

OPAL-RT

Power System Overview



OPAL-RT
TECHNOLOGIES



OPAL-RT TECHNOLOGIES Inc.

- Established in 1997 in **Montreal, Canada**
- Background in Power Systems & Power Electronics from Hydro-Québec
- 400 employees
- Offices in USA (Michigan & Denver), Brazil, France, Germany, India & China
- Utilities, Universities, Electric Transportation, Aerospace & Defense



APPLICATIONS



Microgrid



Power Generation



Power System Controls



Wide Area Monitoring



Cybersecurity



Modular Multi-Level Converter (MMC)



Protection System



All Electric Ship



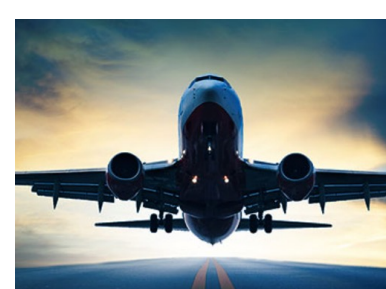
Battery Storage



Electric Transportation



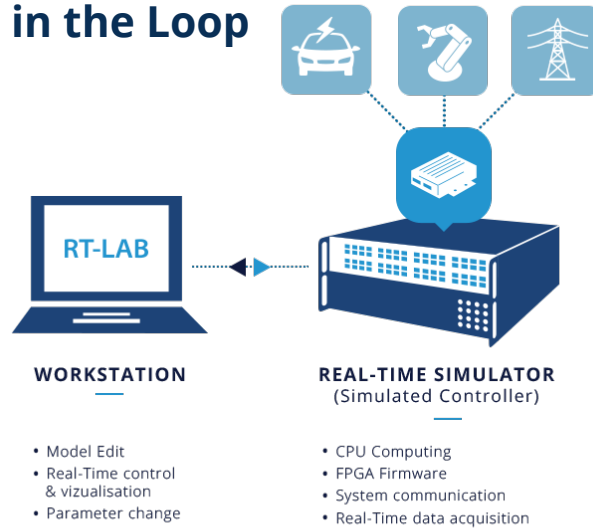
Autonomous Vehicles



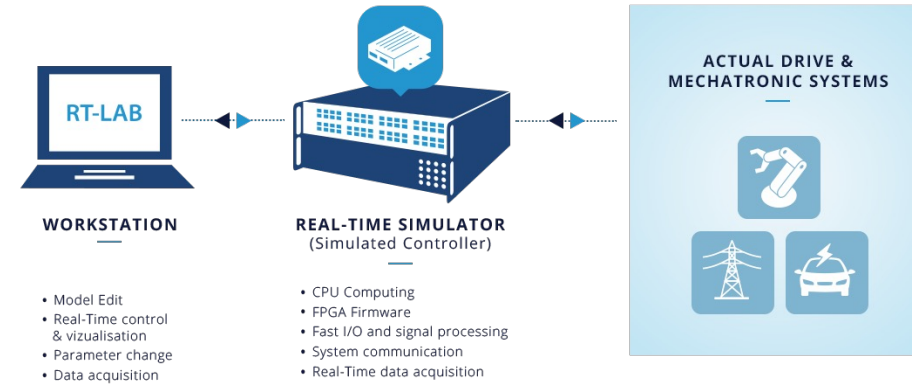
Aerospace and Defense

TYPE OF SIMULATION

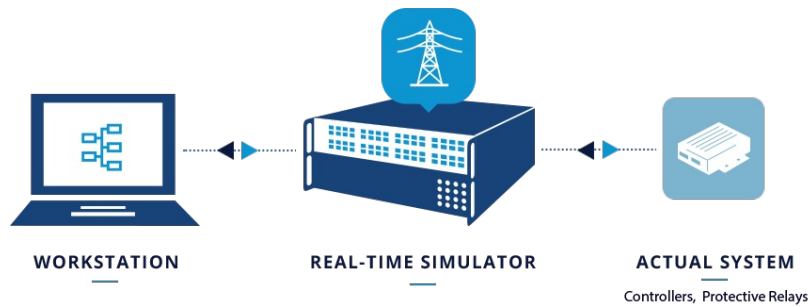
Software / Model in the Loop (SIL / MIL)



