



High Performance Storage System

# 2017 HUF Burning Issues Update



# Disclaimer



High Performance Storage System

- Forward looking information including schedules and future software reflect current planning that may change and should not be taken as commitments by IBM or the other members of the HPSS collaboration.

# Agenda



High Performance Storage System

- Introduction
- Process
- Review of New Burning Issues
- Status of Open Burning Issues
- Backup

# Introduction

- HPSS User Forum (HUF) Burning Issues (HBIs) are valuable input for influencing and setting Collaboration priorities
  - HBI's are used as one source of input during release planning activities. Realistically, all HBI's are not going to be addressed, so ranking during the voting process is important.
- Clarity on Priority, Importance, and Impact is needed
  - Changes that benefit our broader community will likely have higher importance or impact
- Please keep input at the requirements level helping understand what you need and why
  - Proposing a solution may not always help us understand what is needed and why

# Introduction

- Submit the highest priority burning issue per site, per year
  - Submission of burning issues is optional
  - Reusing a previous burning issue is encouraged via the voting process
    - If there is no new issue that is more important than an existing one, please consider voting on the existing one
- Please keep in mind that broader programmatic decisions, strategy, and direction, especially those impacting the architecture of HPSS are still within the domain of the HPSS Executive Committee
  - We are listening, but we cannot do everything
- Burning Issues are addressed with the following:
  - Change Request (CR)
  - Call Report
  - Bug (defect)

# Burning Issue Assessments

- Priority
  - Priority as reflected in the CR database.
  - CRs are reviewed on a monthly basis. CR priorities are assessed and updated regularly.
  - Questions we ask:
    - How much does the issue impact the system? Where and How?
    - How much interest is there with the development partners? Within the HPSS Community
  - Priority is relative to other work and things to get done on a defined schedule

# Burning Issue Assessments

- Importance
  - Relative to other things, how important is the issue or action
  - Questions we ask:
    - Are we ever likely to address the issue based on factors like schedule impact or strategic direction?
    - How many sites will be involved with the issue
    - Impacts to current and future assignments and schedule expectations.
- Complexity
  - Is there an agreement on the requirements and how best to address the issue?
  - How many SLOCS, time, and effort involved?
  - How many subsystems?
  - How many people?

# Burning Issue Process

- Please use the burning issue form introduced in 2013 for submission
  - Helps with understanding and documentation and provides the input needed to create the CR, call report, or bug
- If a previous burning issue has not been resolved
  - Please vote on it again
    - Provides feedback that issue is still important
    - Allows updates concerning the requirements, use cases, etc
- If you missed the burning issue deadline and have something to provide, please let us know



# Burning Issue Process

- Updates to open burning issues are provided at the HUF
- New burning issues are reviewed at the HUF
- All burning issues are documented by support rep via a call report
  - May result in a new CR or bug
  - May result in updating a previous CR or bug

# Burning Issue Process

- Voting

- Will occur just after the HUF
- Make sure you understand the burning issues you are voting for, if you are not sure, please ask
- Each site gets 3 votes
  - Highest importance
  - Second highest importance
  - Third highest importance
- Results will be posted to the Admin Wiki and emailed to the reflector
  - Results will be review with the Collaboration EC



# Burning Issue Process/Customer Advocacy – Checkpoint and Feedback

- Thoughts on the Burning Issues and Process?
  - What's working well?
  - Where/How is there room for improvement?
  - Other customer advocacy needs?
  - Important to be conducted on customer side by non-development site rep?
  - How do we close Burning Issues?
- Other Hot Issues
  - EC Presence at HUF (Thanks Dick Watson)
  - HPSS DSI support status ([hpss-discuss@globus.org](mailto:hpss-discuss@globus.org))
  - HSI/HTAR support status (Nick Balthaser provided update)
- Mid-year checkpoint concall/webinar?
  - HPSS strategic changes
  - BI/Development updates
  - Other Updates?

# HUF Burning Issues

- HPSS 7.5.2 Burning Issues

- HUF Burning Issues were prioritized with other CRs and bugs for 7.5.2 planning
- Two Burning Issues influenced the development of 7.5.2
  - Combined Issue: Job Cancellation and Freeing Stuck I/O or I/O Abort
    - Highest Priority Burning Issue
    - Most Voted Burning Issue
  - Repack Performance Improvements – New option to repack without freeing space in aggregates.
- Almost all of the work done in the Storage Server for 7.5.2 release involved these two Burning Issues
- I/O Abort was a large and complex feature that required nearly the entire release development period to complete

# 2017 Burning Issues



High Performance Storage System

Site	Title	Comments	Submittal
BNL	RTM Pvname not showing through the job period	Bug 2305	<a href="#">BNL 2017 BI</a>
ECMWF	Allow a dual copy disk/tape to purge the disk if the tape has been written	CR 435	<a href="#">ECMWF 2017 BI</a>
MPCDF	More efficient use of multiple file copies / multiple PVRs	CR 533	<a href="#">MPCDF 2017 BI</a>

[https://hpss-collaboration.clearlake.ibm.com/adminwiki/doku.php?id=userinfo:huf\\_business:burning\\_issues:2017](https://hpss-collaboration.clearlake.ibm.com/adminwiki/doku.php?id=userinfo:huf_business:burning_issues:2017)

# Status of Open Burning Issues



High Performance Storage System

ID	Burning Issue	Status	P I C	Details
BN012016	Eliminate Server Recycle	Open	M H M	Eliminate the need for recycling the Core server after configuration changes CR399 Eliminating HPSS Server Recycles <b>2017:</b> CR is in discussion for 7.5.3 planning
DZ022016	RHEL/HPSS Incompatibility	Open	M M M	Incompatibility between the latest supported RHEL and HPSS versions. <b>2017:</b> This is being addressed with testing and roadmap plans to release with the latest RHEL versions as they become available. There should be not compatibility issues with RHEL minor version upgrades.
SC032016	Reordering of files to be staged	Recommend Closure	H M M	Same as SC022015 Burning Issues. Poor performance when staging files. CR285 Tape Ordered Recall <b>2017:</b> Tape ordered recall was released with 7.4.3p3 and 7.5.1

