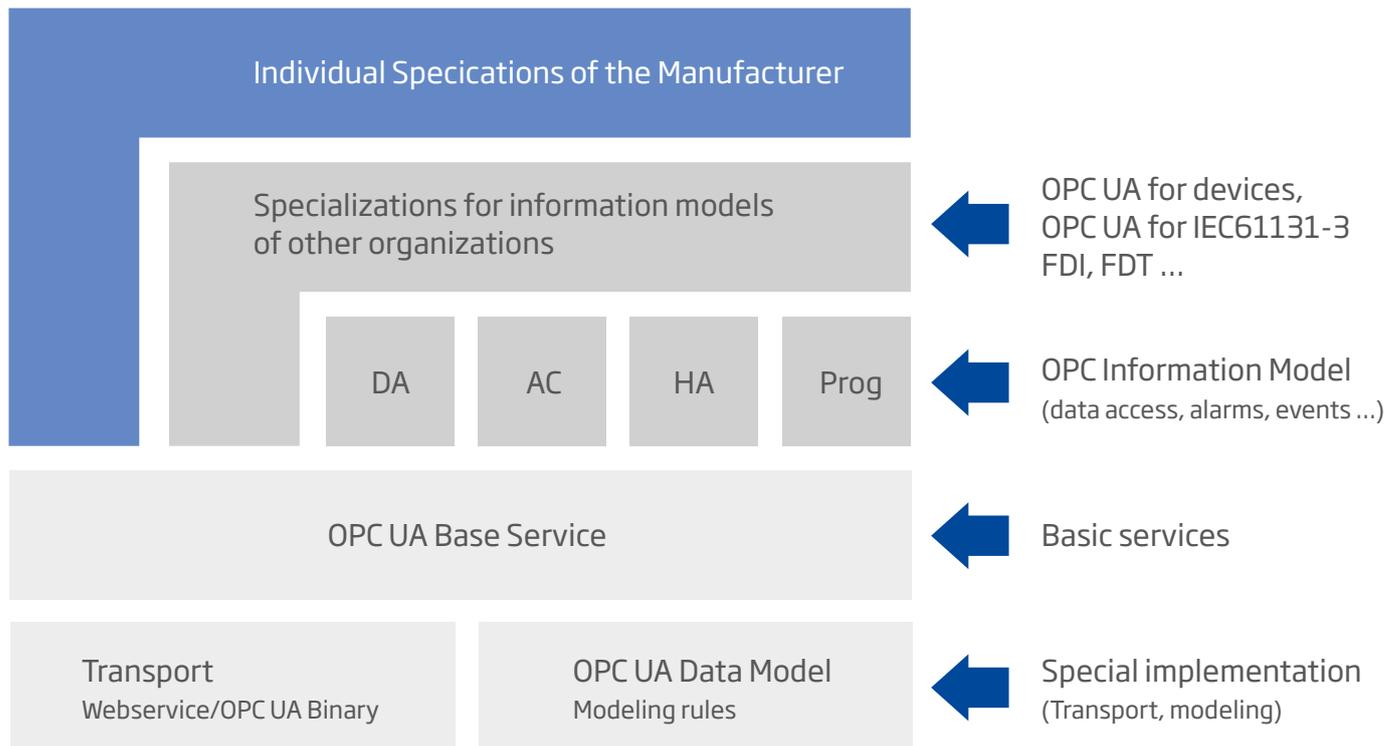# Gantner instruments

Communication Protocol
OPC UA

Open Platform Communication
Unified Architecture

Exchange of Information between Machines
Industrial Standard OPC UA

Compared with all other OPC specifications, OPC UA differs remarkably due to its capability to not just transport data, but also to describe machine-readable data in a meaningful way. OPC UA (Unified Architecture) is an industrial standard issued by the OPC Foundation and is released as IEC standard 62541.

