Argus Automotive Ethernet IDPS Optimized Using the NXP S32G Network Acceleration

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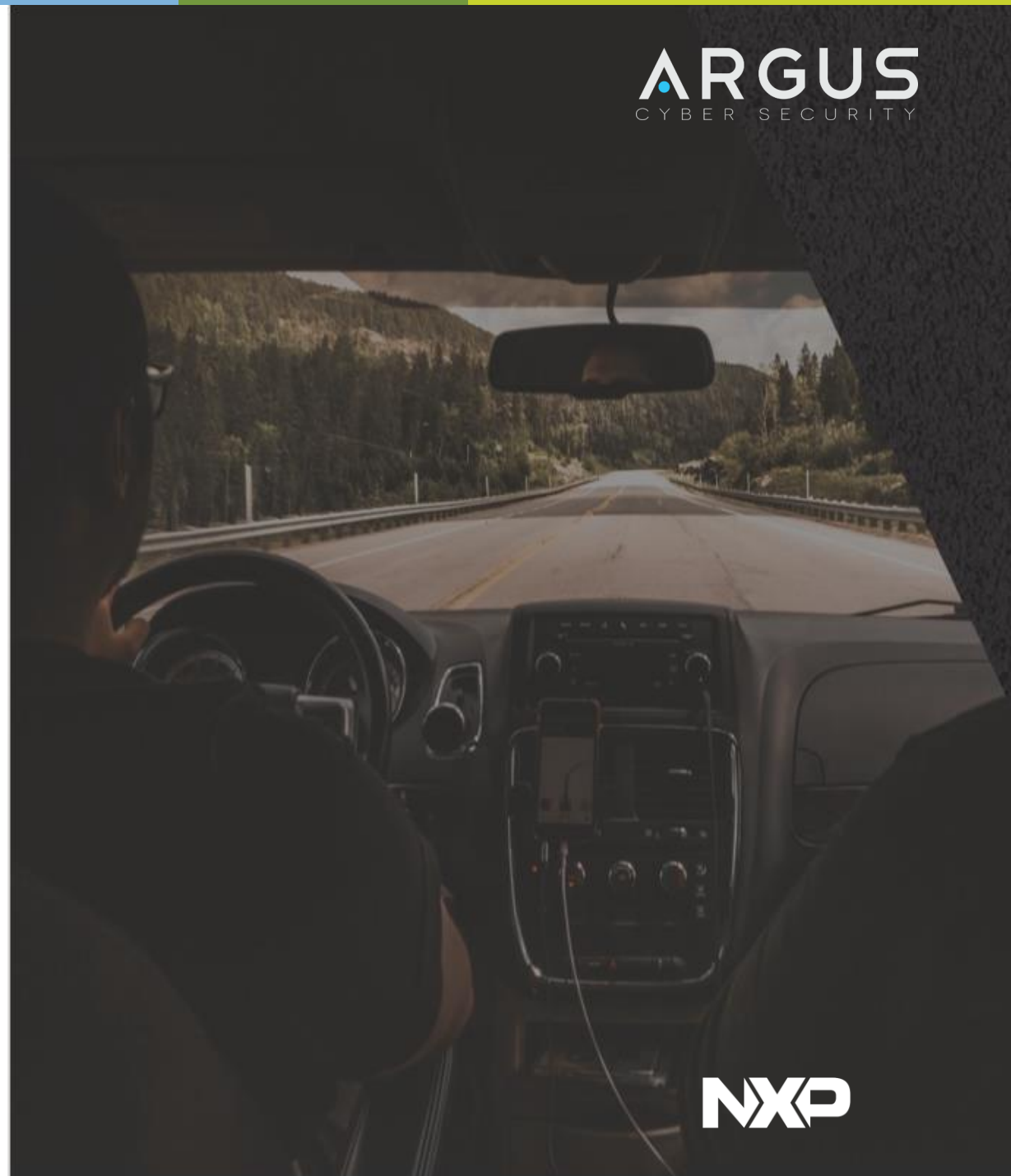

