IEC 61850-8-1 Editions 1 and 2

OPAL·RT TECHNOLOGIES

IEC 61850 is a standard applied to the design of electrical substation automation systems, which defines fast communication of events (GOOSE) through Ethernet frames. Standard naming and object modeling are based on a Substation Configuration Language (SCL), describing data exchange at device and substation levels.

OUR SOLUTION

High speed exchange of status and control commands between logical nodes of the substation protection, control, monitoring and logging systems. The GOOSE configuration can be easily imported from any Substation Configuration Language (SCL) file for the various equipment under test.

IEC 61850-8-1 GOOSE
Native complex data objects and attributes with digital and analog values are supported:
- BOOLEAN, INT8, INT16, INT32, INT64, INT8U, INT16U, INT32U, FLOAT32, FLOAT64, Enum, Dbpos, Tcmd, Check, Quality, Timestamp and Struct.

All mandatory fields in GOOSE headers are configurable by the user, and encoded according to the Edition 1 or Edition 2 standard.

Performance
The current solution has been successfully tested with up to 169 IED or GOOSE trip messages -that the simulator can publish or subscribe to- per simulation core, provided a proper optimization and an adequate number of Ethernet interfaces. The solution is scalable over multiple simulation cores and Ethernet interfaces.

Clock
All types of messages support the use of an external clock. The precision of the timestamp in GOOSE messages is plus or minus the time step of the model.

KEY FEATURES

- **Extraction from SCL/CID/ICD files containing multiple IED/logical nodes**
- **Ed. 2 S bit for simulated GOOSE mode**
- **Connect up to 128 individual GOOSE messages per license**
- **Synchronization through IRIG-B, 1PPS or IEEE 1588 with or without Power Profile**

TECHNICAL SPECIFICATIONS

Standards	IEC 61850-8-1 GOOSE Edition 1 IEC 61850-8-1 GOOSE Edition 2
Process time requirement	< 3 [ms]
Number of GOOSE messages	128 transmissions or receptions per license
Time synchronization options	IEEE 1588v2 (with Power Profile), 1PPS, IRIG-B

OPAL-RT SOFTWARE COMPATIBILITY

SOFTWARE	IEC 61850-8-1 GOOSE
RT-LAB	☑
HYPERSIM	☑

THIRD-PARTY HARDWARE[†]

NAME	SKU	DESCRIPTION
Time synchronisation kit, Oregano Syn1588 PCIe NIC[†]	OP3811 or OP3812	Board required for accurate time synchronization (0.1 ppm oscillator)
Intel Quad-port Ethernet board[†]	EXPI9404PTL	Dispatch Ethernet traffic over multiple ports to increase bandwidth

[†]Prior to ordering and/or installing, check with your local OPAL-RT representative to ensure PCI express and hardware compatibility.