

Acceleron Parallel File Storage® APF S100



Acceleron Parallel File Storage (APF S100) is a parallel file storage arrays designed with enterprise features and reliability at an entry-level cost. This Software Defined Storage solution well suited for high performance computing (HPC) applications. It is suitable for Enterprises looking for flexible storage options. Available in one model, the Acceleron APF S100 provide unified file and block storage and are available in single hybrid or all-flash configurations. The Acceleron APF S100 offers excellent reliability and affordability for small and medium IT environments.

The Acceleron APF S100 fits a wide range of applications from file and media storage to business continuity, HPC applications, AI/ML, video surveillance, and many others. The Acceleron APF S100 provides data integrity, reliability, and ease-of management for business. The Acceleron APF S100 is a dedicated & optimized solution for both file and block support as an appliance using ZFS file system. The Acceleron APF S100 appliance has built-in and fully integrated controllers, storage arrays, OS, NAS software and no other dependency on third party solutions.

IMPROVED SYSTEM PERFORMANCE

Acceleron APFS gives improved performance. It allows concurrent reads and writes from multiple nodes and allowing multiple processes or applications on all nodes in the cluster simultaneous access to the same files. It increases aggregate bandwidth of your file system by spreading reads and writes across multiple disks. It eliminating storage hotspots: by balancing the load evenly across all disks to maximize their combined throughput. APF allows concurrent reads and writes from multiple nodes. It has sophisticated token management that handles fast and fine grained access to cluster, file system, and file resources.

Large files in APFS are divided into equal sized blocks, and consecutive blocks are placed on different disks in a round-robin fashion. APFS automatically detects common data access patterns and automatically begins pre-fetching data accordingly. This pre-fetching and caching provides high throughput and fast response times. Some of the recognized I/O patterns include sequential, reverse sequential, and various forms of strided access patterns

STORAGE OPTIMIZATION

Acceleron APF S100 is a dedicated appliance specially optimized OS for NAS and SAN. Acceleron AUS maximizes storage efficiency and performance by offering compression, deduplication, and thin provisioning at no extra cost. Before data is stored, Acceleron AUS dynamically detects and compresses what it can and skips over any data too inefficient to be worthwhile.

UNLIMITED SNAPSHOTS AND REPLICATION

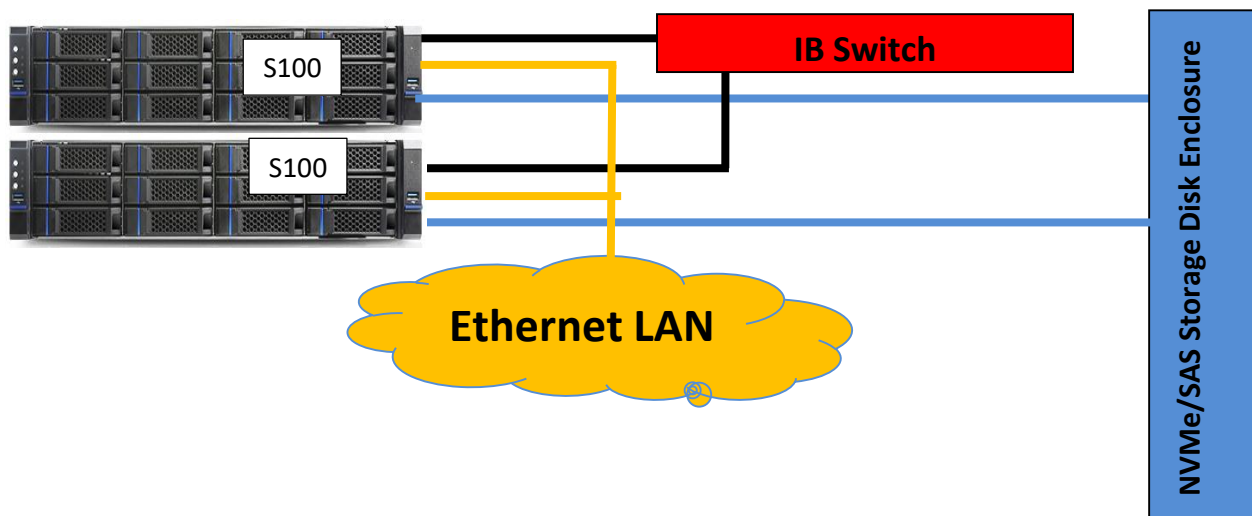
Most storage appliances require additional licenses for advanced features – but not Acceleron AUS. Storage capacity enabled hold good for file version retention, restoration, and replication are some of these features. Data is automatically protected locally against unintentional alteration, such as ransomware or malware, with minimal storage consumption. Data can be replicated locally, remotely, or to the cloud for backups or disaster recovery. It supports configurable snapshots for block level and file level data with both create & restore functionality.

