



Systems Integration Specialists

GOOSE Monitor

Troubleshooting GOOSE-Based Systems

SISCOnet.com

About SISCO

Founded in 1983, Systems Integration Specialists Company (SISCO) set out to harness the emerging power of personal computers to transform factory automation. Early in its journey, SISCO pioneered the first commercial implementation of the Manufacturing Message Specification (MMS), advancing how robots helped reshape the automotive industry.

In the 1990s, the Electric Power Research Institute (EPRI) launched its Utility Communication Architecture initiative. SISCO became a key contributor, demonstrating that its MMS technology aligned seamlessly with the needs of the electric utility sector.

This milestone marked a pivotal shift: SISCO turned its focus to the utility industry, helping to define and drive the adoption of critical standards, such as **ICCP**, **IEC 61850**, and **CIM**. Over the decades, the company has remained deeply engaged in industry organizations and user groups, ensuring these standards continue to evolve.

Today, SISCO is recognized as a leader in utility communications—providing deep expertise, robust products for rapid deployment, and services that connect systems and data with efficiency and reliability.



SISCO Committed to Standards

- IEC Technical Committee 57 (TC57)
 - » WG07/19 – IEC60870-6 TASE.2 (ICCP)
 - » WG10 – IEC 61850 (power system automation communications)
 - » WG13 – IEC 61970 for EMS (CIM modeling and model exchange)
 - » WG14 – IEC 61968 for DMS (CIM modeling and messaging)
 - » WG15 – IEC 62351 Communications Security
 - » WG17 – IEC 61850-420 and 8-2 Distributed Energy Resources
 - » WG19 – Interoperability and Harmonization with TC57
- IEEE
 - » Power System Relaying Committee (PSRC)
 - » Power System Communications and Cybersecurity Committee (PSCC)
 - » CIM Task Force
- UCA International Users Group
 - » Founding Member
 - » CIM Users Group
 - » IEC 61850 Users Group
- ISO
 - » TC 184 - ISO 9506 (MMS)

SISCO Technology

- Communication Protocol Software and Tools for:
 - » Control Center-Control Center and Control Center-Power Plant communications
 - Intercontrol Center Communications Protocol (ICCP) IEC 60870-6 TASE.2
 - » Power System Automation Communications
 - IEC 61850
- Common Information Model
 - » CIM-based messaging for model-driven application integration
 - » Adapter and tools to apply CIM to data and tag name management for operational systems
- COMTRADE Enterprise-level power system disturbance file management system for PI
- Unified Analytic Platform
 - » A high-speed analytic platform for processing real-time data streams such as GOOSE (and Routable GOOSE) for wide-area protection, measurement, and control
- Systems Integration Services
 - » Training
 - » Adapter/application development
 - » Consulting to assist our customers based on international standards

GOOSE Monitor

Architecture & Applications

The Challenge of GOOSE

- IEC 61850 GOOSE Messaging uses multicast technology for station-level time-critical protection and automation messaging
- Each device is typically publishing multiple GOOSE streams and subscribing to multiple GOOSE streams from other devices in the substation
- In large substations, there are many hundreds of publish-subscribe relationships between devices
- With messages being transmitted as fast as 5-10ms per message, it can be very difficult for the substation engineer to debug these systems using traditional network monitoring or by monitoring a single device

The GOOSE Monitor Solution

- The GOOSE Monitor is designed to provide an intuitive visualization of the real-time GOOSE messaging on the network that enables the engineer to identify what is working and what is not working quickly
- Allows the engineer to cut through the complexity and focus their attention on the location or device where the problems are identified