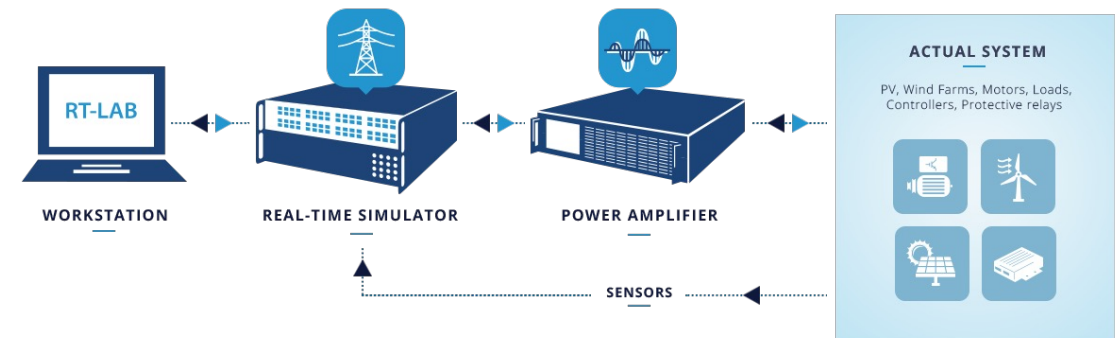
Rapid Control Prototyping (RCP)



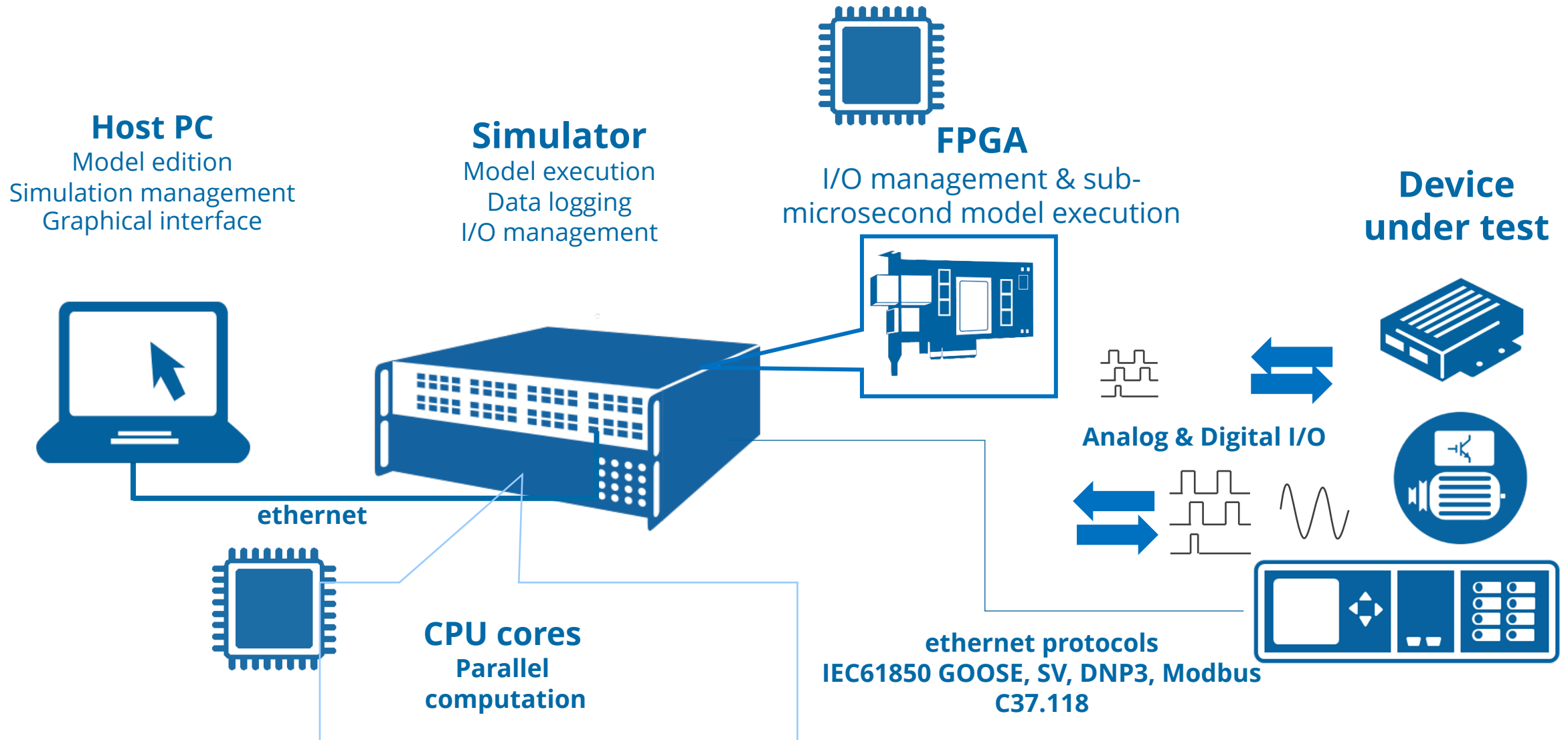
Hardware-in-the-Loop (HIL)



