
PacketExpert™ (1 Gbps) - Ethernet Tester

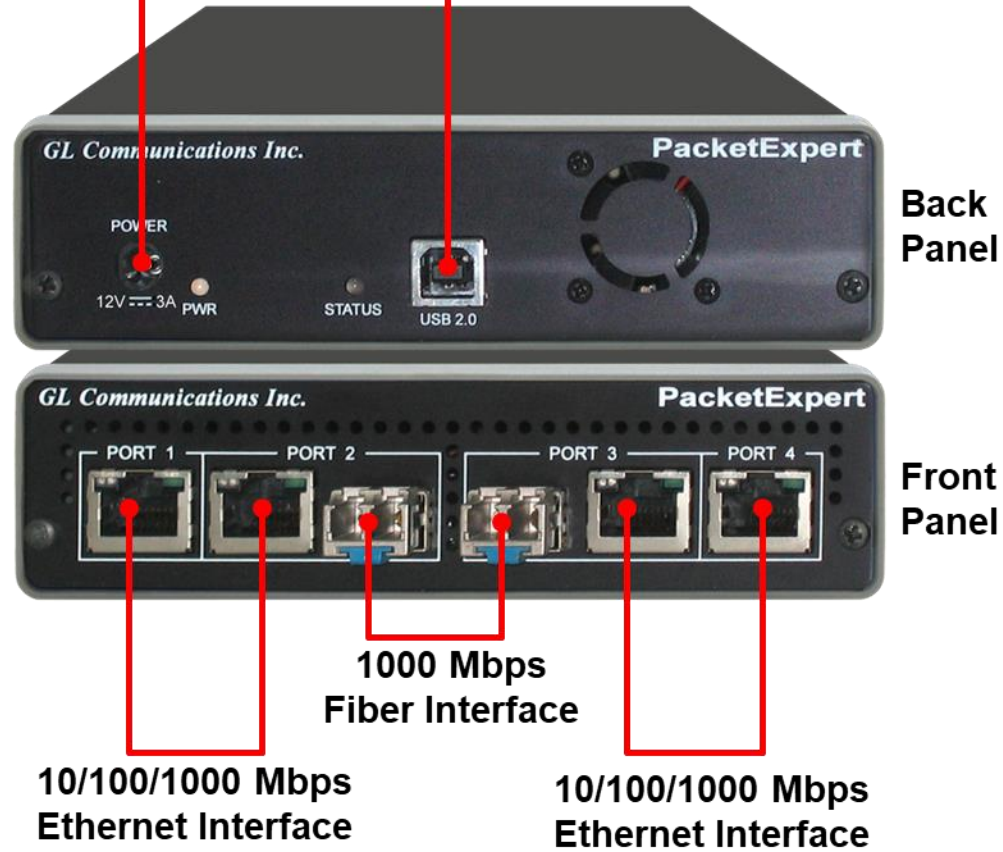


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Website: <https://www.gl.com>

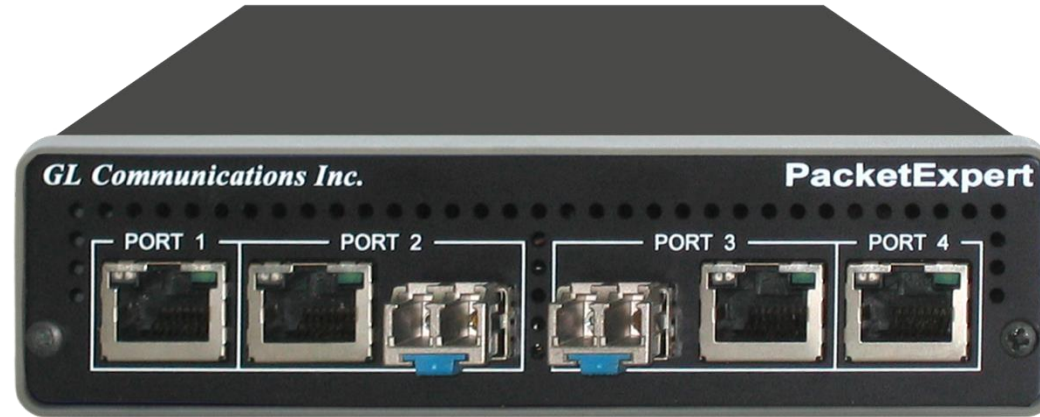
Portable Unit

Power: 12V (Medical Grade), 3A

USB 2.0



Portable Unit



| | |
|-------------------------|--|
| Interfaces | <ul style="list-style-type: none">• 2 x 10 / 100 / 1000 Base-T Electrical only• 2 x 100 Base-FX Optical only• 2 x 1000 Base-X Optical OR 10/100/1000 Base-T Electrical• Single Mode or Multi Mode Fiber SFP support with LC connector |
| Physical Specifications | <ul style="list-style-type: none">• 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) |
| Power Supply | <ul style="list-style-type: none">• +12 Volts (Medical Grade), 3 Amps |
| BUS Interface | <ul style="list-style-type: none">• USB 2.0 or USB 3.0 |
| Protocols | <ul style="list-style-type: none">• RFC 2544 compliance |

1U Rack-Mount Enclosure



- 19" rack option, w/ Embedded Single Board Computer (SBC)
- **SBC Specification:**
 - Intel Core i3 or optional i7 NUC Equivalent,
 - Windows® 11 64-bit Pro Operating System
 - USB 3.0 and USB 2.0 Ports, ATX Power Supply
 - USB Type C Ports, Ethernet 2.5GigE port
 - 256 GB Hard drive, 8G Memory (Min)
 - Two HDMI ports

PacketExpert™ High-Density 12/24 GigE Ports mTOP™ Rack

PacketExpert™ SA (PXE112)



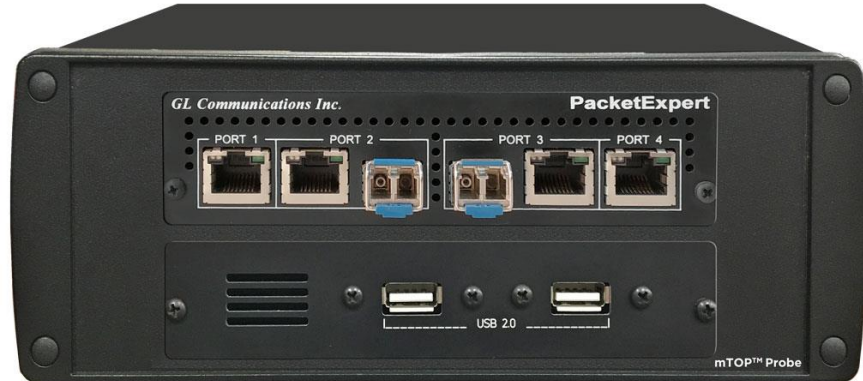
PacketExpert™ SA (PXE124)



| | 1U Rack | 2U Rack |
|-------------------------|---|--|
| Physical Specifications | <ul style="list-style-type: none"> Length: 16 in (406.4), Width: 19 in (482.6), Height: 1U / 2U mTOP™ System (embedded SBC, 3x PacketExpert 1G) | <ul style="list-style-type: none"> Length: 16 in (406.4), Width: 19 in (482.6), Height: 1U / 2U mTOP™ System (embedded SBC, 6x PacketExpert 1G) |
| External Power Supply | <ul style="list-style-type: none"> ATX Power Supply | <ul style="list-style-type: none"> ATX Power Supply |
| BUS Interface | <ul style="list-style-type: none"> 1U HD PacketExpert™ 1G mTOP™ (12 Total Ethernet Ports)– <ul style="list-style-type: none"> ➤ mTOP™ System (embedded SBC, 3x PXE100) ➤ 6x 1000 Base-X Optical OR 10/100/1000 Base-T Electrical ➤ 6x 100 Base-FX Optical only ➤ 6x (10/100/1000) Base-T Electrical | <ul style="list-style-type: none"> 2U HD PacketExpert™ 1G mTOP™ (24 Total Ethernet Ports)– <ul style="list-style-type: none"> ➤ mTOP™ System (embedded SBC, 6x PXE100) ➤ 12x 1000 Base-X Optical OR 10/100/1000 Base-T Electrical ➤ 12x 100 Base-FX Optical only ➤ 12x (10/100/1000) Base-T Electrical |
| SBC Specifications | <ul style="list-style-type: none"> Intel Core i3 or optional i7 NUC Equivalent, Windows® 11 64-bit Pro Operating System USB 3.0 and USB 2.0 Ports, ATX Power Supply USB Type C Ports, Ethernet 2.5GigE port 256 GB Hard drive, 8G Memory (Min) Two HDMI ports | <ul style="list-style-type: none"> Intel Core i3 or optional i7 NUC Equivalent, Windows® 11 64-bit Pro Operating System USB 3.0 and USB 2.0 Ports, ATX Power Supply USB Type C Ports, Ethernet 2.5GigE port 256 GB Hard drive, 8G Memory (Min) Two HDMI ports |

