OPC Unified Architectrue (OPC UA)

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What is OPC

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- OPC Compliance Tests available to ensure compatibility
- Constructed to communicate between sensors or other IoT devices in heterogeneous networks
- OPC standards include:
  1. Real Time Data
  2. Data archiving
  3. Alarm messages
  4. Control (command transmission)

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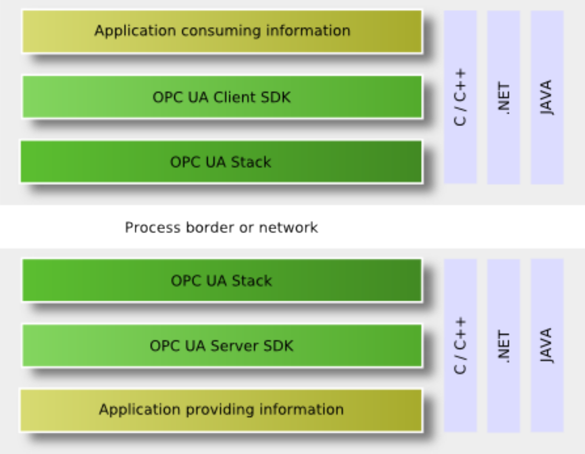
What is OPC UA

- OPC UA - Open Platform Communications Unified Architecture
- Current specification of OPC
- Enables machine readable description of machine data
- Not tied to COM/DCOM anymore
  - ⇒ Eliminate drawbacks such as binding to Windows, security issues, or no configurable timeouts
- Own communication stack for OPC UA includes
  1. Portable ANSI-C implementation as well as C++ and Java
  2. Scalability from embedded control software to operational or management information systems
  3. Compileable for both multithreaded and single-threaded / single-task operation, which is important for porting to embedded devices.
  4. Security implementation based on the latest standards
  5. Configurability of timeouts for each service call
  6. Chunking large data packets

OPC - UA - Communication Stack


Application consuming information
OPC UA Client SDK
OPC UA Stack
C / C++
.NET
JAVA
Process border or network
OPC UA Stack
OPC UA Server SDK
Application providing information
C / C++
.NET
JAVA

https://documentation.unified-automation.com/uasdkhp/1.0.0/html/softwarelayers.png

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    - Open62541 with MPL-2.0 License → Utilization in C++ will generate warnings, but still possible

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Overview

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- Written in common subset of C99 and C++98, usable with all major compilers
- Supports most common OPC UA client and server services
- We take a look at the following client side services:
    - Read
    - Write
    - HistoryRead

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2. To test the HistoryRead behavior of the client, we utilized Prosys OPC UA Simulation Server available at: https://www.prosysopc.com/products/opc-ua-simulation-server/

Demonstration of a Simple Client and a Client with Historical Read

Available: https://github.com/eleicha/OPCTest