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Contents

1	Introduction and functional overview	11
2	Acronyms, abbreviations and definitions	12
2.1	Acronyms and abbreviations	12
2.2	Definitions	12
2.2.1	Ethernet packet	12
2.2.2	Ethernet frame	12
2.2.3	Stream	13
2.2.4	Stream identification	13
3	Related documentation	14
3.1	Input documents & related standards and norms	14
3.2	Related specification	15
4	Constraints and assumptions	16
4.1	Constraints	16
4.2	Assumptions	17
4.3	Applicability to car domains	18
5	Dependencies to other modules	19
6	Requirements Tracing	20
7	Functional specification	25
7.1	Ethernet BSW stack	25
7.1.1	Indexing scheme	26
7.1.2	Ethernet Switch Port Mirroring	27
7.1.3	State Handling	28
7.1.4	Handling of cable diagnostic	29
7.1.5	Support of frame preemption	29
7.1.6	Interaction with the Firewall module	30
7.1.7	Functional Description	33
7.1.7.1	Learning Phase at Start-up	33
7.1.7.2	Frame forwarding process	39
7.1.7.2.1	Ensure VLAN-ID and priority availability	41
7.1.7.2.2	Priority-Code-Point-Regeneration	44
7.1.7.2.3	Stream identification	45
7.1.7.2.4	Ingress filtering	52
7.1.7.2.5	Frame filtering	57
7.1.7.2.6	Egress filtering	58
7.1.7.2.7	Per-stream filtering and policing	59
7.1.7.2.8	Queueing frames	65
7.1.7.2.9	Shapers and transmission selection	70
7.1.7.2.10	Transmission on the network	81
7.1.7.3	Switch Management support	81

7.1.7.4	Global Time support	83
7.1.7.5	Counter synchronization of Ethernet switches which are connected via uplink ports	83
7.1.7.6	Verification of Configuration	84
7.1.7.7	Testing and Diagnostic of Switch Ports	85
7.1.7.8	Low Power Mode Support	85
7.2	Error Classifications	86
7.2.1	Development Errors	86
7.2.2	Runtime Errors	89
7.2.3	Transient Faults	89
7.2.4	Production Errors	89
7.2.5	Extended Production Errors	89
8	API specification	91
8.1	Imported types	91
8.2	Type definitions	92
8.2.1	EthSwt_StateType	92
8.2.2	EthSwt_ConfigType	92
8.2.3	EthSwt_MacLearningType	93
8.2.4	EthSwt_MgmtInfoType	93
8.2.5	EthSwt_PortMirrorCfgType	94
8.2.6	EthSwt_PortMirrorStateType	96
8.2.7	EthSwt_ReturnType	96
8.2.8	EthSwt_MgmtOwner	97
8.2.9	EthSwt_Mgmt_ObjectType	97
8.2.10	EthSwt_MgmtObjectValidType	98
8.3	Function definitions	98
8.3.1	EthSwt_Init	99
8.3.2	EthSwt_SetSwitchPortMode	101
8.3.3	EthSwt_GetSwitchPortMode	102
8.3.4	EthSwt_StartSwitchPortAutoNegotiation	104
8.3.5	EthSwt_CheckWakeup	105
8.3.6	EthSwt_GetSwitchPortWakeupReason	106
8.3.7	EthSwt_GetLinkState	107
8.3.8	EthSwt_GetBaudRate	108
8.3.9	EthSwt_GetDuplexMode	109
8.3.10	EthSwt_GetPortMacAddr	110
8.3.11	EthSwt_GetPortMacAddrVlan	111
8.3.12	EthSwt_GetArITable	114
8.3.13	EthSwt_GetCounterValues	115
8.3.14	EthSwt_GetRxStats	116
8.3.15	EthSwt_GetTxStats	117
8.3.16	EthSwt_GetTxErrorCounterValues	118
8.3.17	EthSwt_GetSwitchReg	119
8.3.18	EthSwt_SetSwitchReg	120
8.3.19	EthSwt_ReadTrcvRegister	121

8.3.20	EthSwT_WriteTrcvRegister	122
8.3.21	EthSwT_ReadMmd	123
8.3.22	EthSwT_WriteMmd	124
8.3.23	EthSwT_EnableVlan	125
8.3.24	EthSwT_StoreConfiguration	126
8.3.25	EthSwT_ResetConfiguration	126
8.3.26	EthSwT_SetMacLearningMode	127
8.3.27	EthSwT_GetMacLearningMode	128
8.3.28	EthSwT_NvmSingleBlockCallback	129
8.3.29	EthSwT_GetVersionInfo	131
8.3.30	EthSwT_EthRxProcessFrame	131
8.3.31	EthSwT_EthRxFinishedIndication	132
8.3.32	EthSwT_EthTxPrepareFrame	133
8.3.33	EthSwT_EthTxAdaptBufferLength	134
8.3.34	EthSwT_SetMgmtInfo	135
8.3.35	EthSwT_EthTxProcessFrame	136
8.3.36	EthSwT_EthTxFinishedIndication	137
8.3.37	EthSwT_PortEnableTimeStamp	138
8.3.38	EthSwT_VerifyConfig	139
8.3.39	EthSwT_SetForwardingMode	139
8.3.40	EthSwT_GetPortSignalQuality	140
8.3.41	EthSwT_GetPortIdentifier	141
8.3.42	EthSwT_GetSwitchIdentifier	142
8.3.43	EthSwT_WritePortMirrorConfiguration	143
8.3.44	EthSwT_ReadPortMirrorConfiguration	145
8.3.45	EthSwT_DeletePortMirrorConfiguration	146
8.3.46	EthSwT_GetPortMirrorState	147
8.3.47	EthSwT_SetPortMirrorState	148
8.3.48	EthSwT_SetPortTestMode	149
8.3.49	EthSwT_SetPortLoopbackMode	150
8.3.50	EthSwT_SetPortTxMode	151
8.3.51	EthSwT_RunPortCableDiagnostic	152
8.3.52	EthSwT_GetPortCableDiagnosticsResult	152
8.3.53	EthSwT_GetCfgDataRaw	154
8.3.54	EthSwT_GetCfgDataInfo	155
8.3.55	EthSwT_PortLinkStateRequest	156
8.3.56	EthSwT_GetMaxQueueBufferFillLevel	157
8.3.57	EthSwT_GetRxMgmtObject	158
8.3.58	EthSwT_GetTxMgmtObject	158
8.3.59	EthSwT_MacSecUpdateSecY	159
8.3.60	EthSwT_MacSecUpdateSecYNotification	160
8.3.61	EthSwT_MacSecInitRxSc	160
8.3.62	EthSwT_MacSecResetRxSc	161
8.3.63	EthSwT_MacSecAddTxSa	162
8.3.64	EthSwT_MacSecAddTxSaNotification	163
8.3.65	EthSwT_MacSecUpdateTxSa	163

8.3.66	EthSwT_MacSecDeleteTxSa	164
8.3.67	EthSwT_MacSecAddRxSa	165
8.3.68	EthSwT_MacSecAddRxSaNotification	166
8.3.69	EthSwT_MacSecUpdateRxSa	166
8.3.70	EthSwT_MacSecDeleteRxSa	167
8.3.71	EthSwT_MacSecGetTxSaNextPn	168
8.3.72	EthSwT_MacSecGetMacSecStatistics	169
8.3.73	EthSwT_MacSecGetMacSecStatisticsNotification	169
8.3.74	EthSwT_MacSecSetControlledPortEnabled	170
8.3.75	EthSwT_ExtractStreamHandleIdx	171
8.3.76	EthSwT_GetStreamHandleIdxStatistics	171
8.3.77	EthSwT_SetStreamState	172
8.4	Callback notifications	173
8.4.1	EthSwTPersistentConfigurationResultCallback	173
8.5	Scheduled functions	174
8.5.1	EthSwT_MainFunction	174
8.5.2	EthSwT_BackgroundTask	174
8.6	Expected interfaces	175
8.6.1	Mandatory Interfaces	175
8.6.2	Optional Interfaces	175
8.6.3	Configurable interfaces	176
8.6.3.1	<EthSwTLinkDownCallout>	177
8.6.3.2	<EthSwTLinkUpCallout>	177
8.6.3.3	<GetCfgDataRawDone>	178
8.7	Service Interfaces	179
9	Sequence diagrams	180
9.1	Switch Management support	181
10	Configuration specification	183
10.1	Containers and configuration parameters	183
10.1.1	EthSwT	183
10.1.2	EthSwTGeneral	185
10.1.3	EthSwTConfig	211
10.1.4	EthSwTAtsGroupInstanceTable	217
10.1.5	EthSwTAtsGroupInstanceEntry	218
10.1.6	EthSwTDemEventParameterRefs	219
10.1.7	EthSwTMacForwardingTable	220
10.1.8	EthSwTNvm	222
10.1.9	EthSwTPSCM	224
10.1.10	EthSwTAtsInstanceTable	225
10.1.11	EthSwTAtsInstanceEntry	226
10.1.12	EthSwTPSFP	228
10.1.13	EthSwTFilterMaxSduSizeTable	230
10.1.14	EthSwTFilterMaxSduSizeEntry	230
10.1.15	EthSwTFlowMeteringTable	232
10.1.16	EthSwTFlowMeteringEntry	232

10.1.17	EthSwtStreamFilterTable	237
10.1.18	EthSwtStreamFilterEntry	237
10.1.19	EthSwtAssignedStreamHandle	242
10.1.20	EthSwtStreamGateTable	244
10.1.21	EthSwtStreamGateEntry	245
10.1.22	EthSwtPort	246
10.1.23	EthSwtPortEgress	255
10.1.24	EthSwtPortPriorityToTrafficClassAssignment	260
10.1.25	EthSwtPortEgressScheduler	262
10.1.26	EthSwtPortEgressSchedulerPredecessor	263
10.1.27	EthSwtPortFifo	264
10.1.28	EthSwtPortQueue	267
10.1.29	EthSwtPortEgressQueueTransmissionSelection	270
10.1.30	EthSwtPortEgressQueueTransmissionSelectionCBSSConfig	271
10.1.31	EthSwtPortEgressQueueTransmissionSelectionETSConfig	274
10.1.32	EthSwtPortShaper	276
10.1.33	EthSwtPortIngress	277
10.1.34	EthSwtPortIngressScheduler	282
10.1.35	EthSwtPortIngressVlanTranslationTable	282
10.1.36	EthSwtPortIngressVlanTranslationTableEntry	283
10.1.37	EthSwtPortPolicer	285
10.1.38	EthSwtPortPriorityRegeneration	289
10.1.39	EthSwtSpi	290
10.1.40	EthSwtSpiSequence	291
10.1.41	EthSwtStreamIdentificationTable	293
10.1.42	EthSwtStreamIdentificationEntry	295
10.1.43	EthSwtStreamFilterAction	297
10.1.44	EthSwtStreamFilterActionDestinationPortModification	299
10.1.45	EthSwtStreamFilterActionVlanModification	301
10.1.46	EthSwtStreamFilterRule	302
10.1.47	EthSwtStreamFilterIPDestAddress	307
10.1.48	EthSwtStreamFilterIPSrcAddress	308
10.1.49	EthSwtStreamFilterMACDestAddress	309
10.1.50	EthSwtStreamFilterMACSrcAddress	311
10.1.51	EthSwtStreamFilterTcpDestPort	311
10.1.52	EthSwtStreamFilterTcpSrcPort	313
10.1.53	EthSwtStreamFilterUdpDestPort	314
10.1.54	EthSwtStreamFilterUdpSrcPort	315
10.1.55	EthSwtStreamFilterIEEE1722StreamId	315
10.1.56	EthSwtUnknownMacDestAddressConfig	317
10.1.57	EthSwtVlanMembership	319
10.1.58	EthSwtVlanMembershipPortRefEntry	320
10.2	Constraints	323
A	Change History	324

A.1	Traceable item history of this document according to AUTOSAR Release R22-11	324
A.1.1	Added Specification Items in R22-11	324
A.1.2	Changed Specification Items in R22-11	326
A.1.3	Deleted Specification Items in R22-11	330
A.1.4	Added Constraints in R22-11	330
A.1.5	Changed Constraints in R22-11	330
A.1.6	Deleted Constraints in R22-11	330
A.2	Traceable item history of this document according to AUTOSAR Release R23-11	330
A.2.1	Added Specification Items in R23-11	330
A.2.2	Changed Specification Items in R23-11	331
A.2.3	Deleted Specification Items in R23-11	332
A.2.4	Added Constraints in R23-11	332
A.2.5	Changed Constraints in R23-11	332
A.2.6	Deleted Constraints in R23-11	333
A.3	Traceable item history of this document according to AUTOSAR Release R24-11	334
A.3.1	Added Specification Items in R24-11	334
A.3.2	Changed Specification Items in R24-11	337
A.3.3	Deleted Specification Items in R24-11	338
A.3.4	Added Constraints in R24-11	339
A.3.5	Changed Constraints in R24-11	340
A.3.6	Deleted Constraints in R24-11	340

1 Introduction and functional overview

In the AUTOSAR Layered Software Architecture [1], the Ethernet Switch Driver belongs to the Communication Hardware Abstraction.

This indicates the main task of the Ethernet Switch Driver:

Provide to the upper layers (e.g. Ethernet Interface [2]) a hardware independent interface comprising a switch with several ports. This interface shall be uniform for all Ethernet switches. Thus, the upper layers may access the underlying communication technology in a uniform manner.

A single Ethernet Switch Driver module supports only one type of switch hardware. The Ethernet physical layer ports are configured by the Ethernet Transceiver Driver[3]. The Ethernet Switch Driver's prefix generates a unique namespace. The Ethernet Interface can access different Ethernet controller types using different Ethernet Switch Drivers using this prefix. The decision which driver to use to access a particular transceiver is a configuration parameter of the Ethernet Interface.

Figure 1.1 depicts the lower part of the Ethernet stack. Accesses via an SPI- and MII/MDIO-Hardware-Interface for switch specific configuration or functions are directly done via the Ethernet Driver [4] or the SPI driver [5].

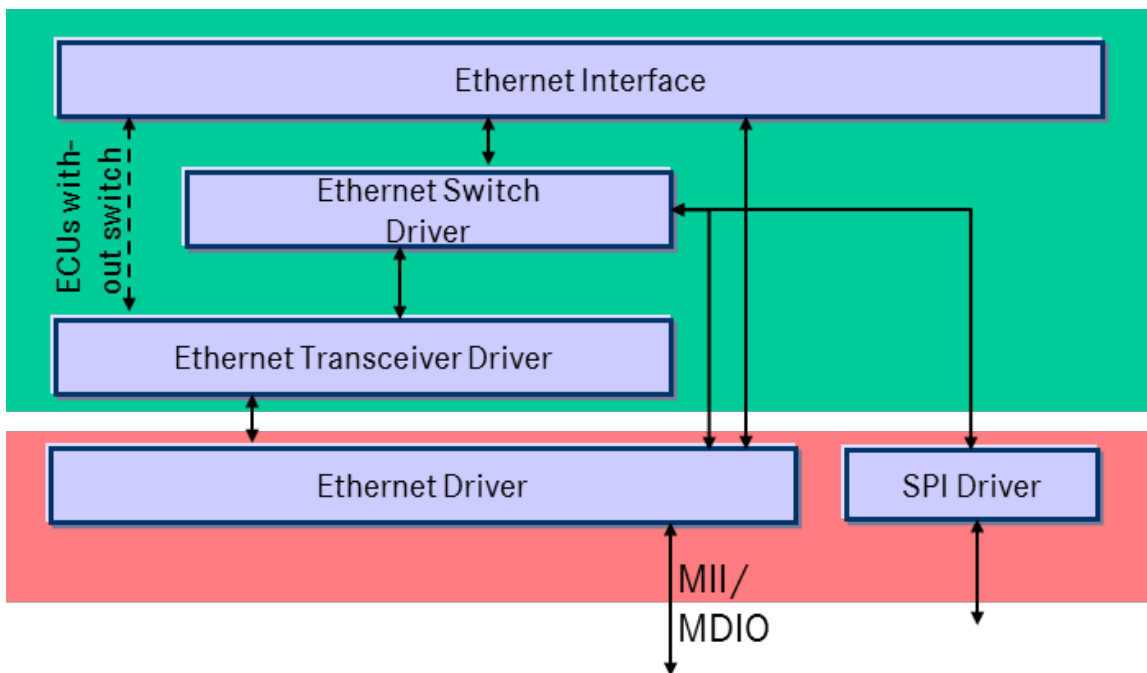


Figure 1.1: Ethernet Switch Driver in layer architecture

2 Acronyms, abbreviations and definitions

The glossary below includes acronyms, abbreviations and definitions relevant to the Ethernet Switch Driver module that are not included in the [6, AUTOSAR glossary].

2.1 Acronyms and abbreviations

Acronym / Abbreviation:	Description:
ARL	Address resolution table. The table contains the (VLAN-specific) MAC address to Ethernet switch port mapping, i.e., for SVL the MAC address to port mapping is learnt and stored as an ARL entry in the ARL table, while for IVL the combination of MAC address and VLAN is associated with a single ARL entry upon learning.
DEM	Diagnostic Event Manager module
EcuM	ECU State Manager module
Eth	Ethernet Controller Driver (AUTOSAR BSW module)
EthIf	Ethernet Interface (AUTOSAR BSW module)
EthTrcv	Ethernet Transceiver Driver (AUTOSAR BSW module)
IVL	Independent VLAN learning defined by [7, IEEE802.1Q]
MII	Media Independent Interface (standardized interface provided by Ethernet controllers to access Ethernet transceivers)
MDIO	Management Data Input/Output
OA TC10	Open Alliance TC10 specification (see [8])
SVL	Shared VLAN learning defined by [7, IEEE802.1Q]

2.2 Definitions

2.2.1 Ethernet packet

Definition: An "Ethernet packet" is an on-wire format defined by [9, IEEE Std 802.3-2022] which includes the following parts: Preamble (7 bytes), SFD (start frame delimiter, 1 byte), Ethernet frame (up to 2000 bytes)

2.2.2 Ethernet frame

Definition: An "Ethernet frame" is on-wire format defined [9, IEEE Std 802.3-2022] which includes the following parts: MAC destination address field (6 bytes), MAC source address field (6 bytes), Type field (2 bytes), MAC client data field (include optional Q-Tag (4 bytes)) (up to 1982 bytes), optional PAD (padding bytes), FCS (frame check sequence, 4 bytes)

2.2.3 Stream

Definition: A "stream" represent multiple Ethernet frames which are grouped by similar frame attributes (e.g. MAC source address)

2.2.4 Stream identification

Definition: The term "Stream identification" is derived from [7, IEEE Std 802.1Q-2022] and represent the functionality to identify received Ethernet frames based on a particular set of frame attributes. Frames carrying different sets of frame attributes can only be identified with a single stream

3 Related documentation

3.1 Input documents & related standards and norms

- [1] Layered Software Architecture
AUTOSAR_CP_EXP_LayeredSoftwareArchitecture
- [2] Specification of Ethernet Interface
AUTOSAR_CP_SWS_EthernetInterface
- [3] Specification of Ethernet Transceiver Driver
AUTOSAR_CP_SWS_EthernetTransceiverDriver
- [4] Specification of Ethernet Driver
AUTOSAR_CP_SWS_EthernetDriver
- [5] Specification of SPI Handler/Driver
AUTOSAR_CP_SWS_SPIHandlerDriver
- [6] Glossary
AUTOSAR_FO_TR_Glossary
- [7] IEEE 802.1Q-2022 - IEEE Standard for Local and Metropolitan Area Network -
Bridges and Bridged Networks
<https://ieeexplore.ieee.org/>
- [8] OPEN Sleep/Wake-up Specification for Automotive Ethernet
<http://www.opensig.org/Automotive-Ethernet-Specifications/>
- [9] IEEE 802.3-2022
<https://www.ieee802.org/3/>
- [10] General Specification of Basic Software Modules
AUTOSAR_CP_SWS_BSWGeneral
- [11] Requirements on Ethernet Support in AUTOSAR
AUTOSAR_CP_RS_Ethernet
- [12] General Requirements on Basic Software Modules
AUTOSAR_CP_RS_BSWGeneral
- [13] IEEE 802.1Q-2018 - IEEE Standard for Local and Metropolitan Area Network -
Bridges and Bridged Networks
<https://ieeexplore.ieee.org/>
- [14] System Template
AUTOSAR_CP_TPS_SystemTemplate
- [15] IEEE 802.1CB-2017 - IEEE Standard for Local and Metropolitan Area Network -
Frame Replication and Elimination for Reliability
<https://ieeexplore.ieee.org/>

- [16] Specification of Time Synchronization over Ethernet
AUTOSAR_CP_SWS_TimeSyncOverEthernet
- [17] Specification of NVRAM Manager
AUTOSAR_CP_SWS_NVRAMManager

3.2 Related specification

AUTOSAR provides a General Specification on Basic Software [10, SWS_BSWGeneral] which is also valid for Ethernet Switch Driver.

Thus, the specifications [SWS_BSWGeneral] [10], SRS_Ethernet [11] shall be considered as additional and required specification for Ethernet Switch Driver.

4 Constraints and assumptions

4.1 Constraints

The following constraints have to be considered:

- The Ethernet switch driver module is only able to handle a single thread of execution. The execution must not be pre-empted by itself.
- The implementation is limited to 10Mbit/s, 100Mbit/s, 1000Mbit/s, 2.5Gbit/s, 5Gbit/s and 10Gbit/s Ethernet bandwidth and to PHYs connected via (gigabit) Media Independent Interface (xMII).
- External MACPHY connected with an Ethernet switch over SPI are not supported.
- The Ethernet switch driver do only support VLAN-aware Ethernet switches
- The Ethernet switch driver support only passive stream identification. Active stream identification is not supported and therefore features like frame replication are not supported
- Stream identification is considered in the out-facing. Thus, stream identification is applied only at ingress side
- The Ethernet switch driver support only a subset of the IEEE specified forwarding process in an Ethernet switch. [Table 4.1](#) give an overview which IEEE specified forwarding processing steps are covered by AUTOSAR:

IEEE specified bridge execution order	Coverage by AUTOSAR
Default priority assignment ([AC]:13.1)	n/a
Placeholder MacSEC (incl. corresponding filter mechanism)	n/a
support of the EISS ([Q]:6.9.1)	n/a
Frame Type Acceptance filter ([Q]:6.9 f))	covered (see Section 7.1.7.2.1)
Ingress VID translation ([Q]:6.9 f))	n/a
Port-based VLAN Classification ([Q]:6.9 d)) XOR Port-and-Protocol-based VLAN classification ([Q]:6.12)	"Port-based VLAN Classification" covered (see Section 7.1.7.2.1)
Priority Code Point Decoding ([Q]:6.9.3)	"derivation of priority" covered (see Section 7.1.7.2.1)
Priority Regeneration ([Q]:6.9.4)	covered (see Section 7.1.7.2.2)
Outfacing Input Stream Identification Function(s) ([CB]:9.1.1.5)	covered (see Section 7.1.7.2.1)
Placeholder FRER functionality	n/a



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Infacing Output Stream Identification Function(s) ([CB]:9.1.1.2)	n/a
Active topology enforcement ([Q]:8.6.1)	n/a
Ingress filtering ([Q]:8.6.2)	covered (see Section 7.1.7.2.4)
Frame filtering ([Q]:8.6.3)	covered (see Section 7.1.7.2.5)
Egress filtering ([Q]:8.6.4)	covered (see Section 7.1.7.2.6)
Stream filtering ([Q]:8.6.5.3) (selection process)	covered (see Section 7.1.7.2.7)
Maximum SDU Size Filtering ([Q]:8.6.5.3.1)	covered (see Section 7.1.7.2.7)
Stream Gating ([Q]:8.6.5.4)	covered (see Section 7.1.7.2.7)
Flow metering ([Q]:8.6.5.5)	covered (see Section 7.1.7.2.7)
ATS Eligibility Time Assignment 9([Q]:8.6.5.6)	covered (see Section 7.1.7.2.7)
Infacing Input Stream Identification Function(s) ([CB]:9.1.1.4)	n/a
Placeholder FRER functionality	n/a
Outfacing Output Stream Identification Function(s) ([CB]:9.1.1.3)	n/a (note: only passive stream identification is supported)
Queuing frames ([Q]:8.6.6)	covered (see Section 7.1.7.2.8)
Shapers and Transmission selection and queuing management	covered (see Section 7.1.7.2.9)
Priority Code Point Encoding ([Q]:6.9.3)	covered (see Section 7.1.7.2.10)
Egress VID translation ([Q]:6.9 g))	n/a
support of the EISS ([Q]:6.9.2)	covered "VLAN forwarding tagged or untagged" (see Section 7.1.7.2.10)
Placeholder MacSEC (incl. corresponding classification mechanism)	n/a

Table 4.1: AUTOSAR coverage of IEEE specified bridge execution order

4.2 Assumptions

The following assumptions have to be considered

- Depending on the Ethernet hardware, it may become necessary that implementations deviate from API specifications in respect to the asynchronous/synchronous behavior.

4.3 Applicability to car domains

The Ethernet BSW stack is intended to be used wherever high data rates are required but no hard real-time is required. Of course, it can also be used for less-demanding use cases, i.e. for low data rates.

5 Dependencies to other modules

This chapter lists the modules interacting with the Ethernet Switch Driver module.

Modules that use the Ethernet Switch Driver module:

- Ethernet Interface (EthIf) calls the Ethernet Switch driver for initializing and accessing the switch device.

Modules used by the Ethernet Switch Driver module:

- Ethernet Controller Driver (Eth) for transceiver access via Media Independent Interface (MII).
- Ethernet Transceiver Driver (EthTrcv) for configuring the PHY ports and controlling/checking the ports.
- The configuration of the Ethernet Switch device can be either via MDIO or SPI. In case of an SPI interface access to SPI module is necessary.

Dependencies to other Modules:

- On certain systems the Ethernet switch might share resources with other components, and may depend on their configuration. If those resources are within the scope of other modules (e.g. PLL configuration, memory mapping, etc.) the Ethernet Switch Driver module does not take care of configuring those components but requires their preceding initialization.

6 Requirements Tracing

The following tables reference the requirements specified in [11] as well as [12] and links to the fulfillment of these. Please note that if column “Satisfied by” is empty for a specific requirement this means that this requirement is not fulfilled by this document.

Requirement	Description	Satisfied by
[FO_RS_Fw_00011]	Hardware-Accelerated Filtering Support	[SWS_EthSwT_00500] [SWS_EthSwT_00502] [SWS_EthSwT_00503] [SWS_EthSwT_00504] [SWS_EthSwT_00524] [SWS_EthSwT_00525] [SWS_EthSwT_00526] [SWS_EthSwT_91041] [SWS_EthSwT_91042] [SWS_EthSwT_91043]
[SRS_BSW_00003]	All software modules shall provide version and identification information	[SWS_EthSwT_00131]
[SRS_BSW_00101]	The Basic Software Module shall be able to initialize variables and hardware in a separate initialization function	[SWS_EthSwT_00006] [SWS_EthSwT_00007] [SWS_EthSwT_00008] [SWS_EthSwT_00011]
[SRS_BSW_00161]	The AUTOSAR Basic Software shall provide a microcontroller abstraction layer which provides a standardized interface to higher software layers	[SWS_EthSwT_00099] [SWS_EthSwT_00130]
[SRS_BSW_00162]	The AUTOSAR Basic Software shall provide a hardware abstraction layer	[SWS_EthSwT_00099] [SWS_EthSwT_00130]
[SRS_BSW_00171]	Optional functionality of a Basic-SW component that is not required in the ECU shall be configurable at pre-compile-time	[SWS_EthSwT_00022] [SWS_EthSwT_00029] [SWS_EthSwT_00035] [SWS_EthSwT_00042] [SWS_EthSwT_00049] [SWS_EthSwT_00056] [SWS_EthSwT_00058] [SWS_EthSwT_00090] [SWS_EthSwT_00095] [SWS_EthSwT_00124] [SWS_EthSwT_00129] [SWS_EthSwT_00177] [SWS_EthSwT_00186] [SWS_EthSwT_00191] [SWS_EthSwT_00202] [SWS_EthSwT_00210] [SWS_EthSwT_00215] [SWS_EthSwT_00220] [SWS_EthSwT_00225] [SWS_EthSwT_00229] [SWS_EthSwT_00230] [SWS_EthSwT_00240] [SWS_EthSwT_00243] [SWS_EthSwT_00249] [SWS_EthSwT_00253] [SWS_EthSwT_00257] [SWS_EthSwT_00261] [SWS_EthSwT_00264] [SWS_EthSwT_00268] [SWS_EthSwT_00273] [SWS_EthSwT_00287] [SWS_EthSwT_00291] [SWS_EthSwT_00297] [SWS_EthSwT_00303] [SWS_EthSwT_00308] [SWS_EthSwT_00312] [SWS_EthSwT_00317] [SWS_EthSwT_00322] [SWS_EthSwT_00327] [SWS_EthSwT_00332] [SWS_EthSwT_00338] [SWS_EthSwT_00344] [SWS_EthSwT_00350] [SWS_EthSwT_00362] [SWS_EthSwT_00370] [SWS_EthSwT_00379] [SWS_EthSwT_00403] [SWS_EthSwT_00405] [SWS_EthSwT_00427] [SWS_EthSwT_00432] [SWS_EthSwT_00441] [SWS_EthSwT_00443] [SWS_EthSwT_00519]
[SRS_BSW_00323]	All AUTOSAR Basic Software Modules shall check passed API parameters for validity	[SWS_EthSwT_00009] [SWS_EthSwT_00154] [SWS_EthSwT_00156] [SWS_EthSwT_00157] [SWS_EthSwT_00180]
[SRS_BSW_00347]	A Naming separation of different instances of BSW drivers shall be in place	[SWS_EthSwT_00131]





Requirement	Description	Satisfied by
[SRS_BSW_00350]	All AUTOSAR Basic Software Modules shall allow the enabling/disabling of detection and reporting of development errors.	[SWS_EthSwT_00386] [SWS_EthSwT_00387] [SWS_EthSwT_00389] [SWS_EthSwT_00390] [SWS_EthSwT_00391] [SWS_EthSwT_00392] [SWS_EthSwT_00393]
[SRS_BSW_00369]	All AUTOSAR Basic Software Modules shall not return specific development error codes via the API	[SWS_EthSwT_00009] [SWS_EthSwT_00128] [SWS_EthSwT_00154] [SWS_EthSwT_00156] [SWS_EthSwT_00157] [SWS_EthSwT_00164] [SWS_EthSwT_00180]
[SRS_BSW_00375]	Basic Software Modules shall report wake-up reasons	[SWS_EthSwT_00098]
[SRS_BSW_00385]	List possible error notifications	[SWS_EthSwT_00001] [SWS_EthSwT_00113] [SWS_EthSwT_00395]
[SRS_BSW_00386]	The BSW shall specify the configuration and conditions for detecting an error	[SWS_EthSwT_00016] [SWS_EthSwT_00164]
[SRS_BSW_00395]	The Basic Software Module specifications shall list all configuration parameter dependencies	[SWS_EthSwT_00165]
[SRS_BSW_00406]	API handling in uninitialized state	[SWS_EthSwT_00123]
[SRS_BSW_00413]	An index-based accessing of the instances of BSW modules shall be done	[SWS_EthSwT_00120] [SWS_EthSwT_00154] [SWS_EthSwT_00156] [SWS_EthSwT_00157] [SWS_EthSwT_00180]
[SRS_BSW_00433]	Main processing functions are only allowed to be called from task bodies provided by the BSW Scheduler	[SWS_EthSwT_00114] [SWS_EthSwT_00115]
[SRS_Eth_00087]	Semi-Static Auto-Configuration	[SWS_EthSwT_00031] [SWS_EthSwT_00032] [SWS_EthSwT_00060] [SWS_EthSwT_00061] [SWS_EthSwT_00086] [SWS_EthSwT_00087] [SWS_EthSwT_00091] [SWS_EthSwT_00092] [SWS_EthSwT_00098] [SWS_EthSwT_00111] [SWS_EthSwT_00117] [SWS_EthSwT_00118] [SWS_EthSwT_00125] [SWS_EthSwT_00126] [SWS_EthSwT_00127] [SWS_EthSwT_00182] [SWS_EthSwT_00183] [SWS_EthSwT_00187] [SWS_EthSwT_00188] [SWS_EthSwT_00193] [SWS_EthSwT_00194] [SWS_EthSwT_00196] [SWS_EthSwT_00197] [SWS_EthSwT_00203] [SWS_EthSwT_00204] [SWS_EthSwT_00226] [SWS_EthSwT_00227] [SWS_EthSwT_00228] [SWS_EthSwT_00235] [SWS_EthSwT_00444] [SWS_EthSwT_00445] [SWS_EthSwT_00448] [SWS_EthSwT_00449] [SWS_EthSwT_00511] [SWS_EthSwT_00512] [SWS_EthSwT_00513] [SWS_EthSwT_00514] [SWS_EthSwT_00515] [SWS_EthSwT_00516] [SWS_EthSwT_00517] [SWS_EthSwT_00518] [SWS_EthSwT_91051]
[SRS_Eth_00107]	The Ethernet Transceiver Driver shall support access to the wake up reason.	[SWS_EthSwT_00442] [SWS_EthSwT_91040]
[SRS_Eth_00114]	Ethernet Switch Filtering and Policing	[SWS_EthSwT_00134] [SWS_EthSwT_00172] [SWS_EthSwT_00173] [SWS_EthSwT_00233] [SWS_EthSwT_00491] [SWS_EthSwT_00492] [SWS_EthSwT_00493] [SWS_EthSwT_00494] [SWS_EthSwT_00601] [SWS_EthSwT_00602] [SWS_EthSwT_00604] [SWS_EthSwT_00605] [SWS_EthSwT_00606] [SWS_EthSwT_00607] [SWS_EthSwT_00608] [SWS_EthSwT_00609]





Requirement	Description	Satisfied by
[SRS_Eth_00118]	Transparent interface to underlying EthTrcv module(s)	[SWS_EthSwT_00018] [SWS_EthSwT_00019] [SWS_EthSwT_00023] [SWS_EthSwT_00025] [SWS_EthSwT_00026] [SWS_EthSwT_00038] [SWS_EthSwT_00044] [SWS_EthSwT_00045] [SWS_EthSwT_00051] [SWS_EthSwT_00052] [SWS_EthSwT_00098] [SWS_EthSwT_00154] [SWS_EthSwT_00156] [SWS_EthSwT_00157] [SWS_EthSwT_00164] [SWS_EthSwT_00217] [SWS_EthSwT_00222] [SWS_EthSwT_00398] [SWS_EthSwT_00440] [SWS_EthSwT_91003]
[SRS_Eth_00119]	Access to hardware status of ports	[SWS_EthSwT_00037] [SWS_EthSwT_00038] [SWS_EthSwT_00098] [SWS_EthSwT_00117] [SWS_EthSwT_00118] [SWS_EthSwT_00154] [SWS_EthSwT_00203] [SWS_EthSwT_00204] [SWS_EthSwT_00430] [SWS_EthSwT_00431]
[SRS_Eth_00120]	Hardware access via MII and/or SPI	[SWS_EthSwT_00098] [SWS_EthSwT_00206] [SWS_EthSwT_00207] [SWS_EthSwT_00211] [SWS_EthSwT_00212] [SWS_EthSwT_00216] [SWS_EthSwT_00217] [SWS_EthSwT_00221] [SWS_EthSwT_00222]
[SRS_Eth_00121]	Configuration of forwarding rules	[SWS_EthSwT_00132] [SWS_EthSwT_00133] [SWS_EthSwT_00134] [SWS_EthSwT_00135] [SWS_EthSwT_00172] [SWS_EthSwT_00173] [SWS_EthSwT_00178] [SWS_EthSwT_00234] [SWS_EthSwT_00461] [SWS_EthSwT_00462] [SWS_EthSwT_00463] [SWS_EthSwT_00520] [SWS_EthSwT_00521] [SWS_EthSwT_00522] [SWS_EthSwT_00523] [SWS_EthSwT_00531] [SWS_EthSwT_00535] [SWS_EthSwT_00537] [SWS_EthSwT_00539] [SWS_EthSwT_00540] [SWS_EthSwT_00541] [SWS_EthSwT_00542] [SWS_EthSwT_00543] [SWS_EthSwT_00547] [SWS_EthSwT_00548] [SWS_EthSwT_00549] [SWS_EthSwT_00550] [SWS_EthSwT_00551] [SWS_EthSwT_00553] [SWS_EthSwT_00554] [SWS_EthSwT_00555] [SWS_EthSwT_00556] [SWS_EthSwT_00557] [SWS_EthSwT_00558] [SWS_EthSwT_00611] [SWS_EthSwT_00612] [SWS_EthSwT_00613]
[SRS_Eth_00122]	Persistent storage of configurations	[SWS_EthSwT_00086] [SWS_EthSwT_00087] [SWS_EthSwT_00091] [SWS_EthSwT_00092] [SWS_EthSwT_00098] [SWS_EthSwT_00125] [SWS_EthSwT_00126] [SWS_EthSwT_00127] [SWS_EthSwT_00182] [SWS_EthSwT_00183] [SWS_EthSwT_00192] [SWS_EthSwT_00193] [SWS_EthSwT_00194] [SWS_EthSwT_00196]





Requirement	Description	Satisfied by
[SRS_Eth_00123]	Testing and diagnostic of switch ports	[SWS_EthSwT_00293] [SWS_EthSwT_00299] [SWS_EthSwT_00305] [SWS_EthSwT_00309] [SWS_EthSwT_00313] [SWS_EthSwT_00318] [SWS_EthSwT_00323] [SWS_EthSwT_00328] [SWS_EthSwT_00334] [SWS_EthSwT_00340] [SWS_EthSwT_00346] [SWS_EthSwT_00416] [SWS_EthSwT_00417] [SWS_EthSwT_00418] [SWS_EthSwT_00419] [SWS_EthSwT_00420] [SWS_EthSwT_00421] [SWS_EthSwT_00422] [SWS_EthSwT_00424] [SWS_EthSwT_00425] [SWS_EthSwT_00426] [SWS_EthSwT_91014] [SWS_EthSwT_91015] [SWS_EthSwT_91016] [SWS_EthSwT_91017] [SWS_EthSwT_91018] [SWS_EthSwT_91019] [SWS_EthSwT_91020] [SWS_EthSwT_91021] [SWS_EthSwT_91022] [SWS_EthSwT_91023] [SWS_EthSwT_91024] [SWS_EthSwT_91025] [SWS_EthSwT_91029] [SWS_EthSwT_91030] [SWS_EthSwT_91031] [SWS_EthSwT_91032]
[SRS_Eth_00125]	The Ethernet Switch Driver shall support switch frame management	[SWS_EthSwT_00098] [SWS_EthSwT_00240] [SWS_EthSwT_00241] [SWS_EthSwT_00242] [SWS_EthSwT_00243] [SWS_EthSwT_00378] [SWS_EthSwT_91002] [SWS_EthSwT_91004] [SWS_EthSwT_91005] [SWS_EthSwT_91006] [SWS_EthSwT_91007] [SWS_EthSwT_91008] [SWS_EthSwT_91009] [SWS_EthSwT_91010] [SWS_EthSwT_91028]
[SRS_Eth_00126]	Independent reset of host ECU and switch hardware	[SWS_EthSwT_00292] [SWS_EthSwT_91012] [SWS_EthSwT_91013]
[SRS_Eth_00128]	The Ethernet Switch Driver shall provide statistic counter values per port	[SWS_EthSwT_00106] [SWS_EthSwT_00198] [SWS_EthSwT_00199] [SWS_EthSwT_00231] [SWS_EthSwT_00372] [SWS_EthSwT_00373] [SWS_EthSwT_91000] [SWS_EthSwT_91001]
[SRS_Eth_00178]	Ethernet Switch Stream Identification	[SWS_EthSwT_00465] [SWS_EthSwT_00467] [SWS_EthSwT_00469] [SWS_EthSwT_00471] [SWS_EthSwT_00472] [SWS_EthSwT_00475] [SWS_EthSwT_00476] [SWS_EthSwT_00477] [SWS_EthSwT_00478] [SWS_EthSwT_00479] [SWS_EthSwT_00480] [SWS_EthSwT_00481] [SWS_EthSwT_00482] [SWS_EthSwT_00483] [SWS_EthSwT_00484] [SWS_EthSwT_00486] [SWS_EthSwT_00487] [SWS_EthSwT_00610]
[SRS_Eth_00179]	Ethernet Switch Transmission Selection Algorithm	[SWS_EthSwT_00539] [SWS_EthSwT_00540] [SWS_EthSwT_00541] [SWS_EthSwT_00542] [SWS_EthSwT_00543] [SWS_EthSwT_00547] [SWS_EthSwT_00548] [SWS_EthSwT_00549] [SWS_EthSwT_00550] [SWS_EthSwT_00551] [SWS_EthSwT_00553] [SWS_EthSwT_00613]
[SRS_Eth_00180]	Ethernet Switch port scheduling of egress queues	[SWS_EthSwT_00539] [SWS_EthSwT_00540] [SWS_EthSwT_00541] [SWS_EthSwT_00542] [SWS_EthSwT_00543] [SWS_EthSwT_00547] [SWS_EthSwT_00548] [SWS_EthSwT_00549] [SWS_EthSwT_00550] [SWS_EthSwT_00551] [SWS_EthSwT_00553] [SWS_EthSwT_00613] [SWS_EthSwT_00614]
[SRS_Eth_00181]	Access to hardware internal configuration	[SWS_EthSwT_00060] [SWS_EthSwT_00061] [SWS_EthSwT_00111] [SWS_EthSwT_00187] [SWS_EthSwT_00197] [SWS_EthSwT_00228] [SWS_EthSwT_00235]





Requirement	Description	Satisfied by
[SRS_Eth_00183]	Support of Ethernet Switch reducing energy consumption	[SWS_EthSwT_00376] [SWS_EthSwT_00377]

Table 6.1: Requirements Tracing

7 Functional specification

7.1 Ethernet BSW stack

As part of the AUTOSAR Layered Software Architecture according to [Figure 7.1](#), the Ethernet BSW modules also form a layered software stack.

[Figure 7.1](#) depicts the basic Ethernet BSW stack. The EthIf module accesses several switches using one or more Ethernet Switch Driver modules. The role of the Ethernet transceiver driver is to configure and control the physical layer ports (PHY) integrated into or connected to a switch. Whereas, the role of the Ethernet switch driver is the configuration and control of the switch. In case the Ethernet interface wants to access a PHY, it has to use the APIs of the switch driver which forward the API call to the addressed transceiver driver.

By separating the transceiver driver from the switch driver, different hardware architectures will be supported. In HW-Variant 1, the PHYs are separate devices from different vendors. They are connected via MII and MDIO to a switch which is integrated into a microcontroller. In HW-Variant 2, the switch has integrated PHYs. In HW-Variant 3, the microcontroller can control the switch via MDIO or SPI and the switch has three external PHYs which can be controlled via MDIO. In this case, different Ethernet transceiver drivers might occur.

Please note that the functional behavior of the ingress and egress port of a switch is implemented in hardware in the switch devices (see [13]). Thus, the configuration from [Chapter 10](#) in some parts has to be written to the switch device.

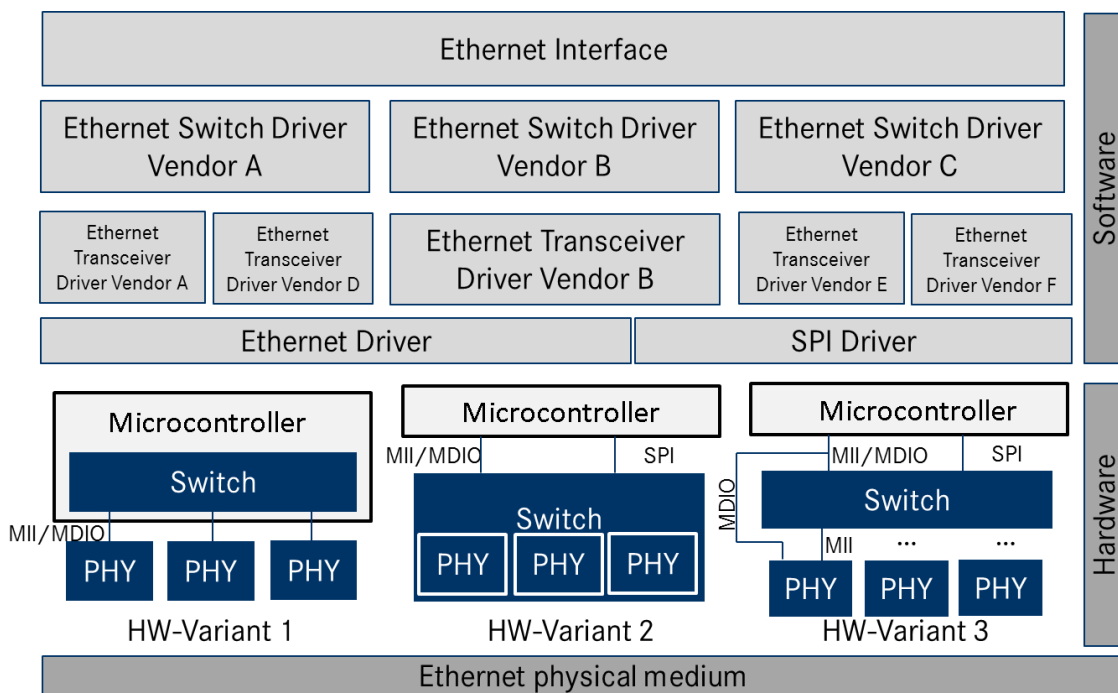


Figure 7.1: Basic Structure of the Ethernet BSW stack.(Note: The different hardware variants are alternative setups)

7.1.1 Indexing scheme

Users of the Ethernet Switch Driver identify switch resources using an indexing scheme as depicted in Figure 7.2.

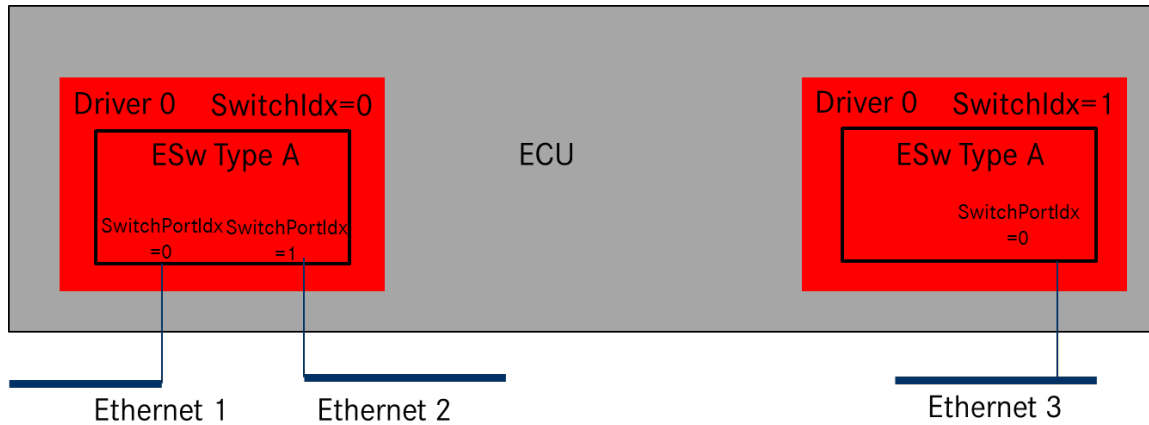


Figure 7.2: Ethernet Switch Driver indexing scheme

[SWS_EthSwT_00099]

Upstream requirements: [SRS_BSW_00161](#), [SRS_BSW_00162](#)

[The Ethernet Switch Driver shall use a zero-based index to abstract the access for upper software layers.]

[SWS_EthSwT_00130]

Upstream requirements: [SRS_BSW_00161](#), [SRS_BSW_00162](#)

[The `SwitchPortIdx` is an index for a port at the switch.]

[SWS_EthSwT_00120]

Upstream requirements: [SRS_BSW_00413](#)

[The parameter `EthSwTIdx` within the configuration shall correspond to the argument used in the API.]

[SWS_EthSwT_00180]

Upstream requirements: [SRS_BSW_00413](#), [SRS_BSW_00323](#), [SRS_BSW_00369](#)

[The parameter `EthSwTIndex` shall be used to distinguish different instances of a switch driver module in case the API `Det_ReportError(uint16 ModuleId, uint8 InstanceId, uint8 ApiId, uint8 ErrorId)` is called.]

[SWS_EthSwt_00131]

Upstream requirements: [SRS_BSW_00003](#), [SRS_BSW_00347](#)

[In case different Switch devices are used in one ECU, the function names of the different Ethernet Switch drivers must be modified such that no two functions with the same names are generated. It is the responsibility of the user to take care that no two functions with the same names are configured. The names may be extended with a vendor ID or a type ID.]

7.1.2 Ethernet Switch Port Mirroring

Ethernet switch port mirroring use the common established functionality of the Ethernet switch hardware to mirror traffic of one or more Ethernet switch ports (mirrored port) to a another Ethernet switch port (capture port). The mirroring configuration is given by the port mirror configuration (see [\[SWS_EthSwt_91017\]](#)). The port mirror configuration is set up per Ethernet switch. The configuration is stored persistently by the Ethernet switch driver. Therefore a shadow buffer is used to store the port mirror configuration during runtime and stored persistently according to the NvM storing strategy (e.g. store the shadow buffer persistently upon ECU shutdown). The port mirror configuration could be activated and de-activated, respectively, explicitly via dedicated APIs. The port mirroring is controlled by a dedicated diagnostic CDD with receive diagnostic request and forward them to the Ethernet switch driver.

[SWS_EthSwt_00416]

Upstream requirements: [SRS_Eth_00123](#)

[The port mirror configuration (see [\[SWS_EthSwt_91017\]](#)) shall be written to a shadow buffer of the Ethernet switch driver per Ethernet Switch by calling [EthSwt_WritePortMirrorConfiguration](#).]

Note: One port mirror configuration is maintained per Ethernet switch.

[SWS_EthSwt_00417]

Upstream requirements: [SRS_Eth_00123](#)

[The port mirror configuration shall be enabled and disabled, respectively, per Ethernet Switch by calling [EthSwt_SetPortMirrorState](#). The current state of the stored port mirror configuration shall be stored persistently, to outlast an ECU reset and to restore the port mirroring activities after an ECU reset.]

[SWS_EthSwt_00418]

Upstream requirements: [SRS_Eth_00123](#)

[The stored port mirror configuration shall be marked as "to be deleted" by calling [EthSwt_DeletePortMirrorConfiguration](#), if the port mirroring of the given Ethernet switch index is disabled (see [\[SWS_EthSwt_91022\]](#)). Otherwise the request to delete the port mirror configuration shall be rejected.]

Note: The shadow buffer is stored persistently according to the NvM storing strategy, e.g. store the shadow buffer persistently upon ECU shutdown.

[SWS_EthSwt_00419]

Upstream requirements: [SRS_Eth_00123](#)

[The current port mirroring state shall be returned by calling [EthSwt_GetPortMirrorState](#).]

[SWS_EthSwt_00420]

Upstream requirements: [SRS_Eth_00123](#)

[The port mirror configuration per Ethernet switch shall be returned by calling [EthSwt_ReadPortMirrorConfiguration](#).]

7.1.3 State Handling

[SWS_EthSwt_00435] [All functions apart from [EthSwt_SetSwitchPortMode](#), [EthSwt_GetSwitchPortMode](#), [EthSwt_StartSwitchPortAutoNegotiation](#), [EthSwt_GetLinkState](#), [EthSwt_GetBaudRate](#), [EthSwt_GetDuplexMode](#), [EthSwt_ReadTrcvRegister](#), [EthSwt_WriteTrcvRegister](#), [EthSwt_Init](#), [EthSwt_MainFunction](#) and [EthSwt_BackgroundTask](#) may only be called in state [ETHSWT_STATE_ACTIVE](#).

If a function which can only run (succeed with [E_OK](#)) in the states [ETHSWT_STATE_PORTINIT_COMPLETED](#) and [ETHSWT_STATE_ACTIVE](#) is called before state [ETHSWT_STATE_PORTINIT_COMPLETED](#) is reached, the Ethernet switch driver shall raise the runtime error [ETHSWT_INIT_NOT_COMPLETED](#).]

[SWS_EthSwt_00436] [[ETHSWT_STATE_PORTINIT_COMPLETED](#) shall be reached as soon as the port initialization has finished.]

Note: [ETHSWT_STATE_PORTINIT_COMPLETED](#) can be reached either by the function [EthSwt_Init](#) or by a background task (see [\[SWS_EthSwt_91104\]](#)).

[SWS_EthSwT_00437] [ETHSWT_STATE_ACTIVE shall be reached, when the Ethernet switch initialization has finished.]

Note: The initialization of the Ethernet switch takes longer than the initialization of the Ethernet switch ports.

7.1.4 Handling of cable diagnostic

Cable diagnostic measurement is triggered by calling `EthSwT_RunPortCableDiagnostic`. The current state of the cable diagnostic measurement is polled by calling `EthSwT_GetPortCableDiagnosticsResult`. If `EthSwT_GetPortCableDiagnosticsResult` return with other value than `ETHTRCV_CABLEDIAG_PENDING`, then the cable diagnostic has finished.

Its up to the caller to re-trigger cable diagnostic again, if the measurement failed by returning `ETHTRCV_CABLEDIAG_ERROR`.

[SWS_EthSwT_00428] [The cable diagnostic APIs (`EthSwT_RunPortCableDiagnostic`, `EthSwT_GetPortCableDiagnosticsResult`) shall only be called for Ethernet switch ports of a Ethernet switch, where the Ethernet switch ports reference an Ethernet transceiver.]

Note: The upper layer is a CDD that triggers the cable diagnostic measurement and maintains the cable diagnostic result. The `EthSwT` forwards the API calls to the `EthTrcv` (see [SWS_EthSwT_00429] and [SWS_EthSwT_00346]).

7.1.5 Support of frame preemption

The `EthSwT` driver module supports the configuration of frame preemption per `EthSwTPort` (see [7, IEEE Std 802.1Q-2022]), if the Ethernet switch hardware support the functionality. By default it is assumed that Ethernet switch hardware is not supposed to perform or not even capable of frame preemption, thus `EthSwTFramePreemptionEnable` is set to `FALSE` on all `EthSwTPorts`.

[SWS_EthSwT_CONSTR_00527] Ethernet switch hardware support for frame preemption

Status: DRAFT

[If and only if an Ethernet switch hardware supports frame preemption, then it shall be allowed to set `EthSwTFramePreemptionEnable` to `TRUE` per `EthSwTPort`.]

[SWS_EthSwt_CONSTR_00528] Frame preemption enabling per EthSwtPort

Status: DRAFT

[If `EthSwtFramePreemptionEnable` is set to TRUE for an `EthSwtPort`, then frame preemption handling shall be enabled on ingress and on egress, for this `EthSwtPort`. Otherwise frame preemption handling shall be disabled for this `EthSwtPort`.]

Note: On a `EthSwtPort` that has frame preemption handling enabled, preemptable Ethernet frames can be preempted on egress by interspersing express Ethernet frames.

[SWS_EthSwt_CONSTR_00529] Frame preemption status classification of preemptable Ethernet frames on egress per traffic class

Status: DRAFT

[If `EthSwtFramePreemptionEnable` is set to TRUE for an `EthSwtPort`, then all Ethernet frames in the `EthSwtPortQueues` of the corresponding `EthSwtPortEgress` are classified as preemptable Ethernet frames, where the `EthSwtTrafficClassToPreemptionStatusAssignment` is set to `ETHSWT_TRAFFIC_CLASS_PREEMPTABLE`.]

[SWS_EthSwt_CONSTR_00530] Frame preemption status classification of express Ethernet frames on egress per traffic class

Status: DRAFT

[If `EthSwtFramePreemptionEnable` is set to TRUE for an `EthSwtPort`, then all Ethernet frames in the `EthSwtPortQueues` of the corresponding `EthSwtPortEgress` are classified as express Ethernet frames, where the `EthSwtTrafficClassToPreemptionStatusAssignment` is set to `ETHSWT_TRAFFIC_CLASS_EXPRESS`.]

Frame preemption is working on a per link basis. Thus, both ends of the link need to support the frame preemption, otherwise it does not work properly. In dynamic networks the frame preemption capability between peers is negotiated via dedicated layer 2 protocols (e.g. LLDP). However, such protocols are not supported by AUTOSAR. Automotive networks are in addition rather statically designed, rendering those protocols unnecessary, as a proper communication network design is ensured by the system description (see [14]), such that a system-wide consistent support of frame preemption can be ensured by the configuration and the data model.

7.1.6 Interaction with the Firewall module

The Ethernet frame inspection with per-stream filtering can be supported by the AUTOSAR firewall module to perform more advanced inspection techniques like state-

ful packet inspection and deep packet inspection. This chapter describes the functionality required by the Firewall module in the EthSwt driver to perform efficient Ethernet frame inspection and filtering supported by per-stream filtering. More details about the interaction between the firewall module and per-stream filtering can be found in `CP_SWS_Firewall`.

Extraction of `StreamHandleIdentifier` from Ethernet frame

When an Ethernet frame is passed to the firewall for inspection, it has already passed the inspection by per-stream filtering. The firewall needs to know the per-stream filtering filter rule that allows the Ethernet frame to pass. This filter rule is modeled by the `StreamHandleIdentifier` in the EthSwt driver. The value of the `StreamHandleIdentifier` can be added by the switch core to the Ethernet frame by modifying the Ethernet frame header and adding Ethernet frame meta information to the network packet. This meta information is however not standardized and depends on the switch vendor.

[SWS_EthSwt_00500]

Status: DRAFT
Upstream requirements: [FO_RS_Fw_00011](#)

[When `EthSwt_ExtractStreamHandleIdx` is called, the EthSwt driver shall extract the `StreamHandleIdentifier` from the passed Ethernet frame, write the value to the `StreamHandleIdxPtr` and return `E_OK`.]

Read out of `StreamHandleIdentifier` counting statistics

Many switches support counting statistics of the per-stream filtering filter rules, i.e., they count how often the filter rules provided matches to Ethernet frame. The firewall module requires this statistics information to raise `Security Events (SEvs)` to the `IdsM`. The counting statistics is typically implemented in terms of buckets, where a bucket counts the number of matches for multiple filter rules (see [Figure 7.3](#))

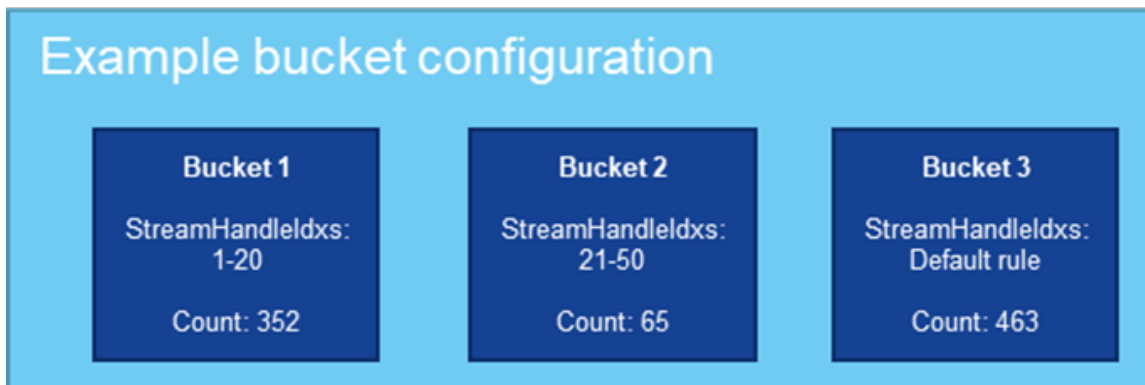


Figure 7.3: Example configuration of buckets counting matches of per-stream filtering filter rules

[SWS_EthSwt_00524] Triggering stream statistics readout

Status: DRAFT

Upstream requirements: [FO_RS_Fw_00011](#)

[When `EthSwt_GetStreamStatistics` is called, the EthSwt driver shall trigger to read out the stream statistics (i.e. count values for the buckets which refer to the configured streams) from the Ethernet switch given with `SwitchIdx`.]

[SWS_EthSwt_00525] Concatenating stream statistics for buckets

Status: DRAFT

Upstream requirements: [FO_RS_Fw_00011](#)

[When `EthSwt_GetStreamStatistics` has been called and the EthSwt driver performs the reading of the stream statistics, then the EthSwt driver shall concatenate the stream statistics of each available bucket as `EthStreamStatisticCounter`.]

[SWS_EthSwt_00526] Indicating the availability of stream statistics

Status: DRAFT

Upstream requirements: [FO_RS_Fw_00011](#)

[When `EthSwt_GetStreamStatistics` has been called and the EthSwt driver finalized the reading of the stream statistics, then the EthSwt driver shall call `EthIf_StreamStatisticsIndication` with `NumberOfBuckets` set to the number of buckets and `ListOfBucketsPtr` set to the start address where the concatenated stream statistics result is stored.]

Depending on the switch type, the bucket values are either reset upon read-out or keeping their count values. The EthSwt driver shall provide a uniform handling of the count values independent of the switch type to ensure correct handling of the count values in the firewall module

[SWS_EthSwt_00502]

Status: DRAFT

Upstream requirements: [FO_RS_Fw_00011](#)

[The EthSwt driver shall provide monotonically increasing count values via `EthIf_StreamStatisticsIndication` starting with 0 upon boot up. If the count values are reset by the Ethernet switch upon read-out, the EthSwt driver shall return the sum of accumulated count values since boot up and the current count values with each call of `EthIf_StreamStatisticsIndication`.]

Runtime management of per-stream filtering filter rules

The firewall module can be switched by the `BswM` into different states, i.e., it can be switched to enable a different set of firewall rules to be active. This use-case also extends to the per-stream filtering filter rules, which should follow the state of the firewall module to ensure coherent packet filtering.

[SWS_EthSwt_00503]

Status: DRAFT

Upstream requirements: [FO_RS_Fw_00011](#)

[When [EthSwt_SetStreamState](#) is called, the EthSwt driver shall set the filter rule of the `StreamHandleIdentifier` identified by the `StreamHandleIdx` to

- Active, if `StreamHandleIdxActivityStatus` is set to TRUE
- Passive, if `StreamHandleIdxActivityStatus` is set to FALSE

]

[SWS_EthSwt_00504]

Status: DRAFT

Upstream requirements: [FO_RS_Fw_00011](#)

[After successfully setting the filter rule active/passive according to [\[SWS_EthSwt_00503\]](#), the EthSwt driver shall call `EthIf_StreamStateIndication` for this `StreamHandleIdx` with `StreamHandleIdxActivityStatus` set to the current activity status of this filter rule.]

7.1.7 Functional Description

7.1.7.1 Learning Phase at Start-up

[SWS_EthSwt_00226]

Upstream requirements: [SRS_Eth_00087](#)

[The switch driver shall support a learning phase which can be divided into several sequential steps.]

Note: After assembly and initial power-up of the network, three learning phases follow which include MAC-Learning and IP-Address Assignment. Afterwards the learned parameters are stored to one or several non-volatile memories to make them available for subsequent start-ups. This process is shown in [Figure 7.4](#). As an example for triggering this process, the DCM receives a diagnostic request via a bus system or a broadcast message in the Ethernet network. This diagnostic request can be forwarded to an SWC which triggers the auto-configuration process. However, the trigger is not part of this specification.

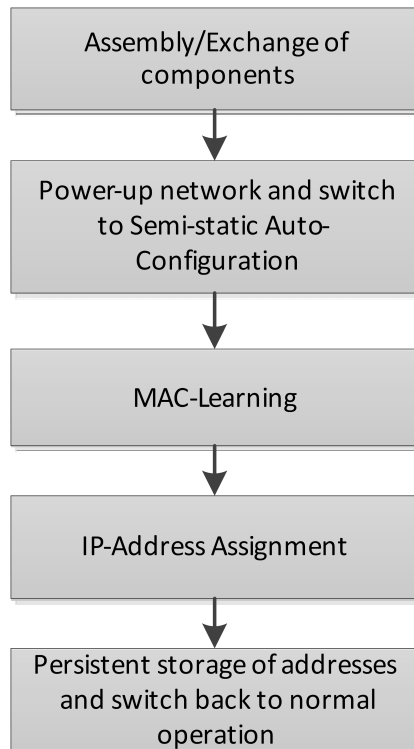


Figure 7.4: Learning Process

MAC-Learning (Optional Step): In this phase, messages need to be sent through the network and the switch will learn new MAC addresses (cf. [Figure 7.5](#) or [Figure 7.6](#)). These MAC-addresses will be stored in addition to predefined addresses, e.g. multi-cast MAC addresses which are configured during the vehicle network design. If static learning is executed, i.e. MAC address will be persistently stored, it might be possible to add dynamically learned entries in the tables.

If software MAC learning is supported by switch hardware and the switch hardware expects an external microcontroller (see Variant 2 and 3 in [Figure 7.1](#)), packets with unknown MAC Source Address will be routed to this microcontroller. The MAC learning is done by integration code. It is intentionally not defined where this algorithm is located within the AUTOSAR stack as this might need a very time-optimized solution.

[7, IEEE802.1Q] define 2 different modes for MAC address learning phase:

- SVL (shared VLAN learning): the Ethernet switch considers the source MAC address from a received Ethernet frame and the ingress port from where the Ethernet frame was received to create an entry for the ARL table
- IVL (independent VLAN learning): the Ethernet switch considers the source MAC address and the VLAN-ID from a received Ethernet frame and the ingress port from where the Ethernet frame was received to create an entry for the ARL table

Ethernet switched network topologies where it is granted, that a MAC source address appears exclusively at the same Ethernet switch port only, would most likely use the SVL as MAC address learning mode. Otherwise IVL needs to be used as MAC ad-

dress learning mode in order to have an unambiguous assignment of the MAC source address to an Ethernet switch port by considering additionally the VLAN-ID.

[SWS_EthSwT_00444] SVL MAC address learning mode

Upstream requirements: [SRS_Eth_00087](#)

[The Ethernet switch shall consider the MAC source address of the received Ethernet frame and the ingress port from where the Ethernet frame was received for the creation of an entry in ARL table, if all following conditions are valid:

- [EthSwTMacAddressLearningMode](#) is set to *SVL*
- the address learning phase has been activated (see [EthSwT_SetMacLearningMode](#))

]

[SWS_EthSwT_00445] IVL MAC address learning mode

Upstream requirements: [SRS_Eth_00087](#)

[The Ethernet switch shall consider the MAC source address of the received Ethernet frame and the VLAN-ID of the received Ethernet frame and the ingress port from where the Ethernet frame was received for the creation of an entry in the ARL table, if all following conditions are valid:

- [EthSwTMacAddressLearningMode](#) is set to *IVL*
- the address learning phase has been activated (see [EthSwT_SetMacLearningMode](#))

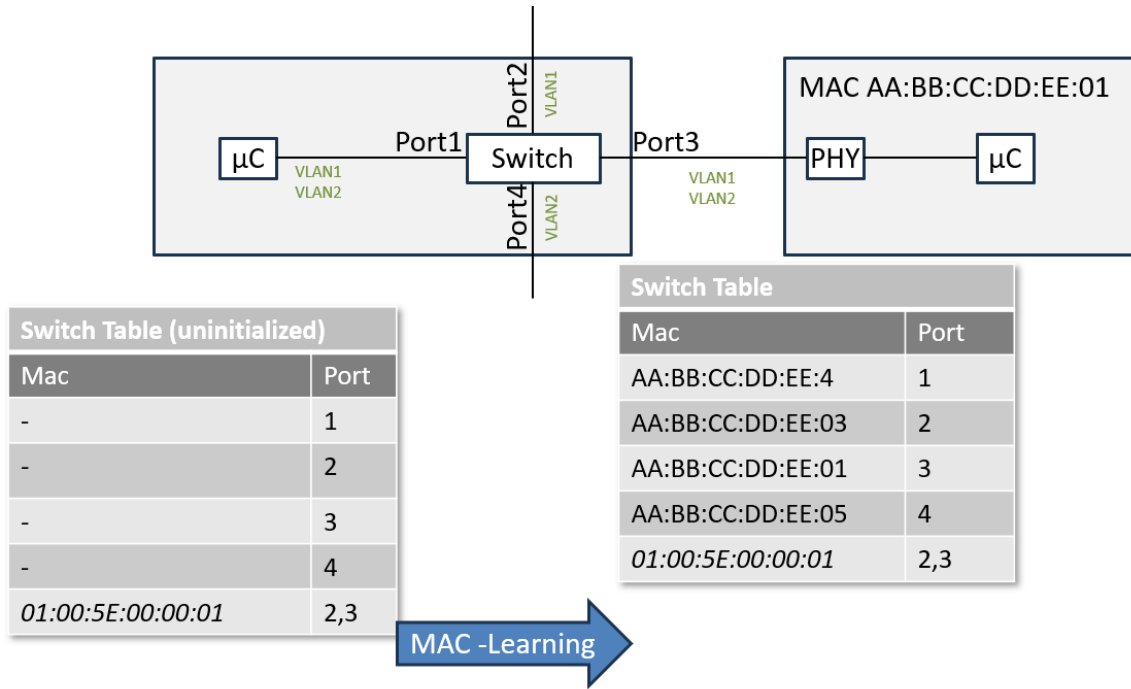
]

As stated before the EthSwT configuration could contain predefined MAC address, which are statically added to the Ethernet switch ARL table. The configuration of those predefined MAC address is constrained by the used [EthSwTMacAddressLearningMode](#): either having VLAN membership relation if using *IVL* as [EthSwTMacAddressLearningMode](#), or having no VLAN membership relation if using *SVL* as [EthSwTMacAddressLearningMode](#).

[SWS_EthSwT_CONSTR_00446] **SVL predefined MAC address configuration** [if [EthSwTMacAddressLearningMode](#) is set to *SVL*, then all configured [EthSwTMacForwardingTable](#) shall have no [EthSwTVlanMembershipRef](#) configured at the affected [EthSwTConfig](#)]

[SWS_EthSwT_CONSTR_00447] **IVL predefined MAC address configuration** [if [EthSwTMacAddressLearningMode](#) is set to *IVL*, then all configured [EthSwTMacForwardingTable](#) shall have a [EthSwTVlanMembershipRef](#) configured at the affected [EthSwTConfig](#)]

Figure 7.5 depict an example for a MAC address learning within the Ethernet switch where `EthSwtMacAddressLearningMode` is set to `SVL`. Please note, the figure depict only a logic view on the Ethernet switch behaviour for the MAC address learning phase and not an implementation.



01:00:5E:00:00:01 is a predefined
MAC multicast address

Figure 7.5: Example for a MAC address learning within the Ethernet switch with `EthSwtMacAddressLearningMode` is set to `SVL`

Figure 7.6 depict an example for a MAC address learning within the Ethernet switch where `EthSwtMacAddressLearningMode` is set to `IVL`. Please note, the figure depict only a logic view on the Ethernet switch behaviour for the MAC address learning phase and not an implementation.

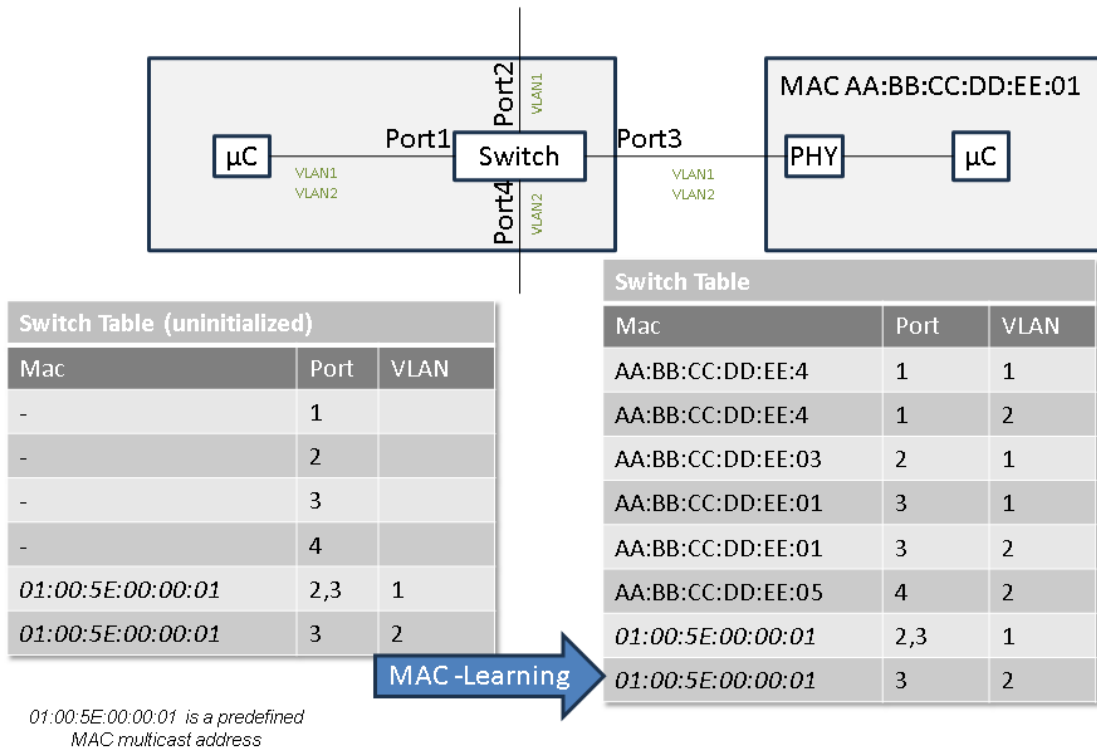


Figure 7.6: Example for a MAC address learning within the Ethernet switch with `Eth-SwtMacAddressLearningMode` is set to `IVL`

Note: Ingress filtering is always activated, therefore only known VLANs can be learnt

IP-Address Assignment: In this phase, ECUs without a predefined IP-address will start to acquire an IP-address via DHCP (cf. Figure 7.7). Thus, these ECUs will run a DHCP-client while the ECU with the switch will run a DHCP server. In order to be able to assign always the same IP-address to a certain node, the DHCP server needs the information at which port the MAC address has been received. This port information can be interpreted as a "domain name" in the internet which is resolved to an IP address using a domain name server (DNS). With this port information the DHCP-server will assign the IP-address according to the IP-Assignment Table to the node. As mentioned above, this allows the assignment of MAC addresses by the Tier 1 and assignment of IP addresses by the OEM. With this mechanism it is also possible to assign different IP addresses to several VLANs at the same port. For this purpose, the IP-Assignment Table needs to be extended with a VLAN-column. Please note that the MAC-Learning-Phase can be combined with this phase.

