What's new in IBM Spectrum Scale 4.2

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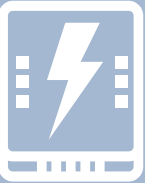
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IBM Spectrum Scale and Elastic Storage Server (ESS) Roadmap

4Q 2015	1H2016	2H 2016	1H 2017	2H2017
Quality of Service - Maintenance commands include: mmadddisk, mmapplypolicy, mmbackup, mmcheckquota, mmdefragfs, mmdeldisk, mmdelfileset, mmdelsnapshot, mmdf, mmfileid, mmfsck, mmimgbackup, mmimgrestore, mmlssnapshot, mmrestripefs, mmrpldisk. All of these commands have a new --qos option to use QoS. Default value of the --qos option is 'maintenance' class, which means that by default the maintenance tasks run at the IO rate specified in the maintaineance class. The class "others" represents everything else including customer applications. When a mantianane class is defined and qos enabled, to run one of File compression can help you reclaim storage space occupied by infrequently accessed files. The mmchattr command and the mmapplypolicy command can be used to identify and compress files. Compression works in a similar fashion to a migrate, you cannot define a compression placement rule. For example you can run file compression synchronously or defer it, if you defer it run mmrestripefile or mmrestripefs to complete the compression. You can decompress files with the same commands used to compress files. When a compressed file is read it is decompressed on the fly and remains compressed on disk. When a compressed file is overwritten the parts of the file affected are decompressed on disk synchronously ten data blocks at a time. File compression can help you reclaim storage space occupied by infrequently accessed files. The mmchattr command and the mmapplypolicy command can be used to identify and compress files. Compression works in a similar fashion to a migrate, you cannot define a compression placement rule. For example you can run file compression synchronously or defer it, if you defer it run mmrestripefile or mmrestripefs to complete the compression. You can decompress files with the same commands used to compress files. 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When a compressed file is overwritten the parts of the file affected are decompressed on disk synchronously ten data blocks at a time. **Object** IBM Spectrum Scale enhances OpenStack Swift Storage Policies which supports file-access, compression and multi-region functions. Each Swift container has only one Swift Storage Policy. With IBM Spectrum Scale, each Swift Storage Policy is mapped to a container which corresponds to a new or existing independant fileset. Containers are assigned a Storage Policy while creating. When objects are created in a container, they get stored into the associated fileset defined in the Swift Storage Policy. *Example - Defining a Swift storage policy:* *mmobj policy create CompressedSoF --enable-file-access --enable-compression -- compression-schedule "*:1:*:*"* **GUI** IBM Spectrum Scale web based GUI can monitor and notify system health and performance based on various aspects. It can manage file system, filesets, snapshots, policies, NFS, SMB, Object and accounts. Separate from ESS GUI until Q1 2016.Performance data is kept in the directory /opt/IBM/zimon/data in the local file system. When the customer installs two GUI nodes a collector is installed on each in this case performance data is gathered by each collector. The node running the GUI does not need an IBM Spectrum Scale server license. File compression can help you reclaim storage space occupied by infrequently accessed files. The mmchattr command and the mmapplypolicy command can be used to identify and compress files. Compression works in a similar fashion to a migrate, you cannot define a compression placement rule. For example you can run file compression synchronously or defer it, if you defer it run mmrestripefile or mmrestripefs to complete the compression. You can decompress files with the same commands used to compress files. 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(Plans to accelerate delivery pending) ·NFS 4.1/pNFS ·CompressionFile compression can help you reclaim storage space occupied by infrequently accessed files. The mmchattr command and the mmapplypolicy command can be used to identify and compress files. Compression works in a similar fashion to a migrate, you cannot define a compression placement rule. For example you can run file compression synchronously or defer it, if you defer it run mmrestripefile or mmrestripefs to complete the compression. You can decompress files with the same commands used to compress files. When a compressed file is read it is decompressed on the fly and remains compressed on disk. When a compressed file is overwritten the parts of the file affected are decompressed on disk synchronously ten data blocks at a time.
Object Store · OpenStack Swift Support · File compression can help you reclaim storage space occupied by infrequently accessed files. The mmchattr command and the mmapplypolicy command can be used to identify and compress files. Compression works in a similar fashion to a migrate, you cannot define a compression placement rule. For example you can run file compression synchronously or defer it, if you defer it run mmrestripefile or mmrestripefs to complete the compression. You can decompress files with the same commands used to compress files. When a compressed file is read it is decompressed on the fly and remains compressed on disk. When a compressed file is overwritten the parts of the file affected are decompressed on disk synchronously ten data blocks at a time.	**Object Store** · OpenStack Swift Automated install · File compression can help you reclaim storage space occupied by infrequently accessed files. The mmchattr command and the mmapplypolicy command can be used to identify and compress files. Compression works in a similar fashion to a migrate, you cannot define a compression placement rule. For example you can run file compression synchronously or defer it, if you defer it run mmrestripefile or mmrestripefs to complete the compression. You can decompress files with the same commands used to compress files. When a compressed file is read it is decompressed on the fly and remains compressed on disk. When a compressed file is overwritten the parts of the file affected are decompressed on disk synchronously ten data blocks at a time.	