PLATFORM WHITE PAPER

AIC FBOF

with EXTEN HyperDynamic Software Platform

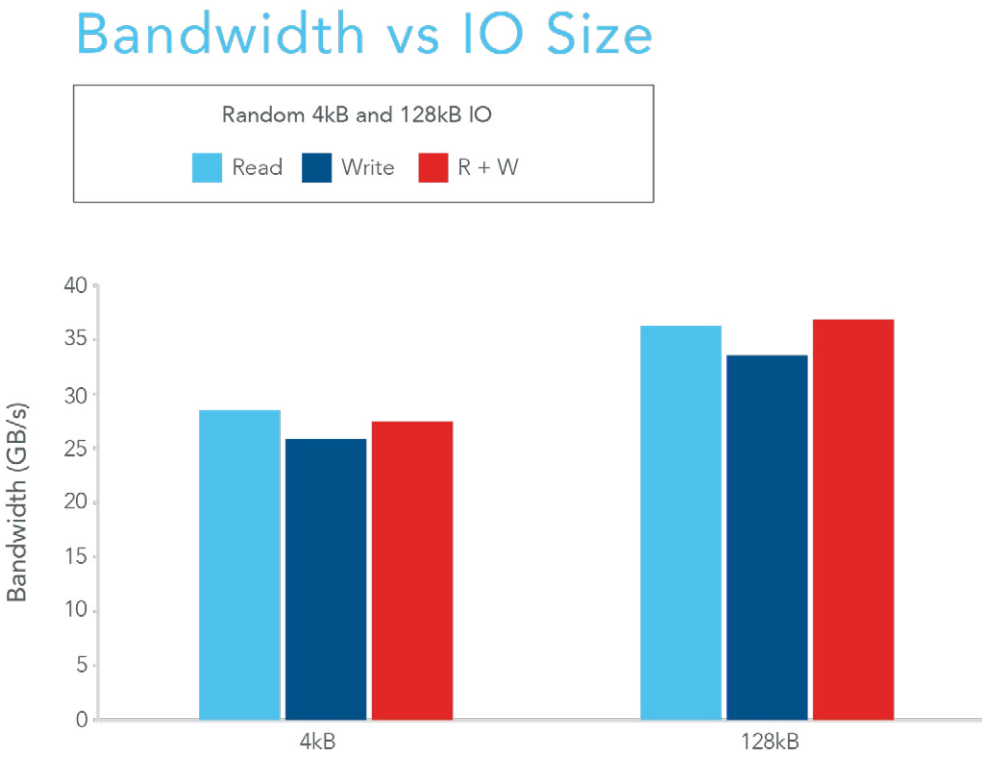
EXTEN™ AIC BROADCOM®

NVME-OF STORAGE SOLUTIONS WITH THE SAME ULTRA-HIGH PERFORMANCE AS DIRECT CONNECTED NVME

AIC and EXTEN™ Technologies have partnered to provide a complete NVMe-oF target solution using a cost-effective FBOF (fabric connected flash array) platform running Broadcom PS1100R Stingray 100G SmartNIC's with EXTEN HyperDynamic Software. The AIC J2024-04 platform supports twice the PCIe bandwidth of a typical 2U server, allowing quad 100GbE networking with 24 NVMe drives. EXTEN HyperDynamic™ storage software provides record-breaking performance with advanced management, provisioning, and RAID data protection services.

The highly-available AIC platform benefits from EXTEN's native understanding of dual-ported drives and controller failover. Utilizing standard MPIO and Linux initiator drivers, EXTEN and AIC provide a robust storage platform with fault tolerance at both the controller and drive level.

EXTEN's award-winning software uses open-standards drivers and management frameworks to provide complete management of NVMe-oF clusters. This open standards based approach ensures there is never any vendor lock-in.



Using HGST Ultrastar SN200 800GB NVMe drives, the total throughput exceeds 38GB/s. The EXTEN HyperDynamic datapath is optimized for consistent latency rivaling direct-attached SSDs, creating a flexible, shared, software-defined storage solution.

STORAGE DISAGGREGATION

Every datacenter needs to balance performance, capacity, density, and cost. The AIC FBOF with EXTEN HyperDynamic software installed provides highly-available, serviceable, storage that is disaggregated from compute resources. This arrangement allows storage and compute to scale independently with no performance sacrifice. EXTEN HyperDynamic storage software allows datacenter architects to select multiple hardware platforms and fabrics while maintaining a consistent user experience and the highest possible datapath performance.

Disaggregation provides many advantages, including flexible provisioning that allows capacity and bandwidth to be allocated to each initiator node without the typical overprovisioning of hardware resources. Compute and storage nodes are loosely coupled with Ethernet switches, allowing performance to scale linearly with additional targets. EXTEN software offloads RAID 0-6 encoding from compute nodes to optimized NVMe-oF targets, providing drive-level redundancy, with full support for PCIe drive hotplugging.

EXTEN HYPERDYNAMIC STORAGE SOFTWARE

HYPERDYNAMIC DATAPATH

EXTEN reinvented the storage datapath to gain every efficiency that the modern, parallel architectures of NVMe and RDMA make possible. Bandwidth controls allow administrators to limit resources on any exported namespace, and detailed statistics allow monitoring and tuning of the storage fabric.