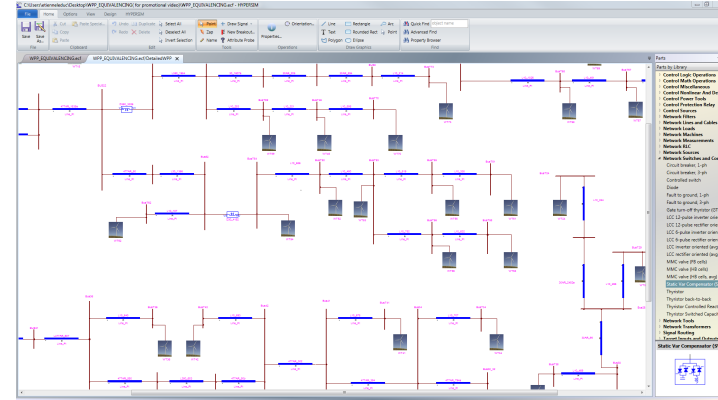
Power Hardware-in-the-Loop (PHIL)



HARDWARE SYSTEM ARCHITECTURE



SOFTWARE SYSTEM

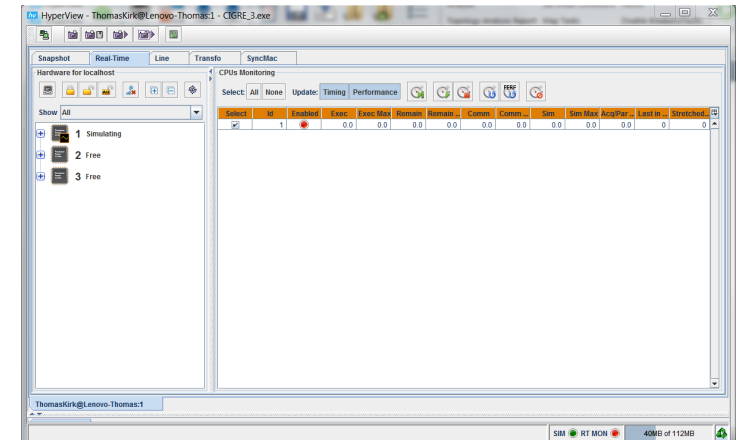
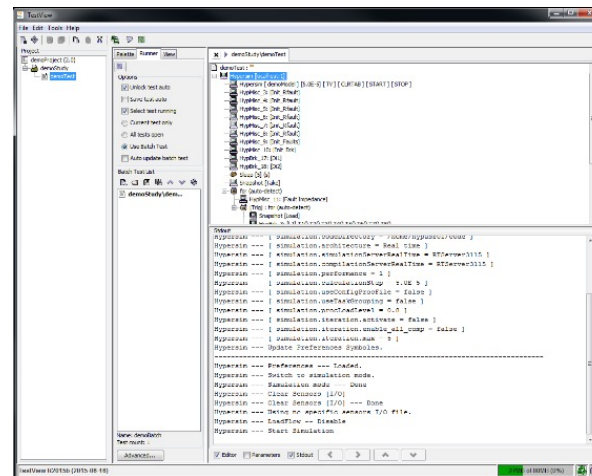
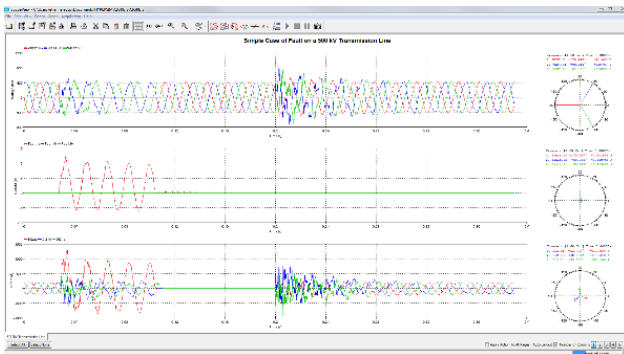


