ODX Authoring Guidelines (ODX-RS Companion Standard V1.0.0)
Overview of Companion Standard
ASAM Project P05-08 (Subitem of ODX 2.2 Maintenance)

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Introduction

• ODX standard was developed as exchange data format for diagnostic data of ECUs
• It is applied for several different use cases: diagnostic data description, documentation, specification, diagnostic communication between tester and ECUs, software development, kernel development
• Current ODX versions:
  • Used: V 2.0.1 and V 2.1.0
  • To be used: V 2.2.0 (ISO 22901-1)
Situation

- One major scenario for ODX is the **exchange of diagnostic data** in common OEM Projects.
- ODX was designed as a flexible format to describe various common used diagnostic protocols.
- ODX allows to describe diagnostic content in several ways (e.g. services via diagnostic services or via ODX tables or via muxes).
- Diagnostic data has to be aligned to the authoring guidelines of each OEM with every new step of data exchange.
- Off-the-shelf authoring tools need to cover the whole variety of ODX.
Objective

- Development of common authoring guidelines for the exchange of ODX data
- Driven by the OEMs and major suppliers of the ODX Core Group
- Starting at the existing OEM-specific authoring guidelines
- Including the experiences of the ECU projects based on ODX format of the last few years
- Providing common guidelines for OEMs, suppliers and toolsuppliers
Motivation and Benefits

• Less effort in adapting ODX data for OEMs and suppliers in common ECU projects
• Easier data exchange process between project partners according to precise application rules
• Higher quality of ODX authoring tools and D-server because of common application of ODX data model
• Lower tool expenses due to wide application areas
• Long term benefits:
  • Providing a better basis for content-based unification of diagnostics: usage of diagnostic services, OBD diagnostics, legal requirements, diagnostic kits
  • Clearing up the standard regarding missing or unused aspects revealed by the common guidelines
Intended data exchange process

OEM 1

ODX Guideline files

Converter
Conversion to
ODX-RS Guidelines

ODX-RS Files

OEM 2

ODX Guideline files

Converter
Conversion to
ODX OEM 2 Guidelines

ODX-RS Files
Vision

All OEMs and suppliers adopt the common authoring guidelines
Guidelines

• The common authoring guidelines are applicable for all ODX versions 2.0.1, 2.1.0 and 2.2.0
• The main focus is the UDS diagnostic protocol but the general recommendations are applicable for other diagnostic protocols too
• The authoring guidelines cover in addition to ODX some miscellaneous subjects like process data
• ODX data which obey the common authoring guidelines (ODX-RS Companion Standard) are called ODX-RS conform or ODX-RS compliant
• ODX-RS compliant data are fully compliant to the ODX standard
Main Topics (1)

• General Conventions for naming and build-up of LONG-NAMEs, SHORT-NAMEs, IDs, OID-s, DESCs, ODX-Links, file names, DATA-OBJECT-PROPs

• General recommendations for DIAG-LAYERs, FUNCTIONAL-GROUPs and FUNCTIONAL-CLASSes

• General recommendations for the use of special data groups (SDGs)

• General recommendations for the description of diagnostic services: conventions for LONG-NAMEs, use of SEMANTICs, Service-Ids, nesting depth, negative response codes and constraints

• Recommendations for the description of diagnostic trouble codes (DTCs)
Main Topics (2)

- Recommendations for the description of DataIdentifier and RoutineIdentifier related data
- Recommendations for the function oriented diagnostics
- Recommendations for ODX packaging (PDX)
- Definition of ODX-RS standardized objects:
  - Physical units
  - Global negative response codes
  - DATA-OBJECT-PROPERTIES
- Recommendations for the data exchange process
Use of ODX Tables

- The largest part of diagnostic data description is covered by dataidentifiers and routineidentifiers (UDS protocol)
- The guidelines define some ODX TABLEs for the description of these data
- The flexibility of ODX format is reduced substantially by these definitions
Special Data Groups

- Special data groups (SDGs) within ODX are a method to enhance the data description by a well-formed but flexible method for specific purposes.
- All OEMs use the application of SDGs.
- The authoring guidelines include an XML schema to define SDGs in a structured and common way.
- Use of the SDG-Config schema provides an easy and common way to define, check and publish SDGs.
- Authoring tools may support that definition directly (that has already happened).
Process annotation

• The ODX standard keeps itself aside from process specific information
• The authoring guidelines provide an XML schema to describe process information along with ODX data
• Process annotation includes information about the maturity and requirement status of the diagnostic data described by ODX
• Process annotation helps to facilitate the development process of ECUs
ODX-RS Standardized Objects

- ODX-RS standardized objects are ODX objects which are normally frequently used by everybody who creates ODX data.
- ODX-RS standardized objects are specific pieces of ODX data completely described and ready to use in any diagnostic data.
- The descriptions of the following objects are standardized by ODX-RS:
  - Most frequently used physical units
  - Global negative responses for UDS protocol
  - Frequently used DATA-OBJECT-PROPERTIES
Examples

• A set of examples show the use of the ODX-RS companion standard

• Examples of diagnostic services embedded in DIAG-LAYERs:
  • ReadDataByIdentifier
  • InputOutputControl
  • RoutineControl

• Example for process annotation data connected to ODX data

• Example for definition of some kinds of SDGs using an SDG-config conform XML file
## Deliverables of ODX-RS V 1.0.0

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<tr>
<th>Title</th>
<th>File</th>
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<tr>
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<td>ODX_AG_Subgroup_Recommendations.doc</td>
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<td>Library with physical units</td>
<td>ODX_RS_UNIT_LIB.odx-d</td>
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<td>Collection of global negative response</td>
<td>ODX_RS_GLOBAL_NEG_RESPONS odx-d</td>
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<td>Library with a collection of data object properties</td>
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<td>XML schema for the definitions of SDGs at ODX objects</td>
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<td>XML schema for the definitions of process annotation information at</td>
<td>Annotation-xsd, odx-xhtml.xsd</td>
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<td>Examples for DIAG-SERVICEs with TABLEs</td>
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<td>Example for SDG-Config</td>
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<td>Example for process annotation data</td>
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Conclusion

ODX-RS V 1.0.0

Companion Standard

ready for release