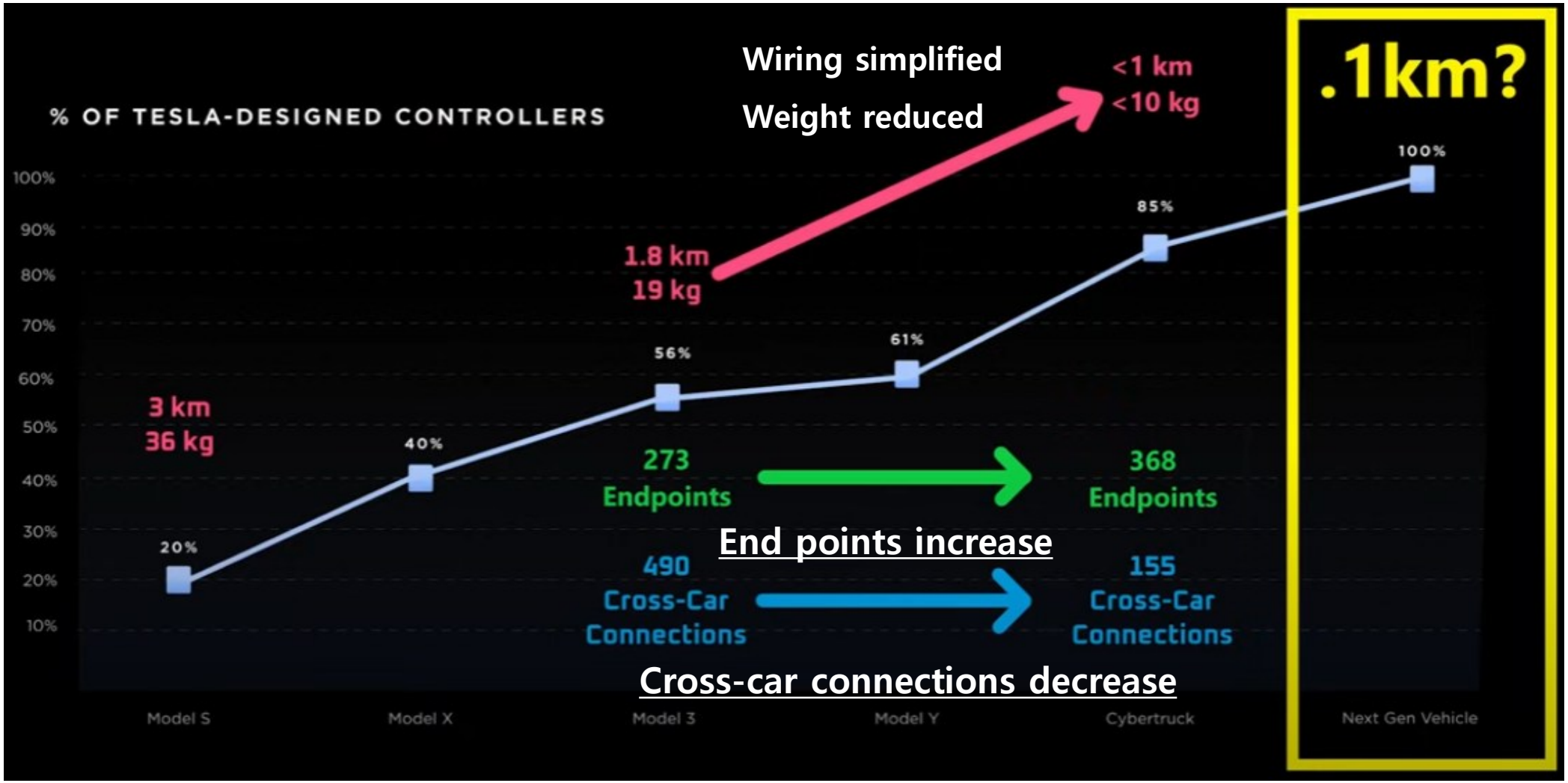
Learn More
Web / www.cotstech.com
Email / cots@cotstech.com
COTS Technology

Automotive Ethernet



Ref: Tesla

Automotive Ethernet

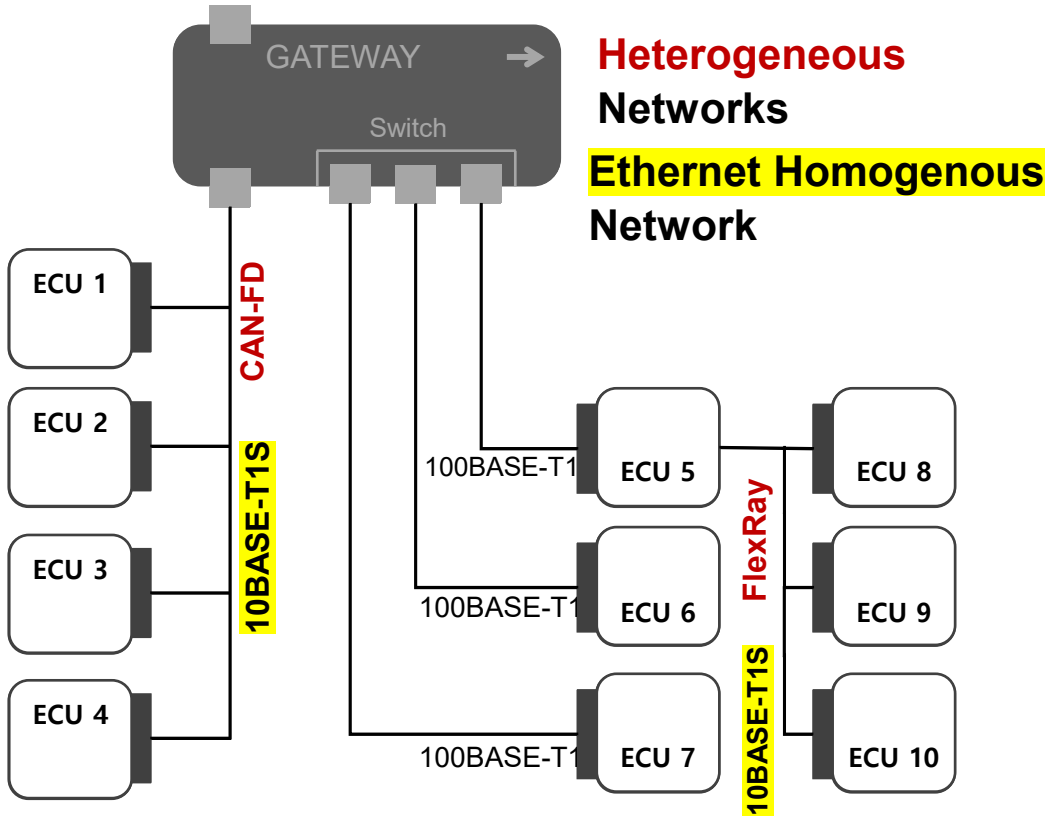


Ref: Tesla

10BASE-T1S

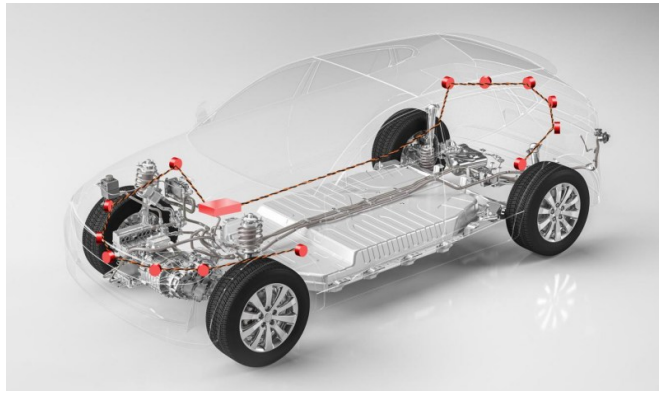
Goals

- ❑ IP/Ethernet solution in same cost
- ❑ Simple network design with all IP
- ❑ Reduce dependency on gateways
- ❑ PoDL (Power over Data Lines) support
  to further reduce complexity and cost
- ❑ Bus/Multi-drop architecture
  to further reduce wiring and PHY

