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# 1 Introduction

This technical report provides information about the Features of the AUTOSAR Standard. An AUTOSAR Feature is a characteristic of the AUTOSAR Standard to satisfy a user objective. This document represents infomation of the AUTOSAR Features and its Branches of each Feature, presented in a graph (AUTOSAR Feature Graph or in short: Feature Graph) similar to a tree. The Feature Graph release in R24-11 is preliminary and will be developed further in the upcoming release

## 1.1 Objectives

As a goal, the sum of all AUTOSAR Features shall cover the whole AUTOSAR Standard. That means vice versa, everything in the AUTOSAR Standard shall be covered by an AUTOSAR Feature.

## 1.2 Scope

The AUTOSAR Features cover a wide range of functionalities, from hardware abstraction and communication to safety, security, and system diagnostics, ensuring that automotive software is interoperable, reliable and future-proof.

## 1.3 Motivation (UseCase)

In terms of use cases this means for example:

- As a user of the AUTOSAR Standard, I want to select a consistent subset of AUTOSAR documents based on short and expressive terms.
- As an AUTOSAR developer (doc-owner), I want to analyze dependencies to other documents, and I also want to describe dependencies of my own document to other documents.
- As a product manager, I want to discuss and plan implementations based on standardized Features.
- As a concept owner, I want to identify the integrated Features and the respective documents in the Standard.

Example for Feature Branch:

Communication >Network Technology >CAN >(CAN 2.0 , CAN FD, CAN XL)

as a recommended pattern: If the user decide to select CAN, they automatically would get the Standard documents for CAN 2.0 and CAN FD. Optionally they can select the CAN XL which automatically selects Ethernet. Considering the resource consumption

of the CAN XL-Feature and resulting additional costs of a product it makes sense to decide, if the CAN XL-Feature is required or not. Hardware extensions must be foreseen as well. It does not make sense to select that Feature for a single ECU. Also, the respective communication partners should have selected that Feature as well.

It is helpful for a user to select this function under a single term and not to select several SWS elements, which always carries a high risk of forgetting or overlooking something.

# 2 Definition of acronyms and abbreviations

## 2.1 Acronyms and abbreviations

The table below contains all acronyms, abbreviations or initialisms that are component-specific and not available in the AUTOSAR glossary [1].

| Acronym/ Abbreviation | Description |
|---|---|
| **A** | |
| ADAS | Advanced Driving Assistance Systems |
| AIF | Application InterFace |
| **B** | |
| BASE-T | Ethernet standard for local area networks with twisted pair cabling |
| **C** | |
| CAN FD | Controller Area Network Flexible Data-Rate |
| CAN NM | Controller Area Network Network Management |
| CAN TP | Controller Area Network Transport Protocol |
| CAN XL | Controller Area Network longer data frames and higher data rates |
| CXPI | Clock Extension Peripheral Interface |
| **E** | |
| ETH | Ethernet |
| **G** | |
| GPIO | General Purpose Input/Output |
| **H** | |
| HW Support IO | Hardware Support Input Output |
| **I** | |
| IDS | Intrusion Detection System |
| IOC | Inter-Operating System Communication |
| IP v4 | Internet Protocol version 4 |
| IP v6 | Internet Protocol version 6 |
| IPDU | Interaction Layer Protocol Data Unit |
| IPSec | Internet Protocol Security |
| **M** | |
| MACsec | Media Access Control Security |
| **N** | |
| NDP | Neighbor Discovery Protocol |
| **O** | |
| OBDII | On-Board Diagnostics II |
| **S** | |
| SCREIAM | Service Communication Registration, Interaction, and Application Management |
| SecOC | Secure Onboard Communication |
| **V** | |
| VMCI | Vehicle Motion Control Interface |
| VSS | Vehicle Signal Specification |
| **W** | |
| WETH | Wake-Up-Ethernet |

**Table 2.1: Acronyms and Abbreviations**

The table below contains all document-independant acronyms or abbreviations that are defined in the AUTOSAR glossary [1].

| Acronym/ Abbreviation | Description |
|---|---|
| - | - |

**Table 2.2: Acronyms and Abbreviations used from AUTOSAR Glossary**

# 3 Related Documentation

[1] Glossary
AUTOSAR_FO_TR_Glossary

[2] AUTOSAR Feature Model
AUTOSAR_FO_MOD_Features

[3] AUTOSAR Feature Model Exchange Format
AUTOSAR_FO_TPS_FeatureModelExchangeFormat

# 4 Features

This chapter descibes the AUTOSAR Features and its Branches, presented in a Feature Graph. The complete Feature Graph is published separately in the Feature Model documentation [2]. The Feature Graph complies to the AUTOSAR Feature Model Exchange Format [3].

To read the figures in this document properly, please see the legend below:

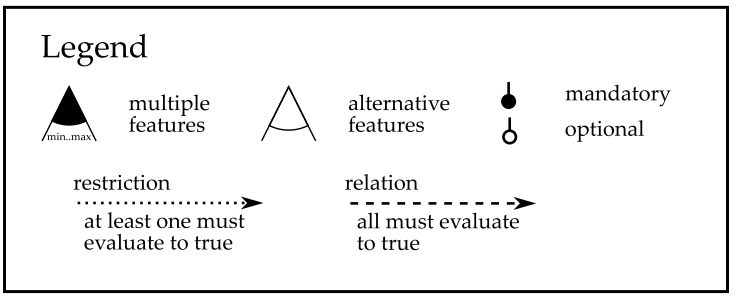


**Figure 4.1: Legend for Feature Graph figures**

The following chapters present the AUTOSAR Features level by level, starting with root level 1. The Features are ordered alphabetically. Each Feature begins with its name, a graphical representation of its children, followed by a table of the Feature's attributes.

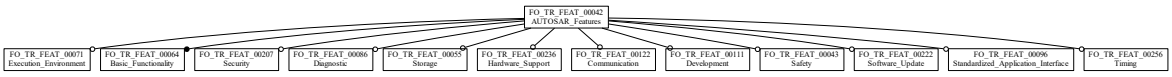


**Figure 4.2: AR_Features**

## 4.1 Level 1

### 4.1.1 [FO_TR_FEAT_00064] Basic_Functionality

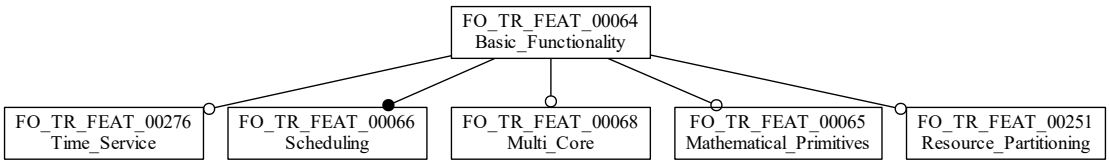


**Figure 4.3: Feature FO_TR_FEAT_00064**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00064 |
| ***Long Name:*** | Basic_Functionality |
| ***Obligation:*** | Mandatory |
| ***Description:*** | The Basic Functionality represents the essential services and capabilities as a foundation for developing and operating automotive software applications. |
| ***Parent Feature:*** | [FO_TR_FEAT_00042] AUTOSAR_Features |
| ***Sub Features:*** | • [FO_TR_FEAT_00065] Mathematical_Primitives<br>• [FO_TR_FEAT_00066] Scheduling<br>• [FO_TR_FEAT_00068] Multi_Core<br>• [FO_TR_FEAT_00276] Time_Service<br>• [FO_TR_FEAT_00251] Resource_Partitioning |

**Table 4.1: Details FO_TR_FEAT_00064**

### 4.1.2 [FO_TR_FEAT_00122] Communication

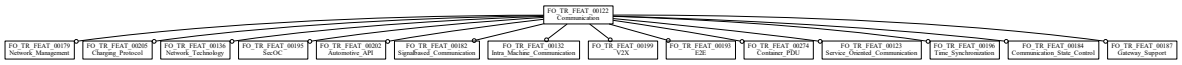


**Figure 4.4: Feature FO_TR_FEAT_00122**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00122 |
| ***Long Name:*** | Communication |
| ***Obligation:*** | Optional |
| ***Description:*** | This Feature describes mechanisms and protocols that enable data exchange between different software components, Electronic Control Units (ECUs), and external systems within an automotive environment. |
| ***Parent Feature:*** | [FO_TR_FEAT_00042] AUTOSAR_Features |
| ***Sub Features:*** | • [FO_TR_FEAT_00123] Service_Oriented_Communication<br>• [FO_TR_FEAT_00132] Intra_Machine_Communication<br>• [FO_TR_FEAT_00136] Network_Technology<br>• [FO_TR_FEAT_00179] Network_Management<br>• [FO_TR_FEAT_00182] Signalbased_Communication<br>• [FO_TR_FEAT_00184] Communication_State_Control<br>• [FO_TR_FEAT_00274] Container_PDU<br>• [FO_TR_FEAT_00187] Gateway_Support<br>• [FO_TR_FEAT_00193] E2E<br>• [FO_TR_FEAT_00195] SecOC<br>• [FO_TR_FEAT_00196] Time_Synchronization<br>• [FO_TR_FEAT_00199] V2X<br>• [FO_TR_FEAT_00202] Automotive_API<br>• [FO_TR_FEAT_00205] Charging_Protocol |

**Table 4.2: Details FO_TR_FEAT_00122**

### 4.1.3 [FO_TR_FEAT_00111] Development

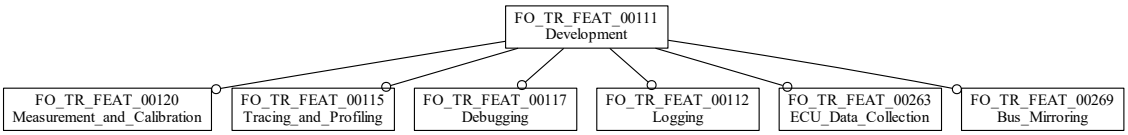


**Figure 4.5: Feature FO_TR_FEAT_00111**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00111 |
| ***Long Name:*** | Development |
| ***Obligation:*** | Optional |
| ***Description:*** | This Feature facilitates and enhances the software development process for automotive systems. |
| ***Parent Feature:*** | [FO_TR_FEAT_00042] AUTOSAR_Features |
| ***Sub Features:*** | • [FO_TR_FEAT_00112] Logging<br>• [FO_TR_FEAT_00115] Tracing_and_Profiling<br>• [FO_TR_FEAT_00117] Debugging<br>• [FO_TR_FEAT_00120] Measurement_and_Calibration<br>• [FO_TR_FEAT_00269] Bus_Mirroring<br>• [FO_TR_FEAT_00263] ECU_Data_Collection |

**Table 4.3: Details FO_TR_FEAT_00111**

### 4.1.4 [FO_TR_FEAT_00086] Diagnostic

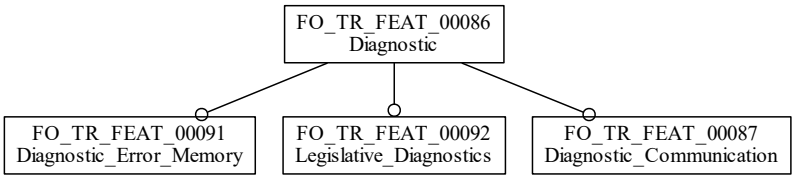


**Figure 4.6: Feature FO_TR_FEAT_00086**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00086 |
| ***Long Name:*** | Diagnostic |
| ***Obligation:*** | Optional |
| ***Description:*** | This Feature ensures that diagnostic information is consistently represented,that it allows for effective maintenance and troubleshooting, and that it complies with legislative requirements. |
| ***Applies to:*** | AP, CP |
| ***Parent Feature:*** | [FO_TR_FEAT_00042] AUTOSAR_Features |

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|---|---|
| ***Sub Features:*** | • [FO_TR_FEAT_00087] Diagnostic_Communication<br>• [FO_TR_FEAT_00091] Diagnostic_Error_Memory<br>• [FO_TR_FEAT_00092] Legislative_Diagnostics |

**Table 4.4: Details FO_TR_FEAT_00086**

### 4.1.5 [FO_TR_FEAT_00071] Execution_Environment

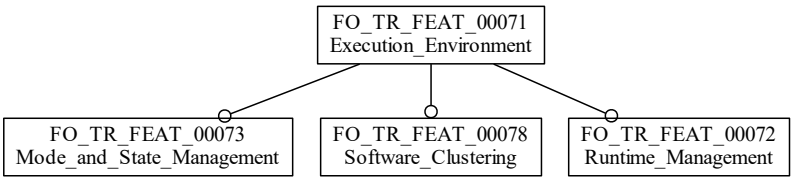


**Figure 4.7: Feature FO_TR_FEAT_00071**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00071 |
| ***Long Name:*** | Execution_Environment |
| ***Obligation:*** | Optional |
| ***Description:*** | The Execution Environment describes the underlying infrastructure and support mechanisms that enable the execution of automotive software components on Electronic Control Units (ECUs). |
| ***Parent Feature:*** | [FO_TR_FEAT_00042] AUTOSAR_Features |
| ***Sub Features:*** | • [FO_TR_FEAT_00072] Runtime_Management<br>• [FO_TR_FEAT_00073] Mode_and_State_Management<br>• [FO_TR_FEAT_00078] Software_Clustering |

**Table 4.5: Details FO_TR_FEAT_00071**

### 4.1.6 [FO_TR_FEAT_00236] Hardware_Support

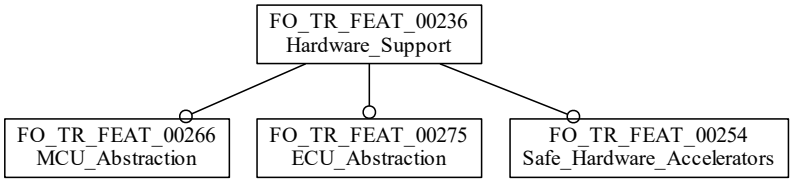


**Figure 4.8: Feature FO_TR_FEAT_00236**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00236 |
| ***Long Name:*** | Hardware_Support |
| ***Obligation:*** | Optional |
| ***Description:*** | The Hardware Support in AUTOSAR refers to the Feature that facilitates interaction between the software applications and the vehicle's hardware components. |
| ***Parent Feature:*** | [FO_TR_FEAT_00042] AUTOSAR_Features |
| ***Sub Features:*** | • [FO_TR_FEAT_00254] Safe_Hardware_Accelerators<br>• [FO_TR_FEAT_00266] MCU_Abstraction<br>• [FO_TR_FEAT_00275] ECU_Abstraction |

**Table 4.6: Details FO_TR_FEAT_00236**

### 4.1.7 [FO_TR_FEAT_00043] Safety

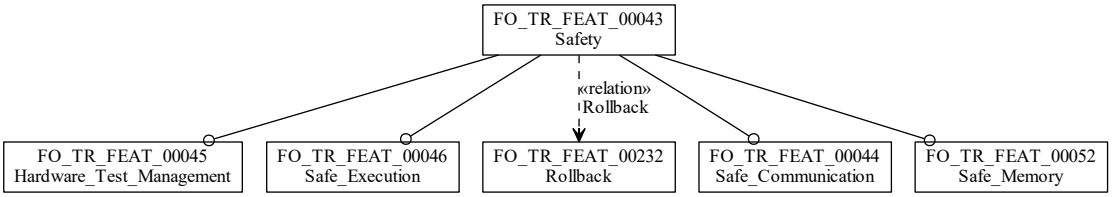


**Figure 4.9: Feature FO_TR_FEAT_00043**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00043 |
| ***Long Name:*** | Safety |
| ***Obligation:*** | Optional |
| ***Description:*** | Safety according to ISO26262. The underlying structure follows ISO26262-6:2018. |
| ***Applies to:*** | FO |
| ***Relations:*** | [FO_TR_FEAT_00232] Rollback |
| ***Parent Feature:*** | [FO_TR_FEAT_00042] AUTOSAR_Features |
| ***Sub Features:*** | • [FO_TR_FEAT_00044] Safe_Communication<br>• [FO_TR_FEAT_00045] Hardware_Test_Management<br>• [FO_TR_FEAT_00046] Safe_Execution<br>• [FO_TR_FEAT_00052] Safe_Memory |

**Table 4.7: Details FO_TR_FEAT_00043**

### 4.1.8 [FO_TR_FEAT_00207] Security

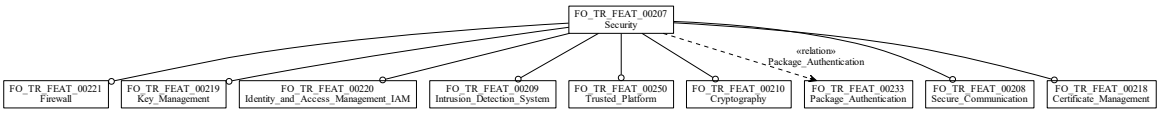


**Figure 4.10: Feature FO_TR_FEAT_00207**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00207 |
| ***Long Name:*** | Security |
| ***Obligation:*** | Optional |
| ***Description:*** | The Security Feature encompasses various mechanisms and protocols designed to protect the ECU's sensible resources (e.g. cryptographic keys), the vehicle's network and its communication from unauthorized access. |
| ***Relations:*** | [FO_TR_FEAT_00233] Package_Authentication |
| ***Parent Feature:*** | [FO_TR_FEAT_00042] AUTOSAR_Features |
| ***Sub Features:*** | • [FO_TR_FEAT_00208] Secure_Communication<br>• [FO_TR_FEAT_00209] Intrusion_Detection_System<br>• [FO_TR_FEAT_00210] Cryptography<br>• [FO_TR_FEAT_00218] Certificate_Management<br>• [FO_TR_FEAT_00219] Key_Management<br>• [FO_TR_FEAT_00220] Identity_and_Access_Management_IAM<br>• [FO_TR_FEAT_00221] Firewall<br>• [FO_TR_FEAT_00250] Trusted_Platform |

**Table 4.8: Details FO_TR_FEAT_00207**

### 4.1.9 [FO_TR_FEAT_00222] Software_Update

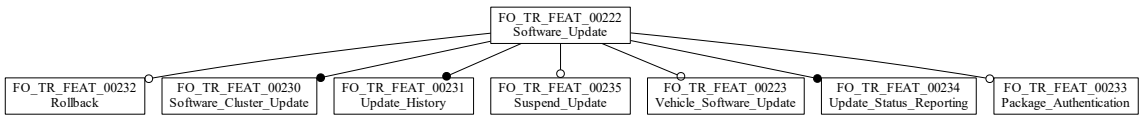


**Figure 4.11: Feature FO_TR_FEAT_00222**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00222 |
| ***Long Name:*** | Software_Update |
| ***Obligation:*** | Optional |
| ***Description:*** | The Software Update in AUTOSAR ensures that vehicle software remains up-to-date and functional through a managed process of updates |
| ***Parent Feature:*** | [FO_TR_FEAT_00042] AUTOSAR_Features |

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|---|---|
| ***Sub Features:*** | • [FO_TR_FEAT_00223] Vehicle_Software_Update<br>• [FO_TR_FEAT_00230] Software_Cluster_Update<br>• [FO_TR_FEAT_00231] Update_History<br>• [FO_TR_FEAT_00232] Rollback<br>• [FO_TR_FEAT_00233] Package_Authentication<br>• [FO_TR_FEAT_00234] Update_Status_Reporting<br>• [FO_TR_FEAT_00235] Suspend_Update |

**Table 4.9: Details FO_TR_FEAT_00222**

### 4.1.10 [FO_TR_FEAT_00096] Standardized_Application_Interface

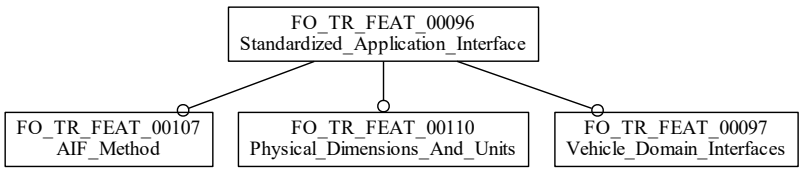


**Figure 4.12: Feature FO_TR_FEAT_00096**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00096 |
| ***Long Name:*** | Standardized_Application_Interface |
| ***Obligation:*** | Optional |
| ***Description:*** | This Feature contains definitions for commonly agreed interface definitions to ensure interoperability between applications. |
| ***Applies to:*** | AP, CP |
| ***Parent Feature:*** | [FO_TR_FEAT_00042] AUTOSAR_Features |
| ***Sub Features:*** | • [FO_TR_FEAT_00097] Vehicle_Domain_Interfaces<br>• [FO_TR_FEAT_00107] AIF_Method<br>• [FO_TR_FEAT_00110] Physical_Dimensions_And_Units |

**Table 4.10: Details FO_TR_FEAT_00096**

### 4.1.11 [FO_TR_FEAT_00055] Storage

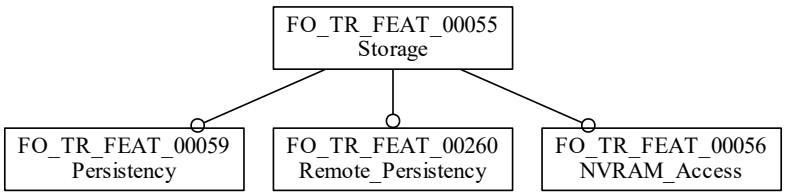


**Figure 4.13: Feature FO_TR_FEAT_00055**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00055 |
| ***Long Name:*** | Storage |
| ***Obligation:*** | Optional |
| ***Description:*** | The Feature Storage ensures the reliable and efficient management of data within automotive systems, which allows preservation of critical information even in the event of power loss. |
| ***Parent Feature:*** | [FO_TR_FEAT_00042] AUTOSAR_Features |
| ***Sub Features:*** | • [FO_TR_FEAT_00056] NVRAM_Access<br>• [FO_TR_FEAT_00059] Persistency<br>• [FO_TR_FEAT_00260] Remote_Persistency |

