

Innovative High-Performance Solid-State Storage Solutions

The Leading Enterprise SSD Expert

Shannon SSD OCS Venice Series

Shannon Open Channel SSDs(OCS) are the first commercialized OCS implementation in industry with volume deployment in hyperscale data centers. With customized firmware and controllers, OCS have the ability to adapt to different application workloads by customizing its functionality, features, capacity and performance. Functions such as Key-Value Store, features such as Atomic Write, Namespace, and Multi-Stream are readily available by convenient software configurations.

Key-Value Store

The performance of traditional KV store highly depends on the amount of host memory utilized. Shannon's KV-Store, based on Open Channel SSD directly stores key value pair on flash, while only leaving indexes in the host memory. With the same amount of host DRAM, Shannon's KV-Store can accommodate more data than traditional KV store in memory, offering performance improvements up to orders of magnitude.

Atomic-Write

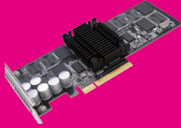
In order to ensure the data integrity under extreme circumstances, MySQL/MariaDB/Percona/InnoDB enable DoubleWrite by default. As a result, one piece of user data are written twice to the flash. Shannon's Atomic Write in Open Channel SSD implements the atomicity of DB page-write without modifications to the applications or file systems. By utilizing Atomic Writes with DoubleWrite turned off, application's access latency can be reduced by up to 50%, while increasing life expectancy of the SSDs.

Namespace

Within virtualized IT infrastructure, traditional methods for resource management such as Cgroup are used. However, these solutions are not always effective. Shannon's Open Channel SSDs allow user to create multiple namespaces to handle data from different applications. Each namespace can be configured independently on features such as capacity, performance limits and IO priority, efficiently implementing IO prioritization, scheduling and isolation.



Shannon Systems

Product Type						
		 Shannon SSD OCS Venice Series-AIC		 Shannon SSD OCS Venice Series-U.2		
Technical Parameter	Capacity	3200GB	2000GB	3200GB	3840GB	7680GB
	Flash NAND	3D TLC				
Performance	128KB Sequential Read	3.0GB/s	2.8GB/s	3.0GB/s	3.0GB/s	2.8GB/s
	128KB Sequential Write	2.7GB/s	2.2GB/s	2.7GB/s	2.8GB/s	2.2GB/s
	4KB Random Read IOPS	650k	650k	650k	650k	650k
	4KB Random Write IOPS	170k	80k	170k	140k	100k
	4KB Random Read Latency	95μs	98μs	95μs	90μs	115μs
	4KB Random Write Latency	22μs	19μs	22μs	20μs	22μs
Reliability	UBER	$< 10^{-17}$				
	MTBF	2 million hours				
	Endurance	7.4PBW	3.2PBW	7.4PBW	7.5PBW	8.5PBW
Physical	Form Factor	HL-FH PCIe			2.5-inch	
	Interface	PCIe 3.0 x 8			PCIe 3.0 x 4	
Environmental	Active Power	16W	12W	16W	16W	16W
	Idle Power	6W	5W	6W	6W	6W
	Operating Temperature	0~50°C				
	Storage Temperature	-40°C~ 90°C				
	Humidity	5%~95%				
	Altitude	3000m				
	Airflow (LFM)	750	700	950	950	950
Software Support Operation Systems		RHEL 6/7/8, CentOS 6/7/8, SLES 11/12/15, Ubuntu 14/15/16/17/18/19/20 Debian 8/9/10				
Certification		CB , RoHS , REACH		CE , FCC , CB , RoHS , REACH		

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Shannon SSD NVMe Venice Series

Highlights

- NVMe 1.3 Standard
- 190k Random write IOPS(4KB)

3D TLC NAND Flash

Powered by the latest 3D TLC technology, Shannon NVMe drives deliver lower TCO (30% or more) while maintain the same reliability and performance as the previous MLC based drives.

NVMe 1.3 Standard

Shannon NVMe drives adhere to the latest NVMe 1.3 standard and are backward compatible with the previous 1.0/1.1/1.2 standards. All mainstream operation systems such as Linux, Windows and VMWare are automatically supported without additional software installation.

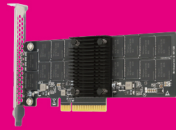
Power-loss Data Protection

Shannon NVMe drives are designed with advanced protection circuits and firmware to ensure your data in transit to be reliably programmed onto persistent media in the advent of power loss, system crash or unplanned drive removal.

High Reliability

With LDPC based and soft decode capable ECC, on driver RAID and end to end protection, Shannon NVMe drives boast MTBF of larger than 2,000,000 hours.



