Status of LHCb SRM2.2 Testing

Andrew C. Smith
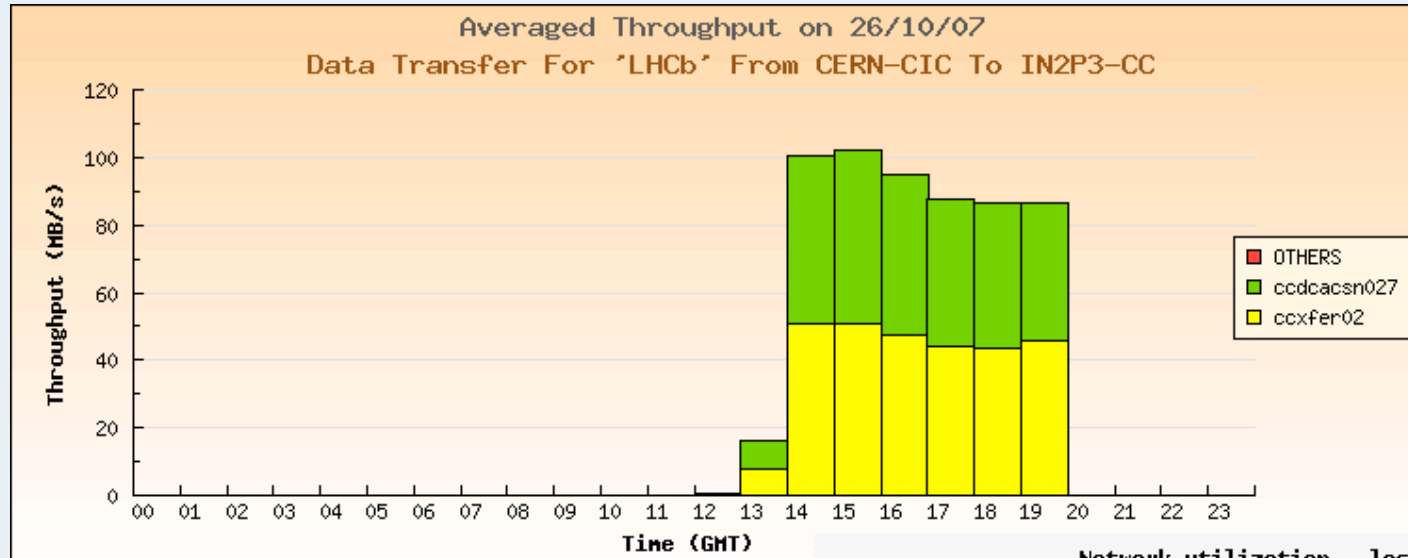
- **Pre-staged 12k file on CERN Castor**
  - ~2.2TB on dedicated disk pools
  - Ensure file availability

- **FTS Channels configured on production FTS(2)**
  - Source
    - srm.cern.ch production SRM1 endpoint
  - Destinations
    - ccsrmtestv2.in2p3.fr (files: 50, streams: 5)
    - ant2.grid.sara.nl (files: 40, streams: 5)
    - srm-v2.cr.cnaf.infn.it (files: 40, streams: 3)
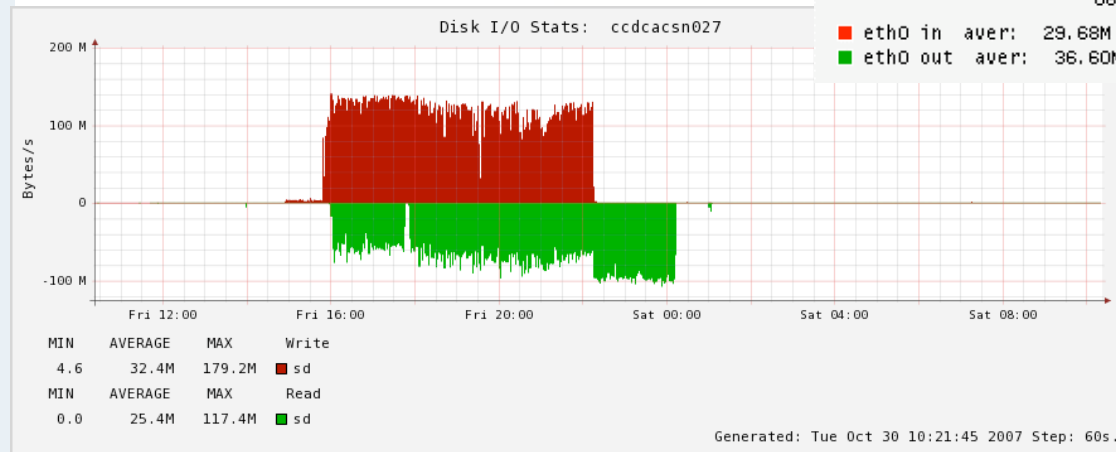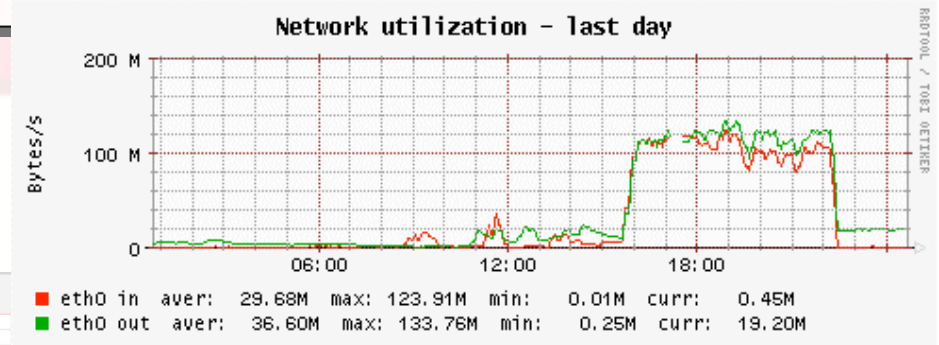   - storm-fe.cr.cnaf.infn.it (as above)

