



Spirent GEM

NETWORK PLAYBACK MODULE FOR CES, TOP, MEF-18, G.8261

Spirent Network Emulators enable users to accurately create the delays and impairments that occur over live production 10/100 Mbps, 1Gbps and 10Gbps Ethernet networks for validating and evaluating new products and technologies.

APPLICATIONS

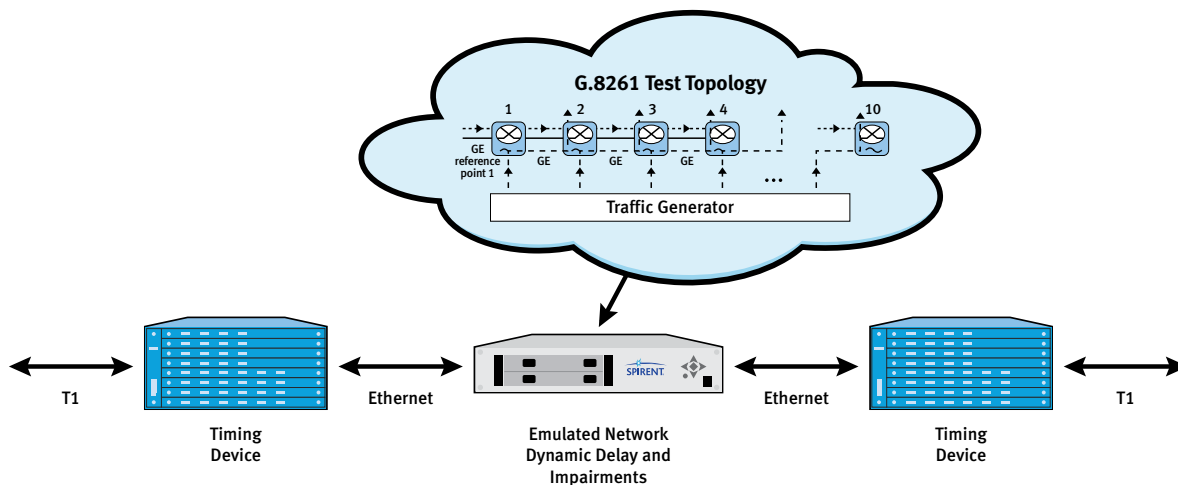
- Verify conformance to ITU-T G.8261, MEF-18 and other emerging standards
- Characterize clock recovery performance across a packet based network
- Validate TDM services are delivered with the required jitter and wander performance
- Verify packet-loss-concealment algorithms by introducing packet loss and re-order
- Validate the performance of protection fail-over features
- Verify accuracy of performance metrics reporting and status/alarm indicators

Building on this proven platform, Spirent Communications provides the optional Network Playback software module. Network Playback allows the user to create precisely defined custom impairment tables with nanosecond or packet-to-packet variations – critical for Circuit Emulation or Timing over Packet testing applications. Users can now create virtually any network scenarios required including:

- Dynamic delay and impairment conditions (packet-to-packet or time-based control)
- Custom statistical impairment distributions such as “long tail”
- Extremely high or low (sub-Hertz) frequency delay change and impairments
- Pathological timing scenarios

Network Playback’s open file format enables configuration input from actual live network measurements or software-based network models. These network scenarios can be customized with user-defined impairment tables. Extremely large tables are supported for multi-day scenarios for low frequency content (e.g., diurnal variation).

Combine Network Playback with the MEF-18 Test Suite and vendors and service providers alike can significantly reduce the time and cost to characterize performance and validate the Interworking Functions of their CES (ITU-T Y.1413, IETF CESoPSN or IETF SAToP) and ToP (IEEE 1588 or NTP) solutions.



