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2022-11-24	R22-11	AUTOSAR Release Management	• Initial release

Disclaimer

Contents

Known Limitations

None.

1 Introduction and functional overview

This specification specifies the functionality, API and the configuration of the **Data Distribution Service AUTOSAR Basic Software module (Dds BSW)** .

1.1 DDS protocol overview

The **Data Distribution Service (DDS)** is a middleware protocol and API standard from the Object Management Group (OMG).

A preliminary overview of DDS can be found into chapter 4 of AUTOSAR_RS_DDS or referring directly the OMG standard [1].

2 Acronyms and Abbreviations

2.1 Acronyms

For acronyms and abbreviations refer to [2, AUTOSAR glossary].

2.2 Abbreviations

None.

2.3 Glossary

- **DDS/non-DDS PDU:** PDU containing/NOT containing DDS data (e.g., PDU listed/not listed into `DdsAppDataTxPduCollection` or `DdsAppDataRxPduCollection` or `DdsDomainParticipantUnicastRtpsPduCollection` or `DdsDomainParticipantMulticastRtpsPduCollection` containers).

3 Related documentation

3.1 Input documents & related standards and norms

[1] Data Distribution Service (DDS), Version 1.4
http://www.omg.org/spec/DDS/1.4

[2] Glossary
AUTOSAR_FO_TR_Glossary

[3] General Specification of Basic Software Modules
AUTOSAR_CP_SWS_BSWGeneral

[4] Specification of RTE Software
AUTOSAR_CP_SWS_RTE

[5] Specification of PDU Router
AUTOSAR_CP_SWS_PDURouter

[6] DDS Interoperability Wire Protocol, Version 2.2
http://www.omg.org/spec/DDSI-RTPS/2.2

[7] Specification of Default Error Tracer
AUTOSAR_CP_SWS_DefaultErrorTracer

[8] Specification of Crypto Service Manager
AUTOSAR_CP_SWS_CryptoServiceManager

[9] Specification of CRC Routines
AUTOSAR_CP_SWS_CRCLibrary

[10] Requirements on Data Distribution Service
AUTOSAR_FO_RS_DataDistributionService

[11] DDS Security, Version 1.1
https://www.omg.org/spec/DDS-SECURITY/1.1

[12] ISO 26262:2018 (all parts) – Road vehicles – Functional Safety
https://www.iso.org

[13] Extensible and Dynamic Topic Types for DDS, Version 1.2
https://www.omg.org/spec/DDS-XTypes/1.2

[14] Specification of Platform Types for Classic Platform
AUTOSAR_CP_SWS_PlatformTypes

3.2 Related specification

AUTOSAR provides a General Specification on Basic Software modules [3], which is also valid for the Dds BSW.

Thus, the specification SWS BSW General shall be considered as additional and required specification for Dds.

4 Constraints and assumptions

4.1 Constraints and assumptions

4.1.1 Assumptions

- **DDS/non-DDS PDU concatenation.** Concatenating DDS PDUs and non-DDS PDUs by IpduM is out of the scope of this concept.

4.1.2 Limitations

- **DDS Dynamic Discovery [1]:** Not supported.
- **AP/CP Interoperability by means of RPC communication:** Not supported.
- **DDS/CAN Data gateway:** Not supported
- **Shared-memory communication:** Not supported.
- **Immediate transmission:** Not supported.
- **Immediate reception:** Not supported.
- **PDU Metadata:** Currently not used.
- **Dds_Transmit and Dds_TriggerTransmit:** Both APIs are always available, but only one of them must be used (e.g., Dds_TriggerTransmit is used instead of Dds_Transmit only if to be called by lower layer).
- **Software Cluster Connection Layer (SwCluC):** Not supported.
- **Multicore Distribution:** Dds module is assumed to be located and running in a single partition (no multiple sets of Tx/Rx main functions per partition).
- **Communication use cases:** Below a table summarizes the supported Communication paths.

Short name:	Y/N
Signal-based with Sender/Receiver interface	Yes
Signal-based with Client/Server interface	No
Service-oriented	Yes
Diagnostic	No
DLT	No
XCP	No
Mirror	No

Table 4.1: DDS supported Communication paths

4.1.3 Constraints

- **DDS-related Transformation:** Since Dds needs to access to data and data type directly, no transformation is performed at RTE level (see [CP_SWS_Dds_CONSTR_00725]). Also no BSW module "DDS Transformer" (transformer dedicated for DDS communication stack) exists.
- **DDS-SOME/IP network interaction:** Dds and SOME/IP share the same bus type, so some mechanism to assure they don't interfere would be provided. This mechanism will mostly consist on UDP port choice: SOME/IP and DDS shall never share reception port numbers.
- **DDS-SOME/IP SoAd resource sharing:** Shall not be mix of DDS and SOME/IP (or any other potential protocol) communication on the same socket connection. A socket (or a set of sockets) is reserved for DDS only.
- **DDS/non-DDS PDU concatenation:** DDS and SOME/IP shall not share the same socket connection. A socket (or a set of sockets) shall be reserved to DDS only.
- **UDP Usage:** According to the OMG specification [1], the UDP/IP PSM shall be used for inter-ecu communications.

4.2 Applicability to car domains

This module is applicable all domains where DDS communication is required and/or beneficial.

5 Dependencies to other modules

This section describes the relations to other modules and files within the AUTOSAR basic software architecture. It contains brief descriptions of configuration information and services, which are required by the Dds module from other modules.

5.1 RTE (BSW Scheduler)

The RTE BSW Scheduler [4] calls the main functions of the Dds BSW, which are necessary for the cyclic processes of the Dds.

5.2 PDU Router

The Dds module uses the PDU Router [5] as middle layer module.

5.3 StbM

OMG Standard states that each RTPS message sent by the originating Participant can include a timestamp. ([6] 8.3.2.2). It may be used by the receiving application to estimate the time offset between the clocks of the sending and receiving Participants (for instance in DESTINATION_ORDER QoS policy handling). The StbM_GetCurrentTime() API shall be used to guarantee the needed precision ([6] 8.3.5.8, 9.4.2.9).

5.4 Default Error Tracer

In order to be able to report development or runtime errors, the Dds module has to have access to the error hook of the Default Error Tracer [7].

5.5 Crypto Service Manager

In order to support Security capabilities (e.g., Key management, Message Authentication Code generation and verification), the Dds shall use the Crypto Service Module API [8]: The Dds requires:

- the MAC-generate interface *(Csm_MacGenerate)* to generate MAC to be added to messages to be sent;

- the MAC-verify interface *(Csm_MacVerify)* to check MAC of received messages.

5.6 Cyclic Redundancy Check

In order to support Safety capabilities, Dds uses the CRC Library [9].

The Dds requires the *Crc_CalculateCRC32* or the *Crc_CalculateCRC64* APIs to calculate CRC to be added to messages to be sent or to be checked for received messages.

6 Requirements Tracing

The following tables reference the requirements specified in [10, RS-DDS] 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_Dds_00001]	DDS Compliance	[CP_SWS_Dds_00734] [CP_SWS_Dds_00736] [CP_SWS_Dds_00859] [CP_SWS_Dds_CONSTR_00725]
[FO_RS_Dds_00002]	DDS standard serialization rules	[CP_SWS_Dds_00726]
[FO_RS_Dds_00004]	DDS payload serialization rules	[CP_SWS_Dds_00728] [CP_SWS_Dds_00729] [CP_SWS_Dds_00730] [CP_SWS_Dds_00731] [CP_SWS_Dds_00734] [CP_SWS_Dds_00735] [CP_SWS_Dds_00736] [CP_SWS_Dds_CONSTR_00725] [CP_SWS_Dds_CONSTR_00732] [CP_SWS_Dds_CONSTR_00733]
[FO_RS_Dds_00005]	DDS Quality of Service	[CP_SWS_Dds_00763] [CP_SWS_Dds_00764] [CP_SWS_Dds_00773] [CP_SWS_Dds_00832] [CP_SWS_Dds_00833] [CP_SWS_Dds_01001]
[FO_RS_Dds_00006]	The DDS AUTOSAR components receive unserialized data	[CP_SWS_Dds_CONSTR_00725]
[FO_RS_Dds_00007]	Type Definition	[CP_SWS_Dds_00728] [CP_SWS_Dds_00729] [CP_SWS_Dds_00730] [CP_SWS_Dds_00731] [CP_SWS_Dds_00735] [CP_SWS_Dds_00801] [CP_SWS_Dds_00802] [CP_SWS_Dds_CONSTR_00732] [CP_SWS_Dds_CONSTR_00733]
[FO_RS_Dds_00008]	Customization	[CP_SWS_Dds_CONSTR_00712]
[FO_RS_Dds_00009]	Security mechanism	[CP_SWS_Dds_00750] [CP_SWS_Dds_00752] [CP_SWS_Dds_00753] [CP_SWS_Dds_00756] [CP_SWS_Dds_00758] [CP_SWS_Dds_00773] [CP_SWS_Dds_00832] [CP_SWS_Dds_00833] [CP_SWS_Dds_CONSTR_00743] [CP_SWS_Dds_CONSTR_00754]
[FO_RS_Dds_00010]	Safety mechanism	[CP_SWS_Dds_00761] [CP_SWS_Dds_00762] [CP_SWS_Dds_00763] [CP_SWS_Dds_00764] [CP_SWS_Dds_00766] [CP_SWS_Dds_00769] [CP_SWS_Dds_00773] [CP_SWS_Dds_00832] [CP_SWS_Dds_00833]
[FO_RS_Dds_00015]	Publish	[CP_SWS_Dds_00772] [CP_SWS_Dds_00773] [CP_SWS_Dds_00828] [CP_SWS_Dds_00829] [CP_SWS_Dds_00830] [CP_SWS_Dds_00832] [CP_SWS_Dds_00835] [CP_SWS_Dds_00837] [CP_SWS_Dds_00838] [CP_SWS_Dds_00843] [CP_SWS_Dds_00851] [CP_SWS_Dds_00852] [CP_SWS_Dds_00854] [CP_SWS_Dds_00855] [CP_SWS_Dds_00859] [CP_SWS_Dds_00871] [CP_SWS_Dds_00872] [CP_SWS_Dds_00873] [CP_SWS_Dds_00881] [CP_SWS_Dds_00882] [CP_SWS_Dds_00883] [CP_SWS_Dds_CONSTR_00865] [CP_SWS_Dds_CONSTR_00866] [CP_SWS_Dds_CONSTR_00884]

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Requirement	Description	Satisfied by
[FO_RS_Dds_00016]	Subscribe	[CP_SWS_Dds_00772] [CP_SWS_Dds_00773] [CP_SWS_Dds_00825] [CP_SWS_Dds_00826] [CP_SWS_Dds_00827] [CP_SWS_Dds_00832] [CP_SWS_Dds_00834] [CP_SWS_Dds_00836] [CP_SWS_Dds_00841] [CP_SWS_Dds_00861] [CP_SWS_Dds_00862] [CP_SWS_Dds_00863] [CP_SWS_Dds_00864] [CP_SWS_Dds_00873] [CP_SWS_Dds_CONSTR_00867] [CP_SWS_Dds_CONSTR_00868]
[FO_RS_Dds_00017]	Transport protocol	[CP_SWS_Dds_00726]
[FO_RS_Dds_00019]	RTPS message encapsulation	[CP_SWS_Dds_00726] [CP_SWS_Dds_00734] [CP_SWS_Dds_00736]
[FO_RS_Dds_00020]	RTPS message decapsulation	[CP_SWS_Dds_00726] [CP_SWS_Dds_00734] [CP_SWS_Dds_00736]
[SRS_BSW_00003]	All software modules shall provide version and identification information	[CP_SWS_Dds_00820] [CP_SWS_Dds_00821] [CP_SWS_Dds_00831]
[SRS_BSW_00101]	The Basic Software Module shall be able to initialize variables and hardware in a separate initialization function	[CP_SWS_Dds_00810] [CP_SWS_Dds_00811] [CP_SWS_Dds_00812] [CP_SWS_Dds_00813]
[SRS_BSW_00318]	Each AUTOSAR Basic Software Module file shall provide version numbers in the header file	[CP_SWS_Dds_00820] [CP_SWS_Dds_00831]
[SRS_BSW_00373]	The main processing function of each AUTOSAR Basic Software Module shall be named according the defined convention	[CP_SWS_Dds_00823] [CP_SWS_Dds_00824]
[SRS_BSW_00374]	All Basic Software Modules shall provide a readable module vendor identification	[CP_SWS_Dds_00820] [CP_SWS_Dds_00831]
[SRS_BSW_00379]	All software modules shall provide a module identifier in the header file and in the module XML description file.	[CP_SWS_Dds_00820] [CP_SWS_Dds_00831]
[SRS_BSW_00402]	Each module shall provide version information	[CP_SWS_Dds_00820] [CP_SWS_Dds_00831]
[SRS_BSW_00405]	BSW Modules shall support multiple configuration sets	[CP_SWS_Dds_00802] [CP_SWS_Dds_00810]
[SRS_BSW_00407]	Each BSW module shall provide a function to read out the version information of a dedicated module implementation	[CP_SWS_Dds_00820] [CP_SWS_Dds_00831]
[SRS_BSW_00411]	All AUTOSAR Basic Software Modules shall apply a naming rule for enabling/disabling the existence of the API	[CP_SWS_Dds_00820] [CP_SWS_Dds_00831]
[SRS_BSW_00414]	Init functions shall have a pointer to a configuration structure as single parameter	[CP_SWS_Dds_00810]
[SRS_BSW_00424]	BSW module main processing functions shall not be allowed to enter a wait state	[CP_SWS_Dds_00823] [CP_SWS_Dds_00824]
[SRS_BSW_00433]	Main processing functions are only allowed to be called from task bodies provided by the BSW Scheduler	[CP_SWS_Dds_00823] [CP_SWS_Dds_00824]

Table 6.1: RequirementsTracing

7 Functional specification

7.1 Overview

The Dds module implements all the interface logic (Entity management, QoS, etc.) and the DDSI-RTPS standard layer [6] for DDS communication. It is a full-fledged middleware composed by several functional aspects:

- Serialization
- Deserialization
- Data filtering
- Data reordering
- Data persistency
- Data re-transmission
- Security
- E2E protection

From the transmission path point of view, Dds interacts with the PDU Router only offering a PDU-based interface for the incoming (e.g., **Upper layer PDUs**) and outgoing (e.g., **Lower layer PDUs**) PDUs.

Basically, at sender side, DDS Data is created in the application layer and passed to RTE directly (as unserialized data), and then forwarded to LdCom, PduR and then Dds as a PDU without any modification nor transformation (and vice versa at receiver side). RTE, LdCom and PduR (as upper-layer) act simply as pass-through modules. Serialization is performed inside the Dds BSW and it is completely opaque to the AUTOSAR stack. The Dds BSW shall know the exact data type of the copied data.

Note: no transformation nor serialization would be performed at RTE, even for composite data type: the data would be copied to the ISignal (in the LdCom buffer) from where the PduR routes the information to the DDS module, where the data arrives completely unmodified.

The Dds module is able to process the data through its **type** mapped to the PDU (see 10.2). The lower layer PDU contains the DDSI-RTPS protocol packet ready to be delivered to the transport layer.

The **transport layer** provides a set connections suitable to enable the Dds communication. For instance, let's consider a simple publishing SW-C using some Publishers/DataWriters under some DomainParticipants. If dynamic discovery is not supported on local DomainParticipant, for each DataWriter it is necessary to statically configure proper RemoteDataReader reachability information. Similar thing shall happen at the receiving side: the local DataReader shall known the information about reachability of the related Data Writer. This information shall be used to proper configure underlying

transport protocol. For details about remote configuration, refer to DdsRemoteDomainParticipant.

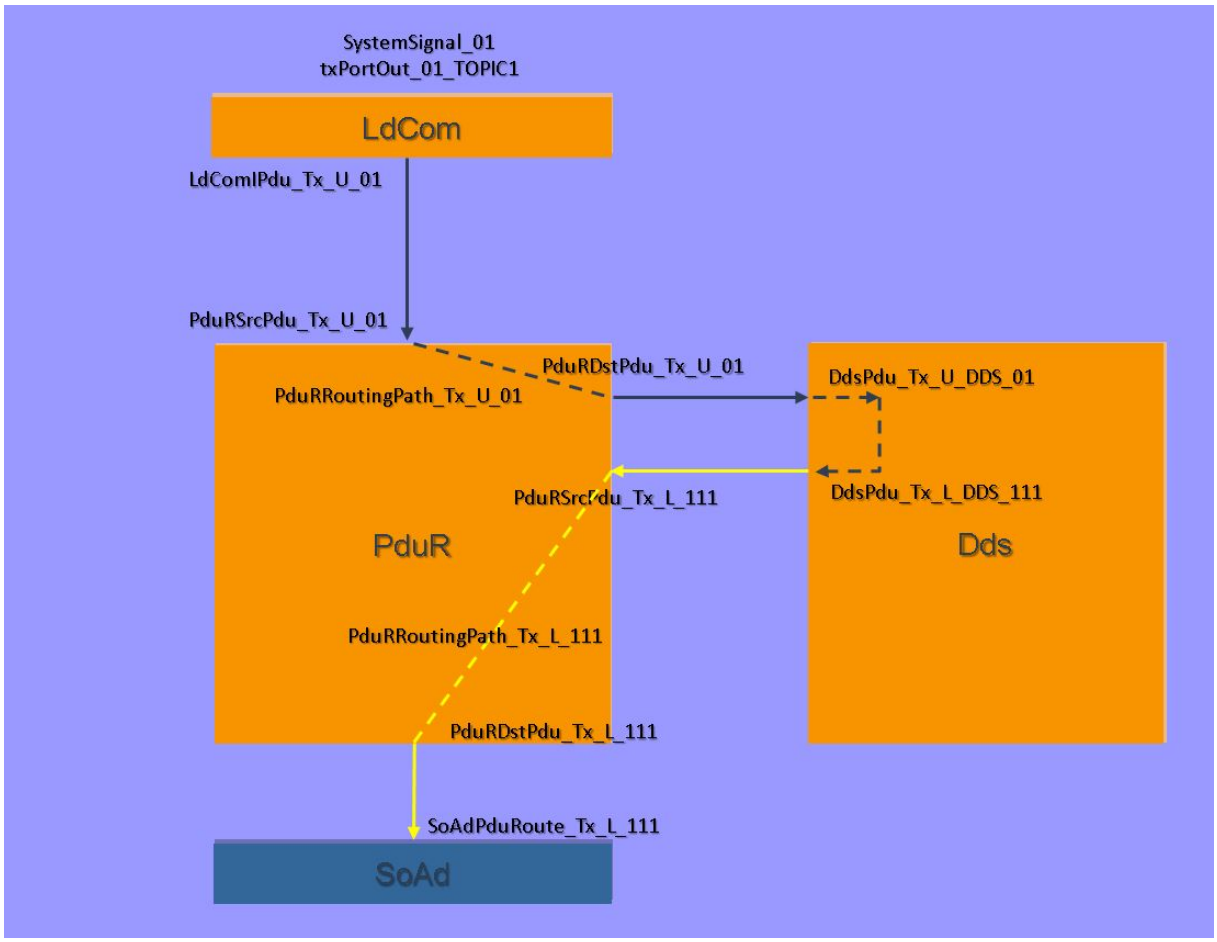

Figure 7.1: Dds full transmission path

7.1.1 QoS Management

The Dds BSW could support a subset (even empty) of QoS policies. There is no mandatory QoS to be implemented. It is vendor-specific which QoS policy is actually supported.

END_CONC_707_AR114488

Each entity could define its own set of supported QoS policy, by static configuration.

7.1.1.1 TRANSPORT_PRIORITY QoS mapping

The DDS standard defines the TRANSPORT_PRIORITY QoS for a certain DataWriter. Its purpose is to allow the application to take advantage of transports capable of sending messages with different priorities (any value within the range of a 32-bit signed

integer may be chosen; higher values indicate higher priority). In AUTOSAR CP the information closest to the concept of transport priority is the value of **SoAdSocketFramePriority** defined in **SoAdSocketConnectionGroup** parent object of the **SoAd** module. This specifies the priority of the Ethernet frame handled for all the **SoAdSocketConnections** owned by the related **SoAdConnectionGroup**.

Unfortunately there is no direct link between the application level of the Dds module (e.g., the upper layer PDU and the DdsDataWriter) and its transport level (e.g., the lower layer PDU).

In other words: the Dds module selects at runtime the lower layer PDU based on the configuration of the according `DdsDataWriter`. If any, the Dds module should select a `DdsRtpsDataTxPdu` that belongs to a **SoAdSocketConnectionGroup** configured with the needed **SoAdSocketFramePriority**.

Note: the TRANSPORT_PRIORITY QoS is considered just an hint for the underlying transport protocol. The policy depends on the ability of the underlying transports to set a priority on the messages they send.

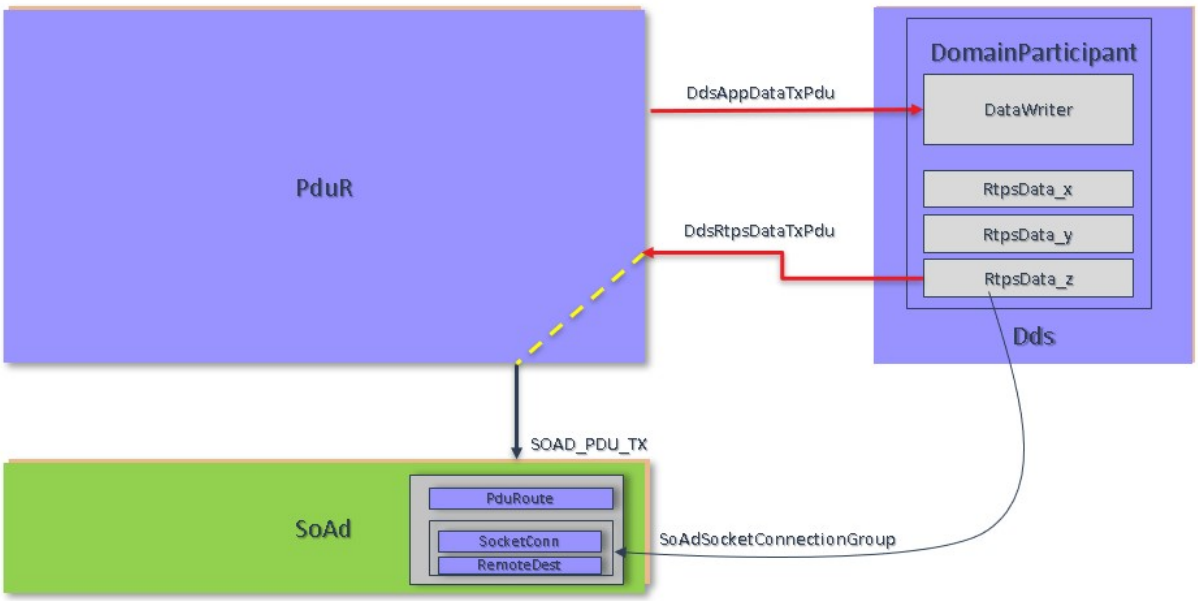

Figure 7.2: DataWriter Transport priority QoS value

7.1.2 Security Mechanisms

Opening up a communication path between AP and CP, and even between CP and non-AUTOSAR platforms, could involve security risks, so it may require the usage of some security mechanisms.

The Dds BSW Module guarantees some security mechanism by the usage of DDS Security Specification [11]. The usage of this specification is necessary to guarantee the interoperability with other DDS systems, both with AP (where DDS- Security is already

in use) and in non-AUTOSAR systems. Implementing this specification, however, could be really resource consuming. In particular, to be used on a slow microcontroller, these features would need hardware acceleration. To overcome this issue, a subset of DDS-security functionalities which guarantee a minimum security level has been selected.

At this stage, implementing DDS-Security aims to guarantee message authentication, data integrity and group authentication. Security mechanism can be enabled or disabled at configuration time. If enabled, all security parameters must be statically configured at pre-compile time. For details on security parameters configuration, please refer to subparagraph 10.2.3.3.1.4.

If configured, a Message Authentication Code (MAC) of the entire RTPS message is added. The AUTOSAR CSM is used for key management and MAC calculation. Which algorithm to be used is configurable (choosing from supported ones).

The keys used for hash algorithms are symmetric keys shared between entities associated to a DomainParticipant, so authentication is done at DomainParticipant level (not of single Publisher/Subscriber, not of single DataWriter/DataReader). The symmetric key to be used for a specific DomainParticipant shall be managed directly by CSM, which should provide a handle to DDS to use its services.

For the above mentioned purposes, the DDS **Cryptographic Plugin** is used, which offers an interface to protect the whole RTPS message. The resulting RTPS message, after security is applied, is shown in the picture Figure 7.3 below.

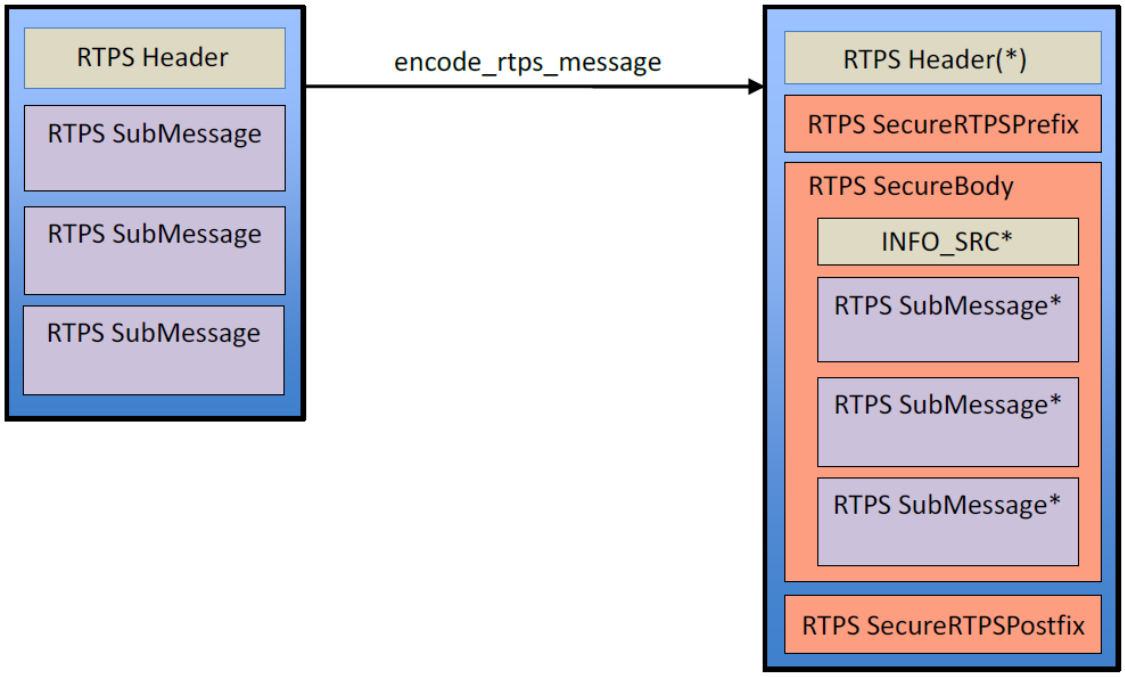

Figure 7.3: Dds RTPS message encoding

7.1.3 Safety Mechanisms

According to ISO 26262, there is a set of faults that can be considered on communication link between senders and receivers executed in different software partitions or ECUs.