**Table 4.11: Details FO_TR_FEAT_00055**

### 4.1.12 [FO_TR_FEAT_00256] Timing

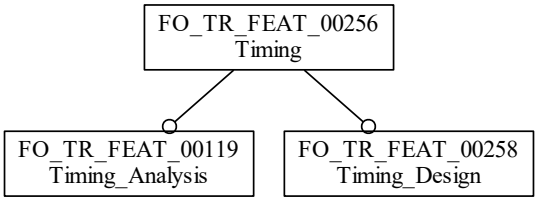


**Figure 4.14: Feature FO_TR_FEAT_00256**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00256 |
| ***Long Name:*** | Timing |
| ***Obligation:*** | Optional |
| ***Description:*** | Captures temporal aspects such as durations and coordination relevant to the system's resource-constrained behavior. |
| ***Applies to:*** | AP, CP |

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|---|---|
| ***Introduced:*** | R25-11 |
| ***Parent Feature:*** | [FO_TR_FEAT_00042] AUTOSAR_Features |
| ***Sub Features:*** | • [FO_TR_FEAT_00258] Timing_Design<br>• [FO_TR_FEAT_00119] Timing_Analysis |

**Table 4.12: Details FO_TR_FEAT_00256**

## 4.2 Level 2

### 4.2.1 [FO_TR_FEAT_00107] AIF_Method

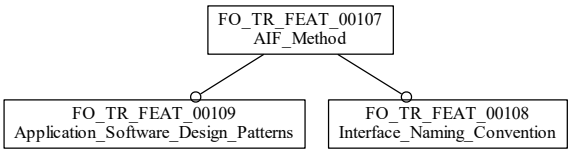


**Figure 4.15: Feature FO_TR_FEAT_00107**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00107 |
| ***Long Name:*** | AIF_Method |
| ***Obligation:*** | Optional |
| ***Description:*** | This Feature describes a collection of methods for Interfaces between software applications and components within an automotive system. |
| ***Applies to:*** | AP, CP |
| ***Parent Feature:*** | [FO_TR_FEAT_00096] Standardized_Application_Interface |
| ***Sub Features:*** | • [FO_TR_FEAT_00108] Interface_Naming_Convention<br>• [FO_TR_FEAT_00109] Application_Software_Design_Patterns |

**Table 4.13: Details FO_TR_FEAT_00107**

### 4.2.2 [FO_TR_FEAT_00202] Automotive_API

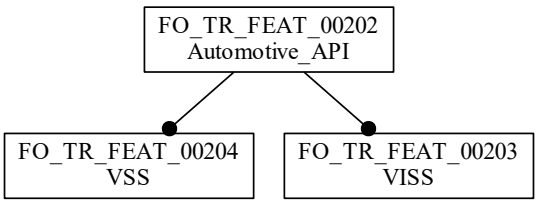


**Figure 4.16: Feature FO_TR_FEAT_00202**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00202 |
| ***Long Name:*** | Automotive_API |
| ***Obligation:*** | Optional |
| ***Description:*** | The Automotive API is an interface that allows data-centric communication with the vehicle. It defines how other systems can access selected vehicle data securely and independently of the in-vehicle representation using a standardized interface across vehicle types and manufacturers. |
| ***Parent Feature:*** | [FO_TR_FEAT_00122] Communication |
| ***Sub Features:*** | • [FO_TR_FEAT_00203] VISS<br>• [FO_TR_FEAT_00204] VSS |

**Table 4.14: Details FO_TR_FEAT_00202**

### 4.2.3 [FO_TR_FEAT_00269] Bus_Mirroring

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00269 |
| ***Long Name:*** | Bus_Mirroring |
| ***Obligation:*** | Optional |
| ***Lifecycle Status:*** | Valid |
| ***Description:*** | This Feature enables forwarding of communication on internal buses towards diagnostic connectors, also through intermediate gateways. Communication is either forwarded as-is, possibly changing IDs on the fly, or packed into a protocol. It is used to "debug" networks by using the Bus_Mirror Feature. |
| ***Applies to:*** | CP |
| ***Introduced:*** | R25-11 |
| ***Relations:*** | [FO_TR_FEAT_00187] Gateway_Support |
| ***Parent Feature:*** | [FO_TR_FEAT_00111] Development |

**Table 4.15: Details FO_TR_FEAT_00269**

### 4.2.4 [FO_TR_FEAT_00218] Certificate_Management

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00218 |
| ***Long Name:*** | Certificate_Management |
| ***Obligation:*** | Optional |
| ***Description:*** | The Certificate Management involves the processes and technologies used to manage digital certificates. |
| ***Parent Feature:*** | [FO_TR_FEAT_00207] Security |

**Table 4.16: Details FO_TR_FEAT_00218**

### 4.2.5 [FO_TR_FEAT_00205] Charging_Protocol

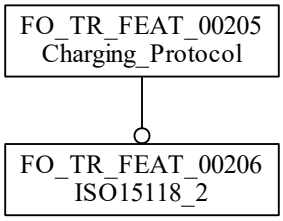


**Figure 4.17: Feature FO_TR_FEAT_00205**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00205 |
| ***Long Name:*** | Charging_Protocol |
| ***Obligation:*** | Optional |
| ***Description:*** | This Feature manages the charging protocol of electric vehicles. |
| ***Applies to:*** | CP |
| ***Parent Feature:*** | [FO_TR_FEAT_00122] Communication |
| ***Sub Features:*** | [FO_TR_FEAT_00206] ISO15118_2 |

**Table 4.17: Details FO_TR_FEAT_00205**

### 4.2.6 [FO_TR_FEAT_00184] Communication_State_Control

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00184 |
| ***Long Name:*** | Communication_State_Control |
| ***Obligation:*** | Optional |
| ***Description:*** | The Communication State Control refers to the mechanisms and protocols used to manage the communication states of the network and individual communication channels or protocols. |
| ***Parent Feature:*** | [FO_TR_FEAT_00122] Communication |

**Table 4.18: Details FO_TR_FEAT_00184**

### 4.2.7 [FO_TR_FEAT_00274] Container_PDU

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00274 |
| ***Long Name:*** | Container_PDU |
| ***Obligation:*** | Optional |
| ***Description:*** | The Container PDU (Protocol Data Unit) refers to a data structure used to encapsulate multiple individual PDUs into a single container for transmission. |

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|---|---|
| ***Parent Feature:*** | [FO_TR_FEAT_00122] Communication |

**Table 4.19: Details FO_TR_FEAT_00274**

### 4.2.8 [FO_TR_FEAT_00210] Cryptography

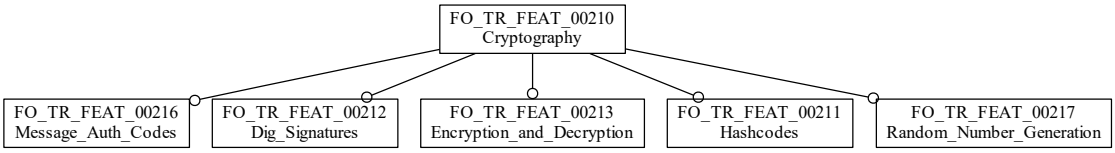


**Figure 4.18: Feature FO_TR_FEAT_00210**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00210 |
| ***Long Name:*** | Cryptography |
| ***Obligation:*** | Optional |
| ***Description:*** | The Cryptography in AUTOSAR refers to the techniques and methods used to secure data communication and storage. |
| ***Parent Feature:*** | [FO_TR_FEAT_00207] Security |
| ***Sub Features:*** | • [FO_TR_FEAT_00211] Hashcodes<br>• [FO_TR_FEAT_00212] Dig_Signatures<br>• [FO_TR_FEAT_00213] Encryption_and_Decryption<br>• [FO_TR_FEAT_00216] Message_Auth_Codes<br>• [FO_TR_FEAT_00217] Random_Number_Generation |

**Table 4.20: Details FO_TR_FEAT_00210**

### 4.2.9 [FO_TR_FEAT_00117] Debugging

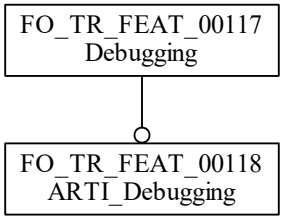


**Figure 4.19: Feature FO_TR_FEAT_00117**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00117 |
| ***Long Name:*** | Debugging |
| ***Obligation:*** | Optional |
| ***Description:*** | The Debugging in the AUTOSAR context refers to the process of identifying, analyzing, and resolving defects or issues within automotive software systems. |
| ***Parent Feature:*** | [FO_TR_FEAT_00111] Development |
| ***Sub Features:*** | [FO_TR_FEAT_00118] ARTI_Debugging |

**Table 4.21: Details FO_TR_FEAT_00117**

### 4.2.10 [FO_TR_FEAT_00087] Diagnostic_Communication

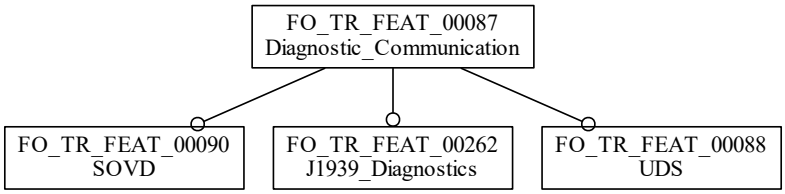


**Figure 4.20: Feature FO_TR_FEAT_00087**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00087 |
| ***Long Name:*** | Diagnostic_Communication |
| ***Obligation:*** | Optional |
| ***Description:*** | The Diagnostic_Communication describes the communication between Diagnostics clients and servers according ISO-14229. |
| ***Applies to:*** | CP, AP |
| ***Parent Feature:*** | [FO_TR_FEAT_00086] Diagnostic |
| ***Sub Features:*** | • [FO_TR_FEAT_00088] UDS<br>• [FO_TR_FEAT_00090] SOVD<br>• [FO_TR_FEAT_00262] J1939_Diagnostics |

**Table 4.22: Details FO_TR_FEAT_00087**

### 4.2.11 [FO_TR_FEAT_00091] Diagnostic_Error_Memory

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00091 |
| ***Long Name:*** | Diagnostic_Error_Memory |
| ***Obligation:*** | Optional |

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|---|---|
| ***Description:*** | This Feature ensures that fault information is recorded accurately and that it can be accessed for diagnostics and repairs by managing the storage and retrieval of Diagnostic Trouble Codes (DTCs) and error information within the vehicle's ECUs. |
| ***Applies to:*** | CP, AP |
| ***Parent Feature:*** | [FO_TR_FEAT_00086] Diagnostic |

**Table 4.23: Details FO_TR_FEAT_00091**

### 4.2.12 [FO_TR_FEAT_00193] E2E

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00193 |
| ***Long Name:*** | E2E |
| ***Obligation:*** | Optional |
| ***Description:*** | The E2E (End-to-End) Protection is a set of mechanisms and protocols designed to detect communication faults in intra vehicle comunication and to return the results of the checks. |
| ***Restrictions:*** | • [FO_TR_FEAT_00182] Signalbased_Communication<br>• [FO_TR_FEAT_00127] SOME_IP<br>• [FO_TR_FEAT_00124] DDS |
| ***Relations:*** | [FO_TR_FEAT_00246] CRC_Support |
| ***Parent Feature:*** | [FO_TR_FEAT_00122] Communication |

**Table 4.24: Details FO_TR_FEAT_00193**

### 4.2.13 [FO_TR_FEAT_00275] ECU_Abstraction

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00275 |
| ***Long Name:*** | ECU_Abstraction |
| ***Obligation:*** | Optional |
| ***Description:*** | ECU Abstraction abstracts the hardware of an ECU. It abstracts the ECU hardware layout , MCU and connected devices to the MCU. |
| ***Applies to:*** | CP |
| ***Parent Feature:*** | [FO_TR_FEAT_00236] Hardware_Support |

**Table 4.25: Details FO_TR_FEAT_00275**

### 4.2.14 [FO_TR_FEAT_00263] ECU_Data_Collection

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00263 |
| ***Long Name:*** | ECU_Data_Collection |
| ***Obligation:*** | Optional |
| ***Description:*** | The feature allows capturing and recording of ECU internal data during operation. |

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| | |
|---|---|
| ***Applies to:*** | CP |
| ***Introduced:*** | R25-11 |
| ***Parent Feature:*** | [FO_TR_FEAT_00111] Development |

**Table 4.26: Details FO_TR_FEAT_00263**

### 4.2.15 [FO_TR_FEAT_00221] Firewall

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00221 |
| ***Long Name:*** | Firewall |
| ***Obligation:*** | Optional |
| ***Description:*** | The Firewall is a security system that monitors and controls incoming and outgoing network traffic based on predetermined security rules. |
| ***Parent Feature:*** | [FO_TR_FEAT_00207] Security |

**Table 4.27: Details FO_TR_FEAT_00221**

### 4.2.16 [FO_TR_FEAT_00187] Gateway_Support

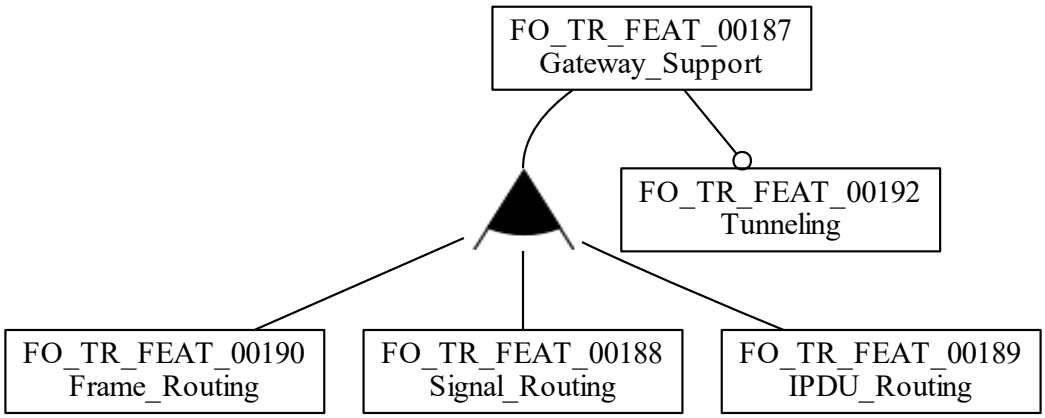


**Figure 4.21: Feature FO_TR_FEAT_00187**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00187 |
| ***Long Name:*** | Gateway_Support |
| ***Obligation:*** | Optional |
| ***Description:*** | The Gateway Support describes the functionalities to facilitate routing and transfer of data between different communication networks or protocols within a vehicle. |

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| | |
|---|---|
| ***Parent Feature:*** | [FO_TR_FEAT_00122] Communication |
| ***Sub Features:*** | • [FO_TR_FEAT_00188] Signal_Routing<br>• [FO_TR_FEAT_00189] IPDU_Routing<br>• [FO_TR_FEAT_00190] Frame_Routing<br>• [FO_TR_FEAT_00192] Tunneling |

**Table 4.28: Details FO_TR_FEAT_00187**

### 4.2.17 [FO_TR_FEAT_00045] Hardware_Test_Management

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00045 |
| ***Long Name:*** | Hardware_Test_Management |
| ***Obligation:*** | Optional |
| ***Description:*** | This Feature represents a built-in test at startup or cyclically. |
| ***Applies to:*** | CP, AP |
| ***Introduced:*** | R25-11 |
| ***Parent Feature:*** | [FO_TR_FEAT_00043] Safety |

**Table 4.29: Details FO_TR_FEAT_00045**

### 4.2.18 [FO_TR_FEAT_00220] Identity_and_Access_Management_IAM

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00220 |
| ***Long Name:*** | Identity_and_Access_Management_IAM |
| ***Obligation:*** | Optional |
| ***Description:*** | The Identity and Access Management (IAM) focuses on identifying and controlling who has access to the vehicle's network and ECU's resources. |
| ***Parent Feature:*** | [FO_TR_FEAT_00207] Security |

**Table 4.30: Details FO_TR_FEAT_00220**

### 4.2.19 [FO_TR_FEAT_00132] Intra_Machine_Communication

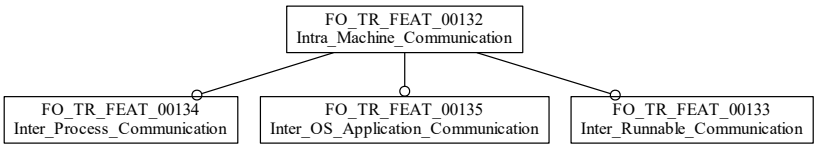


**Figure 4.22: Feature FO_TR_FEAT_00132**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00132 |
| ***Long Name:*** | Intra_Machine_Communication |
| ***Obligation:*** | Optional |
| ***Description:*** | This Feature describes the data exchange mechanisms and protocols within a single vehicle's electronic system |
| ***Parent Feature:*** | [FO_TR_FEAT_00122] Communication |
| ***Sub Features:*** | • [FO_TR_FEAT_00133] Inter_Runnable_Communication<br>• [FO_TR_FEAT_00134] Inter_Process_Communication<br>• [FO_TR_FEAT_00135] Inter_OS_Application_Communication |

**Table 4.31: Details FO_TR_FEAT_00132**

### 4.2.20 [FO_TR_FEAT_00209] Intrusion_Detection_System

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00209 |
| ***Long Name:*** | Intrusion_Detection_System |
| ***Obligation:*** | Optional |
| ***Description:*** | The Intrusion Detection System (IDS) monitors the vehicle's network and ECU's resources for suspicious activities and potential security breaches. |
| ***Parent Feature:*** | [FO_TR_FEAT_00207] Security |

**Table 4.32: Details FO_TR_FEAT_00209**

### 4.2.21 [FO_TR_FEAT_00219] Key_Management

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00219 |
| ***Long Name:*** | Key_Management |
| ***Obligation:*** | Optional |
| ***Description:*** | The Key Management encompasses the methods and processes for handling cryptographic keys throughout their lifecycle. |
| ***Parent Feature:*** | [FO_TR_FEAT_00207] Security |

**Table 4.33: Details FO_TR_FEAT_00219**

### 4.2.22 [FO_TR_FEAT_00092] Legislative_Diagnostics

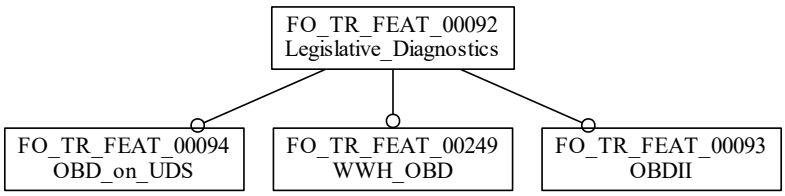


**Figure 4.23: Feature FO_TR_FEAT_00092**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00092 |
| ***Long Name:*** | Legislative_Diagnostics |
| ***Obligation:*** | Optional |
| ***Description:*** | This Feature describes the standardized diagnostic protocols and procedures mandated by regulatory authorities to ensure that vehicles comply with environmental and safety regulations. |
| ***Applies to:*** | CP |
| ***Parent Feature:*** | [FO_TR_FEAT_00086] Diagnostic |
| ***Sub Features:*** | • [FO_TR_FEAT_00093] OBDII<br>• [FO_TR_FEAT_00094] OBD_on_UDS<br>• [FO_TR_FEAT_00249] WWH_OBD |

**Table 4.34: Details FO_TR_FEAT_00092**

### 4.2.23 [FO_TR_FEAT_00112] Logging

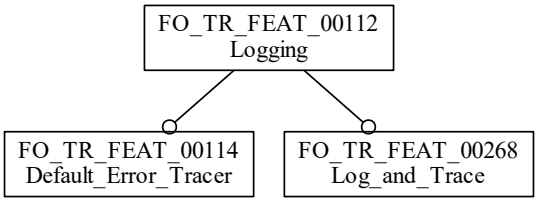


**Figure 4.24: Feature FO_TR_FEAT_00112**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00112 |
| ***Long Name:*** | Logging |
| ***Obligation:*** | Optional |

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| | |
|---|---|
| ***Description:*** | This Feature allows capturing and recording of system events and messages during operation. |
| ***Parent Feature:*** | [FO_TR_FEAT_00111] Development |
| ***Sub Features:*** | • [FO_TR_FEAT_00268] Log_and_Trace<br>• [FO_TR_FEAT_00114] Default_Error_Tracer |

**Table 4.35: Details FO_TR_FEAT_00112**

### 4.2.24 [FO_TR_FEAT_00065] Mathematical_Primitives

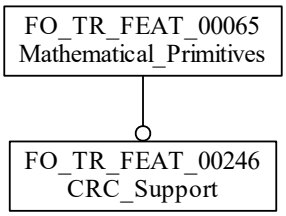


**Figure 4.25: Feature FO_TR_FEAT_00065**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00065 |
| ***Long Name:*** | Mathematical_Primitives |
| ***Obligation:*** | Optional |
| ***Description:*** | This feature is basic to perform mathematical computations efficiently and accurately, e.g. libraries. |
| ***Parent Feature:*** | [FO_TR_FEAT_00064] Basic_Functionality |
| ***Sub Features:*** | [FO_TR_FEAT_00246] CRC_Support |

**Table 4.36: Details FO_TR_FEAT_00065**

### 4.2.25 [FO_TR_FEAT_00266] MCU_Abstraction

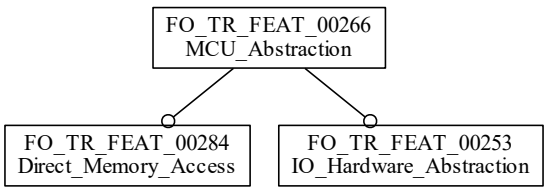


**Figure 4.26: Feature FO_TR_FEAT_00266**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00266 |
| ***Long Name:*** | MCU_Abstraction |
| ***Obligation:*** | Optional |
| ***Description:*** | The MCU Abstraction provides a uniform interface to the microcontroller hardware. It abstracts the internal peripherals of the MCU and offers standardized services for upper software layers. |
| ***Applies to:*** | CP |
| ***Parent Feature:*** | [FO_TR_FEAT_00236] Hardware_Support |
| ***Sub Features:*** | • [FO_TR_FEAT_00253] IO_Hardware_Abstraction<br>• [FO_TR_FEAT_00284] Direct_Memory_Access |

