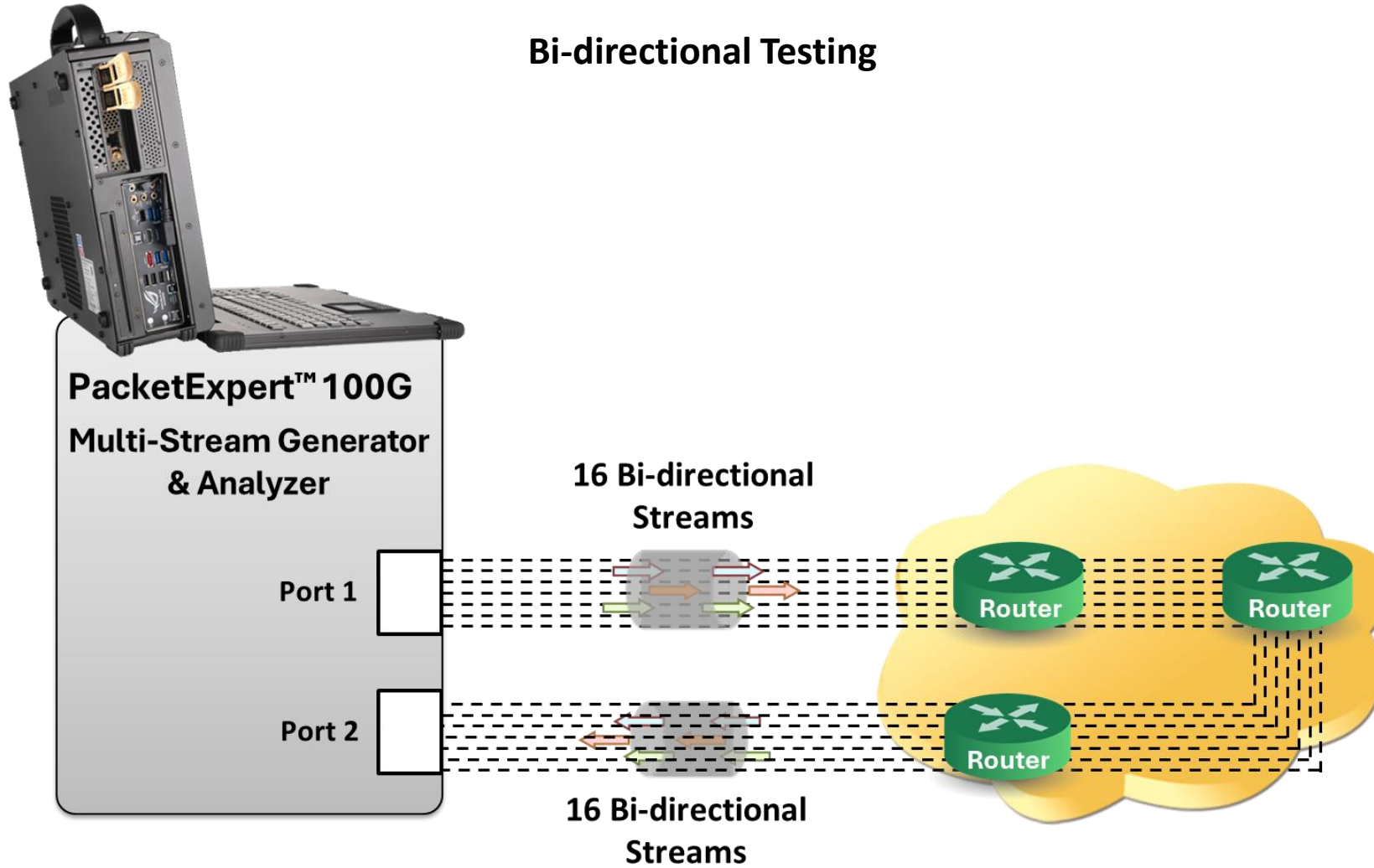

Multi-Stream Traffic Generator and Analyzer (Up to 100 Gbps)



818 West Diamond Avenue - Third Floor, Gaithersburg, MD 20878
Phone: (301) 670-4784 Fax: (301) 670-9187 Email: info@gl.com
Website: <https://www.gl.com>

