

# Prove Ethernet Sync to 10GbE

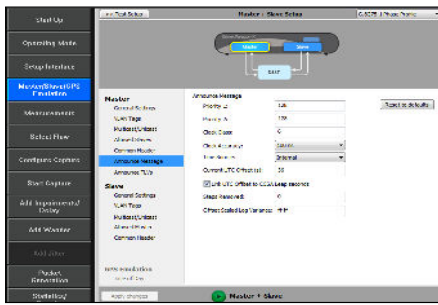
1588 (PTP) • SyncE • NTP • CES • E-OAM



Calnex Paragon - *x*



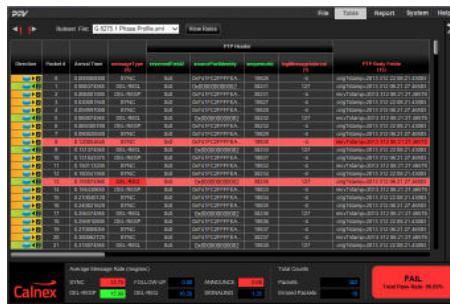
- Prove Connectivity Fault Management and Performance Monitoring for Y.1731, 802.1ag and 802.3ah
- Add latency, jitter, errors, dropped packets to prove OAM implementation
- Prove G.8031/2 protection
- Support for 1000s of MEGs



## Master and Slave Emulation

PTP Master and Slave emulation (with optional SyncE support) allows fully controllable protocol and timing test – no additional network equipment required and no Command Line Interface.

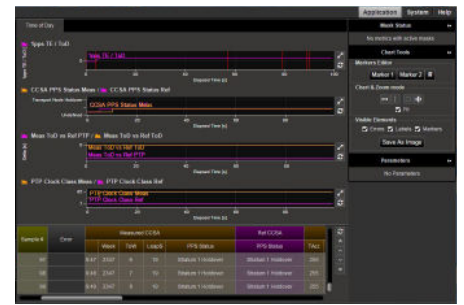
- Generate PTP to defined/custom profiles with easy drop-down menus and total control of fields
- Manipulate PTP messages in controlled ways – ideal for Negative testing and troubleshooting
- Generate high-accuracy timing: no external equipment, no uncertainty
- Impair timing signals including Time Error/Package Delay Variation and SyncE Jitter/Wander



## PTP Field Verifier

Analyze PTP protocol for conformance to standards or user-defined profiles with the PTP Field Verifier (PFV).

- Automatic Pass/Fail indication – check captured PTP messages against a pre-defined set of rules, with clear Pass/Fail alerts
- Check transmitted PTP messages for compliance with ITU-T, IEEE and user-defined standards and rules – areas of non-conformance immediately visible
- Flexible XML rules allow full customisation of pass criteria
- Full report generation capability



## Advanced Time of Day (ToD)

Generate industry-standard ToD event and information messages with full control of message format and alarms.

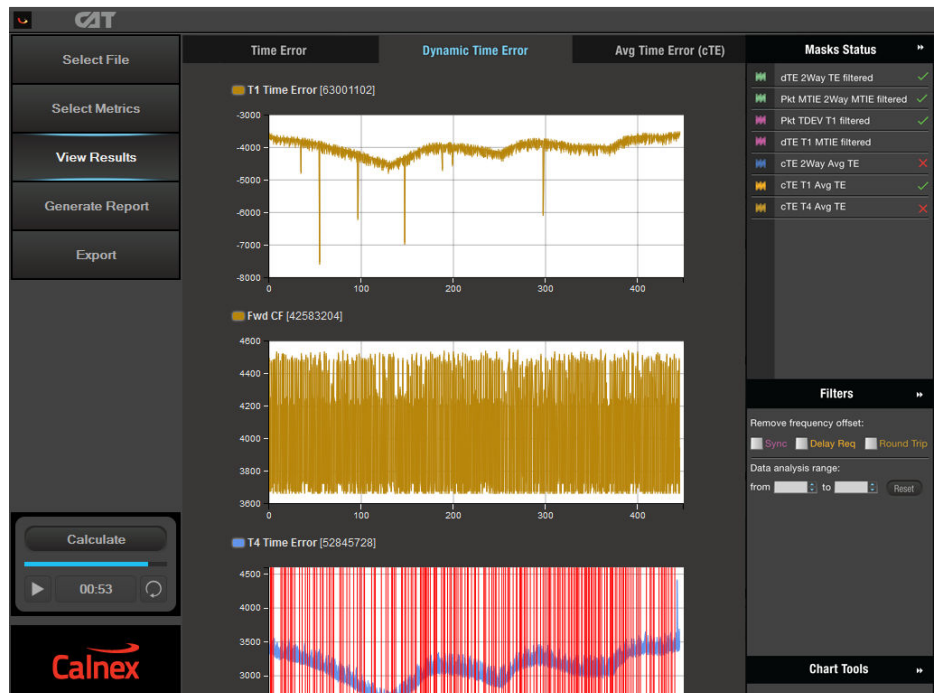
Full decode of significant fields in ToD messages lets you rapidly identify and pin down timing errors.