# Status of Open Burning Issues



High Performance Storage System

ID	Burning Issue	Status	P I C	Details
KI012015	Support for (Unicode) UTF-8 characters	Open	M M M	Complete support for native language character sets for directory and file names. CR 321 "Support for Unicode (UTF-8, 16) character set" Object names can contain unprintable characters setting in the global configuration can provide support for large percentage of characters, but is not full UTF-8 support. <b>2017:</b> Being Evaluated
SC022015	Reordering of files to be staged	Recommend Closure	H M M	Same as SC2013 Burning Issues. Poor performance when staging files. CR285 Tape Ordered Recall Tape ordered recall was released with 7.4.3p3 and will be released with 7.5.1
IN032015	Retrieve the Media Type of a Physical Volume (PV) using the API	Open	M M M	Return the media type for the volume through the API CR368 Retrieve the Media Type of a Physical Volume (PV) using the API <b>2017:</b> Low priority in voting. Is there a work around? <b>2016:</b> Passed to the TC for evaluation
NC042015	Repack Performance Improvements	Open	M M H	Add tape drive vendor specific commands to help improve repack performance. CR365 Advanced repack capability - migrating at native tape drive performance <b>2017:</b> Needs more evaluation. Xcopy commands copy tape segments to new volumes. Evaluation needs to be done to determine the best way to update HPSS tape headers during the copy process. Oracle has also stopped development of their enterprise drives.

P = priority, I = importance, C = complexity

# Status of Open Burning Issues



High Performance Storage System

ID	Burning Issue	Status	P I C	Details
SC2014	Quota Accounting Feature	Open	L M M	<p>Quota/Accounting Features: We need a way to enforce the HPSS storage resources that are allocated on a yearly application process to projects, groups and users.</p> <p>CR 298 “Implement group-based accounting and quota system”</p> <p><b>2017:</b> No updates.</p> <p><b>2016:</b> What more is needed from this burning issue?</p> <p>A basic quota system using the Gatekeeper site lib and HPSS accounting is available. It can be configured with soft and hard limits for users, groups, or both. When the soft limit is reached, an email is sent as a warning, but users can still create files. If the hard limit has been reached, an email is sent and the user can no longer create or append files. The quota system is available for 7.4.3p1. Work with your support representative to configure and install the quota feature.</p>
BN2014	HPSS Upgrade Installation readme documentation	Recommend Closure	L M M	<p>A readme document that explains the detailed step by step upgrade procedure for that release.</p> <p>2017: Step by step guide is available for 7.5.1 Q-Rep upgrades.</p> <p>2016: The conversion guide already provides a detailed set of instructions for the conversion steps for each release.</p>

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# Status of Open Burning Issues



High Performance Storage System

ID	Burning Issue	Status	P I C	Details
IU2014	Verify Second Copy	Open	M M M	<p>CR339: Would like the ability to stage data from specified tape copy without administrator intervention. Currently the first copy tape volume must be marked down by the administrator for the system to read from the second copy tape volume.</p> <p><b>2017:</b> LBP Verify tool was released with 7.5.1 and can verify the data is valid on the volume. Keeping open to allow reading from the second copy.</p> <p><b>2016:</b> TC Passed. Would the LBP Verify tool cover this requirement or is there still the need to read the file?</p>
EC2014	Requests for Migration Improvements	Open	H H H	<p>CR348: Scalability issues with MPS. When using complicated COS and Hierarchy configurations, MPS can use a large number of tape drives. Migration streams are also limited to the slowest streaming tape drive. ECMWF would like MPS to migrate data based on the target SC rather than the source SC.</p> <p><b>2017:</b> 3 new CRs 414, 415, and 416. CRs are being evaluated for 7.5.3 planning.</p> <p><b>2016:</b> TC Evaluated. CR was evaluated, but it did not make the cutoff for 7.5.2.</p>

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# Status of Open Burning Issues



High Performance Storage System

ID	Burning Issue	Status	P I C	Details
BN022013	Tape Streaming repacks with utilization of disk cache.	In Work	M M H	<p>CR 327 Optimize Repack  <b>2017:</b> CR397 is included in 7.5.2. Evaluating CR 327.  <b>2016:</b> CR 397 is planned for 7.5.2. It will provide an option that will not remove sparse space in aggregates during repack.  <b>2015:</b> Planning for Feature Release  <b>2014:</b> Repack performance is important but it has been a lower priority than other HPSS scalability and performance goals.                      Tape mover operations and repack behavior have been studied, tests have been conducted, and many ideas generated. Data integrity remains our number one priority and concern.                      While a complete plan has not been finalized, current efforts have been in three areas:                      1. Looking at a new tape management approach with the goal of repacking media from multiple slower drives onto a newer faster tape drive possibly using disk for buffering I/O operations.                      -This is a large and complex problem which has not been high enough in priority or importance to make a release plan.                      -Work will likely continue outside of mainstream release plans on a best-effort basis.                      2. Reviewing tape read and write operations, in general. Repack is all reading and writing to tape. If we can read and write from tape faster, repack will be faster.                      -Some specific cases have been studied (repacking sparse tapes) with some promising results which have not been fully vetted.                      -New tape drive features may offer improved write performance (e.g., buffered TMs) but these features and changes have not been fully vetted.                      -This is a large and complex problem which has not been high enough in priority or importance to make a release plan.                      -Work will likely continue outside of mainstream release plans on a best-effort basis.                      3. Other tape I/O-related changes that will be of benefit to repack (e.g., tape ordered recall).</p>

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# Status of Open Burning Issues