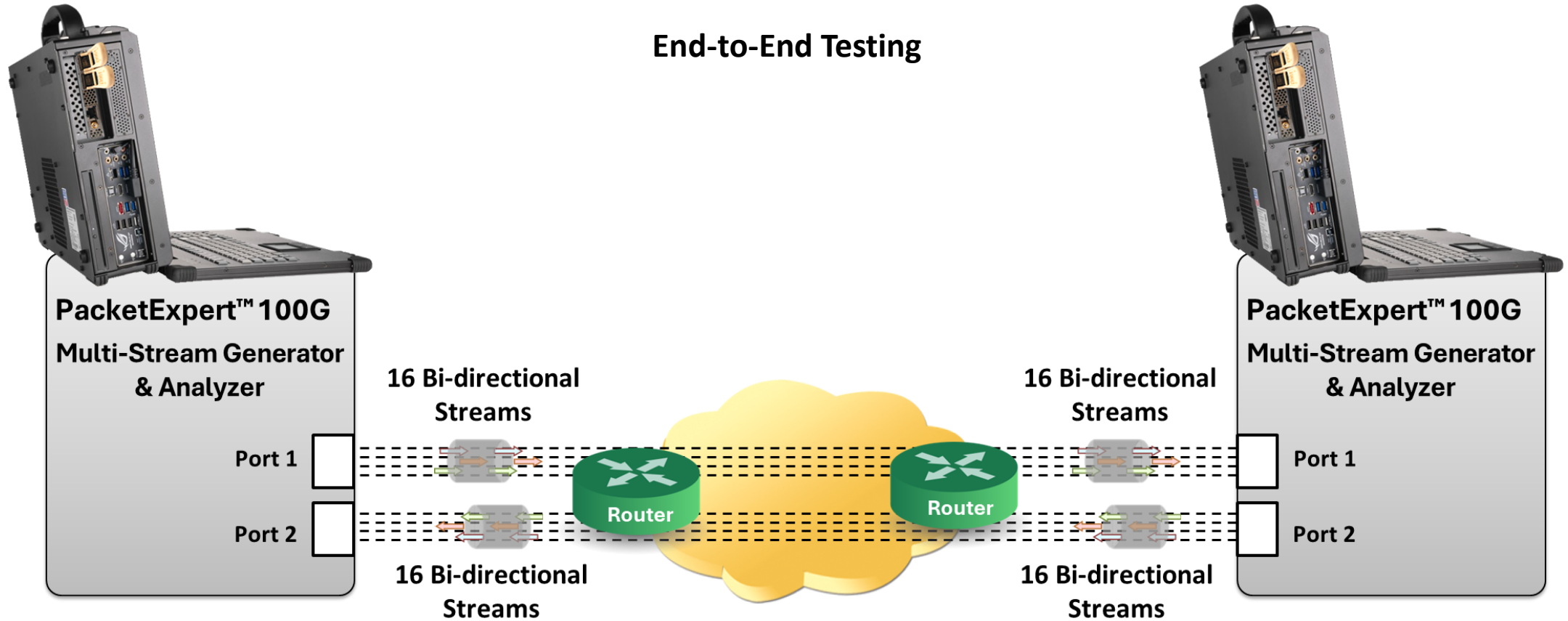
Multi-Stream Traffic Generator

Bi-directional Testing



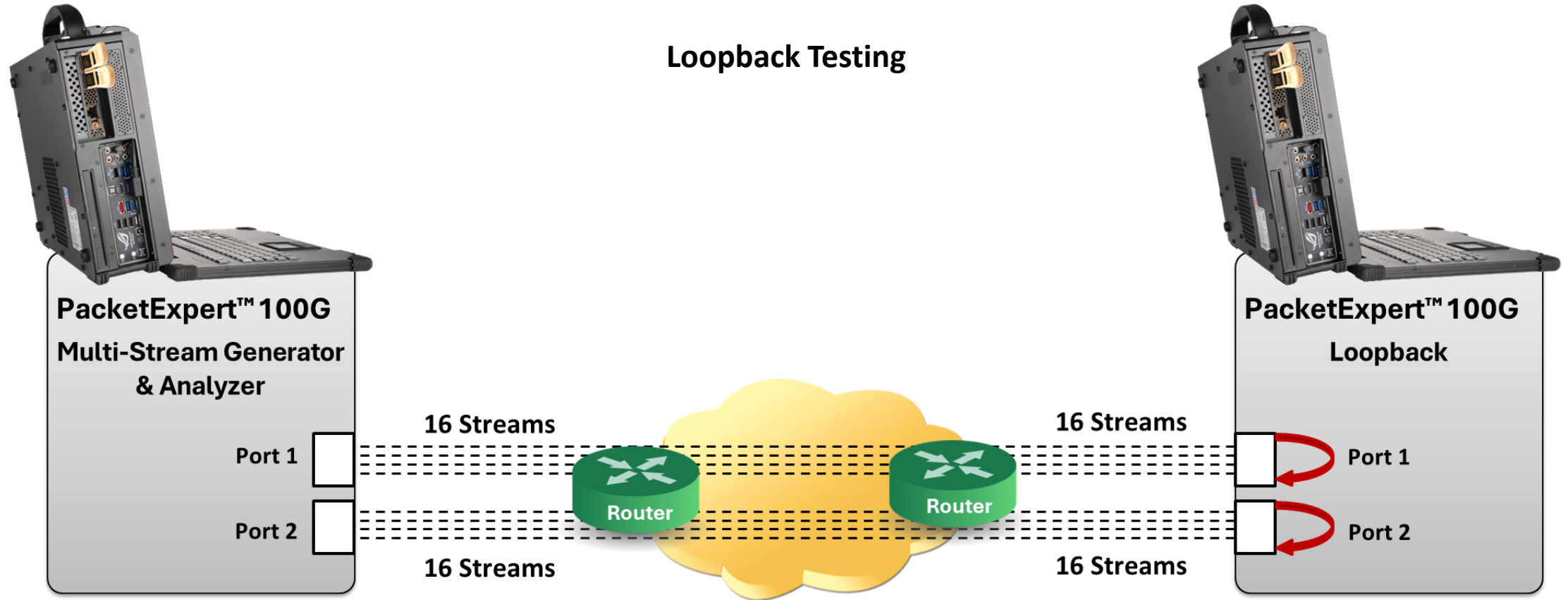
Multi-Stream Traffic Generator

End-to-End Testing



Multi-Stream Traffic Generator

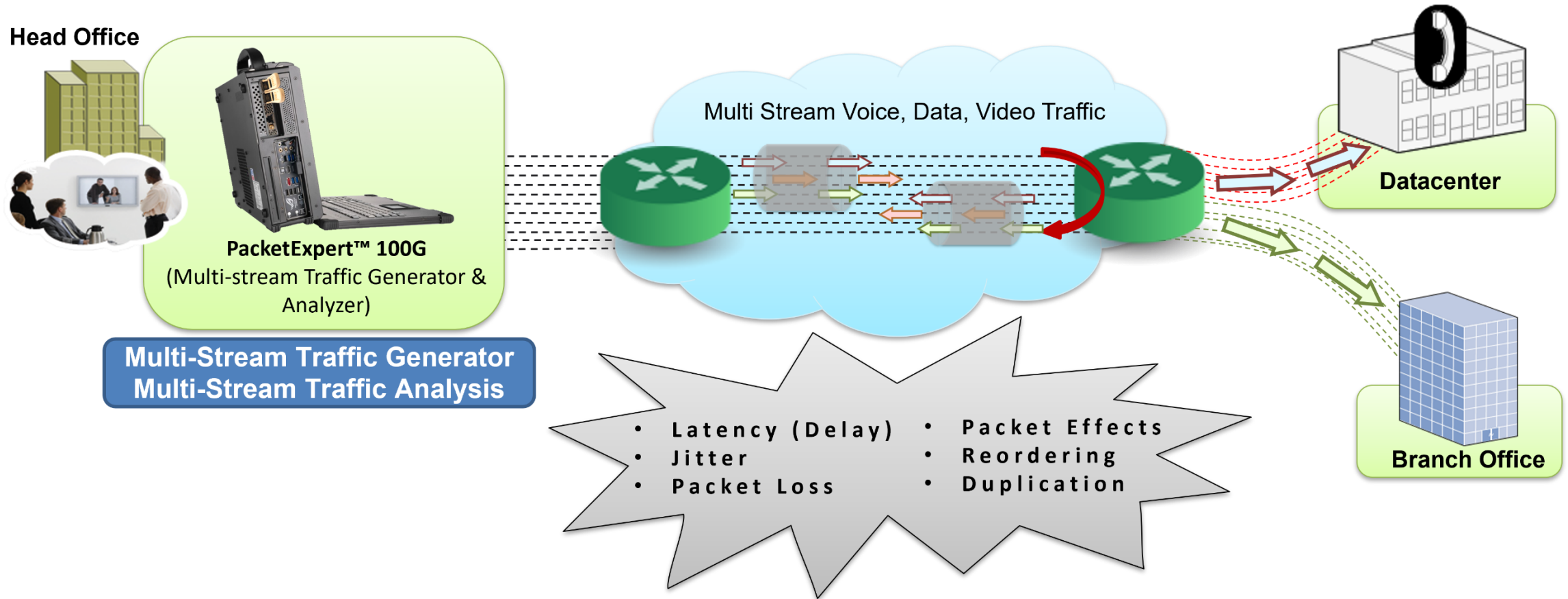
Loopback Testing



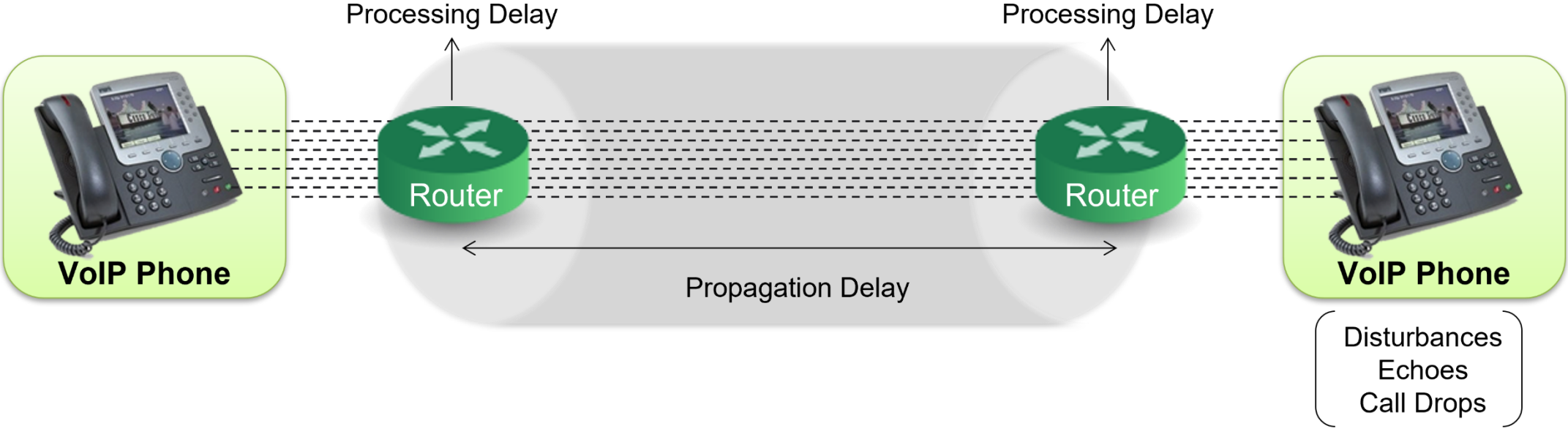
Main Feature

- Generates traffic from Layer 2 to Layer 4 at up to 100 Gbps with varying protocol headers and packet sizes
- Latency/Frame Transfer Delay (FTD)
- Provides packet loss, round trip delay and jitter measurements for each stream. Provides graphs for all streams
- Supports multiple streams with customizable configurations, including MAC/VLAN/IP/UDP headers, rate, and frame size, allowing prioritization of different traffic types (e.g., voice, video, data)
- Supports up to 16 streams per port
- Accommodates frame lengths ranging from 64 bytes to 16,000 bytes (Jumbo frames)
- Each stream can include a mixture of different frames sizes (up to 5)
- Emulate Carrier Ethernet traffic with stacked VLANs (C-Tag and S-Tag)
- Real-time statistics of throughput, packet loss, round-trip delay, and jitter across multiple streams
- Real-time graphs of all statistics mentioned above, for each stream
- Comprehensive statistics for individual streams
- Delivers per-port frame statistics such as Total Frames and Bytes Received, Rx Frame Rate, and Rx Data Rate
- PacketExpert™ 100G supports a Command Line Interface (CLI) that enables remote access to all functionalities using a Python client

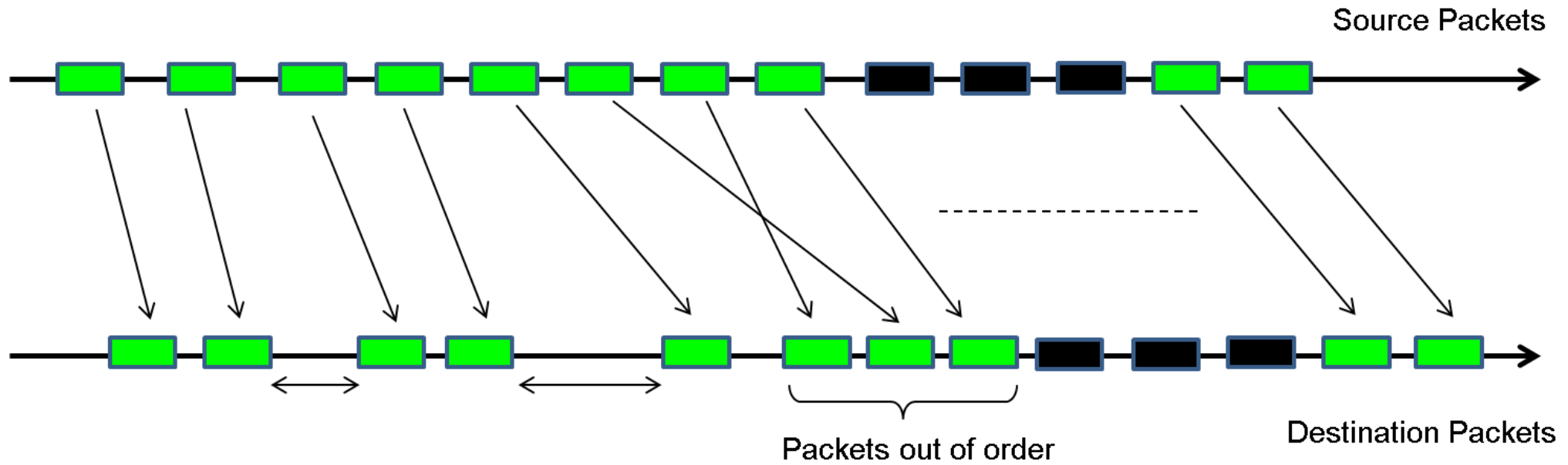
Impairments Introduced by Packet Switching Networks