**Object Store** · Unifed file/ Swift object support · File compression can help you reclaim storage space occupied by infrequently accessed files. The mmchattr command and the mmapplypolicy command can be used to identify and compress files. Compression works in a similar fashion to a migrate, you cannot define a compression placement rule. For example you can run file compression synchronously or defer it, if you defer it run mmrestripefile or mmrestripefs to complete the compression. You can decompress files with the same commands used to compress files. When a compressed file is read it is decompressed on the fly and remains compressed on disk. When a compressed file is overwritten the parts of the file affected are decompressed on disk synchronously ten data blocks at a time.	**Object Store** · Swift Object Updates · File compression can help you reclaim storage space occupied by infrequently accessed files. The mmchattr command and the mmapplypolicy command can be used to identify and compress files. Compression works in a similar fashion to a migrate, you cannot define a compression placement rule. For example you can run file compression synchronously or defer it, if you defer it run mmrestripefile or mmrestripefs to complete the compression. You can decompress files with the same commands used to compress files. When a compressed file is read it is decompressed on the fly and remains compressed on disk. When a compressed file is overwritten the parts of the file affected are decompressed on disk synchronously ten data blocks at a time.	**Object Store** · Cloud Tier · Object – Storlets File compression can help you reclaim storage space occupied by infrequently accessed files. The mmchattr command and the mmapplypolicy command can be used to identify and compress files. Compression works in a similar fashion to a migrate, you cannot define a compression placement rule. For example you can run file compression synchronously or defer it, if you defer it run mmrestripefile or mmrestripefs to complete the compression. You can decompress files with the same commands used to compress files. When a compressed file is read it is decompressed on the fly and remains compressed on disk. When a compressed file is overwritten the parts of the file affected are decompressed on disk synchronously ten data blocks at a time.
ESS •GUI •Failure Domains More HW Options •GSS21s (SSD) •GSS22s (SSD & SAS) •GSS24s (SSD & SAS) •GSS26s (SAS) File compression can help you reclaim storage space occupied by infrequently accessed files. The mmchattr command and the mmapplypolicy command can be used to identify and compress files. Compression works in a similar fashion to a migrate, you cannot define a compression placement rule. For example you can run file compression synchronously or defer it, if you defer it run mmrestripefile or mmrestripefs to complete the compression. You can decompress files with the same commands used to compress files. When a compressed file is read it is decompressed on the fly and remains compressed on disk. When a compressed file is overwritten the parts of the file affected are decompressed on disk synchronously ten data blocks at a time.	**ESS** •Power platform •Update Linux (RHEL7) •RAS focus •performance monitoring •callbacks for alerts •enhanced maintenance procedures •Work with partners to expand optionsFile compression can help you reclaim storage space occupied by infrequently accessed files. The mmchattr command and the mmapplypolicy command can be used to identify and compress files. Compression works in a similar fashion to a migrate, you cannot define a compression placement rule. For example you can run file compression synchronously or defer it, if you defer it run mmrestripefile or mmrestripefs to complete the compression. You can decompress files with the same commands used to compress files. When a compressed file is read it is decompressed on the fly and remains compressed on disk. When a compressed file is overwritten the parts of the file affected are decompressed on disk synchronously ten data blocks at a time.	**ESS 3.0** • New Hardware • Problem determination enhancements • Configuration guidance • Call Home Support File compression can help you reclaim storage space occupied by infrequently accessed files. The mmchattr command and the mmapplypolicy command can be used to identify and compress files. Compression works in a similar fashion to a migrate, you cannot define a compression placement rule. For example you can run file compression synchronously or defer it, if you defer it run mmrestripefile or mmrestripefs to complete the compression. You can decompress files with the same commands used to compress files. When a compressed file is read it is decompressed on the fly and remains compressed on disk. When a compressed file is overwritten the parts of the file affected are decompressed on disk synchronously ten data blocks at a time.	**ESS 4.2** • New Hardware • Problem determination enhancements • Integrated NFS and SMB • Integrated OpenStack Swift File compression can help you reclaim storage space occupied by infrequently accessed files. The mmchattr command and the mmapplypolicy command can be used to identify and compress files. Compression works in a similar fashion to a migrate, you cannot define a compression placement rule. For example you can run file compression synchronously or defer it, if you defer it run mmrestripefile or mmrestripefs to complete the compression. You can decompress files with the same commands used to compress files. When a compressed file is read it is decompressed on the fly and remains compressed on disk. When a compressed file is overwritten the parts of the file affected are decompressed on disk synchronously ten data blocks at a time.	**ESS 4.3** • Additional integrated solution(s) File compression can help you reclaim storage space occupied by infrequently accessed files. The mmchattr command and the mmapplypolicy command can be used to identify and compress files. Compression works in a similar fashion to a migrate, you cannot define a compression placement rule. For example you can run file compression synchronously or defer it, if you defer it run mmrestripefile or mmrestripefs to complete the compression. You can decompress files with the same commands used to compress files. When a compressed file is read it is decompressed on the fly and remains compressed on disk. When a compressed file is overwritten the parts of the file affected are decompressed on disk synchronously ten data blocks at a time.