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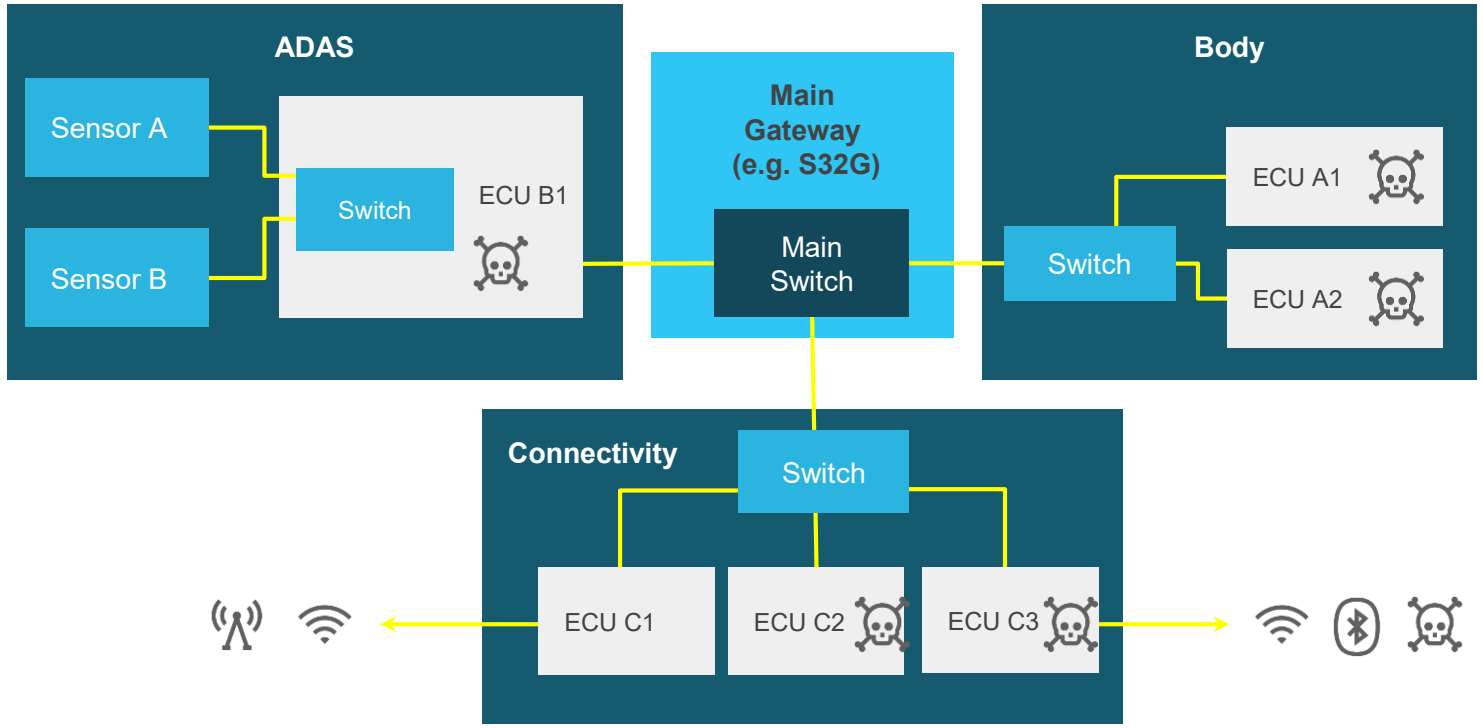
Automotive Ethernet

In-Vehicle Ethernet Security

A key topic in introducing Ethernet

Example Risk scenario: Attacker compromises one ECU and attacks the network from it.



Tampering ECU functionality with stack vulnerabilities

Activation of unallowed services

Triggering invalid action with Malicious packets

Denial of service

Security in In-Vehicle Ethernet Differs from IT

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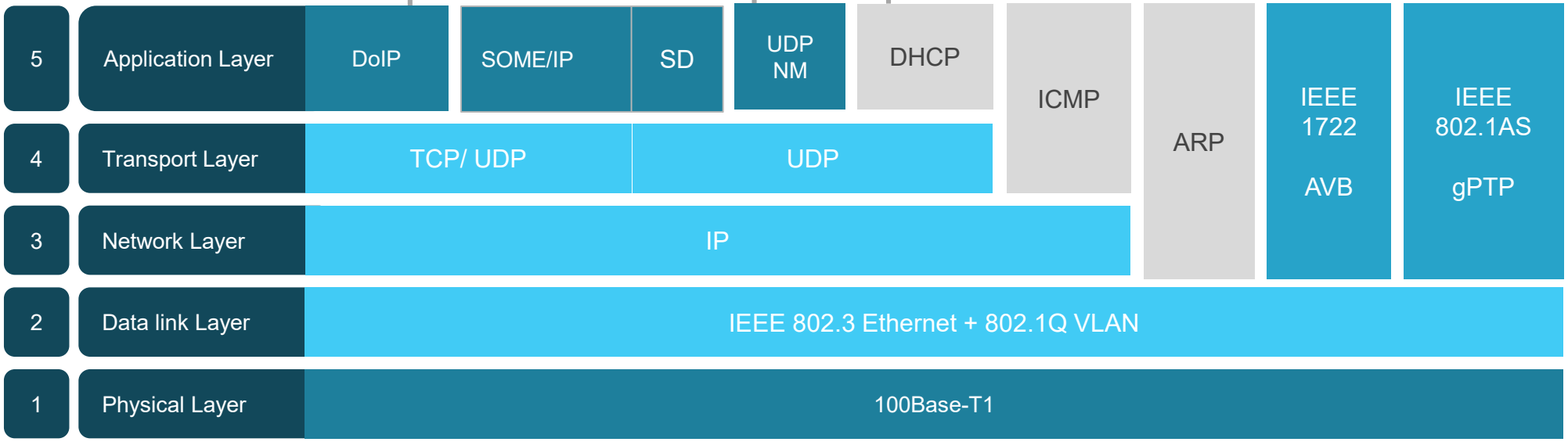
New protocols are in early stage - vulnerabilities are expected

(in design & implementation)

"Static nature" reduces attack surface and allows attack mitigation



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Security of In-Vehicle Ethernet Example Strategy