**Table 4.37: Details FO_TR_FEAT_00266**

### 4.2.26 [FO_TR_FEAT_00120] Measurement_and_Calibration

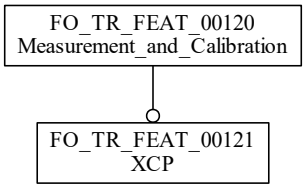


**Figure 4.27: Feature FO_TR_FEAT_00120**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00120 |
| ***Long Name:*** | Measurement_and_Calibration |
| ***Obligation:*** | Optional |
| ***Description:*** | The Measurement and Calibration in the AUTOSAR context refer to the processes and tools used to gather data from the automotive system (measurement) and adjust parameters to optimize performance (calibration). |
| ***Parent Feature:*** | [FO_TR_FEAT_00111] Development |
| ***Sub Features:*** | [FO_TR_FEAT_00121] XCP |

**Table 4.38: Details FO_TR_FEAT_00120**

### 4.2.27 [FO_TR_FEAT_00073] Mode_and_State_Management

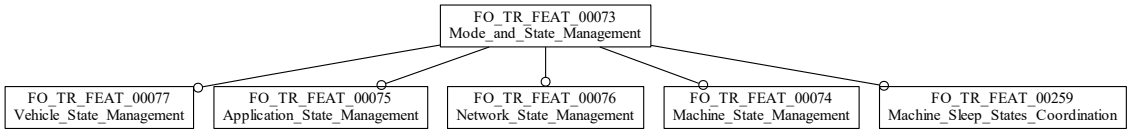


**Figure 4.28: Feature FO_TR_FEAT_00073**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00073 |
| ***Long Name:*** | Mode_and_State_Management |
| ***Obligation:*** | Optional |
| ***Description:*** | This Feature describes mechanisms and services that handle the different operational modes and states of the automotive system. |
| ***Parent Feature:*** | [FO_TR_FEAT_00071] Execution_Environment |
| ***Sub Features:*** | • [FO_TR_FEAT_00074] Machine_State_Management<br>• [FO_TR_FEAT_00075] Application_State_Management<br>• [FO_TR_FEAT_00076] Network_State_Management<br>• [FO_TR_FEAT_00077] Vehicle_State_Management<br>• [FO_TR_FEAT_00259] Machine_Sleep_States_Coordination |

**Table 4.39: Details FO_TR_FEAT_00073**

### 4.2.28 [FO_TR_FEAT_00068] Multi_Core

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00068 |
| ***Long Name:*** | Multi_Core |
| ***Obligation:*** | Optional |
| ***Description:*** | The Feature Multi-Core describes the distribution of applications to multiple cores of a micro controller. |
| ***Applies to:*** | CP |
| ***Parent Feature:*** | [FO_TR_FEAT_00064] Basic_Functionality |

**Table 4.40: Details FO_TR_FEAT_00068**

### 4.2.29 [FO_TR_FEAT_00179] Network_Management

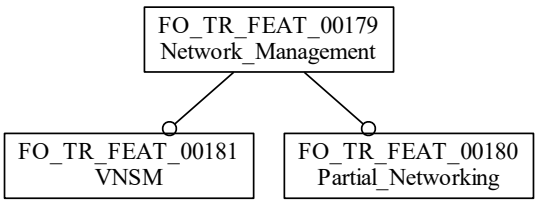


**Figure 4.29: Feature FO_TR_FEAT_00179**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00179 |
| ***Long Name:*** | Network_Management |
| ***Obligation:*** | Optional |

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| | |
|---|---|
| ***Description:*** | The Network Management describes mechanisms and protocols used to control, configure, and monitor the state and operation of the network within a vehicle. |
| ***Parent Feature:*** | [FO_TR_FEAT_00122] Communication |
| ***Sub Features:*** | • [FO_TR_FEAT_00180] Partial_Networking<br>• [FO_TR_FEAT_00181] VNSM |

**Table 4.41: Details FO_TR_FEAT_00179**

### 4.2.30 [FO_TR_FEAT_00136] Network_Technology

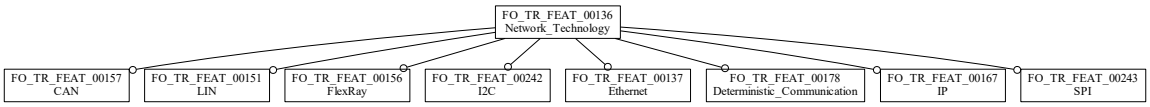


**Figure 4.30: Feature FO_TR_FEAT_00136**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00136 |
| ***Long Name:*** | Network_Technology |
| ***Obligation:*** | Optional |
| ***Description:*** | This Feature represents communication protocols, hardware, and software infrastructure that facilitate data exchange between ECUs in automotive systems. |
| ***Parent Feature:*** | [FO_TR_FEAT_00122] Communication |
| ***Sub Features:*** | • [FO_TR_FEAT_00137] Ethernet<br>• [FO_TR_FEAT_00151] LIN<br>• [FO_TR_FEAT_00156] FlexRay<br>• [FO_TR_FEAT_00157] CAN<br>• [FO_TR_FEAT_00167] IP<br>• [FO_TR_FEAT_00178] Deterministic_Communication<br>• [FO_TR_FEAT_00242] I2C<br>• [FO_TR_FEAT_00243] SPI |

**Table 4.42: Details FO_TR_FEAT_00136**

### 4.2.31 [FO_TR_FEAT_00056] NVRAM_Access

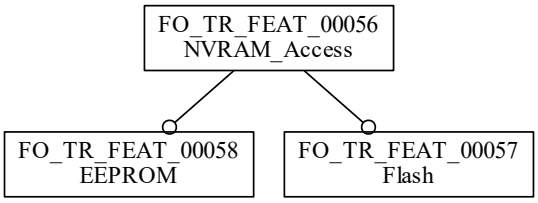


**Figure 4.31: Feature FO_TR_FEAT_00056**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00056 |
| ***Long Name:*** | NVRAM_Access |
| ***Obligation:*** | Optional |
| ***Description:*** | The NVRAM Access (non-volatile random-access memory) is used to store data which are retained across power cycles. |
| ***Parent Feature:*** | [FO_TR_FEAT_00055] Storage |
| ***Sub Features:*** | • [FO_TR_FEAT_00057] Flash<br>• [FO_TR_FEAT_00058] EEPROM |

**Table 4.43: Details FO_TR_FEAT_00056**

### 4.2.32 [FO_TR_FEAT_00233] Package_Authentication

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00233 |
| ***Long Name:*** | Package_Authentication |
| ***Obligation:*** | Optional |
| ***Description:*** | The Package Authentication involves verifying the integrity and authenticity of the software update packages before they are applied. |
| ***Parent Feature:*** | [FO_TR_FEAT_00222] Software_Update |

**Table 4.44: Details FO_TR_FEAT_00233**

### 4.2.33 [FO_TR_FEAT_00059] Persistency

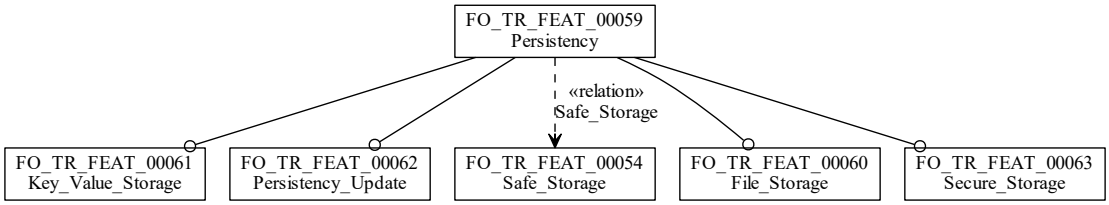


**Figure 4.32: Feature FO_TR_FEAT_00059**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00059 |
| ***Long Name:*** | Persistency |
| ***Obligation:*** | Optional |
| ***Description:*** | This Feature ensures that the system can resume operations seamlessly by retaining necessary information. |
| ***Relations:*** | [FO_TR_FEAT_00054] Safe_Storage |
| ***Parent Feature:*** | [FO_TR_FEAT_00055] Storage |
| ***Sub Features:*** | • [FO_TR_FEAT_00060] File_Storage<br>• [FO_TR_FEAT_00061] Key_Value_Storage<br>• [FO_TR_FEAT_00062] Persistency_Update<br>• [FO_TR_FEAT_00063] Secure_Storage |

**Table 4.45: Details FO_TR_FEAT_00059**

### 4.2.34 [FO_TR_FEAT_00110] Physical_Dimensions_And_Units

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00110 |
| ***Long Name:*** | Physical_Dimensions_And_Units |
| ***Obligation:*** | Optional |
| ***Description:*** | This Feature defines a collection of standardized definitions of physical dimensions and their units. |
| ***Applies to:*** | FO |
| ***Parent Feature:*** | [FO_TR_FEAT_00096] Standardized_Application_Interface |

**Table 4.46: Details FO_TR_FEAT_00110**

### 4.2.35 [FO_TR_FEAT_00260] Remote_Persistency

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00260 |
| ***Long Name:*** | Remote_Persistency |
| ***Obligation:*** | Optional |

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|---|---|
| ***Description:*** | Remote Persistency provides access to centrally stored data items on one ECU or for a vehicle. Supports different update paths. Access to Remote Persistency is implemented via service interfaces. Therefore, ara::com can be used to read and write data items of the Remote Persistency. IAM protections is expected for the write access. |
| ***Applies to:*** | AP |
| ***Relations:*** | [FO_TR_FEAT_00131] Remote_IAM |
| ***Parent Feature:*** | [FO_TR_FEAT_00055] Storage |

**Table 4.47: Details FO_TR_FEAT_00260**

### 4.2.36 [FO_TR_FEAT_00251] Resource_Partitioning

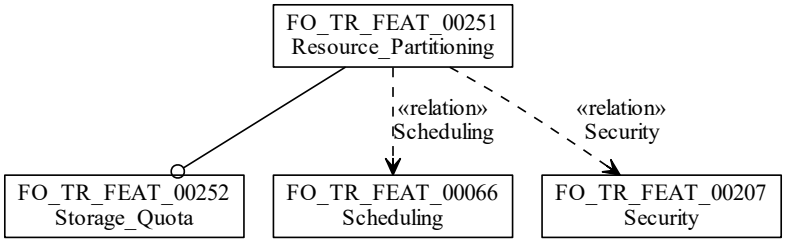


**Figure 4.33: Feature FO_TR_FEAT_00251**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00251 |
| ***Long Name:*** | Resource_Partitioning |
| ***Obligation:*** | Optional |
| ***Description:*** | This feature enables the partitioning of system resources such as CPU time and RAM into distinct groups, ensuring that software components are allocated and limited to specific resource sets. By isolating resources, the feature enhances system stability and security, preventing unintended interference or resource contention between different applications. Resource Partitioning also supports safety by containing potential misbehavior, ensuring that critical tasks have the resources they need while maintaining overall system integrity. |
| ***Relations:*** | • [FO_TR_FEAT_00066] Scheduling<br>• [FO_TR_FEAT_00207] Security |
| ***Parent Feature:*** | [FO_TR_FEAT_00064] Basic_Functionality |
| ***Sub Features:*** | [FO_TR_FEAT_00252] Storage_Quota |

**Table 4.48: Details FO_TR_FEAT_00251**

### 4.2.37 [FO_TR_FEAT_00232] Rollback

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00232 |
| ***Long Name:*** | Rollback |
| ***Obligation:*** | Optional |
| ***Description:*** | The Rollback refers to the ability to revert to a previous version of the software if the latest update fails or causes issues. |
| ***Parent Feature:*** | [FO_TR_FEAT_00222] Software_Update |

**Table 4.49: Details FO_TR_FEAT_00232**

### 4.2.38 [FO_TR_FEAT_00072] Runtime_Management

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00072 |
| ***Long Name:*** | Runtime_Management |
| ***Obligation:*** | Optional |
| ***Description:*** | This Feature describes set of services and mechanisms that oversee the execution lifecycle of software components on the ECUs. |
| ***Parent Feature:*** | [FO_TR_FEAT_00071] Execution_Environment |

**Table 4.50: Details FO_TR_FEAT_00072**

### 4.2.39 [FO_TR_FEAT_00044] Safe_Communication

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00044 |
| ***Long Name:*** | Safe_Communication |
| ***Obligation:*** | Optional |
| ***Description:*** | The Safe Communication provides elements to protect information exchange and enables detection of communication faults. |
| ***Applies to:*** | AP, CP |
| ***Relations:*** | [FO_TR_FEAT_00193] E2E |
| ***Parent Feature:*** | [FO_TR_FEAT_00043] Safety |

**Table 4.51: Details FO_TR_FEAT_00044**

### 4.2.40 [FO_TR_FEAT_00046] Safe_Execution

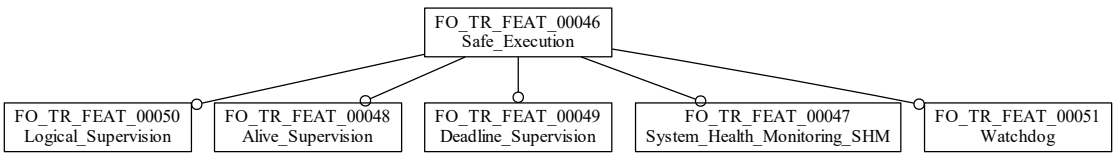


**Figure 4.34: Feature FO_TR_FEAT_00046**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00046 |
| ***Long Name:*** | Safe_Execution |
| ***Obligation:*** | Optional |
| ***Description:*** | The Safe Execution enables the detection of faults during SWS execution and provides reactions. |
| ***Applies to:*** | AP, CP |
| ***Parent Feature:*** | [FO_TR_FEAT_00043] Safety |
| ***Sub Features:*** | • [FO_TR_FEAT_00047] System_Health_Monitoring_SHM<br>• [FO_TR_FEAT_00048] Alive_Supervision<br>• [FO_TR_FEAT_00049] Deadline_Supervision<br>• [FO_TR_FEAT_00050] Logical_Supervision<br>• [FO_TR_FEAT_00051] Watchdog |

**Table 4.52: Details FO_TR_FEAT_00046**

### 4.2.41 [FO_TR_FEAT_00254] Safe_Hardware_Accelerators

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00254 |
| ***Long Name:*** | Safe_Hardware_Accelerators |
| ***Obligation:*** | Optional |
| ***Description:*** | The Safe Hardware Accelerators in AUTOSAR refers to the Feature that facilitates interaction between the software applications and the vehicle's hardware accelerators. |
| ***Applies to:*** | AP |
| ***Parent Feature:*** | [FO_TR_FEAT_00236] Hardware_Support |

**Table 4.53: Details FO_TR_FEAT_00254**

### 4.2.42 [FO_TR_FEAT_00052] Safe_Memory

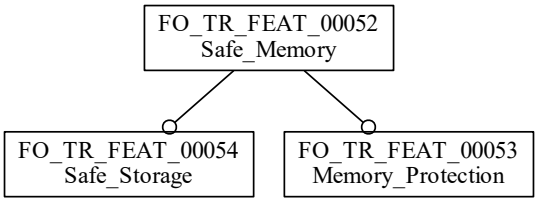


**Figure 4.35: Feature FO_TR_FEAT_00052**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00052 |
| ***Long Name:*** | Safe_Memory |
| ***Obligation:*** | Optional |
| ***Description:*** | The Safe Memory provides method for safe storage in volatile and non-volatile memory. |
| ***Applies to:*** | AP, CP |
| ***Parent Feature:*** | [FO_TR_FEAT_00043] Safety |
| ***Sub Features:*** | • [FO_TR_FEAT_00053] Memory_Protection<br>• [FO_TR_FEAT_00054] Safe_Storage |

**Table 4.54: Details FO_TR_FEAT_00052**

### 4.2.43 [FO_TR_FEAT_00066] Scheduling

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00066 |
| ***Long Name:*** | Scheduling |
| ***Obligation:*** | Mandatory |
| ***Description:*** | This feature manages the execution order and timing of threads or tasks within the system. It ensures that resources like CPU time are efficiently allocated, coordinating task execution based on priority, deadlines, or specific conditions. By organizing when and how tasks are run, Scheduling ensures system responsiveness, balancing the workload to meet performance, real-time, and safety requirements. |
| ***Applies to:*** | CP |
| ***Parent Feature:*** | [FO_TR_FEAT_00064] Basic_Functionality |

**Table 4.55: Details FO_TR_FEAT_00066**

### 4.2.44 [FO_TR_FEAT_00195] SecOC

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00195 |
| ***Long Name:*** | SecOC |
| ***Obligation:*** | Optional |
| ***Description:*** | The SecOC (Secure Onboard Communication) Feature is an AUTOSAR module designed to ensure authenticity, integrity and optionally the confidentiality of communication within a vehicle's network. |
| ***Parent Feature:*** | [FO_TR_FEAT_00122] Communication |

**Table 4.56: Details FO_TR_FEAT_00195**

### 4.2.45 [FO_TR_FEAT_00208] Secure_Communication

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00208 |
| ***Long Name:*** | Secure_Communication |
| ***Obligation:*** | Optional |
| ***Description:*** | The Secure Communication ensures that data exchanged between ECUs and other components within the vehicle is protected. |
| ***Restrictions:*** | • [FO_TR_FEAT_00145] MACsec<br>• [FO_TR_FEAT_00125] DDS_Security<br>• [FO_TR_FEAT_00195] SecOC<br>• [FO_TR_FEAT_00176] IPSec<br>• [FO_TR_FEAT_00175] TLS<br>• [FO_TR_FEAT_00221] Firewall<br>• [FO_TR_FEAT_00282] CANsec |
| ***Parent Feature:*** | [FO_TR_FEAT_00207] Security |

**Table 4.57: Details FO_TR_FEAT_00208**

### 4.2.46 [FO_TR_FEAT_00123] Service_Oriented_Communication

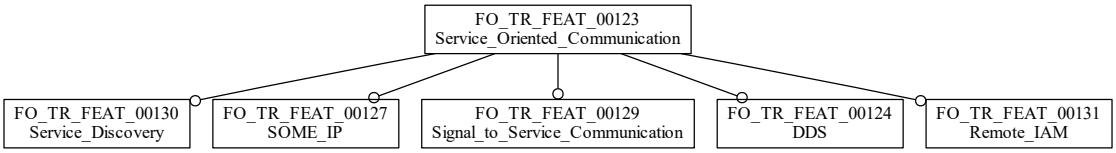


**Figure 4.36: Feature FO_TR_FEAT_00123**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00123 |
| ***Long Name:*** | Service_Oriented_Communication |
| ***Obligation:*** | Optional |
| ***Description:*** | This Feature refers to a communication paradigm that focuses on the interaction between software components through well-defined services. |
| ***Parent Feature:*** | [FO_TR_FEAT_00122] Communication |
| ***Sub Features:*** | • [FO_TR_FEAT_00124] DDS<br>• [FO_TR_FEAT_00127] SOME_IP<br>• [FO_TR_FEAT_00129] Signal_to_Service_Communication<br>• [FO_TR_FEAT_00130] Service_Discovery<br>• [FO_TR_FEAT_00131] Remote_IAM |

**Table 4.58: Details FO_TR_FEAT_00123**

### 4.2.47 [FO_TR_FEAT_00182] Signalbased_Communication

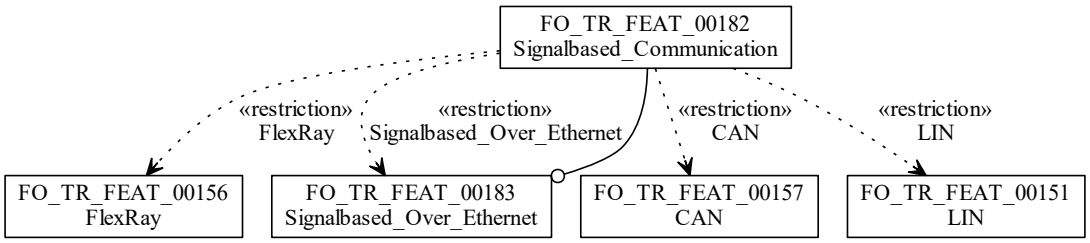


**Figure 4.37: Feature FO_TR_FEAT_00182**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00182 |
| ***Long Name:*** | Signalbased_Communication |
| ***Obligation:*** | Optional |
| ***Description:*** | Signalbased Communication refers to a method of data exchange where individual signals are transmitted over the vehicle network. |
| ***Restrictions:*** | • [FO_TR_FEAT_00157] CAN<br>• [FO_TR_FEAT_00151] LIN<br>• [FO_TR_FEAT_00156] FlexRay<br>• [FO_TR_FEAT_00183] Signalbased_Over_Ethernet |
| ***Parent Feature:*** | [FO_TR_FEAT_00122] Communication |
| ***Sub Features:*** | [FO_TR_FEAT_00183] Signalbased_Over_Ethernet |

**Table 4.59: Details FO_TR_FEAT_00182**

### 4.2.48 [FO_TR_FEAT_00230] Software_Cluster_Update

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00230 |
| ***Long Name:*** | Software_Cluster_Update |
| ***Obligation:*** | Mandatory |
| ***Description:*** | The Software Cluster Update involves updating specific groups of software components or clusters within a vehicle's systems. |
| ***Relations:*** | [FO_TR_FEAT_00062] Persistency_Update |
| ***Parent Feature:*** | [FO_TR_FEAT_00222] Software_Update |