- **Submitted replication requests to DIRAC DMS**
  - Overloads the FTS channels with 3 FTS jobs
    - Maintain load
  - Each FTS job contains 100 files
    - Retain control

Averaged Throughput on 26/10/07
Data Transfer For 'LHCb' From CERN-CIC To IN2P3-CC

- IN2P3
  - 26th October

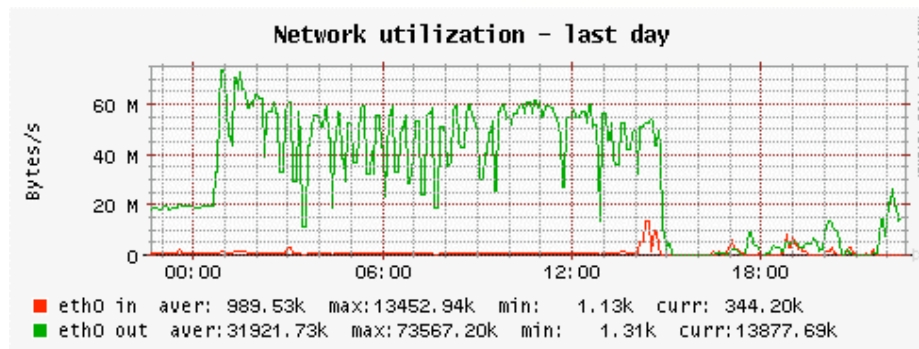- All 12k transfer successfully
- No transient errors
- ~ 90-100MB/s

Averaged Throughput during the last 24 hrs (26/10 – 27/10)
Data Transfer For 'LHCb' From CERN-CIC To INFN-T1

Network utilization – last day
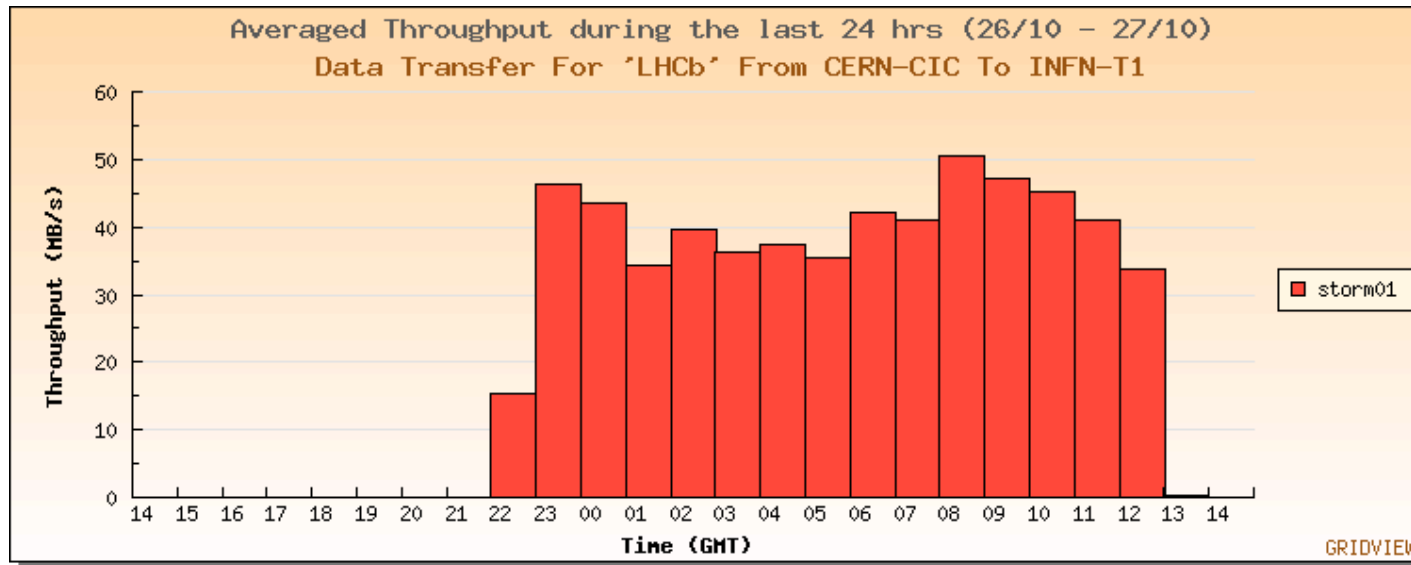
- **CNAF Storm**
  - 26-27th October

