STONEFLY | The Original Innovator of the iSCSI Protocol

StoneFly S3 Object
Solution Brief

S3
Cloud-native S3 object storage

Cloud Connect to AWS, other S3 clouds, or StoneFly Cloud

STONEFLY
Powered by 8th gen patented storage OS

S3 Object Storage Appliances

On-premises S3 object storage appliances powered by 8th gen patented storage OS and integrated with data protection, storage optimization, cloud connect, and advanced monitoring features.

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About StoneFly, Inc.

The Beginning

StoneFly's journey started with the creation of the iSCSI storage protocol and the registration of the domain name "iscsi.com" in March 1996. Headquartered in Silicon Valley (Hayward, California), StoneFly was among the first to manufacture and ship iSCSI storage appliances in 2002. Ever since, StoneFly has contributed in making the iSCSI protocol into the globally standard storage protocol used by industry professionals across the globe.

Our Vision

StoneFly was founded with the singular vision of delivering simple and affordable enterprise grade data management solutions to SMBs, SMEs, and large organizations worldwide.

Wide Range of Enterprise Products – Physical Servers & Cloud-Based Solutions

This vision has guided innovation at every step of the way and enabled StoneFly to introduce several enterprise-grade storage solutions such as NAS, SAN, Unified (NAS, SAN and Object), and Hyperconverged Infrastructure (HCI). StoneFly also stepped into the backup and disaster recovery market with purpose-built unified server and storage hyperconverged backup solutions capable of delivering reduced RTPOs for enterprise workloads.

With more than two decades in the industry, StoneFly has now built a wide range of enterprise products and solutions that extend beyond physical solutions and also include serverless and cloud-based offerings. Our strategic technology partnerships with Veeam, Microsoft Azure, Amazon AWS, and other industry leaders has enabled us to offer cloud storage, cloud backup, cloud storage gateways, and data migration solutions to our customers worldwide.

Our Patents

All StoneFly physical and virtual data management solutions are protected by StoneFly storage virtualization patents as certified by the United States Patent and Trademark Office (Patent#: 7302500, 7555586, 7558885, 8069292).

Our Memberships

StoneFly is a member of the Storage Networking Industry Association (SNIA) and the founding member of the IP Storage Institute (IPSI).

Our Partnerships

StoneFly has longstanding partnerships with industry giants such as Veeam, Microsoft, Amazon, VMware, and several others.

A brief list of StoneFly partnerships is as follows:

Veeam

- Veeam Technology Alliance Partner
- Veeam Cloud Service Provider (CSP)

Microsoft

- Certified Microsoft Azure Marketplace Partner
- Microsoft Cloud Solution Provider (CSP) Partner
- Microsoft Government Cloud Service Provider Partner

VMware

- VMware TAP Advanced Partner
- VMware Professional Solution Provider

Amazon

- Amazon AWS Technology Partner

Chapter 1:

Storage Hardware Overview

StoneFly data storage solutions support a number of hardware architectures facilitating a variety of enterprise and SMB use-cases. In this chapter, we take a closer look at these storage hardware architectures, the different key components within the hardware, supported storage drives, and the maximum storage capacities of the available storage appliances.

1.1   Available Storage Hardware Architectures

StoneFly storage appliances support the following hardware architectures:

Key Hardware Components of StoneFly Storage Appliances

Before exploring the aforementioned hardware architectures, it is important to know about the four key components of StoneFly storage appliances:

- Storage Controller (SC)
- RAID Controller (Integrated Solutions)
- Expandable Bunch of Drives (EBODs)

Storage Controller
Storage Controller (SC)

The storage controller is a hardware component that functions as the management layer for the storage system.

The StoneFly storage OS (StoneFusion) is configured on a dedicated SSD or PCI-E based NVMe SSD (depending on the product model and series) which runs independently of the data storage.

RAID Controller

The high-performance hardware Redundant Array of Independent Disks (RAID) controller configures multiple drives (depending on the configured RAID level) to work as redundant drives for fault-tolerance and high availability. Supported RAID levels depend on the appliance series and model.

	I-Series	D-Series	XS-Series	XD-Series
RAID Controller	Standard	Standard	Standard	Standard
RAID Cache Battery Backup	**4 and 6-bay:** Not Supported	**4-bay to 6-bay:** Not Supported	Standard	Standard
	8-bay & higher: Optional	**8-bay & higher:** Standard		

Expandable Bunch of Drives (EBODs)

EBODs are storage expansion units compatible with most StoneFly storage solutions. EBODs are used to add more storage capacities to existing StoneFly appliances (scale up or vertical scaling). With support for enterprise SAS drives, StoneFly EBODs enable users to set up multi-tiered storage capacities with their existing storage infrastructure.

For more information, please refer to sections 2.2.