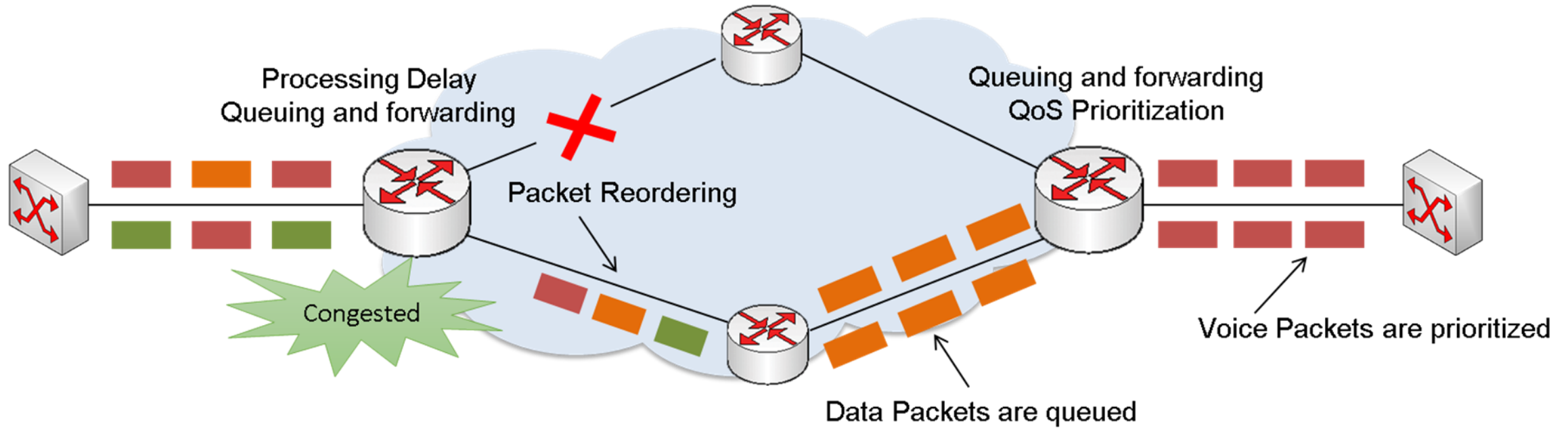
Latency or Frame Transfer Delay



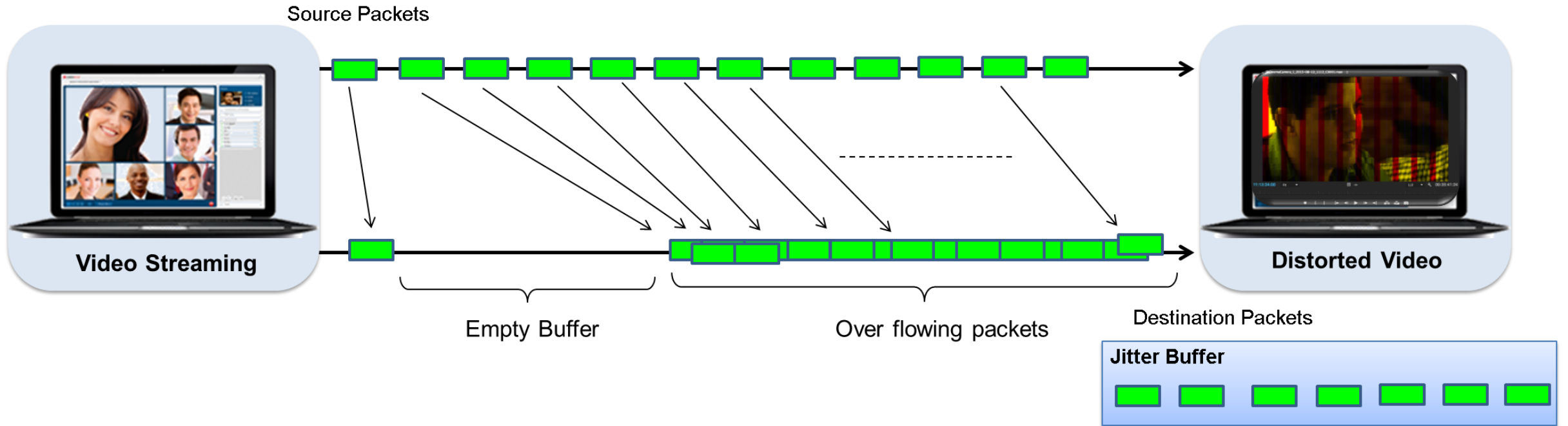
Jitter



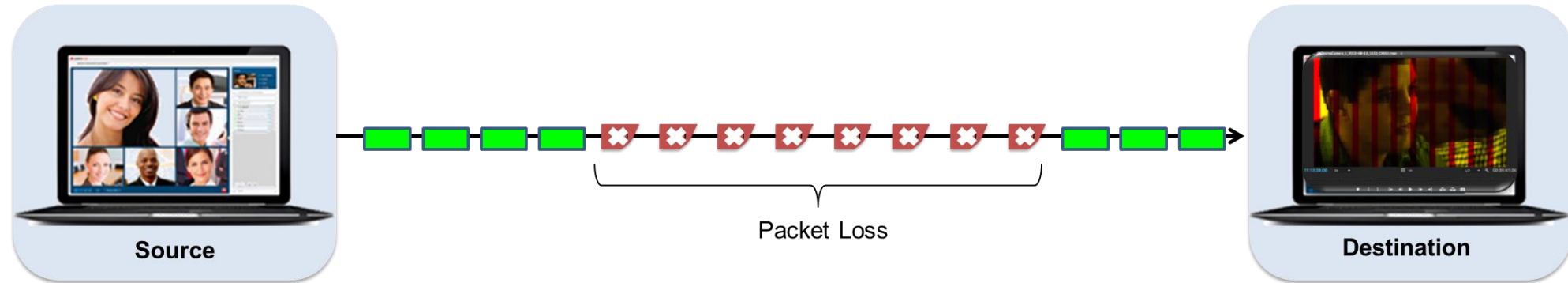
Jitter Introduced in Various Ways



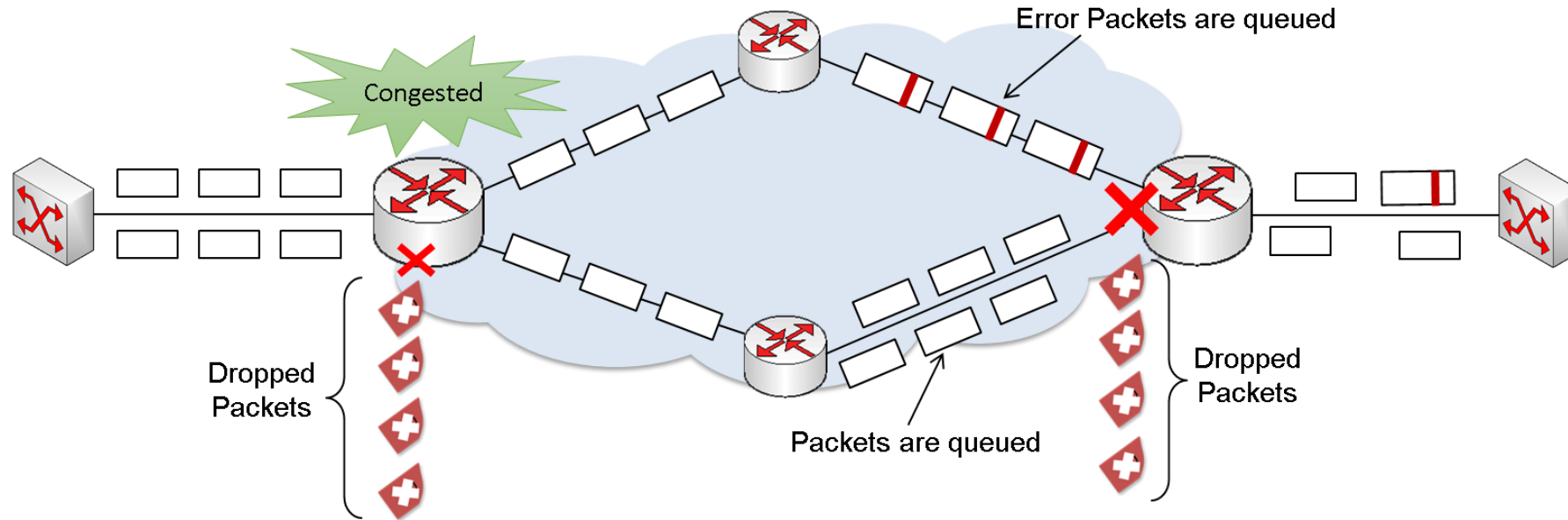
Effects of Jitter on Video Playback



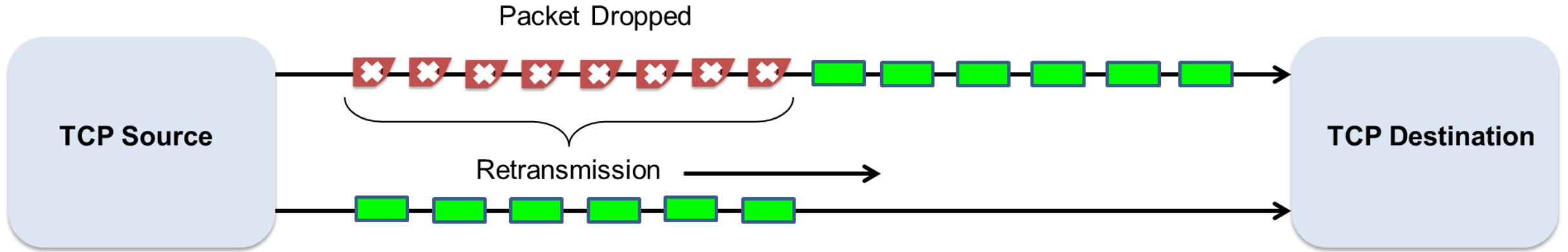
Packet Loss



Packet Loss introduced in many ways



Effects of Packet Loss

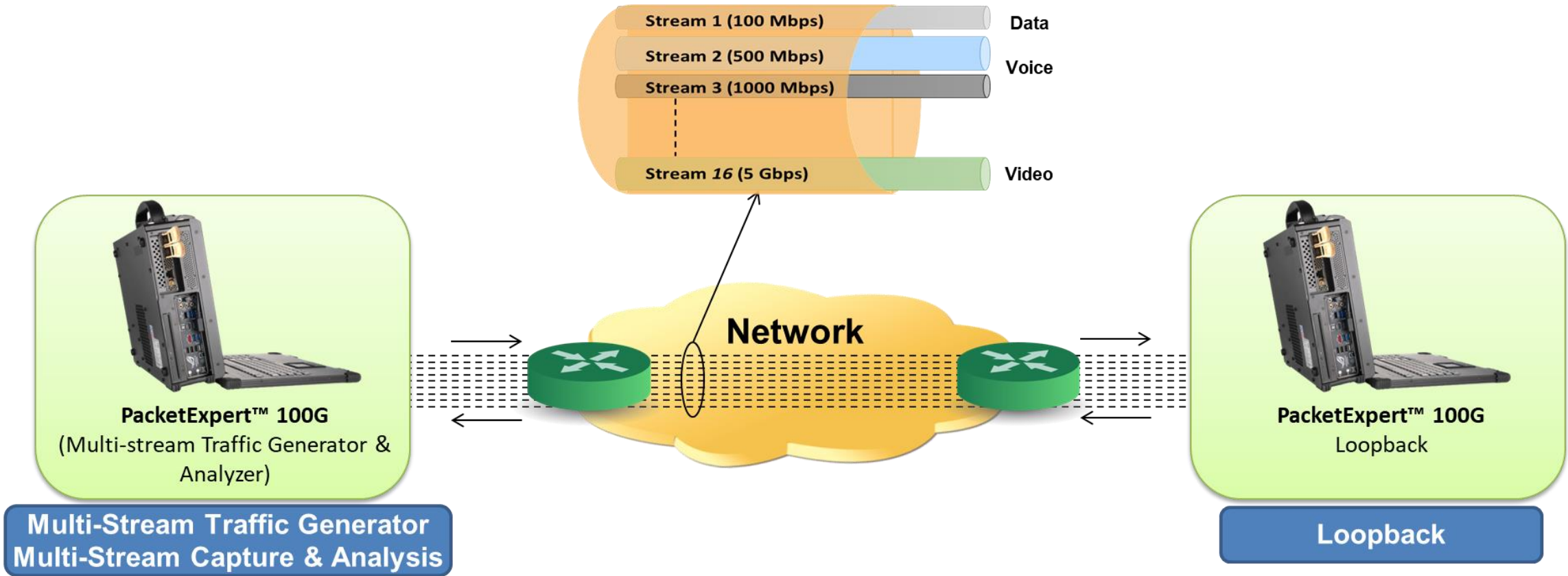


IP Measurements

The following are the IP Metrics to measure:

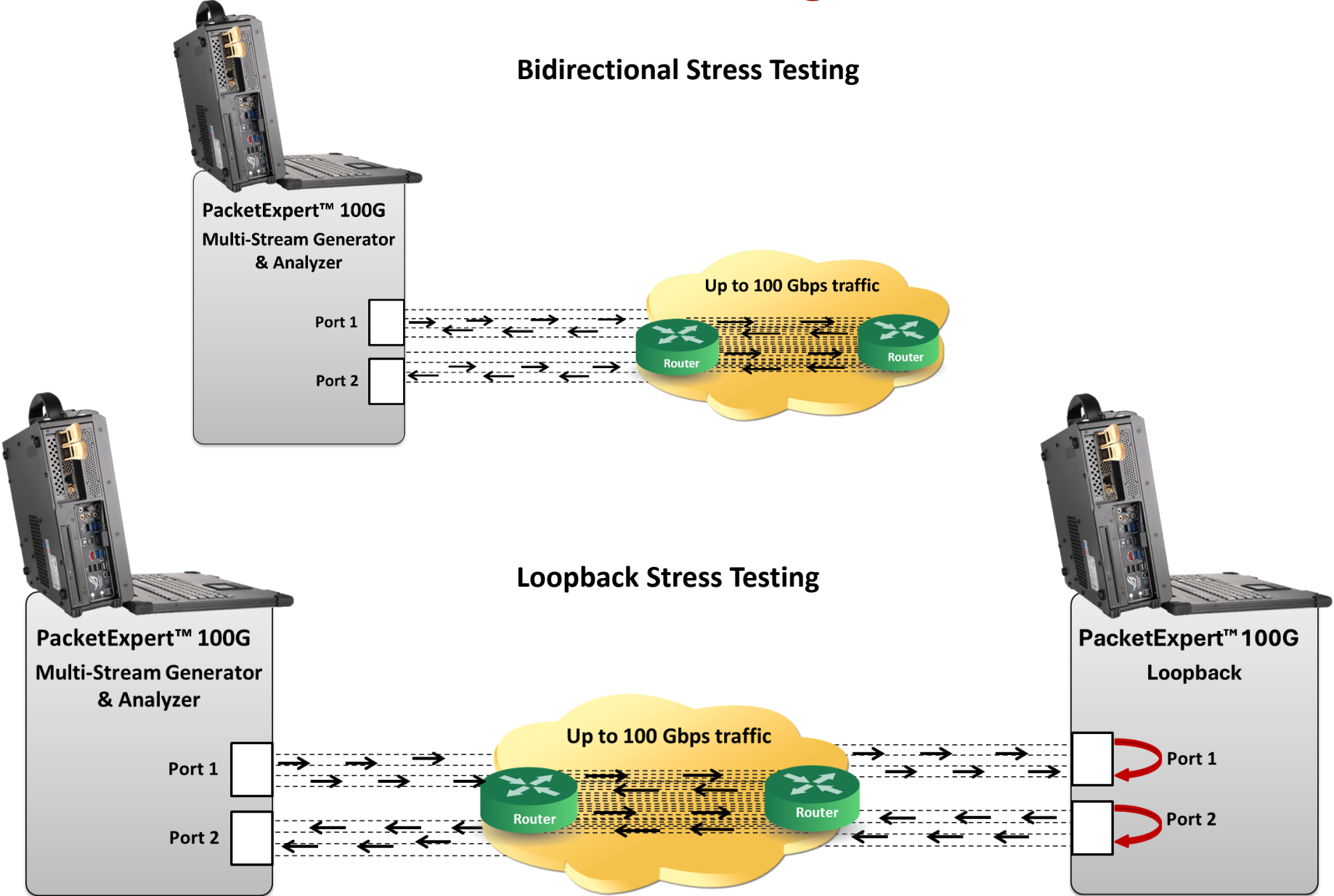
- Throughput/Bandwidth
- Latency/Frame Transfer Delay (FTD)
- Jitter/Frame Delay Variation (FDV)
- Packet Loss/Frame Loss (FL)