**Table 4.60: Details FO_TR_FEAT_00230**

### 4.2.49 [FO_TR_FEAT_00078] Software_Clustering

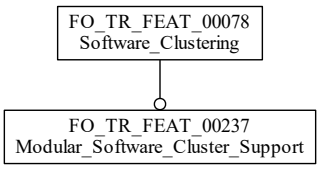


**Figure 4.38: Feature FO_TR_FEAT_00078**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00078 |
| ***Long Name:*** | Software_Clustering |
| ***Obligation:*** | Optional |
| ***Description:*** | The Software Clustering describes the organization and grouping of software components based on their functionality, dependencies, and communication needs. |
| ***Parent Feature:*** | [FO_TR_FEAT_00071] Execution_Environment |
| ***Sub Features:*** | [FO_TR_FEAT_00237] Modular_Software_Cluster_Support |

**Table 4.61: Details FO_TR_FEAT_00078**

### 4.2.50 [FO_TR_FEAT_00235] Suspend_Update

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00235 |
| ***Long Name:*** | Suspend_Update |
| ***Obligation:*** | Optional |
| ***Description:*** | This Feature allows to suspend and resume updates of the vehicle software or software-platform. |
| ***Parent Feature:*** | [FO_TR_FEAT_00222] Software_Update |

**Table 4.62: Details FO_TR_FEAT_00235**

### 4.2.51 [FO_TR_FEAT_00276] Time_Service

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00276 |
| ***Long Name:*** | Time_Service |
| ***Obligation:*** | Optional |
| ***Description:*** | This feature allows users to get time (or counter) values e.g. to measure time or wait for some real time. |
| ***Applies to:*** | CP |
| ***Introduced:*** | 25-11 |

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|---|---|
| ***Parent Feature:*** | [FO_TR_FEAT_00064] Basic_Functionality |

**Table 4.63: Details FO_TR_FEAT_00276**

### 4.2.52 [FO_TR_FEAT_00196] Time_Synchronization

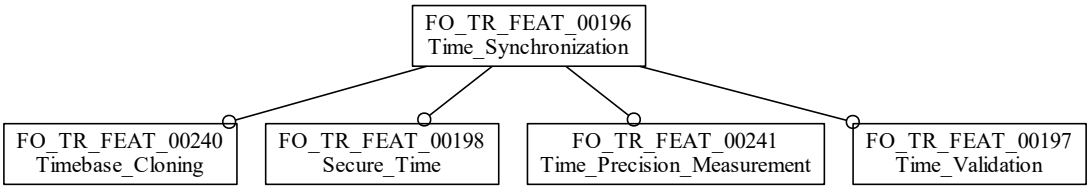


**Figure 4.39: Feature FO_TR_FEAT_00196**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00196 |
| ***Long Name:*** | Time_Synchronization |
| ***Obligation:*** | Optional |
| ***Description:*** | The Time Synchronization ensures that all ECUs in the vehicle have a consistent and accurate sense of time. |
| ***Parent Feature:*** | [FO_TR_FEAT_00122] Communication |
| ***Sub Features:*** | • [FO_TR_FEAT_00197] Time_Validation<br>• [FO_TR_FEAT_00198] Secure_Time<br>• [FO_TR_FEAT_00241] Time_Precision_Measurement<br>• [FO_TR_FEAT_00240] Timebase_Cloning |

**Table 4.64: Details FO_TR_FEAT_00196**

### 4.2.53 [FO_TR_FEAT_00119] Timing_Analysis

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00119 |
| ***Long Name:*** | Timing_Analysis |
| ***Obligation:*** | Optional |
| ***Description:*** | Timing Analysis investigates the timing of a system on different levels of abstraction. |
| ***Applies to:*** | AP, CP |
| ***Parent Feature:*** | [FO_TR_FEAT_00256] Timing |

**Table 4.65: Details FO_TR_FEAT_00119**

### 4.2.54 [FO_TR_FEAT_00258] Timing_Design

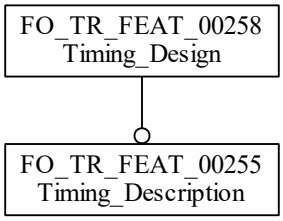


**Figure 4.40: Feature FO_TR_FEAT_00258**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00258 |
| ***Long Name:*** | Timing_Design |
| ***Obligation:*** | Optional |
| ***Description:*** | Timing Design models the timing and/or timing constraints of a system on different levels of abstraction. |
| ***Applies to:*** | AP, CP |
| ***Introduced:*** | R25-11 |
| ***Parent Feature:*** | [FO_TR_FEAT_00256] Timing |
| ***Sub Features:*** | [FO_TR_FEAT_00255] Timing_Description |

**Table 4.66: Details FO_TR_FEAT_00258**

### 4.2.55 [FO_TR_FEAT_00115] Tracing_and_Profiling

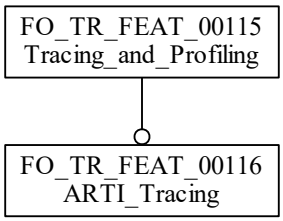


**Figure 4.41: Feature FO_TR_FEAT_00115**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00115 |
| ***Long Name:*** | Tracing_and_Profiling |
| ***Obligation:*** | Optional |

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|---|---|
| ***Description:*** | This Feature is a set of techniques and tools used to monitor, record, and analyze the execution behavior of software components. |
| ***Parent Feature:*** | [FO_TR_FEAT_00111] Development |
| ***Sub Features:*** | [FO_TR_FEAT_00116] ARTI_Tracing |

**Table 4.67: Details FO_TR_FEAT_00115**

### 4.2.56 [FO_TR_FEAT_00250] Trusted_Platform

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00250 |
| ***Long Name:*** | Trusted_Platform |
| ***Obligation:*** | Optional |
| ***Description:*** | This feature ensures the authenticity and integrity of executed code and configurations within the system. By implementing robust verification mechanisms, it safeguards against unauthorized modifications and ensures that only validated software components are executed. This feature establishes a secure execution environment and enables compliance with security standards. |
| ***Relations:*** | [FO_TR_FEAT_00071] Execution_Environment |
| ***Parent Feature:*** | [FO_TR_FEAT_00207] Security |

**Table 4.68: Details FO_TR_FEAT_00250**

### 4.2.57 [FO_TR_FEAT_00231] Update_History

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00231 |
| ***Long Name:*** | Update_History |
| ***Obligation:*** | Mandatory |
| ***Description:*** | The Update History involves tracking and recording details about past software updates. |
| ***Parent Feature:*** | [FO_TR_FEAT_00222] Software_Update |

**Table 4.69: Details FO_TR_FEAT_00231**

### 4.2.58 [FO_TR_FEAT_00234] Update_Status_Reporting

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00234 |
| ***Long Name:*** | Update_Status_Reporting |
| ***Obligation:*** | Mandatory |
| ***Description:*** | The Update Status Reporting involves communicating the current status and progress of the software update process. |
| ***Parent Feature:*** | [FO_TR_FEAT_00222] Software_Update |

**Table 4.70: Details FO_TR_FEAT_00234**

### 4.2.59 [FO_TR_FEAT_00199] V2X

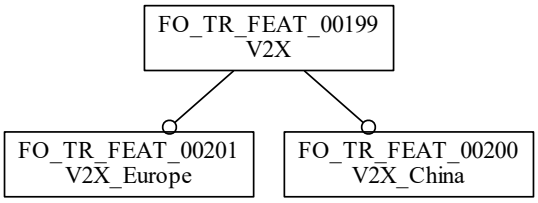


**Figure 4.42: Feature FO_TR_FEAT_00199**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00199 |
| ***Long Name:*** | V2X |
| ***Obligation:*** | Optional |
| ***Description:*** | The V2X (Vehicle-to-Everything) communication refers to the exchange of information between a vehicle and various entities in its environment. |
| ***Parent Feature:*** | [FO_TR_FEAT_00122] Communication |
| ***Sub Features:*** | • [FO_TR_FEAT_00200] V2X_China<br>• [FO_TR_FEAT_00201] V2X_Europe |

**Table 4.71: Details FO_TR_FEAT_00199**

### 4.2.60 [FO_TR_FEAT_00097] Vehicle_Domain_Interfaces

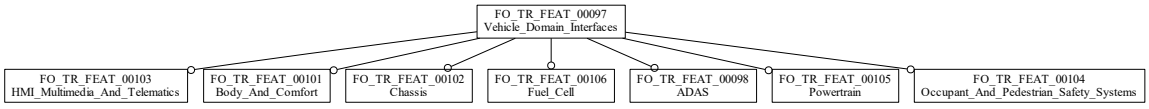


**Figure 4.43: Feature FO_TR_FEAT_00097**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00097 |
| ***Long Name:*** | Vehicle_Domain_Interfaces |
| ***Obligation:*** | Optional |
| ***Description:*** | This Feature facilitates communication and integration between various vehicle domains to ensure interoperability and consistency across different ECUs and software components, enabling seamless interaction and data exchange. |
| ***Applies to:*** | AP, CP |
| ***Parent Feature:*** | [FO_TR_FEAT_00096] Standardized_Application_Interface |

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|---|---|
| ***Sub Features:*** | • [FO_TR_FEAT_00098] ADAS<br>• [FO_TR_FEAT_00101] Body_And_Comfort<br>• [FO_TR_FEAT_00102] Chassis<br>• [FO_TR_FEAT_00103] HMI_Multimedia_And_Telematics<br>• [FO_TR_FEAT_00104] Occupant_And_Pedestrian_Safety_Systems<br>• [FO_TR_FEAT_00105] Powertrain<br>• [FO_TR_FEAT_00106] Fuel_Cell |

**Table 4.72: Details FO_TR_FEAT_00097**

### 4.2.61 [FO_TR_FEAT_00223] Vehicle_Software_Update

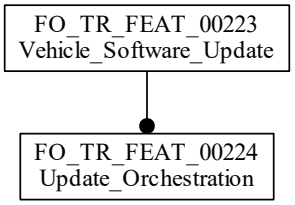


**Figure 4.44: Feature FO_TR_FEAT_00223**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00223 |
| ***Long Name:*** | Vehicle_Software_Update |
| ***Obligation:*** | Optional |
| ***Description:*** | The Vehicle Software Update refers to the capability to update the software components of the vehicle's electronic systems. |
| ***Parent Feature:*** | [FO_TR_FEAT_00222] Software_Update |
| ***Sub Features:*** | [FO_TR_FEAT_00224] Update_Orchestration |

**Table 4.73: Details FO_TR_FEAT_00223**

## 4.3 Level 3

### 4.3.1 [FO_TR_FEAT_00098] ADAS

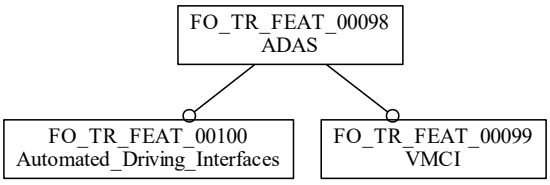


**Figure 4.45: Feature FO_TR_FEAT_00098**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00098 |
| ***Long Name:*** | ADAS |
| ***Obligation:*** | Optional |
| ***Description:*** | The ADAS (Advanced Driving Assistance Systems) utilize data from sensors, cameras, and other sources to assist the driver in making informed decisions, reduce human error, and enhance overall vehicle control. |
| ***Applies to:*** | AP, CP |
| ***Parent Feature:*** | [FO_TR_FEAT_00097] Vehicle_Domain_Interfaces |
| ***Sub Features:*** | • [FO_TR_FEAT_00099] VMCI<br>• [FO_TR_FEAT_00100] Automated_Driving_Interfaces |

**Table 4.74: Details FO_TR_FEAT_00098**

### 4.3.2 [FO_TR_FEAT_00048] Alive_Supervision

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00048 |
| ***Long Name:*** | Alive_Supervision |
| ***Obligation:*** | Optional |
| ***Description:*** | This Feature ensures the continuous and correct operation of software tasks and functions within ECU. It detects faults in execution and triggers reactions. |
| ***Parent Feature:*** | [FO_TR_FEAT_00046] Safe_Execution |

**Table 4.75: Details FO_TR_FEAT_00048**

### 4.3.3 [FO_TR_FEAT_00109] Application_Software_Design_Patterns

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00109 |
| ***Long Name:*** | Application_Software_Design_Patterns |
| ***Obligation:*** | Optional |

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|---|---|
| ***Description:*** | This Feature describes standardized, reusable solutions to common software design challenges encountered in automotive software development. It representens a abstraction pattern for solutions. |
| ***Applies to:*** | CP |
| ***Parent Feature:*** | [FO_TR_FEAT_00107] AIF_Method |

**Table 4.76: Details FO_TR_FEAT_00109**

### 4.3.4 [FO_TR_FEAT_00075] Application_State_Management

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00075 |
| ***Long Name:*** | Application_State_Management |
| ***Obligation:*** | Optional |
| ***Description:*** | This Feature refers to the control and coordination of the different operational states of software applications within an ECU. it contains tasks like managing transitions between states such as initialization, active operation, standby, and shutdown. |
| ***Parent Feature:*** | [FO_TR_FEAT_00073] Mode_and_State_Management |

**Table 4.77: Details FO_TR_FEAT_00075**

### 4.3.5 [FO_TR_FEAT_00118] ARTI_Debugging

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00118 |
| ***Long Name:*** | ARTI_Debugging |
| ***Obligation:*** | Optional |
| ***Description:*** | The ARTI Debugging (AUTOSAR Runtime Interface Debugging) refers to a set of standardized interfaces and tools within the AUTOSAR framework. |
| ***Applies to:*** | CP |
| ***Parent Feature:*** | [FO_TR_FEAT_00117] Debugging |

**Table 4.78: Details FO_TR_FEAT_00118**

### 4.3.6 [FO_TR_FEAT_00116] ARTI_Tracing

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00116 |
| ***Long Name:*** | ARTI_Tracing |
| ***Obligation:*** | Optional |
| ***Description:*** | The ARTI Tracing (AUTOSAR Runtime Interface Tracing) refers to a standardized method for capturing and analyzing the execution behavior of software components. |
| ***Applies to:*** | AP, CP |

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|---|---|
| ***Parent Feature:*** | [FO_TR_FEAT_00115] Tracing_and_Profiling |

**Table 4.79: Details FO_TR_FEAT_00116**

### 4.3.7 [FO_TR_FEAT_00101] Body_And_Comfort

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00101 |
| ***Long Name:*** | Body_And_Comfort |
| ***Obligation:*** | Optional |
| ***Description:*** | This Feature describes interface definitions for body and comfort control software managing vehicle body functions and comfort Features, such as lighting, climate control, and door systems. |
| ***Applies to:*** | CP |
| ***Parent Feature:*** | [FO_TR_FEAT_00097] Vehicle_Domain_Interfaces |

**Table 4.80: Details FO_TR_FEAT_00101**

### 4.3.8 [FO_TR_FEAT_00157] CAN

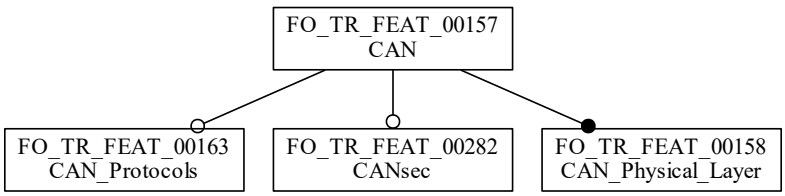


**Figure 4.46: Feature FO_TR_FEAT_00157**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00157 |
| ***Long Name:*** | CAN |
| ***Obligation:*** | Optional |
| ***Description:*** | The CAN (Controller Area Network) describes the communcation of microcontrollers and devices with each other without a host computer. This Feature has to be according ISO 11898 and other external specifications. |
| ***Parent Feature:*** | [FO_TR_FEAT_00136] Network_Technology |
| ***Sub Features:*** | • [FO_TR_FEAT_00158] CAN_Physical_Layer<br>• [FO_TR_FEAT_00163] CAN_Protocols<br>• [FO_TR_FEAT_00282] CANsec |

**Table 4.81: Details FO_TR_FEAT_00157**

### 4.3.9 [FO_TR_FEAT_00102] Chassis

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00102 |
| ***Long Name:*** | Chassis |
| ***Obligation:*** | Optional |
| ***Description:*** | This Feature is a collection of interface definitions related to chassis domain, including suspension, braking, and stability control. |
| ***Applies to:*** | CP |
| ***Parent Feature:*** | [FO_TR_FEAT_00097] Vehicle_Domain_Interfaces |

**Table 4.82: Details FO_TR_FEAT_00102**

### 4.3.10 [FO_TR_FEAT_00246] CRC_Support

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00246 |
| ***Long Name:*** | CRC_Support |
| ***Obligation:*** | Optional |
| ***Description:*** | The Feature CRC (Cyclic Redundancy Check) enables protection of certain values by detecting alteration. |
| ***Applies to:*** | AP. CP |
| ***Parent Feature:*** | [FO_TR_FEAT_00065] Mathematical_Primitives |

**Table 4.83: Details FO_TR_FEAT_00246**

### 4.3.11 [FO_TR_FEAT_00124] DDS

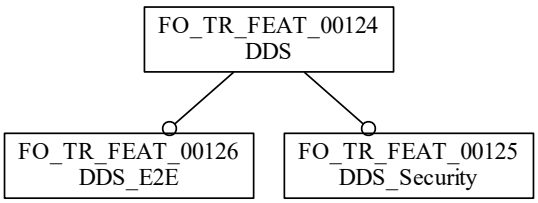


**Figure 4.47: Feature FO_TR_FEAT_00124**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00124 |
| ***Long Name:*** | DDS |
| ***Obligation:*** | Optional |
| ***Description:*** | The DDS (Data Distribution Service) is a middleware protocol and API standard for data-centric communication. |
| ***Parent Feature:*** | [FO_TR_FEAT_00123] Service_Oriented_Communication |
| ***Sub Features:*** | • [FO_TR_FEAT_00125] DDS_Security<br>• [FO_TR_FEAT_00126] DDS_E2E |

**Table 4.84: Details FO_TR_FEAT_00124**

### 4.3.12 [FO_TR_FEAT_00049] Deadline_Supervision

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00049 |
| ***Long Name:*** | Deadline_Supervision |
| ***Obligation:*** | Optional |
| ***Description:*** | This Feature checks if the execution time between two Checkpoints is within minimum/ maximum time limit for real time performance. |
| ***Parent Feature:*** | [FO_TR_FEAT_00046] Safe_Execution |

**Table 4.85: Details FO_TR_FEAT_00049**

### 4.3.13 [FO_TR_FEAT_00114] Default_Error_Tracer

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00114 |
| ***Long Name:*** | Default_Error_Tracer |
| ***Obligation:*** | Optional |
| ***Description:*** | This Feature standardizes mechanism for reporting and reactions to errors that occur during the software's execution. |
| ***Parent Feature:*** | [FO_TR_FEAT_00112] Logging |

**Table 4.86: Details FO_TR_FEAT_00114**

### 4.3.14 [FO_TR_FEAT_00178] Deterministic_Communication

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00178 |
| ***Long Name:*** | Deterministic_Communication |
| ***Obligation:*** | Optional |
| ***Description:*** | The Deterministic Communication refers to the ability to guarantee that data is transmitted within a predictable and bounded timeframe. |
| ***Restrictions:*** | [FO_TR_FEAT_00156] FlexRay |

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|---|---|
| ***Parent Feature:*** | [FO_TR_FEAT_00136] Network_Technology |

**Table 4.87: Details FO_TR_FEAT_00178**

### 4.3.15 [FO_TR_FEAT_00212] Dig_Signatures

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00212 |
| ***Long Name:*** | Dig_Signatures |
| ***Obligation:*** | Optional |
| ***Description:*** | The Digital Signatures are cryptographic techniques used to validate the authenticity and integrity of a message or document. |
| ***Parent Feature:*** | [FO_TR_FEAT_00210] Cryptography |

**Table 4.88: Details FO_TR_FEAT_00212**

### 4.3.16 [FO_TR_FEAT_00284] Direct_Memory_Access

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00284 |
| ***Long Name:*** | Direct_Memory_Access |
| ***Obligation:*** | Optional |
| ***Description:*** | A Direct Memory Access (DMA) controller is a hardware peripheral capable of initiating data transfers from one or more memory locations to other locations, without direct intervention from the CPU. |
| ***Applies to:*** | CP |
| ***Parent Feature:*** | [FO_TR_FEAT_00266] MCU_Abstraction |

**Table 4.89: Details FO_TR_FEAT_00284**

### 4.3.17 [FO_TR_FEAT_00058] EEPROM

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00058 |
| ***Long Name:*** | EEPROM |
| ***Obligation:*** | Optional |
| ***Description:*** | The EEPROM (Electrically Erasable Programmable Read-Only Memory) is a type of non-volatile memory, which retains stored data even when the power is turned off, ideal for data where persistence is crucial. |
| ***Parent Feature:*** | [FO_TR_FEAT_00056] NVRAM_Access |

**Table 4.90: Details FO_TR_FEAT_00058**

### 4.3.18 [FO_TR_FEAT_00213] Encryption_and_Decryption

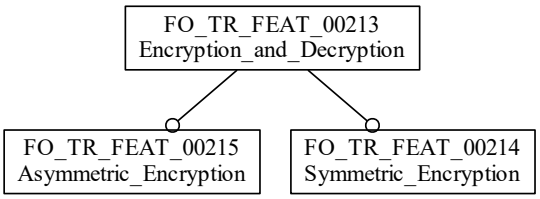


**Figure 4.48: Feature FO_TR_FEAT_00213**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00213 |
| ***Long Name:*** | Encryption_and_Decryption |
| ***Obligation:*** | Optional |
| ***Description:*** | The "Encryption and Decryption" are processes used to convert plaintext data into an encrypted data (unreadable format) and decrypt data (readable format). |
| ***Parent Feature:*** | [FO_TR_FEAT_00210] Cryptography |
| ***Sub Features:*** | • [FO_TR_FEAT_00214] Symmetric_Encryption<br>• [FO_TR_FEAT_00215] Asymmetric_Encryption |