Available Form Factors for EBODs

EBODs for Integrated Hardware with support for 3.5" enterprise SAS drives and SSDs:

- 12-bay 2U 12Gb SAS Expansion Unit
- 16-bay 3U 12Gb SAS Expansion Unit
- 24-bay 4U 12Gb SAS Expansion Unit
- 44-bay 4U 12Gb SAS Expansion Unit
- 60-bay 4U 12Gb SAS Expansion Unit

EBODs for Integrated Hardware with support for 2.5" enterprise SAS drives and SSDs:

- 24-bay 2U 12Gb SAS Expansion Unit

For the hardware specifications of integrated appliance EBODs, please refer to section 2.2.

1.1.1　Integrated Storage Appliances

The integrated storage appliance hardware architecture delivers the "storage in a box" experience. This hardware architecture is comprised of a single hardware chassis with built-in SC, RAID Controller (if any), and storage drives.

StoneFly integrated appliance hardware supports 6Gb SATA (4-bay and 6-bay I-Series & D-Series appliances only), enterprise 12Gb SAS 7200RPM, 10k RPM, and 15k RPM drives, and enterprise 12Gb SAS SSDs with storage capacities ranging from a few terabytes to multiple petabytes.

Available Integrated Appliance Form Factors

Integrated appliances that support 3.5" 6Gb SATA hard drives:

- 4-bay Mini-Tower (I-Series & D-Series)
- 6-bay 2U Rackmount (I-Series & D-Series)

12-bay 2U 3.5" Rackmount

Integrated appliances that support 3.5" 12Gb SAS drives & SSDs:

- 8-bay 2U Rackmount
- 12-bay 2U Rackmount
- 16-bay 3U Rackmount
- 24-bay 4U Rackmount
- 36-bay 4U Rackmount

Integrated appliances that support 2.5" 12Gb SAS drives & SSDs:

- 24-bay 2U Rackmount

Note: Supported integrated appliance form factors vary depending on the storage solution. For more information, please refer to the **Hardware Specifications** section of the relevant StoneFly storage product or contact StoneFly pre-sales engineers.

1.1.2　Dual-Node Shared Nothing Storage Systems

StoneFly dual-node shared nothing storage systems are comprised of two synchronized integrated appliance nodes. This hardware configuration is built to deliver fault-tolerance and high-availability in the event of the complete hardware failure of an entire integrated appliance node.

This high-availability hardware configuration leverages the StoneFly storage OS to replicate data between the two appliance nodes in real-time thereby creating redundant copies of data.

In the event of hardware failure of a single integrated appliance node, the system automatically fails over to the secondary node, delivering a disruption-free storage experience while the

primary system is repaired. This makes this configuration the best fit for enterprise environments that cannot tolerate downtime and are looking for storage systems that do not have a single point-of-failure.

Clustering

Failover

Failback

Primary On-Site Storage

Secondary On-Site or Off-Site Storage
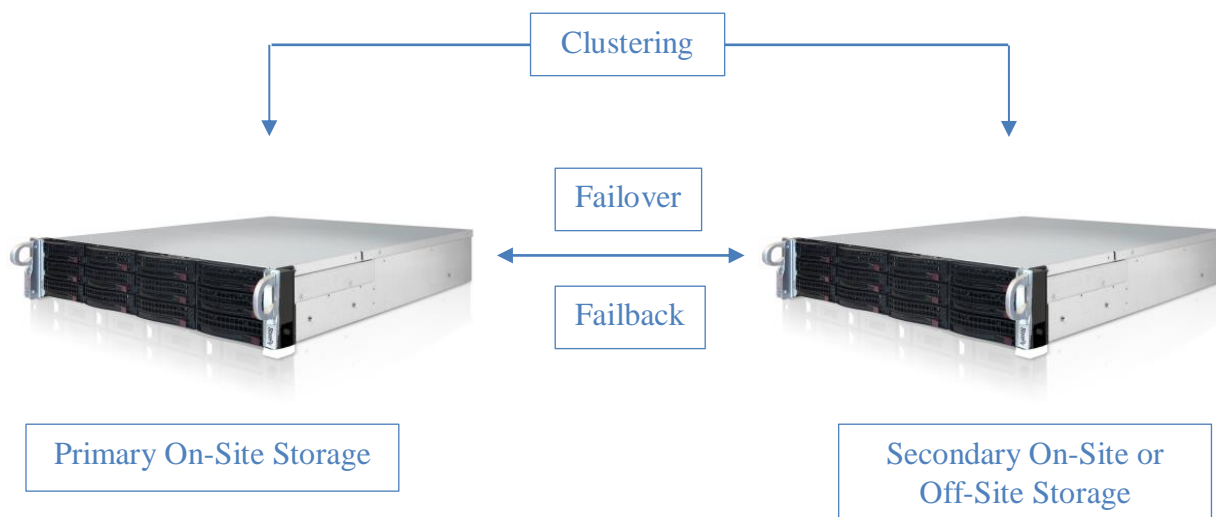
Note: The available form factors, appliance models and hardware components of the dual-node shared nothing storage systems are the same as the integrated appliance hardware architecture. The only difference between the two is that integrated appliances are comprised of a single hardware chassis whereas the dual-node shared nothing solution use two synchronized integrated appliances.