Acceleron AUS Data Protection

APFS allow you to add or delete disks while the file system is mounted. While the time is favorable and system demand is low, APFS rebalance the file system across all currently configured disks and APFS also allow to add or delete nodes without stop and restarting the APFS daemon on all nodes. When physical connection to the disk is broken, APFS dynamically switches disk access to the server's nodes and continues to provide data through NSD server nodes. APFS detects and falls back to local disk access when the path has been repaired. APFS allows a large number of quorum nodes to facilitate maintaining quorum and continued cluster operation

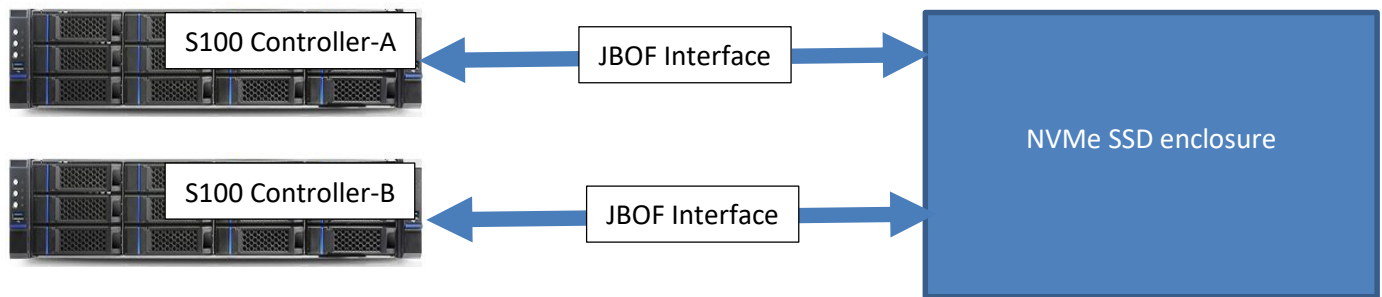
Optimized for Data Centre

The Acceleron APF S100 is optimized for the modern data center, ready for compute-intensive applications that involve big data, Block Chain, AI/ML, High Performance Computing (HPC), intensive virtualization workloads and higher-density server configurations. It helps customers a web based management of storage infrastructures and maintaining continuous operations during updates or refreshes. It supports various configurable options such as Intel Scalable CPU power, Fiber Channel connections, IB connections 100Gbps/200Gbps, networks running, 10, 25, 40, 50 or 100 Gb Ethernet while developing solutions specialized for datacenter.



Acceleron AUS Scalability

Acceleron APF S100 will let you experience unlimited flexibility and minimize downtime. Acceleron APF S100 uses a 128-bit file system that includes unlimited snapshots for easy backup, unlimited clones for easy duplication, unlimited capacity with volume sizes up to one Zetabyte, as well as unlimited amount of disks which can be increased on the fly without effort by using thin provisioning and file systems can have the capability to grow online. There are no limitations and you may easily control the total cost of ownership and expand your storage infrastructure as data grow. APF S100 supports more than 1000 active concurrent file sessions. APF S100 can scale out using SAS interface and JBOF NVMe-oF interface. Additional disk enclosure can be connected using SAS interface incase of SAS/NL-SAS HDD, SAS SSD storage. Whereas JBOF will be used to expand storage with NVMe disks.



High Availability

APF S100 has high available internal configuration with No Single Point of Failure(NSPof) architecture and redundancy features at all levels, controllers, hot swap power supplies, PDUs, cache, links between subsystems etc. Acceleron APF S100 provides equivalent RAID protection mechanism for RAID levels 0/1/10, 4/5/6. Acceleron APF S100 support different RAID groups within one storage system. There are dual storage and file redundant controllers in active active mode with automatic fail over to each other in case of failure. The same controller pair should provide all the required functionality of NAS. APF S100 an enterprise class storage array that guarantees 99.9999% high availability. For NAS protocols such as NFS and SMB/CIFS it will take minimum 30 seconds delay while failover, but it won't result in any data loss.

