Huawei OceanStor 5000/6000 V5

Overview

Huawei OceanStor mid-range storage systems are comprised of multiple models, including hybrid systems and all flash systems. The hybrid systems are the 53100, 55100, 5610,and 6810 systems. The all-flash systems are the OceanStor Dorado models. These are mid-range systems with extensive features and capabilities supporting both block and file access. Huawei has delivered a succession of storage systems in the high-end, mid-range and entry levels. These systems represent a succession to their previous V3 models of these same products.

All systems support a scale-out architecture with up to 8 controller pairs, (16 controllers) connected via 100 Gb Ethernet. Storage devices in enclosures are connected with 12 Gb/s SAS. SSDs and HDDs are supported in any combination.

Connectivity for block access is through Fibre Channel, iSCSI, and FCoE. File access is over Ethernet using CIFS and NFS protocols. Block and file support is an integral capability, not requiring an additional controller function. NVMe over fabrics are supported with NVMe/FC and RoCE.

Third party storage can be virtualized behind the OceanStor system allowing centralized management of storage resources and migration of volumes for load balancing, retiring external storage systems, and conversion from thickly provisioned volumes to thin.

Advanced features of the OceanStor system include compression and deduplication, cache partitioning, quality of service controls, secure erase, dynamic tiering, and caching with SSDs. Snapshots, asynchronous and synchronous remote replication, LUN copies, and consistency groups are also included.

Highlights

- Scale-out storage system with block and file support – up to 16 controllers – (8 pairs)
- FC, iSCSI, FCoE attach for block
- CIFS/SMB and NFS support for file
- Storage virtualization of 3rd party storage
- LUN migration
- Thin Provisioning & reclamation
- Snapshots – LUN and file
- Remote Replication
- Data Reduction – deduplication and compression
- Tiering
- SSD caching

Usage

Huawei OceanStor 5000 and 6000 V5 systems are general purpose storage designed for use in multi-tenant environments and for environment with multiple workloads running on the same storage system.

Support for block and file access gives customers flexibility in deployment of applications. Capacity and performance scaling capabilities widen the usage to many environments. The availability and resiliency designed into the system plus the advanced features for data protection and business continuity allow customers to place the OceanStor system in demanding environments.

For a system targeted at the mid-range market, features such as multi-tenancy, quality of service, and end-to-end data integrity checking are unique in their combination.

- Characteristics
  - Both block and file access support.
  - Performance – Performance features added include hardware acceleration, scaling of nodes, and use of caching and solid state technology.
  - Availability – Multiple controllers provide non-disruptive HA. The scale-out architecture allows for redistribution of workload when a failure occurs.
  - Replication for BC/DR – Both asynchronous and synchronous remote replication is available as is the ability to make local and remote LUN copies.
  - Data reduction using deduplication and compression with user controls.
- Applications
  - OceanStor systems are targeted at applications that use block or file I/O.
  - The OceanStor systems include thin provisioning, snapshots and replication at no additional cost.
  - Additional cost software licenses are available and support the entire suite of software.
- System environments
  - The Huawei OceanStor systems provide block storage accessed using Fibre Channel (FCP), FCoE or iSCSI with standard drivers on host systems. File access is supported using CIFS/SMB or NFS.
- Deployment and Administration
  - The installation of OceanStor is designed for IT users familiar with storage systems. For customers without the required knowledge, reseller or Huawei service specialists can be used.
  - Management is provided through a management console for multiple nodes, a Replication Director to manage disaster recovery software, and multi-pathing software called UltraPath.
  - Remote Management and Call Home support is also available and is enabled through Huawei eService.

Evaluator Group EvaluScale™: Huawei OceanStor Midrange 5000/6000 - SAN Storage

Evaluator Group product review methodology "EvaluScale" assesses each product within a specific technology area. The definitions of the criteria and explanations of how products are reviewed can be found in the **Evaluation Guides**.

