



Solution for monitoring and commissioning a GOOSE installation, consisting of a Tap and a Protocol Analyser. The Tap filters and forwards messages to GOOSE Monitor, the application that displays the IED topology and the messages in real time.

Datasheet

Updated on 27/4/23

GOOSE Auditor a commissioning tool

GOOSE Monitor

1. Packet Monitor & Capture

1.1 Filters

- IED
- Control Block Reference
- Protocol types
- DateTime
- Ignored retransmissions

1.2 Packet List

- Time
- Source
- Dest
- Protocol
- IED
- CB Ref
- Interface Index/Name/IP Addr/MAC Addr
- Length

1.3 Settings

- Duration
- Direction
- PCAP parameters

2. GOOSE Analysis

2.1 Ethernet GOOSE and Routable GOOSE (R-GOOSE)

2.2 Filters

- IED
- Control Block Reference
- Protocol
- DateTime
- Ignored retransmissions

2.3 Local / Remote monitoring

- Subscription information from GOOSE subscription supervision logical nodes (LGOS)

2.4 Rogue GOOSE

- Unknown
- Not matching
- StNum missed
- out of range

2.5 Alerts

- Expired TAL
- Invalid/Missed/OoRange
- Duplicate

- Mismatched GoID/Dataset
- Unexpected ConfRev
- Needs Commissioning
- Bad Data
- Multiple Publishers
- Duplicate Source/Destination IP or MAC Address
- Non-unique Source IP

3. IED Inventory

3.1 Setup

- Manual
- IEC-61850 Substation Configuration Language (SCL) files

3.2 Alert State

- No Alerts
- Alerts Latched
- Alerts Active LPHD In Simulation Mode

3.3 Publication State

- All Seen
- Some Seen
- None Seen
- Some or All Simulated

3.4 Subscriptions State

- All Active
- Some Active
- None Active
- No LGOS
- Connection Error

4. IED Status

4.1 GOOSE Control Block

4.2 Node Status

- LGOS OK
- LGOS Not OK
- No LGOS
- Connection Error
- Simulation Processed

4.3 Edge Status

- LGOS OK
- LGOS Not OK
- No LGOS

4.4 Connection Error

4.5 IED Traits

- Publisher

CONFIDENTIAL

- Subscriber
- Simulation Sent
- Simulation Received

5. IED Visualization

5.1 Status

- On
- Blocked
- Test
- Test Blocked
- Off

5.2 Mode

- Layered
- Multidimensional
- Ranking

6. IED Details

6.1 GOOSE Control Blocks

- Enabled
- Alerts
- Subscribing IEDs
- Access Point
- Control Block
- Header
- Data Set

6.2 LGOS References

- Alerts
- SP [GoCBRefsetSrcRef GoCBRefsetSrcCB]
- ST [BehstVal ConfRevNumstVal]

6.3 LGOS

- HealthstVal
- LastStNumstVal
- ModstVal
- NdsComstVal
- SimStstVal
- StstVal
- ST/NdsCom/stVal
- ST/SimSt/stVal
- ST/ConfRevNum/stVal
- LGOS/ST/RxConfRevNum/stVal
- LGOS/ST/Beh/stVal
- LGOS/ST/Health/stVal
- LGOS/ST/Mod/stVal
- LLNO/GO/GoEna LLNO/RG/GoEna
- LLNO/GO/NdsCom LLNO/RG/NdsCom
- LLNO/ST/Beh/stVal
- LLNO/ST/Health/stVal
- LPHD/ST/Sim/stVal

6.4 LLNO

- ST [Beh Health]
- DC [NamPlt]
- EX [NamPlt]
- LPHDm
- ST [Sim]
- DC [PhyNam]

7. Alerts

7.1 Expired TAL

- SqNum Invalid/Missed/OoRange/Missed

7.2 Error

- Multiple Publishers
- Duplicate Frame
- Mismatched GoID/Dataset/AppID
- Unexpected ConfRev
- Needs Commissioning

- Bad Data

7.3 IP/MAC Address

- Duplicatinction
- Source/Dest/Non-unique

7.4 Log

- Syslog client enabling TAL expirations
- Rogue GOOSE messages
- other error conditions

8. Operation

- Laptop / PC equipped with at least one Ethernet adapter
- Local / Remote monitoring

Net.Shark

1. Ports and Interfaces

- RJ-45 port for electrical connection 10/100/1000BASE-T for mirror ports
- Optical and electrical SFPs ports operating at up to 1 Gb/s for line ports
- SFP interfaces support: 10BASE-T 100BASE-TX 1000BASE-T 100BASE-FX, 1000BASE-SX, 1000BASE-LX, 1000BASE-ZX