PacketExpert™ mTOP™ Probe

Front Panel View

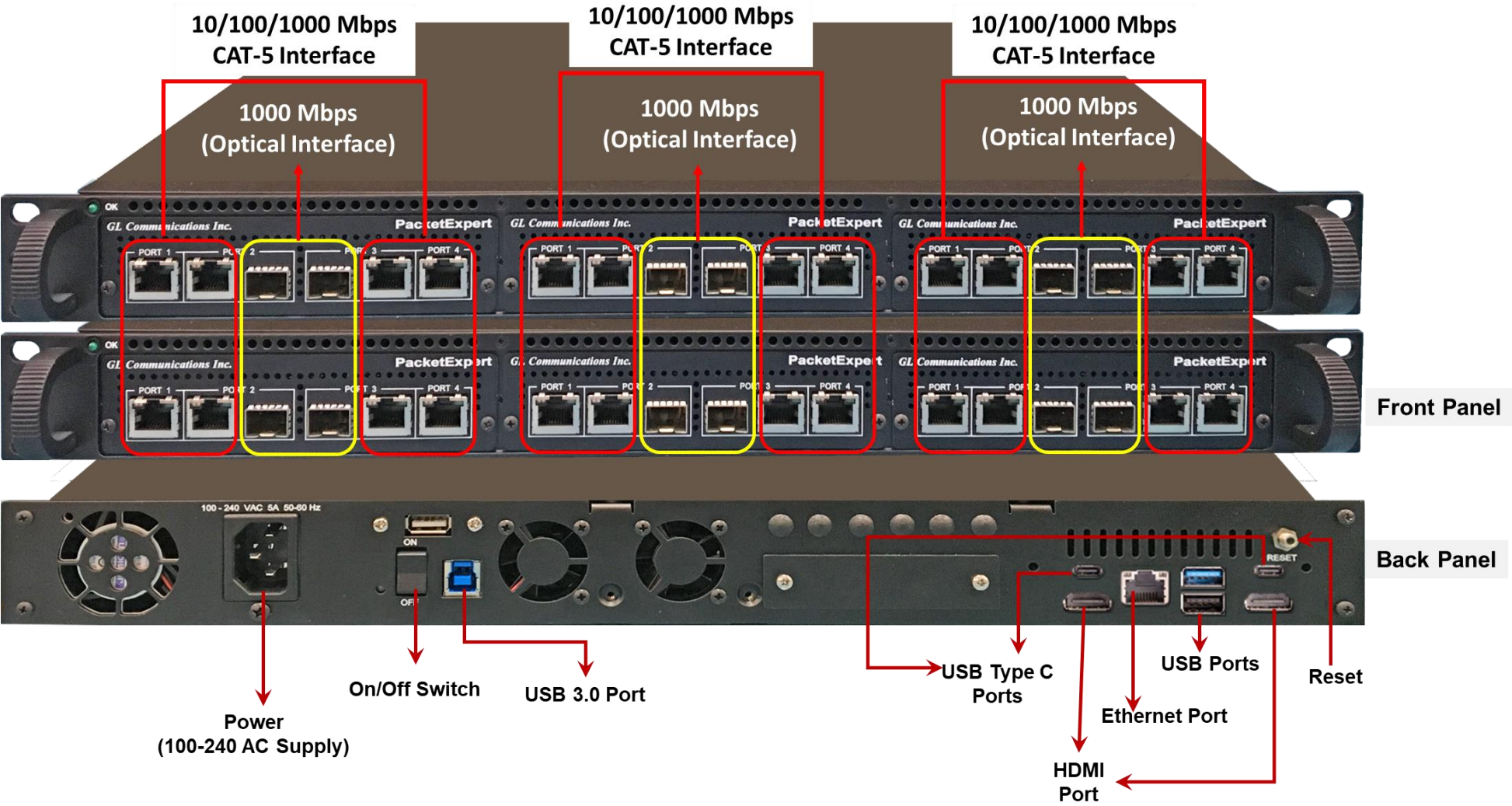


Rear Panel View

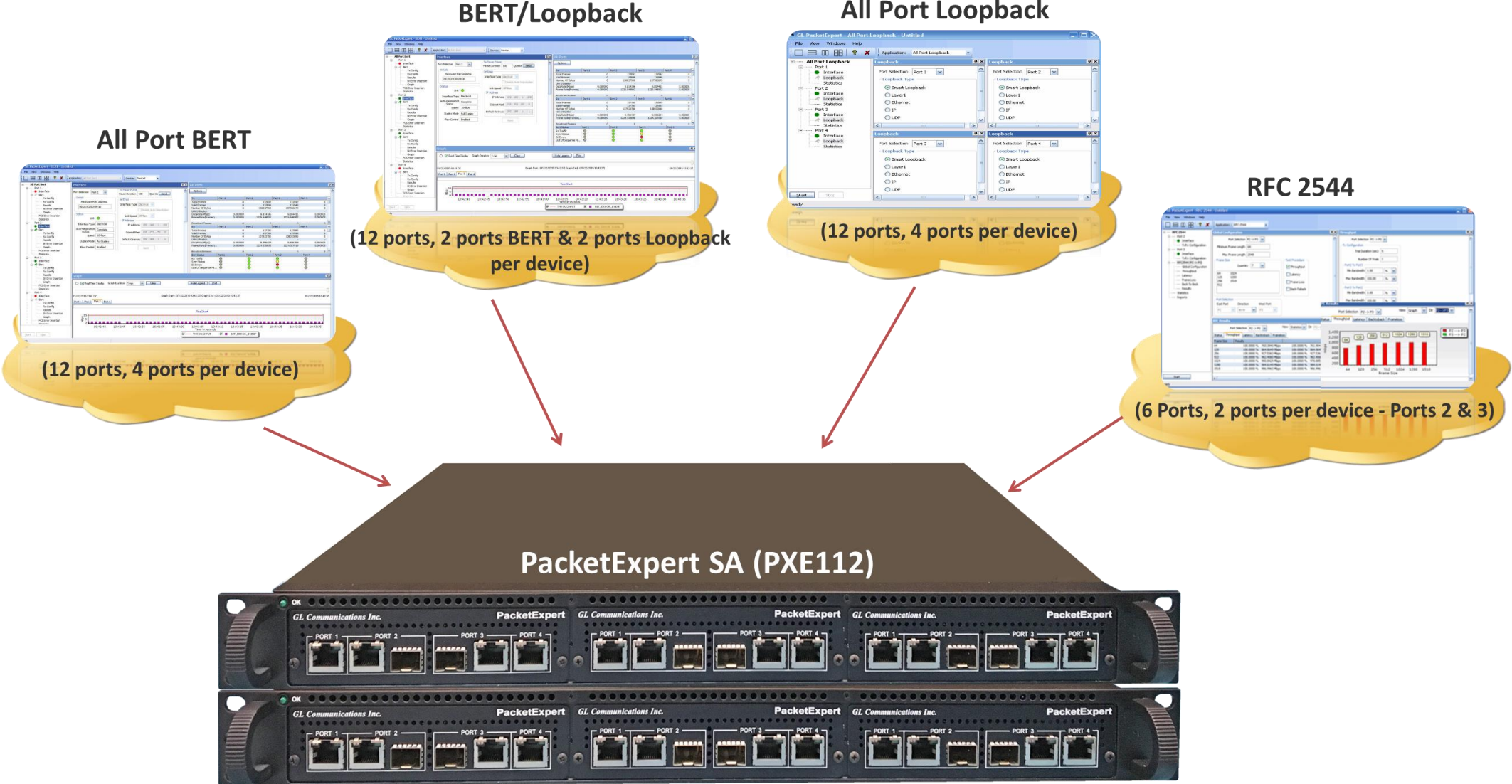


- Portable Quad Port Ethernet/VLAN/MPLS/IP/UDP Tester with 4 Electrical Ethernet Ports (10/100/1000 Mbps) and 2 Optical Ports (100/1000 Mbps). Embedded with Single Board Computer (SBC)
- **SBC Specs:** Intel Core i3 or optional i7 NUC Equivalent, Windows® 11 64-bit Pro Operating System, USB 3.0 and USB 2.0 Ports, ATX Power Supply, USB Type C Ports, Ethernet 2.5GigE port, 256 GB Hard drive, 8G Memory (Min), Two HDMI ports
- Each GigE port provides independent Ethernet/VLAN/MPLS/IP/UDP testing at wire speed for applications such as BERT, RFC 2544, and Loopback.
- RFC 2544 is applicable for Layers 2, 2.5, and 3, and Loopback is applicable for Layers 2, 3, and 4

PacketExpert™ 24 Ports – Hardware Specifications



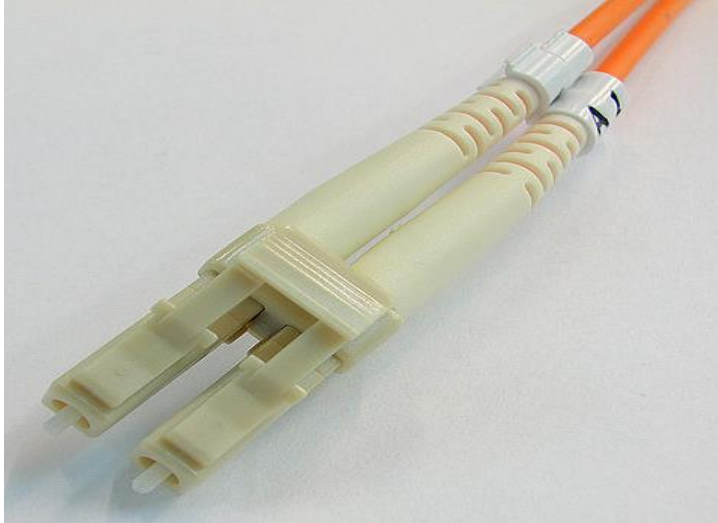
Different Applications loaded on same Platform



Note: Only one application can run at a time

Optical Connectors and SFP Transceivers

LC Connectors



850/1310 nm SFP Module



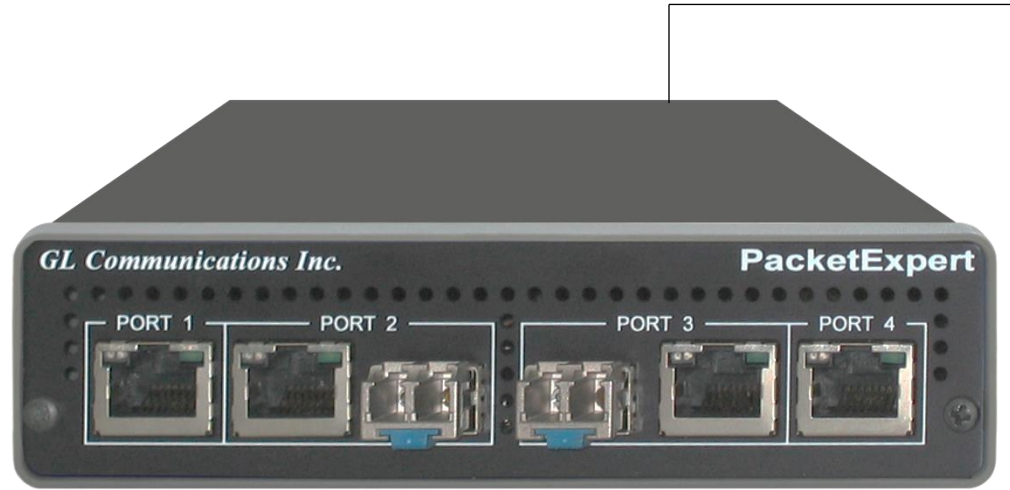
- PacketExpert™ supports LC connectors and 850/1310 nm SFP (Small Factor Pluggable) modules

Note: In case customer have different type of connectors, then we need converters like LC-to-SC, LC-to-FC and vice-versa

PacketExpert™ - 24 Ports Unit



Applications



PacketExpert™ 1G

USB 2.0



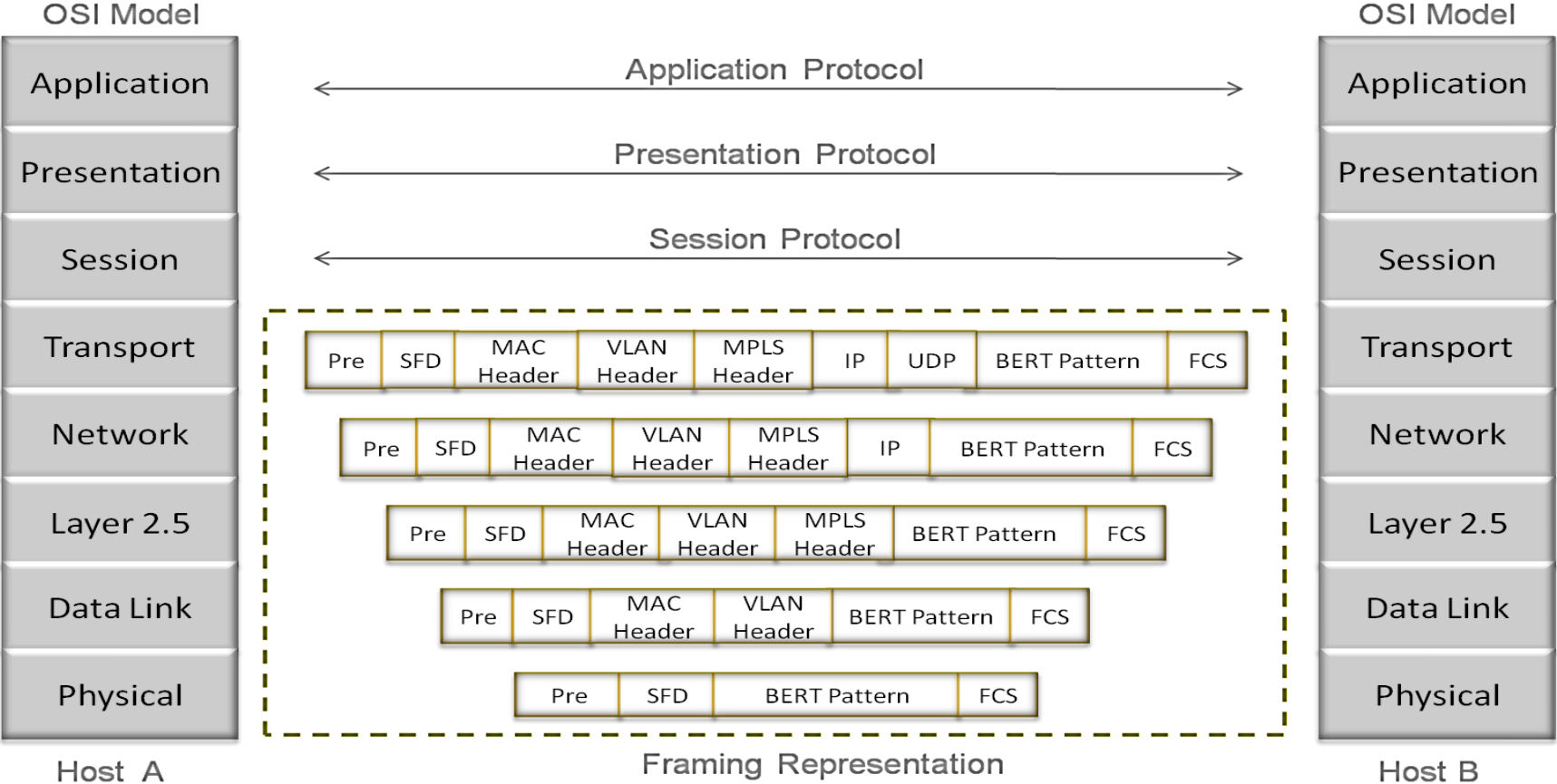
- Bit Error Rate Testing
- RFC 2544
- Loopback
- ITU-T Y.1564
- Multi-Stream Traffic Generator
- RFC 6349
- Record and Playback Traffic
- Wirespeed Network Tap

Applications

- Test and verify QoS Parameters of network devices like Switches/Routers etc.
- End to end testing of network paths for QoS parameters
- In-depth troubleshooting of the Carrier network in the event of network failures or impairments
- QoS testing of Triple-play services to ensure that they fully qualify SLA parameters
- Terrestrial wireless, satellite, and other WAN technologies network validations
- Test VoIP network in real-time conditions to verify if it meets the quality requirements before you deploy
- Testing video on IP networks by emulating the loss and congestion characteristics
- SPF support can be used for Broadband aggregation applications, Metro edge switching, Metro and access multi-service platforms, and are suitable for Fast Ethernet applications

Wire-Speed BERT

OSI Model

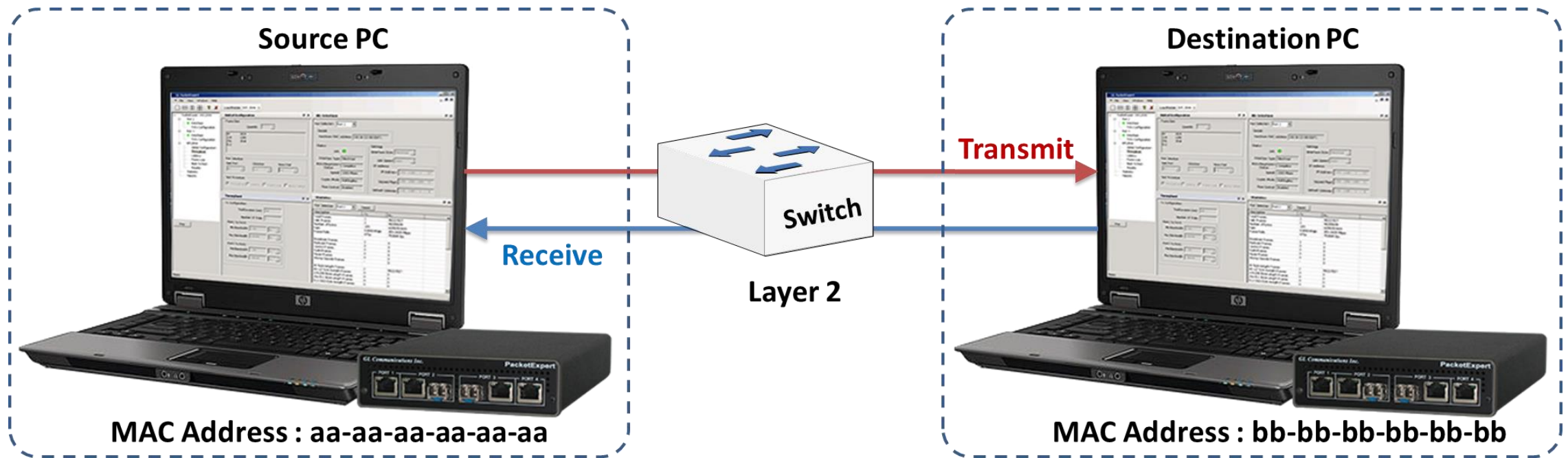


- Preamble – 7 Bytes
- Start Frame Delimiter – (SFD)- 1 Byte
- MAC Header –
 - Dest/Src MAC Address – 6 Bytes
 - Ether Length/Type – 2 Bytes (0x0800)
- IP
- VLAN Header – 4 bytes each

- MPLS Header – 4 bytes each
- IP Header – 20 Bytes
- UDP Header – 8 Bytes
- Payload – BER Test Pattern
- Frame Check Sum – (FCS) – 4 Bytes

