



Technical Specification

SPACE+



Contents

- 1 Unit specifications
- 2 Configurable capacities
- 3 Connectivity
- 4 Key features
- 5 Performance
- 6 Performance analysis - Delivery to network
- 7 File system
- 8 Data security and disaster recovery
- 9 API and third-party integration

1. Unit specifications

Unit dimensions:	13.2cm x 43.7cm x 64.8cm (5.1" x 17.2" x 25.5")
Unit weight:	33kg (72.7lbs)
Input range:	100 - 240 VAC, 50-60Hz
PSU safety:	EMC - USA-UL listed. Canada-CUL listed, Germany-TUV certified, EN60950/IEC 60950-Compliant, CB report, CCC certification
Power supply:	Dual redundant 1000W removable PSUs
Power requirements standby:	33W
Power requirements full load:	350W
Operating temperature range:	10°C - 35°C
Non-operating range:	-40°C - 70°C
Operating humidity range:	8 - 90% non-condensing
Non-operating humidity range:	5 - 95% non-condensing
Unit form factor:	3U rackmount (rack mounts included)

Bootable replacement OS is provided on **Rescue Capsule** USB drive for fast system recovery.

2. Configurable capacities

- **SPACE+** 128TB, 160TB, 192TB and 224TB
- **SPACE EX** 32TB, 64TB, 128TB, 160TB, 192TB and 224TB (Up to 4PB)

3. Connectivity

On Motherboard

- 4 x USB 3.0 ports
- 1 x VGA connector
- 1 x COM port
- 2 x 10Gb Ethernet (RJ45) ports - Backwards compatible with 1Gb Ethernet (RJ45)
- 1 x RJ45 dedicated IPMI LAN port

Other

- 2 x 10/25/40/50/100Gb Ethernet ports
- Option for additional 1Gb, 10Gb, 25Gb, 40Gb and 100Gb Ethernet ports (RJ45 or SFP+)

4. Key Features

- **CORE.4 OS**
Ultimately designed to elegantly manipulate data.

With the powerful and highly intelligent CORE.4 operating system at their centre, GB Labs' storage systems can not only govern and regulate read/write requests simultaneously - which is unique to the market - but can make autonomous decisions on how and where to read, or place that data (that's the intelligent bit), in safe and secure ways that both smooths and accelerates the process, saving a lot of time, money, and aggravation.

This is because, as powerful and clever as CORE.4 is, it's ultimately designed to elegantly manipulate data with a fluidity and lightness of touch that is as kind to that data as possible, using as few disks as possible, but always with speed, accuracy, and economy of effort.

Most central storage systems can either read or write, but not at the same time, whether it's an SSD, HDD, or hybrid system. The notion some have that SSD can read/write at the same time is a fallacy. In mixed read/write environments, their performance nosedives.

The inevitable peaks and troughs of read/write processes absolutely kill performance and those systems have little or no in-built intelligence to govern how those read/write requests are handled because, frankly, they're very difficult and complicated algorithms to create, so most manufacturers don't bother.

- **Dynamic Bandwidth Control**

Dynamic Bandwidth Control is an extremely valuable benefit only available in GB Labs storage systems.

Traditionally, client storage usage is capped at certain levels to reserve storage capacity for priority users, whether or not it is being used. Storage that is reserved but not used can unnecessarily restrict the performance of others who could make beneficial use of that extra capacity.

GB Labs resolved this problem by developing Dynamic Bandwidth Control, which swiftly identifies and selects high, medium, and low priority users and constantly evaluates and balances performance. This guarantees that not only is every user getting the full performance they need and expect, but that the entire system is operating at peak performance at all times.

- **HyperSpace compatible**

HyperSpace is an intelligent SSD based acceleration unit. This SSD based accelerator addresses the I/O performance gap between HDD systems and the ultimate performance of the SSD range, by intelligently lowering latency and increasing IOPS performance.