**Table 4.91: Details FO_TR_FEAT_00213**

### 4.3.19 [FO_TR_FEAT_00137] Ethernet

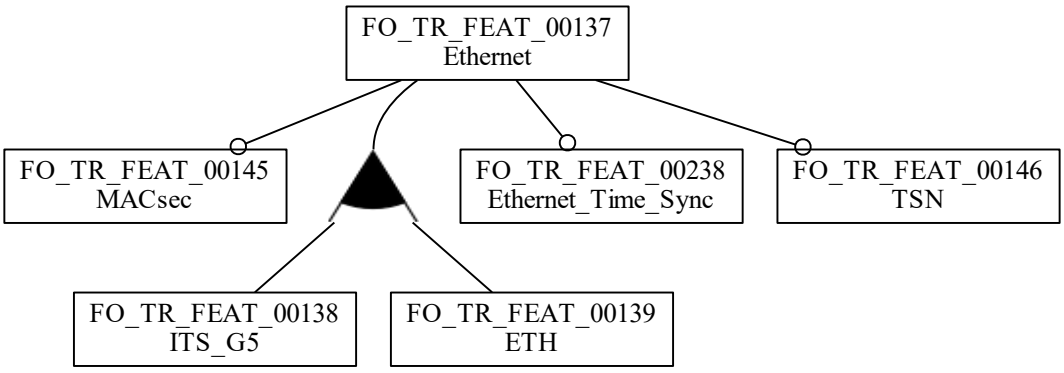


**Figure 4.49: Feature FO_TR_FEAT_00137**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00137 |
| ***Long Name:*** | Ethernet |
| ***Obligation:*** | Optional |
| ***Description:*** | This Feature describes a high-speed, standardized communication protocol used for data exchange within the vehicle network. |
| ***Parent Feature:*** | [FO_TR_FEAT_00136] Network_Technology |
| ***Sub Features:*** | • [FO_TR_FEAT_00138] ITS_G5<br>• [FO_TR_FEAT_00139] ETH<br>• [FO_TR_FEAT_00145] MACsec<br>• [FO_TR_FEAT_00146] TSN<br>• [FO_TR_FEAT_00238] Ethernet_Time_Sync |

**Table 4.92: Details FO_TR_FEAT_00137**

### 4.3.20 [FO_TR_FEAT_00060] File_Storage

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00060 |
| ***Long Name:*** | File_Storage |
| ***Obligation:*** | Optional |
| ***Description:*** | The File Storage is storing data in a file-based format on non-volatile memory to ensure that important information is preserved across power cycles. |
| ***Parent Feature:*** | [FO_TR_FEAT_00059] Persistency |

**Table 4.93: Details FO_TR_FEAT_00060**

### 4.3.21 [FO_TR_FEAT_00057] Flash

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00057 |
| ***Long Name:*** | Flash |
| ***Obligation:*** | Optional |
| ***Description:*** | This Feature is used as a type of non-volatile storage to store data that must be retained even when the power is turned off. |
| ***Parent Feature:*** | [FO_TR_FEAT_00056] NVRAM_Access |

**Table 4.94: Details FO_TR_FEAT_00057**

### 4.3.22 [FO_TR_FEAT_00156] FlexRay

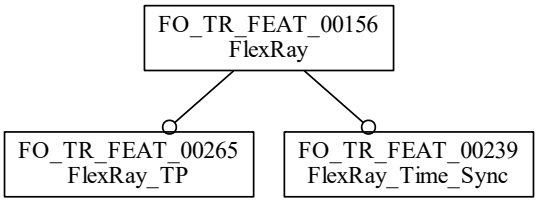


**Figure 4.50: Feature FO_TR_FEAT_00156**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00156 |
| ***Long Name:*** | FlexRay |
| ***Obligation:*** | Optional |
| ***Description:*** | The FlexRay is a high-speed, deterministic, and fault-tolerant automotive network protocol designed for advanced control systems. |
| ***Parent Feature:*** | [FO_TR_FEAT_00136] Network_Technology |
| ***Sub Features:*** | • [FO_TR_FEAT_00239] FlexRay_Time_Sync<br>• [FO_TR_FEAT_00265] FlexRay_TP |

**Table 4.95: Details FO_TR_FEAT_00156**

### 4.3.23 [FO_TR_FEAT_00190] Frame_Routing

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00190 |
| ***Long Name:*** | Frame_Routing |
| ***Obligation:*** | Multiple |
| ***Description:*** | The Frame Routing describes the routing of entire frames between different communication networks,where a frame is a structured data packet used in networking protocols. |
| ***Parent Feature:*** | [FO_TR_FEAT_00187] Gateway_Support |

**Table 4.96: Details FO_TR_FEAT_00190**

### 4.3.24 [FO_TR_FEAT_00106] Fuel_Cell

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00106 |
| ***Long Name:*** | Fuel_Cell |
| ***Obligation:*** | Optional |
| ***Description:*** | This Feature describes the interface definitions according the integration and control of the fuel cell systems. |

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|---|---|
| ***Applies to:*** | CP |
| ***Parent Feature:*** | [FO_TR_FEAT_00097] Vehicle_Domain_Interfaces |

**Table 4.97: Details FO_TR_FEAT_00106**

### 4.3.25 [FO_TR_FEAT_00211] Hashcodes

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00211 |
| ***Long Name:*** | Hashcodes |
| ***Obligation:*** | Optional |
| ***Description:*** | The Hashcodes are fixed-size numerical values derived from input data of arbitrary size through a hash function. |
| ***Parent Feature:*** | [FO_TR_FEAT_00210] Cryptography |

**Table 4.98: Details FO_TR_FEAT_00211**

### 4.3.26 [FO_TR_FEAT_00103] HMI_Multimedia_And_Telematics

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00103 |
| ***Long Name:*** | HMI_Multimedia_And_Telematics |
| ***Obligation:*** | Optional |
| ***Description:*** | This Feature describes interface definitions related to the user and device Interfaces as in multimedia systems, telematics services, enhancing user experience and connectivity. |
| ***Applies to:*** | CP |
| ***Parent Feature:*** | [FO_TR_FEAT_00097] Vehicle_Domain_Interfaces |

**Table 4.99: Details FO_TR_FEAT_00103**

### 4.3.27 [FO_TR_FEAT_00242] I2C

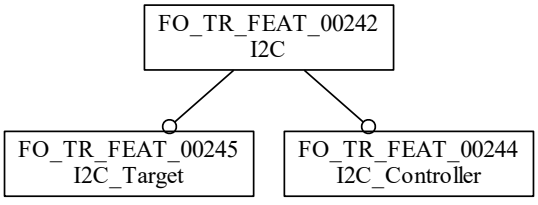


**Figure 4.51: Feature FO_TR_FEAT_00242**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00242 |
| ***Long Name:*** | I2C |
| ***Obligation:*** | Optional |
| ***Description:*** | I2C (Inter-Integrated Circuit) is a synchronous, multi-controller/multi-target, single-ended, serial communication bus for attaching lower-speed peripheral integrated circuits (ICs) to processors and microcontrollers in short-distance, intra-board communication. |
| ***Parent Feature:*** | [FO_TR_FEAT_00136] Network_Technology |
| ***Sub Features:*** | • [FO_TR_FEAT_00244] I2C_Controller<br>• [FO_TR_FEAT_00245] I2C_Target |

**Table 4.100: Details FO_TR_FEAT_00242**

### 4.3.28 [FO_TR_FEAT_00135] Inter_OS_Application_Communication

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00135 |
| ***Long Name:*** | Inter_OS_Application_Communication |
| ***Obligation:*** | Optional |
| ***Description:*** | The Inter_OS_Application_Communication enables the communication between different OS-Applications which are managed by the same OS. |
| ***Applies to:*** | CP |
| ***Relations:*** | [FO_TR_FEAT_00068] Multi_Core |
| ***Parent Feature:*** | [FO_TR_FEAT_00132] Intra_Machine_Communication |

**Table 4.101: Details FO_TR_FEAT_00135**

### 4.3.29 [FO_TR_FEAT_00134] Inter_Process_Communication

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00134 |
| ***Long Name:*** | Inter_Process_Communication |
| ***Obligation:*** | Optional |
| ***Description:*** | This Feature describes mechanisms that enable data exchange between different processes running on the same ECU. Processes are independent execution units with their own memory space. |
| ***Relations:*** | [FO_TR_FEAT_00071] Execution_Environment |
| ***Parent Feature:*** | [FO_TR_FEAT_00132] Intra_Machine_Communication |

**Table 4.102: Details FO_TR_FEAT_00134**

### 4.3.30 [FO_TR_FEAT_00133] Inter_Runnable_Communication

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00133 |
| ***Long Name:*** | Inter_Runnable_Communication |
| ***Obligation:*** | Optional |
| ***Description:*** | This Feature describes data exchange between different runnables within the same ECU. Runnables are the smallest schedulable units of code within an AUTOSAR software component. |
| ***Relations:*** | [FO_TR_FEAT_00071] Execution_Environment |
| ***Parent Feature:*** | [FO_TR_FEAT_00132] Intra_Machine_Communication |

**Table 4.103: Details FO_TR_FEAT_00133**

### 4.3.31 [FO_TR_FEAT_00108] Interface_Naming_Convention

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00108 |
| ***Long Name:*** | Interface_Naming_Convention |
| ***Obligation:*** | Optional |
| ***Description:*** | The Interface Naming Convention is a standardation for naming the interfaces between software components and modules to achieve consisten, descriptive and easily understandable naming. |
| ***Applies to:*** | FO |
| ***Parent Feature:*** | [FO_TR_FEAT_00107] AIF_Method |

**Table 4.104: Details FO_TR_FEAT_00108**

### 4.3.32 [FO_TR_FEAT_00253] IO_Hardware_Abstraction

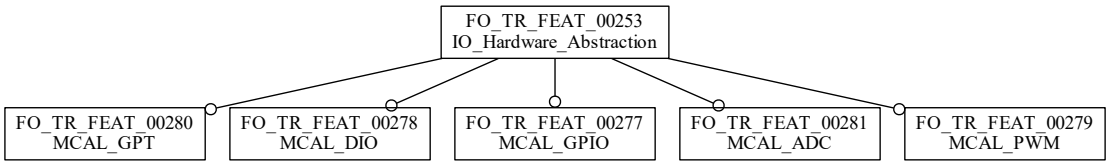


**Figure 4.52: Feature FO_TR_FEAT_00253**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00253 |
| ***Long Name:*** | IO_Hardware_Abstraction |
| ***Obligation:*** | Optional |
| ***Description:*** | The IO Hardware Abstraction provides access to MCAL drivers by mapping IO hardware abstration ports to ECU Signals. |
| ***Applies to:*** | CP |

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|---|---|
| ***Parent Feature:*** | [FO_TR_FEAT_00266] MCU_Abstraction |
| ***Sub Features:*** | • [FO_TR_FEAT_00281] MCAL_ADC<br>• [FO_TR_FEAT_00278] MCAL_DIO<br>• [FO_TR_FEAT_00277] MCAL_GPIO<br>• [FO_TR_FEAT_00280] MCAL_GPT<br>• [FO_TR_FEAT_00279] MCAL_PWM |

**Table 4.105: Details FO_TR_FEAT_00253**

### 4.3.33 [FO_TR_FEAT_00167] IP

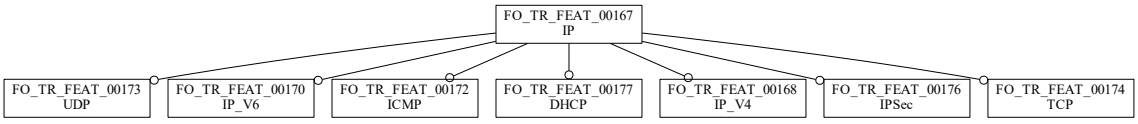


**Figure 4.53: Feature FO_TR_FEAT_00167**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00167 |
| ***Long Name:*** | IP |
| ***Obligation:*** | Optional |
| ***Description:*** | The IP (Internet Protocol) in the AUTOSAR context refers to the suite of communication protocols. |
| ***Parent Feature:*** | [FO_TR_FEAT_00136] Network_Technology |
| ***Sub Features:*** | • [FO_TR_FEAT_00168] IP_V4<br>• [FO_TR_FEAT_00170] IP_V6<br>• [FO_TR_FEAT_00172] ICMP<br>• [FO_TR_FEAT_00173] UDP<br>• [FO_TR_FEAT_00174] TCP<br>• [FO_TR_FEAT_00176] IPSec<br>• [FO_TR_FEAT_00177] DHCP |

**Table 4.106: Details FO_TR_FEAT_00167**

### 4.3.34 [FO_TR_FEAT_00189] IPDU_Routing

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00189 |
| ***Long Name:*** | IPDU_Routing |
| ***Obligation:*** | Multiple |
| ***Description:*** | The IPDU Routing (Interaction Layer Protocol Data Unit Routing) involves routing of entire PDUs between networks. PDUs are larger data. |

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|---|---|
| ***Parent Feature:*** | [FO_TR_FEAT_00187] Gateway_Support |

**Table 4.107: Details FO_TR_FEAT_00189**

### 4.3.35 [FO_TR_FEAT_00206] ISO15118_2

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00206 |
| ***Long Name:*** | ISO15118_2 |
| ***Obligation:*** | Optional |
| ***Description:*** | The Charging protocol for the European market, focusing on conductive charging. |
| ***Applies to:*** | CP |
| ***Parent Feature:*** | [FO_TR_FEAT_00205] Charging_Protocol |

**Table 4.108: Details FO_TR_FEAT_00206**

### 4.3.36 [FO_TR_FEAT_00262] J1939_Diagnostics

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00262 |
| ***Long Name:*** | J1939_Diagnostics |
| ***Obligation:*** | Optional |
| ***Lifecycle Status:*** | Valid |
| ***Description:*** | This Features enables diagnostics according to SAE J1939-73. |
| ***Applies to:*** | CP |
| ***Introduced:*** | R25-11 |
| ***Relations:*** | [FO_TR_FEAT_00267] SAE_J1939 |
| ***Parent Feature:*** | [FO_TR_FEAT_00087] Diagnostic_Communication |

**Table 4.109: Details FO_TR_FEAT_00262**

### 4.3.37 [FO_TR_FEAT_00061] Key_Value_Storage

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00061 |
| ***Long Name:*** | Key_Value_Storage |
| ***Obligation:*** | Optional |
| ***Description:*** | This Feature is a unique identifier associated with a specific piece of data (the value). This approach is simpler and often faster than file-based storage. |
| ***Parent Feature:*** | [FO_TR_FEAT_00059] Persistency |

**Table 4.110: Details FO_TR_FEAT_00061**

### 4.3.38 [FO_TR_FEAT_00151] LIN

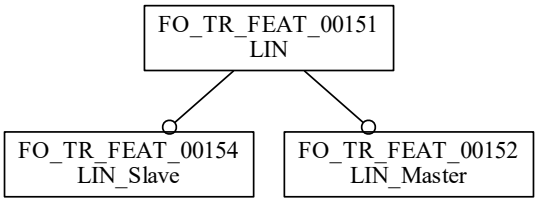


**Figure 4.54: Feature FO_TR_FEAT_00151**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00151 |
| ***Long Name:*** | LIN |
| ***Obligation:*** | Optional |
| ***Description:*** | The LIN (Local Interconnect Network) is a low-cost, low-speed communication protocol used in automotive networks for ECU and sensors communcation.. |
| ***Parent Feature:*** | [FO_TR_FEAT_00136] Network_Technology |
| ***Sub Features:*** | • [FO_TR_FEAT_00152] LIN_Master<br>• [FO_TR_FEAT_00154] LIN_Slave |

**Table 4.111: Details FO_TR_FEAT_00151**

### 4.3.39 [FO_TR_FEAT_00268] Log_and_Trace

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00268 |
| ***Long Name:*** | Log_and_Trace |
| ***Obligation:*** | Optional |
| ***Description:*** | This Feature enables comprehensive tracking of software execution and performance, facilitating in-depth analysis and optimization. |
| ***Parent Feature:*** | [FO_TR_FEAT_00112] Logging |

**Table 4.112: Details FO_TR_FEAT_00268**

### 4.3.40 [FO_TR_FEAT_00050] Logical_Supervision

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00050 |
| ***Long Name:*** | Logical_Supervision |
| ***Obligation:*** | Optional |
| ***Description:*** | This Feature checks if the software (Supervised Entity or set of Supervised Entities) is executed in the sequence defined by the developed code. |

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|---|---|
| ***Parent Feature:*** | [FO_TR_FEAT_00046] Safe_Execution |

**Table 4.113: Details FO_TR_FEAT_00050**

### 4.3.41 [FO_TR_FEAT_00259] Machine_Sleep_States_Coordination

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00259 |
| ***Long Name:*** | Machine_Sleep_States_Coordination |
| ***Obligation:*** | Optional |
| ***Description:*** | The Feature empowers the StateManagement to coordinate the systems sleep states between the Operating System, the Adaptive Applications, and potentially between the FunctionalClusters. |
| ***Applies to:*** | AP |
| ***Parent Feature:*** | [FO_TR_FEAT_00073] Mode_and_State_Management |

**Table 4.114: Details FO_TR_FEAT_00259**

### 4.3.42 [FO_TR_FEAT_00074] Machine_State_Management

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00074 |
| ***Long Name:*** | Machine_State_Management |
| ***Obligation:*** | Optional |
| ***Description:*** | This Feature refers to the mechanisms and services responsible for handling the various operational states of an ECU or the entire system. Purpose: General: Coordination of different functionalities provided at a particular time. Specific: Coordination of start and stop of processes via function groups. Recovery actions at function group level when processes fail. Coordination of update sessions together with the update configuration management. Handling of network handle states via network management. Coordination of ECU reset together with diagnostig management. |
| ***Parent Feature:*** | [FO_TR_FEAT_00073] Mode_and_State_Management |

**Table 4.115: Details FO_TR_FEAT_00074**

### 4.3.43 [FO_TR_FEAT_00053] Memory_Protection

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00053 |
| ***Long Name:*** | Memory_Protection |
| ***Obligation:*** | Optional |
| ***Description:*** | This Feature ensures that the main memory used by various software components is managed that way that it preserves system integrity and prevents unintended access or accidental corruption. Examples are Means like CRC, MMU or MPU. |
| ***Applies to:*** | AP, CP |

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|---|---|
| ***Restrictions:*** | [FO_TR_FEAT_00246] CRC_Support |
| ***Parent Feature:*** | [FO_TR_FEAT_00052] Safe_Memory |

**Table 4.116: Details FO_TR_FEAT_00053**

### 4.3.44 [FO_TR_FEAT_00216] Message_Auth_Codes

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00216 |
| ***Long Name:*** | Message_Auth_Codes |
| ***Obligation:*** | Optional |
| ***Description:*** | The Message Authentication Codes are cryptographic tools used to verify the authenticity and integrity of data. |
| ***Parent Feature:*** | [FO_TR_FEAT_00210] Cryptography |

**Table 4.117: Details FO_TR_FEAT_00216**

### 4.3.45 [FO_TR_FEAT_00237] Modular_Software_Cluster_Support

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00237 |
| ***Long Name:*** | Modular_Software_Cluster_Support |
| ***Obligation:*** | Optional |
| ***Description:*** | The Modular Software Cluster Support enables the effective management and integration of software organized into modular clusters. (CP Flex) |
| ***Applies to:*** | CP |
| ***Parent Feature:*** | [FO_TR_FEAT_00078] Software_Clustering |

**Table 4.118: Details FO_TR_FEAT_00237**

### 4.3.46 [FO_TR_FEAT_00076] Network_State_Management

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00076 |
| ***Long Name:*** | Network_State_Management |
| ***Obligation:*** | Optional |
| ***Description:*** | This Feature refers to the mechanisms and services that handle the various states and transitions of the in-vehicle communication network. Jobs like managing the network's operational states such as normal operation, sleep, and wake-up, as well as handling error states and recovery processes are part of it. |
| ***Relations:*** | [FO_TR_FEAT_00075] Application_State_Management |
| ***Parent Feature:*** | [FO_TR_FEAT_00073] Mode_and_State_Management |

**Table 4.119: Details FO_TR_FEAT_00076**

### 4.3.47 [FO_TR_FEAT_00094] OBD_on_UDS

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00094 |
| ***Long Name:*** | OBD_on_UDS |
| ***Obligation:*** | Optional |
| ***Description:*** | The OBD-on-UDS (On-Board Diagnostics on Unified Diagnostic Services) is a diagnostic protocol that integrates traditional OBD-II with the more advanced UDS protocol, allowing for more detailed vehicle diagnostics and fault detection. |
| ***Applies to:*** | CP |
| ***Restrictions:*** | [FO_TR_FEAT_00088] UDS |
| ***Parent Feature:*** | [FO_TR_FEAT_00092] Legislative_Diagnostics |

**Table 4.120: Details FO_TR_FEAT_00094**

### 4.3.48 [FO_TR_FEAT_00093] OBDII

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00093 |
| ***Long Name:*** | OBDII |
| ***Obligation:*** | Optional |
| ***Description:*** | The OBDII (On-Board Diagnostics II) describes a global standard for monitoring and reporting the performance of emission control systems. |
| ***Applies to:*** | CP |
| ***Restrictions:*** | [FO_TR_FEAT_00262] J1939_Diagnostics |
| ***Parent Feature:*** | [FO_TR_FEAT_00092] Legislative_Diagnostics |

**Table 4.121: Details FO_TR_FEAT_00093**

### 4.3.49 [FO_TR_FEAT_00104] Occupant_And_Pedestrian_Safety_Systems

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00104 |
| ***Long Name:*** | Occupant_And_Pedestrian_Safety_Systems |
| ***Obligation:*** | Optional |
| ***Description:*** | This Feature describes interface definitions related to the safety of individuals like airbags, seatbelts, and collision detection. |
| ***Applies to:*** | CP |
| ***Parent Feature:*** | [FO_TR_FEAT_00097] Vehicle_Domain_Interfaces |