APFS allows you to organize your storage hardware into failure groups. A failure group is defined as a set of disks that share a common point of failure that could cause them all to become simultaneously unavailable. Replication in APFS ensures that there is a copy of each block of replicated data and metadata on disks in different failure groups., APFS fails over to the replicated copies in another failure group

Storage Array Capacity Expansion

Acceleron APF S100 has a two controllers and it is called its base units and the base unit, expansion disk enclosures and disks are interconnected with multiple SAS-2 backend links with failover. From both the controllers SAS cables links will be connected to external expansion disk enclosure and within disk enclosure enterprise class and dual-ported disks are connected. The base unit and disk expansion units are seamlessly connected in RAID configurations. RAID groups and LUNs are spanned across the enclosures. Acceleron APF S100 storage supports configuring volumes/ LUNs across all the disks. Acceleron APF S100 storage supports more than 500 dual-ported disk drives without any replacement or upgrade of controllers with 5 external disk enclosures.

Disk Type Support

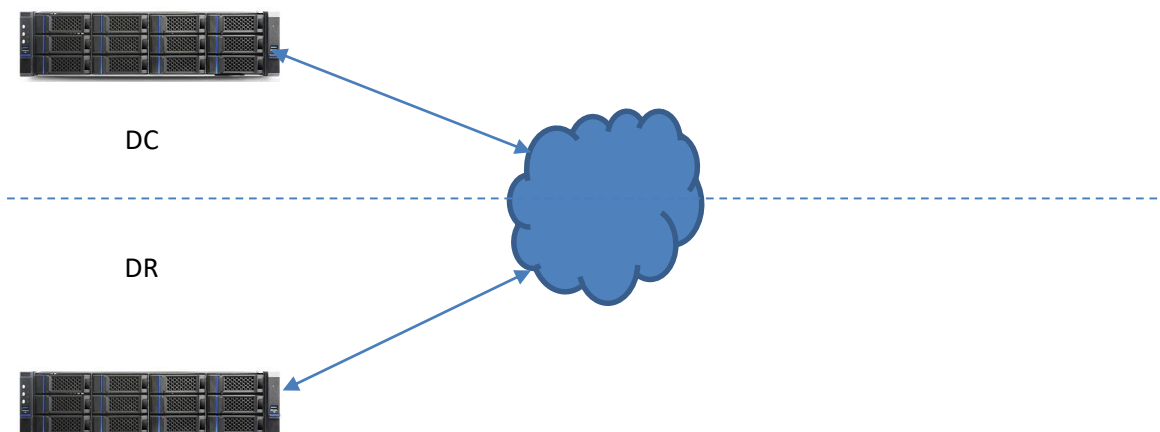
Acceleron APF S100 supports SSD, SAS & SATA/ NL-SAS disks and enclosures within same storage system. Acceleron APF S100 supports configurable hot spare support. User will be able to configure the homogeneous disks as hot spare for a storage disk cluster. Acceleron APF S100 support Global hot spare and it can be assigned to any disk cluster. There is a provision to define/ configure the required RAID levels, RAID groups, data & parity disks and global hot spare disks allocation.

Access Client Systems and Protocol Support

Acceleron APF S100 supports heterogeneous client operating systems on both block and file which include all popular flavors of Windows, Linux and virtualization hypervisors (VMware, Xen, Hyper-V, etc.). Acceleron APF S100 can be configured with PFS, NFS, SMB clients. It provides multiple levels of access control including role-based security and auditing and also support Active Directory and LDAP integration. It also provides user/group/directory based file system quotas with access controls, It supports concurrent access using PFS/ NFS/ SMB on each file system.

Local and Remote Replication Support

Acceleron APF S100 supports The on- & off-site Data Protection feature allows users to back up and restore crucial company data in case of an unexpected disaster due to a combination of several technologies. This backup-focused feature enables creating consistent snapshots and asynchronous snapshot replication to local and/or remote destinations. The replication tasks can be set according to the specific user requirements thanks to advanced retention plans. On- and Off-site Data Protection is very flexible, as it covers a wide range of disaster recovery plans without the need to use additional third party tools.