  - Successful: 11749
  - Failed: 267

  - ~40-50MB/s

Averaged Throughput during the last 24 hrs (30/10 – 31/10)
Data Transfer For 'LHCb' From CERN-CIC To INFN-T1

- diskserv-san-1
- diskserv-san-36
- disksrv-3

Throughput on 30/10/07
...sfer From CERN-CIC To INFN-T1

- Atlas
- CMS
- DTeam
- LHCb
- OTHERS
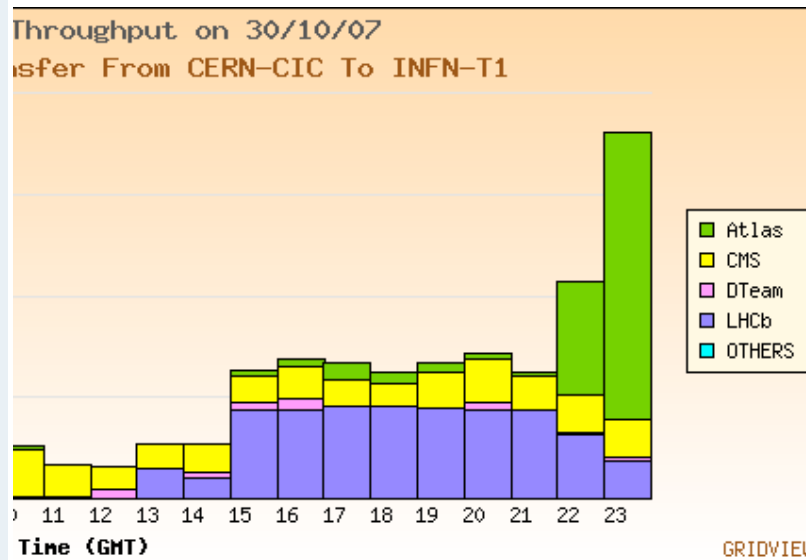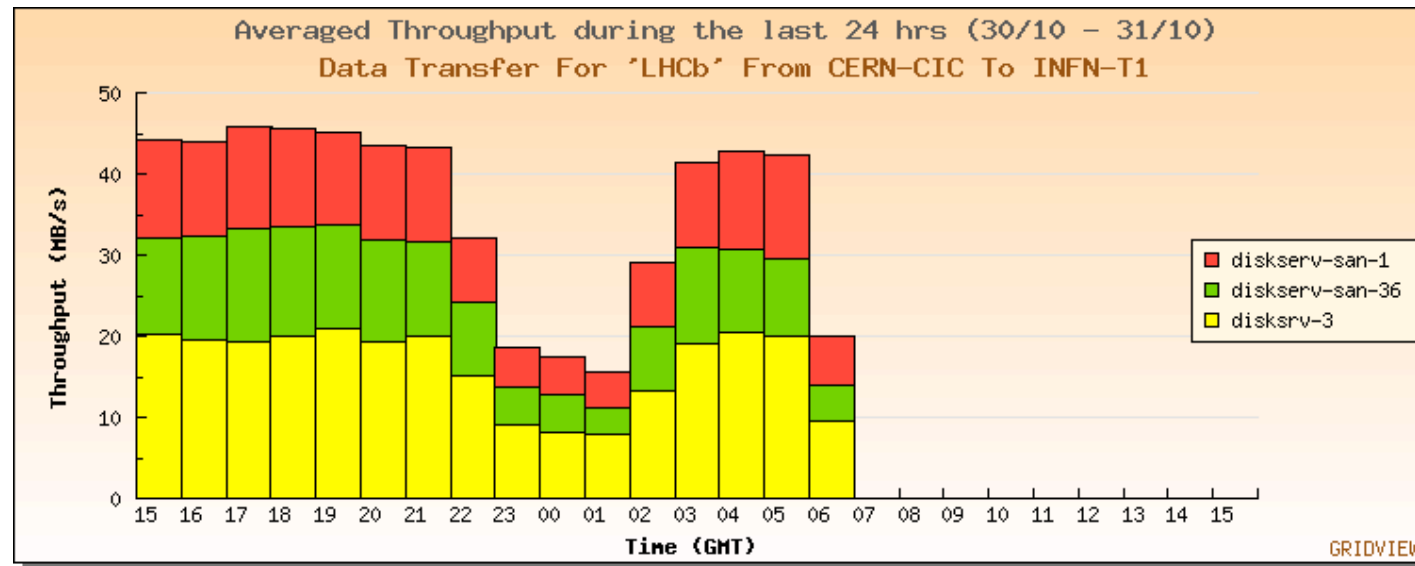
- **CNAF Castor**
  - 30-31st October

