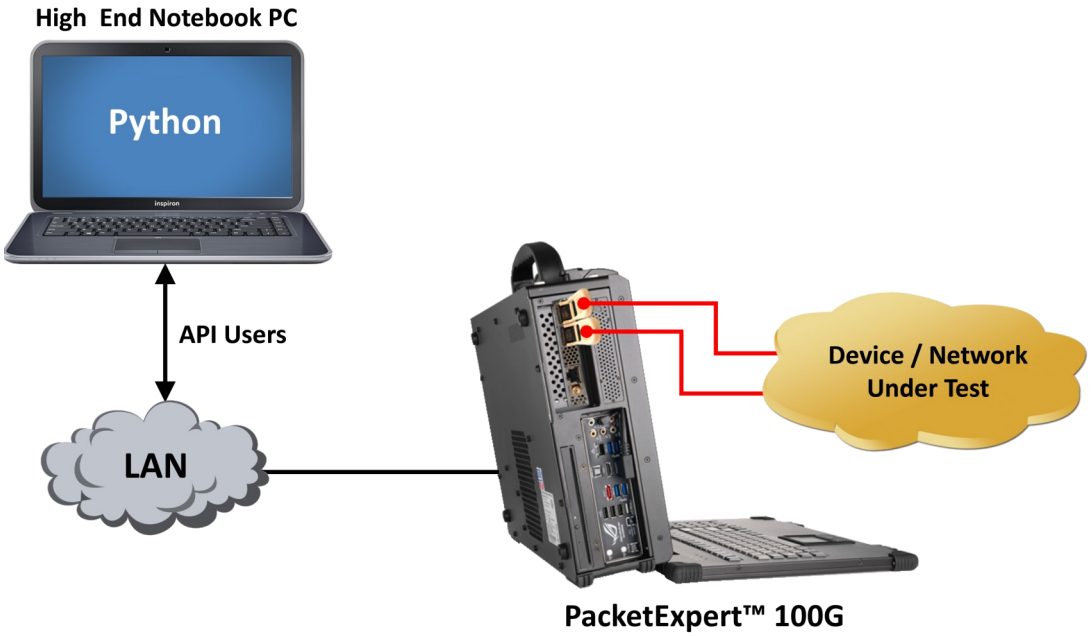
Python API Solutions for PacketExpert™ 100G Testing

(Automation and Regression Testing using Python APIs)



Overview

PacketExpert™ 100G supports test automation and remote accessibility of various functionalities such as BERT (Bit Error Rate Testing), Loopback, RFC 2544, ExpertSAM™ (Y.1564 Testing), and Multi Stream Traffic Generator and Analyzer (MTGA) using Python client APIs.

An optional software license **PXX109**, is required for test automation using scripting with client-server APIs on the PacketExpert™ 100G platform.

The Python interface for PacketExpert™ 100G enables seamless control of all device features via Python APIs. Using a client-server architecture, the PacketExpert™ 100G Server connects to the hardware, while the client, equipped with a Python API dll and scripts for Windows, allows users to issue commands and receive real-time results.

Communication between the Python client and the PacketExpert 100G Server is facilitated over a LAN connection, providing efficient and reliable interaction with the PacketExpert™ 100G hardware.

For more information, visit PacketExpert™ 100G Python APIs for Test Automation and Remote Access webpage.

Main Features

- Capability of remote operation, automation and multi-site connectivity using Python client and PacketExpert 100G Server.
- Supports Bert, Loopback, RFC 2544, ExpertSAM™, and Multi-Stream Traffic Generator and Analyzer functionalities.
- Multiple PacketExpert™ can be controlled remotely from single client application via PacketExpert 100G Server.
- Support for a wide range of tests setup, interfaces, protocols, and script languages.
- Python client access through PacketExpert 100G Server.
- High Level APIs allows to access PacketExpert functionalities.
- Scripts for MAC, VLAN, MPLS, IP and UDP layers testing.
- Remote monitoring capability.
- Requires additional licensing (PXX109) for test automation and regression testing across various PacketExpert™ 100G platforms.