Clarity of Vision

IBM Spectrum Storage Family

IBM Spectrum Control	Centralized storage management.	**Any Storage**
IBM Spectrum Protect	Enterprise backup and HSM	
IBM Spectrum Archive	Cost effective tape tier	
IBM Spectrum Virtualize	Storage virtualization of mixed environments	**FlashSystem**
IBM Spectrum Accelerate	Enterprise storage for cloud **deployed in minutes** instead of months	
IBM Spectrum Scale	High-performance, highly scalable storage **for file, object and analytics**	**Private, Public or Hybrid Cloud**

Speed and Simplicity

- **Reduce administration overhead**
  - Graphical User Interface for common tasks
- **Easy to adopt**
  - Same look and feel as other IBM Spectrum Storage products
- **Integrated into Spectrum Control**
  - Storage portfolio visibility
    - Consolidated management
    - Multiple clusters
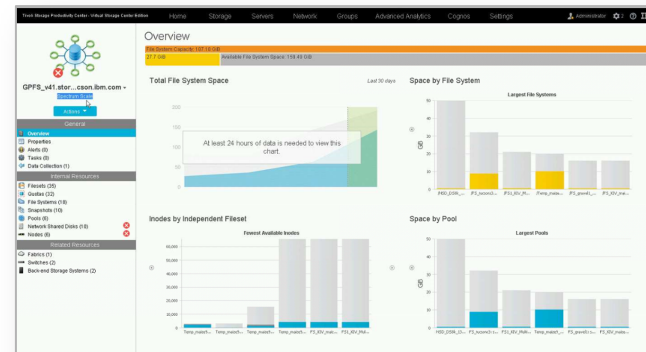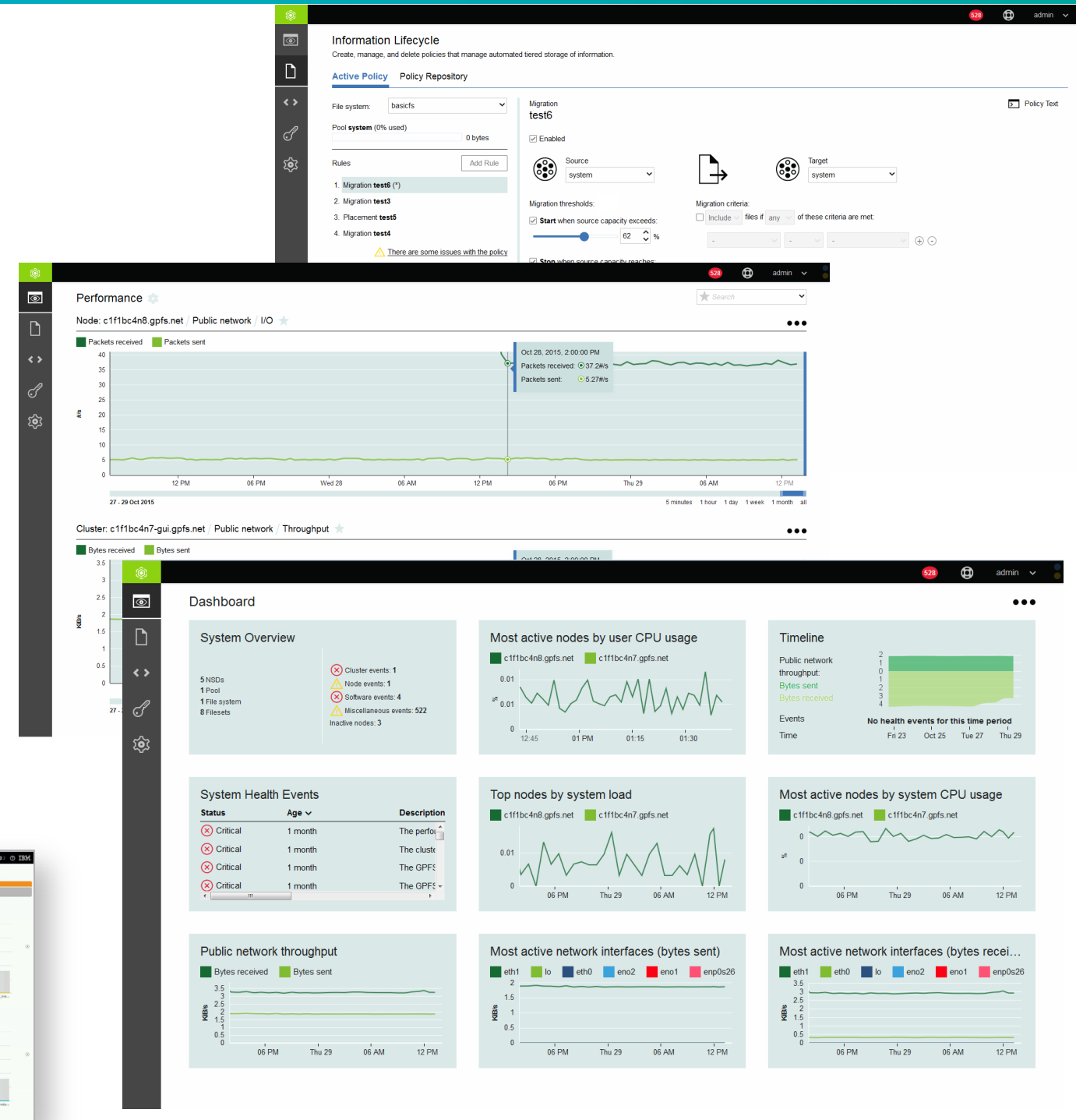
Speed and Simplicity: Performance Monitoring Highlights