  - Successful: 11878
  - Failed: 138

  - ~ 40MB/s
    - ➤ Dip in throughput due to Atlas activity.

- SARA dCache
  - 1st October

- All 12k transfer successfully
  - Despite problems with MSS backend
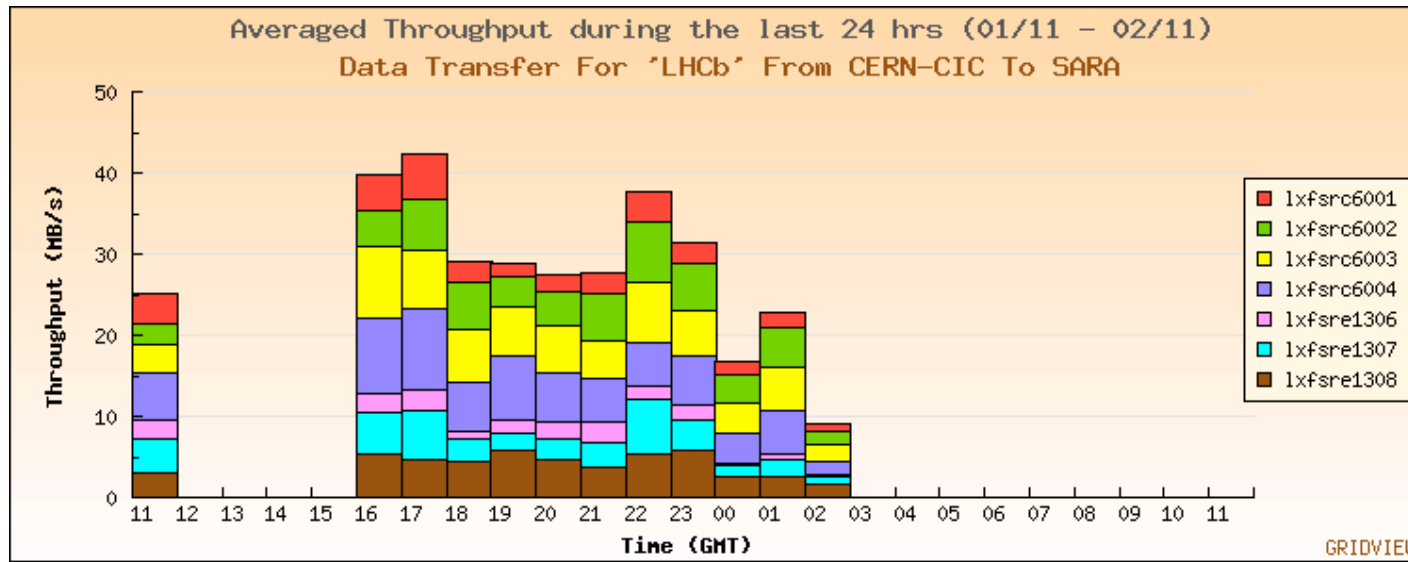 - Some transient errors

- ~30-40MB/s

Transient vs. Terminal Errors

- **IN2P3**
  - No errors!!

- **SARA**
  - No retries > 1

- **CNAF Castor**
  - Many errors
  - Decreasing with retries

- **CNAF Storm**
  - Many errors
  - # Failed > # 2 Retries
    - ➤ Files terminally fail after previous error?
    - ➤ See next slide

File Transfer Attempts by Endpoint

Count vs Endpoint

Legend:
- Successful (green)
- 1 Retry (blue)
- 2 Retries (yellow)
- Failed (red)

