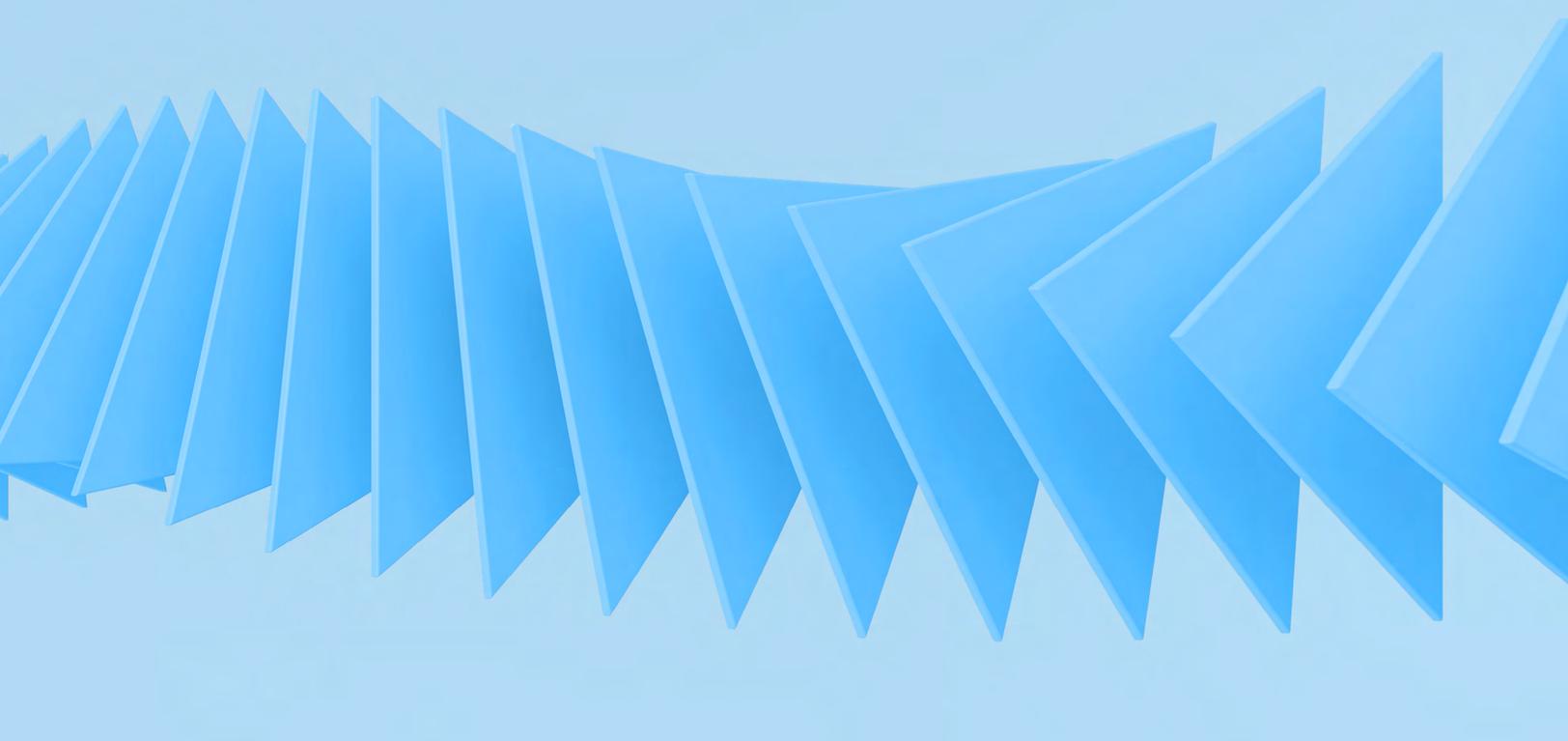


DATASHEET

NetApp StorageGRID



Object storage that enables you to manage your unstructured data across public, private, and hybrid multicloud environments

The challenge

Today's unprecedented growth in unstructured data offers enterprises opportunities to uncover new customer engagements and revenue streams. To keep pace, IT must overcome the challenges of keeping up not only with the volume of data, but also with changes in how data is stored and accessed. Users need IT to support a huge number of applications, from traditional workloads to cloud-based applications, with access to data across data centers, remote offices, and the public cloud.