System health

Node performance

Network traffic

Historical trends
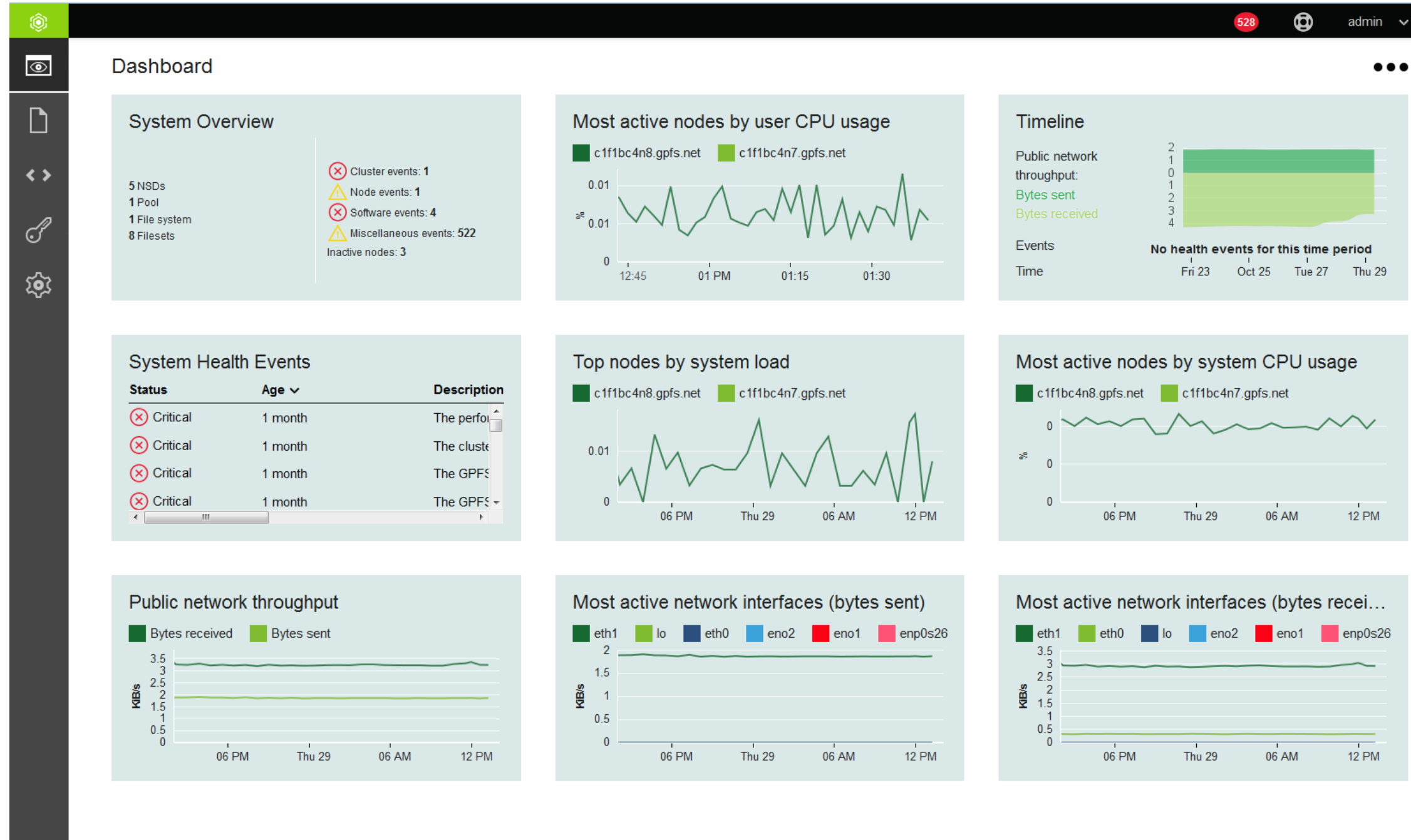
IBM Spectrum Scale Installer