Individual Specications of the Manufacturer	
Specializations for information models of other organizations	← OPC UA for devices, OPC UA for IEC61131-3 FDI, FDT ...
DA AC HA Prog	← OPC Information Model (data access, alarms, events ...)
OPC UA Base Service	← Basic services
Transport — Webservice/OPC UA Binary OPC UA Data Model — Modeling rules	← Special implementation (Transport, modeling)

The Basic Concept of OPC UA

- Service-oriented approach with internet ability
- Consistent data model for process, alarm and historical data
- Easy computer comprehensive use, no DCOM configuration problems
- Platform independent and scalable down to small systems
- Support of complex data structures with machine readable description
- Own security implementation based on latest standards

Transport and coding, as well as the security mechanism can be defined using the OPC UA Protocol Bindings.

The OPC UA Communication Model controls the degreee of access (OPC Base Service) to the information provided by the OPC UA server.

The OPC UA Information Model Layer provides a powerful approach for modelling information.

Coming from basic rules for allocation of information (OPC Meta Model) and basic methods for data exchange (Build-In Information Models) it is possible to create any advanced information model for a dedicated special user case.

Similar to object-oriented programming languages, additional data types can be created from existing data. More complex data types, like object files can be modeled with variables, methods and events.

These kinds of data can be used to build further types with a hierarchical structure. The data type can be pre-defined as device specific, vendor specific, or ready for dedicated application areas or user cases.

Such pre-defined data types can be specified within "OPC Companion Specification".

The "Information Knots", provided from the OPC UA server (also called „Instances") have, in each case, a concrete data type. The type of an information knot and the corresponding description of this type are provided by the OPC UA server. The OPC UA client will read this information.

Therefore an exchange of the description file (Device Description) between the OPC UA server and the client is not necessary for interpretation of the data. The essential benefit of this type description is on the OPC UA client side.

Example:

A SCADA system - operating as an OPC UA client - identifies the type description from each connected information knot and automatically sets the visual presentation options it can offer to the user.

The display of the offered information and the linking to the source is facilitated without programming effort.
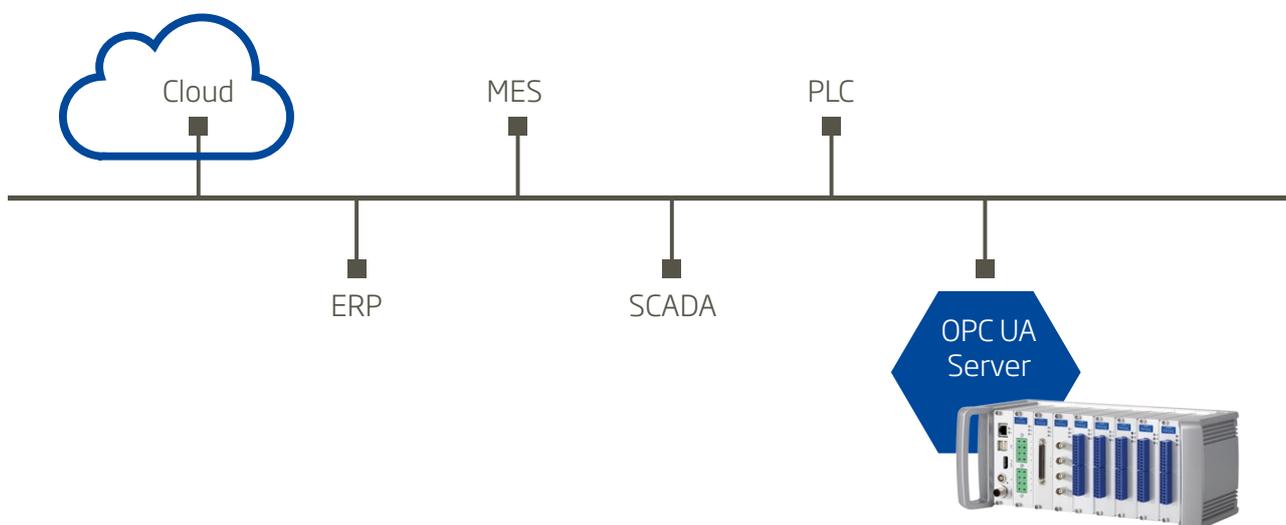
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