Next Generation Ethernet Hardware and New Driver Interface
Agenda

- **Introduction**
  - Current Hardware
  - New Hardware
  - Scalability
  - Measurement
  - Simulation
  - Multi Application Scenario
  - Upcoming Ethernet Interfaces
Introduction

Mode of operation GEN1 (VN5610)
Introduction

Mode of operation GEN2 (VN5610, VN5610A, VN5640)
Mode of operation GEN3 (VN5610, VN5610A, VN5640, VN5430, VN5620, etc.)
Introduction

Example network topology
Example network topology – Setup 1
Example network topology – Setup 2
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Current Hardware

Configuration 1

CANoe

ETH1
- DCU1
- ICL

ETH2
- DCU2
- RDR

Interface

Switch1

Switch2

HU

CAM

HP 1
HP 2
HP 3
HP 4
HP 5
HP 6
HP 7
HP 8
HP 9
HP 10
HP 11
HP 12
Agenda

Introduction
Current Hardware

New Hardware
Scalability
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Simulation
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Upcoming Ethernet Interfaces
New Hardware

Definitions

Network X
- TAP
- VP 1
- VP 2
- VP 3

Network Y
- DC
- VP 4
- VP 5

Physical Port
- PP 1
- PP 2
- PP 3
- PP 4
- PP 5
- PP 6
- PP 7
- PP 8
- PP 9
- PP 10
- PP 11
- PP 12

Virtual Port
- VP 1
- VP 2
- VP 3
- VP 4
- VP 5

Segment
- DC
- switch

Uplink

Tool
New Hardware

**TAP vs. Direct Connection**

**Synergies:**
- Connection between 2 Ports
- Link Transparency
  - Link Status
  - Sleep/Wakeup
- Low Latency
The Network Approach

CANoe / PC1
VecNet / Body

Network

Interface

VecNet / Body

Link Switch Link

PP 1 PP 2 PP 3 PP 4 PP 5 PP 6 PP 7 PP 8 PP 9 PP 10 PP 11 PP 12

Switch
DCU1 HU
New Hardware

The new Network Concept

Diagram showing the network concept with various components and interfaces including:
- CANoe / PC1
  - VecNet / Body
- CANoe / PC2
  - VecNet / Comfort
  - VecNet / Body

Links and switches connecting different components such as PP 1 to PP 12, DCU1, and HU.
New Hardware

Hardware Configuration

- Connect physical devices and define physical layer
- Define network
- Define segments
- Connect physical ports to segments
- Name physical ports
New Hardware

Configuration 2

VecNet

Tool

DCU1  ICL  DCU2  RDR  CAM

VecNet

DCU1  ICL  DCU2-SW1  CAM  RDR  DCU2-SW2

Switch

HU  PP 1  PP 2  PP 3  DCU1-SW  PP 4  PP 5  DCU2-SW1  PP 8  PP 9  PP 10  PP 11  PP 12

HU  Switch  DCU2
Introduction
Current Hardware
New Hardware

**Scalability**
Measurement
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Scalability

Physical ports (cascade)
Agenda

- Introduction
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- Scalability
- **Measurement**
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Example network topology – Setup 3

Measurement
What is a Link?

CANoe

Link

CAM  DCU2
What is a Link?

CANoe

Link

CAM

DCU2
Measurement

Link characteristics

- Link closed
- Today: MAC Bypass
- Application is able to listen
- Application is allowed to send
- Low latency
Link characteristics

- Link interrupted
- Ethernet frames are not transmitted automatically. Application is responsible to do so
- Today: Bypass open
- Higher latency
Using ports for measurement
Measurement

Using ports for measurement

<table>
<thead>
<tr>
<th>Time</th>
<th>Port</th>
<th>Src_MAC</th>
<th>Dst_MAC</th>
<th>Dir</th>
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<tbody>
<tr>
<td>1</td>
<td>CAM</td>
<td>CAM_Addr.</td>
<td>DCU2_Addr.</td>
<td>Rx</td>
</tr>
<tr>
<td>2</td>
<td>CAM</td>
<td>DCU2_Addr.</td>
<td>CAM_Addr.</td>
<td>Tx</td>
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Using ports for measurement