Object storage through cloud-based data management is quickly becoming the norm, but it comes with its fair share of concerns:

- Is my data safe?
- What happens if my requirements change?
- What is cost effective today and tomorrow?
- Does choosing one solution create vendor lock-in?
- Can I meet performance demands with data that lives both on premises and in the public cloud?

Key benefits

Smart: Explore the industry's leading data lifecycle management software.

- With the data management capabilities of the NetApp® StorageGRID® object-based storage solution, you can deliver high-value outcomes from your large amount of unstructured data while lowering your TCO.

Fast: Combine high performance with cost efficiencies.

- Unleash the full power of flash with StorageGRID object quality of service (QoS), dedicated load balancer, and lifecycle management capabilities.

Future-proof: Realize cloud as a strategy, not just a location.

- Today and tomorrow, StorageGRID delivers industry-leading features and capabilities to help you manage your data with the simplicity, speed, and fluidity that you have built your business on.

The solution

NetApp StorageGRID is a software-defined, object-based storage solution that supports industry-standard object APIs like the Amazon Simple Storage Service (Amazon S3) API. With StorageGRID, you can build a single namespace across up to 16 data centers worldwide, with customizable service levels for metadata-driven object lifecycle policies. The integrated lifecycle management policies optimize where your data lives throughout its lifecycle.

StorageGRID optimizes the durability and availability of your data across multiple geographies. Whether your data is on premises or in a public cloud, it enables hybrid cloud workflows to fit your business

demands with access to Amazon Simple Notification Service (Amazon SNS), Google Cloud, Microsoft Azure Blob, Amazon S3 Glacier, Elasticsearch, and similar services.

StorageGRID seamlessly integrates with the NetApp portfolio products. We have expanded capabilities with several NetApp BlueXP services offerings, such as BlueXP Console, Cloud Tiering (powered by FabricPool), Cloud Data Sense, Cloud Insights, Cloud Backup, and Active IQ.

Enable the hybrid cloud

StorageGRID supports industry-leading hybrid cloud solutions with its user-controlled platform services. You can keep your data in a local private cloud while taking advantage of public cloud offerings. Storage tenants can configure mirroring of selected objects at the bucket level to an S3-compatible public cloud. You can trigger hybrid cloud workflows by integrating S3 notification of events in your on-premises buckets with Amazon SNS. And you can gain further value with metadata search and analytics by streaming object metadata to an external Elasticsearch service, on premises or in the public cloud.

StorageGRID lets you take advantage of industry-leading Amazon S3 APIs, such as object versioning, object locking, multipart upload, S3 Select, Amazon Identity and Access Management-style access policies, cross-origin resource sharing, and object tags. With Active Directory and LDAP identity federation, StorageGRID bridges the gap between enterprise IT and cloud semantics.

Cloud-to-cloud data management can also help you reduce costs. StorageGRID can manage and store objects in its own globally distributed infrastructure, and in Amazon S3 or S3-compatible object stores or public clouds. Depending on your hybrid cloud strategy, you can replicate data with the StorageGRID CloudMirror service to Amazon S3, Google Cloud, or an S3-compatible object store for data protection, or to leverage cloud services. And for further cost savings, you can tier cold StorageGRID data to the cloud through Cloud Storage Pool to Amazon S3, Google Cloud, or Microsoft Azure.

StorageGRID has an extensive integration with various ISVs. You can find the list of third-party solutions validated for StorageGRID [here](#).

Facilitate compliance with tamper-proof data retention

StorageGRID offers many features to help you meet your regulatory obligations. It can provide immutable protection for your critical data assets.