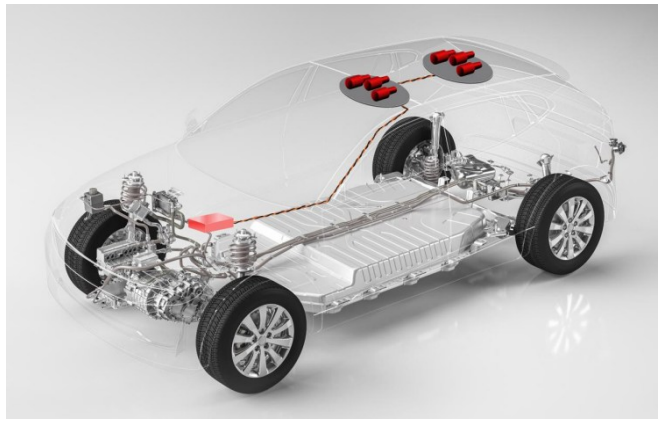


Application examples

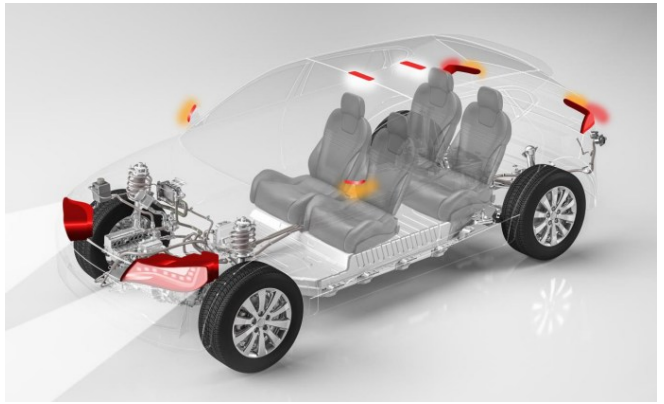
- ❑ Ultrasonic sensor units
- ❑ Radar sensor units
- ❑ Front radar



- ❑ Microphones
- ❑ Handfree
- ❑ Emergency Call
- ❑ 360° environment sensing



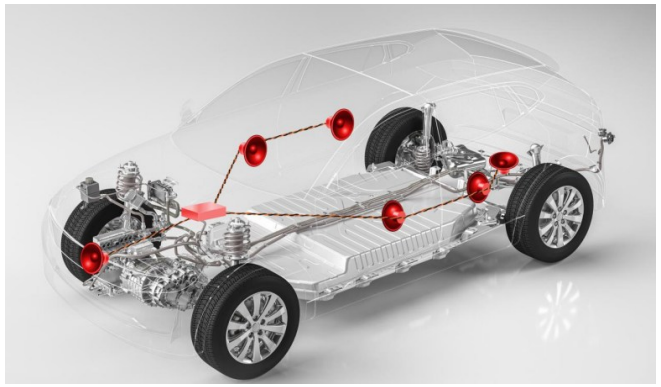
- ❑ Front-/Backlight
- ❑ Indicator
- ❑ Ambient Lighting



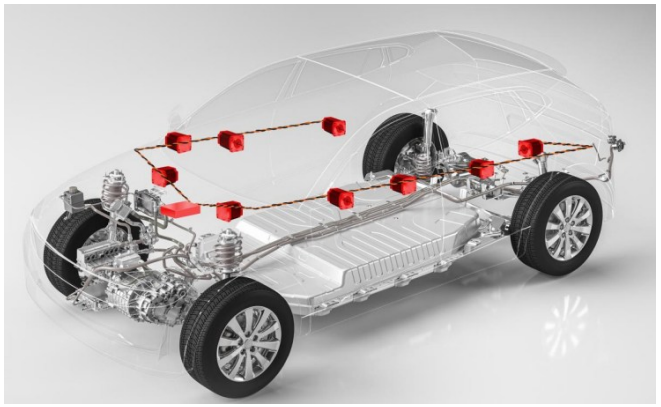
Ref: Microchip

Application examples

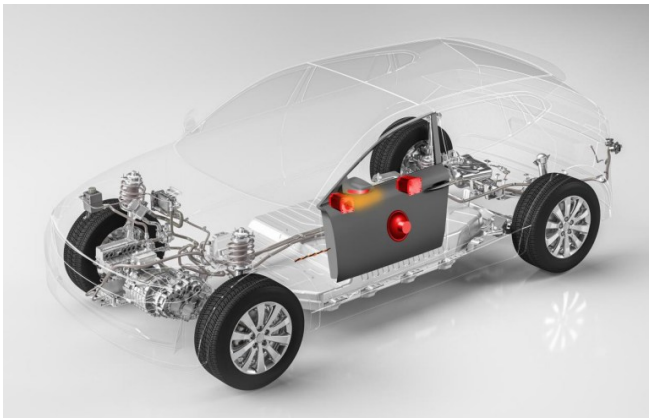
- ❑ Door Speaker
- ❑ Subwoofer
- ❑ eSound
- ❑ Emergency Call Unit



- ❑ Electric motors
- ❑ Windows
- ❑ Mirrors
- ❑ Pumps
- ❑ Windshield wiper



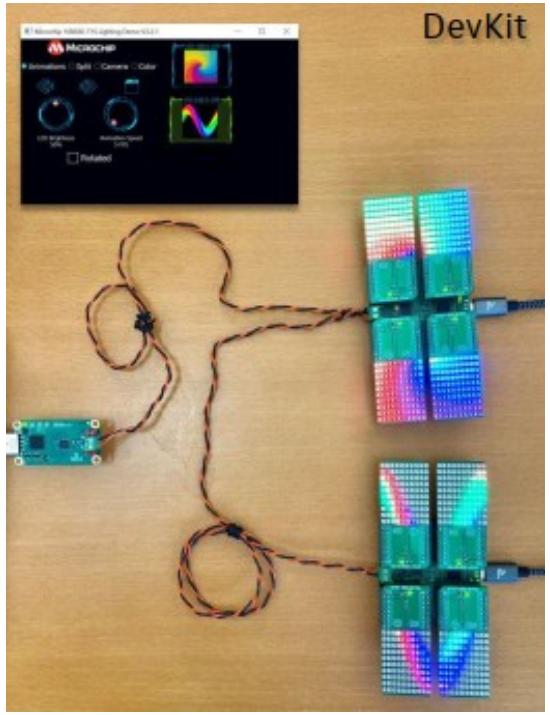
- ❑ Door Zone
- ❑ Window Lifter
- ❑ Mirror Control
- ❑ Speakers
- ❑ Lock
- ❑ Ultrasonic
- ❑ Ambient Light

