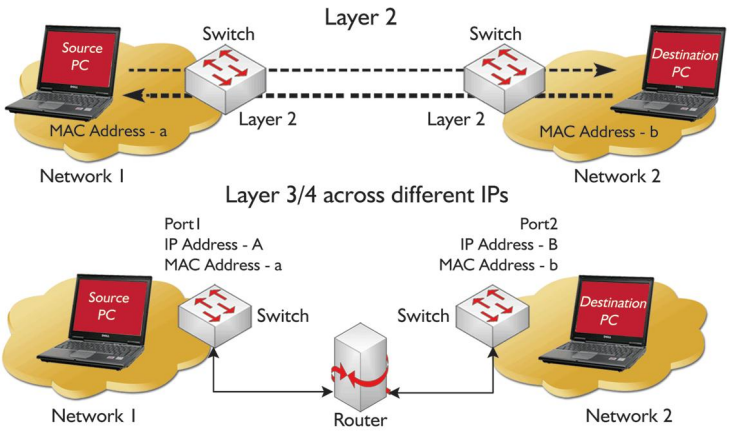
PacketCheck™ - Software Ethernet Tester



Overview

GL's enhanced PacketCheck™ is a PC based Ethernet / IP BERT and throughput (up to 800 Mbps) test tool that is comprehensive and very easy to use as a general purpose network performance analysis tool for 10Mbps, 100Mbps and 1Gbps LANs and WANs.

The application truly takes confusion out of Ethernet and IP testing at all protocol layers - from raw Ethernet frames to IP/UDP packets.

PacketCheck™ now has features like transmission of prerecorded file traffic. This is a new traffic generation mode that can duplicate packet traffic as it occurred at a particular Ethernet interface. A new Command Line Interface (CLI) has also been added that supports all the GUI functionalities of PacketCheck™. This will permit easy scripting and automation. Also, a powerful Report Generation feature allows easy generation of user friendly reports.

PacketCheck™ has wide ranging applications - including maximum IP bandwidth measurement between two points, Round Trip Delay (RTD) between two IP address locations with microsecond accuracy, Locating LAN Data Switch packet dropping and errors occurrence, detection of traffic overload, testing network behavior with real world traffic like IPTV, VoIP and more.

PacketCheck™ makes use of the PC's network interface card (NIC) to transmit and receive Ethernet or IP packets over the network. Throughputs up to 800 Mbps can be easily tested. The application generates multi stream Ethernet/IP/UDP traffic and measures end to end performance such as Byte Error Rate, Total Packets, Packet loss, Out of Sequence Packets, and Errorred Packets.

For detailed information on PacketCheck™, refer to http://www.gl.com/packetcheck.html.

Main Features

- Test Ethernet traffic of up to 800Mbps bandwidth
- Generates full duplex IP, UDP, or Ethernet frame traffic to transmit and/or receive traffic on any of the four layers (Layer1/ Data Link / Network / Transport) with on-demand bandwidth
- Multistream Traffic generation with independent configuration parameters and measurements for each stream
- PRBS Pattern Generation/Verification of various patterns like QRSS, 26-1, 29-1, 211-1, 215-1, 220-1, and 223-1
- Measures Byte Error Rate, Declares Sync/Sync Loss and Monitors Performance Statistics like Throughput, Packet loss, Out of order packets, Calculates Round Trip delay
- Run Time Impairments generation of various impairments like Insert/Delete Bytes, Change Bytes etc.
- Jumbo frames are supported, in addition to all normal frame sizes from 64 bytes to 1518 bytes
- Customizable protocol headers like MAC Source/Destination address, Length/Type field, IP Source/destination address, and UDP Source/Destination Port

Test Data Link Layer, Network Layer, & Transport Layer

Generates Full Duplex IP, UDP, or Ethernet Traffic

Throughputs Up to 800 Mbps On-demand Bandwidth

Generate and Receive Various patterns – QRSS, PRBS: 2^6-1, 2^9-1, and so on

Ethernet, IP & UDP Level BER Testing w/ User–defined Patterns

HDL File Playback

Generate Various per Stream Impairments

User-defined Test Patterns – up to 24 bytes Length

Traffic Generation Burst & IFG Modes

Tx and Rx Packet and Frame Statistics

End-to-End Performance Statistics w/ RTD Measurement

Command Line Interface

Report Generation pdf, csv Formats

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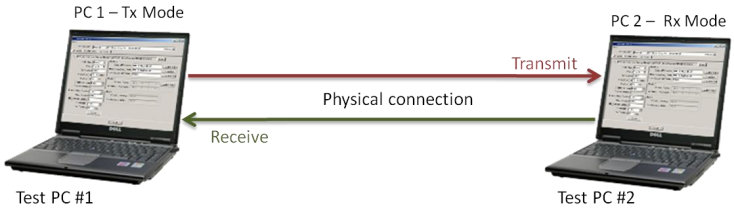
Ethernet BER Testing

