

Communication interface between Real-Time simulators and grid automation architecture using VILLAS

Our Profile:

The researchers affiliated with the Institute for Automation of Complex Power Systems work at developing automation solutions for distribution grid. One of the aspect that is related to the automation architecture is the protection of the grid during a fault, by excluding the branch where the fault happened, and the restoration of the disconnected portion of the grid by re-energizing loads and generators from a different electrical feeder. In a field application, this approach requires the communication of data from the grid sensors to the servers where the algorithms are running and, then, the communication of the signals to the controllable devices. In a simulated environment, the measurements and the control signals are exchanged with a real-time simulator, namely RTDS [1]. To realize this interface the software tool VILLASnode [2], developed in the institute, can be exploited.

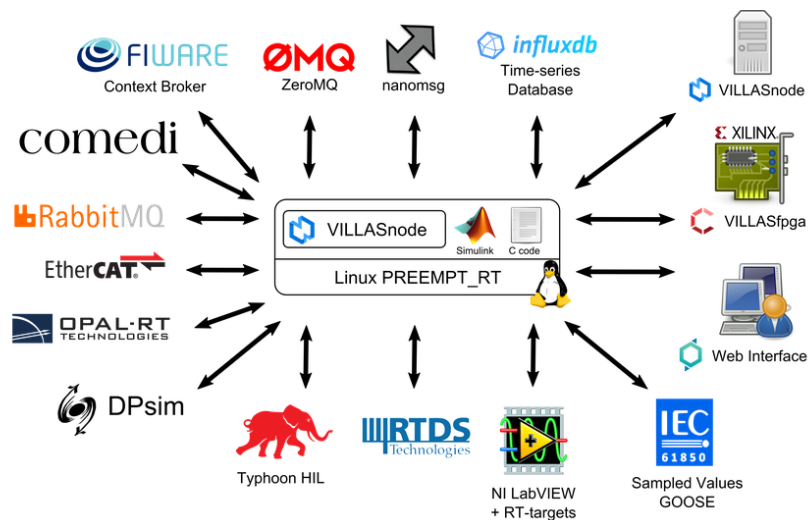


Figure 1: VILLAS interfaces (<https://www.fein-aachen.org/projects/villas-node/>)

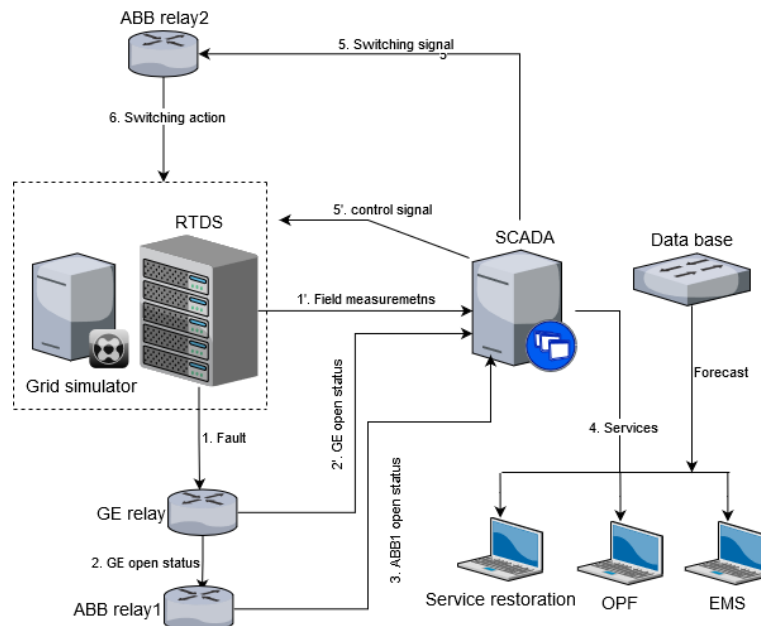


Figure 2: Scheme of the test setup

Your Profile:

We are searching for a Bachelor or Master student with a knowledge of C/C++ and eventually Python.

Your Project:

The work will consist in setting up VILLASnode and prepare the interface with the algorithms running on the server and the interface with RTDS. The communication protocols used in the project are UDP, MQTT and GOOSE (IEC61850).

Our offer:

The work is expected to be completed in a 3 month period (eventually extendable) with a contract of 12 hours/week.

[1] RTDS: <https://www.rtds.com/>

[2] VILLASnode: <https://villas.fein-aachen.org/docs/node/>

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