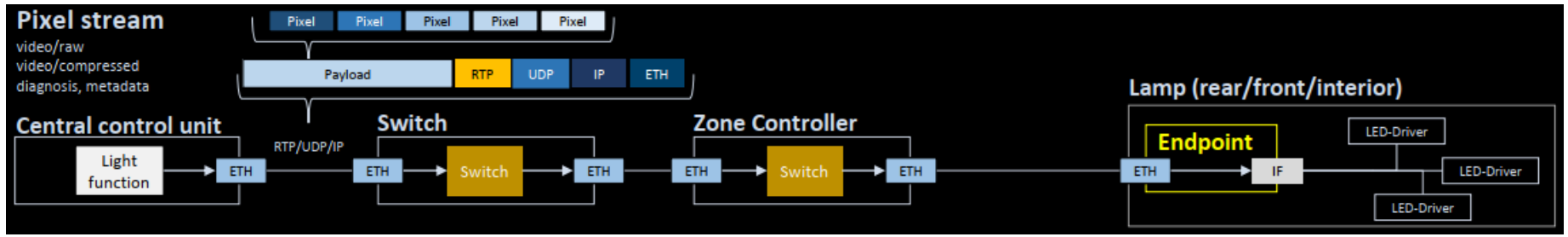


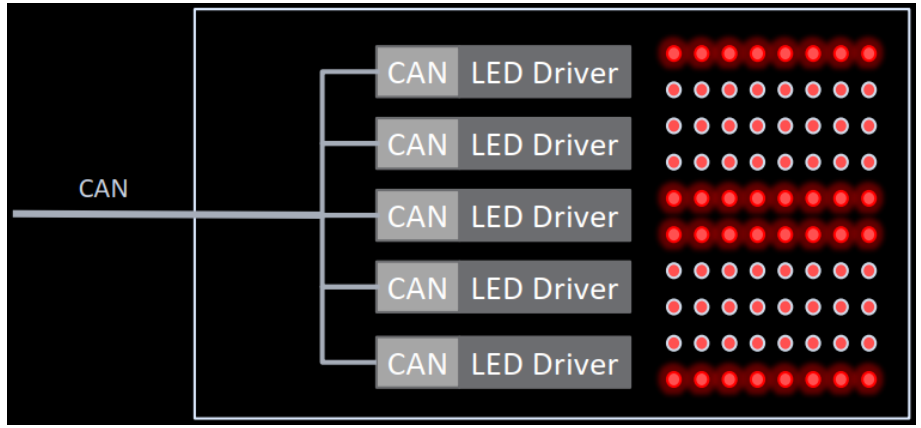
Ref: Microchip

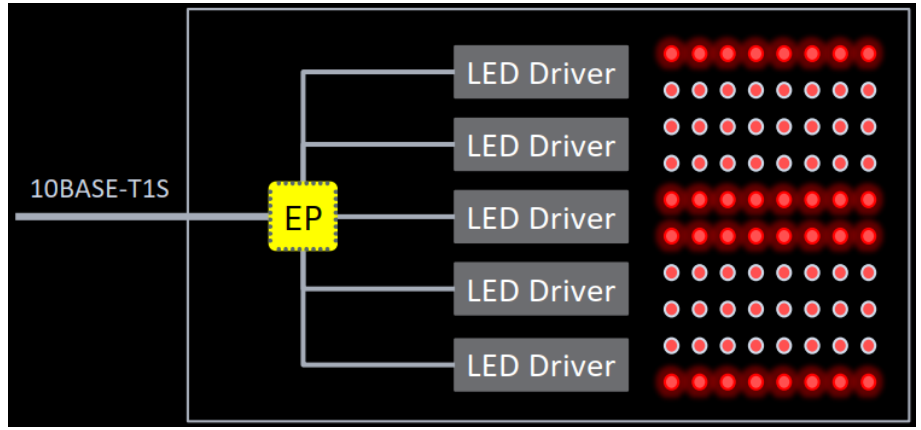
Example: Scalable Ethernet Lighting-Architecture

- ❑ Max LEDs = 15 (max CAN nodes) x 16 (channels per LED driver) = 240
- ❑ Max LEDs = 20,000 (uncompressed) @60 FPS





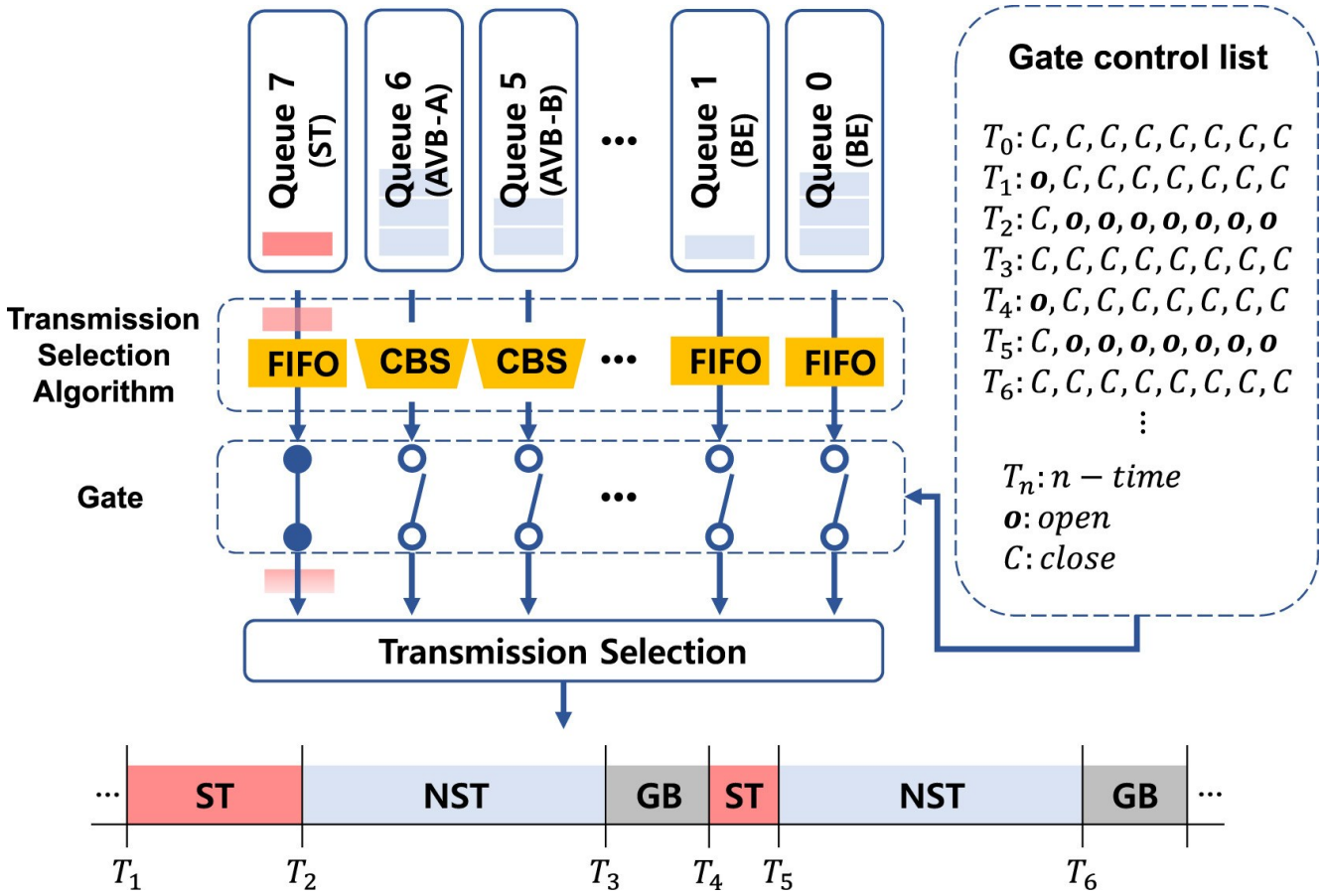




B. Kreipe, et al., Scalable Ethernet lighting-architecture, 15th International Symposium On Automotive Lighting, 25th Sep. 2023, Darmstadt.