Auto-Tiering Support

Acceleron APF S100 supports cache tiering feature which implements auto-tiering feature, during setup user can specify different Tiering options to setup a volume based on the type of storage available in the storage box. It helps the administrator to setup a dynamic and automatic placement/ movement of data across the right disk storage tiers based on defined policies configured during initial configuration.

Storage Management

Acceleron APF S100 has management software (Web GUI, CLI) for configuring, managing & administering file storage and associated functionalities including deployment, automation, provisioning, protection and continuous system monitoring, auditing, advanced remote diagnostics. Acceleron APF S100 support Web based, Email facility for remote services to report errors and warnings.

Storage pools with a collection of disks or RAID's with similar properties that are managed together as a group and Policies files can be assigned to a storage pool based on defined policies that includes, Placement policies and File management policies. The file sets provide a method for partitioning a file system and allow administrative operations

LAN Management

Acceleron APF S100 give dedicated management Ethernet port for management for the storage. It supports Ethernet Trunking and link aggregation for both management and Datapath Ethernet interfaces.

ACCELERON AUS Hardware Specifications	
Form factor	<ul style="list-style-type: none"> • 2U/4U, 19" rack mount • Dimensions (WxDxH) – 438 x 658 x 174 (mm)
Processor subsystem	<ul style="list-style-type: none"> • Single /Dual Controller (configured at purchase) • One node failure tolerance • 2 x Intel Xeon Processor upto 165W • From 128GB to 1TB RAM • Support Intel® Optane™ DC Persistent memory • Intel® C621 chipset
Max Physical Storage	<ul style="list-style-type: none"> • NLSAS HDD 384TB in 2U or 640TB in 4U • NMVe SSD 154TB in 2U or 308TB in 4U • SAS HDD 57.6TB in 2U or 114 TB in 4U • SAS SSD 364TB in 2U or 640TB in 4U • It can scale more than 4PB with additional disk enclosures

Read Cache Size	<ul style="list-style-type: none"> 480GB Intel® Optane™ NVMe
<h3>ACCELERON AUS Software Specifications</h3>	
Storage Architecture	<ul style="list-style-type: none"> HDD + Optional R/W Cache SSD + NVMe R/W Cache
Storage Operating System	<ul style="list-style-type: none"> Dedicated Storage System and Linux OS (debian) optimized for SAN and NAS.
Storage Technology	<ul style="list-style-type: none"> SATA SAS NL-SAS SSD NVMe
Read Cache Technology	<ul style="list-style-type: none"> SAS SSD, NV-DIMM
Enterprise File System	<ul style="list-style-type: none"> LustreFS Block File System
Data Management	<ul style="list-style-type: none"> Snapshots Replication Rollback Clones Encryption (optional) Mirroring RAID levels: 0, 1, 5, 6, 7.3, 10, N+M, 50, 60, and 70
Data Reduction	<ul style="list-style-type: none"> Thin Provisioning Compression Clones De-duplication
Access Protocol	<ul style="list-style-type: none"> SMB (optional) CIFS (optional) NFS (optional) NVMe-oF POSIX Lustre FS
Administration	<ul style="list-style-type: none"> Unlimited number of users, groups, NICs or HDDs English, German and Japanese language Tuning Tools for advanced administrators Remote Access Console Automated update and rollback to previous OS version Task and Schedule Manager Command Line Interface (CLI) and WebGUI Save and restore settings Connection status and session management
Network management	<ul style="list-style-type: none"> DHCP Client