ID	Burning Issue	Status	P I C	Details
UK012013	Administrative functions, such as down a tape or drive, should take precedence over other commands and be action'ed immediately.	Being Eval'ed	M L M	CR 316 Update PVR Mount-Available Drives in Real-time (from NCSA) <b>2017:</b> No Change <b>2016:</b> No Change <b>2015:</b> No Change <b>2014:</b> The TC feels that at least one case of CR 316 will be covered by the solution for CR 183, Need a way to interrupt/stop i/o in flight. Other cases for CR 316 are also probably related to CR 183. Nothing else has been done.
EC042012 EC032013	On the Fly metadata conversion.	Recommend Closure	H+ H H	CR 272 Capability to continue running HPSS during metadata conversion; Same as 2012 HUF BI #4 <b>2017:</b> Sites have used Q-Rep for 7.5.1 migrations <b>2016:</b> Several sites have used Q-Rep for migrations and 7.5.1 migration will be Q-Rep only <b>2015:</b> Q-Rep based upgrades were used to upgrade 4 sites in 2015. Close for 2015 <b>2014:</b> Recommend closure based on Dave's update and availability of Qrep-based upgrades.
SC042013	Reordering of files to be staged.	Recommend Closure	H L M	Duplicate of NE042013, Poor performance staging files from an aggregate if requests are not in tape order, which has been closed. Corresponds to Bug 2213, which was closed because it maps to CR 285 (H) Ordered File Recall from tape including advanced tape functions. <b>2017:</b> Tape Order Recall and Quaid are available in 7.5.1 <b>2016:</b> Tape Order Recall was released with 7.4.3p2 and will be included in 7.5.1 <b>2015:</b> Tape Order Recall feature to be released with HPSS 7.4.3p3 <b>2014:</b> Changed status to In Work.

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# Status of Open Burning Issues

ID	Burning Issue	Status	P I C	Details
LN072013 LN052012	Job and I/O Cancellation.	In Work	M M M	CR 280 "Capability in RTM Summary to kill jobs". <b>2017:</b> In Development for 7.5.2 release <b>2016:</b> Targeted for 7.5.2 <b>2015:</b> No Change, Planning together with CR 183 <b>2014:</b> This is a way to represent an interface for CR 183. No change based on priority and importance.
LN112012	Freeing Stuck I/O	In Work	H M H	CR 183 "Need a way to interrupt/stop I/O in flight". The CR is being designed and developed, however the Collaboration has not yet targeted it to a release. <b>2017:</b> In Development for 7.5.2 <b>2016:</b> Targeted for 7.5.2 <b>2015:</b> No Change, will be worked with CR 280. <b>2014:</b> Next on the list after tape ordered recall for Geoff and Michael.
UN102012	GHI problem isolation	Recommend Closure	H H M	CR 42 "Syslog function needs to be configurable so that users can filter the messages logged. Preferred method of implementation is command line function to enable/disable error tracing of various levels." CR 55 "Update the GHI logging system so it supports syslog out of the box." These CRs are targeted for GHI 2.4.1. <b>2017:</b> Sites are using 2.5 <b>2016:</b> GHI 2.5 has been released <b>2015:</b> GHI 2.5 Release 4Q2015 <b>2014:</b> Planned with GHI 2.5 (development complete) with 2015 target release.

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# Status of Open Burning Issues

ID	Burning Issue	Status	P I C	Details
NA022012	Fix VFS Security	Being Eval'ed	L L M	<p>CR 224 "VFS host access/mount point control".</p> <p><b>2017:</b> No Change  <b>2016:</b> No Change  <b>2015:</b> No Change  <b>2014:</b> Solution needs to focus on the general client case; this issue is not specific to VFS (Kernel or FUSE implementations). Please consult with IBM support for how to deploy VFS in a more secure manner and to discuss known risks and limitations.</p>
BN032012	Short Tape Issue	Needs Evaluation	L M M	<p>CR 274 "LTO4/5 tapes EOM prematurely due to tape drive errors". In summary, would like the ability to un-EOM prematurely EOM' ed tape.</p> <p><b>2017:</b> No Change, Is this still an issue?  <b>2016:</b> No Change  <b>2015:</b> No Change  <b>2014:</b> TC has discussed this issue and CR for all drive types, not just constrained to LTO4/5. There are many ways of dealing with this problem and it's been difficult to come to agreement on an approach that can be done in a reasonable amount of time, effort, and complexity (e.g., making everything configurable). We're also concerned about maintaining drive-unique information. We think there may be some changes that can be done to alter the state of a volume and not mark it EOM (e.g., RO). More discussion is needed. Accommodating sense code feedback and adjusting accordingly is of interest but low priority and importance at this time.</p>

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# Status of Open Burning Issues



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UN062012	Migration Stream Granularity	Needs Evaluation	L H M	CR 309 “Migration streams per file family”. Has not been formally accepted as a CR by the Collaboration. <b>2017:</b> Need to evaluate with other MPS CRs <b>2015:</b> Possibly combine with CR348? <b>2014:</b> No change. Important issue but this is stacked-up behind other MPS work.
UN142012	GHI Backup Validation	Closed	M H M	CR 40 “Provide a feature such a customer can validate the backup process”. CR is targeted for GHI 2.4. <b>2015:</b> Closed <b>2014:</b> Implemented in GHI 2.4 released April 2014.
UN152012	Quota and Accounting Features	Open	M L M	CR 298 “Implement group-based accounting and quota system”; CR is in development and once complete will be targeted for a HPSS release. <b>2017:</b> No Change <b>2015:</b> Gatekeeper Site library developed for DKRZ and available with 7.4.3p1 <b>2014:</b> Regressed... was an issue with NOAA (and DKRZ to an extent) as a driving business need but that need went away.
UN082012	Media Read Flexibility	Recommend Closure	M M M	CR 314: Enable HPSS to be read and write media-type aware for multi-generation media support with appropriately featured tape drives. <b>2017:</b> Released with 7.5.1 <b>2016:</b> Will release with 7.5.1 in 2016 <b>2015:</b> Development for CR is almost complete in 7.5. <b>2014:</b> Targeted for 7.5.1. Dependency on SS in order to share information about the type of mount. If that’s satisfied, will be available in 751.