The concept of end-to-end protection assumes that safety-related data exchange shall be protected at runtime against the effects of faults within the communication link.

The DDS Specification has intrinsic safety mechanisms (Counters, CRCs, QoS policies) that can be used to support a safety argument.

The following is a list of possible faults, as defined in [12], to be addressed in the pursuit of functional safety, and the mechanisms DDS offers to support them:

- **Repetition, loss, insertion, incorrect sequence, information from a sender received by only a subset of receivers, and blocking access to a communication channel:** submessage 64-bit sequence number, as defined in [6] section 8 3.5.4 "SequenceNumber", and additional SequenceNumber-typed fields in section 8.3.7 "RTPS Submessages". Those mechanisms can be useful only to detect losses at receiver side; if detection is required also to sender side, the RELIABILITY DDS QoS (defined in [1], section 2.2.3.14 "RELIABILITY") shall be used in conjuction.
- **Delay of information and blocking access to a communication channel:** LATENCY_BUDGET, DEADLINE and LIFESPAN Quality of Service policies, as defined respectively in [1], 2.2.3.8 "LATENCY_BUDGET", 2.2.3.7 "DEADLINE" and 2.2.3.16 "LIFESPAN" sections.
- **Masquerade or incorrect addressing of information:** DDS Security authentication plugin, as defined in [11] section 8.3 "Authentication Plugin". In this concept, only Autentication at DomainParticipant level could be achieved, since all entities belonging to the same DomainParticipant level share the same symmetric key. This prevent entities external to DomainParticipant to have access to the DomainParticipant communication, but it does prevent to distinguish 2 different entities that are authorized to communicate inside the DomainParticipant.
- **Corruption of information, asymmetric information sent from a sender to multiple receivers (effective only for resulting invalid CRC):** rtpsMessageChecksum under HeaderExtension submessage ([RTPS 2.5 or higher]). In absence of this feature, [11] also provides message integrity verification built into its message authentication protocol. For CRC calculation, the AUTOSAR CRC library is used.
- **Notification of these fault conditions errors:** In case of any communication errors or faults (even timeout errors), the Dds BSW should notify the Det module. Specific safety-related error codes are detailed into subsection 7.2.3

7.2 General Requirements

Inside the same DDS Domain Participant, topic names shall be unique according to [1].

[CP_SWS_Dds_CONSTR_00712]{DRAFT} **Topic name uniqueness** ⌈During validation of the configuration, a validation error shall be raised if different DdsTopics belonging to the same DdsDomainParticipant share the same name.⌋*(FO_RS_Dds_00008)*

7.2.1 Communication requirements

7.2.1.1 Serialization requirements

During transmission, the Dds BSW module receives data produced by an upper layer module as DdsAppDataTxPdu. The upper layer module forwards raw data (e.g. byte stream) to the Dds BSW module, i.e. no data serialization or data transformation is performed before the Dds BSW Module is invoked. The Dds BSW knows the exact data type of the received data, by means of the ImplementationDataType, and it performs a cast from raw data to ImplementationDataType, in order to have structured data. By using this structured data, the DDS performs its own processing, serializes resulting data into an RTPS packet and then saves the final RTPS packet into the lower PDU to be forwarded to the PduR.

[CP_SWS_Dds_CONSTR_00725]{DRAFT} **No data serialization** ⌈The validation of the Dds configuration shall consider other transformer configuration. Any ISignal that is mapped at the same time to a DdsTopic and to a transformer shall be rejected and considered as invalid.⌋*(FO_RS_Dds_00001, FO_RS_Dds_00004, FO_RS_Dds_00006)*

The Dds BSW module serializes a given DdsAppDataTxPdu to an DDS Wire Interoperability protocol message ([6]). The DDS serialized DdsAppDataTxPdu is provided into a DdsRtpsDataTxPdu or DdsRtpsMulticastDataTxPdu. Thereby the DDS middleware internal policies decide which target PDU is used.

[CP_SWS_Dds_00734]{DRAFT} **DDS Data serialization** ⌈The Dds BSW shall perform the serialization of a DdsAppDataTxPdu into a DdsRtpsDataTxPdu or a DdsRtpsMulticastDataTxPdu. The PDU, which is used by the DdsDataWriter (either DdsRtpsDataTxPdu or DdsRtpsMulticastDataTxPdu), shall be selected at runtime according to the DDS middleware internal policies.⌋*(FO_RS_Dds_00001, FO_RS_Dds_00004, FO_RS_Dds_00019, FO_RS_Dds_00020)*

[CP_SWS_Dds_00726]{DRAFT} **DDS-RTPS compliance** ⌈Data produced into a DdsRtpsDataTxPdu or into a DdsRtpsMulticastDataTxPdu shall be compliant with the DDS Wire Interoperability protocol (RTPS) defined in [6]. To guarantee such compliance, the Dds BSW module shall serialize the payload according to the DDS standard serialization rules defined in section 7.4.3.5 of above mentioned doc-

ument ([13]).⌋*(FO_RS_Dds_00002, FO_RS_Dds_00017, FO_RS_Dds_00019, FO_RS_Dds_00020)*

[CP_SWS_Dds_00728]{DRAFT} **DDS serialization of primitive types** ⌈The Dds BSW module shall serialize AUTOSAR primitive data types according to the standard serialization rules for the equivalent DDS PRIMITIVE_TYPE defined in section 7.2.2.2 of [13]⌋*(FO_RS_Dds_00004, FO_RS_Dds_00007)*

Table 7.1 provides the equivalent DDS PRIMITIVE_TYPEs for the primitive AUTOSAR CP platform data types. For AUTOSAR CP platform data types, please refer to [14], chapter 8.2

Type	DDS Type	Remark
boolean	Boolean	
uint8	Byte	
uint16	UInt16	
uint32	UInt32	
uint64	UInt64	
sint8	Byte	
sint16	Int16	
sint32	Int32	
sint64	Int64	
uint8_least	Byte	
uint16_least	UInt16	
uint32_least	UInt32	
sint8_least	Byte	
sint16_least	Int16	
sint32_least	Int32	
float32	Float32	
float64	Float64	

Table 7.1: Serialization of primitive AUTOSAR CP platform data types

[CP_SWS_Dds_00729]{DRAFT} **DDS serialization of enumeration data types** ⌈The Dds BSW module shall serialize ImplementationDataType of category ENUMERATION (refer to chapter 5.5.4 of [4]) according to the standard serialization rules for DDS ENUM_TYPE defined in section 7.2.2.4.1.1 of [13].⌋*(FO_RS_Dds_00004, FO_RS_Dds_00007)*

[CP_SWS_Dds_00730]{DRAFT} **DDS serialization of ARRAY data type** ⌈The Dds BSW module shall serialize ImplementationDataType of category ARRAY (refer to chapter 5.3.4.4 of [4]) according to the standard serialization rules for DDS ARRAY_TYPE defined in section 7.2.2.4.3 of [13].⌋*(FO_RS_Dds_00004, FO_RS_Dds_00007)*

[CP_SWS_Dds_00731]{DRAFT} **DDS serialization of STRUCTURE data type** ⌈The Dds BSW module shall serialize ImplementationDataType of category STRUCTURE (refer to chapter 7.2.2.4.4.1 of [4]) according to the standard serialization rules for DDS STRUCT_TYPE defined in section 7.4.3.5 of [13]. The Dds BSW module shall mark as optional all optional members of the structure (refer to section 7.2.2.4.4.5 of [13].)⌋ *(FO_RS_Dds_00004, FO_RS_Dds_00007)*

[CP_SWS_Dds_CONSTR_00732]{DRAFT} **DDS serialization of UNION data type** ⌈ImplementationDataType of category UNION (refer to chapter 7.2.2.4.4.2 of [4]) are not managed by the Dds BSW.

The Dds BSW configuration validation shall fail in case a DdsTopic links an ImplementationDataType which contains a union.⌋*(FO_RS_Dds_00004, FO_RS_Dds_00007)*

[CP_SWS_Dds_CONSTR_00733]{DRAFT} **DDS serialization of POINTER data type** ⌈ImplementationDataType of category POINTER (refer to chapter 7.2.2.4.6 of [4]) are not managed by the Dds BSW.

The Dds BSW configuration validation shall fail in case a DdsTopic links an ImplementationDataType which contains a pointer.⌋*(FO_RS_Dds_00004, FO_RS_Dds_00007)*

[CP_SWS_Dds_00735]{DRAFT} **Encoding Format and Endianness of Strings in DDS** ⌈The Dds BSW module shall encode Strings according to Section 7.4.1.1.2 of [13].⌋*(FO_RS_Dds_00004, FO_RS_Dds_00007)*

7.2.1.2 Deserialization requirements

On reception side, the lower layer module forwards DDS data, serialized into a RTPS packet, to the Dds BSW module. The Dds BSW module receives DDS serialized data from the lower layer module as `DdsRtpsDataRxPdu` or `DdsRtpsMulticastDataRxPdu`. The Dds BSW module constructs the structured data, by means of the configured ImplementationDataType, performs its own processing, and then it saves raw data into the upper layer PDU to be sent to upper modules.

[CP_SWS_Dds_00736]{DRAFT} **DDS Data deserialization** ⌈

On receiving side, the Dds BSW module shall deserialize a given `DdsRtpsDataRxPdu` according the DDS Wire Interoperability protocol ([6]) to an AUTOSAR compliant PDU. The DDS deserialized `DdsRtpsDataRxPdu` or `DdsRtpsMulticastDataRxPdu` is then provided as `DdsAppDataRxPdu` to upper layers.⌋*(FO_RS_Dds_00001, FO_RS_Dds_00004, FO_RS_Dds_00019, FO_RS_Dds_00020)*

7.2.1.3 Transmission Queue management

The Dds module shall provide a Dds_Transmit function so that the PDU Router is able to initiate the transmission of a upper layer `DdsAppDataTxPdu`. When called, the Dds_Transmit function saves the received PDU into the queue and then returns.

For Dds_Transmit API specific requirements refer to the specific API subsection 8.3.3.

[CP_SWS_Dds_00851]{DRAFT} **Internal transmission queues** ⌈The Dds module shall manage an internal set of queues where incoming transmission upper layer PDUs shall be stored.⌋*(FO_RS_Dds_00015)*

Note: The properties of the queue are configurable by DdsTxQueueSize and DdsTxQueueUnicastPduRef/DdsTxQueueMulticastPduRef.

[CP_SWS_Dds_00828]{DRAFT} **Tx queues set processing order** ⌈The Transmission function (e.g., Dds_MainFunction_Tx()) shall establish the tx queues processing order based on the queue specific period. If some queue has the same period value, their mutual order is not defined.⌋*(FO_RS_Dds_00015)*

[CP_SWS_Dds_00838]{DRAFT} **Tx queue processing rules** ⌈For each queue the Transmission function shall perform all the DDS Middleware processing (QoS management, safety and security tasks, se-rialization) on received data, according to the configurated processing algorithm.⌋*(FO_RS_Dds_00015)*

The transmission queue shall have its own processing period. The queue specific period shall be a multiple of the DdsTxMainFunctionPeriod.

[CP_SWS_Dds_00837]{DRAFT} **Tx queue processing algorithm** ⌈The order of the queue processing shall depend by the configurated DdsQueueAlgorithm:

- **FIFO:** the oldest received transmission upper layer PDU present in queue shall be processed first
- **LIFO:** the latest received transmission upper layer PDU present in queue shall be processed first
- **VENDOR_SPECIFIC:** the order of processing is not specified

⌋*(FO_RS_Dds_00015)*

7.2.1.4 Transmission requirements

The Dds module shall provide a Dds_MainFunction_Tx() function to perform the actual DDS Middleware processing (and subsequent PDU transmission). For Dds_MainFunction_Tx() specific requirements refer to the specific subsection 8.5.2.

DDSI-RTPS [6] supports both UDP unicast and UDP multicast when sending RTPS messages. Also, they aren't mutually exclusive: just one or both can be used in the same domain according to the system's communications design constraints (network architecture, performance, safety, security, etc.). To support both unicast and multicast address, the SoAd shall be properly configured.

[CP_SWS_Dds_CONSTR_00865]{DRAFT} **Unicast transmission** ⌈During validation of the configuration, a validation error shall be raised if a `DdsRtpsDataTxPdu` belongs to a **SoAdSocketConnection** configured with a multicast **SoAdSocketRemoteIpAddress**.⌋*(FO_RS_Dds_00015)*

[CP_SWS_Dds_CONSTR_00866]{DRAFT} **Multicast transmission** ⌈During validation of the configuration, a validation error shall be raised if a `DdsRtpsMulticastDataTxPdu` belongs to a **SoAdSocketConnection** configured with a unicast **SoAdSocketRemoteIpAddress**.⌋*(FO_RS_Dds_00015)*

7.2.1.5 Reception Queue management

[CP_SWS_Dds_00864]{DRAFT} **Internal reception queues** ⌈The Dds module shall manage an internal set of queues where incoming reception lower layer PDUs shall be stored.⌋*(FO_RS_Dds_00016)*

Note: The properties of the queue are configurable by DdsRxQueueSize and DdsRxQueueUnicastPduRef/DdsRxQueueMulticastPduRef

[CP_SWS_Dds_00825]{DRAFT} **Rx queues set processing order** ⌈The reception function (e.g., Dds_MainFunction_Rx) shall establish the Rx queues processing order based on the queue period. If some queue has the same DdsRxQueuePeriod value, their mutual order is not defined.⌋*(FO_RS_Dds_00016)*

[CP_SWS_Dds_00834]{DRAFT} **Rx queue processing rules** ⌈For each queue the reception function shall perform all the DDS Middleware operations (QoS management, safety and security tasks, de-serialization) on received data, according to the configurated processing algorithm.⌋*(FO_RS_Dds_00016)*

The reception queue shall have its own processing period. The queue specific period shall be a multiple of the DdsRxMainFunctionPeriod.

[CP_SWS_Dds_00836]{DRAFT} **Rx queue processing algorithm** ⌈The order of the queue processing shall depend by the configurated algorithm:

- **FIFO:** the oldest received lower layer PDU present in queue shall be processed first
- **LIFO:** the latest received lower layer PDU present in queue shall be processed first
- **VENDOR_SPECIFIC:** the order of processing is not specified

⌋*(FO_RS_Dds_00016)*

7.2.1.6 Reception requirements

Every reception lower layer PDU which is received by the Ethernet Interface is given to the PDU Router by means of the SoAd. The PDU Router routes those PDUs to the Dds reception interface invoking the Dds_RxIndication callback.

For Dds_RxIndication API specific requirements refer to the specific API subsection 8.4.1.

Similar to transmission, DDSI-RTPS [6] supports both UDP unicast and UDP multicast also when receiving RTPS messages. Also, they aren't mutually exclusive: just one or both can be used in the same domain according to the system's communications design constraints (network architecture, performance, safety, security, etc.).

To support both unicast and multicast address, the SoAd shall be properly configured.

[CP_SWS_Dds_CONSTR_00867]{DRAFT} **Unicast reception** ⌈During validation of the configuration, a validation error shall be raised if a `DdsRtpsDataRxPdu` belongs to a **SoAdSocketConnectionGroup** configured with a multicast **SoAdSocketLocalAddressRef**.⌋*(FO_RS_Dds_00016)*

[CP_SWS_Dds_CONSTR_00868]{DRAFT} **Multicast reception** ⌈During validation of the configuration, a validation error shall be raised if a `DdsRtpsMulticastDataRxPdu` belongs to a **SoAdSocketConnectionGroup** configured with a unicast **SoAdSocketLocalAddressRef**.⌋*(FO_RS_Dds_00016)*

7.2.1.7 Timing requirements

[CP_SWS_Dds_00873]{DRAFT} **Processing timestamp** ⌈If needed, the DDS middleware shall obtain the timestamp by invoking the **StbM_GetCurrentTime()** API.⌋*(FO_RS_Dds_00015, FO_RS_Dds_00016)*

[CP_SWS_Dds_00859]{DRAFT} **RTPS Timestamp** ⌈The Timestamp needed for the RTPS packet shall be provided by the StbM_GetCurrentTime() StbM API.⌋*(FO_RS_Dds_00001, FO_RS_Dds_00015)*

Note: The AUTOSAR Dds module is not responsible to time stamp received or transmitted PDUs. The responsibility is bound to the DDS middleware.

7.2.2 Security requirements

[CP_SWS_Dds_00750]{DRAFT} **DDS-security** ⌈In order to be compliant and to intercommunicate with other DDS systems, the Dds BSW module shall implement security mechanisms by using DDS-Security Specification [11].⌋*(FO_RS_Dds_00009)*

[CP_SWS_Dds_00752]{DRAFT} **MAC usage** ⌈The Dds BSW module shall guarantee data-integrity and message authentication at DomainParticipant level by adding a Message Authentication Code (MAC) to the message to be sent, calculated by using symmetric key algorithms. The resulting message shall still be DDSI-RTPS compliant.⌋*(FO_RS_Dds_00009)*

[CP_SWS_Dds_00753]{DRAFT} **CSM library usage** ⌈The Dds BSW shall configure, for each DomainParticipant, one reference to each CSM job needed: one job to calculate MAC (DdsDomainParticipantCsmAuthenticateJob) and one to check MAC of received messages (DdsDomainParticipantCsmVerifyJob). For configuration details, refer to `DdsDomainParticipantCryptoInfo`. At sender side, the Dds BSW shall add the resulting MAC of DdsDomainParticipantCsmAuthenticateJob to each message of this DomainParticipant. At receiving side, the Dds BSW shall check the result of the DdsDomainParticipantCsmVerifyJob.⌋*(FO_RS_Dds_00009)*

[CP_SWS_Dds_CONSTR_00754]{DRAFT} **CSM job configuration** ⌈The CSM **DdsDomainParticipantCsmAuthenticateJob** shall be configured to

call Csm_MacGenerate and the **DdsDomainParticipantCsmVerifyJob** to call Csm_MacVerify.

The Dds BSW configuration validation shall fail in case the DdsDomainParticipantCsmAuthenticateJob/DdsDomainParticipantCsmVerifyJob related to the same `DdsDomainParticipant` link CSM jobs that are not configured with Csm_MacGenerate and Csm_MacVerify respectly.

For configuration details, refer to `DdsDomainParticipantCryptoInfo`.⌋*(FO_RS_Dds_00009)*

[CP_SWS_Dds_CONSTR_00743]{DRAFT} **CSM key configuration** ⌈Each CSM authenticate/verify pair, related to a single DomainParticipant, shall use the same keys (only simmetric-key algorithms are supported). For each DomainParticipant, the CSM used jobs shall be configured with the same keys.

The Dds BSW configuration validation shall fail in case the DdsDomainParticipantCsmAuthenticateJob/DdsDomainParticipantCsmVerifyJob related to the same DdsDomainParticipant link CSM jobs that are not configured with the same key.

For configuration details, refer to `DdsDomainParticipantCryptoInfo`.⌋*(FO_RS_Dds_00009)*

[CP_SWS_Dds_00756]{DRAFT} **MAC calculation failure** ⌈If the MAC calculation fails (e.g., the Csm_MacGenerate() or Csm_MacVerify() return any error), the Dds BSW module shall call the API Det_ReportRuntimeError() with the DDS_E_CSM_LIBRARY_ERROR runtime error code and discard the message to be sent.

In this case, during transmission the Dds BSW shall call the PduR_DdsTxConfirmation function with result = E_NOT_OK.⌋*(FO_RS_Dds_00009)*

[CP_SWS_Dds_00758]{DRAFT} **MAC check failure** ⌈At receiving side, if the MAC check fails, the Dds BSW module shall call the API Det_ReportRuntimeError() with the DDS_E_CSM_CHECK_FAILED rutime error code and discard the message.⌋*(FO_RS_Dds_00009)*

7.2.3 Safety requirements

[CP_SWS_Dds_00761]{DRAFT} **Repetition or Insertion of Information** ⌈The Dds BSW module shall use submessages which have counters, e.g., AckNack, Data and DataFrag, etc., to guarantee safety mechanisms against Repetition or Insertion of Information faults. At receiving side, if a message with a duplicated counter is received, the Dds BSW module shall discard the message and call the API Det_ReportRuntimeError() with the DDS_E_SAMPLE_REJECTED runtime error code.⌋*(FO_RS_Dds_00010)*

[CP_SWS_Dds_00762]{DRAFT} **Loss or Incorrect sequence of Information** ⌈The Dds BSW module shall use submessages which have counters, e.g., AckNack, Data

and DataFrag, etc., to guarantee safety mechanisms against Loss or Incorrect sequence of Information faults. At receiving side, if a message with a non-consecutive counter is received, the Dds BSW module shall discard the message and call the API Det_ReportRuntimeError() with the DDS_E_SAMPLE_LOST runtime error code.⌋ *(FO_RS_Dds_00010)*

The Dds BSW module shall use QoSs able to monitor timeouts, such as DEADLINE, LATENCY_BUDGET, LIFESPAN and TIME_BASED_FILTER (refer respectively to `DdsDeadline`, `DdsLatencyBudget`, `DdsLifespan` and `DdsTimeBasedFilter`) to guarantee safety mechanisms against Delay of Information fault (take [1] for details on those QoS policies).

[CP_SWS_Dds_00763]{DRAFT} **Delay of Information - sending checks** ⌈At sending side, if some timing constraint is not fulfilled, the Dds BSW module shall discard the message and call the API Det_ReportRuntimeError() with the DDS_E_SENDER_TIMING_MISSED runtime error code.⌋ *(FO_RS_Dds_00005, FO_RS_Dds_00010)*

[CP_SWS_Dds_00764]{DRAFT} **Delay of Information - receiving checks** ⌈At receiving side, if some timing constraint is not fulfilled, the Dds BSW module shall discard the message and call the API Det_ReportRuntimeError() with the DDS_E_RECEIVER_TIMING_MISSED runtime error code.⌋ *(FO_RS_Dds_00005, FO_RS_Dds_00010)*

[CP_SWS_Dds_00766]{DRAFT} **Corruption of Information** ⌈The Dds BSW module shall use CRC check to guarantee safety mechanisms against Corruption of Information fault.⌋ *(FO_RS_Dds_00010)*

[CP_SWS_Dds_00769]{DRAFT} **CRC check failure** ⌈On received side, if the CRC check fails, the Dds BSW module shall call the API Det_ReportRuntimeError() with the DDS_E_CRC_CHECK_FAILED runtime error code and discard the message.⌋ *(FO_RS_Dds_00010)*

7.3 Error Classification

Section 7.2 "Error Handling" of the document "General Specification of Basic Software Modules" [3] 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.

7.3.1 Development Errors

[CP_SWS_Dds_00772]{DRAFT} **Definiton of development errors in module Dds** ⌈

Type of error	*Related error code*	*Error value*
Module not initialized	DDS_E_UNINIT	0x00
Null pointer has been passed as an argument	DDS_E_PARAM_POINTER	0x02
Invalid Upper Layer PduId	DDS_E_U_PDUID_INVALID	0x03
Invalid Lower Layer PduId	DDS_E_L_PDUID_INVALID	0x04

⌋(*FO_RS_Dds_00015*, *FO_RS_Dds_00016*)

7.3.2 Runtime Errors

[CP_SWS_Dds_00773]{DRAFT} **Definiton of runtime errors in module Dds** ⌈

Type of error	*Related error code*	*Error value*
Upper layer module request rejected	DDS_E_U_PDUID_REJECTED	0x10
Lower layer notify ignored	DDS_E_L_PDUID_IGNORED	0x11
CSM library error	DDS_E_CSM_LIBRARY_ERROR	0x30
CSM check error	DDS_E_CSM_CHECK_FAILED	0x40
CRC check failed	DDS_E_CRC_CHECK_FAILED	0x41
Sample rejected	DDS_E_SAMPLE_REJECTED	0x42
Sample lost	DDS_E_SAMPLE_LOST	0x43
Timing constraints missed at receiver side	DDS_E_RECEIVER_TIMING_MISSED	0x44
Timing constraints missed at sender side	DDS_E_SENDER_TIMING_MISSED	0x45
Internal error	DDS_INTERNAL_ERROR	0x46

⌋(*FO_RS_Dds_00005*, *FO_RS_Dds_00009*, *FO_RS_Dds_00010*, *FO_RS_Dds_-00015*, *FO_RS_Dds_00016*)

7.3.3 Production Errors

There are no production errors.

7.3.4 Extended Production Errors

There are no extended production errors.

8 API specification

8.1 Imported types

In this chapter all types included from the following files are listed.