Multi-Stream Generator and Analyzer



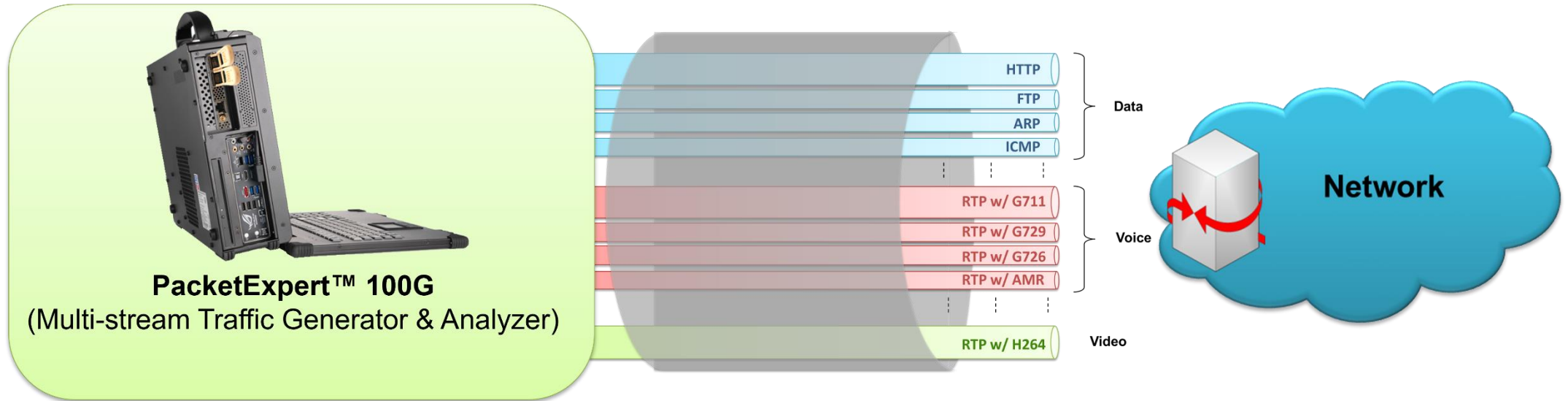
Stress Testing

Bidirectional Stress Testing



Application Examples

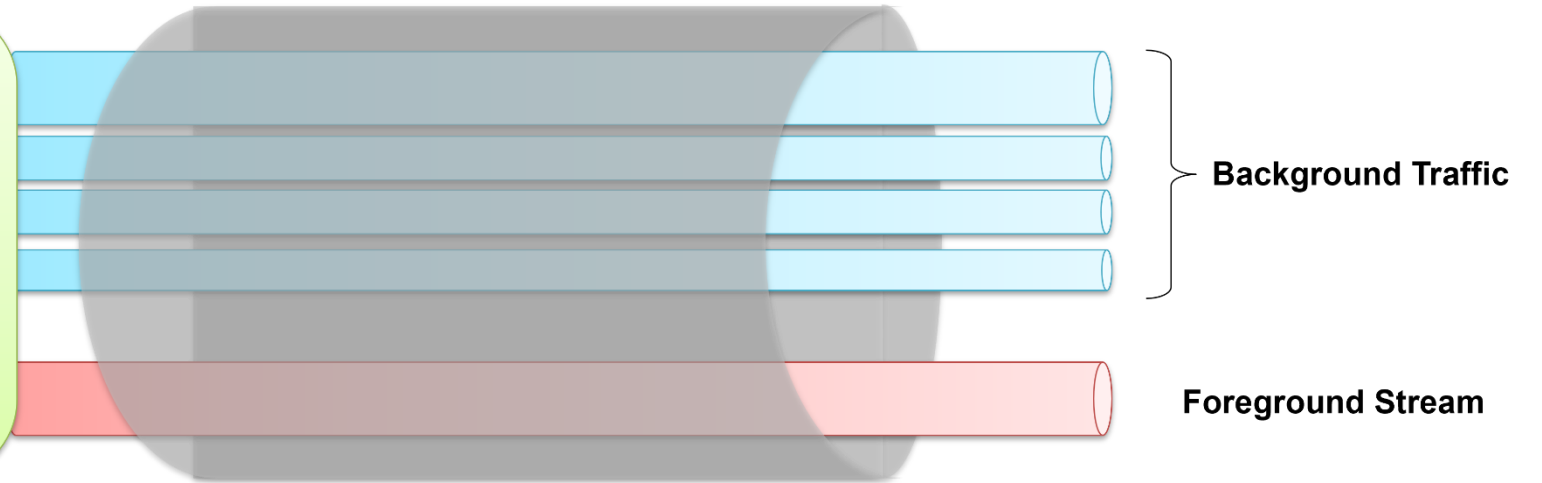
PacketExpert™ 100G in the Network



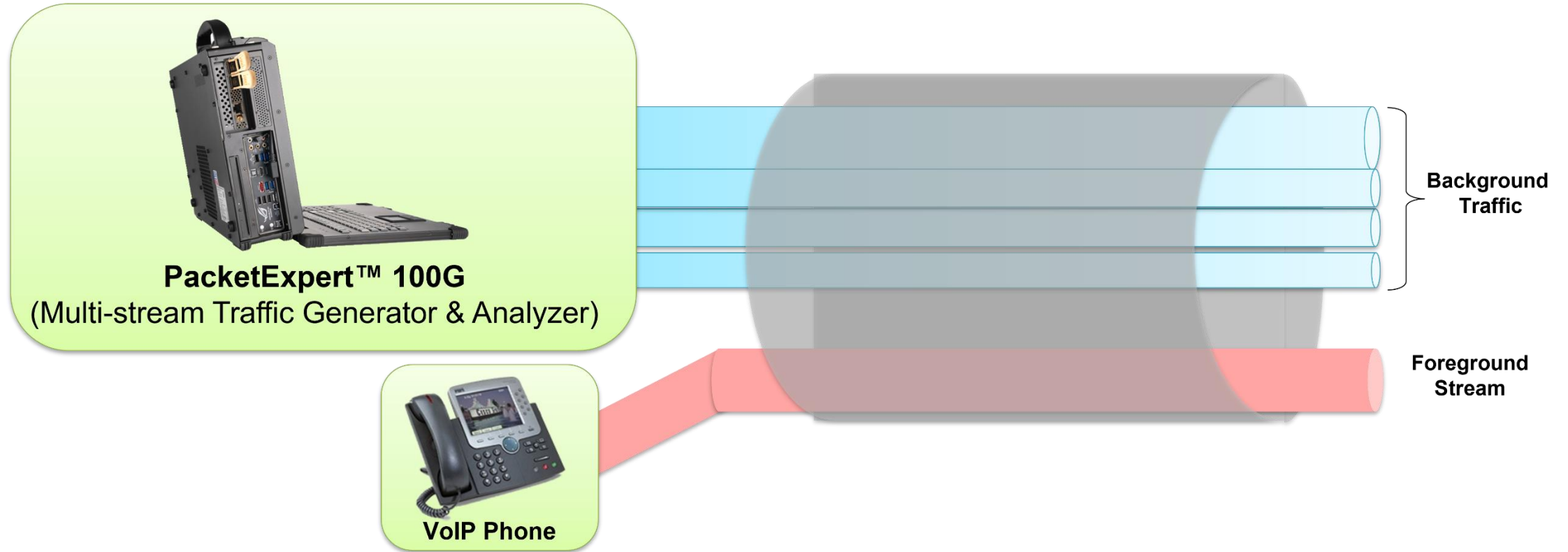
Stress Testing



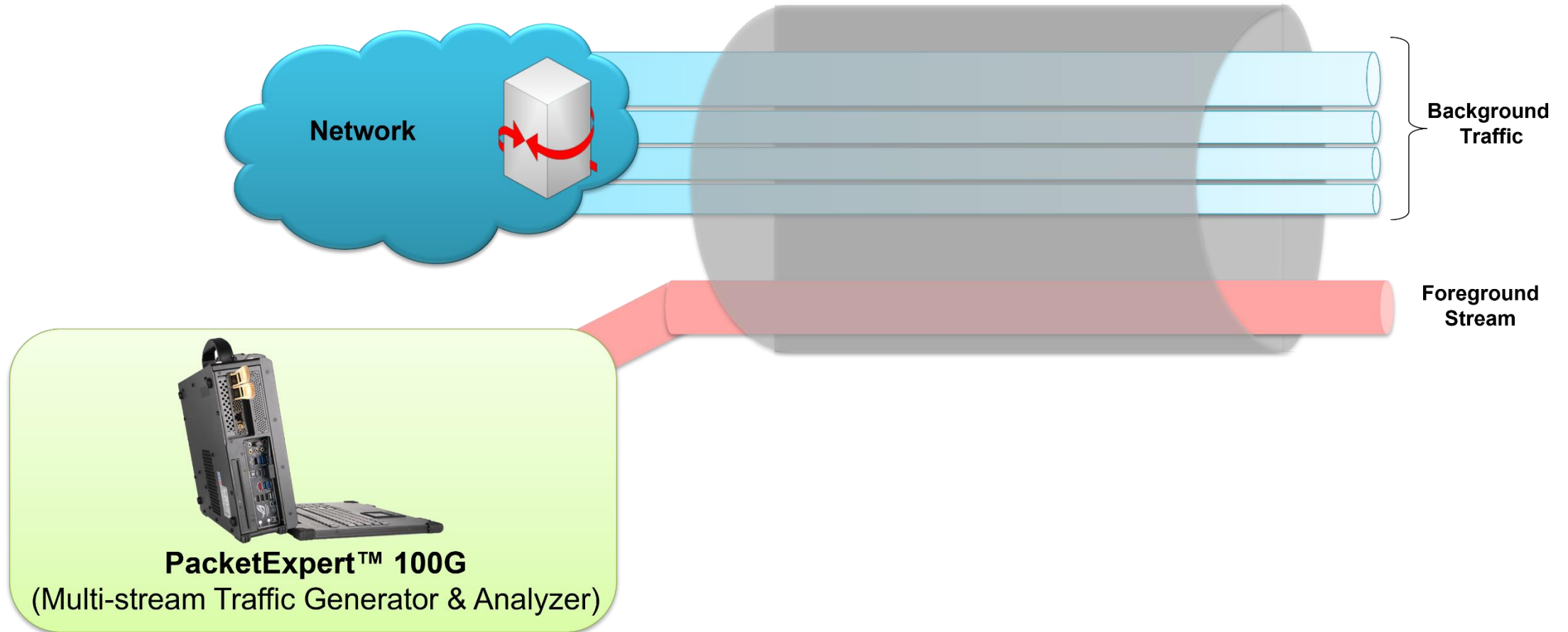
PacketExpert™ 100G
(Multi-stream Traffic Generator & Analyzer)