The system delivers exceptional performance, using two unique technologies - IDA² (In-flight Data Acceleration) and the DRAM based Chaos Cache. Working as a single volume, HyperSpace SSD's and SPACE+ HDDs offer highly cost-effective performance with expandable capacities.

- **Data protection**

RAID 6 data protection.

Optional Hardware based RAID 0/1/5/6 and Software based RAID 0/1/5/50/60.

- **Replication**
Designed to create near-line, or online, backups of your data. Replication is used to transfer files between GB Labs systems and other storage systems. All replications are performed using Smart Sync, which means that files are only sent when they need to be. Files can be checksummed for extra security to ensure that files are transferred correctly.
- **Snapshots**
A set of reference markers, pointers or data stored on a disk drive, tape drive or storage network (NAS/SAN). A Snapshot is like a detailed table of contents that is treated by the computer as a complete data backup. Snapshots streamline access to stored data and can speed up the process of data recovery. The GB Labs Snapshot tool takes incremental backups of a workspace, or other servers, on a connected network which allows you to then recover a workspace to a specific point in time.
- **Automation**
SPACE SSD has automation built into its' CORE OS which, when enabled, can watch a folder and perform actions when a file event occurs. CORE OS uses these rules to perform actions when these events occur, such as; permission changes and transferring of files.
- **Active Directory**
If you have an Active Directory (AD) server on your network, you can enable the system to authenticate against the users on the AD server, and use that authentication with AFP, SMB and HTTP.
- **Workspace access control**
GB Labs CORE OS can control access to workspaces via IP addresses. This control allows you to override all other sharing access by setting access based rules around IP address, range or entire subnet of any active range connected to the system.
- **Mosaic**
The introduction of Mosaic is an industry-first combination of AI and intelligent storage.

All new GB Labs storage systems now include GB Labs' 'Mosaic' automatic asset organiser - a dynamic, intelligent, and vastly enriched way to track and find media, that saves users enormous amounts of time. Mosaic is streets ahead of old and inefficient search methods. It automatically scours all in-built metadata and integrates it with a highly professional AI tagging system.

In short, users no longer need to tag anything. Mosaic takes care of that.

All the user has to do is enter a date, location, or object located within the assets; select the useful clips presented to them; and load them into a basket that can be subsequently opened on a client workstation.

Content is tagged automatically with a great deal of information giving far more consistency in how and where it's stored and the ability to rapidly retrieve it later. That means that subsequent search parameters can be refined by every user's preferences and requirements, enabling them to find what

they want very quickly, select from the relevant options presented to them, and effortlessly manage those assets the rest of the way through the editing process.

- **File Manager**

Allows you to copy or move files around the workspaces on your system, or to and from other CORE OS systems on the network. File Manager enables changes to permissions and file ownership, in addition to being able to preview and retrieve file information.

- **Analytics Centre**

GB Labs Analytics Centre is an easy way to see, at a glance, everything that is taking place on a network.

Any issues, anywhere, are flagged the instant they occur with a straight-line path that enables users to find out exactly what happened, when, where, and determine how it can be resolved.

A ghost graph on the Analytics Centre UI clearly displays the most important, top line operational information, and can be used to delve much deeper into certain areas with a click.

Not only will Analytics Centre display historical data, it will also indicate who is – and has been – consuming the most data; how they are connected; by what protocol; and if they are performing at peak efficiency on the storage network.

For most, this is everything, and more, that they will need to have a very clear and comprehensive view of what’s transpiring on their network. Whether it analyses the activity of five users or 500, GB Labs’ Analytics Centre helps to make sure everyone is productive.



- **CloakDR**

CloakDR enables two GB Labs intelligent storage systems to act as master and slave respectively, failing over in as little as 2 seconds.

