Overview

GL Communications’ PacketExpert™ is a portable (USB based) Quad Port Ethernet / VLAN / MPLS / IP / UDP Tester with 4 Electrical Ethernet ports (10/100/1000 Mbps) and 2 Optical Ports (1000 Mbps). PacketExpert™ connects to a Notebook PC through a USB 2.0 interface. GL Communications’ HD-PacketExpert™ offers higher densities from 12/24 ports form factor solution for testing GigE switches, routers and network conditions. In both, each port provides independent Ethernet/VLAN/MPLS/IP/UDP testing at wire speed for applications such as BERT, RFC 2544, and Loopback. BERT is implemented for all layers (as depicted below). RFC 2544 is applicable for Layers 2, 2.5, and 3, and Loopback is applicable for Layers 2, 3, and 4. The chassis comprises of both electrical and optical (fiber) interfaces. Electrical ports can operate up to 10/100/1000 Mbps line rates in Full Duplex mode, while Optical ports can operate up to 1000 Mbps line rate in Full Duplex mode.

Along with user friendly GUI, PacketExpert™ provides two other options to access its functionality – through APIs and through Command Line Interface. PacketExpert™ provides .NET API (C# APIs), that provide comprehensive access to all functionalities. In addition, a Command Line Interface is also provided, in which a client passes text commands through the Command Line Interface.

A typical application is with QualiSystems’ TestShell as the centerpiece for achieving network wide automation for testing telecom services and telecom network equipment. TestShell is an enterprise software framework offering complete Lab Management, Device Provisioning and Test Automation solutions for engineers. TestShell has variety of clients built in, including .NET client and CLI text based client, with scripting, drag and drop interface. This makes the system compatible with GL Communications’ PacketExpert’s software. TestShell’s .NET Client calls the PacketExpert™’s .NET APIs and controls various aspects of the test in detail. Similarly, the TestShell/CLI client allows issuing text commands directly to the PacketExpert™ CLI application, thereby controlling the test.

For more information, visit http://www.gl.com/optical-and-ethernet-testing-packetexpert.html
Applications
Typical applications of GL’s PacketExpert™ integrated with QualiSystems’ TestShell include:

- Continuous and long term BERT testing of Ethernet line, and continuous monitoring for errors
- Automated RFC 2544 testing of Network devices like Switches/Routers etc.
- Carrier Ethernet testing with stacked VLAN (Q-in-Q)
- Core Network testing with MPLS
- Ethernet/IP end to end testing - Path Verification, QoS parameters etc.
- Stress Testing - generating full wirespeed traffic on all 4 ports and verifying the behavior of the test DUT/Network

Main Features
- PacketExpert™ CLI with TestShell framework offers complete Lab Management, Device Provisioning and Test Automation solutions.
- A unified solution for advanced testing with intuitive drag and drop user interface
- Tests can easily be executed over multiple test stations and at distributed testing labs.
- Support for a wide range of test setups, interfaces, protocols, and script languages.
- Capability of remote operation, automation and multi-site connectivity using TCL client and MAPS™ CLI server.
- Scripts for MAC, VLAN, MPLS, IP and UDP layers testing
- Remote monitoring capability.
- All script commands are simple and self-explanatory.
- Compatible with Windows® 7 and higher Operating System.

SPECIFICATIONS — Quad Port PacketExpert™

| Interfaces | 2 x 10/100/1000 Base-T Electrical only  
| Protocols | RFC 2544 compliance  
| Bus Interface | USB 2.0  
| Power | +9 volts, 2.2 Amps  
| Temperature | Operating Temperature: +5 to +40C  
| Humidity | Operating Humidity: 0% to 80% RH  
| Altitude | Operating Altitude: Up to 10,000 feet  
| Physical Specification | Length: 8.45 in. (214.63 mm)  
| | Width: 5.55 in. (140.97 mm)  
| | Height: 1.60 in (40.64 mm)  
| | Weight: 1.66 lbs. (0.75 kg)  

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Working Principle of PacketExpert™ and TestShell Integration

Shown below is the working principle of the PacketExpert™ CLI Test System.

- TestShell/.NET client loads the PacketExpertCSAPI.dll, the library containing the C# APIs. Once loaded, all APIs become available to the TestShell/.NET client.
- Similarly, in case of TestShell/CLI client, it loads the Packetexpert™ CLI executable - PacketExpertCLI.exe.
- TestShell client calls the appropriate APIs / commands to set test parameters, start/stop the test and get results.
- PacketExpert™ (.NET or CLI) Server processes the APIs / commands, performs the tests and returns the results via the same interface.

