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1 Scope of this document

This document specifies the requirements of Adaptive Applications to the functional cluster Persistency of the AUTOSAR Adaptive Platform. The motivation is to provide a standardized and portable way to store and write data persistently.

1.1 Document Conventions

The representation of requirements in AUTOSAR documents follows the table specified in [TPS_STDT_00078], see Standardization Template, chapter Support for Traceability ([1]).

The verbal forms for the expression of obligation specified in [TPS_STDT_00053] shall be used to indicate requirements, see Standardization Template, chapter Support for Traceability ([1]).

2 Acronyms and Abbreviations

The glossary below includes acronyms and abbreviations relevant to AP_RS_Persistency that are not included in the AUTOSAR Glossary [2].

Abbreviation / Acronym:	Description:
-	-

Table 2.1: Acronyms and abbreviations

3 Functional overview

The AUTOSAR Adaptive Platform Persistency provides services for Adaptive Applications and other clusters of the AUTOSAR Adaptive Platform. The AUTOSAR Adaptive Platform Persistency is responsible for all aspects which regard the storage/retrieve of data and therefore it has to deal with:

- Persistently store data over boot and ignition cycles
- Load data which is persistently stored
- Access data using a unique identifier
- Read and write data from file-like structures
- Encryption of persistent data
- Error detection and correction of stored data

4 Requirements Tracing

The following table references the requirements specified in [3] and links to the fulfillments of these.

Requirement	Description	Satisfied by
[RS_Main_00011]	AUTOSAR shall support the development of reliable systems	[RS_PER_00008] [RS_PER_00009]
[RS_Main_00440]	AUTOSAR shall standardize access to non-volatile memory	[RS_PER_00001] [RS_PER_00002] [RS_PER_00003] [RS_PER_00004]
[RS_Main_00514]	AUTOSAR shall support the development of secure systems	[RS_PER_00005] [RS_PER_00007]

5 Requirements specification

5.1 Storage of Persistent Data

[RS_PER_00001] Persistency shall support storage of persistent data [

Type:	draft
Description:	Persistency shall support persistent storage of data on a platform instance over restart cycles of the Adaptive Application or the platform.
Rationale:	Persistent storage of data
Dependencies:	–
Use Case:	Storage of data which shall be available after an Adaptive Application has been shut down and restarted.
Supporting Material:	–

] ([RS_Main_00440](#))

[RS_PER_00002] Persistency shall support to retrieve data that has been persistently stored on a platform instance [

Type:	draft
Description:	Persistency shall provide the functionality to load data which is persistently stored.
Rationale:	Load of persistently stored data
Dependencies:	–
Use Case:	An Adaptive Application which stores persistent data needs to restore it after a restart of the Adaptive Application or the platform.
Supporting Material:	–

] ([RS_Main_00440](#))

[RS_PER_00003] Persistency shall support identification of data using a unique identifier [

Type:	draft
Description:	Data shall be stored in way that it can be accessed from an Adaptive Application by using a unique identifier e.g. identify a value by a key.
Rationale:	Load of persistently stored data
Dependencies:	–
Use Case:	Storage of a variety of different data objects that can be accessed individually for loading.
Supporting Material:	–

] ([RS_Main_00440](#))

[RS_PER_00004] Persistency shall support access to file-like structures [

Type:	draft
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Description:	Persistency shall provide a standardized way to access file-like structures. Adaptive Applications shall be able to read and write data from file-like structures.
Rationale:	Filesystem abstraction
Dependencies:	–
Use Case:	Persistent data can be represented in multiple ways, e.g. human-readable format or binary. Every format of data needs to be accessible by the Persistency cluster.
Supporting Material:	–

](RS_Main_00440)

5.2 Secure Storage of Persistent Data

[RS_PER_00005] Persistency shall support encryption/decryption of persistent data [

Type:	draft
Description:	Persistency shall provide a standardized way to encrypt/decrypt persistent data.
Rationale:	Support of data encryption
Dependencies:	–
Use Case:	Storage of persistent data that shall be encrypted for security reasons.
Supporting Material:	–

](RS_Main_00514)

[RS_PER_00007] Persistency shall allow access to persistent data only to authorized Adaptive Applications [

Type:	draft
Description:	Access to persistent storage shall only be granted to Adaptive Applications that are allowed to do so. The Adaptive Platform shall support the enforcement and provision of credentials for the validation of access rights.
Rationale:	Support of access right for persistent data
Dependencies:	–
Use Case:	Not every persistent data or database shall be accessible by all Adaptive Applications for security and privacy reasons.
Supporting Material:	–

](RS_Main_00514)

5.3 Safe Storage of Persistent Data

[RS_PER_00008] Persistency shall support detection of data corruption in persistent memory [

Type:	draft
Description:	Detection of data corruption in persistently stored data. The corruption may be caused by systematic or random failures.
Rationale:	Support detection of data corruption
Dependencies:	–
Use Case:	Notification to an Adaptive Application in case of corrupted data in persistent memory. The detection of data corruption is also necessary to support data recovery mechanisms.
Supporting Material:	–

](RS_Main_00011)

[RS_PER_00009] Persistency shall support data recovery mechanisms if persistent data was corrupted [

Type:	draft
Description:	Persistency shall support a recovery mechanism if corruption of persistently stored data was detected.
Rationale:	Support of data recovery mechanism
Dependencies:	–
Use Case:	If corruption of persistent data was detected it shall be possible for safety reasons to recover corrupted data (e.g. by usage of redundant data or error correcting codes).
Supporting Material:	–

](RS_Main_00011)

6 References

- [1] Standardization Template
AUTOSAR_TPS_StandardizationTemplate
- [2] Glossary
AUTOSAR_TR_Glossary
- [3] Main Requirements
AUTOSAR_RS_Main