Endpoints: CNAF-Castor, CNAF-Storm, SARA, IN2P3
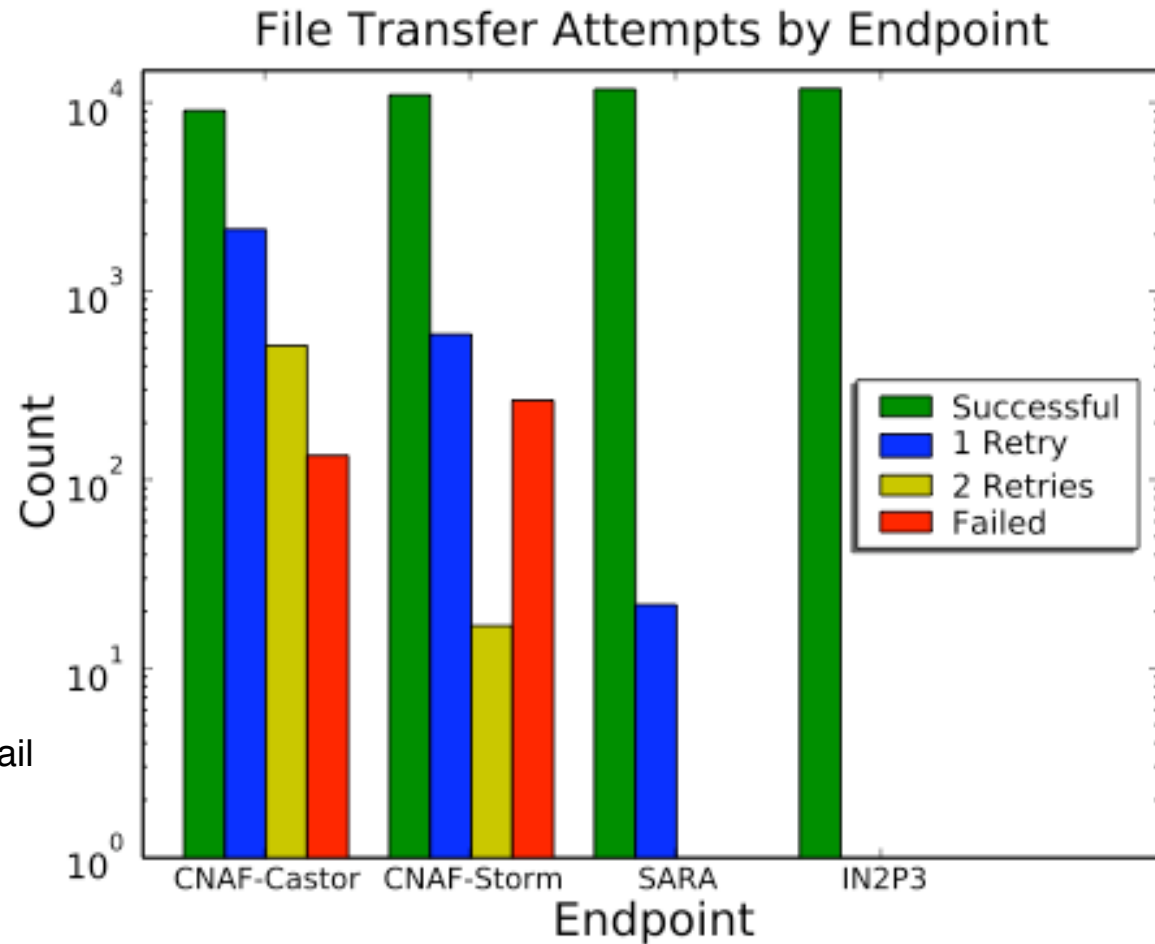
- **CNAF Storm**
  - For all errors

DESTINATION error during PREPARATION phase: [REQUEST_TIMEOUT] failed to prepare Destination file in 180 seconds	612
DESTINATION error during PREPARATION phase: [FILE_EXISTS] Cannot srmPut file because it already exists!	251
Source error? TRANSFER error during TRANSFER phase: [GRIDFTP] a system call failed (Connection refused)	1
Source error SOURCE error during TRANSFER phase: [GRIDFTP] a system call failed (Connection refused)	1

  - For failed files

DESTINATION error during PREPARATION phase: [FILE_EXISTS] Cannot srmPut file because it already exists!	250
DESTINATION error during PREPARATION phase: [REQUEST_TIMEOUT] failed to prepare Destination file in 180 seconds	17

  - Looks like the '[REQUEST_TIMEOUT]' error precipitates the '[FILE_EXISTS]' error.
    - ➤ Operation timeouts not cleaned up properly internally by Storm/FTS?