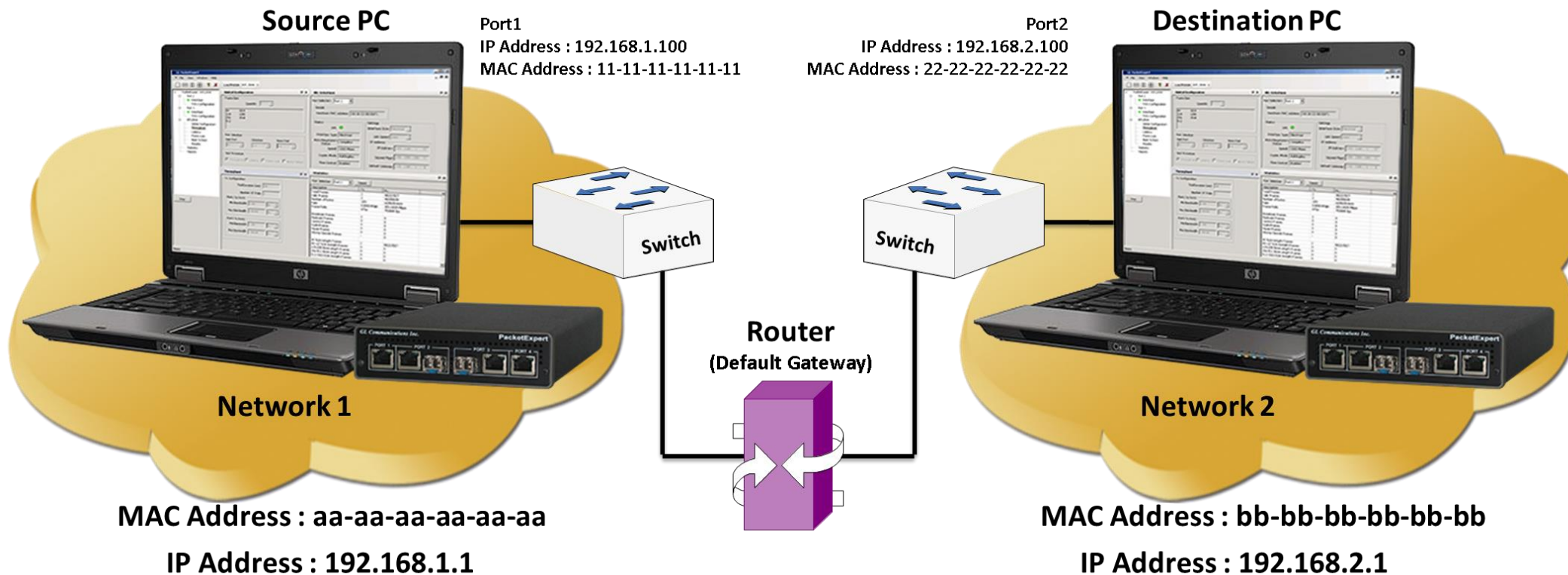
} Ethernet Payload

BER Testing at Layer 2



BER Test Setup at Layer 3/4

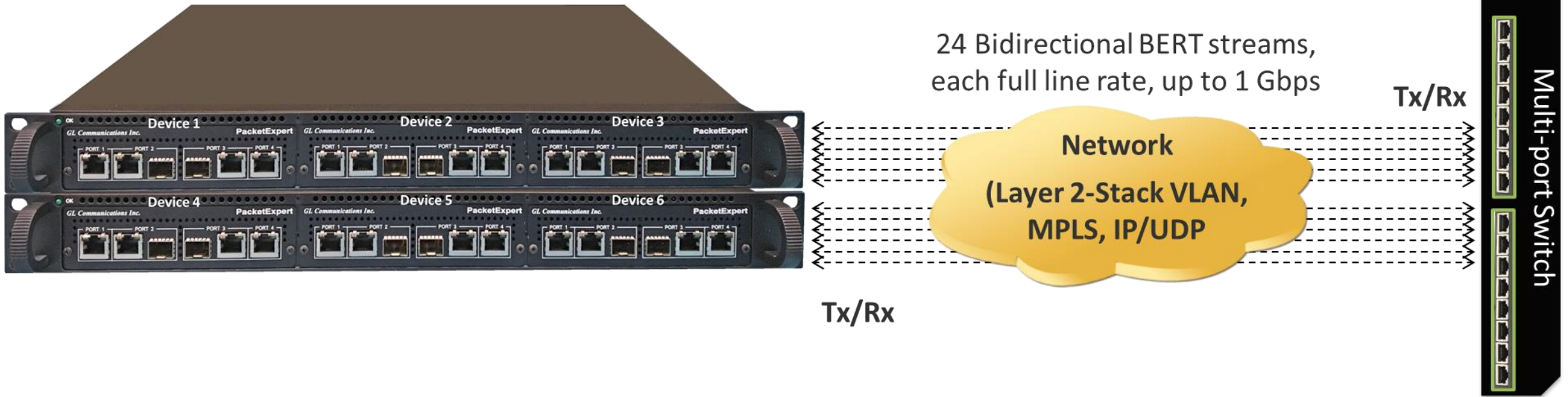
Layer 3 Testing between PacketExpert™ located in different IP Networks



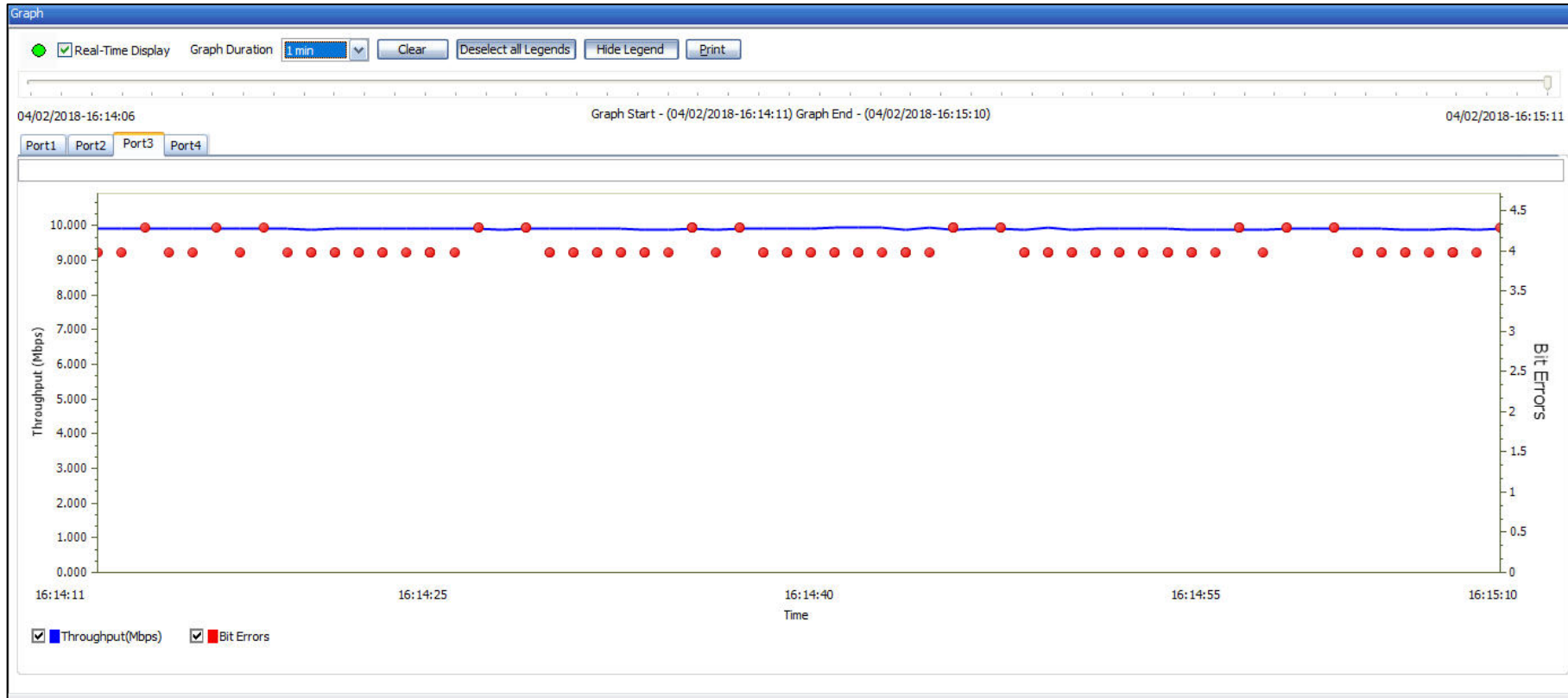
- In this case, Source and the Destination PacketExpert™ applications are located in different IP networks. These 2 networks are connected through a router. A simple example above shows 2 LANs connected through a router

PacketExpert™ 24 Ports - BERT

PacketExpert™ (PXE124)



BERT Results (w/ LEDs) and Graph



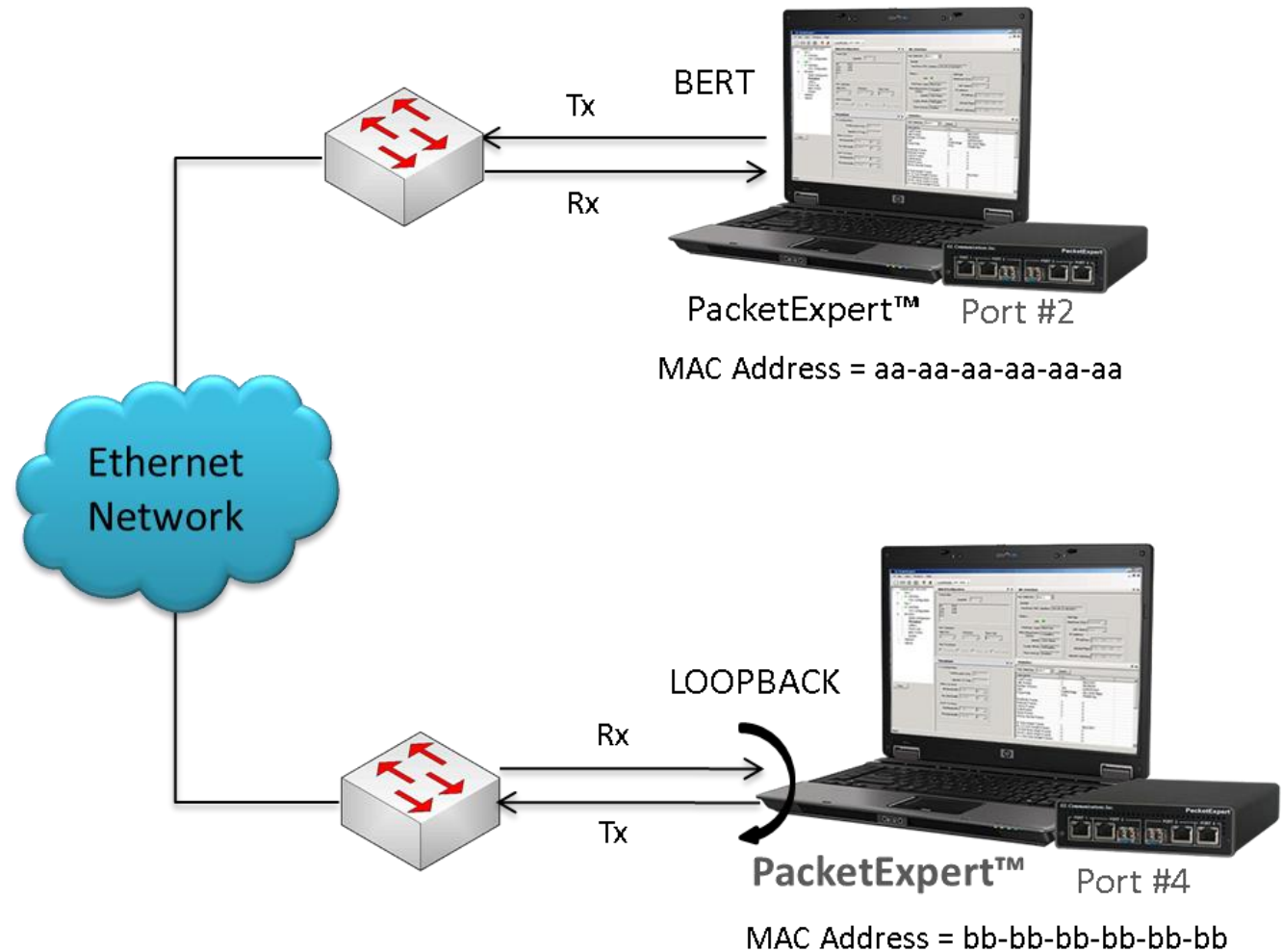
- Optional Sequence number insertion allows detecting Out-of-sequence packets and packet loss
- Detailed BERT statistics like the Bit Error Count, Bit Error Rate, Bit Error Seconds etc. are provided
- Bit Error Count is displayed in both Tabular and Graphical formats