FEATURES & BENEFITS

- Hardware-based architecture provides maximum accuracy and repeatability with 100 percent line rate (up to 11.3Gbps) support even with minimum size frames
- Precisely emulate delays and impairments that occur over Ethernet networks to enable validation, performance and interop testing of systems under real world conditions – with precise and reproducible results
- Define up to 16 Network Profiles per interface to improve Proof of Concept testing and customer demonstrations with separate delay, bandwidth and impairments for emulating different classes of service or multiple paths through a network
- Dynamic Impairments allow changing multiple impairments simultaneously without data loss or test restart. Users can perform realistic problem replication for troubleshooting and development purposes.
- Standards-based Network Impairment Models per TIA-921/ITU-T G.1050 and MEF-18/G.8261. Provides quick and easy test set up for accurate and repeatable testing against models based on industry standards.
- Multi-protocol support (SONET, SDH, OTN, Fibre Channel, CPRI and Ethernet) on the same chassis for growing easily as needs change and to protect your investment
- Powerful filtering for selective or focused impairments
- Easy GUI and Tcl scripting support for automating tests
- Support for all proprietary and standard L3 – L7 protocols including IPv6
- Jumbo frame support – infinite size (12K bytes for reorder and duplication)

TECHNICAL SPECIFICATIONS

Network Profiles

- Support for up to 16 distinct network profiles emulating 16 “network clouds” per blade
- Define bandwidth, delay, and impairments for each profile
- Each profile can be defined by any combination of VLAN tag, MPLS label, MAC or IP address TCP/UDP port or any value up to 2000 bytes deep within the Ethernet frame

Delay

- Emulates static or variable delay occurring during transmission of Ethernet data through a network
- Introduce frame or packet delay variation (jitter)
- Optional delay extenders are available for extra delay

Impairment Highlights

- Fixed and random impairment distributions
- Single or bursty
- Random and filtered or targeted impairments
- Chain multiple impairments simultaneously
- Loss of Signal, Loss of Frame Synchronization
- PCS, MAC, and higher layer bit errors, CRC Corruption
- Frame/Packet Drop, Reorder, Duplication Modification
- Bandwidth control or Policing per Metro Ethernet Forum
- Bandwidth Shaping
- Available Impairments depend on configuration

Dynamic Search Filter (DSF)

- Search entire TCP/UDP payload for a user-defined string pattern to trigger an impairment event
- Define an impairment counter (to prevent a TCP session from timing out, for example)
- Up to 8 strings each up to 8 bytes can be defined within each GEM network profile

Statistics/Alarms

- Provides real time stats on the input such as running disparity errors, code group errors, IPG errors, idle errors, bandwidth statistics and more
- Provides stats for impairments introduced at output port
- Indicates alarms for Loss of Signal (LOS), Loss of Lock (LOL), Loss of Frame sync (LOF), Code group errors, running disparity errors

User Interface

- Remote monitoring and control via RJ-45 Fast Ethernet
 - Easy to use GUI (HTML)
 - Powerful Tcl-based API enables full automated testing
- Front panel status control

ORDERING INFORMATION**Chassis**

- **CKL-2U** – Rack mountable chassis with support up to 4 M1 blades, 2 H10 blades or 2M1 + 1H10 blades

Modules

- **M1** – “Maui” Network Emulator Hardware Module supports up to 2.6Gbps
- **H10**– “Hawaii” Network Emulator Hardware Module supports up to 11.3Gbps

Interfaces

- SFP (10/100/1Gig)
- XFP (10Gig)

Software/Emulator Load

- GEM (10/100/1GigE), XGEM (10GigE)
- 1, 4, 8 or 16 Profiles

Maintenance

- 1 year Software and Hardware Maintenance Agreement

Options

- **AS-CAPPLAY** – Provides the ability to capture and replay up to 1G of traffic at full line rate
- **AS-NETPLAY** – Provides custom impairment table creation and playback capabilities with extreme resolution
- **AS-MEF-18** – Provides MEF-18/G.8261 Network Impairment Models
- **AS-PROPLAY** – Enables automatic replay of impairment condition data (captured from ICMP pings using "Profiler") through the GEM Emulator
- **AS-IPTV** – Provides the ability to selectively impair I, P and/or B Frames over H.262 or H.264 streams.
- **AS-TIA-921** – Provides TIA-921/ITU-T G.1050 Network Impairment Models
- **AS-DSF** – Dynamically search through TCP/UDP payload to trigger impairments upon match (GEM only)
- **AS-DSX** – Provides extended delay at less than full line rate; max delay bank is up to 12sec or 6x the standard delay

SPIRENT SERVICES

Spirent Global Services provides a variety of professional services, support services and education services – all focused on helping customers meet their complex testing and service assurance requirements. For more information, visit the Global Services' Web site at www.spirentcom.com/gs or contact your Spirent sales representative.

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