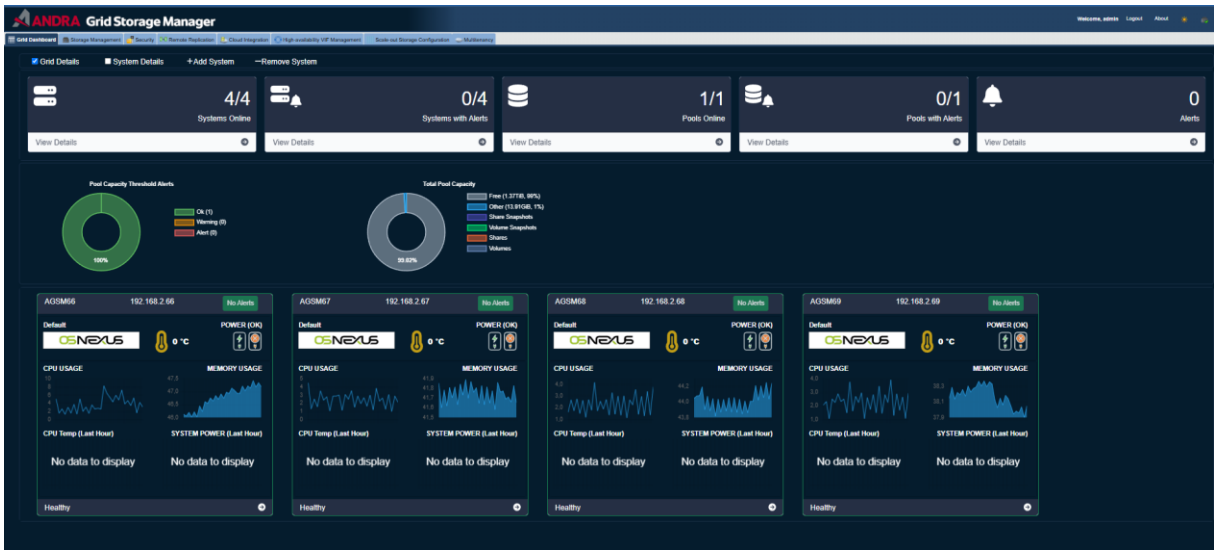
STORANDER File One Platform

The STORANDER File One Platform combines state-of-the-art file (NFSv4, SMB/CIFS 3.1) and block (iSCSI, NVMe-oF) storage access. It is built on STORANDER hardware using Supermicro Storage Super Server platforms with dual Intel® Xeon® 6 CPUs, Intel and NVIDIA/Mellanox Ethernet adapters, and STORANDER software — the ANDRA Grid Storage Manager (AGSM) environment (Powered by OSNEXUS).



STORANDER File One Platform is designed and built for **24×7** operations. All approved components are thoroughly validated, and the platform architecture eliminates any **Single Point of Failure (SPOF)**. The solution is engineered for the most critical, demanding workloads in the enterprise. **On-site 24×7 hardware maintenance and software support for five years** are standard and included with the STORANDER File One Platform.

ANDRA Grid Storage Manager (AGSM) is a unified, software-defined storage platform that provides file and block services for a broad spectrum of application workloads. Built on a unique storage-grid architecture, AGSM delivers federated management across all systems, enabling multiple storage clusters—spanning multiple sites—to be administered within a single grid. This gives IT organizations the flexibility to reduce costs while increasing security, performance, and uptime.

Grid technology. AGSM's storage-grid architecture provides unified management of AGSM servers and clusters. Grid management is built into every system, allowing administrators to log in to any node and manage the entire grid without installing or maintaining additional software. Each grid can scale beyond **100 PB** and may include multiple scale-out and scale-up storage clusters.