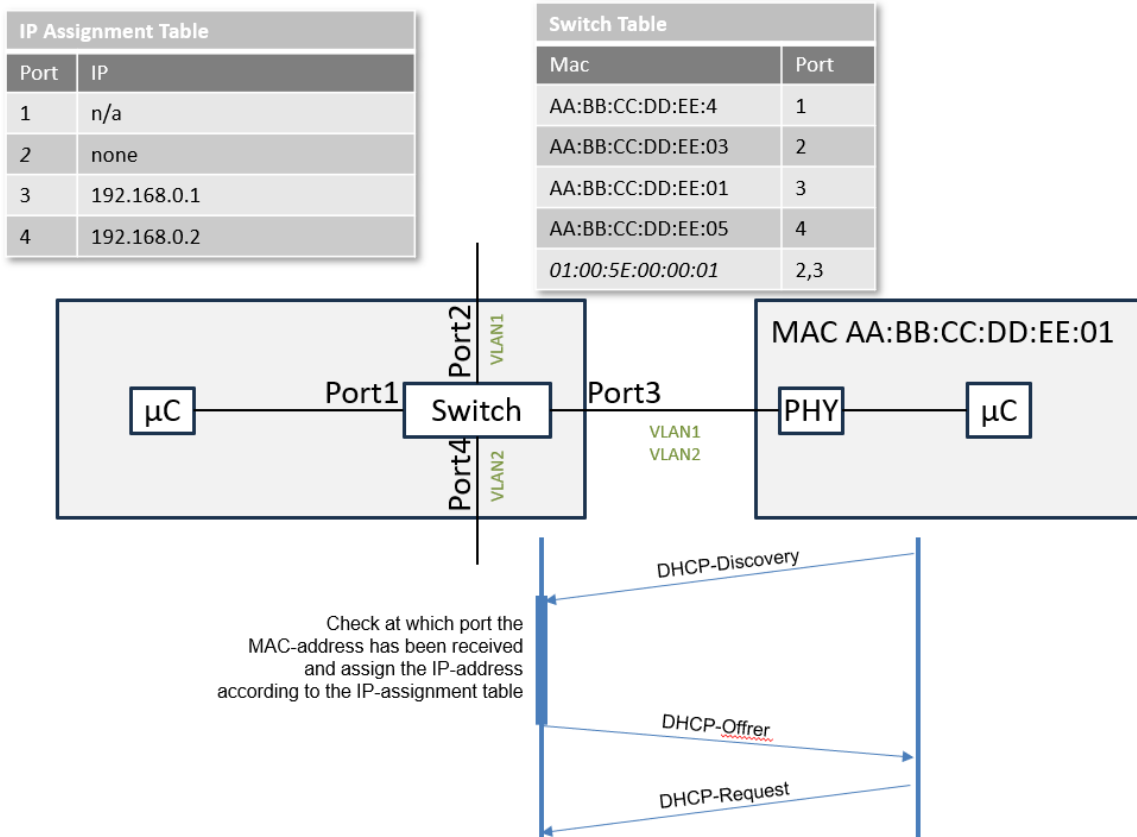


Figure 7.7: IP-address assignment via DHCP

[SWS_EthSwt_00087]

Upstream requirements: [SRS_Eth_00087](#), [SRS_Eth_00122](#)

[The function `EthSwt_StoreConfiguration` shall request to store the configuration of the learned MAC/Port tables of a switch in a persistent manner. This can be done in two ways: 1.) Reading out the parameters and storing them in the NV-RAM of the host CPU using the NV-RAM manager. 2.) Advising the switch to store the configuration data in its local NV-RAM.

In both alternatives `<EthSwtPersistentConfigurationResultCallback>` shall be invoked if `EthSwtPersistentConfigurationResultCallback` is configured. In case of storage to switch local NV-RAM, `JobResult` shall be set to `NVM_REQ_OK` to indicate success or to `NVM_REQ_NOT_OK` to indicate failure.]

[SWS_EthSwt_00092]

Upstream requirements: [SRS_Eth_00122](#), [SRS_Eth_00087](#)

[The function `EthSwt_ResetConfiguration` shall request to reset the configuration of the learned MAC/Port tables of a switch in a persistent manner. This can be done in two ways: 1.) Overwriting the learned parameters in the NV-RAM of the host CPU with preconfigured default values. 2.) Advising the switch to reset the learned configuration data in its local NV-RAM.

In both alternatives `<EthSwtPersistentConfigurationResultCallback>` shall be invoked if `EthSwtPersistentConfigurationResultCallback` is configured. In case of storage to switch local NV-RAM, `JobResult` shall be set to `NVM_REQ_OK` to indicate success or to `NVM_REQ_NOT_OK` to indicate failure.]

[SWS_EthSwt_00061]

Upstream requirements: [SRS_Eth_00087](#), [SRS_Eth_00181](#)

[The function `EthSwt_GetPortMacAddr` shall return the port index over which the given MAC-address is reachable within the indexed switch. If for the `PortIdxPtr` the maximal possible value (255) is returned the given MAC address cannot be reached via a port of this switch. If multiple ports were found the API returns `E_NOT_OK`.]

[SWS_EthSwt_00163] [The Ethernet Switch driver shall support an API which allows to reset learned parameters like address resolution tables by using the API `EthSwt_ResetConfiguration`.]

[SWS_EthSwt_00407] [Unused ARL table entries shall be removed from the ARL table after the timeout configured via `EthSwtArlTableEntryTimeout`, if this parameter is present in the configuration.]

7.1.7.2 Frame forwarding process

As shown in [Figure 7.8](#), the Ethernet switch consists of a certain number of Ethernet switch ports. A single physical Ethernet port is logically divided in an ingress port and an egress port. A frame is received by an Ethernet switch port in the role of an ingress port. This frame is processed within the Ethernet switch and most likely forwarded to one or more Ethernet switch ports in the role of an egress port. This process is called the "frame forwarding process". A frame forwarding process considers among others the following points:

- An Ethernet frame is typically not forwarded to the Ethernet switch port where it has been received.
- A unicast Ethernet frame could be forwarded to exactly one egress port. (Please note, for some reasons (e.g. mirroring or unknown unicast Ethernet frame) a unicast Ethernet frame may be forwarded to multiple egress ports)
- A multicast Ethernet frame (e.g. SOME/IP-SD offer frame) could be forwarded to one or more egress ports.
- A broadcast Ethernet frame (e.g. ARP frame) is forwarded to all egress ports except the Ethernet switch port from where the frame has been received.

Please note: The route of the frame within an Ethernet switch from an ingress port to one or multiple egress ports is called "internal frame route".

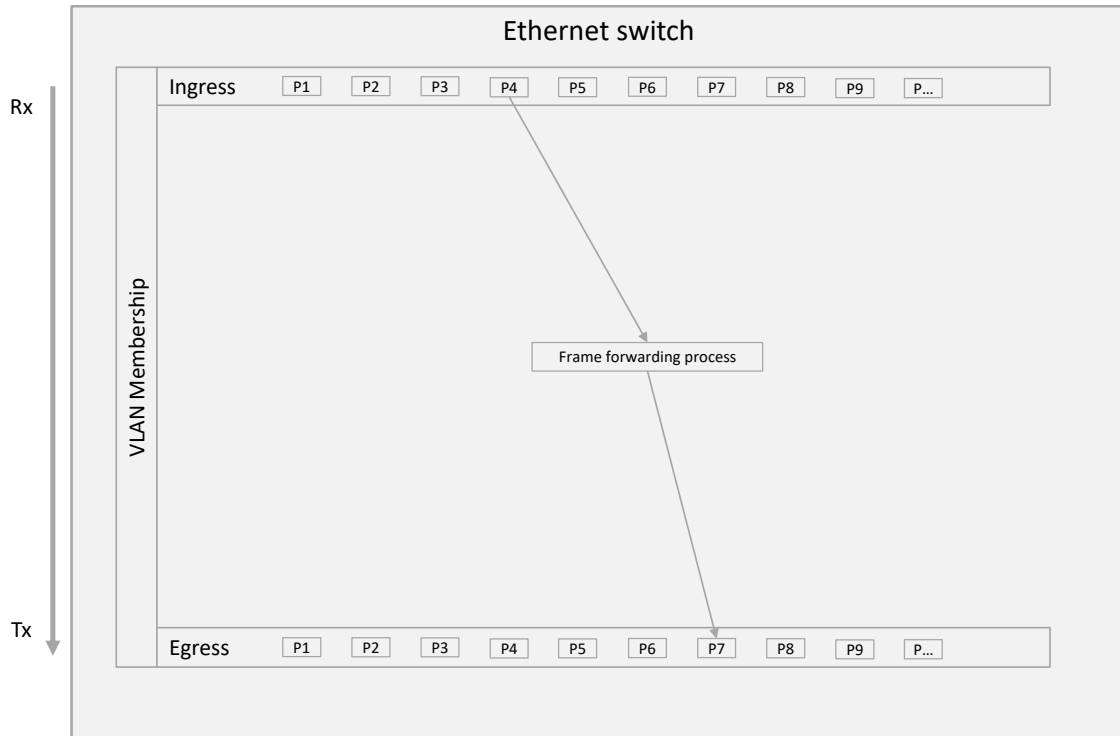


Figure 7.8: Simplified frame forwarding process within an Ethernet switch

The forwarding process consists of multiple frame processing stages. Some frame processing stages are always performed (e.g. check of VLAN membership) and some frame processing stages are performed if they are configured (e.g. flow metering). A frame processing stage may qualify a received frame as invalid. Such a frame is discarded and therefore not forwarded to the subsequential frame processing stage. [7, IEEE Std 802.1Q] specifies the frame forwarding process and particular frame processing stages. Figure 7.9 shows an overview of the processing stages which are supported by AUTOSAR (please refer to Section 4.1)

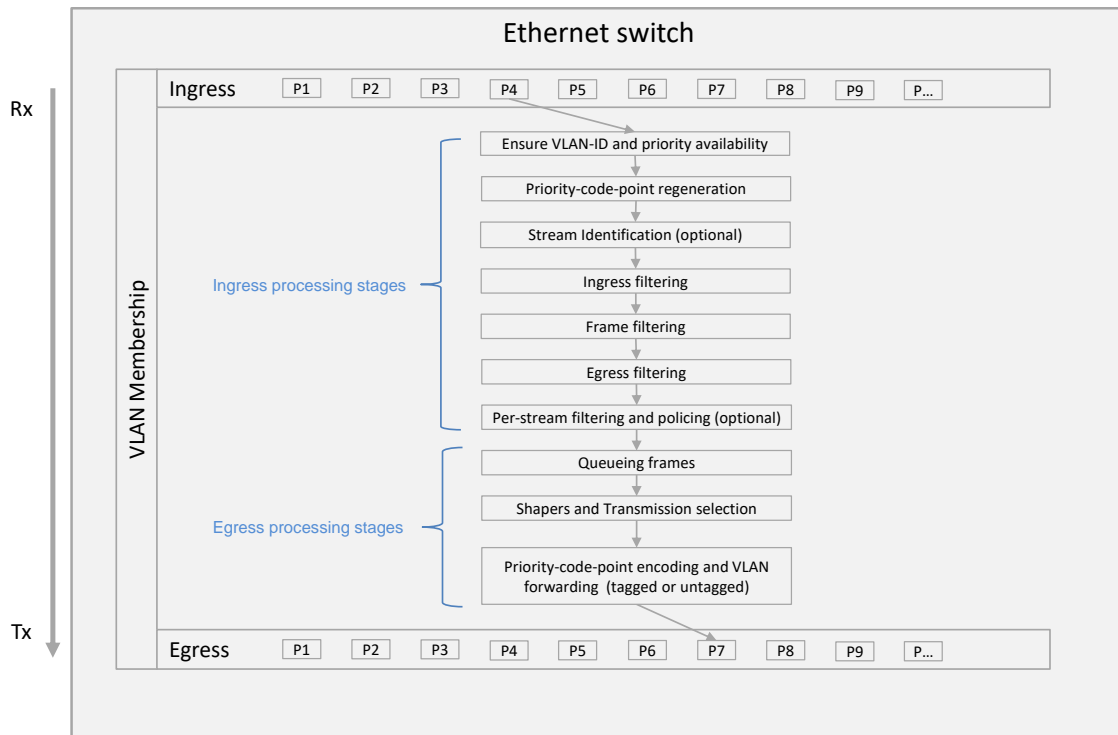


Figure 7.9: Overview of frame processing stages within an Ethernet switch supported by AUTOSAR

Most likely Ethernet frames are not modified in an Ethernet switch. Important information which impact the Ethernet frame attributes (e.g. VLAN-ID, priority) are kept in a separate memory section for each Ethernet frame while traveling through the processing stages. In this specification such a section is called "Ethernet frame meta information". If an Ethernet frame arrive at an ingress port, a Ethernet frame meta information is assigned to this Ethernet frame. The Ethernet frame meta information contain important state values (e.g. stream handle id). Available entries in the Ethernet frame meta information could be updated (e.g. destination port vector, priority). The Ethernet frame meta information is available along the internal frame route. At the very last processing stage all relevant entries of the Ethernet frame meta information which impact the Ethernet frame attributes are written to the Ethernet frame.

The following chapters describe the behaviour of the supported processing stages.

7.1.7.2.1 Ensure VLAN-ID and priority availability

AUTOSAR Ethernet switches are exclusively VLAN-aware (refer to chapter [Section 4.1](#)). If an Ethernet frame is received, then an AUTOSAR Ethernet switch ensures the availability of a VLAN-ID and a priority for this Ethernet frame before forwarding to the next processing stage. Therefore the so-called "frame type acceptance filter", "port-based VLAN classification" and "priority-code-point decoding" is performed by an

Ethernet switch. The following chapters describe how to ensure VLAN-ID and priority availability.

7.1.7.2.1.1 Handling of untagged Ethernet frames

Ethernet frames carrying a TPID set to 0x8100 are considered as tagged Ethernet frames, i.e. they carry a VLAN-tag. For Ethernet frames which are received without an VLAN-tag, a specific Ethernet switch handling could be configured via the AUTOSAR Ethernet switch driver.

There are two ways to handle untagged Ethernet frames at ingress side:

- Drop all untagged Ethernet frames at ingress side of the Ethernet port where the Ethernet frame was received
- Tag all untagged Ethernet frames at ingress side with a default VLAN and default VLAN priority.

Note: The handling of untagged Ethernet frames by the Ethernet switch is expected to be performed before all other modifications of the VLAN (e.g. VLAN modification). This applies also for the VLAN priority handling, which is expected to be performed before a Traffic Class assignment (see subsequential chapters) is done.

Basically, an Ethernet switch tag all Ethernet frames internally for its internal processing with hardware specific default value for a VLAN-tag. This hardware specific default value can be overwritten via `EthSwtPortIngressDefaultVlan` and `EthSwtPortIngressDefaultPriority` per Ethernet switch port

[SWS_EthSwt_CONSTR_00452]

Status: DRAFT

[If `EthSwtPortIngressDefaultVlan` and `EthSwtPortIngressDefaultPriority` for a particular Ethernet port is available, then the default VLAN and the default priority of this hardware Ethernet switch port shall be configured with the available values.]

Implementation Hint: A VLAN-tag consist of a VLAN-ID and the VLAN priority.

[SWS_EthSwt_CONSTR_00453]

Status: DRAFT

[A configuration of an ingress port shall be rejected as invalid, where `EthSwtPortIngressDropUntagged` is set to `TRUE`, and the parameters `EthSwtPortIngressDefaultVlan` and `EthSwtPortIngressDefaultPriority` are configured (multiplicity of both parameters are 0).]

[SWS_EthSwt_00611]

Status: DRAFT

Upstream requirements: [SRS_Eth_00121](#)

[If parameter [EthSwtPortIngressDropUntagged](#) of an specific ingress port is set to `TRUE` and a Ethernet frame without a VLAN-tag (untagged Ethernet frame) is received at this specific ingress port, then this Ethernet frame shall be dropped.]

[SWS_EthSwt_CONSTR_00454]

Status: DRAFT

[A configuration of an specific ingress port shall either have both parameters [EthSwtPortIngressDefaultVlan](#) and [EthSwtPortIngressDefaultPriority](#) configured or none of them.]

[SWS_EthSwt_00612]

Status: DRAFT

Upstream requirements: [SRS_Eth_00121](#)

[If parameter [EthSwtPortIngressDropUntagged](#) of an specific ingress port is set to `FALSE`, the parameters [EthSwtPortIngressDefaultVlan](#) and [EthSwtPortIngressDefaultPriority](#) are configured and a Ethernet frame without a VLAN-tag (untagged Ethernet frame) is received at this specific ingress port, then the default vlan and default priority shall be assigned to this Ethernet frame and handled for further processing by the Ethernet switch.]

Note: If a Ethernet frame shall be sent without a VLAN-tag (untagged Ethernet frame) of a specific VLAN-ID and on a particular egress port, then [EthSwtVlanForwardingType](#) of this VLAN-ID at this Ethernet port need to be set to `ETHSWT_SENT_UNTAGGED` (see [Section 7.1.7.2.4.1](#))

7.1.7.2.1.2 Handling of double tagged Ethernet frames

AUTOSAR support to configure the handling for so-called "double tagged" Ethernet frames per Ethernet switch. Double tagged Ethernet frames contain two VLAN-tags. The first tag is called "S-TAG" (service provider tag) and the second tag is called "C-TAG" (customer tag). Per default the forwarding of double tagged frames is supported. In the forwarding process the S-TAG is considered. For some use cases it is necessary to avoid handling of such Ethernet frames. Therefore a boolean parameter [EthSwtDropDoubleTagged](#) is available. The Ethernet Switch Driver supports a configuration of dropping double tagged frames via the configuration parameter [EthSwtDropDoubleTagged](#), if the Ethernet switch hardware supports dropping of double tagged Ethernet frames.

[SWS_EthSwT_00233]

Upstream requirements: [SRS_Eth_00114](#)

[If parameter [EthSwTDropDoubleTagged](#) is set to `TRUE`, double tagged Ethernet frames shall be dropped independent on which Ethernet switch port this Ethernet frame has been received.]

Note: Dropping of double tagged Ethernet frames depend on the configuration of the TPID for the outer VLAN-tag.

7.1.7.2.2 Priority-Code-Point-Regeneration

If an Ethernet frame pass the processing stage to ensure VLAN-ID and priority availability, then the co-called "priority regeneration" is performed. This processing step is mandatory and will always be executed. The PCP-field (priority code point) within an VLAN-tag of an received Ethernet frame can be modified at an ingress port of an Ethernet switch. For this purpose a so-called priority regeneration table has to be defined:

Priority Regeneration Table								
Ingress PCP	0	1	2	3	4	5	6	7
Regenerated PCP	0	1	2	3	4	5	6	7

Table 7.1: In this table, the "Ingress PCP" is mapped to the "Regenerated PCP".

[SWS_EthSwT_00178]

Status: OBSOLETE

Upstream requirements: [SRS_Eth_00121](#)

[Replaced by [\[SWS_EthSwT_00614\]](#). The switch configuration shall support the configuration how the PCP field of incoming Ethernet frames will be modified before they are forwarded to the egress port, i.e. a priority regeneration table can be configured (Please refer to [EthSwTPortPriorityRegeneration](#), [EthSwTPortPriorityRegenerationIngressPCP](#) and [EthSwTPortPriorityRegenerationRegeneratedPriority](#).)]

[SWS_EthSwT_00614]

Status: DRAFT

Upstream requirements: [SRS_Eth_00180](#)

[If an Ethernet frame is forwarded within an Ethernet switch, then the Ethernet switch shall perform a PCP regeneration for the PCP of this Ethernet frame by considering the configured priority regeneration table (see [EthSwTPortPriorityRegeneration](#), [EthSwTPortPriorityRegenerationIngressPCP](#) and [EthSwTPort-](#)

[PriorityRegenerationRegeneratedPriority](#)) available at the [EthSwtPort-Ingress](#), where this Ethernet frame was received.]

Please note: If no modification is required, than the PCP ingress and PCP regenerated should have the same value.

7.1.7.2.3 Stream identification

If an Ethernet frame pass the "priority-code-point regeneration" than a so-called "stream identification" could be performed by an Ethernet switch, if this processing stage is configured. Otherwise the Ethernet switch forward the Ethernet frame to the next processing stage "ingress filtering".

[15, IEEE Std 802.1CB] defines stream identification. A stream identification is the mandatory pre-condition to perform "per-stream filtering and policing" in a later processing stage. The stream identification function is used to identify a Ethernet frame according particular Ethernet frame attributes. If the Ethernet frame match, then a so-called "stream handle id" is assigned to the Ethernet frame. Therefore the stream handle id is added to Ethernet frame meta information. If the Ethernet frame reaches the processing stage "per-stream filtering and policing", then this stream handle id is used to find a corresponding [EthSwtStreamFilterEntry](#) to perform e.g. a flow metering.

If the Ethernet switch HW supports this feature, then it can be configured by using the sub container [EthSwtStreamIdentificationTable](#). [EthSwtStreamIdentificationTable](#) represents a table, where multiple [EthSwtStreamIdentificationEntry](#)s form an ordered list. Each entry represents an stream identification definition. The stream identification definition applies to streams within an Ethernet switch. Ethernet frames (i.e. streams) are received by an ingress port. A stream identification could be defined in dependency of ingress ports or independent of ingress ports. Therefore a stream identification could reference 0...n ingress ports ([EthSwtPort-Ingress](#)).

[SWS_EthSwt_CONSTR_00464]

Status: DRAFT

[If an [EthSwtStreamIdentificationEntry](#) is configured, then it shall be possible that this [EthSwtStreamIdentificationEntry](#) could reference none, one or multiple ingress via [EthSwtStreamIdentificationIngressPortRef](#).]

[SWS_EthSwt_00465]

Status: DRAFT

Upstream requirements: [SRS_Eth_00178](#)

[If an [EthSwtStreamIdentificationEntry](#) references one or multiple ingress ports, then the stream identification shall be processed for streams received via any of the referencing ingress ports.]

[SWS_EthSwt_00467]

Status: DRAFT

Upstream requirements: [SRS_Eth_00178](#)

[If an [EthSwtStreamIdentificationEntry](#) references no ingress ports, then the stream identification shall be processed for all streams received via any ingress port.]

[SWS_EthSwt_CONSTR_00468]

Status: DRAFT

[If a configured [EthSwtStreamIdentificationEntry](#) references an [EthSwtPortIngress](#), then this stream identification definition shall reference the same [EthSwtPortIngress](#) exclusively one time.]

The configuration of an [EthSwtStreamIdentificationEntry](#) which references ingress ports define the dependency between an [EthSwtStreamIdentificationEntry](#) and the stream route of a received Ethernet frame (i.e. stream) within an Ethernet switch. Therefore this stream route is called the "internal stream route".

[SWS_EthSwt_00469]

Status: DRAFT

Upstream requirements: [SRS_Eth_00178](#)

[If an Ethernet frame (i.e stream) has been received, then the stream identification shall be processed by configured [EthSwtStreamIdentificationEntry](#) where the internal stream route match.]

Multiple [EthSwtStreamIdentificationEntry](#)s are configured as an ordered list of an [EthSwtStreamIdentificationTable](#). The position within the ordered list is defined with the configured value of [EthSwtStreamIdentificationPosition](#). The list is processed in ascending order by the Ethernet switch. As soon as the first [EthSwtStreamIdentificationEntry](#) matches, the Ethernet switch will treat this Ethernet frame according to the configuration that is associated with this [EthSwtStreamIdentificationEntry](#). Subsequent [EthSwtStreamIdentificationEntry](#)s of the ordered list will not be applied. In case a received Ethernet frame does not match any of the [EthSwtStreamIdentificationEntry](#)s, the Ethernet frame will be forwarded to the next frame processing stage.

[SWS_EthSwt_CONSTR_00470]

Status: DRAFT

[Every [EthSwtStreamIdentificationEntry](#) shall have a unique position value configured via [EthSwtStreamIdentificationPosition](#). The value shall start with 0 and continue in ascending order with no gaps for each subsequent [EthSwtStreamIdentificationEntry](#).]

Note: The position value forms a ordered list of [EthSwtStreamIdentificationEntries](#)

[SWS_EthSwt_00471]

Status: DRAFT

Upstream requirements: [SRS_Eth_00178](#)

[If a Ethernet frame (i.e stream) has been received, then the Ethernet switch shall check for a matching [EthSwtStreamIdentificationEntry](#) in ascending order according the [EthSwtStreamIdentificationPosition](#), starting with [EthSwtStreamIdentificationPosition](#) configured with value 0.]

[SWS_EthSwt_00472]

Status: DRAFT

Upstream requirements: [SRS_Eth_00178](#)

[If a received Ethernet frame (i.e stream) does not match any [EthSwtStreamIdentificationEntry](#), the Ethernet frame shall be forwarded to the next frame processing stage without applying any further stream identification handling.]

An [EthSwtStreamIdentificationEntry](#) consist of the [EthSwtStreamFilterRule](#) (multiplicity 1) a [EthSwtStreamHandleAssignment](#) (multiplicity 1) and additionally of the optional element [EthSwtStreamFilterAction](#).

The elements of an [EthSwtStreamIdentificationEntry](#) define the filter rules and filter actions. The order to perform the stream identification (apply filter rules, perform filter actions and further stream handling) is statically defined.

[SWS_EthSwt_00475]

Status: DRAFT

Upstream requirements: [SRS_Eth_00178](#)

[If a Ethernet frame (i.e. stream) has been received and the internal stream route match to a configured [EthSwtStreamIdentificationEntry](#), then this stream identification shall be processed in the following order:

1. Apply the [EthSwtStreamFilterRule](#)
2. If the [EthSwtStreamFilterRule](#) identifies a match, the configured stream handle id (see [EthSwtStreamHandleAssignment](#)) shall be added to the Eth-

ernet frame meta information and, if `EthSwtStreamFilterAction` is configured, consider the filter action to be performed

]

Note:

- It is implementation specific in which processing stage a configured `EthSwtStreamFilterAction` is performed. For example, if the filter action `EthSwtStreamFilterActionDropFrame` set to `TRUE` and a stream is identified, then it makes sense to immediately drop the Ethernet frame and abort the forwarding process. But if the filter action is configured to `EthSwtStreamFilterActionDestinationPortModification`, then the action should be considered after egress filtering is finalized.
- If a filter rule is empty (no filter rule primitives configured (see [Section 7.1.7.2.3.1](#))), then the Ethernet frame (i.e. stream) pass this filter per default. Thus, the configured stream handle id (see `EthSwtStreamHandleAssignment`) is added to the Ethernet frame meta information. The stream processing proceed with the "ingress filtering"

An `EthSwtStreamIdentificationEntry` is considered as an empty stream identification definition, where none of the optional elements are defined. Thus, incoming Ethernet frames which match the internal stream route of an empty stream identification definition, always identified as match of this `EthSwtStreamIdentificationEntry` per default.

[SWS_EthSwt_00476]

Status: DRAFT

Upstream requirements: [SRS_Eth_00178](#)

[A configured `EthSwtStreamIdentificationEntry` where no optional elements are configured, shall be considered as empty stream identification, where incoming Ethernet frames always pass.]

7.1.7.2.3.1 Stream identification and filter rules

An `EthSwtStreamIdentificationEntry` has always a filter rule configured (`EthSwtStreamFilterRule`). `EthSwtStreamFilterRule` defines which parts of a received Ethernet frame are considered for the filtering (e.g. MAC source address, IP destination address a.s.o). The `EthSwtStreamFilterRule` could contain multiple filter rules. One particular filter rule (e.g. `EthSwtStreamFilterMACDestAddress`) is called a "filter rule primitive".

[SWS_EthSwt_00477]

Status: DRAFT

Upstream requirements: [SRS_Eth_00178](#)

[If an [EthSwtStreamFilterRule](#) have multiple filter rule primitives configured (e.g. [EthSwtStreamFilterMACSrcAddress](#) and [EthSwtStreamFilterVlanId](#)), then the filter rule primitives shall be considered as AND-linked filter rules.]

Note: A received Ethernet frame (i.e. stream) matches the filter, if all configured filter rule primitives are matches. E.g. if [EthSwtStreamFilterMACSrcAddress](#) and [EthSwtStreamFilterVlanId](#) is configured, then a stream matches, if the source MAC address AND the VLAN-ID match the defined values. A stream where for example only the [EthSwtStreamFilterMACSrcAddress](#) matches is considered as NOT matching Ethernet frame.

[SWS_EthSwt_00478]

Status: DRAFT

Upstream requirements: [SRS_Eth_00178](#)

[If a Ethernet frame (i.e. stream) has been received, the internal stream route for this Ethernet frame matches to an configured [EthSwtStreamIdentificationEntry](#), the [EthSwtStreamFilterRule](#) of this [EthSwtStreamIdentificationEntry](#) have filter rule primitives configured (e.g. [EthSwtStreamFilterMACSrcAddress](#) and [EthSwtStreamFilterVlanId](#)) and the Ethernet frame matches all configured filter rule primitives, then this Ethernet frame shall be qualified as matching stream.]

[SWS_EthSwt_00479]

Status: DRAFT

Upstream requirements: [SRS_Eth_00178](#)

[If an Ethernet frame (i.e. stream) has been received, the internal stream route for this Ethernet frame matches to an configured [EthSwtStreamIdentificationEntry](#) and a particular filter rule primitive in the [EthSwtStreamFilterRule](#) of this entry is not configured, then this filter rule primitive shall be considered as matching filter rule primitive.]

Note: Not configured filter rule primitives within an existing [EthSwtStreamFilterRule](#) are called "wildcard filter rule primitives". In order to qualify an Ethernet frame (i.e. stream) as matching stream, an Ethernet frame must match all filter rule primitives, as all filter rule primitives are AND-linked. Therefore, an empty [EthSwtStreamFilterRule](#), i.e. without any filter rule primitives configured, will match every received Ethernet frame where the internal frame route of Ethernet frame match to configuration of the according [EthSwtStreamIdentificationEntry](#).

7.1.7.2.3.2 Stream identification and filter action

An [EthSwtStreamIdentificationEntry](#) could define a filter action ([EthSwtStreamFilterAction](#)). The filter action describe the expected behaviour, if a matching stream has been detected. A filter action always refer to the filter rule of the same [EthSwtStreamIdentificationEntry](#).

[SWS_EthSwt_00480]

Status: DRAFT

Upstream requirements: [SRS_Eth_00178](#)

[If a Ethernet frame (i.e. stream) has been qualified as matching stream and an [EthSwtStreamFilterAction](#) is configured, then this filter action shall be applied on this Ethernet frame.]

[SWS_EthSwt_00481]

Status: DRAFT

Upstream requirements: [SRS_Eth_00178](#)

[If a filter action is applied on a Ethernet frame (i.e. stream) and the corresponding [EthSwtStreamFilterAction](#) has [EthSwtStreamFilterActionDropFrame](#) set to TRUE, then this Ethernet frame shall be dropped.]

[SWS_EthSwt_00482]

Status: DRAFT

Upstream requirements: [SRS_Eth_00178](#)

[If a filter action is applied on a Ethernet frame (i.e. stream) and the corresponding [EthSwtStreamFilterAction](#) [EthSwtStreamFilterActionBlockSource](#) set to TRUE, then this Ethernet frame and all sub sequential receptions of Ethernet frames with the same source MAC address shall be blocked.]

[SWS_EthSwt_00483]

Status: DRAFT

Upstream requirements: [SRS_Eth_00178](#)

[If a filter action is applied on a Ethernet frame (i.e. stream) and the corresponding [EthSwtStreamFilterAction](#) has an [EthSwtStreamFilterActionVlanModification](#) configured, then the VLAN-ID of this Ethernet frame shall be modified with the configured VLAN-ID given by [EthSwtStreamFilterActionVlanModificationVlanId](#).]

An Ethernet switch determine the egress destination of an Ethernet frame within the forwarding process. An egress destination for an Ethernet frame could include one or multiple destination ports (egress ports). This egress destination could be modified if [EthSwtStreamFilterActionDestinationPortModification](#) is configured.

The egress destination which is used for the modification is configured as reference to the according egress port(s).

[SWS_EthSwT_00484]

Status: DRAFT

Upstream requirements: [SRS_Eth_00178](#)

[If a filter action [EthSwTStreamFilterActionDestinationPortModification](#) is configured, then the egress destination which is used for the modification shall be determined according the configured references to egress ports via [EthSwTStreamFilterActionDestinationPortModificationEgressPortRef](#).]

[SWS_EthSwT_CONSTR_00485]

Status: DRAFT

[If a filter action [EthSwTStreamFilterActionDestinationPortModification](#) is configured, then this [EthSwTStreamFilterActionDestinationPortModification](#) shall reference the same [EthSwTPortEgress](#) via [EthSwTStreamFilterActionDestinationPortModificationEgressPortRef](#) exclusively one time.]

[SWS_EthSwT_00486]

Status: DRAFT

Upstream requirements: [SRS_Eth_00178](#)

[If a filter action is applied on a Ethernet frame (i.e. stream), the corresponding [EthSwTStreamFilterAction](#) has an [EthSwTStreamFilterActionDestinationPortModification](#) configured and the [EthSwTStreamFilterActionDestinationPortModificationType](#) is set to [ETHSWT_STREAM_EGRESS_DESTINATION_OVERWRITE](#), then the egress destination of this Ethernet frame shall be overwritten with the configured egress destination (see [EthSwTStreamFilterActionDestinationPortModificationEgressPortRef](#)).]

[SWS_EthSwT_00487]

Status: DRAFT

Upstream requirements: [SRS_Eth_00178](#)

[If a filter action is applied on a Ethernet frame (i.e. stream), the corresponding [EthSwTStreamFilterAction](#) has an [EthSwTStreamFilterActionDestinationPortModification](#) configured and the [EthSwTStreamFilterActionDestinationPortModificationType](#) is set to [ETHSWT_STREAM_EGRESS_DESTINATION_EXTEND](#), then the egress destination of this Ethernet frame shall be extended with the configured egress destination (see [EthSwTStreamFilterActionDestinationPortModificationEgressPortRef](#)).]

[SWS_EthSwt_00610]

Status: DRAFT

Upstream requirements: [SRS_Eth_00178](#)

[If a filter action is applied on a Ethernet frame (i.e. stream), the corresponding [EthSwtStreamFilterAction](#) has an [EthSwtStreamFilterActionDestinationPortModification](#) configured and the [EthSwtStreamFilterActionDestinationPortModificationType](#) is set to [ETHSWT_STREAM_EGRESS_DESTINATION_LIMIT](#), then the egress destination of this Ethernet frame shall be extended with the configured egress destination (see [EthSwtStreamFilterActionDestinationPortModificationEgressPortRef](#), but limited to those referenced egress ports where this Ethernet frame is allowed to be transmitted according to the egress port state (e.g. VLAN membership, assigned MAC address)).]

Note: use case for [\[SWS_EthSwt_00610\]](#) is to limit/restrict the egress ports on which packet are allowed to egress the Ethernet switch.

7.1.7.2.4 Ingress filtering

If an Ethernet frame pass the "priority-code-point regeneration" and the optional "stream identification" frame processing stage, then a so-called ingress filtering is performed by an Ethernet switch. The following sub chapters describe the details of the processing.

7.1.7.2.4.1 Vlan-Membership

For each Ethernet switch port a VLAN membership could be defined. An Ethernet switch port could be member of 0..* VLANs. The VLAN membership impacts the frame processing. A VLAN Membership describes ingress and egress behavior in terms of filtering, tagging or untagging.

Vlan-Membership - ingress implications

If an Ethernet frame has been received, then the Ethernet switch inspect the frame regarding a VLAN-tag. If an VLAN-tag within the received Ethernet frame exist, the Ethernet switch evaluates the received VLAN identifier (VLAN-ID). If the Ethernet switch port from where the Ethernet frame has been received is member of the VLAN which is associated with the received VLAN-ID, then the frame processing will continue, otherwise the frame is discarded and no further frame processing will be performed. Thus, all supported VLAN-IDs are configured in [EthSwtVlanMembership](#).

[SWS_EthSwt_00601]

Status: DRAFT
Upstream requirements: [SRS_Eth_00114](#)

[If an Ethernet switch port, from where the Ethernet frame has been received, is member of the VLAN according to the configuration of [EthSwtVlanMembership](#) and the VLAN-ID of the received Ethernet match to the configured VLAN membership of this Ethernet switch port, then the frame processing shall continue, otherwise the Ethernet frame shall be discarded and frame processing aborted.]

Vlan-Membership - egress implications

Please note: VLAN-membership egress handling is performed in processing stage "egress filtering", but it is described in this section, since this gives an overview of the VLAN-membership handling.

If a received Ethernet frame with an particular VLAN-ID passed all processing stages, the Ethernet switch has to add the frame to an egress queue according to the internal frame route. Thereby, the VLAN membership defines with [EthSwtVlanForwarding-Type](#), if an Ethernet frame with a particular VLAN-ID shall be sent on the affected port with a VLAN-tag ([ETHSWT_SENT_TAGGED](#), or if this Ethernet frame shall be sent on the affected port without the VLAN-tag ([ETHSWT_SENT_UNTAGGED](#)), or if this Ethernet frame shall not be sent on the affected port ([ETHSWT_NOT_SENT](#)).

For each VLAN-ID a table is necessary which stores at which egress port an Ethernet frame with the corresponding VLAN-ID is sent tagged, sent untagged or not sent. For an 8-port switch, this table could look like the following example where T stands for tagging, U for untagging, N for not sent and "-" not member of this VLAN:

VLAN Forwarding Table								
VLAN-ID	Port Number							
	1	2	3	4	5	6	7	8
1	T	T	-	U	-	-	-	T
2	T	U	-	T	-	-	-	N
...								
4094								

Examples of communication scenarios:

- Incoming Ethernet frames which contain a VLAN-ID of e.g. 1 can be forwarded to the ports 1, 2, 4, and 8. At ports 1, 2, and 8 these Ethernet frames will be transmitted with the VLAN-tag and at port 4 the VLAN-tag will be removed. Ethernet frames which contain a VLAN-ID e.g. 1 received on ports 3,5,6 and 7 will be discarded.
- If a broadcast message with e.g. VLAN-ID 2 will be received at port 2, it will be forwarded to port 1,4 and 8. At ports 1 and 4 these Ethernet frames will

be transmitted with the VLAN-tag and on port 8 it will not be send, since the forwarding type is configured with N (`ETHSWT_NOT_SENT`). The other ports 3, 5, 6, and 7 are not in the same VLAN. Thus, the Ethernet frame will not be forwarded to these egress ports.

- If a broadcast message with e.g. VLAN-ID 2 will be received at port 8, it will be forwarded to port 1,2 and 4. At ports 1 and 4 these Ethernet frames will be transmitted with the VLAN-tag and on port 2 the VLAN-tag will be removed. The other ports 3, 5, 6, and 7 are not in the same VLAN. Thus, the Ethernet frame will not be forwarded to these egress ports.

The table considers only messages, which contain a VLAN-ID within the Ethernet switch.

[SWS_EthSwt_00134]

Status: OBSOLETE

Upstream requirements: [SRS_Eth_00121](#), [SRS_Eth_00114](#)

[Replaced by [\[SWS_EthSwt_00450\]](#). The switch configuration shall support the configuration how packets will be forwarded with respect to configured VLANs by using the configuration parameters of the subcontainer [EthSwtVlanMembership](#).]

[SWS_EthSwt_00450] [If an Ethernet frame has been received and the Ethernet frame passes the Egress filtering, then the Ethernet frame shall be forwarded to the Egress port according the [EthSwtVlanForwardingType](#) configuration:

- If egress port is configured to `ETHSWT_SENT_TAGGED`, then the Ethernet frame shall be transmitted with a VLAN tag,
- else If egress port is configured to `ETHSWT_SENT_UNTAGGED`, then the Ethernet frame shall be transmitted without a VLAN tag,
- else if egress port is configured to `ETHSWT_NOT_SENT`, then the Ethernet frame shall be dropped

]

Note: VLAN-Memberships of a port are modeled with the container [EthSwtVlanMembership](#) where the associated ports are referenced via [EthSwtVlanMembership-PortRef](#) and the according [EthSwtVlanForwardingType](#) is configured.

7.1.7.2.4.2 VLAN-modification at ingress side

It is possible to define a port-based modification of the VLAN-ID or an insertion of a VLAN-ID into a received Ethernet frame. (Please note, as described in [Section 7.1.7.2](#), the Ethernet frame itself will not be modified, but the change is stored in the Ethernet

frame meta information to be considered in the subsequential forwarding process) This is specified with another table, e.g.:

Ingress VLAN Modification/Insertion Table								
Port Number	1	2	3	4	5	6	7	8
VLAN-ID	2	-	-	6	-	-	-	-

In this example, all incoming Ethernet frames at port 1 will get the VLAN-ID 2 if they already had one before. At port 4, all incoming VLAN-tagged Ethernet frames will get 6 as their VLAN-ID. At the remaining ports, no VLAN-IDs will be inserted and an existing VLAN-ID in the Ethernet frame will remain without modification.

[SWS_EthSwT_00135]

Status: OBSOLETE

Upstream requirements: [SRS_Eth_00121](#)

[Replaced by [\[SWS_EthSwT_00555\]](#), [\[SWS_EthSwT_00556\]](#) [\[SWS_EthSwT_00557\]](#) and [\[SWS_EthSwT_00558\]](#). The switch configuration shall support the configuration how VLANs will be inserted into Ethernet frames or existing VLANs will be modified by the configuration `EthSwTPortIngressVlanModification`.]

[SWS_EthSwT_00555] Translating VLAN IDs

Upstream requirements: [SRS_Eth_00121](#)

[If an `EthSwTPortIngressVlanTranslationTable` is configured at an ingress port, all VLAN IDs matching a configured `EthSwTIngressVlanId` shall be mapped to the corresponding `EthSwTTranslatedVlanId`. The `EthSwTTranslatedVlanId` replaces the VLAN ID of a frame internally for all stages of the forwarding process after the ingress filtering stage.]

Note: If the `EthSwTTranslatedVlanId` is set to 0 in any entry of that table, then the `EthSwTIngressVlanId` value configured in this entry is mapped to the `DefaultVlanID` upon port-based VLAN classification.

[SWS_EthSwT_00556] Wildcard for VLAN ID translation

Upstream requirements: [SRS_Eth_00121](#)

[If an `EthSwTPortIngressVlanTranslationTable` is configured at an ingress port, but the `EthSwTIngressVlanId` is not configured in an entry of that table, then this entry is considered a wildcard entry.]

[SWS_EthSwT_00557] Only one wildcard entry allowed

Upstream requirements: [SRS_Eth_00121](#)

[An `EthSwTPortIngressVlanTranslationTable` shall not contain more than one wildcard entry.]

[SWS_EthSwT_00558] Wildcard match operation

Upstream requirements: [SRS_Eth_00121](#)

[If a wildcard entry is configured in an [EthSwTPortIngressVlanTranslationTable](#) at an ingress port, then all VLAN IDs not matching any configured [EthSwTIngressVlanId](#) value shall be mapped to the [EthSwTTranslatedVlanId](#) of the wildcard entry.]

7.1.7.2.4.3 Priority handling

A VLAN-tag of an Ethernet frame consist of a VLAN-ID and the VLAN priority. The VLAN priority within a VLAN-tag is called the PCP-field (priority code point). The PCP defines the priority with which this Ethernet frame shall be handled in an Ethernet network. The PCP is a 3bit value and defines the lowest priority with 0 and highest priority with 7. The prioritisation of Ethernet traffic supports the quality of service technique on a switched Ethernet network. From the Ethernet switch perspective the priority received with an Ethernet frame could be re-defined for the internal frame processing. AUTOSAR supports the following methodes to re-define the internal priority of a received Ethernet frame for the internal frame processing:

- priority regeneration based on ingress PCP (regenerated priority (see [EthSwTPortPriorityRegeneration](#)))
- definition of an internal priority value (IPV) which could be configured if stream filtering is used (see [Section 7.1.7.2.7](#))

A priority regeneration based on the PCP (VLAN-priority) of the Ethernet frame is mandatory and will always be performed. After the priority regeneration has been finalized, the regenerated priority is available in the Ethernet frame meta information. Further internal priority value (IPV) could be added to the Ethernet frame meta information in a subsequential processing stage of the Ethernet frame if stream identification is used. If an IPV is available, then this value is used for the traffic class assignment of an Ethernet frame. Otherwise the regenerated priority. However, as soon as the Ethernet frame is enqueued in a egress queue and the Ethernet frame is transmitted with a VLAN-tag, the regenerated priority value is used as PCP (VLAN-priority) of the outgoing Ethernet frame, independent of the availability and value of an IPV. The usage of a priorities differs partly:

- the regenerated priority is used for the traffic class assignment of an Ethernet frame, if an IPV is not available.
- the IPV is used for the traffic class assignment of an Ethernet frame, if an IPV is available.
- the regenerated priority is always used as PCP (VLAN-priority) for an outgoing Ethernet frame transmitted with a VLAN-tag.

Internal priority value

An internal priority value could be defined by configuring an [EthSwtPSFP](#) (per-stream filtering and policing) in combination with an [EthSwtStreamFilterTable](#), where an [EthSwtStreamFilterEntry](#) references an [EthSwtStreamGateEntry](#) which has an [EthSwtStreamGateIPV](#). As described before, the internal priority value is used to assign a traffic class to an Ethernet frame. Please refer to [Section 7.1.7.2.7](#) for further description regarding the configuration.

7.1.7.2.5 Frame filtering

If an Ethernet frame passes the "ingress filtering", then a so-called "frame filtering" is performed by an Ethernet switch. In this processing stage, the Ethernet switch determines the egress ports to which the Ethernet frame is forwarded, based on the destination MAC address of the frame and the internal address resolution lookup (ARL) table. Please refer to chapter [Section 7.1.7.1](#) for further information regarding the process to setup the ARL table.

[SWS_EthSwt_00461]

Status: DRAFT

Upstream requirements: [SRS_Eth_00121](#)

[If the destination MAC address of a received Ethernet frame is a MAC unicast/multicast address and this MAC address is available in the ARL table, then the Ethernet frame shall be considered to be forwarded to the corresponding egress port(s) according to the matching ARL table entry.]

[SWS_EthSwt_00520] Broadcast destination

Status: DRAFT

Upstream requirements: [SRS_Eth_00121](#)

[If the destination MAC address of a received Ethernet frame is the MAC broadcast address (FF:FF:FF:FF:FF:FF), then this Ethernet frame shall be considered to be forwarded to all available egress ports.]

Note: If the destination MAC address of a received Ethernet frame is qualified as a MAC broadcast address, then this Ethernet frame is forwarded for further processing. No check in ARL table is performed.

[SWS_EthSwt_00521] Unicast destination

Status: DRAFT

Upstream requirements: [SRS_Eth_00121](#)

[If the destination MAC address is a unicast address which is not available in the ARL table, then the Ethernet frame shall be considered to be forwarded to all egress ports]

referenced via `EthSwtDestPortsForUnknownUnicastMacDestAddressRef`. If all egress ports are referenced (flooding) the Ethernet frame is forwarded to all ports that are member in the respective VLAN except the incoming port to support the learning process. If the reference `EthSwtDestVlanForUnknownMacDestAddressRef` is defined in the context of that `EthSwtUnknownMacDestAddressConfig`, then only Ethernet frames addressed to that VLANs shall be considered, i.e. frame handling is VLAN-specific in this case.]

[SWS_EthSwt_00522] Multicast destination

Status: DRAFT

Upstream requirements: [SRS_Eth_00121](#)

[If the destination MAC address is a multicast address and it is not available in the ARL table, then the Ethernet frame shall be considered to be forwarded to all egress ports referenced via `EthSwtDestPortsForUnknownMulticastMacDestAddressRef`. If all egress ports are referenced (flooding) the Ethernet frame is forwarded to all ports that are member in the respective VLAN except the incoming port. If the reference `EthSwtDestVlanForUnknownMacDestAddressRef` is defined in the context of that `EthSwtUnknownMacDestAddressConfig`, then only Ethernet frames addressed to that VLANs shall be considered, i.e. frame handling is VLAN-specific in this case.]

[SWS_EthSwt_00523] Processing or dropping

Status: DRAFT

Upstream requirements: [SRS_Eth_00121](#)

[If after frame filtering an Ethernet Frame needs to be forwarded on at least one egress port or the meta information of this Ethernet frames contains a stream handle id (see [EthSwtStreamHandleAssignment](#)), the frame shall be further processed. Otherwise, the Ethernet frame shall be dropped, and the forwarding process shall be aborted.]

Note: An Ethernet frame which was identified by a stream identification (i.e. the meta data of the Ethernet frame contains a stream handle id), but has no egress port assigned upon frame filtering, is still subject to “pre-stream filtering and policing”. So, even Ethernet frames that are dropped upon frame filtering because of an unknown destination MAC address, e.g., can be mirrored to a specific egress port using a stream identification.

Note: If the Ethernet frame is considered to be forwarded to a least one egress port and MAC address learning is enabled, then the source MAC address is added into the ARL table.

7.1.7.2.6 Egress filtering

If an Ethernet frame pass the "frame filtering" than a so-called "egress filtering" is performed by an Ethernet switch. This processing stage has the focus on the VLAN

membership. The previous processing stage "frame filtering" assigned this Ethernet to one or multiple egress ports. The egress filtering inspect the VLAN membership of the egress ports where the received Ethernet frame has been assigned to and the VLAN-ID of the received Ethernet frame. The egress filtering process keep the Ethernet frame assignment to those egress ports where the VLAN-ID of the received Ethernet frame and the VLAN membership of the egress port match. Otherwise the assignment of the Ethernet frame to a egress port is removed.

[SWS_EthSwT_00462]

Status: DRAFT

Upstream requirements: [SRS_Eth_00121](#)

[If the VLAN membership of a egress port match to the VLAN-ID of a received Ethernet frame and this Ethernet frame has been assigned to this egress port, then the assignment of this Ethernet frame to this egress port shall be kept. Otherwise the assignment of this Ethernet frame to the affected egress port shall be removed.]

[SWS_EthSwT_00463]

Status: DRAFT

Upstream requirements: [SRS_Eth_00121](#)

[If after the egress filtering an Ethernet frame is still assigned to a least one egress port or the Ethernet frame meta information of this Ethernet frames contains a stream handle id (see [EthSwTStreamHandleAssignment](#)), the frame shall be further processed. Otherwise, the Ethernet frame shall be dropped, and the forwarding process shall be aborted.]

7.1.7.2.7 Per-stream filtering and policing

If an Ethernet frame pass the "egress filtering" than a so-called "per stream filtering and policing" could be performed by an Ethernet switch, if this processing stage is configured. Otherwise the Ethernet switch forward the Ethernet frame to the next processing stage "queueing frames".

[7, IEEE Std 802.1Q] defines per-stream filtering and policing. Per stream filtering and policing could be configured with [EthSwTPSFP](#). The neighboring configuration container [EthSwTAtsInstanceTable](#) represent a table of so-called "asynchronous traffic shapers", which could be used by [EthSwTPSFP](#). Both [EthSwTPSFP](#) and [EthSwTAtsInstanceTable](#) reside below the superordinated [EthSwTPSCM](#) (per stream classification and metering).

The [EthSwTPSFP](#) container include the following tables:

- [EthSwTFilterMaxSduSizeTable](#), if configured at least one [EthSwTFilterMaxSduSizeEntry](#) exists

- `EthSwtFlowMeteringTable`, if configured at least one `EthSwtFlowMeteringEntry` exists
- `EthSwtStreamFilterTable`, if configured at least one `EthSwtStreamFilterEntry` exists
- `EthSwtStreamGateTable`, if configured at least one `EthSwtStreamGateEntry` exists

If the Ethernet switch HW supports this feature, then it can be configured by using the tables of `EthSwtPSFP` and `EthSwtAtsInstanceTable`.

The `EthSwtStreamFilterTable` represents the core table, because an entry of the `EthSwtStreamFilterTable` could reference one entry from the `EthSwtFilterMaxSduSizeTable`, `EthSwtFlowMeteringTable` and `EthSwtStreamGateTable`.

The `EthSwtStreamFilterTable` could have multiple `EthSwtStreamFilterEntries`, where each entry represents a stream filter. `EthSwtStreamFilterEntries` are configured as an ordered list. The position within the ordered list is defined with the configured value of `EthSwtStreamFilterEntryPosition`. The list is processed in ascending order by the Ethernet switch. As soon as the first `EthSwtStreamFilterEntry` matches, the Ethernet switch will treat this Ethernet frame according to the configuration that is associated with this `EthSwtStreamFilterEntry`. Subsequent `EthSwtStreamFilterEntries` of the ordered list will not be applied. In case a received Ethernet frame does not match any of the `EthSwtStreamFilterEntries`, the Ethernet frame will be forwarded to the next frame processing stage.

[SWS_EthSwt_CONSTR_00602]

Status: DRAFT

[Every `EthSwtStreamFilterEntry` shall have a unique position value configured via `EthSwtStreamFilterEntryPosition`. The value shall start with 0 and continue in ascending order with no gaps for each subsequent `EthSwtStreamFilterEntry`.]

Note: The position value forms a ordered list of `EthSwtStreamFilterEntries`

[SWS_EthSwt_00602]

Status: DRAFT

Upstream requirements: [SRS_Eth_00114](#)

[If a Ethernet frame (i.e stream) arrives at processing stage per-stream filtering and policing, then the Ethernet switch shall check for a matching `EthSwtStreamFilterEntry` that is active (see [[SWS_EthSwt_00503](#)]) in ascending order according the `EthSwtStreamFilterEntryPosition`, starting with `EthSwtStreamFilterEntryPosition` configured with value 0.]

[SWS_EthSwt_00604]

Status: DRAFT

Upstream requirements: [SRS_Eth_00114](#)

[If an arrived Ethernet frame (i.e stream) does not match any [EthSwtStreamFilterEntry](#)s or the matching [EthSwtStreamFilterEntry](#) is deactivated (see [\[SWS_EthSwt_00503\]](#)), the Ethernet frame shall be forwarded to the next frame processing stage without applying any further stream filter handlings.]

An [EthSwtStreamFilterEntry](#) consist of [EthSwtAssignedStreamHandle](#) , [EthSwtStreamFilterPriority](#), [EthSwtFilterMaxSduSizeRef](#) and additionally the optional references to the neighboring tables: [EthSwtAssignedStreamHandle](#), [EthSwtFlowMeteringEntryRef](#) and [EthSwtStreamGateEntryRef](#)

A match of Ethernet frame to an stream filter is identified by considering [EthSwtAssignedStreamHandle](#) and [EthSwtStreamFilterPriority](#)

[SWS_EthSwt_00605]

Status: DRAFT

Upstream requirements: [SRS_Eth_00114](#)

[If an Ethernet frame (i.e. stream) arrives at processing stage per-stream-filtering-and-policing, and this Ethernet Frame carries an Ethernet frame meta information which contains a stream handle id (see [EthSwtStreamHandleAssignment](#)) assigned by the stream-identification processing stage, then the Ethernet switch shall scan the [EthSwtStreamFilterTable](#) (with respect to [\[SWS_EthSwt_00602\]](#)) for an [EthSwtStreamFilterEntry](#) where its [EthSwtAssignedStreamHandle](#) and [EthSwtStreamFilterPriority](#) match to the stream handle id and priority of the arrived Ethernet frame (see [EthSwtStreamHandleAssignment](#) and [EthSwtPortPriorityRegenerationRegeneratedPriority](#)). Ohterwise the per-stream-filtering-and-policing process shall be aborted for this Ethernet frame and the Ethernet frame shall be forwarded to the next processing stage.]

If an Ethernet switch detect an Ethernet frame which match to an [EthSwtStreamFilterEntry](#), then the size of the Ethernet frame will be evaluated by considering the maximal acceptable Ethernet frame size referenced by the [EthSwtStreamFilterEntry](#) via [EthSwtFilterMaxSduSizeRef](#).

[SWS_EthSwt_CONSTR_00603]

Status: DRAFT

[All [EthSwtStreamFilterEntry](#)s shall have a reference to a value of max-sdu-size via [EthSwtFilterMaxSduSizeRef](#) configured.]

Note: The definition of [EthSwtFilterMaxSduSizeEntry](#) includes the size of Preamble, SFD and minimum IPG (see [Section 10.1.13](#))

Implementation hint: An Ethernet switch hardware does not need (and probably does not) consider the length of Preamble, SFD and minimum IPG in its native filtering mechanism. In general, these three elements can be considered as known constants in an engineered Ethernet network by the Ethernet switch engine, such that an Ethernet switch can easily be configured to behave according to the definition of [EthSwtFilterMaxSduSizeEntry](#)

[SWS_EthSwt_00606]

Status: DRAFT

Upstream requirements: [SRS_Eth_00114](#)

[If an Ethernet switch detect a match of an Ethernet frame to an [EthSwtStreamFilterEntry](#) according to [\[SWS_EthSwt_00605\]](#), then the Ethernet switch shall evaluate, if the frame size of this Ethernet frame (i.e. stream) exceeds the value of the [EthSwtFilterMaxSduSizeEntry](#) referenced by the [EthSwtStreamFilterEntry](#) via [EthSwtFilterMaxSduSizeRef](#):

- If the frame size of the Ethernet frame exceeds the referenced max-sdu-size and then the per-stream-filtering-and-policing process shall be aborted for this Ethernet frame and the Ethernet frame shall be dropped.
- If the frame size of the Ethernet frame is equal or smaller than the referenced max-sdu-size, then the per-stream-filtering-and-policing processing shall continue.

]

[SWS_EthSwt_00607]

Status: DRAFT

Upstream requirements: [SRS_Eth_00114](#)

[If the evaluation of the Ethernet frame size result to continue with the per-stream-filtering-and-policing processing according to [\[SWS_EthSwt_00606\]](#) and the [EthSwtStreamFilterEntry](#) reference a [EthSwtStreamGateEntry](#), then the Ethernet switch shall assign the configured internal priority value (see [EthSwtStreamGateIPV](#)) by updating the Ethernet frame meta information of this Ethernet frame]

Note: The internal priority value is used for the traffic class assignment (see [7.1.7.2.8 “Queueing frames”](#)). The internal priority value is modeled as a 32bit value, but the value is limited by the configured internal priority upper value of the Ethernet switch (see [EthSwtUsedInternalPriorityUpperValue](#)).

The state of a gate could be open or close. If a gate is open, then Ethernet frames could pass through for further processing. Otherwise a gate is closed and Ethernet frames are not permitted to pass through. Please note, AUTOSAR supports only open gates.

[SWS_EthSwt_CONSTR_00489]

Status: DRAFT

[If a `EthSwtPSFP` is configured, then the corresponding Ethernet switch hardware shall be configured such that Ethernet frames (i.e. streams) could always pass through (open gate).]

[SWS_EthSwt_00608]

Status: DRAFT

Upstream requirements: [SRS_Eth_00114](#)

[If the evaluation of the Ethernet frame size result to continue with the per-stream-filtering-and-policing processing according to [\[SWS_EthSwt_00606\]](#), then the Ethernet switch shall perform the actions in dependency of the affected `EthSwtStreamFilterEntry` configuration in the following order:

1. If the `EthSwtStreamFilterEntry` reference a `EthSwtStreamGateEntry`, then the Ethernet switch shall assign the configured internal priority value (see `EthSwtStreamGateIPV`) to the Ethernet frame by updating its Ethernet frame meta information.
2. If the `EthSwtStreamFilterEntry` reference a `EthSwtFlowMeteringEntry`, then the Ethernet switch shall apply the flow metering configuration on the Ethernet frame.
3. If the `EthSwtStreamFilterEntry` reference a `EthSwtAtsInstanceEntry`, then the Ethernet switch shall apply the asynchronous traffic shaper configuration on the Ethernet frame.

]

A `EthSwtPSFP` has the possibility to define a flow metering by configuring a (`EthSwtFlowMeteringTable`). The table contain one or multiple `EthSwtFlowMeteringEntries`. Each `EthSwtFlowMeteringEntry` represents a configuration of one flow metering. One `EthSwtStreamFilterEntry` could reference exactly one `EthSwtFlowMeteringEntry`. The configuration of the flow metering support to limit the rate of Ethernet frames (i.e. streams).

[SWS_EthSwt_00491]

Status: DRAFT

Upstream requirements: [SRS_Eth_00114](#)

[If an Ethernet frame match to `EthSwtStreamIdentificationEntry`, this Ethernet frame pass the filtering and a `EthSwtFlowMeteringEntry` is available, then this Ethernet frame shall be handled by this `EthSwtFlowMeteringEntry`.]

[SWS_EthSwt_00492]

Status: DRAFT

Upstream requirements: [SRS_Eth_00114](#)

[A configured [EthSwtFlowMeteringEntry](#) shall perform the metering according to the configuration: [EthSwtFlowMeteringColorMode](#), [EthSwtFlowMeteringCIR](#), [EthSwtFlowMeteringCBS](#), [EthSwtFlowMeteringEIR](#), [EthSwtFlowMeteringEBS](#) and [EthSwtFlowMeterCF](#)]

A [EthSwtPSCM](#) has the possibility to define asynchronous traffic shaping by configuring a ([EthSwtAtsInstanceTable](#)). The table contain one or multiple [EthSwtAtsInstanceEntry](#)s. Each [EthSwtAtsInstanceEntry](#) represents a configuration of one asynchronous traffic shaper. One [EthSwtStreamFilterEntry](#) could reference exactly one [EthSwtAtsInstanceEntry](#). The configuration of an asynchronous traffic shapping support to shape Ethernet traffic according a so-called eligibility time .

[SWS_EthSwt_00493]

Status: DRAFT

Upstream requirements: [SRS_Eth_00114](#)

[If asynchronous traffic shaping is configured [EthSwtAtsInstanceEntry](#) and applied on an Ethernet frame, then a eligibility time shall be assigned to this Ethernet frame by updating its Ethernet frame meta information.]

[SWS_EthSwt_00494]

Status: DRAFT

Upstream requirements: [SRS_Eth_00114](#)

[A configured [EthSwtAtsInstanceEntry](#) shall perform the scheduling according to the following configuration: [EthSwtPortATSCommittedBurstSize](#) , [EthSwtPortATSCommittedInformationRate](#) and [EthSwtAtsGroupMaximumResidenceTime](#).]

Note: [EthSwtAtsGroupMaximumResidenceTime](#) is available by the referenced [EthSwtAtsGroupInstanceEntry](#) (referenced via [EthSwtPortAtsSchedulerGroupRef](#)) which is part of the [EthSwtAtsGroupInstanceTable](#).

An [EthSwtAtsGroupInstanceEntry](#) represents one so-called "ATS Scheduler Group". All ATS instances ([EthSwtAtsInstanceEntry](#)s) which belonging to the same ATS Scheduler Group (referencing the same [EthSwtAtsGroupInstanceEntry](#)) use the same [EthSwtAtsGroupMaximumResidenceTime](#). For an ATS Scheduler Group the eligibility assignment algorithm ensures, that Ethernet frames which have been received in a specific order will also be transmitted in that same order if they have been processed by any ATS instance belonging to that ATS scheduler group.

[SWS_EthSwt_00609]

Status: DRAFT

Upstream requirements: [SRS_Eth_00114](#)

[If multiple [EthSwtAtsInstanceEntry](#)s reference the same [EthSwtAtsGroupInstanceEntry](#) and Ethernet frames are processed by those [EthSwtAtsInstanceEntry](#), then the Ethernet switch eligibility assignment algorithm shall ensure, that processed Ethernet frames are transmitted in the same order as they have been arrived at the Ethernet switch]

7.1.7.2.8 Queueing frames

If an Ethernet frame pass all previous processing stages of the forwarding process, then the Ethernet frames enters the egress side of the Ethernet switch and a queueing of Ethernet frames is performed. As first step a so-called "priority to traffic class assignment" is executed, i.e. the Ethernet frame will be assigned to a traffic class based on the available priority. The used priority for the assignment is determined from the meta information of this Ethernet frame. As stated in [7.1.7.2.4.3 "Priority handling"](#), the regenerated priority value (see [EthSwtPortPriorityRegeneration](#)) is used if no IPV is present, otherwise the IPV value is used (added by a stream identification process (see [\(EthSwtStreamGateIPV\)](#)), which is present in the meta information of this Ethernet frame.

[SWS_EthSwt_00531] IPV as priority

Status: DRAFT

Upstream requirements: [SRS_Eth_00121](#)

[If an Ethernet switch has to perform a priority to traffic class assignment for an Ethernet frame and an IPV is available in the meta information of this Ethernet frame, then the Ethernet switch shall consider the IPV value as priority. Otherwise the Ethernet switch shall consider the regenerated priority value (see [EthSwtPortPriorityRegeneration](#)) as priority.]

The mapping of the priority to traffic class assignment need to be configured to assign a dedicated traffic class to an Ethernet frame based on the determined priority (see [\[SWS_EthSwt_00531\]](#)). The used internal priority values are configured per Ethernet switch and have a value range from 0 to [EthSwtUsedInternalPriorityUpperValue](#). Also the used traffic classes values are configured per Ethernet switch and have a value range from 0 to [EthSwtUsedTrafficClassUpperValue](#). The priority to traffic class mapping is configured per [EthSwtPortEgress](#). Each [EthSwtPortEgress](#) could have multiple [EthSwtPortPriorityToTrafficClassAssignments](#) configured. One [EthSwtPortPriorityToTrafficClassAssignment](#) represents exactly one priority to traffic class mapping, where [EthSwtPortPriorityToTrafficClassAssignmentPriority](#) represents the priority and [EthSwtPortPriorityToTrafficClassAssignmentTrafficClass](#) the traffic class.

For each possible priority (range from 0 to `EthSwtUsedTrafficClassUpperValue`) only one `EthSwtPortPriorityToTrafficClassAssignment` could exist at the same `EthSwtPortEgress`. All Ethernet frames which arrive at an egress port are assigned to a default traffic class, where the associated priority of this Ethernet frame is not considered by an `EthSwtPortPriorityToTrafficClassAssignment` at this egress port. Therefore, a mandatory `EthSwtPortDefaultTrafficClass` is configured per `EthSwtPortEgress` of an Ethernet switch.

[SWS_EthSwt_CONSTR_00532] Value of priority to traffic class assignment should respect configured limitations

Status: DRAFT

[The value of `EthSwtPortPriorityToTrafficClassAssignmentPriority` within an `EthSwtPortPriorityToTrafficClassAssignment` shall not exceed the configured value range from 0 to `EthSwtUsedInternalPriorityUpperValue` at the same Ethernet switch]

[SWS_EthSwt_CONSTR_00533] Value of traffic class assignment should respect configured limitations

Status: DRAFT

[The value of `EthSwtPortPriorityToTrafficClassAssignmentTrafficClass` within an `EthSwtPortPriorityToTrafficClassAssignment` shall not exceed the configured value range from 0 to `EthSwtUsedTrafficClassUpperValue` at the same Ethernet switch.]

[SWS_EthSwt_CONSTR_00534] Availability of a default traffic class per `EthSwtPortEgress`

Status: DRAFT

[Each `EthSwtPortEgress` shall have a `EthSwtPortDefaultTrafficClass` configured. The value of `EthSwtPortDefaultTrafficClass` shall not exceed `EthSwtUsedInternalPriorityUpperValue` configured at the corresponding `EthSwtConfig`.]

For example: An Ethernet switch has configured `EthSwtUsedInternalPriorityUpperValue` to 10 and `EthSwtUsedTrafficClassUpperValueEthSwtPortEgress` to 4. Port_B of this Ethernet switch has the following `EthSwtPortPriorityToTrafficClassAssignments` configured:

- `EthSwtPortPriorityToTrafficClassAssignment` one at port_B has priority 0 to traffic class 0 assigned.
- `EthSwtPortPriorityToTrafficClassAssignment` two at port_B has priority 1 to traffic class 1 assigned.

- `EthSwtPortPriorityToTrafficClassAssignment` three at port_B has priority 2 to traffic class 1 assigned.
- `EthSwtPortPriorityToTrafficClassAssignment` four at port_B has priority 3 to traffic class 1 assigned.
- `EthSwtPortPriorityToTrafficClassAssignment` five at port_B has priority 10 to traffic class 3 assigned.
- `EthSwtPortDefaultTrafficClass` is configured to traffic class 2.

This priority to traffic class assignments are interpreted as depicted in [Table 7.2](#).

Priority	Traffic Class
Prio 0	0
Prio 1-3	1
Prio 4-9	2 (default traffic class)
Prio 10	3

Table 7.2: This table shows the "Priorities" to "Traffic class" mapping according the configuration example

The previous example shows, that multiple priorities could be mapped to one traffic class. And further, only a subset of the possible priority range is configured. According the example, for Ethernet frames which are forwarded to port_B where the determined priority is in the range from 4 to 9 are assigned to the `EthSwtPortDefaultTrafficClass` 2, since no `EthSwtPortPriorityToTrafficClassAssignment` is available which cover priorities in the range from 4 to 9. Additionally, the possible traffic class 4 is not considered by the `EthSwtPortPriorityToTrafficClassAssignment`. This flexibility comes along with potential missconfiguration, therefore the communication network design has to ensure proper egress port configuration.

Most likely eight priorities are mapped to the eight traffic classes, since this would match to the eight VLAN-priorities of a VLAN-tag.

[Table 7.3](#) shows an example for priority to traffic class mapping with 8 priorities, which reflect the recommended configuration described in [7, IEEE Std 802.1Q-2022] (see chapter "8.6.6. Queueing frames" Table 8-5 "Recommended priority to traffic class mappings").

Priority	Traffic Class
Prio 7	7
Prio 6	6
Prio 5	5
Prio 4	4
Prio 3	3
Prio 2	2
Prio 1	0
Prio 0	1

Table 7.3: In this table, "Priorities" are mapped to a particular "Traffic class"

[SWS_EthSwt_00535] Determine traffic class for an Ethernet frame

Status: DRAFT

Upstream requirements: [SRS_Eth_00121](#)

[If an Ethernet switch has determined the priority (according to [\[SWS_EthSwt_00531\]](#)) of an Ethernet frame and an [EthSwtPortPriorityToTrafficClassAssignment](#) is available where the [EthSwtPortPriorityToTrafficClassAssignmentPriority](#) matches to the determined priority of this Ethernet frame, then the Ethernet switch shall consider the value of the [EthSwtPortPriorityToTrafficClassAssignmentTrafficClass](#) as assigned traffic class for this Ethernet frame. Otherwise the Ethernet frame shall be assigned to the configured [EthSwtPortDefaultTrafficClass](#).]

If an Ethernet frame has been successfully assigned to a traffic class, then the Ethernet switch will try to enqueue the Ethernet frame to a [EthSwtPortQueue](#) at each [EthSwtPortEgress](#), which is determined as destination Ethernet switch port. Each [EthSwtPortQueue](#) has one traffic class configured via [EthSwtPortQueueTrafficClassAssignment](#).

[SWS_EthSwt_CONSTR_00536] Traffic class to egress port queue assignment

Status: DRAFT

[For each traffic class configured via [EthSwtPortPriorityToTrafficClassAssignment](#) and [EthSwtPortDefaultTrafficClass](#) at an [EthSwtPortEgress](#), one [EthSwtPortQueue](#) shall be configured where the value of the [EthSwtPortQueueTrafficClassAssignment](#) is set the value of the corresponding [EthSwtPortPriorityToTrafficClassAssignmentTrafficClass](#) and [EthSwtPortDefaultTrafficClass](#), respectively.]

[SWS_EthSwt_00537] Enqueue Ethernet frames to the matching egress port queue

Status: DRAFT

Upstream requirements: [SRS_Eth_00121](#)

[If the assigned traffic class of an Ethernet frame match to the value of the [EthSwtPortQueueTrafficClassAssignment](#) at an [EthSwtPortQueue](#) of an [EthSwtPortEgress](#) where this Ethernet frame is considered to be forwarded and the [EthSwtPortQueue](#) has free space to enqueue this transmission request, then the Ethernet switch shall enqueue this Ethernet frame in the matching [EthSwtPortQueue](#). Otherwise the Ethernet frame shall be discarded.]

[SWS_EthSwt_00133]

Status: OBSOLETE

Upstream requirements: [SRS_Eth_00121](#)

[Replaced by [\[SWS_EthSwt_00531\]](#). The Ethernet switch configuration shall support to configure the linkage between the priority of an received Ethernet frame and

the according queue of an egress port via the traffic class assignment. Therefore the priority to traffic class assignment at an ingress port (exclusively either via `EthSwtPortTrafficClassAssignment` or `EthSwtPortPriorityTrafficClassAssignment`) and the traffic class to a queue assignment at the egress port (via `EthSwtPortQueueTrafficClassAssignment`) shall be configured.]

[SWS_EthSwt_00234]

Upstream requirements: [SRS_Eth_00121](#)

[The Parameter `EthSwtPortQueueMinimumLength` shall define the minimum length for one queue of an dedicated egress port.]