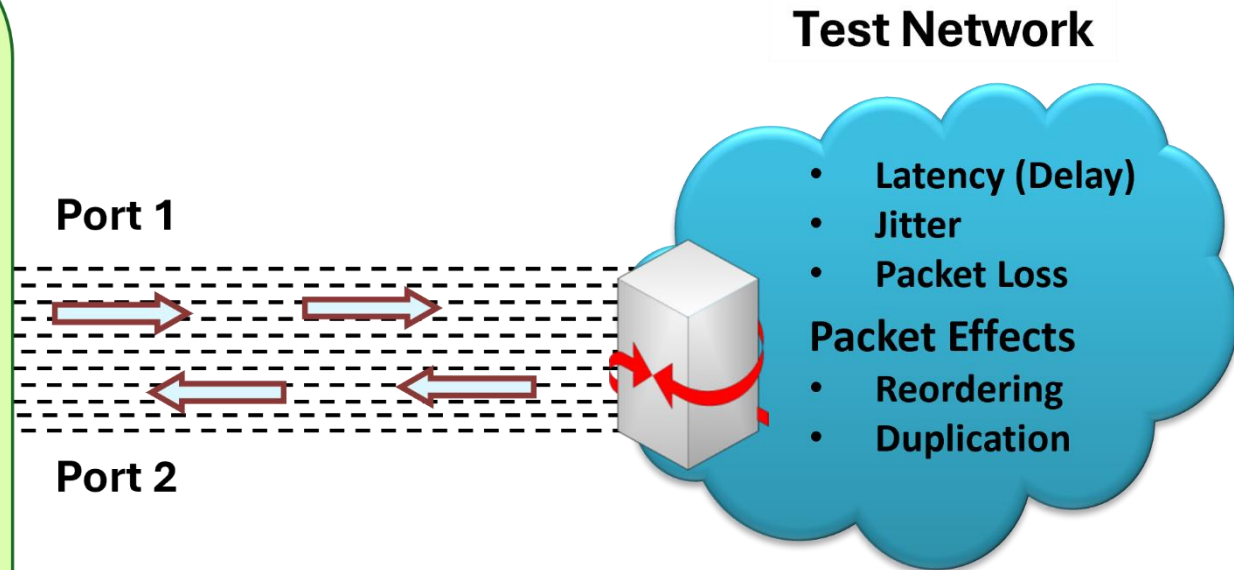
Background Traffic Generator for Stress Testing



Foreground Traffic Generator and Analyzer



Network Testing with Impairments



Stream Configuration Summary

The screenshot displays the PacketExpert interface for stream configuration. The top navigation bar includes 'Dashboard', 'Servers', 'Event Log', and 'Admin'. The main header shows 'Devices', 'Ports', and 'MTGA' with 'Load' and 'Save' buttons. The sub-header contains tabs for 'Summary', 'Stream Configuration', 'Stream Selection', 'Multistream Results', 'Graphs', 'Port Statistics', 'All Port Statistics', and 'Event Log'. The 'Stream Configuration' section has radio buttons for 'Continuous' (selected) and 'Duration'. A dropdown menu is set to 'SETUP2'. Below this is a list of 16 streams, each with edit and delete icons. A 'Summary' button is active, and other filter buttons include 'Frame Size', 'Layer', 'MAC', 'VLAN', 'MPLS', 'IP', 'UDP', 'Payload', and 'Bandwidth Profile'. The 'Stream1 Configuration' panel is open, showing the following details:

Stream1 Configuration	
Description	Left <-> Right
Frame Size	Type-Fixed [100]
Layer	UDP
MAC	
Source MAC Address	00-0D-E9-09-72-05 (HW MAC Address)
Destination MAC Address	00-0D-E9-09-72-06
Len/Type	08-00
VLAN	
Disabled	
MPLS	
Disabled	
IP	
IP Selection	IPv4
Source IP Address	192.168.1.11
Destination IP Address	192.168.1.12
Default Gateway	192.168.1.1
Subnet Mask	255.255.255.0
TTL	128
ToS/DS	0
Protocol	17
Header Checksum	Auto
Identification	Auto
UDP	
Source UDP	1001
Destination UDP	1002
Checksum	Auto
Payload	
Payload	AB-CD
Bandwidth Profile	
Rate	10 %

Stream Configuration

Summary Frame Size Layer MAC **VLAN** MPLS IP UDP Payload Bandwidth Profile

Stream1 Configuration

VLAN Enable

	Type	Id	Priority
<input checked="" type="checkbox"/> C-Tag	81-00 ▼	0	0
<input type="checkbox"/> S-Tag	81-00 ▼	0	0

VLAN Configuration

Summary Frame Size Layer MAC VLAN MPLS IP UDP Payload **Bandwidth Profile**

Stream1 Configuration

Symmetrical Asymmetrical

Left <-> Right

Rate Unit % ▼

Rate 5 %

Bandwidth Profile Configuration

Summary Frame Size Layer MAC VLAN MPLS IP UDP **Payload** Bandwidth Profile

Stream1 Configuration

Payload AB-CD

Payload Configuration

Multi-Stream Results (Vertical View)

PacketExpert™ Dashboard Servers Event Log Admin

Devices Ports MTGA Load Save

Summary Stream Configuration Stream Selection Multistream Results Graphs Port Statistics All Port Statistics Event Log

Test Time: 00:03:29 Throughput: Gbps Delay Unit: usec Jitter Unit: usec Vertical Activate All Deactivate All

SETUP2

Stream Name	Direction	Throughput (Curr)	Throughput (Min)	Throughput (Avg)	Throughput (Max)	FL Count	FL Rate (%)	Delay (Curr)	Delay (Min)	Delay (Avg)	Delay (Max)	Jitter (Curr)	Jitter (Min)	Jitter (Avg)	Jitter (Max)
Stream1	L → R	5.000	1.296	4.982	5.000	4	0.000	0.439	0.424	0.439	0.460	< 0.01	0.000	< 0.01	< 0.01
	R → L	5.000	1.215	4.982	5.000	3	0.000	0.441	0.424	0.441	0.460	< 0.01	0.000	< 0.01	< 0.01
Stream2	L → R	5.000	1.296	4.982	5.000	4	0.000	0.442	0.424	0.442	0.460	< 0.01	0.000	< 0.01	< 0.01
	R → L	5.000	1.215	4.982	5.000	3	0.000	0.444	0.424	0.444	0.460	< 0.01	0.000	< 0.01	< 0.01
Stream3	L → R	15.000	3.889	14.947	15.000	11	0.000	0.450	0.424	0.450	0.476	< 0.01	0.000	< 0.01	< 0.01
	R → L	15.000	3.646	14.946	15.000	10	0.000	0.452	0.432	0.452	0.476	< 0.01	0.000	< 0.01	< 0.01
Stream4	L → R	5.000	1.296	4.982	5.000	3	0.000	0.401	0.392	0.401	0.416	< 0.01	0.000	< 0.01	< 0.01
	R → L	5.000	1.215	4.982	5.000	4	0.000	0.403	0.396	0.403	0.420	< 0.01	0.000	< 0.01	< 0.01
Stream5	L → R	10.000	2.593	9.965	10.000	7	0.000	0.426	0.392	0.426	0.464	< 0.01	< 0.01	< 0.01	< 0.01
	R → L	10.000	2.431	9.964	10.000	7	0.000	0.428	0.396	0.428	0.468	< 0.01	< 0.01	< 0.01	< 0.01
Stream6	L → R	5.000	1.296	4.982	5.000	3	0.000	0.407	0.396	0.407	0.424	< 0.01	0.000	< 0.01	< 0.01
	R → L	5.000	1.215	4.982	5.000	4	0.000	0.409	0.396	0.409	0.428	< 0.01	0.000	< 0.01	< 0.01
Stream7	L → R	5.000	1.296	4.982	5.000	3	0.000	0.410	0.400	0.410	0.428	< 0.01	0.000	< 0.01	< 0.01
	R → L	5.000	1.215	4.982	5.000	3	0.000	0.412	0.400	0.412	0.432	< 0.01	0.000	< 0.01	< 0.01
Stream8	L → R	5.000	1.296	4.982	5.000	3	0.000	0.413	0.404	0.413	0.436	< 0.01	0.000	< 0.01	< 0.01
	R → L	5.000	1.215	4.982	5.000	3	0.000	0.415	0.404	0.415	0.436	< 0.01	0.000	< 0.01	< 0.01
Stream9	L → R	5.000	1.296	4.982	5.000	3	0.000	0.416	0.404	0.416	0.436	< 0.01	0.000	< 0.01	< 0.01
	R → L	5.000	1.215	4.982	5.000	3	0.000	0.417	0.408	0.417	0.440	< 0.01	0.000	< 0.01	< 0.01
Stream10	L → R	5.000	1.296	4.982	5.000	3	0.000	0.419	0.408	0.419	0.440	< 0.01	0.000	< 0.01	< 0.01
	R → L	5.000	1.215	4.982	5.000	3	0.000	0.420	0.412	0.420	0.444	< 0.01	0.000	< 0.01	< 0.01
Stream11	L → R	5.000	1.296	4.982	5.000	3	0.000	0.421	0.408	0.421	0.440	< 0.01	0.000	< 0.01	< 0.01
	R → L	5.000	1.215	4.982	5.000	3	0.000	0.423	0.412	0.423	0.444	< 0.01	0.000	< 0.01	< 0.01
Stream12	L → R	5.000	1.296	4.984	5.000	3	0.000	0.424	0.412	0.424	0.444	< 0.01	0.000	< 0.01	< 0.01
	R → L	5.000	1.215	4.983	5.000	4	0.000	0.426	0.412	0.426	0.448	< 0.01	0.000	< 0.01	< 0.01
Stream13	L → R	5.000	1.296	4.984	5.000	3	0.000	0.427	0.412	0.427	0.448	< 0.01	0.000	< 0.01	< 0.01
	R → L	5.000	1.215	4.983	5.000	4	0.000	0.429	0.412	0.429	0.448	< 0.01	0.000	< 0.01	< 0.01
Stream14	L → R	5.000	1.296	4.984	5.000	3	0.000	0.430	0.420	0.430	0.452	< 0.01	0.000	< 0.01	< 0.01
	R → L	5.000	1.215	4.983	5.000	4	0.000	0.432	0.420	0.432	0.452	< 0.01	0.000	< 0.01	< 0.01
Stream15	L → R	5.000	1.296	4.984	5.000	3	0.000	0.433	0.420	0.433	0.452	< 0.01	0.000	< 0.01	< 0.01
	R → L	5.000	1.215	4.983	5.000	4	0.000	0.435	0.424	0.435	0.456	< 0.01	0.000	< 0.01	< 0.01
Stream16	L → R	5.000	1.296	4.984	5.000	3	0.000	0.436	0.420	0.436	0.456	< 0.01	0.000	< 0.01	< 0.01
	R → L	5.000	1.215	4.983	5.000	4	0.000	0.438	0.424	0.438	0.460	< 0.01	0.000	< 0.01	< 0.01

Multi-Stream Results (Horizontal View)

PacketExpert™ Dashboard Servers Event Log Admin

Devices Ports MTGA Load Save Export

Summary Stream Configuration Stream Selection Multistream Results Graphs Port Statistics All Port Statistics Event Log

Multistream Results Activate All Deactivate All SETUP1

Test Time 00:25:52 Throughput Mbps Delay Unit usec Jitter Unit usec **Horizontal**