TestShell CLI with PacketExpert™ CLI

QualiSystems’ TestShell comes with CLI Client that includes a command-line interface into which client users may key in commands or load commands from previously saved files.

PacketExpert™ CLI interface provides CLI exe (PacketExpertCLI.exe) that takes text commands through the Command Line Interface. The PacketExpert™ CLI allows a script file (text file containing list of commands, similar to DOS batch file) to be loaded and executed. This eases test execution.

TestShell Integration with PacketExpert™ using .NET

QualiSystems’ TestShell comes with .NET client application that users may use to load APIs related to PacketExpert™.
PacketExpert™ .NET Interface includes a PacketExpertCSIAPI.dll file, a packaged library that provides C# APIs, that covers all the functionalities of PacketExpert™ that are available through the GUI.
A Typical Test System for RFC 2544 Testing
As depicted in the figure below, PacketExpert Test System (eg: for RFC 2544), consists of the following –

- TestShell is communicating via the .NET/CLI client
- PacketExpert™ system, i.e, the host PC on which the PacketExpertCSAPI.dll or CLI is running, and the PacketExpert™ hardware, connected to the PC through the USB interface.

![RFC2544 Test System Diagram](image)

Sample CLI Script — for RFC2544 Testing

```
set RFC2544_FrameSizes (64) port (2-3);
set RFC2544_Tests Throughput port (2-3);
set ThroughputBWParams MinBandwidth 10.0 % MaxBandwidth 100.0 % port (2-3);
set ThroughputTrialParams NumberOfTrials 1 TrialDuration 2 port (2-3);
start rfc2544 port (2-3);
wait 10 sec;
get rfc2544results status port (2-3);
get rfc2544results throughput port (2-3);
stop rfc2544 port (2-3);
```

Sample C# API of PacketExpert™
Sample CLI Script for Setting Stream Parameters

```bash
set SourceMACAddress 00-21-C2-00-04-25 port 2;
set DestinationMACAddress 00-21-C2-00-04-26 port 2;
set EthernetLengthType 08-00 port 2;
set SourceMACAddress 00-21-C2-00-04-26 port 3;
set DestinationMACAddress 00-21-C2-00-04-25 port 3;
set EthernetLengthType 08-00 port 3;
set EnableVLAN false port 2;
set EnableVLAN false port 3;
set EnableMPLS false port 2;
set EnableMPLS false port 3;
wait 2 sec;
set IPType IPv4 port 2;
set IPType IPv4 port 3;
set SourceIPv4Address Address 192.168.1.22 SubnetMask 255.255.255.0 DefaultGateway 192.168.1.1 port 2;
set SourceIPv4Address Address 192.168.1.33 SubnetMask 255.255.255.0 DefaultGateway 192.168.1.1 port 3;
set EnableDefaultGateway true port 3;
set EnableDefaultGateway true port 2;
set DestinationIPv4Address 192.168.1.33 port 2;
set DestinationIPv4Address 192.168.1.22 port 3;
set IP_TOS_DS 0 port 2;
set IP_TOS_DS 0 port 3;
set IP_TTL 128 port 2;
set IP_TTL 128 port 3;
set IP_Protocol 17 port 2;
set IP_Protocol 17 port 3;
set EnableIPChecksumCompute true port 2;
set EnableIPChecksumCompute true port 3;
set EnableIPIdentification true port 2;
set EnableIPIdentification true port 3;
```

Buyer's Guide

- **PXE100** – PacketExpert™ 1G
- **PXE104** – PacketExpert™ SA (4 ports)
- **PXE112** – PacketExpert™ SA (12 Ports)
- **PXE124** – PacketExpert™ SA (24 Ports)
- **IPN110** – IPLinkSim™ WAN Link Emulator (1 Gbps, 2 active ports)
- **PXE105** – Wire speed Record /Playback - 1G
- **PXE107** – PacketBroker™ - 1G
- **PXE106** – ExpertSAM™ - 1G
- **PXG100** – PacketExpert™ 10G
- **PXG101** – PacketExpert™ 10G with Tablet
- **IPN510** – IPLinkSim™ WAN Link Emulator (10G, 2 active ports)
- **PXG105** – Wire speed Record /Playback - 10G
- **PXG107** – PacketBroker™ - 10G
- **PXG106** – ExpertSAM™ - 10G