Note: The actual queue length can be longer. The decision on the queue length is most likely to be taken by the Ethernet switch hardware or fixed by the Ethernet switch design. The definition of the minimum queue length in the configuration is supposed to guarantee that some priorities have enough egress buffer.

The [Figure 7.10](#) shows the principle how a traffic class assignment and enqueueing of an Ethernet frame is handled in an Ethernet switch.

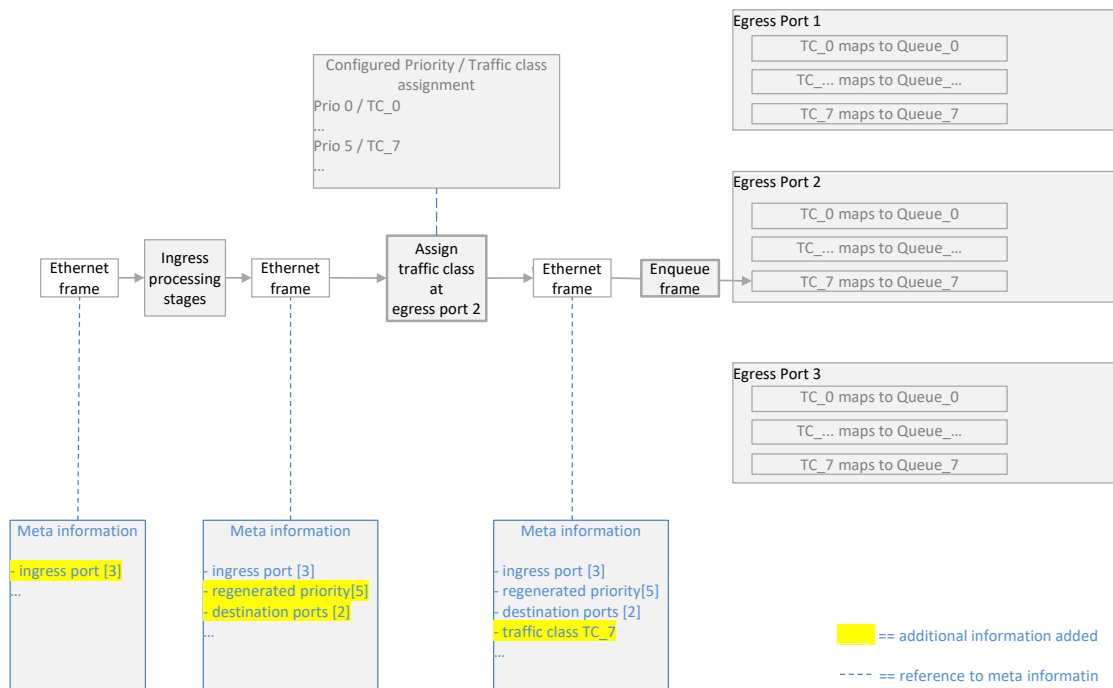


Figure 7.10: Example for an assignment to a traffic class and enqueueing of an Ethernet frame

7.1.7.2.9 Shapers and transmission selection

Ethernet frames are enqueued in egress queues according to their traffic class assignment. A Ethernet frame stay in the egress queue as long as the so-called `EthSwtPortEgressScheduler` select an Ethernet frame for transmission. Each egress queue (see `EthSwtPortQueue`) has to configure the algorithm to select the Ethernet frames for transmission. Therefore each egress queue has an mandatory sub container `EthSwtPortEgressQueueTransmissionSelection`. `EthSwtPortEgressQueueTransmissionSelection` defines the selection algorithm via `EthSwtPortEgressQueueTransmissionSelectionAlgorithm` (e.g. credit based shaper, asynchronous traffic shaper ... a.s.o.). Each `EthSwtPortQueue` is connected to an port scheduler. The port scheduler has to schedule all connected egress queues. Each port scheduler has an mandatory sub container `EthSwtPortEgressScheduler` which defines the scheduler algorithm via `EthSwtPortSchedulerAlgorithm` (e.g. strict priority). Multiple egress schedulers at the same egress port could be configured and connected in a cascaded manner. Thus, the output of an egress scheduler is used as an input for the sub sequential egress port scheduler. [Figure 7.11](#) shows examples for an egress port structure.

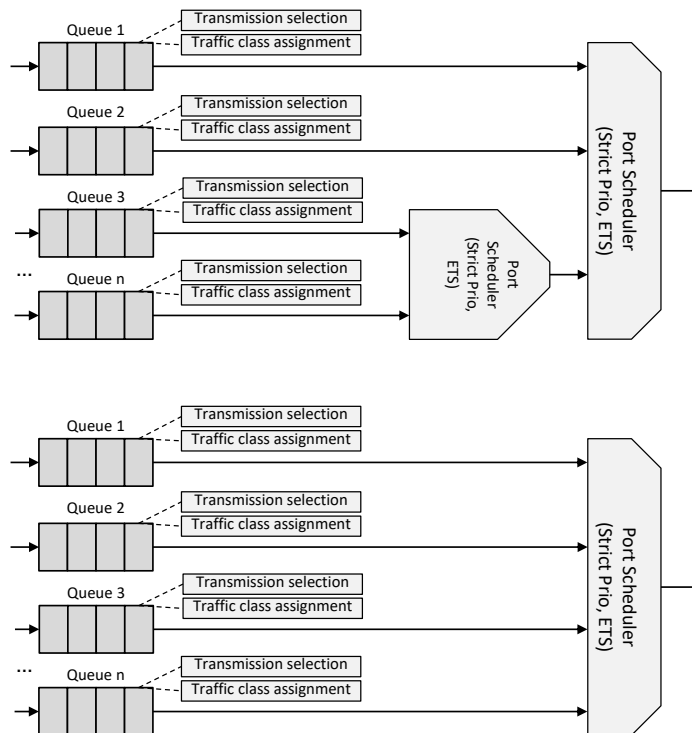


Figure 7.11: Examples for an egress port structure

The port scheduler algorithm schedule its input (either an egress queue or an egress port scheduler) by considering the according properties (e.g. traffic class assignment). Once the port scheduler algorithm has decided which of its input should be handled, the port scheduler select an Ethernet frame from the according egress queue based on the configured transmission selection algorithm:

- If the transmission selection algorithm is configured as credit based shaper, then the according egress queue is handled as FIFO. The egress queue has a budget of credits, which is increased in the idle phase and decreased for each transmission of Ethernet frame from this egress queue.
- If the transmission selection algorithm is configured as asynchronous traffic shaper, then the according egress queue is handled as queue. Each Ethernet frame of the queue has an assigned eligibility time. According to the eligibility time an Ethernet frame is selected from this egress queue. The Ethernet frames are not handled according to the arrival in this egress queue, but according to the assigned eligibility time which has been added at the ingress side
- If the transmission selection algorithm is configured as unshaped, then the according egress queue is handled as FIFO
- If the transmission selection algorithm is configured as enhanced traffic shaping, then the according egress queue is handled as queue

Note: The parameterization of the egress port influences the latency of Ethernet frames within the network.

The configuration of the egress port schedulers is done with the container `EthSwtPortEgressScheduler` and its sub-container `EthSwtPortEgressSchedulerPredecessor` with multiplicity 1 to *. Egress port scheduler connects its predecessors with the predecessor references `EthSwtPortEgressPredecessorRef`. An egress port scheduler could either have a further egress port scheduler or an egress port queue as predecessor.

Egress port queues are considered as neighboring egress port queues if they are referenced by the same `EthSwtPortEgressScheduler` via `EthSwtPortEgressPredecessorRef`. The composition of an egress port queue(s) and its directly connected `EthSwtPortEgressScheduler` form an Ethernet frame processing unit, where its output is used as input to the connected successor. The very last successor at an `EthSwtPortEgress` is always an `EthSwtPortEgressScheduler` referenced via `EthSwtPortEgressLastSchedulerRef`.

Please note, the configured egress port structure is a configuration model and does not reflect the hardware implementation at an egress port of an Ethernet switch.

[SWS_EthSwt_00132]

Status: OBSOLETE

Upstream requirements: [SRS_Eth_00121](#)

[Replaced by [\[SWS_EthSwt_00613\]](#). The configuration of the Ethernet switch driver shall support different egress port structures by the configuration `EthSwtPortEgressScheduler`.]

[SWS_EthSwt_CONSTR_00538] Definition of neighboring egress port queues

Status: DRAFT

[Egress port queues shall be considered as neighboring egress port queues if they are referenced by the same `EthSwtPortEgressScheduler` via `EthSwtPortEgressPredecessorRef`.]

[SWS_EthSwt_00613]

Status: DRAFT

Upstream requirements: `SRS_Eth_00121`, `SRS_Eth_00179`, `SRS_Eth_00180`

[If an Ethernet frame is added to an `EthSwtPortQueue`, then the Ethernet switch shall handle this Ethernet frame according the configured transmission selection algorithm (`EthSwtPortEgressQueueTransmissionSelection`) of this `EthSwtPortQueue` and with respect to the configured egress port structure (`EthSwtPortEgressScheduler`, `EthSwtPortEgressSchedulerPredecessor`) of the corresponding egress port (`EthSwtPortEgress`)]

7.1.7.2.9.1 Details on egress port scheduler

As mentioned before `EthSwtPortEgressScheduler` select Ethernet frames which are offered to be transmitted by the `EthSwtPortQueue` based on the configured `EthSwtPortEgressQueueTransmissionSelectionAlgorithm`. The `EthSwtPortEgressScheduler` examine each of its incoming predecessor `EthSwtPortQueue`, starting with the `EthSwtPortQueue` where the highest traffic class is assigned and proceed in descending order. This scheduling process highly depends on the configuration of the `EthSwtPortSchedulerAlgorithm`, the `EthSwtPortEgressQueueTransmissionSelectionAlgorithm` of each relevant egress port queue and the egress port structure.

The configuration supports the following `EthSwtPortSchedulerAlgorithms`:

- `ETHSWT_SCHEDULER_STRICT_PRIORITY`: The egress port scheduler always selects a relevant egress port queue with the highest assigned traffic class, that offers an emission opportunity to dequeue an Ethernet frame. After each dequeued Ethernet frame the scheduling algorithm checks for current available offers of an egress port queue with a higher assigned traffic class before proceeding. If no other egress port queue with a higher assigned traffic class offers an emission opportunity the scheduling algorithm proceeds by either dequeuing further Ethernet frames of the current processed egress port queue or by scheduling the next egress port queue in descending order.
- `ETHSWT_SCHEDULER_ENHANCED_TRAFFIC_SHAPER`: The egress port scheduler starts with the `EthSwtPortQueue` where the highest traffic class is assigned and proceed in descending order. If reaching the last relevant egress port queue, the scheduling algorithm continues with the egress port queue where the highest

traffic class is assigned. This round robin scheduling strictly keeps the order of the scheduled relevant egress port queues.

[SWS_EthSwT_00539] Scheduling with strict priority

Status: DRAFT

Upstream requirements: [SRS_Eth_00121](#), [SRS_Eth_00179](#), [SRS_Eth_00180](#)

[If an [EthSwTPortSchedulerAlgorithm](#) is configured with [ETHSWT_SCHEDULER_STRICT_PRIORITY](#), then the egress port scheduler shall always select a relevant egress port queue with the highest assigned traffic class, that offers an emission opportunity to dequeue an Ethernet frame.]

[SWS_EthSwT_00540] Scheduling with enhanced traffic shaping

Status: DRAFT

Upstream requirements: [SRS_Eth_00121](#), [SRS_Eth_00179](#), [SRS_Eth_00180](#)

[If an [EthSwTPortSchedulerAlgorithm](#) is configured with [ETHSWT_SCHEDULER_ENHANCED_TRAFFIC_SHAPER](#), then the egress port scheduler shall start with the egress port queue where the highest traffic class is assigned and proceed in descending order. If reaching the last relevant egress port queue, the scheduling algorithm shall continue with the egress port queue where the highest traffic class is assigned.]

The [EthSwTPortEgressQueueTransmissionSelectionAlgorithm](#) and the according configuration defines the amount of Ethernet frames which are dequeued, if the egress port scheduler select an relevant egress port queue.

[SWS_EthSwT_00541] Dequeueing Ethernet frames with strict priority scheduling

Status: DRAFT

Upstream requirements: [SRS_Eth_00121](#), [SRS_Eth_00179](#), [SRS_Eth_00180](#)

[If an [EthSwTPortSchedulerAlgorithm](#) is configured with [ETHSWT_SCHEDULER_STRICT_PRIORITY](#) and a relevant egress port queue is selected that offers an emission opportunity, then the egress port scheduler shall dequeue Ethernet frames from this egress port queue until either of the following conditions is valid:

- an egress port queue with a higher traffic class offers an emission opportunity
- the emission offer opportunity of this egress port queue is suspended
- no further Ethernet frames are available in this egress port queue

]

[SWS_EthSwt_00542] Emission opportunity suspension with strict priority scheduling

Status: DRAFT

Upstream requirements: SRS_Eth_00121, SRS_Eth_00179, SRS_Eth_00180

[If an `EthSwtPortSchedulerAlgorithm` is configured with `ETHSWT_SCHEDULER_STRICT_PRIORITY` and the connected egress port queue is dequeued by the `EthSwtPortEgressScheduler`, then a connected egress port queue shall suspend its emission opportunity in dependency to the configured `EthSwtPortEgressQueueTransmissionSelectionAlgorithm` according the following conditions:

- If set to `ETHSWT_TRANSMISSION_SELECTION_ALGORITHM_UNSHAPED`, then the emission opportunity is suspended if no Ethernet frame resides in the egress port queue
- If set to `ETHSWT_TRANSMISSION_SELECTION_ALGORITHM_CBS`, then the emission opportunity is suspended if the credit of this egress port queue is equal or lower than 0
- If set to `ETHSWT_TRANSMISSION_SELECTION_ALGORITHM_ATS`, then the emission opportunity is suspended if all Ethernet frames are dequeued which are eligible for transmission
- If set to `ETHSWT_TRANSMISSION_SELECTION_ALGORITHM_ETS`, then the emission opportunity is suspended under either the following conditions:
 - if the configured limit (either in weight or in percent of the available bandwidth see (`EthSwtPortEgressQueueTransmissionSelectionETSConfig`)) exceeds and at least one neighboring egress port queue configured to `ETHSWT_TRANSMISSION_SELECTION_ALGORITHM_ETS` resume its emission opportunity
 - no further Ethernet frames resides in this egress port queue

]

Please note: It is recommended to use `ETHSWT_TRANSMISSION_SELECTION_ALGORITHM_UNSHAPED` for egress port queues, where it is ensured by the network communication design, that the amount of network traffic is limited to a minium. Otherwise Ethernet frames in egress port queues assigned to lower traffic classes may be confronted with high delay in network traffic burst scenarios.

[SWS_EthSwt_00543] Emission opportunity suspension with enhanced traffic shaping

Status: DRAFT

Upstream requirements: SRS_Eth_00121, SRS_Eth_00179, SRS_Eth_00180

[If an `EthSwtPortSchedulerAlgorithm` is configured with `ETHSWT_SCHEDULER_ENHANCED_TRAFFIC_SHAPER` and the connected egress port queue is dequeued by the `EthSwtPortEgressScheduler`, then a connected egress port queue shall suspend its emission opportunity in dependency to the configured `EthSwtPortEgressQueueTransmissionSelectionAlgorithm` according the following conditions:

- If set to `ETHSWT_TRANSMISSION_SELECTION_ALGORITHM_ETS`, then the emission opportunity is suspended under either the following conditions:
 - if the configured limit (either in weight or in percent of the available bandwidth see (`EthSwtPortEgressQueueTransmissionSelectionETSConfig`)) exceeds and at least one neighboring egress port queue configured to `ETHSWT_TRANSMISSION_SELECTION_ALGORITHM_ETS` resume its emission opportunity
 - no further Ethernet frames resides in this egress port queue

]

An `EthSwtPortEgressScheduler` where the `EthSwtPortSchedulerAlgorithm` is configured to `ETHSWT_SCHEDULER_ENHANCED_TRAFFIC_SHAPER` could only handle egress port queues where the `EthSwtPortEgressQueueTransmissionSelectionAlgorithm` are configured to `ETHSWT_TRANSMISSION_SELECTION_ALGORITHM_ETS`. An egress port queue configured with `ETHSWT_SCHEDULER_ENHANCED_TRAFFIC_SHAPER` as its `EthSwtPortSchedulerAlgorithm` need to have at least one neighboring egress port queue with the same `EthSwtPortSchedulerAlgorithm`. An `EthSwtPortEgressScheduler` where the `EthSwtPortSchedulerAlgorithm` is configured to `ETHSWT_SCHEDULER_ENHANCED_TRAFFIC_SHAPER` shape the traffic of all direct connected egress port queues to get an fair bandwidth distribution in traffic contesgion scenarios where at least two egress port queues resume the emission opportunity.

[SWS_EthSwt_CONSTR_00544] Egress configuration constraint for scheduling with enhanced traffic shaping

Status: DRAFT

[A configuration where an `EthSwtPortEgressScheduler` has set the `EthSwtPortSchedulerAlgorithm` to `ETHSWT_SCHEDULER_ENHANCED_TRAFFIC_SHAPER` shall support to have egress port queues with `EthSwtPortEgressQueueTransmissionSelectionAlgorithm` set to `ETHSWT_TRANSMISSION_SELECTION_ALGORITHM_ETS`. All other `EthSwtPortEgressQueueTransmissionSelectionAlgorithms` are not supported in combination with `EthSwtPortEgressScheduler` set to `ETHSWT_SCHEDULER_ENHANCED_TRAFFIC_SHAPER`.]

[SWS_EthSwt_CONSTR_00545] Enhanced traffic shaping require at least two egress port queues

Status: DRAFT

[A configuration where an `EthSwtPortEgressScheduler` has set the `EthSwtPortSchedulerAlgorithm` to `ETHSWT_SCHEDULER_ENHANCED_TRAFFIC_SHAPER` shall have at least two egress port queues with `EthSwtPortEgressQueueTransmissionSelectionAlgorithm` set to `ETHSWT_TRANSMISSION_SELECTION_ALGORITHM_ETS` as direct connected predecessors.]

The combination of `EthSwtPortEgressScheduler` with `EthSwtPortSchedulerAlgorithm` set to `ETHSWT_SCHEDULER_ENHANCED_TRAFFIC_SHAPER` and egress port queues with `EthSwtPortEgressQueueTransmissionSelectionAlgorithm` set to `ETHSWT_TRANSMISSION_SELECTION_ALGORITHM_ETS` realize round-robin network traffic handling. The available bandwidth for transmission of enqueued Ethernet frames of the configured egress port queues, are configured per egress port queue via `EthSwtPortEgressQueueTransmissionSelectionETSConfig`. The configuration supports the following options:

- configuration of available bandwidth as weights of Ethernet frames via `EthSwtETSConfigAvailableBandwidthInWeightValue`
- configuration of available bandwidth in percent via `EthSwtETSConfigAvailableBandwidthInPercent`

Independent which configuration variant for `EthSwtPortEgressQueueTransmissionSelectionETSConfig` is used, all egress port queues that are scheduled by the same `EthSwtPortEgressScheduler` with `EthSwtPortEgressQueueTransmissionSelectionAlgorithm` set to `ETHSWT_TRANSMISSION_SELECTION_ALGORITHM_ETS` should use the same variant of `EthSwtPortEgressQueueTransmissionSelectionETSConfig`

[SWS_EthSwt_CONSTR_00546] Neighboring egress port queues need the same variant of availability bandwidth configuration

Status: DRAFT

[If an `EthSwtPortEgressScheduler` is configured with `EthSwtPortSchedulerAlgorithm` set to `ETHSWT_SCHEDULER_ENHANCED_TRAFFIC_SHAPER`, then all egress port queues which are configured for this `EthSwtPortEgressScheduler` shall exclusively use the same configuration of `EthSwtPortEgressQueueTransmissionSelectionETSConfig`:

- `EthSwtETSConfigAvailableBandwidthInWeightValue` XOR
- `EthSwtETSConfigAvailableBandwidthInPercent`

]

The configuration for the ETS traffic shaping allows the following variants:

- `EthSwtETSConfigAvailableBandwidthInWeightValue`: the available bandwidth is configured in weights, where the weights represents the amount of Ethernet frames
- `EthSwtETSConfigAvailableBandwidthInPercent`: the available bandwidth per egress port queue is configured in percent

Both configuration variants are based on congestion scenario where all neighboring egress port queues consume their bandwidth.

The configuration of the available bandwidth in weights as Ethernet frames need to be considered in relation to the emission of all neighboring egress port queues. The sum of all configured weights as Ethernet frames across all neighboring egress port queues reflect one emission portion of Ethernet frames. If an emission portion of Ethernet frames were processed by an `EthSwtPortEgressScheduler`, then the amount of configured weights as Ethernet frames per neighboring egress port queue should be enclosed in the emission portion of processed Ethernet frames. Or in other words, the configured available bandwidth in weights as Ethernet frames of each neighboring egress port queue should be processed, if an emission portion of Ethernet frames were processed by the `EthSwtPortEgressScheduler`.

The configuration of the available bandwidth in percent need to be considered in relation to a measurement interval. This interval defines the time slot which is used to calculate the expected emission of each egress port at the same `EthSwtPortEgressScheduler`.

Note: For both configuration variants count, the order of Ethernet frames, either within one emission portion or within the measurement interval, depends on the implemented scheduler algorithm (e.g. weighted round robin, deficit round robin) and is not defined / configurable by the `EthSwt` driver module.

[SWS_EthSwt_00547] Determination of egress port queue emission with available bandwidth configured in weights as amount of Ethernet frames

Status: DRAFT

Upstream requirements: [SRS_Eth_00121](#), [SRS_Eth_00179](#), [SRS_Eth_00180](#)

[If the available bandwidth of neighboring egress port queues configured with [EthSwtETSTConfigAvailableBandwidthInWeightValue](#) and all egress port queues consume their available bandwidth, then the expected emission of all neighboring egress port queues shall be determined with the following considerations:

The emission of one egress queue in Ethernet frames:

$$em_{queue\ n}[Ethernet\ frames] = weight_{queue\ n}[Ethernet\ frames] \quad (7.1)$$

em_{queue n}: emission of egress port queue n in unit of Ethernet frames

weight_{queue n}: [EthSwtETSTConfigAvailableBandwidthInWeightValue](#) configured for queue n in unit of Ethernet frames

One emission portion is equal to the configured emission of all neighboring egress port queues in Ethernet frames:

$$em_{neighboring\ queues}[Ethernet\ frames] = \sum_{n=1}^N em_{queue\ n}(n)[Ethernet\ frames] \quad (7.2)$$

N: count of neighboring egress port queues

em_{neighboring queues}: emission in unit of Ethernet frames of all neighboring egress port queues (one emission portion)

em_{queue n}: emission of egress port queue n in unit of Ethernet frames

]

[SWS_EthSwt_00548] Amount of Ethernet frames within one emission portion if available bandwidth is configured in weights as amount of Ethernet frames

Status: DRAFT

Upstream requirements: [SRS_Eth_00121](#), [SRS_Eth_00179](#), [SRS_Eth_00180](#)

[If an [EthSwtPortSchedulerAlgorithm](#) is configured with [ETHSWT_SCHEDULER_ENHANCED_TRAFFIC_SHAPER](#) and the [EthSwtPortEgressQueueTransmissionSelectionETSTConfig](#) is set to [EthSwtETSTConfigAvailableBandwidthInWeightValue](#) and all neighboring egress port queues offers an emission opportunity during the procession of one emission portion, then the emission portion shall enclose the amount of Ethernet frames of each neighboring egress port queue configured via [EthSwtETSTConfigAvailableBandwidthInWeightValue](#).]

[SWS_EthSwt_00549] Tolerance of egress port queue emission within the defined measurement interval if available bandwidth is configured in percent is used

Status: DRAFT

Upstream requirements: SRS_Eth_00121, SRS_Eth_00179, SRS_Eth_00180

[If an `EthSwtPortSchedulerAlgorithm` is configured with `ETHSWT_SCHEDULER_ENHANCED_TRAFFIC_SHAPER` and the `EthSwtPortEgressQueueTransmissionSelectionETSTConfig` of all neighboring egress port queues is set to `EthSwtETSTConfigAvailableBandwidthInPercent` and all neighboring egress port queues offers an emission opportunity during a defined measurement interval, then the emission of all egress port queues during this defined measurement interval shall reflect the configured bandwidth limitation of neighboring egress port queue in percent of the available bandwidth with a tolerance of 10 % (see [7, IEEE Std 802.1Q] chapter "ETS algorithm").]

The definition of a measurement interval need to consider the line rate (`EthSwtPortPhysicalLayerType`) of the according `EthSwtPort`. The `EthSwtPortPhysicalLayerType` defines the bit time. The measurement interval divided by bit time defines the amount of bits which is expected for the emission of all neighboring egress port queues.

[SWS_EthSwt_00550] Definition of bit time

Status: DRAFT

Upstream requirements: SRS_Eth_00121, SRS_Eth_00179, SRS_Eth_00180

[The time consumed to transmit a bit (bit time) shall be calculated according the following equation:

$$bit_{time}[\frac{s}{bit}] = \frac{1}{line_{rate}[\frac{Bit}{s}]} \quad (7.3)$$

line_{rate}[Bit/s]: `EthSwtPortPhysicalLayerType`]

[SWS_EthSwt_00551] Determination of egress port queue emission with available bandwidth configured in percent

Status: DRAFT

Upstream requirements: SRS_Eth_00121, SRS_Eth_00179, SRS_Eth_00180

[If the available bandwidth of neighboring egress port queues are configured with `EthSwtETSTConfigAvailableBandwidthInPercent` and all egress port queues consume their available bandwidth, then the emission per egress port queue within the defined measurement interval of the according `EthSwtPortEgressScheduler` shall be determined by the following calculations:

The emission of all neighboring egress port queues in bits:

$$em_{neighboring\ queues}(T) = \frac{T[s]}{bit_{time}[\frac{s}{bit}]} \quad (7.4)$$

T: measurement interval in seconds

em_{neighboring queues}: emission in bits of all neighboring egress port queues per defined measurement interval

The emission of one egress queue in bits:

$$em_{queue\ n}(T)[bit] = em_{neighboring\ queues}(T)[bit] * \frac{bw_{queue\ n}}{100} \quad (7.5)$$

em_{queue n}: emission of egress port queue *n* in bits during the defined measurement interval

bw_{queue n}: bandwidth of queue *n* in percent configured via `EthSwtETSTConfigAvailableBandwidthInPercent`]

Note: If the available bandwidth of neighboring egress port queues is configured with `EthSwtETSTConfigAvailableBandwidthInPercent`, then the total number of bits that are consumed on the medium by the transmission of the according Ethernet frames need to be considered for determining an emission, i.e. including all required framing bits like preamble, start frame delimiter (SFD), frame check sequence (FCS) and minimum inter-packet gap (IPG).

[SWS_EthSwt_CONSTR_00552] Constraint for configuration of available bandwidth in percent

Status: DRAFT

[If the available bandwidth of neighboring egress port queues configured with `EthSwtETSTConfigAvailableBandwidthInPercent`, then the sum of the configured available bandwidth of all neighboring egress port queues shall result in 100 %.]

The available bandwidth of the neighboring egress port queues need to be shared on runtime, if egress port queues have bandwidth left over and their emission opportunity was resumed. A round-robin traffic shaping configured with `EthSwtPortEgressScheduler` set the `EthSwtPortSchedulerAlgorithm` to `ETHSWT_SCHEDULER_ENHANCED_TRAFFIC_SHAPER` should always try to utilize the complete available bandwidth.

[SWS_EthSwt_00553] Utilization of all neighboring egress port queues with a resumed emission opportunity

Status: DRAFT

Upstream requirements: `SRS_Eth_00121`, `SRS_Eth_00179`, `SRS_Eth_00180`

[Neighboring egress port queues with `EthSwtPortEgressQueueTransmissionSelectionAlgorithm` set to `ETHSWT_TRANSMISSION_SELECTION_ALGORITHM_ETS` shall equally share remaining available bandwidth on runtime. The sum of utilized bandwidth of all neighboring egress port queues with a resumed emission opportunity should result

- in the amount of Ethernet frames covered by one emission portion if available bandwidth is configured in weights as amount of Ethernet frames
- in approximately 100 % if available bandwidth is configured in percent

]

The available bandwidth per neighboring egress port queues could deviate on runtime from the configured available bandwidth (either in weights or in percent of the available bandwidth see ([EthSwtPortEgressQueueTransmissionSelectionETSTConfig](#))). The configured bandwidth represent the expected utilized bandwidth if all neighboring egress port queues consume their configured bandwidth within the defined measurement interval, i.e. all neighboring egress port queues resume the emission opportunity.

7.1.7.2.10 Transmission on the network

An Ethernet frame which is selected by the very last [EthSwtPortEgressScheduler](#), will be transferred from the egress queue to the Ethernet network. As preparation for the transmission a so-called "Priority Code Point Encoding" and "VLAN forwarding" is performed. This is the last procession stage in the frame forwarding process. This processing stage ensure that all information of the Ethernet frame meta information are written in the Ethernet frame before the frame is forwarded to an PHY. The Ethernet frame meta information contain the latest state of the Ethernet frame from the path through the Ethernet switch. An Example for the content of an Ethernet frame meta information:

- [EthSwtPortPriorityRegenerationRegeneratedPriority](#): the Ethernet frame will be transmitted with this priority as VLAN-priority in the VLAN-tag
- [EthSwtVlanForwardingType](#) set to [ETHSWT_SENT_TAGGED](#): the Ethernet frame will be transmitted with a VLAN-tag

[SWS_EthSwt_00554] Use regenerated priority value as VLAN-priority

Status: DRAFT

Upstream requirements: [SRS_Eth_00121](#)

[If an Ethernet frame is selected to be transmitted on the Ethernet network, then the Ethernet switch shall use the regenerated priority value of its meta information as VLAN-priority, if this Ethernet frame is transmitted with a VLAN-tag.]

7.1.7.3 Switch Management support

Switch Management enables the possibility to control an Ethernet frame regarding a Switch-Port specific ingress and egress handling as well as providing a Switch-Port

specific timestamp. This functionality is essential for other BSW modules, in particular for EthTSyn, which requires Port specific information associated to a time synchronization or path-delay measurement frame.

For an introduction of the basic HW architecture and interaction, please refer to [4, SWS_EthernetDriver].

[SWS_EthSwT_00240]

Upstream requirements: [SRS_BSW_00171](#), [SRS_Eth_00125](#)

[The Switch driver shall offer Switch management APIs

- [EthSwT_EthRxProcessFrame](#)
- [EthSwT_EthRxFinishedIndication](#)
- [EthSwT_EthTxAdaptBufferLength](#)
- [EthSwT_EthTxPrepareFrame](#)
- [EthSwT_SetMgmtInfo](#)
- [EthSwT_EthTxProcessFrame](#) and
- [EthSwT_EthTxFinishedIndication](#)

if [EthSwTManagementSupportApi](#) is set to TRUE.]

Note: Switch management APIs support the EthIf to gather / modify Switch-Port specific communication attributes.

[SWS_EthSwT_00241]

Upstream requirements: [SRS_Eth_00125](#)

[The Switch Driver management APIs

- [EthSwT_EthRxProcessFrame](#)
- [EthSwT_EthRxFinishedIndication](#)
- [EthSwT_EthTxAdaptBufferLength](#)
- [EthSwT_EthTxPrepareFrame](#)
- [EthSwT_SetMgmtInfo](#)
- [EthSwT_EthTxProcessFrame](#) and
- [EthSwT_EthTxFinishedIndication](#)

shall support the Ethernet Driver to gather the Switch specific management information out of an Ethernet frame for reception or to prepare an Ethernet frame for management mode conformant frame transmission, e.g. the egress route of a frame.]

[SWS_EthSwt_00242]

Upstream requirements: [SRS_Eth_00125](#)

[The Switch Driver management APIs [EthSwt_EthTxProcessFrame](#) and [EthSwt_EthTxFinishedIndication](#) shall return immediately, if [EthSwt_SetMgmtInfo](#) has not been called before a call of [EthSwt_EthTxProcessFrame](#).]

7.1.7.4 Global Time support

For more details regarding time measurement with Switches, please refer to [16, [SWS_TimeSyncOverEthernet](#)].

[SWS_EthSwt_00243]

Upstream requirements: [SRS_BSW_00171](#), [SRS_Eth_00125](#)

[The Switch driver shall access the port specific hardware time stamps if [EthSwtPortTimeStampSupport](#) of the port is set to `TRUE`.]

[SWS_EthSwt_00378]

Upstream requirements: [SRS_Eth_00125](#)

[If [EthSwt_PortEnableTimeStamp](#) is called for a `PortIdx`, the switch driver shall enable the time-stamping for this port if [EthSwtPortTimeStampSupport](#) is set to `TRUE` for this port.]

7.1.7.5 Counter synchronization of Ethernet switches which are connected via uplink ports

Some Ethernet Switches provide the possibility to synchronize their internal clock. For Ethernet switches which are connected via uplink ports it is not necessary to measure the delay between the connected uplink ports, if the clock synchronization clock is activated ([EthSwtClockSynchronizationSupport](#) set to `TRUE`).

[SWS_EthSwt_00408] [The Switch driver shall enable clock synchronization with another Ethernet switch to which it is connected via uplink port, if [EthSwtClockSynchronizationSupport](#) is set to `TRUE`.]

[SWS_EthSwt_CONSTR_00409] [The port specific timestamping ([EthSwtPortTimeStampSupport](#)) can be set to `TRUE`, if clock synchronization for connected Ethernet switches is deactivated ([EthSwtClockSynchronizationSupport](#) set to `FALSE`).]

[SWS_EthSwt_CONSTR_00410] [The port specific timestamping (`EthSwtPortTimestampSupport`) can be set to `TRUE`, if `EthSwtClockSynchronizationSupport` is activated and `EthSwtPortRole` is not `ETHSWT_UP_LINK_PORT`. `EthSwtPorts` with `EthSwtPortRole` `ETHSWT_UP_LINK_PORT` are connected to another Ethernet switch and not considered for the time delay compensation, if `EthSwtClockSynchronizationSupport` is activated.]

7.1.7.6 Verification of Configuration

There are some situations where the Host controller needs to verify the Switch configuration.

[SWS_EthSwt_00292]

Upstream requirements: [SRS_Eth_00126](#)

[If the parameter `EthSwtVerifyConfigApi` is set to `TRUE` the function `EthSwt_VerifyConfig` shall be used to verify switch configuration.]

Implementation hint: As Switch configuration is highly HW-Architecture dependent the steps inside the function are implementation specific.

In some use cases, it is necessary to stop frame forwarding during the verification using the optional function `EthSwt_SetForwardingMode`

The function `EthSwt_VerifyConfig` could for example do the following steps:

- Stop frame forwarding by calling `EthSwt_SetForwardingMode` (`FALSE`).
- Verify the switch configuration
- In case the switch configuration is valid then frame forwarding shall be enabled by calling `EthSwt_SetForwardingMode` (`TRUE`) (if disabled in step 1).
- In case the switch configuration is not valid then the switch shall be reset and reconfigured.

Note: Please note that a reset of the Host Controller does not necessarily need a reset of the connected Switch HW. This needs to be evaluated individually very carefully as a reset raises the risk of uncontrolled communication during reset phase of the host controller.

Note: The Verification of the Switch Configuration as described above is just an example how and when this Verification may be done. It is very dependent on the used switch HW as well as the individual HW-Architecture and even Power supply and Reset strategy of the Switch of the ECU how the Configuration is verified or even how it can be verified. The only thing what this Module specifies is the interface to the upper layer to apply some verification on the switch configuration.

7.1.7.7 Testing and Diagnostic of Switch Ports

If configured, the Ethernet Switch Driver provides following interfaces to apply Testing and diagnostic functionalities

- `EthSwt_GetPortSignalQuality`
- `EthSwt_GetPortIdentifier`
- `EthSwt_GetSwitchIdentifier`
- `EthSwt_WritePortMirrorConfiguration`
- `EthSwt_ReadPortMirrorConfiguration`
- `EthSwt_GetPortMirrorState`
- `EthSwt_SetPortMirrorState`
- `EthSwt_SetPortTestMode`
- `EthSwt_SetPortLoopbackMode`
- `EthSwt_SetPortTxMode`
- `EthSwt_GetPortCableDiagnosticsResult`
- `EthSwt_GetCfgDataRaw`
- `EthSwt_GetCfgDataInfo`

The Availability of these functions is strongly depending on the possibilities of the used Transceiver-(Phy)-HW.

7.1.7.8 Low Power Mode Support

[SWS_EthSwt_00376]

Upstream requirements: [SRS_Eth_00183](#)

[If `EthSwtLowPowerModeSupport` is set to `TRUE` and at least one `EthSwtPort` of a Ethernet switch is enabled and the corresponding Ethernet switch HW is in an inactive or low power mode the Ethernet switch HW shall be set to an active mode in which forwarding of Ethernet frames is possible.]

[SWS_EthSwt_00377]

Upstream requirements: [SRS_Eth_00183](#)

[If `EthSwtLowPowerModeSupport` is set to `TRUE` and no `EthSwtPort` for a certain Ethernet switch is enabled, the corresponding Ethernet switch HW shall be set to an inactive or low power mode.]

7.2 Error Classifications

Section 7.2 "Error Handling" of the document [10, SWS_BSW General] describes the error handling of the Basic Software in detail. Above all, it constitutes a classification scheme consisting of five error types which may occur in BSW modules.

Based on this foundation, the following section specifies particular errors arranged in the respective subsections below

7.2.1 Development Errors

[SWS_EthSwt_00001] Definition of development errors in module EthSwt

Upstream requirements: [SRS_BSW_00385](#)

[

Type of error	Related error code	Error value
Invalid switch index	ETHSWT_E_INV_SWITCH_IDX	0x01
EthSwt module was not initialized	ETHSWT_E_UNINIT	0x02
Invalid pointer in parameter list	ETHSWT_E_PARAM_POINTER	0x03
Invalid API which is not available by another module	ETHSWT_E_INV_API	0x05
Invalid switch port index	ETHSWT_E_INV_SWITCHPORT_IDX	0x06
Invalid Controller Index	ETHSWT_E_INV_CTRL_IDX	0x07
Invalid input parameter	ETHSWT_E_INV_PARAM	0x08
Invalid configuration	ETHSWT_E_INIT_FAILED	0x09

]

[SWS_EthSwt_00009]

Upstream requirements: [SRS_BSW_00323](#), [SRS_BSW_00369](#)

[If development error detection is enabled, the function `EthSwt_Init` shall check the parameter `CfgPtr` for being valid. If the check fails, `EthSwt_Init` shall raise the development error `ETHSWT_E_INIT_FAILED`.]

Note: Please note that in case of variant pre-compile `NULL_PTR` is allowed.

[SWS_EthSwt_00164]

Upstream requirements: [SRS_BSW_00369](#), [SRS_BSW_00386](#), [SRS_Eth_00118](#)

[The switch driver shall check whether the lower layer driver, i.e. the `EthTrcv` provides the APIs which can be called by an upper layer module (`EthIf`) of the switch driver and will be forwarded to the lower layer. In case of missing APIs, the switch driver shall raise the development error `ETHSWT_E_INV_API` if APIs are missing in the lower layer module.]

Note: This check will be performed upon calling a certain API. For this check the input parameter `SwitchPortIdx` and a configuration table which needs to be derived from the configuration of the Ethernet transceiver drivers which are attached to the Ethernet switch driver are necessary. This functionality is necessary if development error tracing is activated. This check is necessary because an Ethernet switch driver API can be called by an upper layer module with the argument `SwitchPortIdx`. This value of this `SwitchPortIdx` can be in a valid range, but some Ethernet transceiver driver which are used by the switch driver support the API and some do not support this API. In order to resolve this conflict, this check has been implemented.

[SWS_EthSwt_00156]

Upstream requirements: [SRS_BSW_00413](#), [SRS_BSW_00323](#), [SRS_BSW_00369](#), [SRS_Eth_00118](#)

[The function `EthSwt_SetSwitchPortMode` shall check whether the `EthTrcv_SetTransceiverMode` API of the indexed transceiver driver is available by checking whether for this `SwitchPortIdx` the corresponding `EthTrcv` API is available. If this is not the case, the function shall raise the development error `ETHSWT_E_INV_API`.]

[SWS_EthSwt_00157]

Upstream requirements: [SRS_BSW_00413](#), [SRS_BSW_00323](#), [SRS_BSW_00369](#), [SRS_Eth_00118](#)

[The function `EthSwt_GetSwitchPortMode` shall check whether the `EthTrcv_GetTransceiverMode` API of the indexed transceiver driver is available by checking whether for this `SwitchPortIdx` the corresponding `EthTrcv` API is available. If this is not the case, the function shall raise the development error `ETHSWT_E_INV_API`.]

[SWS_EthSwt_00386]

Upstream requirements: [SRS_BSW_00350](#)

[If development error detection is activated by `EthSwtDevErrorDetect`, all functions except `EthSwt_Init` shall check that the service `EthSwt_Init` was previously called. If the check fails, the function shall raise the development error `ETHSWT_E_UNINIT`.]

[SWS_EthSwt_00387]

Upstream requirements: [SRS_BSW_00350](#)

[If development error detection is activated by `EthSwtDevErrorDetect`, all functions with input parameter `SwitchIdx` shall check the parameter for being valid. If the check fails, the functions shall raise the development error `ETHSWT_E_INV_SWITCH_IDX`.]

[SWS_EthSwt_00389]

Upstream requirements: [SRS_BSW_00350](#)

[If development error detection is enabled, all functions with input parameter `SwitchPortIdx` or `PortIdx` shall check the parameter for being valid. If the check fails, the functions shall raise the development error [ETHSWT_E_INV_SWITCH_IDX](#).]

[SWS_EthSwt_00390]

Upstream requirements: [SRS_BSW_00350](#)

[If development error detection is enabled, all functions with input parameter `CtrlIdx` shall check the parameter for being valid. If the check fails, the functions shall raise the development error [ETHSWT_E_INV_CTRL_IDX](#).]

[SWS_EthSwt_00391]

Upstream requirements: [SRS_BSW_00350](#)

[If development error detection is enabled, all functions with input parameter `BufIdx` shall check the parameter for being valid. If the check fails, the functions shall raise the development error [ETHSWT_E_INV_PARAM](#).]

[SWS_EthSwt_00392]

Upstream requirements: [SRS_BSW_00350](#)

[If development error detection is enabled, all functions with inout or output pointer parameter shall check the parameter for being valid. If the check fails, the functions shall raise the development error [ETHSWT_E_PARAM_POINTER](#).]

[SWS_EthSwt_00393]

Upstream requirements: [SRS_BSW_00350](#)

[If development error tracing is activated by `EthSwtDevErrorDetect`, the functions which call an Ethernet Transceiver API and do not obtain the functionality directly from the switch port interface shall check whether the API of the indexed transceiver driver is available. If this is not the case, the functions shall raise the development error [ETHSWT_E_INV_API](#).]

[SWS_EthSwt_00154]

Upstream requirements: [SRS_Eth_00118](#), [SRS_Eth_00119](#), [SRS_BSW_00413](#), [SRS_BSW_00323](#), [SRS_BSW_00369](#)

[If development error detection is activated by `EthSwtDevErrorDetect`, the function `EthSwt_GetLinkState` shall check whether the `EthTrcv_GetLinkState` API of the indexed transceiver driver is available by checking whether for this `SwitchPortIdx` the corresponding `EthTrcv` API is available. If this is not the case, the function shall raise the development error [ETHSWT_E_INV_API](#).]

7.2.2 Runtime Errors

[SWS_EthSwT_00434] Definiton of runtime errors in module EthSwT [

Type of error	Related error code	Error value
Initialization of ports is not finished	ETHSWT_INIT_NOT_COMPLETED	0x01

]

7.2.3 Transient Faults

There are no transient faults.

7.2.4 Production Errors

There are no production errors.

7.2.5 Extended Production Errors

[SWS_EthSwT_00113] ETHSWT_E_ACCESS

Upstream requirements: [SRS_BSW_00385](#)

[

Error Name:	ETHSWT_E_ACCESS	
Short Description:	Ethernet Switch Access Failure	
Long Description:	This production error shall be issued when the switch is not accessible.	
Recommended DTC:	N/A	
Detection Criteria:	Fail	When access to the Ethernet Switch fails the module shall report the extended production error with event status DEM_EVENT_STATUS_PREFAILED to DEM.
	Pass	When access to the Ethernet Switch succeeds the module shall report the extended production error with event status DEM_EVENT_STATUS_PREPASSED to DEM.
Secondary Parameters:	N/A	
Time Required:	N/A	
Monitor Frequency	N/A	
MIL illumination:	N/A	

]

[SWS_EthSwT_00395] ETHSWT_E_SYNCPOINT2PHY

Upstream requirements: [SRS_BSW_00385](#)

[

Error Name:	ETHSWT_E_SYNCPOINT2PHY	
Short Description:	Ethernet switch port and the referenced Ethernet transceiver are in contradicting modes.	
Long Description:	While getting the Ethernet switch port mode, the Ethernet switch driver detected an inconsistent state between Ethernet switch port and the referenced Ethernet transceiver Mode.	
Recommended DTC:	N/A	
Detection Criteria:	Fail	When getting the Ethernet switch port mode together with the Ethernet transceiver mode and the mode of the two referenced modules was found inconsistent the module shall report the extended production error with event status DEM_EVENT_STATUS_PREFAILED to DEM.
	Pass	When getting the Ethernet switch port mode together with the Ethernet transceiver mode and the mode of the two referenced modules was found consistent the module shall report the extended production error with event status DEM_EVENT_STATUS_PREPASSED to DEM.
Secondary Parameters:	N/A	
Time Required:	N/A	
Monitor Frequency	N/A	
MIL illumination:	N/A	

]

8 API specification

8.1 Imported types

This chapter lists all types included from the following files:

[SWS_EthSwt_00002] Definition of imported datatypes of module EthSwt [

<i>Module</i>	<i>Header File</i>	<i>Imported Type</i>
Comtype	ComStackTypes.h	TimeStampType (draft)
Dem	Rte_Dem_Type.h	Dem_EventIdType
	Rte_Dem_Type.h	Dem_EventStatusType
Eth	Eth_GeneralTypes.h	Eth_BuflDxType
	Eth_GeneralTypes.h	Eth_CounterType
	Eth_GeneralTypes.h	Eth_DataType
	Eth_GeneralTypes.h	Eth_MacVlanType
	Eth_GeneralTypes.h	Eth_ModeType
	Eth_GeneralTypes.h	Eth_RxStatsType
	Eth_GeneralTypes.h	Eth_StreamStatisticCounterType
	Eth_GeneralTypes.h	Eth_TxErrorCounterValuesType
	Eth_GeneralTypes.h	Eth_TxStatsType
EthTrcv	Eth_GeneralTypes.h	EthTrcv_BaudRateType
	Eth_GeneralTypes.h	EthTrcv_CableDiagResultType
	Eth_GeneralTypes.h	EthTrcv_DuplexModeType
	Eth_GeneralTypes.h	EthTrcv_LinkStateType
	Eth_GeneralTypes.h	EthTrcv_PhyLoopbackModeType
	Eth_GeneralTypes.h	EthTrcv_PhyTestModeType
	Eth_GeneralTypes.h	EthTrcv_PhyTxModeType
	Eth_GeneralTypes.h	EthTrcv_WakeupReasonType
Mka	Mka.h	Mka_ConfidentialityOffsetType (draft)
	Mka.h	Mka_MacSecConfigType (draft)
	Mka.h	Mka_SakKeyPtrType (draft)
	Mka.h	Mka_Stats_Rx_ScType (draft)
	Mka.h	Mka_Stats_Rx_SecYType (draft)
	Mka.h	Mka_Stats_SecYType (draft)
	Mka.h	Mka_Stats_Tx_ScType (draft)
	Mka.h	Mka_Stats_Tx_SecYType (draft)
	Mka.h	Mka_ValidateFramesType (draft)
NvM	Rte_NvM_Type.h	NvM_BlockIdType
	Rte_NvM_Type.h	NvM_BlockRequestType
	Rte_NvM_Type.h	NvM_RequestResultType
Spi	Spi.h	Spi_AsyncModeType
	Spi.h	Spi_ChannelType
	Spi.h	Spi_DataBufferType





Module	Header File	Imported Type
	Spi.h	Spi_NumberOfDataType
	Spi.h	Spi_SequenceType
Std	Std_Types.h	Std_ReturnType
	Std_Types.h	Std_VersionInfoType

]

8.2 Type definitions

8.2.1 EthSwt_StateType

[SWS_EthSwt_00123] Definition of datatype EthSwt_StateType

Upstream requirements: [SRS_BSW_00406](#)

[

Name	EthSwt_StateType		
Kind	Enumeration		
Range	ETHSWT_STATE_UNINIT	0x00	Switch is not yet configured
	ETHSWT_STATE_INIT	0x01	Switch driver is initialized
	ETHSWT_STATE_PORTINIT_COMPLETED	0x02	Port initialization is completed
	ETHSWT_STATE_ACTIVE	0x03	Switch is active
Description	Status supervision used for Development Error Detection. The state shall be available for debugging.		
Available via	Eth_GeneralTypes.h		

]

8.2.2 EthSwt_ConfigType

[SWS_EthSwt_00165] Definition of datatype EthSwt_ConfigType

Upstream requirements: [SRS_BSW_00395](#)

[

Name	EthSwt_ConfigType
Kind	Structure
Elements	implementation specific





	Type	–
	Comment	–
Description	Implementation specific structure of the post build configuration.	
Available via	EthSwt.h	

]

8.2.3 EthSwt_MacLearningType

[SWS_EthSwt_00227] Definition of datatype EthSwt_MacLearningType

Upstream requirements: [SRS_Eth_00087](#)

[

Name	EthSwt_MacLearningType		
Kind	Enumeration		
Range	ETHSWT_MACLEARNING_HWDISABLED	–	If hardware learning disabled, the switch must not learn new MAC addresses
	ETHSWT_MACLEARNING_HWENABLED	–	If hardware learning enabled, the switch learns new MAC addresses
	ETHSWT_MACLEARNING_SWENABLED	–	If software learning enabled, the hardware learning is disabled and the switch forwards packets with an unknown source address to a host CPU
Description	The interpretation of this value		
Available via	Eth_GeneralTypes.h		

]

8.2.4 EthSwt_MgmtInfoType

[SWS_EthSwt_91002] Definition of datatype EthSwt_MgmtInfoType

Upstream requirements: [SRS_Eth_00125](#)

[

Name	EthSwt_MgmtInfoType	
Kind	Structure	
Elements	SwitchIdx	
	Type	uint8
	Comment	Switch index





	SwitchPortIdx	
	Type	uint8
	Comment	Port index of the switch
Description	Type for holding the management information received/transmitted on Switches (ports).	
Available via	Eth_GeneralTypes.h	

]

8.2.5 EthSwt_PortMirrorCfgType

[SWS_EthSwt_91017] Definition of datatype EthSwt_PortMirrorCfgType

Upstream requirements: [SRS_Eth_00123](#)

[

Name	EthSwt_PortMirrorCfgType	
Kind	Structure	
Elements	srcMacAddrFilter	
	Type	Array of uint8
	Size	6
	Comment	Specifies the source MAC address [0..255,0..255,0..255,0..255,0..255,0..255] that should be mirrored. If set to 0,0,0,0,0,0, no source MAC address filtering shall take place.
	dstMacAddrFilter	
	Type	Array of uint8
	Size	6
	Comment	Specifies the destination MAC address [0..255,0..255,0..255,0..255,0..255,0..255] that should be mirrored. If set to 0,0,0,0,0,0, no destination MAC address filtering shall take place.
	VlanIdFilter	
	Type	uint16
	Comment	Specifies the VLAN address 0..4094 that should be mirrored. If set to 65535, no VLAN filtering shall take place.
	MirroringPacketDivider	
	Type	uint8
	Comment	Divider if only a subset of received frames should be mirrored. E.g. MirroringPacketDivider = 2 means every second frames is mirrored
	MirroringMode	
	Type	uint8
Comment	specifies the mode how the mirrored traffic should be tagged : 0x00 == No VLAN retagging; 0x01 == VLAN retagging; 0x02 == VLAN Double tagging	
TrafficDirectionIngressBitMask		
Type	uint32	





	Comment	Specifies the bit mask of Ethernet switch ingress port traffic direction to be mirrored. The bit mask is calculated depending of the values of EthSwPortIdx. (e.g. set EthSwPortIdx == 2 => TrafficDirectionIngressBitMask = 0b0000 0000 0000 0000 0000 0000 0100). 0b0 == enable ingress port mirroring 0b1 == disable ingress port mirroring Example: TrafficDirectionIngressBitMask = 0b0000 0000 0000 0000 0000 0000 0100 => Ingress traffic mirroring is enabled of Ethernet switch port with EthSwPortIdx=2
	TrafficDirectionEgressBitMask	
	Type	uint32
	Comment	Specifies the bit mask of Ethernet switch egress port traffic direction to be mirrored. The bit mask is calculated depending of the values of EthSwPortIdx. (e.g. set EthSwPortIdx == 2 => TrafficDirectionEgressBitMask = 0b0000 0000 0000 0000 0000 0000 0100). 0b0 == enable egress port mirroring 0b1 == disable egress port mirroring Example: TrafficDirectionEgressBitMask = 0b0000 0000 0000 0000 0000 0000 0001 => Egress traffic mirroring is enabled of Ethernet switch port with EthSwPortIdx=0
	CapturePortIdx	
	Type	uint8
	Comment	Specifies the Ethernet switch port which capture the mirrored traffic
	ReTaggingVlanId	
	Type	uint16
	Comment	Specifies the VLAN address 0..4094 which shall be used for re-tagging if MirroringMode is set to 0x01 (VLAN re-tagging). If the value is set to 65535, the value shall be ignored, because the VLAN address for re-tagging is provided by the Ethernet switch configuration
	DoubleTaggingVlanId	
	Type	uint16
	Comment	Specifies the VLAN address 0..4094 which shall be used for double-tagging if MirroringMode is set to 0x02 (VLAN double tagging). If the value is set to 65535, the value shall be ignored, because the VLAN address for double tagging is provided by the Ethernet switch configuration
Description	The EthSwPortMirrorCfgType specify the port mirror configuration which is set up per Ethernet switch. The configuration is written to the Ethernet switch driver by calling EthSwPortMirrorConfiguration. One port mirror configuration is maintained per Ethernet Switch.	
Available via	Eth_GeneralTypes.h	

]

8.2.6 EthSwt_PortMirrorStateType

[SWS_EthSwt_91020] Definition of datatype EthSwt_PortMirrorStateType

Upstream requirements: [SRS_Eth_00123](#)

[

Name	EthSwt_PortMirrorStateType		
Kind	Enumeration		
Range	PORT_MIRRORING_DISABLED	0x00	port mirroring disabled
	PORT_MIRRORING_ENABLED	0x01	port mirroring enabled
Description	Type to request or obtain the port mirroring state (enable/disable) for a particular port mirror configuration per Ethernet switch.		
Available via	Eth_GeneralTypes.h		

]

8.2.7 EthSwt_ReturnType

[SWS_EthSwt_91033] Definition of Std_ReturnType-extension for module EthSwt

[

Range	ETHSWT_PORT_MIRRORING_CONFIGURATION_NOT_SUPPORTED	0x02	port mirroring configuration is not supported by Ethernet switch driver or by the Ethernet switch hardware
Description	Overlaid return value of Std_ReturnType for Ethernet switch driver API EthSwt_WritePortMirror Configuration, if the port mirroring configuration is not supported by Ethernet switch driver or by the Ethernet switch hardware (e.g. the configured mirrored traffic direction (see SWS_EthSwt_91017 "TrafficDirectionIngressBitMask" and "TrafficDirectionEgressBitMask") for ingress and egress traffic of the same port is not supported, or the addressed Ethernet switch ports within the port mirror configuration are not accessible by the Ethernet switch driver)		
Available via	Eth_GeneralTypes.h		

]

8.2.8 EthSwt_MgmtOwner

[SWS_EthSwt_91035] Definition of datatype EthSwt_MgmtOwner [

Name	EthSwt_MgmtOwner		
Kind	Enumeration		
Range	ETHSWT_MGMT_OBJ_UNUSED	0x00	Object unused
	ETHSWT_MGMT_OBJ_OWNED_BY_ETHSWT	0x01	Object used and EthSwt collects needed data
	ETHSWT_MGMT_OBJ_OWNED_BY_UPPER_LAYER	0x02	Object used and the upper layer does calculations
Description	Holds information if upper layer or EthSwt is owner of mgmt_obj.		
Available via	Eth_GeneralTypes.h		

]

8.2.9 EthSwt_Mgmt_ObjectType

[SWS_EthSwt_91037] Definition of datatype EthSwt_MgmtObjectType [

Name	EthSwt_MgmtObjectType		
Kind	Structure		
Elements	Validation		
	Type	EthSwt_MgmtObjectValidType	
	Comment	The validation information for the mgmt_obj.	
	IngressTimestamp		
	Type	TimeStampType	
	Comment	The ingress timestamp value out of the switch.	
	EgressTimestamp		
	Type	TimeStampType	
	Comment	The egress timestamp value out of the switch.	
	MgmtInfo		
	Type	EthSwt_MgmtInfoType	
	Comment	Received/Transmitted Management information of the switches.	
	Ownership		
Type	EthSwt_MgmtOwner		
Comment	The ownership of MgmtObj.		
Description	Provides information about all struct member elements. The ownership gives information whether EthSwt has finished its activities in providing all struct member elements.		
Available via	Eth_GeneralTypes.h		

]

[SWS_EthSwt_00433] [A MgmtObject is just allowed to be owned between EthSwt and only one <UPPER_LAYER>. The structure element can be identified unambiguously using the DataPtr in Rx- and BufIdx in Tx-context, because both elements are definitively unique within the RxIndication() / TxConfirmation() context.]

8.2.10 EthSwt_MgmtObjectValidType

[SWS_EthSwt_91036] Definition of datatype EthSwt_MgmtObjectValidType [

Name	EthSwt_MgmtObjectValidType	
Kind	Structure	
Elements	IngressTimestampValid	
	Type	Std_ReturnType
	Comment	IngressTimestampValid shall be set to E_NOT_OK if ingress timestamp is not available
	EgressTimestampValid	
	Type	Std_ReturnType
	Comment	EgressTimestampValid shall be set to E_NOT_OK if ingress timestamp is not available.
	MgmtInfoValid	
	Type	Std_ReturnType
	Comment	MgmtInfoValid shall be set to E_NOT_OK if ingress timestamp is not available(e.g. timeout).
Description	Will be set from EthSwt and marks EthSwt_MgmtObject as valid or not. So the upper layer will be able to detect inconsistencies.	
Available via	Eth_GeneralTypes.h	

]

8.3 Function definitions

This is a list of functions provided for upper layer modules.

8.3.1 EthSwt_Init

[SWS_EthSwt_00006] Definition of API function EthSwt_Init

Upstream requirements: [SRS_BSW_00101](#)

[

Service Name	EthSwt_Init	
Syntax	<pre>void EthSwt_Init (const EthSwt_ConfigType* CfgPtr)</pre>	
Service ID [hex]	0x01	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	CfgPtr	Points to the implementation specific structure
Parameters (inout)	None	
Parameters (out)	None	
Return value	None	
Description	Initializes the Ethernet Switch Driver	
Available via	EthSwt.h	

]

[SWS_EthSwt_00007]

Upstream requirements: [SRS_BSW_00101](#)

[The function `EthSwt_Init` shall store the access to the configuration structure for subsequent API calls.]

[SWS_EthSwt_00008]

Upstream requirements: [SRS_BSW_00101](#)

[The function `EthSwt_Init` shall change the state of all switches controlled by this Switch Driver from `ETHSWT_STATE_UNINIT` to `ETHSWT_STATE_INIT`.]

[SWS_EthSwt_00421]

Upstream requirements: [SRS_Eth_00123](#)

[The EthSwt shall check for enabled port mirror configuration. The enabled port mirror configuration shall be activated by reconfiguring the Ethernet switch hardware according to the port mirror configuration, before frame forwarding is being enabled.]

[SWS_EthSwt_00422]

Upstream requirements: [SRS_Eth_00123](#)

[If the PortMirrorState is set to 0x01 (port mirroring enabled), then the stored port mirror configuration for the given Ethernet switch shall be written to hardware registers of the given Ethernet switch and enable port mirroring.]

[SWS_EthSwT_00423] [If the PortMirrorState is set to 0x00 (port mirroring disabled) the corresponding hardware registers of the given Ethernet switch shall be reset (to the HW's default values) and the port mirroring shall be disabled.]

[SWS_EthSwT_00011]

Upstream requirements: [SRS_BSW_00101](#)

[After initialization of the Ethernet switch within the [EthSwT_BackgroundTask](#), the Ethernet switch shall enter an inactive or low power mode if [EthSwTLowPowerModeSupport](#) is set to TRUE. If [EthSwTLowPowerModeSupport](#) is not defined or set to FALSE the Ethernet switch shall enter an active state.]

Note: The execution of this function may take a long time (e.g. port structure, VLAN configuration, internal Ethernet switch engine ... a.s.o.) and therefore cannot be called by EcuM or BswM. Instead it should be called e.g. by a background task (see [EthSwT_BackgroundTask](#)).

[SWS_EthSwT_00374] [All Ethernet switch HW ports which are not configured as a EthSwTPort shall be switched off during initialization. This Ethernet switch HW ports shall never be switched on during runtime]

[SWS_EthSwT_00375] [All EthSwTPorts shall be set to ETH_MODE_DOWN during initialization.]

[SWS_EthSwT_00016]

Upstream requirements: [SRS_BSW_00386](#)

[The function [EthSwT_Init](#) shall check the access to the Ethernet Switch hardware, i.e. by trying to read or write registers during the configuration of the switch. If the access to the registers fails, the function shall raise the extended production error [ETHSWT_E_ACCESS](#) and return E_NOT_OK.]

Note: Access to the Ethernet Switch hardware is device dependent, e.g. access through the Ethernet Controller Mii, access through SPI, ... etc.

8.3.2 EthSwt_SetSwitchPortMode

[SWS_EthSwt_00018] Definition of API function EthSwt_SetSwitchPortMode

Upstream requirements: [SRS_Eth_00118](#)

[

Service Name	EthSwt_SetSwitchPortMode	
Syntax	<pre>Std_ReturnType EthSwt_SetSwitchPortMode (uint8 SwitchIdx, uint8 SwitchPortIdx, Eth_ModeType PortMode)</pre>	
Service ID [hex]	0x03	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	SwitchIdx	Index of the switch within the context of the Ethernet Switch Driver
	SwitchPortIdx	Index of the port at the addressed switch
	PortMode	ETH_MODE_DOWN: Disable the addressed Ethernet switch port at the given Ethernet switch ETH_MODE_ACTIVE: Enable the addressed Ethernet switch port at the given Ethernet switch ETH_MODE_ACTIVE_WITH_WAKEUP_REQUEST: Enable the addressed Ethernet switch port at the given Ethernet switch and request to trigger a wake-up on the network. (This could be used e.g. for Ethernet hardware which is compatible with the OA TC10)
Parameters (inout)	None	
Parameters (out)	None	
Return value	Std_ReturnType	E_OK: success E_NOT_OK: The indexed switch port could not be set to Port Mode, or the function is called in state ETHSWT_STATE_UNINIT or ETHSWT_STATE_INIT.
Description	Enables/disables the indexed switch port	
Available via	EthSwt.h	

]

[SWS_EthSwt_00019]

Upstream requirements: [SRS_Eth_00118](#)

[The function [EthSwt_SetSwitchPortMode](#) shall put the indexed port of the switch into the specified mode. If EthSwtPort references an EthTrcv then the function [EthTrcv_SetTransceiverMode](#) of the Ethernet Transceiver Driver shall additionally be called with the corresponding transceiver mode.]

[SWS_EthSwt_00396] [When calling the function [EthSwt_SetSwitchPortMode](#) with mode ETH_MODE_DOWN, the EthSwt shall disable the Ethernet switch port directly for reduction of power consumption, if it is possible.]

[SWS_EthSwt_00397] [When calling the function [EthSwt_SetSwitchPortMode](#), the function shall check the access to the Ethernet switch driver. If the check fails,

the function shall raise the extended production error `ETHSWT_E_ACCESS` and return `E_NOT_OK`, otherwise pass the extended production error `ETHSWT_E_ACCESS` and return `E_OK`.]

[SWS_EthSwt_00398]

Upstream requirements: [SRS_Eth_00118](#)

[If `EthSwtPort` does not references an `EthTrcv`, `EthSwt` shall indicate a mode of the port by the API `EthIf_SwitchPortModeIndication` latest during the next `EthSwt_MainFunction`.]

[SWS_EthSwt_00022]

Upstream requirements: [SRS_BSW_00171](#)

[The function `EthSwt_SetSwitchPortMode` shall be pre compile time configurable On/Off by the configuration parameter: `EthSwtSetSwitchPortModeApi`.]

[SWS_EthSwt_00023]

Upstream requirements: [SRS_Eth_00118](#)

[If the switch is already in the requested mode `E_OK` shall be returned and no development error shall be raised.]

8.3.3 EthSwt_GetSwitchPortMode

[SWS_EthSwt_00025] Definition of API function EthSwt_GetSwitchPortMode

Upstream requirements: [SRS_Eth_00118](#)

[

Service Name	EthSwt_GetSwitchPortMode	
Syntax	<pre>Std_ReturnType EthSwt_GetSwitchPortMode (uint8 SwitchIdx, uint8 SwitchPortIdx, Eth_ModeType* SwitchModePtr)</pre>	
Service ID [hex]	0x04	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	SwitchIdx	Index of the switch within the context of the Ethernet Switch Driver
	SwitchPortIdx	Index of the port at the addressed switch
Parameters (inout)	None	
Parameters (out)	SwitchModePtr	ETH_MODE_DOWN: The Ethernet switch port of the given Ethernet switch is disabled ETH_MODE_ACTIVE: The Ethernet switch port of the given Ethernet switch is enabled



△

Return value	Std_ReturnType	E_OK: success E_NOT_OK: The mode of the indexed switch port could not be obtained, or the function is called in state ETHSWT_STATE_UNINIT or ETHSWT_STATE_INIT.
Description	Obtains the mode of the indexed switch port	
Available via	EthSwt.h	

]

[SWS_EthSwt_00026]

Upstream requirements: [SRS_Eth_00118](#)

[The function [EthSwt_GetSwitchPortMode](#) shall read the mode of the indexed port of the switch. If [EthSwtPort](#) references an [EthTrcv](#) then the function shall additionally call the corresponding function [EthTrcv_GetTransceiverMode](#) of the Ethernet Transceiver Driver.]

[SWS_EthSwt_00439] [The function shall report the active mode always as `ETH_MODE_ACTIVE`, even though the previous requested (via [EthSwt_SetSwitchPortMode](#)) mode was `ETH_MODE_ACTIVE_WITH_WAKEUP_REQUEST`.]

[SWS_EthSwt_00399] [If the obtained modes of the [EthSwtPort](#) and the [EthTrcv](#) are not aligned, the function [EthSwt_GetSwitchPortMode](#) shall raise the extended production error `ETHSWT_E_SYNCPORT2PHY` and return `E_NOT_OK`.

If [EthTrcv_GetTransceiverMode](#) returns `E_NOT_OK`, the [EthSwt_GetSwitchPortMode](#) shall also return `E_NOT_OK` without raising an error.]

[SWS_EthSwt_00400] [If the function [EthSwt_GetSwitchPortMode](#) is called, the function shall check the access to the Ethernet Switch Driver. If the check fails, the function shall raise the extended production error `ETHSWT_E_ACCESS` and return `E_NOT_OK`, otherwise pass the production error `ETHSWT_E_ACCESS` and return `E_OK`.]

[SWS_EthSwt_00029]

Upstream requirements: [SRS_BSW_00171](#)

[The function [EthSwt_GetSwitchPortMode](#) shall be pre compile time configurable On/Off by the configuration parameter: [EthSwtGetSwitchPortModeApi](#).]

8.3.4 EthSwT_StartSwitchPortAutoNegotiation

[SWS_EthSwT_00031] Definition of API function EthSwT_StartSwitchPortAutoNegotiation

Upstream requirements: [SRS_Eth_00087](#)

[

Service Name	EthSwT_StartSwitchPortAutoNegotiation	
Syntax	Std_ReturnType EthSwT_StartSwitchPortAutoNegotiation (uint8 SwitchIdx, uint8 SwitchPortIdx)	
Service ID [hex]	0x05	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	SwitchIdx	Index of the switch within the context of the Ethernet Switch Driver
	SwitchPortIdx	Index of the port at the addressed switch
Parameters (inout)	None	
Parameters (out)	None	
Return value	Std_ReturnType	E_OK: success E_NOT_OK: Automatic negotiation could not be started for the indexed switch port, or the function is called in state ETHSWT_STATE_UNINIT or ETHSWT_STATE_INIT.
Description	Starts the auto-negotiation of the indexed switch port	
Available via	EthSwT.h	

]

[SWS_EthSwT_00032]

Upstream requirements: [SRS_Eth_00087](#)

[The function [EthSwT_StartSwitchPortAutoNegotiation](#) shall restart the automatic negotiation of the used transmission parameters of the referenced Ethernet transceiver driver by calling the function [EthTrcv_StartAutoNegotiation](#).]

[SWS_EthSwT_00035]

Upstream requirements: [SRS_BSW_00171](#)

[The function [EthSwT_StartSwitchPortAutoNegotiation](#) shall be pre compile time configurable On/Off by the configuration parameter: [EthSwTStartSwitchPortAutoNegotiationApi](#).]

8.3.5 EthSwt_CheckWakeup

[SWS_EthSwt_91003] Definition of API function EthSwt_CheckWakeup

Upstream requirements: [SRS_Eth_00118](#)

[

Service Name	EthSwt_CheckWakeup	
Syntax	Std_ReturnType EthSwt_CheckWakeup (uint8 SwitchIdx)	
Service ID [hex]	0x4c	
Sync/Async	Synchronous	
Reentrancy	Reentrant	
Parameters (in)	SwitchIdx	Index of the switch within the context of the Ethernet Switch Driver
Parameters (inout)	None	
Parameters (out)	None	
Return value	Std_ReturnType	E_OK: request to check for a wake-up is accepted E_NOT_OK: request to check for a wake-up is not accepted
Description	API is called by EthIf. The Ethernet switch driver request to check for a wake-up at all Ethernet switch ports which reference an EthTrcv. For those Ethernet switch ports the call is forwarded to the referenced EthTrcv. The function could be called in context of an interrupt service routine or on task level Note: Interrupt service routine consuming time has to be considered, since all EthSwtPorts of the maintained Ethernet switches has to be checked. Therefore the call is forwarded to the referred EthTrcv where the request to check for wake-up is stored. The check of the Ethernet hardware is done asynchronously in the context of the EthTrcv_MainFunction.	
Available via	EthSwt.h	

]

[SWS_EthSwt_00440]

Upstream requirements: [SRS_Eth_00118](#)

[The function [EthSwt_CheckWakeup](#) shall iterate over the Ethernet switch ports of the indexed Ethernet switch and forward the call to [EthTrcv_CheckWakeup](#) for those Ethernet switch ports, which reference an EthTrcv.]

[SWS_EthSwt_00441]

Upstream requirements: [SRS_BSW_00171](#)

[The function [EthSwt_CheckWakeup](#) shall be pre compile time configurable On/Off by the configuration parameter: [EthSwtCheckWakeupApi](#)]

8.3.6 EthSwT_GetSwitchPortWakeupReason

[SWS_EthSwT_91040] Definition of API function EthSwT_GetSwitchPortWakeupReason

Upstream requirements: [SRS_Eth_00107](#)

[

Service Name	EthSwT_GetSwitchPortWakeupReason	
Syntax	<pre>Std_ReturnType EthSwT_GetSwitchPortWakeupReason (uint8 SwitchIdx, uint8 SwitchPortIdx, EthTrcv_WakeupReasonType* Reason)</pre>	
Service ID [hex]	0x4b	
Sync/Async	Synchronous	
Reentrancy	Reentrant	
Parameters (in)	SwitchIdx	Index of the Ethernet switch within the context of the Ethernet Switch driver
	SwitchPortIdx	Index of the Ethernet switch port index in the context of the Ethernet switch driver
Parameters (inout)	None	
Parameters (out)	Reason	Pointer to structure of least recent wakeup event, which was detected by the Ethernet switch port
Return value	Std_ReturnType	E_OK: Ethernet switch port wake up reason request has been accepted. E_NOT_OK: Ethernet switch port wake up reason request has not been accepted.
Description	This function obtains the wake up reasons of the the indexed Ethernet switch port by calling EthTrcv_GetBusWuReason(...) of the referenced EthTrcv	
Available via	EthSwT.h	

]

[SWS_EthSwT_00442]

Upstream requirements: [SRS_Eth_00107](#)

[The function [EthSwT_GetSwitchPortWakeupReason](#) shall read the current wake-up reason of the indexed Ethernet switch port by forwarding the call to `EthTrcv_GetBusWuReason` of the referenced `EthTrcv`. If the indexed Ethernet switch port has no reference to an `EthTrcv`, the function shall return `E_NOT_OK`.]

