

# 2017 IBM Elastic Storage Server - Update

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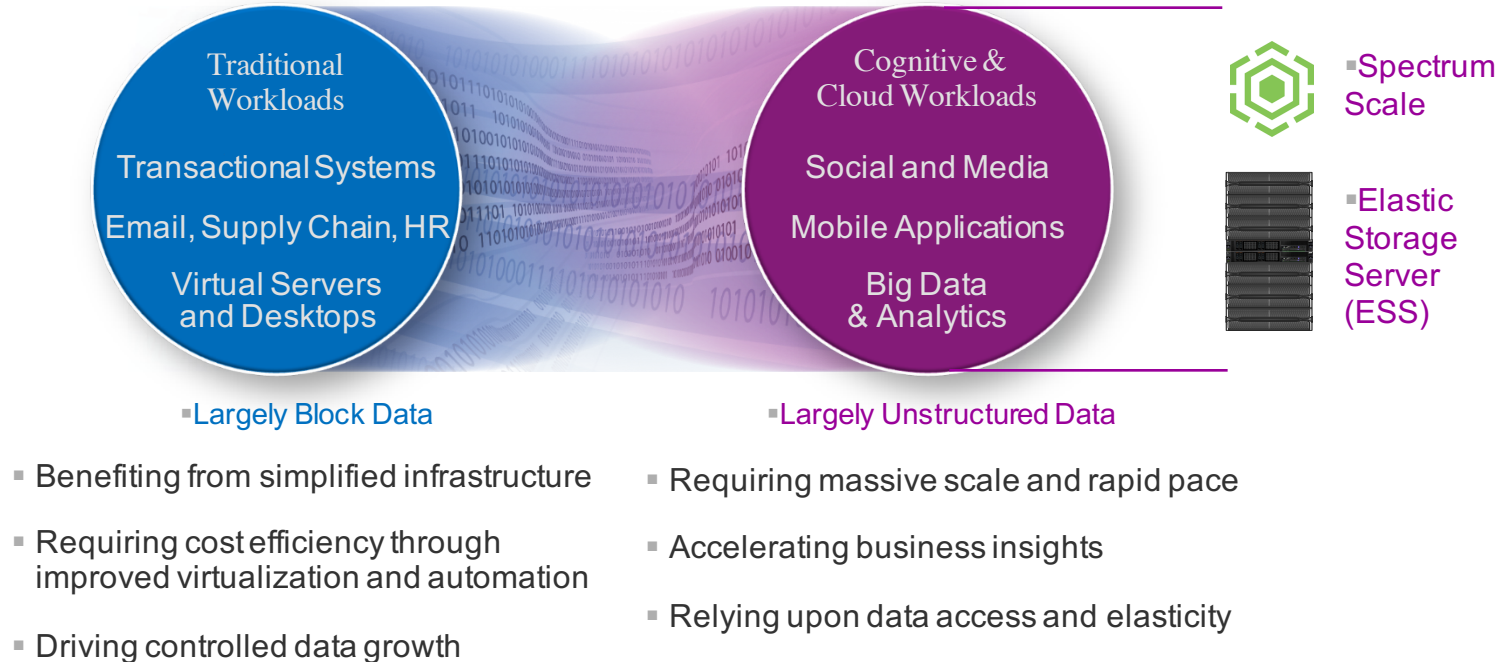
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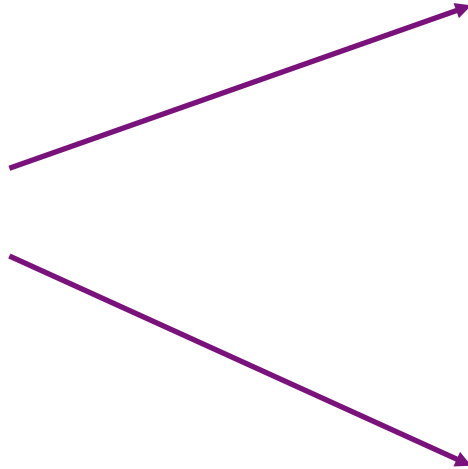
The emerging era of cognitive and cloud underpinned by pervasive technical computing is upon us. IBM Spectrum Scale and ESS are well positioned to respond to this market opportunity.