**Table 4.122: Details FO_TR_FEAT_00104**

### 4.3.50 [FO_TR_FEAT_00180] Partial_Networking

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00180 |
| ***Long Name:*** | Partial_Networking |
| ***Obligation:*** | Optional |
| ***Description:*** | The Partial Networking Feature activates parts of the network as needed, allowing inactive sections to remain in low-power states. |
| ***Parent Feature:*** | [FO_TR_FEAT_00179] Network_Management |

**Table 4.123: Details FO_TR_FEAT_00180**

### 4.3.51 [FO_TR_FEAT_00062] Persistency_Update

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00062 |
| ***Long Name:*** | Persistency_Update |
| ***Obligation:*** | Optional |
| ***Description:*** | This Feature describes the update of persistent data stored in non-volatile memory (e.g. a file system) within automotive systems. |
| ***Parent Feature:*** | [FO_TR_FEAT_00059] Persistency |

**Table 4.124: Details FO_TR_FEAT_00062**

### 4.3.52 [FO_TR_FEAT_00105] Powertrain

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00105 |
| ***Long Name:*** | Powertrain |
| ***Obligation:*** | Optional |
| ***Description:*** | This Feature desribes the interface definitions related to propulsion functions like engine, transmission, and hybrid/electric drive components. |
| ***Applies to:*** | CP |
| ***Parent Feature:*** | [FO_TR_FEAT_00097] Vehicle_Domain_Interfaces |

**Table 4.125: Details FO_TR_FEAT_00105**

### 4.3.53 [FO_TR_FEAT_00217] Random_Number_Generation

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00217 |
| ***Long Name:*** | Random_Number_Generation |
| ***Obligation:*** | Optional |
| ***Description:*** | The Random Number Generation provides unpredictable and high-quality numbers crucial for various cryptographic operations. |

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|---|---|
| ***Parent Feature:*** | [FO_TR_FEAT_00210] Cryptography |

**Table 4.126: Details FO_TR_FEAT_00217**

### 4.3.54 [FO_TR_FEAT_00131] Remote_IAM

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00131 |
| ***Long Name:*** | Remote_IAM |
| ***Obligation:*** | Optional |
| ***Description:*** | The Remote IAM provides access control on inter-ECU service communication based on whitelists. |
| ***Relations:*** | [FO_TR_FEAT_00220] Identity_and_Access_Management_IAM |
| ***Parent Feature:*** | [FO_TR_FEAT_00123] Service_Oriented_Communication |

**Table 4.127: Details FO_TR_FEAT_00131**

### 4.3.55 [FO_TR_FEAT_00054] Safe_Storage

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00054 |
| ***Long Name:*** | Safe_Storage |
| ***Obligation:*** | Optional |
| ***Description:*** | This Feature ensures that data stored in non-volatile memory (NvM) is reliably preserved and protected against corruption and data loss. |
| ***Applies to:*** | FO |
| ***Relations:*** | • [FO_TR_FEAT_00056] NVRAM_Access<br>• [FO_TR_FEAT_00246] CRC_Support |
| ***Parent Feature:*** | [FO_TR_FEAT_00052] Safe_Memory |

**Table 4.128: Details FO_TR_FEAT_00054**

### 4.3.56 [FO_TR_FEAT_00063] Secure_Storage

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00063 |
| ***Long Name:*** | Secure_Storage |
| ***Obligation:*** | Optional |
| ***Description:*** | This Feature represents methods and mechanisms for securely storing data in non-volatile memory (NvM) within automotive systems. |
| ***Relations:*** | • [FO_TR_FEAT_00216] Message_Auth_Codes<br>• [FO_TR_FEAT_00214] Symmetric_Encryption |
| ***Parent Feature:*** | [FO_TR_FEAT_00059] Persistency |

**Table 4.129: Details FO_TR_FEAT_00063**

### 4.3.57 [FO_TR_FEAT_00198] Secure_Time

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00198 |
| ***Long Name:*** | Secure_Time |
| ***Obligation:*** | Optional |
| ***Description:*** | The Secure Time Feature involves protecting the integrity and authenticity of time information. |
| ***Relations:*** | [FO_TR_FEAT_00207] Security |
| ***Parent Feature:*** | [FO_TR_FEAT_00196] Time_Synchronization |

**Table 4.130: Details FO_TR_FEAT_00198**

### 4.3.58 [FO_TR_FEAT_00130] Service_Discovery

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00130 |
| ***Long Name:*** | Service_Discovery |
| ***Obligation:*** | Optional |
| ***Description:*** | This Feature describes mechanisms for discovering available services within the network. |
| ***Parent Feature:*** | [FO_TR_FEAT_00123] Service_Oriented_Communication |

**Table 4.131: Details FO_TR_FEAT_00130**

### 4.3.59 [FO_TR_FEAT_00188] Signal_Routing

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00188 |
| ***Long Name:*** | Signal_Routing |
| ***Obligation:*** | Multiple |
| ***Description:*** | The Signal Routing describes the process of transferring individual signals from one communication network to another. |
| ***Parent Feature:*** | [FO_TR_FEAT_00187] Gateway_Support |

**Table 4.132: Details FO_TR_FEAT_00188**

### 4.3.60 [FO_TR_FEAT_00129] Signal_to_Service_Communication

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00129 |
| ***Long Name:*** | Signal_to_Service_Communication |
| ***Obligation:*** | Optional |
| ***Description:*** | This Feature translates traditional signal-based communication into a service-oriented model. |

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|---|---|
| ***Parent Feature:*** | [FO_TR_FEAT_00123] Service_Oriented_Communication |

**Table 4.133: Details FO_TR_FEAT_00129**

### 4.3.61 [FO_TR_FEAT_00183] Signalbased_Over_Ethernet

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00183 |
| ***Long Name:*** | Signalbased_Over_Ethernet |
| ***Obligation:*** | Optional |
| ***Description:*** | The Signalbased Over Ethernet refers to communication data over Ethernet networks with high bandwidth and scalability of Ethernet. |
| ***Relations:*** | • [FO_TR_FEAT_00137] Ethernet<br>• [FO_TR_FEAT_00274] Container_PDU |
| ***Parent Feature:*** | [FO_TR_FEAT_00182] Signalbased_Communication |

**Table 4.134: Details FO_TR_FEAT_00183**

### 4.3.62 [FO_TR_FEAT_00127] SOME_IP

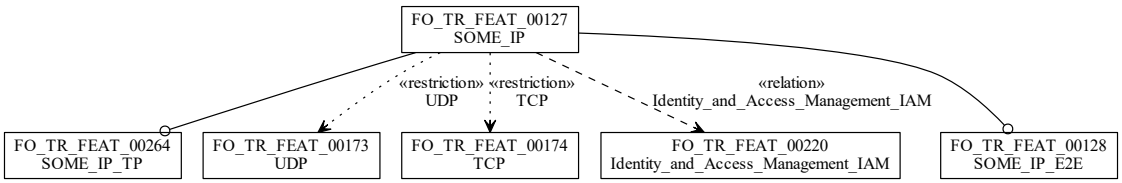


**Figure 4.55: Feature FO_TR_FEAT_00127**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00127 |
| ***Long Name:*** | SOME_IP |
| ***Obligation:*** | Optional |
| ***Description:*** | The SOME/IP (Scalable service-Oriented MiddlewarE over IP) is a communication protocol designed for service-oriented communication over IP networks. |
| ***Restrictions:*** | • [FO_TR_FEAT_00173] UDP<br>• [FO_TR_FEAT_00174] TCP |
| ***Relations:*** | [FO_TR_FEAT_00220] Identity_and_Access_Management_IAM |
| ***Parent Feature:*** | [FO_TR_FEAT_00123] Service_Oriented_Communication |
| ***Sub Features:*** | • [FO_TR_FEAT_00128] SOME_IP_E2E<br>• [FO_TR_FEAT_00264] SOME_IP_TP |

**Table 4.135: Details FO_TR_FEAT_00127**

### 4.3.63 [FO_TR_FEAT_00090] SOVD

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00090 |
| ***Long Name:*** | SOVD |
| ***Obligation:*** | Optional |
| ***Description:*** | The Service Oriented Vehicle Diagnostics (SOVD) is a Diagnostics API for Software Defined Vehicle (SDV) that shall follow the APIs specifications released by ASAM. |
| ***Applies to:*** | AP |
| ***Parent Feature:*** | [FO_TR_FEAT_00087] Diagnostic_Communication |

**Table 4.136: Details FO_TR_FEAT_00090**

### 4.3.64 [FO_TR_FEAT_00243] SPI

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00243 |
| ***Long Name:*** | SPI |
| ***Obligation:*** | Optional |
| ***Description:*** | The Serial Peripheral Interface (SPI) is a standard for synchronous serial communication for short-distance wired communication between the ECU and integrated circuits. |
| ***Parent Feature:*** | [FO_TR_FEAT_00136] Network_Technology |

**Table 4.137: Details FO_TR_FEAT_00243**

### 4.3.65 [FO_TR_FEAT_00252] Storage_Quota

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00252 |
| ***Long Name:*** | Storage_Quota |
| ***Obligation:*** | Optional |
| ***Description:*** | This Features ensures that software uses storage initially allocated for it. |
| ***Applies to:*** | AP |
| ***Parent Feature:*** | [FO_TR_FEAT_00251] Resource_Partitioning |

**Table 4.138: Details FO_TR_FEAT_00252**

### 4.3.66 [FO_TR_FEAT_00047] System_Health_Monitoring_SHM

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00047 |
| ***Long Name:*** | System_Health_Monitoring_SHM |
| ***Obligation:*** | Optional |

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|---|---|
| ***Description:*** | The System Health Monitoring is an essential for safe execution by continuously monitoring, detecting, diagnosing, and responding of automotive systems to faults for a robust system and archieving safety standards. |
| ***Parent Feature:*** | [FO_TR_FEAT_00046] Safe_Execution |

**Table 4.139: Details FO_TR_FEAT_00047**

### 4.3.67 [FO_TR_FEAT_00241] Time_Precision_Measurement

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00241 |
| ***Long Name:*** | Time_Precision_Measurement |
| ***Obligation:*** | Optional |
| ***Description:*** | The Time_Precision_Measurement enables to verify the precision of each Local Time Base compared to the Global Time Base. It is an optional recording mechanism supported for Time Slaves and Time Gateways. |
| ***Parent Feature:*** | [FO_TR_FEAT_00196] Time_Synchronization |

**Table 4.140: Details FO_TR_FEAT_00241**

### 4.3.68 [FO_TR_FEAT_00197] Time_Validation

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00197 |
| ***Long Name:*** | Time_Validation |
| ***Obligation:*** | Optional |
| ***Description:*** | The Time Validation ensures that the time information used by ECUs is accurate and reliable. |
| ***Parent Feature:*** | [FO_TR_FEAT_00196] Time_Synchronization |

**Table 4.141: Details FO_TR_FEAT_00197**

### 4.3.69 [FO_TR_FEAT_00240] Timebase_Cloning

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00240 |
| ***Long Name:*** | Timebase_Cloning |
| ***Obligation:*** | Optional |
| ***Description:*** | The Timebase_Cloning provides means to clone a Time Base by copying its current value, User Data and rate correction to another Time Base. |
| ***Parent Feature:*** | [FO_TR_FEAT_00196] Time_Synchronization |

**Table 4.142: Details FO_TR_FEAT_00240**

### 4.3.70 [FO_TR_FEAT_00255] Timing_Description

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00255 |
| ***Long Name:*** | Timing_Description |
| ***Obligation:*** | Optional |
| ***Description:*** | The formal description of a timing is given in TIMEX model elements. |
| ***Applies to:*** | AP, CP |
| ***Introduced:*** | R25-11 |
| ***Parent Feature:*** | [FO_TR_FEAT_00258] Timing_Design |

**Table 4.143: Details FO_TR_FEAT_00255**

### 4.3.71 [FO_TR_FEAT_00192] Tunneling

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00192 |
| ***Long Name:*** | Tunneling |
| ***Obligation:*** | Optional |
| ***Description:*** | The Tunneling involves encapsulating data from one network protocol within the data packets of another protocol to traverse different types of networks. |
| ***Parent Feature:*** | [FO_TR_FEAT_00187] Gateway_Support |

**Table 4.144: Details FO_TR_FEAT_00192**

### 4.3.72 [FO_TR_FEAT_00088] UDS

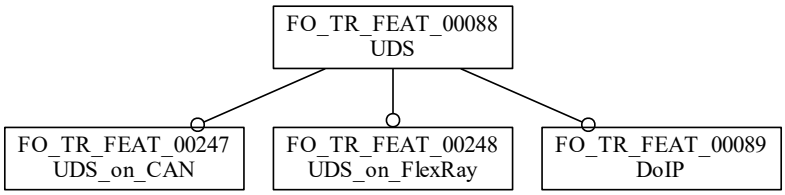


**Figure 4.56: Feature FO_TR_FEAT_00088**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00088 |
| ***Long Name:*** | UDS |
| ***Obligation:*** | Optional |
| ***Description:*** | The Unified Diagnostic Services is a standardized protocol for diagnostic communication between ECUs and diagnostic tools. It supports reading and clearing error codes, retrieving ECU information, and performing routine tests. |
| ***Applies to:*** | CP, AP |

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|---|---|
| ***Parent Feature:*** | [FO_TR_FEAT_00087] Diagnostic_Communication |
| ***Sub Features:*** | • [FO_TR_FEAT_00089] DoIP<br>• [FO_TR_FEAT_00247] UDS_on_CAN<br>• [FO_TR_FEAT_00248] UDS_on_FlexRay |

**Table 4.145: Details FO_TR_FEAT_00088**

### 4.3.73 [FO_TR_FEAT_00224] Update_Orchestration

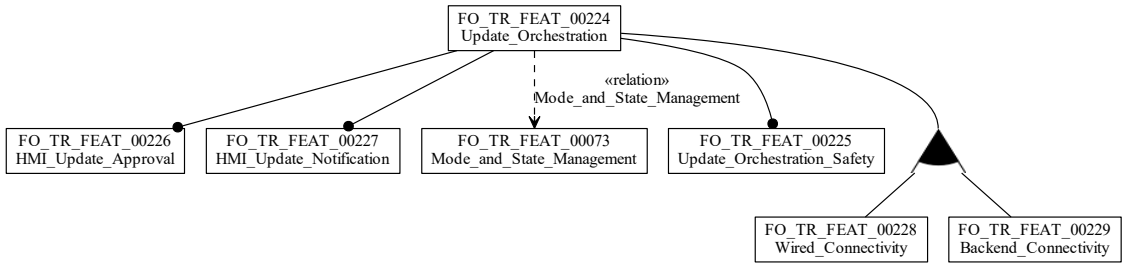


**Figure 4.57: Feature FO_TR_FEAT_00224**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00224 |
| ***Long Name:*** | Update_Orchestration |
| ***Obligation:*** | Mandatory |
| ***Description:*** | The Update Orchestration involves the coordination and management of the entire software update process. |
| ***Relations:*** | [FO_TR_FEAT_00073] Mode_and_State_Management |
| ***Parent Feature:*** | [FO_TR_FEAT_00223] Vehicle_Software_Update |
| ***Sub Features:*** | • [FO_TR_FEAT_00225] Update_Orchestration_Safety<br>• [FO_TR_FEAT_00226] HMI_Update_Approval<br>• [FO_TR_FEAT_00227] HMI_Update_Notification<br>• [FO_TR_FEAT_00228] Wired_Connectivity<br>• [FO_TR_FEAT_00229] Backend_Connectivity |

**Table 4.146: Details FO_TR_FEAT_00224**

### 4.3.74 [FO_TR_FEAT_00200] V2X_China

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00200 |
| ***Long Name:*** | V2X_China |
| ***Obligation:*** | Optional |
| ***Description:*** | The V2X_China refers to the standards, protocols, and technologies specific to V2X communication in China. |

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|---|---|
| ***Parent Feature:*** | [FO_TR_FEAT_00199] V2X |

**Table 4.147: Details FO_TR_FEAT_00200**

### 4.3.75 [FO_TR_FEAT_00201] V2X_Europe

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00201 |
| ***Long Name:*** | V2X_Europe |
| ***Obligation:*** | Optional |
| ***Description:*** | The V2X_Europe refers to the standards, protocols, and technologies specific to V2X communication in Europe. |
| ***Parent Feature:*** | [FO_TR_FEAT_00199] V2X |

**Table 4.148: Details FO_TR_FEAT_00201**

### 4.3.76 [FO_TR_FEAT_00077] Vehicle_State_Management

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00077 |
| ***Long Name:*** | Vehicle_State_Management |
| ***Obligation:*** | Optional |
| ***Description:*** | This Feature involves overseeing the different operational states of the entire vehicle system, by coordinating interaction between various ECUs and subsystems. Examples can be This includes managing states such as driving, parking, diagnostics, and shutdown. |
| ***Parent Feature:*** | [FO_TR_FEAT_00073] Mode_and_State_Management |

**Table 4.149: Details FO_TR_FEAT_00077**

### 4.3.77 [FO_TR_FEAT_00203] VISS

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00203 |
| ***Long Name:*** | VISS |
| ***Obligation:*** | Mandatory |
| ***Description:*** | The VISS (Vehicle Information Service Specification) is a standardized API that provides access to vehicle data. |
| ***Parent Feature:*** | [FO_TR_FEAT_00202] Automotive_API |

**Table 4.150: Details FO_TR_FEAT_00203**

### 4.3.78 [FO_TR_FEAT_00181] VNSM

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00181 |
| ***Long Name:*** | VNSM |
| ***Obligation:*** | Optional |
| ***Description:*** | The VNSM (Vehicle Network State Manager) manages the overseeing the state of the entire vehicle network. |
| ***Relations:*** | [FO_TR_FEAT_00187] Gateway_Support |
| ***Parent Feature:*** | [FO_TR_FEAT_00179] Network_Management |

**Table 4.151: Details FO_TR_FEAT_00181**

### 4.3.79 [FO_TR_FEAT_00204] VSS

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00204 |
| ***Long Name:*** | VSS |
| ***Obligation:*** | Mandatory |
| ***Description:*** | The VSS (Vehicle Signal Specification) defines a standardized model for representing vehicle signals and data. |
| ***Parent Feature:*** | [FO_TR_FEAT_00202] Automotive_API |

**Table 4.152: Details FO_TR_FEAT_00204**

### 4.3.80 [FO_TR_FEAT_00051] Watchdog

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00051 |
| ***Long Name:*** | Watchdog |
| ***Obligation:*** | Optional |
| ***Description:*** | The Watchdog Feature supports supervision of SW execution and can trigger switching to safe state. |
| ***Parent Feature:*** | [FO_TR_FEAT_00046] Safe_Execution |

**Table 4.153: Details FO_TR_FEAT_00051**

### 4.3.81 [FO_TR_FEAT_00249] WWH_OBD

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00249 |
| ***Long Name:*** | WWH_OBD |
| ***Obligation:*** | Optional |
| ***Description:*** | The WWH-OBD protocol (World-Wide Harmonized On-Board Diagnostics) standardizes global emissions diagnostics, enabling real-time monitoring and fault detection in vehicles. It ensures compliance with international emissions regulations and supports advanced diagnostic communication. |

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| | |
|---|---|
| ***Applies to:*** | CP |
| ***Restrictions:*** | [FO_TR_FEAT_00262] J1939_Diagnostics |
| ***Parent Feature:*** | [FO_TR_FEAT_00092] Legislative_Diagnostics |

**Table 4.154: Details FO_TR_FEAT_00249**

### 4.3.82 [FO_TR_FEAT_00121] XCP

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00121 |
| ***Long Name:*** | XCP |
| ***Obligation:*** | Optional |
| ***Description:*** | The XCP (Universal Measurement and Calibration Protocol) Feature represents a protocol used for measuring and calibrating parameters within the vehicle's ECUs. |
| ***Parent Feature:*** | [FO_TR_FEAT_00120] Measurement_and_Calibration |

**Table 4.155: Details FO_TR_FEAT_00121**

## 4.4 Level 4

### 4.4.1 [FO_TR_FEAT_00215] Asymmetric_Encryption

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00215 |
| ***Long Name:*** | Asymmetric_Encryption |
| ***Obligation:*** | Optional |
| ***Description:*** | The Asymmetric Encryption uses a pair of keys: a public key for encryption and a private key for decryption. |
| ***Parent Feature:*** | [FO_TR_FEAT_00213] Encryption_and_Decryption |

**Table 4.156: Details FO_TR_FEAT_00215**

### 4.4.2 [FO_TR_FEAT_00100] Automated_Driving_Interfaces

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00100 |
| ***Long Name:*** | Automated_Driving_Interfaces |
| ***Obligation:*** | Optional |
| ***Description:*** | This Feature describes a collection of sensor interface definitions for enabling automated driving. |
| ***Applies to:*** | AP |
| ***Parent Feature:*** | [FO_TR_FEAT_00098] ADAS |

**Table 4.157: Details FO_TR_FEAT_00100**

### 4.4.3 [FO_TR_FEAT_00229] Backend_Connectivity

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00229 |
| ***Long Name:*** | Backend_Connectivity |
| ***Obligation:*** | Multiple |
| ***Description:*** | The Backend Connectivity uses wireless communication to deliver software updates to the vehicle. |
| ***Parent Feature:*** | [FO_TR_FEAT_00224] Update_Orchestration |

