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OpenPMU, PTP, and Time Synchronised Sampled Values -The Data Hoarder's Approach -

By
Dr. David Laverty, Reader (Full Professor)
Queen's University Belfast, Belfast, Northern Ireland

DATE: Wednesday, December 13, 2023.
TIME: Webinar: 4:30 p.m. – 6:00 p.m., MST

PLACE: Online. Free, registration required at: <https://events.vtools.ieee.org/m/387575>



Abstract

"When you can measure what you are speaking about, and express it in numbers, you know something about it." Lord Kelvin.

Synchronised measurement technology, more specifically the Phasor Measurement Unit (PMU), has yielded tremendous insight into power system phenomena over the last decades. The PMU, however, is an instrument that is not itself well understood by many who make use of its measurements. The time synchronised phasor, or synchrophasor, is a double-edged sword; on the one hand it has made it possible to apply classical methods of power system analysis to "real" data from real systems. On the other hand, the synchrophasor dispenses with all the nuance of the voltage or current waveform that was present in the sampled values from which it is estimated.

What if we just keep all of the time synchronised sampled value (TSSV) data, and use that for our studies? Building machines which can do this is more than feasible. This talk will discuss approaches and challenges that engineers pursuing this strategy face, in particular the not so small matter of the many terabytes of data such a system will create, with "needle in a haystack" levels of useful information. The talk will describe an effort on the island of Ireland to build a national system to record TSSV and also synchronise using PTP in preference to GNSS and its "space-based" vulnerabilities.

Speaker's Bio



David Laverty (Senior Member, IEEE) received the Ph.D. degree from Queen's University Belfast, Northern Ireland, in 2010. His thesis was on the use of synchrophasors for real-time control of generator sets via the Internet, investigating matters related to latency, packet loss and cyber security. He was appointed to a permanent post at the School of EEECS in Queen's University Belfast in 2011, where he is presently a Reader (Full Professor, in North America). His work continues to address matters related to power system measurements, particularly time synchronisation, data systems, machine learning and cyber security. He is known as the founder of the open source project "OpenPMU", which continues to develop open source hardware and software related to Phasor Measurement Units. His recent work is concerned with alternatives to "space-based" time signals, i.e. GNSS, in order to provide a resilient time transfer solution on which electrical utilities and other critical national infrastructure can depend.

Admission: Free. Registration required at: <https://events.vtools.ieee.org/m/387575>

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