The Elastic Storage Server (ESS) is positioned to meet the next market wave - the emerging era of cognitive and cloud underpinned by pervasive technical computing.



Technical Computing  
Foundation



Cognitive Solutions and  
Cloud Platforms Market

# IBM Elastic Storage Server (ESS)

*Integrated scale out data management for file and object data*

IBM Storage & SDI

*The Choice for CORAL!  
ORNL 250 PB of ESS Storage*

## **Optimal building block** for high-performance, scalable, reliable enterprise storage

- Faster data access with choice to scale-up or out
- Easy to deploy clusters with unified system GUI
- Simplified storage administration with IBM Spectrum Control integration

## **One solution** for all your data needs

- Single repository of data with unified file and object support
- Anywhere access with multi-protocol support:  
NFS 4.0, SMB, OpenStack Swift, Cinder, and Manila
- Ideal for Big Data Analytics with full Hadoop transparency

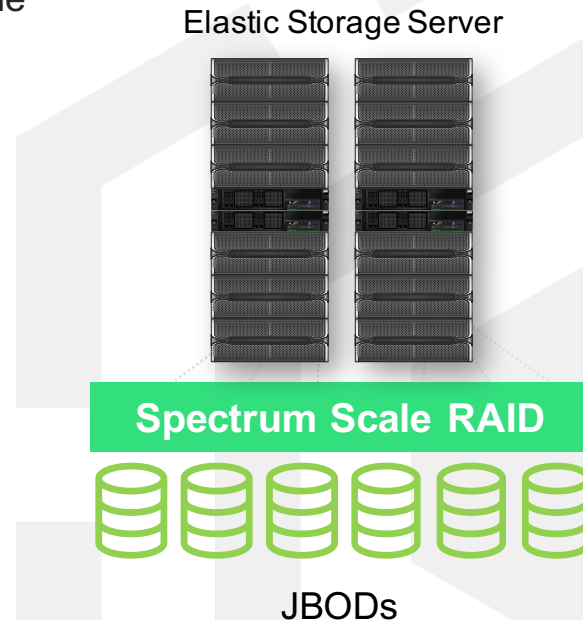
## **Ready for business** critical data

- Disaster recovery with synchronous or asynchronous replication
- Ensure reliability and fast rebuild times using Spectrum Scale RAID's dispersed data and erasure code



# Advantages of Spectrum Scale RAID

- **Use of standard and inexpensive disk drives**
  - 8+2 or 8+3 Erasure Code software implemented in Spectrum Scale
- **Sustained Data Availability**
  - Can survive full enclosure failures or full server maintenance
  - Critical Rebuilds completed in Minutes versus Days!
- **Minimal impact of rebuild on system performance**
  - Rebuild is done across all disks in system
  - Disk failure is a non-maintenance event if desired.
- **Better fault tolerance**
  - End to end checksum protects data all the way to client
  - Much higher mean-time-to-data-loss for large configs (MTTDL)
    - 8+2P: ~ 200 Years
    - 8+3P: ~ 200 Million Years



# Elastic Storage Server (ESS) Family

IBM Storage & SDI



SpectrumScale

IBM Power  
Linux Server



"Twin Tailed" JBOD  
Disk Enclosure  
X TB Drives



IBM Spectrum Storage

## Capacity

**Model GL2:** 2 Enclosures, 12U  
116 NL-SAS, 2 SSD

**Model GL4:** 4 Enclosures, 20U  
232 NL-SAS, 2 SSD

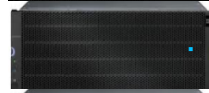
**Model GL6:** 6 Enclosures, 28U  
348 NL-SAS, 2 SSD