1.1.3   Scale Out Storage Systems

Scale out storage systems start with three integrated appliance nodes. As the name suggests, StoneFly scale out hardware architecture is built to deliver the ability to scale out to virtually an unlimited number of appliance nodes for petabytes of storage capacity.

+   +

Scale Out Storage System – 3 x 12-bay 2U Integrated Appliance Nodes

Each integrated appliance node has a built-in processor, SC, RAID controller and storage drives. The total workload is aggregated over the total number of appliance nodes in the storage system. The addition of each new scale out node delivers a gradual increase in performance, along with an increase in storage capacity. The ability to dually scale makes scale out storage systems the perfect fit for business environments that process and store big data.

Note: The available form factors, appliance models and hardware components of the scale out storage systems are the same as the integrated appliance hardware architecture. The only difference between the two is that integrated appliances are a single hardware chassis whereas the scale out storage systems are comprised of at least three integrated appliance nodes.

1.2   Supported Storage Drives

Following is a list of storage drives supported by StoneFly storage appliances.

3.5" Enterprise Drives	
12Gb 7200RPM SAS	4TB, 6TB, 8TB,10TB, 12TB, 14TB, 16TB
6Gb 7200RPM SATA **(4 and 6-bay I-Series & D-Series)**	2TB, 4TB, 6TB, 8TB, 10TB, 12TB, 14TB, 16TB

2.5" Enterprise Drives	
12Gb 10k SAS	1.2TB, 1.8TB, 2.4TB
12Gb 15k SAS	600GB, 900GB
12GB SAS SSD (1x DWPD)	960GB, 1.9TB, 3.8TB, 7.6TB
12GB SAS SSD (3x DWPD)	800GB, 1.6TB, 3.2TB, 6.4TB
12Gb SAS SSD (10x DWPD)	400GB, 800GB, 1.6TB, 3.2TB
6Gb SATA SSD (3x DWPD) **(4 and 6-bay I-Series & D-Series)**	240GB, 480GB, 960GB, 1.9TB, 3.8TB

* 2.5" Enterprise SAS drives are supported in most StoneFly appliances supporting 3.5" Enterprise SAS drives when combined with a special converter or tray.

1.2.1 Raw Storage Capacities for StoneFly Storage Appliances

The following is a measure of the raw storage capacities of StoneFly storage appliances. The usable and effective storage capacities differ based on the configured RAID and optional deduplication features.

All StoneFly D, XS and XD-Series integrated appliances with 12-bays or larger are capable of **scaling up** to 256 drives per appliance node when combined with StoneFly expansion units.

All StoneFly appliances can **scale out** to a virtually unlimited number of appliance nodes and corresponding storage capacities.

Raw Storage Capacities (Integrated Appliances, Dual-Node Shared Nothing, Scale Out Systems, & EBODs)

4-Bay Mini Tower (3.5")	6Gb 7200 RPM SATA	64TB
	6Gb SATA SSD (3x DWPD)	15.2TB
6-Bay 2U Rackmount (3.5")	6Gb 7200 RPM SATA	96TB
	6Gb SATA SSD (3x DWPD)	22.8TB
8-Bay 2U Rackmount (3.5")	12Gb 7200 RPM SAS	128TB
	12Gb 10k RPM SAS	19.2TB
	12Gb 15k RPM SAS	7.2TB
	12Gb SAS SSD (1x DWPD)	60.8TB
	12Gb SAS SSD (3x DWPD)	51.2TB
12-Bay 2U Rackmount (3.5")	12Gb 7200 RPM SAS	192TB
	12Gb 10k RPM SAS	28.8TB
	12Gb 15k RPM SAS	10.8TB
	12Gb SAS SSD (1x DWPD)	91.2TB
	12Gb SAS SSD (3x DWPD)	76.8TB
16-Bay 3U Rackmount (3.5")	12Gb 7200 RPM SAS	256TB
	12Gb 10k RPM SAS	38.4TB
	12Gb 15k RPM SAS	14.4TB
	12Gb SAS SSD (1x DWPD)	121.6TB
	12Gb SAS SSD (3x DWPD)	102.4TB