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# Status of Open Burning Issues



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ID	Burning Issue	Status	P I C	Details
UN162012	HTAR Limitations	In Work	H H H	<p><b>2015:</b> Targeted for HPSS 7.5.1 release.</p> <p><b>2014:</b> HSI 5.0.2.p0 is ready for HPSS 7.4.3 so efforts are turning to these required changes which includes removing the old tar format restrictions. GEL will be asking for volunteer sites to help test as soon as a release is available, which is expected to be in 1-2 months depending on problems/emergencies.</p>
UN092011	Enhancements for all media-related utilities (repack, recover, etc) to take advantage of data still on disk cache	<p>Recover - Completed</p> <p>No change on other utilities.</p>	M M H	<p>In general: CR 246 "MPS Force Migrate Frontend Utility"</p> <p>Recover: CR 249 "Recover utility fixes and improvements" – item 1: "The recover utility needs to support recovery from any valid level". Has been formally accepted as a CR by the Collaboration and is targeted for 7.5</p> <p>Repack: Need more information.</p> <p><b>2017:</b> No Change</p> <p><b>2016:</b> No Change</p> <p><b>2015:</b> Recover enhancements released in 7.4.3 p1</p> <p><b>2014:</b> With respect to Recover only, CR 249 has been implemented and targeted for HPSS 743 patch 1 and 7.5. Nothing has been done to Repack, though. We are unclear on what other media-related utilities should be reviewed.</p>

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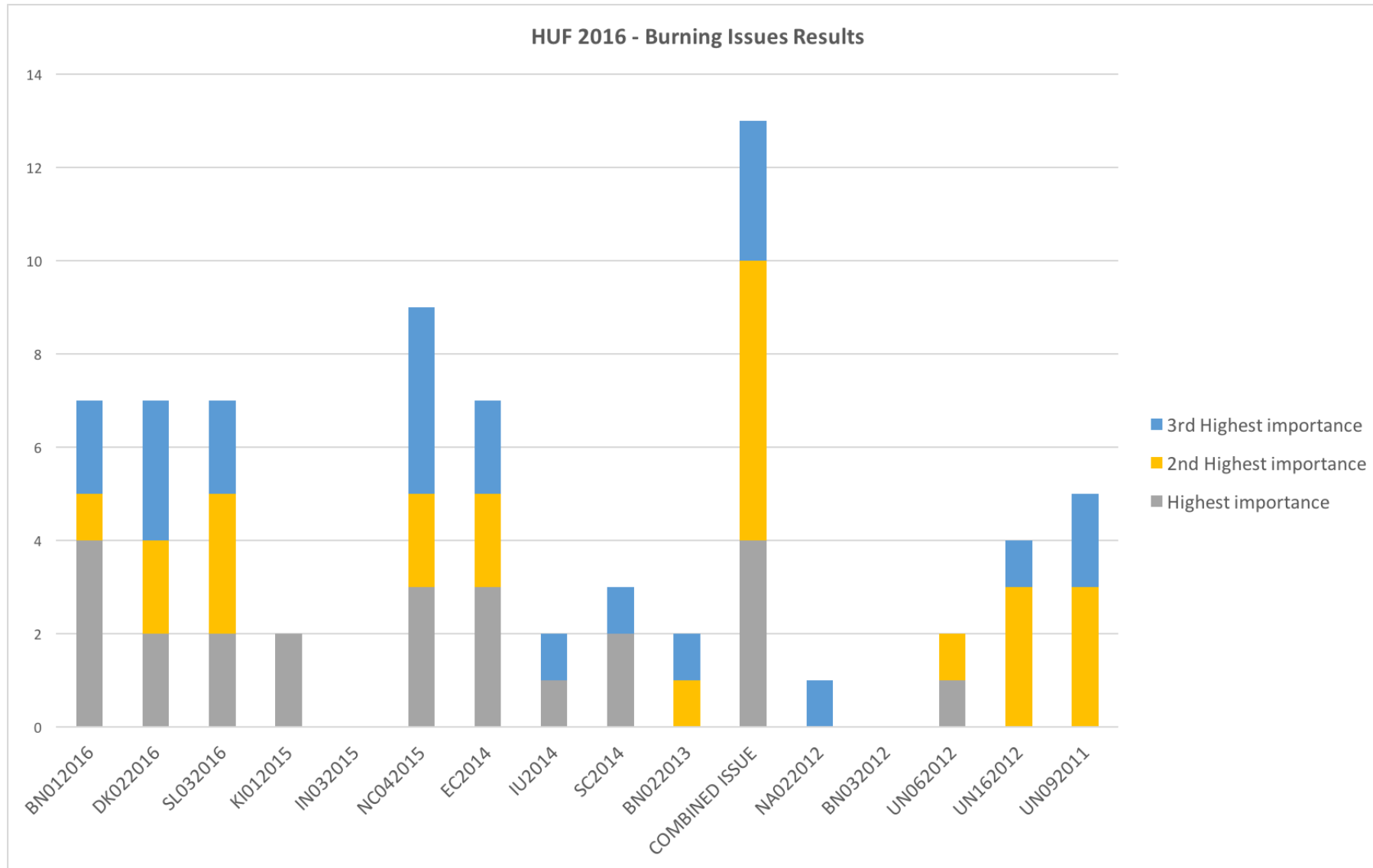
Backup