StorageGRID is built with multitenancy at its core. Every tenant is its own partition, with its own rights and permissions, while sharing the same consolidated infrastructure. Not all tenants need to be the same; they can have different performance, capacity, and security requirements.

Storage tenants can configure write once, read many (WORM) retention with StorageGRID S3 Object Lock (using governance or compliance mode) to comply with regulations. You can configure StorageGRID so that data is stored with multiple copies or logical equivalents, such as erasure-coded objects. You can secure your data with software-based encryption in flight and at rest, with built-in audit trails, and with FIPS drives on some StorageGRID appliances. And other features such as multifactor authentication, role-based access control, and external key management make StorageGRID a leader in security capabilities.

Use proven software designed for nondisruptive operations

StorageGRID is an 11th-generation object store with more than two decades of production deployments in the most demanding industries. With the strength of the portfolio, NetApp has demonstrated more than 20 years of product hardening with more than 1 million systems shipped. With advanced features such as the NetApp Active IQ® Digital Advisor for

proactive, immediate response, and with backing by NetApp's world-class support organization, StorageGRID is a solution that you can trust with your critical data assets. StorageGRID also enables you to maintain and to update your infrastructure without business interruption or downtime.

Deploy granular data protection policies

StorageGRID appliances provide layered data protection at the hardware and software levels. You can protect against failed disk drives and rapidly rebuild lost data segments with local, node-level erasure coding (EC) or redundant array of independent disks (RAID), and you can protect against site-level disasters with geo-distributed EC or in-grid replication. For even greater protection, you can also replicate to another StorageGRID grid or to a cloud object store. An advanced grid federation functionality in StorageGRID enabled by Cross-Grid Replication (CGR) feature provides tenant account cloning and an active-active object level disaster recovery solution.

Flexible deployments

Because every deployment is unique, StorageGRID aligns with your environment, whether it includes nodes as VMs, as optimized hardware-based appliances, as bare-metal servers with Docker containers, or as a combination across virtual and physical environments. In all cases, designing, deploying, and managing StorageGRID is a centralized and streamlined process that enables you to rapidly deploy petabytes of storage.

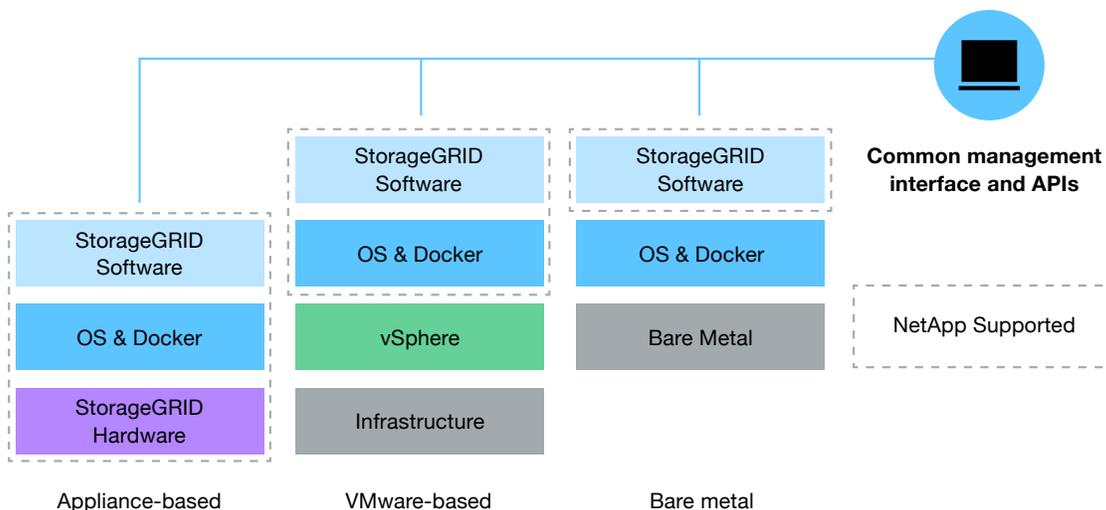


Figure 1) StorageGRID simple, automated deployment on flexible platforms.