At Layer 1

The physical layer abbreviated as "PHY" is the only layer over OSI model where data is physically moved across the network interface. PacketCheck™ can be configured to Layer 1 BER testing automatically by setting other layers to None.

Two PCs are connected using Ethernet cable for Layer 1 testing:

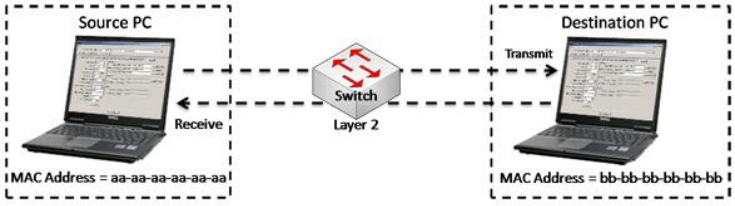


At Layer 2

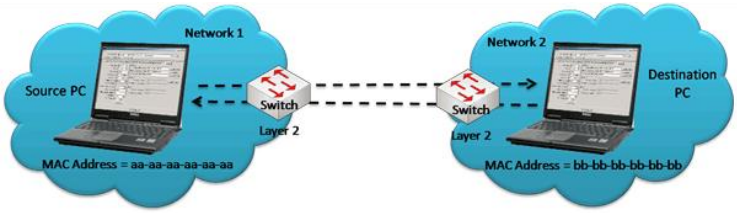
The bridges, switches, and network interface cards (NIC) work at Layer 2 (Data Link) and handle physical addressing, packing data into frames, and sequencing data frames. The Layer 2 consists of Logical Link Control (LLC) and Media Access Control (MAC) sub-layers, which route the packets based on the MAC address. So, only the MAC addresses need to be configured for layer 2 testing. This test is performed in order to:

- Test the capability of the switch to handle the MAC frames at various bandwidths
- Test the forwarding capacity of the switch (based on the MAC addresses)
- Measure the ability of the switch to deliver the frames in sequence
- Verify incoming data by analyzing bit patterns of the received frames

Scenario 1 - Source & Destination PC in the same LAN, connected through a single switch.



Scenario 2 - Source & Destination PC located at different LANs connected through multiple switches.



Ethernet BER Testing…

At Layer 3

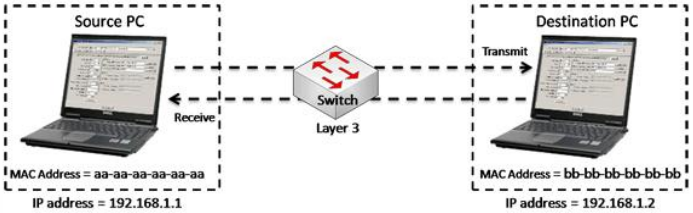
PacketCheck™ supports BER testing at Layer 3 as well as at Layer 4.

The Network Layer (Layer 3) uses routing technologies to connect various systems within a network or to connect multiple networks together through Gateways.

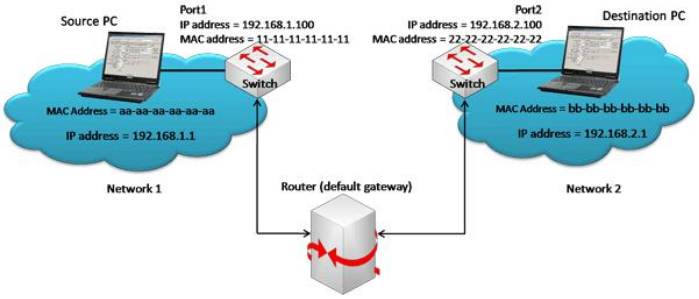
In Layer 3 testing, packets are routed between the Source and Destination PCs based on both the IP address and MAC address. So, both the MAC address and the IP address have to be configured for Layer 3 testing.