GOOSE Monitor Provides Answers

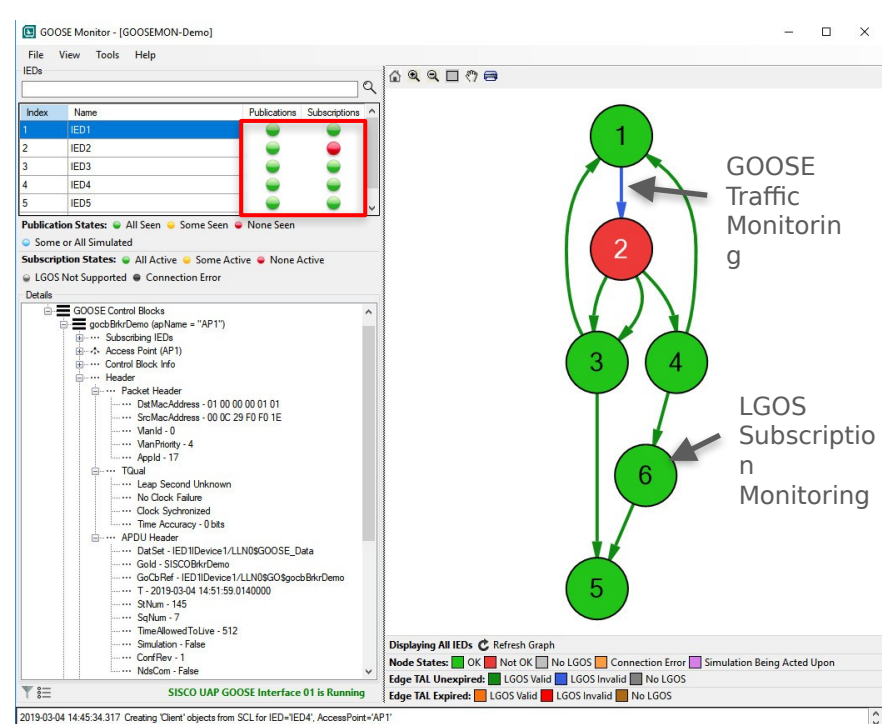
- Are GOOSE messages being published as expected?
- Are GOOSE messages being received by the IEDs as expected?
- Are there unexpected GOOSE messages on the network?
- What data is being published in each GOOSE message?
- Is the flow of GOOSE messages as expected?
- Are there simulated GOOSE messages on the network?

GOOSE Monitor Features

- Provides an intuitive and simplified view of network relationships and GOOSE traffic status to help the engineer focus on what is important
- GOOSE configuration is automatically generated from SCD file:
 - » Graph diagram
 - Nodes represent the state of GOOSE subscriptions via LGOS
 - Connections between nodes represent GOOSE messaging
 - » Addressing
 - » LGOS monitoring
- Other GOOSE subscription configuration options available for systems without an SCD:
 - » Auto discovery of subscriptions by reading LGOS values
 - » Importation of subscriptions via spreadsheet.
- “Focus On” Mode allows the engineer to follow the publisher and subscriber relationships through the system to track down root causes of problems

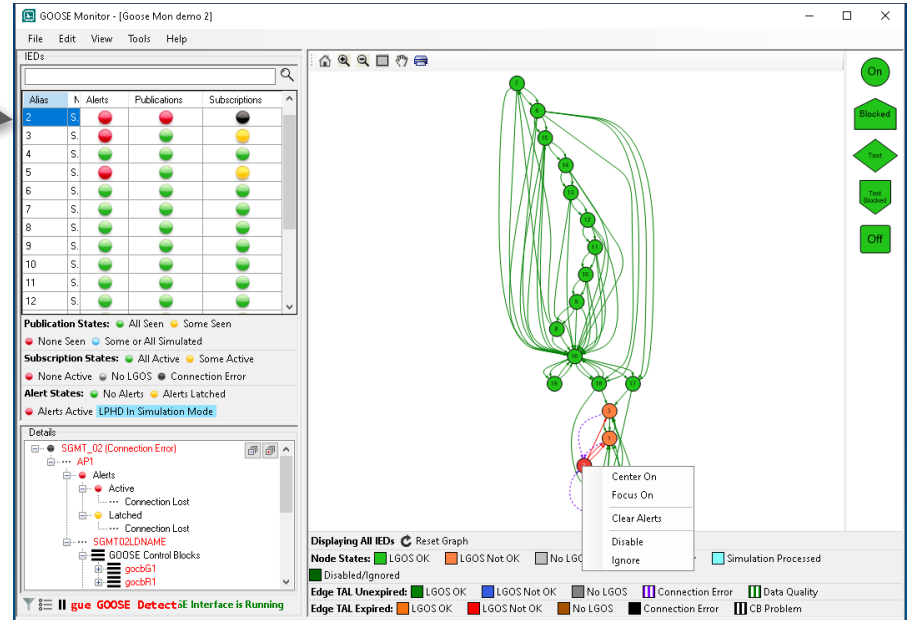
GOOSE Monitor Visualization

- GOOSE configuration is automatically generated from SCD file:
 - » Graph diagram
 - » LGOS subscriptions
 - » Addressing, etc.
- Pub/Sub colors (user configurable) represent GOOSE traffic (Pub) and LGOS state (Sub)
- Node colors (devices) state of GOOSE subscriptions via LGOS
- Edge colors (arrows) represent GOOSE messaging/traffic state



