OVERVIEW

SANBlaze VirtuaLUN storage emulation for Fibre Channel is the key piece of test equipment for anyone developing products supporting the Fibre Channel storage protocol. The VirtuaLUN feature set provides a unique set of functions applicable in all aspects of a product lifecycle; from development to design validation and test and QA. The ability to emulate Fibre Channel targets and initiators with a wide range of configurable attributes provides engineers with a flexible, scalable tool to simulate real SAN environments and test director class switch environments at a fraction of the cost of real devices.

The VirtuaLUN provides full control and programmability of Fibre Channel parameters, providing unique storage test conditions for SAN testing and development.

For target emulation, a Fibre Channel target can be a disk, tape, or collection of devices, such as a tape changer or storage array. Easily configurable target environments with optional storage profiles can be edited and saved for reuse. Multiple error conditions and triggers allow for complex error injection. RAM based targets provide low latency targets for performance testing. In addition to targets such as disks and tapes, Very complex, disk based error conditions can be simulated to provide a unique platform for backplane and controller testing. The ability to program complex and varying range of target configurations and save and restore multiple target configurations provides a flexible, cost effective and invaluable tool for development, test & QA labs.

Initiator emulation delivers the ability to drive Fibre Channel traffic, inject errors, send specific or custom op codes in an easy to use, scriptable platform. The ability to affect fabric login parameters is useful in switch and fabric testing and development. Custom command generation and predefined tests provide simulated host environments. Auto connect and probe features quickly identify targets to test. Features such as Read/Write/Compare testing, error injection and a custom command builder provide an environment to simulate single or multiple Fibre Channel initiators.

Test cases can be saved and restored with a single command. Tests can be started via command line, scripted or via an easy to use Web based interface.

FEATURES
- Support for 32G, 16G, 8G Fibre Channel
- Simulated Fibre Channel Disks drives, Tapes, Disk arrays and Tape Libraries
- Simulated Host (HBA)
- High performance
- Multi-target and Initiator support (NPIV)
- Error injection
- Packet Capture and Decode
- Easy to use Web based interface
- Command line interface and scripting
- Save/load configurations
- Trace Functionality
- Error counters
- Real time statistics and performance data

KEY APPLICATIONS
- Fibre Channel Hardware and Software Development
- Validate and test Fibre Channel HBA
- Validate and test Fibre Channel storage arrays
- Simulate single or multiple FC hosts
- Switch and Fabric testing
- Storage software verification
- SAN management software verification
- Performance testing
- Error handling testing
- Failover and Multipath Simulation
- Scalability testing
- Capacity planning

HARDWARE OPTIONS
- 32G, 16G or 8G auto-negotiable speed
- 2, 4, 8, 12, 16 or 24 ports per system (depending on link speed)
**GENERAL EMULATION FEATURES**
- FCP2 Support with FCP Confirm
- Configurable WWNN/WWPN
- Configurable Symbolic Port name
- T10 DIF emulation including inbound and outbound verification
- Send ELS, user configurable Code, ID and Payload
- Configurable MTU size from 128 - 2048 bytes
- Configurable login parameters and behavior
  - FLOGI
  - PLOGI
- Ability to Record a target "profile", which can be used by an emulation port

**TARGET FEATURES**
- Emulation of up to 256 FC Targets per port
- Up to 512 LUNs per port (Disk and/or Tape)
- Real device emulation mode where all data is retained
- Virtual Device emulation for LUNS up to 100TB
- Disk, Tape, Array and Tape Loader Library emulation
- Near line rate performance
- Configuration and Data Retention via Save/Load to disk function
- Real time statistics
- T10 DIF emulation including inbound and outbound verification
- Configurable LUN parameters
  - Speed
  - Size
  - Personality
  - Errors

**INITIATOR FEATURES**
- Emulation of up to 256 Independent FC Initiators per port
- Up to 512 LUNs per port (Disk and/or Tape)
- Single button "Max Reads all Ports" testing for quick go/no-go
- Read / Write and Compare Tests for traffic generation and data integrity
- Multi-Initiator tests dispatch tests over all available initiators
- Sequential, random, Min/Max and Butterfly seeks
- Multiple data patterns including Random and User Defined
- Multi-path testing on all paths, one path, active path, optimal path
- Comprehensive "Generic" I/O capability
- Task Management functions
- Built in Iometer interface allows Read/Write and Compare test initiation and monitoring
- Compression and Dedup Data Patterns

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**REAL TIME STATISTICS**
- I/O Performance Counters
- Outstanding I/O Count
- Fibre Channel Counters
- FLOGI/FDISK Statistics

**CONFIGURABLE ERROR CAPABILITIES INCLUDE:**
- Busy
- Drop
- Abort
- Read/Write Delay
- Queue Full
- Read Over/Read Under
- Write Over/Write Under
- Out of Order Data
- Data Corruption
- Check Conditions
- Bad Status
- Bad Block
- Bad T10 Dif inbound/outbound
- Link Reset/LIP
- Force Logout/Process Logout
- Change Login Parameters

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**For more information please visit our web site at www.sanblaze.com or send email to info@sanblaze.com**

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SANBlaze Technology, Inc. is a pioneer in SAN Emulation technologies and a leading provider of solutions for embedded systems. SANBlaze emulation products provide storage engineers, test and QA teams with scalable, high performance and configurable emulated environments for Fibre Channel, iSCSI, SAS, NVME and FCoE targets and initiators.