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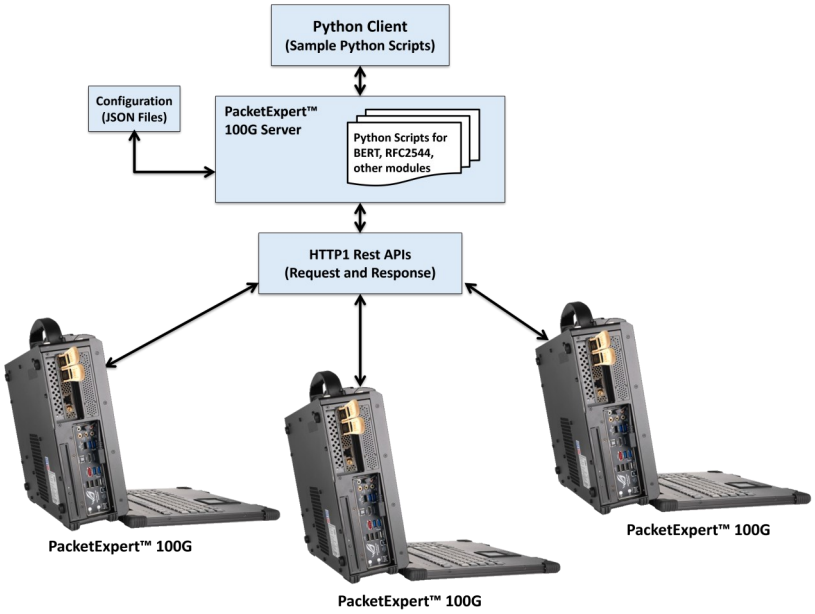
Working Principle of Python Client/PacketExpert™ 100G Server Architecture

At the core of the system, the PacketExpert™ 100G Server operates, interfacing with low-level PacketExpert™ 100G APIs to communicate directly with the hardware. Various scripts enable specific applications, such as BERT and RFC 2544, as shown in the diagram.

Using PacketExpert™ 100G Low-Level APIs, Python scripts provide control over multiple hardware units connected to the system. Users can manage these units from a single Python client through the Python API, allowing for seamless interaction with the PacketExpert™ 100G Server and hardware. Configuration files are in JSON format, which can be directly accessed by the Python scripts for streamlined operations.

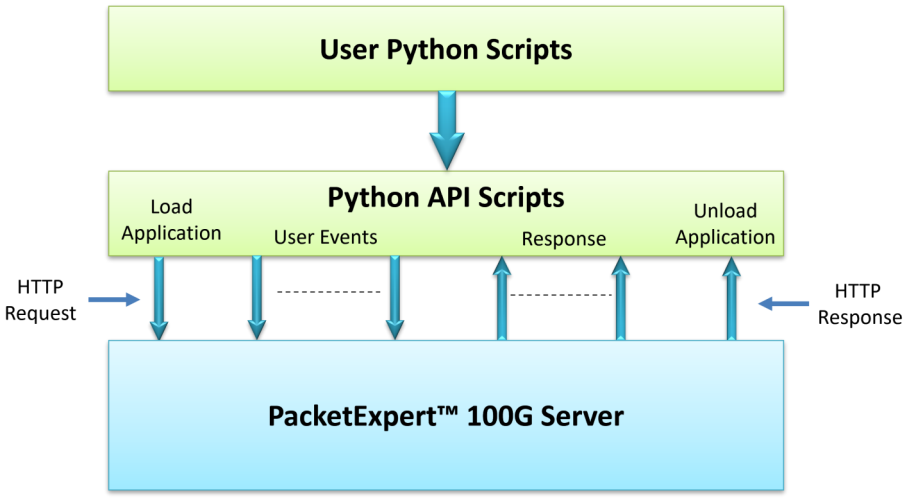


PacketExpert™ 100G Server and Python Client Working Principle

Python API Functional Modules

The application consists of 2 functional modules. These modules interacts with each other to perform as a single entity

- **Python API Scripts** - Acts as User Interface. The API scripts are predefined python scripts, that can be used by users to access various PacketExpert functionalities.
- **PacketExpert™ 100G Server** - The PacketExpert™ 100G is a web-accessible appliance with multiple 100G/40G/25G/10G/1G ports, controlled via a REST Server on an integrated PC, enabling browser-based management through REST APIs. Users can interact with the system using standard HTTP GET/POST requests in JSON format, allowing flexible control and monitoring of the hardware devices.