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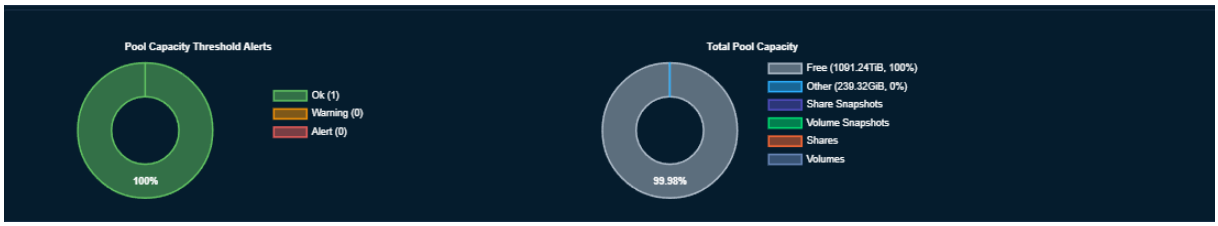

Storage grids can span multiple sites and datacenters. **AGSM** includes advanced access control, encryption, and security compliance capabilities.

AGSM management is available through a **GUI (Graphical User Interface)**, **CLI (Command Line Interface)**, and **API (Application Programming Interface)**. The system supports **role-based access control (RBAC)**, allowing administrators to assign roles with defined access levels.

Flexible storage layout tuning is supported, including **replication/mirroring** (e.g., *r=3, r=4*) for single-site or multi-site configurations. Standard **erasure coding (EC)** schemes range from *2k+2m* up to *20k+4m*. Typical dual-site configuration schemes include *3k+5m* and *4k+6m*, while triple-site configurations commonly use *3k+3m*, *7k+5m*, and *15k+9m*. A **force setup** option allows the deployment of any erasure coding scheme when required.

A **6-node STORANDER File One Platform cluster** configured with triple-mirror protection delivers approximately **15 nines (0.999999999999999)** data durability — equivalent to a *1 in 1 quadrillion* chance of data loss. Erasure-coded layouts with node redundancy and fast rebuild procedures provide up to **14 nines** data durability. The built-in upgrade manager enables **non-disruptive, online system updates** without affecting active workloads.

Data remains protected in the event of a node failure, and is also safeguarded against the simultaneous failure of a node and an NVMe SSD located in another node. Data access is maintained during any single component failure.

The architecture is **active-active**. For example, a six-node scale-out system using the recommended *4k+2m* erasure-coding layout continues to serve data even if **two nodes fail**. The STORANDER File One Platform will continue operating even if **up to 64 NVMe SSDs** become unavailable simultaneously. Such a scenario could also involve the loss of one-third of front-end and one-third of back-end Ethernet interfaces. From the client perspective, this remains **transparent**, as virtual interfaces automatically migrate to healthy nodes.

AGSM integrates with Active Directory (AD) for SMB/CIFS share access control. For NFS, AGSM supports Kerberos-based authentication. Per-share host-level access policies can be defined for granular control of NFS client access.