Product Type													
													
				Venice-E Series		Venice Series		Venice-X Series		Venice-E Series		Venice-X Series	
Technical Parameter	Capacity	1.92	3.84	2	4	1.6	3.2	1.92	3.84	1.6	3.2		
	Flash Media	3D TLC											
Performance	Sequential Read(GB/s)	3.0	3.0	3.0	3.0	3.0	3.0	5.0	5.0	5.0	5.0		
	Sequential Write(GB/s)	1.8	2.4	2.0	2.5	1.8	2.5	1.8	2.8	1.8	2.8		
	Random Read IOPS(4KB)	570k	650k	600k	600k	570k	650k	570k	650k	570k	650k		
	Random Write IOPS(4KB)	60k	80k	100k	120k	160k	190k	65k	100k	150k	180k		
	Random Read Latency(μs)	96	96	96	96	96	96	96	96	96	96		
	Random Write Latency(μs)	18	18	18	18	18	18	18	18	18	18		
Reliability	UBER	< 10 ⁻¹⁷											
	MTBF	2 million hours											
	Endurance(PBW)	2.9	5.8	3.5	7	5	10	2.9	5.8	5	10		
	Warranty	5 Years											
Physical	Form Factor	2.5-inch				HL-HH PCIe							
	Interface	PCIe 3.0*4 (NVMe)				PCIe 3.0*8 (NVMe)							
Environmental	Active power	17W	20W	17W	20W	17W	20W	15W	20W	15W	20W		
	Idle power	5W	6W	5W	6W	5W	6W	5W	6W	5W	6W		
	Operating Temperature	0~40°C				0~50°C							
	Storage Temperature	- 40°C~ 90°C											
	Humidity	5%~95%											
	Altitude	3000m											
	Airflow (LFM)	350	450	350	450	350	450	500	750	500	750		
Software Support	Operation Systems	Microsoft Windows 7-10 , Microsoft Windows Server 2008-2019 , RHEL 6-8 , CentOS 6-8 , SLES 11-15 , Ubuntu 14-20 , Debian 8-10 , VMware vSphere (ESXi) 5-7 , Citrix Hypervisor (XenServer) 6-8											
Certification	UL, CB, CE, FCC, RoHS, REACH	CE, FCC, RoHS, REACH				CB , RoHS , REACH							

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Shannon SSD Direct-IO® PCIe G5I Series

Highlights

- Largest capacity up to 32TB
- 25W peak power consumption

3D-NAND Based SSD

3D-NAND technology further increases the capacity density and lowers the TCO for enterprise SSDs. Shannon Direct-IO® PCIe Flash employs the most advanced 3D-NAND flash and exploits a scalable architecture, providing a user capacity up to 32TB in a single SSD, an industry first-ever.

Atomic-Write

Shannon Direct-IO® PCIe Flash offers atomicity for any write operation of sizes less than 32KB. It can be enabled for database applications to significantly reduce latency and increase the QoS of SSD for mission critical database applications.

Namespace: Shannon Storage Pool Management Software

Shannon Storage Pool (aka My-Space) is designed specially for the cloud storage infrastructure. It contains one or several Direct-IO® PCIe Flash, and can be divided into many logical volumes which support dynamic capacity adjustment, thin-provisioning and IOPS management.

Power-loss Data Protection

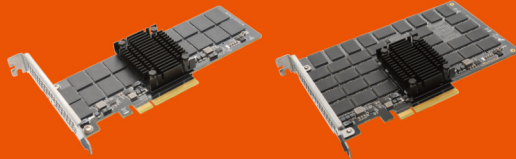
Shannon Direct-IO® PCIe Flash utilizes a DRAM-less architecture; minimum amount of SRAM buffered data are automatically and safely flushed to NAND in case of sudden power-loss, thus guaranteeing data integrity without relying on battery unit or super-capacitor.

Enterprise-grade Reliability

Advanced NAND signal processing and inter-chip flash RAID technology, guarding data with multi layers of protection; end-to-end data protection; always-on copy-on-write for data updates.



Shannon Systems

Product Type							
		Shannon SSD Direct-IO® PCIe G5I Series-AIC				Shannon SSD Direct-IO® PCIe G5I Series-U.2	
Technical Parameter	Capacity	3.2TB	6.4TB	12.8TB	32TB	3.2TB	6.4TB
	Flash NAND	3D TLC					
Performance (stable)	128KB Sequential Read	3.2GB/s	3.8GB/s	4.0GB/s	5.0GB/s	3.0GB/s	2.6GB/s
	128KB Sequential Write	1.8GB/s	2.8GB/s	2.8GB/s	3.5GB/s	1.8GB/s	1.8GB/s
	4KB Random Read IOPS	560k	620k	620k	800k	630k	640k
	4KB Random Write IOPS	210k	350k	310k	250k	210k	135k
	4KB Random Read Latency	94μs	94μs	104μs	104μs	90μs	96μs
	4KB Random Write Latency	16μs	15μs	15μs	15μs	13μs	19μs
Reliability	UBER	1 sector per 10 ⁻¹⁸ bits read					
	MTBF	2 million hours					
	Endurance	5 DWPD for 3 years					
Physical	Form Factor	HL-HH PCIe		HL-FH PCIe		2.5-inch	
	Interface	PCIe 3.0 x 8				PCIe 3.0 x 4	
Environmental	Active Power	< 25W					
	Idle Power	< 8W					
	Operating Temperature	0~50°C				0~40°C	
	Storage Temperature	-40°C~ 90°C					
	Humidity	5%~95%					
	Altitude	3000m					
	Airflow (LFM)	550	600	750	750	350	600
	Software Support	Operation Systems	Windows Server 2008/2008R2/2012/2012R2/2016/2019 x64 Windows 7/8/10 x64 RHEL 5/6/7/8, CentOS 5/6/7/8, SLES 11/12/15, Ubuntu 14/15/16/17/18/19/20 Citrix XenServer 6.5/7				
Certification		CE, FCC					

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