All Ports Result

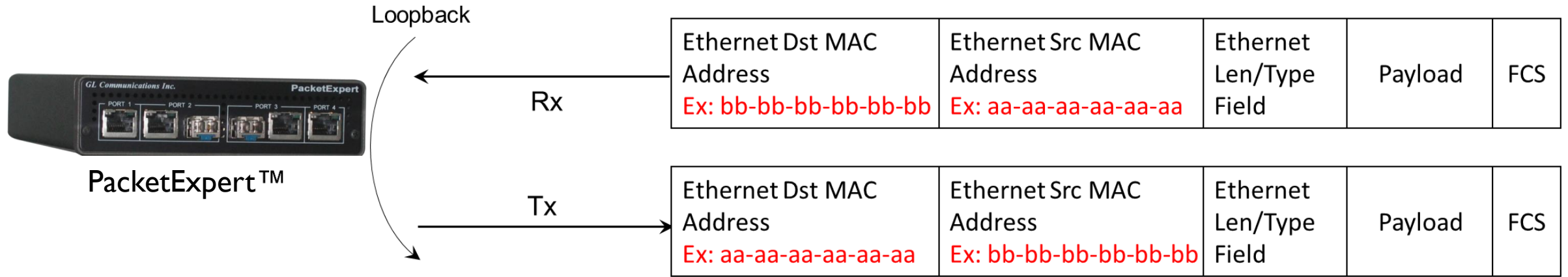
| All Ports | | | | |
|-------------------------|--------------|--------------|--------------|--------------|
| Options | | | | |
| Tx | Port 1 | Port 2 | Port 3 | Port 4 |
| Total Frames | 1562724 | 1562858 | 1562461 | 1615858 |
| Valid Frames | 1562740 | 1562869 | 1562473 | 1615870 |
| Number Of Bytes | 156275500 | 156288100 | 156248400 | 155124864 |
| Link Utilisation | - | - | - | - |
| DataRate(Mbps) | 8.538899 | 8.334709 | 8.337879 | 8.273890 |
| Frame Rate(Fram... | 10672.675522 | 10428.169014 | 10413.434248 | 10770.413064 |
| Broadcast Frames | 0 | 0 | 0 | 0 |
| Rx | Port 1 | Port 2 | Port 3 | Port 4 |
| Total Frames | 1613564 | 1561938 | 1562893 | 1562467 |
| Valid Frames | 1613564 | 1561938 | 1562893 | 1562467 |
| Number Of Bytes | 154903488 | 156194900 | 156290500 | 156247800 |
| Link Utilisation | - | - | - | - |
| DataRate(Mbps) | 8.281139 | 8.337795 | 8.335606 | 8.334615 |
| Frame Rate(Fram... | 10783.681214 | 10426.013195 | 10418.560606 | 10427.333975 |
| Broadcast Frames | 0 | 0 | 0 | 0 |
| Bert Status | Port 1 | Port 2 | Port 3 | Port 4 |
| Rx Traffic | ● | ● | ● | ● |
| Sync Status | ● | ● | ● | ● |
| Bit Errors | ● | ● | ● | ● |
| Out Of Sequence Pack... | ● | ● | ● | ● |
| Bert Statistics | Port 1 | Port 2 | Port 3 | Port 4 |
| Bert Status | Sync | Sync | Sync | Sync |
| Test Time | 00:01:51 | 00:01:51 | 00:01:51 | 00:01:51 |
| Bits Received | 465008480 | 465008480 | 465347048 | 465347048 |
| Bit Error Count | 0 | 0 | 0 | 0 |
| Bit Error Rate | 0.000E+000 | 0.000E+000 | 0.000E+000 | 0.000E+000 |
| Bit Error Seconds | 0 | 0 | 0 | 0 |
| Sync Loss Count | 0 | 0 | 0 | 0 |
| Sync Loss Seconds | 0 | 0 | 0 | 0 |
| Out of Sequence ... | 0 | 0 | 0 | 0 |
| Out of Sequence S... | 0 | 0 | 0 | 0 |
| Error Free Seconds | 149 | 149 | 149 | 149 |

2 Ports BERT and Loopback

- Loopback helps in easy test setup, especially in end-to-end testing, when the other end is in a remote place
- In such cases, one PacketExpert™ can be put in constant Loopback at the remote end, and BERT tests can be started / stopped anytime at the local end



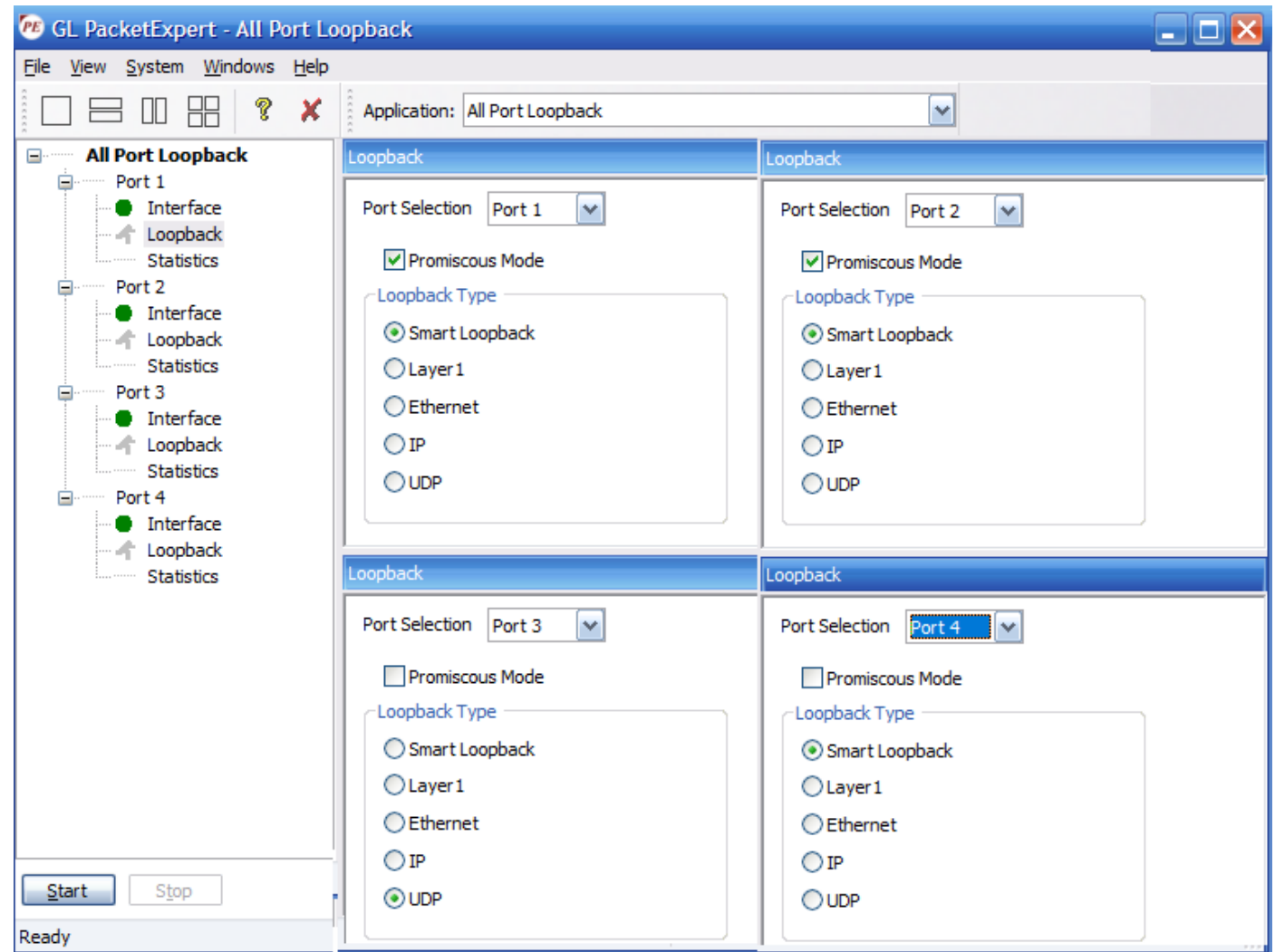
Layer 2 - Ethernet Loopback Types



- PacketExpert™ has all ports/2 ports Loopback capability. PacketExpert™ supports Layer-wise Loopback as well as Smart Loopback
- The above picture depicts the Ethernet Loopback type, swaps Source and Destination MAC addresses before sending back the packet

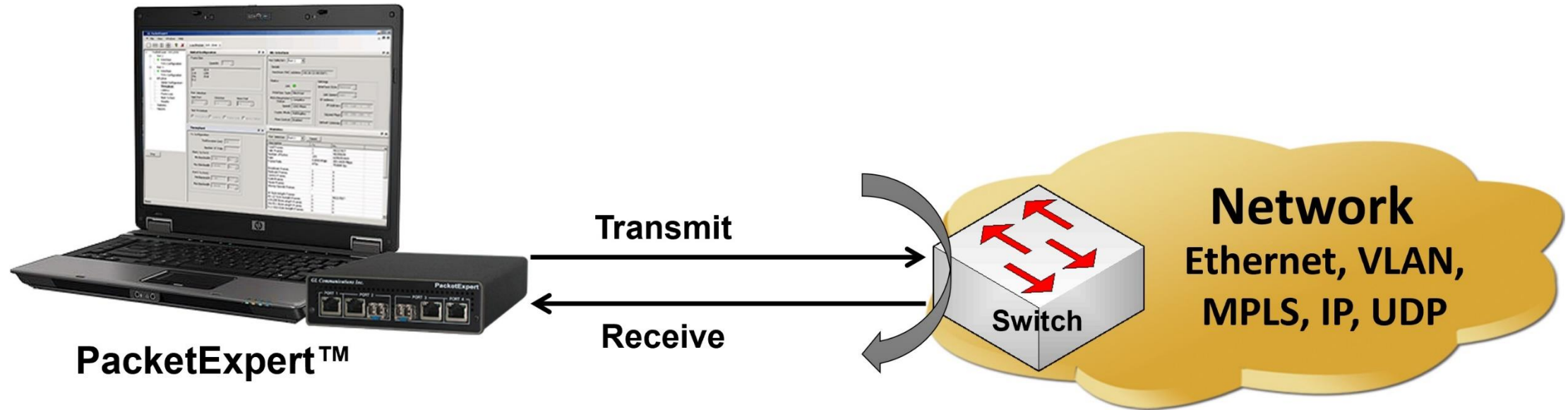
Loopback Testing (On all Ports/4 Ports)

- Supports Loopback on 10G / 1G ports
- Loopback Types – Smart Loopback, Layer 1, Ethernet, IP, UDP
- General statistics per port (similar to BERT port level statistics)



RFC 2544 Testing

RFC 2544 Testing



RFC 2544 test application includes the following tests:

- **Throughput** - Maximum number of frames per second that can be transmitted without any error
- **Latency** - Measures the time required for a frame to travel from the originating device through the network to the destination device
- **Frame Loss** - Measures the network's response in overload conditions
- **Back-to-Back** - It measures the maximum number of frames received at full line rate before a frame is lost

PacketExpert™ 24 Ports – RFC 2544

PacketExpert™ SA (PXE124)

6 simultaneous bidirectional RFC 2544
test at full line rate, up to 1 Gbps

Tx/Rx

Multi-port 1G Switch

Network

(Layer2 – StackVLAN,
MPLS, IP/UDP)

Tx/Rx

Highlights

- Throughput, back-to-back, latency and frame loss testing supporting uni-directional and bi-directional traffic between ports
- Supports RFC 2544 on electrical / optical (1000Mbps) ports
- Includes various parameter configurations such as Test Selection, Frame Sizes selection, Unidirectional/Bidirectional, Number of trials, Trial Duration, and many more
- User-defined options to configure various packet header parameters, like MAC addresses, IP addresses, UDP ports, VLAN ID, MPLS Labels, and more
- Results are displayed in both tabular as well as graphical format

Global Configurations

Global Configuration

Minimum Frame Length

Max Frame Length

Frame Size

Quantity

| | |
|-----|------|
| 64 | 1024 |
| 128 | 1280 |
| 256 | 1518 |
| 512 | |

Test Procedure

Throughput

Latency

Frame Loss

Back-ToBack

Port Selection

| East Port | Direction | West Port |
|---------------------------------|---|---------------------------------|
| <input type="text" value="P2"/> | <input type="text" value="<-->"/> | <input type="text" value="P3"/> |

Individual Test Configuration Details

Throughput

The screenshot shows the 'Throughput' configuration window. It features a 'Tx Configuration' section with 'Trial Duration (sec)' set to 60 and 'Number Of Trials' set to 1. Below this are two port-to-port configurations: 'Port2 To Port3' and 'Port3 To Port2'. Each configuration has 'Min Bandwidth' set to 1.00% and 'Max Bandwidth' set to 100.00%.

Latency

The screenshot shows the 'Latency' configuration window. It features a 'Port Selection' dropdown set to 'Port 2'. The 'Tx Configuration' section has 'Trial Duration (sec)' set to 60 and 'Number Of Trials' set to 1. A 'Use Throughput Value' checkbox is checked. Below is a 'Port 2 To Port 2' configuration with 'Bandwidth' set to 100.00%.

Frame Loss

The screenshot shows the 'Frame Loss' configuration window. The 'Tx Configuration' section has 'Trial Duration (sec)' set to 10 and 'Number Of Trials' set to 1. It includes two port-to-port configurations: 'Port2 To Port3' and 'Port3 To Port2'. Each configuration has 'Min Bandwidth' set to 1.00% and 'Max Bandwidth' set to 100.00%.

Back-to-Back

The screenshot shows the 'Back To Back' configuration window. The 'Tx Configuration' section has 'Trial Duration (sec)' set to 10 and 'Number Of Trials' set to 1. It includes two port-to-port configurations: 'Port2 To Port3' and 'Port3 To Port2'. Each configuration has 'Burst Size' set to 200 msec and 'No Of bursts' set to 1.