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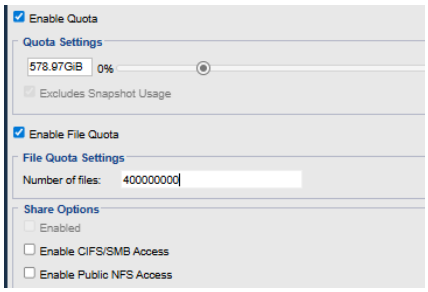
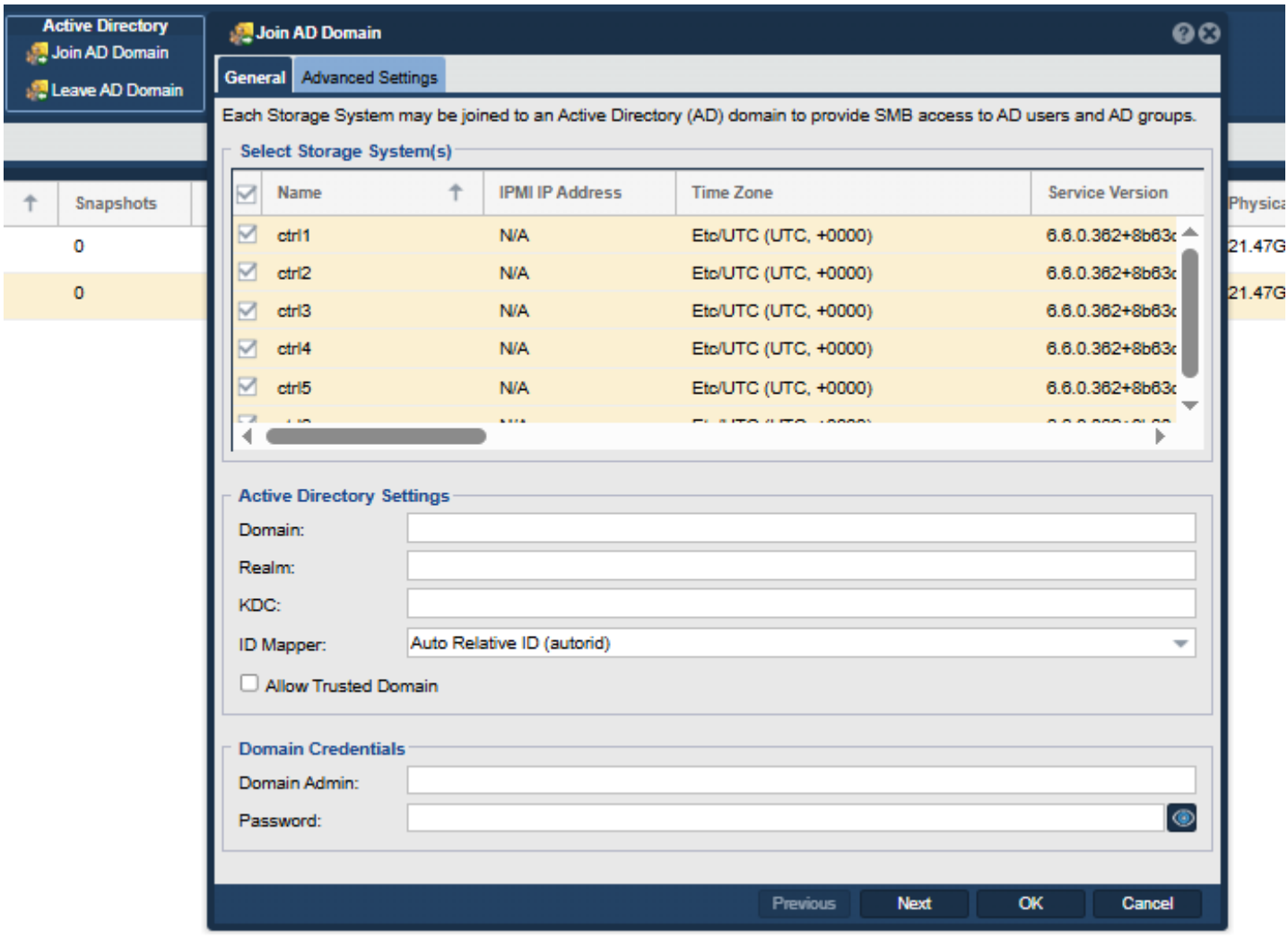


For distinct storage resources with defined capacity and configuration, it is possible to export them via the selected file protocol. The capacity of a resource shared through a file protocol can be increased at any time without disrupting access.