Since IP networks encompass various types of physical networks consisting of LAN and WAN links, there is lot of scope for packet modification, packet loss, and out of order packets. GL's PacketCheck™ helps measure these metrics of the IP network.

Scenario 1 - Source & Destination PC are located within the same IP network, and hence are directly reachable.



Scenario 2 - Source & Destination PC are located at different IP networks, and are connected through routers.



At Layer 4

The Transport Layer (Layer 4) provides end-to-end, error-free reliable data transfer. TCP and UDP are the most common Layer 4 protocols. For Layer 4 testing, source and destination UDP ports need to be configured in addition to MAC and IP addresses.

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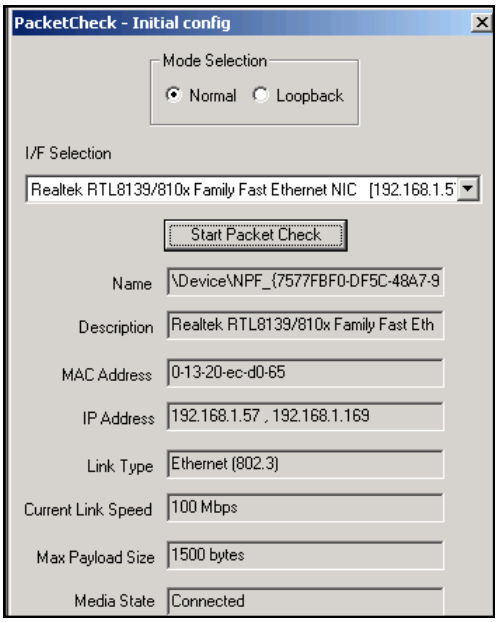
Interface Selection and Details

The MAC address and IP address of the available network cards in a PC are automatically displayed using I/F (Interface) selection option in the GUI.

In **"Normal"** mode, application can be configured to perform "Tx" | "Rx" | "Tx and Rx" on multiple streams. In **"Loopback"** mode the packets (layer2/3/4) received from a device (DUT) are transmitted back to the same device without any modifications of the pattern.

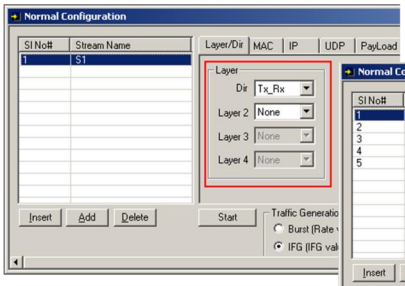


Traffic Generation Modes

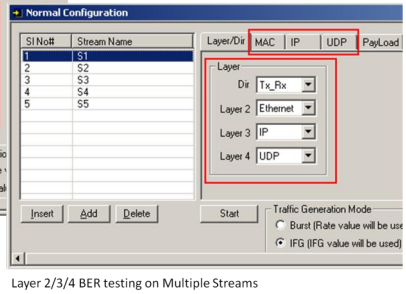
PacketCheck™ can transmit data in 2 modes – Burst Mode and IFG Mode. In Burst mode, traffic is generated in bursts, while maintaining the user defined bandwidth. In IFG (Inter Frame Gap) mode, traffic is generated constantly, while maintaining the user defined Inter Frame Gap.

Parameter Configuration

Various test parameters can be configured for all the PCs connected to DUTs before starting the test using the Configuration GUI window. Some key parameters include – Layer/Direction selection, Layer 2 MAC settings, Layer 3 IP settings, Layer 4 UDP settings, Stream Payload, Tx & Rx Parameter Settings, RTD (µsecs), and various impairments settings.



Layer 1 BER testing on Single Stream



Layer 2/3/4 BER testing on Multiple Streams

Parameter Configuration contd..

Layer – MAC, IP, UDP Parameters

- **[Layer 2] - Ethernet**

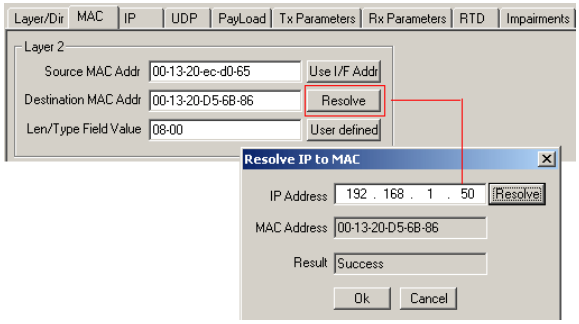
Configure with source and destination MAC Addresses (6 byte hex format). The source address can be automatically fetched from the PacketCheck™ application, while the destination MAC address can be obtained using 'Resolve IP to MAC' feature. In addition, user can specify the Length/Type field value.