Simplify Installation
- Install new cluster
- Add to existing cluster
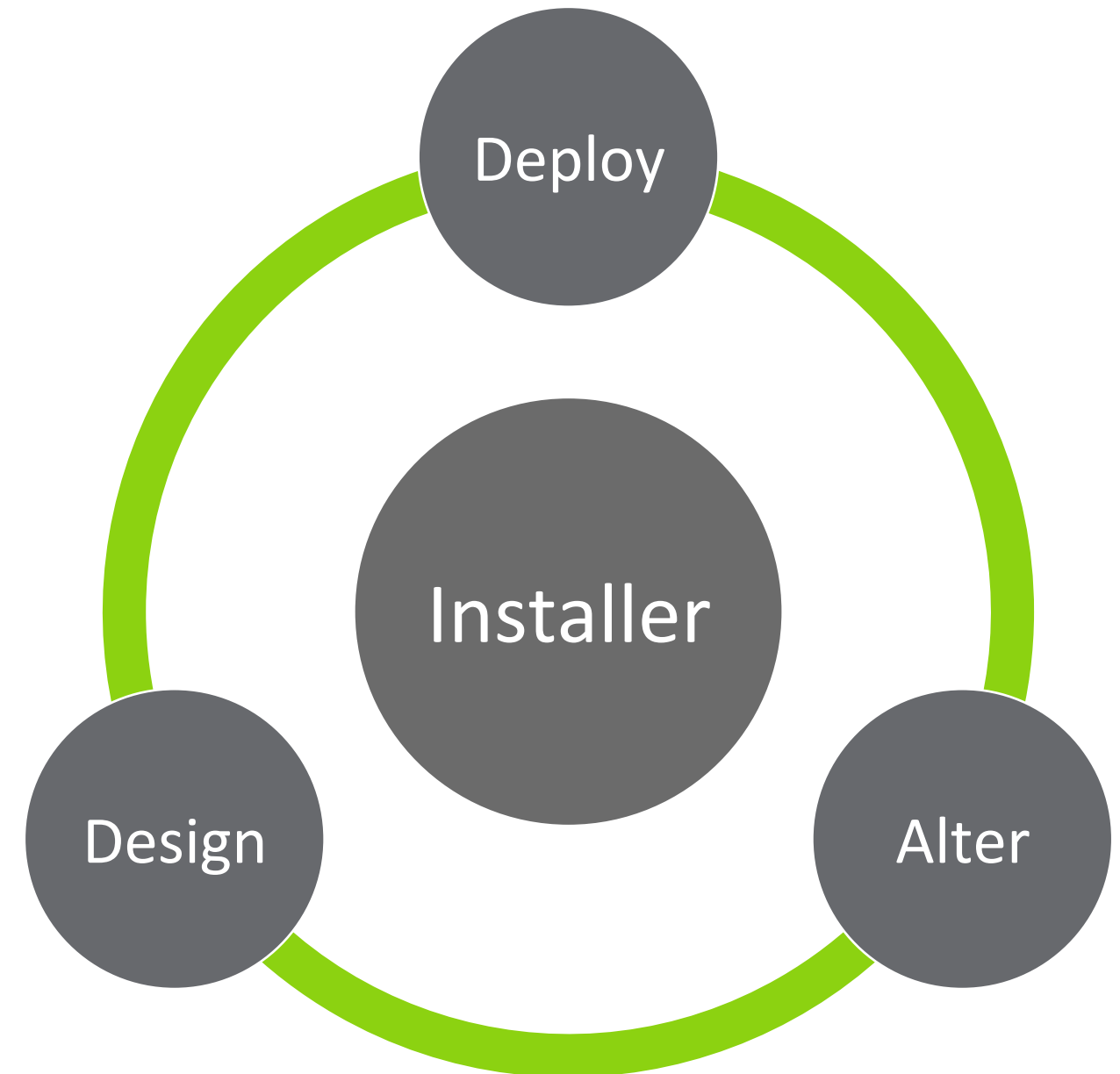
Reduce Costs - File Compression