**Table 4.158: Details FO_TR_FEAT_00229**

### 4.4.4 [FO_TR_FEAT_00158] CAN_Physical_Layer

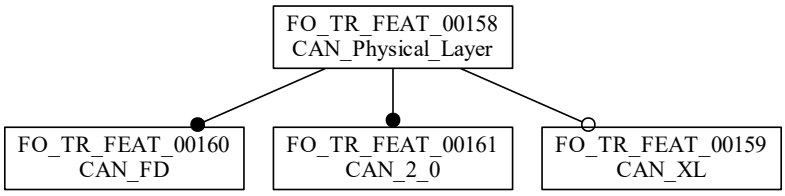


**Figure 4.58: Feature FO_TR_FEAT_00158**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00158 |
| ***Long Name:*** | CAN_Physical_Layer |
| ***Obligation:*** | Mandatory |
| ***Description:*** | This Feature defines the hardware aspects of the CAN network, including signal levels, bit timing, connectors, and noise immunity. |
| ***Parent Feature:*** | [FO_TR_FEAT_00157] CAN |
| ***Sub Features:*** | • [FO_TR_FEAT_00159] CAN_XL<br>• [FO_TR_FEAT_00160] CAN_FD<br>• [FO_TR_FEAT_00161] CAN_2_0 |

**Table 4.159: Details FO_TR_FEAT_00158**

### 4.4.5 [FO_TR_FEAT_00163] CAN_Protocols

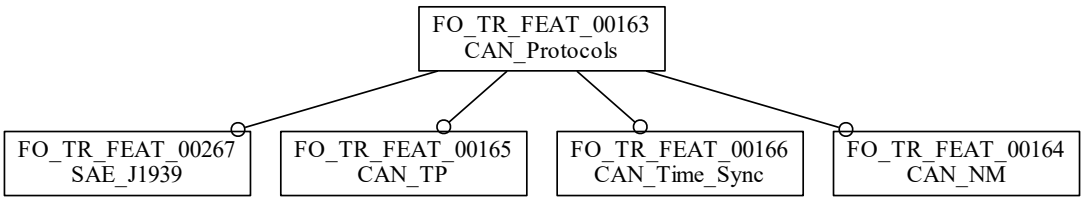


**Figure 4.59: Feature FO_TR_FEAT_00163**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00163 |
| ***Long Name:*** | CAN_Protocols |
| ***Obligation:*** | Optional |
| ***Description:*** | The CAN (Controller Area Network) protocols in AUTOSAR provide robust communication standards that describes CAN specific network layers. |
| ***Parent Feature:*** | [FO_TR_FEAT_00157] CAN |
| ***Sub Features:*** | • [FO_TR_FEAT_00164] CAN_NM<br>• [FO_TR_FEAT_00165] CAN_TP<br>• [FO_TR_FEAT_00166] CAN_Time_Sync<br>• [FO_TR_FEAT_00267] SAE_J1939 |

**Table 4.160: Details FO_TR_FEAT_00163**

### 4.4.6 [FO_TR_FEAT_00282] CANsec

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00282 |
| ***Long Name:*** | CANsec |
| ***Obligation:*** | Optional |
| ***Description:*** | CANsec is a CAN XL based secure communication protocol on Data Link Layer |
| ***Parent Feature:*** | [FO_TR_FEAT_00157] CAN |

**Table 4.161: Details FO_TR_FEAT_00282**

### 4.4.7 [FO_TR_FEAT_00126] DDS_E2E

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00126 |
| ***Long Name:*** | DDS_E2E |
| ***Obligation:*** | Optional |
| ***Description:*** | The DDS E2E (End-to-End) ensures reliable and timely data delivery through end-to-end mechanisms. |

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|---|---|
| ***Relations:*** | [FO_TR_FEAT_00193] E2E |
| ***Parent Feature:*** | [FO_TR_FEAT_00124] DDS |

**Table 4.162: Details FO_TR_FEAT_00126**

### 4.4.8 [FO_TR_FEAT_00125] DDS_Security

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00125 |
| ***Long Name:*** | DDS_Security |
| ***Obligation:*** | Optional |
| ***Description:*** | This Feature provides security mechanisms for DDS communication, including authentication, encryption, and access control. |
| ***Parent Feature:*** | [FO_TR_FEAT_00124] DDS |

**Table 4.163: Details FO_TR_FEAT_00125**

### 4.4.9 [FO_TR_FEAT_00177] DHCP

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00177 |
| ***Long Name:*** | DHCP |
| ***Obligation:*** | Optional |
| ***Description:*** | The DHCP (Dynamic Host Configuration Protocol) is a network management protocol used to automate the process of configuring devices on IP networks. |
| ***Parent Feature:*** | [FO_TR_FEAT_00167] IP |

**Table 4.164: Details FO_TR_FEAT_00177**

### 4.4.10 [FO_TR_FEAT_00089] DoIP

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00089 |
| ***Long Name:*** | DoIP |
| ***Obligation:*** | Optional |
| ***Description:*** | An Extension of Unified Diagnostic Services (UDS) is Diagnostics over IP (DoIP), that allows diagnostic networks, facilitating faster and more flexible diagnostics as specified in ISO-13400-2. |
| ***Applies to:*** | CP, AP |
| ***Parent Feature:*** | [FO_TR_FEAT_00088] UDS |

**Table 4.165: Details FO_TR_FEAT_00089**

### 4.4.11 [FO_TR_FEAT_00139] ETH

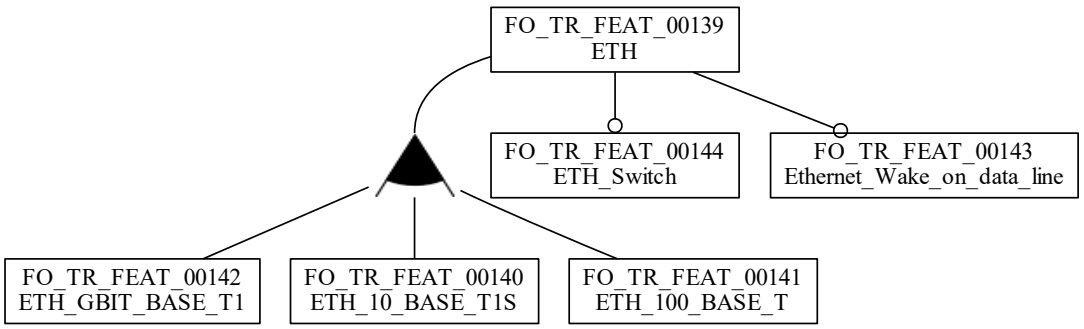


**Figure 4.60: Feature FO_TR_FEAT_00139**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00139 |
| ***Long Name:*** | ETH |
| ***Obligation:*** | Multiple |
| ***Description:*** | The ETH (Ethernet) descibes the context encompasses various Ethernet technologies and functionalities tailored for automotive networks. Diagnostics over IP |
| ***Parent Feature:*** | [FO_TR_FEAT_00137] Ethernet |
| ***Sub Features:*** | • [FO_TR_FEAT_00140] ETH_10_BASE_T1S<br>• [FO_TR_FEAT_00141] ETH_100_BASE_T<br>• [FO_TR_FEAT_00142] ETH_GBIT_BASE_T1<br>• [FO_TR_FEAT_00143] Ethernet_Wake_on_data_line<br>• [FO_TR_FEAT_00144] ETH_Switch |

**Table 4.166: Details FO_TR_FEAT_00139**

### 4.4.12 [FO_TR_FEAT_00238] Ethernet_Time_Sync

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00238 |
| ***Long Name:*** | Ethernet_Time_Sync |
| ***Obligation:*** | Optional |
| ***Description:*** | The Ethernet Time Sync realizes the Ethernet-specific time synchronization protocol. |
| ***Applies to:*** | AP, CP |
| ***Relations:*** | [FO_TR_FEAT_00196] Time_Synchronization |
| ***Parent Feature:*** | [FO_TR_FEAT_00137] Ethernet |

**Table 4.167: Details FO_TR_FEAT_00238**

### 4.4.13 [FO_TR_FEAT_00239] FlexRay_Time_Sync

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00239 |
| ***Long Name:*** | FlexRay_Time_Sync |
| ***Obligation:*** | Optional |
| ***Description:*** | The FlexRay Time Sync realizes the FlexRay-specific time synchronization protocol. An access to the synchronized time base by the SWCs requires the Synchronized Time-Base Manager (-> StbM). |
| ***Applies to:*** | CP |
| ***Relations:*** | [FO_TR_FEAT_00196] Time_Synchronization |
| ***Parent Feature:*** | [FO_TR_FEAT_00156] FlexRay |

**Table 4.168: Details FO_TR_FEAT_00239**

### 4.4.14 [FO_TR_FEAT_00265] FlexRay_TP

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00265 |
| ***Long Name:*** | FlexRay_TP |
| ***Obligation:*** | Optional |
| ***Description:*** | The FlexRay_TP - Transport Protocol is responsible for segmenting the data in the Tx direction, collecting data in the Rx direction and monitoring the data stream. |
| ***Introduced:*** | R25-11 |
| ***Parent Feature:*** | [FO_TR_FEAT_00156] FlexRay |

**Table 4.169: Details FO_TR_FEAT_00265**

### 4.4.15 [FO_TR_FEAT_00226] HMI_Update_Approval

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00226 |
| ***Long Name:*** | HMI_Update_Approval |
| ***Obligation:*** | Mandatory |
| ***Description:*** | The HMI Update Approval involves obtaining user consent through the Human-Machine Interface (HMI) before proceeding with a software update. |
| ***Parent Feature:*** | [FO_TR_FEAT_00224] Update_Orchestration |

**Table 4.170: Details FO_TR_FEAT_00226**

### 4.4.16 [FO_TR_FEAT_00227] HMI_Update_Notification

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00227 |
| ***Long Name:*** | HMI_Update_Notification |
| ***Obligation:*** | Mandatory |

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|---|---|
| ***Description:*** | The HMI Update Notification provides alerts and information to the user through the Human-Machine Interface (HMI) about the status and details of software updates. |
| ***Parent Feature:*** | [FO_TR_FEAT_00224] Update_Orchestration |

**Table 4.171: Details FO_TR_FEAT_00227**

### 4.4.17 [FO_TR_FEAT_00244] I2C_Controller

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00244 |
| ***Long Name:*** | I2C_Controller |
| ***Obligation:*** | Optional |
| ***Description:*** | A device controlling other devices (Targets). Further it initiates a transfer, generates clock signals and terminates a transfer. Formerly known as "Master". |
| ***Parent Feature:*** | [FO_TR_FEAT_00242] I2C |

**Table 4.172: Details FO_TR_FEAT_00244**

### 4.4.18 [FO_TR_FEAT_00245] I2C_Target

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00245 |
| ***Long Name:*** | I2C_Target |
| ***Obligation:*** | Optional |
| ***Description:*** | A device being addressed by a Controller device. Formerly known as "Slave". |
| ***Parent Feature:*** | [FO_TR_FEAT_00242] I2C |

**Table 4.173: Details FO_TR_FEAT_00245**

### 4.4.19 [FO_TR_FEAT_00172] ICMP

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00172 |
| ***Long Name:*** | ICMP |
| ***Obligation:*** | Optional |
| ***Description:*** | The ICMP (Internet Control Message Protocol) is used by network devices to send error messages and operational information indicating success or failure when communicating with another IP address. |
| ***Parent Feature:*** | [FO_TR_FEAT_00167] IP |

**Table 4.174: Details FO_TR_FEAT_00172**

### 4.4.20 [FO_TR_FEAT_00168] IP_V4

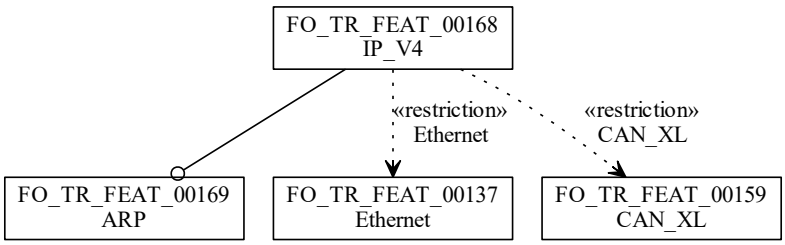


**Figure 4.61: Feature FO_TR_FEAT_00168**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00168 |
| ***Long Name:*** | IP_V4 |
| ***Obligation:*** | Optional |
| ***Description:*** | The IP_V4 (Internet Protocol version 4) Feature is the fourth version of the Internet Protocol. It is one of the core protocols of internet protokol suite, using 32-bit addresses |
| ***Restrictions:*** | • [FO_TR_FEAT_00137] Ethernet<br>• [FO_TR_FEAT_00159] CAN_XL |
| ***Parent Feature:*** | [FO_TR_FEAT_00167] IP |
| ***Sub Features:*** | [FO_TR_FEAT_00169] ARP |

**Table 4.175: Details FO_TR_FEAT_00168**

### 4.4.21 [FO_TR_FEAT_00170] IP_V6

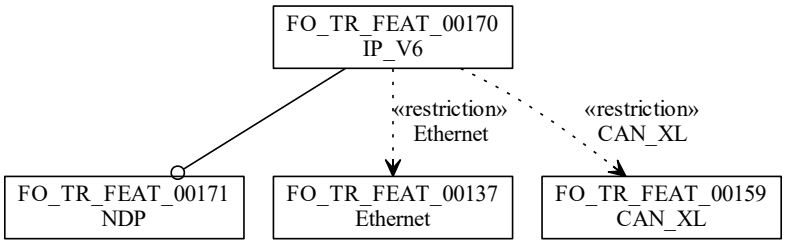


**Figure 4.62: Feature FO_TR_FEAT_00170**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00170 |
| ***Long Name:*** | IP_V6 |
| ***Obligation:*** | Optional |

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|---|---|
| ***Description:*** | The IP_V6 (Internet Protocol version 6) is the most recent version of the Internet Protocol, designed to address the limitations of IPv4, such as address exhaustion, using 128-bit addresses. |
| ***Restrictions:*** | • [FO_TR_FEAT_00137] Ethernet<br>• [FO_TR_FEAT_00159] CAN_XL |
| ***Parent Feature:*** | [FO_TR_FEAT_00167] IP |
| ***Sub Features:*** | [FO_TR_FEAT_00171] NDP |

**Table 4.176: Details FO_TR_FEAT_00170**

### 4.4.22 [FO_TR_FEAT_00176] IPSec

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00176 |
| ***Long Name:*** | IPSec |
| ***Obligation:*** | Optional |
| ***Description:*** | The IPSec (Internet Protocol Security) is a suite of protocols designed to ensure the security of data communications over an IP network through cryptographic security services. |
| ***Restrictions:*** | • [FO_TR_FEAT_00168] IP_V4<br>• [FO_TR_FEAT_00170] IP_V6 |
| ***Parent Feature:*** | [FO_TR_FEAT_00167] IP |

**Table 4.177: Details FO_TR_FEAT_00176**

### 4.4.23 [FO_TR_FEAT_00138] ITS_G5

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00138 |
| ***Long Name:*** | ITS_G5 |
| ***Obligation:*** | Multiple |
| ***Description:*** | This Feature represents Wake-Up and Sleep Funcktionality of Ethernet technology to manage the power consumption of automotive networks dynamically according IEEE 802.11p. |
| ***Applies to:*** | CP, AP |
| ***Parent Feature:*** | [FO_TR_FEAT_00137] Ethernet |

**Table 4.178: Details FO_TR_FEAT_00138**

### 4.4.24 [FO_TR_FEAT_00152] LIN_Master

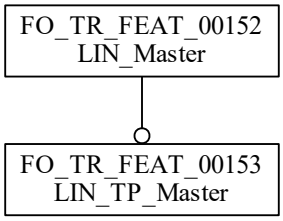


**Figure 4.63: Feature FO_TR_FEAT_00152**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00152 |
| ***Long Name:*** | LIN_Master |
| ***Obligation:*** | Optional |
| ***Description:*** | The LIN master is the primary controller in a LIN network. It initiates communication, schedules the data frame transmissions, and ensures the network's overall synchronization. |
| ***Parent Feature:*** | [FO_TR_FEAT_00151] LIN |
| ***Sub Features:*** | [FO_TR_FEAT_00153] LIN_TP_Master |

**Table 4.179: Details FO_TR_FEAT_00152**

### 4.4.25 [FO_TR_FEAT_00154] LIN_Slave

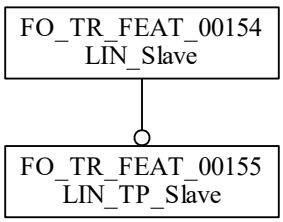


**Figure 4.64: Feature FO_TR_FEAT_00154**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00154 |
| ***Long Name:*** | LIN_Slave |
| ***Obligation:*** | Optional |
| ***Description:*** | The LIN slave is a secondary device on the LIN network that respond to the LIN master's requests. |

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|---|---|
| ***Parent Feature:*** | [FO_TR_FEAT_00151] LIN |
| ***Sub Features:*** | [FO_TR_FEAT_00155] LIN_TP_Slave |

**Table 4.180: Details FO_TR_FEAT_00154**

### 4.4.26 [FO_TR_FEAT_00145] MACsec

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00145 |
| ***Long Name:*** | MACsec |
| ***Obligation:*** | Optional |
| ***Description:*** | The MACsec (Media Access Control Security) is a security protocol that provides data confidentiality, integrity, and origin authenticity for Ethernet frames. |
| ***Restrictions:*** | [FO_TR_FEAT_00219] Key_Management |
| ***Parent Feature:*** | [FO_TR_FEAT_00137] Ethernet |

**Table 4.181: Details FO_TR_FEAT_00145**

### 4.4.27 [FO_TR_FEAT_00281] MCAL_ADC

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00281 |
| ***Long Name:*** | MCAL_ADC |
| ***Obligation:*** | Optional |
| ***Description:*** | This feature represents the ADC MCAL driver. |
| ***Applies to:*** | CP |
| ***Parent Feature:*** | [FO_TR_FEAT_00253] IO_Hardware_Abstraction |

**Table 4.182: Details FO_TR_FEAT_00281**

### 4.4.28 [FO_TR_FEAT_00278] MCAL_DIO

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00278 |
| ***Long Name:*** | MCAL_DIO |
| ***Obligation:*** | Optional |
| ***Description:*** | This feature represents the DIO MCAL driver. |
| ***Applies to:*** | CP |
| ***Parent Feature:*** | [FO_TR_FEAT_00253] IO_Hardware_Abstraction |

**Table 4.183: Details FO_TR_FEAT_00278**

### 4.4.29 [FO_TR_FEAT_00277] MCAL_GPIO

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00277 |
| ***Long Name:*** | MCAL_GPIO |
| ***Obligation:*** | Optional |
| ***Description:*** | This feature represents the GPIO (General Purpose Input/Output) MCAL driver. |
| ***Applies to:*** | CP |
| ***Parent Feature:*** | [FO_TR_FEAT_00253] IO_Hardware_Abstraction |

**Table 4.184: Details FO_TR_FEAT_00277**

### 4.4.30 [FO_TR_FEAT_00280] MCAL_GPT

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00280 |
| ***Long Name:*** | MCAL_GPT |
| ***Obligation:*** | Optional |
| ***Description:*** | This feature represents the GPT MCAL driver. |
| ***Applies to:*** | CP |
| ***Parent Feature:*** | [FO_TR_FEAT_00253] IO_Hardware_Abstraction |

**Table 4.185: Details FO_TR_FEAT_00280**

### 4.4.31 [FO_TR_FEAT_00279] MCAL_PWM

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00279 |
| ***Long Name:*** | MCAL_PWM |
| ***Obligation:*** | Optional |
| ***Description:*** | This feature represents the DIO MCAL driver. |
| ***Applies to:*** | CP |
| ***Parent Feature:*** | [FO_TR_FEAT_00253] IO_Hardware_Abstraction |

**Table 4.186: Details FO_TR_FEAT_00279**

### 4.4.32 [FO_TR_FEAT_00128] SOME_IP_E2E

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00128 |
| ***Long Name:*** | SOME_IP_E2E |
| ***Obligation:*** | Optional |
| ***Description:*** | This Feautre ensures the end-to-end data delivery reliability for SOME/IP communication, managing message integrity and error handling. |
| ***Relations:*** | [FO_TR_FEAT_00193] E2E |

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|---|---|
| ***Parent Feature:*** | [FO_TR_FEAT_00127] SOME_IP |

**Table 4.187: Details FO_TR_FEAT_00128**

### 4.4.33 [FO_TR_FEAT_00264] SOME_IP_TP

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00264 |
| ***Long Name:*** | SOME_IP_TP |
| ***Obligation:*** | Optional |
| ***Description:*** | The SOME/IP TP - Transport Protocol is responsible for segmenting the data in the Tx direction, collecting data in the Rx direction and monitoring the data stream. |
| ***Introduced:*** | R25-11 |
| ***Parent Feature:*** | [FO_TR_FEAT_00127] SOME_IP |

**Table 4.188: Details FO_TR_FEAT_00264**

### 4.4.34 [FO_TR_FEAT_00214] Symmetric_Encryption

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00214 |
| ***Long Name:*** | Symmetric_Encryption |
| ***Obligation:*** | Optional |
| ***Description:*** | The Symmetric Encryption uses the same key for both encryption and decryption, especially for large amounts of data. |
| ***Parent Feature:*** | [FO_TR_FEAT_00213] Encryption_and_Decryption |

**Table 4.189: Details FO_TR_FEAT_00214**

### 4.4.35 [FO_TR_FEAT_00174] TCP

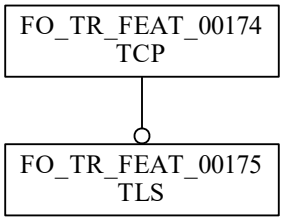


**Figure 4.65: Feature FO_TR_FEAT_00174**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00174 |
| ***Long Name:*** | TCP |
| ***Obligation:*** | Optional |
| ***Description:*** | The TCP (Transmission Control Protocol) is a connection-oriented protocol of data between applications running on hosts communicating over an IP network. |
| ***Parent Feature:*** | [FO_TR_FEAT_00167] IP |
| ***Sub Features:*** | [FO_TR_FEAT_00175] TLS |