Time Sensitive Network

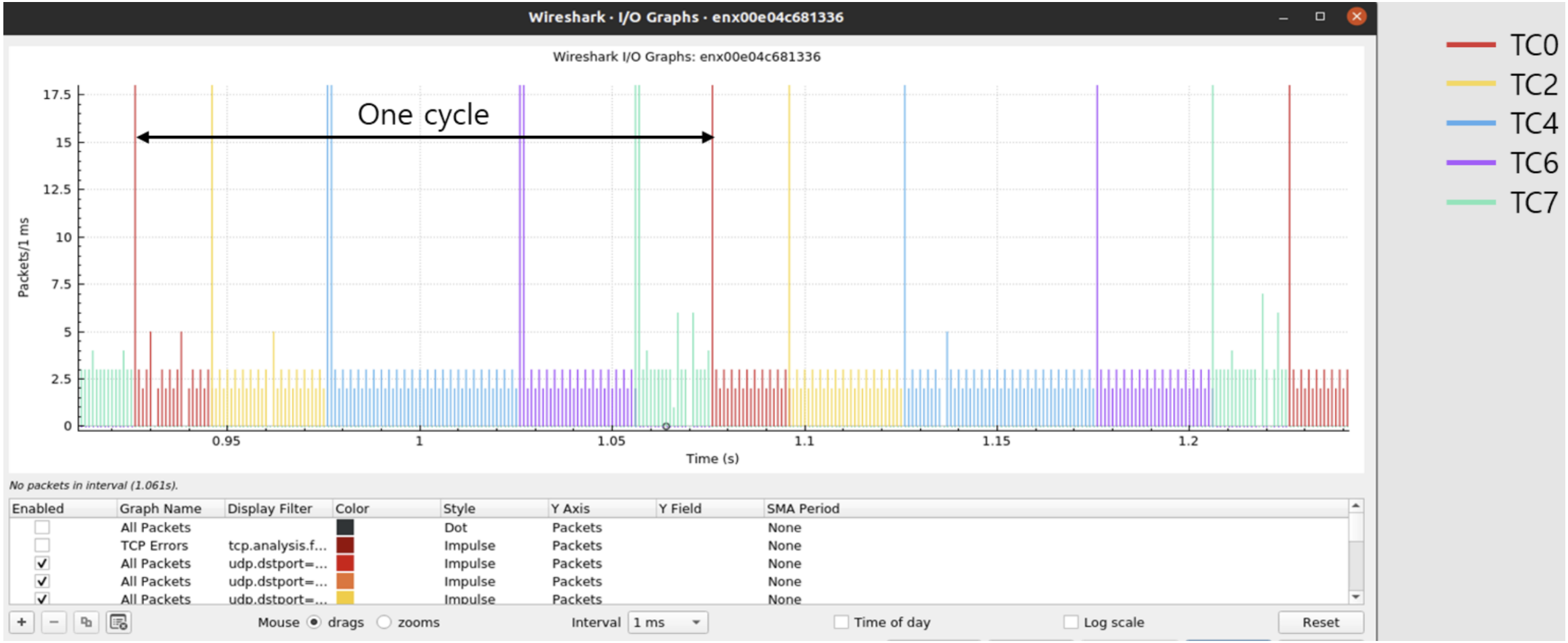
Time Aware Shaper (TAS)



- IEEE 802.1Qbv
- TAS core components
  - Time-triggered gating
  - Gate Control List (GCL)
  - Time slots
  - Guard bands
- Features
  - Bounded latency
  - Traffic isolation
  - Deterministic behavior