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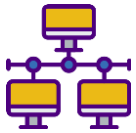

Access control based on static configuration

Network Authentication when possible

Log and report security events

Traffic analysis and DPI (IDPS/Firewall)

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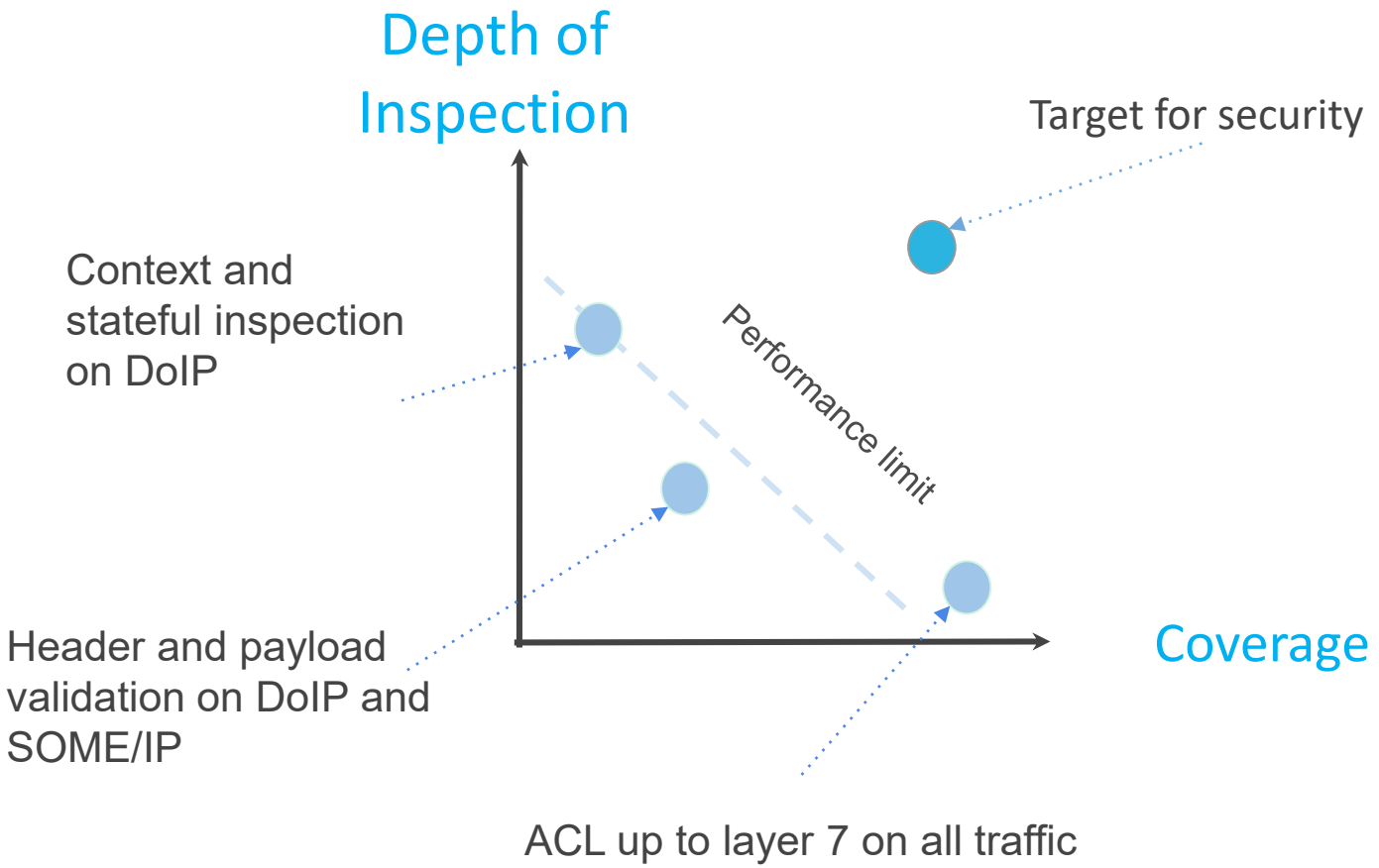
The Typical Performance Tradeoff