SG5000 series

SG5712



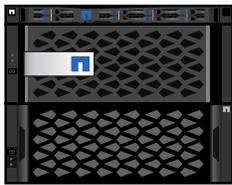
SG5760



- Cost-optimized platforms
- Secondary storage workloads

SG6000 series

SG6060



- Transactional small object workloads
- Mid-range; FabricPool optimized

SG6060-Expansion



- Large-scale deployments; 100s of PBs
- Data lake, > 3.2PB capacity per Storage Node

SGF6024



SGF6112 | NEW



- Performance focused; flash accelerated
- Primary workloads, analytics, IoT, streaming

StorageGRID service appliances

SG1000



- Large deployments, high performance

- Physical appliance for Gateway Node and Admin Node
- Traffic classifiers for tenant- and bucket-based monitoring and QoS

SG100



- Small to midsize deployments
- Also consider for Admin Node only (VM replacement)

Figure 2) StorageGRID appliance portfolio.

StorageGRID service appliances offer the option of even simpler deployment. The SG100 and SG1000 service appliances deliver an enterprise-grade load balancer with full high-availability (HA) capabilities as well as the option to host StorageGRID Admin Nodes. You can streamline deployments by implementing “all appliance grids.” And you have the flexibility to operate the node or HA node pair as a load balancer, an administrative node, or both roles simultaneously.

By deploying NetApp StorageGRID appliances, you get an enterprise-grade turnkey solution that is easy to implement. Each appliance is built to meet specific performance or capacity needs. You can also deploy software-only StorageGRID nodes as containers on physical or virtual servers, taking advantage of the heterogeneous storage underneath.

If you're looking for greater agility and financial flexibility, StorageGRID is available through the NetApp Keystone® Flex Subscription storage-as-a-service offering.



Start your move to StorageGRID

You can migrate large amounts of data to a StorageGRID system while simultaneously using the system for day-to-day operations. Whether you're migrating your legacy storage or repatriating data from the cloud to a low-cost StorageGRID object store, NetApp makes it easy for you to migrate. Work with our experts to plan and to implement your transition to StorageGRID.

Contact [NetApp consulting](#) and [Professional Services](#) or our [certified partners](#).

Key features for object storage	Function
Massive scalability and flexible infrastructure	<ul style="list-style-type: none"> • Massive elastic content store • Multiple geo-distributed sites • Support for multiple storage tiers: <ul style="list-style-type: none"> • NVMe, SSD, SAS, SATA, Tape • Amazon S3 • Microsoft Azure • Google Cloud • Geo-erasure coding and geo-replication • Deployment on VMs, hardware appliances, or bare-metal servers with Docker containers
Application interfaces	<p>Massively parallel transaction engine with:</p> <ul style="list-style-type: none"> • Integrated load balancing • Transaction multithread pipelining <p>Object access protocols:</p> <ul style="list-style-type: none"> • Amazon S3 and OpenStack Swift <p>System and account management:</p> <ul style="list-style-type: none"> • Management API: System installation, system administration, tenant management, maintenance tasks, and system monitoring, including Prometheus • Tenant API: Management of users, credentials, usage, and quotas
Data services	<p>Platform services – tenant-configurable hybrid cloud integration:</p> <ul style="list-style-type: none"> • S3 event notification with Amazon SNS • CloudMirror bucket replication with Amazon S3, Google Cloud, or S3-compatible target • Metadata search and analysis with streaming metadata to external Elasticsearch <p>WORM retention:</p> <ul style="list-style-type: none"> • S3 Object Lock (compliance and governance mode) • Reinforced data integrity with compliance-grade WORM • Litigation hold <p>Advanced security and encryption capabilities:</p> <ul style="list-style-type: none"> • Transport Security Layer (TSL) 1.3 and AES 256-bit encryption • Secure Hash Algorithm 2 (SHA-2) and CPU-efficient integrity protection • External key management • Automatic verification of StorageGRID upgrades and hot fixes with code signing functionality • FIPS-compliant encrypted connections for the load balancers to ensure data security, compliance and confidentiality • Configurable firewalls controls <p>Disaster recovery</p> <ul style="list-style-type: none"> • Cross Grid Replication (CGR) provides bucket level active-active replication across grids
Metadata and content awareness	<p>Metadata-based data management:</p> <ul style="list-style-type: none"> • Content-aware self-healing maintains data protection even during network disruptions • Policies can be modified and applied to both new and existing objects