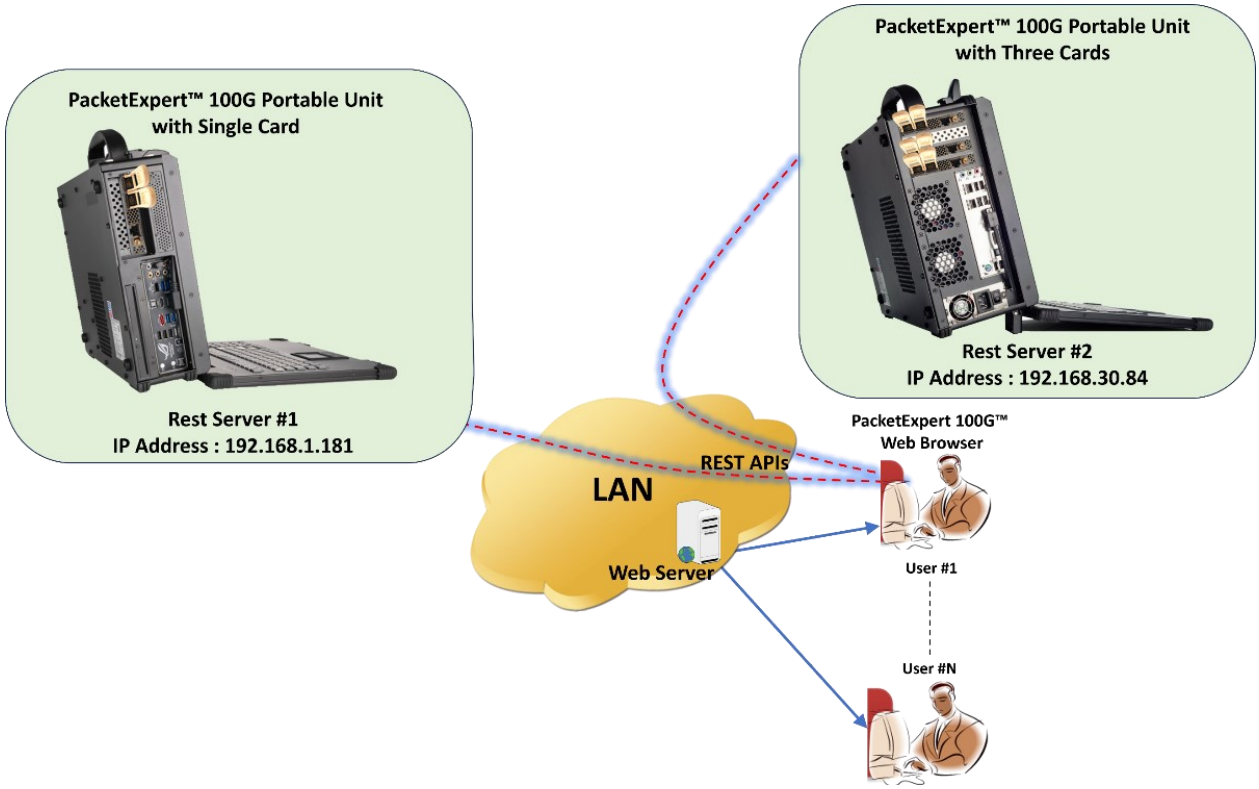


PacketExpert™ 100G Python Functional Modules

PacketExpert™ 100G Server

The PacketExpert™ 100G is a web-accessible appliance, controlled via the standard browser. It features one or more hardware boards integrated with a high-end Windows® PC. Each board, referred to as a Device in the PacketExpert™ 100G GUI, includes two 100G/40G/25G/10G/1G ports. Multiple devices can be installed in a single appliance, increasing the total port capacity per system.

