Basic Background Information on the Development of the xDS Concept

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**Abstract**

**EDS (Electronic Data Sheet) circa 1990s**
Served CIP well, Great for the 90s+
NOT for 2018+
Purely for Device Description

Welcome the xDS Concept
More than a Device Description
needs a new name (coming)
general application
• Automation Systems have changed so must device description technology

• Digitization, Modernization, Data Usage
  – Major influencers on modern automation
  – Impose greater needs

• Introducing the xDS Concept
  – Information model
  – for the lifecycle of the device
The xDS Concept is:

- An Information Model for the device
- Able to support the device “Digital Twin”
- Consumed by the System Tools (but agnostic)
- Available in “Real-Time”
- Secure by design
- All inclusive
  - No separate support for Conformance Testing
Diagram Descriptors

- For those following along, all diagrams use this convention:
  - Tools or Software shaded in **Orange** are developed or provided by the ODVA
    - **Green** shaded Objects are developed or provided by the Vendor
    - **Yellow** represents the DoC by the ODVA
  - The xDS file is represented in **blue**
The Device Vendor is fully responsible for the xDS file throughout its Lifecycle.

- **Inputs:**
  - Manual entry
  - Design documents
  - DTMs and other associated assets

- **Other Artifacts:**
  - Profi GSDs
  - ePlan Macros
  - I4.0 Admin Shell

- **Vendor written Digital Artifact Generation tool**
• The Device Vendor should include TSN Configuration information:
  – CUC Flow Request info
  – CNC TSN Capabilities
xDS Lifecycle: Conformance Testing

Optional when the device does not change (w/minor changes) → Physical Device

xDS:
- Signed by supplier before delivery to ODVA
- Contains Public, Private and Conformance Data
- One artefact for use by both conformance test and end users

Conformance Test Software

ODVA Conformance Certificate & Declaration of Conformity

Certificate
- Associates xDS and Device revisions
- Signed by ODVA on completion of conformance test
- Includes validation for vendor xDS
- Human readable, replacing existing DoC
- Machine readable enabling validation of xDS
xDS Lifecycle: Application Developer Actions

1. xDS certificate from the ODVA server

2. System configuration tool response when certificate cannot be found or is a mismatch, it is the tool vendor’s responsibility

3. The Viewer cannot change or save the xDS file

System Configuration Tool

ODVA De-serializer

Public/Private Cloud

xDS (1)

xDS (n)

System Configuration File

xDS Viewer
xDS Lifecycle: Application Developer Actions (w/ TSN devices)
xDS Lifecycle: System Maintenance and Operation (Console)

- Public/Private Cloud
- Controller
- UA Client
- xDS shall not preclude

Optional:
- xDS

Vendor:
- DTM, etc.
- DTM, etc.

Device Vendor:
- Server
- Vendor Org.

Company specific HTML5 app
- Business Logic
- Presentation Logic

Generic HTML5 app
- xDS shall not preclude

External xDS file
- Embedded xDS file

Device 1
- xDS (1)

Device n
- Embedded Config Server

xDS (n)
- Pdf
- DTM, etc.
- Pdf, etc.
- DTM, etc.

Pointers
- (n)
- (n)
xDS Lifecycle: In a Generic IIoT Network Application

- Controller
- Apps (applications)
- IoT Gateway
  - Data (from Device)
  - Meta Data (from xDS)
- Public/Private Cloud
- Gateway discovers the device xDS and Certificate
- xDS from the Device Vendor server
- xDS certificate from the ODVA server
- Device 1
  - xDS (1)
  - Embedded xDS file
- External xDS file
- Device n
  - Gateway discovers the devices
- Virtual Discovery
- Physical Discovery
Conclusion

• The EDS file is being replaced by the xDS concept
  – An Information Model for the device
• The device vendors are fully responsible for their xDS Artefacts
  – The electronic signature and availability to the user
• The ODVA conformance tests xDS Artefacts
  – And is responsible for the DoC and certificates and their availability
• The end-user is responsible for the usage of xDS Artefacts
  – Recommended to use only certified xDS Artefacts
  – But the final decision resides with the end-user
THANK YOU