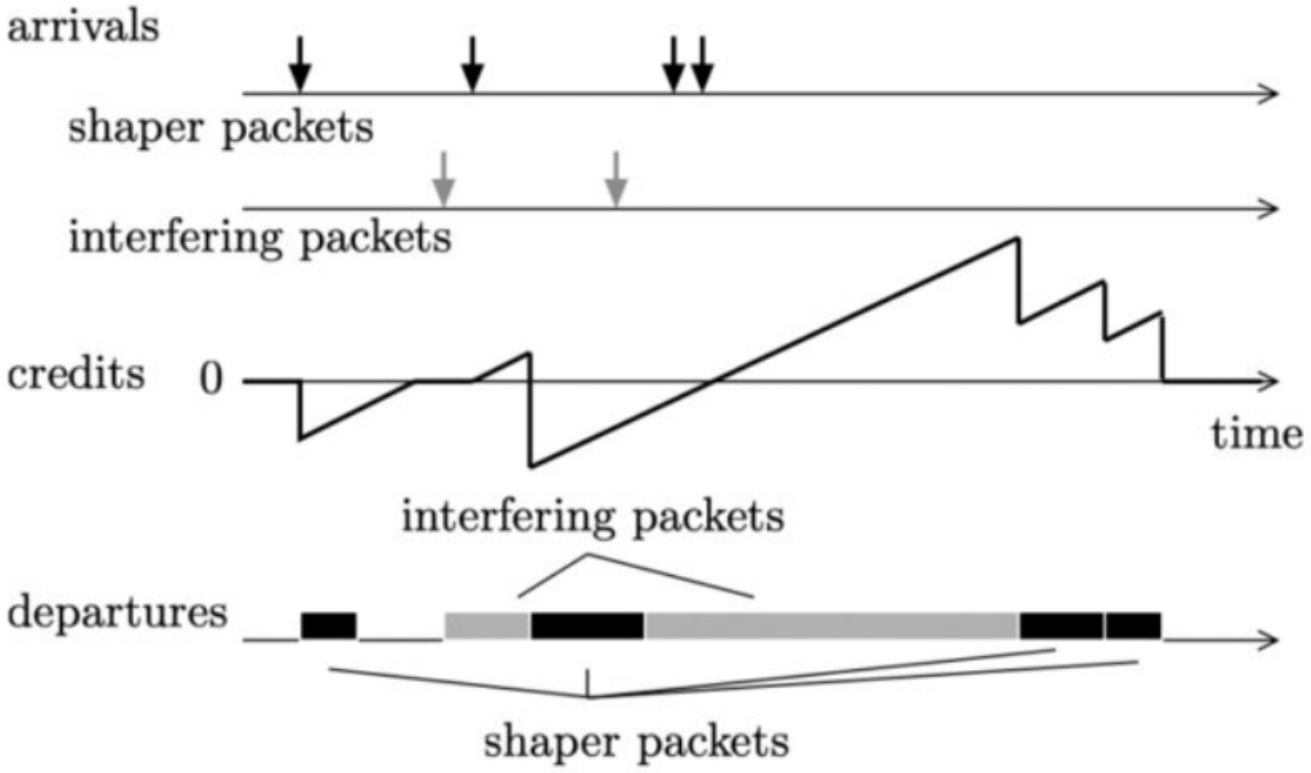
Time Sensitive Network

Result of TAS Scheduling



Time Sensitive Network

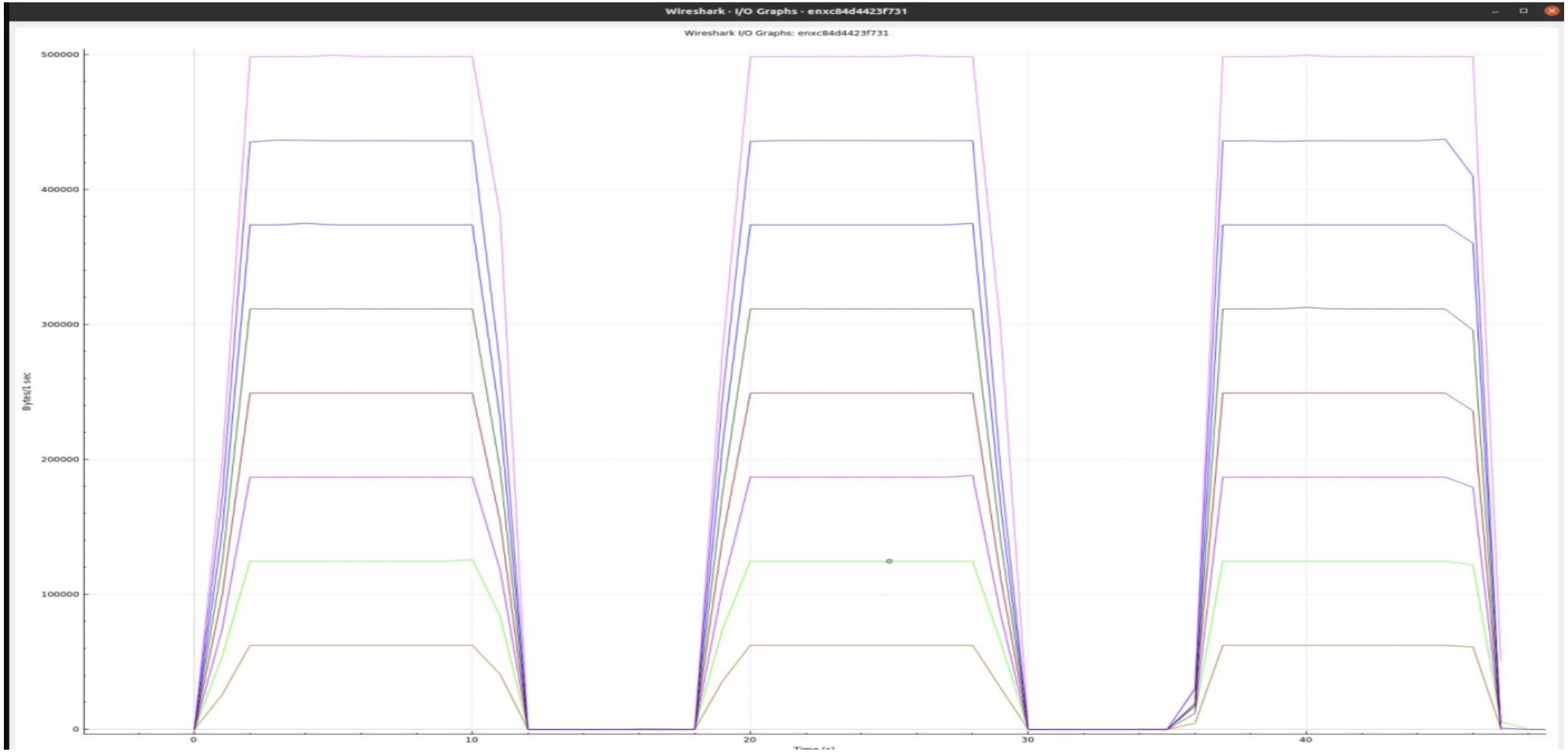
Credit Based Shaper (CBS)



- IEEE 802.1Qav
- Credit Accumulation
  idleSlope
- Packet Arrival and Queueing
- Credit Check and Transmission
  sendSlope
- Resumeing Transmission
- Delay lower-priority traffic
- Non-synchronous shaper
- Control the burstiness

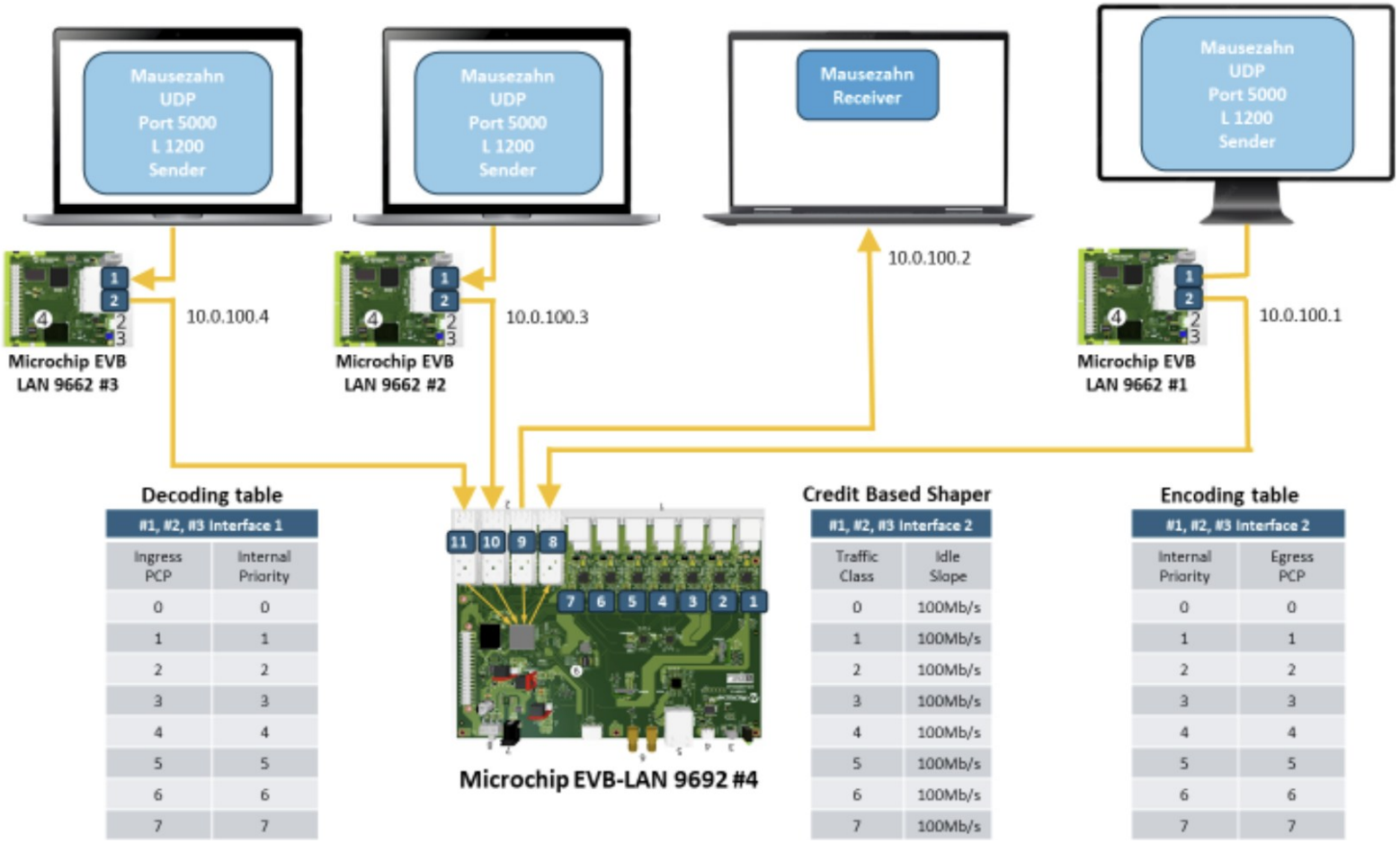
Time Sensitive Network

Result of CBS Scheduling



Time Sensitive Network

Experiments Environment



Decoding table

#1, #2, #3 Interface 1	
Ingress PCP	Internal Priority
0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	7