[SWS_EthSwT_00443]

Upstream requirements: [SRS_BSW_00171](#)

[The function [EthSwT_GetSwitchPortWakeupReason](#) shall be pre compile time configurable On/Off by the configuration parameter: [EthSwTGetSwitchPortWakeupReasonApi](#)]

8.3.7 EthSwt_GetLinkState

[SWS_EthSwt_00037] Definition of API function EthSwt_GetLinkState

Upstream requirements: [SRS_Eth_00119](#)

[

Service Name	EthSwt_GetLinkState	
Syntax	<pre>Std_ReturnType EthSwt_GetLinkState (uint8 SwitchIdx, uint8 SwitchPortIdx, EthTrcv_LinkStateType* LinkStatePtr)</pre>	
Service ID [hex]	0x06	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	SwitchIdx	Index of the switch within the context of the Ethernet Switch Driver
	SwitchPortIdx	Index of the port at the addressed switch
Parameters (inout)	None	
Parameters (out)	LinkStatePtr	ETHTRCV_LINK_STATE_DOWN: Switch port is disconnected ETHTRCV_LINK_STATE_ACTIVE: Switch port is connected
Return value	Std_ReturnType	E_OK: success E_NOT_OK: Link state of the indexed switch port could not be obtained, or the function is called in state ETHSWT_STATE_UNINIT or ETHSWT_STATE_INIT.
Description	Obtains the link state of the indexed switch port	
Available via	EthSwt.h	

]

[SWS_EthSwt_00038]

Upstream requirements: [SRS_Eth_00118](#), [SRS_Eth_00119](#)

[The function `EthSwt_GetLinkState` shall read the current (link) state of the indexed switch port. If the indexed Ethernet port references an Ethernet transceiver, the link state shall be obtained by calling the function `EthTrcv_GetLinkState` of the Ethernet Transceiver Driver. If the indexed Ethernet Switch port does not reference an Ethernet transceiver, the state shall be obtained from the MAC interface of the Switch port. If the MAC interface is not able to provide a link state (e.g. Ethernet hardware does not support a link state of the MAC interface), the API shall return the following state which is derived from the current mode:

- If the current mode of the indexed switch port is `ETH_MODE_ACTIVE`, then `ETHTRCV_LINK_STATE_ACTIVE` shall be returned
- If the current mode of the indexed switch port is `ETH_MODE_DOWN`, then `ETHTRCV_LINK_STATE_DOWN` shall be returned

]

[SWS_EthSwt_00042]

Upstream requirements: [SRS_BSW_00171](#)

[The function [EthSwt_GetLinkState](#) shall be pre compile time configurable On/Off by the configuration parameter: [EthSwtGetLinkStateApi](#).]

8.3.8 EthSwt_GetBaudRate

[SWS_EthSwt_00044] Definition of API function EthSwt_GetBaudRate

Upstream requirements: [SRS_Eth_00118](#)

[

Service Name	EthSwt_GetBaudRate	
Syntax	<pre>Std_ReturnType EthSwt_GetBaudRate (uint8 SwitchIdx, uint8 SwitchPortIdx, EthTrcv_BaudRateType* BaudRatePtr)</pre>	
Service ID [hex]	0x07	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	SwitchIdx	Index of the switch within the context of the Ethernet Switch Driver
	SwitchPortIdx	Index of the port at the addressed switch
Parameters (inout)	None	
Parameters (out)	BaudRatePtr	ETHTRCV_BAUD_RATE_10MBIT: 10MBit connection ETHTRCV_BAUD_RATE_100MBIT: 100MBit connection ETHTRCV_BAUD_RATE_1000MBIT: 1000MBit connection ETHTRCV_BAUD_RATE_2500MBIT: 2500MBit connection
	Return value	Std_ReturnType E_OK: success E_NOT_OK: Baud rate of the indexed switch port could not be obtained, or the function is called in state ETHSWT_STATE_UNINIT or ETHSWT_STATE_INIT.
Description	Obtains the baud rate of the indexed switch port	
Available via	EthSwt.h	

]

[SWS_EthSwt_00045]

Upstream requirements: [SRS_Eth_00118](#)

[The function [EthSwt_GetBaudRate](#) shall read the current baud rate of the indexed switch port. If the indexed Ethernet port reference an Ethernet transceiver, the baud rate shall be obtained by the function [EthTrcv_GetBaudRate](#) of the Ethernet Transceiver Driver. If the indexed Ethernet Switch port does not reference an Ethernet transceiver, the baud rate shall be obtained from the MAC interface of the Switch port.]

[SWS_EthSwt_00049]

Upstream requirements: [SRS_BSW_00171](#)

[The function [EthSwt_GetBaudRate](#) shall be pre compile time configurable On/Off by the configuration parameter: [EthSwtGetBaudRateApi](#).]

8.3.9 EthSwt_GetDuplexMode

[SWS_EthSwt_00051] Definition of API function EthSwt_GetDuplexMode

Upstream requirements: [SRS_Eth_00118](#)

[

Service Name	EthSwt_GetDuplexMode	
Syntax	Std_ReturnType EthSwt_GetDuplexMode (uint8 SwitchIdx, uint8 SwitchPortIdx, EthTrcv_DuplexModeType* DuplexModePtr)	
Service ID [hex]	0x08	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	SwitchIdx	Index of the switch within the context of the Ethernet Switch Driver
	SwitchPortIdx	Index of the port at the addressed switch
Parameters (inout)	None	
Parameters (out)	DuplexModePtr	ETHTRCV_DUPLEX_MODE_HALF: half duplex connections ETHTRCV_DUPLEXMODE_FULL: full duplex connection
	Std_ReturnType	E_OK: success E_NOT_OK: duplex mode of the indexed switch port could not be obtained, or the function is called in state ETHSWT_STATE_UNINIT or ETHSWT_STATE_INIT.
Return value	Std_ReturnType	E_OK: success E_NOT_OK: duplex mode of the indexed switch port could not be obtained, or the function is called in state ETHSWT_STATE_UNINIT or ETHSWT_STATE_INIT.
Description	Obtains the duplex mode of the indexed switch port	
Available via	EthSwt.h	

]

[SWS_EthSwt_00052]

Upstream requirements: [SRS_Eth_00118](#)

[The function [EthSwt_GetDuplexMode](#) shall read the current duplex mode of the indexed switch port. If the indexed Ethernet port reference an Ethernet transceiver, the duplex mode shall be obtained by calling the function [EthTrcv_GetDuplexMode](#) of the Ethernet Transceiver Driver. If the indexed Ethernet Switch port does not reference an Ethernet transceiver, the duplex mode shall be obtained from the MAC interface of the Switch port.]

[SWS_EthSwt_00056]

Upstream requirements: [SRS_BSW_00171](#)

[The function [EthSwt_GetDuplexMode](#) shall be pre compile time configurable On/Off by the configuration parameter: [EthSwtGetDuplexModeApi](#).]

8.3.10 EthSwt_GetPortMacAddr

[SWS_EthSwt_00060] Definition of API function EthSwt_GetPortMacAddr

Upstream requirements: [SRS_Eth_00087](#), [SRS_Eth_00181](#)

[

Service Name	EthSwt_GetPortMacAddr	
Syntax	Std_ReturnType EthSwt_GetPortMacAddr (uint8 SwitchIdx, const uint8* MacAddrPtr, uint8* PortIdxPtr)	
Service ID [hex]	0x09	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	SwitchIdx	Index of the switch within the context of the Ethernet Switch Driver
	MacAddrPtr	MAC-address for which a switch port is searched over which the node with this MAC-address can be reached.
Parameters (inout)	None	
Parameters (out)	PortIdxPtr	Pointer to the port index
Return value	Std_ReturnType	E_OK: success E_NOT_OK: multiple ports were found
Description	Obtains the port over which this MAC-address at the indexed switch can be reached. The result might be used for a DHCP-server which will need the port/MAC-resolution. If for the PortIdxPtr the maximal possible value (255) is returned the given MAC address cannot be reached via a port of this switch. If multiple ports were found the API returns E_NOT_OK.	
Available via	EthSwt.h	

]

[SWS_EthSwt_00448] Behaviour if [EthSwtMacAddressLearningMode](#) is set to [IVL](#)

Upstream requirements: [SRS_Eth_00087](#)

[if [EthSwtMacAddressLearningMode](#) is set to [IVL](#) then the EthSwt driver shall return with E_NOT_OK.]

Note: If [EthSwtMacAddressLearningMode](#) is set to [IVL](#), then the MAC-address to Ethernet switch port assignment is learned with respect to the according VLAN. With [IVL](#) the presence of an VLAN-ID is needed.

[SWS_EthSwt_00449] Behaviour if given MAC-address is available at exactly one Ethernet port

Upstream requirements: [SRS_Eth_00087](#)

[If the given MAC-address is available at exact one Ethernet switch port, then the EthSwt driver shall return the port index via PortIdxPtr and report E_OK.]

[SWS_EthSwt_00511] Behaviour if given MAC-address is available at multiple Ethernet ports

Upstream requirements: [SRS_Eth_00087](#)

[If the given MAC-address is available at multiple Ethernet switch ports, then the Eth-Swt driver shall return with E_NOT_OK.]

Note: If [EthSwtMacAddressLearningMode](#) is set to [SVL](#) and the MAC-address given with [MacAddrPtr](#) is a MAC multicast address, then the given MAC-address could be available at several Ethernet switch ports of the Ethernet switch addressed with [SwitchIdx](#).

[SWS_EthSwt_00230]

Upstream requirements: [SRS_BSW_00171](#)

[The function [EthSwt_GetPortMacAddr](#) shall be pre compile time configurable On/Off by the configuration parameter: [EthSwtGetPortMacAddrApi](#).]

8.3.11 EthSwt_GetPortMacAddrVlan

[SWS_EthSwt_91051] Definition of API function EthSwt_GetPortMacAddrVlan

Upstream requirements: [SRS_Eth_00087](#)

[

Service Name	EthSwt_GetPortMacAddrVlan	
Syntax	<pre>Std_ReturnType EthSwt_GetPortMacAddrVlan (uint8 SwitchIdx, const uint8* MacAddrPtr, const uint16* VlanIdPtr, uint32* PortBitMapPtr)</pre>	
Service ID [hex]	0x60	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	SwitchIdx	Index of the Ethernet switch within the context of the Ethernet Switch Driver





	MacAddrPtr	MAC-address which is requested to look-up the assignment to an Ethernet switch port
	VlanIdPtr	VlanId which is requested to look-up the assignment to an Ethernet switch port
Parameters (inout)	None	
Parameters (out)	PortBitMapPtr	Returns a pointer to an Ethernet switch port bit map, where the requested MAC-address with respect to the given VLAN-ID is available
Return value	Std_ReturnType	E_OK: success E_NOT_OK: request could not be successfully finalized, due to several possible reasons (e.g. requested Ethernet switch addressed with switchIdx is not valid or inactive)
Description	Obtains an Ethernet switch port bit map, where the given MAC-address with respect to the given VLAN-ID is assigned to. The return argument PortBitMapPtr points to uint32 value which shall be handled as Ethernet switch port bit map. Each bit of the Ethernet switch port bit map represents an EthSwtPortIdx, where the least significant bit (bit 0) represents EthSwitchPortIdx 0 and most significant bit (bit 32) represents EthSwitchPortIdx 31 (e.g. 0x0001 == EthSwitchPortIdx 0 is set; 0x8005 == EthSwitchPortIdx 0, 2 and 31 are set).	
Available via	EthSwt.h	

]

[SWS_EthSwt_00512] Behaviour if [EthSwtMacAddressLearningMode](#) is set to [SVL](#)

Upstream requirements: [SRS_Eth_00087](#)

[If [EthSwtMacAddressLearningMode](#) is set to [SVL](#), then the EthSwt driver shall consider the given the MAC-address and ignore the given VLAN-ID to determine the MAC-address to Ethernet port assignment.]

Note: If [EthSwtMacAddressLearningMode](#) is set to [SVL](#), the MAC-address to port assignment is shared across all VLANs and therefore the given VLAN is ignored.

[SWS_EthSwt_00513] Behaviour if [EthSwtMacAddressLearningMode](#) is set to [IVL](#) and VLAN-ID is set to value in a range from 1 to 4095

Upstream requirements: [SRS_Eth_00087](#)

[If [EthSwtMacAddressLearningMode](#) is set to [IVL](#) and given VLAN-ID is set to a value in a range from 1 to 4095, then the EthSwt driver shall consider the given the MAC-address and the given VLAN-ID to determine the MAC-address to Ethernet port assignment.]

[SWS_EthSwt_00514] Behaviour if [EthSwtMacAddressLearningMode](#) is set to [IVL](#) and VLAN-ID is set to 0

Upstream requirements: [SRS_Eth_00087](#)

[If [EthSwtMacAddressLearningMode](#) is set to [IVL](#) and given VLAN-ID is set to 0, then the EthSwt driver shall consider the given the MAC-address to determine the MAC-address to Ethernet port assignment irrespective of the VLAN.]

[SWS_EthSwT_00515] Behaviour if `EthSwTMacAddressLearningMode` is set to `IVL` and VLAN-ID is set to a value greater than 4095

Upstream requirements: [SRS_Eth_00087](#)

[If `EthSwTMacAddressLearningMode` is set to `IVL` and given VLAN-ID is set to a value greater than 4095, then the EthSwT driver shall return with `E_NOT_OK`.]

[SWS_EthSwT_00516] Creation of Ethernet switch port bit map

Upstream requirements: [SRS_Eth_00087](#)

[The function shall create a Ethernet switch port bit map addressed by `PortBitMapPtr` with respect to [\[SWS_EthSwT_00512\]](#), [\[SWS_EthSwT_00513\]](#) and [\[SWS_EthSwT_00514\]](#), where the index of the affected EthSwTPorts are encoded in a 32bit data type. The least significant bit shall represent `EthSwTPortIdx 0` and the most significant bit shall represent `EthSwTPortIdx 31`.]

[SWS_EthSwT_00517] Behaviour for creation of Ethernet switch port bit map

Upstream requirements: [SRS_Eth_00087](#)

[If the creation of the Ethernet switch port bit map was successfully finalized and transferred to the location addressed with `PortBitMapPtr`, then the EthSwT driver shall return with `E_OK`.]

[SWS_EthSwT_00518] Behaviour if Ethernet switch port bit map exceeds uint32 data type

Upstream requirements: [SRS_Eth_00087](#)

[If the resulting Ethernet switch port bit map exceeds the `uint32` data type, then the EthSwT driver shall return with `E_NOT_OK`.]

[SWS_EthSwT_00519] compile configuration for API

Upstream requirements: [SRS_BSW_00171](#)

[The function `EthSwT_GetPortMacAddrVlan` shall be pre compile time configurable On/Off by the configuration parameter: `EthSwT_GetPortMacAddrVlanApi`.]

8.3.12 EthSwt_GetArlTable

[SWS_EthSwt_00111] Definition of API function EthSwt_GetArlTable

Upstream requirements: [SRS_Eth_00087](#), [SRS_Eth_00181](#)

[

Service Name	EthSwt_GetArlTable	
Syntax	<pre>Std_ReturnType EthSwt_GetArlTable (uint8 switchIdx, uint16* numberOfElements, Eth_MacVlanType* arlTableListPointer)</pre>	
Service ID [hex]	0x0a	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	switchIdx	Index of the switch within the context of the Ethernet Switch Driver
Parameters (inout)	numberOfElements	In: Maximum number of elements which can be written into the arlTable Out: Number of elements which are currently available in the EthSwitch module.
Parameters (out)	arlTableListPointer	Returns a pointer to the memory where the ARL table of the switch consisting of a list of structs with MAC-address, VLAN-ID and port shall be stored.
Return value	Std_ReturnType	E_OK: success E_NOT_OK: requested switchIdx is not valid or inactive
Description	Obtains the address resolution table of a switch and copies the list into a user provided buffer. The function will copy all or numberOfElements into the output list. If input value of numberOfElements is 0 the function will not copy any data but only return the number of valid entries in the cache. arlTableListPointer may be NULL_PTR in this case.	
Available via	EthSwt.h	

]

[SWS_EthSwt_00228]

Upstream requirements: [SRS_Eth_00087](#), [SRS_Eth_00181](#)

[The function [EthSwt_GetArlTable](#) shall provide a list of structs with MAC-address, VLAN-ID and port for the indexed switch.]

[SWS_EthSwt_00197]

Upstream requirements: [SRS_Eth_00087](#), [SRS_Eth_00181](#)

[If the numberOfElements is greater 0x00, the arlTableListPointer shall be filled with up to numberOfElements elements. numberOfElements shall return the number of copied elements.]

[SWS_EthSwt_00235]

Upstream requirements: [SRS_Eth_00087](#), [SRS_Eth_00181](#)

[The [EthSwt_GetArlTable](#) API shall return only the numberOfElements if the numberOfElements is set to 0x00. In this case no data will be copied and a NULLPTR can be used for the arlTableListPointer.]

[SWS_EthSwt_00229]

Upstream requirements: [SRS_BSW_00171](#)

[The function [EthSwt_GetArlTable](#) shall be pre compile time configurable On/Off by the configuration parameter: [EthSwtGetArlTableApi](#).]

8.3.13 EthSwt_GetCounterValues

[SWS_EthSwt_00231] Definition of API function EthSwt_GetCounterValues

Upstream requirements: [SRS_Eth_00128](#)

[

Service Name	EthSwt_GetCounterValues	
Syntax	<pre>Std_ReturnType EthSwt_GetCounterValues (uint8 SwitchIdx, uint8 SwitchPortIdx, Eth_CounterType* CounterPtr)</pre>	
Service ID [hex]	0x0c	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	SwitchIdx	Index of the switch within the context of the Ethernet Switch Driver
	SwitchPortIdx	Index of the port at the addressed switch
Parameters (inout)	None	
Parameters (out)	CounterPtr	counter values according to IETF RFC 1757, RFC 1643 and RFC 2233.
Return value	Std_ReturnType	E_OK: success E_NOT_OK: counter values read failure
Description	Reads a list with drop counter values of the corresponding port of the switch. The meaning of these values is described at Eth_CounterType .	
Available via	EthSwt.h	

]

[SWS_EthSwt_00106]

Upstream requirements: [SRS_Eth_00128](#)

[[EthSwt_GetCounterValues](#) shall read a list with drop counter values of the corresponding port of the switch. The meaning of these values is described at [Eth_CounterType](#).]

8.3.14 EthSwT_GetRxStats

[SWS_EthSwT_00198] Definition of API function EthSwT_GetRxStats

Upstream requirements: [SRS_Eth_00128](#)

[

Service Name	EthSwT_GetRxStats	
Syntax	<pre>Std_ReturnType EthSwT_GetRxStats (uint8 SwitchIdx, uint8 SwitchPortIdx, Eth_RxStatsType* RxStats)</pre>	
Service ID [hex]	0x0d	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	SwitchIdx	Index of the switch within the context of the Ethernet Switch Driver
	SwitchPortIdx	Index of the port at the addressed switch
Parameters (inout)	None	
Parameters (out)	RxStats	List of values according to IETF RFC 2819 (Remote Network Monitoring Management Information Base)
Return value	Std_ReturnType	E_OK: success E_NOT_OK: drop counter could not be obtained
Description	Returns a list of statistic counters defined with Eth_RxStatsType. The majority of these Counters are derived from the IETF RFC2819.	
Available via	EthSwT.h	

]

[SWS_EthSwT_00199]

Upstream requirements: [SRS_Eth_00128](#)

[[EthSwT_GetRxStats](#) shall return a list of statistic counters defined with `Eth_RxStatsType`. The majority of these Counters are derived from the IETF RFC2819.]

[SWS_EthSwT_00202]

Upstream requirements: [SRS_BSW_00171](#)

[The function [EthSwT_GetRxStats](#) shall be pre compile time configurable On/Off by the configuration parameter: [EthSwTGetRxStatsApi](#).]

8.3.15 EthSwt_GetTxStats

[SWS_EthSwt_91001] Definition of API function EthSwt_GetTxStats

Upstream requirements: [SRS_Eth_00128](#)

[

Service Name	EthSwt_GetTxStats	
Syntax	<pre>Std_ReturnType EthSwt_GetTxStats (uint8 SwitchIdx, uint8 SwitchPortIdx, Eth_TxStatsType* TxStats)</pre>	
Service ID [hex]	0x20	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	SwitchIdx	Index of the switch within the context of the Ethernet Switch Driver
	SwitchPortIdx	Index of the port at the addressed switch
Parameters (inout)	None	
Parameters (out)	TxStats	List of values to read statistic values for transmission.
Return value	Std_ReturnType	E_OK: success E_NOTOK: Tx-statistics could not be obtained
Description	Returns the list of Transmission Statistics out of IETF RFC1213 defined with Eth_TxStatsType, where the maximal possible value shall denote an invalid value, e.g. this counter is not available.	
Available via	EthSwt.h	

]

[SWS_EthSwt_00372]

Upstream requirements: [SRS_Eth_00128](#)

[[EthSwt_GetTxStats](#) shall return the list of Transmission Statistics out of IETF RFC1213 defined with Eth_TxStatsType, where the maximal possible value shall denote an invalid value, e.g. this counter is not available.]

[SWS_EthSwt_00362]

Upstream requirements: [SRS_BSW_00171](#)

[The function [EthSwt_GetTxStats](#) shall be pre compile time configurable On/Off by the configuration parameter: [EthSwtGetTxStatsApi](#).]

8.3.16 EthSwT_GetTxErrorCounterValues

[SWS_EthSwT_91000] Definition of API function EthSwT_GetTxErrorCounterValues

Upstream requirements: [SRS_Eth_00128](#)

[

Service Name	EthSwT_GetTxErrorCounterValues	
Syntax	Std_ReturnType EthSwT_GetTxErrorCounterValues (uint8 SwitchIdx, uint8 SwitchPortIdx, Eth_TxErrorCounterValuesType* TxStats)	
Service ID [hex]	0x21	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	SwitchIdx	Index of the switch within the context of the Ethernet Switch Drive
	SwitchPortIdx	Index of the port at the addressed switch
Parameters (inout)	None	
Parameters (out)	TxStats	List of values to read statistic error counter values for transmission.
		E_OK: success, E_NOTOK: Tx-statistics could not be obtained
Return value	Std_ReturnType	
Description	Returns the list of Transmission Error Counters out of IETF RFC1213 and RFC1643 defined with Eth_TxErrorCounterValuesType, where the maximal possible value shall denote an invalid value, e.g. this counter is not available.	
Available via	EthSwT.h	

]

[SWS_EthSwT_00373]

Upstream requirements: [SRS_Eth_00128](#)

[[EthSwT_GetTxErrorCounterValues](#) returns the list of Transmission Error Counters out of IETF RFC1213 and RFC1643 defined with `Eth_TxErrorCounterValuesType`, where the maximal possible value shall denote an invalid value, e.g. this counter is not available.]

[SWS_EthSwT_00370]

Upstream requirements: [SRS_BSW_00171](#)

[The function [EthSwT_GetTxErrorCounterValues](#) shall be pre compile time configurable On/Off by the configuration parameter: `EthSwTGetTxErrorCounterValuesApi`.]

8.3.17 EthSwt_GetSwitchReg

[SWS_EthSwt_00206] Definition of API function EthSwt_GetSwitchReg

Upstream requirements: [SRS_Eth_00120](#)

[

Service Name	EthSwt_GetSwitchReg	
Syntax	<pre>Std_ReturnType EthSwt_GetSwitchReg (uint8 SwitchIdx, uint32 page, uint32 register, uint32* registerContent)</pre>	
Service ID [hex]	0x0e	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	SwitchIdx	Index of the switch within the context of the Ethernet Switch Driver
	page	Address of a register page
	register	Address of a register
Parameters (inout)	None	
Parameters (out)	registerContent	Content of the addresses register
Return value	Std_ReturnType	E_OK: success E_NOT_OK: drop counter could not be obtained
Description	Generic API for reading the content of a switch register	
Available via	EthSwt.h	

]

[SWS_EthSwt_00207]

Upstream requirements: [SRS_Eth_00120](#)

[The function [EthSwt_GetSwitchReg](#) shall read the content of a switch register.]

[SWS_EthSwt_00210]

Upstream requirements: [SRS_BSW_00171](#)

[The function [EthSwt_GetSwitchReg](#) shall be pre compile time configurable On/Off by the configuration parameter: [EthSwtGetSwitchRegApi](#).]

8.3.18 EthSwt_SetSwitchReg

[SWS_EthSwt_00211] Definition of API function EthSwt_SetSwitchReg

Upstream requirements: [SRS_Eth_00120](#)

[

Service Name	EthSwt_SetSwitchReg	
Syntax	<pre>Std_ReturnType EthSwt_SetSwitchReg (uint8 SwitchIdx, uint32 page, uint32 register, uint32 registerContent)</pre>	
Service ID [hex]	0x0f	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	SwitchIdx	Index of the switch within the context of the Ethernet Switch Driver
	page	Address of a register page
	register	Address of a register
	registerContent	Content of the addresses register
Parameters (inout)	None	
Parameters (out)	None	
Return value	Std_ReturnType	E_OK: success E_NOT_OK: drop counter could not be obtained
Description	Generic API for writing the content of a switch register	
Available via	EthSwt.h	

]

[SWS_EthSwt_00212]

Upstream requirements: [SRS_Eth_00120](#)

[The function [EthSwt_SetSwitchReg](#) shall write the content to the switch register.]

[SWS_EthSwt_00215]

Upstream requirements: [SRS_BSW_00171](#)

[The function [EthSwt_SetSwitchReg](#) shall be pre compile time configurable On/Off by the configuration parameter: [EthSwtSetSwitchRegApi](#).]

8.3.19 EthSwt_ReadTrcvRegister

[SWS_EthSwt_00216] Definition of API function EthSwt_ReadTrcvRegister

Upstream requirements: [SRS_Eth_00120](#)

[

Service Name	EthSwt_ReadTrcvRegister	
Syntax	<pre>Std_ReturnType EthSwt_ReadTrcvRegister (uint8 SwitchIdx, uint8 SwitchPortIdx, uint8 RegIdx, uint16* RegValPtr)</pre>	
Service ID [hex]	0x10	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	SwitchIdx	Index of the switch within the context of the Ethernet Switch Driver
	SwitchPortIdx	Index of the port at the addressed switch
	RegIdx	Index of the register
Parameters (inout)	None	
Parameters (out)	RegValPtr	Pointer to the register content
Return value	Std_ReturnType	E_OK: success E_NOT_OK: Content of the transceiver could not be obtained, or the function is called in state ETHSWT_STATE_UNINIT or ETHSWT_STATE_INIT.
Description	Generic API for reading the content of a transceiver register	
Available via	EthSwt.h	

]

[SWS_EthSwt_00217]

Upstream requirements: [SRS_Eth_00118](#), [SRS_Eth_00120](#)

[The function [EthSwt_ReadTrcvRegister](#) shall read the specified transceiver register through the MII or SPI of the indexed switch port.]

[SWS_EthSwt_00220]

Upstream requirements: [SRS_BSW_00171](#)

[The function [EthSwt_ReadTrcvRegister](#) shall be pre compile time configurable On/Off by the configuration parameter: [EthSwtReadTrcvRegisterApi](#).]

8.3.20 EthSwt_WriteTrcvRegister

[SWS_EthSwt_00221] Definition of API function EthSwt_WriteTrcvRegister

Upstream requirements: [SRS_Eth_00120](#)

[

Service Name	EthSwt_WriteTrcvRegister	
Syntax	<pre>Std_ReturnType EthSwt_WriteTrcvRegister (uint8 SwitchIdx, uint8 SwitchPortIdx, uint8 RegIdx, uint16 RegVal)</pre>	
Service ID [hex]	0x11	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	SwitchIdx	Index of the switch within the context of the Ethernet Switch Driver
	SwitchPortIdx	Index of the port at the addressed switch
	RegIdx	Index of the register
	RegVal	Content for the indexed register
Parameters (inout)	None	
Parameters (out)	None	
Return value	Std_ReturnType	E_OK: success E_NOT_OK: Content given by RegVal could not be written to the given register (RegIdx) of the transceiver, or the function is called in state ETHSWT_STATE_UNINIT or ETHSWT_STATE_INIT.
Description	Generic API for writing the content of a transceiver register	
Available via	EthSwt.h	

]

[SWS_EthSwt_00222]

Upstream requirements: [SRS_Eth_00118](#), [SRS_Eth_00120](#)

[The function [EthSwt_WriteTrcvRegister](#) shall write the specified transceiver register through the MII or SPI of the indexed switch port.]

[SWS_EthSwt_00225]

Upstream requirements: [SRS_BSW_00171](#)

[The function [EthSwt_WriteTrcvRegister](#) shall be pre compile time configurable On/Off by the configuration parameter: [EthSwtWriteTrcvRegisterApi](#).]

8.3.21 EthSwt_ReadMmd

[SWS_EthSwt_91052] Definition of API function EthSwt_ReadMmd [

Service Name	EthSwt_ReadMmd	
Syntax	<pre>Std_ReturnType EthSwt_ReadMmd (uint8 SwitchIdx, uint8 SwitchPortIdx, uint8 Mmd, uint16 RegIdx, uint16* RegValPtr)</pre>	
Service ID [hex]	0x61	
Sync/Async	Synchronous	
Reentrancy	Reentrant for different SwitchIdx, non reentrant for same SwitchIdx	
Parameters (in)	SwitchIdx	Index of the switch within the context of the Ethernet Switch Driver
	SwitchPortIdx	Index of the port at the addressed switch
	Mmd	MDIO Manageable Device
	RegIdx	Index of the transceiver register on the MII
Parameters (inout)	None	
Parameters (out)	RegValPtr	Filled with the register content of the indexed register
Return value	Std_ReturnType	E_OK: Service accepted E_NOT_OK: Service denied
Description	Generic API for reading the content of a transceiver register	
Available via	Eth.h	

]

[SWS_EthSwt_00560] EthSwt_ReadMmd functionality [The function [EthSwt_ReadMmd](#) shall read the specified transceiver register through the MII or SPI of the indexed switch port.]

[SWS_EthSwt_00561] Configuring EthSwt_ReadMmd availability [The function [EthSwt_ReadMmd](#) shall be precompile time configurable On/Off by the configuration parameter: [EthSwtReadMmdApi](#).]

8.3.22 EthSwt_WriteMmd

[SWS_EthSwt_91053] Definition of API function EthSwt_WriteMmd [

Service Name	EthSwt_WriteMmd	
Syntax	<pre>Std_ReturnType EthSwt_WriteMmd (uint8 SwitchIdx, uint8 SwitchPortIdx, uint8 Mmd, uint16 RegIdx, uint16 RegVal)</pre>	
Service ID [hex]	0x62	
Sync/Async	Synchronous	
Reentrancy	Reentrant for different SwitchIdx, non reentrant for same SwitchIdx	
Parameters (in)	SwitchIdx	Index of the switch within the context of the Ethernet Switch Driver
	SwitchPortIdx	Index of the port at the addressed switch
	Mmd	MDIO Manageable Device
	RegIdx	Index of the transceiver register on the MII
	RegVal	Value to be written to the given address
Parameters (inout)	None	
Parameters (out)	None	
Return value	Std_ReturnType	E_OK: Service accepted E_NOT_OK: Service denied
Description	Generic API for writing the content of a transceiver register	
Available via	Eth.h	

]

[SWS_EthSwt_00562] EthSwt_WriteMmd functionality [The function [EthSwt_WriteMmd](#) shall write a value to the specified transceiver register through the MII of the indexed switch port.]

[SWS_EthSwt_00563] Configuring EthSwt_WriteMmd availability [The function [EthSwt_WriteMmd](#) shall be precompile time configurable On/Off by the configuration parameter: [EthSwtWriteMmdApi](#).]

8.3.23 EthSwt_EnableVlan

[SWS_EthSwt_00172] Definition of API function EthSwt_EnableVlan

Upstream requirements: [SRS_Eth_00121](#), [SRS_Eth_00114](#)

[

Service Name	EthSwt_EnableVlan	
Syntax	<pre>Std_ReturnType EthSwt_EnableVlan (uint8 SwitchIdx, uint8 SwitchPortIdx, uint16 VlanId, boolean Enable)</pre>	
Service ID [hex]	0x12	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	SwitchIdx	Index of the switch within the context of the Ethernet Switch Driver
	SwitchPortIdx	Index of the port at the addressed switch
	VlanId	VLAN-ID to a preconfigured configuration on the given ingress port
	Enable	1 = VLAN-configuration enabled 0 = VLAN-configuration disabled (frames with given VLAN-ID will be dropped)
Parameters (inout)	None	
Parameters (out)	None	
Return value	Std_ReturnType	E_OK: success E_NOT_OK: buffer level could not be obtained
Description	Enables or disables a pre-configured VLAN at a certain port of a switch.	
Available via	EthSwt.h	

]

[SWS_EthSwt_00173]

Upstream requirements: [SRS_Eth_00121](#), [SRS_Eth_00114](#)

[The function [EthSwt_EnableVlan](#) shall enable or disable a pre-configured VLAN at a certain port of a switch.]

[SWS_EthSwt_00177]

Upstream requirements: [SRS_BSW_00171](#)

[The function [EthSwt_EnableVlan](#) shall be pre compile time configurable On/Off by the configuration parameter: [EthSwtEnableVlanApi](#).]

8.3.24 EthSwT_StoreConfiguration

[SWS_EthSwT_00086] Definition of API function EthSwT_StoreConfiguration

Upstream requirements: [SRS_Eth_00087](#), [SRS_Eth_00122](#)

[

Service Name	EthSwT_StoreConfiguration	
Syntax	Std_ReturnType EthSwT_StoreConfiguration (uint8 SwitchIdx)	
Service ID [hex]	0x13	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	SwitchIdx	Index of the switch within the context of the Ethernet Switch Driver
Parameters (inout)	None	
Parameters (out)	None	
Return value	Std_ReturnType	E_OK: Request to persistently store the MAC/Port table was accepted E_NOT_OK: Request to persistently store the MAC/Port table was not accepted
Description	Trigger the storage/reset of the configuration of the learned MAC/Port tables of a switch in a persistent manner and will be used by e.g. CDD.	
Available via	EthSwT.h	

]

[SWS_EthSwT_00090]

Upstream requirements: [SRS_BSW_00171](#)

[The function [EthSwT_StoreConfiguration](#) shall be pre compile time configurable On/Off by the configuration parameter: [EthSwTStoreConfigurationApi](#).]

8.3.25 EthSwT_ResetConfiguration

[SWS_EthSwT_00091] Definition of API function EthSwT_ResetConfiguration

Upstream requirements: [SRS_Eth_00087](#), [SRS_Eth_00122](#)

[

Service Name	EthSwT_ResetConfiguration	
Syntax	Std_ReturnType EthSwT_ResetConfiguration (uint8 SwitchIdx)	
Service ID [hex]	0x14	
Sync/Async	Synchronous	





Reentrancy	Non Reentrant	
Parameters (in)	SwitchIdx	Index of the switch within the context of the Ethernet Switch Driver
Parameters (inout)	None	
Parameters (out)	None	
Return value	Std_ReturnType	E_OK: Request to persistently reset the MAC/Port table was accepted E_NOT_OK: Request to persistently reset the MAC/Port table was not accepted
Description	The function shall request to reset and store the configuration of the learned MAC/Port tables of a Ethernet switch in a persistent manner. This could be used by e.g. a CDD.	
Available via	EthSwt.h	

]

[SWS_EthSwt_00095]

Upstream requirements: [SRS_BSW_00171](#)

[The function [EthSwt_ResetConfiguration](#) shall be pre compile time configurable On/Off by the configuration parameter: [EthSwtResetConfigurationApi](#).]

8.3.26 EthSwt_SetMacLearningMode

[SWS_EthSwt_00182] Definition of API function EthSwt_SetMacLearningMode

Upstream requirements: [SRS_Eth_00087](#), [SRS_Eth_00122](#)

[

Service Name	EthSwt_SetMacLearningMode	
Syntax	Std_ReturnType EthSwt_SetMacLearningMode (uint8 SwitchIdx, uint8 SwitchPortIdx, EthSwt_MacLearningType MacLearningMode)	
Service ID [hex]	0x15	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	SwitchIdx	Index of the switch within the context of the Ethernet Switch Driver
	SwitchPortIdx	Index of the port at the addressed switch
	MacLearningMode	Defines whether MAC addresses shall be learned and if they shall be learned in software or hardware.
Parameters (inout)	None	
Parameters (out)	None	
Return value	Std_ReturnType	E_OK: success E_NOT_OK: configuration could be persistently reset





Description	Sets the MAC learning mode in one of the tree modes: 1.) HW learning enabled, 2.) Hardware learning disabled, 3.) Software learning enabled. Note: This feature is hardware dependent, i.e. the switch hardware needs to support the different learning modes.
Available via	EthSwT.h

]

[SWS_EthSwT_00183]

Upstream requirements: [SRS_Eth_00122](#), [SRS_Eth_00087](#)

[The function [EthSwT_SetMacLearningMode](#) shall set the MAC learning mode according to [EthSwT_MacLearningType](#).]

Note: This feature is hardware dependent, i.e. the switch hardware needs to support the different modes.

[SWS_EthSwT_00186]

Upstream requirements: [SRS_BSW_00171](#)

[The function [EthSwT_SetMacLearningMode](#) shall be pre compile time configurable On/Off by the configuration parameter: [EthSwT_SetMacLearningModeApi](#).]

8.3.27 EthSwT_GetMacLearningMode

[SWS_EthSwT_00187] Definition of API function EthSwT_GetMacLearningMode

Upstream requirements: [SRS_Eth_00087](#), [SRS_Eth_00181](#)

[

Service Name	EthSwT_GetMacLearningMode	
Syntax	<pre>Std_ReturnType EthSwT_GetMacLearningMode (uint8 SwitchIdx, uint8 SwitchPortIdx, EthSwT_MacLearningType* MacLearningMode)</pre>	
Service ID [hex]	0x16	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	SwitchIdx	Index of the switch within the context of the Ethernet Switch Driver
	SwitchPortIdx	Index of the port at the addressed switch
Parameters (inout)	None	
Parameters (out)	MacLearningMode	Defines whether MAC addresses shall be learned and if they shall be learned in software or hardware.
Return value	Std_ReturnType	E_OK: success E_NOT_OK: configuration could be persistently reset





Description	Returns the MAC learning mode, i.e. 1.) HW learning enabled, 2.) Hardware learning disabled, 3.) Software learning enabled. Note: This feature is hardware dependent, i.e. the switch hardware needs to support the different learning modes
Available via	EthSwt.h

]

[SWS_EthSwt_00188]

Upstream requirements: [SRS_Eth_00087](#)

[The function [EthSwt_GetMacLearningMode](#) shall return the MAC learning mode according to [EthSwt_MacLearningType](#).]

Note: This feature is hardware dependent, i.e. the switch hardware needs to support the different learning modes.

[SWS_EthSwt_00191]

Upstream requirements: [SRS_BSW_00171](#)

[The function [EthSwt_GetMacLearningMode](#) shall be pre compile time configurable On/Off by the configuration parameter: [EthSwtGetMacLearningModeApi](#).]

8.3.28 EthSwt_NvmSingleBlockCallback

[SWS_EthSwt_00125] Definition of callback function EthSwt_NvmSingleBlock Callback

Upstream requirements: [SRS_Eth_00087](#), [SRS_Eth_00122](#)

[

Service Name	EthSwt_NvmSingleBlockCallback	
Syntax	Std_ReturnType EthSwt_NvmSingleBlockCallback (NvM_BlockRequestType BlockRequest, NvM_RequestResultType JobResult)	
Service ID [hex]	0x17	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	BlockRequest	The request type (read, write, ... etc.) of the previous processed block job
	JobResult	Covers the job result of the previous processed single block job.
Parameters (inout)	None	
Parameters (out)	None	



△

Return value	Std_ReturnType	E_OK: success E_NOT_OK: Callback function has not been processed successfully
Description	Function will be called by the NVRAMManager after the switch configuration has been stored or resetted.	
Available via	EthSwT_NvM.h	

]

[SWS_EthSwT_00126]

Upstream requirements: [SRS_Eth_00122](#), [SRS_Eth_00087](#)

[The function [EthSwT_NvmSingleBlockCallback](#) shall be called by the NVRAM-Manager [17] after the switch configuration has been stored or reset in the the NV RAM.]

[SWS_EthSwT_00196]

Upstream requirements: [SRS_Eth_00122](#), [SRS_Eth_00087](#)

[The function [EthSwT_NvmSingleBlockCallback](#) shall call the function <user>_PersistentConfigurationResult to provide the JobResult to the caller of [EthSwT_StoreConfiguration](#) or [EthSwT_ResetConfiguration](#).]

[SWS_EthSwT_00127]

Upstream requirements: [SRS_Eth_00122](#), [SRS_Eth_00087](#)

[The function [EthSwT_NvmSingleBlockCallback](#) shall always return E_OK according to [SWS_NvM_00368](#).]

[SWS_EthSwT_00128]

Upstream requirements: [SRS_BSW_00369](#)

[The function [EthSwT_NvmSingleBlockCallback](#) shall raise a development error if the JobResult equals NVM_REQ_NOT_OK, i.e. the write request has been finished unsuccessfully.]

Note: Please note that a production error at this point is not necessary because the NvM will raise also a production error if the write to NV RAM was not successful.

[SWS_EthSwT_00129]

Upstream requirements: [SRS_BSW_00171](#)

[The function [EthSwT_NvmSingleBlockCallback](#) shall be pre compile time configurable On/Off by the existence of the container [EthSwTNvm](#).]

8.3.29 EthSwt_GetVersionInfo

[SWS_EthSwt_00058] Definition of API function EthSwt_GetVersionInfo

Upstream requirements: [SRS_BSW_00171](#)

[

Service Name	EthSwt_GetVersionInfo	
Syntax	<pre>void EthSwt_GetVersionInfo (Std_VersionInfoType* VersionInfoPtr)</pre>	
Service ID [hex]	0x18	
Sync/Async	Synchronous	
Reentrancy	Reentrant	
Parameters (in)	None	
Parameters (inout)	None	
Parameters (out)	VersionInfoPtr	Pointer to where to store the version information of this module.
Return value	None	
Description	Returns the version information of this module.	
Available via	EthSwt.h	

]

[SWS_EthSwt_00124]

Upstream requirements: [SRS_BSW_00171](#)

[The function [EthSwt_GetVersionInfo](#) shall be pre compile time configurable On/Off by the configuration parameter: [EthSwtVersionInfoApi](#).]

8.3.30 EthSwt_EthRxProcessFrame

[SWS_EthSwt_91004] Definition of API function EthSwt_EthRxProcessFrame

Upstream requirements: [SRS_Eth_00125](#)

[

Service Name	EthSwt_EthRxProcessFrame	
Syntax	<pre>Std_ReturnType EthSwt_EthRxProcessFrame (uint8 CtrlIdx, Eth_BufIdxType BufIdx, uint8** DataPtr, uint16* LengthPtr, boolean* IsMgmtFrameOnlyPtr)</pre>	
Service ID [hex]	0x23	
Sync/Async	Synchronous	

▽



Reentrancy	Non Reentrant	
Parameters (in)	CtrlIdx	Ethernet Controller index
	BufIdx	Ethernet Rx Buffer index
Parameters (inout)	DataPtr	IN: Pointer to the position of the EtherType of a common Ethernet frame OUT: Pointer to the position of the EtherType in the management frame
	LengthPtr	IN: Pointer to the length of the frame received OUT: Pointer to the length decreased by the management information length.
Parameters (out)	IsMgmtFrameOnlyPtr	Information about the kind of frame FALSE: Frame is not only for management purpose, but also for normal communication. TRUE: Frame is only for management purpose and must not be processed in common receive process
Return value	Std_ReturnType	E_OK: Frame successfully processed E_NOT_OK: Frame processing failed
Description	Function inspects the Ethernet frame passed by the data pointer for management information and stores it for later use in EthSwT_EthRxFinishedIndication().	
Available via	EthSwT_Eth.h	

]

[SWS_EthSwT_00249]

Upstream requirements: [SRS_BSW_00171](#)

[The function [EthSwT_EthRxProcessFrame](#) shall be pre compile time configurable ON/OFF by the configuration parameter: [EthSwTManagementSupportApi](#) .]

8.3.31 EthSwT_EthRxFinishedIndication

[SWS_EthSwT_91005] Definition of API function EthSwT_EthRxFinishedIndication

Upstream requirements: [SRS_Eth_00125](#)

[

Service Name	EthSwT_EthRxFinishedIndication	
Syntax	Std_ReturnType EthSwT_EthRxFinishedIndication (uint8 CtrlIdx, Eth_BufIdxType BufIdx)	
Service ID [hex]	0x24	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	CtrlIdx	Ethernet Controller index





	BufIdx	Ethernet Rx Buffer index
Parameters (inout)	None	
Parameters (out)	None	
Return value	Std_ReturnType	E_OK: Frame successfully processed E_NOT_OK: Frame processing failed
Description	Indication for a finished receive process for a specific Ethernet frame, which results in providing the management information retrieved during EthSwt_EthRxProcessFrame().	
Available via	EthSwt_Eth.h	

]

[SWS_EthSwt_00253]

Upstream requirements: [SRS_BSW_00171](#)

[The function [EthSwt_EthRxFinishedIndication](#) shall be pre compile time configurable ON/OFF by the configuration parameter: [EthSwtManagementSupportApi](#).]

8.3.32 EthSwt_EthTxPrepareFrame

[SWS_EthSwt_91006] Definition of API function EthSwt_EthTxPrepareFrame

Upstream requirements: [SRS_Eth_00125](#)

[

Service Name	EthSwt_EthTxPrepareFrame	
Syntax	<pre>Std_ReturnType EthSwt_EthTxPrepareFrame (uint8 CtrlIdx, Eth_BufIdxType BufIdx, uint8** DataPtr, uint16* LengthPtr)</pre>	
Service ID [hex]	0x25	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	CtrlIdx	Ethernet Controller index
	BufIdx	Ethernet Rx Buffer index
Parameters (inout)	DataPtr	IN: Pointer to the position of the EtherType of a common Ethernet frame OUT: Pointer to the position of the EtherType in the management frame
	LengthPtr	IN: Pointer to the length of the buffer without management information OUT: Pointer to the modified length needed for buffer and management information
Parameters (out)	None	





Return value	Std_ReturnType	E_OK: Frame successfully prepared E_NOT_OK: Frame preparation failed
Description	Prepares the Ethernet frame for common Ethernet communication (frame shall be handled by switch according to the common address resolution behavior) and stores the information for processing of EthSwT_EthTxFinishedIndication().	
Available via	EthSwT_Eth.h	

]

[SWS_EthSwT_00257]

Upstream requirements: [SRS_BSW_00171](#)

[The function [EthSwT_EthTxPrepareFrame](#) shall be pre compile time configurable ON/OFF by the configuration parameter: [EthSwTManagementSupportApi](#) .]

8.3.33 EthSwT_EthTxAdaptBufferLength

[SWS_EthSwT_91007] Definition of API function EthSwT_EthTxAdaptBuffer Length

Upstream requirements: [SRS_Eth_00125](#)

[

Service Name	EthSwT_EthTxAdaptBufferLength	
Syntax	void EthSwT_EthTxAdaptBufferLength (uint16* LengthPtr)	
Service ID [hex]	0x26	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	None	
Parameters (inout)	LengthPtr	IN: Pointer to the length of the buffer without management information. OUT: Pointer to the modified length needed for buffer and management information.
Parameters (out)	None	
Return value	None	
Description	Modifies the buffer length to be able to insert management information.	
Available via	EthSwT_Eth.h	

]

[SWS_EthSwt_00261]

Upstream requirements: [SRS_BSW_00171](#)

[The function `EthSwt_EthTxAdaptBufferLength` shall be pre compile time configurable ON/OFF by the configuration parameter: `EthSwtManagementSupportApi` .]

8.3.34 EthSwt_SetMgmtInfo

[SWS_EthSwt_91008] Definition of API function EthSwt_SetMgmtInfo

Upstream requirements: [SRS_Eth_00125](#)

[

Service Name	EthSwt_SetMgmtInfo	
Syntax	<pre>Std_ReturnType EthSwt_SetMgmtInfo (uint8 CtrlIdx, Eth_BufIdxType BufIdx, const EthSwt_MgmtInfoType* MgmtInfoPtr)</pre>	
Service ID [hex]	0x27	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	CtrlIdx	Ethernet Controller index
	BufIdx	Ethernet Rx Buffer index
	MgmtInfoPtr	Pointer to the management information
Parameters (inout)	None	
Parameters (out)	None	
Return value	Std_ReturnType	E_OK: Management infos successfully set E_NOT_OK: Setting of management infos failed
	Description	
Description		Extends the Ethernet frame prepared previously by <code>EthSwt_EthTxPrepareFrame()</code> with the management information to achieve transmission only on specific ports.
Available via	EthSwt.h	

]

[SWS_EthSwt_00264]

Upstream requirements: [SRS_BSW_00171](#)

[The function `EthSwt_SetMgmtInfo` shall be pre compile time configurable ON/OFF by the configuration parameter: `EthSwtManagementSupportApi` .]

8.3.35 EthSwT_EthTxProcessFrame

[SWS_EthSwT_91009] Definition of API function EthSwT_EthTxProcessFrame

Upstream requirements: [SRS_Eth_00125](#)

[

Service Name	EthSwT_EthTxProcessFrame	
Syntax	<pre>Std_ReturnType EthSwT_EthTxProcessFrame (uint8 CtrlIdx, Eth_BufIdxType BufIdx, uint8** DataPtr, uint16* LengthPtr)</pre>	
Service ID [hex]	0x28	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	CtrlIdx	Ethernet Controller index
	BufIdx	Ethernet Rx Buffer index
Parameters (inout)	DataPtr	IN: Pointer to the position of the EtherType of a common Ethernet frame OUT: Pointer to the position of the EtherType in the management frame
	LengthPtr	IN: Pointer to the length of the received frame OUT: Pointer to the length decreased by the management information length
Parameters (out)	None	
Return value	Std_ReturnType	E_OK: Frame successfully processed E_NOT_OK: Frame processing failed
Description	Function inserts management information into the Ethernet frame.	
Available via	EthSwT_Eth.h	

]

[SWS_EthSwT_00268]

Upstream requirements: [SRS_BSW_00171](#)

[The function [EthSwT_EthTxProcessFrame](#) shall be pre compile time configurable ON/OFF by the configuration parameter: [EthSwTManagementSupportApi](#) .]

8.3.36 EthSwt_EthTxFinishedIndication

[SWS_EthSwt_91010] Definition of API function EthSwt_EthTxFinishedIndication

Upstream requirements: [SRS_Eth_00125](#)

[

Service Name	EthSwt_EthTxFinishedIndication	
Syntax	Std_ReturnType EthSwt_EthTxFinishedIndication (uint8 CtrlIdx, Eth_BufIdxType BufIdx)	
Service ID [hex]	0x29	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	CtrlIdx	Ethernet Controller index
	BufIdx	Ethernet Rx Buffer index
Parameters (inout)	None	
Parameters (out)	None	
Return value	Std_ReturnType	E_OK: Frame successfully processed E_NOT_OK: Frame processing failed
Description	Indication for a finished transmit process for a specific Ethernet frame.	
Available via	EthSwt_Eth.h	

]

[SWS_EthSwt_00273]

Upstream requirements: [SRS_BSW_00171](#)

[The function [EthSwt_EthTxFinishedIndication](#) shall be pre compile time configurable ON/OFF by the configuration parameter: [EthSwtManagementSupportApi](#).]

8.3.37 EthSwt_PortEnableTimeStamp

[SWS_EthSwt_91028] Definition of API function EthSwt_PortEnableTimeStamp

Upstream requirements: [SRS_Eth_00125](#)

[

Service Name	EthSwt_PortEnableTimeStamp	
Syntax	Std_ReturnType EthSwt_PortEnableTimeStamp (uint8 CtrlIdx, Eth_BufIdxType BufIdx, EthSwt_MgmtInfoType* MgmtInfoPtr)	
Service ID [hex]	0x40	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	CtrlIdx	Ethernet Controller index
	BufIdx	Ethernet Rx Buffer index
	MgmtInfoPtr	Management information including SwitchIdx and SwitchPortIdx
Parameters (inout)	None	
Parameters (out)	None	
Return value	Std_ReturnType	E_OK: Time stamping on egress successfully enabled E_NOT_OK: Enabling of time stamping on egress has been failed
	Description	
Activates egress time stamping on a dedicated message object on a dedicated port of a Switch if EthSwtPortTimeStampSupport is set to TRUE for this port. The selective activation of dedicated message objects for time stamping reduces the number of notification calls only to the required calls. Some HW does store once the egress time stamp marker and some HW needs it always before transmission. There will be no disabled functionality, due to the fact, that the message type is always "time stamped" by network design.		
Available via	EthSwt.h	

]

[SWS_EthSwt_00379]

Upstream requirements: [SRS_BSW_00171](#)

[The function [EthSwt_PortEnableTimeStamp](#) shall be pre compile time configurable ON/OFF by the configuration parameter: [EthSwtGlobalTimeSupportApi](#).]

8.3.38 EthSwt_VerifyConfig

[SWS_EthSwt_91012] Definition of API function EthSwt_VerifyConfig

Upstream requirements: [SRS_Eth_00126](#)

[

Service Name	EthSwt_VerifyConfig	
Syntax	Std_ReturnType EthSwt_VerifyConfig (uint8 SwitchIdx, boolean* Result)	
Service ID [hex]	0x31	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	SwitchIdx	Index of the switch within the context of the Ethernet Switch Driver
Parameters (inout)	None	
Parameters (out)	Result	Result of verification, TRUE: configuration verified ok, FALSE: configuration values found corrupted
Return value	Std_ReturnType	E_OK: Configuration verification succeeded, E_NOT_OK: Configuration verification not succeeded.
Description	Verifies the Switch Configuration depending on the HW-Architecture, HW-capability and the intended accuracy of this verification.	
Available via	EthSwt.h	

]

[SWS_EthSwt_00287]

Upstream requirements: [SRS_BSW_00171](#)

[The function [EthSwt_VerifyConfig](#) shall be compile time configurable On/Off by the configuration parameter: [EthSwtVerifyConfigApi](#).]

8.3.39 EthSwt_SetForwardingMode

[SWS_EthSwt_91013] Definition of API function EthSwt_SetForwardingMode

Upstream requirements: [SRS_Eth_00126](#)

[

Service Name	EthSwt_SetForwardingMode	
Syntax	Std_ReturnType EthSwt_SetForwardingMode (uint8 SwitchIdx, boolean mode)	
Service ID [hex]	0x32	

▽



Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	SwitchIdx	Index of the switch within the context of the Ethernet Switch Driver
	mode	True Forwarding enabled, False Forwarding disabled
Parameters (inout)	None	
Parameters (out)	None	
Return value	Std_ReturnType	E_OK: stopping of frame forwarding succeeded, E_NOT_OK: stopping of frame forwarding not succeeded.
Description	Configures switch to start or stop forwarding for all ports. This API call may be used during switch configuration verification.	
Available via	EthSwt.h	

]

[SWS_EthSwt_00291]

Upstream requirements: [SRS_BSW_00171](#)

[The function `EthSwt_SetForwardingMode` shall be compile time configurable On/Off by the configuration parameter: `EthSwtSetForwardingModeApi`.]

8.3.40 EthSwt_GetPortSignalQuality

[SWS_EthSwt_91014] Definition of API function EthSwt_GetPortSignalQuality

Upstream requirements: [SRS_Eth_00123](#)

[

Service Name	EthSwt_GetPortSignalQuality	
Syntax	Std_ReturnType EthSwt_GetPortSignalQuality (uint8 SwitchIdx, uint8 PortIdx, uint32* SignalQualityPtr)	
Service ID [hex]	0x33	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	SwitchIdx	Index of the switch within the context of the Ethernet Switch Driver
	PortIdx	Index of the port at the addressed switch
Parameters (inout)	None	
Parameters (out)	SignalQualityPtr	Pointer to the memory where the signal quality shall be stored.
Return value	Std_ReturnType	E_OK: signal quality could be read. E_NOT_OK: signal quality could not be read (i.e. no Ethernet transceiver is available for this Ethernet switch port)
Description	The function retrieves the signal quality of the link of the indexed Ethernet switch port. If no transceiver is referenced the signal quality shall be set to 0xFFFFFFFF.	





Available via	EthSwT.h
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]

[SWS_EthSwT_00293]

Upstream requirements: [SRS_Eth_00123](#)

[The function `EthSwT_GetPortSignalQuality` shall obtain the signal quality by calling the function `EthTrcv_GetPhySignalQuality` of the referenced Ethernet Transceiver Driver. If the current signal quality is not available, the signal quality shall be set to `0xFFFFFFFF`.]

[SWS_EthSwT_00297]

Upstream requirements: [SRS_BSW_00171](#)

[The function `EthSwT_GetPortSignalQuality` shall be pre compile time configurable On/Off by the configuration parameter: `EthSwTGetPortSignalQualityApi`.]

8.3.41 EthSwT_GetPortIdentifier

[SWS_EthSwT_91015] Definition of API function EthSwT_GetPortIdentifier

Upstream requirements: [SRS_Eth_00123](#)

[

Service Name	EthSwT_GetPortIdentifier	
Syntax	<pre>Std_ReturnType EthSwT_GetPortIdentifier (uint8 SwitchIdx, uint8 PortIdx, uint32* OrgUniqueIdPtr, uint8* ModelNrPtr, uint8* RevisionNrPtr)</pre>	
Service ID [hex]	0x34	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	SwitchIdx	Index of the switch within the context of the Ethernet Switch Driver
	PortIdx	Index of the port at the addressed switch
Parameters (inout)	None	
Parameters (out)	OrgUniqueIdPtr	Pointer to the memory where the Organizationally Unique Identifier (OUI) shall be stored.
	ModelNrPtr	Pointer to the memory where the Manufacturer's Model Number shall be stored.





	RevisionNrPtr	Pointer to the memory where the Revision Number shall be stored.
Return value	Std_ReturnType	E_OK: organizationally unique identifier of the Ethernet transceiver could be read. E_NOT_OK: organizationally unique identifier of the Ethernet transceiver could not be obtained (i.e. OUI is not available).
Description	This function retrieves the OUI (24 bit) of the indexed Ethernet switch port.	
Available via	EthSwT.h	

]

[SWS_EthSwT_00299]

Upstream requirements: [SRS_Eth_00123](#)

[The function [EthSwT_GetPortIdentifier](#) shall return the value of the organizationally unique identifier (OUI 24 bit) of the indexed Ethernet switch port that is connected to the indexed Ethernet switch. It shall set the 8 most significant bits of the OUI to 0xFFxxxxxx. If the Ethernet switch port references an Ethernet transceiver, the function shall obtain the OUI by calling the function [EthTrcv_GetPhyIdentifier](#) and set the 8 most significant bits of the OUI to 0x00xxxxxx.]

[SWS_EthSwT_00394] [If neither the Ethernet switch port nor the Ethernet Transceiver Driver can provide an OUI the function [EthSwT_GetPortIdentifier](#) shall return E_NOT_OK.]

[SWS_EthSwT_00303]

Upstream requirements: [SRS_BSW_00171](#)

[The function [EthSwT_GetPortIdentifier](#) shall be pre compile time configurable On/Off by the configuration parameter: [EthSwTGetPortIdentifierApi](#).]

8.3.42 EthSwT_GetSwitchIdentifier

[SWS_EthSwT_91016] Definition of API function EthSwT_GetSwitchIdentifier

Upstream requirements: [SRS_Eth_00123](#)

[

Service Name	EthSwT_GetSwitchIdentifier
Syntax	Std_ReturnType EthSwT_GetSwitchIdentifier (uint8 SwitchIdx, uint32* OrgUniqueIdPtr)
Service ID [hex]	0x35





Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	SwitchIdx	Index of the switch within the context of the Ethernet Switch Driver
Parameters (inout)	None	
Parameters (out)	OrgUniqueIdPtr	Pointer to the memory where the Organizationally Unique Identifier shall be stored.
Return value	Std_ReturnType	E_OK: organizationally unique identifier of the Ethernet switch could be read. E_NOT_OK: organizationally unique identifier of the Ethernet switch could not be read (i.e. no OUI is available for this Ethernet switch)
Description	Obtain the Organizationally Unique Identifier that is given by the IEEE of the indexed Ethernet switch. This function shall provide the OUI of Ethernet switch. The OUI has a size of 24 bit. If a ethernet switch can provide the OUI the 8 most significant bits of the OUI shall be set to 0x00xxxxx. If a Ethernet switch can not provide the OUI the 8 most significant bits of the OUI shall be set to 0xFFxxxxx.	
Available via	EthSwt.h	

]

[SWS_EthSwt_00305]

Upstream requirements: [SRS_Eth_00123](#)

[The function `EthSwt_GetSwitchIdentifier` shall return the value of the organizationally unique identifier of the indexed Ethernet switch.]

[SWS_EthSwt_00308]

Upstream requirements: [SRS_BSW_00171](#)

[The function `EthSwt_GetSwitchIdentifier` shall be pre compile time configurable On/Off by the configuration parameter: `EthSwtGetSwitchIdentifierApi`.]

8.3.43 EthSwt_WritePortMirrorConfiguration

[SWS_EthSwt_91018] Definition of API function EthSwt_WritePortMirrorConfiguration

Upstream requirements: [SRS_Eth_00123](#)

[

Service Name	EthSwt_WritePortMirrorConfiguration
Syntax	Std_ReturnType EthSwt_WritePortMirrorConfiguration (uint8 MirroredSwitchIdx, const EthSwt_PortMirrorCfgType* PortMirrorConfigurationPtr)
Service ID [hex]	0x36





Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	MirroredSwitchIdx	Index of the switch within the context of the Ethernet Switch Driver, where the Ethernet switch port is located, that has to be mirrored
	PortMirrorConfiguration Ptr	Pointer of the port configuration, which shall be stored in a shadow buffer in the Ethernet switch driver
Parameters (inout)	None	
Parameters (out)	None	
Return value	Std_ReturnType	E_OK: the port mirror configuration for the indexed Ethernet switch port was written. E_NOT_OK: the port mirror configuration for the indexed Ethernet switch port was not written. (i.e. indexed ethernet switch is not available) ETHSWT_PORT_MIRRORING_CONFIGURATION_NOT_SUPPORTED: port mirroring configuration is not supported by Ethernet switch driver or by the Ethernet switch hardware
Description	Store the given port mirror configuration in a shadow buffer in the Ethernet switch driver for the given MirroredSwitchIdx.	
Available via	EthSwt.h	

]

[SWS_EthSwt_00309]

Upstream requirements: [SRS_Eth_00123](#)

[The function [EthSwt_WritePortMirrorConfiguration](#) shall store the port mirror configuration of the given [MirroredSwitchIdx](#) in a shadow buffer. The [MirroredSwitchIdx](#) shall be used to identify the port mirror configuration within the Ethernet switch driver.]

[SWS_EthSwt_00312]

Upstream requirements: [SRS_BSW_00171](#)

[The function [EthSwt_WritePortMirrorConfiguration](#) shall be pre compile time configurable On/Off by the configuration parameter: [EthSwtWritePortMirrorConfigurationApi](#).]

[SWS_EthSwt_00424]

Upstream requirements: [SRS_Eth_00123](#)

[The function shall return with `ETHSWT_PORT_MIRRORING_CONFIGURATION_NOT_SUPPORTED`, if the port mirroring configuration is not supported by the Ethernet switch driver or by the Ethernet switch hardware, e.g.:

- the configured mirrored traffic direction (see [\[SWS_EthSwt_91017\]](#) "TrafficDirectionIngressBitMask" and "TrafficDirectionEgressBitMask") for ingress and egress traffic of the same port is not supported
- mirrored ports and capture ports, respectively, are not available within the Ethernet switch driver

]

8.3.44 EthSwt_ReadPortMirrorConfiguration

[SWS_EthSwt_91019] Definition of API function EthSwt_ReadPortMirrorConfiguration

Upstream requirements: [SRS_Eth_00123](#)

[

Service Name	EthSwt_ReadPortMirrorConfiguration	
Syntax	Std_ReturnType EthSwt_ReadPortMirrorConfiguration (uint8 MirroredSwitchIdx, EthSwt_PortMirrorCfgType* PortMirrorConfigurationPtr)	
Service ID [hex]	0x37	
Sync/Async	Asynchronous	
Reentrancy	Non Reentrant	
Parameters (in)	MirroredSwitchIdx	Index of the Ethernet switch within the context of the Ethernet Switch Driver, where the Ethernet switch ports are located, that have to be mirrored
Parameters (inout)	None	
Parameters (out)	PortMirrorConfiguration Ptr	Pointer to the memory where the port configuration shall be stored.
Return value	Std_ReturnType	E_OK: the port mirror configuration for the indexed Ethernet switch port was read successfully. E_NOT_OK: the port mirror configuration for the indexed Ethernet switch was not read successfully. (i.e. indexed Ethernet switch is not available)
Description	Obtain the port mirror configuration of the given Ethernet switch.	
Available via	EthSwt.h	

]

[SWS_EthSwt_00313]

Upstream requirements: [SRS_Eth_00123](#)

[The function [EthSwt_ReadPortMirrorConfiguration](#) shall return the port mirror configuration identified by the given `MirroredSwitchIdx`. If no port mirror configuration is found for the `MirroredSwitchIdx`, the function shall return `E_NOT_OK`.]

[SWS_EthSwt_00317]

Upstream requirements: [SRS_BSW_00171](#)

[The function [EthSwt_ReadPortMirrorConfiguration](#) shall be pre compile time configurable On/Off by the configuration parameter: [EthSwtReadPortMirrorConfigurationApi](#).]

8.3.45 EthSwt_DeletePortMirrorConfiguration

[SWS_EthSwt_91034] Definition of API function EthSwt_DeletePortMirrorConfiguration [

Service Name	EthSwt_DeletePortMirrorConfiguration	
Syntax	Std_ReturnType EthSwt_DeletePortMirrorConfiguration (uint8 MirroredSwitchIdx)	
Service ID [hex]	0x4a	
Sync/Async	Synchronous	
Reentrancy	Reentrant for different MirroredSwitchIdx. Non reentrant for the same SwitchIdx.	
Parameters (in)	MirroredSwitchIdx	Index of the switch within the context of the Ethernet Switch Driver.
Parameters (inout)	None	
Parameters (out)	None	
Return value	Std_ReturnType	E_OK: Port mirror configuration was deleted successfully E_NOT_OK: Port mirror configuration was not deleted successfully. (e.g. the port mirroring is enabled)
Description	Delete the stored port mirror configuration of the given MirroredSwitchIdx. If no port mirror configuration was found for the given MirroredSwitchIdx, the return value shall be E_OK.	
Available via	EthSwt.h	

]

[SWS_EthSwt_00425]

Upstream requirements: [SRS_Eth_00123](#)

[The function [EthSwt_DeletePortMirrorConfiguration](#) shall mark the stored port mirror configuration in the shadow buffer of the given MirroredSwitchIdx as "to be deleted".]

[SWS_EthSwt_00426]

Upstream requirements: [SRS_Eth_00123](#)

[If a port mirroring for the given MirroredSwitchIdx is enabled, the request to delete the configuration shall be rejected by returning E_NOT_OK. Only those port configurations are allowed to be deleted, where the port mirroring of the given MirroredSwitchIdx is disabled.]

[SWS_EthSwt_00427]

Upstream requirements: [SRS_BSW_00171](#)

[The function [EthSwt_DeletePortMirrorConfiguration](#) shall be pre compile time configurable On/Off by the configuration parameter: [EthSwtDeletePortMirrorConfigurationApi](#).]

8.3.46 EthSwt_GetPortMirrorState

[SWS_EthSwt_91021] Definition of API function EthSwt_GetPortMirrorState

Upstream requirements: [SRS_Eth_00123](#)

[

Service Name	EthSwt_GetPortMirrorState	
Syntax	<pre>Std_ReturnType EthSwt_GetPortMirrorState (uint8 SwitchIdx, uint8 PortIdx, EthSwt_PortMirrorStateType* PortMirrorStatePtr)</pre>	
Service ID [hex]	0x38	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	SwitchIdx	Index of the switch within the context of the Ethernet Switch Driver
	PortIdx	Index of the port at the addressed switch
Parameters (inout)	None	
Parameters (out)	PortMirrorStatePtr	Pointer to the memory where the port mirroring state (either PORT_MIRRORING_ENABLED or PORT_MIRRORING_DISABLED)of the given Ethernet switch port shall be stored.
Return value	Std_ReturnType	<p>E_OK: the port mirroring state for the indexed Ethernet switch port returned successfully.</p> <p>E_NOT_OK: the port mirror configuration for the indexed Ethernet switch returned not successfully. (i.e. indexed ethernet switch port is not available)</p>
Description	Obtain the current status of the port mirroring for the indexed Ethernet switch port	
Available via	EthSwt.h	

]

[SWS_EthSwt_00318]

Upstream requirements: [SRS_Eth_00123](#)

[The function [EthSwt_GetPortMirrorState](#) shall return the port mirroring state of the indexed ethernet switch port.]

[SWS_EthSwt_00322]

Upstream requirements: [SRS_BSW_00171](#)

[The function [EthSwt_GetPortMirrorState](#) shall be pre compile time configurable On/Off by the configuration parameter: [EthSwtGetPortMirrorStateApi](#).]

8.3.47 EthSwt_SetPortMirrorState

[SWS_EthSwt_91022] Definition of API function EthSwt_SetPortMirrorState

Upstream requirements: [SRS_Eth_00123](#)

[

Service Name	EthSwt_SetPortMirrorState	
Syntax	Std_ReturnType EthSwt_SetPortMirrorState (uint8 MirroredSwitchIdx, EthSwt_PortMirrorStateType PortMirrorState)	
Service ID [hex]	0x39	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	MirroredSwitchIdx	Index of the Ethernet switch within the context of the Ethernet Switch Driver, where the port mirroring configuration is located that has to be enabled and disabled, respectively.
	PortMirrorState	Contain the requested port mirroring state either PORT_MIRRORING_ENABLED or PORT_MIRRORING_DISABLED
Parameters (inout)	None	
Parameters (out)	None	
Return value	Std_ReturnType	E_OK: the requested port mirroring state for the indexed Ethernet switch port was set successfully. E_NOT_OK: the requested port mirroring state for the indexed Ethernet switch was not set successfully. (i.e. indexed Ethernet switch is not available, no port mirror configuration is available)
Description	Request to set the given port mirroring state of the port mirror configuration for the given Ethernet switch.	
Available via	EthSwt.h	

]

[SWS_EthSwt_00323]

Upstream requirements: [SRS_Eth_00123](#)

[The function [EthSwt_SetPortMirrorState](#) shall request the given port mirroring state for the port mirroring configuration of the indexed Ethernet switch, and store the requested port mirror state in a shadow buffer.]

[SWS_EthSwt_00327]

Upstream requirements: [SRS_BSW_00171](#)

[The function [EthSwt_SetPortMirrorState](#) shall be pre compile time configurable On/Off by the configuration parameter: [EthSwtSetPortMirrorStateApi](#).]

8.3.48 EthSwt_SetPortTestMode

[SWS_EthSwt_91029] Definition of API function EthSwt_SetPortTestMode

Upstream requirements: [SRS_Eth_00123](#)

[

Service Name	EthSwt_SetPortTestMode	
Syntax	Std_ReturnType EthSwt_SetPortTestMode (uint8 SwitchIdx, uint8 PortIdx, EthTrcv_PhyTestModeType Mode)	
Service ID [hex]	0x3a	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	SwitchIdx	Index of the switch within the context of the Ethernet Switch Driver
	PortIdx	Index of the port at the addressed switch
	Mode	Test mode to be activated
Parameters (inout)	None	
Parameters (out)	None	
Return value	Std_ReturnType	E_OK: the port test mode for the indexed Ethernet switch port was set successfully. E_NOT_OK: the port test mode for the indexed Ethernet switch was not set successfully. (i.e. indexed Ethernet switch port is not available)
Description	Activates a given test mode of the indexed Ethernet switch port.	
Available via	EthSwt.h	

]

[SWS_EthSwt_00328]

Upstream requirements: [SRS_Eth_00123](#)

[The function [EthSwt_SetPortTestMode](#) shall forward the call with the given test mode by calling the function [EthTrcv_SetPhyTestMode](#) of the referenced Ethernet Transceiver Driver.]

[SWS_EthSwt_00332]

Upstream requirements: [SRS_BSW_00171](#)

[The function [EthSwt_SetPortTestMode](#) shall be pre compile time configurable On/Off by the configuration parameter: [EthSwtSetPortTestModeApi](#).]

8.3.49 EthSwt_SetPortLoopbackMode

[SWS_EthSwt_91023] Definition of API function EthSwt_SetPortLoopbackMode

Upstream requirements: [SRS_Eth_00123](#)

[

Service Name	EthSwt_SetPortLoopbackMode	
Syntax	<pre>Std_ReturnType EthSwt_SetPortLoopbackMode (uint8 SwitchIdx, uint8 PortIdx, EthTrcv_PhyLoopbackModeType Mode)</pre>	
Service ID [hex]	0x3b	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	SwitchIdx	Index of the switch within the context of the Ethernet Switch Driver
	PortIdx	Index of the port at the addressed switch
	Mode	Loop-back mode to be activated
Parameters (inout)	None	
Parameters (out)	None	
Return value	Std_ReturnType	E_OK: the port mirroring loop-back mode for the indexed Ethernet switch port was activated successfully. E_NOT_OK: the port mirroring loop-back mode for the indexed Ethernet switch port was not activated successfully. (i.e. indexed Ethernet switch port is not available)
	Description	Activates a given test loop-back mode of the indexed Ethernet switch port.
Available via	EthSwt.h	

]

[SWS_EthSwt_00334]

Upstream requirements: [SRS_Eth_00123](#)

[The function [EthSwt_SetPortLoopbackMode](#) shall forward the call with the given loop-back mode by calling the function [EthTrcv_SetPhyLoopbackMode](#) of the referenced Ethernet Transceiver Driver.]

