Me

Hello!

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COPA-DATA
The Future is Ergonomics

Ergonomic and highly-dynamic process solutions for HMI/SCADA, dynamic production reporting and integrated PLC systems

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Ing. Thomas Punzenberger
COPA-DATA CEO
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zenon Logic
Integrated PLC System

zenon Operator
Embedded HMI System
One System – Many Industries
Successful Customers

E N E R G Y & I N F R A S T R U C T U R E

SIEMENS  SPRECHER AUTOMATION  ALSTOM GRID  GE
SEL  CAPULA  LEITWIND  REMSDAQ  CG AUTOMATION

AND MANY MORE...
What we are focusing on in Energy

Energy Automation

- Substation Automation Transmission
- Substation Automation Distribution
- Hydro Power Plants
- Control Centers Distribution
- Integration of Renewables (Wind, PV)
Substation Automation with IEC 61850

It’s about communication

• IED – IED
• IED – HMI
This is how SAS typically looks like

- **Engineering WS**
- **Client WS**
- **STATION Computer**
- **SERVER**
- **STAND-BY**
- **LAN**
- **WAN**
- **Control Center**
  - IEC60870-5-104 master

- **BCU** Bay Control Unit
- **BMU** Bay Monitoring Unit
- **Protection**

- **BAY 1**
- **BAY 2**
- **BAY n**

- **SERVER STAND-BY**
- **Web client**
This is how SAS typically looks like
Challenge

Configuration of IEC 61850 Clients
IEC 61850 Configuration

Easy configuration of a complex topic
IEC 61850 Configuration

Easy configuration of a complex topic
New challenge

Load shedding with IEC 61850 GOOSE
Load shedding with IEC 61850 GOOSE

- Trend to CRAS (Centralized Remedial Action Schemes)
- Short response time (within a wavelength [20.00ms/50Hz, 16.67ms/60Hz])
- High demand for guaranteed response time
Load shedding with IEC 61850 GOOSE

• Trend to CRAS (Centralized Remedial Action Schemes)

• Short response time (within a wavelength [20.00ms/50Hz, 16.67ms/60Hz])

• High demand for guaranteed response time

Can we do that with off the shelf hardware and a standard implementation of GOOSE?
1. Detects fault and trips the breaker

2. Calculates current matrix and sends trips to other relays

3. Relays execute necessary trips
Questions

- Can we do that with a Windows platform?
- Can we run a SCADA application at the same time?
- How shall the GOOSE control blocks be configured?
How we tested it

1. DSC10 Bay Control Unit (Ducati Sistemi)
2. Load Shedding PC
3. Analysis PC

IEC 61850 GOOSE

© by Ducati
How we tested it

Relay PC
DSC10 Bay Control Unit (Ducati Sistemi)

Load Shedding PC

Analysis PC

3ms cycle time

IEC 61850 MMS
DNP3

IEC 61850 GOOSE

COPADATA
Results

- Combined GOOSE messages with multiple data objects do perform significantly better.

- Despite the load on the network and on the SCADA host with the load shedding logic, the system is capable of delivering a fairly consistent load shedding performance.
Benefits of integrating real-time automation functions into IEC 61850-based SCADA platforms

Grid Automation

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Keywords: SCADA Automation, Smart Grid, Load Shedding, GOOSE, MMS, IEC 61850, IEC 6131-3

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1 Abstract
Proposed smart grids will use a digital platform for the automation of the power system. There is a requirement for substations automation systems to provide a higher degree of automation capability to ensure reliability of supply to the customer and deliver on the main objectives of a smart grid. The performance of current automation systems have to date been sufficient. However, new applications such as wide-area measurement and control/remedial action schemes and automatic load shedding and load restoration require more capable automation systems and the use of international standards to ensure interoperability between systems and vendors. Furthermore, these automation systems need to be robust,
Questions?
Thank you!

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