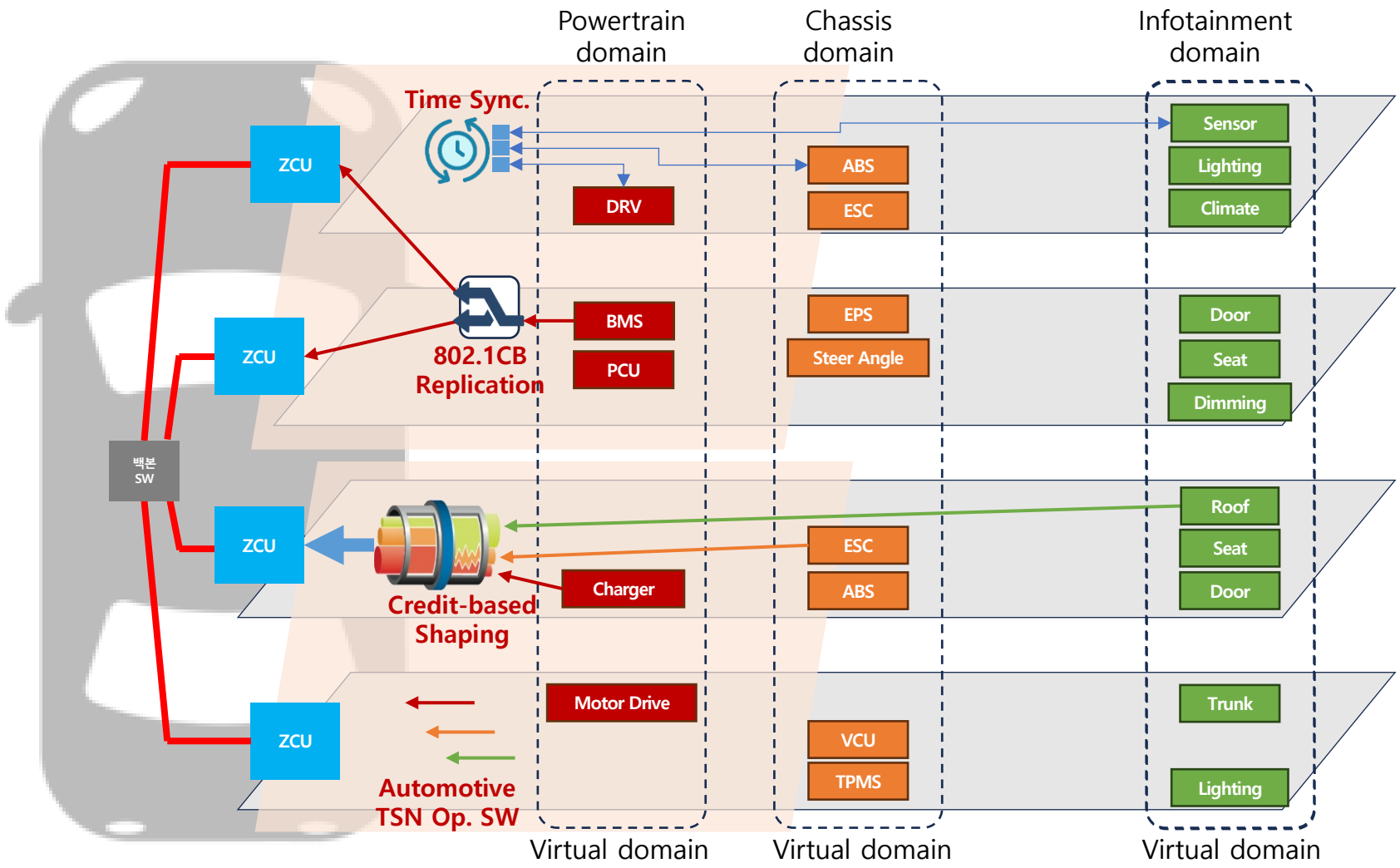
Credit Based Shaper

#1, #2, #3 Interface 2	
Traffic Class	Idle Slope
0	100Mb/s
1	100Mb/s
2	100Mb/s
3	100Mb/s
4	100Mb/s
5	100Mb/s
6	100Mb/s
7	100Mb/s

Encoding table

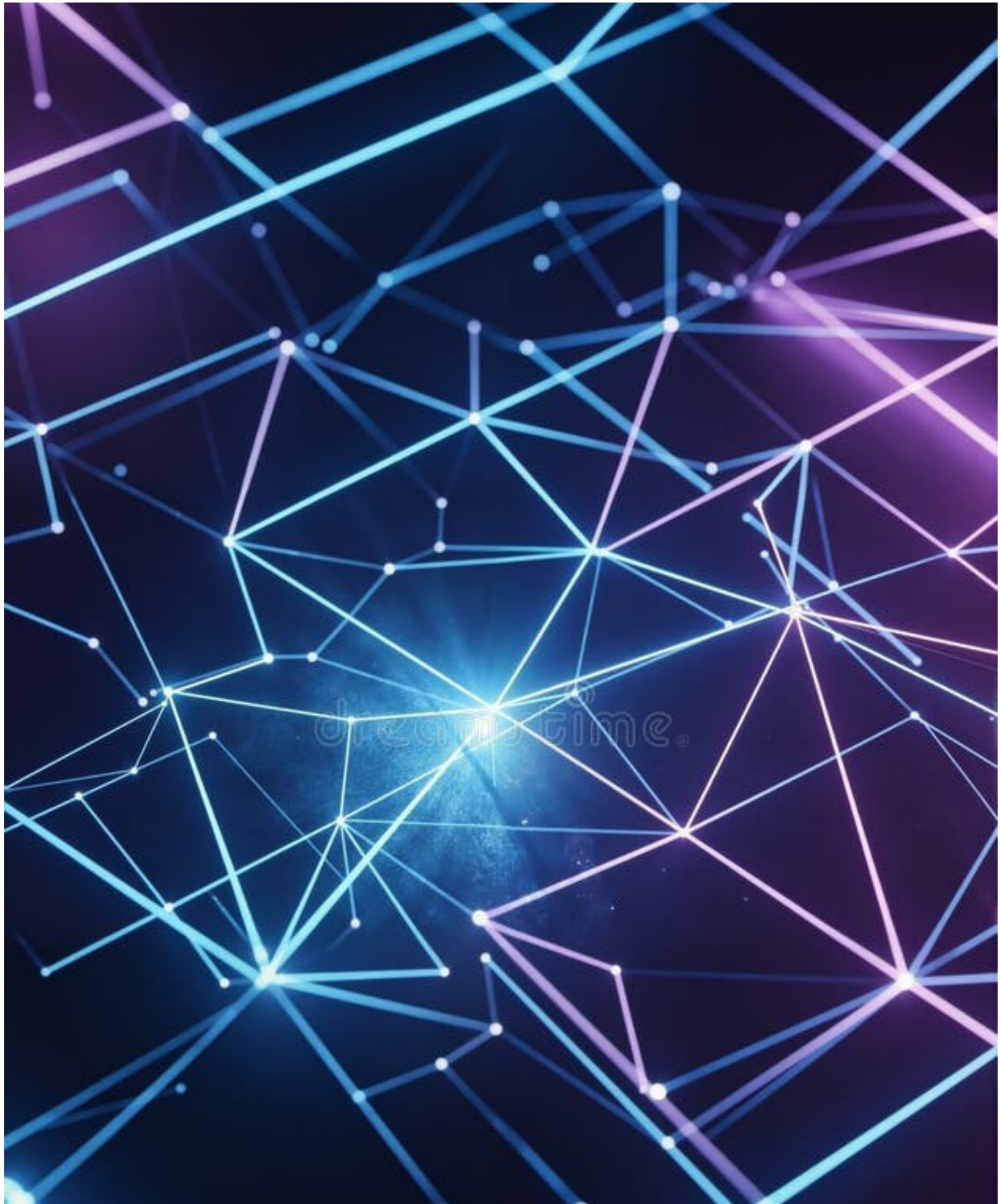
#1, #2, #3 Interface 2	
Internal Priority	Egress PCP
0	0
1	1
2	2
3	3
4	4
5	5
6	6
7	7