[SWS_EthSwt_00338]

Upstream requirements: [SRS_BSW_00171](#)

[The function [EthSwt_SetPortLoopbackMode](#) shall be pre compile time configurable On/Off by the configuration parameter: [EthSwtSetPortLoopbackModeApi](#).]

8.3.50 EthSwt_SetPortTxMode

[SWS_EthSwt_91024] Definition of API function EthSwt_SetPortTxMode

Upstream requirements: [SRS_Eth_00123](#)

[

Service Name	EthSwt_SetPortTxMode	
Syntax	<pre>Std_ReturnType EthSwt_SetPortTxMode (uint8 SwitchIdx, uint8 PortIdx, EthTrcv_PhyTxModeType Mode)</pre>	
Service ID [hex]	0x3c	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	SwitchIdx	Index of the switch within the context of the Ethernet Switch Driver
	PortIdx	Index of the port at the addressed switch
	Mode	Transmission mode to be activated
Parameters (inout)	None	
Parameters (out)	None	
Return value	Std_ReturnType	E_OK: the port Tx mode for the indexed Ethernet switch port was activated successfully. E_NOT_OK: the port Tx mode for the indexed Ethernet switch port was not activated successfully. (i.e. indexed Ethernet switch port is not available)
	Description	Activates a given transmission mode of the indexed Ethernet switch port.
Available via	EthSwt.h	

]

[SWS_EthSwt_00340]

Upstream requirements: [SRS_Eth_00123](#)

[The function [EthSwt_SetPortTxMode](#) shall forward the call with the given transmission mode by calling the function [EthTrcv_SetPhyTxMode](#) of the referenced Ethernet Transceiver Driver.]

[SWS_EthSwt_00344]

Upstream requirements: [SRS_BSW_00171](#)

[The function [EthSwt_SetPortTxMode](#) shall be pre compile time configurable On/Off by the configuration parameter: [EthSwtSetPortTxModeApi](#).]

8.3.51 EthSwt_RunPortCableDiagnostic

[SWS_EthSwt_91011] Definition of API function EthSwt_RunPortCableDiagnostic [

Service Name	EthSwt_RunPortCableDiagnostic	
Syntax	<pre>Std_ReturnType EthSwt_RunPortCableDiagnostic (uint8 SwitchIdxIdx, uint8 PortIdx)</pre>	
Service ID [hex]	0x45	
Sync/Async	Asynchronous	
Reentrancy	Reentrant for different SwitchIdx and PortIdx. Non reentrant for the same SwitchIdx and PortIdx.	
Parameters (in)	SwitchIdxIdx	Index of the switch within the context of the Ethernet Switch Driver.
	PortIdx	Index of the port at the addressed switch.
Parameters (inout)	None	
Parameters (out)	None	
Return value	Std_ReturnType	E_OK: The trigger to run the cable diagnostic has been accepted E_NOT_OK: The trigger to run the cable diagnostic has not been accepted
Description	Trigger the cable diagnostics of the given Ethernet Switch port (PortIdx) by calling EthTrcv_RunCableDiagnostic of the referenced Ethernet transceiver.	
Available via	EthSwt.h	

]

[SWS_EthSwt_00429] [The function `EthSwt_RunPortCableDiagnostic` shall forward the call by calling `EthTrcv_RunCableDiagnostic` of the referenced Ethernet Transceiver Driver.]

8.3.52 EthSwt_GetPortCableDiagnosticsResult

[SWS_EthSwt_91025] Definition of API function EthSwt_GetPortCableDiagnosticsResult

Upstream requirements: [SRS_Eth_00123](#)

[

Service Name	EthSwt_GetPortCableDiagnosticsResult	
Syntax	<pre>Std_ReturnType EthSwt_GetPortCableDiagnosticsResult (uint8 SwitchIdx, uint8 PortIdx, EthTrcv_CableDiagResultType* ResultPtr)</pre>	

▽



Service ID [hex]	0x3f	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	SwitchIdx	Index of the switch within the context of the Ethernet Switch Driver
	PortIdx	Index of the port at the addressed switch
Parameters (inout)	None	
Parameters (out)	ResultPtr	Pointer to the location where the cable diagnostics result shall be stored
Return value	Std_ReturnType	E_OK: the port cable diagnostic result for the indexed Ethernet switch port was obtained successfully. E_NOT_OK: the port cable diagnostic result for the indexed Ethernet switch port was not obtained successfully. (i.e. indexed Ethernet switch port is not available)
Description	Retrieves the cable diagnostics result of the indexed Ethernet switch port respectively the referenced Ethernet Transceiver Driver.	
Available via	EthSwt.h	

]

[SWS_EthSwt_00346]

Upstream requirements: [SRS_Eth_00123](#)

[The function `EthSwt_GetPortCableDiagnosticsResult` shall obtain the cable diagnostics result by calling the function `EthTrcv_GetCableDiagnosticsResult` of the referenced Ethernet Transceiver Driver.]

[SWS_EthSwt_00350]

Upstream requirements: [SRS_BSW_00171](#)

[The function `EthSwt_GetPortCableDiagnosticsResult` shall be pre compile time configurable On/Off by the configuration parameter: `EthSwtGetPortCableDiagnosticsResultApi`.]

8.3.53 EthSwt_GetCfgDataRaw

[SWS_EthSwt_91030] Definition of API function EthSwt_GetCfgDataRaw

Upstream requirements: [SRS_Eth_00123](#)

[

Service Name	EthSwt_GetCfgDataRaw	
Syntax	<pre>Std_ReturnType EthSwt_GetCfgDataRaw (uint8 SwitchIdx, uint32 Offset, uint16 Length, uint8* BufferPtr)</pre>	
Service ID [hex]	0x41	
Sync/Async	Asynchronous	
Reentrancy	Non Reentrant	
Parameters (in)	SwitchIdx	Index of the Ethernet switch within the context of the Ethernet Switch Driver
	Offset	Offset of the Ethernet switch memory from where the reading starts
	Length	Length of data in bytes that shall be copied
Parameters (inout)	None	
Parameters (out)	BufferPtr	Pointer to the location where the data shall be copied
Return value	Std_ReturnType	E_OK: the data read was triggered successfully E_NOT_OK: the data read was not triggered successfully (i.e. indexed Ethernet switch is not available)
Description	Retrieves the data in memory of the indexed Ethernet switch in variable length	
Available via	EthSwt.h	

]

[SWS_EthSwt_00403]

Upstream requirements: [SRS_BSW_00171](#)

[The function [EthSwt_GetCfgDataRaw](#) shall only be available if parameter EthSwt-GetCfgRaw is set to TRUE.]

[**SWS_EthSwt_00404**] [When calling the function [EthSwt_GetCfgDataRaw](#), the function shall check the access to the Ethernet switch driver. If the check fails, the function shall raise the extended production error [ETHSWT_E_ACCESS](#) and return E_NOT_OK, otherwise pass the extended production error [ETHSWT_E_ACCESS](#) and return E_OK.]

8.3.54 EthSwT_GetCfgDataInfo

[SWS_EthSwT_91031] Definition of API function EthSwT_GetCfgDataInfo

Upstream requirements: [SRS_Eth_00123](#)

[

Service Name	EthSwT_GetCfgDataInfo	
Syntax	<pre>Std_ReturnType EthSwT_GetCfgDataInfo (uint8 SwitchIdx, uint32* DataSizePtr, uint32* DataAddressPtr)</pre>	
Service ID [hex]	0x42	
Sync/Async	Synchronous	
Reentrancy	Reentrant	
Parameters (in)	SwitchIdx	Index of the Ethernet switch within the context of the Ethernet Switch Driver
Parameters (inout)	None	
Parameters (out)	DataSizePtr	Pointer to the location where the total size of the configuration data shall be copied
	DataAddressPtr	Pointer to the location where the start address of the configuration registers shall be copied
Return value	Std_ReturnType	E_OK: the data was obtained successfully E_NOT_OK: the data was not obtained successfully. (i.e. indexed Ethernet switch is not available)
Description	Retrieves the total size of data and the memory start address of the indexed Ethernet Switch.	
Available via	EthSwT.h	

]

[SWS_EthSwT_00405]

Upstream requirements: [SRS_BSW_00171](#)

[The function [EthSwT_GetCfgDataInfo](#) shall only be available if parameter EthSwT-GetCfgRaw is set to TRUE.]

[SWS_EthSwT_00406] [When calling the function [EthSwT_GetCfgDataInfo](#), the function shall check the access to the Ethernet switch driver. If the check fails, the function shall raise the extended production error [ETHSWT_E_ACCESS](#) and return E_NOT_OK, otherwise pass the extended production error [ETHSWT_E_ACCESS](#) and return E_OK.]

8.3.55 EthSwt_PortLinkStateRequest

[SWS_EthSwt_91123] Definition of API function EthSwt_PortLinkStateRequest [

Service Name	EthSwt_PortLinkStateRequest	
Syntax	<pre>Std_ReturnType EthSwt_PortLinkStateRequest (uint8 SwitchIdx, uint8 PortIdx, EthTrcv_LinkStateType PortLinkState)</pre>	
Service ID [hex]	0x49	
Sync/Async	Asynchronous	
Reentrancy	Reentrant for different SwitchIdx and PortIdx. Non reentrant for the same SwitchIdx and PortIdx.	
Parameters (in)	SwitchIdx	Index of the switch within the context of the Ethernet Switch Driver.
	PortIdx	Index of the port at the addressed switch.
	PortLinkState	The Ethernet link state of a physical Ethernet connection.
Parameters (inout)	None	
Parameters (out)	None	
Return value	Std_ReturnType	<p>E_OK: Request has been accepted and if the function call is in state ETHSWT_STATE_PORTINIT_COMPLETED or ETHSWT_STATE_ACTIVE</p> <p>E_NOT_OK: Request has not been accepted. (e.g. the indexed Ethernet switch port does not reference an EthTrcv)</p>
Description	Request a link state by calling EthTrcv_TransceiverLinkStateRequest with the TrcvIdx of the Ethernet transceiver which is referenced by the Ethernet Switch port (PortIdx).	
Available via	EthSwt.h	

]

[SWS_EthSwt_00415] [The function `EthSwt_PortLinkStateRequest` shall request the given link state for the indexed Ethernet switch port of the switch by calling the `EthTrcv_TransceiverLinkStateRequest` with the given `EthTrcv_LinkStateType`. If the `EthSwtPort` does not reference an `EthTrcv`, then the function shall return `E_NOT_OK`.]

8.3.56 EthSwt_GetMaxQueueBufferFillLevel

[SWS_EthSwt_91050] Definition of API function EthSwt_GetMaxQueueBufferFillLevel

Service Name	EthSwt_GetMaxQueueBufferFillLevel	
Syntax	<pre>Std_ReturnType EthSwt_GetMaxQueueBufferFillLevel (uint8 SwitchIdx, uint8 SwitchPortIdx, uint8 SwitchPortEgressQueueIdx, uint32* SwitchPortEgressMaxQueueBufferFillLevelPtr)</pre>	
Service ID [hex]	0x48	
Sync/Async	Synchronous	
Reentrancy	Reentrant for different SwitchIdx and PortIdx. Non reentrant for the same SwitchIdx and PortIdx.	
Parameters (in)	SwitchIdx	Index of the Ethernet switch within the context of the Ethernet Switch Driver.
	SwitchPortIdx	Index of the Ethernet switch egress port at the addressed Ethernet switch.
	SwitchPortEgressQueueIdx	Index of the egress queue of the addressed Ethernet switch port
Parameters (inout)	None	
Parameters (out)	SwitchPortEgressMaxQueueBufferFillLevelPtr	Pointer to a memory location, where the maximum amount of allocated queue buffer (in bytes) since the last read out shall be stored
Return value	Std_ReturnType	E_OK: The queue buffer fill level was written to the address pointed to by SwitchPortEgressMaxQueueBufferFillLevelPtr. E_NOT_OK: The maximal queue buffer level could not be obtained
Description	The function retrieves the maximum amount of allocated queue buffer of the indexed Ethernet switch egress port. If the Ethernet switch hardware does not support Ethernet switch port based maximal queue buffer level, the content of SwitchPortEgressMaxQueueBufferFillLevelPtr shall be set to 0xFFFFFFFF. This API may be called by e.g. a CDD.	
Available via	EthSwt.h	

[SWS_EthSwt_00430]

Upstream requirements: [SRS_Eth_00119](#)

[The function [EthSwt_GetMaxQueueBufferFillLevel](#) shall read out the maximum amount of allocated queue buffer since the last read out.]

[SWS_EthSwt_00431]

Upstream requirements: [SRS_Eth_00119](#)

[When the maximum amount of allocated queue buffer is read out, the value shall be reset to 0x00000000 explicitly, if it is not done by the hardware.]

[SWS_EthSwT_00432]

Upstream requirements: [SRS_BSW_00171](#)

[The function [EthSwT_GetMaxQueueBufferFillLevel](#) shall be pre compile time configurable On/Off by the configuration parameter: [EthSwT_GetMaxQueueBuffer-FillLevelApi](#).]

8.3.57 EthSwT_GetRxMgmtObject

[SWS_EthSwT_91038] Definition of API function EthSwT_GetRxMgmtObject [

Service Name	EthSwT_GetRxMgmtObject	
Syntax	<pre>Std_ReturnType EthSwT_GetRxMgmtObject (uint8 CtrlIdx, Eth_DataType* DataPtr, EthSwT_MgmtObjectType** MgmtObjectPtr)</pre>	
Service ID [hex]	0x47	
Sync/Async	Synchronous	
Reentrancy	Reentrant	
Parameters (in)	CtrlIdx	Index of an Ethernet Interface controller
	DataPtr	Ethernet data pointer
Parameters (inout)	None	
Parameters (out)	MgmtObjectPtr	Pointer to the management object.
Return value	Std_ReturnType	E_OK: success E_NOT_OK: management object could not be obtained
Description	Obtains the MgmtObject of the (in this context) unique DataPtr.	
Available via	EthSwT.h	

]

8.3.58 EthSwT_GetTxMgmtObject

[SWS_EthSwT_91039] Definition of API function EthSwT_GetTxMgmtObject [

Service Name	EthSwT_GetTxMgmtObject	
Syntax	<pre>Std_ReturnType EthSwT_GetTxMgmtObject (uint8 CtrlIdx, Eth_BufIdxType BufIdx, EthSwT_MgmtObjectType** MgmtObjectPtr)</pre>	
Service ID [hex]	0x44	
Sync/Async	Synchronous	



△

Reentrancy	Reentrant	
Parameters (in)	CtrlIdx	Index of an Ethernet Interface controller
	BuflIdx	Ethernet Rx Buffer index
Parameters (inout)	None	
Parameters (out)	MgmtObjectPtr	Pointer to the management object.
Return value	Std_ReturnType	E_OK: success E_NOT_OK: management object could not be obtained
Description	Obtains the MgmtObject of the (in this context) unique BuflIdx.	
Available via	EthSwt.h	

]

8.3.59 EthSwt_MacSecUpdateSecY

[SWS_EthSwt_91124] Definition of API function EthSwt_MacSecUpdateSecY

Status: DRAFT

[

Service Name	EthSwt_MacSecUpdateSecY (draft)	
Syntax	<pre>Std_ReturnType EthSwt_MacSecUpdateSecY (const EthSwt_MgmtInfoType* MgmtInfoPtr, const Mka_MacSecConfigType* MACsecCfgPtr, uint64 TxSci)</pre>	
Service ID [hex]	0x4d	
Sync/Async	Asynchronous	
Reentrancy	Reentrant for different MgmtInfoPtr, Non reentrant for the same MgmtInfoPtr	
Parameters (in)	MgmtInfoPtr	Pointer to the management information within the context of an Ethernet Switch Driver. SwitchIdx in context of EthSwt (EthSwt Config/EthSwtIdx), PortIdx in context of EthSwt (EthSwtPort/EthSwtPortIdx).
	MACsecCfgPtr	Pointer to the structure to configure a MACsec Entity (SecY)
	TxSci	Secure Channel Identifier for the MACsec's Transmission Secure channel
Parameters (inout)	None	
Parameters (out)	None	
Return value	Std_ReturnType	E_OK: The request has been accepted E_NOT_OK: The request has not been accepted
Description	Requests the Ethernet Switch to update the SecY/PAC of the PHY with the provided parameters. A Transmission Secure Channel with the provided SCI shall be configured during the first call. A pointer to a MACsec Basic Parameters Configuration file shall be provided to create the Secure Channel. Tags: atp.Status=draft	
Available via	EthSwt.h	

]

8.3.60 EthSwT_MacSecUpdateSecYNotification

[SWS_EthSwT_91135] Definition of callback function EthSwT_MacSecUpdateSecYNotification

Status: DRAFT

[

Service Name	EthSwT_MacSecUpdateSecYNotification (draft)	
Syntax	<pre>void EthSwT_MacSecUpdateSecYNotification (const EthSwT_MgmtInfoType* MgmtInfoPtr, Std_ReturnType Result)</pre>	
Service ID [hex]	0x58	
Sync/Async	Synchronous	
Reentrancy	Reentrant for different MgmtInfoPtr, Non reentrant for the same MgmtInfoPtr	
Parameters (in)	MgmtInfoPtr	Pointer to the management information within the context of an Ethernet Switch Driver. SwitchIdx in context of EthSwT (EthSwT Config/EthSwTIdx), PortIdx in context of EthSwT (EthSwTPort/EthSwTPortIdx).
	Result	<p>E_OK: EthTrcv_EthSwitchMacSecUpdateSecY has finished and SecY is updated with the provided parameters of EthTrcv_EthSwitchMacSecUpdateSecY</p> <p>E_NOT_OK: SecY has not been updated with the provided parameters of EthTrcv_EthSwitchMacSecUpdateSecY.</p>
Parameters (inout)	None	
Parameters (out)	None	
Return value	None	
Description	<p>Callback to notify that EthTrcv_EthSwitchMacSecUpdateSecY has finished.</p> <p>Tags: atp.Status=draft</p>	
Available via	EthSwT.h	

]

8.3.61 EthSwT_MacSecInitRxSc

[SWS_EthSwT_91125] Definition of API function EthSwT_MacSecInitRxSc

Status: DRAFT

[

Service Name	EthSwT_MacSecInitRxSc (draft)	
Syntax	<pre>Std_ReturnType EthSwT_MacSecInitRxSc (const EthSwT_MgmtInfoType* MgmtInfoPtr, uint64 Sci)</pre>	
Service ID [hex]	0x4e	





Sync/Async	Synchronous	
Reentrancy	Reentrant for different MgmtInfoPtr, Non reentrant for the same MgmtInfoPtr	
Parameters (in)	MgmtInfoPtr	Pointer to the management information within the context of an Ethernet Switch Driver. SwitchIdx in context of EthSwt (EthSwt Config/EthSwtIdx), PortIdx in context of EthSwt (EthSwtPort/EthSwtPortIdx).
	Sci	Secure Channel Identifier for the MACsec's Reception Secure channel
Parameters (inout)	None	
Parameters (out)	None	
Return value	Std_ReturnType	E_OK: The request has been accepted E_NOT_OK: The request has not been accepted
Description	Requests the Ethernet Switch Driver to configure a Reception Secure Channel for the given Secure Channel Identifier. Tags: atp.Status=draft	
Available via	EthSwt.h	

]

8.3.62 EthSwt_MacSecResetRxSc

[SWS_EthSwt_91126] Definition of API function EthSwt_MacSecResetRxSc

Status: DRAFT

[

Service Name	EthSwt_MacSecResetRxSc (draft)	
Syntax	<pre>Std_ReturnType EthSwt_MacSecResetRxSc (const EthSwt_MgmtInfoType* MgmtInfoPtr, uint64 Sci)</pre>	
Service ID [hex]	0x4f	
Sync/Async	Synchronous	
Reentrancy	Reentrant for different MgmtInfoPtr, Non reentrant for the same MgmtInfoPtr	
Parameters (in)	MgmtInfoPtr	Pointer to the management information within the context of an Ethernet Switch Driver. SwitchIdx in context of EthSwt (EthSwt Config/EthSwtIdx), PortIdx in context of EthSwt (EthSwtPort/EthSwtPortIdx).
	Sci	Secure Channel Identifier for the MACsec's Reception Secure channel
Parameters (inout)	None	
Parameters (out)	None	
Return value	Std_ReturnType	E_OK: The request has been accepted E_NOT_OK: The request has not been accepted
Description	Requests the Ethernet Switch Driver to reset to default the MACsec values of the Reception Secure Channel for the given Secure Channel Identifier. Tags: atp.Status=draft	
Available via	EthSwt.h	

]

8.3.63 EthSwt_MacSecAddTxSa

[SWS_EthSwt_91127] Definition of API function EthSwt_MacSecAddTxSa

Status: DRAFT

[

Service Name	EthSwt_MacSecAddTxSa (draft)	
Syntax	<pre>Std_ReturnType EthSwt_MacSecAddTxSa (const EthSwt_MgmtInfoType* MgmtInfoPtr, uint8 An, uint64 NextPn, uint32 Ssci, const Mka_SakKeyPtrType* KeysPtr, boolean Active)</pre>	
Service ID [hex]	0x50	
Sync/Async	Asynchronous	
Reentrancy	Reentrant for different MgmtInfoPtr, Non reentrant for the same MgmtInfoPtr	
Parameters (in)	MgmtInfoPtr	Pointer to the management information within the context of an Ethernet Switch Driver. SwitchIdx in context of EthSwt (EthSwt Config/EthSwtIdx), PortIdx in context of EthSwt (EthSwtPort/EthSwtPortIdx).
	An	Association Number to use in the MACsec's transmission secure association
	NextPn	Next accepted Packet Number in the MACsec's transmission secure association
	Ssci	Short Secure Channel Identifier used in the MACsec's transmission secure association
	KeysPtr	Pointer to the SAKs Key (and needed Key information) to use in the MACsec's transmission secure association
	Active	Boolean to enable/disable the MACsec's transmission secure association
Parameters (inout)	None	
Parameters (out)	None	
Return value	Std_ReturnType	E_OK: The request has been accepted E_NOT_OK: The request has not been accepted
Description	Requests the Ethernet Switch Driver to create a Transmission Secure Association in the Transceiver. The Short Secure Channel Identifier is included to support XPN configurations. Tags: atp.Status=draft	
Available via	EthSwt.h	

]

8.3.64 EthSwt_MacSecAddTxSaNotification

[SWS_EthSwt_91136] Definition of callback function EthSwt_MacSecAddTxSa Notification

Status: DRAFT

[

Service Name	EthSwt_MacSecAddTxSaNotification (draft)	
Syntax	<pre>void EthSwt_MacSecAddTxSaNotification (const EthSwt_MgmtInfoType* MgmtInfoPtr, Std_ReturnType Result)</pre>	
Service ID [hex]	0x59	
Sync/Async	Synchronous	
Reentrancy	Reentrant for different MgmtInfoPtr, Non reentrant for the same MgmtInfoPtr	
Parameters (in)	MgmtInfoPtr	Pointer to the management information within the context of an Ethernet Switch Driver. SwitchIdx in context of EthSwt (EthSwt Config/EthSwtIdx), PortIdx in context of EthSwt (EthSwtPort/EthSwtPortIdx).
	Result	E_OK: EthTrcv_EthSwitchMacSecAddTxSa has finished and Transmission Secure Association is created E_NOT_OK: The Transmission Secure Association is not created through EthTrcv_EthSwitchMacSecAddTxSa.
Parameters (inout)	None	
Parameters (out)	None	
Return value	None	
Description	Callback to notify that EthTrcv_EthSwitchMacSecAddTxSa has finished. Tags: atp.Status=draft	
Available via	EthSwt.h	

]

8.3.65 EthSwt_MacSecUpdateTxSa

[SWS_EthSwt_91128] Definition of API function EthSwt_MacSecUpdateTxSa

Status: DRAFT

[

Service Name	EthSwt_MacSecUpdateTxSa (draft)	
Syntax	<pre>Std_ReturnType EthSwt_MacSecUpdateTxSa (const EthSwt_MgmtInfoType* MgmtInfoPtr, uint8 An, uint64 NextPn, boolean Active)</pre>	
Service ID [hex]	0x51	





Sync/Async	Synchronous	
Reentrancy	Reentrant for different MgmtInfoPtr, Non reentrant for the same MgmtInfoPtr	
Parameters (in)	MgmtInfoPtr	Pointer to the management information within the context of an Ethernet Switch Driver. SwitchIdx in context of EthSwt (EthSwt Config/EthSwtIdx), PortIdx in context of EthSwt (EthSwtPort/EthSwtPortIdx).
	An	Association Number to use in the MACsec's transmission secure association
	NextPn	Next accepted Packet Number in the MACsec's transmission secure association
	Active	Boolean to enable/disable the MACsec's transmission secure association
Parameters (inout)	None	
Parameters (out)	None	
Return value	Std_ReturnType	E_OK: The request has been accepted E_NOT_OK: The request has not been accepted
Description	Requests the Ethernet Switch Driver to update the Transmission Secure Association with the given Packet Number. The Active parameter is included to change the specified AN status. Tags: atp.Status=draft	
Available via	EthSwt.h	

]

8.3.66 EthSwt_MacSecDeleteTxSa

[SWS_EthSwt_91129] Definition of API function EthSwt_MacSecDeleteTxSa

Status: DRAFT

[

Service Name	EthSwt_MacSecDeleteTxSa (draft)	
Syntax	<pre>Std_ReturnType EthSwt_MacSecDeleteTxSa (const EthSwt_MgmtInfoType* MgmtInfoPtr, uint8 An)</pre>	
Service ID [hex]	0x52	
Sync/Async	Synchronous	
Reentrancy	Reentrant for different MgmtInfoPtr, Non reentrant for the same MgmtInfoPtr	
Parameters (in)	MgmtInfoPtr	Pointer to the management information within the context of an Ethernet Switch Driver. SwitchIdx in context of EthSwt (EthSwt Config/EthSwtIdx), PortIdx in context of EthSwt (EthSwtPort/EthSwtPortIdx).
	An	Association Number to use in the MACsec's transmission secure association
Parameters (inout)	None	
Parameters (out)	None	
Return value	Std_ReturnType	E_OK: The request has been accepted E_NOT_OK: The request has not been accepted





Description	Request the Ethernet Switch Driver to remove the Transmission Secure Association identified by the provided Association Number. Tags: atp.Status=draft
Available via	EthSwt.h

]

8.3.67 EthSwt_MacSecAddRxSa

[SWS_EthSwt_91130] Definition of API function EthSwt_MacSecAddRxSa

Status: DRAFT

[

Service Name	EthSwt_MacSecAddRxSa (draft)	
Syntax	<pre>Std_ReturnType EthSwt_MacSecAddRxSa (const EthSwt_MgmtInfoType* MgmtInfoPtr, uint8 An, uint64 LowestPn, uint32 Ssci, const Mka_SakKeyPtrType* KeysPtr, boolean Active)</pre>	
Service ID [hex]	0x53	
Sync/Async	Asynchronous	
Reentrancy	Reentrant for different MgmtInfoPtr, Non reentrant for the same MgmtInfoPtr	
Parameters (in)	MgmtInfoPtr	Pointer to the management information within the context of an Ethernet Switch Driver. SwitchIdx in context of EthSwt (EthSwt Config/EthSwtIdx), PortIdx in context of EthSwt (EthSwtPort/EthSwtPortIdx).
	An	Association Number to use in the MACsec's reception secure association
	LowestPn	Lowest accepted Packet Number in the MACsec's reception secure association
	Ssci	Short Secure Channel Identifier used in the MACsec's reception secure association
	KeysPtr	Pointer to the SAKs Key (and needed Key information) to use in the MACsec's reception secure association
	Active	Boolean to enable/disable the MACsec's reception secure association
Parameters (inout)	None	
Parameters (out)	None	
Return value	Std_ReturnType	E_OK: The request has been accepted E_NOT_OK: The request has not been accepted
Description	Request the Ethernet Switch Driver to create a Reception Secure Association in the Transceiver. The Short Secure Channel Identifier is included to support XPN configurations. Tags: atp.Status=draft	
Available via	EthSwt.h	

]

8.3.68 EthSwt_MacSecAddRxSaNotification

[SWS_EthSwt_91137] Definition of callback function EthSwt_MacSecAddRxSa Notification

Status: DRAFT

[

Service Name	EthSwt_MacSecAddRxSaNotification (draft)	
Syntax	<pre>void EthSwt_MacSecAddRxSaNotification (const EthSwt_MgmtInfoType* MgmtInfoPtr, Std_ReturnType Result)</pre>	
Service ID [hex]	0x5a	
Sync/Async	Synchronous	
Reentrancy	Reentrant for different MgmtInfoPtr, Non reentrant for the same MgmtInfoPtr	
Parameters (in)	MgmtInfoPtr	Pointer to the management information within the context of an Ethernet Switch Driver. SwitchIdx in context of EthSwt (EthSwt Config/EthSwtIdx), PortIdx in context of EthSwt (EthSwtPort/EthSwtPortIdx).
	Result	E_OK: EthTrcv_SwitchMacSecAddRxSa has finished and Reception Secure Association is created E_NOT_OK: The Reception Secure Association is not created through EthTrcv_SwitchMacSecAddRxSa.
Parameters (inout)	None	
Parameters (out)	None	
Return value	None	
Description	Callback to notify that EthTrcv_SwitchMacSecAddRxSa has finished. Tags: atp.Status=draft	
Available via	EthSwt.h	

]

8.3.69 EthSwt_MacSecUpdateRxSa

[SWS_EthSwt_91131] Definition of API function EthSwt_MacSecUpdateRxSa

Status: DRAFT

[

Service Name	EthSwt_MacSecUpdateRxSa (draft)	
Syntax	<pre>Std_ReturnType EthSwt_MacSecUpdateRxSa (const EthSwt_MgmtInfoType* MgmtInfoPtr, uint8 An, uint64 LowestPn, boolean Active)</pre>	
Service ID [hex]	0x54	





Sync/Async	Synchronous	
Reentrancy	Reentrant for different MgmtInfoPtr, Non reentrant for the same MgmtInfoPtr	
Parameters (in)	MgmtInfoPtr	Pointer to the management information within the context of an Ethernet Switch Driver. SwitchIdx in context of EthSwt (EthSwt Config/EthSwtIdx), PortIdx in context of EthSwt (EthSwtPort/EthSwtPortIdx).
	An	Association Number to use in the MACsec's reception secure association
	LowestPn	Lowest accepted Packet Number in the MACsec's reception secure association
	Active	Boolean to enable/disable the MACsec's reception secure association
Parameters (inout)	None	
Parameters (out)	None	
Return value	Std_ReturnType	E_OK: The request has been accepted E_NOT_OK: The request has not been accepted
Description	Request the Ethernet Switch Driver to update the Reception Secure Association with the given Packet Number. The Active parameter is included to change the specified AN status. Tags: atp.Status=draft	
Available via	EthSwt.h	

]

8.3.70 EthSwt_MacSecDeleteRxSa

[SWS_EthSwt_91132] Definition of API function EthSwt_MacSecDeleteRxSa

Status: DRAFT

[

Service Name	EthSwt_MacSecDeleteRxSa (draft)	
Syntax	<pre>Std_ReturnType EthSwt_MacSecDeleteRxSa (const EthSwt_MgmtInfoType* MgmtInfoPtr, uint8 An)</pre>	
Service ID [hex]	0x55	
Sync/Async	Synchronous	
Reentrancy	Reentrant for different MgmtInfoPtr, Non reentrant for the same MgmtInfoPtr	
Parameters (in)	MgmtInfoPtr	Pointer to the management information within the context of an Ethernet Switch Driver. SwitchIdx in context of EthSwt (EthSwt Config/EthSwtIdx), PortIdx in context of EthSwt (EthSwtPort/EthSwtPortIdx).
	An	Association Number to use in the MACsec's reception secure association
Parameters (inout)	None	
Parameters (out)	None	
Return value	Std_ReturnType	E_OK: The request has been accepted E_NOT_OK: The request has not been accepted





Description	Request the Ethernet Switch Driver to remove the Reception Secure Association identified by the provided Association Number. Tags: atp.Status=draft
Available via	EthSwt.h

]

8.3.71 EthSwt_MacSecGetTxSaNextPn

[SWS_EthSwt_91133] Definition of API function EthSwt_MacSecGetTxSaNextPn

Status: DRAFT

[

Service Name	EthSwt_MacSecGetTxSaNextPn (draft)	
Syntax	<pre>Std_ReturnType EthSwt_MacSecGetTxSaNextPn (const EthSwt_MgmtInfoType* MgmtInfoPtr, uint8 An, uint64* NextPnPtr)</pre>	
Service ID [hex]	0x56	
Sync/Async	Synchronous	
Reentrancy	Reentrant for different MgmtInfoPtr, Non reentrant for the same MgmtInfoPtr	
Parameters (in)	MgmtInfoPtr	Pointer to the management information within the context of an Ethernet Switch Driver. SwitchIdx in context of EthSwt (EthSwt Config/EthSwtIdx), PortIdx in context of EthSwt (EthSwtPort/EthSwtPortIdx).
	An	Association Number to use in the MACsec's reception secure association
Parameters (inout)	None	
Parameters (out)	NextPnPtr	Pointer to the Next Packet Number read out from the MACsec Entity (SecY)
Return value	Std_ReturnType	E_OK: The request has been accepted E_NOT_OK: The request has not been accepted
Description	Request the Ethernet Switch Driver to return the Packet Number that is used for the next packet in the given Transmission Secure Association. Tags: atp.Status=draft	
Available via	EthSwt.h	

]

8.3.72 EthSwT_MacSecGetMacSecStatistics

[SWS_EthSwT_91134] Definition of API function EthSwT_MacSecGetMacSecStatistics

Status: DRAFT

[

Service Name	EthSwT_MacSecGetMacSecStatistics (draft)	
Syntax	<pre>Std_ReturnType EthSwT_MacSecGetMacSecStatistics (const EthSwT_MgmtInfoType* MgmtInfoPtr, Mka_Stats_SecYType* MacSecStatsPtr)</pre>	
Service ID [hex]	0x57	
Sync/Async	Asynchronous	
Reentrancy	Reentrant for different MgmtInfoPtr, Non reentrant for the same MgmtInfoPtr	
Parameters (in)	MgmtInfoPtr	Pointer to the management information within the context of an Ethernet Switch Driver. SwitchIdx in context of EthSwT (EthSwT Config/EthSwTIdx), PortIdx in context of EthSwT (EthSwTPort/EthSwTPortIdx).
Parameters (inout)	None	
Parameters (out)	MacSecStatsPtr	Pointer to a structure including the MACsec statistics of an MKA participant
Return value	Std_ReturnType	E_OK: The request has been accepted E_NOT_OK: The request has not been accepted
Description	Request the Ethernet Switch Driver to provide MACsec statistics. Tags: atp.Status=draft	
Available via	EthSwT.h	

]

8.3.73 EthSwT_MacSecGetMacSecStatisticsNotification

[SWS_EthSwT_91138] Definition of callback function EthSwT_MacSecGetMacSecStatisticsNotification

Status: DRAFT

[

Service Name	EthSwT_MacSecGetMacSecStatisticsNotification (draft)	
Syntax	<pre>void EthSwT_MacSecGetMacSecStatisticsNotification (const EthSwT_MgmtInfoType* MgmtInfoPtr, Std_ReturnType Result)</pre>	
Service ID [hex]	0x5b	
Sync/Async	Synchronous	
Reentrancy	Reentrant for different MgmtInfoPtr, Non reentrant for the same MgmtInfoPtr	





Parameters (in)	MgmtInfoPtr	Pointer to the management information within the context of an Ethernet Switch Driver. SwitchIdx in context of EthSwt (EthSwt Config/EthSwtIdx), PortIdx in context of EthSwt (EthSwtPort/EthSwtPortIdx).
	Result	E_OK: MacSecStatistics have been received E_NOT_OK: MacSecStatistics have not been received.
Parameters (inout)	None	
Parameters (out)	None	
Return value	None	
Description	Callback to notify that EthTrcv_SwitchMacSecGetMacSecStatistics has finished and provide the requested statistics. Tags: atp.Status=draft	
Available via	EthSwt.h	

8.3.74 EthSwt_MacSecSetControlledPortEnabled

[SWS_EthSwt_91139] Definition of API function EthSwt_MacSecSetControlledPortEnabled

Status: DRAFT

Service Name	EthSwt_MacSecSetControlledPortEnabled (draft)	
Syntax	Std_ReturnType EthSwt_MacSecSetControlledPortEnabled (const EthSwt_MgmtInfoType* MgmtInfoPtr, boolean ControlledPortEnabled)	
Service ID [hex]	0x5c	
Sync/Async	Synchronous	
Reentrancy	Reentrant for different MgmtInfoPtr, Non reentrant for the same MgmtInfoPtr	
Parameters (in)	MgmtInfoPtr	Pointer to the management information within the context of an Ethernet Switch Driver. SwitchIdx in context of EthSwt (EthSwt Config/EthSwtIdx), PortIdx in context of EthSwt (EthSwtPort/EthSwtPortIdx).
	ControlledPortEnabled	Boolean to activate the Controlled Port of the PAE
Parameters (inout)	None	
Parameters (out)	None	
Return value	Std_ReturnType	E_OK: The request has been accepted E_NOT_OK: The request has not been accepted
Description	Requests to set the Controlled Port enabled parameter of a PAE. Tags: atp.Status=draft	
Available via	EthSwt.h	

8.3.75 EthSwt_ExtractStreamHandleIdx

[SWS_EthSwt_91043] Definition of API function EthSwt_ExtractStreamHandleIdx

Status: DRAFT

Upstream requirements: [FO_RS_Fw_00011](#)

[

Service Name	EthSwt_ExtractStreamHandleIdx (draft)	
Syntax	<pre>Std_ReturnType EthSwt_ExtractStreamHandleIdx (const Eth_DataType* DataPtr, uint16 LenByte, uint16* StreamHandleIdxPtr)</pre>	
Service ID [hex]	0x5d	
Sync/Async	Synchronous	
Reentrancy	Reentrant	
Parameters (in)	DataPtr	Pointer to payload of received Ethernet frame.
	LenByte	Length (bytes) of the payload in received frame.
Parameters (inout)	None	
Parameters (out)	StreamHandleIdxPtr	Pointer to the StreamHandleIdx extracted from the network packet
Return value	Std_ReturnType	E_OK: The operation was carried out successfully E_NOT_OK: The operation failed to execute
Description	Extracts the StreamHandleIdx from the switch vendor specific part of the network packet header Tags: atp.Status=draft	
Available via	EthSwt.h	

]

8.3.76 EthSwt_GetStreamHandleIdxStatistics

[SWS_EthSwt_91042] Definition of API function EthSwt_GetStreamStatistics

Status: DRAFT

Upstream requirements: [FO_RS_Fw_00011](#)

[

Service Name	EthSwt_GetStreamStatistics (draft)	
Syntax	<pre>void EthSwt_GetStreamStatistics (uint8 SwitchIdx)</pre>	
Service ID [hex]	0x5e	
Sync/Async	Synchronous	
Reentrancy	Reentrant	
Parameters (in)	SwitchIdx	Index of the switch within the context of the Ethernet Switch Driver

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Parameters (inout)	None
Parameters (out)	None
Return value	None
Description	Requests the statistics (bucket counter values) of an Ethernet switch of all configured streams. Tags: atp.Status=draft
Available via	EthSwt.h

]

8.3.77 EthSwt_SetStreamState

[SWS_EthSwt_91041] Definition of API function EthSwt_SetStreamState

Status: DRAFT

Upstream requirements: [FO_RS_Fw_00011](#)

[

Service Name	EthSwt_SetStreamState (draft)	
Syntax	<pre>void EthSwt_SetStreamState (uint8 SwitchIdx, uint8 StreamHandleIdx, boolean StreamActivityStatus)</pre>	
Service ID [hex]	0x5f	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	SwitchIdx	Index of the switch within the context of the Ethernet Switch Driver
	StreamHandleIdx	Pointer to the StreamHandleIdx for which the status shall be set
	StreamActivityStatus	Activity status of the StreamHandleIdx (True = active, False = inactive) to be set
Parameters (inout)	None	
Parameters (out)	None	
Return value	None	
Description	This function is called by an upper layer application (e.g. diagnostic application) via the EthIf module to control the activity status of a configured stream (given with StreamHandleIdx) within an dedicated Ethernet switch (given with SwitchIdx). Tags: atp.Status=draft	
Available via	EthSwt.h	

]

8.4 Callback notifications

8.4.1 EthSwtPersistentConfigurationResultCallback

[SWS_EthSwt_00193] Definition of callback function <EthSwtPersistentConfigurationResultCallback>

Upstream requirements: [SRS_Eth_00122](#), [SRS_Eth_00087](#)

[

Service Name	<EthSwtPersistentConfigurationResultCallback>	
Syntax	void <EthSwtPersistentConfigurationResultCallback> (NvM_RequestResultType JobResult)	
Service ID [hex]	0x1b	
Sync/Async	Synchronous	
Reentrancy	Reentrant	
Parameters (in)	JobResult	Covers the job result of the previous processed single block job.
Parameters (inout)	None	
Parameters (out)	None	
Return value	None	
Description	Job end notification of EthSwt_StoreConfiguration or EthSwt_ResetConfiguration	
Available via	EthSwtExternals.h	

]

[SWS_EthSwt_00194]

Upstream requirements: [SRS_Eth_00122](#), [SRS_Eth_00087](#)

[The callback function <EthSwtPersistentConfigurationResultCallback> shall be called by the [EthSwt_NvmSingleBlockCallback](#) to inform the caller of [EthSwt_StoreConfiguration](#) or [EthSwt_ResetConfiguration](#) about the state of the past calls.]

8.5 Scheduled functions

8.5.1 EthSwT_MainFunction

[SWS_EthSwT_00114] Definition of scheduled function EthSwT_MainFunction

Upstream requirements: [SRS_BSW_00433](#)

[

Service Name	EthSwT_MainFunction
Syntax	void EthSwT_MainFunction (void)
Service ID [hex]	0x1c
Description	Service to support asynchronous behavior of API calls
Available via	EthSwT_SchM.h

]

[SWS_EthSwT_00115]

Upstream requirements: [SRS_BSW_00433](#)

[The [EthSwT_MainFunction](#) support asynchronous behavior of API calls. This function is directly called by Basic Software Scheduler.]

8.5.2 EthSwT_BackgroundTask

[SWS_EthSwT_91104] Definition of API function EthSwT_BackgroundTask [

Service Name	EthSwT_BackgroundTask
Syntax	void EthSwT_BackgroundTask (void)
Service ID [hex]	0x46
Sync/Async	Synchronous
Reentrancy	Non Reentrant
Parameters (in)	None
Parameters (inout)	None
Parameters (out)	None
Return value	None
Description	The background task should be scheduled as often as possible when no other task runs. It may be used for switch and port initialization in case the EthSwT_Init function needs too much time.
Available via	EthSwT.h

]

8.6 Expected interfaces

In this chapter all external interfaces required from other modules are listed.

8.6.1 Mandatory Interfaces

This chapter defines all external interfaces which are required to fulfill the core functionality of the module.

No mandatory Interfaces defined.

8.6.2 Optional Interfaces

This chapter defines all external interfaces which are required to fulfill an optional functionality of the module.

[SWS_EthSwT_00098] Definition of optional interfaces requested by module Eth Swt

Upstream requirements: [SRS_Eth_00122](#), [SRS_Eth_00118](#), [SRS_Eth_00119](#), [SRS_Eth_00120](#), [SRS_Eth_00087](#), [SRS_Eth_00125](#), [SRS_BSW_00375](#)

[

API Function	Header File	Description
Dem_SetEventStatus	Dem.h	Called by SW-Cs or BSW modules to report monitor status information to the Dem. BSW modules calling Dem_SetEventStatus can safely ignore the return value. This API will be available only if $\{\{Dem/DemConfigSet/DemEventParameter/DemEventReportingType\} == STANDARD_REPORTING\}$
Det_ReportError	Det.h	Service to report development errors.
Eth_ReadMii	Eth.h	Reads a transceiver register
Eth_ReadMmd	Eth.h	Reads a transceiver register using Clause45 access if supported by hardware or implements a Clause45 access using Clause 22 operations
Eth_WriteMii	Eth.h	Configures a transceiver register or triggers a function offered by the receiver
Eth_WriteMmd	Eth.h	Writes a transceiver register using Clause 45 access or implements a Clause45 access using Clause 22 operations
Ethlf_StreamStateIndication (draft)	Ethlf_Cbk.h	The function is called by the EthSwT driver module once it has successfully set the streams activity status in the Ethernet switch given with SwitchIdx, triggered by a previous call of Ethlf_SetStreamState. Tags: atp.Status=draft

▽



API Function	Header File	Description
Ethlf_StreamStatisticsIndication (draft)	Ethlf_Cbk.h	The function is called by the lower layer once it has successfully retrieved the stream statistics (i.e. bucket counter values) from the EthSwt driver given with SwitchIdx. Tags: atp.Status=draft
EthTrcv_GetBaudRate	EthTrcv.h	Obtains the baud rate of the indexed transceiver
EthTrcv_GetDuplexMode	EthTrcv.h	Obtains the duplex mode of the indexed transceiver
EthTrcv_GetLinkState	EthTrcv.h	Obtains the link state of the indexed transceiver
EthTrcv_GetTransceiverMode	EthTrcv.h	Obtains the state of the indexed transceiver
EthTrcv_SetTransceiverMode	EthTrcv.h	Enables / disables the indexed transceiver
EthTrcv_StartAutoNegotiation	EthTrcv.h	Restarts the negotiation of the transmission parameters used by the indexed transceiver
NvM_GetErrorStatus	NvM.h	Service to read the block dependent error/status information.
NvM_ReadBlock	NvM.h	Service to copy the data of the NV block to its corresponding RAM block.
NvM_WriteBlock	NvM.h	Service to copy the data of the RAM block to its corresponding NV block.
Spi_AsyncTransmit	Spi.h	Service to transmit data on the SPI bus.
Spi_Cancel	Spi.h	Service cancels the specified on-going sequence transmission.
Spi_ReadIB	Spi.h	Service for reading synchronously one or more data from an IB SPI Handler/Driver Channel specified by parameter.
Spi_SetAsyncMode	Spi.h	Service to set the asynchronous mechanism mode for SPI busses handled asynchronously.
Spi_SetupEB	Spi.h	Service to setup the buffers and the length of data for the EB SPI Handler/Driver Channel specified.
Spi_SyncTransmit	Spi.h	Service to transmit data on the SPI bus
Spi_WriteIB	Spi.h	Service for writing one or more data to an IB SPI Handler/Driver Channel specified by parameter.

]

[SWS_EthSwt_00192]

Upstream requirements: [SRS_Eth_00122](#)

[The NvM APIs will only be used if the respective block is not configured for NvM_ReadAll and NvM_WriteAll.]

8.6.3 Configurable interfaces

In this chapter all interfaces are listed where the target function could be configured. The names of these kind of interfaces are not fixed because they are configurable.

8.6.3.1 <EthSwtLinkDownCallout>

[SWS_EthSwt_00117] Definition of callback function <EthSwtLinkDownCallout>

Upstream requirements: [SRS_Eth_00119](#), [SRS_Eth_00087](#)

[

Service Name	<EthSwtLinkDownCallout>	
Syntax	<pre>void <EthSwtLinkDownCallout> (uint8 SwitchIdx, uint8 PortIdx)</pre>	
Service ID [hex]	0x19	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	SwitchIdx	Index of the switch within the context of the Ethernet Switch Driver
	PortIdx	Index of the port at the addressed switch
Parameters (inout)	None	
Parameters (out)	None	
Return value	None	
Description	Is called, if a link which is configured goes down.	
Available via	EthSwt_Externals.h	

]

[SWS_EthSwt_00118]

Upstream requirements: [SRS_Eth_00119](#), [SRS_Eth_00087](#)

[The function <EthSwtLinkDownCallout> shall be called if a link, which is configured, goes down (link loss). The function provides the Switch index and the Port index, such that the port which went down can be identified.]

8.6.3.2 <EthSwtLinkUpCallout>

[SWS_EthSwt_00203] Definition of callback function <EthSwtLinkUpCallout>

Upstream requirements: [SRS_Eth_00119](#), [SRS_Eth_00087](#)

[

Service Name	<EthSwtLinkUpCallout>	
Syntax	<pre>void <EthSwtLinkUpCallout> (uint8 SwitchIdx, uint8 PortIdx)</pre>	
Service ID [hex]	0x1a	

▽



Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	SwitchIdx	Index of the switch within the context of the Ethernet Switch Driver
	PortIdx	Index of the port at the addressed switch
Parameters (inout)	None	
Parameters (out)	None	
Return value	None	
Description	Is called, if a link which is configured goes up	
Available via	EthSwT_Externals.h	

]

[SWS_EthSwT_00204]

Upstream requirements: [SRS_Eth_00119](#), [SRS_Eth_00087](#)

[The function `<EthSwTLinkUpCallout>` shall be called if a link, which is configured, goes up. The function provides the Switch index and the Port index, such that the port which went up can be identified.]

Note: If the hardware cannot signal a link up with an interrupt, the status of the link has to be determined in polling mode by checking the state of the link.

8.6.3.3 <GetCfgDataRawDone>

[SWS_EthSwT_91032] Definition of callback function <GetCfgDataRawDone>

Upstream requirements: [SRS_Eth_00123](#)

[

Service Name	<GetCfgDataRawDone>	
Syntax	<pre>void <GetCfgDataRawDone> (uint8 SwitchIdx)</pre>	
Service ID [hex]	0x43	
Sync/Async	Synchronous	
Reentrancy	Reentrant	
Parameters (in)	SwitchIdx	Index of the Ethernet switch where the Configuration is read.
Parameters (inout)	None	
Parameters (out)	None	
Return value	None	
Description	The call of the function <code>EthSwT_GetCfgDataRaw()</code> triggers a asynchrony read of a certain memory section of the Ethernet switch driver. If the read is done, the configured callout function <code><GetCfgDataRawDone></code> shall be called]	
Available via	EthSwT_Externals.h	

]

8.7 Service Interfaces

No direct access is necessary from the application layer.

9 Sequence diagrams

The following sequence diagram shows the interaction between the DHCP-Server in the TCP/IP-module and the Ethernet Switch Driver:

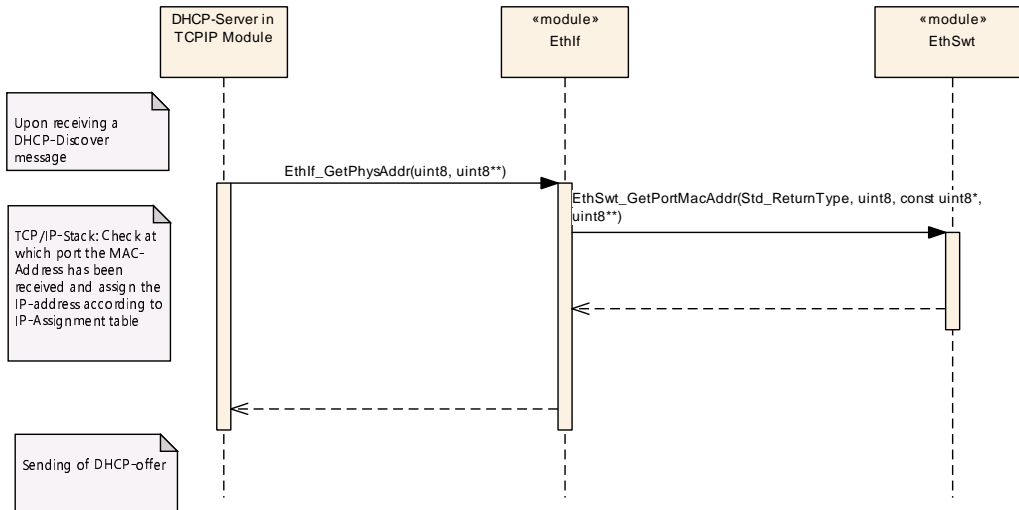


Figure 9.1

The following sequence diagram shows the interaction between the EthIf, EthSwt and the EthTrcv for API calls to the EthIf:

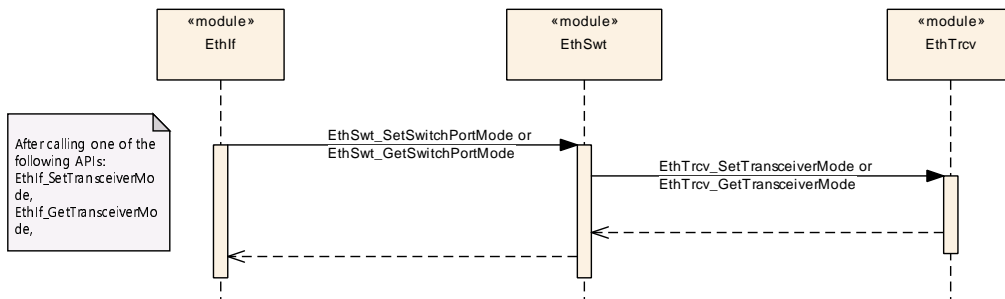


Figure 9.2

The following sequence diagram shows the interaction between the EthIf, EthSwt, and the EthTrcv for API calls which are initiated by the EthIf:

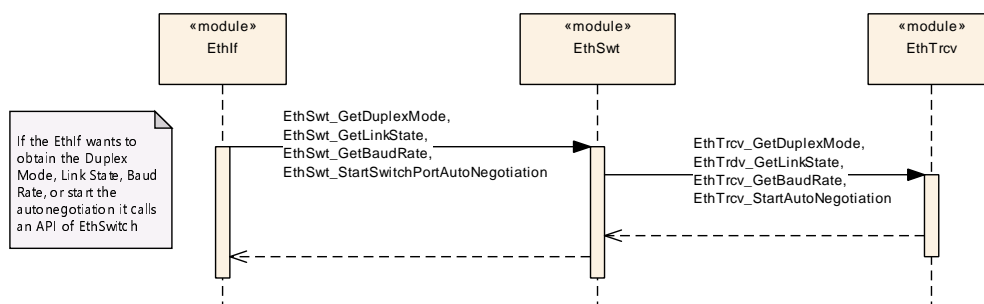
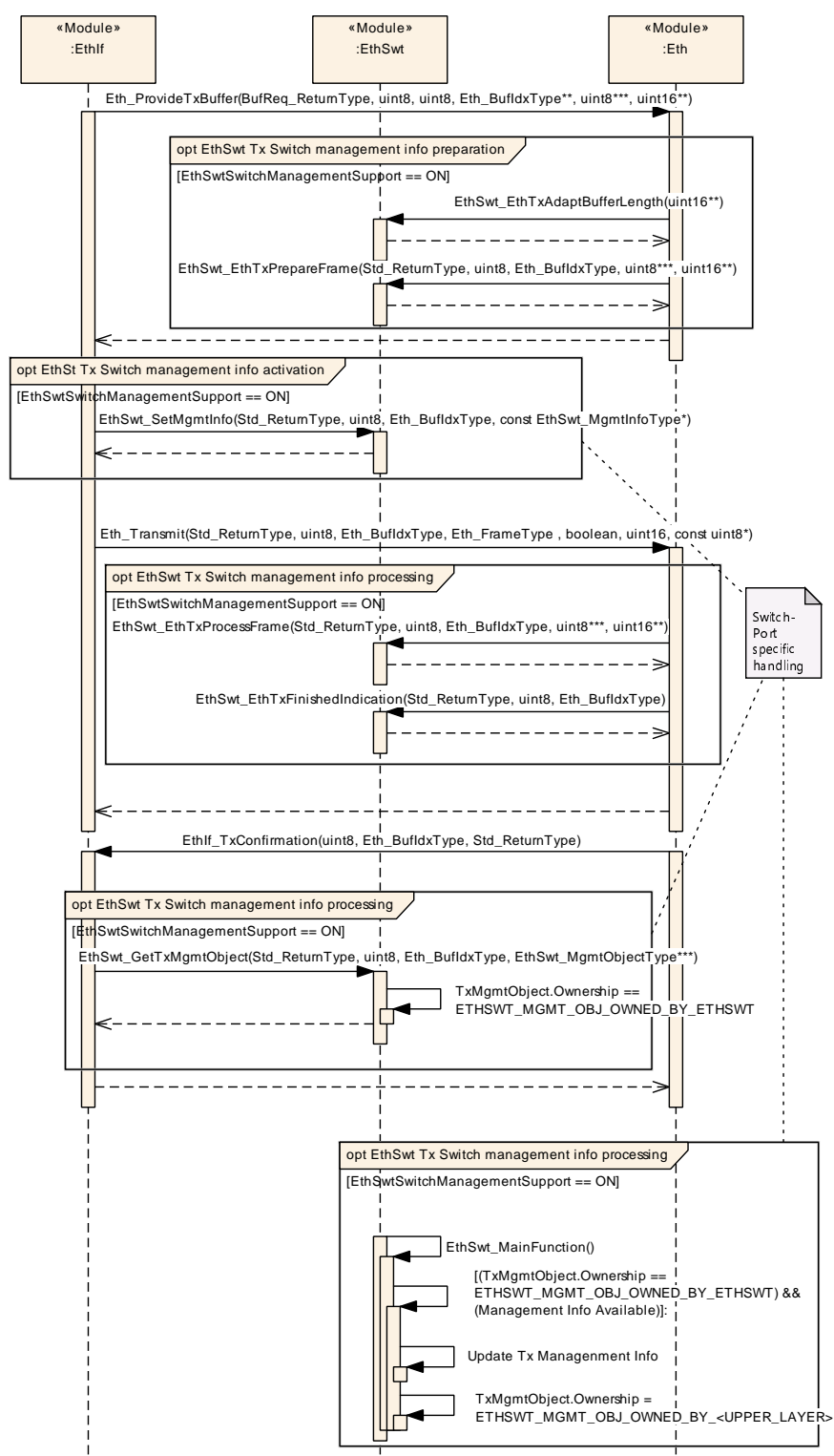


Figure 9.3

9.1 Switch Management support

**Figure 9.4: Switch Management support for transmission**

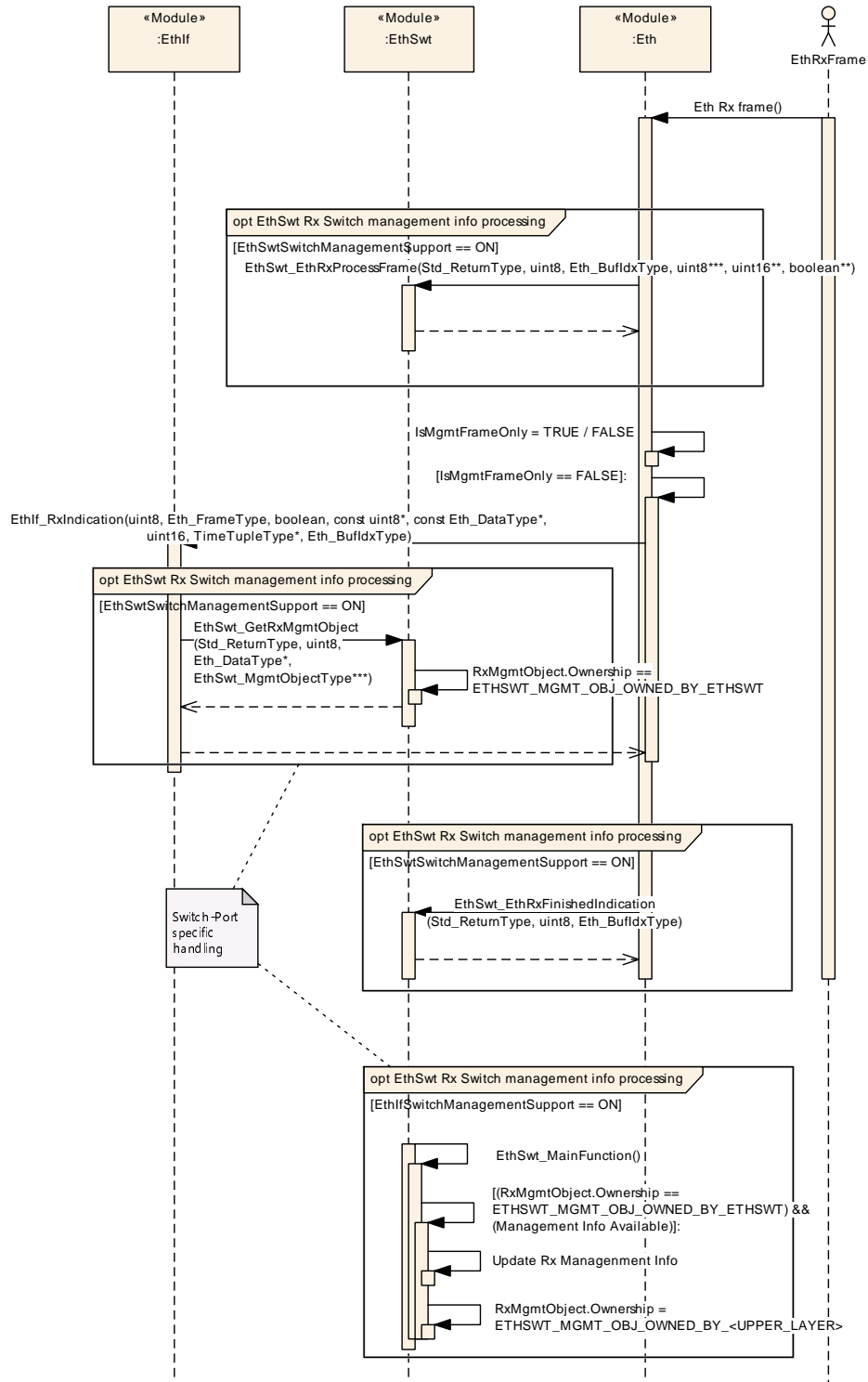


Figure 9.5: Management support for reception

10 Configuration specification

Section 10.2 specifies the structure (containers) and the parameters of the module EthSwt.

10.1 Containers and configuration parameters

The following chapters summarize all configuration parameters. The detailed meanings of the parameters describe Chapter 7 and Chapter 8.

[SWS_EthSwt_00414] [The Ethernet Switch Driver module shall reject configurations with partition mappings which are not supported by the implementation.]

10.1.1 EthSwt

[ECUC_EthSwt_00046] Definition of EcucModuleDef EthSwt [

Module Name	EthSwt
Description	Configuration of the EthSwt (Ethernet Switch Driver) module.
Post-Build Variant Support	true
Supported Config Variants	VARIANT-LINK-TIME, VARIANT-POST-BUILD, VARIANT-PRE-COMPILE

Included Containers		
Container Name	Multiplicity	Scope / Dependency
EthSwtConfig	1..*	Configuration of one Ethernet Switch.
EthSwtGeneral	1	General configuration of Ethernet Switch Driver module.

]

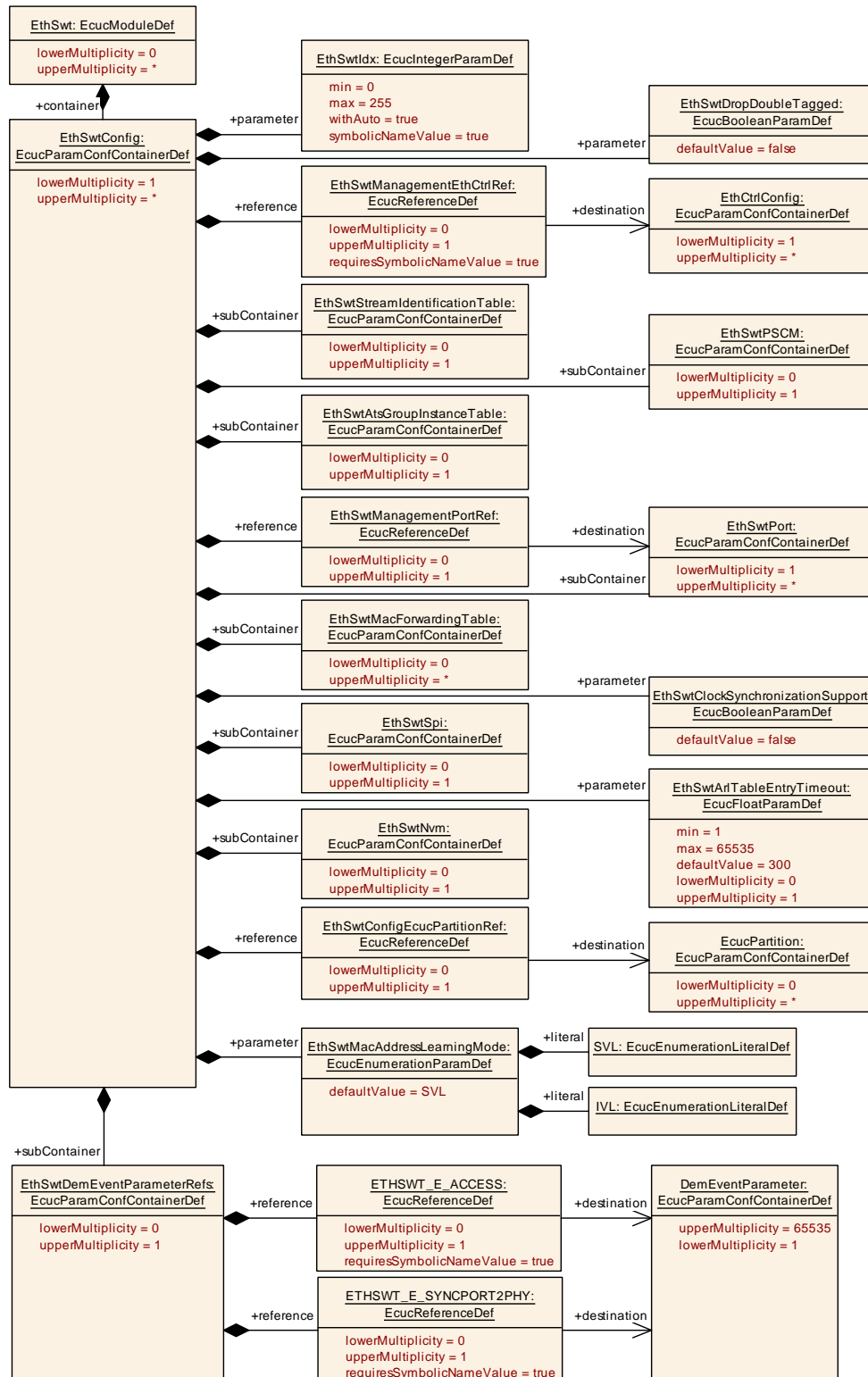


Figure 10.1: EthSwt

10.1.2 EthSwtGeneral

[ECUC_EthSwt_00003] Definition of EcucParamConfContainerDef EthSwtGeneral

Container Name	EthSwtGeneral
Parent Container	EthSwt
Description	General configuration of Ethernet Switch Driver module.
Configuration Parameters	

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
EthSwtCheckWakeupApi	1	[ECUC_EthSwt_00136]
EthSwtDeletePortMirrorConfigurationApi	1	[ECUC_EthSwt_00133]
EthSwtDevErrorDetect	1	[ECUC_EthSwt_00002]
EthSwtEnableCableDiagnosticApi	1	[ECUC_EthSwt_00135]
EthSwtEnableVlanApi	1	[ECUC_EthSwt_00055]
EthSwtGetArlTableApi	1	[ECUC_EthSwt_00052]
EthSwtGetBaudRateApi	1	[ECUC_EthSwt_00121]
EthSwtGetCfgDataRawDone	0..1	[ECUC_EthSwt_00124]
EthSwtGetCfgRaw	1	[ECUC_EthSwt_00123]
EthSwtGetCounterValuesApi	1	[ECUC_EthSwt_00053]
EthSwtGetDuplexModeApi	1	[ECUC_EthSwt_00122]
EthSwtGetLinkStateApi	1	[ECUC_EthSwt_00120]
EthSwtGetMacLearningModeApi	1	[ECUC_EthSwt_00061]
EthSwtGetMaxQueueBufferFillLevelApi	1	[ECUC_EthSwt_00131]
EthSwtGetPortCableDiagnosticsResultApi	1	[ECUC_EthSwt_00092]
EthSwtGetPortIdentifierApi	1	[ECUC_EthSwt_00083]
EthSwtGetPortMacAddrApi	1	[ECUC_EthSwt_00051]
EthSwtGetPortMacAddrVlanApi	0..1	[ECUC_EthSwt_00235]
EthSwtGetPortMirrorStateApi	1	[ECUC_EthSwt_00087]
EthSwtGetPortSignalQualityApi	1	[ECUC_EthSwt_00082]
EthSwtGetRxStatsApi	1	[ECUC_EthSwt_00065]
EthSwtGetSwitchIdentifierApi	1	[ECUC_EthSwt_00084]
EthSwtGetSwitchPortModeApi	1	[ECUC_EthSwt_00118]
EthSwtGetSwitchPortWakeupReasonApi	1	[ECUC_EthSwt_00137]
EthSwtGetSwitchRegApi	1	[ECUC_EthSwt_00066]
EthSwtGetTxErrorCounterValuesApi	1	[ECUC_EthSwt_00100]
EthSwtGetTxStatsApi	1	[ECUC_EthSwt_00099]
EthSwtGlobalTimeSupportApi	1	[ECUC_EthSwt_00107]
EthSwtIndex	1	[ECUC_EthSwt_00033]
EthSwtLinkDownCallout	0..1	[ECUC_EthSwt_00115]
EthSwtLinkUpCallout	0..1	[ECUC_EthSwt_00116]
EthSwtLowPowerModeSupport	0..1	[ECUC_EthSwt_00102]
EthSwtMainFunctionPeriod	1	[ECUC_EthSwt_00071]
EthSwtManagementSupportApi	1	[ECUC_EthSwt_00108]





Included Parameters		
Parameter Name	Multiplicity	ECUC ID
EthSwtPersistentConfigurationResult	1	[ECUC_EthSwt_00062]
EthSwtPersistentConfigurationResultCallback	0..1	[ECUC_EthSwt_00063]
EthSwtPublicCddHeaderFile	0..*	[ECUC_EthSwt_00064]
EthSwtReadMmdApi	1	[ECUC_EthSwt_00243]
EthSwtReadPortMirrorConfigurationApi	1	[ECUC_EthSwt_00086]
EthSwtReadTrcvRegisterApi	1	[ECUC_EthSwt_00069]
EthSwtResetConfigurationApi	1	[ECUC_EthSwt_00049]
EthSwtSetForwardingModeApi	1	[ECUC_EthSwt_00104]
EthSwtSetMacLearningModeApi	1	[ECUC_EthSwt_00060]
EthSwtSetPortLoopbackModeApi	1	[ECUC_EthSwt_00090]
EthSwtSetPortMirrorStateApi	1	[ECUC_EthSwt_00088]
EthSwtSetPortTestModeApi	1	[ECUC_EthSwt_00089]
EthSwtSetPortTxModeApi	1	[ECUC_EthSwt_00091]
EthSwtSetSwitchPortModeApi	1	[ECUC_EthSwt_00117]
EthSwtSetSwitchRegApi	1	[ECUC_EthSwt_00067]
EthSwtStartSwitchPortAutoNegotiationApi	1	[ECUC_EthSwt_00119]
EthSwtStoreConfigurationApi	1	[ECUC_EthSwt_00050]
EthSwtVerifyConfigApi	1	[ECUC_EthSwt_00105]
EthSwtVersionInfoApi	1	[ECUC_EthSwt_00031]
EthSwtWriteMmdApi	1	[ECUC_EthSwt_00244]
EthSwtWritePortMirrorConfigurationApi	1	[ECUC_EthSwt_00085]
EthSwtWriteTrcvRegisterApi	1	[ECUC_EthSwt_00070]
EthSwtEcucPartitionRef	0..*	[ECUC_EthSwt_00129]

No Included Containers

]

[ECUC_EthSwt_00136] Definition of EcucBooleanParamDef EthSwtCheckWakeupApi [

Parameter Name	EthSwtCheckWakeupApi		
Parent Container	EthSwtGeneral		
Description	Enables / Disables EthSwt_CheckWakeup API.		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	-		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00133] Definition of EcucBooleanParamDef EthSwtDeletePortMirrorConfigurationApi

Parameter Name	EthSwtDeletePortMirrorConfigurationApi		
Parent Container	EthSwtGeneral		
Description	Enables / Disables EthSwt_DeletePortMirrorConfiguration API		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	-		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00002] Definition of EcucBooleanParamDef EthSwtDevErrorDetect

Parameter Name	EthSwtDevErrorDetect		
Parent Container	EthSwtGeneral		
Description	Switches the development error detection and notification on or off. <ul style="list-style-type: none"> • true: detection and notification is enabled. • false: detection and notification is disabled. 		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	false		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00135] Definition of EcucBooleanParamDef EthSwtEnableCableDiagnosticApi

Parameter Name	EthSwtEnableCableDiagnosticApi		
Parent Container	EthSwtGeneral		
Description	Enable/disable the APIs for cable diagnostic: EthSwt_RunPortCableDiagnostic, EthSwt_GetPortCableDiagnosticsResult		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	-		
Post-Build Variant Value	false		



△

Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

]

[ECUC_EthSwT_00055] Definition of EcucBooleanParamDef EthSwTEnableVlan Api [

Parameter Name	EthSwTEnableVlanApi		
Parent Container	EthSwTGeneral		
Description	Enables / Disables EthSwT_EnableVLAN API.		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	–		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

]

[ECUC_EthSwT_00052] Definition of EcucBooleanParamDef EthSwTGetArITable Api [

Parameter Name	EthSwTGetArITableApi		
Parent Container	EthSwTGeneral		
Description	Enables / Disables EthSwT_GetArITable API.		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	–		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00121] Definition of EcucBooleanParamDef EthSwtGetBaudRate Api [

Parameter Name	EthSwtGetBaudRateApi		
Parent Container	EthSwtGeneral		
Description	Enables / Disables EthSwt_GetBaudRate API		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	-		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00124] Definition of EcucFunctionNameDef EthSwtGetCfgData RawDone [

Parameter Name	EthSwtGetCfgDataRawDone		
Parent Container	EthSwtGeneral		
Description	Defines the function name for <GetCfgDataRawDone>		
Multiplicity	0..1		
Type	EcucFunctionNameDef		
Default value	-		
Regular Expression	-		
Post-Build Variant Multiplicity	false		
Post-Build Variant Value	false		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency	scope: local dependency: The function GetCfgDataRawDone shall only be configured if parameter EthSwtGetCfgRaw is set to TRUE.		