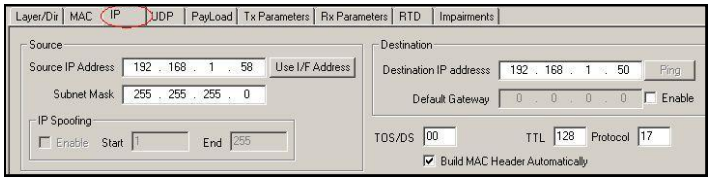
- **[Layer 3] - IP**

Configure with source and destination IP Addresses. The source address can be automatically fetched from the PacketCheck™ application. Users can define destination IP address and configure various IP header fields like TOS field, TTL field and protocol field. "Build MAC Header Automatically" option helps user to easily obtain MAC addresses while performing Layer3/Layer4 testing.

- **[Layer 4] - UDP**

Requires source and destination UDP ports to be defined for Layer 4 testing, which can also be changed as per the user's requirements.

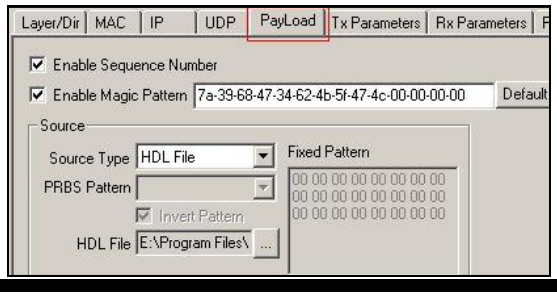




Payload

Users can choose to insert various types of payload into the stream like PRBS patterns (through predefined files), and user-defined fixed patterns of up to 24 bytes, HDL File. Transmission of pre-captured HDL file (GL's proprietary file) allows simulation of real-world traffic (such as IPTV, RTP,…).

Option is provided to insert Sequence number to the payload to identify Lost/Out of order packets and to insert Magic pattern to uniquely identify test packets.



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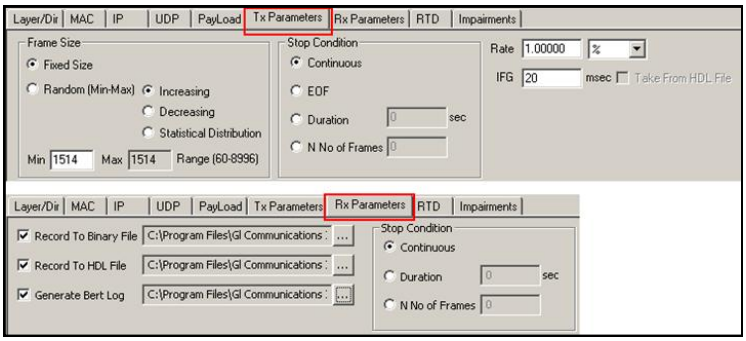
Tx Rx Parameters Settings

Tx Parameter settings are applicable to Tx or Tx Rx modes. Used to configure Frame size, Bandwidth, Inter Frame Gap (IFG), and transmission stop condition parameters, frame size of fixed / random length, and define the transmission rate in various units.

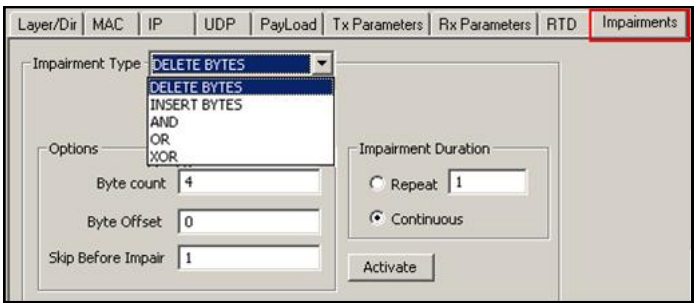
Rx Parameter settings allow creation of log files for each stream. The received frame details can be logged into a binary (*.bin), HDL, and also BERT files.