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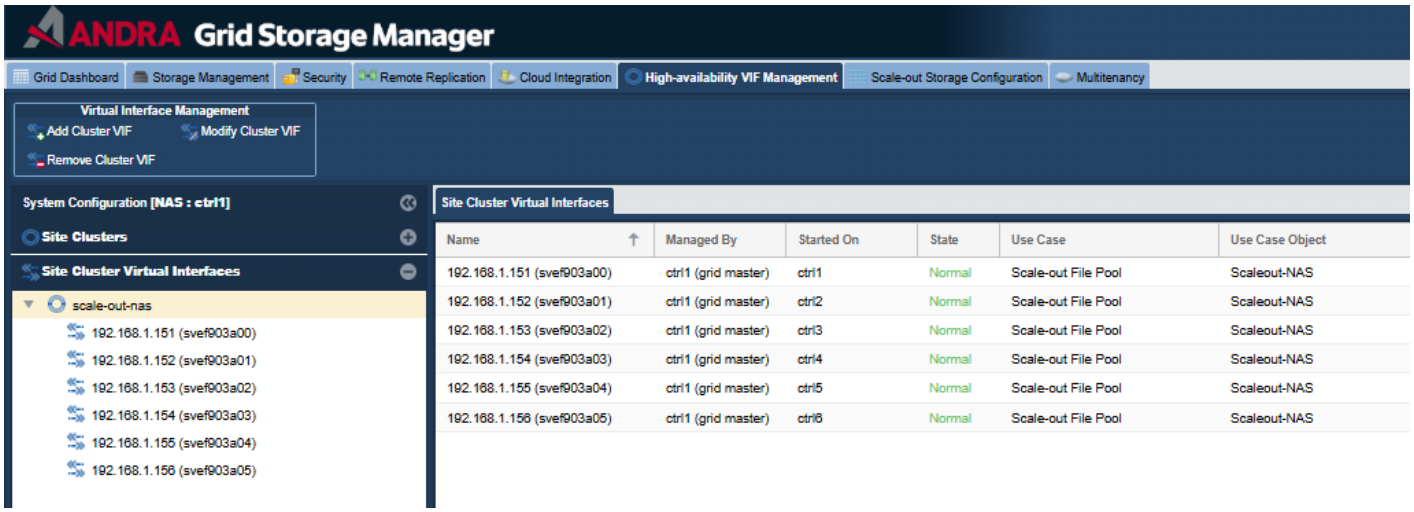
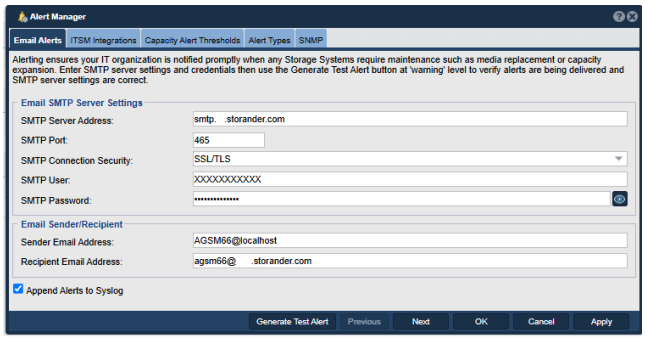
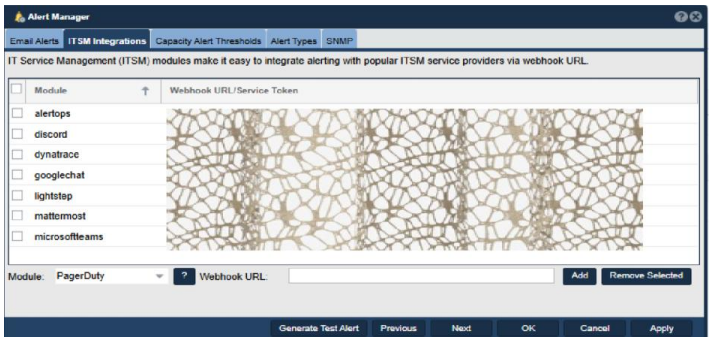
The STORANDER File One Platform is designed to provide **hot-swap capability** for all critical system components, including NVMe SSDs, power supplies, and cooling modules. **Cluster controllers (nodes)** can be added online without interrupting client workloads, ensuring continuous service availability during system expansion or maintenance.



AGSM proactively monitors NVMe SSD wear levels and the integrity of stored data. When degraded NAND flash blocks or unhealthy NVMe SSDs are detected, AGSM automatically relocates affected fragments to healthy media, ensuring data integrity and continuous system reliability.

Comprehensive notification and alerting capabilities are available through the **Alert Manager**. The AGSM GUI allows straightforward configuration of **SNMP**, **SMTP email alerts**, alert severity levels, and integrations with ITSM/observability platforms such as AlertOps, Dynatrace, Freshservice, Google Chat, ServiceNow, Lightstep, Atlassian OpsGenie, Microsoft Teams, PagerDuty, Squadcast, Splunk On-Call, and others.