# 2016 HUF Burning Issue Vote Results

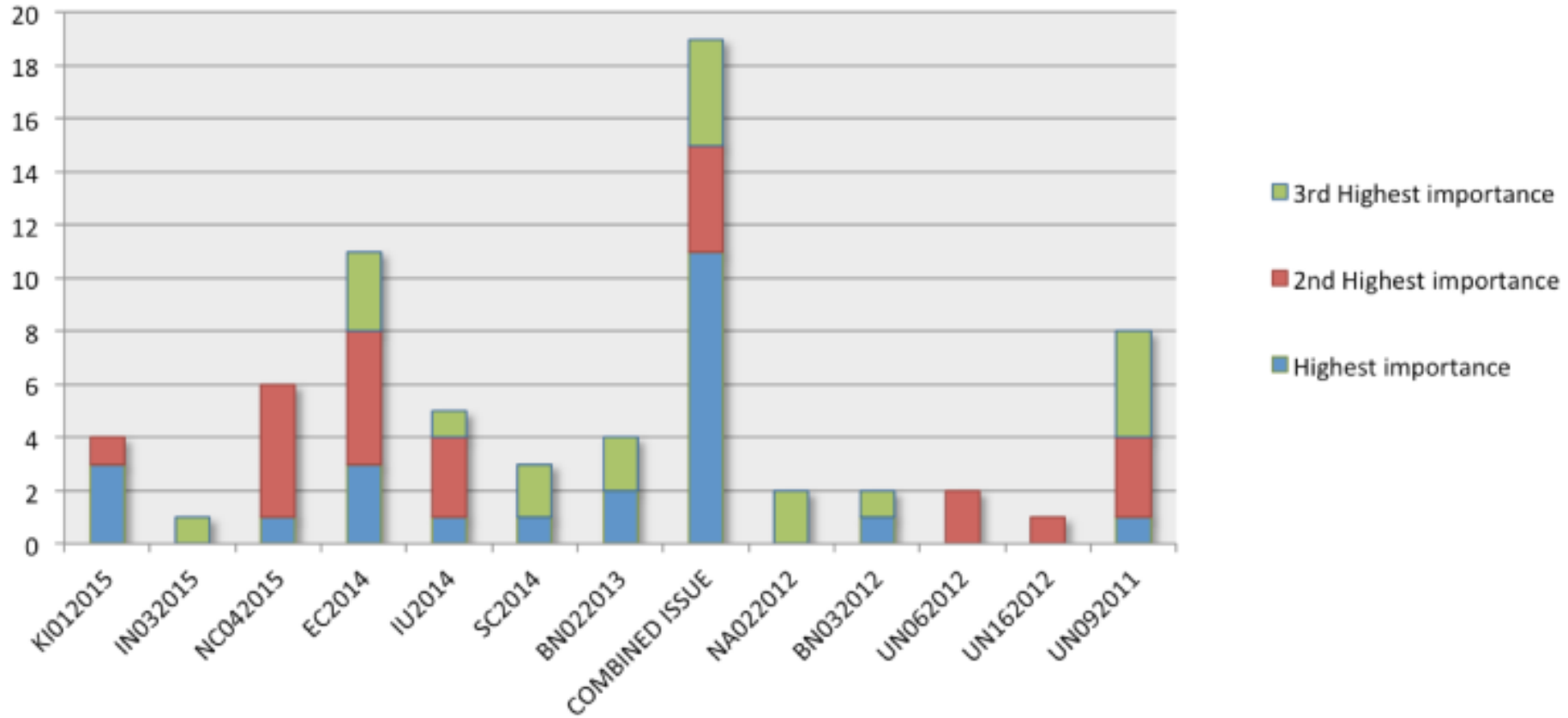


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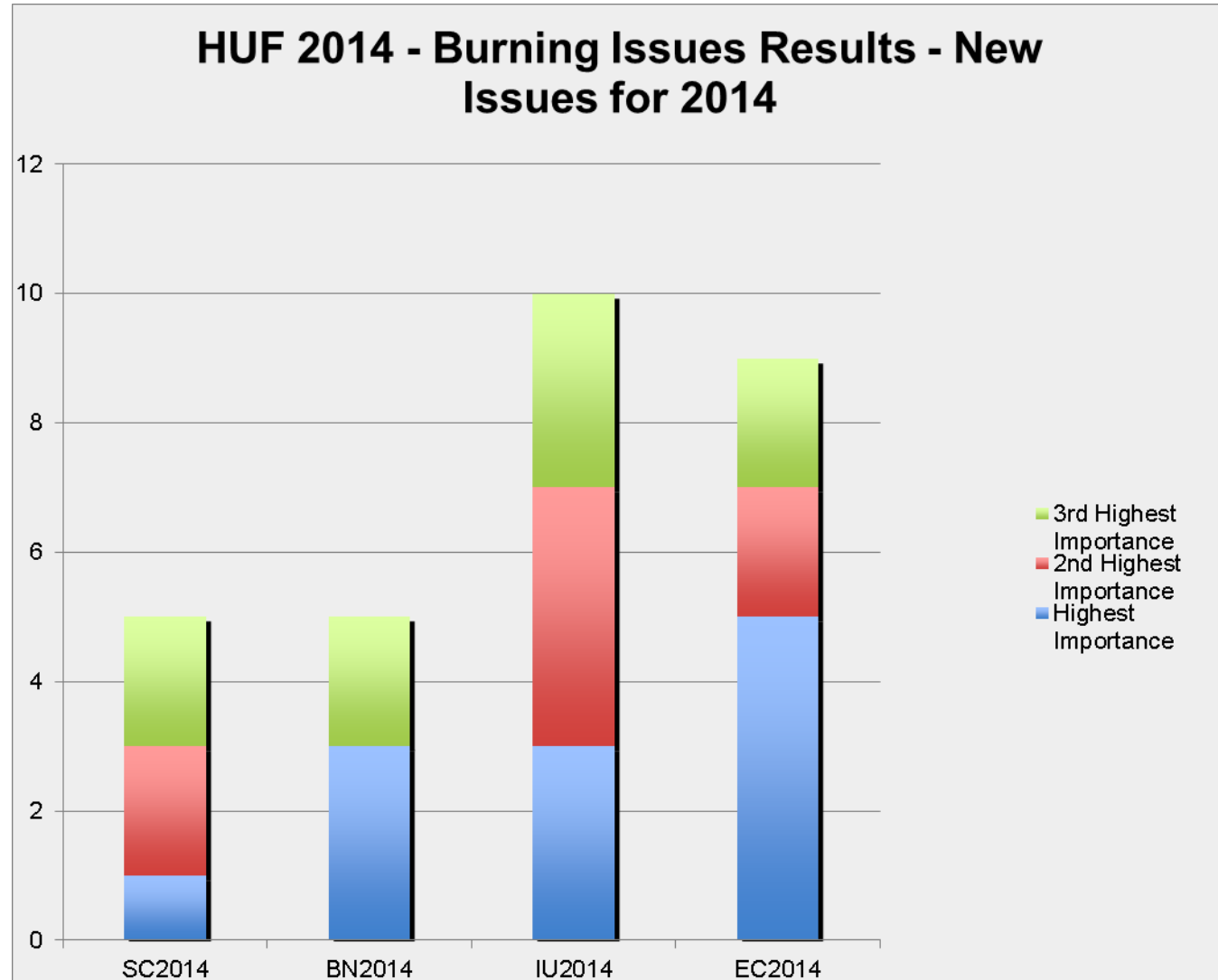