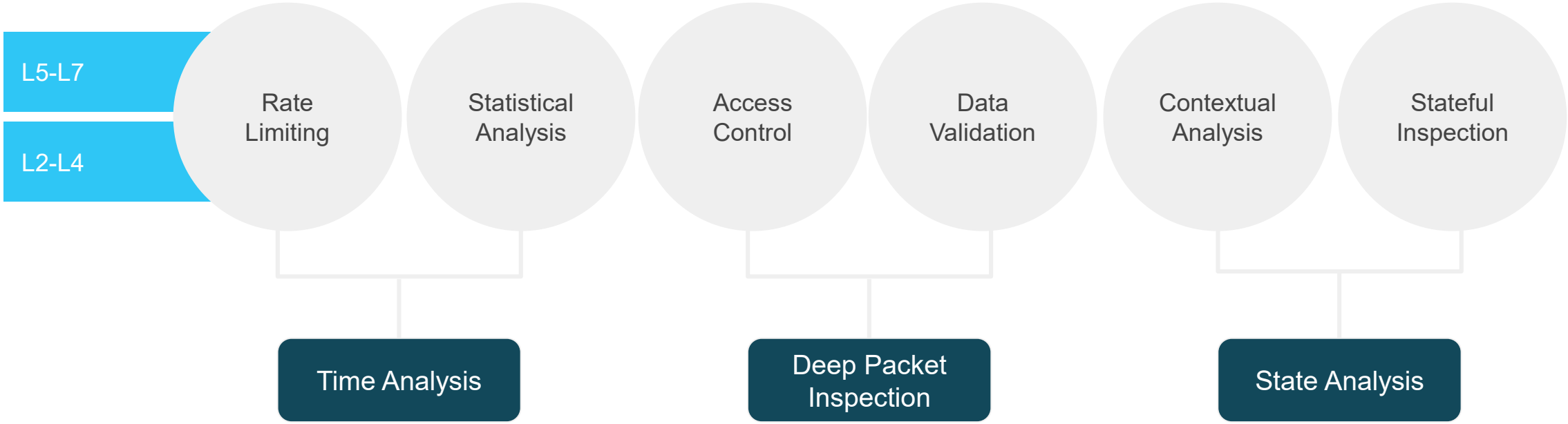
Argus Ethernet IDPS and NXP S32G

Argus Ethernet IDPS Overview

Rule-based real time analysis of traffic

Detect & log malicious traffic with optional prevention

Flexible integration options (POSIX/Classic AUTOSAR cores, network switch)



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NXP S32G – Packet Forwarding Engine

- Packet Forwarding Engine (PFE)
  - Offloads multi-core Arm® processors to handle IP packets
  - Advanced packet stateful inspection, classification and filtering functionality
  - Can implement firewall, routing, and IDPS capabilities

Processing

Lockstep Microcontrollers
Cluster Lockstep Microprocessors
Automotive Networks Acceleration
Ethernet Packet Acceleration

Networking

20 x CAN/CAN FD Interfaces
LIN and FlexRay™ Interfaces
4 x Gigabit Ethernet Interfaces
PCI Express Gen 3 Interfaces

