SIAMA SYSTEMS

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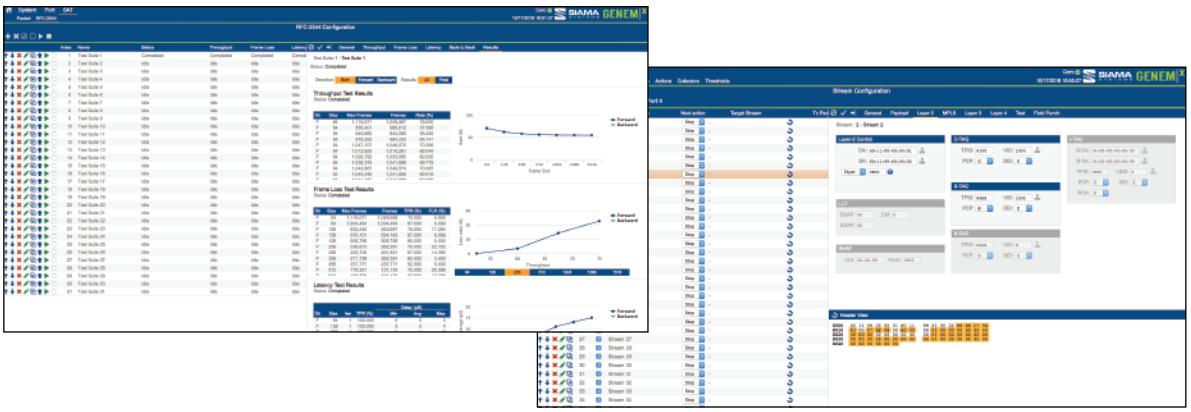
Our mission is to deliver feature-rich test and measurement tools to network operations and support teams at a price-point allowing for ubiquitous deployment, and reaching the ultimate goals of reducing mean-time-to-repair and increasing subscriber satisfaction.

GENEM-X

NETWORK INFRASTRUCTURE TESTING

ETHERNET/IP APPLICATION EMULATION
MULTI-FLOW TRAFFIC GENERATION
SERVICE ASSURANCE
PERFORMANCE & CONFORMANCE TESTING
PACKET CAPTURE, ANALYSIS & PLAYBACK
NETWORK EMULATION & IMPAIRMENT TOOLS

GENEM-X is a robust network infrastructure testing application for the PROVA-X test appliance. The application allows you to verify, monitor and troubleshoot Ethernet/IP network deployments and data center applications to ensure network services can accommodate the demands of your users. GENEM incorporates the best of both an application emulator and service assurance tool in a single package. Enterprise IT, Service Providers and Network Equipment Vendors can use GENEM to validate data center infrastructure, networks or devices.



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GENEM-X DATA SHEET RELEASE 2.0

OVERVIEW

GENEM-X is a feature-rich Ethernet and IP traffic generator, capture, playback and impairment application that runs on the PROVA-X test appliance. GENEM-X allows service providers, networking equipment manufacturers and enterprise to stress-test services, networking appliances, infrastructure or Virtual Network Functions (VNFs) in a lab or production environment. GENEM-X can emulate network traffic by generating packets up to line-rate on each of the PROVA-X test ports while simultaneously filtering and capturing flows for analysis. It can be used for Service Assurance in production environments, on-demand troubleshooting and SLA reporting. The network emulation features allow you to add delay, jitter and loss to flows to emulate complex networks and track application performance. GENEM-X transforms the PROVA-X into the ultimate multi-tool test appliance.

IDEAL FOR USE IN THESE ENVIRONMENTS	
COMMUNICATION SERVICE PROVIDER PRODUCTION NETWORKS	ENTERPRISE DATA CENTER
QUALITY ASSURANCE LABS	NETWORK EQUIPMENT MANUFACTURER DEVELOPMENT TEST

ETHERNET SERVICE ASSURANCE

GENEM is loaded with Ethernet Service Assurance features that turn your PROVA appliance into the ultimate test head and probe. Service Providers can deploy the PROVA in production networks and remotely manage the GENEM application to perform Y.1564 Ethernet Service Activation Testing (SAT) and Y.1731 Performance and Fault Management.

It is essential to perform Service Activation Testing before allowing subscribers to connect to your Ethernet services to ensure that these services conform to the throughput, delay, jitter and loss requirements specified in the Service Level Specification (SLS). Performing SAT increases customer satisfaction by reducing the amount of time it takes to bring new services on-line and eliminates those initial trouble-tickets often associated with a new service turn-up. GENEM-X is the industry's most powerful Service Activation Test tool:

- Test 16 Ethernet services simultaneously using Y.1564 methodology
- Supports Configuration and Performance tests, including CBS/EBS testing
- Supports single or dual-ended tests for one-way measures
- MEF 46 compliant latching loopback to a NID or remote test set
- SAT reports exported in PDF format
- Legacy RFC 2544 and proprietary *Quick Mode* testing support

Once your Ethernet services are verified for conformance, you can continuously monitor them for delay, jitter and loss using GENEM's Service OAM features. By making use of standard performance monitoring protocols, GENEM can continuously perform delay, jitter and loss measurements to a NID, switch or router at the service demarcation point to ensure your services remain compliant to the Service Level Specification:

- Monitor 64 Ethernet services using standards-based Y.1731 protocols to a NID, switch or router at the customer premise
- Measure delay, jitter and loss using standard Y.1731 DMM and SLM protocols
- Report per-service Availability metrics
- Continuously check for faults using Y.1731 CCM
- Supports LBM and LTM protocols to troubleshoot connectivity issues

TRAFFIC GENERATION

GENEM can be used to generate various types of synthetic traffic to validate and stress test infrastructure or devices. You can build different packet streams using the intuitive packet editor to synthesize a variety of protocols to be transmitted out a test port. The precise rate control allows you to configure the rate of transmission of any stream with ultra-fine granularity. Create bursty traffic with the touch of a button to emulate real-world traffic conditions. A Siama proprietary test field that contains a sequence number and timestamp can be inserted into every packet to facilitate packet tracking and latency measures. Use field punchers to vary fields within packet streams as they are transmitted to enable value-sweeps of MAC Addresses, VLAN-IDs, IP Addresses, Port Numbers or any other relevant field within a packet header. Assign these streams to create flows for transmission out a test port. Multiple simultaneous traffic flows can be transmitted on a test port to emulate a wide variety of network traffic.

- Generate VLAN, PBB, MPLS, IPv4, IPv6, UDP, TCP, ARP, ICMP, and other traffic types
- Up to 64 independently configurable streams
- Up to 32 flows per test port, each containing any number of stream instances
- Up to 4 levels of nested stream hierarchy within a flow, each capable of looping

PACKET FILTERING

GENEM takes traditional packet filters to a new level with Siama's proprietary micro-scan™ engines. These packet scanning engines are lightweight and flexible, and can be configured to inspect any part of a packet for various match criterion at line-rate. Multiple filters with different match criteria can be configured per port for multiple logical matches, each with their own associated action. Matched packets can be sent to a performance collector, modified and looped back, forwarded to another test port or CPU for additional processing, or stored in a capture buffer.

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CAPTURE AND PLAYBACK

The PROVA-X test appliance is equipped with 8GB of onboard high-speed capture memory. You can configure the GENEM application to allocate this heap of memory as individual capture buffers and independently assign them to test ports. When an incoming packet matches a filter entity, it can be forwarded to one of these capture buffers for storage. You can then export the capture buffer in PCAP format for decoding and analysis in Wireshark. You can save a packet capture exported from the production network on your PC, import the PCAP onto a PROVA appliance in the lab, and playback the trace to replicate the traffic in a controlled lab environment. GENEM also allows you to control the rate of packet playback so that you are able to stress-test your systems all the way up to line-rate.

IMPAIRMENT

The GENEM application allows you to add delay, jitter and loss to flows in order to emulate real network conditions. Over 6 seconds of delay can be introduced to flows at 10Gb/s line-rate. In addition to latency, you can optionally select from a variety of jitter distributions, including Uniform, Normal, Exponential and Gamma distribution functions. Each function includes a full set of user-configurable parameters so you can recreate the exact profile that emulates your real-world environment. Impairment entities add periodic or pseudo-random loss to flows that can be averaged over user-configurable burst sizes.

SPECIFICATIONS

Service Activation Testing

- ITU-T Y.1564 testing
  - 16 simultaneous tests
  - Conformance & performance tests
  - Color-aware and color-blind services
  - CBS and EBS testing
- MEF 46 Latching Loopback
  - Automatically loopback remote end
- One-way or Two-way performance measurement
- RFC 2544
  - Layer 2 and Layer 3 testing
  - Throughput
  - Frame loss
  - Latency
  - Back-to-back
- Export reports in PDF format

Performance Management

- ITU-T Y.1731 Performance & Fault Management
  - Test 64 simultaneous Ethernet services
  - MEF 35 PM-1 solution
  - DMM for FD and IFDV
  - SLM for loss measures (availability)
  - CCM & LBM for continuity check

Traffic Generation

- Generate Layer 2 to 4 stateless traffic
- 64 configurable streams
- 32 flows per test port
- Create complex traffic patterns and bursts

Packet Filtering & Actions

- Powerful micro-scan™ engines match incoming packets at line rate
- Up to 32 complex filter rules can be defined per test port
- Perform actions on matched packets
  - Loopback modified or unmodified
  - Forward to performance collector
  - Store in capture buffer
  - Forward to another test port
  - Forward to CPU for further processing

Packet Capture & Playback

- 8GB of onboard capture memory
- Line-rate capture on each test port simultaneously
- User-configurable buffer sizes
- Export buffers in PCAP format
- Import PCAPs into buffers for replay at captured rate or up to line rate

Network Emulation & Impairment

- Add delay, jitter and loss to flows
- Up to 6 seconds of delay can be introduced
- Select from a variety of jitter distribution functions
  - Uniform
  - Normal
  - Exponential
  - Gamma
- Add periodic or pseudo-random loss

Management

- Web GUI, HTTPS, TLS1.2
- SSH access for CLI and LUA Scripting
- IPv4 and IPv6 support
- VLAN support
- Local, RADIUS & TACACS+ User Authentication and Authorization

License Options

- 1-Port Activation License (APP-GENEMX-001)
- 2-Port Activation License (APP-GENEMX-002)
- 4-Port Activation License (APP-GENEMX-004)

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