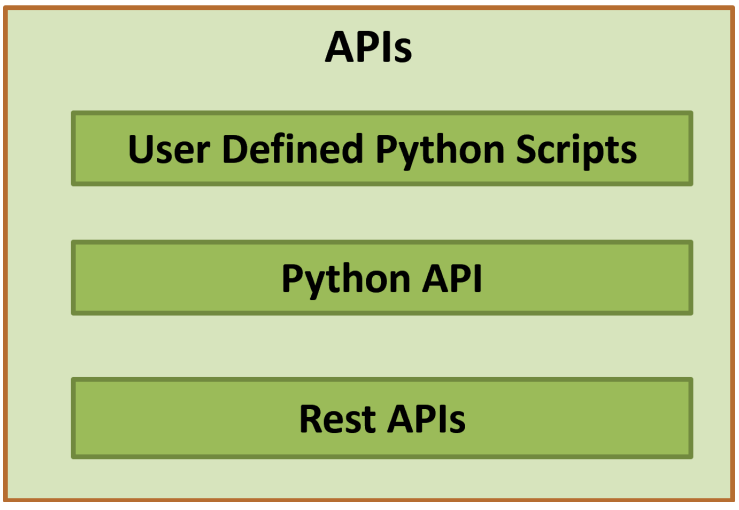
The integrated PC runs a PacketExpert 100G Server software that controls the hardware devices and handles functionality. Browser clients communicate with the Server via REST APIs, using HTTP GET/POST requests with JSON data. The Rest Server listens to these requests, interacts with the hardware, and sends responses back to the clients.



PacketExpert™ 100G Server

Python Client

Python Client consists of python API scripts, and user defined python scripts. These APIs in turn use a low-level library to communicate with the PacketExpert™ 100G Server.



PacketExpert™ 100G Python Client

Python Client and Scripting

The Python interface developed for PacketExpert™ 100G allows users to control all features of PacketExpert™ 100G through Python APIs. The Python interface is implemented based on a client-server model. The server is the PacketExpert™ 100G Server. The client consists of Python API scripts, which allows user to control the PacketExpert™ 100G Server, issue commands and get back results.

AllPortBert.py

```python
from Core.Utils import *
from PacketExpertTests import *


1 usage
def main():
    # Specify server details and test configuration
    global time
    server_ip = "127.0.0.1"
    server_port = 3333
    device_list = [1]
    port_list = [1, 2]

    err, device_test_configuration = set_device_traffic_config(device_list)

    # Configure Bert Test Parameters

    device_test_configuration[1].port_mode = PortMode.Gbps10  # Link Speed Selection for 100G, Set the
    device_test_configuration[1].start_error_rate = 4  # Bit error insertion rate 10^-4

    test_duration = 10

    result_file_name = "Bert_Results"

    generate_report_info = GenerateReport()
    generate_report_info.test_conducted_by = "GLIndia"
    generate_report_info.filename = "Bert_Report"
    generate_report_info.title = "All Port Bert"
    generate_report_info.init_selected_ports(device_list, port_list, AppName.AllPortBERT)

    enable_generate_report = True

    # Uncomment the following section to set default paths
    # default_json_path = 'C:\\ProgramFiles\\GLCommunicationsInc\\PXXPythonClient\\JSON\\'
    # result_file_path = 'C:\\ProgramFiles\\GLCommunicationsInc\\PXXPythonClient\\Log\\'
    # set_default_config_path(default_json_path)
    # set_default_result_path(result_file_path)
```

Python Sample Script

```
BERT Result for Device1_Port1 :

Bit error Status  : No Error
Sync loss Status : InSync
Out of sequence Status : No Error
Bit error Count  : 0
Sync loss Count : 0
Out of sequence Count : 0

BERT Result for Device1_Port2 :

Bit error Status  : No Error
Sync loss Status : InSync
Out of sequence Status : No Error
Bit error Count  : 0
Sync loss Count : 0
Out of sequence Count : 0
```

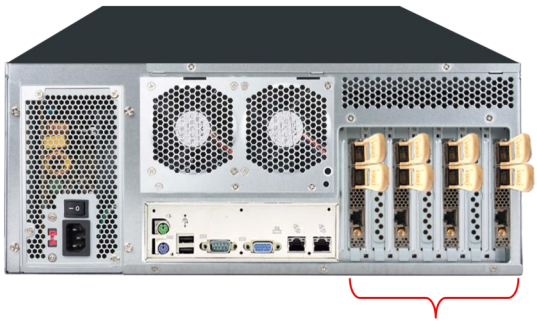
BERT Result on Port 1

Hardware Specifications (*Contd.*)