6+ GB/sec\*



13+ GB/sec\*



25+ GB/sec\*

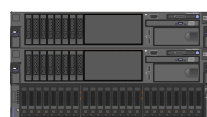
## Speed

**Model GS1** 24 SSD

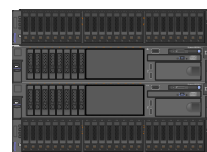
**Model GS2** 46 SAS + 2 SSD  
or 48 SSD Drives

**Model GS4** 94 SAS + 2 SSD  
or 96 SSD Drives

**Model GS6** 142 SAS  
+ 2 SSD Drives



6+ GB/sec\*



2 GB/sec SAS\*

12 GB/sec SSD\*



5 GB/sec SAS\*

18+ GB/sec SSD\*



7 GB/Sec\*

All Performance Estimates are dependent on workload,  
block size and Infiniband networking connections

Guideline Usable Space includes allowance for Erasure  
Coding, Metadata, and Spare Disk Space. These can  
vary based upon customer and workload requirements.

# We've Listened: Recent GNR/ESS Improvements

- Focus on quality, support and superior customer experience
  - Improved flow for Level 2 support (worldwide launch April 2017!)
  - Knowledge Center reworked to be more intuitive ([https://www.ibm.com/support/knowledgecenter/SSYSP8/sts\\_welcome.html](https://www.ibm.com/support/knowledgecenter/SSYSP8/sts_welcome.html))
  - Simplification of performance tunables
  - Call Home Stage 1: for components in I/O and management nodes
- ESS 5.0
  - **RedHat** ppc64 Little Endian (LE) support (no need for HMC); Update to RHEL 7.2
  - **Spectrum Scale** 4.2.2 support
  - **Call Home** Stage 2: disc
  - **Performance** enhancements – Hardware and software updates (ie LSI 12Gb adapter)
  - **Installation:** gssprecheck – catches common installation and upgrade issues prior to start, decreases chance of deployment errors and further reduces the time required for system bring up (found in sample directory)
  - **Security** Phase 1 hardening: Split of /home and /var from /root partition and security flags added in /etc/fstab



## Continue to expand boundaries of high performance

- All Flash Optimized models for high File IOPS
- Deliver Petascale Flash-Only ESS Systems
- Support “Integrated Burst Buffer” configurations (Coral)
- Support high speed NICs
- Big Data Analytics validated configurations

Leveraging Flash and Server Cache

## Simplify the Exascale

- *Call Home* for automated problem identification and maintenance
- Failed parts auto shipped
- Simplify troubleshooting problems by admin
- Simplify debugging and fixing Network Performance
- Enhanced Protocol Support

Leveraging RAS at scale

## Continue to bring down TCO

- Deploy Higher Density Enclosures
- Support higher capacity drives inline with industry
- Support hybrid (Flash and Disk based) ESS models
- Flexibility in choosing HDD/SSD/Flash and RAM

Leveraging GNR Software

Welcome Request for Enhancement (RFE) Community users! Here you have an opportunity to collaborate directly with the IBM product development teams and other product users.

developerWorks®

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All products

scale

Spectrum Scale (formerly known as GPFS) - Private RFEs

Spectrum Scale (formerly known as GPFS) - Public RFEs

WebSphere eXtreme Scale

GSS

GPFS Storage Server (GSS)