2. Operation Modes

- Tap & filter: Traffic is forwarded between line ports, traffic is selectively copied to the mirror ports or stored in an SD card
- Filter: Traffic is filtered and forwarded to the corresponding mirror port or stored in an SD card

3. Formats and Protocols

- Ethernet frame: IEEE 802.3, IEEE 802.1Q, IEEE 802.1ad
- IP packet: IPv4 (IETF RFC 791), IPv6 (IETF RFC 2460)
- Jumbo frames: up to 10 kB MTU (Maximum Transmission Unit)
- Throughput between measurement ports: 1 Gb/s or 1,500,000 frames/s in each direction
- PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at) pass-through

4. Auto-negotiation

- Auto-negotiation and forced bit rate modes supported by mirror and line ports
- Negotiation of bit rate. Allow 10 Mb/s, allow 100 Mb/s, allow 1000 Mb/s

5. Configuration

- Configurable MTU size from 1518 bytes to 1000 bytes
- Enable / disable traffic aggregation of both transmission directions to a single mirror port

6. Filters

- Up to 16 fully configurable and independent filters for each test port
- User-configurable filters defined by field contents on Ethernet, IP, UDP and TCP headers

6.1 Generic Filters

- Agnostic filters defined by 16-bit masks and user defined offset
- Pattern filter (one per port) to match alphanumeric words or expressions
- Length filters to match frames by their length

6.2 Ethernet Filters

- MAC address: source, destination
- MAC address group: subset filtered by a mask
- Ethertype field with selection mask
- VID (Net.Shark) or C-VID and S-VID (Net.Hunter)
- VLAN priority or C-VLAN priority and S-VLAN priority
- S-VLAN DEI

6.3 IPv4 Filters

- Selection by IPv4 source or destination address or both
- It is possible to select address sets by masks

- Selection by protocol encapsulated in the IP packet (TCP, UDP, Telnet, FTP, etc.)
- Selection by DSCP value
- Storage range: -20°C to +70°C
- Operation humidity: 5% - 95%



6.4 IPv6 Filters

- Selection by IPv6 source or destination address (or both at the same time)
- It is possible to select address sets by using masks
- Selection by IPv6 flow label
- Selection based on the next header field value
- Selection by DSCP value

6.5 TCP / UDP Filters

- Selection by *TCP / UDP port*
- Single value or a ranges

7. Results

- Auto-negotiation results including current bit rate, duplex mode, Ethernet interface
- SFP presence, interface, vendor, and part number
- Separate traffic statistics for each port
- Separate statistics for transmit and receive directions
- Frame counts: Ethernet, and IEEE 802.1Q (VLAN), control frames
- Frame counts: unicast, multicast and broadcast
- Error analysis: FCS errors, undersized frames, oversized frames, fragments, jabbers
- Frame size counts: 64, 65-127, 128-255, 256-511, 512-1023, and 1024-1518 bytes
- Byte counts: Port A (Tx / Rx) and Port B (Tx / Rx)
- Traffic counters follow RFC 2819

7.1 Captures

- Capture format is PCAP or PCAP Next Generation
- Hardware time stamping of captured data (error < ±20 ns)
- Export filters: Based on date / time or previous capture filter settings
- Phase synchronization of capture timestamps through NTP
- Frame counters for each configured filter

8. Platform

8.1 Ergonomics

- Size 223 x 144 x 65 mm
- Weight: 1.0 kg (with rubber boot, one battery pack)
- 4.3 inch TFT colour screen (480 x 272 pixels)

8.2 Graphical User Interface

- GUI controlled by Touch-screen, Keyboard or Mouse
- Direct configuration and management in graphical mode
- User interface by touch-screen, keyboard and mouse
- Full remote control with VNC
- Configuration up/down through Internet, USB and SNMP
- Local management with CLI
- Full remote control: SNMP, SSH, VNC

8.3 Results

- Local storage in txt and pdf files
- File transfer to SD card and USB port
- File management through web interface and SNMP

8.4 Board

- 2 x USB ports
- 1 x RJ45 port
- 2 x LEDs
- Software upgrade through USB port

8.5 Batteries

- Li Ion Polymer
- Up to 22 hours of operation in E1 (with two packs)
- Up to 10 hours of operation in Ethernet (with two packs)

8.6 Operational Ranges

- IP rating: 54
- Operational range: -10°C to +50°C