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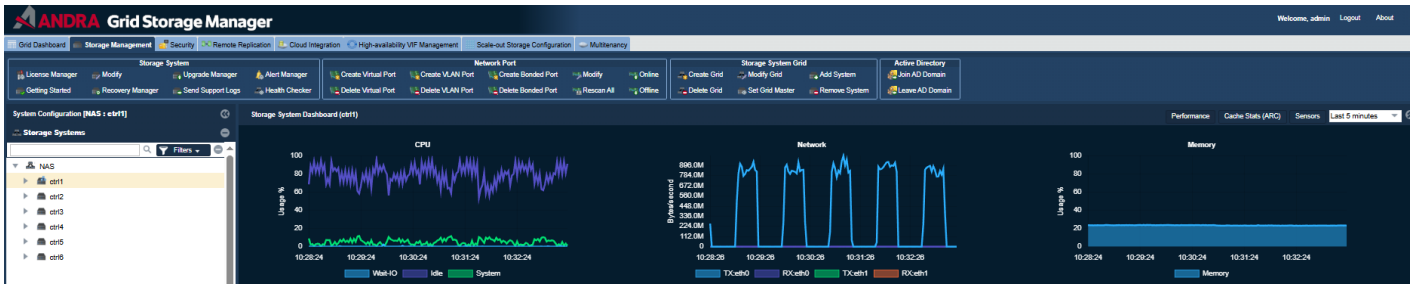
AGSM provides comprehensive monitoring of system operations, including CIFS/SMB and NFS services. The monitoring layer captures key performance and resource metrics for each controller and node, including CPU load, memory utilization, and network interface throughput. AGSM also tracks the capacity and utilization of NVMe-based SSD storage pools, share occupancy, and read/write performance to ensure optimal system behavior and early detection of potential issues. Optional integration with RabbitMQ, an open-source message broker implementing the AMQP standard, enables efficient distribution of system events and alerts across messaging or automation platforms when required.



AGSM supports both **scale-out** and **scale-up** storage architectures for unified file and block services. **Scale-out** configurations deliver high-performance NAS and SAN storage with scalability beyond **50 PB** per cluster. **Scale-up** configurations provide cost-optimized NAS and SAN capabilities with a smaller hardware footprint, typically supporting up to **~6 PB** per cluster.

The **STORANDER File One Platform** is fully tested and supported as a **backup repository target** for data protection solutions such as **Veeam** and **Commvault**.

Storage SuperServer SSG-222B is 2U front-loading all-flash storage server with 24 E3.S NVMe drives and PCIe 5.0

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AGSM cluster is built from 4 to 64 nodes. Nodes are being added online with no interruption to the workload. Storage capacity and workload utilization are distributed automatically.

Each node is equipped with two M.2 SSDs for AGSM boot operation and 512 GB high speed DDR5 memory, expandable to 4 TB.

Each node is populated with two Intel XEON 6 model 6710E processors.

Each node is equipped with redundant power supplies.

The Intel Xeon 6 model 6710E is a 64-core, 64-thread server processor launched in June 2024 as part of Intel's Sierra Forest-SP platform. Designed for high-density, energy-efficient workloads.

Cores/Threads: 64 cores and 64 threads, utilizing single-threaded Crestmont E-cores.

Base/Turbo Frequency: 2.4 GHz base, boosting up to 3.2 GHz.

Cache: 96 MB shared L3 cache.

Fabrication: Built on Intel's 5nm "Intel 3" process.

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Each node is equipped with two to four of dedicated 25/100/200 Gbit Ethernet adapters for intra-cluster communication (East/Weast) workload and client workload (North/South).

- Intel 25GbE Intel® Ethernet Network Adapter E810 quad port
- Mellanox ConnectX®-6 200 Gbit Ethernet Adapter Card dual port

Single node offers up to 16 x 25 Gbit Ethernet ports or up to 8 x 100 Gbit Ethernet ports or up to 8 x 200 Gbit Ethernet ports or mix of above mentioned interfaces.