[CP_SWS_Dds_00801]{DRAFT} **Definition of imported datatypes of module Dds** ⌈

Module	*Header File*	*Imported Type*
ComStack_Types	ComStack_Types.h	PduIdType
	ComStack_Types.h	PduInfoType
	ComStack_Types.h	PduLengthType
Csm	Rte_Csm_Type.h	Crypto_OperationModeType
	Rte_Csm_Type.h	Crypto_VerifyResultType
StbM	Rte_StbM_Type.h	StbM_SynchronizedTimeBaseType
	Rte_StbM_Type.h	StbM_TimeBaseStatusType
	Rte_StbM_Type.h	StbM_TimeStampType
	Rte_StbM_Type.h	StbM_TimeTupleType
	Rte_StbM_Type.h	StbM_UserDataType
	StbM.h	StbM_VirtualLocalTimeType
Std	Std_Types.h	Std_ReturnType
	Std_Types.h	Std_VersionInfoType

⌋(*FO_RS_Dds_00007*)

8.2 Type definitions

8.2.1 Dds_ConfigType

[CP_SWS_Dds_00802]{DRAFT} **Definition of datatype Dds_ConfigType** ⌈

Name	Dds_ConfigType (draft)	
Kind	Structure	
Elements	implementation specific	
	Type	–
	Comment	The content of the initialization data structure is implementation specific
Description	This is the type of the data structure containing the initialization data for Dds. **Tags:** atp.Status=draft	
Available via	Dds.h	

⌋(*FO_RS_Dds_00007*, *SRS_BSW_00405*)

8.3 Function definitions

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

8.3.1 Dds_Init

[CP_SWS_Dds_00810]{DRAFT} **Definition of API function Dds_Init** ⌈

Service Name	Dds_Init (draft)	
Syntax	`void Dds_Init ( const Dds_ConfigType* Dds_ConfigPtr )`	
Service ID [hex]	0x00	
Sync/Async	Synchronous	
Reentrancy	Non Reentrant	
Parameters (in)	Dds_ConfigPtr	Pointer to a selected configuration structure
Parameters (inout)	None	
Parameters (out)	None	
Return value	None	
Description	This service initializes interfaces and variables of the AUTOSAR Dds layer. **Tags:** atp.Status=draft	
Available via	Dds.h	

⌋*(SRS_BSW_00405, SRS_BSW_00101, SRS_BSW_00414)*

[CP_SWS_Dds_00811]{DRAFT} **Dds_Init behaviour** ⌈The function Dds_Init shall initialize all module-related variables and constants according to the configuration.⌋ *(SRS_BSW_00101)*

[CP_SWS_Dds_00812]{DRAFT} **Dds_Init - Entity state** ⌈The function Dds_Init shall initialize all Entities to "enabled" state.⌋*(SRS_BSW_00101)*

[CP_SWS_Dds_00813]{DRAFT} **Dds_Init - Queue state** ⌈The function Dds_Init shall empty all internal queues.⌋*(SRS_BSW_00101)*

8.3.2 Dds_GetVersionInfo

[CP_SWS_Dds_00820]{DRAFT} **Definition of API function Dds_GetVersionInfo** ⌈

Service Name	Dds_GetVersionInfo (draft)
Syntax	`void Dds_GetVersionInfo ( Std_VersionInfoType* versioninfo )`
Service ID [hex]	0x01
Sync/Async	Synchronous
Reentrancy	Reentrant

▽

△

Parameters (in)	None	
Parameters (inout)	None	
Parameters (out)	versioninfo	Pointer to where to store the version information of this module.
Return value	None	
Description	Returns the version information of this module. **Tags:** atp.Status=draft	
Available via	Dds.h	

⌋(*SRS_BSW_00402*, *SRS_BSW_00407*, *SRS_BSW_00411*, *SRS_BSW_00374*, *SRS_BSW_00379*, *SRS_BSW_00003*, *SRS_BSW_00318*)

[CP_SWS_Dds_00821]{DRAFT} **Dds_GetVersion - Null VersionInfoPtr** ⌈If development error detection for the Dds module is enabled, then the function Dds_GetVersionInfo shall check whether the parameter VersioninfoPtr is a NULL pointer (NULL_PTR). If VersioninfoPtr is a NULL pointer, then the function Dds_GetVersionInfo shall raise the development error DDS_E_PARAM_POINTER.⌋ (*SRS_BSW_00003*)

8.3.3 Dds_Transmit

[CP_SWS_Dds_00831]{DRAFT} **Definition of API function Dds_Transmit** ⌈

Service Name	Dds_Transmit (draft)	

Syntax	`Std_ReturnType Dds_Transmit (`
	`  PduIdType TxPduId,`
	`  const PduInfoType* PduInfoPtr`
	`)`	

Service ID [hex]	0x02	
Sync/Async	Synchronous	
Reentrancy	Reentrant for different PduIds. Non reentrant for the same PduId.	
Parameters (in)	TxPduId	Identifier of the PDU to be transmitted
	PduInfoPtr	Length of and pointer to the PDU data and pointer to MetaData.
Parameters (inout)	None	
Parameters (out)	None	
Return value	Std_ReturnType	`E_OK`: Transmit request has been accepted. `E_NOT_OK`: Transmit request has not been accepted.
Description	Request for transmitting a message. **Tags:** atp.Status=draft	
Available via	Dds.h	

⌋(*SRS_BSW_00402*, *SRS_BSW_00407*, *SRS_BSW_00411*, *SRS_BSW_00374*, *SRS_BSW_00379*, *SRS_BSW_00003*, *SRS_BSW_00318*)

[CP_SWS_Dds_00852]{DRAFT} **Dds_Transmit - Error conditions** ⌈The function Dds_Transmit shall call the Det_ReportError, if development error detection is enabled and if function call has failed because of the following reasons:

- Dds module is not initialized (DDS_E_UNINIT)

- PduInfoPtr equals NULL_PTR (DDS_E_PARAM_POINTER).
- Invalid upper layer TxPduId (DDS_E_U_PDUID_INVALID).

⌋(*FO_RS_Dds_00015*)

[CP_SWS_Dds_00854]{DRAFT} **Dds_Transmit - DDS_E_U_PDUID_REJECTED** ⌈If upper layer module transmission request cannot be accepted or the proper transmission queue is full, Dds_Transmit shall call the API Det_ReportRuntimeError with the runtime error code DDS_E_U_PDUID_REJECTED and then return E_NOT_OK.

⌋(*FO_RS_Dds_00015*)

[CP_SWS_Dds_00855]{DRAFT} **Dds_Transmit - E_OK** ⌈If upper layer module transmission request can be accepted, Dds_Transmit shall store the transmission upper layer PDU into the proper transmission queue, update the queue offset which indicates where to store new PDUs and return E_OK.⌋(*FO_RS_Dds_00015*)

8.4 Callback notifications

This is a list of functions provided for other modules.

8.4.1 Dds_RxIndication

[CP_SWS_Dds_00841]{DRAFT} **Definition of callback function Dds_RxIndication** ⌈

Service Name	Dds_RxIndication (draft)	

Syntax	`void Dds_RxIndication (`
	`  PduIdType RxPduId,`
	`  const PduInfoType* PduInfoPtr`
	`)`	

Service ID [hex]	0x42	
Sync/Async	Synchronous	
Reentrancy	Reentrant for different PduIds. Non reentrant for the same PduId.	
Parameters (in)	RxPduId	ID of the received PDU.
	PduInfoPtr	Contains the length (SduLength) of the received PDU, a pointer to a buffer (SduDataPtr) containing the PDU, and the MetaData related to this PDU.
Parameters (inout)	None	
Parameters (out)	None	
Return value	None	
Description	Indication of a received PDU from the PDU Router interface module. **Tags:** atp.Status=draft	
Available via	Dds.h	

⌋(*FO_RS_Dds_00016*)

[CP_SWS_Dds_00861]{DRAFT} **Dds_RxIndication - Error conditions** ⌈The function Dds_RxIndication shall call the Det_ReportError, if development error detection is enabled and if function call has failed because of the following reasons:

- Dds module is not initialized (DDS_E_UNINIT)
- PduInfoPtr equals NULL_PTR (DDS_E_PARAM_POINTER).
- Invalid lower layer RxPduId (DDS_E_L_PDUID_INVALID).

⌋*(FO_RS_Dds_00016)*

[CP_SWS_Dds_00862]{DRAFT} **Dds_RxIndication - DDS_E_L_PDUID_IGNORED** ⌈If the reception lower layer PDU cannot be accepted or the proper internal queue is full, Dds_RxIndication shall call the API Det_ReportRuntimeError with the runtime error code DDS_E_L_PDUID_IGNORED and return.⌋*(FO_RS_Dds_00016)*

[CP_SWS_Dds_00863]{DRAFT} **Dds_RxIndication - OK condition** ⌈If the reception lower layer PDU can be accepted, the Dds_RxIndication shall store this PDU into the proper internal queue and return.⌋*(FO_RS_Dds_00016)*

8.4.2 Dds_TxConfirmation

[CP_SWS_Dds_00843]{DRAFT} **Definition of callback function Dds_TxConfirmation** ⌈

Service Name	Dds_TxConfirmation (draft)	
Syntax	`void Dds_TxConfirmation ( PduIdType TxPduId, Std_ReturnType result )`	
Service ID [hex]	0x40	
Sync/Async	Synchronous	
Reentrancy	Reentrant for different PduIds. Non reentrant for the same PduId.	
Parameters (in)	TxPduId	ID of the PDU that has been transmitted.
	result	E_OK: The PDU was transmitted. E_NOT_OK: Transmission of the PDU failed.
Parameters (inout)	None	
Parameters (out)	None	
Return value	None	
Description	The PDU Router interface module confirms the transmission of a PDU, or the failure to transmit a PDU. **Tags:** atp.Status=draft	
Available via	Dds.h	

⌋*(FO_RS_Dds_00015)*

[CP_SWS_Dds_00871]{DRAFT} **Dds_TxConfirmation - Error conditions** ⌈The function Dds_TxConfirmation() shall call the Det_ReportError(), if development error detection is enabled and if function call has failed because of the following reasons:

- Dds module is not initialized (DDS_E_UNINIT)

- Invalid lower layer TxPduId (DDS_E_L_PDUID_INVALID).

⌋(*FO_RS_Dds_00015*)

[CP_SWS_Dds_00872]{DRAFT} **Dds_TxConfirmation behaviour** ⌈Dds_TxConfirmation shall call the API PduR_DdsTxConfirmation with the same input parameters and return.⌋(*FO_RS_Dds_00015*)

8.4.3 Dds_TriggerTransmit

[CP_SWS_Dds_00835]{DRAFT} **Definition of callback function Dds_TriggerTransmit** ⌈

Service Name	Dds_TriggerTransmit (draft)	
Syntax	`Std_ReturnType Dds_TriggerTransmit ( PduIdType TxPduId, PduInfoType* PduInfoPtr )`	
Service ID [hex]	0x41	
Sync/Async	Synchronous	
Reentrancy	Reentrant for different PduIds. Non reentrant for the same PduId.	
Parameters (in)	TxPduId	ID of the SDU that is requested to be transmitted.
Parameters (inout)	PduInfoPtr	Contains a pointer to a buffer (SduDataPtr) to where the SDU data shall be copied, and the available buffer size in SduLengh. On return, the service will indicate the length of the copied SDU data in SduLength.
Parameters (out)	None	
Return value	Std_ReturnType	`E_OK`: SDU has been copied and SduLength indicates the number of copied bytes. `E_NOT_OK`: No SDU data has been copied. PduInfoPtr must not be used since it may contain a NULL pointer or point to invalid data.
Description	Within this API, the upper layer module (called module) shall check whether the available data fits into the buffer size reported by PduInfoPtr->SduLength. If it fits, it shall copy its data into the buffer provided by PduInfoPtr->SduDataPtr and update the length of the actual copied data in PduInfoPtr->SduLength. If not, it returns E_NOT_OK without changing PduInfoPtr. **Tags:** atp.Status=draft	
Available via	Dds.h	

⌋(*FO_RS_Dds_00015*)

[CP_SWS_Dds_00881]{DRAFT} **Dds_TriggerTransmit - Error conditions** ⌈The function Dds_TriggerTransmit() shall call the Det_ReportError(), if development error detection is enabled and if function call has failed because of the following reasons:

- Dds module is not initialized (DDS_E_UNINIT)
- PduInfoPtr equals NULL_PTR (DDS_E_PARAM_POINTER).
- Invalid lower layer TxPduId (DDS_E_L_PDUID_INVALID).

⌋(*FO_RS_Dds_00015*)

[CP_SWS_Dds_00882]{DRAFT} **Dds_TriggerTransmit behaviour** ⌈Within the function Dds_TriggerTransmit(), the Dds BSW shall copy the contents of its PDU transmit buffer to the PDU buffer given by PduInfoPtr->SduDataPtr and update PduInfoPtr->SduLength with length of the copied data accordingly.⌋*(FO_RS_Dds_00015)*

[CP_SWS_Dds_00883]{DRAFT} **Dds_TriggerTransmit - Error conditions** ⌈If another Dds_TriggerTransmit() request on the same PduId is not yet completed, the function Dds_TriggerTransmit() shall call the Det_ReportRuntimeError() with the code DDS_E_L_PDUID_IGNORED.⌋*(FO_RS_Dds_00015)*

[CP_SWS_Dds_CONSTR_00884]{DRAFT} **Dds_TriggerTransmit limitation** ⌈The validation of the Dds configuration shall consider the LdCom configuration. If any PDU belonging to Dds BSW has a non NULL value for LdComTxTriggerTransmit, the configuration shall be rejected as invalid.

Rationale: The Dds_TriggerTransmit function can be called only by lower-layer module.⌋*(FO_RS_Dds_00015)*

8.5 Scheduled functions

Following functions are called directly by Basic Software Scheduler. They have no return value and no parameter. All functions shall be non-reentrant

8.5.1 Dds_MainFunction_Rx

[CP_SWS_Dds_00823]{DRAFT} **Definition of scheduled function Dds_MainFunction_Rx** ⌈

Service Name	Dds_MainFunction_Rx (draft)

Syntax	`void Dds_MainFunction_Rx (`
	`  void`
	`)`

Service ID [hex]	0x10
Description	Scheduled function of the Dds module for reception purpose **Tags:** atp.Status=draft
Available via	SchM_Dds.h

⌋*(SRS_BSW_00424, SRS_BSW_00433, SRS_BSW_00373)*

[CP_SWS_Dds_00826]{DRAFT} **Dds_MainFunction_Rx - Error conditions** ⌈If, during processing of the Dds_MainFunction_Rx() any error or violation occurred, the Dds_MainFunction_Rx shall call the Det_ReportRuntimeError() with the DDS_INTERNAL_ERROR code, drop received data and return.⌋*(FO_RS_Dds_00016)*

[CP_SWS_Dds_00827]{DRAFT} **Dds_MainFunction_Rx - OK conditions** ⌈If, during processing of the Dds_MainFunction_Rx(), everything is ok, the Dds_MainFunction_Rx shall find the proper readers to manage the reception of

data and shall call the API PduR_SoAdRxIndication with the resulting upper layer PDU as input parameter.⌋(*FO_RS_Dds_00016*)

8.5.2 Dds_MainFunction_Tx

Into the Dds_MainFunction_Tx function all the DDS Middleware processing for trasmission shall be performed. Internal DDS processing is out of the scope of the SWS: it is vendor-specific (as soon as the implementation is compliant with DDS OMG Specification ([1]). In the following section there are requirements needed to specify AUTOSAR APIs.

[CP_SWS_Dds_00824]{DRAFT} **Definition of scheduled function Dds_MainFunction_Tx** ⌈

Service Name	Dds_MainFunction_Tx (draft)

Syntax	`void Dds_MainFunction_Tx (`
	`  void`
	`)`

Service ID [hex]	0x11
Description	Scheduled function of the Dds module for transmission purpose **Tags:** atp.Status=draft
Available via	SchM_Dds.h

⌋(*SRS_BSW_00424*, *SRS_BSW_00433*, *SRS_BSW_00373*)

[CP_SWS_Dds_00829]{DRAFT} **Dds_MainFunction_Tx - Error conditions** ⌈If, during processing of the Dds_MainFunction_Tx() any error or violation occurred, the Dds_MainFunction_Tx shall call the Det_ReportRuntimeError() with the DDS_INTERNAL_ERROR code, shall call the PduR_DdsTxConfirmation with result = E_NOT_OK, shall drop received data and return.⌋(*FO_RS_Dds_00015*)

[CP_SWS_Dds_00830]{DRAFT} **Dds_MainFunction_Tx - OK conditions** ⌈If, during processing of the Dds_MainFunction_Tx(), everything is ok, the Dds_MainFunction_Tx shall find the proper writers to manage the transmission of data and shall call the API PduR_DdsTransmit with the resulting lower layer PDU as input parameter.⌋(*FO_RS_Dds_00015*)

8.6 Expected interfaces

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

8.6.1 Mandatory interfaces

[CP_SWS_Dds_00832]{DRAFT} **Definition of mandatory interfaces in module Dds** ⌈

API Function	*Header File*	*Description*
Det_ReportError	Det.h	Service to report development errors.
Det_ReportRuntimeError	Det.h	Service to report runtime errors. If a callout has been configured then this callout shall be called.
PduR_DdsRxIndication (draft)	PduR_Dds.h	Indication of a received PDU from a lower layer communication interface module.
PduR_DdsTransmit (draft)	PduR_Dds.h	Requests transmission of a PDU.
PduR_DdsTxConfirmation (draft)	PduR_Dds.h	The lower layer communication interface module confirms the transmission of a PDU, or the failure to transmit a PDU.

⌋(*FO_RS_Dds_00005*, *FO_RS_Dds_00009*, *FO_RS_Dds_00010*, *FO_RS_Dds_-00015*, *FO_RS_Dds_00016*)

8.6.2 Optional interfaces

[CP_SWS_Dds_00833]{DRAFT} **Definition of optional interfaces in module Dds** ⌈

API Function	*Header File*	*Description*
Crc_CalculateCRC32	Crc.h	This service makes a CRC32 calculation on Crc_ Length data bytes.
Crc_CalculateCRC64	Crc.h	This service makes a CRC64 calculation on Crc_ Length data bytes, using the polynomial 0x42F0E1EBA9EA3693. This CRC routine is used by E2E Profile 7.
Csm_MacGenerate	Csm.h	Uses the given data to perform a MAC generation and stores the MAC in the memory location pointed to by the MAC pointer.
Csm_MacVerify	Csm.h	Verifies the given MAC by comparing if the MAC is generated with the given data.
StbM_GetCurrentTime	StbM.h	Returns a time tuple (Local time, Global time and Timebase status) and user data details Note: This API shall be called with locked interrupts / within an Exclusive Area to prevent interruption (i.e., the risk that the time stamp is outdated on return of the function call).

⌋(*FO_RS_Dds_00005*, *FO_RS_Dds_00009*, *FO_RS_Dds_00010*)

8.6.3 Configurable interfaces

None.

9 Sequence diagrams

9.1 Transmission

9.1.1 Dds message transmission

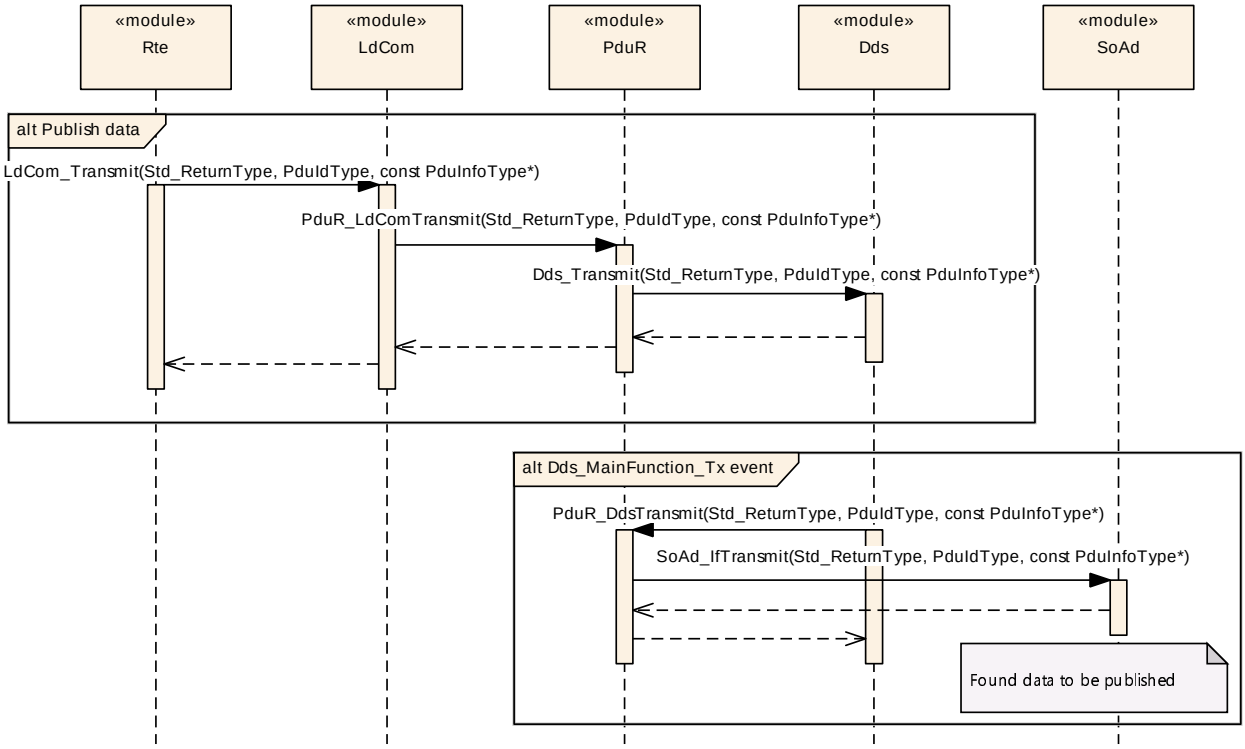

Figure 9.1: Dds transmission path

9.1.2 Dds message transmission confirmation

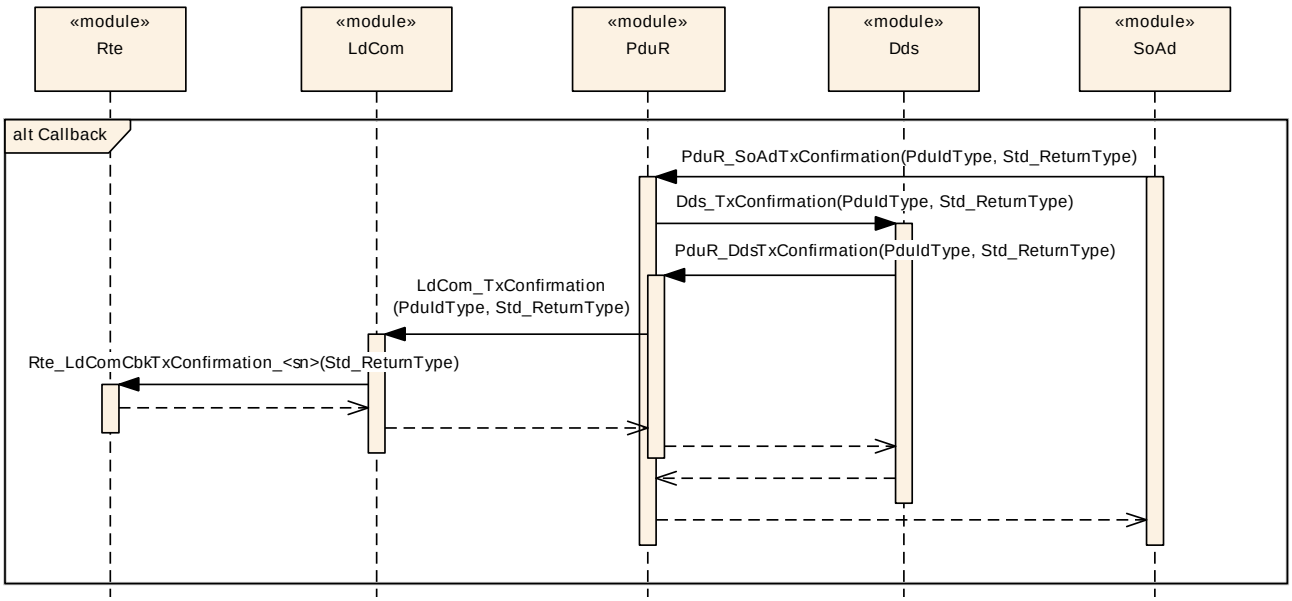

Figure 9.2: Dds transmission confirmation path

9.2 Reception

9.2.1 Dds received indication event

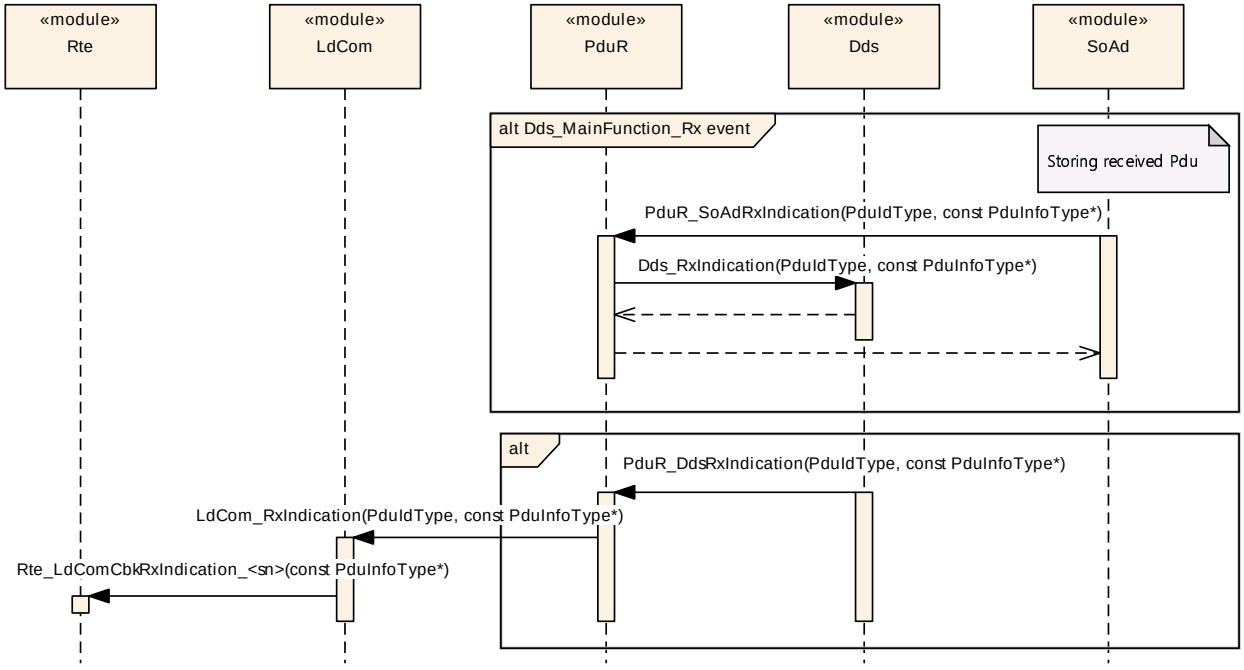

Figure 9.3: Dds reception path

10 Configuration specification

In general, this chapter defines configuration parameters and their clustering into containers. In order to support the specification Chapter 10.1 describes fundamentals. It also specifies a template (table) you shall use for the parameter specification. We intend to leave Chapter 10.1 in the specification to guarantee comprehension.

Chapter 10.2 specifies the structure (containers) and the parameters of the module Dds.

Chapter 10.3 specifies published information of the module Dds.

10.1 How to read this chapter

For details refer to the chapter 10.1 “Introduction to configuration specification” in SWS_BSWGeneral.

10.2 Containers and configuration parameters

The following chapters summarize all configuration parameters.