- CNAF Castor

DESTINATION error during PREPARATION phase: [GENERAL_FAILURE] rfio_open error: No such file or directory (error 2 on diskserv-san-1.cr.cnaf.infn.it)	2352
DESTINATION error during PREPARATION phase: [REQUEST_TIMEOUT] failed to prepare Destination file in 180 seconds	394
DESTINATION error during PREPARATION phase: [GENERAL_FAILURE] stage_put error: Unknown internal error	40
DESTINATION error during PREPARATION phase: [GENERAL_FAILURE] Not able to find the version of castor in the database Original error was ORA-00904: "SCHEMAVERSION": invalid identifier	13
DESTINATION error during TRANSFER phase: [INVALID_SIZE] empty file size returned	3
DESTINATION error during PREPARATION phase: [GENERAL_FAILURE] Internal error	2
DESTINATION error during PREPARATION phase: [GENERAL_FAILURE] stage_put error: Could not find suitable filesystem for diskserv-san-36.cr.cnaf.infn.it:/invalidPath/	2
DESTINATION error during PREPARATION phase: [FILE_EXISTS]	2
DESTINATION error during PREPARATION phase: [INTERNAL_ERROR] No SRM method factory found for the requested version []	1
DESTINATION error during PREPARATION phase: [GENERAL_FAILURE] stage_put error: Could not find suitable filesystem for diskserv-san-1.cr.cnaf.infn.it:/invalidPath/	1
SOURCE error during PREPARATION phase: [GENERAL_FAILURE] CastorStagerInterface.c:2145 Address already in use (errno=9, serrno=98)	1

Resolved during exercise

Source error

- SARA dCache

|	Error	Count
	DESTINATION error during TRANSFER phase: [PERMISSION] the server sent an error response: 553 553 Permission denied, reason: CacheException(rc=10001;msg=/pnfs/grid.sara.nl/data/lhcb/production/DC06/v1-lumi2/00001368/DIGI/0001/filename.digi not found)	5
Source error?	TRANSFER error during TRANSFER phase: [GRIDFTP] a system call failed (Connection refused)	5
Source error	TRANSFER error during TRANSFER phase: [GRIDFTP] the server sent an error response: 451 451 rfio read failure: Connection closed by remote end.	4
Source error?	TRANSFER error during TRANSFER phase: [GRIDFTP] the server sent an error response: 425 425 Cant open data connection.	3
Source error	SOURCE error during PREPARATION phase: [REQUEST_FAILURE] [SRM_FAILURE] [SrmGet] failed: SOAP-ENV:Client - Operation now in progress	2
Source error	SOURCE error during PREPARATION phase: [GENERAL_FAILURE] CastorStagerInterface.c:2145 Address already in use (errno=9, serrno=98)	1
Source error	SOURCE error during PREPARATION phase: [REQUEST_FAILURE] [SRM_INVALID_REQUEST] [SrmGet] failed: SOAP-ENV:Client - RequestRegister.c:182 request record not found in spool, open(srm102.cern.ch:/tmp/0x21940498.xml) and open(srm102.cern.ch:/tmp/0x21940498) failed: Timed out	1

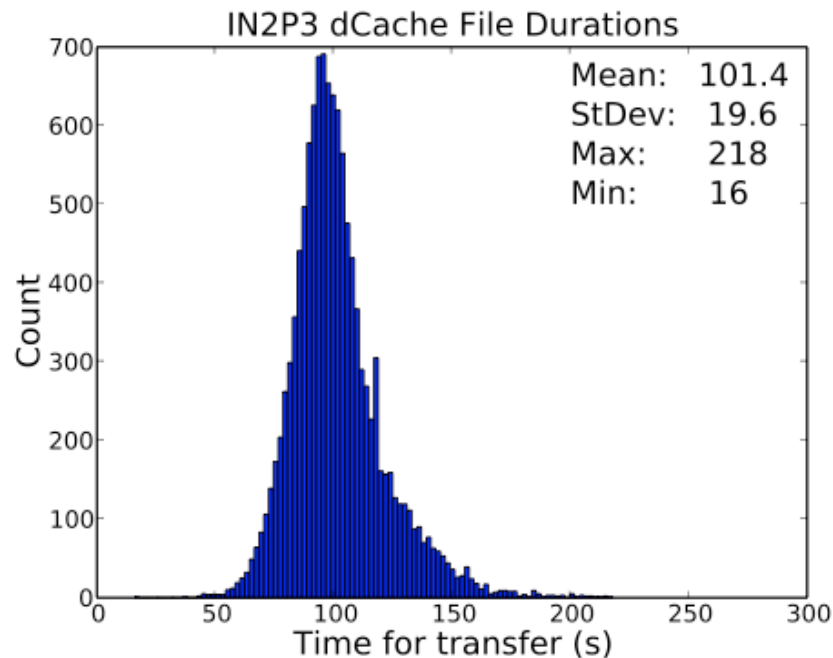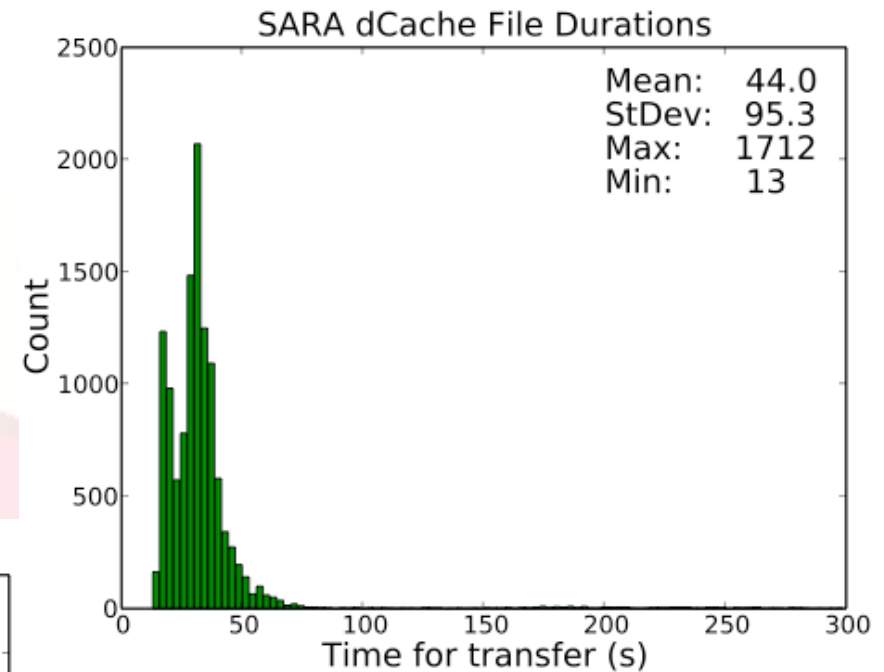- Very few errors attributable to SARA dCache

