

**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**



# PS1 – Q1.03

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- 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...](#)

Category	Event	PCAP
GO GOOSE	Time to live (TTL) expired	<input checked="" type="checkbox"/>
	Out of sequence	<input checked="" type="checkbox"/>
	Format error	<input checked="" type="checkbox"/>
	Transfer time exceeded	<input checked="" type="checkbox"/>
	SCL Comparison	<input checked="" type="checkbox"/>
	Never seen	<input checked="" type="checkbox"/>
	'GOOD' validity changed	<input checked="" type="checkbox"/>
	Test Bit of Quality changed	<input checked="" type="checkbox"/>
	Changes in Time Quality Bits	<input checked="" type="checkbox"/>
	Clock not synchronized (Time Quali	<input checked="" type="checkbox"/>
StNum Quick Change	<input checked="" type="checkbox"/>	
	Appeared	<input type="checkbox"/>
SV Sampled Values	Time Out	<input checked="" type="checkbox"/>
	Out of sequence	<input checked="" type="checkbox"/>
	Format error	<input checked="" type="checkbox"/>
	Higher processing	<input checked="" type="checkbox"/>
	SCL Comparison	<input checked="" type="checkbox"/>
	Never seen	<input checked="" type="checkbox"/>
	'GOOD' validity changed	<input checked="" type="checkbox"/>
	Test Bit of Quality changed	<input checked="" type="checkbox"/>
	Clock slip	<input checked="" type="checkbox"/>
	Synchronization flag changed	<input checked="" type="checkbox"/>
PRP Redundancy	Clock not synchronized	<input checked="" type="checkbox"/>
	Appeared	<input type="checkbox"/>
PTP	Time between messages	<input checked="" type="checkbox"/>
	Message Loss	<input checked="" type="checkbox"/>
	Master precision changed	<input checked="" type="checkbox"/>
	Clock Class Change	<input checked="" type="checkbox"/>
	Updated UTC offset	<input checked="" type="checkbox"/>
	Active Master	<input checked="" type="checkbox"/>
	Appeared	<input type="checkbox"/>
	Device	Out of sequence
Crossed Networks A and B		<input checked="" type="checkbox"/>
Duplicate receipt by networks		<input checked="" type="checkbox"/>
Message without PRP		<input checked="" type="checkbox"/>
PRP network different from the define		<input checked="" type="checkbox"/>
SV message loss		<input checked="" type="checkbox"/>
GO message loss		<input checked="" type="checkbox"/>
Message loss		<input checked="" type="checkbox"/>
Others	GO Unpredicted	<input checked="" type="checkbox"/>
	SV Unpredicted	<input checked="" type="checkbox"/>
	Defined by USER	<input checked="" type="checkbox"/>

# PS1 – Q1.03

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