10.2.1 Dds

SWS Item	[ECUC_Dds_00001]
Module Name	Dds
Description	Configuration of the Dds module.
Post-Build Variant Support	true
Supported Config Variants	VARIANT-POST-BUILD, VARIANT-PRE-COMPILE

Included Containers		
Container Name	Multiplicity	Scope / Dependency
DdsConfig	1	This container contains the configuration parameters and sub containers of the AUTOSAR Dds module. **Tags:** atp.Status=draft
DdsGeneral	1	This container lists the general configuration parameters for the Dds module. **Tags:** atp.Status=draft

In the picture below, the UML diagram of Dds BSW is shown:

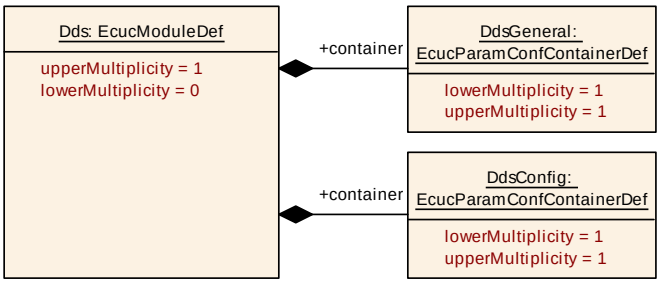

Figure 10.1: Dds model

10.2.2 Dds General

SWS Item	**[ECUC_Dds_00002]**
Container Name	DdsGeneral
Parent Container	Dds
Description	This container lists the general configuration parameters for the Dds module. **Tags:** atp.Status=draft
Configuration Parameters	

SWS Item	**[ECUC_Dds_00003]**		
Parameter Name	DdsDevErrorDetect		
Parent Container	DdsGeneral		
Description	Switches the development error detection and notification on or off. • true: detection and notification is enabled. • false: detection and notification is disabled. **Tags:** atp.Status=draft		
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		

SWS Item	**[ECUC_Dds_00004]**	
Parameter Name	DdsMainRxFunctionPeriod	
Parent Container	DdsGeneral	
Description	This parameter defines the cycle time in seconds of the periodic call of the Dds_Main Function_Rx. **Tags:** atp.Status=draft	
Multiplicity	1	
Type	EcucFloatParamDef	
Range	]0 .. INF[	
Default value	–	

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

SWS Item	**[ECUC_Dds_00127]**		
Parameter Name	DdsMainTxFunctionPeriod		
Parent Container	DdsGeneral		
Description	This parameter defines the cycle time in seconds of the periodic call of the Dds_Main Function_Tx. **Tags:** atp.Status=draft		
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	scope: local		

SWS Item	**[ECUC_Dds_00128]**		
Parameter Name	DdsSynchronizedTimeBaseRef		
Parent Container	DdsGeneral		
Description	Reference to a StbM Synchronized Time Base. **Tags:** atp.Status=draft		
Multiplicity	0..1		
Type	Symbolic name reference to StbMSynchronizedTimeBase		
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: ECU		

No Included Containers

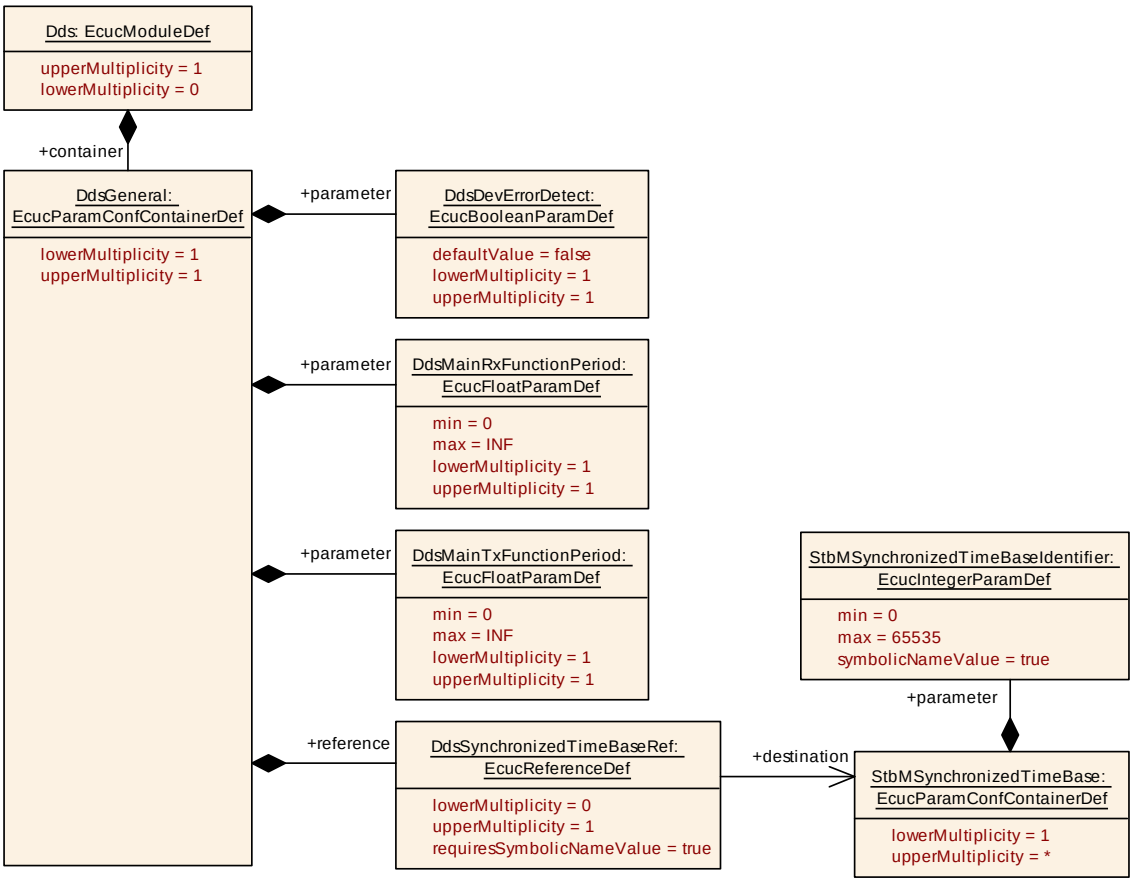

Figure 10.2: Dds General

10.2.3 Dds Config

SWS Item	**[ECUC_Dds_00005]**
Container Name	DdsConfig
Parent Container	Dds
Description	This container contains the configuration parameters and sub containers of the AUTOSAR Dds module. **Tags:** atp.Status=draft
Configuration Parameters	

Included Containers		
Container Name	**Multiplicity**	**Scope / Dependency**
DdsAppDataRxPduCollection	0..1	Collection of upper layer Rx PDUs towards the application layer. **Tags:** atp.Status=draft
DdsAppDataTxPduCollection	0..1	Collection of upper layer Tx PDUs towards the application layer. **Tags:** atp.Status=draft

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Included Containers		
Container Name	**Multiplicity**	**Scope / Dependency**
DdsDomainParticipantCollection	0..1	Collection of DDS Domain Participants. **Tags:** atp.Status=draft
DdsRxQueueCollection	0..1	Collection of Rx queues. **Tags:** atp.Status=draft
DdsTxQueueCollection	0..1	Collection of Tx queues. **Tags:** atp.Status=draft

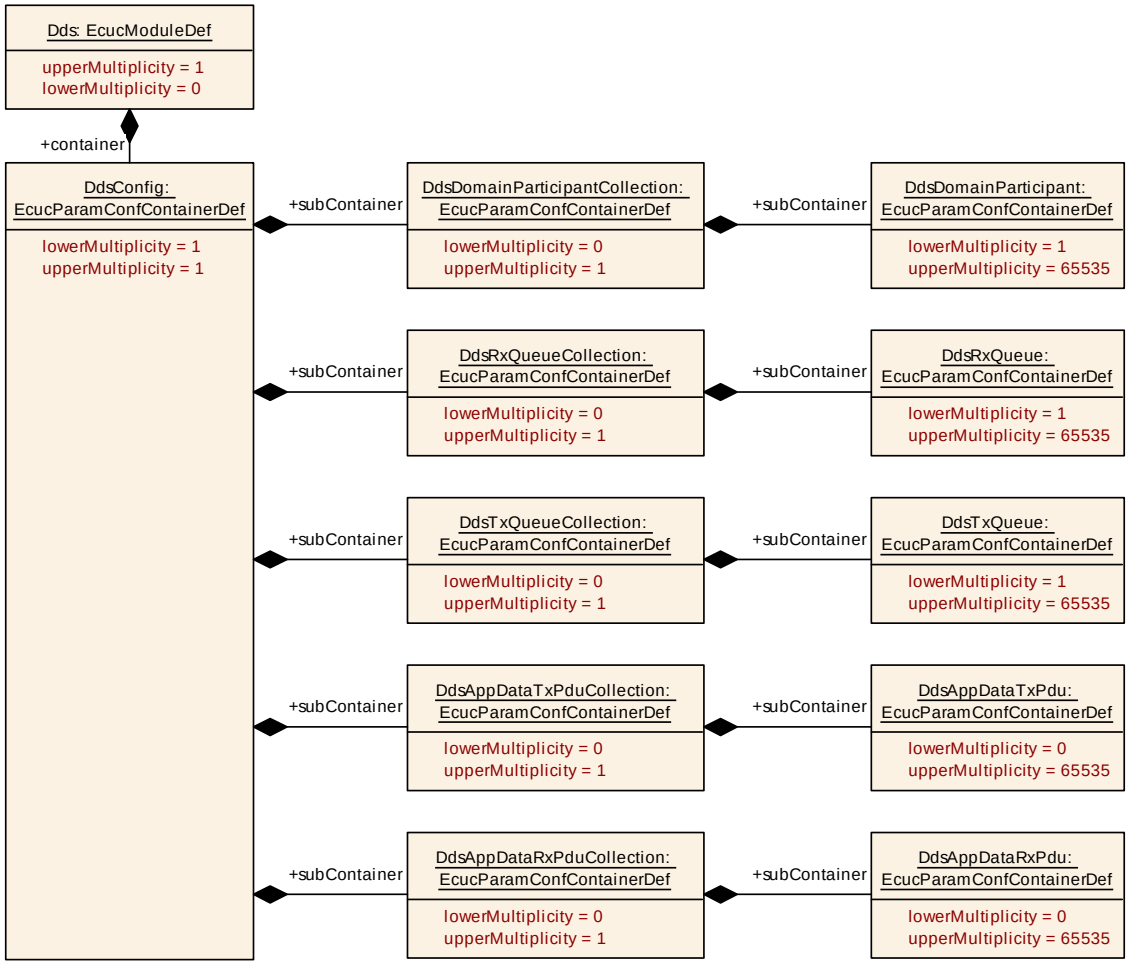

Figure 10.3: Dds Config

10.2.3.1 DdsAppDataPduCollection

The DdsAppDataTxPduCollection and DdsAppDataRxPduCollection containers model the pool of all the upper layer PDUs (respectively Tx and Rx) used for interaction between application layers and the Dds module. They are used just to have a unique definition points for all the upper layer PDUs (they are simply containers of containers).

In the picture below, the UML diagram of DdsAppDataTxPduCollection and DdsAppDataRxPduCollection is shown:

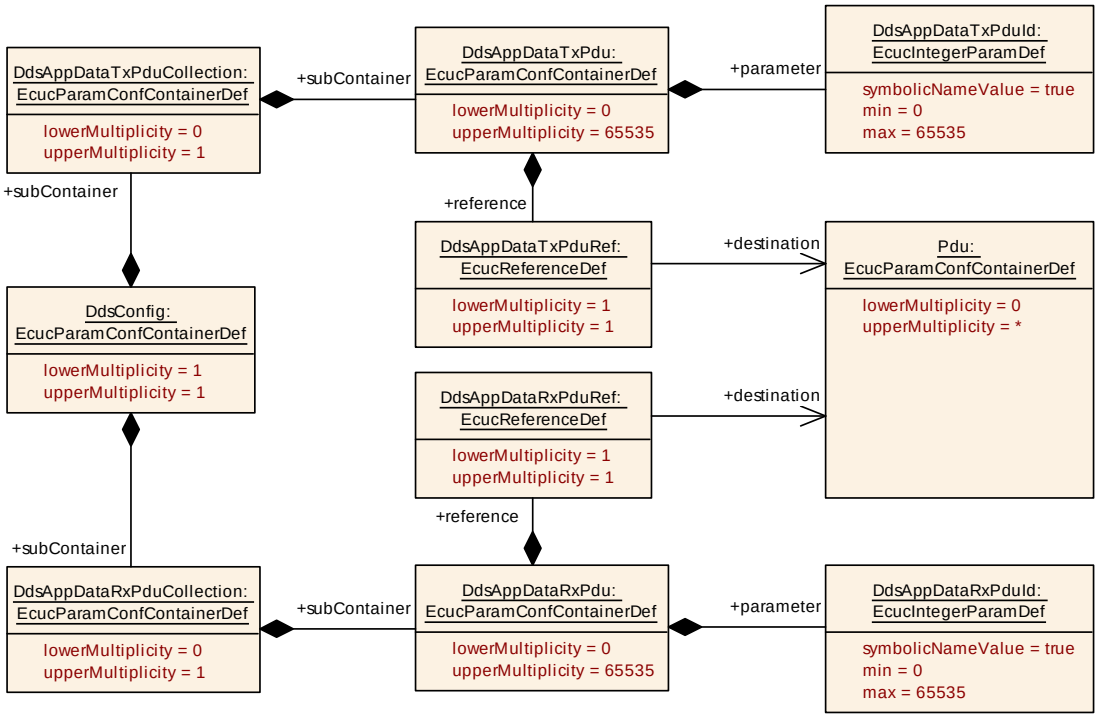

Figure 10.4: Dds Upper layer Pdus

10.2.3.1.1 DdsAppDataTxPduCollection

SWS Item	**[ECUC_Dds_00131]**		
Container Name	DdsAppDataTxPduCollection		
Parent Container	DdsConfig		
Description	Collection of upper layer Tx PDUs towards the application layer. **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 Containers		
Container Name	**Multiplicity**	**Scope / Dependency**
DdsAppDataTxPdu	0..65535	The upper layer PDU used to transmit data from Application to DDS itself. **Tags:** atp.Status=draft

10.2.3.1.1.1 DdsAppDataTxPdu

SWS Item	**[ECUC_Dds_00132]**		
Container Name	DdsAppDataTxPdu		
Parent Container	DdsAppDataTxPduCollection		
Description	The upper layer PDU used to transmit data from Application to DDS itself. **Tags:** atp.Status=draft		
Post-Build Variant Multiplicity	true		
Multiplicity Configuration Class	**Pre-compile time**	X	VARIANT-PRE-COMPILE
	Link time	–	
	Post-build time	X	VARIANT-POST-BUILD
Configuration Parameters			

SWS Item	**[ECUC_Dds_00133]**		
Parameter Name	DdsAppDataTxPduId		
Parent Container	DdsAppDataTxPdu		
Description	The current pdu local id. **Tags:** atp.Status=draft		
Multiplicity	1		
Type	EcucIntegerParamDef (Symbolic Name generated for this parameter)		
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: ECU		

SWS Item	**[ECUC_Dds_00134]**		
Parameter Name	DdsAppDataTxPduRef		
Parent Container	DdsAppDataTxPdu		
Description	The reference to a PDU in the global PDU structure described in the AUTOSAR ECU Configuration Specification. This reference will be used by the Dds module to derive the PDU Id. **Tags:** atp.Status=draft		
Multiplicity	1		
Type	Reference to Pdu		
Post-Build Variant Value	false		
Value Configuration Class	**Pre-compile time**	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: ECU		

No Included Containers

10.2.3.1.2 DdsAppDataRxPduCollection

SWS Item	[ECUC_Dds_00178]		
Container Name	DdsAppDataRxPduCollection		
Parent Container	DdsConfig		
Description	Collection of upper layer Rx PDUs towards the application layer. **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 Containers		
Container Name	**Multiplicity**	**Scope / Dependency**
DdsAppDataRxPdu	0..65535	The upper layer PDU used to send received data from DDS to Application. **Tags:** atp.Status=draft

10.2.3.1.2.1 DdsAppDataRxPdu

SWS Item	[ECUC_Dds_00135]		
Container Name	DdsAppDataRxPdu		
Parent Container	DdsAppDataRxPduCollection		
Description	The upper layer PDU used to send received data from DDS to Application. **Tags:** atp.Status=draft		
Post-Build Variant Multiplicity	true		
Multiplicity Configuration Class	**Pre-compile time**	X	VARIANT-PRE-COMPILE
	Link time	–	
	Post-build time	X	VARIANT-POST-BUILD
Configuration Parameters			

SWS Item	[ECUC_Dds_00136]		
Parameter Name	DdsAppDataRxPduId		
Parent Container	DdsAppDataRxPdu		
Description	The current pdu local id. **Tags:** atp.Status=draft		
Multiplicity	1		
Type	EcucIntegerParamDef (Symbolic Name generated for this parameter)		
Range	0 .. 65535		
Default value	–		
Post-Build Variant Value	false		
Value Configuration Class	**Pre-compile time**	X	All Variants
	Link time	–	

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	Post-build time	–	
Scope / Dependency	scope: ECU		

SWS Item	**[ECUC_Dds_00137]**		
Parameter Name	DdsAppDataRxPduRef		
Parent Container	DdsAppDataRxPdu		
Description	The reference to a PDU in the global PDU structure described in the AUTOSAR ECU Configuration Specification. This reference will be used by the Dds module to derive the PDU Id. **Tags:** atp.Status=draft		
Multiplicity	1		
Type	Reference to Pdu		
Post-Build Variant Value	false		
Value Configuration Class	**Pre-compile time**	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: ECU		

No Included Containers

10.2.3.2 DdsQueueCollection

The DdsTxQueueCollection and DdsRxQueueCollection containers model the pool of all the queue used respectively to store:

- DdsAppDataTxPdus from PduR (as upper) to DDS
- DdsRtpsDataRxPdus or DdsRtpsMulticastDataRxPdus from PduR (as lower) to DDS.

There are used just to have a unique definition points for all the queues (they are simply containers of containers).

10.2.3.2.1 DdsRxQueueCollection

The DdsRxQueueCollection container is used to collect DdsRxQueues.

SWS Item	**[ECUC_Dds_00180]**
Container Name	DdsRxQueueCollection
Parent Container	DdsConfig
Description	Collection of Rx queues. **Tags:** atp.Status=draft
Post-Build Variant Multiplicity	false

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Multiplicity Configuration Class	**Pre-compile time**	X	All Variants
	Link time	–	
	Post-build time	–	
Configuration Parameters			

Included Containers		
Container Name	**Multiplicity**	**Scope / Dependency**
DdsRxQueue	1..65535	The queue used to save DdsRtpsDataRxPdus from PduR (as lower) to DDS. One single queue can be used to save one or more DdsRtps DataRxPdus. **Tags:** atp.Status=draft

10.2.3.2.1.1 DdsRxQueue

The DdsRxQueue containiner models the queues used to store DdsRtpsDataRxPdus or DdsRtpsMulticastDataRxPdus from PduR (as lower) to DDS.

Note: One single queue can be used to save one or more DdsRtpsDataRxPdus or DdsRtpsMulticastDataRxPdu.

The processing of those queues is up to DDS middleware, according its own internal policies (QoS policies, DdsDataReaders subscribed etc.).

In the picture below, the UML diagram of DdsRxQueue template is shown:

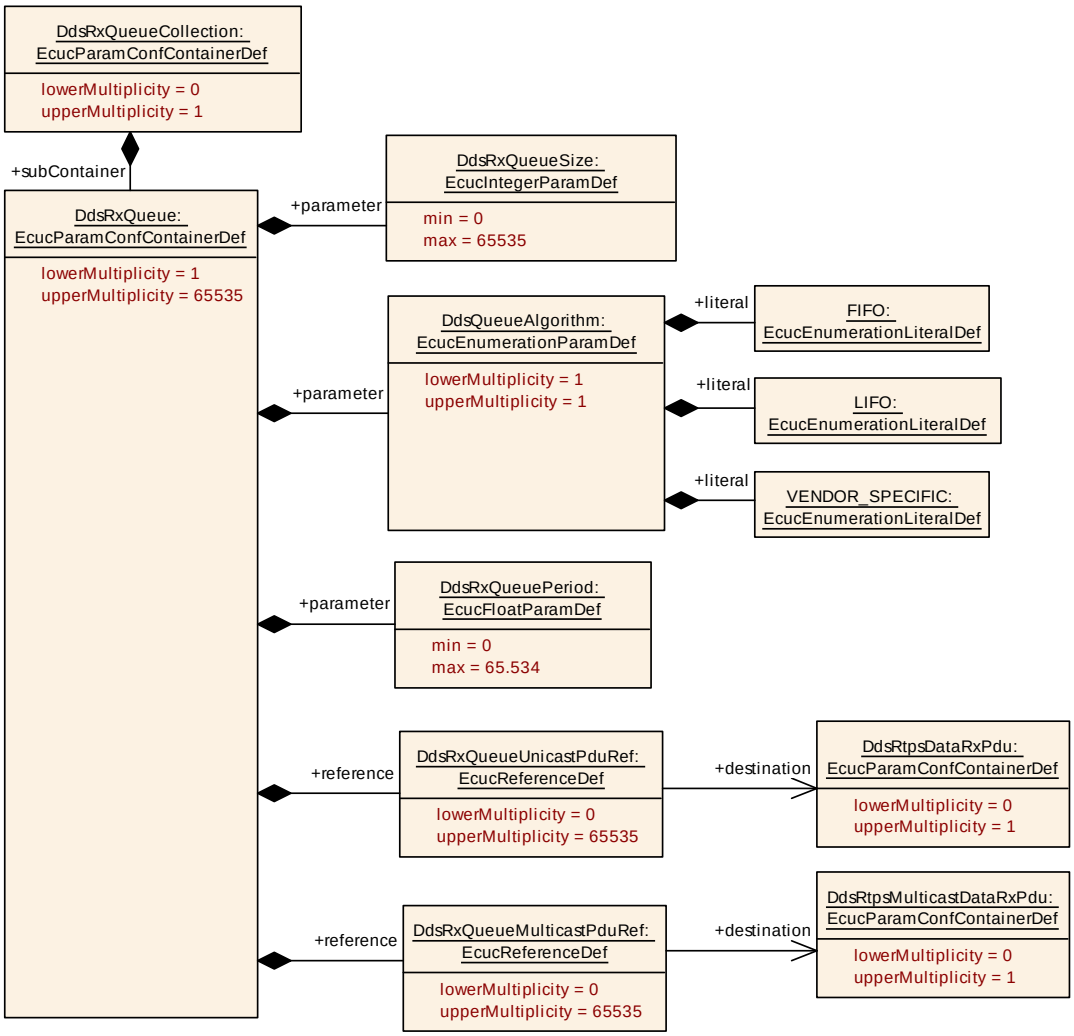

Figure 10.5: DdsRxQueue

SWS Item	**[ECUC_Dds_00167]**		
Container Name	DdsRxQueue		
Parent Container	DdsRxQueueCollection		
Description	The queue used to save DdsRtpsDataRxPdus from PduR (as lower) to DDS. One single queue can be used to save one or more DdsRtpsDataRxPdus. **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			

SWS Item	**[ECUC_Dds_00170]**
Parameter Name	DdsQueueAlgorithm
Parent Container	DdsRxQueue

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Description	Single queue scheduling algorithm **Tags:** atp.Status=draft		
Multiplicity	1		
Type	EcucEnumerationParamDef		
Range	FIFO	FIFO **Tags:** atp.Status=draft	
	LIFO	LIFO **Tags:** atp.Status=draft	
	VENDOR_SPECIFIC	VENDOR_SPECIFIC **Tags:** atp.Status=draft	
Post-Build Variant Value	false		
Value Configuration Class	**Pre-compile time**	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: ECU		

SWS Item	**[ECUC_Dds_00169]**		
Parameter Name	DdsRxQueuePeriod		
Parent Container	DdsRxQueue		
Description	Scheduling period of the single queue. Time given in seconds. **Tags:** atp.Status=draft		
Multiplicity	1		
Type	EcucFloatParamDef		
Range	[0 .. 65.534]		
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		

SWS Item	**[ECUC_Dds_00168]**		
Parameter Name	DdsRxQueueSize		
Parent Container	DdsRxQueue		
Description	Queue size in bytes **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: ECU		

SWS Item	[ECUC_Dds_00172]		
Parameter Name	DdsRxQueueMulticastPduRef		
Parent Container	DdsRxQueue		
Description	Reference to a reception multicast lower layer PDU to be stored in the given queue. **Tags:** atp.Status=draft		
Multiplicity	0..65535		
Type	Reference to DdsRtpsMulticastDataRxPdu		
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: ECU		

SWS Item	[ECUC_Dds_00171]		
Parameter Name	DdsRxQueueUnicastPduRef		
Parent Container	DdsRxQueue		
Description	Reference to a reception unicast lower layer Pdu to be stored in the given queue. **Tags:** atp.Status=draft		
Multiplicity	0..65535		
Type	Reference to DdsRtpsDataRxPdu		
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: ECU		

No Included Containers

10.2.3.2.2 DdsTxQueueCollection

The `DdsTxQueueCollection` container is used to collect `DdsTxQueue`s.

SWS Item	[ECUC_Dds_00181]
Container Name	DdsTxQueueCollection
Parent Container	DdsConfig

▽

△

Description	Collection of Tx queues. **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 Containers		
Container Name	**Multiplicity**	**Scope / Dependency**
DdsTxQueue	1..65535	The queue used to save DdsAppDataTxPdus from PduR (as upper) to DDS. One single queue can be used to save one or more DdsAppData TxPdus. **Tags:** atp.Status=draft

10.2.3.2.2.1 DdsTxQueue

The `DdsTxQueue` contaniner models the queues used to save `DdsAppDataTxPdu`s from PduR (as upper) to DDS.

Note: One single `DdsTxQueue` can be used to save one or more `DdsAppDataTx-Pdu`s.

The processing of those queues is up to DDS middleware, according its own internal policies (QoS policies, DdsDataWriters to be published etc.).