24-Bay 4U Rackmount (3.5")	12Gb 7200 RPM SAS	384TB
	12Gb 10k RPM SAS	57.6TB
	12Gb 15k RPM SAS	21.6TB
	12Gb SAS SSD (1x DWPD)	182.4TB
	12Gb SAS SSD (3x DWPD)	153.6TB
36-Bay 4U Rackmount (3.5")	12Gb 7200 RPM SAS	576TB
	12Gb 10k RPM SAS	86.4TB
	12Gb 15k RPM SAS	32.4TB
	12Gb SAS SSD (1x DWPD)	276.4TB
	12Gb SAS SSD (3x DWPD)	230.4TB
44-Bay 4U Rackmount (3.5") [EBOD only]	12Gb 7200 RPM SAS	704TB
	12Gb 10k RPM SAS	105.6TB
	12Gb 15k RPM SAS	39.6TB
	12Gb SAS SSD (1x DWPD)	337.9TB
	12Gb SAS SSD (3x DWPD)	281.6TB
60-Bay 4U Rackmount (3.5" [EBOD only]	12Gb 7200 RPM SAS	960TB
	12Gb 10k RPM SAS	144TB
	12Gb 15k RPM SAS	54TB
	12Gb SAS SSD (1x DWPD)	456TB
	12Gb SAS SSD (3x DWPD)	384TB
24-Bay 2U Rackmount (2.5")	12Gb 10k RPM SAS	57.6TB
	12Gb 15k RPM SAS	21.6TB
	12Gb SAS SSD (1x DWPD)	182.4TB
	12Gb SAS SSD (3x DWPD)	153.6TB

Note: The raw storage capacities listed above are for appliances fully-populated with a single type of drive. StoneFly appliances can be configured with a combination of different drive types and capacities, thus offering variable raw storage capacities. For more information about the raw capacity of a StoneFly storage appliance, please contact StoneFly pre-sales engineers.

1.3 Network Ports

StoneFly D-Series, XS-Series and XD-Series appliances come standard with at least two 10Gb ports per node. The standard ports vary depending on the appliance series and model.

Following is a list of the supported network ports and available network port upgrade options for StoneFly I-Series (8-bay and larger), XS-Series and XD-Series integrated (including dual-node shared nothing & scale out) appliances:

1.3.1 Network Port Upgrades for StoneFly Integrated Appliances
- Dual 1Gb Copper Ports
- Quad 1Gb Copper Ports
- Dual 10Gb RJ-45 Copper Ports
- Quad 10Gb RJ-45 Copper Ports
- Dual 10Gb SR Optical Ports with 10Gb SFP+ SR Optical Transceiver Modules
- Single 10Gb LR Optical Port with 10Gb SFP+ LR Optical Transceiver Module
- Dual 10Gb SFP+ Ports (Cables/Transceiver Modules Not Included)
- Quad 10Gb SFP+ Ports (Cables/Transceiver Modules Not Included)
- Dual 40Gb QSFP+ Ports (Cables/Transceiver Modules Not Included)

Note: Available network port upgrades vary depending on the appliance series and available PCI-E slots in the appliance. For more information, contact StoneFly pre-sales engineers.

1.4   Processor, System Memory & SSD for OS

This section lists the available processors, system memory and SSD options for the OS.

Note: Standard and compatible hardware components may vary depending on the appliance series and model. Please refer to the **Hardware Specifications** of the relevant storage solution or contact StoneFly pre-sales engineers for more information.

1.4.1 Processor Options

Processor Options for Integrated Appliances

	I-Series	**D-Series**	**XS-Series**	**XD-Series**
Standard	4-Core Intel Processor	4-Core Xeon	10-Core Xeon Processor	Dual 10-Core Xeon Processors
Upgrade Options	• 6-Core Intel • 8-Core Intel	• 6-Core Xeon • 8-Core Xeon	• 8-Core Xeon • 12-Core Xeon • 16-Core Xeon • 18-Core Xeon • 20-Core Xeon • 24-Core Xeon • 28-Core Xeon	• Dual 8-Core Xeons • Dual 12-Core Xeons • Dual 16-Core Xeons • Dual 18-Core Xeons • Dual 20-Core Xeons • Dual 24-Core Xeons • Dual 28-Core Xeons

Note: The processor options listed above are also supported for the dual-node shared nothing and scale out systems.

1.4.2 System Memory Options

System Memory Options for Integrated Appliances

	I-Series	**D-Series**	**XS-Series**	**XD-Series**
Standard	8GB	32GB	32GB	64GB
Upgrade Options	• 16GB • 32GB • 64GB (8-bay or larger)	• 64GB • 128GB	• 64GB • 128GB • 256GB • 384GB • 512GB • 1TB	• 128GB • 256GB • 384GB • 512GB • 768GB • 1TB • 2TB

Note: The system memory options listed above are also supported for the dual-node shared nothing and scale out systems.

