

OPC DAY FINLAND 2020

4.11.2020, 1.00-4.30 PM (EET)

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Case Valio

Improving MES communication reliability and security with OPC UA

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Pyry Grönholm



- Prosys OPC
 - OPC UA software provider since 2010
 - 300+ customer in 47 countries license our technology
 - Valio was our second OPC UA service customer
- Pyry Grönholm
 - COO @ Prosys OPC
 - Head of Valio OPC UA Project since 2014
 - Background as a Software Developer
 - During my first project in 1998 as a Prosys OPC employee, I coded an OEE reporting (Java applet running on Netscape Navigator)

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- Brand leader and the biggest dairy business in Finland
- Valio's product range includes around 1,000 products
- Valio employs approximately 4,000 professionals in various fields



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Case Valio: OPC UA Since 2010

- In 2010 Valio made a decision to replace all 20+ communication plugins between their MES and automation with one OPC UA plugin
- The OPC UA - MES connection was piloted in 2010 at one factory and starting from 2011, OPC UA was rolled out on every production facility
- The automation installation base is very heterogeneous
 - DCS: Siemens, Valmet, Honeywell, ...
 - Connections to PLCs, Building automation, History databases etc.
- Use of OPC UA opened a possibility to bring data from automation to IT systems other than MES.

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OPC UA software at 2010

- None of the plant floor data sources had OPC UA server available, therefore, protocol conversion had to be done for each of them.

The big picture of OPC UA Software in 2010:

- OPC Foundation had low stack level implementations for .NET, C and Java
- The only SDK with DA, HA and AC implementation was .NET SDK from OPC Foundation
- Some gateways were available, but the high price and low reliability ruled out most of them
- We started with UaGateway from Unified Automation and custom code made with OPCF .NET SDK

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Good Practices we have found 1/2

Despite the relatively unproven technology we had to use, we indeed succeeded. What were the cornerstones of the following success?

1. Aggregating OPC UA Server between office and automation network
 - Enabled monitoring and fast reaction to possible OPC UA connection breaks
 - Speed up the commissioning as firewall setups were easy to define
 - Enabled an easy way to connect further IT system with OPC Client to gather data from Production
 - Enable secure communication between office and automation networks

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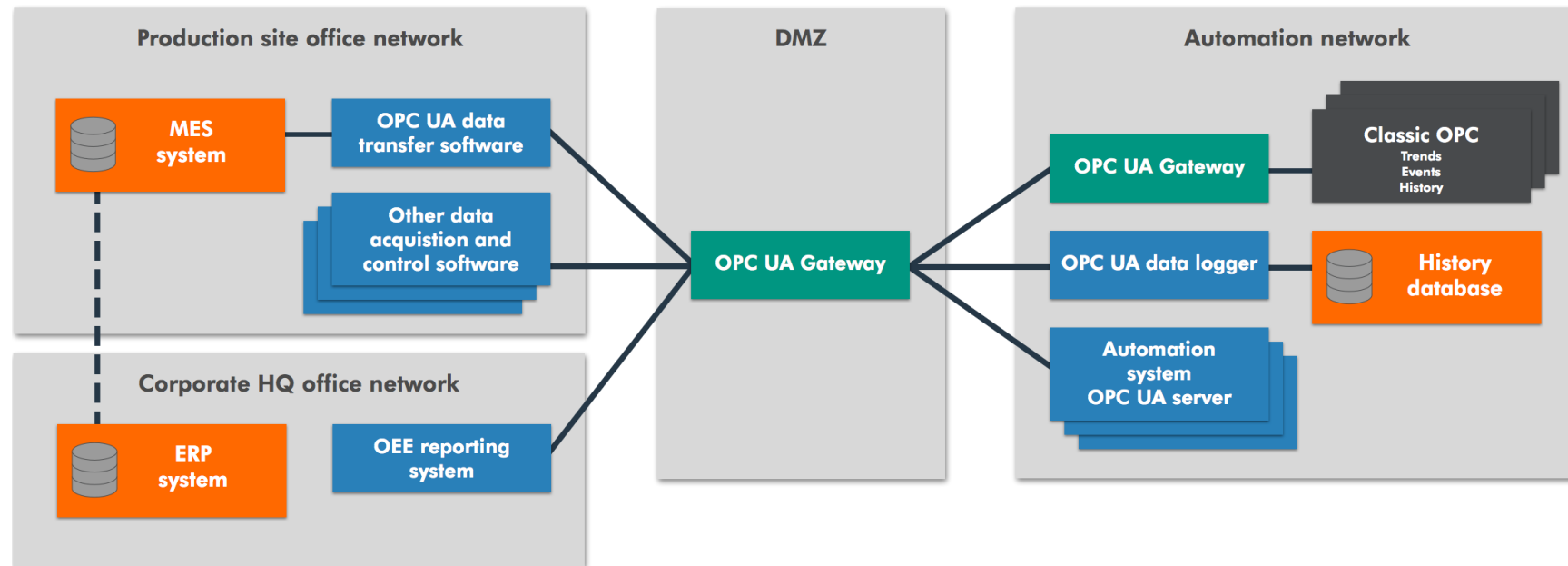
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Good Practices we have found 1/2 ...

Aggregating OPC UA Server between office and automation network



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Good Practices we have found 2/2

2. Avoid use of OPC Classic to OPC UA conversion if there is another suitable solution
 - OPC Classic server is a frequent cause of problems

3. Possibility to code business logic on Edge level application instead of DCS or PLC, enables considerable savings in long-term development cost. Best examples are:
 - “Message generator”, which generates MES process messages from “raw” PLC/DCS measurement tags
 - Recipe connector that takes in XML recipes and writes set point values to PLC/DCS tags

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Some pitfalls along the way 1/2

- Use of software with no commercial support in 24/7 environment
 - Yes, I do not recommend it.
- Thinking that OPC DA (Classic / UA) server is a suitable option if you want to collect Track & Trace data
 - Hard to find suitable time for software / hardware updates
 - Eventually, the connection will have trouble, and some data might be lost (or has to be entered manually)
 - If no other option is available, consider placing data buffer as near to the data source as possible

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Some pitfalls along the way 2/2

- Trusting that system APIs provided by reputable automation vendors are reliable by default
 - Especially on old systems, performance and long-term stability testing is necessary
- Try to force OPC UA in use cases it is not applicable for
 - Typically you eventually succeed, but the work effort may be quite high compared to the more natural solution

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Valio OPC UA Today

- 12 Factories, with 50+ OPC UA data sources using only OPC UA between automation and office network
 - 2 Greenfield and 10 Brownfield
- Less than a dozen OPC UA reliability incidents per year
- A few other IT systems than MES also use OPC UA to connect to the automation
- Use of OPC UA leveraged to include new systems such as building automation
- Machines supporting OPC UA companion specification are being commissioned

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Thank you!