	<ul style="list-style-type: none"> • Teaming / Bonding (including Adapter Fault Tolerance) • Proxy Settings • Jumbo Frames • Static Routing Manager • IPv6 Support
Storage management	<ul style="list-style-type: none"> • Software and Hardware iSCSI Initiator • Software RAID 0, 1, 4, 5, 6, 10 • Fibre Channel HBA support (initiator and target mode) • Multiple snapshots (multiple active snapshots - one LV at a time) • Logical Volumes and Groups • Online Logical Volume Expansion • Online RAID Capacity Expansion • Support for Automatic Session Reassignment (ASR) for FC and iSCSI protocols
Storage management/replications	<ul style="list-style-type: none"> • Synchronous Volume Replication over LAN • Asynchronous Data (file) Replication over LAN and WAN • Dynamically managed re-sync bandwidth of Volume Replication
Monitoring	<ul style="list-style-type: none"> • Hardware monitoring • S.M.A.R.T - monitoring system for hard disc drive failures • SnMP v2, v3 • Performance for IOPS, throughput, latency • Able to monitor controllers, disk pools, NFS shares, drives.
Data optimization	<ul style="list-style-type: none"> • RAM, SSD and HDD hybrid pool • Tiered Caching • Unlimited Snapshots (Support ROW algorithm) • Unlimited Clones (Support COW algorithm) • Thin Provisioning • Over Provisioning • Inline Data Deduplication • Inline Compression
Management	<ul style="list-style-type: none"> • CLI • SNMP and REST API • E-mail notification Roll-back to previous configuration • Remote Diagnostics from CLI
Examples of supported HA configurations	<ul style="list-style-type: none"> • Dual controller Lustre storage • Cluster with multiple Disk Enclosures over NVMe-OF, SAS or FC
LUN support	<ul style="list-style-type: none"> • Support more than 10000 LUNS • Support online LUN expansion
Firmware Upgrade	<ul style="list-style-type: none"> • Non-disruptive online and offline firmware upgrade support for S100 controller and Disk controllers(HBA)
IOPS	<ul style="list-style-type: none"> • NVMe Storage with 24 NVMe SSD configuration, S100 achieves more than 600K IOPS@8K block size • NVMe Storage based S100 achieves Maximum 30GBps read and 30GBps Write with multiple clients

	<ul style="list-style-type: none"> • IOPS and throughput varies based on hardware configuration. Refer BOM for these parameters for certain configuration
Predictive analysis	<ul style="list-style-type: none"> • Smart based predictive analysis to detect the drive failure and subsequent data cloning support.
Front Control	<ul style="list-style-type: none"> • Power button • System reset button
Front I/O Ports	<ul style="list-style-type: none"> • 2 x USB 3.0
Visual Indicators	<ul style="list-style-type: none"> • Power • UID • LAN activity • HDD status
Rear Panel	<ul style="list-style-type: none"> • 10 x10Gbps Network interfaces (BaseT/SFP+) -Auto negotiating 1/10Gbps Ethernet Interfaces • 2 x100Gbps Infiniband (Supported for AUS S100-IB model only) • 4 x40Gbps /4 x100 Gbps Network interfaces • 4 x 10Gbps iSCSI SFP+ ports • 4 x 1Gbps Base-T for management ports • 1 x IPMI interface (10/100/1000 Base-T) • 1 x VGA • 1 x DB-9 (serial port)
Fibre Channel	<ul style="list-style-type: none"> • 16 x 16/32 Gbps FC ports. Auto negotiating 8/16Gbps FC interface
SAS Interface	<ul style="list-style-type: none"> • External SAS Interface for Additional Disk Enclosure
JBOF (NVMe-oF)	<ul style="list-style-type: none"> • External JBOF interface for additional Disk Enclosure connection
Hardware Encryption	<ul style="list-style-type: none"> • Supports Disk drive based encryption such as FP140-2 certified disks, SEDs etc
Drive bays	<ul style="list-style-type: none"> • 2U 24 x 3.5" SAS/SATA or 24 x 2.5" SATA/SAS disks (configured at purchase) • Expanded using with external Disk enclosures, expand upto 500 x 3.5" SAS/SATA or 500 x2.5" SAS/SATA disks disks (configured at purchase) • In all Flash or Hybrid storage combination, 24 x NMVE U.2 drives will be populated in 2U Enclosure (configured at purchase)
Power	<ul style="list-style-type: none"> • 2 (1+1) CRPS (80+ Platinum), 200-240V, 50Hz AC Supply
Cooling	<ul style="list-style-type: none"> • 80 x 25/38mm internal fans
Temperature	<ul style="list-style-type: none"> • Operating: 10°C to 35°C (50°F to 95°F) • Non-operating: -40°C to 70°C (-40°F to 158°F)
Weight	<ul style="list-style-type: none"> • 15Kg
Operating System	<ul style="list-style-type: none"> • Linux
Warranty	<ul style="list-style-type: none"> • 1/2/3/5 years options are available



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