Schematic editor

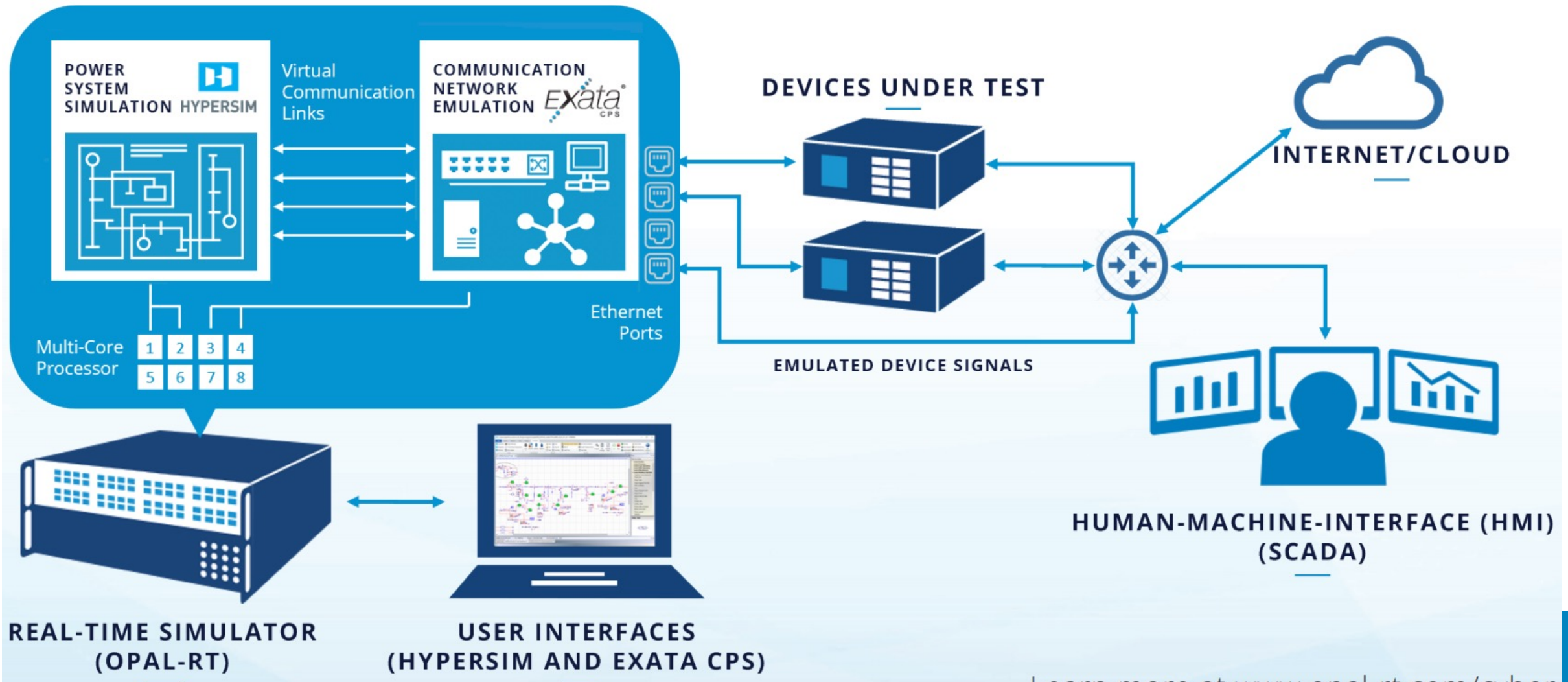
visualization

automation

monitoring



REAL-TIME CYBER-PHYSICAL SYSTEM SIMULATION



Design, Testing and **Validation** of complex electrical and electromechanical systems & their controls

- R&D on Smart Grid Applications
- Validate new technology and products
- Develop and test new behaviors
- Test increasingly complex scenarios
- Interoperability challenges between protection and inverter based DERs
- Faster and more efficient testing
- Safe and Economic environment
- Digital twin allow to test without impacting customer reliability



DIGITAL TWIN