1.4.3 SSD for OS

StoneFly storage appliances use SSD or Flash for the SC and OS. This section describes in detail the standard and available upgrade options for the SSD dedicated for the OS.

Note: NVMe SSD support varies depending on appliance series (I-Series, D-Series, XS-Series & XD-Series) and solution. D-Series integrated appliances use 128GB flash only. For more information, please contact StoneFly pre-sales engineers.

NVMe SSD for OS Options – Integrated Appliances

	I-Series (8-36 bay), XS-Series, XD-Series
Standard	256GB PCI-E Based NVMe SSD for Hypervisor/OS
Upgrade Options	• 512GB PCI-E Based NVMe SSD for Hypervisor/OS • 1TB PCI-E Based NVMe SSD for Hypervisor/OS • 2TB PCI-E Based NVMe SSD for Hypervisor/OS • 3.8TB PCI-E Based NVMe SSD for Hypervisor/OS

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Chapter 2:

S3 Object Storage Solutions

In this chapter, we'll describe our on-premises S3 object data storage solutions, the available models and the hardware specifications of different appliance series and models.

2.1 S3 Object Storage Solutions

The StoneFly storage operating system (StoneFusion on bare-metal or SCVM on HCI) enables users to provision cloud-native local S3 storage repositories. The storage OS also enables users to provision S3 storage repositories in AWS cloud (or any other S3 compatible cloud) and integrate it with on-premises servers and storage infrastructure.

With our storage OS, users can:

- Provision S3 storage in AWS cloud (refer to chapter 5 for cloud storage)
- Configure local S3 storage appliances

We also offer fully provisioned cloud-native S3 storage appliances: S3 storage software + storage hardware.

 Supported Hardware Configurations:

- Integrated Appliances
- Dual-Node Shared Nothing
- Scale Out

StoneFly offers three appliance series that can be used to set up any of the above hardware configurations: I-Series, D-Series, XS-Series and XD-Series.

2.1.1   Enterprise-Grade Features of StoneFly S3 Object Storage Appliances

Standard Storage Management 64-bit Operating System Features
- Logical Volume Creation and Patented Advanced Storage Virtualization Services
- 200 iSCSI Volumes Supported with 1022 Concurrent Host iSCSI Sessions
- iSCSI/NAS Port Teaming, Failover and Load-Balancing
- Volume-Level Access Control and Dynamic Volume Management
- Support for iSCSI, NAS (CIFS/SMB & NFS Protocols), SNMP Traps, UPS, Nagios, RAID Monitoring, Call Home, VMware VAAI Support for iSCSI Volumes
- Real-Time Graphical Performance Monitoring with Tracking & Utilization Reporting
- Automated Online Volume / Storage Expansion
- Supports up to 200 iSCSI Hosts and Unlimited NAS Clients

Advanced Storage Management 64-bit Operating System Features
- StoneFly Snapshot Services with 2520 Delta-Based Snapshots per Subsystem of iSCSI Volumes and 945 Delta-Based Snapshots per Subsystem of NAS Volumes
- Mountable Read-Write (iSCSI) / Read-Only (NAS) Snapshot Volumes
- Snapshot Schedule Utility, Command Line Interface Utility, NAS Volume and Directory Quotas
- Scale Out NAS using a Single Name Space to Scale Capacity & Performance
- StoneFly Real-Time Synchronous Mirroring of iSCSI Volumes and Nodes (Campus Mirroring)
- StoneFly Synchronous Replication of NAS Volumes (Failover Cluster Only)
- Multi-Site/Multi-Appliance Replication and Unified Central Management System
- NAS Segment AES256 Data Encryption
- WORM (Write-Once, Read-Many) Compliant Policy-Based NAS Storage Support Protects Data from Deletion, Modification, Viruses & Ransomware
- Built-In Virus, Malware and Ransomware Detection and Removal for NAS Volumes
- Thin Provisioning with Space Reclamation of iSCSI Volumes
- Tiered Storage Architecture with Hardware and Software Support

Available Upgrade Options: iSCSI Asynchronous Replication (One-to-Many & Many-to-One), Hardware-Enabled iSCSI Volume Encryption, Fibre Channel SAN Target Bundle, NAS/iSCSI Data Deduplication, iSCSI Flash Cache SSD Caching, VSS Support

Highly Scalable Storage Infrastructure
StoneFly S3 object storage appliances can start from a single appliance node with terabytes of storage capacity and scale out to virtually unlimited number of appliance nodes with proportional compute capabilities and storage capacities.

The S3 storage appliances deliver cloud-like scalability and combine with the performance of on-premises systems with multi-core processors and several gigabytes to terabytes of system memory.

Local S3 Storage for Rubrik, Veeam, Commvault, Veritas, etc.

The S3 storage appliances can be configured as storage repositories for any backup software or relational database that is compatible with the industry standard S3 storage protocol.