Safety & Security

ASIL D Functional Safety Support
Advanced Hardware Security Engine

Applications

Service-oriented Gateway
Domain Controller
ADAS/AD Safety Controller

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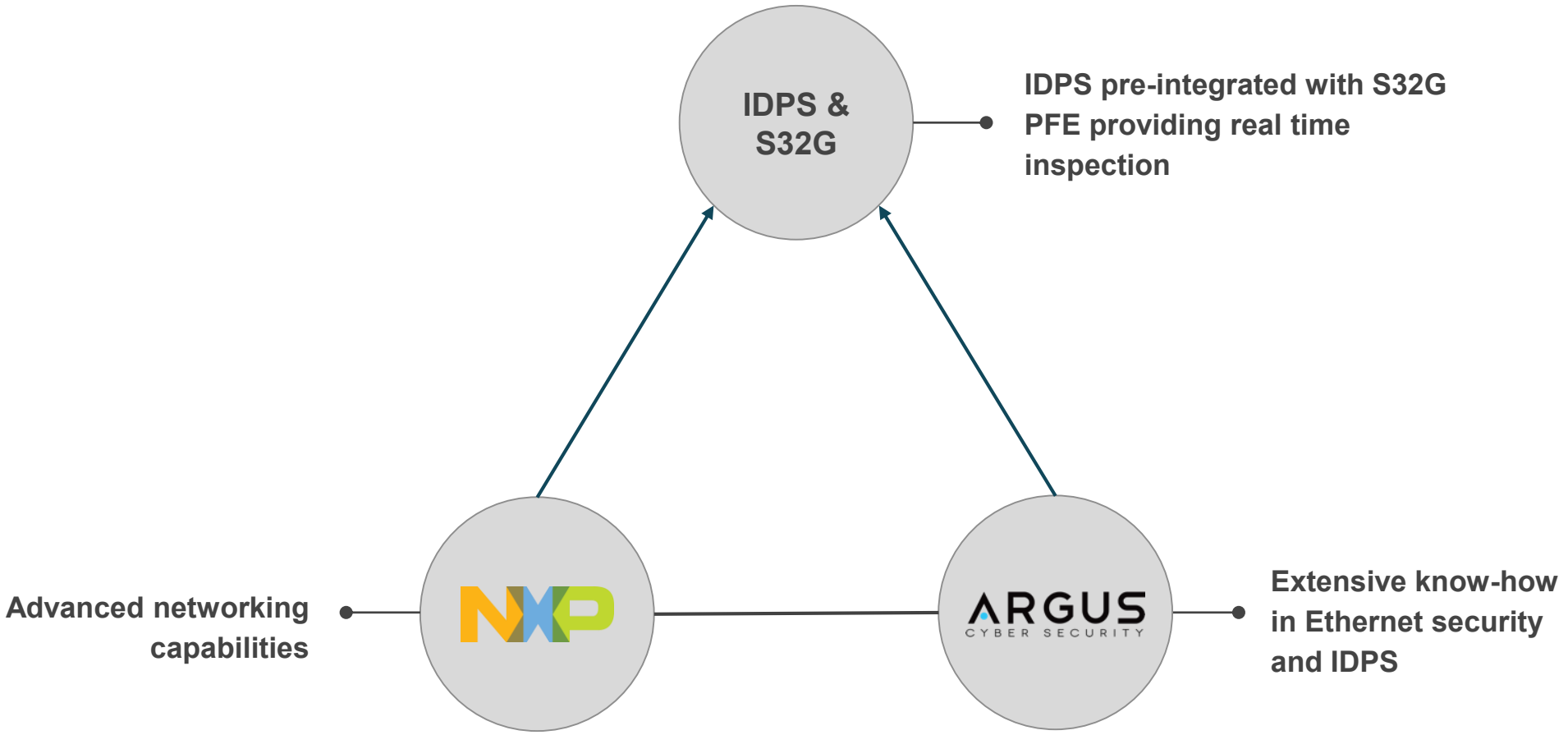
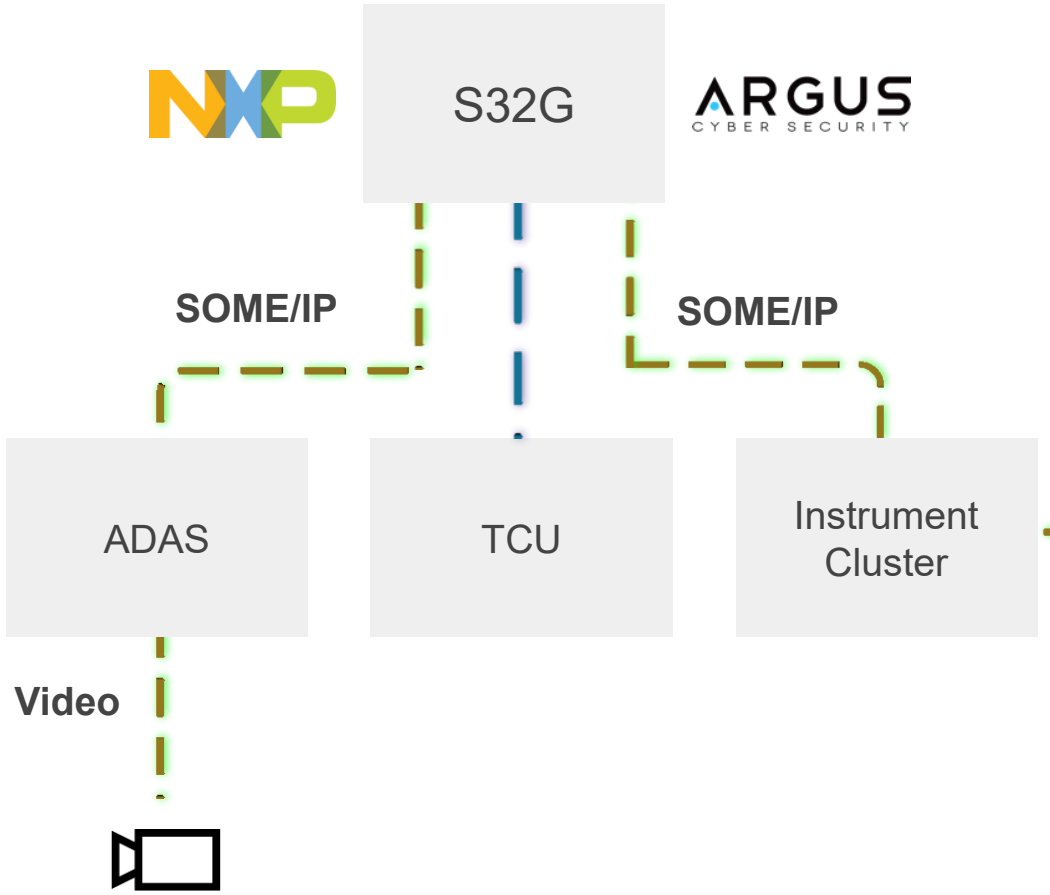
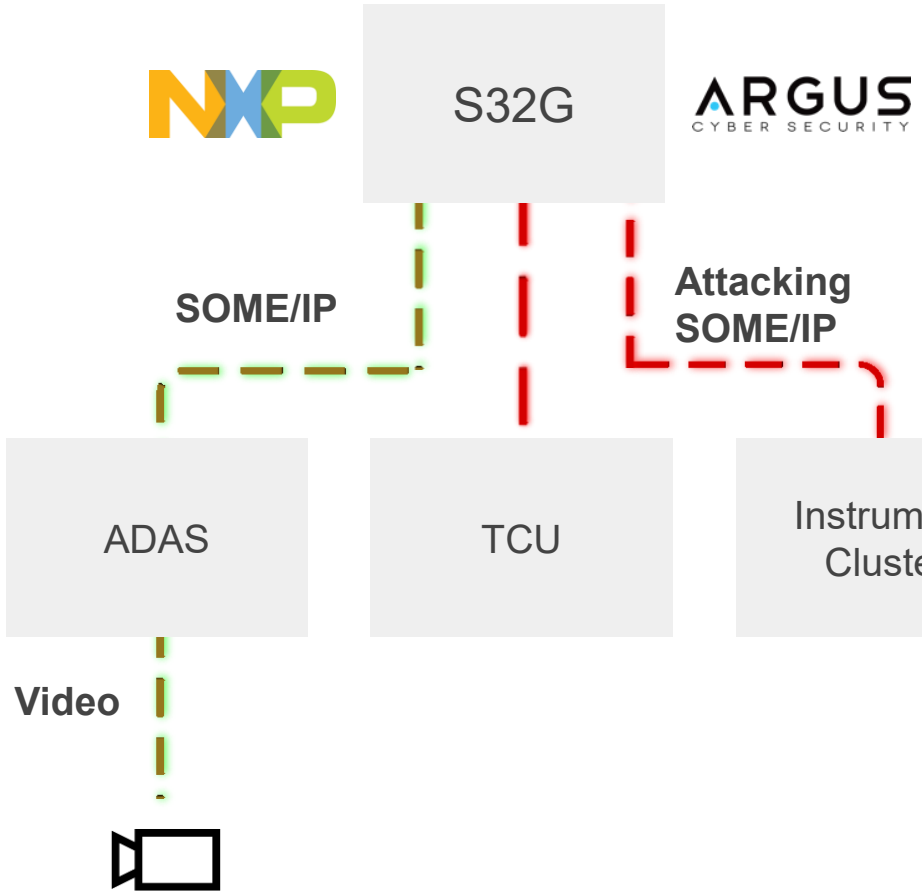
Argus Ethernet IDPS on S32G PFE