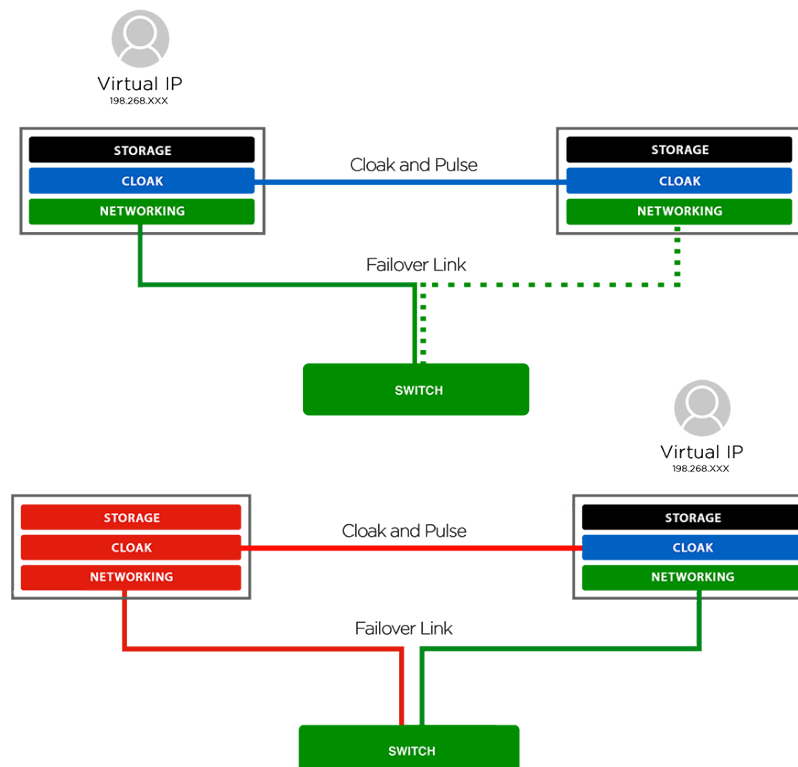
Unlike traditional methods, GB Labs storage systems are completely live, which means that when data is written it's not confirmed until both units have it live. That means that it's impossible to have out-of-sync data between the pair of units.

CloakDR has been designed to not only protect against typical server failures, such as: disk, OS or PSU failure, but the bigger issues too including: rack power outage, accidental removal of network or power cabling, switch failures and even a complete server room outage, with systems placed in separate server rooms.

System administrators will love the easy 'no downtime' maintenance that can be achieved by seamlessly removing servers and allowing them to be worked on independently then re-synchronised quickly, with no interruption to service.

Additionally, separate buildings could be used to house each storage unit to give further protection against fire and flood damage. With a fast and seamless failover, it minimises any disruption to user's workflow and maximises peace of mind.

The units are then configured with GB Labs 'CloakDR' software, creating a 'Primary' and 'Secondary' server and presenting a single 'Virtual IP.' Data is always written to both servers at the same time meaning data is always in sync. If failover occurs, a single IP address is maintained throughout, giving the same path to files and folders. Complete server failover takes as little as two seconds to occur.



5. Performance

To guarantee stream performance, SPACE+ will utilise the full performance of its 12Gb SAS backplane, RAID controller and latest generation disks. Combining the raw performance with our IDA² and Chaos Cache technology, performance is sustained when delivered to network clients.

To dynamically expand performance there are three options;

1. Utilise SPACE EX units collectively to enhance the system performance
2. Attach HyperSpace SSD accelerators to exceed spinning disk capabilities altogether.
3. Use both SPACE EX and HyperSpace to create high-performance storage up to 4PB capacity.

The Hierarchical Storage Management (HSM) automated tiering of the GB Labs systems is key to efficient management of digital assets and the provision of sustained performance for all workstations. A Digital Asset Management (DAM) or Media Asset Management (MAM) server with 10/25/40./100GbE access to all storage platforms on the network, and in conjunction with the powerful automation functionality built into GB Labs servers, is able to push and pull data between CORE OS platforms within the network ecosystem.