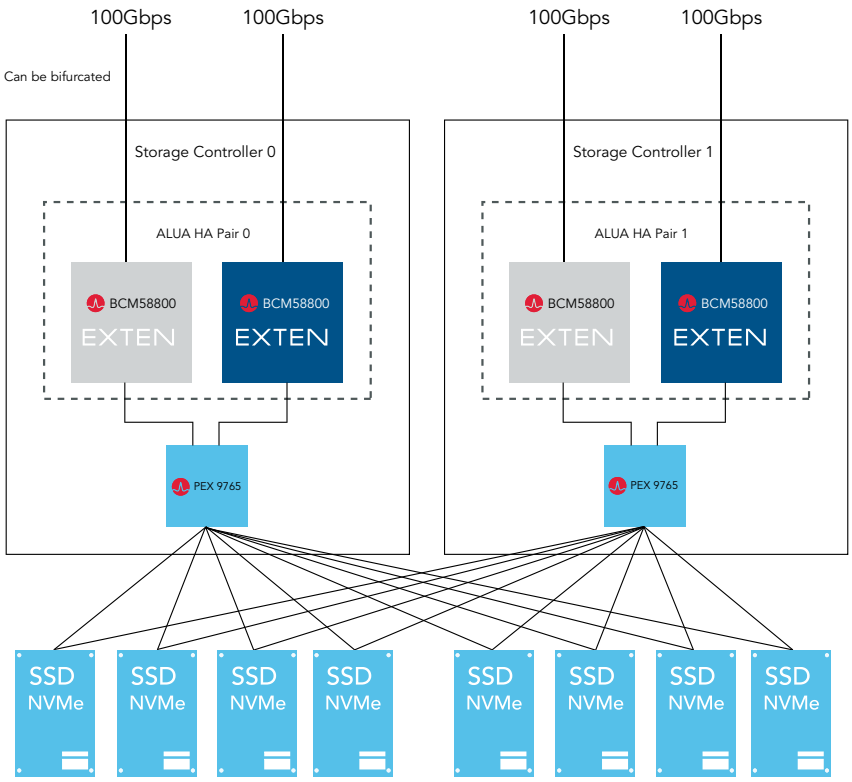
FLEXIBLE MANAGEMENT FRAMEWORK

EXTEN HyperDynamic software provides a complete, high-performance management framework for NVMe-oF targets, including a Redfish/Swordfish standards-based REST API, a command-line interface, and a web UI. Built on a modern microservices architecture, the EXTEN management framework enables clustered management, user access control, event monitoring, telemetry, and storage provisioning.

EXTEN HYPERDYNAMIC SOFTWARE FEATURES

- Standards-Based Datacenters – EXTEN software is built on open standards, including NVMe-oF and a Redfish® and Swordfish™-compliant RESTful API that provides flexible storage provisioning with diverse interop among vendors.
- Software-Defined NVMe-oF provides the ability to choose the hardware components and fabric appropriate for the task. EXTEN supports both RDMA and TCP in parallel for maximum flexibility.
- EXTEN's HyperDynamic Datapath Ensures No IOP is Left Behind – Share the storage capacity and bandwidth of the FBOF among multiple, standards-compliant initiators with no impact on performance. By providing a performance-optimized RAID implementation, the IOPs are no longer stranded within the storage box.
- Advanced Data Services – EXTEN software supports NVMe hotplugging and drive-level redundancy with RAID for the AIC FBOF's 24 hot-swappable, dual-ported drives.
- Standard Initiators – EXTEN HD software's standards-based architecture eliminates the need to install and maintain proprietary client software, without sacrificing performance.

Quad BCM58800 Configuration



AIC J2024-04 FBOF

Engineered as a highly-available storage platform, the AIC J2024-04 supports 24 hot-swappable, dual-ported NVMe drives managed by 4 hot-plugging Broadcom PS1100R Stingray controller cards. This combination provides 64 PCIe lanes for networking, and an additional 64 for storage, maintaining nearly 40GB/s of read or write performance. By utilizing Broadcom PS1100R Stingray controller cards, the FBOF provides an extraordinary performance-to-cost ratio.

FEATURES

- 2U 24-bay NVMe all-flash array
- Performance up to 6 times faster than SATA SSD, 3 times faster than SAS 12G SSD
- Designed for low-latency and high-performance applications
- PCIe interface to support NVMe over fabrics (3rd party cards)
- Hot swap design for easy maintenance and management
- Intelligent enclosure management
- Tool-less tray design

For more information, please visit:

EXTEN	https://www.exten.io
AIC	https://www.aicipc.com

CONTACT

EXTEN	**Email:** sales@exten.io
AIC Global Headquarters	**Email:** sales@aicipc.com.tw **Phone:** +886-3433-9188
Broadcom	**Email:** sales@broadcom.com

EXTEN Technologies, Inc. 4201 W Parmer Ln Bldg A Ste 200, Austin, TX 78727 USA | Tel 800.798.8310 | www.exten.io

May 2019 | Version 1.0