	Criteria	Description	Requirement	EG View of OceanStor	Explanation for OceanStor
1	Capacity	Current capacity of system to meet demand	Must have enough capacity to meet current demand and have ability to scale-up – adding more capacity up to a practical limit.	Meets requirements	Scale out system can reach extremely large capacity.
2	Price – including data reduction	Cost of system. This includes data reduction effect – compression/deduplication	Must be competitive with other leading solutions in this space meaning prices have no more than 20% variance from an average of the other solutions. This includes the effect of data reduction according to the Evaluator Group Data Reduction Estimator tool.	Meets requirements	Inline compression and deduplication reduces cost to store data.
3	Performance	Latency IOPs Bandwidth	The performance requirement can vary based on high-end, mid-tier or entry-level usage. Requirements are that the system be within 10% of the top numbers for products in this class using SPC or IOMARK benchmarks.	Meets requirements	Has SPC numbers but no IOMARK numbers. Scale out increases performance.
4	Scaling – performance and capacity	Ability to increase to meet future demands	Scale-out means scaling both performance and capacity to meet demands up to a practical limit – more capacity without sacrificing performance by crippling the access density.	Exceeds requirements	Has scale-out capability up to 16 controllers (8 pairs)
5	Security – encryption	Data at rest encryption and key management	Data encryption is a perceived requirement across different usage categories for many industries and applications. The high-end enterprise requires an external key manager. A key manager also is a positive factor for the mid—tier.	Area for development	Have encryption with internally managed keys.
6	Data protection	Snapshots – R/W, large number Synchronous replication Asynchronous replication Tiering to clouds	Read/write snapshots are a requirement with a number that roughly equals the number of LUNs supported. The high-end enterprise requirement for remote replication is for both synchronous and asynchronous technology while mid-tier and entry usage require asynchronous. Tiering to clouds may be a benefit to all segments but would only be a requirement in the high-end enterprise.	Meets requirements	Full complement of advanced features other than tiering to cloud for data protection or migration. Has built-in storage virtualization

7	Business continuity	Active-active stretched clusters	The high-end enterprise generally requires active-active stretched clusters. Some mid-tier environments will need that as well but would not be a current requirement but could be a differentiator.	Meets requirements	Has stretched clusters for business continuity
8	Economic considerations	Warranty Evergreen updating Environmentals – power & space Simplicity for admin	The overall environmental footprint being roughly on par with other leading systems in this area is the requirement measure. An extended warranty period for devices and an evergreen program for the controllers in the case of an all-flash system is now a requirement given the competitive nature.	Area for development	Not that simple for use. Standard warranty and no evergreen program for controllers.
9	Storage technology	Use of solid state technology as storage devices and for caching	The requirement is for the system to support solid-state technology for at-rest storage and to have an extension cache using solid-state storage technology.	Exceeds requirements	Uses latest technology SSDs for best economic value. Does support NVMe and SCM.
10	Application / system integration	VMware VAAI, VASA, SRM, etc. and Microsoft ODX, SCOM integration	Given the pervasiveness of hypervisor use in server virtualization, the integration for storage primitives and management is a requirement.	Meets requirements	Has full integration with major application / system software.