Results

- **Throughput** – Both relative (% of link speed) and absolute (in Mbps) throughput values are displayed
- **Latency** – displayed in Microseconds
- **Back-to-Back** – Displayed in Frames/Burst
- **Frame Loss** – Displays the Frame Loss Rate (in %) against attempted Frame Rate (in % of link speed)

RFC 2544 Results

View: Statistics Dir: P2-->P3

Status: Throughput Latency Frameloss Backtoback

| Frame Size | P2-->P3 | P3-->P2 |
|------------|---------------------|---------------------|
| 64 | 100.00% 761.90 Mbps | 100.00% 761.90 Mbps |
| 128 | 100.00% 864.86 Mbps | 100.00% 864.86 Mbps |
| 256 | 100.00% 927.54 Mbps | 100.00% 927.54 Mbps |
| 512 | 100.00% 962.41 Mbps | 100.00% 962.41 Mbps |
| 1024 | 100.00% 980.84 Mbps | 100.00% 980.84 Mbps |
| 1280 | 100.00% 984.62 Mbps | 100.00% 984.62 Mbps |
| 1518 | 100.00% 987.00 Mbps | 100.00% 987.00 Mbps |

Status: Throughput Latency Frameloss Backtoback

| Frame Size | P2-->P3 (Store And Forward , Bit | P3-->P2 (Store And Forward , Bit |
|------------|----------------------------------|----------------------------------|
| 64 | 1.000% 1.808 us, 2.320 us | 1.000% 1.808 us, 2.320 us |
| 128 | 1.000% 2.320 us, 3.344 us | 1.000% 2.328 us, 3.352 us |
| 256 | 1.000% 3.352 us, 5.400 us | 1.000% 3.352 us, 5.400 us |
| 512 | 1.000% 5.384 us, 9.480 us | 1.000% 5.400 us, 9.496 us |
| 1024 | 1.000% 9.496 us, 17.688 us | 1.000% 9.496 us, 17.688 us |
| 1280 | 1.000% 11.544 us, 21.784 us | 1.000% 11.544 us, 21.784 us |
| 1518 | 1.000% 13.448 us, 25.592 us | 1.000% 13.440 us, 25.584 us |

RFC 2544 Results

View: Statistics Dir: P2-->P3

Status: Throughput Latency Frameloss Backtoback

| Frame Size | P2-->P3 | P3-->P2 |
|------------|----------------------|----------------------|
| 64 | 1488090 Frames/Burst | 1488090 Frames/Burst |
| 128 | 844590 Frames/Burst | 844590 Frames/Burst |
| 256 | 452890 Frames/Burst | 452890 Frames/Burst |
| 512 | 234960 Frames/Burst | 234960 Frames/Burst |
| 1024 | 119730 Frames/Burst | 119730 Frames/Burst |
| 1280 | 96150 Frames/Burst | 96150 Frames/Burst |
| 1518 | 81270 Frames/Burst | 81270 Frames/Burst |

RFC 2544 Results

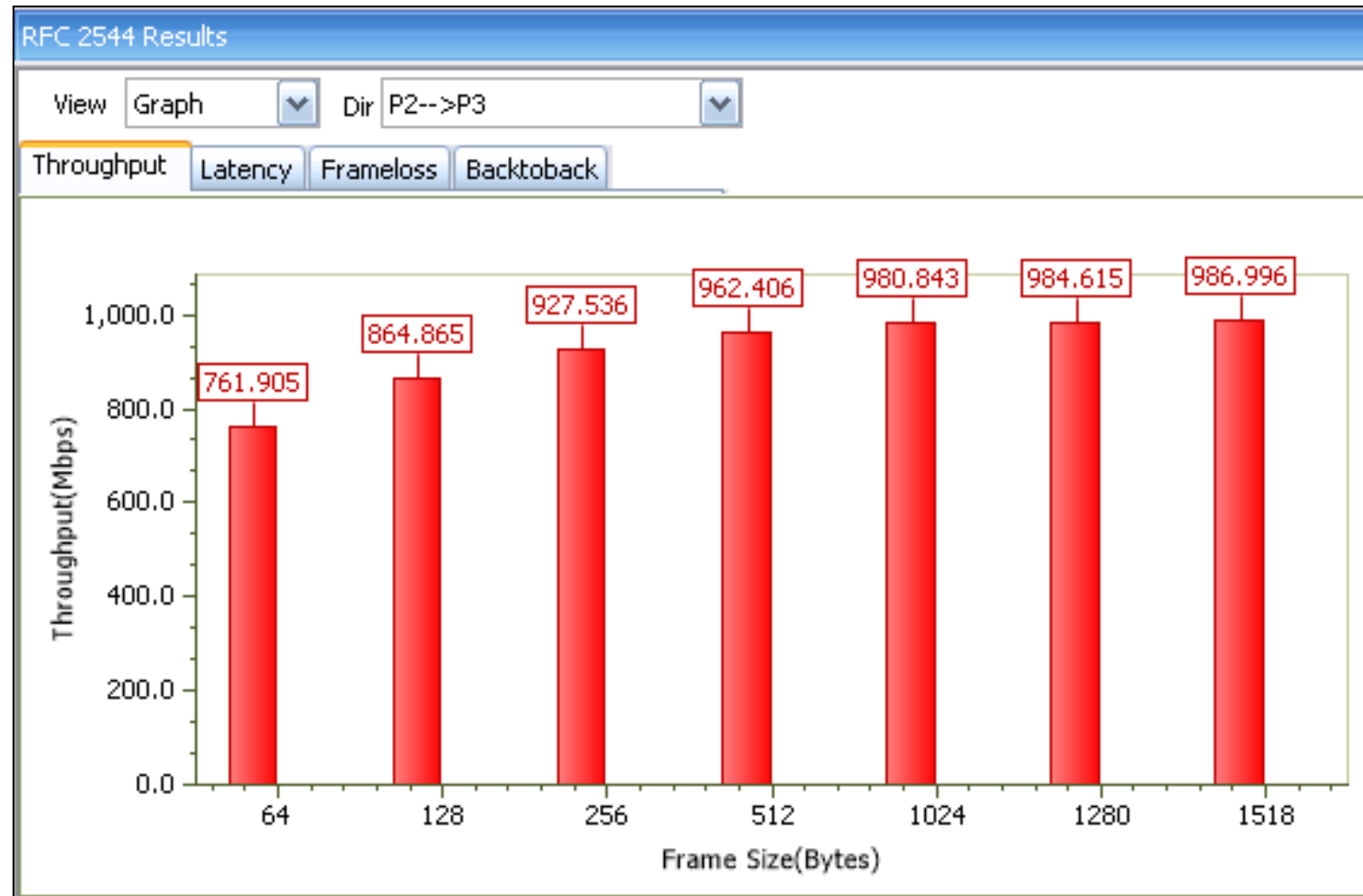
View: Statistics Dir: P2-->P3

Status: Throughput Latency Frameloss Backtoback

| Frame Size | P2-->P3 | P3-->P2 |
|------------|---------------------|---------------------|
| 64 | 100.0000 % 0.0003 % | 100.0000 % 0.0000 % |
| | 90.0000 % 0.0000 % | 90.0000 % 0.0000 % |
| | 80.0000 % 0.0000 % | 80.0000 % 0.0000 % |
| | 70.0000 % 0.0000 % | 70.0000 % 0.0000 % |
| | 60.0000 % 0.0000 % | 60.0000 % 0.0000 % |
| | 50.0000 % 0.0000 % | 50.0000 % 0.0000 % |
| | 40.0000 % 0.0000 % | 40.0000 % 0.0000 % |
| | 30.0000 % 0.0000 % | 30.0000 % 0.0000 % |
| | 20.0000 % 0.0000 % | 20.0000 % 0.0000 % |
| | 10.0000 % 0.0000 % | 10.0000 % 0.0000 % |
| | 1.0000 % 0.0000 % | 1.0000 % 0.0000 % |
| 128 | 100.0000 % 0.0000 % | 100.0000 % 0.0000 % |
| | 90.0000 % 0.0000 % | 90.0000 % 0.0000 % |
| | 80.0000 % 0.0000 % | 80.0000 % 0.0000 % |
| | 70.0000 % 0.0000 % | 70.0000 % 0.0000 % |
| | 60.0000 % 0.0000 % | 60.0000 % 0.0000 % |
| | 50.0000 % 0.0000 % | 50.0000 % 0.0000 % |
| | 40.0000 % 0.0000 % | 40.0000 % 0.0000 % |
| | 30.0000 % 0.0000 % | 30.0000 % 0.0000 % |
| | 20.0000 % 0.0000 % | 20.0000 % 0.0000 % |
| | 10.0000 % 0.0000 % | 10.0000 % 0.0000 % |
| | 1.0000 % 0.0000 % | 1.0000 % 0.0000 % |
| 256 | 100.0000 % 0.0000 % | 100.0000 % 0.0000 % |
| | 90.0000 % 0.0000 % | 90.0000 % 0.0000 % |
| | 80.0000 % 0.0000 % | 80.0000 % 0.0000 % |
| | 70.0000 % 0.0000 % | 70.0000 % 0.0000 % |
| | 60.0000 % 0.0000 % | 60.0000 % 0.0000 % |
| | 50.0000 % 0.0000 % | 50.0000 % 0.0000 % |
| | 40.0000 % 0.0000 % | 40.0000 % 0.0000 % |
| | 30.0000 % 0.0000 % | 30.0000 % 0.0000 % |
| | 20.0000 % 0.0000 % | 20.0000 % 0.0000 % |
| | 10.0000 % 0.0000 % | 10.0000 % 0.0000 % |
| | 1.0000 % 0.0000 % | 1.0000 % 0.0000 % |
| 512 | | |
| 1024 | | |
| 1280 | | |

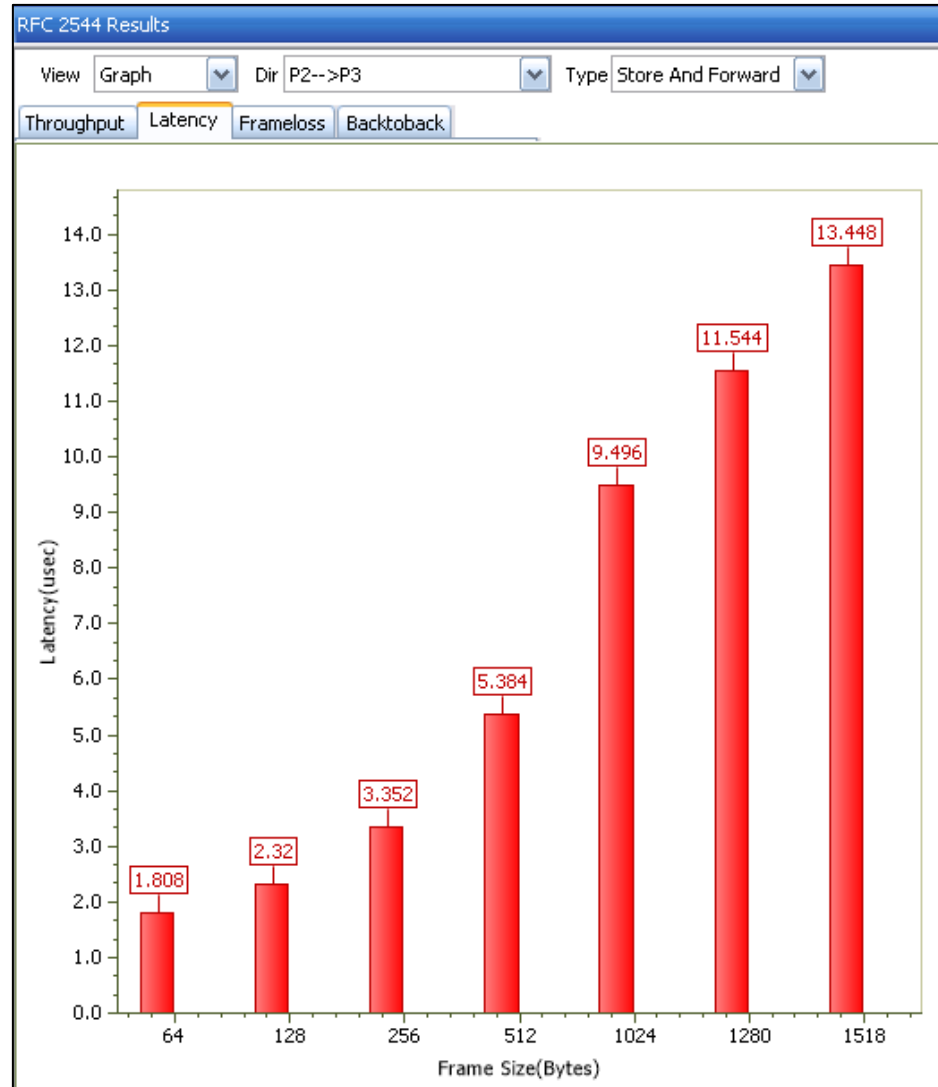
Graphs

Throughput

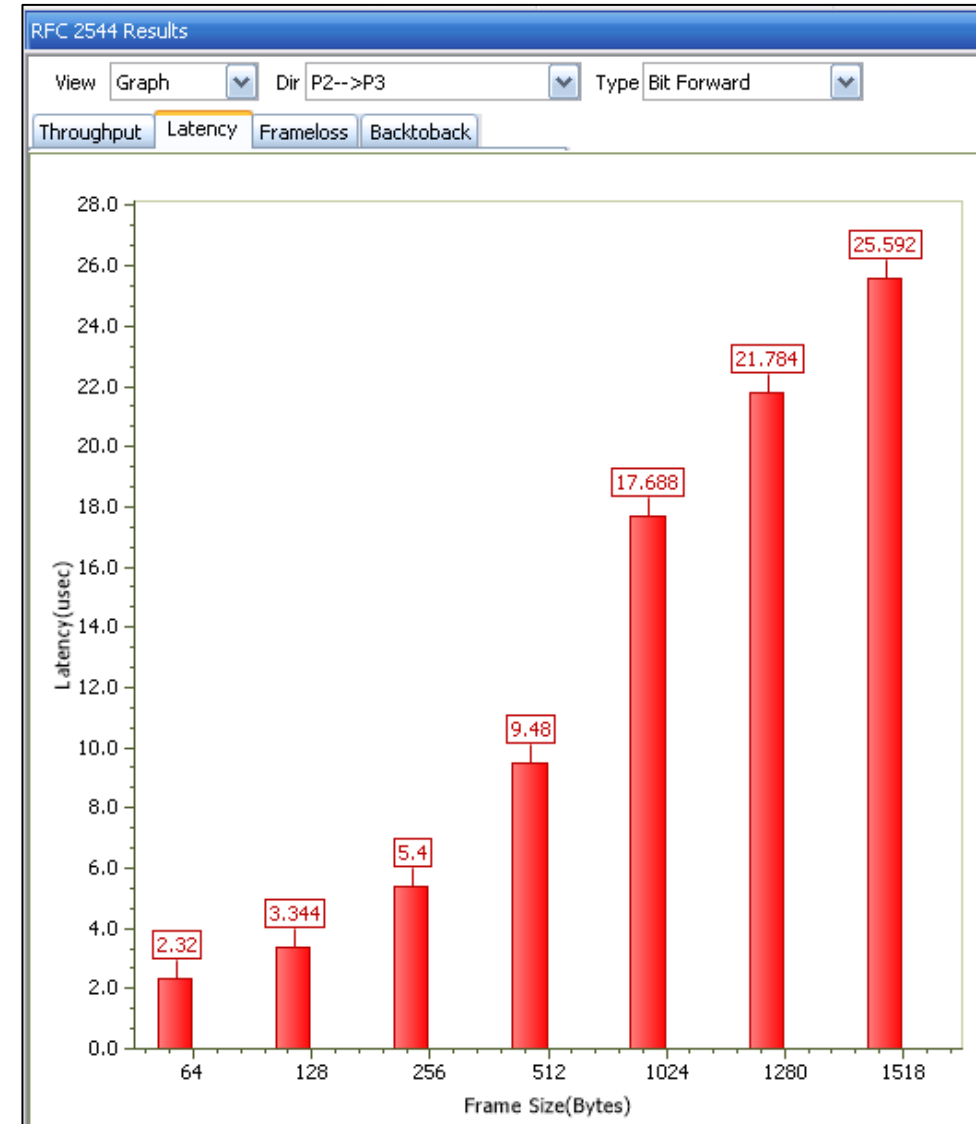


Graphs (Contd.)