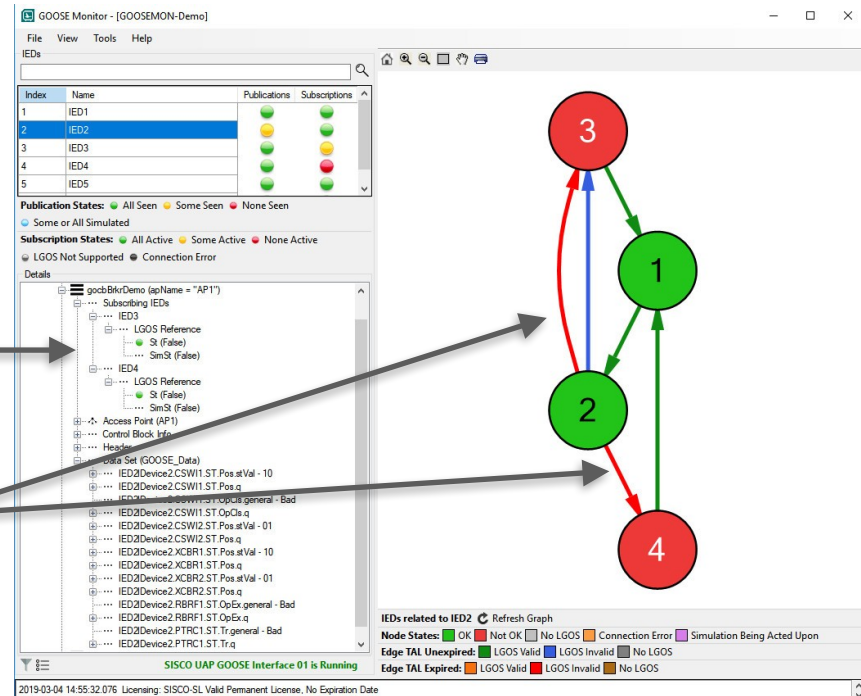
GOOSE Monitor – Device 2 a Problem?

- What is going on with Device 2?
- Click on Device 2 to display details
- Right click on Device 2 to enable “Focus On” Mode
- “Focus On” Mode displays an isolated view of the selected device