- IN2P3 dCache

None
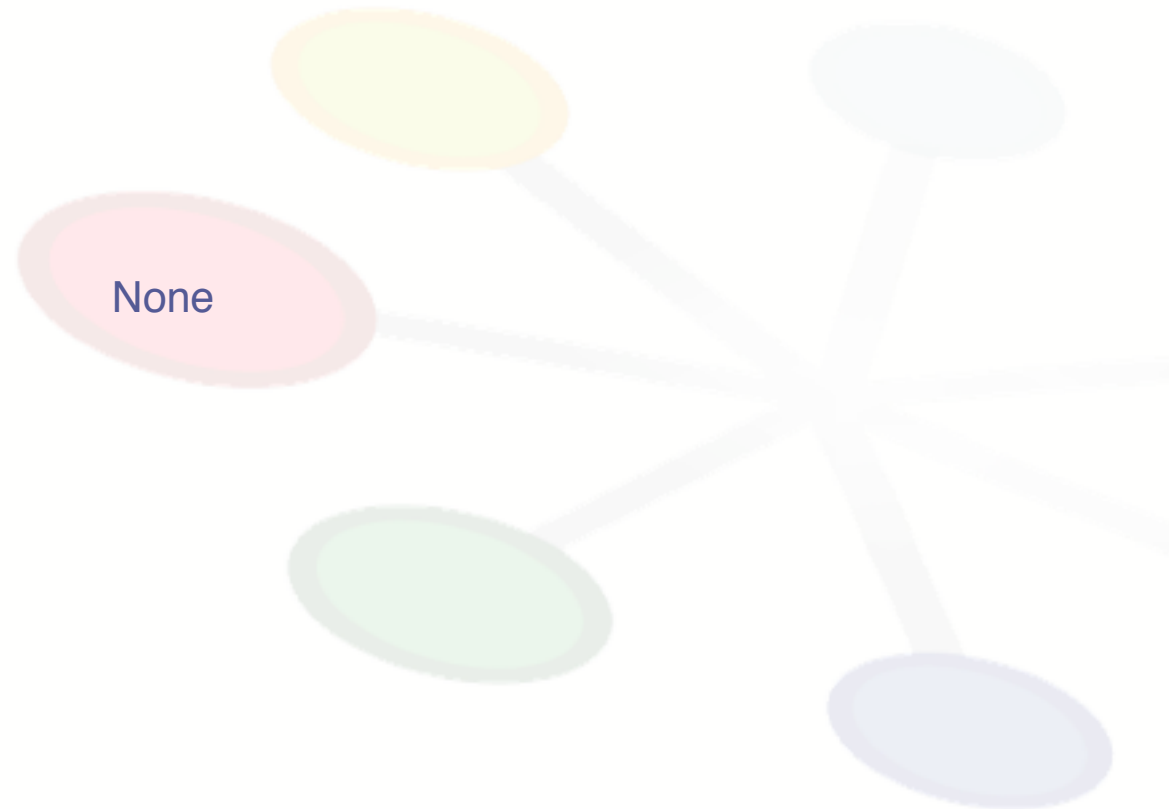
- SARA
  - Exceptionally quick
    - ~92% < 50s
  - But StdDev large
    - 1% > 500s
    - 0.3% > 1000s
    - Small percentages but significant with FTS

