OVERVIEW

SANBlaze VirtuaLUN storage emulation for FCoE is the key piece of test equipment for anyone developing products supporting the FCoE 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 FCoE targets and initiators with a wide range of configurable attributes provides engineers with a flexible, scalable tool to simulate real Data Center Ethernet and SAN environments, at a fraction of the cost of real devices.

The VirtuaLUN provides full control and programmability of SCSI and network parameters, providing unique storage test conditions for network testing and development.

For target emulation, an FCoE target can be a disk, a tape, or a collection of each, 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, SANBlaze FCoE emulation provides emulation of FCoE switch ports. The ability to program complex and varying range of target configurations, emulate switch ports and save and restore multiple target configurations provides a flexible, cost effective and invaluable tool for development, test and QA labs.

Initiator emulation delivers the ability to drive FCoE traffic, inject errors, send specific or custom op codes in an easy to use, scriptable platform. The ability to combine FCoE traffic with other network traffic allows for simulated load. 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 FCoE 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

- Simulated FCoE, Tapes, Disk arrays and Tape Libraries
- Line rate performance
- FCoE Switch emulation
- Multi-target and Initiator support (NPIV)
- Generate/Consume non-FCOE traffic as well (TCP/UDP)
- FIP Support Versions 0 and 1
- DCBX Support Versions 1.00, 1.01
- Pause support
- Error injection
- Traffic priority control
- FCOE header manipulation
- Congestion simulation
- CRC corruption injection
- Packet Capture and Decode
- Easy to use Web based interface
- Command line interface and scripting
- Save/load configurations
- Error counters
- Real time statistics and performance data

KEY APPLICATIONS

- FCoE Hardware & Software Development
- Validate and test FCoE CNA
- Validate and test FCoE storage arrays
- Simulate single or multiple FCoE hosts
- Switch and network testing
- Virtual environment testing
- Storage software verification
- SAN management software verification
- Performance testing
- Error handling testing
- Failover and multipath simulation
- Scalability testing
- Capacity planning
- Network congestion simulation

HARDWARE OPTIONS

- 10G or 1G auto-negotiable speed
- 2, 4, 8 or 12 ports per system (depending on link speed)
GENERAL EMULATION FEATURES
- FC Initialization Protocol (FIP) Support (Ver. 0 and 1)
- Generate/Consume non-FCoE traffic
- UDP Network Generator with VLAN and Priority Class Support
- DCBX Support Versions 1.00, 1.01
- PFC and Standard Pause support
- LLDP Support with user override
- Traffic priority control
- Frame size control (MTU)
- Configurable MAC address
- FCoE header manipulation
- Congestion simulation
- Packet Capture and Decode
- Configurable Symbolic Port name
- T10 DIF emulation including corruption testing
- Generation/Validation of FCoE CRC
- Send ELS, user configurable Code, ID and Payload
- Ability to Record a target "profile", which can be used by an emulation port
- Configurable login parameters and behavior (FLOGI and PLOGI)

REAL TIME STATISTICS INCLUDING:
- I/O Performance Counters
- Network Performance Counters
- Outstanding I/O Count
- FC Specific Traffic Class Counters
- FIP and Extended Link Service (ELS) Counters

TARGET FEATURES
- Emulation of up to 256 FC Targets per port
- Up to 512 LUNs per port (Disk and/or Tape)
- Multi path target support
- Configurable World Wide Names (WWNN/WWPN)
- 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
- T10 DIF emulation including inbound and outbound verification
- Configurable LUN parameters
  - Speed
  - Size
  - Personality
  - Errors

CONFIGURABLE ERROR CAPABILITIES INCLUDE:
- Busy
- Drop
- Abort
- Read/Write Delay
- QueueFull
- Read Over/Read Under
- WriteOver/Write Under
- Out of order Data
- Data Corruption
- Check Condition
- Bad Status
- Bad Block
- Bad T10 DIF inbound/Outbound
- Link Reset
- Force Logout/Process Logout
- Change Login Parameters
- CRC corruption injection
- Force Process Logout
- Bad Destination / Source Address
- Bad VLAN ID
- Bad Ethertype
- Bad Start/End of Frame (SOF)
- Frame Drop
- Congestion (Send Pause Frames)

INITIATOR FEATURES
- Emulation of up to 256 Independent FCoE Initiators per port
- 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-initiator tests 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

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

SANBlaze Technology, Inc. • One Monarch Drive, Suite 204 • Littleton, MA 01460 • Tel: (978) 679-1400 • Fax: (978) 897-3171

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 and FCoE targets and initiators.