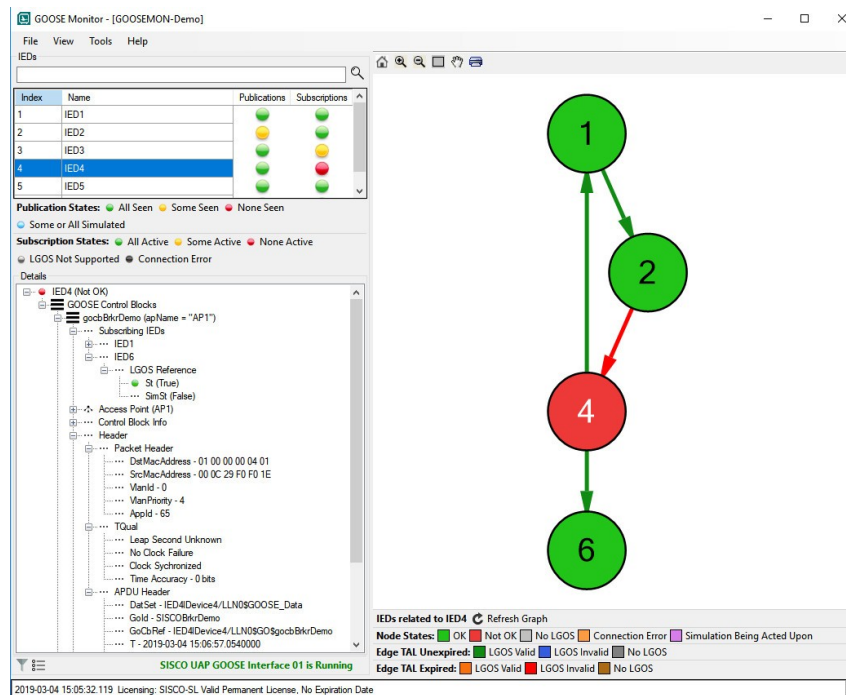
GOOSE Monitor – “Focus On” Mode

- Displays an isolated view involving only the selected device
- Enables the engineer to focus on the more likely causes for problems
- The details screen shows the state of the LGOS subscriptions in subscribed devices
- Edge colors show that Devices 4 and 3 are not subscribed to messages from Device 2
 - » Device 2 is not publishing GOOSE

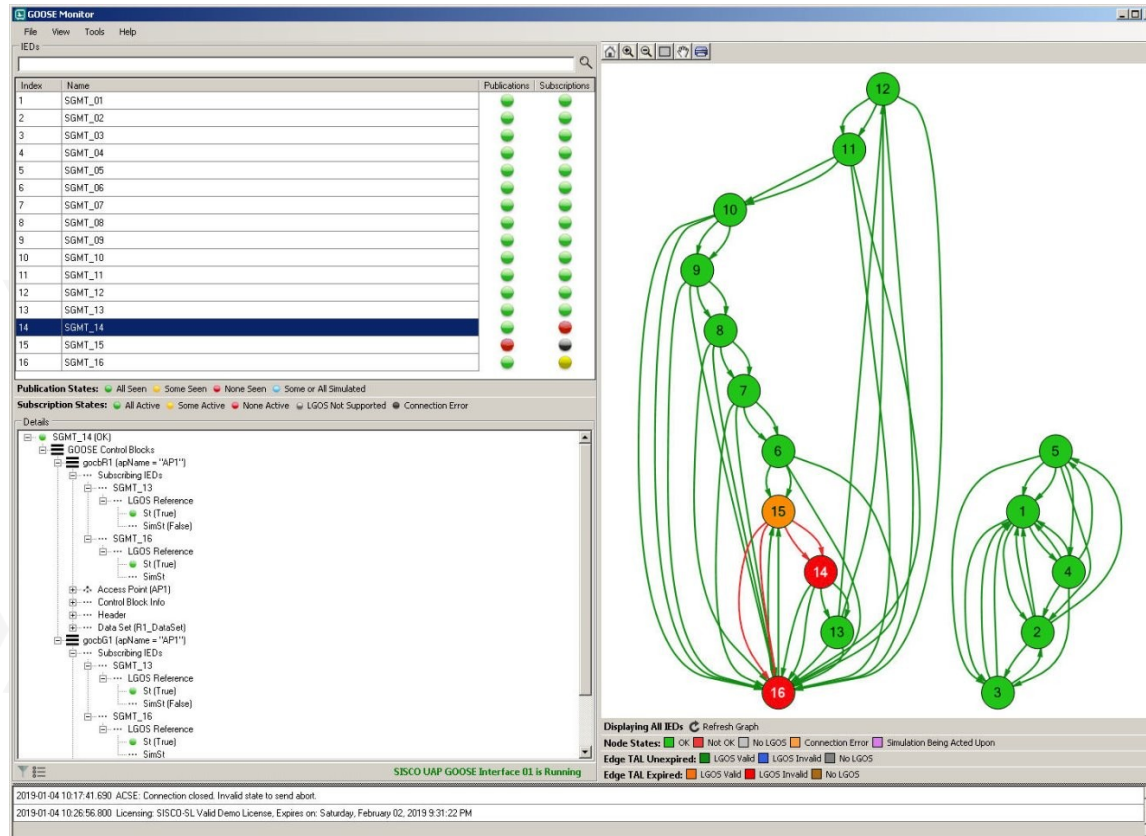


GOOSE Monitor – "Focus On" Mode to Device 4

- "Focus On" Mode allows the engineer to follow the publisher and subscriber relationships through the system to track down root causes of problems



Example: Device 15 Lost Network Connectivity



Summary

- GOOSE Monitor is an essential tool to facilitate quicker identification of the cause of problems in a complex GOOSE pub/sub network
- Provides an intuitive and simplified view of network relationships and GOOSE traffic status to help the engineer focus on what is important



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**For more information or to
schedule a demo, contact us at
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