- **Improved storage efficiency**
  - Typically 2x improvement in storage efficiency
- **Improved i/o bandwidth**
  - Read/write compressed data reduces load on storage
- **Improved client side caching**
  - Caching compressed data increases apparent cache size

Vision

- *Per file compression*
- *Use policies*
- *Compress low use data*

Ease management: Quality of Service

Reduce the IO impact of routine of maintenance tasks

• Policy Execution

• Snapshot Management

• Data rebalance

• IOPS based

Total IO Capability

Management
Capped at 20%

Applications

Mgmt
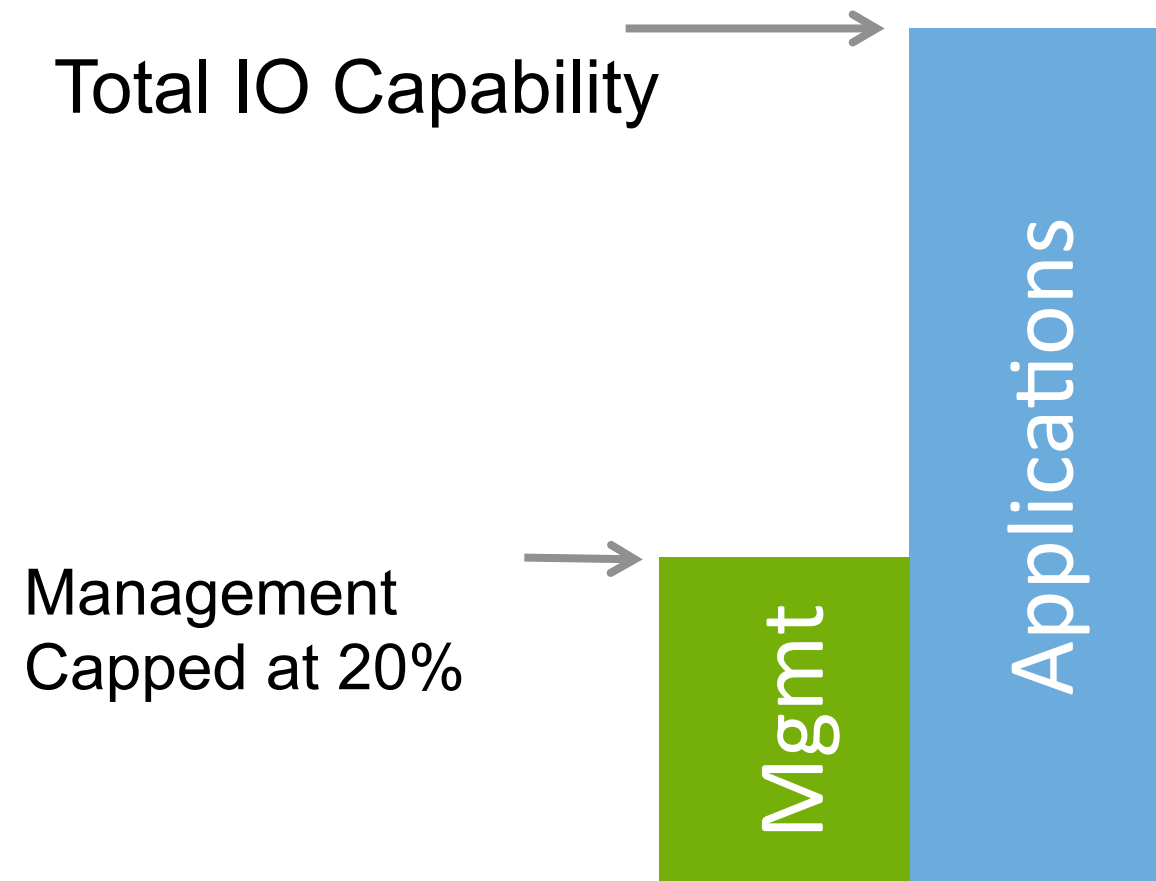
Hadoop Transparency

4.1 and earlier

Hadoop on nodes with
IBM Spectrum Scale installed

Hadoop
Spectrum Scale

- Some `HDFS imcompatiblilty`
- Designed for local disk storage
- Bundled with IBM Spectrum Scale

4.2

Hadoop can run on separate nodes than
IBM Spectrum Scale

Hadoop
↕ HDFS RPC
Spectrum Scale
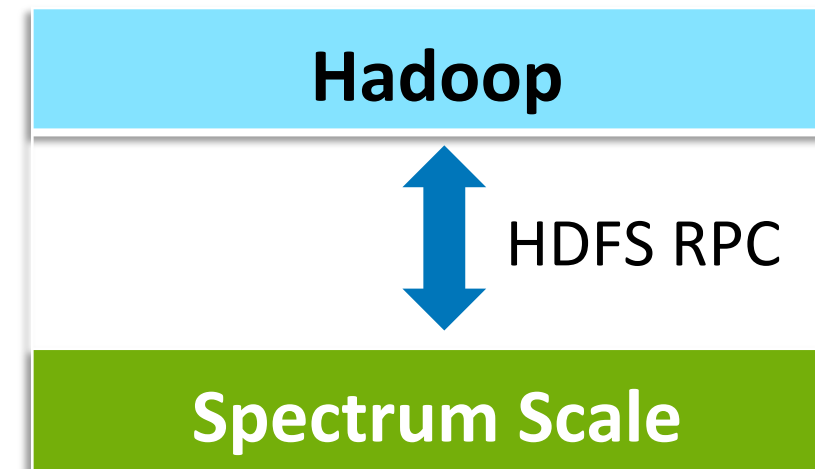
- HDFS client direct to connector service
- All data retrieved directly
- Compatible with HDFS

IBM Spectrum Scale Object

Protocol Support
- Unified File and Object
- Integrated analytics [Hadoop]
- S3 ACL Support

Data Protection and Integrity
- Specify storage features on a container

Advanced Features
- Metadata Search Whitepaper
- Storlet Whitepaper
- Compression

Protocol DR

- Integrate with Async DR
- OpenStack Swift Multi-region
- Protocol Groups

Security Hardening

No need for root passwordless ssh

IBM performing internal audit

- May see notification of security vulnerabilities

Elastic Storage Server

- One de-clustered array per recovery group
- New performance profiles
- InfiniBand EDR support
- Latest Redhat

IBM Spectrum Scale Virtual Machine

Turn-key IBM Spectrum Scale VM available for download
- Try the latest Spectrum Scale enhancements
- Fully functional on laptop, desktop or server
- Incorporate external storage

Use for live demonstrations, proof of concepts, education, validate application interoperability
- Scripted demonstrations

Details
- VirtualBox hypervisor only
- Type-2 Hypervisor limits performance
- Not designed for production workloads