

PROFINET and OPC UA: Real world use case of mapping diagnostic information

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In our previous article, we have learned about OPC UA can be integrated into the PN I/O device, PN Controller device or edge gateway. In this article, we will cover the details of PROFINET diagnostic concept and use cases covered by PROFINET and OPC UA specification for mapping the diagnostic information from PROFINET device to OPC UA.

Real world use cases covered by OPC UA mapping for PROFINET Diagnosis information

Below are the six use cases supported currently by OPC UA mapping of PROFINET diagnosis information

- Identify, if there is any difference between expected configuration given in the ES of the I/O Controller compared to what is installed in the device.
- List the installed devices and their configurations in the field
- State of the PROFINET connection related to the expected configuration of the I/O Controller device
- Differences between the expected and real configuration related to modules/submodules, their identification information and reason for any connection problems.
- Diagnosis or maintenance update related information of the device/module/submodule/channel
- Information about the “health” of the physical PROFINET network in the Diagnosis tool in a topological view

PROFINET Diagnostics: Technical Know-How

Device and network diagnosis are crucial for the proper functioning of the plant. PROFINET defines the comprehensive diagnostic model.

Each PROFINET I/O device maintains Diagnosis ASE, which is nothing but the repository of the global list of active diagnosis from the channel. Channel in this scenario can be a connected sensor or entire submodule. When there is a diagnosis that appears in the channel, it will be updated with the Diagnosis ASE repository. Each channel diagnosis entry contains a severity (Fault, Maintenance demanded, Maintenance required, good – severity high to low) and error codes. When there is a query from upper supervisory (Edge Gateway), relevant diagnostic information will be shared.

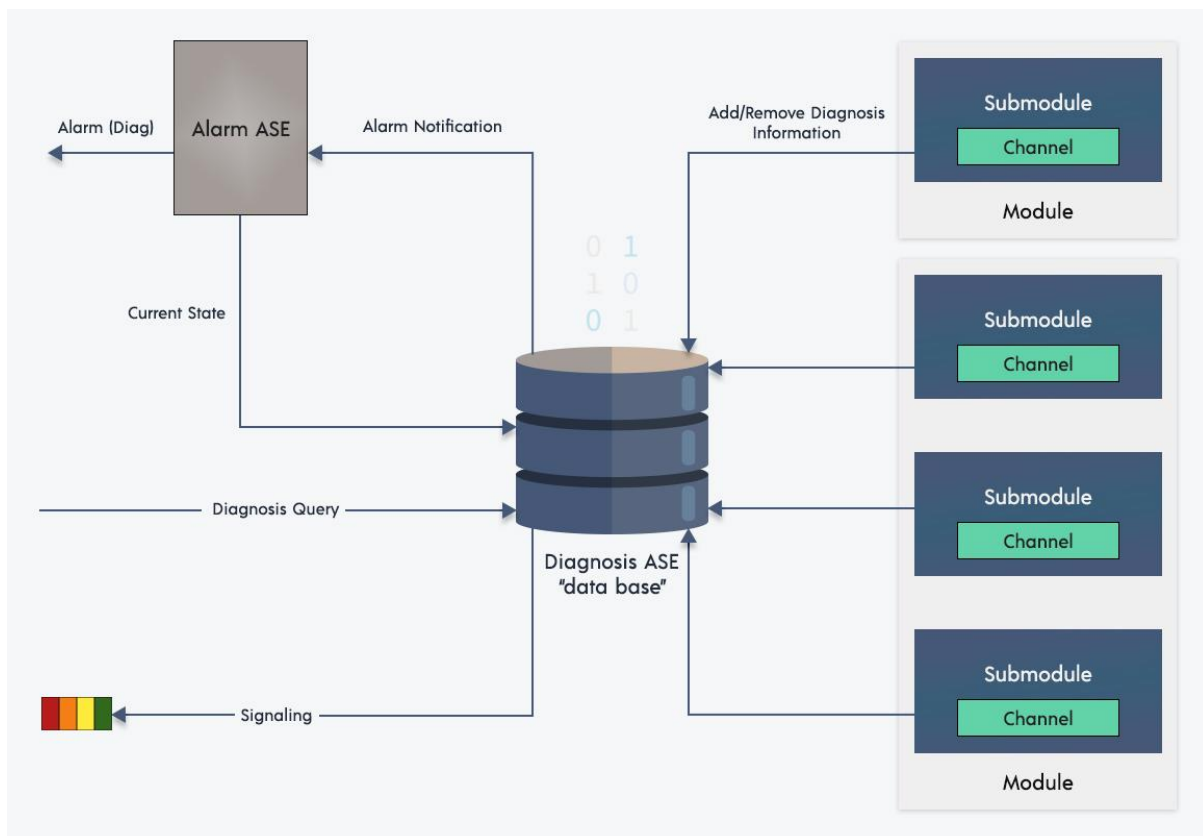


Image Reference Source: PROFINET and OPC UA mapping specification

High-Level Architecture of PROFINET diagnosis

In a typical automation scenario, diagnosis tool is connected to PLC, Edge Gateway or PN I/O device with built-in OPC UA capability. As shown in the below architecture diagram, the diagnostic information provided by the I/O Controller device will be different from Edge Gateway. For instance, if the PROFINET device is unreachable from Edge Gateway during its scanning process, the reason for this can be different compared to the PN I/O Controller point of view.

