![Virtual Instruments logo]

# Performance Validation Appliances

**Industry's Most Comprehensive Storage Performance Validation Solution for Technology Vendors**



## Product Benefits

- Superior Realism
- Highest Performance
- Deepest Protocol Depth

The Load DynamiX performance validation product suite was built with the intelligence and scalability to validate modern storage infrastructures with high accuracy, tremendous load and extremely realistic patterns. The product includes three integrated components that provide the following advantages:

- **Comprehensive storage validation platform:** Lower your testing costs by unifying storage validation processes with a single 2U testing solution for File, Block, and Object/Cloud storage.

- **Emulation of real-world traffic:**  Find performance and scalability bugs fast with the most accurate and efficient workload simulation with the industry's deepest and broadest storage protocol emulations.

- **Easy to use GUI:**  Start validating storage systems quickly with an intuitive graphical user interface and a library of prebuilt tests that will accelerate your time to market.
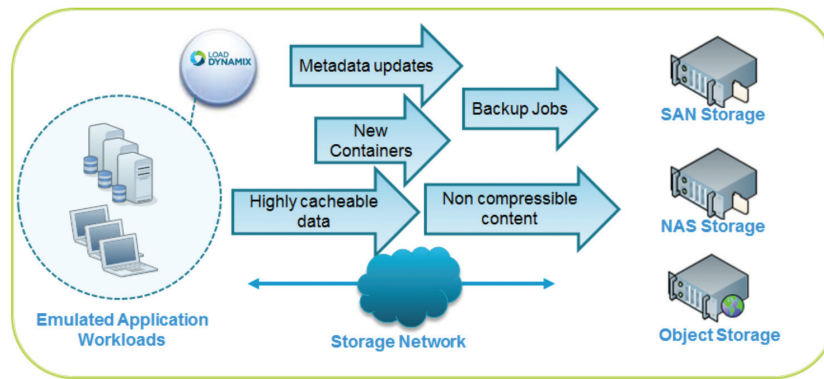
Figure 1.  Load DynamiX unified File, Block, and Object storage validation solution

## Load DynamiX Appliances Offer

**Intuitive & Customizable GUIs**

Tailored for novice to advanced users, Load DynamiX offers customizable GUIs for simplified workload modeling, workload generation, results analysis, and cross-team collaboration.  Users also have access to pre-built, editable tests to accelerate test development.

**Broad Protocol Coverage**

Detailed performance emulation of storage protocols that provide rich, accurate emulations of workloads across File, Block and Object / Cloud storage.

**All-in-one Appliances**

Load generation appliances capable of executing complex traffic emulation at extreme loads; currently available in the configurations listed below.

## Appliances for Storage & Network Technology Vendors

| | Test Interfaces | Performance |
|---|---|---|
| **1G Series** | 1GbE RJ45<br>8 x 1Gb | Single Port:  1.9 Gbps<br>8-Port:  14 Gbps |
| **10G Series** | 2 x 10GbE SFP+<br>8 x 10GbE SFP+<br>8 x 10GBASE-T | 2-Port:  35 Gbps<br>8-Port: 140 Gbps |
| **FC Series** | 2 x 4/8/16GFC<br>4 x 4/8/16GFC<br>8 x 4/8/16GFC | 2-Port: 46 Gbps<br>4-Port:  92 Gbps<br>8-Port:  180 Gbps |
| **Unified Series** | 2 x 10GbE + 2 x FC<br>4 x 10GbE + 4 x FC | 2-Port 10 GbE:  35 Gbps<br>2-Port FC:  46 Gbps<br>4-Port 10 GbE:  70 Gbps<br>4-Port FC:  92 Gbps |
| **Enterprise Series** | Up to 4 X 10GbE<br>Up to 4 X FC | 4-Port 10 GbE:  70 Gbps<br>4-Port FC:  92 Gbps |

## Appliances for Storage & Network Vendors Continued

Load DynamiX appliances work with the following software components:

- **Load DynamiX Enterprise software:** an intuitive Web user interface that controls multiple Load DynamiX appliances that can be leveraged by defined user groups. Ideal for improved collaboration and greater utilization of Load DynamiX ports and tests. It enables simplified workload modeling and 'push-button' testing. Included in the Load DynamiX Enterprise Series; optional in 1G, 10G, FC and the Unified Series.

- **Load DynamiX Test Development Environment (TDE) software:** client application for designing and executing tests as well as validating test results. Included in all appliances.

- **Load DynamiX Test Automation Framework (TAF):** framework for using supported APIs for test configuration, execution and results validation. Included in all appliances.

## Product Features and Specifications

| Superior Realism | | • Extremely flexible I/O access patterns<br>• Richest metadata emulation to evaluate real-world performance<br>• Parallel scenarios and asynchronous constructs to model hypervisor, application and OS behavior using multiple protocols<br>• Canned and user-defined content generation options to validate caching, tiering and deduplication functions<br>• Granular configuration of protocols for functional testing<br>• Powerful Load DynamiX User Parameter files to create highly scalable run-time patterns for folder structures, authentication credentials, connections, addresses, and more<br>• Client leasing/delegation to validate local caching operations<br>• Threading, Async, and Compound Action support for selected protocols |
|---|---|---|
| Storage Protocols | File | • Client: SMB, SMB 2.x, SMB 3.0 dialect, MS-RPC, NFSv2, NFSv3, NFSv4, NFSv4.1<br>• Server: CIFS/SMB, SMB 2.x, NFSv3 |
| | Block | • Initiator: iSCSI, Fibre Channel<br>• Target: iSCSI |
| | Object | • Client: HTTP, HTTPS, OpenStack Swift, SNIA CDMI, Amazon S3<br>• Server: HTTP, HTTPS |
| Network | | • MAC, VLAN, DCB, IPv4, IPv6, TCP<br>• FC, NPIV |

# Product Features and Specifications Continued

| | |
|---|---|
| **Load Profiles** | • Specify the number of concurrent users, new users per second, actions per second, network bandwidth or TCP throughput<br>• Timeline load parameterization to simulate network I/O patterns<br>• Run multiple realistic user workloads simultaneously |
| **Measurements and Reporting** | • Data verification to validate data integrity with error logs<br>• Detail statistics including per-command response time and errors<br>• CSV result export<br>• PCAP capture<br>• Built-in Reporting Tool |
| **Authentication** | • NTLM, Kerberos, CHAP |
| **Automation** | • Test parameters can be specified at run-time<br>• Statistics reported dynamically during the test<br>• Test Execution Rules triggered by test statistics |
| **Hardware:<br>1G, 10G, FC &<br>Unified Series** | • 2 RU enclosure (17.2" X 3.5" X 25.5")<br>• 740W redundant power supply<br>• AC Input:  100-240V, 9-3.5A, 50-60 Hz<br>• Operating temperature range:  50 – 95°F / 10-35°C<br>• Operating humidity range:  8-90% (non-condensing)<br>• Weight:  52lbs / 23.6kg |
| **Hardware Enterprise Series** | • 2 RU enclosure (17.25" X 3.47" X 28.5")<br>• 1280W redundant power supply<br>• AC Input:  100-240V, 9-3.5A, 50-60 Hz<br>• Operating temperature range:  50 – 95°F / 10-35°C<br>• Operating humidity range:  8-90% (non-condensing)<br>• Weight:  85lbs / 38.6kg |

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