Store And Forward Latency

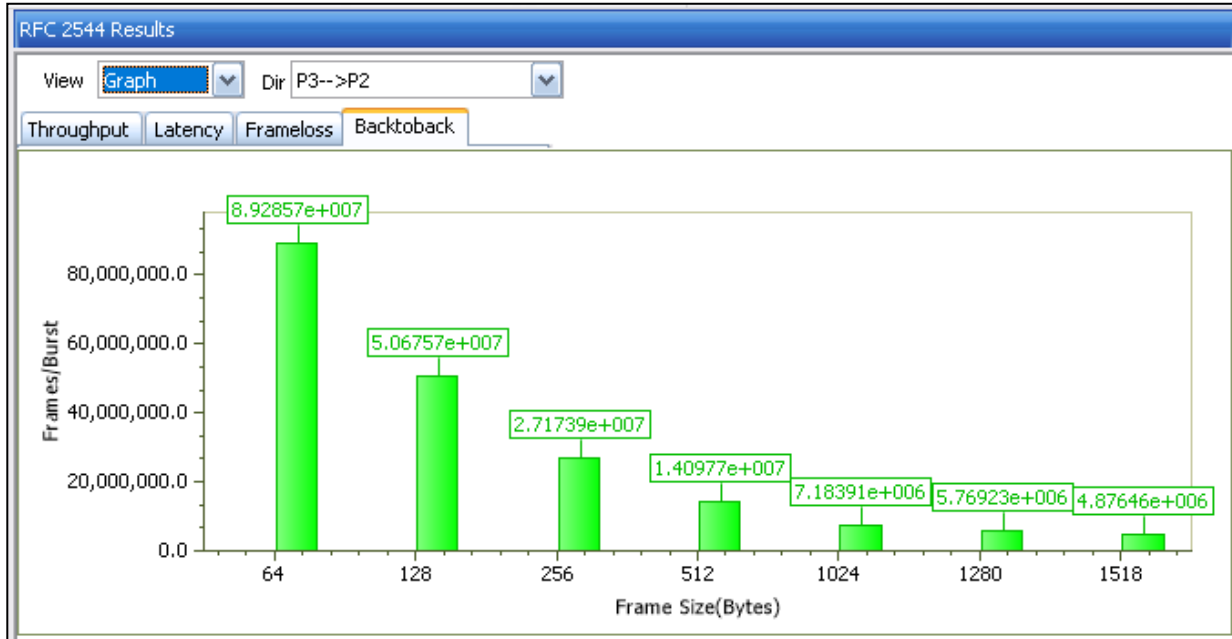


Bit Forward Latency

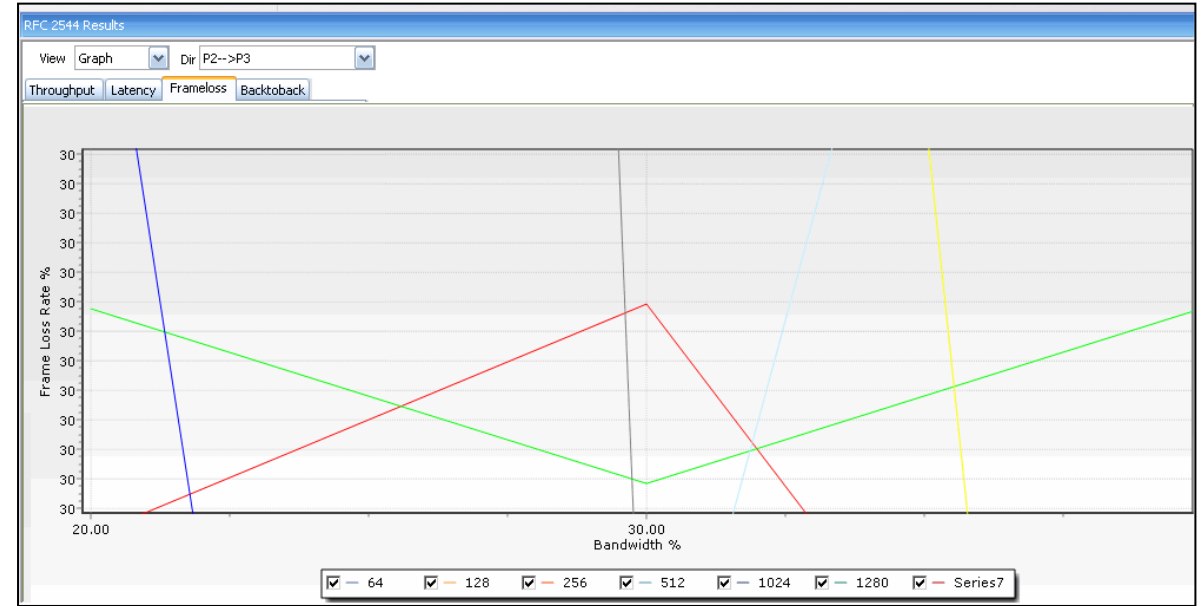


Graphs (Contd.)

Back-to-Back

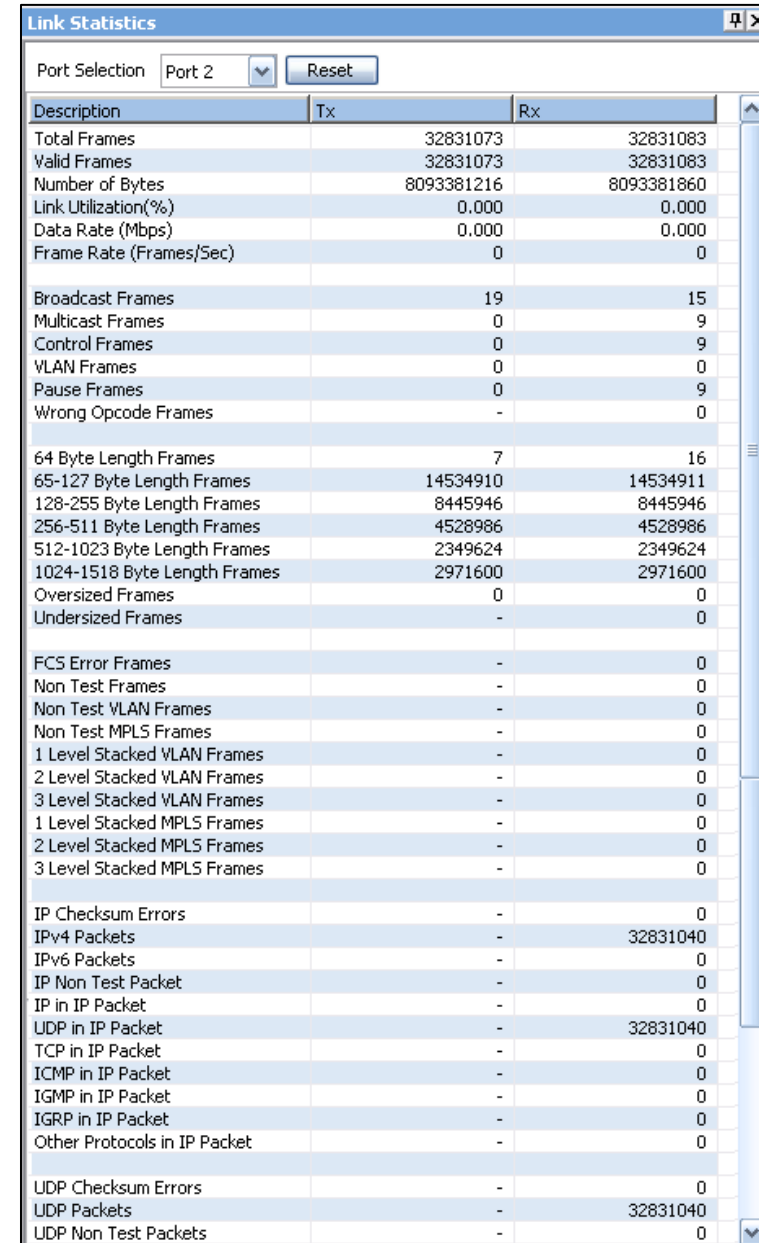


Frame Loss



Port Statistics

- Per port detailed statistics are provided –
 - Tx / Rx Frame count
 - Number of Bytes transmitted & received
 - Tx & Rx Frame Rate
 - Broadcast, Multicast, Control, VLAN, Pause Frame count
 - Frame count for byte lengths 64/65-127
 - MPLS and VLAN Frame count for various stack level
 - IPv4/ UDP packet count
 - Oversized / Undersized Error frame count
 - FCS error count
 - IP/UDP checksum error count and others



| Description | Tx | Rx |
|------------------------------|------------|------------|
| Total Frames | 32831073 | 32831083 |
| Valid Frames | 32831073 | 32831083 |
| Number of Bytes | 8093381216 | 8093381860 |
| Link Utilization(%) | 0.000 | 0.000 |
| Data Rate (Mbps) | 0.000 | 0.000 |
| Frame Rate (Frames/Sec) | 0 | 0 |
| Broadcast Frames | 19 | 15 |
| Multicast Frames | 0 | 9 |
| Control Frames | 0 | 9 |
| VLAN Frames | 0 | 0 |
| Pause Frames | 0 | 9 |
| Wrong Opcode Frames | - | 0 |
| 64 Byte Length Frames | 7 | 16 |
| 65-127 Byte Length Frames | 14534910 | 14534911 |
| 128-255 Byte Length Frames | 8445946 | 8445946 |
| 256-511 Byte Length Frames | 4528986 | 4528986 |
| 512-1023 Byte Length Frames | 2349624 | 2349624 |
| 1024-1518 Byte Length Frames | 2971600 | 2971600 |
| Oversized Frames | 0 | 0 |
| Undersized Frames | - | 0 |
| FCS Error Frames | - | 0 |
| Non Test Frames | - | 0 |
| Non Test VLAN Frames | - | 0 |
| Non Test MPLS Frames | - | 0 |
| 1 Level Stacked VLAN Frames | - | 0 |
| 2 Level Stacked VLAN Frames | - | 0 |
| 3 Level Stacked VLAN Frames | - | 0 |
| 1 Level Stacked MPLS Frames | - | 0 |
| 2 Level Stacked MPLS Frames | - | 0 |
| 3 Level Stacked MPLS Frames | - | 0 |
| IP Checksum Errors | - | 0 |
| IPv4 Packets | - | 32831040 |
| IPv6 Packets | - | 0 |
| IP Non Test Packet | - | 0 |
| IP in IP Packet | - | 0 |
| UDP in IP Packet | - | 32831040 |
| TCP in IP Packet | - | 0 |
| ICMP in IP Packet | - | 0 |
| IGMP in IP Packet | - | 0 |
| IGRP in IP Packet | - | 0 |
| Other Protocols in IP Packet | - | 0 |
| UDP Checksum Errors | - | 0 |
| UDP Packets | - | 32831040 |
| UDP Non Test Packets | - | 0 |