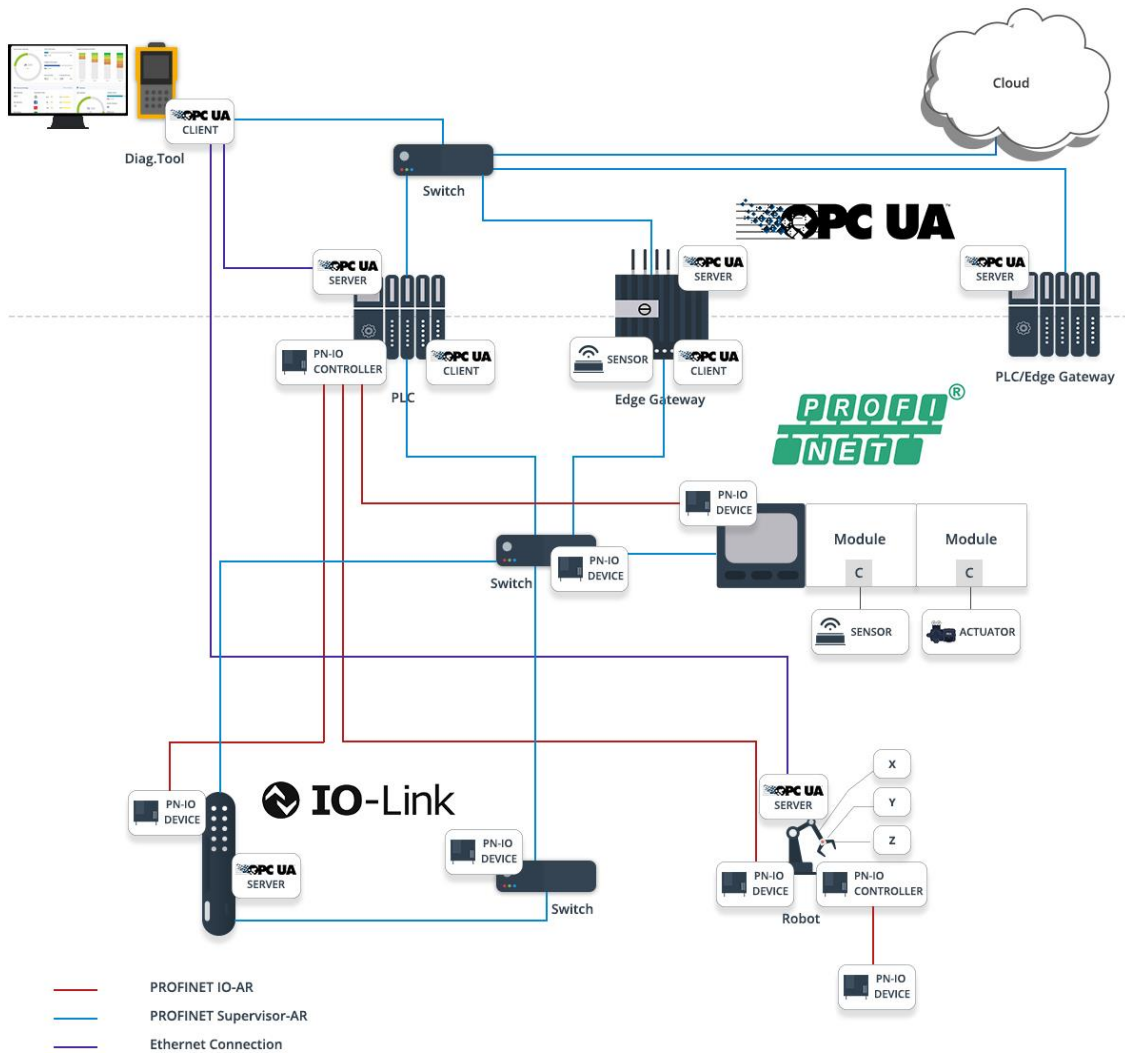


Image Reference Source: PROFINET and OPC UA mapping specification

Conclusion

Mapping the PROFINET diagnosis to OPC UA Information will enable the higher-level system to make the informed decision on time resulting in lower downtime, increasing the overall efficiency of the asset performance.

Stay tuned for our next article: PROFINET and OPC UA – real-world use cases of mapping Asset information

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