Test	Direction	Stream1	Stream2	Stream3	Stream4	Stream5	Stream6	Stream7	Stream8	Stream9	Stream10	Stream11	Stream12	Stream13	Stream14	Stream15	Stream16
Throughput (Curr)	L → R	8,000.004	5,000.034	8,000.001	5,000.034	7,999.978	4,999.978	7,999.957	4,999.961	7,999.963	5,000.002	7,000.000	4,999.967	8,000.004	5,000.034	5,000.034	5,000.005
	R → L	7,999.998	5,000.034	8,000.004	5,000.034	8,000.048	4,999.967	8,000.056	4,999.994	7,999.988	4,999.973	6,999.970	5,000.005	7,999.875	4,999.999	5,000.034	4,999.966
Throughput (Min)	L → R	5,908.304	3,692.674	5,908.432	3,692.674	5,908.432	3,692.762	5,908.393	3,692.770	5,908.398	3,692.770	5,169.878	3,692.762	5,908.432	3,692.674	3,692.674	3,692.770
	R → L	6,654.524	4,159.048	6,654.452	4,159.048	6,654.494	4,159.061	6,654.447	4,159.079	6,654.499	4,159.062	5,822.688	4,159.075	6,654.452	4,159.074	4,159.048	4,159.062
Throughput (Avg)	L → R	7,993.489	4,995.931	7,993.489	4,995.931	7,993.485	4,995.931	7,993.489	4,995.931	7,993.489	4,995.931	6,994.303	4,995.931	7,993.489	4,995.931	4,995.931	4,995.931
	R → L	7,993.971	4,996.232	7,993.971	4,996.232	7,993.966	4,996.232	7,993.971	4,996.232	7,993.971	4,996.232	6,994.724	4,996.232	7,993.971	4,996.232	4,996.232	4,996.232
Throughput (Max)	L → R	8,000.132	5,000.034	8,000.074	5,000.034	8,000.151	5,000.042	8,000.056	5,000.043	8,000.076	5,000.044	7,000.065	5,000.044	8,000.132	5,000.034	5,000.034	5,000.059
	R → L	8,000.069	5,000.034	8,000.132	5,000.034	8,000.149	5,000.048	8,000.056	5,000.043	8,000.072	5,000.044	7,000.062	5,000.042	8,000.132	5,000.045	5,000.034	5,000.048
FL Count	L → R	0	0	31	0	31	3	1	3	4	31	31	15	0	0	0	31
	R → L	16	0	1	0	33	33	0	2	2	33	33	9	1	16	0	34
FL Rate (%)	L → R	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	R → L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Delay (Curr)	L → R	0.525	0.525	0.532	0.523	0.540	0.534	0.531	0.529	0.528	0.533	0.532	0.529	0.530	0.530	0.522	0.533
	R → L	0.516	0.508	0.509	0.504	0.523	0.519	0.519	0.517	0.513	0.517	0.516	0.515	0.515	0.515	0.514	0.518
Delay (Min)	L → R	0.384	0.384	0.388	0.484	0.384	0.384	0.384	0.388	0.384	0.384	0.384	0.384	0.384	0.384	0.384	0.384
	R → L	0.400	0.500	0.400	0.400	0.400	0.400	0.400	0.404	0.404	0.400	0.400	0.400	0.400	0.464	0.500	0.400
Delay (Avg)	L → R	0.524	0.524	0.532	0.523	0.540	0.534	0.530	0.529	0.528	0.533	0.531	0.529	0.530	0.529	0.522	0.532
	R → L	0.516	0.508	0.508	0.504	0.522	0.518	0.519	0.517	0.513	0.516	0.516	0.515	0.515	0.515	0.513	0.518
Delay (Max)	L → R	0.592	0.588	0.596	0.592	0.596	0.596	0.592	0.596	0.592	0.592	0.596	0.596	0.592	0.592	0.548	0.596
	R → L	0.576	0.576	0.576	0.532	0.580	0.580	0.576	0.576	0.576	0.576	0.580	0.580	0.576	0.576	0.576	0.580
Jitter (Curr)	L → R	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
	R → L	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Jitter (Min)	L → R	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	R → L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Jitter (Avg)	L → R	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
	R → L	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Jitter (Max)	L → R	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
	R → L	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

Overall Result (Vertical View)

PacketExpert™ Dashboard Servers Event Log Admin

Devices Ports **MTGA** Load Save Export

Summary Stream Configuration Stream Selection Multistream Results Graphs Port Statistics All Port Statistics Event Log

MTGA Summary Start Selected Stop Selected Report

+ Setup Connection Status Config Start/Stop Test Time
 Port1 - Port2 ● ● ● ⚙ ⏹ 00:33:12

Multistream Results Activate All Deactivate All

Test Time 00:33:12 Throughput Mbps Delay Unit usec Jitter Unit usec **Vertical**

Stream Name	Direction	Throughput (Curr)	Throughput (Min)	Throughput (Avg)	Throughput (Max)	FL Count	FL Rate (%)	Delay (Curr)	Delay (Min)	Delay (Avg)	Delay (Max)	Jitter (Curr)	Jitter (Min)	Jitter (Avg)	Jitter (Max)
<input checked="" type="checkbox"/> Stream1	L → R R → L	8,000.004 7,999.985	5,908.304 6,654.524	7,994.929 7,995.304	8,000.132 8,000.069	0 9	0.000 0.000	0.525 0.516	0.400 0.384	0.525 0.516	0.592 0.580	< 0.01 < 0.01	0.000 0.000	< 0.01 < 0.01	< 0.01 < 0.01
<input checked="" type="checkbox"/> Stream2	L → R R → L	5,000.034 5,000.034	3,692.674 4,159.048	4,996.830 4,997.065	5,000.034 5,000.034	0 0	0.000 0.000	0.525 0.508	0.500 0.384	0.524 0.508	0.588 0.576	< 0.01 < 0.01	0.000 0.000	< 0.01 < 0.01	< 0.01 < 0.01
<input checked="" type="checkbox"/> Stream3	L → R R → L	8,000.010 8,000.004	5,908.432 6,654.452	7,994.929 7,995.304	8,000.074 8,000.132	39 1	0.000 0.000	0.532 0.509	0.400 0.388	0.532 0.509	0.596 0.576	< 0.01 < 0.01	0.000 0.000	< 0.01 < 0.01	< 0.01 < 0.01
<input checked="" type="checkbox"/> Stream4	L → R R → L	5,000.034 4,999.906	3,692.674 4,159.048	4,996.830 4,997.065	5,000.034 5,000.034	0 1	0.000 0.000	0.523 0.504	0.400 0.484	0.523 0.504	0.592 0.532	< 0.01 < 0.01	0.000 0.000	< 0.01 < 0.01	< 0.01 < 0.01
<input checked="" type="checkbox"/> Stream5	L → R R → L	7,999.929 8,000.072	5,908.432 6,654.494	7,994.928 7,995.303	8,000.163 8,000.157	176 48	0.000 0.000	0.540 0.523	0.400 0.384	0.540 0.522	0.596 0.580	< 0.01 < 0.01	0.000 0.000	< 0.01 < 0.01	< 0.01 < 0.01
<input checked="" type="checkbox"/> Stream6	L → R R → L	5,000.012 5,000.021	3,692.762 4,159.061	4,996.831 4,997.065	5,000.042 5,000.048	1 14	0.000 0.000	0.534 0.519	0.400 0.384	0.534 0.518	0.596 0.580	< 0.01 < 0.01	0.000 0.000	< 0.01 < 0.01	< 0.01 < 0.01
<input checked="" type="checkbox"/> Stream7	L → R R → L	8,000.056 7,999.957	5,908.393 6,654.447	7,994.929 7,995.304	8,000.056 8,000.056	0 1	0.000 0.000	0.531 0.519	0.400 0.384	0.530 0.519	0.592 0.576	< 0.01 < 0.01	0.000 0.000	< 0.01 < 0.01	< 0.01 < 0.01
<input checked="" type="checkbox"/> Stream8	L → R R → L	4,999.994 4,999.994	3,692.770 4,159.079	4,996.831 4,997.065	5,000.043 5,000.043	2 2	0.000 0.000	0.529 0.517	0.404 0.388	0.529 0.517	0.596 0.576	< 0.01 < 0.01	0.000 0.000	< 0.01 < 0.01	< 0.01 < 0.01
<input checked="" type="checkbox"/> Stream9	L → R R → L	8,000.005 8,000.025	5,908.398 6,654.499	7,994.979 7,995.351	8,000.076 8,000.072	2 1	0.000 0.000	0.528 0.513	0.404 0.384	0.528 0.513	0.592 0.576	< 0.01 < 0.01	0.000 0.000	< 0.01 < 0.01	< 0.01 < 0.01
<input checked="" type="checkbox"/> Stream10	L → R R → L	4,999.986 4,999.997	3,692.770 4,159.062	4,996.862 4,997.094	5,000.044 5,000.044	23 49	0.000 0.000	0.533 0.517	0.400 0.384	0.533 0.516	0.592 0.576	< 0.01 < 0.01	0.000 0.000	< 0.01 < 0.01	< 0.01 < 0.01
<input checked="" type="checkbox"/> Stream11	L → R R → L	6,999.977 6,999.996	5,169.878 5,822.688	6,995.607 6,995.932	7,000.065 7,000.062	24 37	0.000 0.000	0.532 0.516	0.400 0.384	0.531 0.516	0.596 0.580	< 0.01 < 0.01	0.000 0.000	< 0.01 < 0.01	< 0.01 < 0.01
<input checked="" type="checkbox"/> Stream12	L → R R → L	4,999.996 5,000.008	3,692.762 4,159.075	4,996.862 4,997.094	5,000.044 5,000.042	9 6	0.000 0.000	0.529 0.515	0.400 0.384	0.529 0.515	0.596 0.580	< 0.01 < 0.01	0.000 0.000	< 0.01 < 0.01	< 0.01 < 0.01
<input checked="" type="checkbox"/> Stream13	L → R R → L	8,000.004 8,000.004	5,908.432 6,654.452	7,994.979 7,995.350	8,000.132 8,000.132	1 0	0.000 0.000	0.530 0.515	0.400 0.384	0.530 0.515	0.592 0.576	< 0.01 < 0.01	0.000 0.000	< 0.01 < 0.01	< 0.01 < 0.01
<input checked="" type="checkbox"/> Stream14	L → R R → L	5,000.034 5,000.008	3,692.674 4,159.074	4,996.862 4,997.094	5,000.034 5,000.045	0 10	0.000 0.000	0.530 0.515	0.464 0.384	0.529 0.515	0.592 0.576	< 0.01 < 0.01	0.000 0.000	< 0.01 < 0.01	< 0.01 < 0.01
<input checked="" type="checkbox"/> Stream15	L → R R → L	5,000.034 5,000.034	3,692.674 4,159.048	4,996.862 4,997.094	5,000.034 5,000.034	0 0	0.000 0.000	0.522 0.515	0.500 0.384	0.522 0.514	0.548 0.576	< 0.01 < 0.01	0.000 0.000	< 0.01 < 0.01	< 0.01 < 0.01
<input checked="" type="checkbox"/> Stream16	L → R R → L	4,999.988 5,000.000	3,692.770 4,159.062	4,996.862 4,997.094	5,000.059 5,000.048	23 74	0.000 0.000	0.533 0.518	0.400 0.384	0.533 0.518	0.596 0.580	< 0.01 < 0.01	0.000 0.000	< 0.01 < 0.01	< 0.01 < 0.01

Overall Result (Horizontal View)

PacketExpert™ Dashboard Servers Event Log Admin

Devices **Ports** MTGA Load Save Export

Summary Stream Configuration Stream Selection Multistream Results Graphs Port Statistics All Port Statistics Event Log