Coexistence of Different type of Traffic



- Safety-critical flows (brake, steer, ADAS) share links with infotainment/logging
- Deterministic latency for control; robust service for non-critical flows
- Quality of Service and traffic isolation are mandatory
- TSN mechanisms guarantee timing, reliability, and bandwidth allocation
- Mixed-criticality networking is the new normal in SCV design

Korea SDV Standardization Landscape



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Global SDV Standardization Trends

Global SDV standardization is rapidly advancing through a collaborative ecosystem comprising

Country	Organization	Features	Standards
 USA	○ COVESA	○ Ecosystem Collaboration - AUTOSAR, Eclipse SDV, SOAFEE	○ COVESA VSS(Vehicle Signal Specification / 2016) ○ COVESA VISS(Vehicle Information Service Specification / 2024)
 China	○ CAAM-SDV	○ Government-led Initiative with 114+ participating companies ○ AUTOSAR-based SDV API standardization ○ Production deployment in 10+ OEM models	○ SDV API(v3 / '22.6) ○ SDV API(v4 Beta / '22.12)
 Japan	○ Open SDV Initiative ○ JASPAR	○ Vehicle onboard software & network standardization ○ 250+ participating companies	○ OSDVI SDV API (v1.0 / '25.3) ○ OSDVI SDV API (v2.0 / '25.6)
 Europe	○ Eclipse S-CORE ○ Safe Open Vehicle Core	○ Industry participants - BMW, Volkswagen, Accenture, Elektrobit, ETAS, Mercedes-Benz, Qualcomm, Qorix – 8+ major companies	○ SCORE Definition v1.0(2025) ○ SCORE Release v0.5(2025)

National SDV Standardization Task Force

Initiative Structure

18+ organizations from government, industry, and st andards bodies collaborating on SDV standardization framework

Expert Composition

30+ private and public sector experts representing automotive OEMs, suppliers, IT companies, telecomm unications, and government agencies

TF Meeting 1	**August 14, 2024**
TF Meeting 2	**August 29, 2024**
TF Meeting 3	**September 16, 2024**

SDV Standardization Initiative

Organizer

Korea Standards Association (KSA)

Hosted by

Ministry of Trade and Industry
Korean Agency for Technology and Standards

Date

7 November 2025

Location

Seoul, Korea

Participants

100+ companies

자동차 SDV 표준화 협의체 결성

'자동차+IT' 생태계 확장
2026년까지 표준안 개발

김연균 기자 입력 2025.11.10 08:57 | 댓글 0

'SDV 표준화 협의체'에 참여한 관계자들이 기념촬영을 하고 있다. [사진=산업통상부]

[정보통신신문=김연균기자]

산업통상부 국가기술표준원은 현대차, 삼성전자, LG전자 등 국내 주요기업과 함께 'SDV(소프트웨어중심차량) 표준화 협의체'를 결성하고 11월 7일 소피텔서울잠실에서 출범행사를 개최했다.

Strategic Direction: Korea's Integrated Approach

Promote the development and revitalization of the SDV industry

Strategy

SDV+ (Vehicle + IT)

World-Class Manufacturing Competency + Leading IT Capabilities → SDV Standardization Development → Accelerated Vehicle SDV Transformation + IT-Automotive Convergence → Leading the market

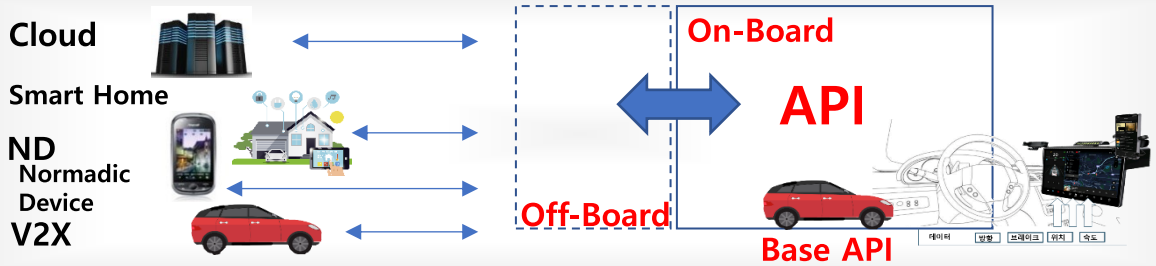
Background

- Accelerating global transition toward Software-Defined Vehicles (SDV) as core automotive platform
- Unique opportunity to integrate world-leading manufacturing and IT competencies into a unified "Korean SDV Ecosystem Model"