By setting up local S3 storage appliances, StoneFly customers do not have to worry about challenges such as:

- Egress costs
- Compliance
- File size limitations
- Bandwidth / Network usage
- Server security

For details, visit the StoneFly website: https://stonefly.com/s3-object-storage

Hardware Specification – S3 Object Storage Appliance Models: I-Series

	4-bay	6-bay	8-bay	12-bay	16-bay	24-bay	36-bay
Storage OS	StoneFly StoneFusion S3 Storage Management 64-Bit Operating System						
Processor	4-Core Intel Processor (Standard) / 6 or 8-Core Intel Processor (Optional)						
System Memory	8GB (Standard) / Up to 32GB (Optional)		8GB (Standard) / Up to 64GB (Optional)				
SSD for OS	NVMe SSD Standard		256GB NVMe SSD (Standard) / Up to 3.8TB NVMe SSD (Optional)				
Fast Storage	N/A		256GB up to 3.8TB PCI-E Based NVMe SSD for Fast Data Storage (Optional)				
RAID Controller	High-Performance 6Gb SATA Hardware RAID Controller		High Performance 12Gb SAS Hardware RAID Controller (Standard) / with RAID Cache Battery Backup (Optional)				
Supported RAID Levels	RAID 0, 1, 5, 6, 10	RAID 0, 1, 5, 6, 10, 50	RAID 0, 1, 3, 5, 6, 10, 30, 50, 60				
Drive Bays	4 x 3.5"	6 x 3.5"	8 x 3.5"	12 x 3.5"	16 x 3.5"	24 x 3.5"	36 x 3.5"
Supported Storage Drives	6Gb SATA: • 7.2k, SSD		12Gb SAS: 7.2k, 10k, 15k, SSD				
Network Ports	1Gb RJ-45 Connection for Data, 1Gb RJ-45 Connection Shared for Data and Management		1Gb RJ-45 Ethernet Connection Shared for Data and Management Requires PCI-E Network Card for Data Ports (See Below)				
Available Slots for Additional Network Ports	No Additional Slots		1 PCI-E Slot for Required Network Card (1Gb RJ-45, 10Gb RJ-45, SFP+, CX4, SR Optical, LR Optical or 40Gb QSFP+); Up to 2 PCI-E Slots Can Be Used for Optional RAID Cache Battery Backup or FC SAN Target Upgrades				
Power Supplies	80-PLUS Bronze PS	High Efficiency PS	Redundant 80-PLUS Titanium Hot-Swappable	Redundant 80-PLUS Platinum Hot-Swappable	Redundant 80-PLUS Titanium Hot-Swappable PS		
Power Output/Input	250W (100-240Vac)	500W (100-240Vac)	800W (100-127Vac) / 1000W (200-240Vac)	920W (100-240Vac)	1000W (100 – 127Vac) / 1200W (200 – 240Vac)		
Form Factor	Mini-Tower	2U Rackmount			3U Rackmount	4U Rackmount	
Dimensions (H x W x D)	9.5" x 8.3" x 11"	3.5" x 16.9" x 26"	3.5" x 17.2" x 25.5"	3.5" x 17.2" x 25.5"	5.2" x 17.2" x 25.5"	7" x 17.2" x 26"	7" x 17.2" x 27.5"

Hardware Specification – S3 Object Storage Appliance Models: D-Series

	4-bay	6-bay	8-bay	12-bay	16-bay	24-bay (3.5")	36-bay	24-bay (2.5")
Storage OS	StoneFly StoneFusion S3 Storage Management 64-Bit Operating System							
Processor	4-Core Xeon Processor (Standard) / 6 or 8-Core Xeon Processor (Optional)							
System Memory	32GB (Standard) / Up to 128GB (Optional)							
SSD for OS	128GB Flash							
RAID Controller	High-Performance 6Gb SATA Hardware RAID Controller		High Performance 12Gb SAS Hardware RAID Controller with RAID Cache Battery Backup					
Supported RAID Levels	RAID 0, 1, 5, 6, 10	RAID 0, 1, 5, 6, 10, 50	RAID 0, 1, 3, 5, 6, 10, 30, 50, 60					
Drive Bays	4 x 3.5"	6 x 3.5"	8 x 3.5"	12 x 3.5"	16 x 3.5"	24 x 3.5"	36 x 3.5"	24 x 2.5"
Supported Storage Drives	6Gb SATA: • 7.2k, SSD		12Gb SAS: 7.2k, 10k, 15k, SSD					12Gb SAS: 10k, 15k, SSD
Expansion	No External Expansion		Supports up to 256 Total Drives via EBODs (4PB)					
Network Ports	Dual Bonded 10Gb RJ-45 Ethernet Connections (Standard) / Dual Bonded 10Gb SFP+ on Select 8-Core Xeon Models* (Optional) * SFP+ network upgrade option not available on 4-bay model.							
Management	Gigabit Management Port and Intelligent Platform Management Interface (IPMI) with KVM-Over-LAN							
Power Supplies	80-PLUS Bronze PS	High Efficiency PS	Redundant 80-PLUS Titanium Hot-Swappable PS	Redundant 80-PLUS Platinum Hot-Swappable PS	Redundant 80-PLUS Titanium Hot-Swappable PS			Redundant 80-PLUS Platinum Hot-Swappable PS
Power Output/Input	250W (100-240Vac)	500W (100-240Vac)	800W (100-127Vac) / 1000W (200-240Vac)	920W (100-240Vac)	1000W (100 – 127Vac) / 1200W (200 – 240Vac)			920W (100-240Vac)
Form Factor	Mini-Tower	2U Rackmount			3U Rackmount	4U Rackmount		2U Rackmount
Dimensions (H x W x D)	9.5" x 8.3" x 11"	3.5" x 16.9" x 26"	3.5" x 17.2" x 25.5"	3.5" x 17.2" x 25.5"	5.2" x 17.2" x 25.5"	7" x 17.2" x 26"	7" x 17.2" x 27.5"	3.5" x 17.2" x 24.8"

