OPC UA SDK
Client + Server Development

Preamble

OPC UA

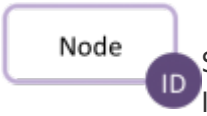
OPC UA stands for OPC Unified Architecture, shortened OPC UA. Contrasting to the predecessor OPC, OPC UA especially differenciates itself through the ability to not only transport machine data (meassurements, parameters etc.), but also describe the data semantically in order for machines to read it. OPC UA means: **O**peness **P**roductivity **C**onnectivity **U**nified **A**rchitechture.

Node

The “Node” is the most basic element of the OPC UA. Nearly every element is “reduced” to one “Node”, so to say. Hearby the Nodes stand within direct relation to each other.
The Wikipedia definition about the OPC Unified Architecture contains a fitting description for the term “Node”:
“The OPC information model is a so-called Full Mesh Network based on nodes. Nodes hold process data as well as all other types of metadata.” Source: wikipedia.org/wiki/OPC_Unified_Architecture

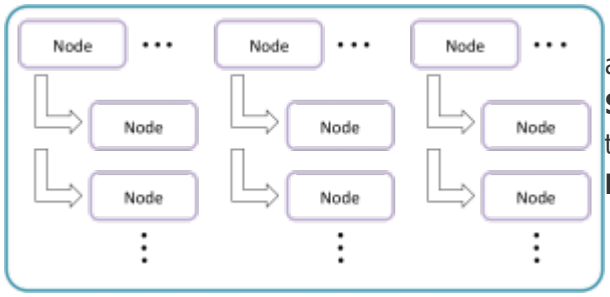
- A Node resembles an object from object oriented programming.
- A Node has attributes, which can be read (Data Access (DA), Historical Data Access (HDA)).
- Nodes are used for process data as well as for all other types of metadata.
- The therefore modelled OPC Address Space contains a type model with which all data types are specified.

NodeId



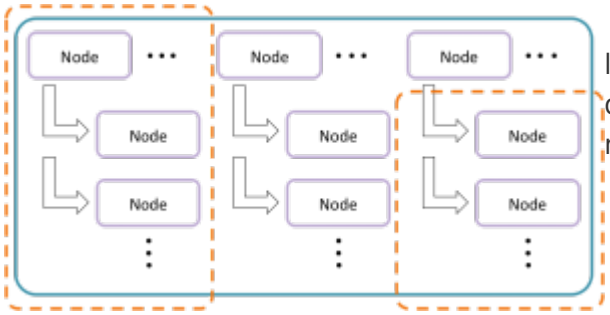
The OPC specification defines that every Node can be uniquely identified in the Adress Space via an Identifier (=**NodeId**). The **NodeId** is defined either by a GUID (Global Unique Identifier), a numeric expression, an array of bytes or a string value. In general but not necessarily, the NodeId contains the “**Namespace**”.

Address Space



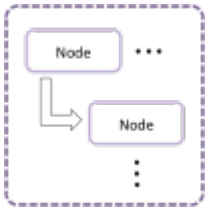
All **Nodes** supplied and processed in the OPC UA are administrated in a so-called **Address Space**. The **Address Space** depicts a kind of logical storage. In this “storage” the contained **Nodes** can logically refer to one or more **Nodes** in the same or another **Address Space**.

View



The “Address Space” mentioned / visualized earlier can be logically segmented into one or more Views. While there is one **Default View**, **Custom Views** can contain one or more Nodes.

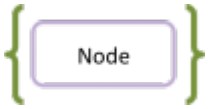
NodeManager



The **Node Manager** supplies one or more Nodes and defines their relationships towards each other. Predefined **System Node Managers** are:

- Core Node Manager (defines i.a. Type Nodes and System Nodes)
- Diagnostics Node Manager (supplies Nodes for diagnostics)
- Master Node Manager (the “administrator” of all Node Managers, it delegates calls to the concerning Node Managers)

Service



OPC UA defines a series of different **Services** by means of which the Client interacts with the Server. Those **Services** are server-sided implemented as Methods and are used for:

- reading and writing Note attributes / values
- administrating Node References
- browsing of Nodes
- reading and writing historical values
- calling Methods
- administrating subscriptions
- e.a.

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