PacketExpert™ 100G Rackmount Platforms

- Ideal for Lab environments that require centralized management of multiple servers and network devices
- Rackmount units offer flexibility for scaling up or down as needed by adding or removing individual units

PacketExpert™ 100G 4U Rack PC

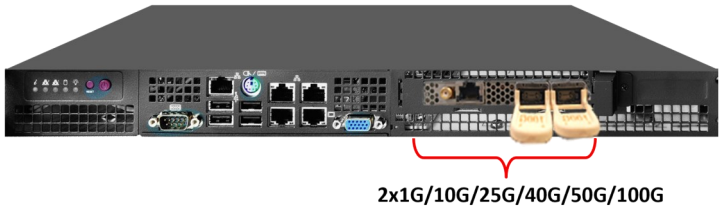


Specifications	
Dimensions	6.9” H x 16.9” W x 17.5” D
Weight	72 lbs.
Number of Supported Cards/Ports	Up to 7 Cards x (2x100G Ports), Maximum of 14 Ports
Power supply	800W

PacketExpert™ 100G 2U Rack PC

Specifications	
Dimensions	3.5” H x 17.2” W x 17.7” D
Weight	30 lbs.
Number of Supported Cards/Ports	Up to 2 Cards x (2x100G Ports), Maximum of 4 Ports
Power supply	800W

PacketExpert™ 100G 1U Rack PC



Specifications	
Dimensions	1.7” H x 17.2” W x 9.8” D
Weight	10 lbs.
Number of Supported Cards/Ports	1 x Full-height 1 Card x (2x100G Ports), Maximum of 2 Ports
Power supply	200W

Hardware Specifications (*Contd.*)
PacketExpert™ 100G Portable Platforms

- Ideal for field engineers, military personnel, or researchers who need a powerful and portable computing solution in remote or rugged locations
- Suitable for environments where traditional desktops or laptops may be too fragile or lack necessary durability

Ultra-Portable PacketExpert™ 100G (Lunchbox)

Specifications	
Dimensions	12.4” H x 16.41” W x 4.39” D
Display	17.3” 1920x1080
Weight	16.5 lbs.
Number of Supported Cards/Ports	Up to 2 Cards x (2x100G Ports), Maximum of 4 Ports
Power supply	400W (optional 500W)

Portable PacketExpert™ 100G (Lunchbox)

Specifications	
Dimensions	13.62” H x 16.50” W x 7.25” D
Display	17.3” 1920x1080
Weight	~23 lbs. (10.4kg)
Number of Supported Cards/Ports	Up to 3 Cards x (2x100G Ports), Maximum of 6 Ports
Power supply	680W 100/240VAC

PacketExpert™ 100G Portable Platform (Lunchbox)

Specifications	
Dimensions	17.06” x 13.67” x 9.02” (H x W x D)
Display	17.3” 1920x1080
Weight	~ 30 lbs.
Number of Supported Cards/Ports	Up to 6 Cards x (2x100G Ports), Maximum of 12 Ports
Power supply	1000W 100-240VAC

Buyer's Guide

Item No	Product Description
PXX109	Optional Software for Test Automation using Scripting with client-server APIs
PXX100	PacketExpert™ 100G Platform (1G, 10G, 25G), All Port BERT, BERT/Loopback, RFC2544, Y.1564
PXX101	Basic Software (Required for PXX100)
PXX103	Additional 2-port card with Basic Software (Up to 4, 2-Port Cards (including the basic 2-Port Card) total per system for 8-Port testing; required for PXX107)
PXX105	40G, 50G, 100G Optional Software
PXX106	PacketExpert™ 100 G – One card / 2 Port Platform with MM Kit
PXX107	PacketExpert™ 100G - Two Card / 4 Port Portable Platform
PXX108	PacketExpert™ 100 G – One card / 2 Port Platform with SM Kit
PXX110	PacketExpert™ 100 G - Two Card / 4 Port Platform with SM Kit
PXX10X	PacketExpert 100 G – 4 Card Platform / 8 Port Platform
Item No	**Related Hardware and Software**
PXN100	PacketExpert™ 10GX
PXN101	10G option for PXN100

Note: PCs which include GL hardware/software require Intel or AMD processors for compliance.

For more information, visit PacketExpert™ 100G- Comprehensive Ethernet/IP Testing Solution webpage.

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