The demo setup has SOME/IP communication between the ECUs

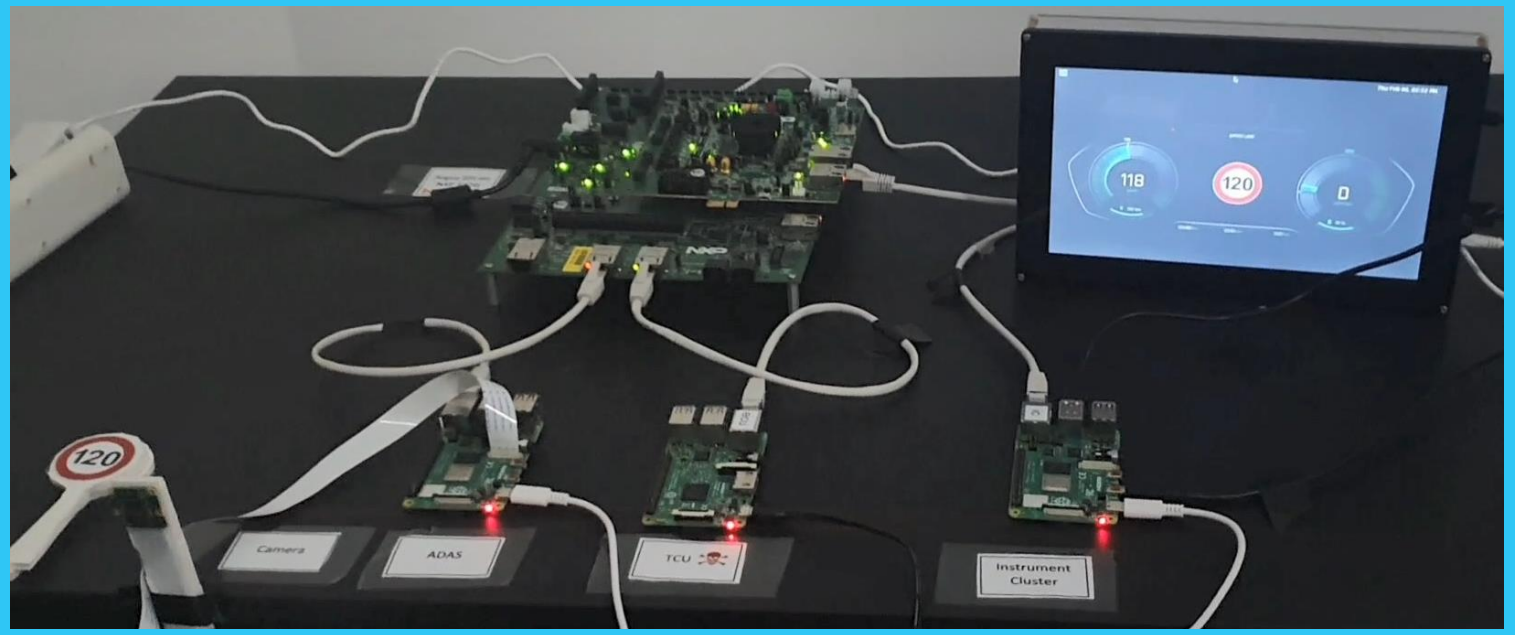
Instrument Cluster Screen



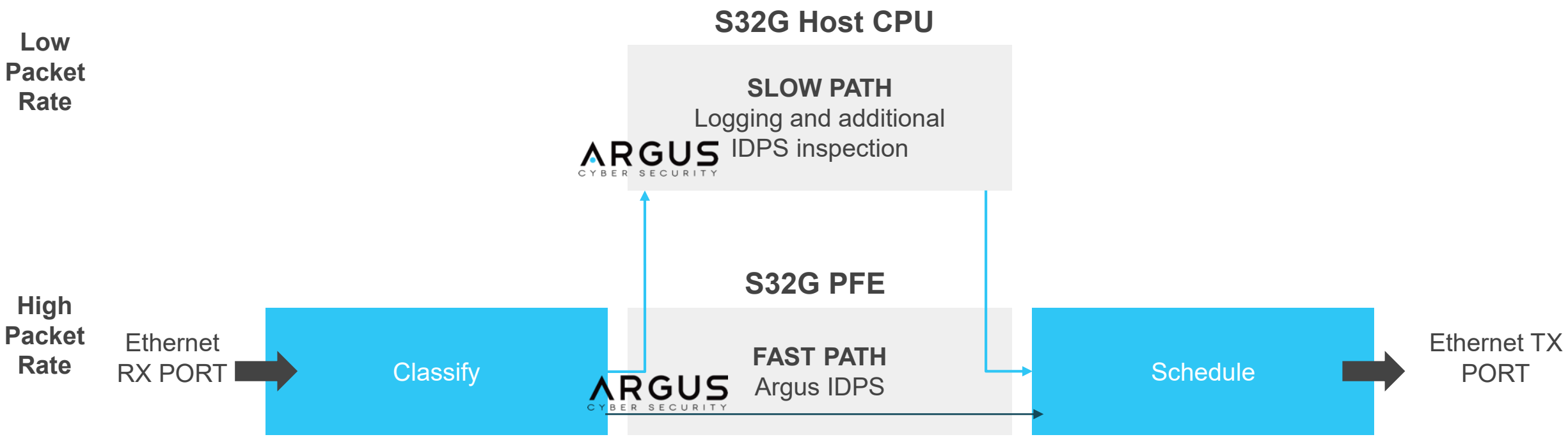
TCU is sending SOME/IP message with ADAS service ID - falsifying data

Instrument Cluster Screen

Demo



Argus Ethernet IDPS on S32G PFE



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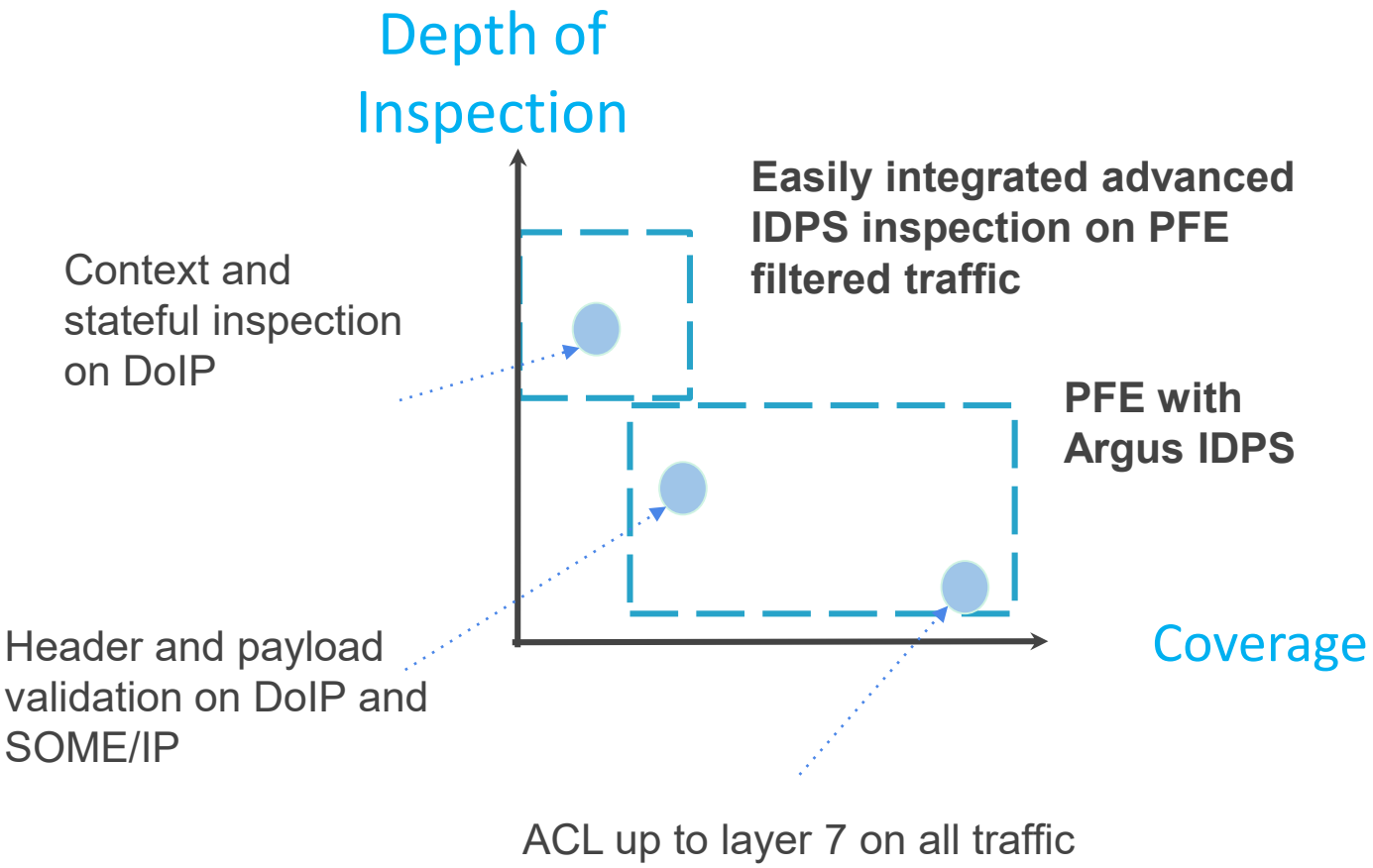
Optimizing the Performance with S32G