<p>Deployment options</p>	<ul style="list-style-type: none"> Physical or virtual servers via Docker containers <p>Virtual appliance:</p> <ul style="list-style-type: none"> VMware ESXi and vCenter <p>Hardware appliances:</p> <ul style="list-style-type: none"> StorageGRID all-flash SGF6112 (NVMe) and SGF6024 (SSD) for high-performance primary object storage workloads, web apps, streaming StorageGRID SG6060 for transactional small object storage workloads, including FabricPool optimization, with expansion shelf options for large scale capacity, including data lakes StorageGRID SG5712 and SG5760 for secondary, capacity object storage workloads StorageGRID SG100 and SG1000 services appliances for simplified operations, including Admin Node software and load balancing
<p>Service-level objective and performance monitoring</p>	<p>Comprehensive performance feeds:</p> <ul style="list-style-type: none"> Access Throughput Replication Throughput Time to policies achieved QoS rate limiting to manage workload performance Transaction round-trip time Isolated application, replication, and admin network traffic Adjustable data policies with flexible information lifecycle management (ILM) Advanced system monitoring with Prometheus
<p>Management and monitoring</p>	<ul style="list-style-type: none"> Centralized and automatable installation and expansions Automated monitoring and tenant management through an API Rolling upgrades without downtime Comprehensive ad hoc real-time, rolling-period, and historical-usage query capability More than 200 predefined monitoring, usage, and performance reports Event-based audit messages for performance tracing, usage monitoring, and enabling billing or chargeback
<p>Professional Services</p>	<p>Reduced deployment risk, streamlined implementation, and the ability to migrate quickly with minimal disruption:</p> <ul style="list-style-type: none"> Discovery and design to determine solution requirements Validated process for appliance deployment and software configuration Data migration with proven methodologies and reliable tools

To learn more about the latest features, visit [StorageGRID technical documentation resource](#)

[Visit here](#)

Models and specification

	SGF6112	SGF6024	SG6060	SG5760	SG5712	SG1000/ SG100
						
CPU cores	48 @ 2.6GHz	40 @ 2.4GHz	40 @ 2.4GHz	8 @ 2.2 GHz	8 @ 2.2 GHz	40 @ 2.1 GHZ (SG1000) 20 @ 2.4 GHZ (SG100)
Raw capacity	1.9TB SSDs = 23TB 3.84TB SSDs = 46TB 15.3TB SSDs = 183.6TB	1.6TB SSDs (FIPS) = 38.4TB 1.9TB SSDs = 46TB 3.8TB SSDs = 91.2TB 15.3TB SSDs = 367.2TB	4TB drives = 232TB (712TB with 2 Exp Shelves) 8TB drives = 464TB (1,424TB with 2 Exp Shelves) 10TB drives (FIPS) = 580TB (1,780TB with 2 Exp Shelves) 12TB drives = 696TB 18TB drives = 1044TB (3,204TB with 2 Exp Shelves)	4TB drives = 240TB 8TB drives = 480TB 10TB drives (FIPS) = 600TB 12TB drives = 720TB 18TB drives = 1080TB	4TB drives = 48TB 8TB drives = 96TB 10TB drives (FIPS) = 120TB 12TB drives = 144TB 18TB drives = 216TB	Not applicable.
Form factor	1U, 12 drives	3U*, 24 drives	5U*, 58 Drives 118 with 1 Exp Shelf 178 with 2 Exp Shelves	4U, 60 drives	2U, 12 drives	1U*
Connectivity	4 x 10/25GbE	4 x 10/25GbE	4 x 10/25GbE	4 x 10/25GbE	4 x 10/25GbE	4x 10/25/40/100GbE (SG1000) 4 x 10/25GbE (SG100)
Width	17.32" (44 cm)	17.32" (44 cm)	17.66" (44.86cm)	17.66" (44.86cm)	17.6" (44.7cm)	17.32" (44 cm)
Depth	32.01" (81.3 cm)	32.01" (81.3 cm)	38.25" (97.16cm)	38.25" (97.16cm)	21.1" (53.6cm)	32.01" (81.3 cm)
Weight	37.9 lb (17.19 kg)	90.74 lb (41.17 kg)	289 lb (131 kg)	250 lb (113 kg)	63.9 lb (29 kg)	37.9 lb (17.19 kg)

