CIGRE PARIS SESSION 2024

Contribution – Question 2.03

B5 – PS2 - Question 2.03 - The reliability of the PACS is associated with redundancy and monitoring of system conditions. Is this aspect being considered within the engineering process, including the application of tools?

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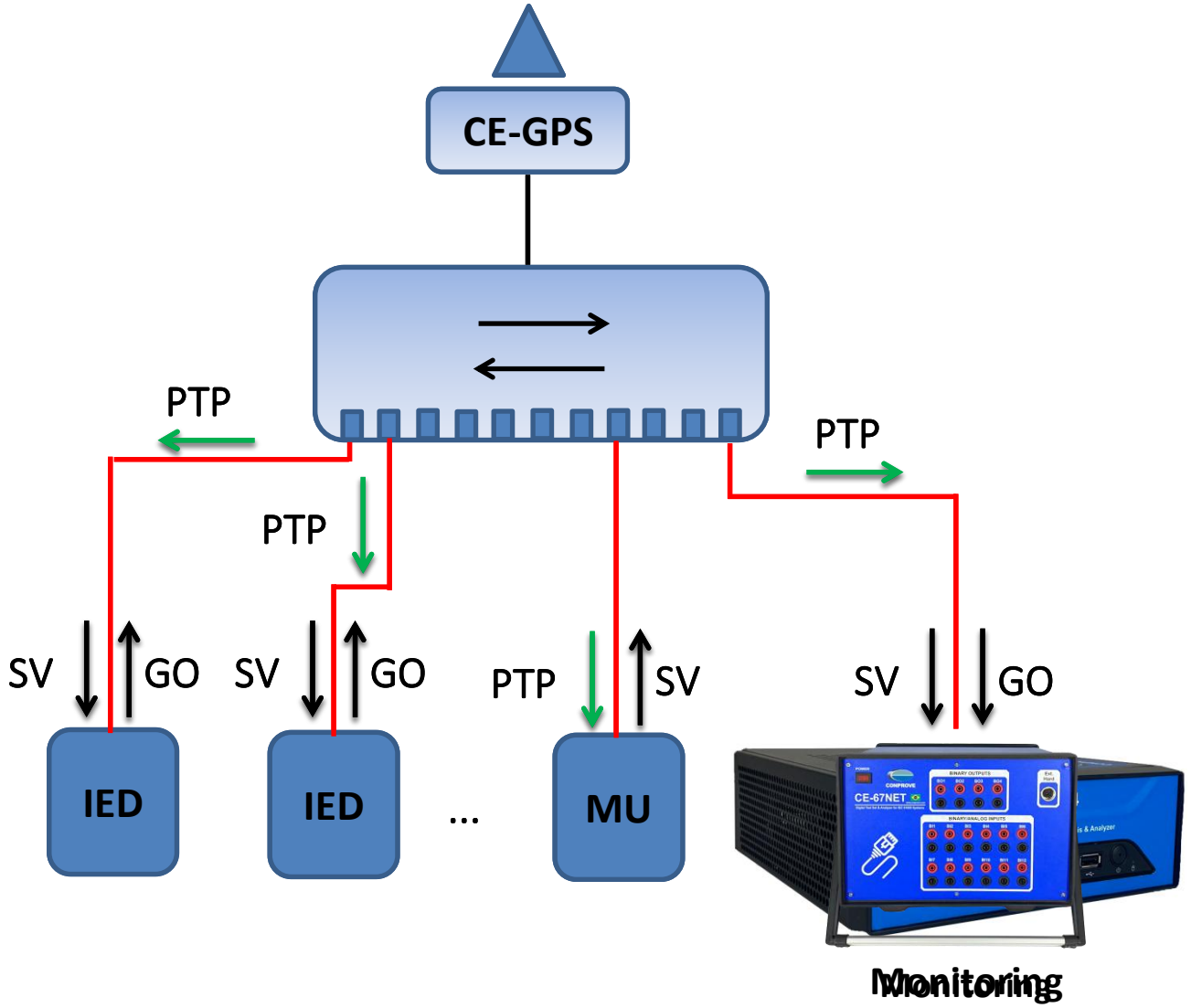
- Analyzing the **importance** of **monitoring** the **IEC 61850 network**:
  - **Early** problem **detection**;
  - **Monitoring** of communication network **operating conditions**;
  - **Reduced downtime** by tracking faulty network elements;
  - **Specialized tools**;
  - **Logging** of all network events;
  - **Security and stability** of the power system.

- Implementation of **fully digital substations** based on IEC 61850:
  - **Process Bus** highlights how vital the **Ethernet communication** network **performance** is in PACS.

- Several **network aspects** must be analyzed to guarantee **reliability**, **speed**, **availability** and **security** of the information being transmitted.

- Monitoring **features** (**hardware/software**):
  - Comparison of **running frames** with **.scl files**;
  - **Unforeseen messages** or **absence** of messages;
  - Messages with **divergent parameters** or **loss of integrity**;
  - **Packet loss**, **duplicated** or **corrupted** packets;
  - **Out-of-order** packets;
  - Condition of the **synchronization clock** (**GrandMaster** mode, **BMCA**, **holdover**);
  - **Failure** in device **synchronization**;
  - **Statistical** functions:
    - **Time between frames**, **processing time**, **transfer time**;
    - **Jitter** and **latency** of messages;
  - **Log** recording;
  - Recording of network traffic **.pcap**.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THANK YOU !

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