**Table 4.190: Details FO_TR_FEAT_00174**

### 4.4.36 [FO_TR_FEAT_00146] TSN

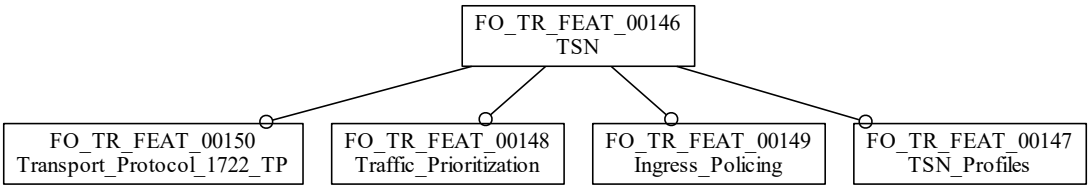


**Figure 4.66: Feature FO_TR_FEAT_00146**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00146 |
| ***Long Name:*** | TSN |
| ***Obligation:*** | Optional |
| ***Description:*** | The TSN (Time-Sensitive Networking) describes IEEE standards to support deterministic real-time communication. |
| ***Parent Feature:*** | [FO_TR_FEAT_00137] Ethernet |
| ***Sub Features:*** | • [FO_TR_FEAT_00147] TSN_Profiles<br>• [FO_TR_FEAT_00148] Traffic_Prioritization<br>• [FO_TR_FEAT_00149] Ingress_Policing<br>• [FO_TR_FEAT_00150] Transport_Protocol_1722_TP |

**Table 4.191: Details FO_TR_FEAT_00146**

### 4.4.37 [FO_TR_FEAT_00173] UDP

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00173 |
| ***Long Name:*** | UDP |
| ***Obligation:*** | Optional |
| ***Description:*** | The UDP (User Datagram Protocol) is a connectionless protocol that provides a lightweight way to send datagrams over an IP network. |

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|---|---|
| ***Parent Feature:*** | [FO_TR_FEAT_00167] IP |

**Table 4.192: Details FO_TR_FEAT_00173**

### 4.4.38 [FO_TR_FEAT_00247] UDS_on_CAN

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00247 |
| ***Long Name:*** | UDS_on_CAN |
| ***Obligation:*** | Optional |
| ***Description:*** | The UDSonCAN protocol facilitates Diagnsotics Communication over the CAN bus, enabling advanced diagnostics, ECU reprogramming, and fault detection in automotive systems. It ensures standardized, efficient communication between diagnostic tools and vehicle ECUs according to ISO-14229-3. |
| ***Applies to:*** | CP |
| ***Parent Feature:*** | [FO_TR_FEAT_00088] UDS |

**Table 4.193: Details FO_TR_FEAT_00247**

### 4.4.39 [FO_TR_FEAT_00248] UDS_on_FlexRay

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00248 |
| ***Long Name:*** | UDS_on_FlexRay |
| ***Obligation:*** | Optional |
| ***Description:*** | The UDSonFR protocol enables Unified Diagnostic Services (UDS) over the FlexRay network, supporting high-speed diagnostics, ECU reprogramming, and fault management in complex automotive systems. It ensures reliable communication in time-critical environments according to ISO-14229-4. |
| ***Applies to:*** | CP |
| ***Parent Feature:*** | [FO_TR_FEAT_00088] UDS |

**Table 4.194: Details FO_TR_FEAT_00248**

### 4.4.40 [FO_TR_FEAT_00225] Update_Orchestration_Safety

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00225 |
| ***Long Name:*** | Update_Orchestration_Safety |
| ***Obligation:*** | Mandatory |
| ***Description:*** | The Update Orchestration Safety ensures that the software update process does not compromise the safety of the vehicle. |
| ***Parent Feature:*** | [FO_TR_FEAT_00224] Update_Orchestration |

**Table 4.195: Details FO_TR_FEAT_00225**

### 4.4.41 [FO_TR_FEAT_00099] VMCI

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00099 |
| ***Long Name:*** | VMCI |
| ***Obligation:*** | Optional |
| ***Description:*** | The VMCI (Vehicle Motion Control Interface) is a standardized interface for controlling and coordinating vehicle motion including managing acceleration, braking, and steering. |
| ***Applies to:*** | CP |
| ***Parent Feature:*** | [FO_TR_FEAT_00098] ADAS |

**Table 4.196: Details FO_TR_FEAT_00099**

### 4.4.42 [FO_TR_FEAT_00228] Wired_Connectivity

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00228 |
| ***Long Name:*** | Wired_Connectivity |
| ***Obligation:*** | Multiple |
| ***Description:*** | The Wired Connectivity desribes the physical connections to transfer software updates to the vehicle. (e.g. USB, Ethernet, or dedicated diagnostic ports) |
| ***Parent Feature:*** | [FO_TR_FEAT_00224] Update_Orchestration |

**Table 4.197: Details FO_TR_FEAT_00228**

## 4.5 Level 5

### 4.5.1 [FO_TR_FEAT_00169] ARP

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00169 |
| ***Long Name:*** | ARP |
| ***Obligation:*** | Optional |
| ***Description:*** | The ARP (Address Resolution Protocol) is a protocol used to map IP addresses to the physical MAC addresses. |
| ***Parent Feature:*** | [FO_TR_FEAT_00168] IP_V4 |

**Table 4.198: Details FO_TR_FEAT_00169**

### 4.5.2 [FO_TR_FEAT_00161] CAN_2_0

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00161 |
| ***Long Name:*** | CAN_2_0 |
| ***Obligation:*** | Mandatory |

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| | |
|---|---|
| ***Description:*** | This Feature is the classical version of CAN, providing robust error detection, standard and extended frames, and efficient arbitration. |
| ***Parent Feature:*** | [FO_TR_FEAT_00158] CAN_Physical_Layer |

**Table 4.199: Details FO_TR_FEAT_00161**

### 4.5.3 [FO_TR_FEAT_00160] CAN_FD

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00160 |
| ***Long Name:*** | CAN_FD |
| ***Obligation:*** | Mandatory |
| ***Description:*** | The CAN FD is an extension of CAN protocol that enhances data transfer efficiency by allowing flexible data rates and larger data payloads within the same frame. |
| ***Parent Feature:*** | [FO_TR_FEAT_00158] CAN_Physical_Layer |

**Table 4.200: Details FO_TR_FEAT_00160**

### 4.5.4 [FO_TR_FEAT_00164] CAN_NM

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00164 |
| ***Long Name:*** | CAN_NM |
| ***Obligation:*** | Optional |
| ***Description:*** | The CAN NM - Network Management coordinates transitions between the wake up and sleep state of the network. |
| ***Relations:*** | [FO_TR_FEAT_00179] Network_Management |
| ***Parent Feature:*** | [FO_TR_FEAT_00163] CAN_Protocols |

**Table 4.201: Details FO_TR_FEAT_00164**

### 4.5.5 [FO_TR_FEAT_00166] CAN_Time_Sync

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00166 |
| ***Long Name:*** | CAN_Time_Sync |
| ***Obligation:*** | Optional |
| ***Description:*** | The CAN Time Sync realizes the CAN-specific time synchronization protocol. An access to the synchronized time base by the SWCs requires the Synchronized Time-Base Manager (-> StbM). |
| ***Applies to:*** | CP |
| ***Relations:*** | [FO_TR_FEAT_00196] Time_Synchronization |
| ***Parent Feature:*** | [FO_TR_FEAT_00163] CAN_Protocols |

**Table 4.202: Details FO_TR_FEAT_00166**

### 4.5.6 [FO_TR_FEAT_00165] CAN_TP

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00165 |
| ***Long Name:*** | CAN_TP |
| ***Obligation:*** | Optional |
| ***Description:*** | The CAN TP - Transport Protocol is responsible for segmenting the data in the Tx direction, collecting data in the Rx direction and monitoring the data stream. |
| ***Restrictions:*** | • [FO_TR_FEAT_00264] SOME_IP_TP<br>• [FO_TR_FEAT_00265] FlexRay_TP |
| ***Parent Feature:*** | [FO_TR_FEAT_00163] CAN_Protocols |

**Table 4.203: Details FO_TR_FEAT_00165**

### 4.5.7 [FO_TR_FEAT_00159] CAN_XL

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00159 |
| ***Long Name:*** | CAN_XL |
| ***Obligation:*** | Optional |
| ***Description:*** | The CAN XL enhances the CAN protocol by supporting longer data frames and higher data rates while maintaining backward compatibility |
| ***Relations:*** | [FO_TR_FEAT_00137] Ethernet |
| ***Parent Feature:*** | [FO_TR_FEAT_00158] CAN_Physical_Layer |

**Table 4.204: Details FO_TR_FEAT_00159**

### 4.5.8 [FO_TR_FEAT_00141] ETH_100_BASE_T

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00141 |
| ***Long Name:*** | ETH_100_BASE_T |
| ***Obligation:*** | Multiple |
| ***Description:*** | The ETH_100_BASE_T (100BASE-T) is a high-speed Ethernet network connection providing 100 Mbps over twisted pair cables. |
| ***Parent Feature:*** | [FO_TR_FEAT_00139] ETH |

**Table 4.205: Details FO_TR_FEAT_00141**

### 4.5.9 [FO_TR_FEAT_00140] ETH_10_BASE_T1S

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00140 |
| ***Long Name:*** | ETH_10_BASE_T1S |
| ***Obligation:*** | Multiple |
| ***Description:*** | ETH_10_BASE_T1S (10BASE-T1S) is a standardized Ethernet physical layer specification for automotive networks providing a 10 Mbps Ethernet connection. |

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|---|---|
| ***Parent Feature:*** | [FO_TR_FEAT_00139] ETH |

**Table 4.206: Details FO_TR_FEAT_00140**

### 4.5.10 [FO_TR_FEAT_00142] ETH_GBIT_BASE_T1

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00142 |
| ***Long Name:*** | ETH_GBIT_BASE_T1 |
| ***Obligation:*** | Multiple |
| ***Description:*** | The ETH_XYZ_BASE_T1 (Placeholder for various higher-speed Ethernet standards, such as 1000BASE-T1, 2.5GBASE-T1, etc.) higher-speed Ethernet standards designed for automotive use, offering speeds from 1 Gbps to multiple Gbps over a single twisted pair cable. |
| ***Parent Feature:*** | [FO_TR_FEAT_00139] ETH |

**Table 4.207: Details FO_TR_FEAT_00142**

### 4.5.11 [FO_TR_FEAT_00144] ETH_Switch

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00144 |
| ***Long Name:*** | ETH_Switch |
| ***Obligation:*** | Optional |
| ***Description:*** | The ETH Switch (Ethernet Switch) describes the connection to multiple Ethernet devices within a vehicle, managing data traffic efficiently. |
| ***Parent Feature:*** | [FO_TR_FEAT_00139] ETH |

**Table 4.208: Details FO_TR_FEAT_00144**

### 4.5.12 [FO_TR_FEAT_00143] Ethernet_Wake_on_data_line

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00143 |
| ***Long Name:*** | Ethernet_Wake_on_data_line |
| ***Obligation:*** | Optional |
| ***Description:*** | This Feature allows the Ethernet network to wake up from a low-power state when data is detected on the line. |
| ***Parent Feature:*** | [FO_TR_FEAT_00139] ETH |

**Table 4.209: Details FO_TR_FEAT_00143**

### 4.5.13 [FO_TR_FEAT_00149] Ingress_Policing

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00149 |
| ***Long Name:*** | Ingress_Policing |
| ***Obligation:*** | Optional |
| ***Description:*** | This Feature monitors and regulates the flow of incoming network traffic to fullfill compliance requirements. |
| ***Parent Feature:*** | [FO_TR_FEAT_00146] TSN |

**Table 4.210: Details FO_TR_FEAT_00149**

### 4.5.14 [FO_TR_FEAT_00153] LIN_TP_Master

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00153 |
| ***Long Name:*** | LIN_TP_Master |
| ***Obligation:*** | Optional |
| ***Description:*** | This TP (Transport Protocol)-Feature is an extension of the LIN master to handle larger data packets across multiple LIN frames. |
| ***Parent Feature:*** | [FO_TR_FEAT_00152] LIN_Master |

**Table 4.211: Details FO_TR_FEAT_00153**

### 4.5.15 [FO_TR_FEAT_00155] LIN_TP_Slave

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00155 |
| ***Long Name:*** | LIN_TP_Slave |
| ***Obligation:*** | Optional |
| ***Description:*** | This TP (Transport Protocol)-Feature is an extension of the LIN slave to handle larger data packets across multiple LIN frames. |
| ***Parent Feature:*** | [FO_TR_FEAT_00154] LIN_Slave |

**Table 4.212: Details FO_TR_FEAT_00155**

### 4.5.16 [FO_TR_FEAT_00171] NDP

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00171 |
| ***Long Name:*** | NDP |
| ***Obligation:*** | Optional |
| ***Description:*** | The NDP (Neighbor Discovery Protocol) is a protocol used in IPv6 to discover other devices on the network. |
| ***Parent Feature:*** | [FO_TR_FEAT_00170] IP_V6 |

**Table 4.213: Details FO_TR_FEAT_00171**

### 4.5.17 [FO_TR_FEAT_00267] SAE_J1939

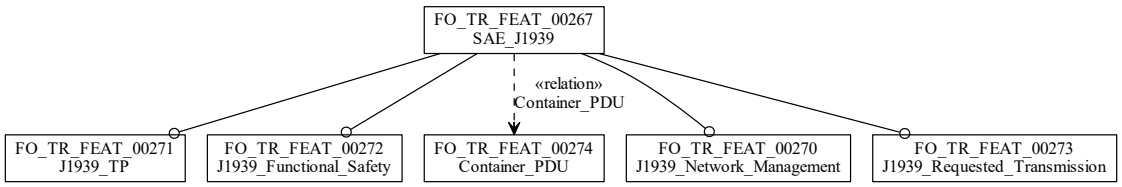


**Figure 4.67: Feature FO_TR_FEAT_00267**

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00267 |
| ***Long Name:*** | SAE_J1939 |
| ***Obligation:*** | Optional |
| ***Lifecycle Status:*** | Valid |
| ***Description:*** | This Feature enables communication for trucks and agricultural machinery according to SAE J1939. |
| ***Applies to:*** | CP |
| ***Introduced:*** | R25-11 |
| ***Relations:*** | [FO_TR_FEAT_00274] Container_PDU |
| ***Parent Feature:*** | [FO_TR_FEAT_00163] CAN_Protocols |
| ***Sub Features:*** | • [FO_TR_FEAT_00270] J1939_Network_Management<br>• [FO_TR_FEAT_00271] J1939_TP<br>• [FO_TR_FEAT_00272] J1939_Functional_Safety<br>• [FO_TR_FEAT_00273] J1939_Requested_Transmission |

**Table 4.214: Details FO_TR_FEAT_00267**

### 4.5.18 [FO_TR_FEAT_00175] TLS

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00175 |
| ***Long Name:*** | TLS |
| ***Obligation:*** | Optional |
| ***Description:*** | The TLS (Transport Layer Security) is a protocol that provides privacy and data integrity between two communicating applications. |
| ***Parent Feature:*** | [FO_TR_FEAT_00174] TCP |

**Table 4.215: Details FO_TR_FEAT_00175**

### 4.5.19 [FO_TR_FEAT_00148] Traffic_Prioritization

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00148 |
| ***Long Name:*** | Traffic_Prioritization |
| ***Obligation:*** | Optional |
| ***Description:*** | This Feature describes the assignment of different levels of priority to various types of network traffic to ensure that critical data gets transmitted with higher prioritiy. |
| ***Parent Feature:*** | [FO_TR_FEAT_00146] TSN |

**Table 4.216: Details FO_TR_FEAT_00148**

### 4.5.20 [FO_TR_FEAT_00150] Transport_Protocol_1722_TP

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00150 |
| ***Long Name:*** | Transport_Protocol_1722_TP |
| ***Obligation:*** | Optional |
| ***Description:*** | This Feature represents the requirements of the IEEE 1722 TP (Transport Protocol) for Audio/Video Bridging (AVB) over Ethernet to ensure timely and synchronized delivery of audio and video streams. |
| ***Parent Feature:*** | [FO_TR_FEAT_00146] TSN |

**Table 4.217: Details FO_TR_FEAT_00150**

### 4.5.21 [FO_TR_FEAT_00147] TSN_Profiles

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00147 |
| ***Long Name:*** | TSN_Profiles |
| ***Obligation:*** | Optional |
| ***Description:*** | This Feature provides tools and protocols to ensure deterministic data transmission over Ethernet. |
| ***Parent Feature:*** | [FO_TR_FEAT_00146] TSN |

**Table 4.218: Details FO_TR_FEAT_00147**

## 4.6 Level 6

### 4.6.1 [FO_TR_FEAT_00272] J1939_Functional_Safety

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00272 |
| ***Long Name:*** | J1939_Functional_Safety |
| ***Obligation:*** | Optional |
| ***Lifecycle Status:*** | Valid |

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|---|---|
| ***Description:*** | This Feature enables safety protected communication according SAE J1939-76. |
| ***Applies to:*** | CP |
| ***Introduced:*** | R25-11 |
| ***Relations:*** | [FO_TR_FEAT_00193] E2E |
| ***Parent Feature:*** | [FO_TR_FEAT_00267] SAE_J1939 |

**Table 4.219: Details FO_TR_FEAT_00272**

### 4.6.2 [FO_TR_FEAT_00270] J1939_Network_Management

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00270 |
| ***Long Name:*** | J1939_Network_Management |
| ***Obligation:*** | Optional |
| ***Lifecycle Status:*** | Valid |
| ***Description:*** | This Feature enables assignment of node adresses according to SAE J1939-81. |
| ***Applies to:*** | CP |
| ***Introduced:*** | R25-11 |
| ***Parent Feature:*** | [FO_TR_FEAT_00267] SAE_J1939 |

**Table 4.220: Details FO_TR_FEAT_00270**

### 4.6.3 [FO_TR_FEAT_00273] J1939_Requested_Transmission

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00273 |
| ***Long Name:*** | J1939_Requested_Transmission |
| ***Obligation:*** | Optional |
| ***Lifecycle Status:*** | Valid |
| ***Description:*** | This Feature allows requesting messages according SAE J1939-21. |
| ***Applies to:*** | CP |
| ***Introduced:*** | R25-11 |
| ***Parent Feature:*** | [FO_TR_FEAT_00267] SAE_J1939 |

**Table 4.221: Details FO_TR_FEAT_00273**

### 4.6.4 [FO_TR_FEAT_00271] J1939_TP

| | |
|---|---|
| ***Short Name:*** | FO_TR_FEAT_00271 |
| ***Long Name:*** | J1939_TP |
| ***Obligation:*** | Optional |
| ***Lifecycle Status:*** | Valid |

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| | |
|---|---|
| ***Description:*** | The Feature J1939 TP (Transport Protocol) enables transmission of large messages according to SAE J1939-21. |
| ***Applies to:*** | CP |
| ***Introduced:*** | R25-11 |
| ***Parent Feature:*** | [FO_TR_FEAT_00267] SAE_J1939 |

**Table 4.222: Details FO_TR_FEAT_00271**

# A Change history of AUTOSAR traceable items

Please note that the lists in this chapter also include traceable items that have been removed from the specification in a later version. These items do not appear as hyperlinks in the document.

## A.1 Traceable item history of this document according to AUTOSAR Release R25-11

- New Features:
  - FO_TR_FEAT_00253 IO_Hardware_Abstraction
  - FO_TR_FEAT_00254 Safe_Hardware_Accelerators
  - FO_TR_FEAT_00255 Timing_Description
  - FO_TR_FEAT_00256 Timing
  - FO_TR_FEAT_00258 Timing_Design
  - FO_TR_FEAT_00259 Machine_Sleep_States_Coordination
  - FO_TR_FEAT_00260 Remote_Persistency
  - FO_TR_FEAT_00262 J1939_Diagnostics
  - FO_TR_FEAT_00263 ECU_Data_Collection
  - FO_TR_FEAT_00264 SOME_IP_TP
  - FO_TR_FEAT_00265 FlexRay_TP
  - FO_TR_FEAT_00266 MCU_Abstraction
  - FO_TR_FEAT_00267 SAE_J1939
  - FO_TR_FEAT_00268 Log_and_Trace
  - FO_TR_FEAT_00269 Bus_Mirroring
  - FO_TR_FEAT_00270 J1939_Network_Management
  - FO_TR_FEAT_00271 J1939_TP
  - FO_TR_FEAT_00272 J1939_Functional_Safety
  - FO_TR_FEAT_00273 J1939_Requested_Transmission
  - FO_TR_FEAT_00274 Container_PDU
  - FO_TR_FEAT_00275 ECU_Abstraction
  - FO_TR_FEAT_00276 Time_Service

  - FO_TR_FEAT_00277 MCAL_GPIO
  - FO_TR_FEAT_00278 MCAL_DIO
  - FO_TR_FEAT_00279 MCAL_PWM
  - FO_TR_FEAT_00280 MCAL_GPT
  - FO_TR_FEAT_00281 MCAL_ADC
- Removed Features:
  - FO_TR_FEAT_00067 Deterministic_Synchronisation
  - FO_TR_FEAT_00095 Zero_Emission
  - FO_TR_FEAT_00113 Log_and_Trace
  - FO_TR_FEAT_00162 TT_CAN
  - FO_TR_FEAT_00185 Padding
  - FO_TR_FEAT_00186 Container_PDU
- Renamed Features:
  - FO_TR_FEAT_00135 Inter_OS_Application_Communication
  - FO_TR_FEAT_00142 ETH_GBIT_BASE_T1
  - FO_TR_FEAT_00205 Charging_Protocol
  - FO_TR_FEAT_00222 Software_Update
  - FO_TR_FEAT_00236 Hardware_Support
- Relocated Features:
  - FO_TR_FEAT_00119 Timing_Analysis
  - FO_TR_FEAT_00246 CRC_Support
  - FO_TR_FEAT_00251 Resource_Partitioning