MTGA Summary Start Selected Stop Selected Report

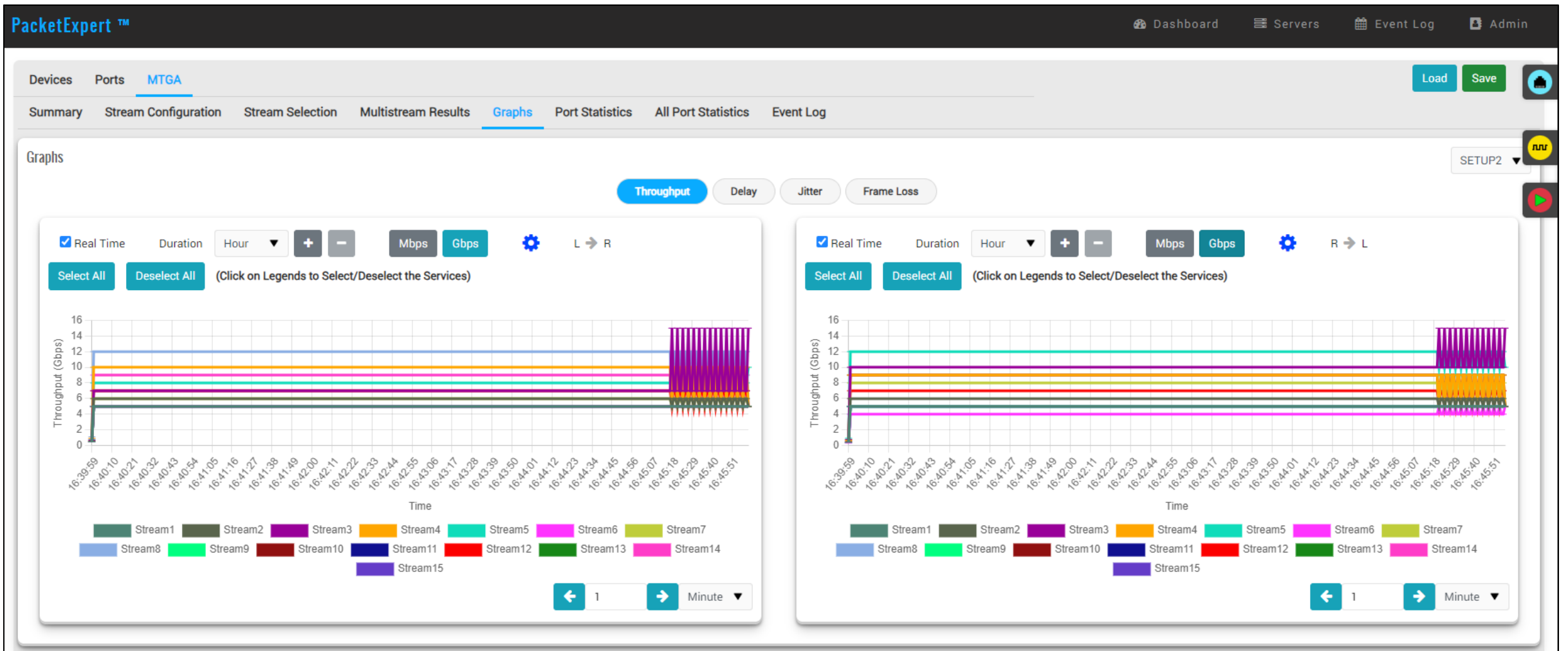
Setup	Connection Status	Config	Start/Stop	Test Time
Port1 - Port2	● ● ●	⚙️	⏹️	00:21:48

Multistream Results Activate All Deactivate All

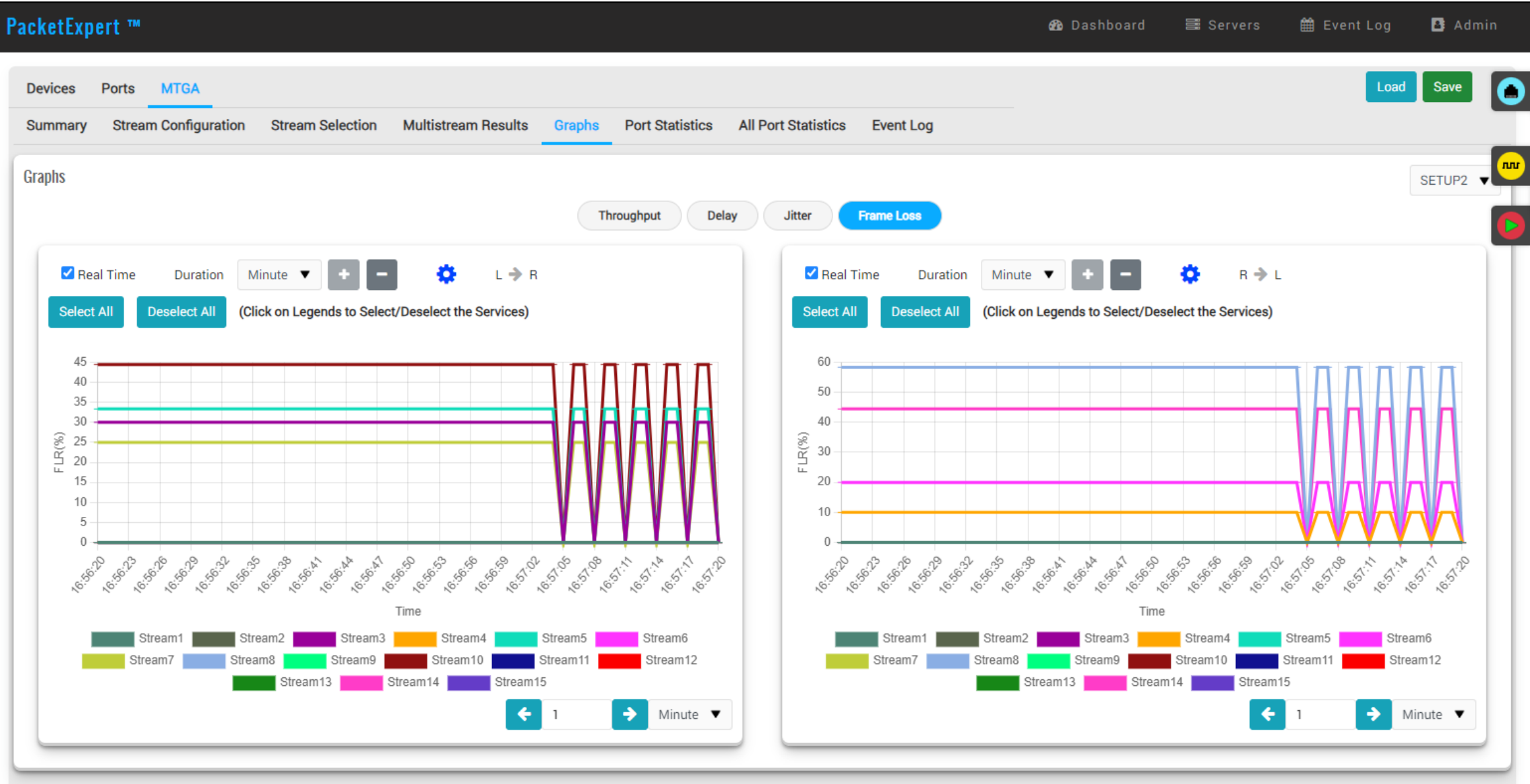
Test Time: 00:21:48 Throughput: Mbps Delay Unit: usec Jitter Unit: usec **Horizontal**

Test	Direction	Stream1	Stream2	Stream3	Stream4	Stream5	Stream6	Stream7	Stream8	Stream9	Stream10	Stream11	Stream12	Stream13	Stream14	Stream15	Stream16
Throughput (Curr)	L → R	8,000.004	5,000.034	7,999.958	5,000.034	7,999.953	4,999.978	7,999.957	4,999.977	7,999.976	4,999.980	6,999.961	4,999.976	8,000.004	5,000.034	5,000.034	4,999.978
	R → L	8,000.035	4,999.906	8,000.004	5,000.034	7,999.921	5,000.039	8,000.056	5,000.027	8,000.052	5,000.024	7,000.026	5,000.023	8,000.004	5,000.020	4,999.906	5,000.038
Throughput (Min)	L → R	5,908.304	3,692.674	5,908.432	3,692.674	5,908.432	3,692.762	5,908.393	3,692.770	5,908.398	3,692.770	5,169.878	3,692.762	5,908.432	3,692.674	3,692.674	3,692.770
	R → L	6,654.524	4,159.048	6,654.452	4,159.048	6,654.494	4,159.061	6,654.447	4,159.079	6,654.499	4,159.062	5,822.688	4,159.075	6,654.452	4,159.074	4,159.048	4,159.062
Throughput (Avg)	L → R	7,992.273	4,995.171	7,992.273	4,995.171	7,992.267	4,995.171	7,992.273	4,995.171	7,992.273	4,995.171	6,993.239	4,995.171	7,992.273	4,995.171	4,995.171	4,995.171
	R → L	7,992.844	4,995.528	7,992.844	4,995.528	7,992.839	4,995.528	7,992.844	4,995.528	7,992.844	4,995.528	6,993.739	4,995.528	7,992.844	4,995.528	4,995.528	4,995.528
Throughput (Max)	L → R	8,000.132	5,000.034	8,000.074	5,000.034	8,000.144	5,000.042	8,000.055	5,000.043	8,000.076	5,000.042	7,000.065	5,000.044	8,000.132	5,000.034	5,000.034	5,000.056
	R → L	8,000.069	5,000.034	8,000.132	5,000.034	8,000.134	5,000.048	8,000.056	5,000.043	8,000.072	5,000.044	7,000.062	5,000.042	8,000.132	5,000.045	5,000.034	5,000.048
FL Count	L → R	0	0	51	0	51	3	1	3	4	52	52	13	0	0	0	52
	R → L	9	1	1	1	304	27	0	1	1	24	22	5	1	9	1	28
FL Rate (%)	L → R	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	R → L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Delay (Curr)	L → R	0.525	0.525	0.532	0.523	0.540	0.534	0.531	0.529	0.528	0.533	0.532	0.529	0.531	0.530	0.522	0.533
	R → L	0.516	0.508	0.509	0.504	0.523	0.519	0.519	0.517	0.513	0.517	0.516	0.515	0.515	0.515	0.514	0.518
Delay (Min)	L → R	0.384	0.384	0.388	0.484	0.384	0.384	0.384	0.388	0.384	0.384	0.384	0.384	0.384	0.384	0.384	0.384
	R → L	0.400	0.500	0.400	0.400	0.400	0.400	0.400	0.404	0.404	0.400	0.400	0.400	0.400	0.464	0.500	0.400
Delay (Avg)	L → R	0.524	0.524	0.532	0.523	0.539	0.534	0.530	0.529	0.528	0.533	0.531	0.529	0.530	0.529	0.522	0.532
	R → L	0.516	0.508	0.508	0.504	0.522	0.518	0.518	0.517	0.513	0.516	0.516	0.515	0.515	0.515	0.513	0.518
Delay (Max)	L → R	0.592	0.588	0.596	0.592	0.596	0.596	0.592	0.596	0.592	0.592	0.596	0.596	0.592	0.592	0.548	0.596
	R → L	0.576	0.572	0.572	0.532	0.580	0.580	0.576	0.576	0.576	0.576	0.580	0.580	0.576	0.576	0.576	0.580
Jitter (Curr)	L → R	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
	R → L	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Jitter (Min)	L → R	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	R → L	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Jitter (Avg)	L → R	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
	R → L	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
Jitter (Max)	L → R	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01
	R → L	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01	< 0.01