Each node offers dedicated IPMI RJ45, two USB 3.0 ports and VGA port.
Each node offers dedicated dual 10 Gbit Ethernet RJ 45 AGSM management ports.

Each node is populated with 8-packs of Micron 6550 61.44 TB ION NVMe SSD. An 8-pack of Micron 6550 61.44 TB ION NVMe SSD is being added online with no interruption to the workload. Storage capacity and workload utilization are distributed automatically.

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The Micron 6550 ION SSD is the world's first 60TB PCIe Gen5 data center SSD, built to deliver unparalleled performance, energy efficiency and density. It's ideal for meeting the increasing demands of AI workloads in AI data lakes, high-performance computing (HPC), big data and analytics environments.

With capacity 61.44TB, the 6550 ION SSD provides the high capacity needed for growing SDS workloads while delivering best-in-class performance and up to 20% lower SSD power consumption than competitive SSDs.

As the first 60TB SSD in an E3.S form factor, the 6550 ION SSD provides industry-leading storage density and helps customers reduce their data center footprint up to 67%.

The 6550 ION SSD is designed for end-to-end security, it safeguards data with features like SED, SPDM 1.2 and secure encrypted environment (SEE).

STORANDER File One Platform* vital components technical links:

- Intel® Xeon® 6710E Processor
  - https://www.intel.com/content/www/us/en/products/sku/240363/intel-xeon-6710e-processor-96m-cache-2-40-ghz/specifications.html
- SAMSUNG 32 GB Registered DIMM DDR 5 speed 5600 Mbps
  - https://semiconductor.samsung.com/dram/module/rdimm/m321r4ga3eb0-cwm/
- Micron 6550 ION SSD E3.S 61.44 TB
  - https://assets.micron.com/adobe/assets/urn:aaid:aem:823ddb16-1baa-4439-b06c-da66b36274d5/renditions/original/as/6550-ion-nvme-ssd-tech-prod-spec.pdf
- Intel® Ethernet Network Adapter E810-XXVDA4
  - https://www.intel.com/content/www/us/en/products/sku/192560/intel-ethernet-network-adapter-e810xxvda4/specifications.html
- Mellanox ConnectX®-6 Ethernet Adapter Card (200 Gbit dual port)
  - https://resources.nvidia.com/en-us-accelerated-networking-resource-library/networking-overal-dp
- Supermicro SuperServer SSG-222B-NE3X24R
  - https://www.supermicro.com/manuals/superserver/2U/MNL-2795.pdf
- Extreme networks 7520 cluster back-end switch
  - https://extr-p-001.sitecorecontenthub.cloud/api/public/content/b5da59835f5d4d10b740208284c8bc09?v=1a1ceae6
- Andra Grid Storage Manager (Powered by OSNEXUS)
  - https://wiki.osnexus.com/index.php?title=OSNEXUS_QuantaStor_Documentation

***STORANDER File One Platform** is designed and integrated under the strict rule of following norm and certification standards: PN-EN ISO 9001:2015, PN-EN ISO 14001:2015, PN-EN ISO/IEC 27001:2017

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The STORANDER File One Platform SKU list.

SKU	Description	Remarks
AG-SF1-N1	STORANDER File One Platform node	min. q'ty = 4
AG-512R-M5	512 GB DDR5 memory upgrade	max. 7 per node
AG-61S3-M1	8-pack of Micron 6550 ION SSD E3.S 61.44 TB	min. 1 – max. 3 per node
AG-25GE-810	Dual pack - Intel® Ethernet Network Adapter E810-XXVDA4 (25 Gbit quad port)	min. 1 – max. 2 per node
AG-200G-C6	Dual pack - Mellanox ConnectX®-6 Ethernet Adapter Card (200/100/50/40/25/10 Gbit Ethernet dual port)	min. 1 – max. 2 per node
AGSM-1TB	Andra Grid Storage Manager (Powered by OSNEXUS) – 1 TB	Based on raw capacity
AG-025-ETH	Cluster back-end switch Extreme networks 7520	min. q'ty = 2
AG-SF1-INSX	STORANDER File One Platform on-site installation & configuration services	Up to 8 nodes. Multiply if needed.