]

[ECUC_EthSwt_00123] Definition of EcucBooleanParamDef EthSwtGetCfgRaw [

Parameter Name	EthSwtGetCfgRaw		
Parent Container	EthSwtGeneral		
Description	Disable /Enable support of reading raw data from switch memory		
Multiplicity	1		



△

Type	EcucBooleanParamDef		
Default value	–		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00053] Definition of EcucBooleanParamDef EthSwtGetCounterValuesApi

Parameter Name	EthSwtGetCounterValuesApi		
Parent Container	EthSwtGeneral		
Description	Enables / Disables EthSwt_GetCounterValues API		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	–		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00122] Definition of EcucBooleanParamDef EthSwtGetDuplexModeApi

Parameter Name	EthSwtGetDuplexModeApi		
Parent Container	EthSwtGeneral		
Description	Enables / Disables EthSwt_GetDuplexMode API		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	–		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00120] Definition of EcucBooleanParamDef EthSwtGetLinkState Api [

Parameter Name	EthSwtGetLinkStateApi		
Parent Container	EthSwtGeneral		
Description	Enables / Disables EthSwt_GetLinkState API		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	-		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00061] Definition of EcucBooleanParamDef EthSwtGetMac LearningModeApi [

Parameter Name	EthSwtGetMacLearningModeApi		
Parent Container	EthSwtGeneral		
Description	Enables / Disables EthSwt_GetMacLearningMode API.		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	-		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00131] Definition of EcucBooleanParamDef EthSwtGetMax QueueBufferFillLevelApi [

Parameter Name	EthSwtGetMaxQueueBufferFillLevelApi		
Parent Container	EthSwtGeneral		
Description	Enables / Disables EthSwt_GetMaxQueueBufferFillLevel API.		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	-		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	

▽



Scope / Dependency	scope: local
--------------------	--------------

]

[ECUC_EthSwt_00092] Definition of EcucBooleanParamDef EthSwtGetPortCableDiagnosticsResultApi [

Parameter Name	EthSwtGetPortCableDiagnosticsResultApi		
Parent Container	EthSwtGeneral		
Description	Enables / Disables EthSwt_GetPortCableDiagnosticsResult API		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	-		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00083] Definition of EcucBooleanParamDef EthSwtGetPortIdentifierApi [

Parameter Name	EthSwtGetPortIdentifierApi		
Parent Container	EthSwtGeneral		
Description	Enables / Disables EthSwt_GetPortIdentifier API		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	-		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00051] Definition of EcucBooleanParamDef EthSwtGetPortMacAddrApi [

Parameter Name	EthSwtGetPortMacAddrApi		
Parent Container	EthSwtGeneral		
Description	Enables / Disables EthSwt_GetPortMacAddr API.		
Multiplicity	1		





Type	EcucBooleanParamDef		
Default value	-		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00235] Definition of EcucBooleanParamDef EthSwtGetPortMacAddrVlanApi [

Parameter Name	EthSwtGetPortMacAddrVlanApi		
Parent Container	EthSwtGeneral		
Description	Enables / Disables EthSwt_GetPortMacAddrVlan API.		
Multiplicity	0..1		
Type	EcucBooleanParamDef		
Default value	-		
Post-Build Variant Multiplicity	false		
Post-Build Variant Value	false		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00087] Definition of EcucBooleanParamDef EthSwtGetPortMirrorStateApi [

Parameter Name	EthSwtGetPortMirrorStateApi		
Parent Container	EthSwtGeneral		
Description	Enables / Disables EthSwt_GetPortMirrorState API		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	-		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00082] Definition of EcucBooleanParamDef EthSwtGetPortSignalQualityApi [

Parameter Name	EthSwtGetPortSignalQualityApi		
Parent Container	EthSwtGeneral		
Description	Enables / Disables EthSwt_GetPortSignalQuality API		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	-		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00065] Definition of EcucBooleanParamDef EthSwtGetRxStatsApi [

Parameter Name	EthSwtGetRxStatsApi		
Parent Container	EthSwtGeneral		
Description	Enables / Disables EthSwt_GetRxStats API.		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	-		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00084] Definition of EcucBooleanParamDef EthSwtGetSwitchIdentifierApi [

Parameter Name	EthSwtGetSwitchIdentifierApi		
Parent Container	EthSwtGeneral		
Description	Enables / Disables EthSwt_GetSwitchIdentifier API		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	-		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	

▽



Scope / Dependency	scope: local
--------------------	--------------

]

[ECUC_EthSwt_00118] Definition of EcucBooleanParamDef EthSwtGetSwitchPortModeApi [

Parameter Name	EthSwtGetSwitchPortModeApi		
Parent Container	EthSwtGeneral		
Description	Enables / Disables EthSwt_GetSwitchPortMode API		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	-		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00137] Definition of EcucBooleanParamDef EthSwtGetSwitchPortWakeupReasonApi [

Parameter Name	EthSwtGetSwitchPortWakeupReasonApi		
Parent Container	EthSwtGeneral		
Description	Enables / Disables EthSwt_GetSwitchPortWakeupReason API.		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	-		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00066] Definition of EcucBooleanParamDef EthSwtGetSwitchRegApi [

Parameter Name	EthSwtGetSwitchRegApi		
Parent Container	EthSwtGeneral		
Description	Enables / Disables EthSwt_GetSwitchReg API.		
Multiplicity	1		



△

Type	EcucBooleanParamDef		
Default value	–		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00100] Definition of EcucBooleanParamDef EthSwtGetTxErrorCounterValuesApi [

Parameter Name	EthSwtGetTxErrorCounterValuesApi		
Parent Container	EthSwtGeneral		
Description	Enables/Disables Eth_GetTxErrorCounterValues API.		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	false		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00099] Definition of EcucBooleanParamDef EthSwtGetTxStatsApi [

Parameter Name	EthSwtGetTxStatsApi		
Parent Container	EthSwtGeneral		
Description	Enables/Disables Eth_GetTxStats API.		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	false		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00107] Definition of EcucBooleanParamDef EthSwtGlobalTimeSupportApi [

Parameter Name	EthSwtGlobalTimeSupportApi		
Parent Container	EthSwtGeneral		
Description	Enables/Disables the Global Time APIs used amongst others by Global Time Synchronization over Ethernet.		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	-		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00033] Definition of EcucIntegerParamDef EthSwtIndex [

Parameter Name	EthSwtIndex		
Parent Container	EthSwtGeneral		
Description	Specifies the InstanceId of this module instance. If only one instance is present it shall have the Id 0.		
Multiplicity	1		
Type	EcucIntegerParamDef		
Range	0 .. 255		
Default value	-		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00115] Definition of EcucFunctionNameDef EthSwtLinkDownCallout [

Parameter Name	EthSwtLinkDownCallout		
Parent Container	EthSwtGeneral		
Description	Defines the function name for the <EthSwtLinkDownCallout> callout.		
Multiplicity	0..1		
Type	EcucFunctionNameDef		
Default value	-		
Regular Expression	-		
Post-Build Variant Multiplicity	false		
Post-Build Variant Value	false		





Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00116] Definition of EcucFunctionNameDef EthSwtLinkUpCallout [

Parameter Name	EthSwtLinkUpCallout		
Parent Container	EthSwtGeneral		
Description	Defines the function name for the <EthSwtLinkUpCallout> callout.		
Multiplicity	0..1		
Type	EcucFunctionNameDef		
Default value	–		
Regular Expression	–		
Post-Build Variant Multiplicity	false		
Post-Build Variant Value	false		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00102] Definition of EcucBooleanParamDef EthSwtLowPowerModeSupport [

Parameter Name	EthSwtLowPowerModeSupport		
Parent Container	EthSwtGeneral		
Description	Disable / Enable support of low power mode.		
Multiplicity	0..1		
Type	EcucBooleanParamDef		
Default value	false		
Post-Build Variant Multiplicity	false		
Post-Build Variant Value	false		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	



△

Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

]

[ECUC_EthSwT_00071] Definition of EcucFloatParamDef EthSwTMainFunctionPeriod [

Parameter Name	EthSwTMainFunctionPeriod		
Parent Container	EthSwTGeneral		
Description	The cycle time of the periodic main function of EthSwT. Defined in seconds .		
Multiplicity	1		
Type	EcucFloatParamDef		
Range]0 .. INF[
Default value	–		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency			

]

[ECUC_EthSwT_00108] Definition of EcucBooleanParamDef EthSwTManagementSupportApi [

Parameter Name	EthSwTManagementSupportApi		
Parent Container	EthSwTGeneral		
Description	Enables/Disables the Switch management APIs to support a Switch-port specific communication attribute access.		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	–		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00062] Definition of EcucBooleanParamDef EthSwtPersistent ConfigurationResult

Parameter Name	EthSwtPersistentConfigurationResult		
Parent Container	EthSwtGeneral		
Description	Enables / Disables the callback API <User>_PersistentConfigurationResult.		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	-		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00063] Definition of EcucFunctionNameDef EthSwtPersistent ConfigurationResultCallback

Parameter Name	EthSwtPersistentConfigurationResultCallback		
Parent Container	EthSwtGeneral		
Description	Defines the function name for <EthSwtPersistentConfigurationResultCallback>.		
Multiplicity	0..1		
Type	EcucFunctionNameDef		
Default value	-		
Regular Expression	-		
Post-Build Variant Multiplicity	false		
Post-Build Variant Value	false		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00064] Definition of EcucStringParamDef EthSwtPublicCdd HeaderFile

Parameter Name	EthSwtPublicCddHeaderFile		
Parent Container	EthSwtGeneral		
Description	Defines header files for callback functions which shall be included in case of CDDs.		
Multiplicity	0..*		
Type	EcucStringParamDef		





Default value	-		
Length	1-32		
Regular Expression	-		
Post-Build Variant Multiplicity	false		
Post-Build Variant Value	false		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00243] Definition of EcucBooleanParamDef EthSwtReadMmdApi

[

Parameter Name	EthSwtReadMmdApi		
Parent Container	EthSwtGeneral		
Description	Enables/Disables EthSwt_ReadMmd		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	false		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00086] Definition of EcucBooleanParamDef EthSwtReadPortMirrorConfigurationApi

[

Parameter Name	EthSwtReadPortMirrorConfigurationApi		
Parent Container	EthSwtGeneral		
Description	Enables / Disables EthSwt_ReadPortMirrorConfiguration API		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	-		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	





Scope / Dependency	scope: local
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]

[ECUC_EthSwt_00069] Definition of EcucBooleanParamDef EthSwtReadTrcvRegisterApi [

Parameter Name	EthSwtReadTrcvRegisterApi		
Parent Container	EthSwtGeneral		
Description	Enables / Disables EthSwt_ReadTrcvRegister API.		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	-		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00049] Definition of EcucBooleanParamDef EthSwtResetConfigurationApi [

Parameter Name	EthSwtResetConfigurationApi		
Parent Container	EthSwtGeneral		
Description	Enables / Disables EthSwt_ResetConfiguration API.		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	-		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00104] Definition of EcucBooleanParamDef EthSwtSetForwardingModeApi [

Parameter Name	EthSwtSetForwardingModeApi		
Parent Container	EthSwtGeneral		
Description	Enables /disables EthSwt_SetForwardingMode API.		
Multiplicity	1		



△

Type	EcucBooleanParamDef		
Default value	false		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00060] Definition of EcucBooleanParamDef EthSwtSetMac LearningModeApi [

Parameter Name	EthSwtSetMacLearningModeApi		
Parent Container	EthSwtGeneral		
Description	Enables / Disables EthSwt_SetMacLearningMode API.		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	–		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00090] Definition of EcucBooleanParamDef EthSwtSetPortLoopbackModeApi [

Parameter Name	EthSwtSetPortLoopbackModeApi		
Parent Container	EthSwtGeneral		
Description	Enables / Disables EthSwt_SetPortLoopbackModeApi API		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	–		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00088] Definition of EcucBooleanParamDef EthSwtSetPortMirrorStateApi [

Parameter Name	EthSwtSetPortMirrorStateApi		
Parent Container	EthSwtGeneral		
Description	Enables / Disables EthSwt_SetPortMirrorState API		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	-		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00089] Definition of EcucBooleanParamDef EthSwtSetPortTestModeApi [

Parameter Name	EthSwtSetPortTestModeApi		
Parent Container	EthSwtGeneral		
Description	Enables / Disables EthSwt_SetPortTestMode API		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	-		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00091] Definition of EcucBooleanParamDef EthSwtSetPortTxModeApi [

Parameter Name	EthSwtSetPortTxModeApi		
Parent Container	EthSwtGeneral		
Description	Enables / Disables EthSwt_SetPortTxModeApi API		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	-		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	

▽



Scope / Dependency	scope: local
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]

[ECUC_EthSwt_00117] Definition of EcucBooleanParamDef EthSwtSetSwitchPortModeApi [

Parameter Name	EthSwtSetSwitchPortModeApi		
Parent Container	EthSwtGeneral		
Description	Enables / Disables EthSwt_SetSwitchPortMode API		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	-		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00067] Definition of EcucBooleanParamDef EthSwtSetSwitchRegApi [

Parameter Name	EthSwtSetSwitchRegApi		
Parent Container	EthSwtGeneral		
Description	Enables / Disables EthSwt_SetSwitchReg API.		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	-		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00119] Definition of EcucBooleanParamDef EthSwtStartSwitchPortAutoNegotiationApi [

Parameter Name	EthSwtStartSwitchPortAutoNegotiationApi		
Parent Container	EthSwtGeneral		
Description	Enables / Disables EthSwt_StartSwitchPortAutoNegotiation API		
Multiplicity	1		



△

Type	EcucBooleanParamDef		
Default value	–		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00050] Definition of EcucBooleanParamDef EthSwtStoreConfigurationApi [

Parameter Name	EthSwtStoreConfigurationApi		
Parent Container	EthSwtGeneral		
Description	Enables / Disables EthSwt_StoreConfiguration API.		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	–		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00105] Definition of EcucBooleanParamDef EthSwtVerifyConfigApi [

Parameter Name	EthSwtVerifyConfigApi		
Parent Container	EthSwtGeneral		
Description	Enables /disables EthSwt_VerifyConfig API.		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	false		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00031] Definition of EcucBooleanParamDef EthSwtVersionInfo Api [

Parameter Name	EthSwtVersionInfoApi		
Parent Container	EthSwtGeneral		
Description	Enables / Disables version info API.		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	false		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00244] Definition of EcucBooleanParamDef EthSwtWriteMmdApi

[

Parameter Name	EthSwtWriteMmdApi		
Parent Container	EthSwtGeneral		
Description	Enables/Disables EthSwt_WriteMmd		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	false		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00085] Definition of EcucBooleanParamDef EthSwtWritePortMirrorConfigurationApi [

Parameter Name	EthSwtWritePortMirrorConfigurationApi		
Parent Container	EthSwtGeneral		
Description	Enables / Disables EthSwt_WritePortMirrorConfiguration API		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	–		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	

▽



Scope / Dependency	scope: local
---------------------------	--------------

]

[ECUC_EthSwt_00070] Definition of EcucBooleanParamDef EthSwtWriteTrcvRegisterApi [

Parameter Name	EthSwtWriteTrcvRegisterApi		
Parent Container	EthSwtGeneral		
Description	Enables / Disables EthSwt_WriteTrcvRegister API.		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	-		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00129] Definition of EcucReferenceDef EthSwtEcucPartitionRef [

Parameter Name	EthSwtEcucPartitionRef		
Parent Container	EthSwtGeneral		
Description	Maps the Ethernet switch driver to zero or multiple ECUC partitions to make the modules API available in this partition.		
Multiplicity	0..*		
Type	Reference to EcucPartition		
Post-Build Variant Multiplicity	true		
Post-Build Variant Value	true		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency	scope: ECU		

]

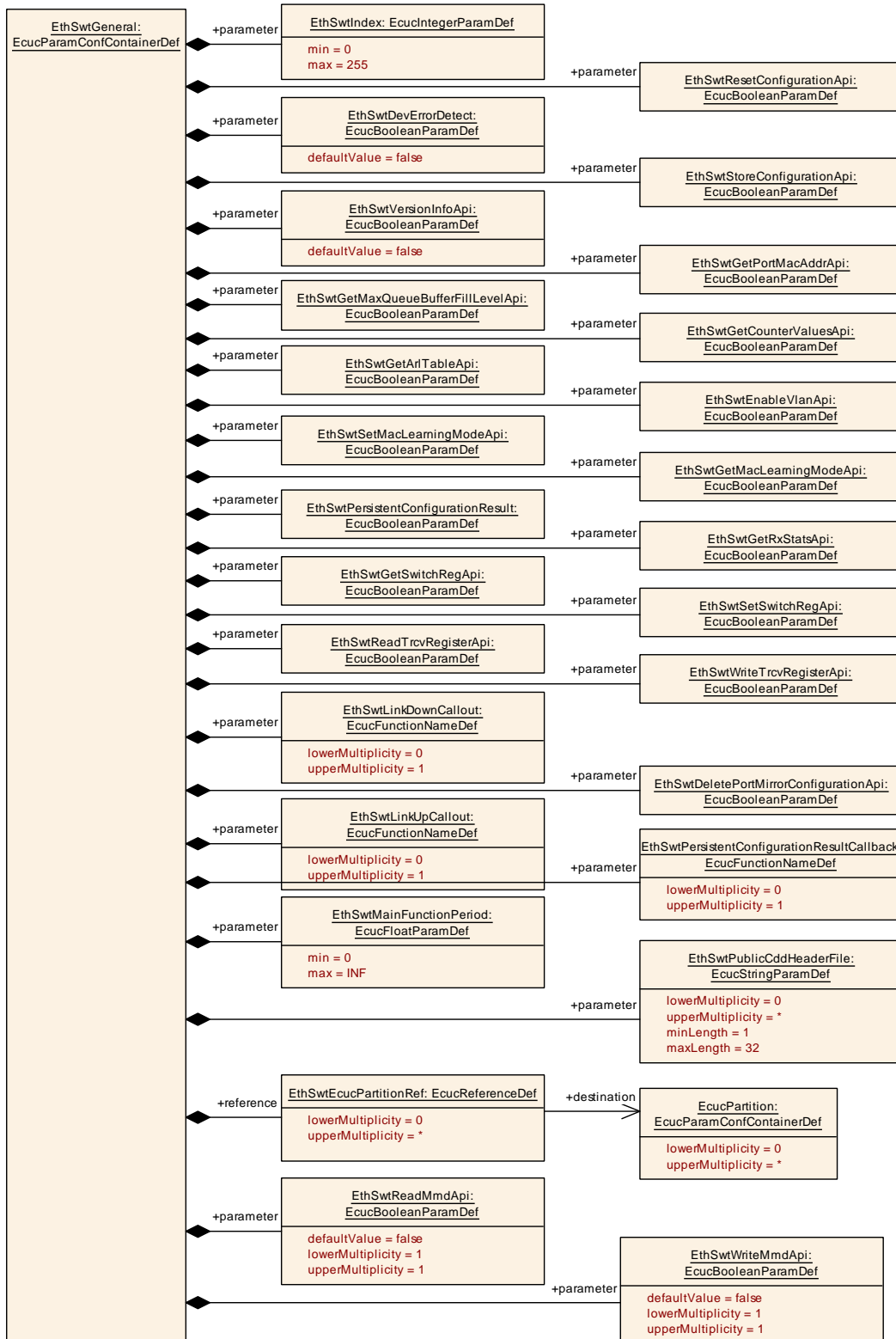


Figure 10.2: EthSwtGeneral (1/2)

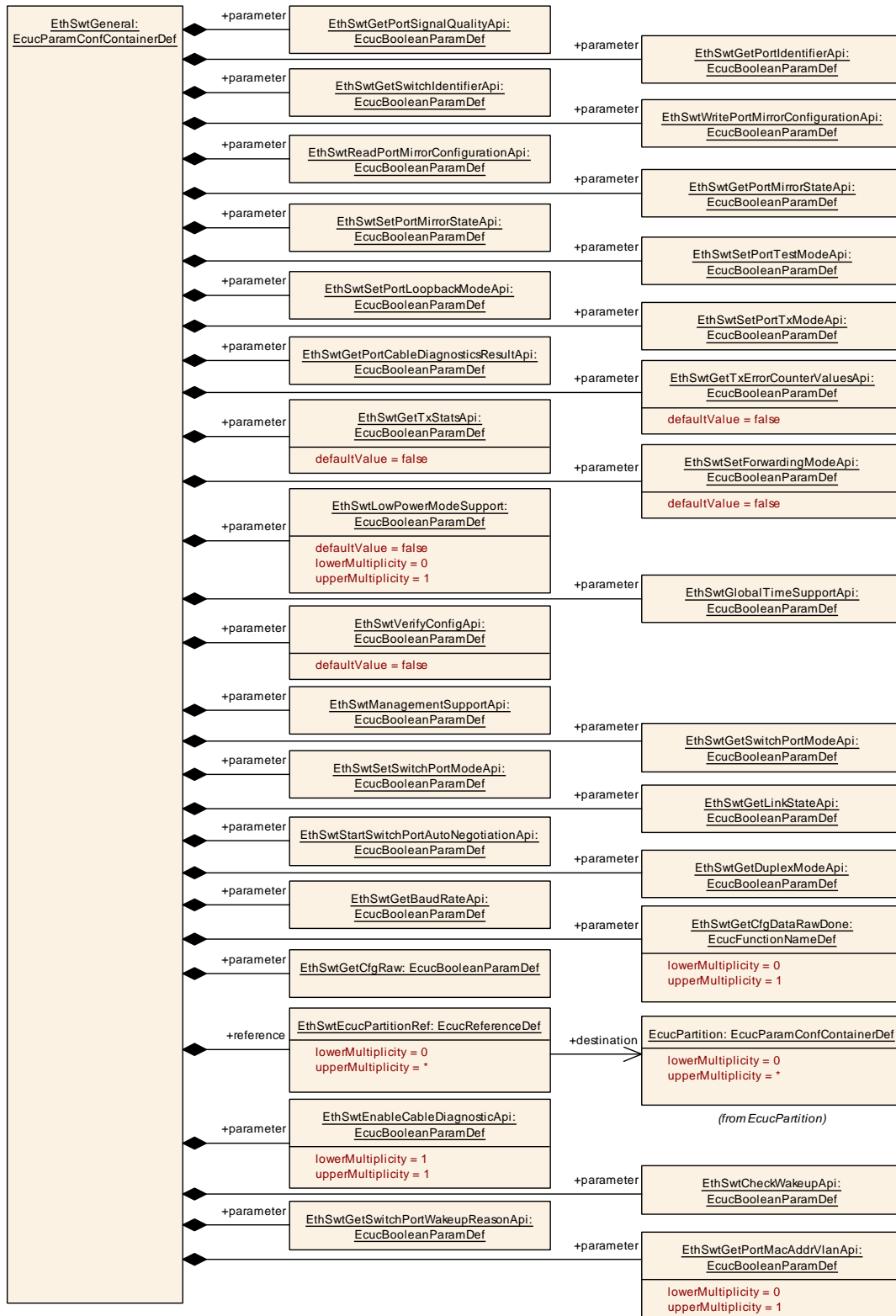


Figure 10.3: EthSwtGeneral (2/2)

10.1.3 EthSwtConfig

[ECUC_EthSwt_00001] Definition of EcucParamConfContainerDef EthSwtConfig

[

Container Name	EthSwtConfig		
Parent Container	EthSwt		
Description	Configuration of one Ethernet Switch.		
Post-Build Variant Multiplicity	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Configuration Parameters			

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
EthSwtArItableEntryTimeout	0..1	[ECUC_EthSwt_00127]
EthSwtClockSynchronizationSupport	1	[ECUC_EthSwt_00128]
EthSwtDropDoubleTagged	1	[ECUC_EthSwt_00073]
EthSwtIdx	1	[ECUC_EthSwt_00004]
EthSwtMacAddressLearningMode	1	[ECUC_EthSwt_00236]
EthSwtUsedInternalPriorityUpperValue	1	[ECUC_EthSwt_00245]
EthSwtUsedTrafficClassUpperValue	1	[ECUC_EthSwt_00246]
EthSwtConfigEcucPartitionRef	0..1	[ECUC_EthSwt_00130]
EthSwtManagementEthCtrlRef	0..1	[ECUC_EthSwt_00110]
EthSwtManagementPortRef	0..1	[ECUC_EthSwt_00111]

Included Containers		
Container Name	Multiplicity	Scope / Dependency
EthSwtAtsGroupInstanceTable	0..1	Collection of AtsGroupInstanceEntries. Tags: atp.Status=draft
EthSwtDemEventParameterRefs	0..1	Container for the references to DemEventParameter elements which shall be invoked using the API Dem_SetEventStatus in case the corresponding error occurs. The EventId is taken from the referenced DemEventParameter's DemEventId symbolic value. The standardized errors are provided in this container and can be extended by vendor-specific error references.
EthSwtMacForwardingTable	0..*	Represents a MAC forwarding table.
EthSwtNvm	0..1	Configuration of one Ethernet Switch Nvm usage in case the module requires non volatile memory in the Ecu to store switch configuration.
EthSwtPSCM	0..1	Per stream classification and metering. Tags: atp.Status=draft
EthSwtPort	1..*	Configuration of one Ethernet Switch Port.
EthSwtSpi	0..1	Configuration of one Ethernet Switch SPI access (if SPI is used).
EthSwtStreamIdentificationTable	0..1	Configuration of a stream identification table. Tags: atp.Status=draft

▽



Included Containers		
Container Name	Multiplicity	Scope / Dependency
EthSwtUnknownMacDestAddress Config	1..*	Definition to which EthSwtPorts an Ethernet frame shall be forwarded if the destination MAC address is not present in the address resolution lookup (ARL) table.
EthSwtVlanMembership	0..4095	Determines the membership of this Ethernet switch and the referenced ports to the virtual network, i.e. frames with this VID can be received and transmitted via the referenced ports.

]

[ECUC_EthSwt_00127] Definition of EcucFloatParamDef EthSwtArlTableEntry Timeout [

Parameter Name	EthSwtArlTableEntryTimeout		
Parent Container	EthSwtConfig		
Description	If present, this parameter specifies the timeout in seconds for removing unused entries from the ARL table of the Ethernet switch. If the parameter is not configured, entries are not removed automatically.		
Multiplicity	0..1		
Type	EcucFloatParamDef		
Range	[1 .. 65535]		
Default value	300		
Post-Build Variant Multiplicity	false		
Post-Build Variant Value	false		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00128] Definition of EcucBooleanParamDef EthSwtClockSynchronizationSupport [

Parameter Name	EthSwtClockSynchronizationSupport		
Parent Container	EthSwtConfig		
Description	<p>This parameter defines, if a Ethernet switch shall enable clock synchronization with another Ethernet switch to which it is connected via uplink port.</p> <p>If this parameter is set to TRUE the clock synchronization between connected Ethernet switches is activated and the clocks of the Ethernet switches are synchronized. If this parameter is set to FALSE the clock synchronization between connected Ethernet switches is deactivated.</p> <p>This parameter shall only be set to TRUE if the Ethernet switch hardware supports clock synchronization.</p>		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	false		
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00073] Definition of EcucBooleanParamDef EthSwtDropDoubleTagged [

Parameter Name	EthSwtDropDoubleTagged		
Parent Container	EthSwtConfig		
Description	<p>This parameter defines if a switch shall drop double tagged (Q in Q) frames.</p> <p>If this parameter is set to TRUE double tagged frames are dropped at all ports.</p> <p>If this parameter is set to FALSE, then double tagged frames are forwarded. If double tagging is used as a feature, this parameter must be set to FALSE.</p> <p>This parameter shall only be set to TRUE when Switch-HW supports the filtering of double tagged frames as filtering by SW is NOT possible!</p>		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	false		
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

]

[ECUC_EthSwT_00004] Definition of EcucIntegerParamDef EthSwTIdx [

Parameter Name	EthSwTIdx		
Parent Container	EthSwTConfig		
Description	Specifies the instance ID of the configured Ethernet Switch.		
Multiplicity	1		
Type	EcucIntegerParamDef (Symbolic Name generated for this parameter)		
Range	0 .. 255		
Default value	-		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency	scope: ECU withAuto = true		

]

[ECUC_EthSwT_00236] Definition of EcucEnumerationParamDef EthSwTMacAddressLearningMode [

Parameter Name	EthSwTMacAddressLearningMode		
Parent Container	EthSwTConfig		
Description	Defines the MAC address learning mode specified by [7, IEEE802.1Q] either shared VLAN learning (SVL) or independent VLAN learning (IVL).		
Multiplicity	1		
Type	EcucEnumerationParamDef		
Range	IVL	The Ethernet switch updates the ARL table (address resolution table) with an entry consisting of source MAC address and VLAN-ID of the received Ethernet frame and the ingress port from on which the Ethernet frame was received.	
	SVL	The Ethernet switch updates the ARL table (address resolution table) with an entry consisting of source MAC address of the received Ethernet frame and the ingress port on which the Ethernet frame was received.	
Default value	SVL		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00245] Definition of EcucIntegerParamDef EthSwtUsedInternalPriorityUpperValue

Status: DRAFT

[

Parameter Name	EthSwtUsedInternalPriorityUpperValue		
Parent Container	EthSwtConfig		
Description	<p>Configure the upper value of the used internal priority range in the Ethernet switch.</p> <p>The range of used internal priority values is defined from 0 to EthSwtUsedInternalPriorityUpperValue, where zero is the lowest and EthSwtUsedInternalPriorityUpperValue the highest internal priority value.</p> <p>Each priority is mapped to at least one traffic class.</p> <p>Tags: atp.Status=draft</p>		
Multiplicity	1		
Type	EcucIntegerParamDef		
Range	0 .. 4294967295		
Default value	7		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00246] Definition of EcucIntegerParamDef EthSwtUsedTrafficClassUpperValue

Status: DRAFT

[

Parameter Name	EthSwtUsedTrafficClassUpperValue		
Parent Container	EthSwtConfig		
Description	<p>Configure the upper value of the used traffic class range in the Ethernet switch.</p> <p>The range of used traffic classes is defined from 0 to EthSwtUsedTrafficClassUpperValue.</p> <p>A traffic class is associated with exactly one egress queue at an egress port.</p> <p>Tags: atp.Status=draft</p>		
Multiplicity	1		
Type	EcucIntegerParamDef		
Range	0 .. 65535		
Default value	7		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00130] Definition of EcucReferenceDef EthSwtConfigEcucPartitionRef

Parameter Name	EthSwtConfigEcucPartitionRef		
Parent Container	EthSwtConfig		
Description	Maps the configuration of one single Ethernet switch to zero or one ECUC partitions. The ECUC partition referenced is a subset of the ECUC partitions where the Ethernet switch driver is mapped to.		
Multiplicity	0..1		
Type	Reference to EcucPartition		
Post-Build Variant Multiplicity	true		
Post-Build Variant Value	true		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: ECU		

]

[ECUC_EthSwt_00110] Definition of EcucReferenceDef EthSwtManagementEthCtrlRef

Parameter Name	EthSwtManagementEthCtrlRef		
Parent Container	EthSwtConfig		
Description	Reference to the Ethernet controller connected to the management port where the management frames will be transmitted/received.		
Multiplicity	0..1		
Type	Symbolic name reference to EthCtrlConfig		
Post-Build Variant Multiplicity	false		
Post-Build Variant Value	false		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00111] Definition of EcucReferenceDef EthSwtManagementPort Ref [

Parameter Name	EthSwtManagementPortRef		
Parent Container	EthSwtConfig		
Description	Reference to the port where the management CPU is connected to.		
Multiplicity	0..1		
Type	Reference to EthSwtPort		
Post-Build Variant Multiplicity	false		
Post-Build Variant Value	false		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

]

10.1.4 EthSwtAtsGroupInstanceTable

[ECUC_EthSwt_00229] Definition of EcucParamConfContainerDef EthSwtAts GroupInstanceTable

Status: DRAFT

[

Container Name	EthSwtAtsGroupInstanceTable		
Parent Container	EthSwtConfig		
Description	Collection of AtsGroupInstanceEntry. Tags: atp.Status=draft		
Post-Build Variant Multiplicity	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Configuration Parameters			

No Included Parameters

Included Containers		
Container Name	Multiplicity	Scope / Dependency
EthSwtAtsGroupInstanceEntry	0..*	AtsGroupInstanceEntry. Tags: atp.Status=draft

]

10.1.5 EthSwtAtsGroupInstanceEntry

[ECUC_EthSwt_00230] Definition of EcucParamConfContainerDef EthSwtAtsGroupInstanceEntry

Status: DRAFT

[

Container Name	EthSwtAtsGroupInstanceEntry		
Parent Container	EthSwtAtsGroupInstanceTable		
Description	AtsGroupInstanceEntry. Tags: atp.Status=draft		
Post-Build Variant Multiplicity	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Configuration Parameters			

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
EthSwtAtsGroupMaximumResidenceTime	1	[ECUC_EthSwt_00195]

No Included Containers

]

[ECUC_EthSwt_00195] Definition of EcucFloatParamDef EthSwtAtsGroupMaximumResidenceTime

Status: DRAFT

[

Parameter Name	EthSwtAtsGroupMaximumResidenceTime		
Parent Container	EthSwtAtsGroupInstanceEntry		
Description	The parameter defines the maximum duration limit for which frames can reside in a bridge in seconds. Tags: atp.Status=draft		
Multiplicity	1		
Type	EcucFloatParamDef		
Range]0 .. INF[
Default value	-		
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

]

10.1.6 EthSwtDemEventParameterRefs

[ECUC_EthSwt_00016] Definition of EcucParamConfContainerDef EthSwtDemEventParameterRefs [

Container Name	EthSwtDemEventParameterRefs		
Parent Container	EthSwtConfig		
Description	Container for the references to DemEventParameter elements which shall be invoked using the API Dem_SetEventStatus in case the corresponding error occurs. The Event Id is taken from the referenced DemEventParameter's DemEventId symbolic value. The standardized errors are provided in this container and can be extended by vendor-specific error references.		
Post-Build Variant Multiplicity	true		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Configuration Parameters			

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
ETHSWT_E_ACCESS	0..1	[ECUC_EthSwt_00006]
ETHSWT_E_SYNCPORT2PHY	0..1	[ECUC_EthSwt_00125]

No Included Containers

]

[ECUC_EthSwt_00006] Definition of EcucReferenceDef ETHSWT_E_ACCESS [

Parameter Name	ETHSWT_E_ACCESS		
Parent Container	EthSwtDemEventParameterRefs		
Description	Reference to the DemEventParameter which shall be issued when the error "Ethernet Switch Access Failure" has occurred.		
Multiplicity	0..1		
Type	Symbolic name reference to DemEventParameter		
Post-Build Variant Multiplicity	true		
Post-Build Variant Value	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00125] Definition of EcucReferenceDef ETHSWT_E_SYNC-PORT2PHY [

Parameter Name	ETHSWT_E_SYNCPORT2PHY		
Parent Container	EthSwtDemEventParameterRefs		
Description	Reference to the DemEventParameter which shall be issued when the error "Ethernet switch port and the referenced Ethernet transceiver are in contradicting modes" has occurred.		
Multiplicity	0..1		
Type	Symbolic name reference to DemEventParameter		
Post-Build Variant Multiplicity	true		
Post-Build Variant Value	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

]

10.1.7 EthSwtMacForwardingTable

[ECUC_EthSwt_00205] Definition of EcucParamConfContainerDef EthSwtMac ForwardingTable [

Container Name	EthSwtMacForwardingTable		
Parent Container	EthSwtConfig		
Description	Represents a MAC forwarding table.		
Post-Build Variant Multiplicity	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Configuration Parameters			

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
EthSwtPredefinedMacAddress	1	[ECUC_EthSwt_00206]
EthSwtMacForwardingTablePortRef	1..255	[ECUC_EthSwt_00207]
EthSwtVlanMembershipRef	0..4095	[ECUC_EthSwt_00237]

No Included Containers

]

[ECUC_EthSwt_00206] Definition of EcucStringParamDef EthSwtPredefinedMacAddress

Parameter Name	EthSwtPredefinedMacAddress		
Parent Container	EthSwtMacForwardingTable		
Description	Specifies a 48-bit physical addresses (MAC addresses) network byte order, which can be reached via the referenced port and if available via the referenced VLAN . Note that further addresses can be learned during runtime.		
Multiplicity	1		
Type	EcucStringParamDef		
Default value	-		
Length	17-17		
Regular Expression	([0-9a-fA-F]{2};){5}[0-9a-fA-F]{2}		
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: ECU		

]

[ECUC_EthSwt_00207] Definition of EcucReferenceDef EthSwtMacForwardingTablePortRef

Parameter Name	EthSwtMacForwardingTablePortRef		
Parent Container	EthSwtMacForwardingTable		
Description	References the ports the MAC shall be assigned to.		
Multiplicity	1..255		
Type	Reference to EthSwtPort		
Post-Build Variant Multiplicity	true		
Post-Build Variant Value	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: ECU		

]

[ECUC_EthSwT_00237] Definition of EcucReferenceDef EthSwTvlanMembership Ref

Parameter Name	EthSwTvlanMembershipRef		
Parent Container	EthSwTmacForwardingTable		
Description	References the VLAN-IDs the MAC address shall be assigned to. Please note, this reference is used if EthSwTmacAddressLearningMode is set to IVL (independent VLAN learning).		
Multiplicity	0..4095		
Type	Reference to EthSwTvlanMembership		
Post-Build Variant Multiplicity	true		
Post-Build Variant Value	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local dependency: Those references are only valid if EthSwTmacAddressLearningMode is set to IVL and the EthSwTport, which is referenced via EthSwTmacForwardingTablePort Ref, is member of the referenced VLAN.		

]

10.1.8 EthSwTnvm
[ECUC_EthSwT_00043] Definition of EcucParamConfContainerDef EthSwTnvm

Container Name	EthSwTnvm		
Parent Container	EthSwTconfig		
Description	Configuration of one Ethernet Switch Nvm usage in case the module requires non volatile memory in the Ecu to store switch configuration.		
Post-Build Variant Multiplicity	true		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Configuration Parameters			

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
EthSwTconfigurationNvmBlockDescriptorRef	1	[ECUC_EthSwT_00134]
EthSwTtableNvmBlockDescriptorRef	1	[ECUC_EthSwT_00044]

No Included Containers

]

[ECUC_EthSwt_00134] Definition of EcucReferenceDef EthSwtConfigurationNvmBlockDescriptorRef

Parameter Name	EthSwtConfigurationNvmBlockDescriptorRef		
Parent Container	EthSwtNvm		
Description	Reference to the Nvm block description in the Nvm module configuration to store e.g. the port mirror configurations		
Multiplicity	1		
Type	Symbolic name reference to NvMBlockDescriptor		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00044] Definition of EcucReferenceDef EthSwtTableNvmBlockDescriptorRef

Parameter Name	EthSwtTableNvmBlockDescriptorRef		
Parent Container	EthSwtNvm		
Description	Reference to the Nvm block description in the Nvm module configuration to store e.g. the learned ARL table		
Multiplicity	1		
Type	Symbolic name reference to NvMBlockDescriptor		
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: ECU		

]

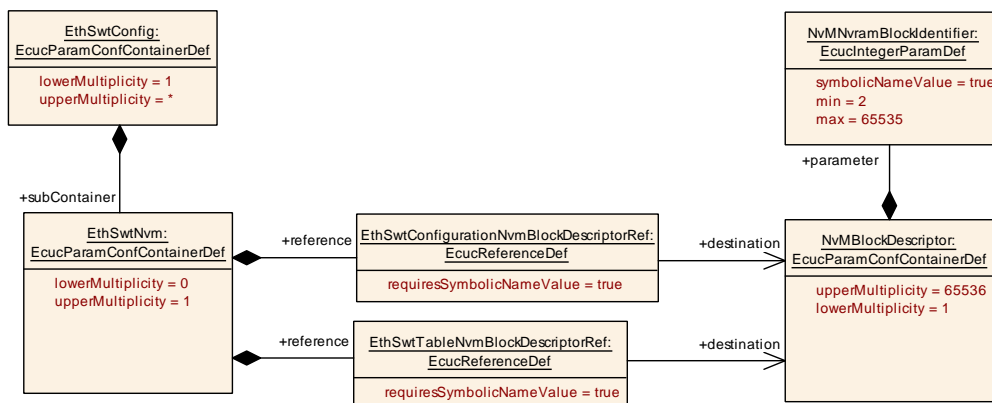


Figure 10.4: EthSwtNvm

10.1.9 EthSwtPSCM

[ECUC_EthSwt_00218] Definition of EcucParamConfContainerDef EthSwtPSCM

Status: DRAFT

[

Container Name	EthSwtPSCM		
Parent Container	EthSwtConfig		
Description	Per stream classification and metering. Tags: atp.Status=draft		
Post-Build Variant Multiplicity	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Configuration Parameters			

No Included Parameters

Included Containers		
Container Name	Multiplicity	Scope / Dependency
EthSwtAtsInstanceTable	0..1	EthSwtAtsInstanceTable Tags: atp.Status=draft
EthSwtPSFP	0..1	Configuration of Per-stream Filtering and Policing (PSFP). Tags: atp.Status=draft

]

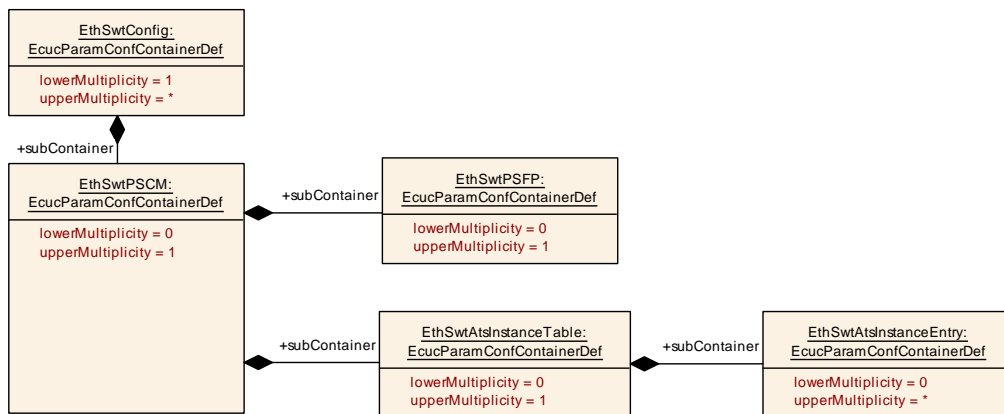


Figure 10.5: EthSwtPSCM

10.1.10 EthSwtAtsInstanceTable

[ECUC_EthSwt_00226] Definition of EcucParamConfContainerDef EthSwtAtsInstanceTable

Status: DRAFT

[

Container Name	EthSwtAtsInstanceTable		
Parent Container	EthSwtPSCM		
Description	EthSwtAtsInstanceTable Tags: atp.Status=draft		
Post-Build Variant Multiplicity	false		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Configuration Parameters			

No Included Parameters

Included Containers		
Container Name	Multiplicity	Scope / Dependency
EthSwtAtsInstanceEntry	0..*	Configuration of an Asynchronous Traffic Scheduler configuration in the scope of the PSFP. Tags: atp.Status=draft

]

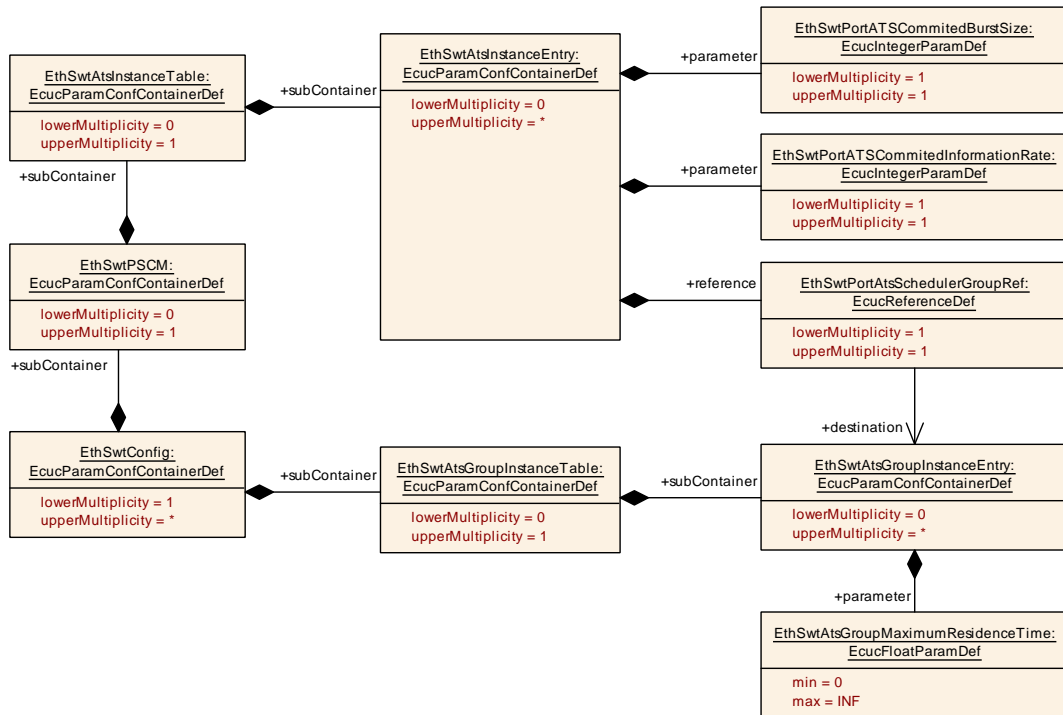


Figure 10.6: [EthSwtAtsInstanceTable](#)

10.1.11 EthSwtAtsInstanceEntry

[ECUC_EthSwt_00228] Definition of EcucParamConfContainerDef EthSwtAtsInstanceEntry

Status: DRAFT

[

Container Name	EthSwtAtsInstanceEntry		
Parent Container	EthSwtAtsInstanceTable		
Description	Configuration of an Asynchronous Traffic Scheduler configuration in the scope of the PSFP. Tags: atp.Status=draft		
Post-Build Variant Multiplicity	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Configuration Parameters			

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
EthSwtPortATSCommittedBurstSize	1	[ECUC_EthSwt_00197]
EthSwtPortATSCommittedInformationRate	1	[ECUC_EthSwt_00198]
EthSwtPortAtsSchedulerGroupRef	1	[ECUC_EthSwt_00196]

No Included Containers

]

[ECUC_EthSwT_00197] Definition of EcucIntegerParamDef EthSwTPortATSCommittedBurstSize

Status: DRAFT

[

Parameter Name	EthSwTPortATSCommittedBurstSize		
Parent Container	EthSwTAtsInstanceEntry		
Description	Maximum token capacity of the token bucket. Tags: atp.Status=draft		
Multiplicity	1		
Type	EcucIntegerParamDef		
Range	0 .. 18446744073709551615		
Default value	-		
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

]

[ECUC_EthSwT_00198] Definition of EcucIntegerParamDef EthSwTPortATSCommittedInformationRate

Status: DRAFT

[

Parameter Name	EthSwTPortATSCommittedInformationRate		
Parent Container	EthSwTAtsInstanceEntry		
Description	Defines the rate at which the token bucket is refilled with tokens. Tags: atp.Status=draft		
Multiplicity	1		
Type	EcucIntegerParamDef		
Range	0 .. 18446744073709551615		
Default value	-		
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00196] Definition of EcucReferenceDef EthSwtPortAtsSchedulerGroupRef

Status: DRAFT

[

Parameter Name	EthSwtPortAtsSchedulerGroupRef		
Parent Container	EthSwtAtsInstanceEntry		
Description	Defines to which ATS scheduler group this ATS scheduler belongs to. Tags: atp.Status=draft		
Multiplicity	1		
Type	Reference to EthSwtAtsGroupInstanceEntry		
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

]

10.1.12 EthSwtPSFP

[ECUC_EthSwt_00154] Definition of EcucParamConfContainerDef EthSwtPSFP

Status: DRAFT

[

Container Name	EthSwtPSFP		
Parent Container	EthSwtPSCM		
Description	Configuration of Per-stream Filtering and Policing (PSFP). Tags: atp.Status=draft		
Post-Build Variant Multiplicity	false		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Configuration Parameters			

No Included Parameters

Included Containers		
Container Name	Multiplicity	Scope / Dependency
EthSwtFilterMaxSduSizeTable	0..1	EthSwtFilterMaxSduSizeTable represents a table of sdu size values, where each value (table entry) could be referenced by a EthSwtStreamFilterEntry. Tags: atp.Status=draft





Included Containers		
Container Name	Multiplicity	Scope / Dependency
EthSwtFlowMeteringTable	0..1	EthSwtFlowMeteringTable represents a table of flowmeter configurations, where each flowmeter configuration (table entry) could be referenced by a EthSwtStreamFilterEntry. Tags: atp.Status=draft
EthSwtStreamFilterTable	0..1	EthSwtStreamFilterTable represents a table of stream filter configurations, where each stream filter configuration (table entry) could reference a EthSwtFilterMaxSduSizeEntry, EthSwtFlowMeteringEntry and EthSwtStreamGateEntry. Tags: atp.Status=draft
EthSwtStreamGateTable	0..1	EthSwtStreamGateTable represents a table of stream gate configurations, where each stream gate configuration (table entry) could be referenced by a EthSwtStreamFilterEntry. Tags: atp.Status=draft

]

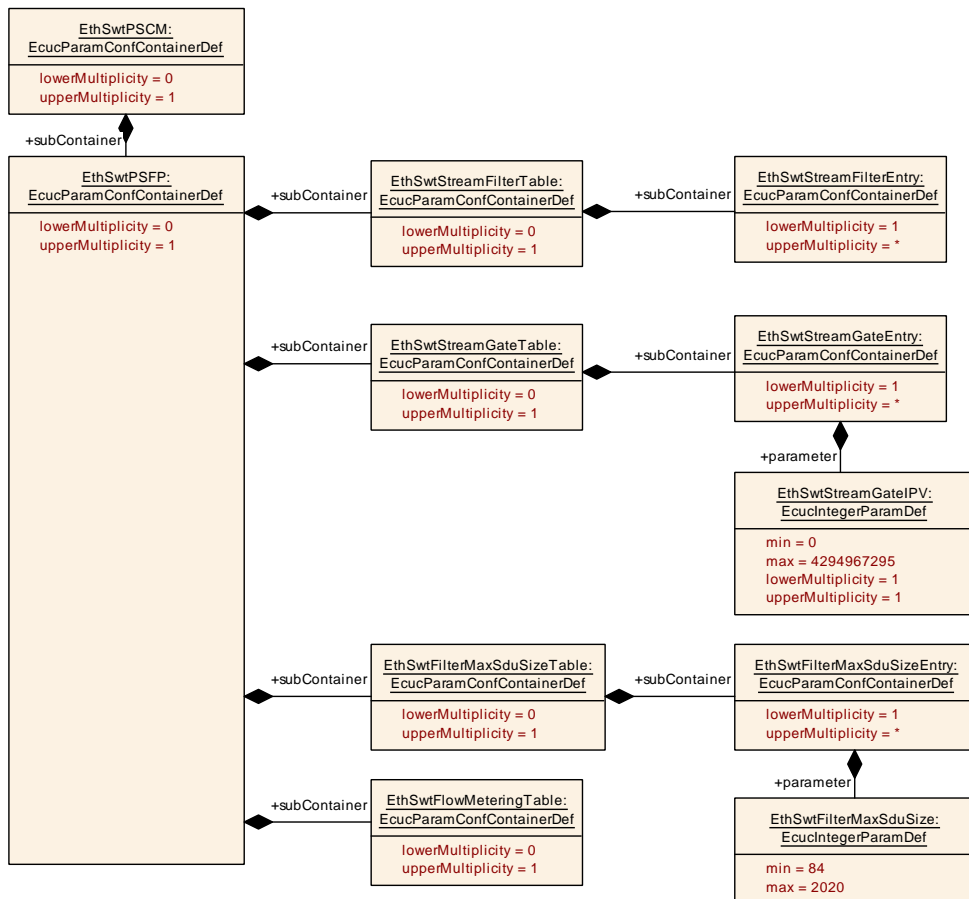


Figure 10.7: EthSwtPSFP

10.1.13 EthSwtFilterMaxSduSizeTable

[ECUC_EthSwt_00222] Definition of EcucParamConfContainerDef EthSwtFilterMaxSduSizeTable

Status: DRAFT

[

Container Name	EthSwtFilterMaxSduSizeTable		
Parent Container	EthSwtPSFP		
Description	EthSwtFilterMaxSduSizeTable represents a table of sdu size values, where each value (table entry) could be referenced by a EthSwtStreamFilterEntry. Tags: atp.Status=draft		
Post-Build Variant Multiplicity	false		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Configuration Parameters			

No Included Parameters

Included Containers		
Container Name	Multiplicity	Scope / Dependency
EthSwtFilterMaxSduSizeEntry	1..*	<p>EthSwtFilterMaxSduSizeEntry defines the maximum SDU size (size of an Ethernet packet) which is acceptable to be processed by the Ethernet switch.</p> <p>The value of EthSwtFilterMaxSduSizeEntry consider the size of the following parts of an Ethernet packet:</p> <ul style="list-style-type: none"> • Preamble (7 byte) • SFD (start of frame delimiter) (1 byte) • Ethernet frame (Dst MAC,Src MAC, VLAN-tag, TypeField, Payload, CRC Checksum) • Minimum IPG (inter package gap) (12 byte times). <p>Tags: atp.Status=draft</p>

]

10.1.14 EthSwtFilterMaxSduSizeEntry

[ECUC_EthSwt_00224] Definition of EcucParamConfContainerDef EthSwtFilterMaxSduSizeEntry

Status: DRAFT

[

Container Name	EthSwtFilterMaxSduSizeEntry		
Parent Container	EthSwtFilterMaxSduSizeTable		
Description	<p>EthSwtFilterMaxSduSizeEntry defines the maximum SDU size (size of an Ethernet packet) which is acceptable to be processed by the Ethernet switch.</p> <p>The value of EthSwtFilterMaxSduSizeEntry consider the size of the following parts of an Ethernet packet:</p> <ul style="list-style-type: none"> • Preamble (7 byte) • SFD (start of frame delimiter) (1 byte) • Ethernet frame (Dst MAC,Src MAC, VLAN-tag, TypeField, Payload, CRC Checksum) • Minimum IPG (inter package gap) (12 byte times). <p>Tags: atp.Status=draft</p>		
Post-Build Variant Multiplicity	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Configuration Parameters			

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
EthSwtFilterMaxSduSize	1	[ECUC_EthSwt_00225]

No Included Containers

]

[ECUC_EthSwt_00225] Definition of EcucIntegerParamDef EthSwtFilterMaxSdu Size

Status: DRAFT

[

Parameter Name	EthSwtFilterMaxSduSize		
Parent Container	EthSwtFilterMaxSduSizeEntry		
Description	<p>Max Sdu size.</p> <p>Tags: atp.Status=draft</p>		
Multiplicity	1		
Type	EcucIntegerParamDef		
Range	84 .. 2020		
Default value	-		
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

]

10.1.15 EthSwtFlowMeteringTable

[ECUC_EthSwt_00219] Definition of EcucParamConfContainerDef EthSwtFlowMeteringTable

Status: DRAFT

[

Container Name	EthSwtFlowMeteringTable		
Parent Container	EthSwtPSFP		
Description	EthSwtFlowMeteringTable represents a table of flowmeter configurations, where each flowmeter configuration (table entry) could be referenced by a EthSwtStreamFilterEntry. Tags: atp.Status=draft		
Post-Build Variant Multiplicity	false		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Configuration Parameters			

No Included Parameters

Included Containers		
Container Name	Multiplicity	Scope / Dependency
EthSwtFlowMeteringEntry	1..*	Configuration of a flow metering. Tags: atp.Status=draft

]

10.1.16 EthSwtFlowMeteringEntry

[ECUC_EthSwt_00157] Definition of EcucParamConfContainerDef EthSwtFlowMeteringEntry

Status: DRAFT

[

Container Name	EthSwtFlowMeteringEntry		
Parent Container	EthSwtFlowMeteringTable		
Description	Configuration of a flow metering. Tags: atp.Status=draft		
Post-Build Variant Multiplicity	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD





Configuration Parameters

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
EthSwtFlowMeterCF	1	[ECUC_EthSwt_00162]
EthSwtFlowMeteringCBS	1	[ECUC_EthSwt_00159]
EthSwtFlowMeteringCIR	1	[ECUC_EthSwt_00158]
EthSwtFlowMeteringColorMode	1	[ECUC_EthSwt_00163]
EthSwtFlowMeteringEBS	1	[ECUC_EthSwt_00161]
EthSwtFlowMeteringEIR	1	[ECUC_EthSwt_00160]

No Included Containers

]

[ECUC_EthSwt_00162] Definition of EcucBooleanParamDef EthSwtFlowMeterCF

Status: DRAFT

[

Parameter Name	EthSwtFlowMeterCF		
Parent Container	EthSwtFlowMeteringEntry		
Description	Coupling Flag that defines if unused "green" tokens in the first bucket are transferred to the second bucket as "yellow" tokens. Note: this parameter maps to IEEE802.1Q parameter "ieee8021PSFPFlowMeterCF". Tags: atp.Status=draft		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	-		
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00159] Definition of EcucIntegerParamDef EthSwtFlowMeteringCBS

Status: DRAFT

[

Parameter Name	EthSwtFlowMeteringCBS		
Parent Container	EthSwtFlowMeteringEntry		
Description	Committed Burst Size (accepted burst size in green token bucket). Note: this parameter maps to IEEE802.1Q parameter "ieee8021PSFPFlowMeterCBS". Tags: atp.Status=draft		
Multiplicity	1		
Type	EcucIntegerParamDef		
Range	0 .. 255		
Default value	-		
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00158] Definition of EcucIntegerParamDef EthSwtFlowMeteringCIR

Status: DRAFT

[

Parameter Name	EthSwtFlowMeteringCIR		
Parent Container	EthSwtFlowMeteringEntry		
Description	Committed Information Rate (accepted rate in green token bucket) in bits per second. Note: this parameter maps to IEEE802.1Q parameter "ieee8021PSFPFlowMeterCIR". Tags: atp.Status=draft		
Multiplicity	1		
Type	EcucIntegerParamDef		
Range	0 .. 4294967295		
Default value	-		
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00163] Definition of EcucEnumerationParamDef EthSwtFlowMeteringColorMode

Status: DRAFT

[

Parameter Name	EthSwtFlowMeteringColorMode		
Parent Container	EthSwtFlowMeteringEntry		
Description	Parameter that defines if color-aware or color-blind mode is used. The mode indicates if a color that might be assigned at ingress is used to chose the bucket from which to take tokens; only green and yellow can be assigned; basically, in color-blind mode, all frames are treated like green frames. Note: this parameter maps to IEEE802.1Q parameter "ieee8021PSFPFlowMeterCM". Tags: atp.Status=draft		
Multiplicity	1		
Type	EcucEnumerationParamDef		
Range	ETHSWT_COLOR_AWARE		color aware color mode. Tags: atp.Status=draft
	ETHSWT_COLOR_BLIND		color blind color mode. Tags: atp.Status=draft
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00161] Definition of EcucIntegerParamDef EthSwtFlowMeteringEBS

Status: DRAFT

[

Parameter Name	EthSwtFlowMeteringEBS		
Parent Container	EthSwtFlowMeteringEntry		
Description	Excess burst size (accepted burst size in yellow token bucket). Note: this parameter maps to IEEE802.1Q parameter "ieee8021PSFPFlowMeterEBS". Tags: atp.Status=draft		
Multiplicity	1		
Type	EcucIntegerParamDef		
Range	0 .. 255		
Default value	-		
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00160] Definition of EcucIntegerParamDef EthSwtFlowMeteringEIR

Status: DRAFT

[

Parameter Name	EthSwtFlowMeteringEIR		
Parent Container	EthSwtFlowMeteringEntry		
Description	Excess Information Rate (accepted rate in yellow token bucket) in bits per second. Note: this parameter maps to IEEE802.1Q parameter "ieee8021PSFPFlowMeterEIR". Tags: atp.Status=draft		
Multiplicity	1		
Type	EcucIntegerParamDef		
Range	0 .. 4294967295		
Default value	-		
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

]

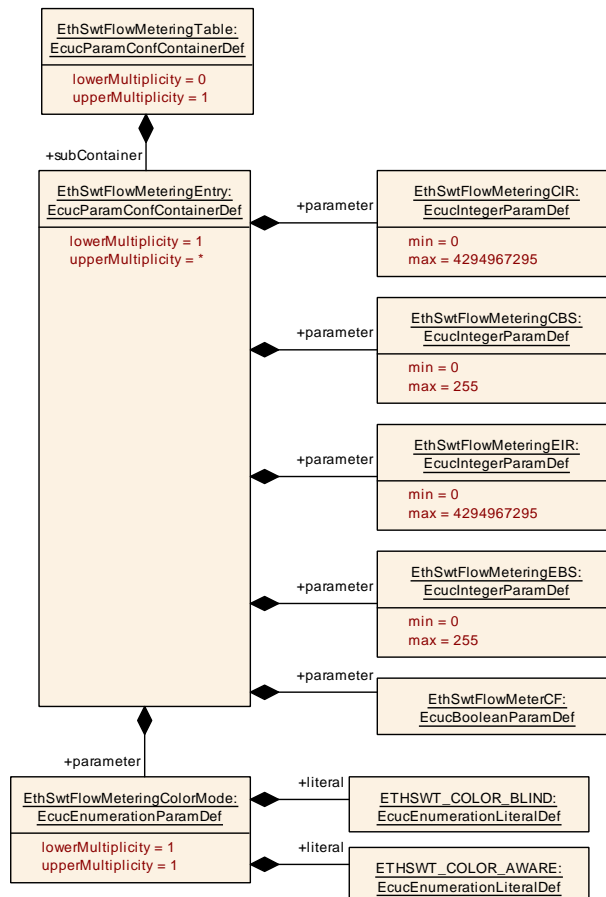


Figure 10.8: EthSwtFlowMeteringEntry

10.1.17 EthSwtStreamFilterTable

[ECUC_EthSwt_00214] Definition of EcucParamConfContainerDef EthSwtStreamFilterTable

Status: DRAFT

[

Container Name	EthSwtStreamFilterTable		
Parent Container	EthSwtPSFP		
Description	EthSwtStreamFilterTable represents a table of stream filter configurations, where each stream filter configuration (table entry) could reference a EthSwtFilterMaxSduSize Entry, EthSwtFlowMeteringEntry and EthSwtStreamGateEntry. Tags: atp.Status=draft		
Post-Build Variant Multiplicity	false		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Configuration Parameters			

No Included Parameters

Included Containers		
Container Name	Multiplicity	Scope / Dependency
EthSwtStreamFilterEntry	1..*	This container represents a stream filter, where EthSwtStreamFilterPriority and EthSwtAssignedStreamHandle are used to detect a matching Ethernet frame. Tags: atp.Status=draft

]

10.1.18 EthSwtStreamFilterEntry

[ECUC_EthSwt_00217] Definition of EcucParamConfContainerDef EthSwtStreamFilterEntry

Status: DRAFT

[

Container Name	EthSwtStreamFilterEntry		
Parent Container	EthSwtStreamFilterTable		
Description	This container represents a stream filter, where EthSwtStreamFilterPriority and EthSwtAssignedStreamHandle are used to detect a matching Ethernet frame. Tags: atp.Status=draft		
Post-Build Variant Multiplicity	true		

▽



Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Configuration Parameters			

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
EthSwtStreamFilterEntryPosition	1	[ECUC_EthSwt_00216]
EthSwtStreamFilterPriority	1	[ECUC_EthSwt_00215]
EthSwtAtsInstanceEntryRef	0..1	[ECUC_EthSwt_00227]
EthSwtFilterMaxSduSizeRef	0..1	[ECUC_EthSwt_00223]
EthSwtFlowMeteringEntryRef	0..1	[ECUC_EthSwt_00221]
EthSwtStreamGateEntryRef	0..1	[ECUC_EthSwt_00213]

Included Containers		
Container Name	Multiplicity	Scope / Dependency
EthSwtAssignedStreamHandle	1	<p>This container represents an assigned stream handle id of this stream filter, which is used to detect a matching Ethernet frame. The EthSwtAssignedStreamHandle could represent a list of assigned stream handle ids.</p> <p>Additionally it could set a wildcard flag (EthSwtStreamHandleId Wildcard), where any assigned stream handle id carried by an Ethernet frame would match to this stream filter.</p> <p>Tags: atp.Status=draft</p>

]

[ECUC_EthSwt_00216] Definition of EcucIntegerParamDef EthSwtStreamFilterEntryPosition

Status: DRAFT

[

Parameter Name	EthSwtStreamFilterEntryPosition		
Parent Container	EthSwtStreamFilterEntry		
Description	<p>Specifies the position as unique ID within an ordered list of EthSwtStreamFilterEntries. The ordered list shall start with 0 and continue as linear list with no gaps.</p> <p>Note: The list is processed in ascending order. The instance of EthSwtStreamFilterEntry with position 0 is processed first.</p> <p>Tags: atp.Status=draft</p>		
Multiplicity	1		
Type	EcucIntegerParamDef		
Range	0 .. 65535		
Default value	-		
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD





Scope / Dependency	scope: ECU
---------------------------	------------

]

[ECUC_EthSwT_00215] Definition of EcucIntegerParamDef EthSwTStreamFilter Priority

Status: DRAFT

[

Parameter Name	EthSwTStreamFilterPriority		
Parent Container	EthSwTStreamFilterEntry		
Description	This parameter represents an assigned priority of this stream filter, which is used to detect a matching Ethernet frame. Tags: atp.Status=draft		
Multiplicity	1		
Type	EcucIntegerParamDef		
Range	0 .. 7		
Default value	-		
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

]

[ECUC_EthSwT_00227] Definition of EcucReferenceDef EthSwTAtsInstanceEntry Ref

Status: DRAFT

[

Parameter Name	EthSwTAtsInstanceEntryRef		
Parent Container	EthSwTStreamFilterEntry		
Description	Reference to an entry of an ATS table, where the entry represents a configuration for asynchronous traffic shaping. Tags: atp.Status=draft		
Multiplicity	0..1		
Type	Reference to EthSwTAtsInstanceEntry		
Post-Build Variant Multiplicity	true		
Post-Build Variant Value	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE





	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00223] Definition of EcucReferenceDef EthSwtFilterMaxSduSizeRef

Status: DRAFT

[

Parameter Name	EthSwtFilterMaxSduSizeRef		
Parent Container	EthSwtStreamFilterEntry		
Description	Reference to an entry of a max-sdu-size table, where the entry represents a particular value. Tags: atp.Status=draft		
Multiplicity	0..1		
Type	Reference to EthSwtFilterMaxSduSizeEntry		
Post-Build Variant Multiplicity	true		
Post-Build Variant Value	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00221] Definition of EcucReferenceDef EthSwtFlowMeteringEntryRef

Status: DRAFT

[

Parameter Name	EthSwtFlowMeteringEntryRef		
Parent Container	EthSwtStreamFilterEntry		
Description	Reference to an entry of a flow metering table, where the entry represents a configuration for flow metering. Tags: atp.Status=draft		
Multiplicity	0..1		
Type	Reference to EthSwtFlowMeteringEntry		
Post-Build Variant Multiplicity	true		
Post-Build Variant Value	true		



△

Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00213] Definition of EcucReferenceDef EthSwtStreamGateEntry Ref

Status: DRAFT

[

Parameter Name	EthSwtStreamGateEntryRef		
Parent Container	EthSwtStreamFilterEntry		
Description	Reference to an entry of a gate table, where the entry represents a configuration for a gate. Tags: atp.Status=draft		
Multiplicity	0..1		
Type	Reference to EthSwtStreamGateEntry		
Post-Build Variant Multiplicity	false		
Post-Build Variant Value	true		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

]

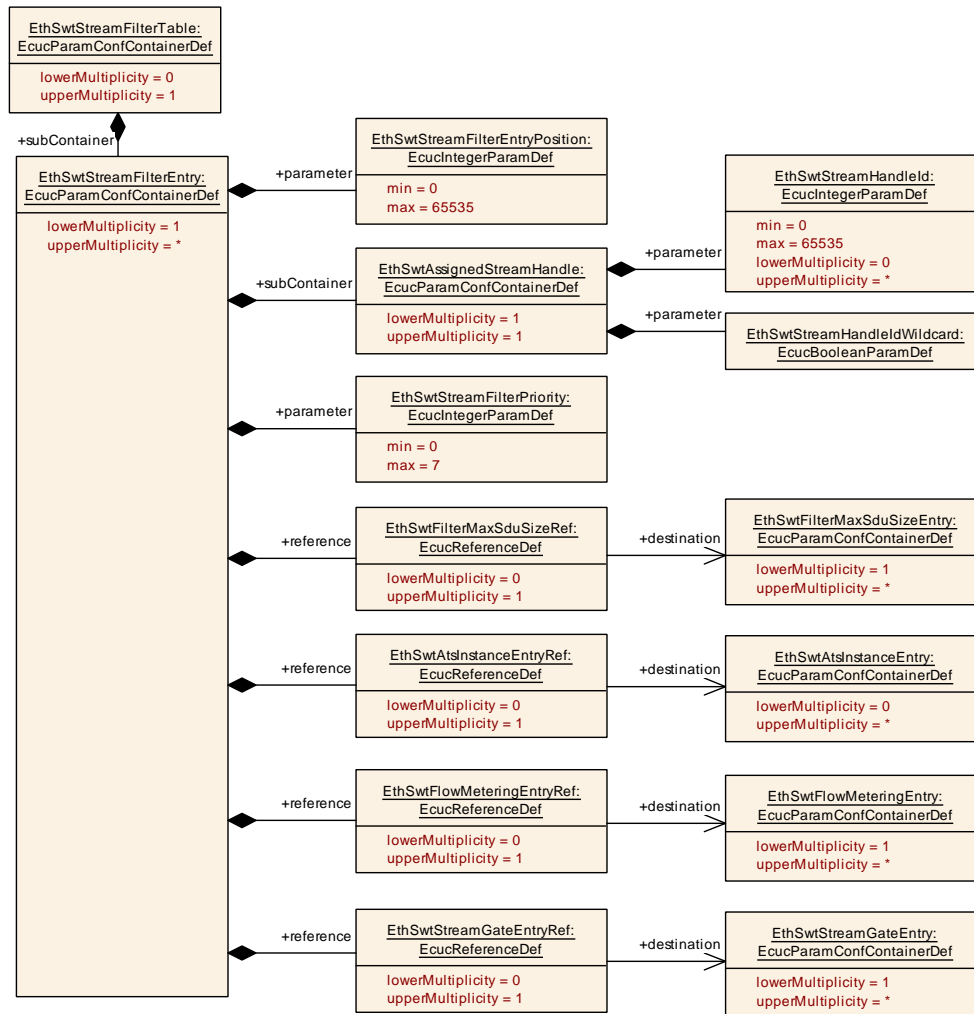


Figure 10.9: EthSwtStreamFilterEntry

10.1.19 EthSwtAssignedStreamHandle

[ECUC_EthSwt_00231] Definition of EcucParamConfContainerDef EthSwtAssignedStreamHandle

Status: DRAFT

[

Container Name	EthSwtAssignedStreamHandle
Parent Container	EthSwtStreamFilterEntry
Description	<p>This container represents an assigned stream handle id of this stream filter, which is used to detect a matching Ethernet frame. The EthSwtAssignedStreamHandle could represent a list of assigned stream handle ids.</p> <p>Additionally it could set a wildcard flag (EthSwtStreamHandleIdWildcard), where any assigned stream handle id carried by an Ethernet frame would match to this stream filter.</p> <p>Tags: atp.Status=draft</p>
Configuration Parameters	

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
EthSwtStreamHandleId	0..*	[ECUC_EthSwt_00210]
EthSwtStreamHandleIdWildcard	1	[ECUC_EthSwt_00209]

No Included Containers

]

[ECUC_EthSwt_00210] Definition of EcuIntegerParamDef EthSwtStreamHandle Id

Status: DRAFT

[

Parameter Name	EthSwtStreamHandleId		
Parent Container	EthSwtAssignedStreamHandle		
Description	<p>Assigned stream handle id of this stream filter, which is used for evaluation of a matching Ethernet frame.</p> <p>Tags: atp.Status=draft</p>		
Multiplicity	0..*		
Type	EcuIntegerParamDef		
Range	0 .. 65535		
Default value	-		
Post-Build Variant Multiplicity	true		
Post-Build Variant Value	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00209] Definition of EcucBooleanParamDef EthSwtStreamHandleIdWildcard

Status: DRAFT

[

Parameter Name	EthSwtStreamHandleIdWildcard		
Parent Container	EthSwtAssignedStreamHandle		
Description	Defines whether this EthSwtAssignedStreamHandle includes the wildcard. Tags: atp.Status=draft		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	-		
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

]

10.1.20 EthSwtStreamGateTable

[ECUC_EthSwt_00212] Definition of EcucParamConfContainerDef EthSwtStreamGateTable

Status: DRAFT

[

Container Name	EthSwtStreamGateTable		
Parent Container	EthSwtPSFP		
Description	EthSwtStreamGateTable represents a table of stream gate configurations, where each stream gate configuration (table entry) could be referenced by a EthSwtStreamFilter Entry. Tags: atp.Status=draft		
Post-Build Variant Multiplicity	false		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Configuration Parameters			

No Included Parameters

Included Containers		
Container Name	Multiplicity	Scope / Dependency
EthSwtStreamGateEntry	1..*	Configuration of a stream gate. Tags: atp.Status=draft

]

10.1.21 EthSwtStreamGateEntry

[ECUC_EthSwt_00155] Definition of EcucParamConfContainerDef EthSwtStreamGateEntry

Status: DRAFT

[

Container Name	EthSwtStreamGateEntry		
Parent Container	EthSwtStreamGateTable		
Description	Configuration of a stream gate. Tags: atp.Status=draft		
Post-Build Variant Multiplicity	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Configuration Parameters			

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
EthSwtStreamGateIPV	1	[ECUC_EthSwt_00156]

No Included Containers

]

[ECUC_EthSwt_00156] Definition of EcucIntegerParamDef EthSwtStreamGateIPV

Status: DRAFT

[

Parameter Name	EthSwtStreamGateIPV	
Parent Container	EthSwtStreamGateEntry	
Description	Internal Priority Value (IPV), a priority value that determines the assigned traffic class. Note: The upper value is limited by the configured used internal priority value of the this Ethernet switch (EthSwtUsedInternalPriorityUpperValue). The remaining value range shall be ignored. Tags: atp.Status=draft	
Multiplicity	1	
Type	EcucIntegerParamDef	
Range	0 .. 4294967295	



△

Default value	-		
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

]

10.1.22 EthSwtPort

[ECUC_EthSwt_00005] Definition of EcucParamConfContainerDef EthSwtPort [

Container Name	EthSwtPort		
Parent Container	EthSwtConfig		
Description	Configuration of one Ethernet Switch Port.		
Post-Build Variant Multiplicity	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Configuration Parameters			

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
EthSwtFramePreemptionEnable	1	[ECUC_EthSwt_00254]
EthSwtPortIdx	1	[ECUC_EthSwt_00013]
EthSwtPortInterPacketGap	0..1	[ECUC_EthSwt_00238]
EthSwtPortMacLayerSpeed	0..1	[ECUC_EthSwt_00114]
EthSwtPortMacLayerSubType	0..1	[ECUC_EthSwt_00113]
EthSwtPortMacLayerType	0..1	[ECUC_EthSwt_00072]
EthSwtPortPhysicalLayerType	0..1	[ECUC_EthSwt_00054]
EthSwtPortRole	0..1	[ECUC_EthSwt_00101]
EthSwtPortTimeStampSupport	1	[ECUC_EthSwt_00112]
EthSwtPortTrcvRef	0..1	[ECUC_EthSwt_00041]

Included Containers		
Container Name	Multiplicity	Scope / Dependency
EthSwtPortEgress	1	Configuration of one Ethernet Switch Port Egress behavior.
EthSwtPortIngress	1	Configuration of one Ethernet Switch Port ingress behavior.