# 2015 Burning Issues Vote Results

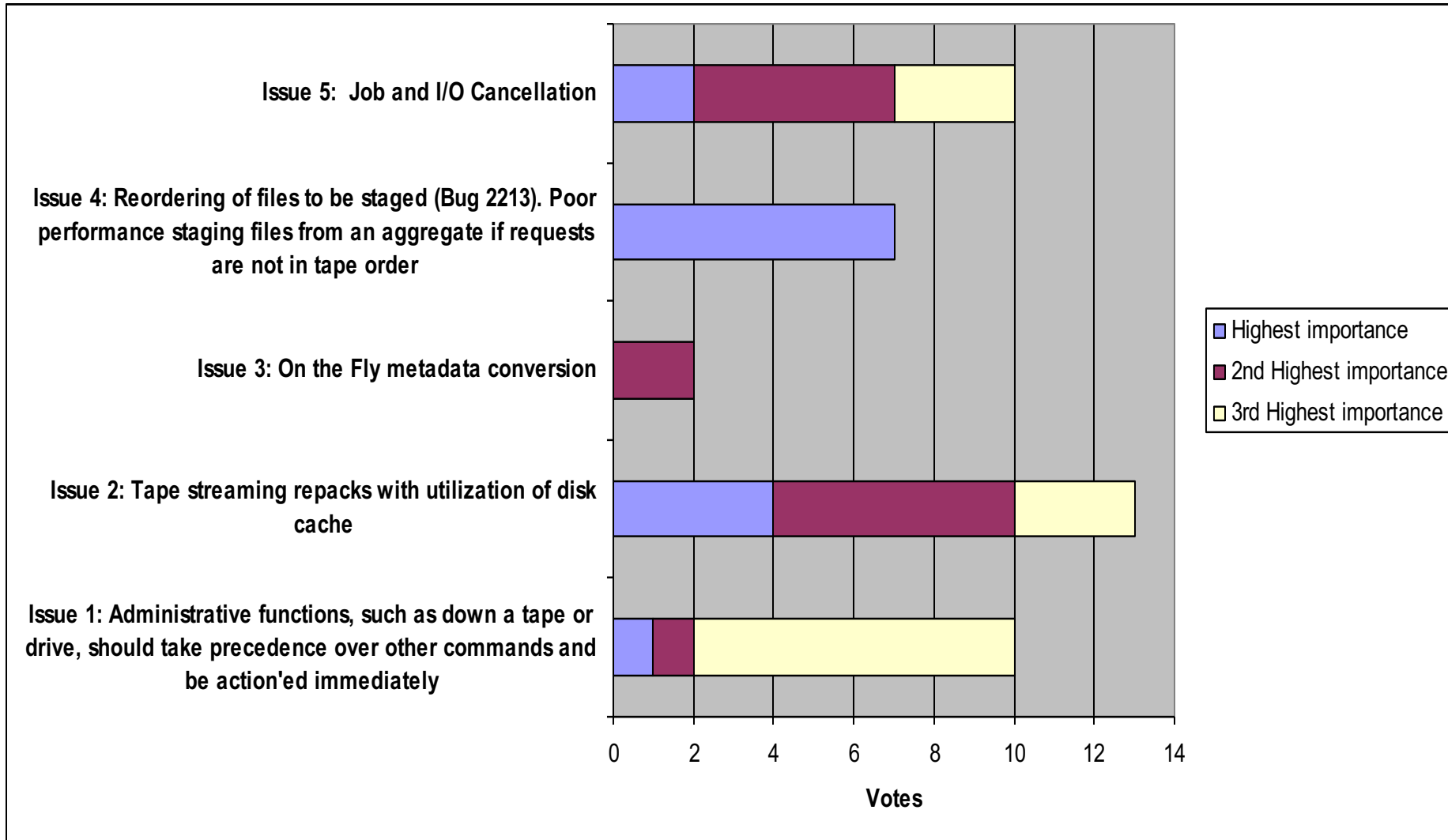
## Burning Issues from HPSS Users Forum 2015