Hardware Specification – S3 Object Storage Appliance Models: XS-Series

	8-bay	12-bay	16-bay	24-bay (3.5")	36-bay	24-bay (2.5")
Storage OS	StoneFly StoneFusion S3 Storage Management 64-Bit Operating System					
Processor	10-Core Xeon Processor (Standard) / 8, 12, 16, 18, 20, 24 or 28-Core Xeon Processor (Optional)					
System Memory	32GB (Standard) / Up to 1TB (Optional)					
NVMe SSD for OS	256GB (Standard) / Up to 3.8TB (Optional)					
RAID Controller	High-Performance 12Gb SAS Hardware RAID Controller with RAID Cache Battery Backup Supports RAID Levels 0, 1, 3, 5, 6, 10, 30, 50 and 60					
Drive Bays	8 x 3.5"	12 x 3.5"	16 x 3.5"	24 x 3.5"	36 x 3.5"	24 x 2.5"
Supported Storage Drives	12Gb SAS drives: 7.2k, 10k, 15k, SSD					12Gb SAS drives: 10k, 15k, SSD
Expansion	No Ext. Expansion	Supports up to 256 Total Drives via EBODs (4PB)				
Network Ports	Dual Bonded 10Gb RJ-45 Ethernet Connections (Backwards Compatible with 1Gb)					
Available Slots for Additional Network Ports	Up to 2 PCI-E Slots Can Be Used For Optional Network Card or FC SAN Target Upgrades Optional Support for 1Gb RJ-45, 10Gb RJ-45, SFP+, CX4, SR Optical, LR Optical, 40Gb QSFP+					
Management	Gigabit Management Port and Intelligent Platform Management Interface (IPMI) with KVM-Over-LAN					
Power Supplies	Redundant 80-PLUS Titanium Hot-Swappable PS	Redundant 80-PLUS Platinum Hot-Swappable PS	Redundant 80-PLUS Titanium Hot-Swappable PS			Redundant 80-PLUS Platinum Hot-Swappable PS
Power Output/Input	800W (100-127Vac) / 1000W (200-240Vac)	920W (100-240Vac)	1000W (100 – 127Vac) / 1200W (200 – 240Vac)			920W (100-240Vac)
Form Factor	2U Rackmount		3U Rackmount	4U Rackmount		2U Rackmount
Dimensions (H x W x D)	3.5" x 17.2" x 25.5"	3.5" x 17.2" x 25.5"	5.2" x 17.2" x 25.5"	7" x 17.2" x 26"	7" x 17.2" x 27.5"	3.5" x 17.2" x 24.8"