Generate Reports

Reports

Choose Format: PDF

Title: PacketExpert

User Comments: Generate RFC 2544 result

Header: RFC2544-Throughput

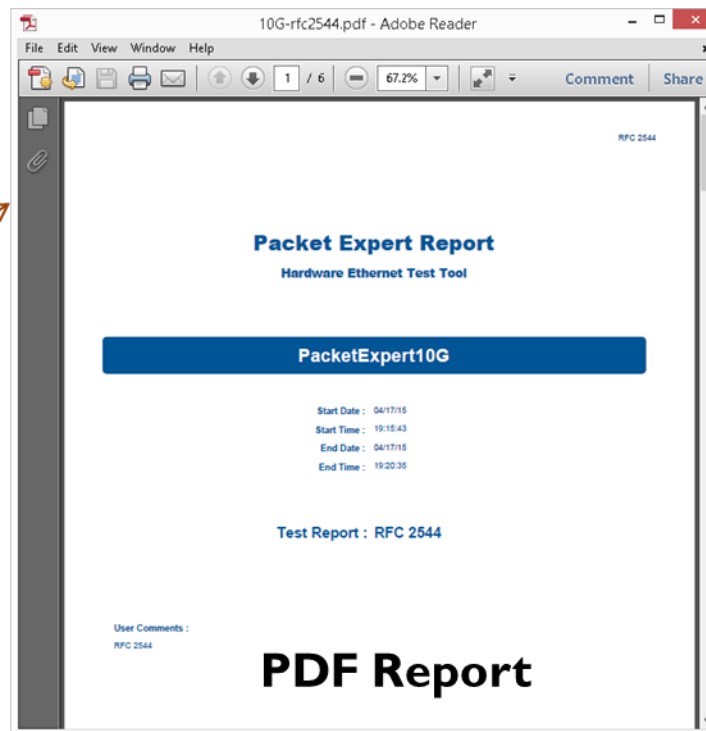
Footer: GL Communications

User Logo: Expert\GL_Logo.JPG

File name: PacketExpert\report1

Generate Report

Configuration



10g-rfc2544.csv - Excel

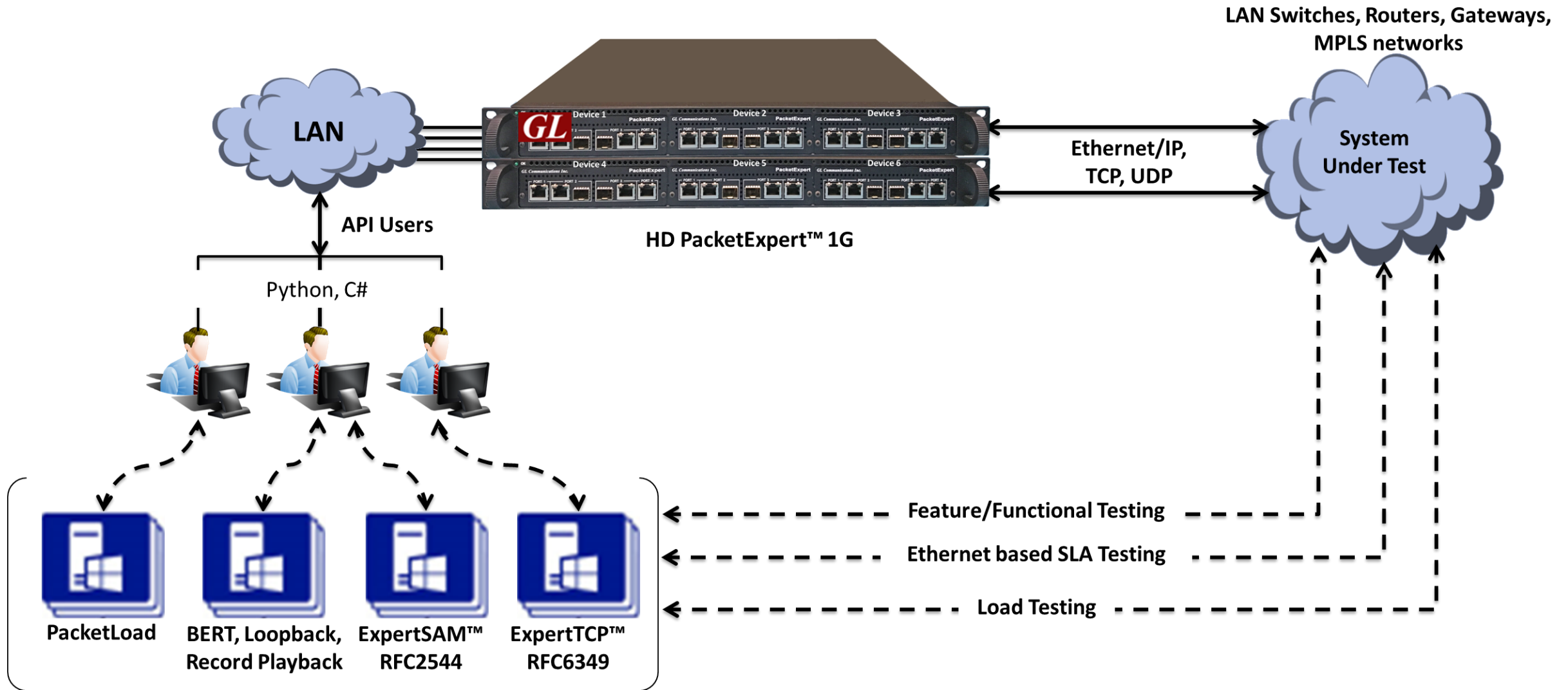
FILE HOME INSERT PAGE LAYOUT FORMULAS DATA REVIEW VIEW ADD-INS

| | A | B | C | D | E | F | G | H | I | J | K | L | M | N | O | P | Q | R |
|---|--------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| 1 | | THP_Throi | THP_Throi | THP_Throi | THP_Throi | THP_Throi | THP_Throi | THP_Throi | THP_Throi | THP_Throi | THP_Throi | THP_Throi | THP_Throi | THP_Throi | THP_Throi | THP_Throi | THP_Throi | THP_Throi |
| 2 | P1->P2 | 8304.25 | 100 | 9125.72 | 100 | 9464.29 | 100 | 9613.68 | 100 | 9697.82 | 100 | 9751.8 | 100 | 9789.37 | 100 | 9817.03 | 100 | 9838.24 |
| 3 | | | | | | | | | | | | | | | | | | |
| 4 | | | | | | | | | | | | | | | | | | |
| 5 | | | | | | | | | | | | | | | | | | |
| 6 | | | | | | | | | | | | | | | | | | |
| 7 | | | | | | | | | | | | | | | | | | |
| 8 | | | | | | | | | | | | | | | | | | |

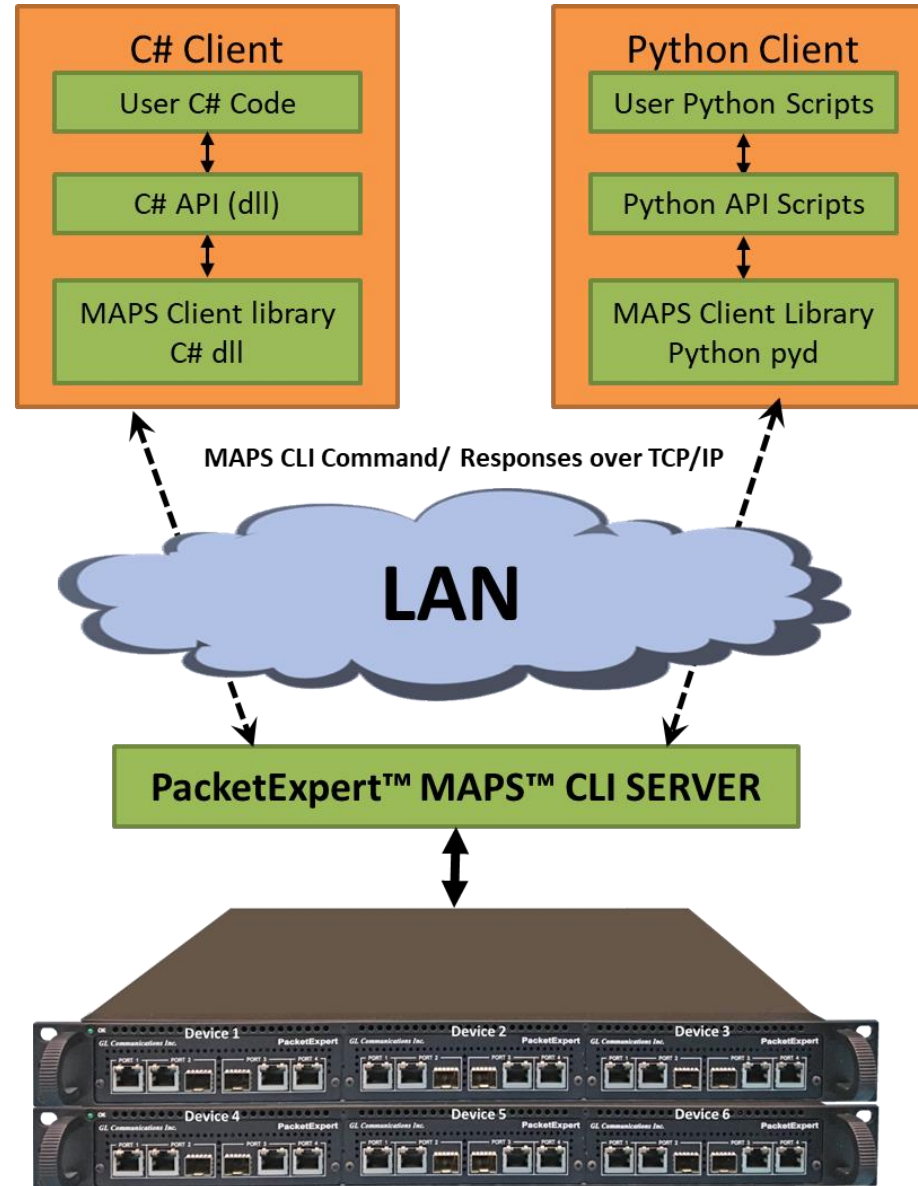
CSV Report

Command Line Interface (CLI)

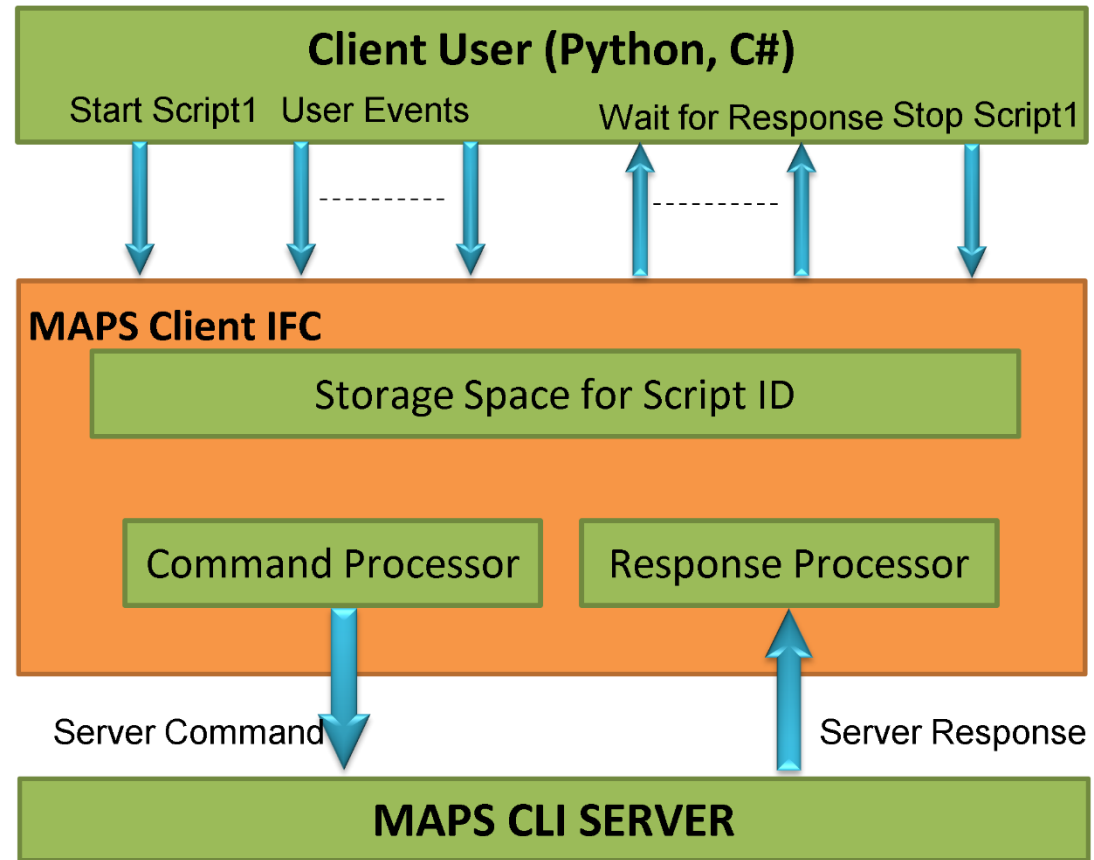
APIs for Test Automation and Remote Access