Evaluator Group EvaluScale™: Huawei OceanStor 5000 & 6000 - NAS Usage

	Criteria	Description	Requirement	EG View of OceanStor Midrange	Explanation for OceanStor Midrange
1	Capacity	Current capacity of system to meet demand Number of file systems & Maximum number of files	Must have enough capacity to meet current demand and have ability to scale-up – adding more capacity up to a practical limit. The number of files systems, the maximum size and number of files may be critical in many environments.	Meets requirements	File system size of 256TB meets most needs. 32 billion files per filesystem exceeds requirements. Largest model can have 1,500 filesystems.
2	Price – including data reduction	Cost of system. This includes data reduction effect – compression/dedup lication or single instancing	Must be competitive with other leading solutions in this space meaning prices have no more than 20% variance from an average of the other solutions. This includes the effect of data reduction according to the Evaluator Group Data Reduction Estimator tool.	Meets requirements	Inline compression and deduplication reduces cost to store data.
3	Performance	Bandwidth SPECsfs file operations per second. Automatic load and capacity balancing TCPIP accelerator	The performance requirement can vary based on high-end, mid-tier or entry- level usage. Requirements are that the system be within 10% of the top numbers for products in this class using SPEC. Balancing I/O for performance and capacity should be a requirement for each product.	Area for development	No recent information is available. Will require testing to assure system will meet the requirements.
4	Connectivity	Number of ports for access Type of port – 10GigE, 40GigE and 100GigE.	The number and type should meet current and planned infrastructure requirements.	Meets requirements	Up to 20 10GigE connections per controller pair is more than usual in mid-tier.
5	Scaling – performance and capacity	Ability to increase to meet future demands Maximum number of nodes supported	Scale-out means scaling both performance and capacity to meet demands up to a practical limit – more capacity without sacrificing performance by crippling the access density.	Exceeds requirements	Scale out with up to 8 controllers.

6	Protocols and sharing support	NFS, CIFS/SMB, HTTP, FTP, file sharing type between protocols	Protocols should include both NFS and CIFS/SMB – with a native SMB3 implementation. File sharing between protocols is a basic requirement.	Area for development	SAMBA at SMB2 – needs native SMB3. NFSv3.
7	Security	LDAP, AD, NIS. File level locks, TLS, IPSEC Data at rest encryption and key management	Both LDAP and AD are basic requirements. File level locking is a security and integrity issue. Encryption and external key management may be a requirement in some environments. This also includes encrypted communications.	Area for development	No file sharing or locking. No encryption
8	Data protection	Snapshots – file based or filesystem Asynchronous replication NDMP support	Read/write snapshots are a requirement with a number that roughly equals the number of filesystems supported. An added bonus is the ability to snapshot individual files. The high-end enterprise requirement for remote replication is for both synchronous and asynchronous technology while mid-tier and entry usage require asynchronous. NDMP for data protection is a basic requirement. Snapshot or tiering to cloud/object storage may be a benefit to all segments but would only be a requirement in the high-end enterprise.	Meets requirements	Snapshots of filesystems with file-level restore. Async periodic replication along with NDMP support
9	Economic considerations	Warranty Evergreen updating Environmentals – power & space Simplicity for administration	The overall environmental footprint being roughly on par with other leading systems in this area is the requirement measure. An extended warranty period for devices and an evergreen program for the controllers in the case of an all- flash system is now a requirement given the competitive nature. Simplicity for administration is a basic requirement.	Area for development	Not very simple for use. Standard warranty and no evergreen program for controllers.
10	Advanced features	Automatic migration to clouds / file shares with stubbing and recall S3 object API Multi-tenancy isolation Regulatory compliance features	File tiering to another mount point or clouds/S3 is a competitive issue and a growing requirement but not currently required. Support as a target for objects using S3 is not a requirement as object storage provides a better solution. Multi-tenancy isolation is a requirement in large NAS system environments and for consolidation in enterprises but not usually in the mid-tier or entry. Regulatory compliance features is specific to certain environments and not a general requirement.	Area for improvement	No file migration to clouds. Has WORM mode but no other compliance capabilities.

Evaluator Group Opinion: Differentiating elements for Huawei OceanStor Midrange

Huawei OceanStor midrange 5000/6000 V5 systems are a unified SAN and NAS system where the file serving function is integral to the system. All of these system support scale-out configurations up to 16 controllers. A full suite of advanced features is also available including storage virtualization of externally attached systems. The system does not support tiering of LUNs to clouds/object storage or file-based tiering. The features of the NAS implementation are not up to the level of native NAS systems and the explanations of the capabilities are somewhat unclear.

The Huawei systems suffers from lack of distribution in North America, which would expand opportunities and help with maturity from competitive demands. Currently, there is no encryption, which has become a checkbox item. Evaluator Group would like to see more customer use cases and experience with the system for a better understanding of maturity of the system and its features. Little information is available from Huawei marketing personnel.

Information that is more detailed is available at **http://evaluatorgroup.com**