Hardware Specification – S3 Object Storage Appliance Models: XD-Series

	8-bay	12-bay	16-bay	24-bay (3.5")	36-bay	24-bay (2.5")
Storage OS	StoneFly StoneFusion S3 Storage Management 64-Bit Operating System					
Processors	Dual 10-Core Xeon Processors (Standard) / Dual 8, 12, 16, 18, 20, 24 or 28-Core Xeon Processors (Optional)					
System Memory	64GB (Standard) / Up to 2TB (Optional)					
NVMe SSD for OS	256GB (Standard) / Up to 3.8TB (Optional)					
Fast Storage	256GB up to 3.8TB PCI-E Based NVMe SSD for Fast Data Storage (Optional)					
RAID Controller	High-Performance 12Gb SAS Hardware RAID Controller with RAID Cache Battery Backup Supports RAID Levels 0, 1, 3, 5, 6, 10, 30, 50 and 60					
Drive Bays	8 x 3.5"	12 x 3.5"	16 x 3.5"	24 x 3.5"	36 x 3.5"	24 x 2.5"
Supported Storage Drives	12Gb SAS drives: 7.2k, 10k, 15k, SSD					12Gb SAS drives: 10k, 15k, SSD
Expansion	No Ext. Expansion	Supports up to 256 Total Drives via EBODs (4PB)				
Network Ports	Dual Bonded 10Gb RJ-45 Ethernet Connections (Backwards Compatible with 1Gb)					
Available Slots for Additional Network Ports	Up to 4 PCI-E Slots Can Be Used For Optional Network Card(s) or FC SAN Target Upgrades Optional Support for 1Gb RJ-45, 10Gb RJ-45, SFP+, CX4, SR Optical, LR Optical, 40Gb QSFP+					
Management	Gigabit Management Port and Intelligent Platform Management Interface (IPMI) with KVM-Over-LAN					
Power Supplies	Redundant 80-PLUS Titanium Hot-Swappable PS	Redundant 80-PLUS Platinum Hot-Swappable PS	Redundant 80-PLUS Titanium Hot-Swappable PS			Redundant 80-PLUS Platinum Hot-Swappable PS
Power Output/Input	800W (100-127Vac) / 1000W (200-240Vac)	920W (100-240Vac)	1000W (100 – 127Vac) / 1200W (200 – 240Vac)			920W (100-240Vac)
Form Factor	2U Rackmount		3U Rackmount	4U Rackmount		2U Rackmount
Dimensions (H x W x D)	3.5" x 17.2" x 25.5"	3.5" x 17.2" x 25.5"	5.2" x 17.2" x 25.5"	7" x 17.2" x 26"	7" x 17.2" x 27.5"	3.5" x 17.2" x 24.8"

All StoneFly S3 object storage appliances come standard with NAS, iSCSI and S3 support, but can also support the following Fibre Channel (FC) SAN Target port upgrades: 2 x 8Gb, 4 x 8Gb or 2 x 16Gb FC Ports.

2.2 Expansion Units for Integrated Appliances (EBODs)

The storage expansion units or EBODs (Expandable Bunch of Drives) are used to add more storage capacity to integrated storage appliances. StoneFly integrated appliance expansion units are capable of supporting 12Gb SAS hard drives and SSDs to increase storage capacities from a few terabytes to petabytes.

All StoneFly D-Series, XS-Series and XD-Series integrated storage appliances with 12 or more internal drive bays can support up to 256 drives (including internal bays) by utilizing the following EBODs:

	24 x 2.5" 2U Expansion Unit	12 x 3.5" 2U Expansion Unit	16 x 3.5" 3U Expansion Unit	24 x 3.5" 4U Expansion Unit	44 x 3.5" 4U Expansion Unit	60 x 3.5" 4U Expansion Unit
Host Interface & Cascading Ports	12Gbps SAS Host Port and 12Gbps SAS Port for Cascading Expansion					
Drive Bays	24 x 2.5"	12 x 3.5"	16 x 3.5"	24 x 3.5"	44 x 3.5"	60 x 3.5"
Supported Storage Drives	12Gb SAS drives: 10k, 15k, SSD	12Gb SAS drives: 7.2k, 10k, 15k, SSD				
Power Supplies	Redundant 80-PLUS Platinum Hot-Swappable PS		Redundant 80-PLUS Titanium Hot-Swappable PS		Redundant 80-PLUS Platinum Hot-Swappable PS	
Power Output/Input	920W (100-240Vac)		1000W (100 – 127Vac) / 1200W (200 – 240Vac)		1000W (100-140Vac) / 1280W (180-240Vac)	1000W (100-127Vac) / 1600W (200-240Vac)
Form Factor	2U Rackmount		3U Rackmount	4U Rackmount		
Dimensions (H x W x D)	3.5" x 17.2" x 24.8"	3.5" x 17.2" x 25.5"	5.2" x 17.2" x 25.5"	7" x 17.2" x 26"	7" x 17.2" x 27.5"	7" x 17.2" x 30.2"

For more information about maximum supported storage capacities of StoneFly integrated appliances, contact StoneFly pre-sales engineers.

Chapter 3:

Contacting StoneFly

We'd love to hear from you about your projects and your data storage needs. You can contact us via email, call us, or schedule a demo directly on the StoneFly website.

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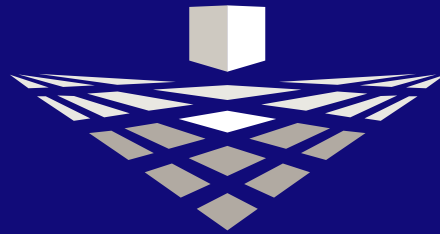
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The Original Innovator of the iSCSI Protocol