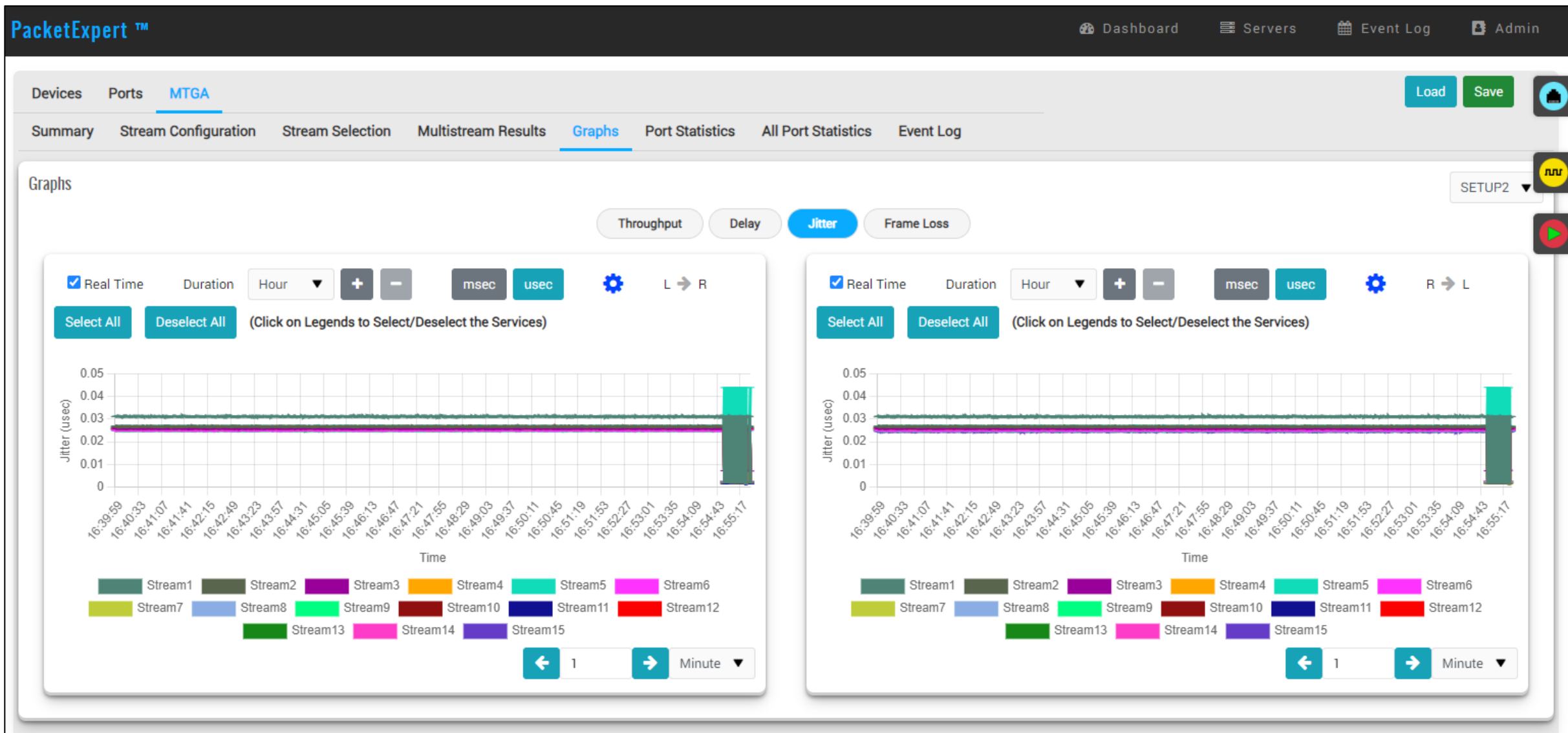
Throughput (IR) Graph



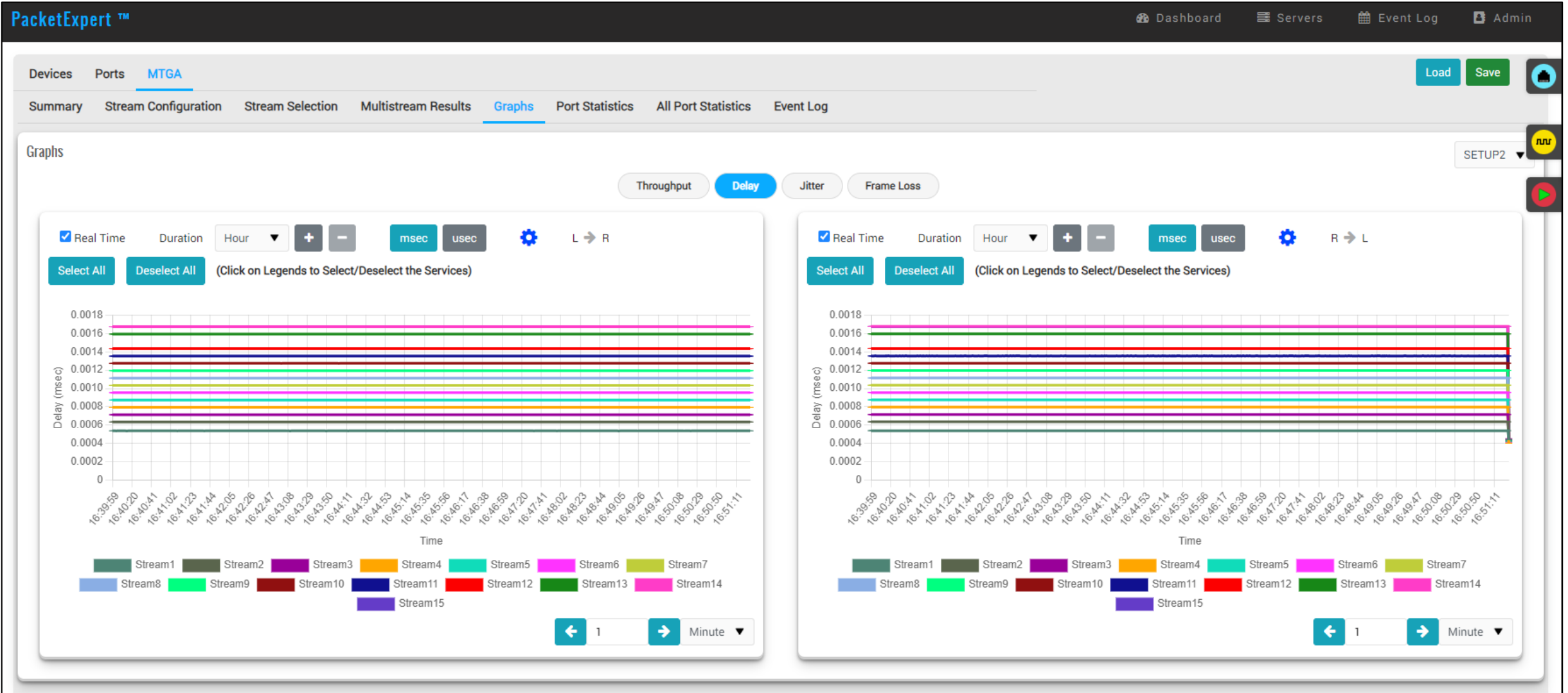
Frame Loss Rate (FLR) Graph



Frame Delay Variation (FDV) Graph



Frame Transfer Delay – FTD Graph



Port Statistics

PacketExpert™ Dashboard Servers Event Log Admin

Devices Ports **MTGA** Load Save

Summary Stream Configuration Stream Selection Multistream Results Graphs **Port Statistics** All Port Statistics Event Log

Port Statistics Running Port1 Reset

Common Statistics

Description	Tx	Rx
Link Utilization (%)	100.000	100.000
Data Rate (Mbps)	99,406.003	99,384.321
Bad Frames	0	0
Non Test Frames	-	0
FCS Error Frames	-	0
IP Checksum Errors	-	0
UDP Checksum Errors	-	0
Total Frames	5,505,942,159	5,706,533,765
Valid Frames	5,505,942,159	5,706,533,765
Number Of Bytes	18,428,558,119,064	18,424,350,288,288
Frame Rate (frames/sec)	3,712,469	3,847,767

VLAN Statistics

Description	Rx
1 Level Stacked VLAN Frames	2,217,521,655
2 Level Stacked VLAN Frames	0
3 Level Stacked VLAN Frames	0

MPLS Statistics

Description	Rx
1 Level Stacked MPLS Frames	0
2 Level Stacked MPLS Frames	0
3 Level Stacked MPLS Frames	0

IP Statistics

Description	Rx
IP Checksum Errors	0
IPv4 Packets	5,775,793,470
IPv6 Packets	0
TCP Packets	0
ICMP Packets	0
IGMP Packets	0
IGRP Packets	0
Other Protocol IP Packets	0

Packet Type Statistics

Description	Tx	Rx
Broadcast Frames	0	0
Multicast Frames	0	0
Control Frames	0	0
VLAN Frames	2,244,458,970	2,244,435,525
Pause Frames	0	0

UDP Statistics

Description	Rx
UDP Checksum Errors	0
UDP Packets	5,775,793,470

Length Statistics

Description	Tx	Rx
Undersized Frames	0	0
64 Bytes Length	0	0
65-127 Byte Length	448,891,794	448,887,105
128-255 Byte Length	448,891,794	448,887,105
256-511 Bytes Length	448,891,794	448,887,105
512-1023 Bytes Length	448,891,794	448,887,105
1024-1518 Byte Length	726,872,193	726,864,601
Oversized Frames	3,050,327,233	3,253,380,450

Report Generation

Report Generation

Test Conducted By: Testers

Customer Name: GL Communications

Operator Name: Admin

Title: PacketExpert 100G MTGA Report

Comments: Multi Stream Traffic Generator

Header:

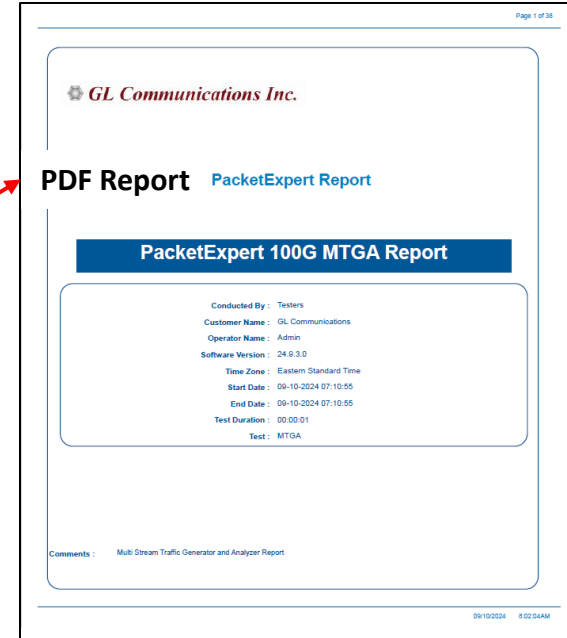
Footer:

Report Format: PDF

File Name:

Test Setup: SETUP1

Generate Report **Cancel**



MTGA Report.csv

Direction	Service No	Throughput MAX(Gbps)	FL RATE(%)	Delay MAX(msec)	Jitter MAX(usec)
L->R	Stream1	5	0 -0.001	0.024	0.024
R->L	Stream1	5	0 -0.001	0.024	0.024
L->R	Stream2	5	0 -0.001	0.024	0.024
R->L	Stream2	5	0 -0.001	0.024	0.024
L->R	Stream3	5	0 -0.001	0.024	0.024
R->L	Stream3	5	0 -0.001	0.024	0.024
L->R	Stream4	5	0 -0.001	0.024	0.024
R->L	Stream4	5	0 -0.001	0.024	0.024
L->R	Stream5	5	0 -0.001	0.024	0.024
R->L	Stream5	5	0 -0.001	0.024	0.024
L->R	Stream6	5	0 -0.001	0.024	0.024
R->L	Stream6	5	0 -0.001	0.024	0.024
L->R	Stream7	5	0 -0.001	0.032	0.032
R->L	Stream7	5	0 -0.001	0.028	0.028
L->R	Stream8	5	0 -0.001	0.028	0.028
R->L	Stream8	5	0 -0.001	0.024	0.024
L->R	Stream9	5	0 -0.001	0.024	0.024
R->L	Stream9	5	0 -0.001	0.028	0.028
L->R	Stream10	5	0 -0.001	0.028	0.028
R->L	Stream10	5	0 -0.001	0.032	0.032
L->R	Stream11	5	0 -0.001	0.032	0.032
R->L	Stream11	5	0 -0.001	0.032	0.032
L->R	Stream12	5	0 -0.001	0.032	0.032
R->L	Stream12	5	0 -0.001	0.032	0.032
L->R	Stream13	5	0 -0.001	0.032	0.032
R->L	Stream13	5	0 -0.001	0.032	0.032
L->R	Stream14	5	0 -0.001	0.032	0.032
R->L	Stream14	5	0 -0.001	0.032	0.032
L->R	Stream15	5	0 -0.001	0.032	0.032
R->L	Stream15	5	0 -0.001	0.032	0.032
L->R	Stream16	5	0 -0.001	0.032	0.032
R->L	Stream16	5	0 -0.001	0.032	0.032

Thank You