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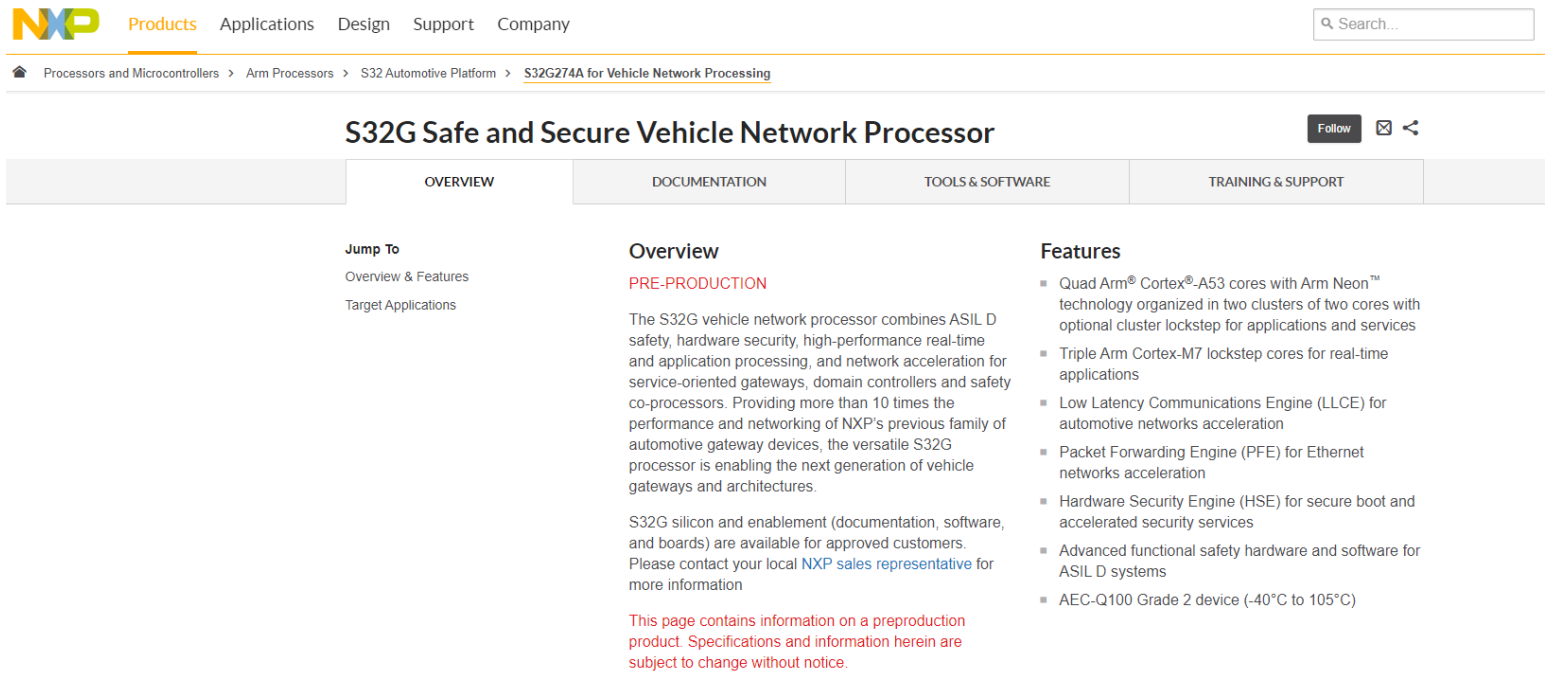
Summary: Argus Ethernet IDPS on NXP S32G

- **Implementing multiple lessons learned** from the joint Argus-NXP collaboration
- **Maximum security with minimum resources:** Taking full advantage of the Packet Forwarding Engine
- **Reduces integration risk and cost:** IDPS pre-integration
- **Real-time prevention in pre-defined cases:** Minimal latency with inspection close to routing and packet retrieval
- **Security events are logged for future analysis:** Alerts received by the host CPU

For More Information

- Contact Argus for more information on the Ethernet IDPS product: argus-sec.com/contact/
- Check nxp.com/s32g for more information about the S32G processor



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THANK YOU!

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