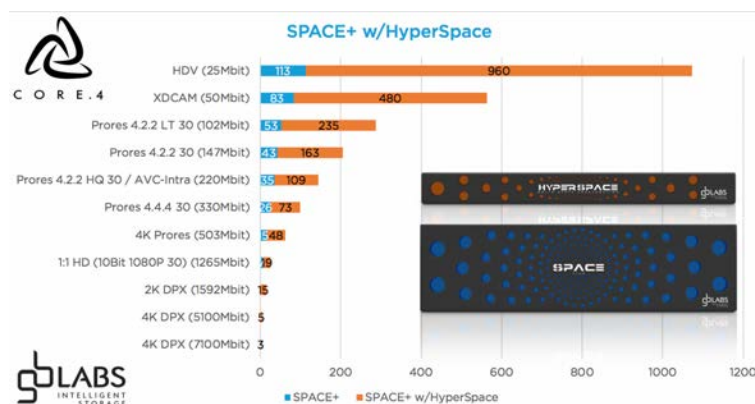
This functionality can move large quantities of data between storage volumes, without the inherent ‘bottle-necking’ usually associated with this type of topology. Therefore, the DAM or MAM server is able to work intelligently across the various available volumes of data, whilst keeping track of the growing number of assets.

As assets reach maturity, VAULT, in conjunction with GB Labs storage servers, can rapidly archive or re-establish assets in the future.

6. Performance Analysis - Delivery to Network

The chart below demonstrates a number of unique AV streams that can be read from a single SPACE or SPACE+ solution.

Each AV streams consists of a number of media files being pulled from the storage to a Non-linear Editing (NLE) timeline, where each file is unique.



7. File System

XFS is a 64-bit, high-performance, journaling file system used on all GB Labs storage platforms. XFS is particularly proficient at parallel I/O due to its design based on allocation groups. This enables extreme scalability of the I/O threads, file system bandwidth, and file system sizes when spanning multiple storage devices.

XFS ensures data consistency by performing metadata journaling and supporting write barriers. Capacity allocation is performed through extents with data structures stored in B+ trees, improving the overall file system performance, especially when handling large files. Delayed allocation helps in preventing file system fragmentation, while online defragmentation is also supported.

As a feature unique to XFS, I/O bandwidth can be pre-allocated for a guaranteed rate, that is suitable for many real-time applications.

8. Data security and disaster recovery

Any single system that is being used for storage of valuable assets is susceptible to data loss and force majeure, regardless of how sophisticated the RAID level or clustering of the disks. It is critical that data is backed up and readily accessible for the purposes of business continuity and preservation of assets.

SPACE+ units can automatically replicate to other GB Labs servers on the network, which allows for data to be available in an emergency on a separate storage volume. Using long-range fibre, this can be up to 10km away.

GB Labs ECHO is the most popular backup or near-line solution for SPACE+ deployments, available in similar capacities to SPACE+ (up to 224TB per unit or further by expansion).

ECHO 36 is the larger of the ECHO storage range and comes with mirrored OS, dual 40Gbe and hot spare disks as standard with ECHO 36 EX for further expansion. With a native capacity of 448TB, this size of unit means that future expansion can go beyond 10PB utilising just one head unit.

It is also possible to re-purpose Fibre Channel RAIDs or SAS JBODs with ECHO Bridge to provide this replication function. For compatibility of RAIDs, please contact us.

The GB Labs range is also complimented by high speed LTO-6, LTO-7 or LTO-8 units that run comprehensive software designed to work within the GB Labs Ecosystem. CORE software will also connect to other network servers, allowing Archive, Backup and LTFS workflows to be flexible.

9. API and third-party integration

A complete and comprehensive API is available for third-party integration with functions of CORE OS, including, File Manager and HSM automation capabilities

of all GB Labs servers.

In addition, there is also a complete API for the VAULT product range, which is also readily available to provide powerful integration with other servers running management services, such as; MAM and DAM software.



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