]

[ECUC_EthSwt_00254] Definition of EcucBooleanParamDef EthSwtFramePreemptionEnable

Status: DRAFT

[

Parameter Name	EthSwtFramePreemptionEnable		
Parent Container	EthSwtPort		
Description	<p>Configures whether frame preemption for this EthSwtPort is enabled.</p> <p>If the Ethernet switch hardware supports frame preemption and this parameter is set TRUE, then frame preemption for the corresponding EthSwtPort is enabled. If for some traffic class(es) EthSwtTrafficClassToPreemptionStatusAssignment at the egress port queue is additionally configured to ETHSWT_TRAFFIC_CLASS_PREEMPTABLE, then frame preemption for the respective traffic class(es) at the corresponding EthSwtEgress Port is possible.</p> <p>Tags: atp.Status=draft</p>		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	false		
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local dependency: If an Ethernet switch hardware does not support frame preemption, then this parameter shall be set to false.		

]

[ECUC_EthSwt_00013] Definition of EcucIntegerParamDef EthSwtPortIdx [

Parameter Name	EthSwtPortIdx		
Parent Container	EthSwtPort		
Description	Specifies the instance ID of the configured Ethernet Switch Port.		
Multiplicity	1		
Type	EcucIntegerParamDef (Symbolic Name generated for this parameter)		
Range	0 .. 255		
Default value	-		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency	scope: ECU withAuto = true		

]

[ECUC_EthSwt_00238] Definition of EcucIntegerParamDef EthSwtPortInterPacketGap

Parameter Name	EthSwtPortInterPacketGap		
Parent Container	EthSwtPort		
Description	This parameter defines the transmit Inter-Packet Gap (IPG) (also called interframe gap (IFG)) between transmitted Ethernet packets in "byte times". This parameter can only exist if the hardware and driver support setting the IPG.		
Multiplicity	0..1		
Type	EcucIntegerParamDef		
Range	0 .. 10000		
Default value	12		
Post-Build Variant Multiplicity	false		
Post-Build Variant Value	false		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	Post-build time	–	
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	Post-build time	–	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00114] Definition of EcucEnumerationParamDef EthSwtPortMacLayerSpeed

Parameter Name	EthSwtPortMacLayerSpeed		
Parent Container	EthSwtPort		
Description	Defines the baud rate of the MAC layer.		
Multiplicity	0..1		
Type	EcucEnumerationParamDef		
Range	ETH_MAC_LAYER_SPEED_100M	–	
	ETH_MAC_LAYER_SPEED_10G	–	
	ETH_MAC_LAYER_SPEED_10M	–	
	ETH_MAC_LAYER_SPEED_1G	–	
	ETH_MAC_LAYER_SPEED_2500M	–	
	ETH_MAC_LAYER_SPEED_5G	–	
Post-Build Variant Multiplicity	true		
Post-Build Variant Value	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	Post-build time	–	
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE

▽



	Link time	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	Post-build time	–	
Scope / Dependency	scope: ECU		

]

[ECUC_EthSwt_00113] Definition of EcucEnumerationParamDef EthSwtPortMacLayerSubType [

Parameter Name	EthSwtPortMacLayerSubType		
Parent Container	EthSwtPort		
Description	Defines the MAC layer subtype of this EthSwtPort.		
Multiplicity	0..1		
Type	EcucEnumerationParamDef		
Range	REDUCED	Reduced media-independent interface	
	REVERSED	reversed media-independent interface (to provide direct connection between two Ethernet MACs)	
	SERIAL	low-power and low pin-count serial 8b/10b-coded media-independent interface	
	STANDARD	standard media-independent interface	
	UNIVERSAL_SERIAL	Universal low-power and low pin-count serial 8b/10b-coded media-independent interface	
Post-Build Variant Multiplicity	true		
Post-Build Variant Value	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	Post-build time	–	
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	Post-build time	–	
Scope / Dependency	scope: ECU		

]

[ECUC_EthSwt_00072] Definition of EcucEnumerationParamDef EthSwtPortMacLayerType [

Parameter Name	EthSwtPortMacLayerType		
Parent Container	EthSwtPort		
Description	Defines the MAC layer type of this EthSwtPort.		
Multiplicity	0..1		
Type	EcucEnumerationParamDef		
Range	ETHSWT_PORT_MAC_LAYER_TYPE_XGMII	MAC layer interface (data) bandwidth class 1Gbit/s (e.g. GMII, RGMII, SGMII, RvGMII, USGMII)	





	ETHSWT_PORT_MAC_LAYER_TYPE_XMII	MAC layer interface (data) bandwidth class 100Mbit/s (e.g. MII, RMII, RvMII, SMII, RvMII)	
	ETHSWT_PORT_MAC_LAYER_TYPE_XXGMII	MAC layer interface (data) bandwidth class 10Gbit/s	
Post-Build Variant Multiplicity	true		
Post-Build Variant Value	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	Post-build time	–	
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	Post-build time	–	
Scope / Dependency	scope: ECU		



[ECUC_EthSwt_00054] Definition of EcucEnumerationParamDef EthSwtPort PhysicalLayerType

Parameter Name	EthSwtPortPhysicalLayerType		
Parent Container	EthSwtPort		
Description	Defines the physical layer type of this EthSwtPort.		
Multiplicity	0..1		
Type	EcucEnumerationParamDef		
Range	ETHSWT_PORT_1000BASE_T1	physical layer interface 10GBASE-T1 (10Gbit/s, 1pair). Used for automotive.	
	ETHSWT_PORT_1000BASE_T	physical layer interface 1000BASE-T (1Gbit/s, 4 pairs). Used for consumer electronic.	
	ETHSWT_PORT_1000BASE_T1	physical layer interface 1000BASE-T1 (1Gbit/s, 1 pair). Used for automotive.	
	ETHSWT_PORT_100BASE_T1	physical layer interface 100BASE-T1 (100Mbit/s, 1 pair). Used for automotive.	
	ETHSWT_PORT_100BASE_TX	physical layer interface 100BASE-TX (100Mbit/s, 2 pairs). Used for consumer electronic.	
	ETHSWT_PORT_10BASE_T1S	physical layer interface 10BASE-T1S (10Mbit/s, 1 pair). Used for automotive.	
	ETHSWT_PORT_2500BASE_T1	physical layer interface 2.5GBASE-T1 (2.5Gbit/s, 1pair). Used for automotive.	
	ETHSWT_PORT_5000BASE_T1	physical layer interface 5GBASE-T1 (5Gbit/s, 1pair). Used for automotive.	
Post-Build Variant Multiplicity	true		
Post-Build Variant Value	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	Post-build time	–	
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE





	Link time	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	Post-build time	–	
Scope / Dependency	scope: ECU dependency: If a EthSwtPort has an EthSwtPortPhysicalLayerType then EthSwtPort shall reference an EthTrcv.		

]

[ECUC_EthSwt_00101] Definition of EcucEnumerationParamDef EthSwtPortRole

[

Parameter Name	EthSwtPortRole		
Parent Container	EthSwtPort		
Description	Set a special role of the Ethernet switch port. It is either a host port or a up link port. If not configured it is a standard port.		
Multiplicity	0..1		
Type	EcucEnumerationParamDef		
Range	ETHSWT_HOST_PORT	The hostPort is connected to an ECU (host ecu). The host ECU controls the connected Coupling Element (e.g. Ethernet switch).	
	ETHSWT_UP_LINK_PORT	A CouplingPort can be connected to another CouplingPort of a CouplingElement located on the same ECU (CouplingElement.ecuInstance) using the CouplingPortConnection. This is used to model a cascaded switch.	
Post-Build Variant Multiplicity	true		
Post-Build Variant Value	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local dependency: One Ethernet switch shall have either exactly one host port or at least one up link port. In case of having a host port also multiple up link port can exist. A master switch shall be connected by one host port with the host ecu. A slave switch shall be connected to a master switch by one up link port.		

]

[ECUC_EthSwt_00112] Definition of EcucBooleanParamDef EthSwtPortTime StampSupport

[

Parameter Name	EthSwtPortTimeStampSupport		
Parent Container	EthSwtPort		
Description	Enables/Disables the Switch-port specific timestamping.		
Multiplicity	1		



△

Type	EcucBooleanParamDef		
Default value	–		
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local dependency: EthSwtPortTimeStampSupport can only be set to TRUE, * if (EthSwtClockSynchronizationSupport is FALSE) OR * if ((EthSwtClockSynchronizationSupport is TRUE) AND (EthSwtPortRole is NOT ETHSWT_UP_LINK_PORT))		

]

[ECUC_EthSwt_00041] Definition of EcucReferenceDef EthSwtPortTrcvRef [

Parameter Name	EthSwtPortTrcvRef		
Parent Container	EthSwtPort		
Description	Reference to the Ethernet transceiver driver this EthSwtPort is connected with.		
Multiplicity	0..1		
Type	Symbolic name reference to EthTrcvConfig		
Post-Build Variant Multiplicity	true		
Post-Build Variant Value	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME, VARIANT-POST-BUILD
	Post-build time	–	
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: ECU dependency: If EthSwtPortPhysicalLayerType is defined, then EthSwtPortTrcvRef holds the reference to the corresponding EthTrcv.		

]

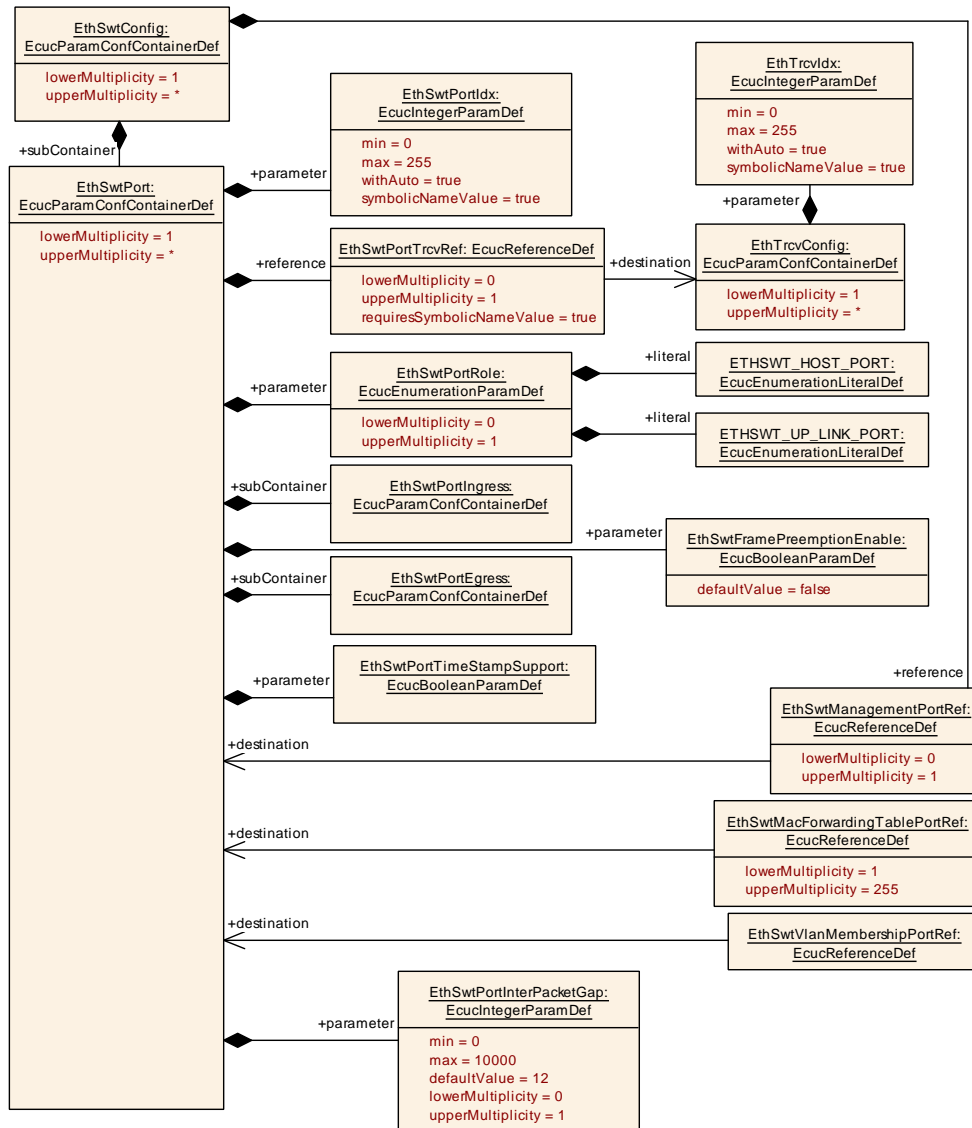


Figure 10.10: EthSwtPort (1/2)

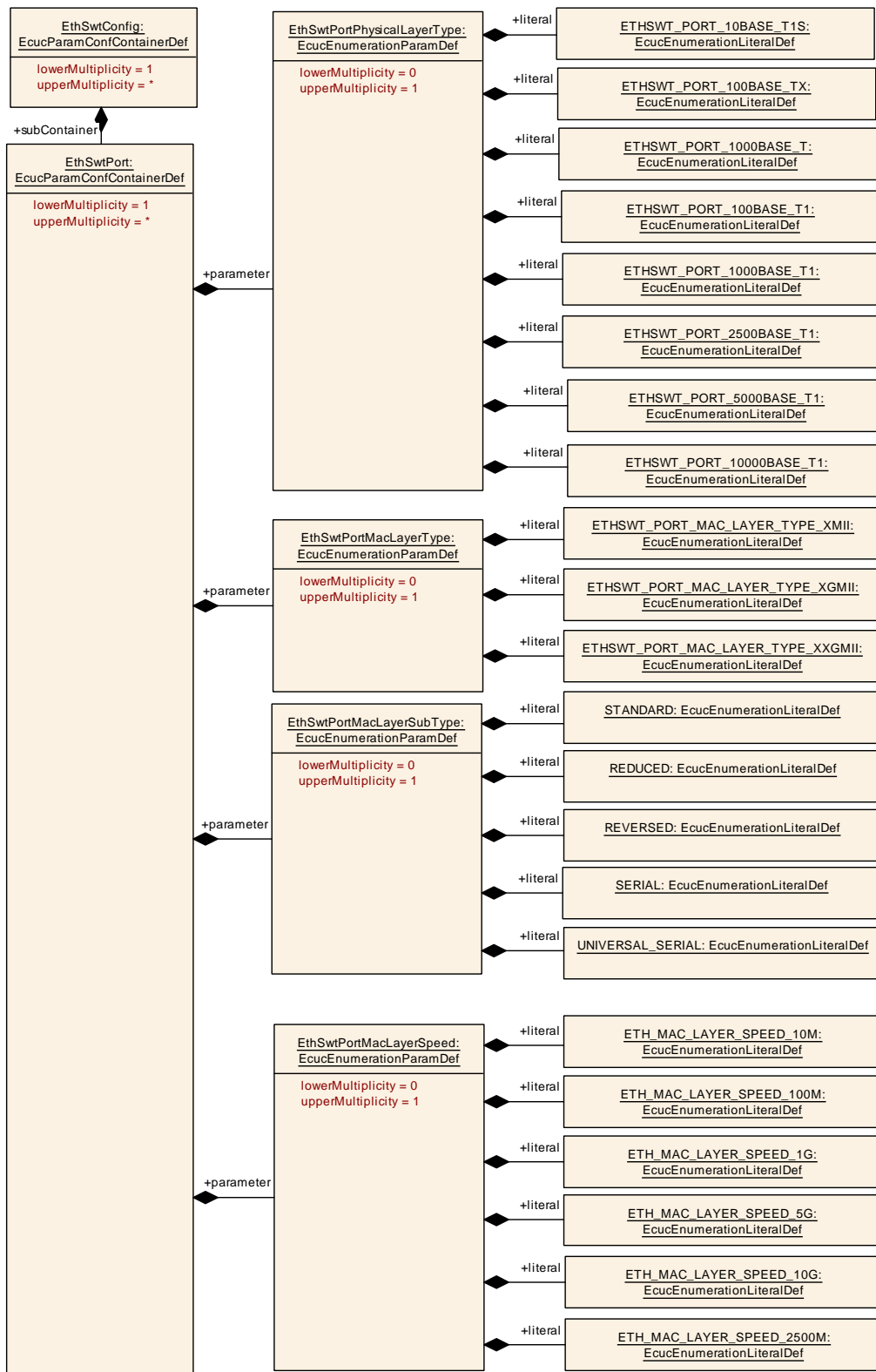


Figure 10.11: EthSwtPort (2/2)

Please note that the functional behavior of the ingress and egress port of a switch is implemented in hardware in the switch devices (see [13]). Thus, the configuration of

EthSwtPort and described in the following has to be written to the switch device or is related to the switch configuration.

10.1.23 EthSwtPortEgress

[ECUC_EthSwt_00007] Definition of EcucParamConfContainerDef EthSwtPort Egress [

Container Name	EthSwtPortEgress
Parent Container	EthSwtPort
Description	Configuration of one Ethernet Switch Port Egress behavior.
Configuration Parameters	

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
EthSwtPortDefaultTrafficClass	1	[ECUC_EthSwt_00247]
EthSwtPortEgressLastSchedulerRef	1	[ECUC_EthSwt_00008]

Included Containers		
Container Name	Multiplicity	Scope / Dependency
EthSwtPortEgressScheduler	1..*	Represents a Scheduler in the egress port.
EthSwtPortFifo	1..*	Represents a Fifo in the egress port. Tags: atp.Status=obsolete
EthSwtPortPriorityToTrafficClass Assignment	1..65535	Defines a priority based traffic class assignment. All Ethernet frames with a specific priority (EthSwtPortPriorityToTrafficClass AssignmentPriority) arriving at the egress side within the forwarding process, shall be assigned to the corresponding traffic class (EthSwtPortPriorityToTrafficClassAssignmentTrafficClass). Tags: atp.Status=draft
EthSwtPortQueue	1..65535	Represents a Queue at the egress port. Tags: atp.Status=draft
EthSwtPortShaper	0..*	Represents a Shaper in the egress port. Tags: atp.Status=obsolete

]

[ECUC_EthSwt_00247] Definition of EcucIntegerParamDef EthSwtPortDefaultTrafficClass

Status: DRAFT

[

Parameter Name	EthSwtPortDefaultTrafficClass		
Parent Container	EthSwtPortEgress		
Description	Represents the default traffic class assignment. All Ethernet frames, where the priority associated with this Ethernet frame is not available in a EthSwtPortTrafficClass Assignment of this egress port, are assigned to the default traffic class. Tags: atp.Status=draft		
Multiplicity	1		
Type	EcucIntegerParamDef		
Range	0 .. 65535		
Default value	1		
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00008] Definition of EcucReferenceDef EthSwtPortEgressLastSchedulerRef

Parameter Name	EthSwtPortEgressLastSchedulerRef		
Parent Container	EthSwtPortEgress		
Description	Reference to the port scheduler which is the last in the egress port structure.		
Multiplicity	1		
Type	Reference to EthSwtPortEgressScheduler		
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

]

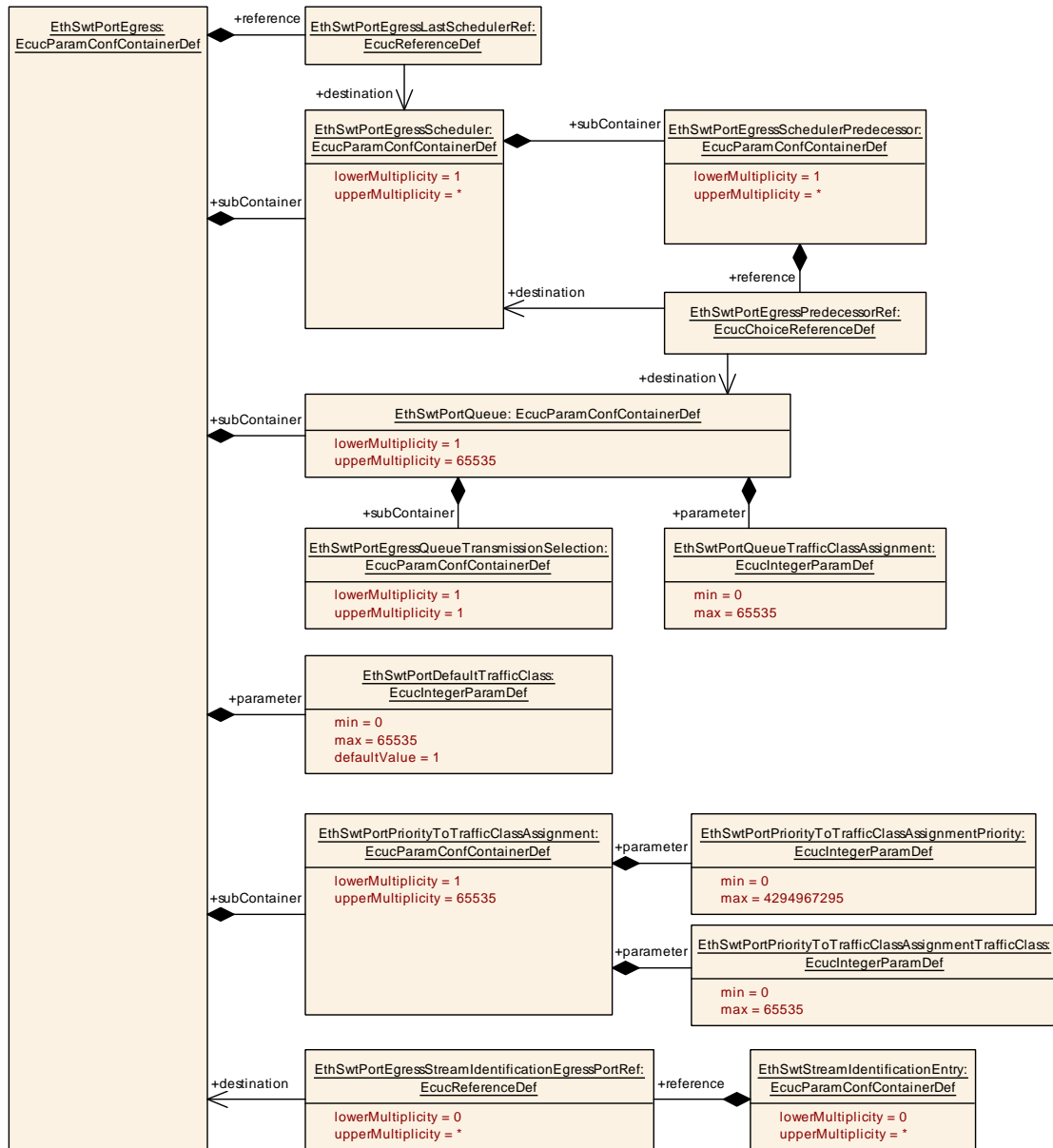


Figure 10.12: EthSwtPortEgress (1/3)

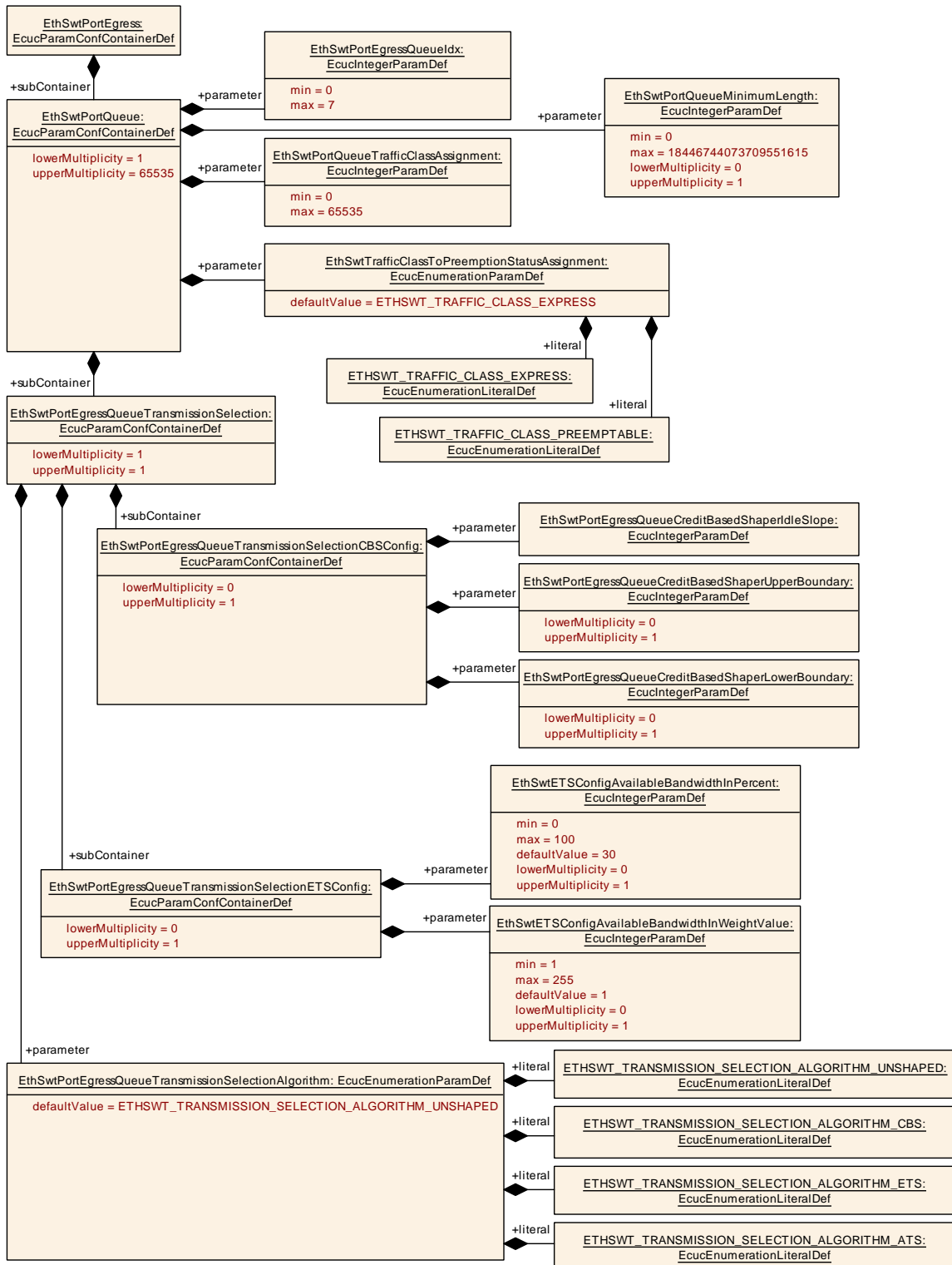


Figure 10.13: EthSwtPortEgress (2/3)

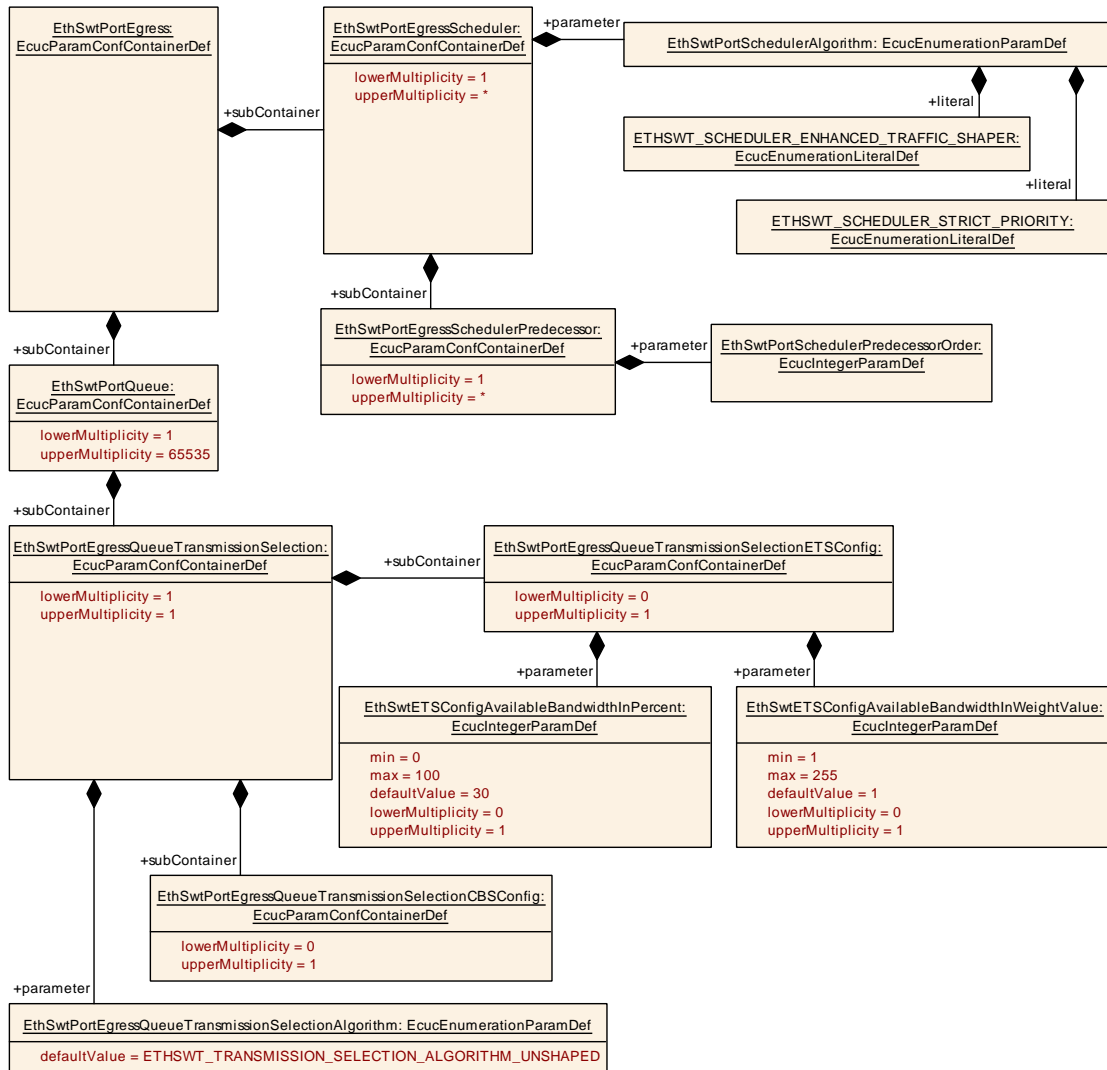


Figure 10.14: EthSwtPortEgress (3/3)

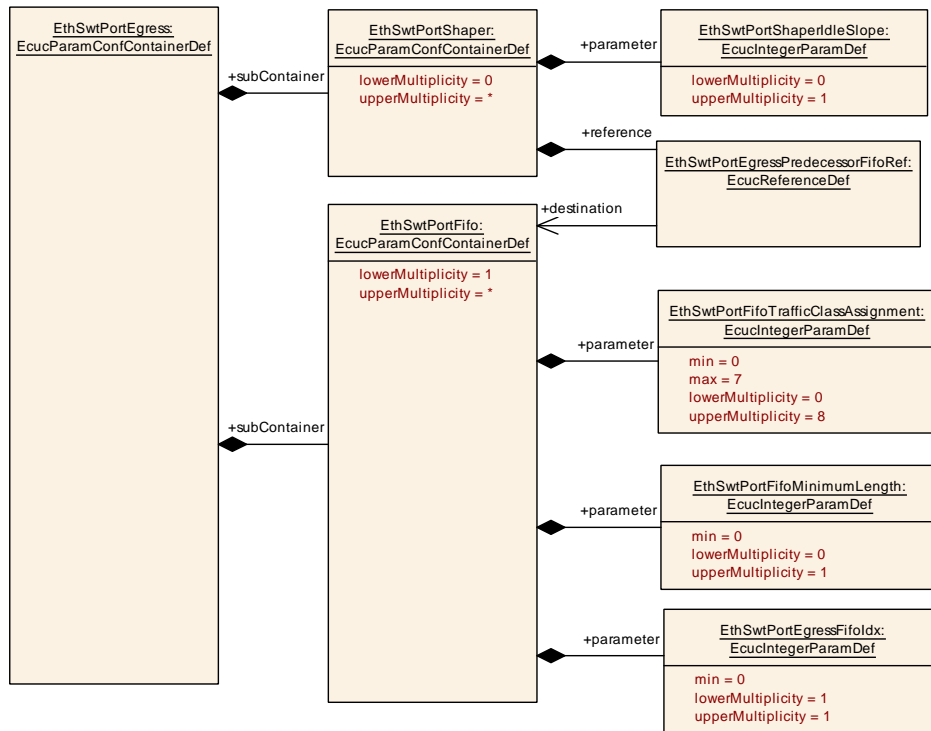


Figure 10.15: EthSwtPortEgressShaperFifo

10.1.24 EthSwtPortPriorityToTrafficClassAssignment

[ECUC_EthSwt_00248] Definition of EcucParamConfContainerDef EthSwtPort PriorityToTrafficClassAssignment

Status: DRAFT

[

Container Name	EthSwtPortPriorityToTrafficClassAssignment		
Parent Container	EthSwtPortEgress		
Description	Defines a priority based traffic class assignment. All Ethernet frames with a specific priority (EthSwtPortPriorityToTrafficClassAssignmentPriority) arriving at the egress side within the forwarding process, shall be assigned to the corresponding traffic class (EthSwtPortPriorityToTrafficClassAssignmentTrafficClass). Tags: atp.Status=draft		
Post-Build Variant Multiplicity	false		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Configuration Parameters			

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
EthSwtPortPriorityToTrafficClassAssignmentPriority	1	[ECUC_EthSwt_00249]
EthSwtPortPriorityToTrafficClassAssignmentTrafficClass	1	[ECUC_EthSwt_00250]

No Included Containers

[[ECUC_EthSwt_00249](#)] Definition of EcucIntegerParamDef EthSwtPortPriorityToTrafficClassAssignmentPriority

Status: DRAFT

Parameter Name	EthSwtPortPriorityToTrafficClassAssignmentPriority		
Parent Container	EthSwtPortPriorityToTrafficClassAssignment		
Description	<p>Defines the priority derived from the Ethernet frame, which is used to determine the corresponding traffic class, where this Ethernet frame shall be assigned to. The upper value range is restricted to the configured value of EthSwtUsedInternalPriorityUpper Value.</p> <p>Tags: atp.Status=draft</p>		
Multiplicity	1		
Type	EcucIntegerParamDef		
Range	0 .. 4294967295		
Default value	-		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency	scope: local		

[[ECUC_EthSwt_00250](#)] Definition of EcucIntegerParamDef EthSwtPortPriorityToTrafficClassAssignmentTrafficClass

Status: DRAFT

Parameter Name	EthSwtPortPriorityToTrafficClassAssignmentTrafficClass		
Parent Container	EthSwtPortPriorityToTrafficClassAssignment		
Description	<p>Defines the traffic class value where an Ethernet frame, with the corresponding priority, is assigned to. The upper value range is restricted to the configured value of EthSwtUsedTrafficClassUpperValue.</p> <p>Tags: atp.Status=draft</p>		
Multiplicity	1		
Type	EcucIntegerParamDef		





Range	0 .. 65535		
Default value	-		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency	scope: local		

]

10.1.25 EthSwtPortEgressScheduler

[ECUC_EthSwt_00017] Definition of EcucParamConfContainerDef EthSwtPortEgressScheduler [

Container Name	EthSwtPortEgressScheduler		
Parent Container	EthSwtPortEgress		
Description	Represents a Scheduler in the egress port.		
Post-Build Variant Multiplicity	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Configuration Parameters			

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
EthSwtPortSchedulerAlgorithm	1	[ECUC_EthSwt_00018]

Included Containers		
Container Name	Multiplicity	Scope / Dependency
EthSwtPortEgressScheduler Predecessor	1..*	Defines an ordered list of predecessors for this scheduler.

]

[ECUC_EthSwt_00018] Definition of EcucEnumerationParamDef EthSwtPortSchedulerAlgorithm [

Parameter Name	EthSwtPortSchedulerAlgorithm
Parent Container	EthSwtPortEgressScheduler
Description	Defines the scheduler algorithm.
Multiplicity	1





Type	EcucEnumerationParamDef		
Range	ETHSWT_SCHEDULER_ENHANCED_TRAFFIC_SHAPER	Represents a scheduler used for enhanced traffic shaping (e.g. weighted round robin).	
	ETHSWT_SCHEDULER_STRICT_PRIORITY	Represents a strict priority scheduler.	
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

]

10.1.26 EthSwtPortEgressSchedulerPredecessor

[ECUC_EthSwt_00019] Definition of EcucParamConfContainerDef EthSwtPortEgressSchedulerPredecessor [

Container Name	EthSwtPortEgressSchedulerPredecessor		
Parent Container	EthSwtPortEgressScheduler		
Description	Defines an ordered list of predecessors for this scheduler.		
Post-Build Variant Multiplicity	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Configuration Parameters			

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
EthSwtPortSchedulerPredecessorOrder	1	[ECUC_EthSwt_00020]
EthSwtPortEgressPredecessorRef	1	[ECUC_EthSwt_00010]

No Included Containers

]

[ECUC_EthSwt_00020] Definition of EcucIntegerParamDef EthSwtPortSchedulerPredecessorOrder [

Parameter Name	EthSwtPortSchedulerPredecessorOrder		
Parent Container	EthSwtPortEgressSchedulerPredecessor		
Description	Defines the order of the scheduler predecessors. This value has to be understood as a relative value, i.e. the value shows only the relative ordering of the elements. The highest value has the highest priority and gaps are allowed (not dense based). The values need to be unique within one EthSwtPort Scheduler.		
Multiplicity	1		
Type	EcucIntegerParamDef		
Range	0 .. 18446744073709551615		
Default value	-		
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: ECU		

]

[ECUC_EthSwt_00010] Definition of EcucChoiceReferenceDef EthSwtPortEgressPredecessorRef [

Parameter Name	EthSwtPortEgressPredecessorRef		
Parent Container	EthSwtPortEgressSchedulerPredecessor		
Description	Choice reference to the scheduler predecessor.		
Multiplicity	1		
Type	Choice reference to [EthSwtPortEgressScheduler , EthSwtPortFifo , EthSwtPortQueue , EthSwtPortShaper]		
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

]

10.1.27 EthSwtPortFifo

[ECUC_EthSwt_00011] Definition of EcucParamConfContainerDef EthSwtPortFifo

Status: OBSOLETE

[

Container Name	EthSwtPortFifo		
Parent Container	EthSwtPortEgress		
Description	Represents a Fifo in the egress port. Tags: atp.Status=obsolete		
Post-Build Variant Multiplicity	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Configuration Parameters			

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
EthSwtPortEgressFifoldx	1	[ECUC_EthSwt_00132]
EthSwtPortFifoMinimumLength	0..1	[ECUC_EthSwt_00098]
EthSwtPortFifoTrafficClassAssignment	0..8	[ECUC_EthSwt_00012]

No Included Containers

]

[[ECUC_EthSwt_00132](#)] Definition of EcuIntegerParamDef EthSwtPortEgressFifoldx

Status: OBSOLETE

[

Parameter Name	EthSwtPortEgressFifoldx		
Parent Container	EthSwtPortFifo		
Description	Specifies the instance ID of the fifo of the configured Ethernet switch egress port Tags: atp.Status=obsolete		
Multiplicity	1		
Type	EcuIntegerParamDef		
Range	0 .. 18446744073709551615		
Default value	-		
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency	scope: ECU		

]

[ECUC_EthSwt_00098] Definition of EcucIntegerParamDef EthSwtPortFifoMinimumLength

Status: OBSOLETE

[

Parameter Name	EthSwtPortFifoMinimumLength		
Parent Container	EthSwtPortFifo		
Description	FIFO minimum length in Byte. This assignment is used to configure a guaranteed size of a configured FIFO. Tags: atp.Status=obsolete		
Multiplicity	0..1		
Type	EcucIntegerParamDef		
Range	0 .. 18446744073709551615		
Default value	-		
Post-Build Variant Multiplicity	true		
Post-Build Variant Value	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: ECU		

]

[ECUC_EthSwt_00012] Definition of EcucIntegerParamDef EthSwtPortFifoTrafficClassAssignment

Status: OBSOLETE

[

Parameter Name	EthSwtPortFifoTrafficClassAssignment		
Parent Container	EthSwtPortFifo		
Description	Defines which traffic classes are assigned to this Fifo. Tags: atp.Status=obsolete		
Multiplicity	0..8		
Type	EcucIntegerParamDef		
Range	0 .. 7		
Default value	-		
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: ECU		

]

10.1.28 EthSwtPortQueue

[ECUC_EthSwt_00182] Definition of EcucParamConfContainerDef EthSwtPort Queue

Status: DRAFT

[

Container Name	EthSwtPortQueue		
Parent Container	EthSwtPortEgress		
Description	Represents a Queue at the egress port. Tags: atp.Status=draft		
Post-Build Variant Multiplicity	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Configuration Parameters			

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
EthSwtPortEgressQueueIdx	1	[ECUC_EthSwt_00183]
EthSwtPortQueueMinimumLength	0..1	[ECUC_EthSwt_00184]
EthSwtPortQueueTrafficClassAssignment	1	[ECUC_EthSwt_00185]
EthSwtTrafficClassToPreemptionStatusAssignment	1	[ECUC_EthSwt_00255]

Included Containers		
Container Name	Multiplicity	Scope / Dependency
EthSwtPortEgressQueueTransmissionSelection	1	Represents the transmission selection of an egress port queue. Tags: atp.Status=draft

]

[ECUC_EthSwt_00183] Definition of EcucIntegerParamDef EthSwtPortEgress QueueIdx

Status: DRAFT

[

Parameter Name	EthSwtPortEgressQueueIdx	
Parent Container	EthSwtPortQueue	
Description	Specifies the instance ID of the queue of the configured Ethernet switch egress port. Tags: atp.Status=draft	
Multiplicity	1	
Type	EcucIntegerParamDef	
Range	0 .. 7	
Default value	-	

▽



Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

]

[ECUC_EthSwT_00184] Definition of EcucIntegerParamDef EthSwTPortQueue MinimumLength

Status: DRAFT

[

Parameter Name	EthSwTPortQueueMinimumLength		
Parent Container	EthSwTPortQueue		
Description	Queue minimum length in Byte. This assignment is used to configure a guaranteed size of a configured Queue. Tags: atp.Status=draft		
Multiplicity	0..1		
Type	EcucIntegerParamDef		
Range	0 .. 18446744073709551615		
Default value	-		
Post-Build Variant Multiplicity	true		
Post-Build Variant Value	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00185] Definition of EcucIntegerParamDef EthSwtPortQueueTrafficClassAssignment

Status: DRAFT

[

Parameter Name	EthSwtPortQueueTrafficClassAssignment		
Parent Container	EthSwtPortQueue		
Description	Defines the traffic class where this egress port queue is assigned to. All Ethernet frames which arrive at the corresponding egress port are considered to be enqueued in this egress port queue, where the assigned traffic class of the Ethernet frame match to the assigned traffic class of this egress port queue. Tags: atp.Status=draft		
Multiplicity	1		
Type	EcucIntegerParamDef		
Range	0 .. 65535		
Default value	-		
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00255] Definition of EcucEnumerationParamDef EthSwtTrafficClassToPreemptionStatusAssignment

Status: DRAFT

[

Parameter Name	EthSwtTrafficClassToPreemptionStatusAssignment		
Parent Container	EthSwtPortQueue		
Description	Defines the preemption status for the traffic class which is derived from the priority via EthSwtPortPriorityToTrafficClassAssignment. If this parameter is set to ETHSWT_TRAFFIC_CLASS_PREEMPTABLE, then the Ethernet frames assigned to the corresponding traffic class could be preempted within the transmission process. If set to ETHSWT_TRAFFIC_CLASS_EXPRESS, then the Ethernet frames assigned to the corresponding traffic class will never be preempted. Tags: atp.Status=draft		
Multiplicity	1		
Type	EcucEnumerationParamDef		
Range	ETHSWT_TRAFFIC_CLASS_EXPRESS		Traffic class will never be preempted. Tags: atp.Status=draft
	ETHSWT_TRAFFIC_CLASS_PREEMPTABLE		Traffic class can/may be preempted. Tags: atp.Status=draft
Default value	ETHSWT_TRAFFIC_CLASS_EXPRESS		
Post-Build Variant Value	true		

▽

△

Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local dependency: If EthSwtFramePreemptionEnable is set to false, then this parameter shall be set to ETHSWT_TRAFFIC_CLASS_EXPRESS.		

]

10.1.29 EthSwtPortEgressQueueTransmissionSelection

[ECUC_EthSwt_00186] Definition of EcucParamConfContainerDef EthSwtPortEgressQueueTransmissionSelection

Status: DRAFT

[

Container Name	EthSwtPortEgressQueueTransmissionSelection
Parent Container	EthSwtPortQueue
Description	Represents the transmission selection of an egress port queue. Tags: atp.Status=draft
Configuration Parameters	

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
EthSwtPortEgressQueueTransmissionSelectionAlgorithm	1	[ECUC_EthSwt_00191]

Included Containers		
Container Name	Multiplicity	Scope / Dependency
EthSwtPortEgressQueueTransmissionSelectionCBSConfig	0..1	Represents the configuration of a credit based shaper transmission selection algorithm of an egress port queue. This configuration is used if the EthSwtPortEgressQueueTransmissionSelectionAlgorithm is set to ETHSWT_TRANSMISSION_SELECTION_ALGORITHM_CBS. Tags: atp.Status=draft
EthSwtPortEgressQueueTransmissionSelectionETSCConfig	0..1	Represents the configuration of an enhanced transmission selection algorithm of an egress port queue. This configuration is used if the EthSwtPortEgressQueueTransmissionSelectionAlgorithm is set to ETHSWT_SCHEDULER_ENHANCED_TRAFFIC_SHAPER. The subordinated configuration parameters allow to configure the ETS in different variants to support commonly used scheduler algorithms (e.g. weighted round robin). Tags: atp.Status=draft

]

[ECUC_EthSwt_00191] Definition of EcucEnumerationParamDef EthSwtPortEgressQueueTransmissionSelectionAlgorithm

Status: DRAFT

Parameter Name	EthSwtPortEgressQueueTransmissionSelectionAlgorithm		
Parent Container	EthSwtPortEgressQueueTransmissionSelection		
Description	Represents the transmission selection algorithm of an egress port queue. Tags: atp.Status=draft		
Multiplicity	1		
Type	EcucEnumerationParamDef		
Range	ETHSWT_TRANSMISSION_SELECTION_ALGORITHM_ATS	Ethernet frames are selected from the egress queue for transmission according the asynchronous traffic shaping algorithm. Tags: atp.Status=draft	
	ETHSWT_TRANSMISSION_SELECTION_ALGORITHM_CBS	Ethernet frames are selected from the egress queue for transmission according the credit based shaping algorithm. Tags: atp.Status=draft	
	ETHSWT_TRANSMISSION_SELECTION_ALGORITHM_ETS	Ethernet frames are selected from the egress queue for transmission according the enhanced transmission selection algorithm. Tags: atp.Status=draft	
	ETHSWT_TRANSMISSION_SELECTION_ALGORITHM_UNSHAPED	Ethernet frames are selected from the egress queue for transmission in an unshaped manner. Please note: IEEE802.1Q uses the term "strict priority". Term "UNSHAPED" is used to avoid confusion with strict priority in context of EthSwtPortEgressScheduler. Tags: atp.Status=draft	
Default value	ETHSWT_TRANSMISSION_SELECTION_ALGORITHM_UNSHAPED		
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

10.1.30 EthSwtPortEgressQueueTransmissionSelectionCBSConfig

[ECUC_EthSwt_00187] Definition of EcucParamConfContainerDef EthSwtPortEgressQueueTransmissionSelectionCBSConfig

Status: DRAFT

Container Name	EthSwtPortEgressQueueTransmissionSelectionCBSConfig		
Parent Container	EthSwtPortEgressQueueTransmissionSelection		
Description	<p>Represents the configuration of a credit based shaper transmission selection algorithm of an egress port queue.</p> <p>This configuration is used if the EthSwtPortEgressQueueTransmissionSelection Algorithm is set to ETHSWT_TRANSMISSION_SELECTION_ALGORITHM_CBS.</p> <p>Tags: atp.Status=draft</p>		
Post-Build Variant Multiplicity	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Configuration Parameters			

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
EthSwtPortEgressQueueCreditBasedShaperIdleSlope	1	[ECUC_EthSwt_00188]
EthSwtPortEgressQueueCreditBasedShaperLower Boundary	0..1	[ECUC_EthSwt_00190]
EthSwtPortEgressQueueCreditBasedShaperUpper Boundary	0..1	[ECUC_EthSwt_00189]

No Included Containers

[ECUC_EthSwt_00188] Definition of EcuIntegerParamDef EthSwtPortEgress QueueCreditBasedShaperIdleSlope

Status: DRAFT

Parameter Name	EthSwtPortEgressQueueCreditBasedShaperIdleSlope		
Parent Container	EthSwtPortEgressQueueTransmissionSelectionCBSConfig		
Description	<p>Defines the increase of credit in bits per second for the AVB shaper.</p> <p>Note: this parameter maps to IEEE802.1Q parameter "ieee8021FqtssAdminIdleSlope Ms" and "ieee8021FqtssAdminIdleSlopeLs".</p> <p>Note: If the value exceeds the available bandwidth according the configured EthSwt PortPhysicalLayerType, the CBS becomes ineffective.</p> <p>Tags: atp.Status=draft</p>		
Multiplicity	1		
Type	EcuIntegerParamDef		
Range	0 .. 18446744073709551615		
Default value	-		
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD





Scope / Dependency	scope: local
---------------------------	--------------

]

[ECUC_EthSwT_00190] Definition of EcucIntegerParamDef EthSwTPortEgressQueueCreditBasedShaperLowerBoundary

Status: DRAFT

[

Parameter Name	EthSwTPortEgressQueueCreditBasedShaperLowerBoundary		
Parent Container	EthSwTPortEgressQueueTransmissionSelectionCBSCConfig		
Description	Defines the lower credit boundary for the Credit Based Shaper. Tags: atp.Status=draft		
Multiplicity	0..1		
Type	EcucIntegerParamDef		
Range	0 .. 18446744073709551615		
Default value	-		
Post-Build Variant Multiplicity	false		
Post-Build Variant Value	true		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

]

[ECUC_EthSwT_00189] Definition of EcucIntegerParamDef EthSwTPortEgressQueueCreditBasedShaperUpperBoundary

Status: DRAFT

[

Parameter Name	EthSwTPortEgressQueueCreditBasedShaperUpperBoundary		
Parent Container	EthSwTPortEgressQueueTransmissionSelectionCBSCConfig		
Description	Defines the upper credit boundary for the Credit Based Shaper. Tags: atp.Status=draft		
Multiplicity	0..1		
Type	EcucIntegerParamDef		
Range	0 .. 18446744073709551615		
Default value	-		
Post-Build Variant Multiplicity	false		





Post-Build Variant Value	true		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

]

10.1.31 EthSwtPortEgressQueueTransmissionSelectionETSTConfig

[ECUC_EthSwt_00251] Definition of EcucParamConfContainerDef EthSwtPortEgressQueueTransmissionSelectionETSTConfig

Status: DRAFT

[

Container Name	EthSwtPortEgressQueueTransmissionSelectionETSTConfig		
Parent Container	EthSwtPortEgressQueueTransmissionSelection		
Description	<p>Represents the configuration of an enhanced transmission selection algorithm of an egress port queue. This configuration is used if the EthSwtPortEgressQueueTransmissionSelectionAlgorithm is set to ETHSWT_SCHEDULER_ENHANCED_TRAFFIC_SHAPER. The subordinated configuration parameters allow to configure the ETS in different variants to support commonly used scheduler algorithms (e.g. weighted round robin).</p> <p>Tags: atp.Status=draft</p>		
Post-Build Variant Multiplicity	false		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Configuration Parameters			

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
EthSwtETSTConfigAvailableBandwidthInPercent	0..1	[ECUC_EthSwt_00252]
EthSwtETSTConfigAvailableBandwidthInWeightValue	0..1	[ECUC_EthSwt_00253]

No Included Containers

]

[ECUC_EthSwt_00252] Definition of EcucIntegerParamDef EthSwtETSTConfig AvailableBandwidthInPercent

Status: DRAFT

[

Parameter Name	EthSwtETSTConfigAvailableBandwidthInPercent		
Parent Container	EthSwtPortEgressQueueTransmissionSelectionETSTConfig		
Description	Represents the configuration of an enhanced transmission selection algorithm for one egress port queue, where the available bandwidth is configured in percent. The percent value represents the available bandwidth for emission opportunities to transmit Ethernet frames calculated in bits. The resolution is 1%. Tags: atp.Status=draft		
Multiplicity	0..1		
Type	EcucIntegerParamDef		
Range	0 .. 100		
Default value	30		
Post-Build Variant Multiplicity	false		
Post-Build Variant Value	false		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00253] Definition of EcucIntegerParamDef EthSwtETSTConfig AvailableBandwidthInWeightValue

Status: DRAFT

[

Parameter Name	EthSwtETSTConfigAvailableBandwidthInWeightValue		
Parent Container	EthSwtPortEgressQueueTransmissionSelectionETSTConfig		
Description	Represents the configuration of an enhanced transmission selection algorithm of an egress port queue, where the available bandwidth is configured as weight value. The weight value represents the number of emission opportunities to transmit Ethernet frames. Tags: atp.Status=draft		
Multiplicity	0..1		
Type	EcucIntegerParamDef		
Range	1 .. 255		
Default value	1		
Post-Build Variant Multiplicity	false		
Post-Build Variant Value	false		

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Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

]

10.1.32 EthSwtPortShaper

[ECUC_EthSwt_00021] Definition of EcucParamConfContainerDef EthSwtPort Shaper

Status: OBSOLETE

[

Container Name	EthSwtPortShaper		
Parent Container	EthSwtPortEgress		
Description	Represents a Shaper in the egress port. Tags: atp.Status=obsolete		
Post-Build Variant Multiplicity	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Configuration Parameters			

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
EthSwtPortShaperIdleSlope	0..1	[ECUC_EthSwt_00042]
EthSwtPortEgressPredecessorFifoRef	1	[ECUC_EthSwt_00009]

No Included Containers

]

[ECUC_EthSwt_00042] Definition of EcucIntegerParamDef EthSwtPortShaperIdleSlope

Status: OBSOLETE

[

Parameter Name	EthSwtPortShaperIdleSlope		
Parent Container	EthSwtPortShaper		
Description	Defines the increase of credit in bits per second for the AVB shaper. Tags: atp.Status=obsolete		
Multiplicity	0..1		
Type	EcucIntegerParamDef		
Range	0 .. 18446744073709551615		
Default value	-		
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00009] Definition of EcucReferenceDef EthSwtPortEgressPredecessorFifoRef

Status: OBSOLETE

[

Parameter Name	EthSwtPortEgressPredecessorFifoRef		
Parent Container	EthSwtPortShaper		
Description	Reference to the fifo which is the predecessor for this shaper. Tags: atp.Status=obsolete		
Multiplicity	1		
Type	Reference to EthSwtPortFifo		
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

]

10.1.33 EthSwtPortIngress

[ECUC_EthSwt_00014] Definition of EcucParamConfContainerDef EthSwtPortIngress [

Container Name	EthSwtPortIngress
Parent Container	EthSwtPort
Description	Configuration of one Ethernet Switch Port ingress behavior.
Configuration Parameters	

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
EthSwtPortIngressDefaultPriority	0..1	[ECUC_EthSwt_00096]
EthSwtPortIngressDefaultVlan	0..1	[ECUC_EthSwt_00095]
EthSwtPortIngressDropUntagged	1	[ECUC_EthSwt_00097]

Included Containers		
Container Name	Multiplicity	Scope / Dependency
EthSwtPortIngressScheduler	0..*	Represents a Scheduler configuration at an ingress port. Tags: atp.Status=draft
EthSwtPortIngressVlanTranslation Table	1	This container defines 0..* entries of the form (IngressVlanID, TranslatedVlanID) that define the ingress Vlan translation. The IngressVlanID is the VlanID read from the incoming frame upon reception (ingress), which is replaced by the corresponding TranslatedVlanID upon ingress Vlan translation.
EthSwtPortPolicer	0..32760	Definition of Rate Policing parameters. Tags: atp.Status=obsolete
EthSwtPortPriorityRegeneration	8	Defines a priority regeneration where the EthSwtPortPriorityRegenerationIngressPCP is replaced by EthSwtPortPriorityRegenerationRegeneratedPriority. The EthSwtPortPriorityRegeneration is mandatory and shall always be available. An EthSwtPortPriorityRegeneration shall have 8 mappings, one for each priority. Rational: an Ethernet switch always performs a priority regeneration.

]

[ECUC_EthSwt_00096] Definition of EcucIntegerParamDef EthSwtPortIngressDefaultPriority [

Parameter Name	EthSwtPortIngressDefaultPriority		
Parent Container	EthSwtPortIngress		
Description	Default priority for ingress.		
Multiplicity	0..1		
Type	EcucIntegerParamDef		
Range	0 .. 7		
Default value	0		
Post-Build Variant Multiplicity	true		
Post-Build Variant Value	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD





Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local dependency: If EthSwPortIngressDefaultPriority is configured (multiplicity set to 1) then EthSwPortIngressDefaultVlan shall be configured. If EthSwPortIngressDefaultVlan is configured EthSwPortIngressDropUntagged shall be set to FALSE.		

]

[ECUC_EthSw_00095] Definition of EcucIntegerParamDef EthSwPortIngressDefaultVlan [

Parameter Name	EthSwPortIngressDefaultVlan		
Parent Container	EthSwPortIngress		
Description	Default VLAN for ingress.		
Multiplicity	0..1		
Type	EcucIntegerParamDef		
Range	0 .. 4094		
Default value	1		
Post-Build Variant Multiplicity	true		
Post-Build Variant Value	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local dependency: If EthSwPortIngressDefaultVlan is configured (multiplicity set to 1) then EthSwPortIngressDefaultPriority shall be configured. If EthSwPortIngressDefaultVlan is configured EthSwPortIngressDropUntagged shall be set to FALSE.		

]

[ECUC_EthSw_00097] Definition of EcucBooleanParamDef EthSwPortIngressDropUntagged [

Parameter Name	EthSwPortIngressDropUntagged		
Parent Container	EthSwPortIngress		
Description	Defines the ingress behavior for untagged frames.		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	false		
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE



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	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local dependency: If EthSwPortIngressDropUntagged is set to TRUE then EthSwPortIngressDefaultVlan and EthSwPortIngressDefaultPriority parameters shall not be configured.		

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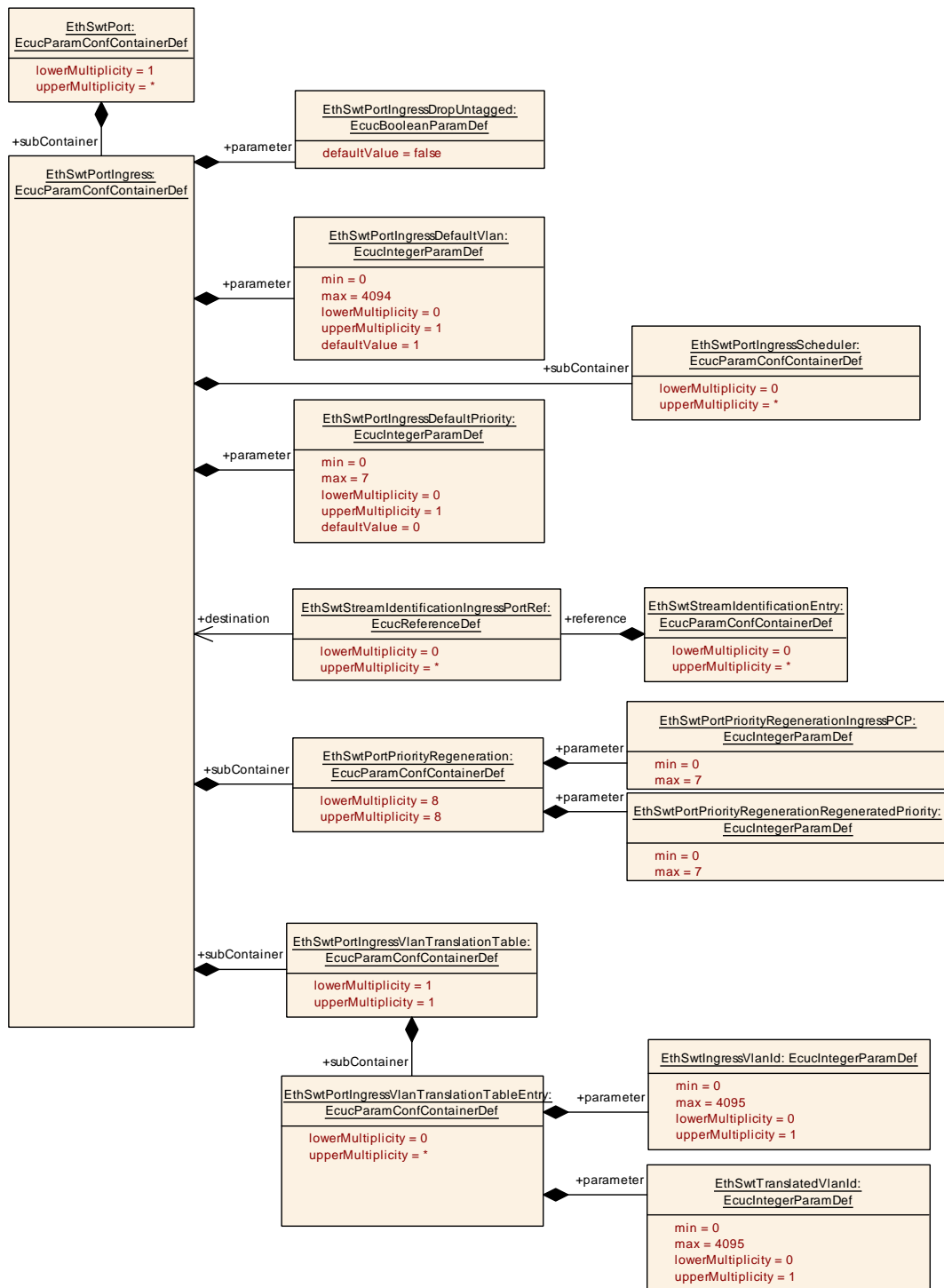


Figure 10.16: EthSwtPortIngress (1/2)

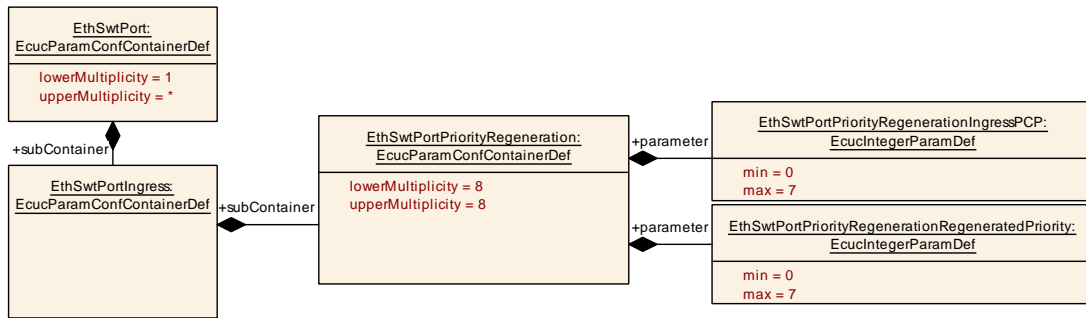


Figure 10.17: EthSwtPortIngress (2/2)

10.1.34 EthSwtPortIngressScheduler

[ECUC_EthSwt_00139] Definition of EcucParamConfContainerDef EthSwtPort IngressScheduler

Status: DRAFT

[

Container Name	EthSwtPortIngressScheduler		
Parent Container	EthSwtPortIngress		
Description	Represents a Scheduler configuration at an ingress port. Tags: atp.Status=draft		
Post-Build Variant Multiplicity	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Configuration Parameters			

No Included Parameters

No Included Containers

]

10.1.35 EthSwtPortIngressVlanTranslationTable

[ECUC_EthSwt_00256] Definition of EcucParamConfContainerDef EthSwtPort IngressVlanTranslationTable [

Container Name	EthSwtPortIngressVlanTranslationTable
Parent Container	EthSwtPortIngress
Description	This container defines 0..* entries of the form (IngressVlanID, TranslatedVlanID) that define the ingress Vlan translation. The IngressVlanID is the VlanID read from the incoming frame upon reception (ingress), which is replaced by the corresponding TranslatedVlanID upon ingress Vlan translation.
Configuration Parameters	

No Included Parameters

Included Containers		
Container Name	Multiplicity	Scope / Dependency
EthSwtPortIngressVlanTranslationTableEntry	0..*	This container defines the mapping between the IngressVlanID (VlanID read from the received frame upon ingress) and the corresponding TranslatedVlanID upon ingress Vlan translation.

]

10.1.36 EthSwtPortIngressVlanTranslationTableEntry

[ECUC_EthSwt_00257] Definition of EcucParamConfContainerDef EthSwtPortIngressVlanTranslationTableEntry [

Container Name	EthSwtPortIngressVlanTranslationTableEntry		
Parent Container	EthSwtPortIngressVlanTranslationTable		
Description	This container defines the mapping between the IngressVlanID (VlanID read from the received frame upon ingress) and the corresponding TranslatedVlanID upon ingress Vlan translation.		
Post-Build Variant Multiplicity	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Configuration Parameters			

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
EthSwtIngressVlanId	0..1	[ECUC_EthSwt_00258]
EthSwtTranslatedVlanId	0..1	[ECUC_EthSwt_00259]

No Included Containers

]

[ECUC_EthSwT_00258] Definition of EcucIntegerParamDef EthSwTIngressVlanId

Parameter Name	EthSwTIngressVlanId		
Parent Container	EthSwTPortIngressVlanTranslationTableEntry		
Description	Incoming VlanID from received frame.		
Multiplicity	0..1		
Type	EcucIntegerParamDef		
Range	0 .. 4095		
Default value	-		
Post-Build Variant Multiplicity	true		
Post-Build Variant Value	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: ECU		

[ECUC_EthSwT_00259] Definition of EcucIntegerParamDef EthSwTTranslatedVlanId

Parameter Name	EthSwTTranslatedVlanId		
Parent Container	EthSwTPortIngressVlanTranslationTableEntry		
Description	Mapped VlanID after ingress Vlan translation.		
Multiplicity	0..1		
Type	EcucIntegerParamDef		
Range	0 .. 4095		
Default value	-		
Post-Build Variant Multiplicity	true		
Post-Build Variant Value	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: ECU		

10.1.37 EthSwtPortPolicer

[ECUC_EthSwt_00074] Definition of EcucParamConfContainerDef EthSwtPortPolicer

Status: OBSOLETE

[

Container Name	EthSwtPortPolicer		
Parent Container	EthSwtPortIngress		
Description	Definition of Rate Policing parameters. Tags: atp.Status=obsolete		
Post-Build Variant Multiplicity	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Configuration Parameters			

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
EthSwtPortRatePolicedByteCount	1	[ECUC_EthSwt_00075]
EthSwtPortRatePolicedPriority	0..1	[ECUC_EthSwt_00077]
EthSwtPortRatePolicedTimeInterval	1	[ECUC_EthSwt_00076]
EthSwtPortRateViolationAction	1	[ECUC_EthSwt_00078]
EthSwtRateVlanMembershipRef	0..4095	[ECUC_EthSwt_00081]

No Included Containers

]

[ECUC_EthSwt_00075] Definition of EcucIntegerParamDef EthSwtPortRatePolicedByteCount

Status: OBSOLETE

[

Parameter Name	EthSwtPortRatePolicedByteCount	
Parent Container	EthSwtPortPolicer	
Description	Amount of Byte Counts (excluding Header information) which can be received in a configured EthSwtPortRatePolicedTimeInterval. Tags: atp.Status=obsolete	
Multiplicity	1	
Type	EcucIntegerParamDef	
Range	1 .. 18446744073709551615	
Default value	-	
Post-Build Variant Value	true	



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Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00077] Definition of EcucIntegerParamDef EthSwtPortRatePolicedPriority

Status: OBSOLETE

[

Parameter Name	EthSwtPortRatePolicedPriority		
Parent Container	EthSwtPortPolicer		
Description	Defines the priority which this rate policy shall be limited on. If no priority is given this rate policy is not considering priority. Tags: atp.Status=obsolete		
Multiplicity	0..1		
Type	EcucIntegerParamDef		
Range	0 .. 7		
Default value	-		
Post-Build Variant Multiplicity	true		
Post-Build Variant Value	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local dependency: If no priority is configured the rate policing only applies to the configured EthSwtRateVlanMembershipRef.		