In the picture below, the UML diagram of `DdsTxQueue` template is shown:

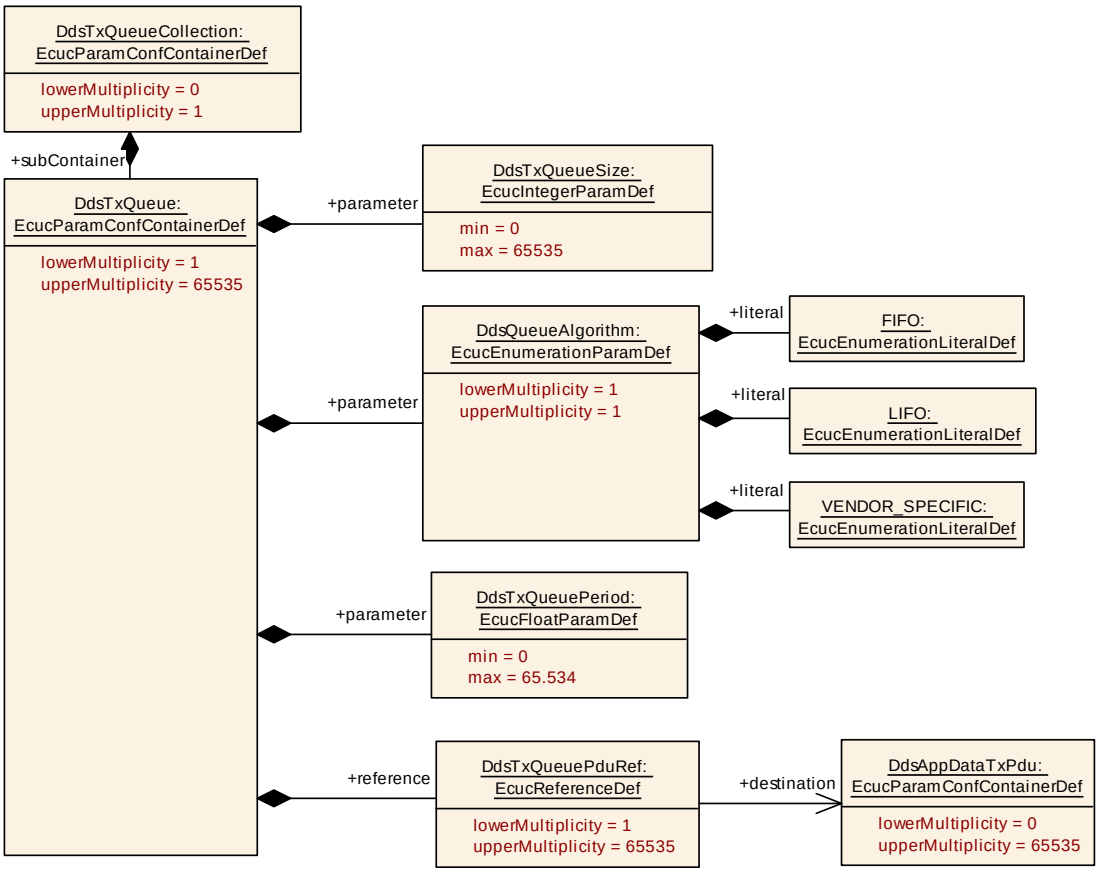

Figure 10.6: DdsTxQueue

SWS Item	**[ECUC_Dds_00173]**		
Container Name	DdsTxQueue		
Parent Container	DdsTxQueueCollection		
Description	The queue used to save DdsAppDataTxPdus from PduR (as upper) to DDS. One single queue can be used to save one or more DdsAppDataTxPdus. **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			

SWS Item	**[ECUC_Dds_00170]**
Parameter Name	DdsQueueAlgorithm
Parent Container	DdsTxQueue
Description	Single queue scheduling algorithm **Tags:** atp.Status=draft
Multiplicity	1
Type	EcucEnumerationParamDef

▽

△

Range	FIFO	FIFO **Tags:** atp.Status=draft	
	LIFO	LIFO **Tags:** atp.Status=draft	
	VENDOR_SPECIFIC	VENDOR_SPECIFIC **Tags:** atp.Status=draft	
Post-Build Variant Value	false		
Value Configuration Class	**Pre-compile time**	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: ECU		

SWS Item	**[ECUC_Dds_00175]**		
Parameter Name	DdsTxQueuePeriod		
Parent Container	DdsTxQueue		
Description	Scheduling period of the single queue. Time given in seconds. **Tags:** atp.Status=draft		
Multiplicity	1		
Type	EcucFloatParamDef		
Range	[0 .. 65.534]		
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		

SWS Item	**[ECUC_Dds_00174]**		
Parameter Name	DdsTxQueueSize		
Parent Container	DdsTxQueue		
Description	Queue size in bytes **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: ECU		

SWS Item	**[ECUC_Dds_00176]**
Parameter Name	DdsTxQueuePduRef
Parent Container	DdsTxQueue

▽

△

Description	Reference to a transmission upper layer PDU to be stored in the given queue. **Tags:** atp.Status=draft		
Multiplicity	1..65535		
Type	Reference to DdsAppDataTxPdu		
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: ECU		

No Included Containers

10.2.3.3 DdsDomainParticipantCollection

The `DdsDomainParticipantCollection` container models the pool of all the `DdsDomainParticipant`. It is used just to have a unique definition points for all the `DdsDomainParticipant`s (it is simply a container of containers).

In the picture below, the UML diagram of `DdsDomainParticipantCollection` container is shown.

SWS Item	**[ECUC_Dds_00179]**		
Container Name	DdsDomainParticipantCollection		
Parent Container	DdsConfig		
Description	Collection of DDS Domain Participants. **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 Containers		
Container Name	**Multiplicity**	**Scope / Dependency**
DdsDomainParticipant	1..65535	This container represents the configuration of one single "Domain Participant" to which the current node belongs. One node can belong to more than one Domain Participant. One node can communicate only with other nodes belonging to the same Domain Participant. **Tags:** atp.Status=draft

10.2.3.3.1 DdsDomainParticipant

In the picture below, the UML diagram of `DdsDomainParticipant` container is shown.

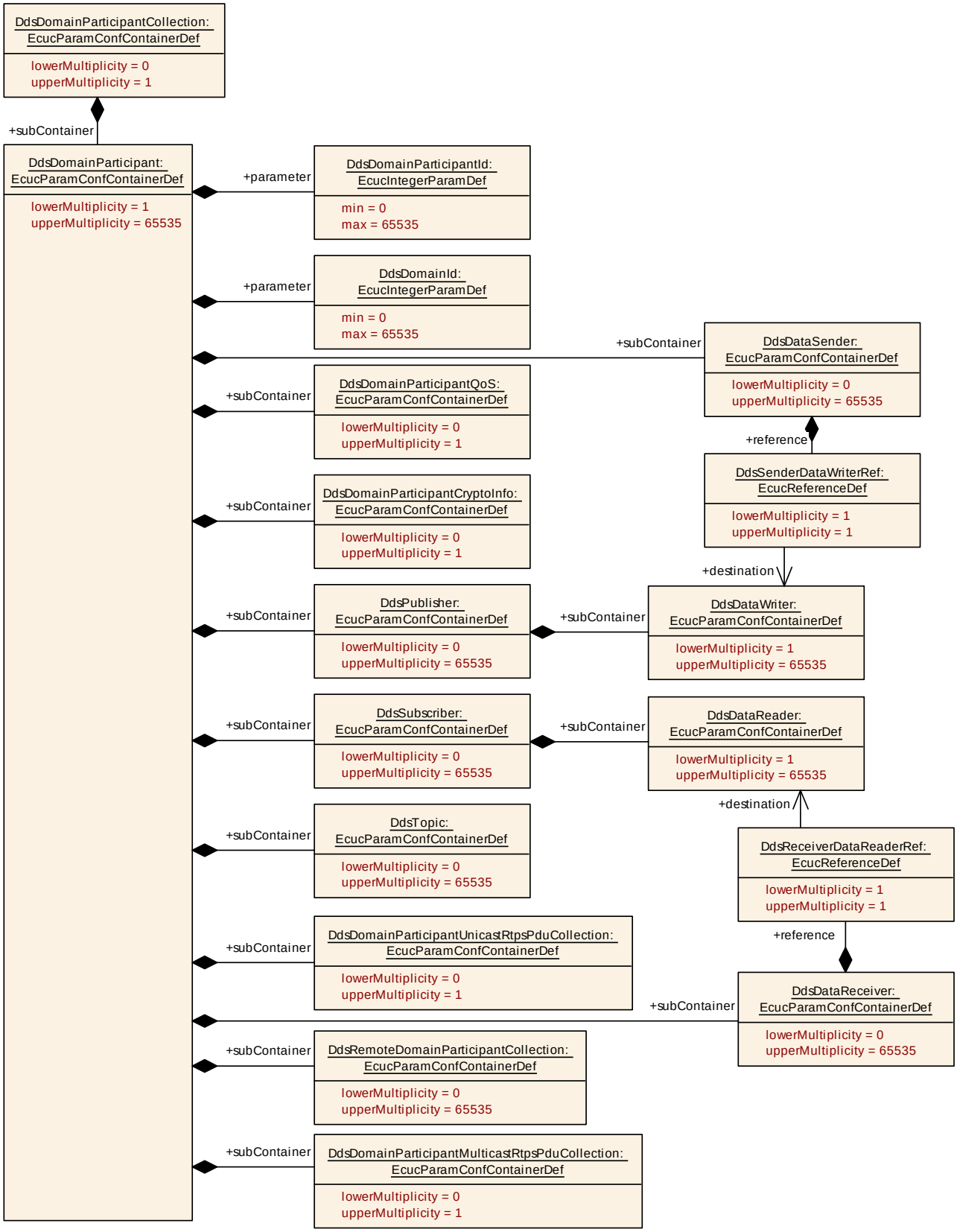

Figure 10.7: Dds Domain Participant

SWS Item	[ECUC_Dds_00012]		
Container Name	DdsDomainParticipant		
Parent Container	DdsDomainParticipantCollection		
Description	This container represents the configuration of one single "Domain Participant" to which the current node belongs. One node can belong to more than one Domain Participant. One node can communicate only with other nodes belonging to the same Domain Participant. **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			

SWS Item	[ECUC_Dds_00138]		
Parameter Name	DdsDomainId		
Parent Container	DdsDomainParticipant		
Description	The ID of the Domain to which this DDS node belongs. **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: ECU		

SWS Item	[ECUC_Dds_00014]		
Parameter Name	DdsDomainParticipantId		
Parent Container	DdsDomainParticipant		
Description	Identifier of a Dds Domain Participant. Only entities that belong to the same domain participant can communicate each other. **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: ECU dependency: inter-ECU - this value shall be shared between configurations.		

Included Containers		
Container Name	**Multiplicity**	**Scope / Dependency**
DdsDataReceiver	0..65535	Container useful to usability: it defines a DDS DataReader linked to a Sender/ReceiverInterface. **Tags:** atp.Status=draft
DdsDataSender	0..65535	Container useful to usability: it defines a DDS DataWriter linked to a Sender/ReceiverInterface. **Tags:** atp.Status=draft
DdsDomainParticipantCryptoInfo	0..1	This container contains the configuration of the Crypto service to be used by Entities belonging to this DomainParticipant. If it is not present, it means that not security mechanism is supported. **Tags:** atp.Status=draft
DdsDomainParticipantMulticastRtpsPduCollection	0..1	The pool of multicast lower layer PDUs towards lower network layers. **Tags:** atp.Status=draft
DdsDomainParticipantQoS	0..1	This container represents the configuration of QoS supported by the Dds DomainParticipant. **Tags:** atp.Status=draft
DdsDomainParticipantUnicastRtpsPduCollection	0..1	Collection of unicast lower layer PDUs towards lower network layers. **Tags:** atp.Status=draft
DdsPublisher	0..65535	This container represents the configuration of one Publisher. **Tags:** atp.Status=draft
DdsRemoteDomainParticipantCollection	0..65535	Collection of Remote Domain Participants. **Tags:** atp.Status=draft
DdsSubscriber	0..65535	This container represents the configuration of a Subscriber. **Tags:** atp.Status=draft
DdsTopic	0..65535	This container represents the configuration of one Topic. **Tags:** atp.Status=draft

10.2.3.3.1.1 DdsDomainParticipantUnicastRtpsPduCollection

The `DdsDomainParticipantUnicastRtpsPduCollection` container models the pool of all the unicast lower layer PDUs (both Tx and Rx) towards lower network layers.

It is used just to have a unique definition points for all the unicast lower layer PDUs (it is simply a container of containers).

In the picture below, the UML diagram of DdsDomainParticipantUnicastRtpsPduCollection container is shown.

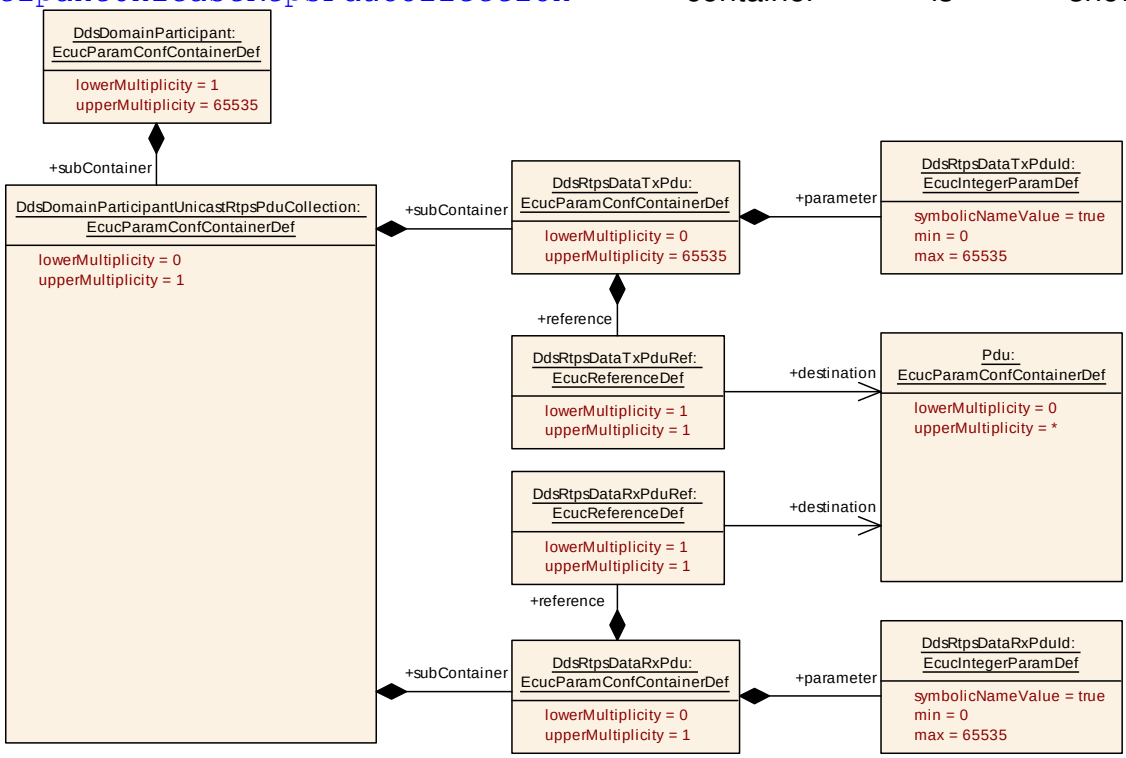

Figure 10.8: DdsDomainParticipantUnicastRtpsPduCollection

SWS Item	**[ECUC_Dds_00143]**		
Container Name	DdsDomainParticipantUnicastRtpsPduCollection		
Parent Container	DdsDomainParticipant		
Description	Collection of unicast lower layer PDUs towards lower network layers. **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 Containers		
Container Name	**Multiplicity**	**Scope / Dependency**
DdsRtpsDataRxPdu	0..1	The unicast reception lower layer pdu used to send data from the lower network layer to DDS itself. **Tags:** atp.Status=draft
DdsRtpsDataTxPdu	0..65535	The unicast transmission lower layer pdu used to transmit data from DDS to lower network layer. **Tags:** atp.Status=draft

DdsRtpsDataRxPdu

SWS Item	[ECUC_Dds_00148]		
Container Name	DdsRtpsDataRxPdu		
Parent Container	DdsDomainParticipantUnicastRtpsPduCollection		
Description	The unicast reception lower layer pdu used to send data from the lower network layer to DDS itself. **Tags:** atp.Status=draft		
Post-Build Variant Multiplicity	true		
Multiplicity Configuration Class	**Pre-compile time**	X	VARIANT-PRE-COMPILE
	Link time	–	
	Post-build time	X	VARIANT-POST-BUILD
Configuration Parameters			

SWS Item	[ECUC_Dds_00149]		
Parameter Name	DdsRtpsDataRxPduId		
Parent Container	DdsRtpsDataRxPdu		
Description	The current pdu local id. **Tags:** atp.Status=draft		
Multiplicity	1		
Type	EcucIntegerParamDef (Symbolic Name generated for this parameter)		
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: ECU		

SWS Item	[ECUC_Dds_00150]		
Parameter Name	DdsRtpsDataRxPduRef		
Parent Container	DdsRtpsDataRxPdu		
Description	The reference to a PDU in the global PDU structure described in the AUTOSAR ECU Configuration Specification. This reference will be used by the Dds module to derive the PDU Id. **Tags:** atp.Status=draft		
Multiplicity	1		
Type	Reference to Pdu		
Post-Build Variant Value	false		
Value Configuration Class	**Pre-compile time**	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: ECU		

No Included Containers

DdsRtpsDataTxPdu

SWS Item	[ECUC_Dds_00145]		
Container Name	DdsRtpsDataTxPdu		
Parent Container	DdsDomainParticipantUnicastRtpsPduCollection		
Description	The unicast transmission lower layer pdu used to transmit data from DDS to lower network layer. **Tags:** atp.Status=draft		
Post-Build Variant Multiplicity	true		
Multiplicity Configuration Class	**Pre-compile time**	X	VARIANT-PRE-COMPILE
	Link time	–	
	Post-build time	X	VARIANT-POST-BUILD
Configuration Parameters			

SWS Item	[ECUC_Dds_00146]		
Parameter Name	DdsRtpsDataTxPduId		
Parent Container	DdsRtpsDataTxPdu		
Description	The current pdu local id **Tags:** atp.Status=draft		
Multiplicity	1		
Type	EcucIntegerParamDef (Symbolic Name generated for this parameter)		
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: ECU		

SWS Item	[ECUC_Dds_00147]		
Parameter Name	DdsRtpsDataTxPduRef		
Parent Container	DdsRtpsDataTxPdu		
Description	The reference to a PDU in the global PDU structure described in the AUTOSAR ECU Configuration Specification. This reference will be used by the Dds module to derive the PDU Id. **Tags:** atp.Status=draft		
Multiplicity	1		
Type	Reference to Pdu		
Post-Build Variant Value	false		
Value Configuration Class	**Pre-compile time**	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: ECU		

No Included Containers

10.2.3.3.1.2 DdsDomainParticipantMulticastRtpsCollection

The DdsDomainParticipantMulticastRtpsPduCollection container models the pool of all the multicast lower layer PDUs (both Tx and Rx) towards lower network layers.

It is used just to have a unique definition points for all the Multicast lower layer PDUs (it is simply a container of containers).

In the picture below, the UML diagram of DdsDomainParticipantMulticastRtpsPduCollection container is shown.

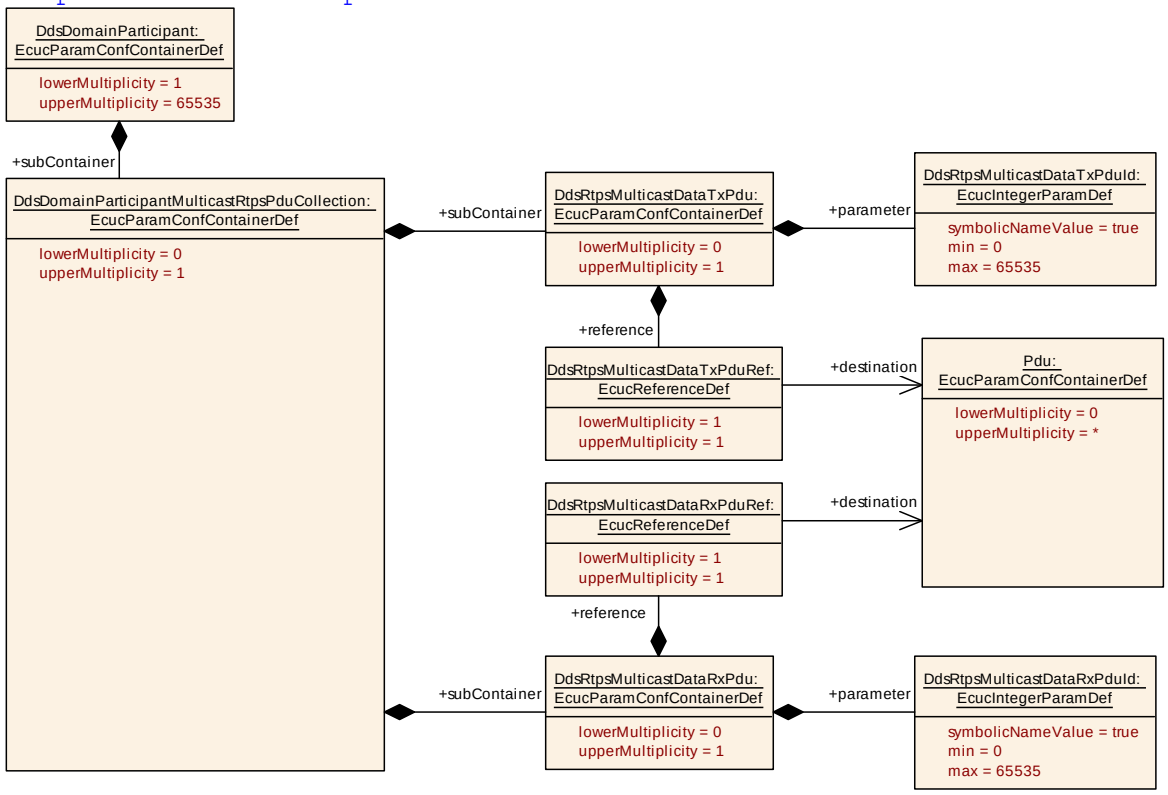

Figure 10.9: DdsDomainParticipantMulticastRtpsPduCollection

SWS Item	**[ECUC_Dds_00144]**		
Container Name	DdsDomainParticipantMulticastRtpsPduCollection		
Parent Container	DdsDomainParticipant		
Description	The pool of multicast lower layer PDUs towards lower network layers. **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 Containers		
Container Name	**Multiplicity**	**Scope / Dependency**
DdsRtpsMulticastDataRxPdu	0..1	The multicast reception lower layer pdu used to send data from the lower network layer to DDS itself. **Tags:** atp.Status=draft
DdsRtpsMulticastDataTxPdu	0..1	The multicast lower layer transmission PDU used to transmit data from DDS to lower network layer. **Tags:** atp.Status=draft

DdsRtpsMulticastDataTxPdu

SWS Item	**[ECUC_Dds_00151]**		
Container Name	DdsRtpsMulticastDataTxPdu		
Parent Container	DdsDomainParticipantMulticastRtpsPduCollection		
Description	The multicast lower layer transmission PDU used to transmit data from DDS to lower network layer. **Tags:** atp.Status=draft		
Post-Build Variant Multiplicity	true		
Multiplicity Configuration Class	**Pre-compile time**	X	VARIANT-PRE-COMPILE
	Link time	–	
	Post-build time	X	VARIANT-POST-BUILD
Configuration Parameters			

SWS Item	**[ECUC_Dds_00152]**		
Parameter Name	DdsRtpsMulticastDataTxPduId		
Parent Container	DdsRtpsMulticastDataTxPdu		
Description	The current pdu local id **Tags:** atp.Status=draft		
Multiplicity	1		
Type	EcucIntegerParamDef (Symbolic Name generated for this parameter)		
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: ECU		

SWS Item	**[ECUC_Dds_00153]**
Parameter Name	DdsRtpsMulticastDataTxPduRef
Parent Container	DdsRtpsMulticastDataTxPdu
Description	The reference to a PDU in the global PDU structure described in the AUTOSAR ECU Configuration Specification. This reference will be used by the Dds module to derive the PDU Id. **Tags:** atp.Status=draft
Multiplicity	1
Type	Reference to Pdu
Post-Build Variant Value	false

△

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

No Included Containers

DdsRtpsMulticastDataRxPdu

SWS Item	**[ECUC_Dds_00154]**		
Container Name	DdsRtpsMulticastDataRxPdu		
Parent Container	DdsDomainParticipantMulticastRtpsPduCollection		
Description	The multicast reception lower layer pdu used to send data from the lower network layer to DDS itself. **Tags:** atp.Status=draft		
Post-Build Variant Multiplicity	true		
Multiplicity Configuration Class	**Pre-compile time**	X	VARIANT-PRE-COMPILE
	Link time	–	
	Post-build time	X	VARIANT-POST-BUILD
Configuration Parameters			

SWS Item	**[ECUC_Dds_00155]**		
Parameter Name	DdsRtpsMulticastDataRxPduId		
Parent Container	DdsRtpsMulticastDataRxPdu		
Description	The current pdu local id. **Tags:** atp.Status=draft		
Multiplicity	1		
Type	EcucIntegerParamDef (Symbolic Name generated for this parameter)		
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: ECU		

SWS Item	**[ECUC_Dds_00156]**
Parameter Name	DdsRtpsMulticastDataRxPduRef
Parent Container	DdsRtpsMulticastDataRxPdu
Description	The reference to a PDU in the global PDU structure described in the AUTOSAR ECU Configuration Specification. This reference will be used by the Dds module to derive the PDU Id. **Tags:** atp.Status=draft
Multiplicity	1
Type	Reference to Pdu
Post-Build Variant Value	false

▽

△

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

No Included Containers

10.2.3.3.1.3 DdsDomainParticipantQoS

SWS Item	**[ECUC_Dds_00013]**		
Container Name	DdsDomainParticipantQoS		
Parent Container	DdsDomainParticipant		
Description	This container represents the configuration of QoS supported by the Dds Domain Participant. **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 Containers		
Container Name	**Multiplicity**	**Scope / Dependency**
DdsEntityFactory	0..1	If present, this container indicates that Dds ENTITY_FACTORY QoS is supported by this DomainParticipant. **Tags:** atp.Status=draft
DdsUserData	0..1	If present, this container indicates that Dds USER_DATA QoS is supported by this DomainParticipant. **Tags:** atp.Status=draft

DdsUserData For description of this subcontainer, please refer to paragraph 10.2.3.4.1

DdsEntityFactory For description of this subcontainer, please refer to paragraph 10.2.3.4.20

10.2.3.3.1.4 DdsDomainParticipantCryptoInfo

In the picture below, the UML diagram of DdsDomainParticipantCryptoInfo container is shown

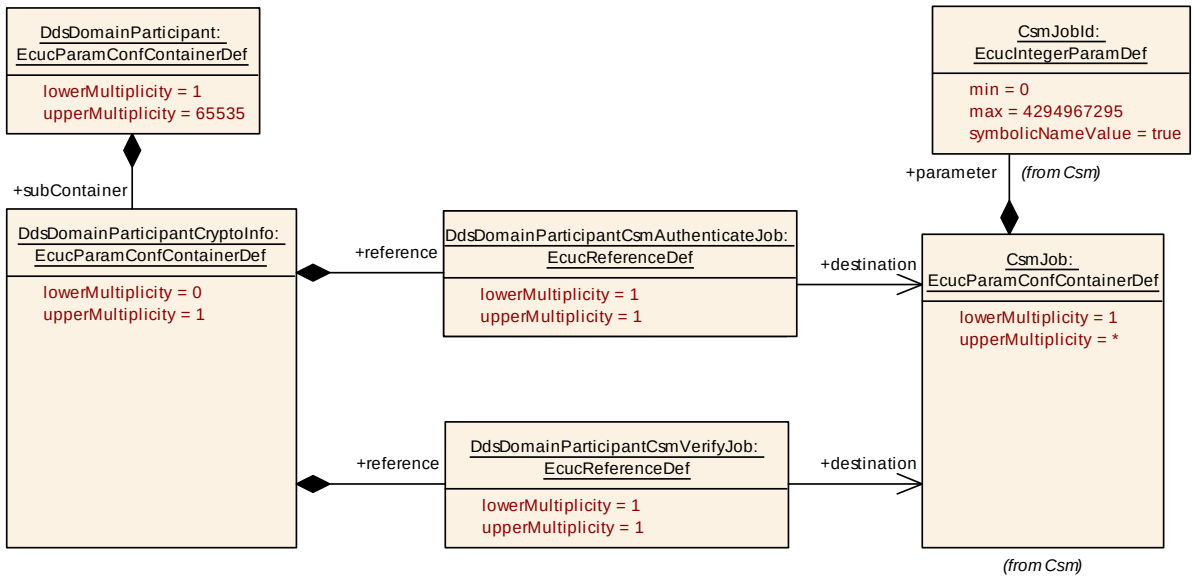

Figure 10.10: Dds DomainParticipant Crypto Info

SWS Item	**[ECUC_Dds_00015]**		
Container Name	DdsDomainParticipantCryptoInfo		
Parent Container	DdsDomainParticipant		
Description	This container contains the configuration of the Crypto service to be used by Entities belonging to this DomainParticipant. If it is not present, it means that not security mechanism is supported. **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			

SWS Item	**[ECUC_Dds_00020]**		
Parameter Name	DdsDomainParticipantCsmAuthenticateJob		
Parent Container	DdsDomainParticipantCryptoInfo		
Description	The reference to the CSM job to be used to authenticate data. **Tags:** atp.Status=draft		
Multiplicity	1		
Type	Reference to CsmJob		
Post-Build Variant Value	false		
Value Configuration Class	**Pre-compile time**	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: ECU		

SWS Item	[ECUC_Dds_00021]		
Parameter Name	DdsDomainParticipantCsmVerifyJob		
Parent Container	DdsDomainParticipantCryptoInfo		
Description	The reference to the CSM job to be used to verify data. **Tags:** atp.Status=draft		
Multiplicity	1		
Type	Reference to CsmJob		
Post-Build Variant Value	false		
Value Configuration Class	**Pre-compile time**	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: ECU		

No Included Containers

10.2.3.3.1.5 DdsDataSender

The `DdsDataSender` is used to model a DdsWriter linked to a Sender/Receiver interface.