Impairments

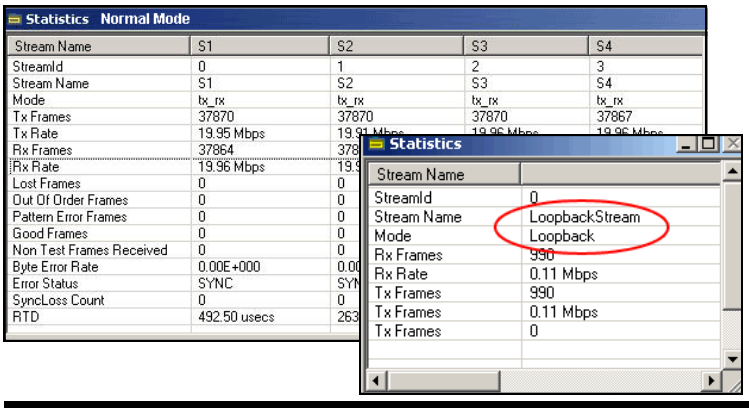
Introduce impairments into the outgoing traffic using various impairment types and duration.

Supports various types of impairments –DELETE BYTES, INSERT BYTES, AND, OR, & XOR. Impairments can be introduced at specific intervals or can be set to continuous insertion on each stream.



Tx & Rx Statistics and Results

Once the test is started, users can view various statistics and measurements performed for the configured streams. Some parameters displayed include StreamID, Stream Name, Mode, Tx/Rx Frames, Tx/Rx Rate, Lost Frames, Out Of Order Frames, Pattern Error Frames, Good Frames, Non-test Frames Received, Byte Error Rate, Error Status, Sync Loss Count, Error Count, & RTD.

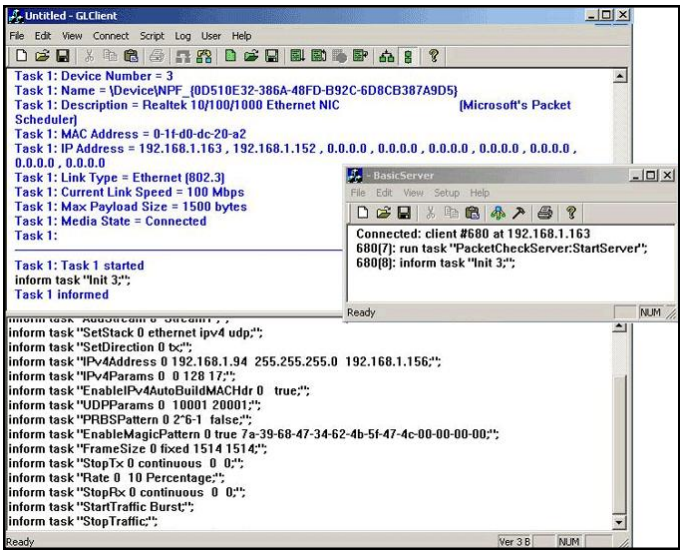


Command Line Interface (CLI)

PacketCheck™ Command Line Interface (CLI) that supports all the functionalities of PacketCheck™ can be accessed via Commands, instead of the GUI. The CLI can be accessed through GL's proprietary WCS (Windows Client Server) architecture, thereby allowing remote execution of commands.

Sample Script:

```
run task "PacketCheckServer:StartServer";
inform task "Init 2;";
inform task "Runscript 0 'Scripts\Layer2_Test.txt' 0.0.0.0;";
inform task "Statistics 0;";
inform task "StopTraffic;";
inform task "GenerateReport pdf 'TestRpt' 'Good Test'
'www.gl.com' 'Copyright' 'GL_Logo.JPG' 's1'; ";
```



Buyer's Guide

ETH100 – PacketCheck™

ETH200 – Two PacketCheck™ applications

Related Products

PXE100 – PacketExpert™

PKS100 - PacketGen™ (includes PacketScan™)

PKV100 - PacketScan™ (Online and Offline)

PKB100 - RTP Toolbox™

PKS110 - Packet H. 323

IPN010 - IPNetSim™ - 100Mbps of through bandwidth

IPN100 - IPNetSim™ - 1Gbps of through bandwidth

IPN400 - IPNetSim™ - 1Gbps w/ 4 links through bandwidth

PKS120 - Message Automation & Protocol Simulation (MAPS™) for SIP

PKS121 - MAPS™ - SIP Conformance Test Suite (Test Scripts)

PKS122 - MAPS™ - for MEGACO

PKS123 - MAPS™ - MEGACO Conformance Test Suite

PKS124 - Message Automation and Protocol Simulation (MAPS™) for MGCP

PKS125 - MAPS™ - MGCP Conformance Suite (Test Scripts)

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