]

[ECUC_EthSwt_00076] Definition of EcucFloatParamDef EthSwtPortRatePolicedTimeInterval

Status: OBSOLETE

[

Parameter Name	EthSwtPortRatePolicedTimeInterval		
Parent Container	EthSwtPortPolicer		
Description	Time interval in seconds where a configured EthSwtPortRatePolicedByteCount can be received without a rate limitation. Tags: atp.Status=obsolete		
Multiplicity	1		
Type	EcucFloatParamDef		
Range]0 .. INF[
Default value	-		
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00078] Definition of EcucEnumerationParamDef EthSwtPortRateViolationAction

Status: OBSOLETE

[

Parameter Name	EthSwtPortRateViolationAction		
Parent Container	EthSwtPortPolicer		
Description	Action to be taken when the rate policy criteria defined for this EthSwtPortPolicer are met. Tags: atp.Status=obsolete		
Multiplicity	1		
Type	EcucEnumerationParamDef		
Range	BLOCK_SOURCE	All incoming traffic from the violating Source based on the MAC-Address is blocked. Tags: atp.Status=obsolete	
	DROP_FRAME	The received frame which led to the violation of the rate policy is dropped. Tags: atp.Status=obsolete	
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00081] Definition of EcucReferenceDef EthSwtRateVlanMembershipRef

Status: OBSOLETE

[

Parameter Name	EthSwtRateVlanMembershipRef		
Parent Container	EthSwtPortPolicer		
Description	References the Vlans this rate policy shall apply to. If no EthSwtRateVlanMembershipRef is configured the rate policing applies only on the configured EthSwtPortRatePolicedPriority. Tags: atp.Status=obsolete		
Multiplicity	0..4095		
Type	Reference to EthSwtVlanMembership		
Post-Build Variant Multiplicity	true		
Post-Build Variant Value	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

]

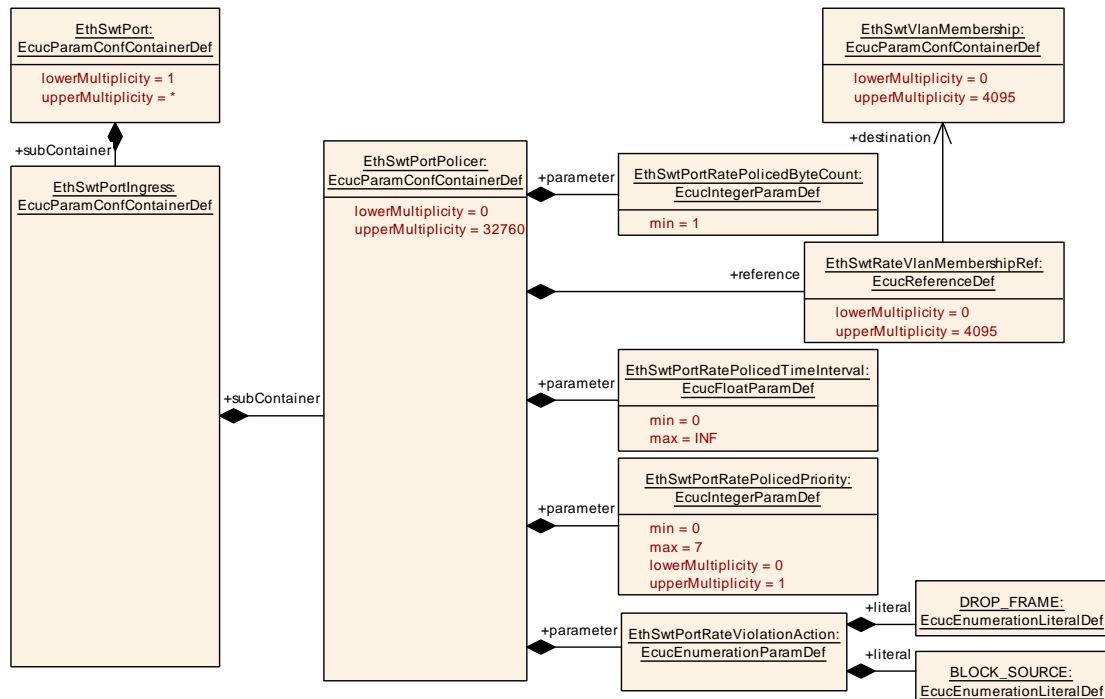


Figure 10.18: EthSwtPortPolicer

10.1.38 EthSwtPortPriorityRegeneration

[ECUC_EthSwt_00057] Definition of EcucParamConfContainerDef EthSwtPortPriorityRegeneration [

Container Name	EthSwtPortPriorityRegeneration		
Parent Container	EthSwtPortIngress		
Description	Defines a priority regeneration where the EthSwtPortPriorityRegenerationIngressPCP is replaced by EthSwtPortPriorityRegenerationRegeneratedPriority. The EthSwtPortPriorityRegeneration is mandatory and shall always be available. An EthSwtPortPriorityRegeneration shall have 8 mappings, one for each priority. Rational: an Ethernet switch always performs a priority regeneration.		
Post-Build Variant Multiplicity	false		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Configuration Parameters			

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
EthSwtPortPriorityRegenerationIngressPCP	1	[ECUC_EthSwt_00058]
EthSwtPortPriorityRegenerationRegeneratedPriority	1	[ECUC_EthSwt_00059]

No Included Containers

]

[ECUC_EthSwt_00058] Definition of EcucIntegerParamDef EthSwtPortPriorityRegenerationIngressPCP [

Parameter Name	EthSwtPortPriorityRegenerationIngressPCP		
Parent Container	EthSwtPortPriorityRegeneration		
Description	PCP (VLAN-priority) in the incoming message.		
Multiplicity	1		
Type	EcucIntegerParamDef		
Range	0 .. 7		
Default value	–		
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: ECU		

]

[ECUC_EthSwt_00059] Definition of EcucIntegerParamDef EthSwtPortPriorityRegenerationRegeneratedPriority [

Parameter Name	EthSwtPortPriorityRegenerationRegeneratedPriority		
Parent Container	EthSwtPortPriorityRegeneration		
Description	Message priority the incoming message will be tagged with.		
Multiplicity	1		
Type	EcucIntegerParamDef		
Range	0 .. 7		
Default value	-		
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: ECU		

]

10.1.39 EthSwtSpi

[ECUC_EthSwt_00030] Definition of EcucParamConfContainerDef EthSwtSpi [

Container Name	EthSwtSpi		
Parent Container	EthSwtConfig		
Description	Configuration of one Ethernet Switch SPI access (if SPI is used).		
Post-Build Variant Multiplicity	true		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Configuration Parameters			

No Included Parameters

Included Containers		
Container Name	Multiplicity	Scope / Dependency
EthSwtSpiSequence	1..*	Container gives EthSwt driver information about one SPI sequence. One SPI sequence used by EthSwt driver is in exclusive use for it. No other driver is allowed to access this sequence. EthSwt driver may use one sequence to access n Eth Swt hardware chips of the same type or n sequences are used to access one single EthSwt hardware chip. If a EthSwt hardware has no SPI interface, there is no instance of this container.

]

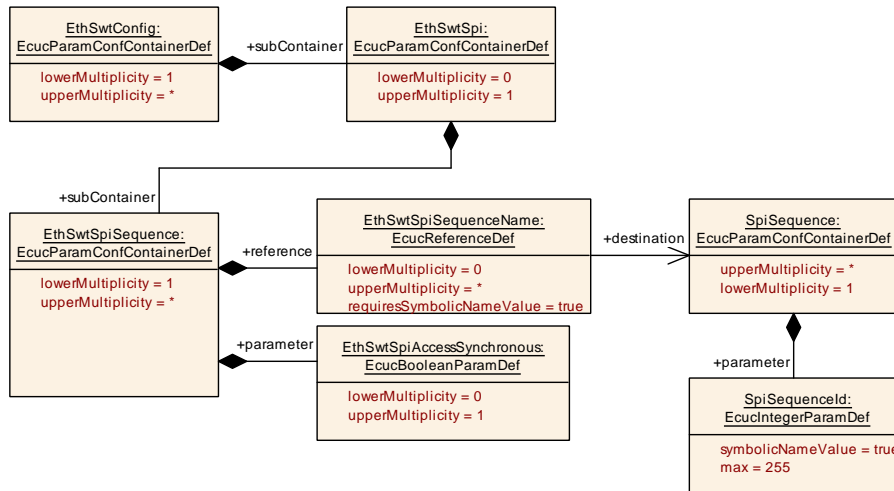


Figure 10.19: EthSwtSpi

10.1.40 EthSwtSpiSequence

[ECUC_EthSwt_00034] Definition of EcucParamConfContainerDef EthSwtSpiSequence

Container Name	EthSwtSpiSequence		
Parent Container	EthSwtSpi		
Description	Container gives EthSwt driver information about one SPI sequence. One SPI sequence used by EthSwt driver is in exclusive use for it. No other driver is allowed to access this sequence. EthSwt driver may use one sequence to access n EthSwt hardware chips of the same type or n sequences are used to access one single EthSwt hardware chip. If a EthSwt hardware has no SPI interface, there is no instance of this container.		
Post-Build Variant Multiplicity	true		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Configuration Parameters			

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
EthSwtSpiAccessSynchronous	0..1	[ECUC_EthSwt_00036]
EthSwtSpiSequenceName	0..*	[ECUC_EthSwt_00035]

No Included Containers

]

[ECUC_EthSwt_00036] Definition of EcucBooleanParamDef EthSwtSpiAccess Synchronous

Parameter Name	EthSwtSpiAccessSynchronous		
Parent Container	EthSwtSpiSequence		
Description	This parameter is used to define whether the access to the Spi sequence is synchronous or asynchronous. true: SPI access is synchronous. false: SPI access is asynchronous.		
Multiplicity	0..1		
Type	EcucBooleanParamDef		
Default value	–		
Post-Build Variant Multiplicity	true		
Post-Build Variant Value	true		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: ECU		

]

[ECUC_EthSwt_00035] Definition of EcucReferenceDef EthSwtSpiSequence Name

Parameter Name	EthSwtSpiSequenceName		
Parent Container	EthSwtSpiSequence		
Description	Reference to a Spi sequence configuration container.		
Multiplicity	0..*		
Type	Symbolic name reference to SpiSequence		
Post-Build Variant Multiplicity	true		
Post-Build Variant Value	true		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: ECU		

]

10.1.41 EthSwtStreamIdentificationTable

[ECUC_EthSwt_00208] Definition of EcucParamConfContainerDef EthSwtStream IdentificationTable

Status: DRAFT

[

Container Name	EthSwtStreamIdentificationTable		
Parent Container	EthSwtConfig		
Description	Configuration of a stream identification table. Tags: atp.Status=draft		
Post-Build Variant Multiplicity	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Configuration Parameters			

No Included Parameters

Included Containers		
Container Name	Multiplicity	Scope / Dependency
EthSwtStreamIdentificationEntry	0..*	Configuration of a stream identification. Tags: atp.Status=draft

]

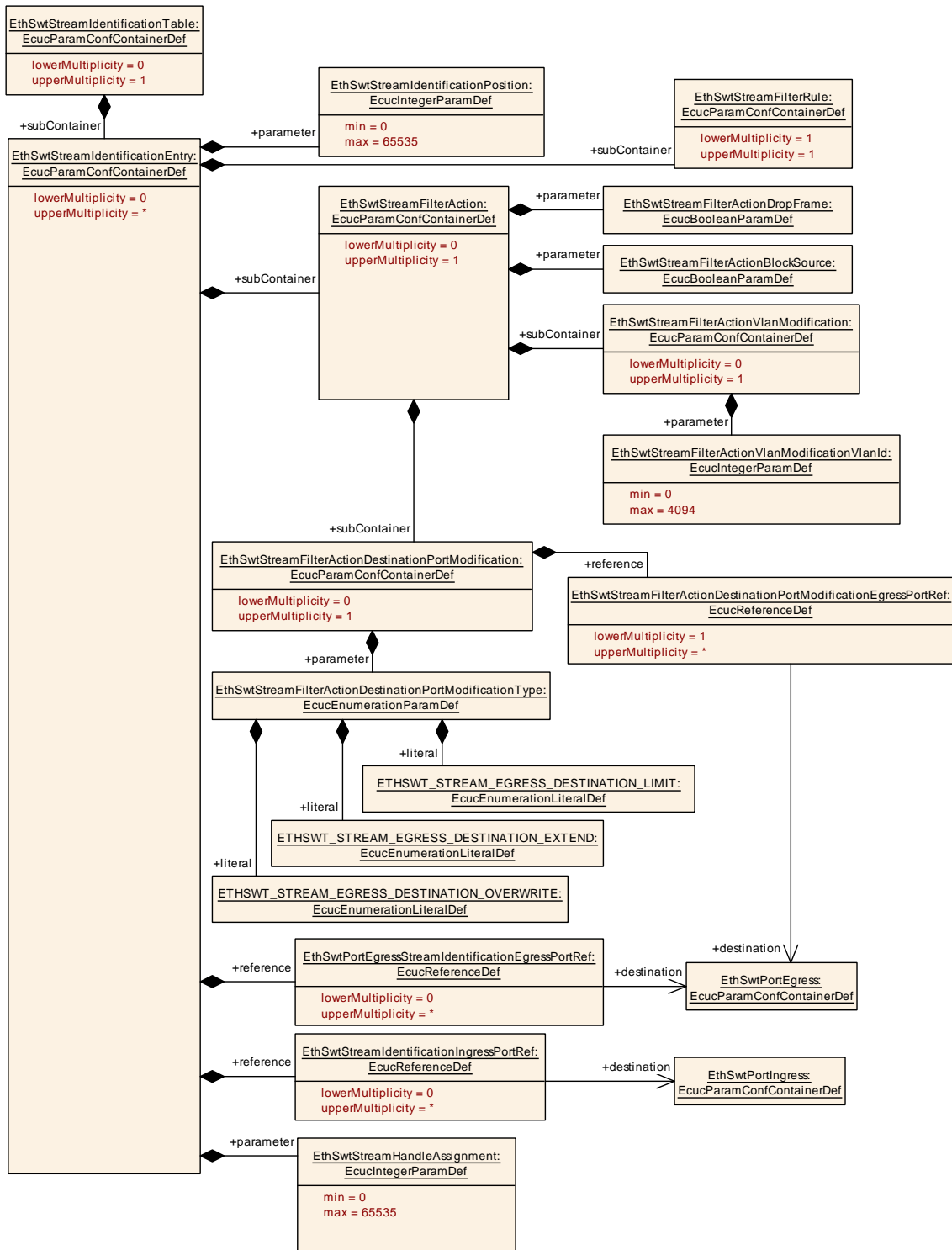


Figure 10.20: EthSwtStreamIdentificationTable

10.1.42 EthSwtStreamIdentificationEntry

[ECUC_EthSwt_00140] Definition of EcucParamConfContainerDef EthSwtStreamIdentificationEntry

Status: DRAFT

[

Container Name	EthSwtStreamIdentificationEntry		
Parent Container	EthSwtStreamIdentificationTable		
Description	Configuration of a stream identification. Tags: atp.Status=draft		
Post-Build Variant Multiplicity	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Configuration Parameters			

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
EthSwtStreamHandleAssignment	1	[ECUC_EthSwt_00211]
EthSwtStreamIdentificationPosition	1	[ECUC_EthSwt_00142]
EthSwtPortEgressStreamIdentificationEgressPortRef	0..*	[ECUC_EthSwt_00153]
EthSwtStreamIdentificationIngressPortRef	0..*	[ECUC_EthSwt_00152]

Included Containers		
Container Name	Multiplicity	Scope / Dependency
EthSwtStreamFilterAction	0..1	Configuration of a stream filter action. Tags: atp.Status=draft
EthSwtStreamFilterRule	1	Configuration of a filter rule. Tags: atp.Status=draft

]

[ECUC_EthSwt_00211] Definition of EcucIntegerParamDef EthSwtStreamHandleAssignment

Status: DRAFT

[

Parameter Name	EthSwtStreamHandleAssignment
Parent Container	EthSwtStreamIdentificationEntry
Description	Assignment of this stream identification to an stream filter entry. Tags: atp.Status=draft
Multiplicity	1

▽



Type	EcucIntegerParamDef		
Range	0 .. 65535		
Default value	-		
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00142] Definition of EcucIntegerParamDef EthSwtStreamIdentificationPosition

Status: DRAFT

[

Parameter Name	EthSwtStreamIdentificationPosition		
Parent Container	EthSwtStreamIdentificationEntry		
Description	Specifies the position as unique ID within an ordered list of EthSwtStreamIdentification Entries. The ordered list shall start with 0 and continue as linear list with no gaps. Note: The list is processed in ascending order. The instance of EthSwtStream IdentificationEntry with position 0 is processed first. Tags: atp.Status=draft		
Multiplicity	1		
Type	EcucIntegerParamDef		
Range	0 .. 65535		
Default value	-		
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: ECU		

]

[ECUC_EthSwt_00153] Definition of EcucReferenceDef EthSwtPortEgress StreamIdentificationEgressPortRef

Status: DRAFT

[

Parameter Name	EthSwtPortEgressStreamIdentificationEgressPortRef		
Parent Container	EthSwtStreamIdentificationEntry		
Description	Reference to the egress ports this stream identification applies to. Tags: atp.Status=draft		



△

Multiplicity	0..*		
Type	Reference to EthSwtPortEgress		
Post-Build Variant Multiplicity	true		
Post-Build Variant Value	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00152] Definition of EcucReferenceDef EthSwtStreamIdentificationIngressPortRef

Status: DRAFT

[

Parameter Name	EthSwtStreamIdentificationIngressPortRef		
Parent Container	EthSwtStreamIdentificationEntry		
Description	Reference to the ingress ports this stream identification applies to. Tags: atp.Status=draft		
Multiplicity	0..*		
Type	Reference to EthSwtPortIngress		
Post-Build Variant Multiplicity	true		
Post-Build Variant Value	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

]

10.1.43 EthSwtStreamFilterAction

[ECUC_EthSwt_00143] Definition of EcucParamConfContainerDef EthSwtStreamFilterAction

Status: DRAFT

[

Container Name	EthSwtStreamFilterAction		
Parent Container	EthSwtStreamIdentificationEntry		
Description	Configuration of a stream filter action. Tags: atp.Status=draft		
Post-Build Variant Multiplicity	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Configuration Parameters			

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
EthSwtStreamFilterActionBlockSource	1	[ECUC_EthSwt_00145]
EthSwtStreamFilterActionDropFrame	1	[ECUC_EthSwt_00144]

Included Containers		
Container Name	Multiplicity	Scope / Dependency
EthSwtStreamFilterActionDestinationPortModification	0..1	Defines the action to modify the destination port(s) determined by the frame forwarding process for an particular Ethernet frame. Either the egress destination of an Ethernet frame is extended or overwritten. Tags: atp.Status=draft
EthSwtStreamFilterActionVlanModification	0..1	Defines the action to modify the VLAN-ID within a VLAN-tag of an Ethernet frame. Tags: atp.Status=draft

]

[ECUC_EthSwt_00145] Definition of EcucBooleanParamDef EthSwtStreamFilterActionBlockSource

Status: DRAFT

[

Parameter Name	EthSwtStreamFilterActionBlockSource		
Parent Container	EthSwtStreamFilterAction		
Description	Enables Blocking all frames from the MAC address. Tags: atp.Status=draft		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	-		
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00144] Definition of EcucBooleanParamDef EthSwtStreamFilterActionDropFrame

Status: DRAFT

[

Parameter Name	EthSwtStreamFilterActionDropFrame		
Parent Container	EthSwtStreamFilterAction		
Description	Enables Drop Frame action. Tags: atp.Status=draft		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	-		
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

]

10.1.44 EthSwtStreamFilterActionDestinationPortModification

[ECUC_EthSwt_00148] Definition of EcucParamConfContainerDef EthSwtStreamFilterActionDestinationPortModification

Status: DRAFT

[

Container Name	EthSwtStreamFilterActionDestinationPortModification		
Parent Container	EthSwtStreamFilterAction		
Description	Defines the action to modify the destination port(s) determined by the frame forwarding process for a particular Ethernet frame. Either the egress destination of an Ethernet frame is extended or overwritten. Tags: atp.Status=draft		
Post-Build Variant Multiplicity	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Configuration Parameters			

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
EthSwtStreamFilterActionDestinationPortModificationType	1	[ECUC_EthSwt_00150]
EthSwtStreamFilterActionDestinationPortModificationEgressPortRef	1..*	[ECUC_EthSwt_00149]

No Included Containers

[ECUC_EthSwt_00150] Definition of EcucEnumerationParamDef EthSwtStreamFilterActionDestinationPortModificationType

Status: DRAFT

Parameter Name	EthSwtStreamFilterActionDestinationPortModificationType		
Parent Container	EthSwtStreamFilterActionDestinationPortModification		
Description	Defines the method to modify the egress destination. Either overwrite or extend the egress destination. Tags: atp.Status=draft		
Multiplicity	1		
Type	EcucEnumerationParamDef		
Range	ETHSWT_STREAM_EGRESS_DESTINATION_EXTEND	extend the egress destination of an Ethernet frame. Tags: atp.Status=draft	
	ETHSWT_STREAM_EGRESS_DESTINATION_LIMIT	limit the egress destination of an Ethernet frame. Tags: atp.Status=draft	
	ETHSWT_STREAM_EGRESS_DESTINATION_OVERWRITE	overwrite the egress destination of an Ethernet frame. Tags: atp.Status=draft	
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

[ECUC_EthSwt_00149] Definition of EcucReferenceDef EthSwtStreamFilterActionDestinationPortModificationEgressPortRef

Status: DRAFT

Parameter Name	EthSwtStreamFilterActionDestinationPortModificationEgressPortRef		
Parent Container	EthSwtStreamFilterActionDestinationPortModification		
Description	Defines a set of destination ports (egress ports) used for the modification of the egress destination of an Ethernet frame. Tags: atp.Status=draft		
Multiplicity	1..*		
Type	Reference to EthSwtPortEgress		
Post-Build Variant Multiplicity	true		
Post-Build Variant Value	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME



△

	Post-build time	X	VARIANT-POST-BUILD
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

]

10.1.45 EthSwtStreamFilterActionVlanModification

[ECUC_EthSwt_00146] Definition of EcucParamConfContainerDef EthSwtStreamFilterActionVlanModification

Status: DRAFT

[

Container Name	EthSwtStreamFilterActionVlanModification		
Parent Container	EthSwtStreamFilterAction		
Description	Defines the action to modify the VLAN-ID within a VLAN-tag of an Ethernet frame. Tags: atp.Status=draft		
Post-Build Variant Multiplicity	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Configuration Parameters			

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
EthSwtStreamFilterActionVlanModificationVlanId	1	[ECUC_EthSwt_00147]

No Included Containers

]

[ECUC_EthSwt_00147] Definition of EcucIntegerParamDef EthSwtStreamFilterActionVlanModificationVlanId

Status: DRAFT

[

Parameter Name	EthSwtStreamFilterActionVlanModificationVlanId		
Parent Container	EthSwtStreamFilterActionVlanModification		
Description	Defines the VLAN-ID to modify the existing VLAN-ID within the VLAN-tag of an Ethernet frame. Tags: atp.Status=draft		
Multiplicity	1		
Type	EcucIntegerParamDef		
Range	0 .. 4094		
Default value	-		
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

]

10.1.46 EthSwtStreamFilterRule

[ECUC_EthSwt_00141] Definition of EcucParamConfContainerDef EthSwtStreamFilterRule

Status: DRAFT

[

Container Name	EthSwtStreamFilterRule
Parent Container	EthSwtStreamIdentificationEntry
Description	Configuration of a filter rule. Tags: atp.Status=draft
Configuration Parameters	

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
EthSwtStreamFilterEtherType	0..*	[ECUC_EthSwt_00170]
EthSwtStreamFilterVlanId	0..*	[ECUC_EthSwt_00168]
EthSwtStreamFilterVlanPriority	0..*	[ECUC_EthSwt_00169]

Included Containers		
Container Name	Multiplicity	Scope / Dependency
EthSwtStreamFilterIEEE1722StreamId	0..1	Definition of the filter IEEE1722 Stream Id. Specifies a 64 bit Stream Id. Please note: According to IEEE802.1Q specification, the 48 most significant bits represents a source MAC address and the 16 least significant bits a unique id. AUTOSAR deviates from this definition and allow to have any kind of MAC address (e.g. source or destination or MAC multicast address)
EthSwtStreamFilterIPDestAddress	0..*	Configuration of one IP destination filter. Tags: atp.Status=draft
EthSwtStreamFilterIPSrcAddress	0..*	Configuration of one IP source filter. Tags: atp.Status=draft
EthSwtStreamFilterMACDestAddress	0..*	Configuration of one MAC destination filter. Tags: atp.Status=draft
EthSwtStreamFilterMACSrcAddress	0..*	Configuration of one MAC source filter. Tags: atp.Status=draft
EthSwtStreamFilterTcpDestPort	0..*	Configuration of a TCP destination port filter. Tags: atp.Status=draft
EthSwtStreamFilterTcpSrcPort	0..*	Configuration of a TCP source port filter. Tags: atp.Status=draft
EthSwtStreamFilterUdpDestPort	0..*	Configuration of a UDP destination port filter. Tags: atp.Status=draft
EthSwtStreamFilterUdpSrcPort	0..*	Configuration of a UDP source port filter. Tags: atp.Status=draft

[ECUC_EthSwt_00170] Definition of EcucIntegerParamDef EthSwtStreamFilterEtherType

Status: DRAFT

Parameter Name	EthSwtStreamFilterEtherType		
Parent Container	EthSwtStreamFilterRule		
Description	Definition of the filter Ether Type. Tags: atp.Status=draft		
Multiplicity	0..*		
Type	EcucIntegerParamDef		
Range	0 .. 65535		
Default value	-		
Post-Build Variant Multiplicity	false		
Post-Build Variant Value	false		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	





	Post-build time	–	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00168] Definition of EcucIntegerParamDef EthSwtStreamFilterVlanId

Status: DRAFT

[

Parameter Name	EthSwtStreamFilterVlanId		
Parent Container	EthSwtStreamFilterRule		
Description	Definition of the filter VLAN-ID. Tags: atp.Status=draft		
Multiplicity	0..*		
Type	EcucIntegerParamDef		
Range	0 .. 4094		
Default value	–		
Post-Build Variant Multiplicity	false		
Post-Build Variant Value	false		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00169] Definition of EcucIntegerParamDef EthSwtStreamFilterVlanPriority

Status: DRAFT

[

Parameter Name	EthSwtStreamFilterVlanPriority		
Parent Container	EthSwtStreamFilterRule		
Description	Definition of the filter VLAN Priority. Tags: atp.Status=draft		
Multiplicity	0..*		
Type	EcucIntegerParamDef		
Range	0 .. 7		
Default value	–		
Post-Build Variant Multiplicity	false		





Post-Build Variant Value	false		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

]

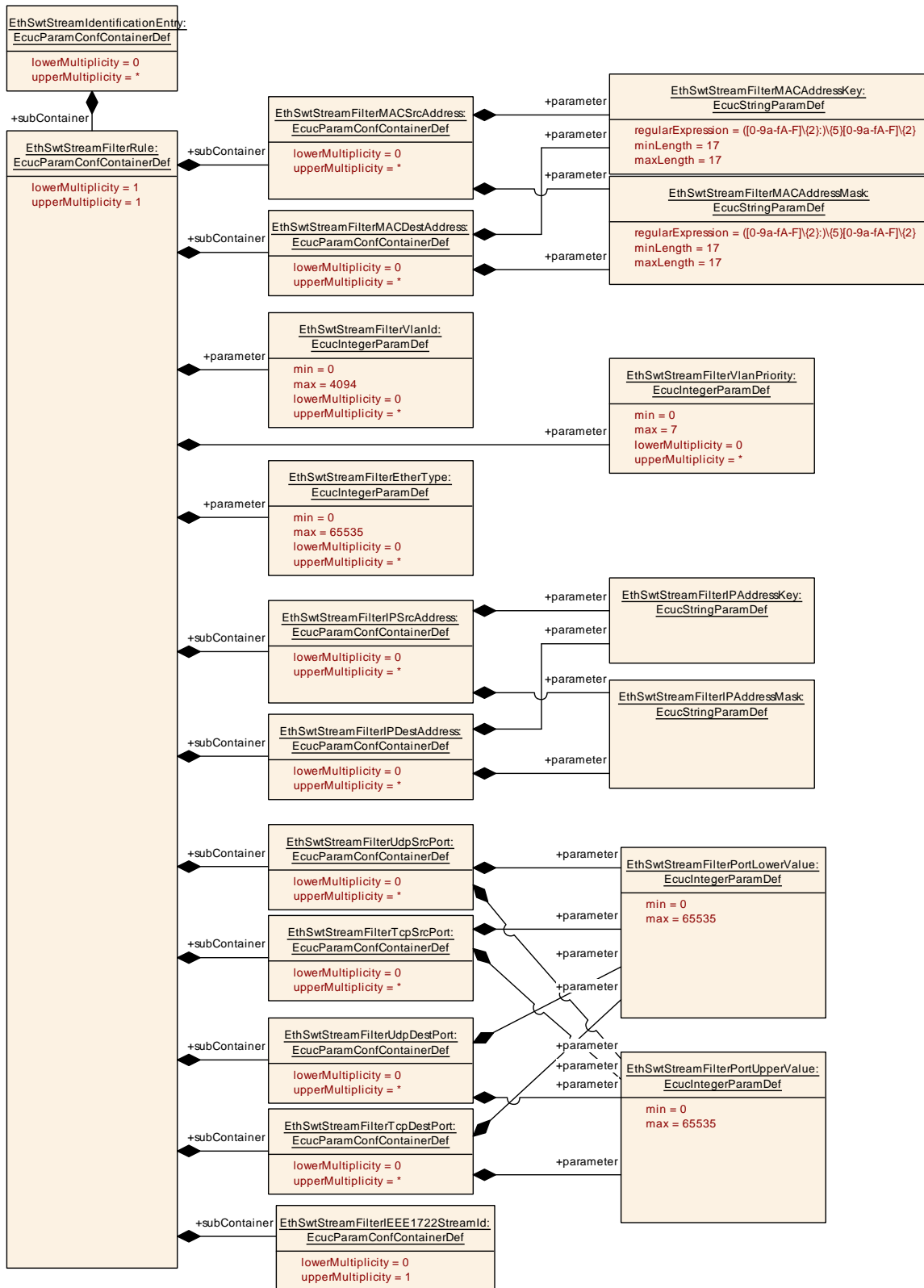


Figure 10.21: EthSwtStreamFilterRule

10.1.47 EthSwtStreamFilterIPDestAddress

[ECUC_EthSwt_00172] Definition of EcucParamConfContainerDef EthSwtStreamFilterIPDestAddress

Status: DRAFT

[

Container Name	EthSwtStreamFilterIPDestAddress		
Parent Container	EthSwtStreamFilterRule		
Description	Configuration of one IP destination filter. Tags: atp.Status=draft		
Post-Build Variant Multiplicity	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Configuration Parameters			

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
EthSwtStreamFilterIPAddressKey	1	[ECUC_EthSwt_00173]
EthSwtStreamFilterIPAddressMask	1	[ECUC_EthSwt_00174]

No Included Containers

]

[ECUC_EthSwt_00173] Definition of EcucStringParamDef EthSwtStreamFilterIPAddressKey

Status: DRAFT

[

Parameter Name	EthSwtStreamFilterIPAddressKey		
Parent Container	EthSwtStreamFilterIPDestAddress , EthSwtStreamFilterIPSrcAddress		
Description	IP address key pattern. Tags: atp.Status=draft		
Multiplicity	1		
Type	EcucStringParamDef		
Default value	-		
Regular Expression	-		
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00174] Definition of EcucStringParamDef EthSwtStreamFilterIPAddressMask

Status: DRAFT

[

Parameter Name	EthSwtStreamFilterIPAddressMask		
Parent Container	EthSwtStreamFilterIPDestAddress , EthSwtStreamFilterIPSrcAddress		
Description	IP address mask pattern. Tags: atp.Status=draft		
Multiplicity	1		
Type	EcucStringParamDef		
Default value	-		
Regular Expression	-		
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

]

10.1.48 EthSwtStreamFilterIPSrcAddress

[ECUC_EthSwt_00171] Definition of EcucParamConfContainerDef EthSwtStreamFilterIPSrcAddress

Status: DRAFT

[

Container Name	EthSwtStreamFilterIPSrcAddress		
Parent Container	EthSwtStreamFilterRule		
Description	Configuration of one IP source filter. Tags: atp.Status=draft		
Post-Build Variant Multiplicity	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Configuration Parameters			

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
EthSwtStreamFilterIPAddressKey	1	[ECUC_EthSwt_00173]
EthSwtStreamFilterIPAddressMask	1	[ECUC_EthSwt_00174]

No Included Containers

]

For parameter table [ECUC_EthSwT_00173] EthSwTStreamFilterIPAddressKey, see definition below container EthSwTStreamFilterIPDestAddress.

For parameter table [ECUC_EthSwT_00174] EthSwTStreamFilterIPAddressMask, see definition below container EthSwTStreamFilterIPDestAddress.

10.1.49 EthSwTStreamFilterMACDestAddress

[ECUC_EthSwT_00165] Definition of EcucParamConfContainerDef EthSwTStreamFilterMACDestAddress

Status: DRAFT

[

Container Name	EthSwTStreamFilterMACDestAddress		
Parent Container	EthSwTStreamFilterRule		
Description	Configuration of one MAC destination filter. Tags: atp.Status=draft		
Post-Build Variant Multiplicity	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Configuration Parameters			

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
EthSwTStreamFilterMACAddressKey	1	[ECUC_EthSwT_00166]
EthSwTStreamFilterMACAddressMask	1	[ECUC_EthSwT_00167]

No Included Containers

]

[ECUC_EthSwt_00166] Definition of EcucStringParamDef EthSwtStreamFilterMACAddressKey

Status: DRAFT

[

Parameter Name	EthSwtStreamFilterMACAddressKey		
Parent Container	EthSwtStreamFilterMACDestAddress , EthSwtStreamFilterMACSrcAddress		
Description	Specifies the 48-bit physical address (MAC address) key value. Tags: atp.Status=draft		
Multiplicity	1		
Type	EcucStringParamDef		
Default value	-		
Length	17-17		
Regular Expression	([0-9a-fA-F]{2:})\{5}[0-9a-fA-F]{2}		
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00167] Definition of EcucStringParamDef EthSwtStreamFilterMACAddressMask

Status: DRAFT

[

Parameter Name	EthSwtStreamFilterMACAddressMask		
Parent Container	EthSwtStreamFilterMACDestAddress , EthSwtStreamFilterMACSrcAddress		
Description	Specifies the 48-bit physical address (MAC address) mask value. Tags: atp.Status=draft		
Multiplicity	1		
Type	EcucStringParamDef		
Default value	-		
Length	17-17		
Regular Expression	([0-9a-fA-F]{2:})\{5}[0-9a-fA-F]{2}		
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

]

10.1.50 EthSwtStreamFilterMACSrcAddress

[ECUC_EthSwt_00164] Definition of EcucParamConfContainerDef EthSwtStreamFilterMACSrcAddress

Status: DRAFT

[

Container Name	EthSwtStreamFilterMACSrcAddress		
Parent Container	EthSwtStreamFilterRule		
Description	Configuration of one MAC source filter. Tags: atp.Status=draft		
Post-Build Variant Multiplicity	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Configuration Parameters			

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
EthSwtStreamFilterMACAddressKey	1	[ECUC_EthSwt_00166]
EthSwtStreamFilterMACAddressMask	1	[ECUC_EthSwt_00167]

No Included Containers

]

For parameter table [ECUC_EthSwt_00166] [EthSwtStreamFilterMACAddressKey](#), see definition below container [EthSwtStreamFilterMACDestAddress](#).

For parameter table [ECUC_EthSwt_00167] [EthSwtStreamFilterMACAddressMask](#), see definition below container [EthSwtStreamFilterMACDestAddress](#).

10.1.51 EthSwtStreamFilterTcpDestPort

[ECUC_EthSwt_00178] Definition of EcucParamConfContainerDef EthSwtStreamFilterTcpDestPort

Status: DRAFT

[

Container Name	EthSwtStreamFilterTcpDestPort		
Parent Container	EthSwtStreamFilterRule		
Description	Configuration of a TCP destination port filter. Tags: atp.Status=draft		
Post-Build Variant Multiplicity	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Configuration Parameters			

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
EthSwtStreamFilterPortLowerValue	1	[ECUC_EthSwt_00179]
EthSwtStreamFilterPortUpperValue	1	[ECUC_EthSwt_00180]

No Included Containers

]

[[ECUC_EthSwt_00179](#)] Definition of EcucIntegerParamDef EthSwtStreamFilterPortLowerValue

Status: DRAFT

[

Parameter Name	EthSwtStreamFilterPortLowerValue		
Parent Container	EthSwtStreamFilterTcpDestPort , EthSwtStreamFilterTcpSrcPort , EthSwtStreamFilterUdpDestPort , EthSwtStreamFilterUdpSrcPort		
Description	Definition of the filter port lower value. Tags: atp.Status=draft		
Multiplicity	1		
Type	EcucIntegerParamDef		
Range	0 .. 65535		
Default value	-		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00180] Definition of EcucIntegerParamDef EthSwtStreamFilterPortUpperValue

Status: DRAFT

[

Parameter Name	EthSwtStreamFilterPortUpperValue		
Parent Container	EthSwtStreamFilterTcpDestPort , EthSwtStreamFilterTcpSrcPort , EthSwtStreamFilterUdpDestPort , EthSwtStreamFilterUdpSrcPort		
Description	Definition of the filter port upper value. Tags: atp.Status=draft		
Multiplicity	1		
Type	EcucIntegerParamDef		
Range	0 .. 65535		
Default value	-		
Post-Build Variant Value	false		
Value Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Scope / Dependency	scope: local		

]

10.1.52 EthSwtStreamFilterTcpSrcPort

[ECUC_EthSwt_00176] Definition of EcucParamConfContainerDef EthSwtStreamFilterTcpSrcPort

Status: DRAFT

[

Container Name	EthSwtStreamFilterTcpSrcPort		
Parent Container	EthSwtStreamFilterRule		
Description	Configuration of a TCP source port filter. Tags: atp.Status=draft		
Post-Build Variant Multiplicity	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Configuration Parameters			

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
EthSwtStreamFilterPortLowerValue	1	[ECUC_EthSwt_00179]
EthSwtStreamFilterPortUpperValue	1	[ECUC_EthSwt_00180]

No Included Containers

]

For parameter table [ECUC_EthSwT_00179] EthSwTStreamFilterPortLowerValue, see definition below container EthSwTStreamFilterTcpDestPort.

For parameter table [ECUC_EthSwT_00180] EthSwTStreamFilterPortUpperValue, see definition below container EthSwTStreamFilterTcpDestPort.

10.1.53 EthSwTStreamFilterUdpDestPort

[ECUC_EthSwT_00177] Definition of EcucParamConfContainerDef EthSwTStreamFilterUdpDestPort

Status: DRAFT

[

Container Name	EthSwTStreamFilterUdpDestPort		
Parent Container	EthSwTStreamFilterRule		
Description	Configuration of a UDP destination port filter. Tags: atp.Status=draft		
Post-Build Variant Multiplicity	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Configuration Parameters			

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
EthSwTStreamFilterPortLowerValue	1	[ECUC_EthSwT_00179]
EthSwTStreamFilterPortUpperValue	1	[ECUC_EthSwT_00180]

No Included Containers

]

For parameter table [ECUC_EthSwT_00179] EthSwTStreamFilterPortLowerValue, see definition below container EthSwTStreamFilterTcpDestPort.

For parameter table [ECUC_EthSwT_00180] EthSwTStreamFilterPortUpperValue, see definition below container EthSwTStreamFilterTcpDestPort.

10.1.54 EthSwtStreamFilterUdpSrcPort

[ECUC_EthSwt_00175] Definition of EcucParamConfContainerDef EthSwtStreamFilterUdpSrcPort

Status: DRAFT

[

Container Name	EthSwtStreamFilterUdpSrcPort		
Parent Container	EthSwtStreamFilterRule		
Description	Configuration of a UDP source port filter. Tags: atp.Status=draft		
Post-Build Variant Multiplicity	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Configuration Parameters			

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
EthSwtStreamFilterPortLowerValue	1	[ECUC_EthSwt_00179]
EthSwtStreamFilterPortUpperValue	1	[ECUC_EthSwt_00180]

No Included Containers

]

For parameter table [\[ECUC_EthSwt_00179\] EthSwtStreamFilterPortLowerValue](#), see definition below container [EthSwtStreamFilterTcpDestPort](#).

For parameter table [\[ECUC_EthSwt_00180\] EthSwtStreamFilterPortUpperValue](#), see definition below container [EthSwtStreamFilterTcpDestPort](#).

10.1.55 EthSwtStreamFilterIEEE1722StreamId

[ECUC_EthSwt_00232] Definition of EcucParamConfContainerDef EthSwtStreamFilterIEEE1722StreamId [

Container Name	EthSwtStreamFilterIEEE1722StreamId
Parent Container	EthSwtStreamFilterRule
Description	Definition of the filter IEEE1722 Stream Id. Specifies a 64 bit Stream Id. Please note: According to IEEE802.1Q specification, the 48 most significant bits represents a source MAC address and the 16 least significant bits a unique id. AUTOSAR deviates from this definition and allow to have any kind of MAC address (e.g. source or destination or MAC multicast address)
Post-Build Variant Multiplicity	true
Configuration Parameters	

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
EthSwtStreamFilterStreamMacId	1	[ECUC_EthSwt_00233]
EthSwtStreamFilterStreamUniqueld	1	[ECUC_EthSwt_00234]

No Included Containers

]

[ECUC_EthSwt_00233] Definition of EcucStringParamDef EthSwtStreamFilterStreamMacId [

Parameter Name	EthSwtStreamFilterStreamMacId		
Parent Container	EthSwtStreamFilterIEEE1722StreamId		
Description	Specifies the 48-bit physical address (MAC address) part of the IEEE1722 Stream Id.		
Multiplicity	1		
Type	EcucStringParamDef		
Default value	-		
Length	17-17		
Regular Expression	([0-9a-fA-F]{2:}{5}[0-9a-fA-F]{2}		
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: local		

]

[ECUC_EthSwt_00234] Definition of EcucIntegerParamDef EthSwtStreamFilterStreamUniqueld [

Parameter Name	EthSwtStreamFilterStreamUniqueld		
Parent Container	EthSwtStreamFilterIEEE1722StreamId		
Description	Specifies the 16-bit unique part of the IEEE1722 Stream Id.		
Multiplicity	1		
Type	EcucIntegerParamDef		
Range	0 .. 65535		
Default value	0		
Post-Build Variant Multiplicity	false		
Post-Build Variant Value	true		
Multiplicity Configuration Class	Pre-compile time	X	All Variants
	Link time	-	
	Post-build time	-	
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD





Scope / Dependency	scope: local
--------------------	--------------

]

10.1.56 EthSwtUnknownMacDestAddressConfig

[ECUC_EthSwt_00239] Definition of EcucParamConfContainerDef EthSwtUnknownMacDestAddressConfig [

Container Name	EthSwtUnknownMacDestAddressConfig		
Parent Container	EthSwtConfig		
Description	Definition to which EthSwtPorts an Ethernet frame shall be forwarded if the destination MAC address is not present in the address resolution lookup (ARL) table.		
Post-Build Variant Multiplicity	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Configuration Parameters			

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
EthSwtDestPortsForUnknownMulticastMacDestAddressRef	0..255	[ECUC_EthSwt_00241]
EthSwtDestPortsForUnknownUnicastMacDestAddressRef	0..255	[ECUC_EthSwt_00240]
EthSwtDestVlanForUnknownMacDestAddressRef	0..4095	[ECUC_EthSwt_00242]

No Included Containers

]

[ECUC_EthSwt_00241] Definition of EcucReferenceDef EthSwtDestPortsForUnknownMulticastMacDestAddressRef [

Parameter Name	EthSwtDestPortsForUnknownMulticastMacDestAddressRef
Parent Container	EthSwtUnknownMacDestAddressConfig
Description	This parameter specifies the egress ports frames with unknown multicast MAC destination addresses (without a matching ARL entry) are forwarded on. Note that "Drop Unknown Multicast" behavior can be achieved by not referencing any EthSwtPort.
Multiplicity	0..255
Type	Reference to EthSwtPort
Post-Build Variant Multiplicity	true
Post-Build Variant Value	true





Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: ECU		

]

[ECUC_EthSwt_00240] Definition of EcucReferenceDef EthSwtDestPortsForUnknownUnicastMacDestAddressRef [

Parameter Name	EthSwtDestPortsForUnknownUnicastMacDestAddressRef		
Parent Container	EthSwtUnknownMacDestAddressConfig		
Description	This parameter specifies the egress ports frames with unknown unicast MAC destination addresses (without a matching ARL entry) are forwarded on. Note that "Flooding" can be achieved by referencing all EthSwtPorts.		
Multiplicity	0..255		
Type	Reference to EthSwtPort		
Post-Build Variant Multiplicity	true		
Post-Build Variant Value	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: ECU		

]

[ECUC_EthSwt_00242] Definition of EcucReferenceDef EthSwtDestVlanForUnknownMacDestAddressRef [

Parameter Name	EthSwtDestVlanForUnknownMacDestAddressRef		
Parent Container	EthSwtUnknownMacDestAddressConfig		
Description	Optional reference to a set of VLANs to define that the owning EthSwtUnknownMacDestAddressConfig is applicable for these VLANs only.		
Multiplicity	0..4095		
Type	Reference to EthSwtVlanMembership		
Post-Build Variant Multiplicity	true		
Post-Build Variant Value	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD





Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: ECU		

]

10.1.57 EthSwtVlanMembership

[ECUC_EthSwt_00199] Definition of EcucParamConfContainerDef EthSwtVlanMembership [

Container Name	EthSwtVlanMembership		
Parent Container	EthSwtConfig		
Description	Determines the membership of this Ethernet switch and the referenced ports to the virtual network, i.e. frames with this VID can be received and transmitted via the referenced ports.		
Post-Build Variant Multiplicity	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Configuration Parameters			

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
EthSwtVlanMembershipld	1	[ECUC_EthSwt_00202]

Included Containers		
Container Name	Multiplicity	Scope / Dependency
EthSwtVlanMembershipPortRefEntry	0..255	Determines the VLAN membership of one referenced ports to the virtual network and the according forwarding type (NOT_SENT, SENT_UNTAGGED, SENT_TAGGED).

]

[ECUC_EthSwt_00202] Definition of EcucIntegerParamDef EthSwtVlanMembershipld [

Parameter Name	EthSwtVlanMembershipld
Parent Container	EthSwtVlanMembership
Description	Determines the VID of the virtual network this port belongs to.
Multiplicity	1
Type	EcucIntegerParamDef





Range	0 .. 4094		
Default value	–		
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: ECU		

]

10.1.58 EthSwtVlanMembershipPortRefEntry

[ECUC_EthSwt_00203] Definition of EcucParamConfContainerDef EthSwtVlanMembershipPortRefEntry [

Container Name	EthSwtVlanMembershipPortRefEntry		
Parent Container	EthSwtVlanMembership		
Description	Determines the VLAN membership of one referenced ports to the virtual network and the according forwarding type (NOT_SENT, SENT_UNTAGGED, SENT_TAGGED).		
Post-Build Variant Multiplicity	true		
Multiplicity Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Configuration Parameters			

Included Parameters		
Parameter Name	Multiplicity	ECUC ID
EthSwtVlanForwardingType	1	[ECUC_EthSwt_00026]
EthSwtVlanMembershipPortRef	1	[ECUC_EthSwt_00204]

No Included Containers

]

[ECUC_EthSwt_00026] Definition of EcucEnumerationParamDef EthSwtVlanForwardingType [

Parameter Name	EthSwtVlanForwardingType
Parent Container	EthSwtVlanMembershipPortRefEntry
Description	Defines how the message with a specific VLAN-ID at the referenced port shall be handled.
Multiplicity	1
Type	EcucEnumerationParamDef



△

Range	ETHSWT_NOT_SENT	The message with the specific VLAN Id shall not be sent at the referenced port.	
	ETHSWT_SENT_TAGGED	The message with the specific VLAN Id shall be sent with its VLAN Id at the referenced port.	
	ETHSWT_SENT_UNTAGGED	The message with the specific VLAN Id shall be sent untagged at the referenced port.	
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: ECU		

]

[ECUC_EthSwt_00204] Definition of EcucReferenceDef EthSwtVlanMembershipPortRef [

Parameter Name	EthSwtVlanMembershipPortRef		
Parent Container	EthSwtVlanMembershipPortRefEntry		
Description	Reference to one port the VLAN shall be assigned to.		
Multiplicity	1		
Type	Reference to EthSwtPort		
Post-Build Variant Value	true		
Value Configuration Class	Pre-compile time	X	VARIANT-PRE-COMPILE
	Link time	X	VARIANT-LINK-TIME
	Post-build time	X	VARIANT-POST-BUILD
Scope / Dependency	scope: ECU		

]

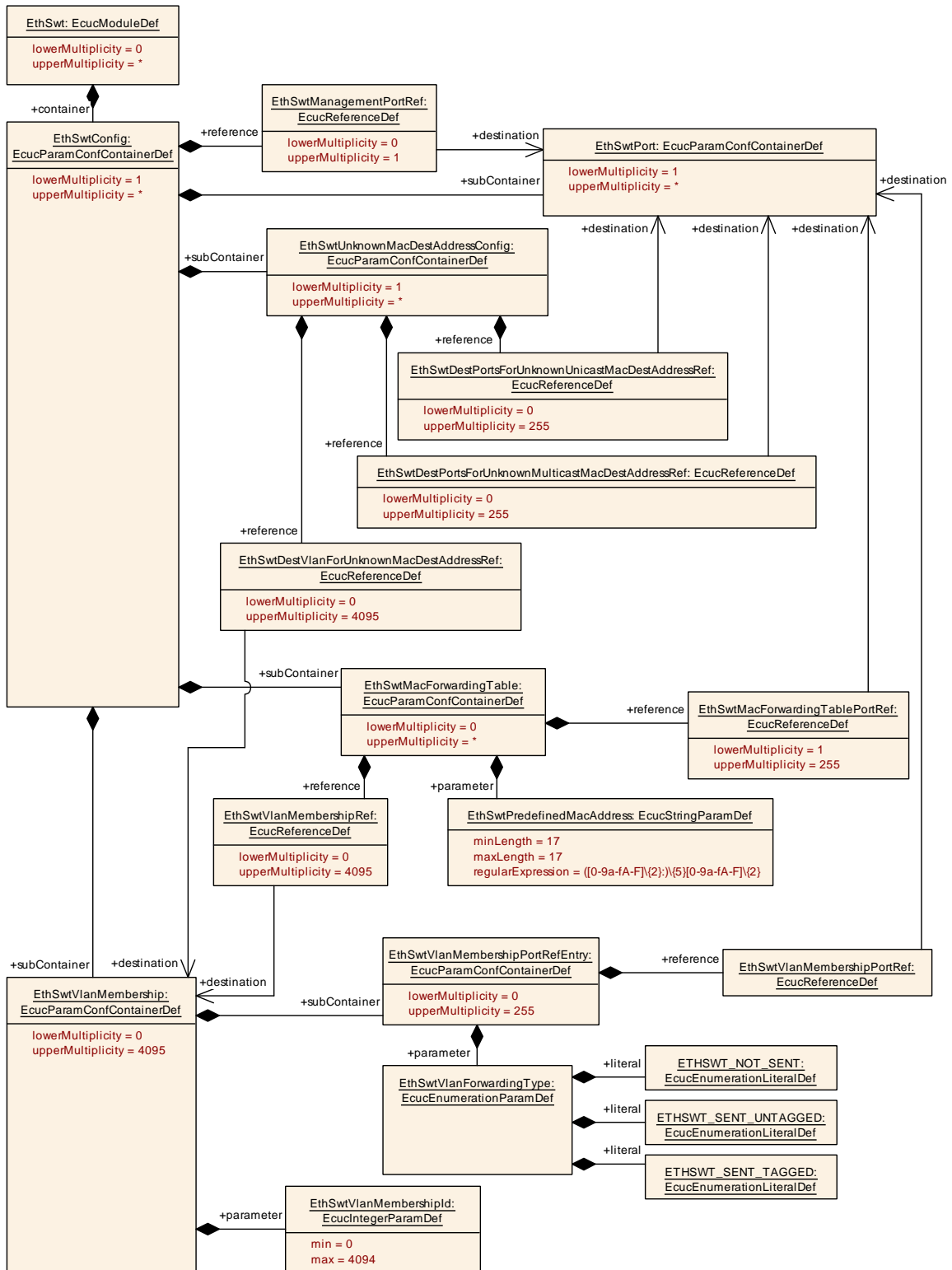


Figure 10.22: EthSwtVlanMembershipPortRefEntry

10.2 Constraints

[SWS_EthSwt_CONSTR_00411] [The ECUC partitions referenced by [EthSwtConfigEcucPartitionRef](#) shall be a subset of the ECUC partitions referenced by [EthSwtEcucPartitionRef](#).]

[SWS_EthSwt_CONSTR_00412] [[EthSwtConfig](#), [EthCtrlConfig](#) and [EthTrcvConfig](#) of one communication channel shall all reference the same ECUC partition.]

[SWS_EthSwt_CONSTR_00438] [If [EthSwtEcucPartitionRef](#) references one or more ECUC partitions, [EthSwtConfigEcucPartitionRef](#) shall have a multiplicity of one and reference one of these ECUC partitions as well.]

A Change History

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

A.1 Traceable item history of this document according to AUTOSAR Release R22-11

A.1.1 Added Specification Items in R22-11

Number	Heading
[SWS_EthSwt_00455]	
[SWS_EthSwt_00460]	
[SWS_EthSwt_00461]	
[SWS_EthSwt_00462]	
[SWS_EthSwt_00463]	
[SWS_EthSwt_00465]	
[SWS_EthSwt_00466]	
[SWS_EthSwt_00467]	
[SWS_EthSwt_00469]	
[SWS_EthSwt_00471]	
[SWS_EthSwt_00472]	
[SWS_EthSwt_00475]	
[SWS_EthSwt_00476]	
[SWS_EthSwt_00477]	
[SWS_EthSwt_00478]	
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[SWS_EthSwt_00487]	
[SWS_EthSwt_00490]	
[SWS_EthSwt_00491]	
[SWS_EthSwt_00492]	
[SWS_EthSwt_00493]	





Number	Heading
[SWS_EthSwt_00494]	
[SWS_EthSwt_91124]	
[SWS_EthSwt_91125]	
[SWS_EthSwt_91126]	
[SWS_EthSwt_91127]	
[SWS_EthSwt_91128]	
[SWS_EthSwt_91129]	
[SWS_EthSwt_91130]	
[SWS_EthSwt_91131]	
[SWS_EthSwt_91132]	
[SWS_EthSwt_91133]	
[SWS_EthSwt_91134]	
[SWS_EthSwt_91135]	
[SWS_EthSwt_91136]	
[SWS_EthSwt_91137]	
[SWS_EthSwt_91138]	
[SWS_EthSwt_91139]	
[SWS_EthSwt - CONSTR_00450]	
[SWS_EthSwt - CONSTR_00451]	
[SWS_EthSwt - CONSTR_00452]	
[SWS_EthSwt - CONSTR_00453]	
[SWS_EthSwt - CONSTR_00454]	
[SWS_EthSwt - CONSTR_00456]	
[SWS_EthSwt - CONSTR_00457]	
[SWS_EthSwt - CONSTR_00458]	
[SWS_EthSwt - CONSTR_00459]	
[SWS_EthSwt - CONSTR_00464]	
[SWS_EthSwt - CONSTR_00468]	
[SWS_EthSwt - CONSTR_00470]	





Number	Heading
[SWS_EthSwt - CONSTR_00473]	
[SWS_EthSwt - CONSTR_00474]	
[SWS_EthSwt - CONSTR_00485]	
[SWS_EthSwt - CONSTR_00488]	
[SWS_EthSwt - CONSTR_00489]	
[SWS_EthSwt - CONSTR_00495]	
[SWS_EthSwt - CONSTR_00496]	

Table A.1: Added Specification Items in R22-11

A.1.2 Changed Specification Items in R22-11

Number	Heading
[SWS_EthSwt_00001]	
[SWS_EthSwt_00002]	
[SWS_EthSwt_00006]	
[SWS_EthSwt_00009]	
[SWS_EthSwt_00018]	
[SWS_EthSwt_00019]	
[SWS_EthSwt_00023]	
[SWS_EthSwt_00025]	
[SWS_EthSwt_00026]	
[SWS_EthSwt_00031]	
[SWS_EthSwt_00032]	
[SWS_EthSwt_00037]	
[SWS_EthSwt_00038]	
[SWS_EthSwt_00044]	
[SWS_EthSwt_00045]	
[SWS_EthSwt_00051]	
[SWS_EthSwt_00052]	
[SWS_EthSwt_00058]	
[SWS_EthSwt_00060]	





Number	Heading
[SWS_EthSwt_00061]	
[SWS_EthSwt_00086]	
[SWS_EthSwt_00087]	
[SWS_EthSwt_00091]	
[SWS_EthSwt_00092]	
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[SWS_EthSwt_00106]	
[SWS_EthSwt_00111]	
[SWS_EthSwt_00114]	
[SWS_EthSwt_00117]	
[SWS_EthSwt_00118]	
[SWS_EthSwt_00123]	
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[SWS_EthSwt_00193]	
[SWS_EthSwt_00194]	





Number	Heading
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[SWS_EthSwt_91000]	





Number	Heading
[SWS_EthSwt_91001]	
[SWS_EthSwt_91002]	
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[SWS_EthSwt_91038]	
[SWS_EthSwt_91039]	
[SWS_EthSwt_91040]	
[SWS_EthSwt_91050]	





Number	Heading
[SWS_EthSwt_91104]	
[SWS_EthSwt_91123]	

Table A.2: Changed Specification Items in R22-11

A.1.3 Deleted Specification Items in R22-11

none

A.1.4 Added Constraints in R22-11

none

A.1.5 Changed Constraints in R22-11

none

A.1.6 Deleted Constraints in R22-11

none

A.2 Traceable item history of this document according to AUTOSAR Release R23-11

A.2.1 Added Specification Items in R23-11

Number	Heading
[SWS_EthSwt_00163]	
[SWS_EthSwt_00450]	
[SWS_EthSwt_00451]	
[SWS_EthSwt_00456]	
[SWS_EthSwt_00459]	
[SWS_EthSwt_00500]	
[SWS_EthSwt_00501]	





Number	Heading
[SWS_EthSwt_00502]	
[SWS_EthSwt_00503]	
[SWS_EthSwt_00504]	
[SWS_EthSwt_00601]	
[SWS_EthSwt_00602]	
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[SWS_EthSwt_00609]	
[SWS_EthSwt_00610]	
[SWS_EthSwt_00611]	
[SWS_EthSwt_00612]	
[SWS_EthSwt_00613]	
[SWS_EthSwt_00614]	
[SWS_EthSwt_91041]	Definition of API function EthSwt_SetStreamHandleIdxConfiguration
[SWS_EthSwt_91042]	Definition of API function EthSwt_GetStreamHandleIdxStatistics
[SWS_EthSwt_91043]	Definition of API function EthSwt_ExtractStreamHandleIdx

Table A.3: Added Specification Items in R23-11

A.2.2 Changed Specification Items in R23-11

Number	Heading
[SWS_EthSwt_00002]	Definition of imported datatypes of module EthSwt
[SWS_EthSwt_00016]	
[SWS_EthSwt_00133]	
[SWS_EthSwt_00179]	
[SWS_EthSwt_00455]	
[SWS_EthSwt_00465]	
[SWS_EthSwt_00467]	
[SWS_EthSwt_00469]	
[SWS_EthSwt_00471]	
[SWS_EthSwt_00472]	
[SWS_EthSwt_00475]	
[SWS_EthSwt_00476]	





Number	Heading
[SWS_EthSwt_00478]	
[SWS_EthSwt_00493]	

Table A.4: Changed Specification Items in R23-11

A.2.3 Deleted Specification Items in R23-11

Number	Heading
[SWS_EthSwt_00136]	
[SWS_EthSwt_00162]	
[SWS_EthSwt_00181]	
[SWS_EthSwt_00466]	
[SWS_EthSwt_00490]	

Table A.5: Deleted Specification Items in R23-11

A.2.4 Added Constraints in R23-11

Number	Heading
[SWS_- EthSwt_- CONSTR_- 00602]	
[SWS_- EthSwt_- CONSTR_- 00603]	

Table A.6: Added Constraints in R23-11

A.2.5 Changed Constraints in R23-11

Number	Heading
[SWS_- EthSwt_- CONSTR_- 00453]	





Number	Heading
[SWS_ - EthSwt_ - CONSTR_ - 00454]	
[SWS_ - EthSwt_ - CONSTR_ - 00464]	
[SWS_ - EthSwt_ - CONSTR_ - 00468]	

Table A.7: Changed Constraints in R23-11

A.2.6 Deleted Constraints in R23-11

Number	Heading
[SWS_ - EthSwt_ - CONSTR_ - 00450]	
[SWS_ - EthSwt_ - CONSTR_ - 00451]	
[SWS_ - EthSwt_ - CONSTR_ - 00456]	
[SWS_ - EthSwt_ - CONSTR_ - 00458]	
[SWS_ - EthSwt_ - CONSTR_ - 00459]	
[SWS_ - EthSwt_ - CONSTR_ - 00473]	





Number	Heading
[SWS_EthSwt_CONSTR_00474]	
[SWS_EthSwt_CONSTR_00488]	
[SWS_EthSwt_CONSTR_00496]	

Table A.8: Deleted Constraints in R23-11

A.3 Traceable item history of this document according to AUTOSAR Release R24-11

A.3.1 Added Specification Items in R24-11

Number	Heading
[ECUC_EthSwt_00232]	Definition of EcucParamConfContainerDef EthSwtStreamFilter IEEE1722StreamId
[ECUC_EthSwt_00233]	Definition of EcucStringParamDef EthSwtStreamFilterStreamMacId
[ECUC_EthSwt_00234]	Definition of EcucIntegerParamDef EthSwtStreamFilterStreamUniqueld
[ECUC_EthSwt_00235]	Definition of EcucBooleanParamDef EthSwtGetPortMacAddrVlanApi
[ECUC_EthSwt_00236]	Definition of EcucEnumerationParamDef EthSwtMacAddressLearningMode
[ECUC_EthSwt_00237]	Definition of EcucReferenceDef EthSwtVlanMembershipRef
[ECUC_EthSwt_00238]	Definition of EcucIntegerParamDef EthSwtPortInterPacketGap
[ECUC_EthSwt_00239]	Definition of EcucParamConfContainerDef EthSwtUnknownMacDest AddressConfig
[ECUC_EthSwt_00240]	Definition of EcucReferenceDef EthSwtDestPortsForUnknownUnicastMac DestAddressRef
[ECUC_EthSwt_00241]	Definition of EcucReferenceDef EthSwtDestPortsForUnknownMulticastMac DestAddressRef





Number	Heading
[ECUC_EthSwt_00242]	Definition of EcucReferenceDef EthSwtDestVlanForUnknownMacDestAddressRef
[ECUC_EthSwt_00243]	Definition of EcucBooleanParamDef EthSwtReadMmdApi
[ECUC_EthSwt_00244]	Definition of EcucBooleanParamDef EthSwtWriteMmdApi
[ECUC_EthSwt_00245]	Definition of EcucIntegerParamDef EthSwtUsedInternalPriorityUpperValue
[ECUC_EthSwt_00246]	Definition of EcucIntegerParamDef EthSwtUsedTrafficClassUpperValue
[ECUC_EthSwt_00247]	Definition of EcucIntegerParamDef EthSwtPortDefaultTrafficClass
[ECUC_EthSwt_00248]	Definition of EcucParamConfContainerDef EthSwtPortPriorityToTrafficClassAssignment
[ECUC_EthSwt_00249]	Definition of EcucIntegerParamDef EthSwtPortPriorityToTrafficClassAssignmentPriority
[ECUC_EthSwt_00250]	Definition of EcucIntegerParamDef EthSwtPortPriorityToTrafficClassAssignmentTrafficClass
[ECUC_EthSwt_00251]	Definition of EcucParamConfContainerDef EthSwtPortEgressQueueTransmissionSelectionETSConfig
[ECUC_EthSwt_00252]	Definition of EcucIntegerParamDef EthSwtETSConfigAvailableBandwidthInPercent
[ECUC_EthSwt_00253]	Definition of EcucIntegerParamDef EthSwtETSConfigAvailableBandwidthInWeightValue
[ECUC_EthSwt_00254]	Definition of EcucBooleanParamDef EthSwtFramePreemptionEnable
[ECUC_EthSwt_00255]	Definition of EcucEnumerationParamDef EthSwtTrafficClassToPreemptionStatusAssignment
[ECUC_EthSwt_00256]	Definition of EcucParamConfContainerDef EthSwtPortIngressVlanTranslationTable
[ECUC_EthSwt_00257]	Definition of EcucParamConfContainerDef EthSwtPortIngressVlanTranslationTableEntry
[ECUC_EthSwt_00258]	Definition of EcucIntegerParamDef EthSwtIngressVlanId
[ECUC_EthSwt_00259]	Definition of EcucIntegerParamDef EthSwtTranslatedVlanId
[SWS_EthSwt_00444]	SVL MAC address learning mode
[SWS_EthSwt_00445]	IVL MAC address learning mode
[SWS_EthSwt_00448]	Behaviour if EthSwtMacAddressLearningMode is set to IVL
[SWS_EthSwt_00449]	Behaviour if given MAC-address is available at exactly one Ethernet port
[SWS_EthSwt_00511]	Behaviour if given MAC-address is available at multiple Ethernet ports
[SWS_EthSwt_00512]	Behaviour if EthSwtMacAddressLearningMode is set to SVL





Number	Heading
[SWS_EthSwT_00513]	Behaviour if <code>EthSwTMacAddressLearningMode</code> is set to <code>IVL</code> and VLAN-ID is set to value in a range from 1 to 4095
[SWS_EthSwT_00514]	Behaviour if <code>EthSwTMacAddressLearningMode</code> is set to <code>IVL</code> and VLAN-ID is set to 0
[SWS_EthSwT_00515]	Behaviour if <code>EthSwTMacAddressLearningMode</code> is set to <code>IVL</code> and VLAN-ID is set to a value greater than 4095
[SWS_EthSwT_00516]	Creation of Ethernet switch port bit map
[SWS_EthSwT_00517]	Behaviour for creation of Ethernet switch port bit map
[SWS_EthSwT_00518]	Behaviour if Ethernet switch port bit map exceeds uint32 data type
[SWS_EthSwT_00519]	compile configuration for API
[SWS_EthSwT_00520]	Broadcast destination
[SWS_EthSwT_00521]	Unicast destination
[SWS_EthSwT_00522]	Multicast destination
[SWS_EthSwT_00523]	Processing or dropping
[SWS_EthSwT_00524]	Triggering stream statistics readout
[SWS_EthSwT_00525]	Concatenating stream statistics for buckets
[SWS_EthSwT_00526]	Indicating the availability of stream statistics
[SWS_EthSwT_00531]	IPV as priority
[SWS_EthSwT_00535]	Determine traffic class for an Ethernet frame
[SWS_EthSwT_00537]	Enqueue Ethernet frames to the matching egress port queue
[SWS_EthSwT_00539]	Scheduling with strict priority
[SWS_EthSwT_00540]	Scheduling with enhanced traffic shaping
[SWS_EthSwT_00541]	Dequeueing Ethernet frames with strict priority scheduling
[SWS_EthSwT_00542]	Emission opportunity suspension with strict priority scheduling
[SWS_EthSwT_00543]	Emission opportunity suspension with enhanced traffic shaping
[SWS_EthSwT_00547]	Determination of egress port queue emission with available bandwidth configured in weights as amount of Ethernet frames
[SWS_EthSwT_00548]	Amount of Ethernet frames within one emission portion if available bandwidth is configured in weights as amount of Ethernet frames
[SWS_EthSwT_00549]	Tolerance of egress port queue emission within the defined measurement interval if available bandwidth is configured in percent is used
[SWS_EthSwT_00550]	Definition of bit time
[SWS_EthSwT_00551]	Determination of egress port queue emission with available bandwidth configured in percent
[SWS_EthSwT_00553]	Utilization of all neighboring egress port queues with a resumed emission opportunity
[SWS_EthSwT_00554]	Use regenerated priority value as VLAN-priority
[SWS_EthSwT_00555]	Translating VLAN IDs
[SWS_EthSwT_00556]	Wildcard for VLAN ID translation
[SWS_EthSwT_00557]	Only one wildcard entry allowed





Number	Heading
[SWS_EthSwT_00558]	Wildcard match operation
[SWS_EthSwT_00560]	EthSwT_ReadMmd functionality
[SWS_EthSwT_00561]	Configuring EthSwT_ReadMmd availability
[SWS_EthSwT_00562]	EthSwT_WriteMmd functionality
[SWS_EthSwT_00563]	Configuring EthSwT_WriteMmd availability
[SWS_EthSwT_91051]	Definition of API function EthSwT_GetPortMacAddrVlan
[SWS_EthSwT_91052]	Definition of API function EthSwT_ReadMmd
[SWS_EthSwT_91053]	Definition of API function EthSwT_WriteMmd

Table A.9: Added Specification Items in R24-11

A.3.2 Changed Specification Items in R24-11

Number	Heading
[ECUC_EthSwT_00001]	Definition of EcucParamConfContainerDef EthSwTConfig
[ECUC_EthSwT_00003]	Definition of EcucParamConfContainerDef EthSwTGeneral
[ECUC_EthSwT_00005]	Definition of EcucParamConfContainerDef EthSwTPort
[ECUC_EthSwT_00007]	Definition of EcucParamConfContainerDef EthSwTPortEgress
[ECUC_EthSwT_00014]	Definition of EcucParamConfContainerDef EthSwTPortIngress
[ECUC_EthSwT_00018]	Definition of EcucEnumerationParamDef EthSwTPortSchedulerAlgorithm
[ECUC_EthSwT_00054]	Definition of EcucEnumerationParamDef EthSwTPortPhysicalLayerType
[ECUC_EthSwT_00114]	Definition of EcucEnumerationParamDef EthSwTPortMacLayerSpeed
[ECUC_EthSwT_00141]	Definition of EcucParamConfContainerDef EthSwTStreamFilterRule
[ECUC_EthSwT_00182]	Definition of EcucParamConfContainerDef EthSwTPortQueue
[ECUC_EthSwT_00185]	Definition of EcucIntegerParamDef EthSwTPortQueueTrafficClass Assignment
[ECUC_EthSwT_00186]	Definition of EcucParamConfContainerDef EthSwTPortEgressQueue TransmissionSelection
[ECUC_EthSwT_00205]	Definition of EcucParamConfContainerDef EthSwTMacForwardingTable





Number	Heading
[SWS_EthSwt_00098]	Definition of optional interfaces requested by module EthSwt
[SWS_EthSwt_00502]	
[SWS_EthSwt_00602]	
[SWS_EthSwt_00604]	
[SWS_EthSwt_91134]	Definition of API function EthSwt_MacSecGetMacSecStatistics
[SWS_EthSwt_91135]	Definition of callback function EthSwt_MacSecUpdateSecYNotification
[SWS_EthSwt_91136]	Definition of callback function EthSwt_MacSecAddTxSaNotification
[SWS_EthSwt_91137]	Definition of callback function EthSwt_MacSecAddRxSaNotification
[SWS_EthSwt_91138]	Definition of callback function EthSwt_MacSecGetMacSecStatistics Notification

Table A.10: Changed Specification Items in R24-11

A.3.3 Deleted Specification Items in R24-11

Number	Heading
[ECUC_EthSwt_-00015]	Definition of EcucIntegerParamDef EthSwtPortIngressVlanModification
[ECUC_EthSwt_-00023]	Definition of EcucIntegerParamDef EthSwtPortTrafficClassAssignment
[ECUC_EthSwt_-00027]	Definition of EcucParamConfContainerDef EthSwtPortPriorityTrafficClassAssignment
[ECUC_EthSwt_-00028]	Definition of EcucIntegerParamDef EthSwtPortPriorityTrafficClassAssignmentRegeneratedPriority
[ECUC_EthSwt_-00029]	Definition of EcucIntegerParamDef EthSwtPortPriorityTrafficClassAssignmentTrafficClass
[ECUC_EthSwt_-00138]	Definition of EcucParamConfContainerDef EthSwtPortOutboundVlanPriorityAssignment
[ECUC_EthSwt_-00181]	Definition of EcucStringParamDef EthSwtStreamFilterIEEE1722StreamId
[ECUC_EthSwt_-00192]	Definition of EcucIntegerParamDef EthSwtPortOutboundVlanPriorityAssignmentRegeneratedPriority
[ECUC_EthSwt_-00193]	Definition of EcucIntegerParamDef EthSwtPortOutboundVlanPriorityAssignmentOutboundVlanPriority
[SWS_EthSwt_00179]	
[SWS_EthSwt_00245]	
[SWS_EthSwt_00451]	
[SWS_EthSwt_00455]	
[SWS_EthSwt_00456]	
[SWS_EthSwt_00459]	





Number	Heading
[SWS_EthSwt_00460]	
[SWS_EthSwt_00501]	

Table A.11: Deleted Specification Items in R24-11

A.3.4 Added Constraints in R24-11

Number	Heading
[SWS_EthSwt_CONSTR_00446]	SVL predefined MAC address configuration
[SWS_EthSwt_CONSTR_00447]	IVL predefined MAC address configuration
[SWS_EthSwt_CONSTR_00527]	Ethernet switch hardware support for frame preemption
[SWS_EthSwt_CONSTR_00528]	Frame preemption enabling per <code>EthSwtPort</code>
[SWS_EthSwt_CONSTR_00529]	Frame preemption status classification of preemptable Ethernet frames on egress per traffic class
[SWS_EthSwt_CONSTR_00530]	Frame preemption status classification of express Ethernet frames on egress per traffic class
[SWS_EthSwt_CONSTR_00532]	Value of priority to traffic class assignment should respect configured limitations
[SWS_EthSwt_CONSTR_00533]	Value of traffic class assignment should respect configured limitations





Number	Heading
[SWS_- EthSwT_- CONSTR_- 00534]	Availability of a default traffic class per <code>EthSwTPortEgress</code>
[SWS_- EthSwT_- CONSTR_- 00536]	Traffic class to egress port queue assignment
[SWS_- EthSwT_- CONSTR_- 00538]	Definition of neighboring egress port queues
[SWS_- EthSwT_- CONSTR_- 00544]	Egress configuration constraint for scheduling with enhanced traffic shaping
[SWS_- EthSwT_- CONSTR_- 00545]	Enhanced traffic shaping require at least two egress port queues
[SWS_- EthSwT_- CONSTR_- 00546]	Neighboring egress port queues need the same variant of availability bandwidth configuration
[SWS_- EthSwT_- CONSTR_- 00552]	Constraint for configuration of available bandwidth in percent

Table A.12: Added Constraints in R24-11

A.3.5 Changed Constraints in R24-11

none

A.3.6 Deleted Constraints in R24-11

Number	Heading
[SWS_- EthSwT_- CONSTR_- 00413]	



△

Number	Heading
[SWS_- EthSwT_- CONSTR_- 00457]	
[SWS_- EthSwT_- CONSTR_- 00495]	

Table A.13: Deleted Constraints in R24-11