SWS Item	[ECUC_Dds_00157]		
Container Name	DdsDataSender		
Parent Container	DdsDomainParticipant		
Description	Container useful to usability: it defines a DDS DataWriter linked to a Sender/Receiver Interface. **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			

SWS Item	[ECUC_Dds_00158]		
Parameter Name	DdsSenderDataWriterRef		
Parent Container	DdsDataSender		
Description	Reference to the dataWriter used by the sender **Tags:** atp.Status=draft		
Multiplicity	1		
Type	Reference to DdsDataWriter		
Post-Build Variant Value	false		
Value Configuration Class	**Pre-compile time**	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: ECU		

No Included Containers

10.2.3.3.1.6 DdsDataReceiver

The DdsDataReceiver is used to model a DdsReader linked to a Sender/Receiver interface.

SWS Item	**[ECUC_Dds_00159]**		
Container Name	DdsDataReceiver		
Parent Container	DdsDomainParticipant		
Description	Container useful to usability: it defines a DDS DataReader linked to a Sender/Receiver Interface. **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			

SWS Item	**[ECUC_Dds_00160]**		
Parameter Name	DdsReceiverDataReaderRef		
Parent Container	DdsDataReceiver		
Description	Reference to the dataReader used by the receiver **Tags:** atp.Status=draft		
Multiplicity	1		
Type	Reference to DdsDataReader		
Post-Build Variant Value	false		
Value Configuration Class	**Pre-compile time**	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: ECU		

No Included Containers

10.2.3.3.1.7 DdsPublisher

In the picture below, the UML diagram of DdsPublisher container is shown

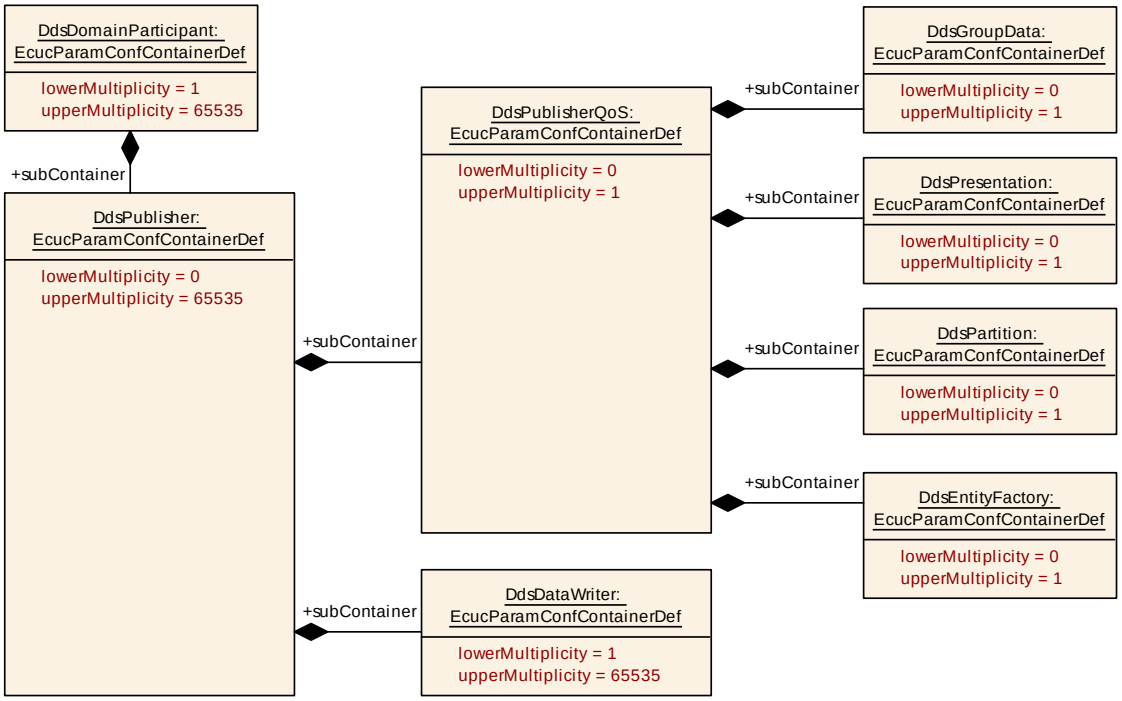

Figure 10.11: Dds Publisher

SWS Item	**[ECUC_Dds_00016]**		
Container Name	DdsPublisher		
Parent Container	DdsDomainParticipant		
Description	This container represents the configuration of one Publisher. **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 Containers		
Container Name	**Multiplicity**	**Scope / Dependency**
DdsDataWriter	1..65535	This container represents the configuration of one data writer. One publisher can refer to one or more writer, but a writer can belong to one single publisher. **Tags:** atp.Status=draft
DdsPublisherQoS	0..1	This container represents the configuration of QoS Profiles related to the current Dds Publisher. **Tags:** atp.Status=draft

DdsPublisherQoS

SWS Item	**[ECUC_Dds_00022]**
Container Name	DdsPublisherQoS
Parent Container	DdsPublisher

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Description	This container represents the configuration of QoS Profiles related to the current Dds Publisher. **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 Containers		
Container Name	**Multiplicity**	**Scope / Dependency**
DdsEntityFactory	0..1	If present, this container indicates that Dds ENTITY_FACTORY QoS is supported. **Tags:** atp.Status=draft
DdsGroupData	0..1	If present, this container indicates that Dds GROUP_DATA QoS is supported. **Tags:** atp.Status=draft
DdsPartition	0..1	If present, this container indicates that Dds PARTITION QoS is supported. **Tags:** atp.Status=draft
DdsPresentation	0..1	If present, this container indicates that Dds PRESENTATION Qo S is supported. **Tags:** atp.Status=draft

DdsGroupData For description of this subcontainer, please refer to paragraph 10.2.3.4.3

DdsPresentation For description of this subcontainer, please refer to paragraph 10.2.3.4.6

DdsPartition For description of this subcontainer, please refer to paragraph 10.2.3.4.13

DdsEntityFactory For description of this subcontainer, please refer to paragraph 10.2.3.4.20

DdsDataWriter

In the picture below, the UML diagram of `DdsDataWriter` container is shown

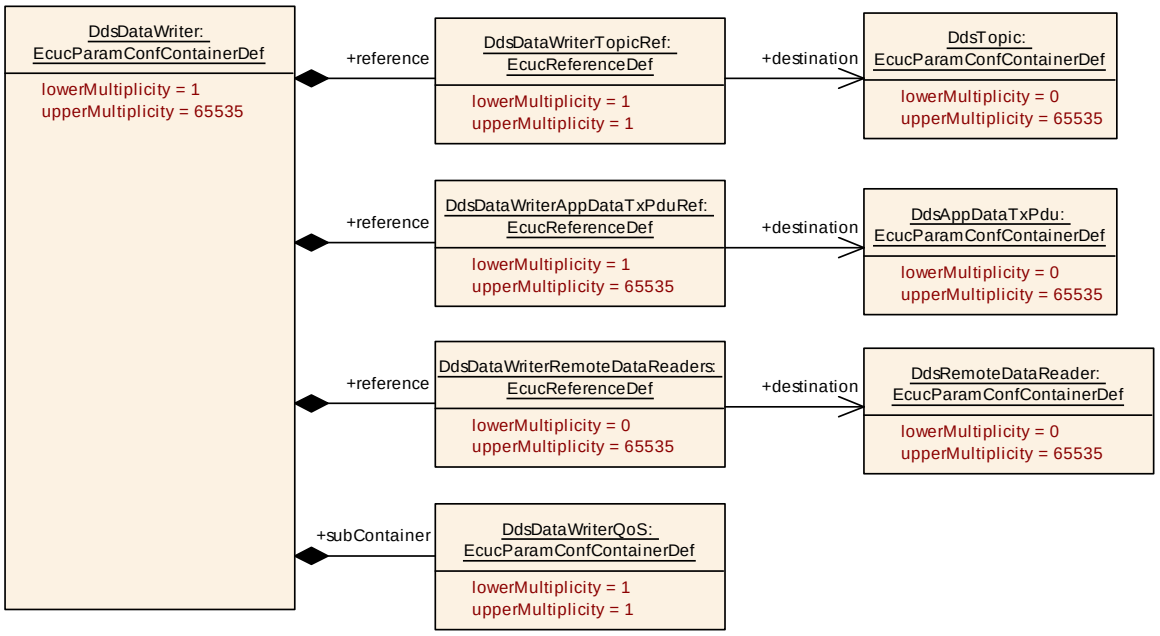

Figure 10.12: Dds DataWriter

SWS Item	**[ECUC_Dds_00023]**		
Container Name	DdsDataWriter		
Parent Container	DdsPublisher		
Description	This container represents the configuration of one data writer. One publisher can refer to one or more writer, but a writer can belong to one single publisher. **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			

SWS Item	**[ECUC_Dds_00139]**		
Parameter Name	DdsDataWriterAppDataTxPduRef		
Parent Container	DdsDataWriter		
Description	This reference refers to the DdsAppDataTxPdu which is used by the upper layer of the Dds module to transfer data which is requested to be transmitted on the network as DDS serialized data. **Tags:** atp.Status=draft		
Multiplicity	1..65535		
Type	Reference to DdsAppDataTxPdu		
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	–	

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	Post-build time	–	
Scope / Dependency	scope: ECU		

SWS Item	**[ECUC_Dds_00140]**		
Parameter Name	DdsDataWriterRemoteDataReaders		
Parent Container	DdsDataWriter		
Description	Reference to the remote DdsDataReaders that the current DdsDataWriters has to send data to. For each remote DdsDataReader configured, the local DdsDataWriter shall send data by using the DdsDataReaderRemotePdu configured for the given remote DataReader. **Tags:** atp.Status=draft		
Multiplicity	0..65535		
Type	Reference to DdsRemoteDataReader		
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: ECU		

SWS Item	**[ECUC_Dds_00029]**		
Parameter Name	DdsDataWriterTopicRef		
Parent Container	DdsDataWriter		
Description	This reference selects the Topic on which the current Dds Writer wants to publish. **Tags:** atp.Status=draft		
Multiplicity	1		
Type	Reference to DdsTopic		
Post-Build Variant Value	false		
Value Configuration Class	**Pre-compile time**	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: ECU		

Included Containers		
Container Name	**Multiplicity**	**Scope / Dependency**
DdsDataWriterQoS	1	This container represents the configuration of QoS Profiles related to the current DdsDataWriter. **Tags:** atp.Status=draft

DdsDataWriterQoS

SWS Item	**[ECUC_Dds_00028]**
Container Name	DdsDataWriterQoS
Parent Container	DdsDataWriter, DdsRemoteDataWriter

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Description	This container represents the configuration of QoS Profiles related to the current Dds DataWriter. **Tags:** atp.Status=draft
Configuration Parameters	

Included Containers		
Container Name	**Multiplicity**	**Scope / Dependency**
DdsDeadline	0..1	If present, this container indicates that Dds DEADLINE QoS is supported. **Tags:** atp.Status=draft
DdsDestinationOrder	0..1	If present, this container indicates that Dds DESTINATION_ ORDER QoS is supported. **Tags:** atp.Status=draft
DdsDurability	0..1	If present, this container indicates that Dds DURABILITY QoS is supported. **Tags:** atp.Status=draft
DdsDurabilityService	0..1	If present, this container indicates that Dds DURABILITY_ SERVICE QoS is supported. **Tags:** atp.Status=draft
DdsHistory	0..1	If present, this container indicates that Dds HISTORY QoS is supported. **Tags:** atp.Status=draft
DdsLatencyBudget	0..1	If present, this container indicates that Dds LATENCY_BUDGET QoS is supported. **Tags:** atp.Status=draft
DdsLifespan	0..1	If present, this container indicates that Dds LIFESPAN QoS is supported. **Tags:** atp.Status=draft
DdsLiveliness	0..1	If present, this container indicates that Dds LIVELINESS QoS is supported. **Tags:** atp.Status=draft
DdsOwnership	0..1	If present, this container indicates that Dds OWNERSHIP QoS is supported. **Tags:** atp.Status=draft
DdsOwnershipStrength	0..1	Describes the DDS [1] OWNERSHIP_STRENGTH QoS policy. **Tags:** atp.Status=draft
DdsReliability	0..1	If present, this container indicates that Dds RELIABILITY QoS is supported. **Tags:** atp.Status=draft
DdsResourceLimits	0..1	If present, this container indicates that Dds RESOURCE_LIMITS QoS is supported. **Tags:** atp.Status=draft
DdsTransportPriority	0..1	If present, this container indicates that Dds TRANSPORT_ PRIORITY QoS is supported. **Tags:** atp.Status=draft
DdsUserData	0..1	If present, this container indicates that Dds USER_DATA QoS is supported. **Tags:** atp.Status=draft
DdsWriterDataLifecycle	0..1	Describes the DDS [1] WRITER_DATA_LIFECYCLE QoS policy. **Tags:** atp.Status=draft

DdsUserData For description of this subcontainer, please refer to paragraph 10.2.3.4.1

DdsDurability For description of this subcontainer, please refer to paragraph 10.2.3.4.4

DdsDurabilityService For description of this subcontainer, please refer to paragraph 10.2.3.4.5

DdsDeadline For description of this subcontainer, please refer to paragraph 10.2.3.4.7

DdsLatencyBudget For description of this subcontainer, please refer to paragraph 10.2.3.4.8

DdsOwnership For description of this subcontainer, please refer to paragraph 10.2.3.4.9

DdsOwnershipStrength For description of this subcontainer, please refer to paragraph 10.2.3.4.10

DdsLiveliness For description of this subcontainer, please refer to paragraph 10.2.3.4.11

DdsReliability For description of this subcontainer, please refer to paragraph 10.2.3.4.14

DdsTransportPriority For description of this subcontainer, please refer to paragraph 10.2.3.4.15

DdsLifespan For description of this subcontainer, please refer to paragraph 10.2.3.4.16

DdsDestinationOrder For description of this subcontainer, please refer to paragraph 10.2.3.4.17

DdsHistory For description of this subcontainer, please refer to paragraph 10.2.3.4.18

DdsResourceLimits For description of this subcontainer, please refer to paragraph 10.2.3.4.19

DdsWriterDataLifecycle For description of this subcontainer, please refer to paragraph 10.2.3.4.21

10.2.3.3.1.8 DdsSubscriber

In the picture below, the UML diagram of DdsSubscriber container is shown

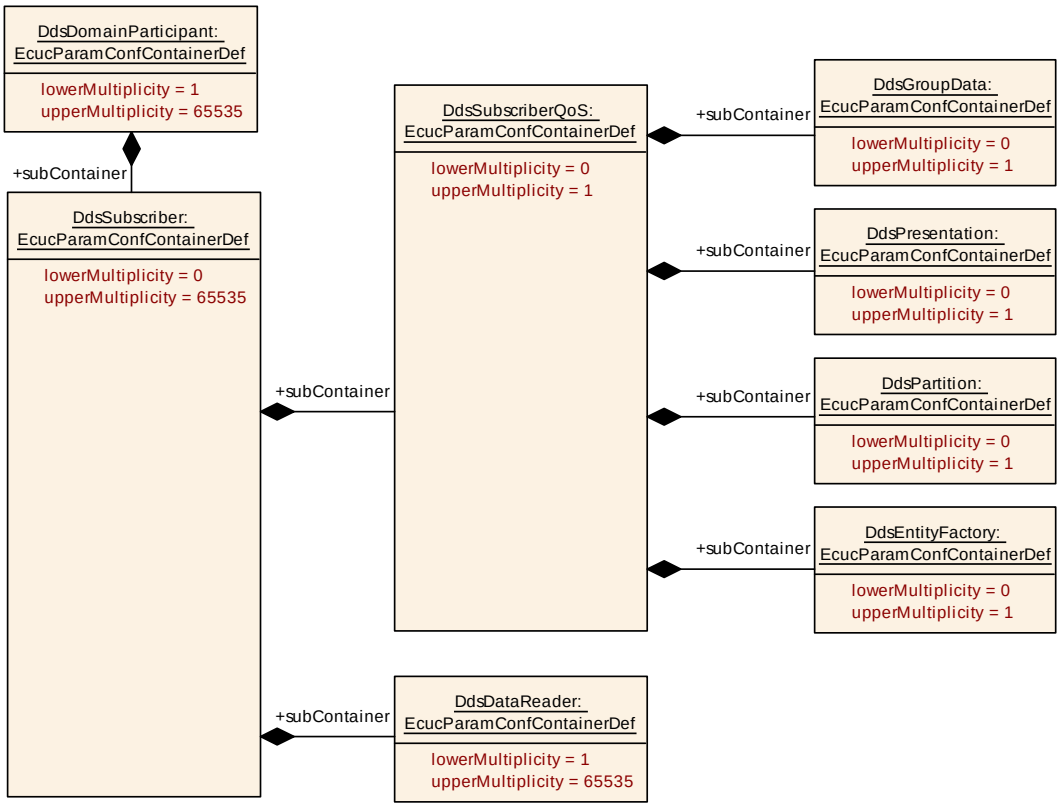

Figure 10.13: Dds Subscriber

SWS Item	**[ECUC_Dds_00017]**		
Container Name	DdsSubscriber		
Parent Container	DdsDomainParticipant		
Description	This container represents the configuration of a Subscriber. **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 Containers		
Container Name	**Multiplicity**	**Scope / Dependency**
DdsDataReader	1..65535	This container represents the configuration of one data reader. One subscriber can refer to one or more readers, but a reader can belong to one single subscriber. **Tags:** atp.Status=draft
DdsSubscriberQoS	0..1	This container represents the configuration of QoS Profiles related to the current Dds Subscriber. **Tags:** atp.Status=draft

DdsSubscriberQoS

SWS Item	[ECUC_Dds_00074]		
Container Name	DdsSubscriberQoS		
Parent Container	DdsSubscriber		
Description	This container represents the configuration of QoS Profiles related to the current Dds Subscriber. **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 Containers		
Container Name	**Multiplicity**	**Scope / Dependency**
DdsEntityFactory	0..1	If present, this container indicates that Dds ENTITY_FACTORY QoS is supported. **Tags:** atp.Status=draft
DdsGroupData	0..1	If present, this container indicates that Dds GROUP_DATA QoS is supported. **Tags:** atp.Status=draft
DdsPartition	0..1	If present, this container indicates that Dds PARTITION QoS is supported. **Tags:** atp.Status=draft
DdsPresentation	0..1	If present, this container indicates that Dds PRESENTATION QoS is supported. **Tags:** atp.Status=draft

DdsGroupData For description of this subcontainer, please refer to paragraph 10.2.3.4.3

DdsPresentation For description of this subcontainer, please refer to paragraph 10.2.3.4.6

DdsPartition For description of this subcontainer, please refer to paragraph 10.2.3.4.13

DdsEntityFactory For description of this subcontainer, please refer to paragraph 10.2.3.4.20

DdsDataReader

In the picture below, the UML diagram of DdsDataReader container is shown

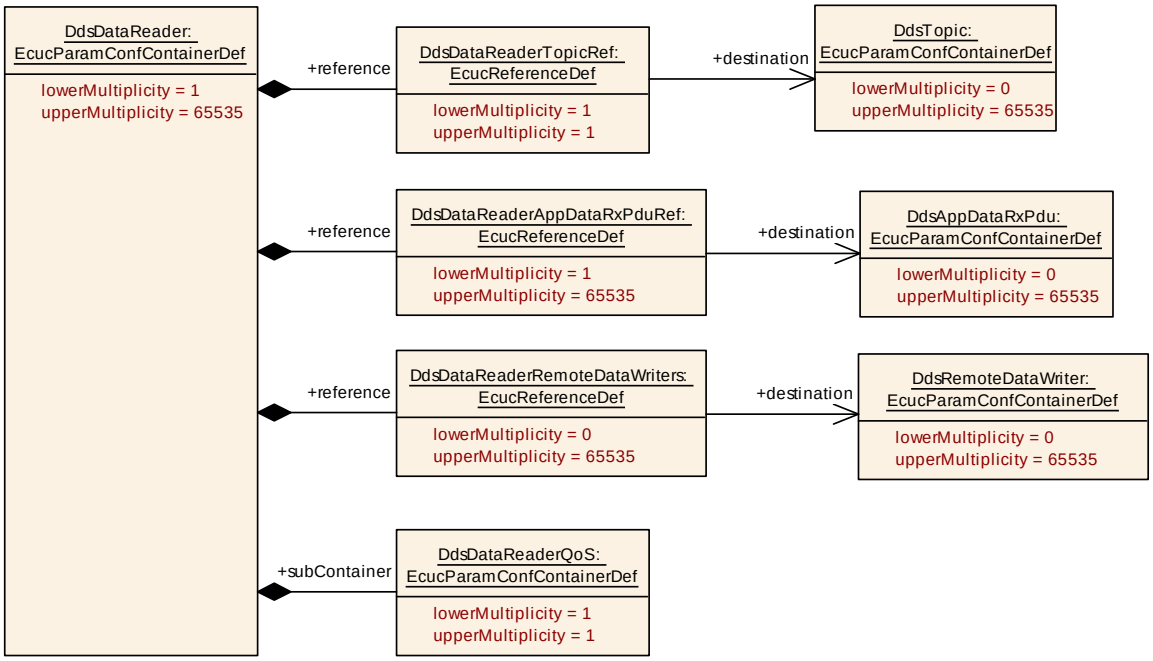

Figure 10.14: Dds DataReader

SWS Item	**[ECUC_Dds_00075]**		
Container Name	DdsDataReader		
Parent Container	DdsSubscriber		
Description	This container represents the configuration of one data reader. One subscriber can refer to one or more readers, but a reader can belong to one single subscriber. **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			

SWS Item	**[ECUC_Dds_00141]**		
Parameter Name	DdsDataReaderAppDataRxPduRef		
Parent Container	DdsDataReader		
Description	This reference refers to the DdsAppDataRxPdu which is used by Dds module to forward de-serialized DDS data to the upper layer of the DDS module. **Tags:** atp.Status=draft		
Multiplicity	1..65535		
Type	Reference to DdsAppDataRxPdu		
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: ECU		

SWS Item	**[ECUC_Dds_00142]**		
Parameter Name	DdsDataReaderRemoteDataWriters		
Parent Container	DdsDataReader		
Description	Reference to the remote DdsDataWriters from which the current DdsDataReaders would like to receive data. Data from a remote writer is received by using the DdsRemoteDataWriterPdu referred by the given DdsRemoteDataWriter. **Tags:** atp.Status=draft		
Multiplicity	0..65535		
Type	Reference to DdsRemoteDataWriter		
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: ECU		

SWS Item	**[ECUC_Dds_00076]**		
Parameter Name	DdsDataReaderTopicRef		
Parent Container	DdsDataReader		
Description	This reference selects the Topic on which the current Dds Reader wants to publish. **Tags:** atp.Status=draft		
Multiplicity	1		
Type	Reference to DdsTopic		
Post-Build Variant Value	false		
Value Configuration Class	**Pre-compile time**	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: ECU		

Included Containers		
Container Name	**Multiplicity**	**Scope / Dependency**
DdsDataReaderQoS	1	This container represents the configuration of QoS Profiles related to the current DdsDataReader. **Tags:** atp.Status=draft

DdsDataReaderQoS

SWS Item	**[ECUC_Dds_00079]**
Container Name	DdsDataReaderQoS
Parent Container	DdsDataReader, DdsRemoteDataReader