	SGF6112		SGF6024		SG6060		SG5760		SG5712		SG1000/SG100	
Environmental specifications**												
	Typical	Maximum	Typical	Maximum	Typical	Maximum	Typical	Maximum	Typical	Maximum	Typical	Maximum
	1.92TB SSDs		800GB drives		4TB drives		4TB drives		4TB drives		Standard configuration	
Amps	2.758	3.92	2.25	5.52	6.29	9.68	6.25	8.06	2.02	2.54	1.67	2.62
Watts	549	784	490	1204	1374	2114	1361	1755	440	552	334	524
BTU	1872	2674	1671	4108	4690	7212	4642	5989	1501	1884	1140	1788
	3.84TB SSDs		1.6TB drives		8TB drives		8TB drives		8TB drives			
Amps	2.82	3.98	2.27	5.56	6	9.38	5.95	7.77	1.97	2.49		
Watts	566	796	512	986	1310	2050	1297	1692	429	541		
BTU	1932	2716	1683	4132	4472	6994	4425	5772	1462	1846		
	15.3TB SSDs		3.8TB drives***		10TB drives (FIPS)		10TB drives (FIPS)		10TB drives (FIPS)			
Amps	3.08	4.4	2.36	5.74	6.29	9.68	6.25	8.06	1.97	2.49		
Watts	616	880	513	1251	1374	2114	1360	1755	441	554		
BTU	2101	3001	1750	4268	4689	7211	4642	5989	1506	1889		
			7.6TB drives		12TB drives		12TB drives		12TB drives			
Amps			2.42	5.88	6.33	9.71	6.28	8.1	2.23	2.75		
Watts			527	1279	1382	2122	1369	1764	498	611		
BTU			1799	4365	4718	7240	4671	6018	1700	2083		
			15.3TB drives		18TB drives		18TB drives		18TB drives			
Amps			2.42	5.88	5.24	7.04	5.80	7.62	2.28	2.82		
Watts			527	1279	1140	1534	1263	1660	524	640		
BTU			1799	4365	3890	5235	4310	5666	1791	2181		

* A 1U compute server is included in the form factor. Environmental specifications use 220V for the compute server.

** The SG5760 and SG6060 require 208V-240V power. They do not function with 120V power.

***Available in self-encrypting drives (SED) and non-SED.

About NetApp

In a world full of generalists, NetApp is a specialist. We're focused on one thing, helping your business get the most out of your data. NetApp brings the enterprise-grade data services you rely on into the cloud, and the simple flexibility of cloud into the data center. Our industry-leading solutions work across diverse customer environments and the world's biggest public clouds.

As a cloud-led, data-centric software company, only NetApp can help build your unique data fabric, simplify and connect your cloud, and securely deliver the right data, services and applications to the right people—anytime, anywhere. www.netapp.com



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