

PS1 – Q1.03 - Which measures could be taken to ensure the reliability, security and performance of the PACS with digital process bus, including non-nominal network and synchronization states? What is the impact of these measures on the design and cost of the PACS ?

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The Network Monitoring as a Solution for a Reliable IEC 61850
Process Bus



- The **concept of network monitoring**;
- Several **network aspects must be analyzed** to guarantee the **security, reliability, speed** and **availability** of the information being transmitted, warning potential communication failures or invasions.

Monitoring events

Monitored Events

Filters: ☒ Critical ☒ Warning ☒ Information ☒ PCAP Recording [Advanced...](#)

☒ GO GOOSE

	PCAP
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Time to live (TTL) expired	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Out of sequence	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Format error	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Transfer time exceeded	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> SCL Comparison	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Never seen	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 'GOOD' validity changed	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Test Bit of Quality changed	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Changes in Time Quality Bits	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Clock not synchronized (Time Quali	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> SttNum Quick Change	<input checked="" type="checkbox"/>
<input type="checkbox"/> <input checked="" type="checkbox"/> Appeared	<input type="checkbox"/>

☒ SV Sampled Values

	PCAP
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Time Out	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Out of sequence	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Format error	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Higher processing	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> SCL Comparison	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Never seen	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> 'GOOD' validity changed	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Test Bit of Quality changed	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Clock slip	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Synchronization flag changed	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Clock not synchronized	<input checked="" type="checkbox"/>
<input type="checkbox"/> <input checked="" type="checkbox"/> Appeared	<input type="checkbox"/>

☒ PTP

	PCAP
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Time between messages	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Message Loss	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Master precision changed	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Clock Class Change	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Updated UTC offset	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Active Master	<input checked="" type="checkbox"/>
<input type="checkbox"/> <input checked="" type="checkbox"/> Appeared	<input type="checkbox"/>

☒ Device

	PCAP
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Loss of synchronization	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Overload	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Synchronization established	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Link established	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Link lost	<input checked="" type="checkbox"/>

☒ PRP Redundancy

	PCAP
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Out of sequence	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Crossed Networks A and B	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Duplicate receipt by networks	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Message without PRP	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> PRP network different from the defin	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> SV message loss	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> GO message loss	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Message loss	<input checked="" type="checkbox"/>

☒ Others

	PCAP
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> GO Unpredicted	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> SV Unpredicted	<input checked="" type="checkbox"/>
<input checked="" type="checkbox"/> <input checked="" type="checkbox"/> Defined by USER	<input checked="" type="checkbox"/>

PS1 – Q1.03

- Study case to exemplify an application of a monitoring system.