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Description	This container represents the configuration of QoS Profiles related to the current Dds DataReader. **Tags:** atp.Status=draft
Configuration Parameters	

Included Containers		
Container Name	**Multiplicity**	**Scope / Dependency**
DdsDeadline	0..1	If present, this container indicates that Dds DEADLINE QoS is supported. **Tags:** atp.Status=draft
DdsDestinationOrder	0..1	If present, this container indicates that Dds DESTINATION_ ORDER QoS is supported. **Tags:** atp.Status=draft
DdsHistory	0..1	If present, this container indicates that Dds HISTORY QoS is supported. **Tags:** atp.Status=draft
DdsLatencyBudget	0..1	If present, this container indicates that Dds LATENCY_BUDGET QoS is supported. **Tags:** atp.Status=draft
DdsLiveliness	0..1	If present, this container indicates that Dds LIVELINESS QoS is supported. **Tags:** atp.Status=draft
DdsOwnership	0..1	If present, this container indicates that Dds OWNERSHIP QoS is supported. **Tags:** atp.Status=draft
DdsReaderDataLifecycle	0..1	Describes the DDS [1] READER_DATA_LIFECYCLE QoS policy. **Tags:** atp.Status=draft
DdsReliability	0..1	If present, this container indicates that Dds RELIABILITY QoS is supported. **Tags:** atp.Status=draft
DdsResourceLimits	0..1	If present, this container indicates that Dds RESOURCE_LIMITS QoS is supported. **Tags:** atp.Status=draft
DdsTimeBasedFilter	0..1	Describes the DDS [1] TIME_BASED_FILTER QoS policy. **Tags:** atp.Status=draft
DdsUserData	0..1	If present, this container indicates that Dds USER_DATA QoS is supported. **Tags:** atp.Status=draft

DdsUserData For description of this subcontainer, please refer to paragraph 10.2.3.4.1

DdsDurability For description of this subcontainer, please refer to paragraph 10.2.3.4.4

DdsDeadline For description of this subcontainer, please refer to paragraph 10.2.3.4.7

DdsLatencyBudget For description of this subcontainer, please refer to paragraph 10.2.3.4.8

DdsOwnership For description of this subcontainer, please refer to paragraph 10.2.3.4.9

DdsLiveliness For description of this subcontainer, please refer to paragraph 10.2.3.4.11

DdsTimeBasedFilter For description of this subcontainer, please refer to paragraph 10.2.3.4.12

DdsReliability For description of this subcontainer, please refer to paragraph 10.2.3.4.14

DdsDestinationOrder For description of this subcontainer, please refer to paragraph 10.2.3.4.17

DdsHistory For description of this subcontainer, please refer to paragraph 10.2.3.4.18

DdsResourceLimits For description of this subcontainer, please refer to paragraph 10.2.3.4.19

DdsReaderDataLifecycle For description of this subcontainer, please refer to paragraph 10.2.3.4.22

10.2.3.3.1.9 DdsTopic

In the picture below, the UML diagram of DdsTopic container is shown

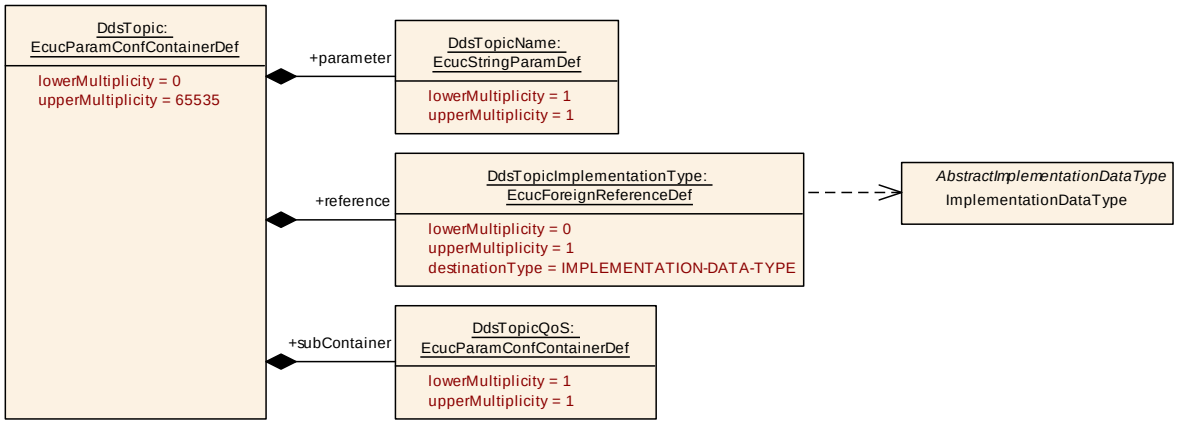

Figure 10.15: Dds Topic

SWS Item	**[ECUC_Dds_00018]**		
Container Name	DdsTopic		
Parent Container	DdsDomainParticipant		
Description	This container represents the configuration of one Topic. **Tags:** atp.Status=draft		
Post-Build Variant Multiplicity	false		
Multiplicity Configuration Class	**Pre-compile time**	X	All Variants
	Link time	–	
	Post-build time	–	

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Configuration Parameters

SWS Item	[ECUC_Dds_00103]		
Parameter Name	DdsTopicName		
Parent Container	DdsTopic		
Description	Identify the name of the Topic. Publishers and subscribers intercommunication is based on topic name: only entities that share the same topic can communicate with each other. **Tags:** atp.Status=draft		
Multiplicity	1		
Type	EcucStringParamDef		
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: ECU dependency: inter-ECU - this value shall be shared between configurations.		

SWS Item	[ECUC_Dds_00104]		
Parameter Name	DdsTopicImplementationType		
Parent Container	DdsTopic		
Description	This reference selects the ImplementationDataType the topic is related. A Topic is used to publish a well-defined data type, described by the referenced ImplementationData Type. **Tags:** atp.Status=draft		
Multiplicity	0..1		
Type	Foreign reference to IMPLEMENTATION-DATA-TYPE		
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: ECU		

Included Containers		
Container Name	**Multiplicity**	**Scope / Dependency**
DdsTopicQoS	1	This container contains the configuration of the QoS supported by the DdsTopic **Tags:** atp.Status=draft

DdsTopicQos

SWS Item	[ECUC_Dds_00102]
Container Name	DdsTopicQoS
Parent Container	DdsTopic
Description	This container contains the configuration of the QoS supported by the DdsTopic **Tags:** atp.Status=draft
Configuration Parameters	

Included Containers		
Container Name	**Multiplicity**	**Scope / Dependency**
DdsDeadline	0..1	If present, this container indicates that Dds DEADLINE QoS is supported. **Tags:** atp.Status=draft
DdsDestinationOrder	0..1	If present, this container indicates that Dds DESTINATION_ ORDER QoS is supported. **Tags:** atp.Status=draft
DdsDurability	0..1	If present, this container indicates that Dds DURABILITY QoS is supported. **Tags:** atp.Status=draft
DdsDurabilityService	0..1	If present, this container indicates that Dds DURABILITY_ SERVICE QoS is supported. **Tags:** atp.Status=draft
DdsHistory	0..1	If present, this container indicates that Dds HISTORY QoS is supported. **Tags:** atp.Status=draft
DdsLatencyBudget	0..1	If present, this container indicates that Dds LATENCY_BUDGET QoS is supported. **Tags:** atp.Status=draft
DdsLifespan	0..1	If present, this container indicates that Dds LIFESPAN QoS is supported. **Tags:** atp.Status=draft
DdsLiveliness	0..1	If present, this container indicates that Dds LIVELINESS QoS is supported. **Tags:** atp.Status=draft
DdsOwnership	0..1	If present, this container indicates that Dds OWNERSHIP QoS is supported. **Tags:** atp.Status=draft
DdsReliability	0..1	If present, this container indicates that Dds RELIABILITY QoS is supported. **Tags:** atp.Status=draft
DdsResourceLimits	0..1	If present, this container indicates that Dds RESOURCE_LIMITS QoS is supported. **Tags:** atp.Status=draft
DdsTopicData	0..1	Describes the DDS [1] TOPIC_DATA QoS policy. **Tags:** atp.Status=draft
DdsTransportPriority	0..1	If present, this container indicates that Dds TRANSPORT_ PRIORITY QoS is supported. **Tags:** atp.Status=draft

DdsTopicData For description of this subcontainer, please refer to paragraph 10.2.3.4.2

DdsDurability For description of this subcontainer, please refer to paragraph 10.2.3.4.4

DdsDurabilityService For description of this subcontainer, please refer to paragraph 10.2.3.4.5

DdsDeadline For description of this subcontainer, please refer to paragraph 10.2.3.4.7

DdsLatencyBudget For description of this subcontainer, please refer to paragraph 10.2.3.4.8

DdsOwnership For description of this subcontainer, please refer to paragraph 10.2.3.4.9

DdsLiveliness For description of this subcontainer, please refer to paragraph 10.2.3.4.11

DdsReliability For description of this subcontainer, please refer to paragraph 10.2.3.4.14

DdsTransportPriority For description of this subcontainer, please refer to paragraph 10.2.3.4.15

DdsLifespan For description of this subcontainer, please refer to paragraph 10.2.3.4.16

DdsDestinationOrder For description of this subcontainer, please refer to paragraph 10.2.3.4.17

DdsHistory For description of this subcontainer, please refer to paragraph 10.2.3.4.18

DdsResourceLimits For description of this subcontainer, please refer to paragraph 10.2.3.4.19

10.2.3.3.1.10 DdsRemoteDomainParticipantCollection

The Dds BSW shall support complete static configuration of remotes DdsDomainParticipants of each local DdsDomainParticipant, in order to be able to correctly work also in environments where Dynamic discovery is not supported. The `DdsRemoteDomainParticipant` is used to statically configure remote DdsDomainParticipants.

In the picture below, the UML diagram of DdsRemoteDomainParticipant template is shown:

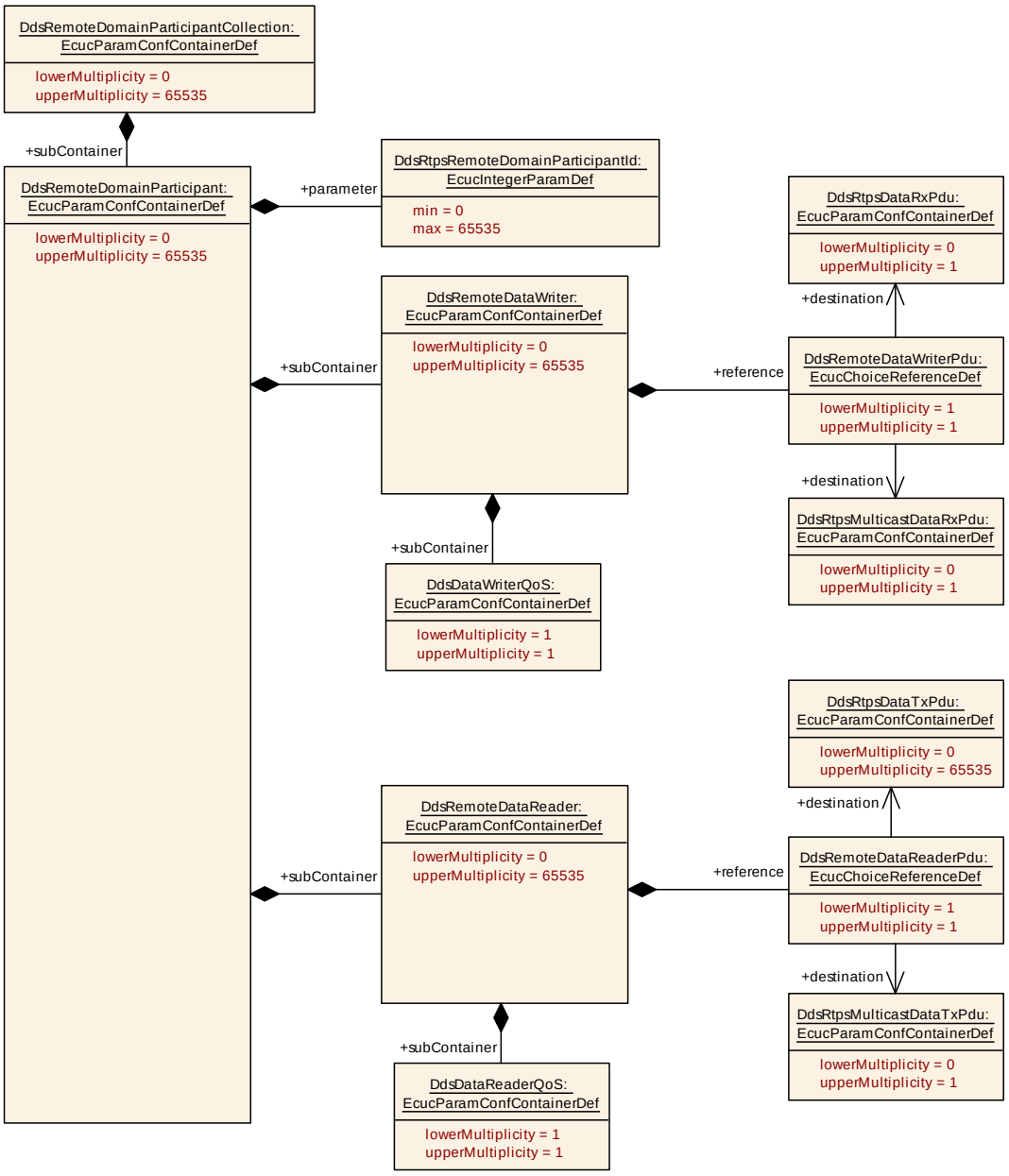

Figure 10.16: DdsRemoteDomainParticipant

SWS Item	**[ECUC_Dds_00182]**		
Container Name	DdsRemoteDomainParticipantCollection		
Parent Container	DdsDomainParticipant		
Description	Collection of Remote Domain Participants. **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 Containers		
Container Name	**Multiplicity**	**Scope / Dependency**
DdsRemoteDomainParticipant	0..65535	Static configuration of remote endpoints. This container contains information about reachability and QoS parameters of remote endpoints. **Tags:** atp.Status=draft

DdsRemoteDomainParticipant

SWS Item	[ECUC_Dds_00161]		
Container Name	DdsRemoteDomainParticipant		
Parent Container	DdsRemoteDomainParticipantCollection		
Description	Static configuration of remote endpoints. This container contains information about reachability and QoS parameters of remote endpoints. **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			

SWS Item	[ECUC_Dds_00162]		
Parameter Name	DdsRtpsRemoteDomainParticipantId		
Parent Container	DdsRemoteDomainParticipant		
Description	The DomainParticipant ID of the remote DDS node **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: ECU		

Included Containers		
Container Name	**Multiplicity**	**Scope / Dependency**
DdsRemoteDataReader	0..65535	The configuration of a specific remote DataReader. **Tags:** atp.Status=draft
DdsRemoteDataWriter	0..65535	The configuration of a specific remote DataWriter. **Tags:** atp.Status=draft

DdsRemoteDataWriter

The DdsRemoteDataWriter container is used to configure remotes DdsDataWriters for a given local DdsDataReader. The **DdsRemoteDataWriterPdu** is the lower layer pdu to be used by the local DdsDataReader to receive data from the referred DdsRemoteDataWriter.

SWS Item	[ECUC_Dds_00163]		
Container Name	DdsRemoteDataWriter		
Parent Container	DdsRemoteDomainParticipant		
Description	The configuration of a specific remote DataWriter. **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			

SWS Item	[ECUC_Dds_00164]		
Parameter Name	DdsRemoteDataWriterPdu		
Parent Container	DdsRemoteDataWriter		
Description	The Pdu used to receive data from the given remote DataWriter. It could refer both a unicast and a multicast Pdu **Tags:** atp.Status=draft		
Multiplicity	1		
Type	Choice reference to [DdsRtpsDataRxPdu, DdsRtpsMulticastDataRxPdu]		
Post-Build Variant Value	false		
Value Configuration Class	**Pre-compile time**	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: ECU		

Included Containers		
Container Name	**Multiplicity**	**Scope / Dependency**
DdsDataWriterQoS	1	This container represents the configuration of QoS Profiles related to the current DdsDataWriter. **Tags:** atp.Status=draft

DdsRemoteDataReader

The DdsRemoteDataReader container is used to configure remotes DdsDataReaders for a given local DdsDataWriter. The **DdsRemoteDataReaderPdu** is the lower layer pdu to be used by the local DdsDataWriter to transmit data to the referred DdsRemoteDataReader.

SWS Item	[ECUC_Dds_00165]		
Container Name	DdsRemoteDataReader		
Parent Container	DdsRemoteDomainParticipant		
Description	The configuration of a specific remote DataReader. **Tags:** atp.Status=draft		
Post-Build Variant Multiplicity	false		
Multiplicity Configuration Class	**Pre-compile time**	X	All Variants
	Link time	–	
	Post-build time	–	

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Configuration Parameters			
SWS Item	**[ECUC_Dds_00166]**		
Parameter Name	DdsRemoteDataReaderPdu		
Parent Container	DdsRemoteDataReader		
Description	The Pdu used to transmit data to the given remote DataReader. It could refer both a unicast and a multicast Pdu **Tags:** atp.Status=draft		
Multiplicity	1		
Type	Choice reference to [DdsRtpsDataTxPdu, DdsRtpsMulticastDataTxPdu]		
Post-Build Variant Value	false		
Value Configuration Class	**Pre-compile time**	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: ECU		

Included Containers		
Container Name	**Multiplicity**	**Scope / Dependency**
DdsDataReaderQoS	1	This container represents the configuration of QoS Profiles related to the current DdsDataReader. **Tags:** atp.Status=draft

10.2.3.4 DdsQoSPolicies

Note: This chapter is intended to describe all the possible QoS policies. Each of them can be applied only to specific entity types.

The container DdsQoSPolicies does not exist actually, there is a specific Dds<Entity_type>QoS subcontainer for each entity type that supports QoS policies. For each entity type, in the related chapter, the correct Dds<Entity_type>QoS is described.

Note: For description of specific QoS policies, refer to "Supported QoS" chapter of DDS OMG specification ([1]).

10.2.3.4.1 DdsUserData

[CP_SWS_Dds_01001]{DRAFT} **DDS USER_DATA semantics** ⌈If DdsUserData (the container used for DDS USER_DATA QoS policy) is configured for a specific entity (DdsDomainParticipants, DdsDataReaders or DdsDataWriters), the Dds BSW shall provide user defined information for this entity to other entities in the same DdsDomainParticipant. User data information would be distributed in the context of a DomainParticipant only by means of build-in topics, not with every exchanged message.

The DdsUserDataValue buffer shall be statically configured according an external agreement between parties and it will be never modified at runtime. Being statically configured and not accessible from the application, which can not modify its content, no API is required.

Note: the configuration and meaning of USER_DATA QoS is vendor specific, it can be used to exchange any kind of information between entities. For any details on this QoS topic, the "USER_DATA" chapter of [1] shall be taken as reference.

⌋(*FO_RS_Dds_00005*)

SWS Item	**[ECUC_Dds_00019]**		
Container Name	DdsUserData		
Parent Container	DdsDataReaderQoS, DdsDataWriterQoS, DdsDomainParticipantQoS		
Description	Describes the DDS [1] USER_DATA QoS policy. **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			

SWS Item	**[ECUC_Dds_00124]**		
Parameter Name	DdsUserDataValue		
Parent Container	DdsUserData		
Description	See "USER_DATA" chapter of DDS [1]. **Tags:** atp.Status=draft		
Multiplicity	1		
Type	EcucStringParamDef		
Default value	–		
Regular Expression	–		
Post-Build Variant Value	false		
Value Configuration Class	**Pre-compile time**	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: ECU		

No Included Containers

10.2.3.4.2 DdsTopicData

SWS Item	**[ECUC_Dds_00106]**
Container Name	DdsTopicData
Parent Container	DdsTopicQoS

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Description	Describes the DDS [1] TOPIC_DATA QoS policy. **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			

SWS Item	**[ECUC_Dds_00126]**		
Parameter Name	DdsTopicDataValue		
Parent Container	DdsTopicData		
Description	See "TOPIC_DATA" chapter of DDS [1]. **Tags:** atp.Status=draft		
Multiplicity	1		
Type	EcucStringParamDef		
Default value	–		
Regular Expression	–		
Post-Build Variant Value	false		
Value Configuration Class	**Pre-compile time**	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: ECU		

No Included Containers

10.2.3.4.3 DdsGroupData

SWS Item	**[ECUC_Dds_00024]**		
Container Name	DdsGroupData		
Parent Container	DdsPublisherQoS, DdsSubscriberQoS		
Description	Describes the DDS [1] GROUP_DATA QoS policy. **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			

SWS Item	**[ECUC_Dds_00125]**
Parameter Name	DdsGroupDataValue
Parent Container	DdsGroupData
Description	See "GROUP_DATA" chapter of DDS [1]. **Tags:** atp.Status=draft

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Multiplicity	1		
Type	EcucStringParamDef		
Default value	–		
Regular Expression	–		
Post-Build Variant Value	false		
Value Configuration Class	**Pre-compile time**	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: ECU		

No Included Containers

10.2.3.4.4 DdsDurability

SWS Item	**[ECUC_Dds_00034]**		
Container Name	DdsDurability		
Parent Container	DdsDataWriterQoS, DdsTopicQoS		
Description	Describes the DDS [1] DURABILITY QoS policy. **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			

SWS Item	**[ECUC_Dds_00035]**	
Parameter Name	DdsDurabilityKind	
Parent Container	DdsDurability	
Description	See "DURABILITY" chapter of DDS [1]. **Tags:** atp.Status=draft	
Multiplicity	1	
Type	EcucEnumerationParamDef	
Range	PERSISTENT	See "DURABILITY" chapter of DDS[1]. **Tags:** atp.Status=draft
	TRANSIENT	See "DURABILITY" chapter of DDS [1]. **Tags:** atp.Status=draft
	TRANSIENT_LOCAL	See "DURABILITY" chapter of DDS [1]. **Tags:** atp.Status=draft
	VOLATILE	See "DURABILITY" chapter of DDS [1]. **Tags:** atp.Status=draft
Default value	VOLATILE	
Post-Build Variant Value	false	
Value Configuration Class	**Pre-compile time**	X	All Variants

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	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: ECU		

No Included Containers

10.2.3.4.5 DdsDurabilityService

SWS Item	**[ECUC_Dds_00036]**		
Container Name	DdsDurabilityService		
Parent Container	DdsDataWriterQoS, DdsTopicQoS		
Description	Describes the DDS [1] DURABILITY_SERVICE QoS policy. **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			

SWS Item	**[ECUC_Dds_00037]**		
Parameter Name	DdsDurabilityServiceCleanupDelay		
Parent Container	DdsDurabilityService		
Description	See "DURABILITY_SERVICE" chapter of DDS [1]. Time given in seconds. **Tags:** atp.Status=draft		
Multiplicity	1		
Type	EcucFloatParamDef		
Range	[0 .. 65.534]		
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		

SWS Item	**[ECUC_Dds_00119]**	
Parameter Name	DdsDurabilityServiceHistoryDepth	
Parent Container	DdsDurabilityService	
Description	See "DURABILITY_SERVICE" chapter of DDS [1]. **Tags:** atp.Status=draft	
Multiplicity	1	
Type	EcucIntegerParamDef	
Range	0 .. 65534	

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Default value	1		
Post-Build Variant Value	false		
Value Configuration Class	**Pre-compile time**	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: ECU		

SWS Item	**[ECUC_Dds_00038]**		
Parameter Name	DdsDurabilityServiceHistoryKind		
Parent Container	DdsDurabilityService		
Description	See "DURABILITY_SERVICE" chapter of DDS [1]. **Tags:** atp.Status=draft		
Multiplicity	1		
Type	EcucEnumerationParamDef		
Range	KEEP_ALL	See "DURABILITY_SERVICE" chapter of DDS [1]. **Tags:** atp.Status=draft	
	KEEP_LAST	See "DURABILITY_SERVICE" chapter of DDS [1]. **Tags:** atp.Status=draft	
Default value	KEEP_LAST		
Post-Build Variant Value	false		
Value Configuration Class	**Pre-compile time**	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: ECU		

SWS Item	**[ECUC_Dds_00121]**		
Parameter Name	DdsDurabilityServiceMaxInstances		
Parent Container	DdsDurabilityService		
Description	See "DURABILITY_SERVICE" chapter of DDS [1]. **Tags:** atp.Status=draft		
Multiplicity	1		
Type	EcucIntegerParamDef		
Range	0 .. 65534		
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		

SWS Item	**[ECUC_Dds_00120]**
Parameter Name	DdsDurabilityServiceMaxSamples
Parent Container	DdsDurabilityService

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Description	See "DURABILITY_SERVICE" chapter of DDS [1]. **Tags:** atp.Status=draft		
Multiplicity	1		
Type	EcucIntegerParamDef		
Range	0 .. 65534		
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		

SWS Item	**[ECUC_Dds_00122]**		
Parameter Name	DdsDurabilityServiceMaxSamplesPerInstance		
Parent Container	DdsDurabilityService		
Description	See "DURABILITY_SERVICE" chapter of DDS [1]. **Tags:** atp.Status=draft		
Multiplicity	1		
Type	EcucIntegerParamDef		
Range	0 .. 65534		
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		

No Included Containers

10.2.3.4.6 DdsPresentation

SWS Item	**[ECUC_Dds_00025]**		
Container Name	DdsPresentation		
Parent Container	DdsPublisherQoS, DdsSubscriberQoS		
Description	Describes the DDS [1] PRESENTATION QoS policy. **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			

SWS Item	[ECUC_Dds_00069]		
Parameter Name	DdsPresentationAccessScope		
Parent Container	DdsPresentation		
Description	See "PRESENTATION" chapter of DDS [1]. **Tags:** atp.Status=draft		
Multiplicity	1		
Type	EcucEnumerationParamDef		
Range	GROUP	See "PRESENTATION" chapter of DDS [1]. **Tags:** atp.Status=draft	
	INSTANCE	See "PRESENTATION" chapter of DDS [1]. **Tags:** atp.Status=draft	
	TOPIC	See "PRESENTATION" chapter of DDS [1]. **Tags:** atp.Status=draft	
Post-Build Variant Value	false		
Value Configuration Class	**Pre-compile time**	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: ECU		

SWS Item	[ECUC_Dds_00070]		
Parameter Name	DdsPresentationCoherentAccess		
Parent Container	DdsPresentation		
Description	See "PRESENTATION" chapter of DDS [1]. **Tags:** atp.Status=draft		
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		