SDV Standardization Focus Areas

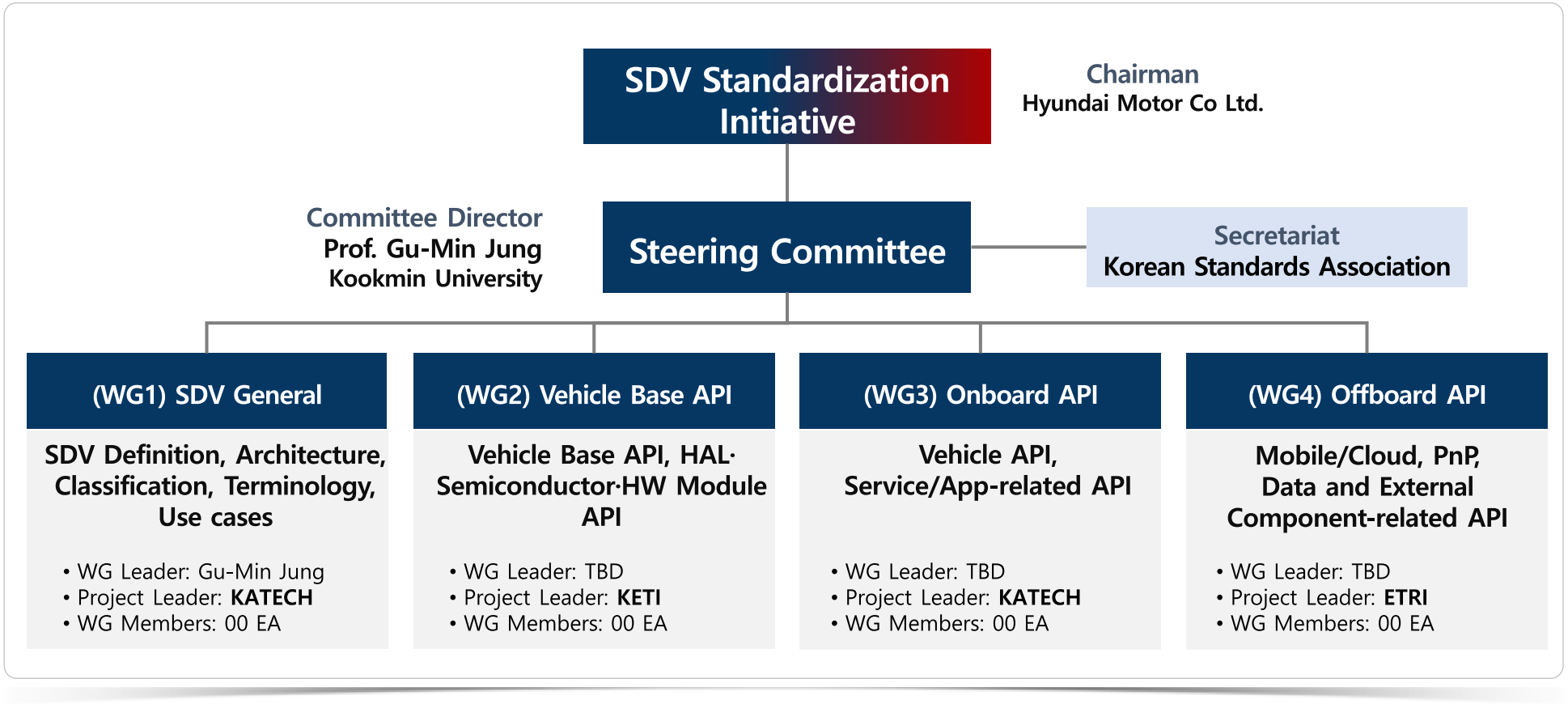
Priority-Based Working Group Structure

The WG operations aligned with priority roadmap to accelerate standardization and reduce time-to-market

1. SDV General	- SDV Definition, Terminology, Use cases - SDV Architecture, Reference Model, Data - SDV Services, Cloud, In-Vehicle Service Data
2~4. SDV API	
5. SDV Security	Software-Centric Vehicle, Communication Security
6. SDV Environment	SDV DevOps, Virtual ECU
7. SDV AI	SDV AI Full stack , AI-Assistant

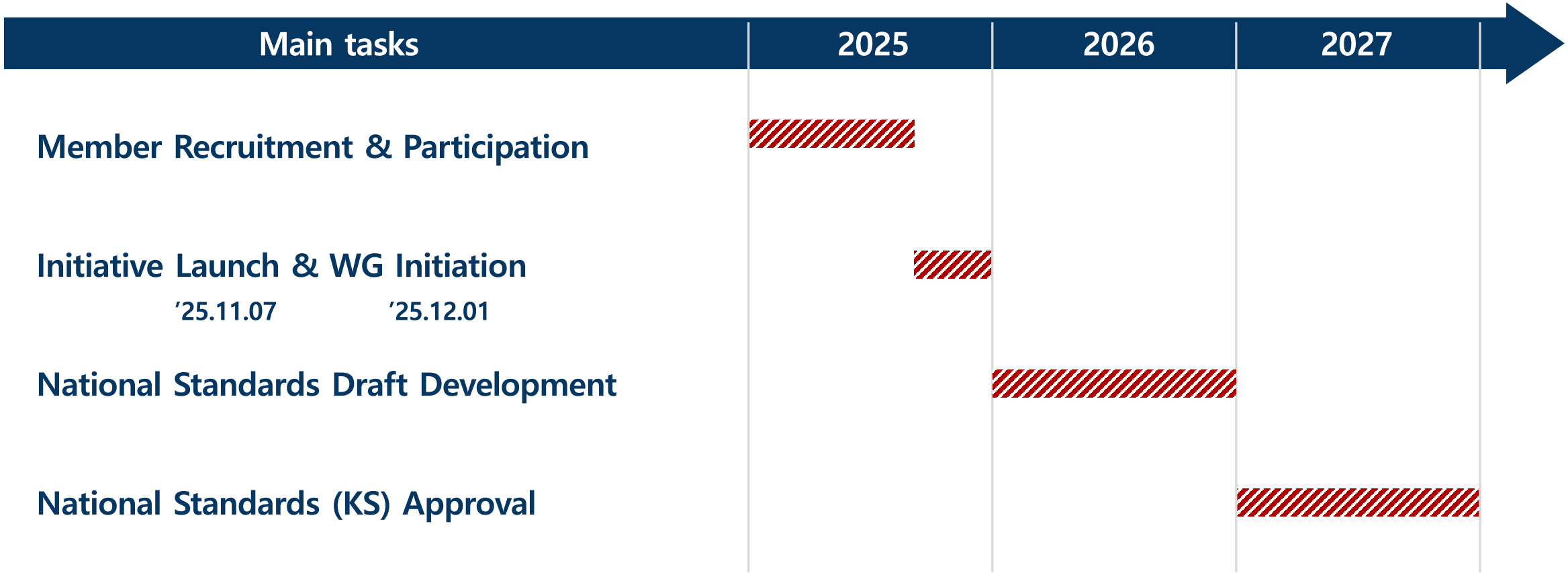
SDV Standardization Initiative Establishment

Establishment of the SDV Standardization Initiative



Timeline

Execution Plan



Members

Membership Status: 71 organizations (as of November 7, 2026)

오비고, ㈜시옷, 새솔테크, 모라이, ㈜토르드라이브, ㈜서울로보틱스, 롯데이노베이트㈜, 라이드플럭스, (주)에스오에스랩, 엠씨넥스, 엠피온 주식회사, ㈜브이웨이, 주식회사 엠큐닉, 휴인스, ㈜우리넷, 엘엑스세미콘, ㈜페르세우스, 주식회사 티솔루션즈, ㈜키미소프트, 영화테크㈜, 에이엠주식회사, ㈜에스엠솔루션즈, ㈜알티스트, 모비음, ㈜레보텍, 에이테크솔루션㈜, 주식회사 맥데이타, 노타, ㈜보스반도체, 주식회사 투비원솔루션즈 , ㈜엔제로, 레보랩, ㈜자스텍엠, 효림엑스이, 노르비스, 씨엔비스㈜, 캡스톤컴퍼니, 티에스엔랩 주식회사, ㈜베이리스, ㈜카네비모빌리티, 비에네스소프트, 주식회사 씨코드, (주)옐로나이프, ㈜티스마트, 모트렉스, 이노와이어리스, 한국교통연구원, 차세대융합기술원, 국민대학교 등

Thank you for listening!

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