OPC UA connection to EtherCAT Master in Microware OS-9

The OpenSource project OPC UA https://open62541.org funded by Kalycito and an OSADL project group https://www.osadl.org/OPC-UA-TSN.opcua-tsn.0.html, has been ported to Microware OS-9 using the LLVM/CLANG compiler https://clang.llvm.org/ . The CLANG compiler is now available as alpha test version for OS-9 customer and supports the latest C and C++ standards.

An example to show how the OPC UA is working, MicroSys has built a sample program to connect the OS-9 EtherCAT Master to OPC UA requests. The EtherCAT Master is running on OS-9 as a separate process, sharing the Process Image of the connected EtherCAT Slaves via a Data Module (Shared Memory) to the control process.

The Process Image contains all necessary information about the Slaves and their I/O. The I/O is created as a tree of node information like "Term 3 (EL1004).Channel 1.Input" or "Term 4 (EL3702).Ch1 Sample 9.Ch1 Value".

The OPC UA example is grabbing this information from the Process Image and creating an object and variable tree. With the DataSource callback functionality for variables in OPC UA, the actual data of the EtherCAT variables in the Process Image can be read and written.

This can be done with an OPC UA browser for example the UAexpert from Unified-Automation: https://www.unified-automation.com/products/development-tools/uaexpert.html
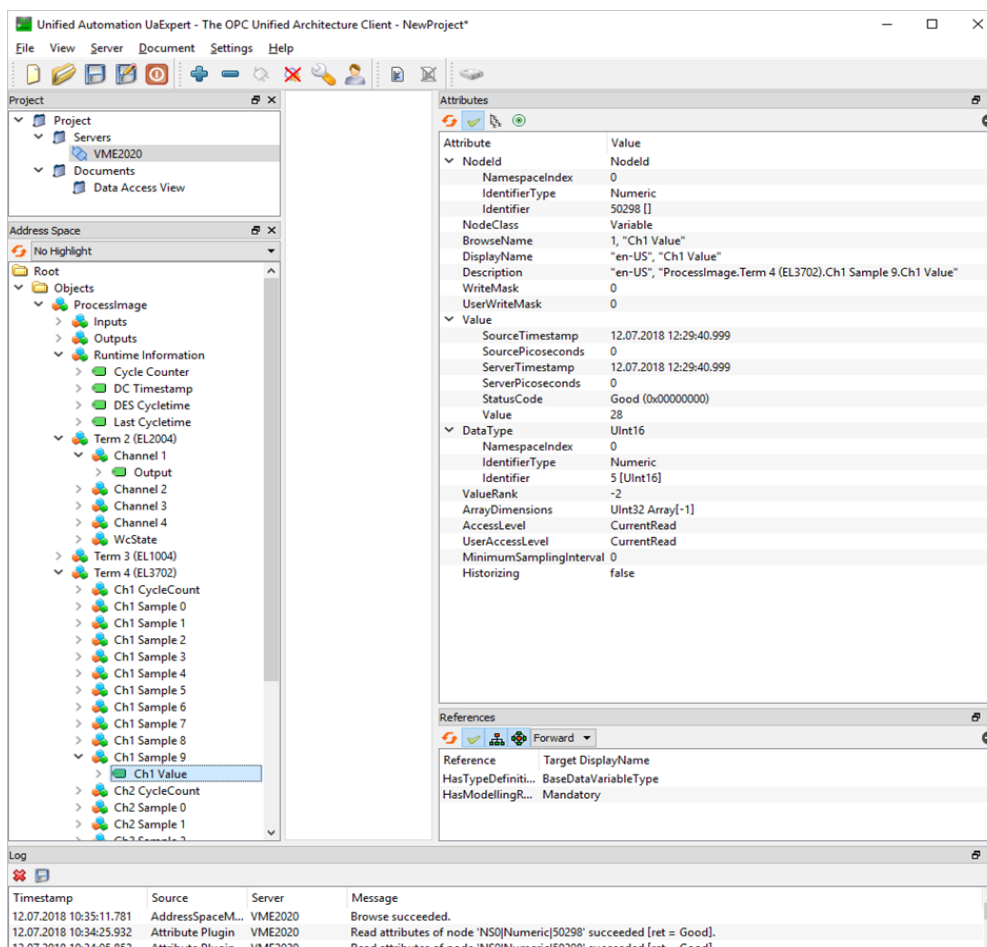
Fig 1.: Dynamically created tree of the EtherCAT Slaves connected to the Master

The picture shows the dynamically created tree of the EtherCAT Slaves connected to the Master. In addition, some Runtime Information like the desired cyclic time, last cyclic time, cycle number and DC Timestamp are readable as well. It is a live view of the Slaves.

The changes needed for OS-9 in the open62541 project were only a few lines of code and have been placed into the master repository https://github.com/open62541/open62541

This project has also been used as another validation to the new CLANG for OS-9 PowerPC and ARM.

For more information on the CLANG and OPC UA project, please contact Kei Thomsen at MicroSys.

Who is standing behind OS-9?

Since February 2013 Microware OS-9 is owned by a partnership of three companies, MicroSys, Freestation (Japan) and RTSI (USA).

MicroSys in Sauerlach near Munich takes care of customers in Europe and provides technical support, consulting and development services.

MicroSys actively continues development on OS-9. Recent developments already provide support for ARM Cortex A series, e.g. cores with NXP's Layerscape LS1043A, LS1046A or LS1088A CPUs.

MicroSys Electronics GmbH	Tel: +49 (0)8104 801-0
Muehlweg 1	Hotline: +49 (0)8104 801-130
D-82054 Sauerlach	Fax: +49 (0)8104 801-110
Germany **www.microsys.de**	Email: info@microsys.de