- Generate ToD signals simultaneously to PTP and SyncE
- Check device response to controlled manipulation of all timing inputs
- Combine with CAT visualization to easily see the effects of status transitions
- Align ToD results with other simultaneous measurements for complete performance analysis



The Calnex Analysis Tool (CAT) provides powerful insight into network and device performance. All your measurement results are now in one place, and you can view multiple graphs simultaneously for easier correlation of your results.

- Enhanced graphics makes it easy to evaluate ITU-T metrics such as Time Error (cTE, dTE), MTIE and TDEV against ITU-T masks
- Import live and archived measurement data
- Customisable multi-graph window lets you rapidly select measurements and channels for detailed analysis
- One button generation of reports in PDF format: Pass/Fail statistics and details of failures



## Meeting Industry Standards

Verify your products and devices meet relevant standards including:

- ITU-T G.8262x/7x
- IEEE 802.1AS/AS-REV
- IEC/IEEE 61850-9-3
- IEEE C 37 238
- SMPTE 2059-2

Elevate your testing with greater accuracy, deeper measurement insight, and with repeatability you can rely on. The Paragon-X gives you all the tools you need to ensure your network devices and network topologies are not only thoroughly tested but truly meet industry standards.

## Ethernet Network Emulation

Calnex Paragon-X lets you emulate 'the Cloud' for real-world testing of your Ethernet devices or topology. It offers both comprehensive and ultra-high precision network emulation, enabling you to test:

- Video/voice applications (IPTV, VoIP, etc.)
- Mobile subscriber networks (VoLTE, eMBMS, etc.)
- Content delivery networks
- Cloud computing/migration
- CoS/QoS levels
- WAN acceleration/network optimization
- LAN/WAN enterprise networks
- ADSL/FTTH
- SLA verification
- ITU-T Y.1731/IEEE 802.1ag operations and maintenance
- Satellite links
- Storage networks
- Telecom/Federal network applications
- Carrier WiFi
- Cable/broadband networks

## Don't emulate just any network, re-create your actual network

With Real Capture + Replay you're neither limited to capturing pings, nor restricted with capacity. Now you can capture IPG and PDV traffic from live networks for long periods of time and replay these back in the lab to test your devices for absolute proof of performance.

## Impair eight CoS/QoS levels up to 10GbE

Class of Service (CoS)/Quality of Service (QoS) levels have to be independently impaired during testing. Paragon-X allows eight CoS/QoS levels to be uniquely impaired at the same time, even at 10GbE.

## Related Products



### Calnex Paragon-neo

- Delivers high accuracy sub-nanosecond timing measurements at rates up to 100GbE
- Capture and decode PTP packets for analysis and Time Error testing
- Prove SyncE jitter and wander performance to ITU-T G.8262.1/G.8262
- Evaluate MTIE/TDEV pass/fail results to ITU-T G.8262.1/G.8262 masks
- Control ESMC (SSM) message generation for testing to ITU-T G.8264



### Calnex Analysis Tool (CAT)

- Analyzes the Time Error and Frequency performance of devices and networks
- Evaluates metrics such as MTIE and TDEV against O-RAN and ITU-T masks
- Displays multiple graphs simultaneously for easy correlation of results



### Calnex Sentinel

- Tests PTP, NTP, SyncE and TDM in one portable box
- Measure ALL parameters at the SAME time
- Over-the-Air Time Error analysis
- For LTE-A, TDD LTE and small cell deployment – test network phase accuracy and validate network performance to ITU-T limits
- Measure and analyze metrics: PDV, FPP, TE/max|TE|/dTE, MTIE/TDEV
- Best-in-class internal Rubidium and measurement accuracy



Pre-deployment



Deep Analysis



Network Deployment

Calnex Solutions is a global leader in Test and Measurement solutions for next-generation telecom networks. Our products help to prove new technologies for Mobile Backhaul and Carrier Ethernet networks.

For more information on Calnex's Paragon and Sentinel products, and to take advantage of our extensive experience in Packet Sync, OAM and Ethernet testing technologies, contact Calnex Solutions today:

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