MAPS™ CLI Client/Server Architecture



Working Principle of MAPS™ CLI



MAPS™ CLI Server

```
CLI MapsCLI (PACKETEXPERT )
File Edit View
View Latest Command
1 :: 2018-10-26 11:00:51.905000 : Start "TestBedDefault.xml" ;
1 :: 2018-10-26 11:00:51.978000 : LoadProfile ""
1 :: 2018-10-26 11:00:53.241000 : StartScript 1 "PEX_Init.gls" "" 1 ;
1 :: 2018-10-26 11:00:53.254000 : UserEvent 1 "InitDevice";
1 :: 2018-10-26 11:00:53.375000 : UserEvent 1 "LoadModule" # "DeviceId"=1,"ModuleName"="AllPortBert";
1 :: 2018-10-26 11:00:57.356000 : StartScript 2 "PEX_BERT_Main.gls" "" 1 ;
1 :: 2018-10-26 11:00:57.370000 : UserEvent 2 "InitBertModule" # "BoardCount"=1;
1 :: 2018-10-26 11:00:59.181000 : UserEvent 2 "StartBertModule" # "BoardCount"=1;
1 :: 2018-10-26 11:01:19.243000 : UserEvent 2 "LoadInterfaceProfile" # "USProfile"="BERT.pex.AllPortBert.ifc.xml", "USSubProfile"="Port1InterfaceConfig";
1 :: 2018-10-26 11:01:19.302000 : UserEvent 2 "LoadBERTProfile" # "ProfileName"="BERT.pex.AllPortBert.bert.xml", "USSubProfile"="Port1RxConfig";
1 :: 2018-10-26 11:01:19.401000 : UserEvent 2 "LoadBERTProfile" # "ProfileName"="BERT.pex.AllPortBert.bert.xml", "USSubProfile"="Port1TxConfig";
1 :: 2018-10-26 11:01:19.468000 : UserEvent 2 "ApplyConfiguration" # "PortIndex"=1;
1 :: 2018-10-26 11:01:19.524000 : UserEvent 2 "LoadInterfaceProfile" # "USProfile"="BERT.pex.AllPortBert.ifc.xml", "USSubProfile"="Port2InterfaceConfig";
1 :: 2018-10-26 11:01:19.580000 : UserEvent 2 "LoadBERTProfile" # "ProfileName"="BERT.pex.AllPortBert.bert.xml", "USSubProfile"="Port2RxConfig";
1 :: 2018-10-26 11:01:19.671000 : UserEvent 2 "LoadBERTProfile" # "ProfileName"="BERT.pex.AllPortBert.bert.xml", "USSubProfile"="Port2TxConfig";
1 :: 2018-10-26 11:01:19.727000 : UserEvent 2 "ApplyConfiguration" # "PortIndex"=2;
1 :: 2018-10-26 11:01:19.782000 : UserEvent 2 "LoadInterfaceProfile" # "USProfile"="BERT.pex.AllPortBert.ifc.xml", "USSubProfile"="Port3InterfaceConfig";
1 :: 2018-10-26 11:01:19.838000 : UserEvent 2 "LoadBERTProfile" # "ProfileName"="BERT.pex.AllPortBert.bert.xml", "USSubProfile"="Port3RxConfig";
1 :: 2018-10-26 11:01:19.940000 : UserEvent 2 "LoadBERTProfile" # "ProfileName"="BERT.pex.AllPortBert.bert.xml", "USSubProfile"="Port3TxConfig";
1 :: 2018-10-26 11:01:20.007000 : UserEvent 2 "ApplyConfiguration" # "PortIndex"=3;
1 :: 2018-10-26 11:01:20.063000 : UserEvent 2 "LoadInterfaceProfile" # "USProfile"="BERT.pex.AllPortBert.ifc.xml", "USSubProfile"="Port4InterfaceConfig";
1 :: 2018-10-26 11:01:20.119000 : UserEvent 2 "LoadBERTProfile" # "ProfileName"="BERT.pex.AllPortBert.bert.xml", "USSubProfile"="Port4RxConfig";
1 :: 2018-10-26 11:01:20.219000 : UserEvent 2 "LoadBERTProfile" # "ProfileName"="BERT.pex.AllPortBert.bert.xml", "USSubProfile"="Port4TxConfig";
1 :: 2018-10-26 11:01:20.286000 : UserEvent 2 "ApplyConfiguration" # "PortIndex"=4;
1 :: 2018-10-26 11:01:20.363000 : UserEvent 2 "StartRxBert" # "PortIndex"=1;
1 :: 2018-10-26 11:01:20.420000 : UserEvent 2 "StartRxBert" # "PortIndex"=2;
1 :: 2018-10-26 11:01:20.477000 : UserEvent 2 "StartRxBert" # "PortIndex"=3;
1 :: 2018-10-26 11:01:20.534000 : UserEvent 2 "StartRxBert" # "PortIndex"=4;
1 :: 2018-10-26 11:01:20.591000 : UserEvent 2 "StartTxBERT" # "PortIndex"=1;
1 :: 2018-10-26 11:01:20.660000 : UserEvent 2 "StartTxBERT" # "PortIndex"=2;
1 :: 2018-10-26 11:01:20.718000 : UserEvent 2 "StartTxBERT" # "PortIndex"=3;
1 :: 2018-10-26 11:01:20.776000 : UserEvent 2 "StartTxBERT" # "PortIndex"=4;
1 :: 2018-10-26 11:01:20.878000 : UserEvent 2 "GetBertStats" # "PortIndex"=1;
1 :: 2018-10-26 11:01:21.079000 : UserEvent 2 "GetTxPortStatistics" # "PortIndex"=4;
1 :: 2018-10-26 11:01:21.269000 : UserEvent 2 "GetRxPortStatistics" # "PortIndex"=4;
1 :: 2018-10-26 11:01:22.665000 : UserEvent 2 "GetBertStats" # "PortIndex"=1;
1 :: 2018-10-26 11:01:22.932000 : UserEvent 2 "GetTxPortStatistics" # "PortIndex"=4;
1 :: 2018-10-26 11:01:23.232000 : UserEvent 2 "GetRxPortStatistics" # "PortIndex"=4;
1 :: 2018-10-26 11:01:24.639000 : UserEvent 2 "StopTxBERT" # "PortIndex"=1;
1 :: 2018-10-26 11:01:24.697000 : UserEvent 2 "StopTxBERT" # "PortIndex"=2;
1 :: 2018-10-26 11:01:24.755000 : UserEvent 2 "StopTxBERT" # "PortIndex"=3;
1 :: 2018-10-26 11:01:24.811000 : UserEvent 2 "StopTxBERT" # "PortIndex"=4;
1 :: 2018-10-26 11:01:25.868000 : UserEvent 2 "StopRxBERT" # "PortIndex"=1;
1 :: 2018-10-26 11:01:27.037000 : UserEvent 2 "StopRxBERT" # "PortIndex"=2;
1 :: 2018-10-26 11:01:28.183000 : UserEvent 2 "StopRxBERT" # "PortIndex"=3;
1 :: 2018-10-26 11:01:29.329000 : UserEvent 2 "StopRxBERT" # "PortIndex"=4;
1 :: 2018-10-26 11:01:31.682000 : UserEvent 2 "GetTxPortStatistics" # "PortIndex"=1;
```

Executing Sample C# Client

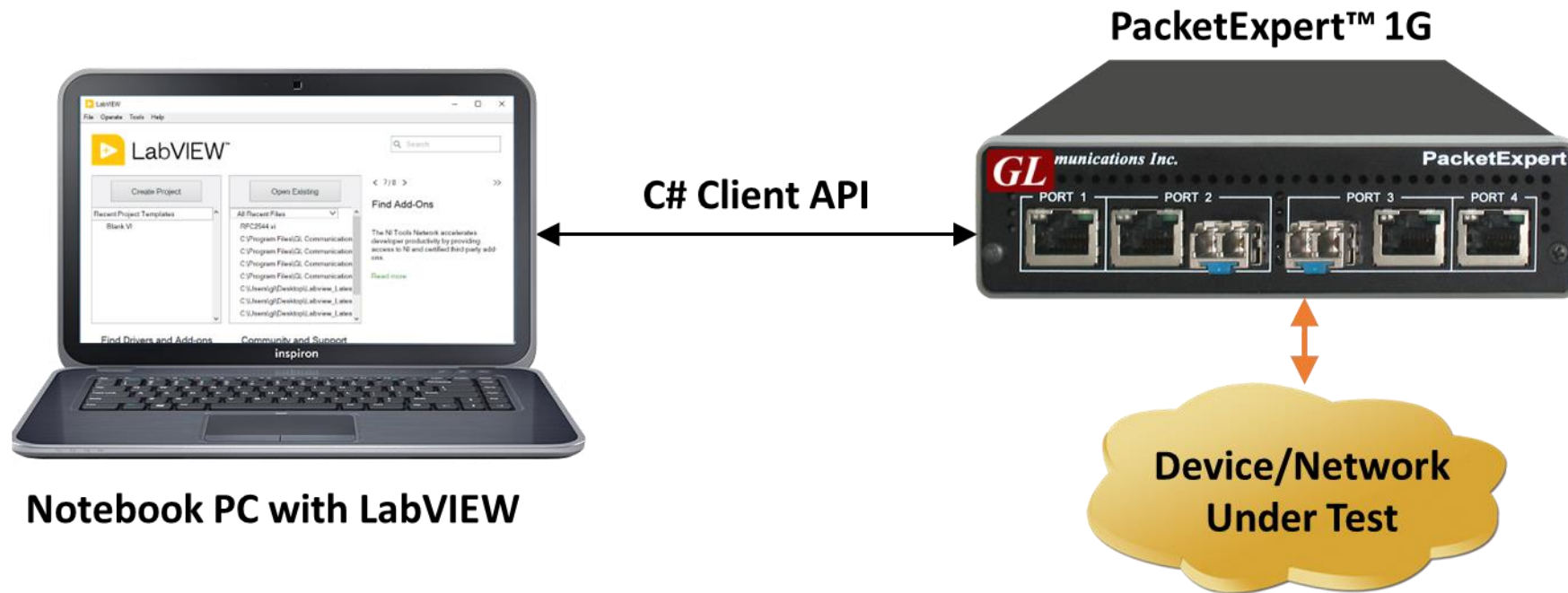
C:\Program Files\GL Communications Inc\PacketExpertPxeClient\C#\AllPortBert_ConsoleApplication.exe

```
Port3
Traffic Status: Rx Traffic
Sync Status: InSync
Bit Error Status: No Error
Out Of Sequence Status: No Error
BERT Status: Sync
BERT Test Time: 00:00:18
Bits Received: 17 012 794 104
Bit Error Count: 0
Bit Error Rate: 0.000E+00
Bit Error Seconds: 0
Sync Loss Count: 0
Sync Loss Seconds: 0
Out of Sequence Count: 0
Out of Sequence Seconds: 0
Error Free Seconds: 19
```

```
Port4
Traffic Status: Rx Traffic
Sync Status: InSync
Bit Error Status: No Error
Out Of Sequence Status: No Error
BERT Status: Sync
BERT Test Time: 00:00:18
Bits Received: 17 071 621 200
Bit Error Count: 0
Bit Error Rate: 0.000E+00
Bit Error Seconds: 0
Sync Loss Count: 0
Sync Loss Seconds: 0
```

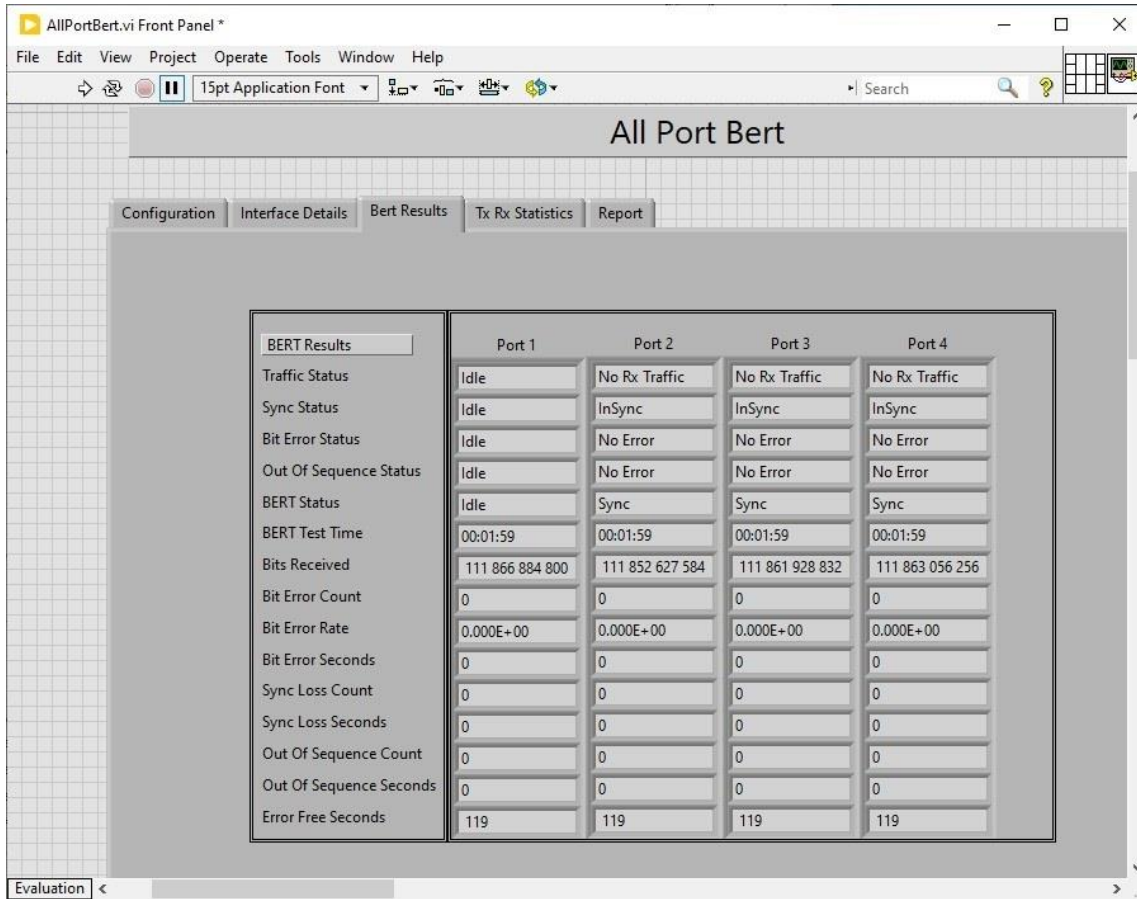

PacketExpert™ Integration with LabVIEW using C# Client

PacketExpert™ Integration with LabVIEW



PacketExpert™ Integration with LabVIEW using C# Client

BERT Results



BERT Statistics



Executing Sample Python Script

```
Run: AllPortBert_SampleApplication x AllPortBert_SampleApplication x
AllPortBert application Initialised
Press any key to continue , 'q' to quit
a
Running BERT Test
Loading Configuration
*****Device 1 *****
Load Configuration Done
*****Ports Interface Information*****
*****Device 1 *****
['Up', '00-21-C2-00-09-B4', 'ELECTRICAL', 'Complete', '1000Mbps', 'Full Duplex', 'Enabled']
['Up', '00-21-C2-00-09-B5', 'ELECTRICAL', 'Complete', '1000Mbps', 'Full Duplex', 'Enabled']
['Up', '00-21-C2-00-09-B6', 'ELECTRICAL', 'Complete', '1000Mbps', 'Full Duplex', 'Enabled']
['Up', '00-21-C2-00-09-B7', 'ELECTRICAL', 'Complete', '1000Mbps', 'Full Duplex', 'Enabled']
*****Device 1 *****
Port : 1 Rx Started
Port : 2 Rx Started
Port : 3 Rx Started
Port : 4 Rx Started
Port : 1 Tx Started
Port : 2 Tx Started
Port : 3 Tx Started
Port : 4 Tx Started
```

```
Port : 4 Tx Started
*****Device 1 *****

Bert Results of Port 1
[{'Traffic Status': 'Rx Traffic'},
 {'Sync Status': 'InSync'},
 {'Bit Error Status': 'No Error'},
 {'Out Of Sequence Status': 'No Error'},
 {'BERT Status': 'Sync'},
 {'BERT Test Time': '00:00:07'},
 {'Bits Received': '5 226 410 336'},
 {'Bit Error Count': '0'},
 {'Bit Error Rate': '0.000E+00'},
 {'Bit Error Seconds': '0'},
 {'Sync Loss Count': '0'},
 {'Sync Loss Seconds': '0'},
 {'Out of Sequence Count': '0'},
 {'Out of Sequence Seconds': '0'},
 {'Error Free Seconds': '7'}]

Bert Results of Port 2
[{'Traffic Status': 'Rx Traffic'},
 {'Sync Status': 'InSync'},
 {'Bit Error Status': 'No Error'},
 {'Out Of Sequence Status': 'No Error'},
 {'BERT Status': 'Sync'},
 {'BERT Test Time': '00:00:07'},
```

Thank you