# 2014 Burning Issues Vote Results



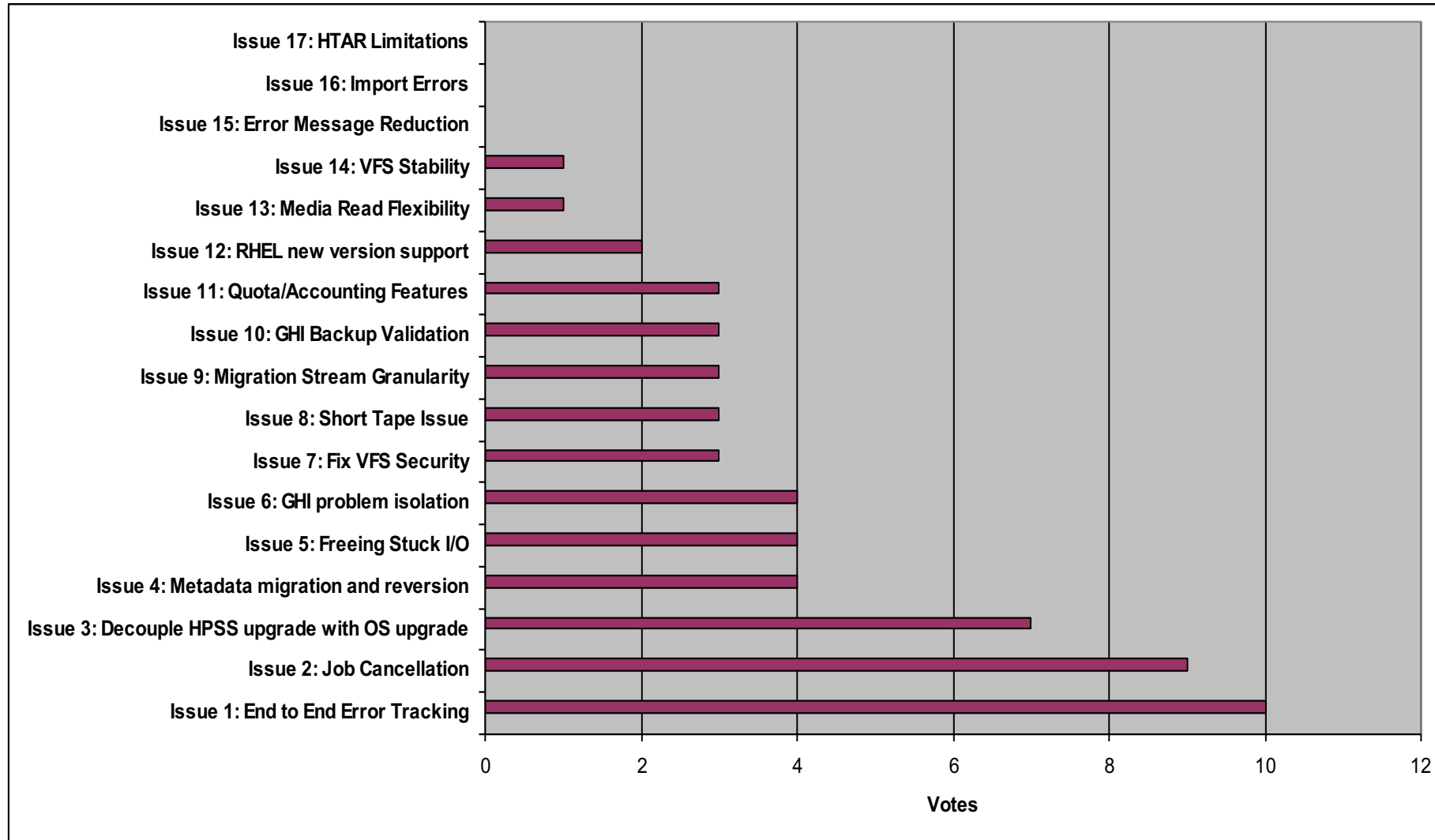
# 2013 Burning Issues Vote Results



## Burning Issues Complete / Rejected / Duplicate

Burning Issue	Status	Details
2013 Issue: The <code>dumppv_pvl -u</code> command should include the volume's PVR name in the output (ANL)	Complete	ANL agrees to close this burning issue as resolved; <code>lshpss</code> was significantly enhanced in HPSS 7.3.3; <code>lshpss -vol</code> now shows the Volume ID, Type, Label Type, PVR, Alloc State, Admin State, Op State and Usage State. ANL responded that this satisfies the request.

# 2012 Burning Issues Vote Results



## Burning Issues Complete / Rejected / Duplicate

Burning Issue	Status	Details
Issue 1 (2012): End to End Error Tracking	Complete	CR 279 “Need enough information in logs to track errors back to source”. Support has been working with customers to identify situations where log messages can be more meaningful. Some examples include: Bug 1725 “CORE2110 errors do not provide the filename or filesset in the log message” (available in 7.3.3.p5), Bug 1778 “Errors flooding HPSS - need to map back to client” (available in 7.3.3.p8), and Bug 2832 “Add list of exclusive bitfile locks to SIGHUP dump of core server” (available in 7.3.3.p9). The scope of this CR is too broad and affects all developers, components and clients. HPSS is always proactively identifying messages that can be made more meaningful. Collaboration recommends that that sites report these to their support rep so that they will be handled case by case. Closed.
Issue 2: Job Cancellation	Dup of 2013 BI#5	CR 280 “Capability in RTM Summary to kill jobs”. Has not been formally accepted as a CR by the Collaboration and is not being developed.