Hot

Top

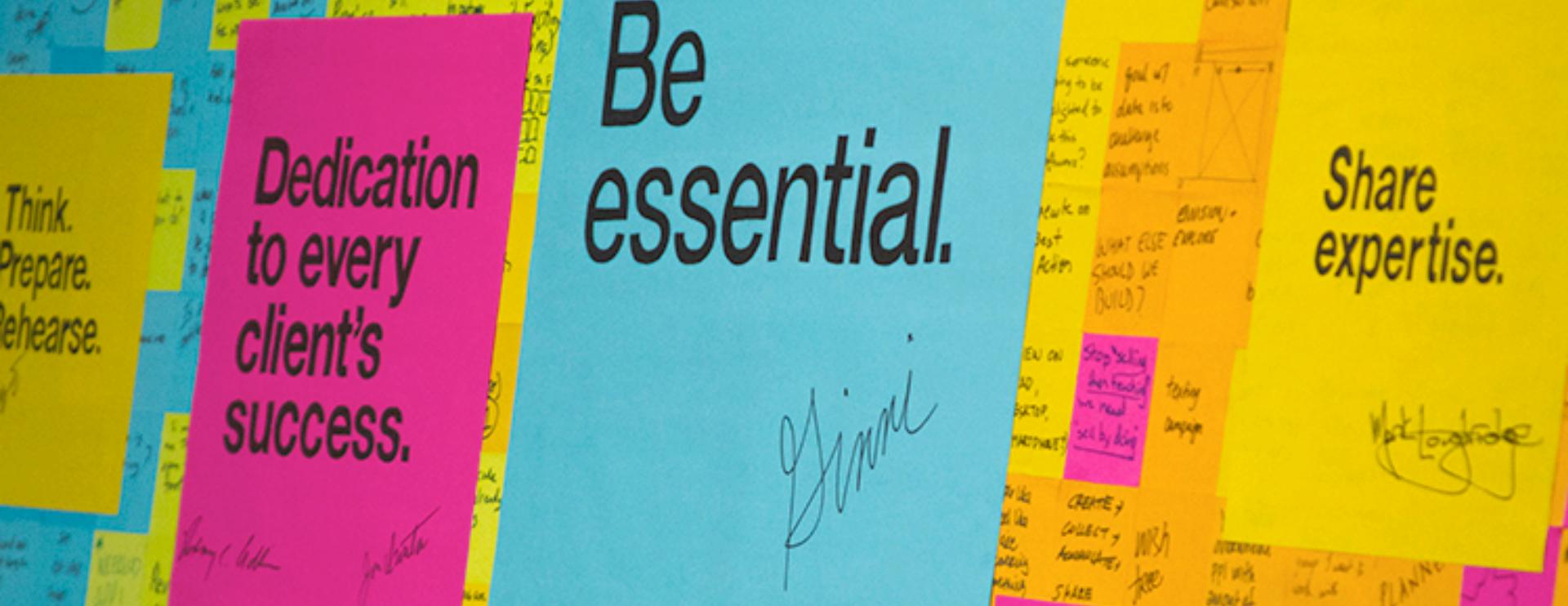
New

361 votes

Add additional member to an existing RFE

The current Storwize V7000 code is not designed to handle increasing storage capacity, it would require a new code release.

Uncommitted Candidate



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**Thank You.**  
**IBM Storage & SDI**

# gssprecheck

## Sample Output

```
# ./gssprecheck -G gss_ppc64l --upgrade --file ./gssdeploy.cfg
2016-10-28T13:23:43.402218 >>>ESS500_BETA_2<<< Start of pre-install check
2016-10-28T13:23:43.402285 This may take a few minutes. Please be patient
2016-10-28T13:23:45.232631 nodelist: c55f04n04 c55f04n05

===== Summary of EMS node =====
[OK] Parsing configuraton file
[OK] Checking xCAT version
[OK] Checking xCAT site table
[OK] Checking xdsh connectivity
[ERROR] Bonded link check
[ERROR] Spectrum Scale lock check
[OK] Checking deploy iface
[OK] Timezone consistency check
[OK] Universal time consistency check
[OK] Quorum node check
[OK] long waiters check
[ERROR] mmhealth health check
[ERROR] mmhealth eventlog check
    >>Running gnrhealthcheck...This will take a few moments<<
[ERROR] GNR health check
[OK] Manifest check
[OK] Checking /etc/hosts exists
[OK] /etc/hosts advanced checks
[OK] Checking for general repo errors
[OK] Checking for enabled external subscriptions
[OK] Checking kernel repo
[ERROR] Checking correct redhat version
[OK] Checking correct Endian type
[ERROR] High CPU % process found
[OK] Checking for servicable events
[OK] Root FS space check
[ERROR] Checking that tracing is disabled
[OK] Checking resolv.conf
[OK] Active Node Check
[OK] Checking for deadlocks
```