SWS Item	[ECUC_Dds_00071]		
Parameter Name	DdsPresentationOrderedAccess		
Parent Container	DdsPresentation		
Description	See "PRESENTATION" chapter of DDS [1]. **Tags:** atp.Status=draft		
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		

No Included Containers

10.2.3.4.7 DdsDeadline

SWS Item	[ECUC_Dds_00039]		
Container Name	DdsDeadline		
Parent Container	DdsDataReaderQoS, DdsDataWriterQoS, DdsTopicQoS		
Description	Describes the DDS [1] DEADLINE QoS policy. **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			

SWS Item	[ECUC_Dds_00040]		
Parameter Name	DdsDeadlinePeriod		
Parent Container	DdsDeadline		
Description	See "DEADLINE" chapter of DDS [1]. Time given in seconds. **Tags:** atp.Status=draft		
Multiplicity	1		
Type	EcucFloatParamDef		
Range	[0 .. 65.534]		
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		

No Included Containers

10.2.3.4.8 DdsLatencyBudget

SWS Item	[ECUC_Dds_00041]		
Container Name	DdsLatencyBudget		
Parent Container	DdsDataReaderQoS, DdsDataWriterQoS, DdsTopicQoS		
Description	Describes the DDS [1] LATENCY_BUDGET QoS policy. **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			

SWS Item	[ECUC_Dds_00042]		
Parameter Name	DdsLatencyBudgetDuration		
Parent Container	DdsLatencyBudget		
Description	See "LATENCY_BUDGET" chapter of DDS [1]. Time given in seconds. **Tags:** atp.Status=draft		
Multiplicity	1		
Type	EcucFloatParamDef		
Range	[0 .. 65.534]		
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		

No Included Containers

10.2.3.4.9 DdsOwnership

SWS Item	[ECUC_Dds_00043]		
Container Name	DdsOwnership		
Parent Container	DdsDataReaderQoS, DdsDataWriterQoS, DdsTopicQoS		
Description	Describes the DDS [1] OWNERSHIP QoS policy. **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			

SWS Item	[ECUC_Dds_00044]	
Parameter Name	DdsOwnershipKind	
Parent Container	DdsOwnership	
Description	See "OWNERSHIP" chapter of DDS [1]. **Tags:** atp.Status=draft	
Multiplicity	1	
Type	EcucEnumerationParamDef	
Range	EXCLUSIVE	See "OWNERSHIP" chapter of DDS [1]. **Tags:** atp.Status=draft
	SHARED	See "OWNERSHIP" chapter of DDS [1]. **Tags:** atp.Status=draft
Default value	SHARED	

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Post-Build Variant Value	false		
Value Configuration Class	**Pre-compile time**	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: ECU		

No Included Containers

10.2.3.4.10 DdsOwnershipStrength

SWS Item	**[ECUC_Dds_00045]**		
Container Name	DdsOwnershipStrength		
Parent Container	DdsDataWriterQoS		
Description	Describes the DDS [1] OWNERSHIP_STRENGTH QoS policy. **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			

SWS Item	**[ECUC_Dds_00046]**		
Parameter Name	DdsOwnershipStrengthValue		
Parent Container	DdsOwnershipStrength		
Description	See "OWNERSHIP_STRENGTH" chapter of DDS [1]. **Tags:** atp.Status=draft		
Multiplicity	1		
Type	EcucIntegerParamDef		
Range	0 .. 65534		
Default value	0		
Post-Build Variant Value	false		
Value Configuration Class	**Pre-compile time**	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: ECU		

No Included Containers

10.2.3.4.11 DdsLiveliness

SWS Item	[ECUC_Dds_00047]		
Container Name	DdsLiveliness		
Parent Container	DdsDataReaderQoS, DdsDataWriterQoS, DdsTopicQoS		
Description	Describes the DDS [1] LIVELINESS QoS policy. **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			

SWS Item	[ECUC_Dds_00049]		
Parameter Name	DdsLivelinessLeaseDuration		
Parent Container	DdsLiveliness		
Description	See "LIVELINESS" chapter of DDS [1]. Time given in seconds. **Tags:** atp.Status=draft		
Multiplicity	1		
Type	EcucFloatParamDef		
Range	[0 .. 65.534]		
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		

SWS Item	[ECUC_Dds_00048]	
Parameter Name	DdsLivenessKind	
Parent Container	DdsLiveliness	
Description	See "LIVELINESS" chapter of DDS [1]. **Tags:** atp.Status=draft	
Multiplicity	1	
Type	EcucEnumerationParamDef	
Range	AUTOMATIC	See "LIVELINESS" chapter of DDS [1]. **Tags:** atp.Status=draft
	MANUAL_BY_PARTICIPANT	See "LIVELINESS" chapter of DDS [1]. **Tags:** atp.Status=draft
	MANUAL_BY_TOPIC	See "LIVELINESS" chapter of DDS [1]. **Tags:** atp.Status=draft
Default value	AUTOMATIC	
Post-Build Variant Value	false	
Value Configuration Class	**Pre-compile time**	X	All Variants
	Link time	–	
	Post-build time	–	

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Scope / Dependency	scope: ECU

No Included Containers

10.2.3.4.12 DdsTimeBasedFilter

SWS Item	[ECUC_Dds_00087]		
Container Name	DdsTimeBasedFilter		
Parent Container	DdsDataReaderQoS		
Description	Describes the DDS [1] TIME_BASED_FILTER QoS policy. **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			

SWS Item	[ECUC_Dds_00088]		
Parameter Name	DdsTimeBasedFilterMinimumSeparation		
Parent Container	DdsTimeBasedFilter		
Description	See "TIME_BASED_FILTER" chapter of DDS [1]. Time given in seconds. **Tags:** atp.Status=draft		
Multiplicity	1		
Type	EcucFloatParamDef		
Range	[0 .. 65.534]		
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		

No Included Containers

10.2.3.4.13 DdsPartition

SWS Item	[ECUC_Dds_00026]
Container Name	DdsPartition
Parent Container	DdsPublisherQoS, DdsSubscriberQoS

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Description	Describes the DDS [1] PARTITION QoS policy. **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			

SWS Item	**[ECUC_Dds_00072]**		
Parameter Name	DdsPartitionName		
Parent Container	DdsPartition		
Description	See "PARTITION" chapter of DDS [1]. **Tags:** atp.Status=draft		
Multiplicity	1..65534		
Type	EcucStringParamDef		
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: ECU		

No Included Containers

10.2.3.4.14 DdsReliability

SWS Item	**[ECUC_Dds_00050]**		
Container Name	DdsReliability		
Parent Container	DdsDataReaderQoS, DdsDataWriterQoS, DdsTopicQoS		
Description	Describes the DDS [1] RELIABILITY QoS policy. **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			

SWS Item	[ECUC_Dds_00051]		
Parameter Name	DdsReliabilityKind		
Parent Container	DdsReliability		
Description	See "RELIABILITY" chapter of DDS [1]. **Tags:** atp.Status=draft		
Multiplicity	1		
Type	EcucEnumerationParamDef		
Range	BEST_EFFORT	See "RELIABILITY" chapter of DDS [1]. **Tags:** atp.Status=draft	
	RELIABLE	See "RELIABILITY" chapter of DDS [1]. **Tags:** atp.Status=draft	
Post-Build Variant Value	false		
Value Configuration Class	**Pre-compile time**	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: ECU		

SWS Item	[ECUC_Dds_00052]		
Parameter Name	DdsReliabilityMaxBlockingTime		
Parent Container	DdsReliability		
Description	See "RELIABILITY" chapter of DDS [1]. Time given in seconds. **Tags:** atp.Status=draft		
Multiplicity	1		
Type	EcucFloatParamDef		
Range	[0 .. 65.534]		
Default value	0.1		
Post-Build Variant Value	false		
Value Configuration Class	**Pre-compile time**	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: ECU		

No Included Containers

10.2.3.4.15 DdsTransportPriority

SWS Item	[ECUC_Dds_00053]
Container Name	DdsTransportPriority
Parent Container	DdsDataWriterQoS, DdsTopicQoS
Description	Describes the DDS [1] TRANSPORT_PRIORITY QoS policy. **Tags:** atp.Status=draft
Post-Build Variant Multiplicity	false

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Multiplicity Configuration Class	**Pre-compile time**	X	All Variants
	Link time	–	
	Post-build time	–	
Configuration Parameters			

SWS Item	**[ECUC_Dds_00054]**		
Parameter Name	DdsTransportPriorityValue		
Parent Container	DdsTransportPriority		
Description	See "TRANSPORT_PRIORITY" chapter of DDS [1]. **Tags:** atp.Status=draft		
Multiplicity	1		
Type	EcucIntegerParamDef		
Range	0 .. 65534		
Default value	0		
Post-Build Variant Value	false		
Value Configuration Class	**Pre-compile time**	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: ECU		

No Included Containers

10.2.3.4.16 DdsLifespan

SWS Item	**[ECUC_Dds_00055]**		
Container Name	DdsLifespan		
Parent Container	DdsDataWriterQoS, DdsTopicQoS		
Description	Describes the DDS [1] LIFESPAN QoS policy. **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			

SWS Item	**[ECUC_Dds_00056]**
Parameter Name	DdsLifespanDuration
Parent Container	DdsLifespan
Description	See "LIFESPAN" chapter of DDS [1]. Time given in seconds. **Tags:** atp.Status=draft
Multiplicity	1
Type	EcucFloatParamDef

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Range	[0 .. 65.534]		
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		

No Included Containers

10.2.3.4.17 DdsDestinationOrder

SWS Item	**[ECUC_Dds_00057]**		
Container Name	DdsDestinationOrder		
Parent Container	DdsDataReaderQoS, DdsDataWriterQoS, DdsTopicQoS		
Description	Describes the DDS [1] DESTINATION_ORDER QoS policy. **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			

SWS Item	**[ECUC_Dds_00058]**		
Parameter Name	DdsDestinationOrderKind		
Parent Container	DdsDestinationOrder		
Description	See "DESTINATION_ORDER" chapter of DDS [1]. **Tags:** atp.Status=draft		
Multiplicity	1		
Type	EcucEnumerationParamDef		
Range	BY_RECEPTION_TIMESTAMP	See "DESTINATION_ORDER" chapter of DDS [1]. **Tags:** atp.Status=draft	
	BY_SOURCE_TIMESTAMP	See "DESTINATION_ORDER" chapter of DDS [1]. **Tags:** atp.Status=draft	
Default value	BY_RECEPTION_TIMESTAMP		
Post-Build Variant Value	false		
Value Configuration Class	**Pre-compile time**	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: ECU		

No Included Containers

10.2.3.4.18 DdsHistory

SWS Item	[ECUC_Dds_00059]		
Container Name	DdsHistory		
Parent Container	DdsDataReaderQoS, DdsDataWriterQoS, DdsTopicQoS		
Description	Describes the DDS [1] HISTORY QoS policy. **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			

SWS Item	[ECUC_Dds_00060]	
Parameter Name	DdsHistoryKind	
Parent Container	DdsHistory	
Description	See "HISTORY" chapter of DDS [1]. **Tags:** atp.Status=draft	
Multiplicity	1	
Type	EcucEnumerationParamDef	
Range	KEEP_ALL	See "HISTORY" chapter of DDS [1]. **Tags:** atp.Status=draft
	KEEP_LAST	See "HISTORY" chapter of DDS [1]. **Tags:** atp.Status=draft
Default value	KEEP_LAST	
Post-Build Variant Value	false	
Value Configuration Class	**Pre-compile time**	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: ECU	

SWS Item	[ECUC_Dds_00063]		
Parameter Name	DdsHistoryOrderDepth		
Parent Container	DdsHistory		
Description	See "HISTORY" chapter of DDS [1]. **Tags:** atp.Status=draft		
Multiplicity	1		
Type	EcucIntegerParamDef		
Range	0 .. 65534		
Default value	1		
Post-Build Variant Value	false		
Value Configuration Class	**Pre-compile time**	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: ECU		

No Included Containers

10.2.3.4.19 DdsResourceLimits

SWS Item	[ECUC_Dds_00061]		
Container Name	DdsResourceLimits		
Parent Container	DdsDataReaderQoS, DdsDataWriterQoS, DdsTopicQoS		
Description	Describes the DDS [1] RESOURCE_LIMITS QoS policy. **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			

SWS Item	[ECUC_Dds_00064]		
Parameter Name	DdsResouceLimitsMaxInstances		
Parent Container	DdsResourceLimits		
Description	See "RESOURCE_LIMITS" chapter of DDS [1]. **Tags:** atp.Status=draft		
Multiplicity	1		
Type	EcucIntegerParamDef		
Range	0 .. 65534		
Default value	65534		
Post-Build Variant Value	false		
Value Configuration Class	**Pre-compile time**	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: ECU		

SWS Item	[ECUC_Dds_00062]		
Parameter Name	DdsResouceLimitsMaxSamples		
Parent Container	DdsResourceLimits		
Description	See "RESOURCE_LIMITS" chapter of DDS [1]. **Tags:** atp.Status=draft		
Multiplicity	1		
Type	EcucIntegerParamDef		
Range	0 .. 65534		
Default value	65534		
Post-Build Variant Value	false		
Value Configuration Class	**Pre-compile time**	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: ECU		

SWS Item	[ECUC_Dds_00065]
Parameter Name	DdsResouceLimitsMaxSamplesPerInstance
Parent Container	DdsResourceLimits

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Description	See "RESOURCE_LIMITS" chapter of DDS [1]. **Tags:** atp.Status=draft		
Multiplicity	1		
Type	EcucIntegerParamDef		
Range	0 .. 65534		
Default value	65534		
Post-Build Variant Value	false		
Value Configuration Class	**Pre-compile time**	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: ECU		

No Included Containers

10.2.3.4.20 DdsEntityFactory

SWS Item	**[ECUC_Dds_00027]**		
Container Name	DdsEntityFactory		
Parent Container	DdsDomainParticipantQoS, DdsPublisherQoS, DdsSubscriberQoS		
Description	Describes the DDS [1] ENTITY_FACTORY QoS policy. **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			

SWS Item	**[ECUC_Dds_00073]**		
Parameter Name	DdsEntityFactoryAutoenableCreatedEntities		
Parent Container	DdsEntityFactory		
Description	See "ENTITY_FACTORY" chapter of DDS [1]. **Tags:** atp.Status=draft		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	true		
Post-Build Variant Value	false		
Value Configuration Class	**Pre-compile time**	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

No Included Containers

10.2.3.4.21 DdsWriterDataLifecycle

SWS Item	**[ECUC_Dds_00066]**		
Container Name	DdsWriterDataLifecycle		
Parent Container	DdsDataWriterQoS		
Description	Describes the DDS [1] WRITER_DATA_LIFECYCLE QoS policy. **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			

SWS Item	**[ECUC_Dds_00067]**		
Parameter Name	DdsAutodisposeUnregisteredInstances		
Parent Container	DdsWriterDataLifecycle		
Description	See "WRITER_DATA_LIFECYCLE" chapter of DDS [1]. **Tags:** atp.Status=draft		
Multiplicity	1		
Type	EcucBooleanParamDef		
Default value	true		
Post-Build Variant Value	false		
Value Configuration Class	**Pre-compile time**	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: local		

No Included Containers

10.2.3.4.22 DdsReaderDataLifecycle

SWS Item	**[ECUC_Dds_00095]**		
Container Name	DdsReaderDataLifecycle		
Parent Container	DdsDataReaderQoS		
Description	Describes the DDS [1] READER_DATA_LIFECYCLE QoS policy. **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			

SWS Item	[ECUC_Dds_00097]		
Parameter Name	DdsAutopurgeDisposedSamplesDelay		
Parent Container	DdsReaderDataLifecycle		
Description	See "READER_DATA_LIFECYCLE" chapter of DDS [1]. **Tags:** atp.Status=draft		
Multiplicity	1		
Type	EcucIntegerParamDef		
Range	0 .. 65534		
Default value	65534		
Post-Build Variant Value	false		
Value Configuration Class	**Pre-compile time**	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: ECU		

SWS Item	[ECUC_Dds_00096]		
Parameter Name	DdsAutopurgeNowriterSamplesDelay		
Parent Container	DdsReaderDataLifecycle		
Description	See "READER_DATA_LIFECYCLE" chapter of DDS [1]. **Tags:** atp.Status=draft		
Multiplicity	1		
Type	EcucIntegerParamDef		
Range	0 .. 65534		
Default value	65534		
Post-Build Variant Value	false		
Value Configuration Class	**Pre-compile time**	X	All Variants
	Link time	–	
	Post-build time	–	
Scope / Dependency	scope: ECU		

No Included Containers

10.3 Published Information

For details refer to the chapter 10.3 “Published Information” in SWS_BSWGeneral.

A Not applicable requirements

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B Change history of AUTOSAR traceable items

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

B.1 Traceable item history of this document according to AUTOSAR Release R22-11

B.1.1 Added Specification Items in R22-11

Number	Heading
[CP_SWS_Dds_-00726]	RTPS compliance
[CP_SWS_Dds_-00727]	DDS standard serialization/deserialization rules
[CP_SWS_Dds_-00728]	DDS serialization of primitive types
[CP_SWS_Dds_-00729]	DDS serialization of enumeration data types
[CP_SWS_Dds_-00730]	DDS serialization of ARRAY data type
[CP_SWS_Dds_-00731]	DDS serialization of STRUCTURE data type
[CP_SWS_Dds_-00734]	DDS Data serialization
[CP_SWS_Dds_-00735]	Encoding Format and Endianness of Strings in DDS
[CP_SWS_Dds_-00750]	DDS-security
[CP_SWS_Dds_-00752]	MAC usage
[CP_SWS_Dds_-00753]	CSM library usage
[CP_SWS_Dds_-00756]	MAC calculation failure
[CP_SWS_Dds_-00758]	MAC check failure
[CP_SWS_Dds_-00761]	Repetition or Insertion of Information
[CP_SWS_Dds_-00762]	Loss or Incorrect sequence of Information

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Number	Heading
[CP_SWS_Dds_-00763]	Delay of Information
[CP_SWS_Dds_-00766]	Corruption of Information
[CP_SWS_Dds_-00769]	CRC check failure
[CP_SWS_Dds_-00772]	
[CP_SWS_Dds_-00773]	
[CP_SWS_Dds_-00801]	
[CP_SWS_Dds_-00802]	
[CP_SWS_Dds_-00810]	
[CP_SWS_Dds_-00811]	Dds_Init behaviour
[CP_SWS_Dds_-00812]	Dds_Init - Entity state
[CP_SWS_Dds_-00813]	Dds_Init - Buffer state
[CP_SWS_Dds_-00820]	
[CP_SWS_Dds_-00821]	Dds_GetVersion - Null VersionInfoPtr
[CP_SWS_Dds_-00823]	
[CP_SWS_Dds_-00824]	
[CP_SWS_Dds_-00825]	Dds_RxMainFunction
[CP_SWS_Dds_-00826]	Dds_RxMainFunction - Error conditions
[CP_SWS_Dds_-00827]	Dds_RxMainFunction - OK conditions
[CP_SWS_Dds_-00828]	Dds_TxMainFunction
[CP_SWS_Dds_-00829]	Dds_TxMainFunction - Error conditions
[CP_SWS_Dds_-00830]	Dds_TxMainFunction - OK conditions
[CP_SWS_Dds_-00831]	

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Number	Heading
[CP_SWS_Dds_-00832]	
[CP_SWS_Dds_-00833]	
[CP_SWS_Dds_-00835]	
[CP_SWS_Dds_-00841]	
[CP_SWS_Dds_-00843]	
[CP_SWS_Dds_-00851]	Internal transmission buffer presence
[CP_SWS_Dds_-00852]	Dds_Transmit - Error conditions
[CP_SWS_Dds_-00854]	Dds_Transmit - DDS_E_U_PDUID_REJECTED
[CP_SWS_Dds_-00855]	Dds_Transmit - E_OK
[CP_SWS_Dds_-00861]	Dds_RxIndication - Error conditions
[CP_SWS_Dds_-00862]	Dds_RxIndication - DDS_E_L_PDUID_IGNORED
[CP_SWS_Dds_-00863]	Dds_RxIndication - OK condition
[CP_SWS_Dds_-00864]	Internal reception buffer presence
[CP_SWS_Dds_-00871]	Dds_TxConfirmation - Error conditions
[CP_SWS_Dds_-00872]	Dds_TxConfirmation behaviour
[CP_SWS_Dds_-00881]	Dds_TriggerTransmit - Error conditions
[CP_SWS_Dds_-00882]	Dds_TriggerTransmit behaviour
[CP_SWS_Dds_-00883]	Dds_TriggerTransmit - Error conditions
[CP_SWS_Dds_-00884]	Dds_TriggerTransmit limitation
[CP_SWS_Dds_-01001]	DDS USER_DATA semantics
[CP_SWS_Dds_-CONSTR_00712]	Topic name uniqueness
[CP_SWS_Dds_-CONSTR_00725]	No data serialization

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Number	Heading
[CP_SWS_Dds_-CONSTR_00732]	DDS serialization of UNION data type
[CP_SWS_Dds_-CONSTR_00733]	DDS serialization of POINTER data type
[CP_SWS_Dds_-CONSTR_00743]	CSM key configuration
[CP_SWS_Dds_-CONSTR_00754]	CSM job configuration

Table B.1: Added Specification Items in R22-11

B.1.2 Changed Specification Items in R22-11

none

B.1.3 Deleted Specification Items in R22-11

none

B.2 Traceable item history of this document according to AUTOSAR Release R23-11

B.2.1 Added Specification Items in R23-11

Number	Heading
[CP_SWS_Dds_-00736]	DDS Data deserialization
[CP_SWS_Dds_-00764]	Delay of Information - receiving checks
[CP_SWS_Dds_-00834]	Rx queue processing rules
[CP_SWS_Dds_-00836]	Rx queue processing algorithm
[CP_SWS_Dds_-00837]	Tx queue processing algorithm
[CP_SWS_Dds_-00838]	Tx queue processing rules

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Number	Heading
[CP_SWS_Dds_-00859]	RTPS Timestamp
[CP_SWS_Dds_-00873]	Processing timestamp

Table B.2: Added Specification Items in R23-11

B.2.2 Changed Specification Items in R23-11

Number	Heading
[CP_SWS_Dds_-00726]	DDS-RTPS compliance
[CP_SWS_Dds_-00734]	DDS Data serialization
[CP_SWS_Dds_-00735]	Encoding Format and Endianness of Strings in DDS
[CP_SWS_Dds_-00753]	CSM library usage
[CP_SWS_Dds_-00756]	MAC calculation failure
[CP_SWS_Dds_-00761]	Repetition or Insertion of Information
[CP_SWS_Dds_-00762]	Loss or Incorrect sequence of Information
[CP_SWS_Dds_-00763]	Delay of Information - sending checks
[CP_SWS_Dds_-00766]	Corruption of Information
[CP_SWS_Dds_-00772]	Definiton of development errors in module Dds
[CP_SWS_Dds_-00773]	Definiton of runtime errors in module Dds
[CP_SWS_Dds_-00801]	Definition of imported datatypes of module Dds
[CP_SWS_Dds_-00802]	Definition of datatype Dds_ConfigType
[CP_SWS_Dds_-00811]	Dds_Init behaviour
[CP_SWS_Dds_-00813]	Dds_Init - Queue state
[CP_SWS_Dds_-00823]	Definition of scheduled function Dds_MainFunction_Rx

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Number	Heading
[CP_SWS_Dds_-00824]	Definition of scheduled function Dds_MainFunction_Tx
[CP_SWS_Dds_-00825]	Rx queues set processing order
[CP_SWS_Dds_-00826]	Dds_MainFunction_Rx - Error conditions
[CP_SWS_Dds_-00827]	Dds_MainFunction_Rx - OK conditions
[CP_SWS_Dds_-00828]	Tx queues set processing order
[CP_SWS_Dds_-00829]	Dds_MainFunction_Tx - Error conditions
[CP_SWS_Dds_-00830]	Dds_MainFunction_Tx - OK conditions
[CP_SWS_Dds_-00831]	Definition of API function Dds_Transmit
[CP_SWS_Dds_-00832]	Definition of mandatory interfaces in module Dds
[CP_SWS_Dds_-00833]	Definition of optional interfaces in module Dds
[CP_SWS_Dds_-00835]	Definition of callback function Dds_TriggerTransmit
[CP_SWS_Dds_-00841]	Definition of callback function Dds_RxIndication
[CP_SWS_Dds_-00843]	Definition of callback function Dds_TxConfirmation
[CP_SWS_Dds_-00851]	Internal transmission queues
[CP_SWS_Dds_-00852]	Dds_Transmit - Error conditions
[CP_SWS_Dds_-00854]	Dds_Transmit - DDS_E_U_PDUID_REJECTED
[CP_SWS_Dds_-00855]	Dds_Transmit - E_OK
[CP_SWS_Dds_-00862]	Dds_RxIndication - DDS_E_L_PDUID_IGNORED
[CP_SWS_Dds_-00863]	Dds_RxIndication - OK condition
[CP_SWS_Dds_-00864]	Internal reception queues
[CP_SWS_Dds_-00882]	Dds_TriggerTransmit behaviour
[CP_SWS_Dds_-01001]	DDS USER_DATA semantics

Table B.3: Changed Specification Items in R23-11

B.2.3 Deleted Specification Items in R23-11

Number	Heading
[CP_SWS_Dds_-00727]	DDS standard serialization/deserialization rules
[CP_SWS_Dds_-00884]	Dds_TriggerTransmit limitation

Table B.4: Deleted Specification Items in R23-11

B.2.4 Added Constraints in R23-11

Number	Heading
[CP_SWS_-Dds_-CONSTR_-00865]	Unicast transmission
[CP_SWS_-Dds_-CONSTR_-00866]	Multicast transmission
[CP_SWS_-Dds_-CONSTR_-00867]	Unicast reception
[CP_SWS_-Dds_-CONSTR_-00868]	Multicast reception
[CP_SWS_-Dds_-CONSTR_-00884]	Dds_TriggerTransmit limitation

Table B.5: Added Constraints in R23-11

B.2.5 Changed Constraints in R23-11

Number	Heading
[CP_SWS_-Dds_-CONSTR_-00712]	Topic name uniqueness

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Number	Heading
[CP_SWS_-Dds_-CONSTR_-00725]	No data serialization
[CP_SWS_-Dds_-CONSTR_-00732]	DDS serialization of UNION data type
[CP_SWS_-Dds_-CONSTR_-00743]	CSM key configuration
[CP_SWS_-Dds_-CONSTR_-00754]	CSM job configuration

Table B.6: Changed Constraints in R23-11

B.2.6 Deleted Constraints in R23-11

none