## Burning Issues Complete / Rejected / Duplicate

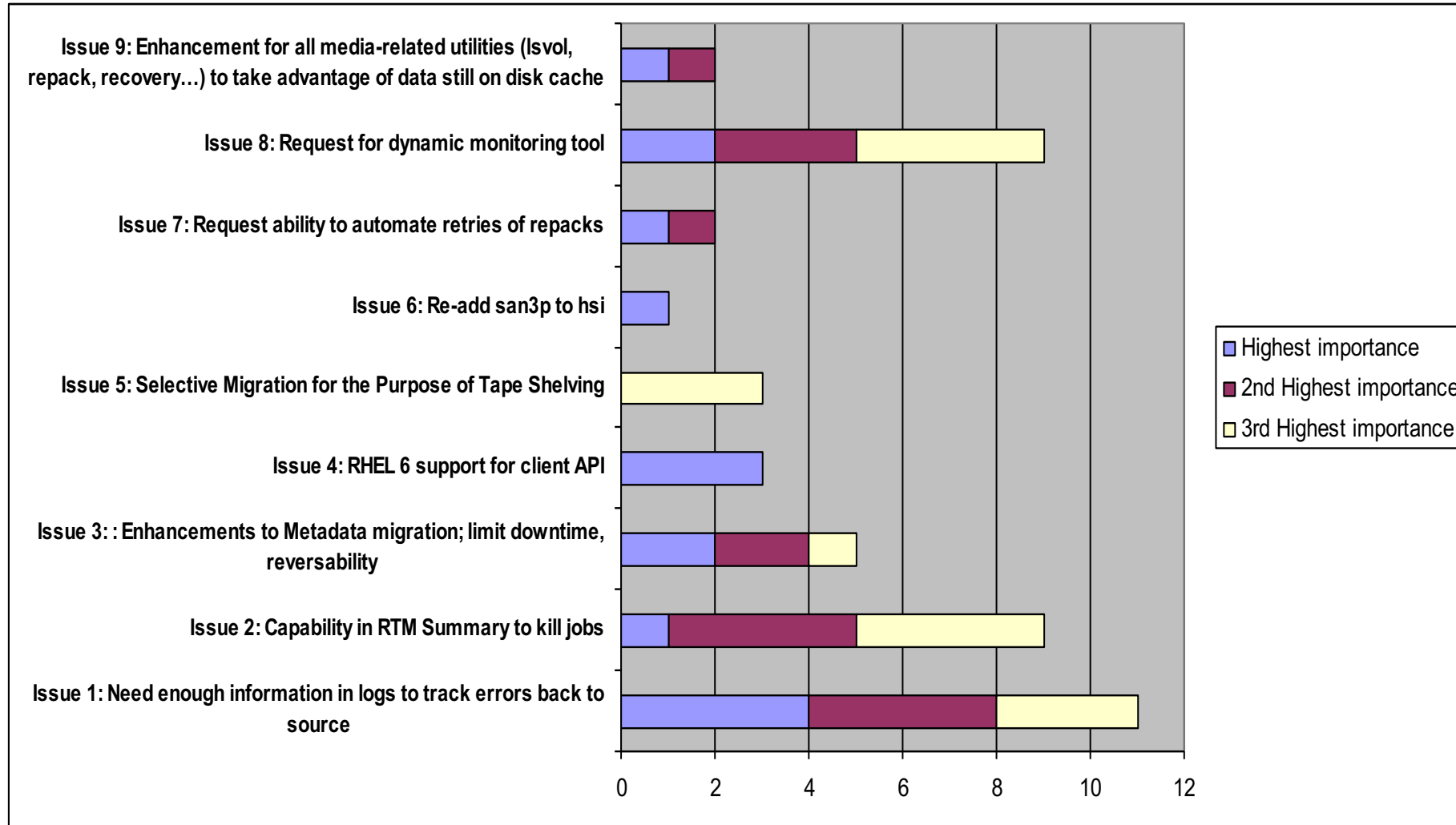
Burning Issue	Status	Details
Issue 3: Decouple HPSS upgrade with OS upgrade	Complete	Evidence includes HPSS versions 7.3.3p9a (added DB2 9.7 and RHEL 6 mover support) and 7.3.3p9b (added RHEL 6 core server support); 7.4.2 will support both DB2 9.7 and 10.5. See also “HPSS Release and Development Plans” presentation for RHEL compatibility statement “...not necessary to re-test or re-certify applications between minor releases of RHEL...”
Issue 4: Metadata migration and reversion	Dup of 2013 BI#4	CR 272 “Capability to continue running HPSS during metadata conversion”. Will be satisfied via DB2 Q-replication. Q-rep will be tested/utilized at ECWMF during their upgrade to 7.4.1. Q-rep will be made available with 7.4.3. Reversion will not be addressed.
Issue 12: RHEL new version support	Complete	New releases of RHEL will be supported within 6 months of general availability for clients only (assuming hardware device drivers, etc. are available).
Issue 14: VFS Stability	Complete	VFS has been separated from HPSS resulting in fixes being released faster and stability has been improved.



## Burning Issues Complete / Rejected / Duplicate

Burning Issue	Status	Details
Issue 15: Error Message Reduction	Complete	We have been making progress in correctly classifying log messages such that they do not cause spam. Support has been working with customers to identify situations where log messages need to be downgraded or reclassified. Some examples include: Bug 1778 “Errors flooding HPSS – need to map back to client” (available in 7.3.3.p8), Bug 2944 “Logs getting flooded with HPSS_ENOENT error” (available in 7.3.3.p9), Bug 3167 “Failure to create bfdesc message should be downgraded when error is exceeded quota” (available in 7.4.1.p2), Bug 3093 “Flood of CORE 3027 messages in log” (available in 7.4.1.p2). The scope of this burning issue is too broad and affects all developers, components and clients. Collab recommends that that sites report these to their support rep so that they will be handled case by case. Closed.
Issue 16: Import Errors	Complete	Bugs 1274 “Import of new tapes (e.g. TS1140 or LTO6) puts mover and device into suspect mode”, 2895 “New E06 tapes using 3592E06/3592E07 drives put mover and device into suspect mode” and 2957 “Mover still goes major on 3592 imports of unwritten tapes” resolved this issue. All are available in 7.3.3p9.

# 2011 Burning Issues Vote Results



## Burning Issues Complete / Rejected / Duplicate

Burning Issue	Status	Details
2011 Issue 1: Need enough information in logs to track errors back to source	Dup of 2012 BI#1	See 2012 Burning Issue 1.
2011 Issue 2: Capability in RTM Summary to kill jobs	Dup of 2012 BI#2	See 2012 Burning Issue 2.
2011 Issue 3: Enhancements to Metadata migration; limit downtime, reversibility	Dup of 2012 BI#4	See 2012 Burning Issue 4.
2011 Issue 4: RHEL 6 support for client API	Complete	Done in HPSS 7.3.3 patch 6 for CLAPI, PIO, PFTP.
2011 Issue 5: Selective Migration for the Purpose of Tape Shelving	Rejected by Collab	CR 269 "Admin utility to move selected data from tape to tape". Wants the ability to "sort material on tapes on demand". CR was rejected by the Collaboration because File Families and Change COS can/should be used to accomplish this. Suggest closure.

## Burning Issues Complete / Rejected / Duplicate

Burning Issue	Status	Details
2011 Issue 6: Re-add san3p to HSI	Complete	Available in HSI 4.0.1.3.
2011 Issue 7: Request ability to automate retries of repacks	Complete	Bug 2137 “Repack retry logic not always called when an error occurs” (available in HPSS 7.3.3.p8)
2011 Issue 8: Request for dynamic monitoring tool	Rejected by Collab	CR 203 “Monitoring of tape media and tape drives for errors”. There are many third party tools (e.g. Crossroads Read-Verify Appliance) that offer this functionality. The new utility “Ispvhistory” which is an HPSS system maintenance utility that lists tape physical volume history information can help. CR is not likely to be implemented and has been rejected by the Collaboration. Suggest closure.

# Any Questions?



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