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<tr>
<td>1</td>
<td>CAM</td>
<td>CAM_Addr</td>
<td>IDC_Addr</td>
<td>Rx</td>
</tr>
<tr>
<td>1+x</td>
<td>DCU2-SW</td>
<td>CAM_Addr</td>
<td>IDC_Addr</td>
<td>Tx</td>
</tr>
<tr>
<td>2</td>
<td>DCU2-SW</td>
<td>IDC_Addr</td>
<td>CAM_Addr</td>
<td>Rx</td>
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<tr>
<td>2+x</td>
<td>CAM</td>
<td>IDC_Addr</td>
<td>CAM_Addr</td>
<td>Tx</td>
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</table>
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Measurement

- **Simulation**
  - Multi Application Scenario
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Example network topology – Setup 4

Simulation
Simulation

What do we see using port DCU1, ICL, HU?

Simulation Setup

Ports

<table>
<thead>
<tr>
<th>Time</th>
<th>Port</th>
<th>Src_MAC</th>
<th>Dst_MAC</th>
<th>Dir</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>DCU1</td>
<td>DCU1</td>
<td>HU</td>
<td>Rx</td>
</tr>
<tr>
<td>1+x</td>
<td>HU</td>
<td>DCU1</td>
<td>HU</td>
<td>Rx</td>
</tr>
<tr>
<td>2</td>
<td>ICL</td>
<td>ICL</td>
<td>HU</td>
<td>Rx</td>
</tr>
<tr>
<td>2+x</td>
<td>HU</td>
<td>ICL</td>
<td>HU</td>
<td>Rx</td>
</tr>
<tr>
<td>3</td>
<td>HU</td>
<td>HU</td>
<td>DCU1</td>
<td>Rx</td>
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<tr>
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<td>DCU1</td>
<td>HU</td>
<td>DCU1</td>
<td>Tx</td>
</tr>
</tbody>
</table>

Switch

1. DCU1 sends to HU
2. ICL sends to HU
3. HU sends to DCU1
What do we see using port DCU1, ICL, HU?

Simulation Setup

**DCU1**

1. DST=HU

2. DST=DCU1

**HU**

3. DST=HU

Ports

<table>
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<td>DCU1</td>
<td>DCU1</td>
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<td>Rx</td>
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<td>HU</td>
<td>DCU1</td>
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</tbody>
</table>

Trace

1. DCU1 sends to HU
2. ICL sends to HU
3. HU sends to DCU1
Agenda

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- **Multi Application Scenario**
  Upcoming Ethernet Interfaces
Multi Application Scenario

CANape Analysis Scenario

CANoe

Simulation Setup
DCU1

Ports
DCU1
ICL

CANape

Monitor
DCU1

Interface

Switch

HW.CH1
HW.CH2
ICL
HW.CH6
HU
HW.CH8
HW.CH9
HW.CH10
HW.CH11
HW.CH12

ICL
HU
Multi Application Scenario

CANape Diagnostic Scenario

Simulation Setup
DCU1

Ports
DCU1
ICL

XCP Device 1
XCP

XCP Device 2
XCP

Switch

ICL
HU

HW_CH1
HW_CH2
HW_CH3
HW_CH4
HW_CH5
HW_CH6
HW_CH7
HW_CH8
HW_CH9
HW_CH10
HW_CH11
HW_CH12
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Introduction
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- Upcoming Ethernet Interfaces
Upcoming Ethernet Interfaces

VN5620 – Ethernet/CAN Interface

- Ports/Channels:
  - 4 x 100 BASE-T1/ 1000BASE-T1
  - 2 x CAN-FD
  - 1 x digital IO

- Host connection
  - USB 3.0
  - Ethernet (100BASE-TX/1000BASE-T)

- Powering
  - USB-C (3A)
  - External Power

- Synchronization
  - Vector HW-Sync line
  - IEEE1588*

*supported with a later SW release
Upcoming Ethernet Interfaces

VN5430 – Ethernet Interface

- **Ports Channels**
  - 6 x 100 BASE-T1/ 1000BASE-T1

- **Host connection**
  - Ethernet (100BASE-TX/1000BASE-T)

- **Powering**
  - External Power

- **Synchronization**
  - Vector HW-Sync line
  - IEEE1588*

*supported with a later SW release
For more information about Vector and our products please visit

www.vector.com

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