SARA dCache File Durations

Mean:	44.0
StDev:	95.3
Max:	1712
Min:	13

IN2P3 dCache File Durations

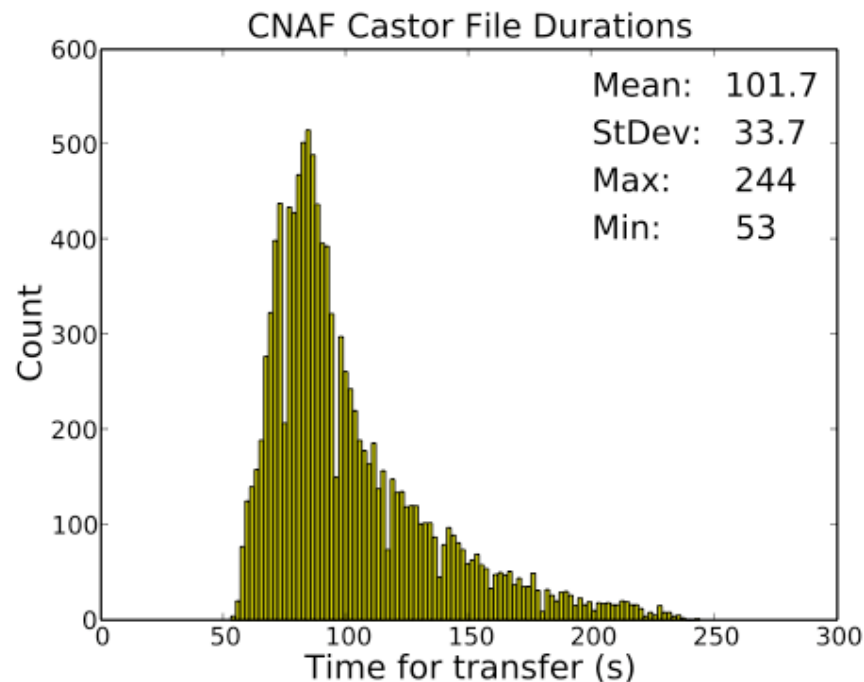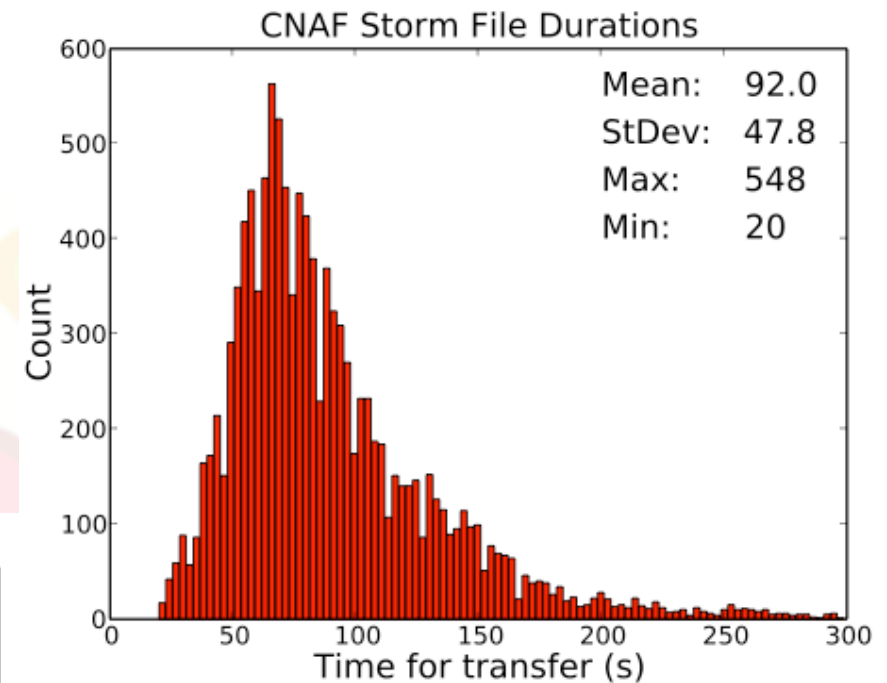|	
Mean:	101.4
StDev:	19.6
Max:	218
Min:	16

- IN2P3
  - Consistent in performance
    - Lowest observed StvDev
    - 97% 50s < t < 150s
  - Average times comparable to other tested endpoints…

- **CNAF Storm**
  - Slightly better mean performance than IN2P3
  - Higher StdDev
    - 78% 50s < t < 150s
  - Also suffers from long tail
    - 3.3% > 200s

CNAF Storm File Durations

Mean:	92.0
StDev:	47.8
Max:	548
Min:	20

Count vs Time for transfer (s)

CNAF Castor File Durations

Mean:	101.7
StDev:	33.7
Max:	244
Min:	53

Count vs Time for transfer (s)

- **CNAF Castor**
  - Similar profile to Storm
    - Slightly higher mean
    - 2.0% > 200s

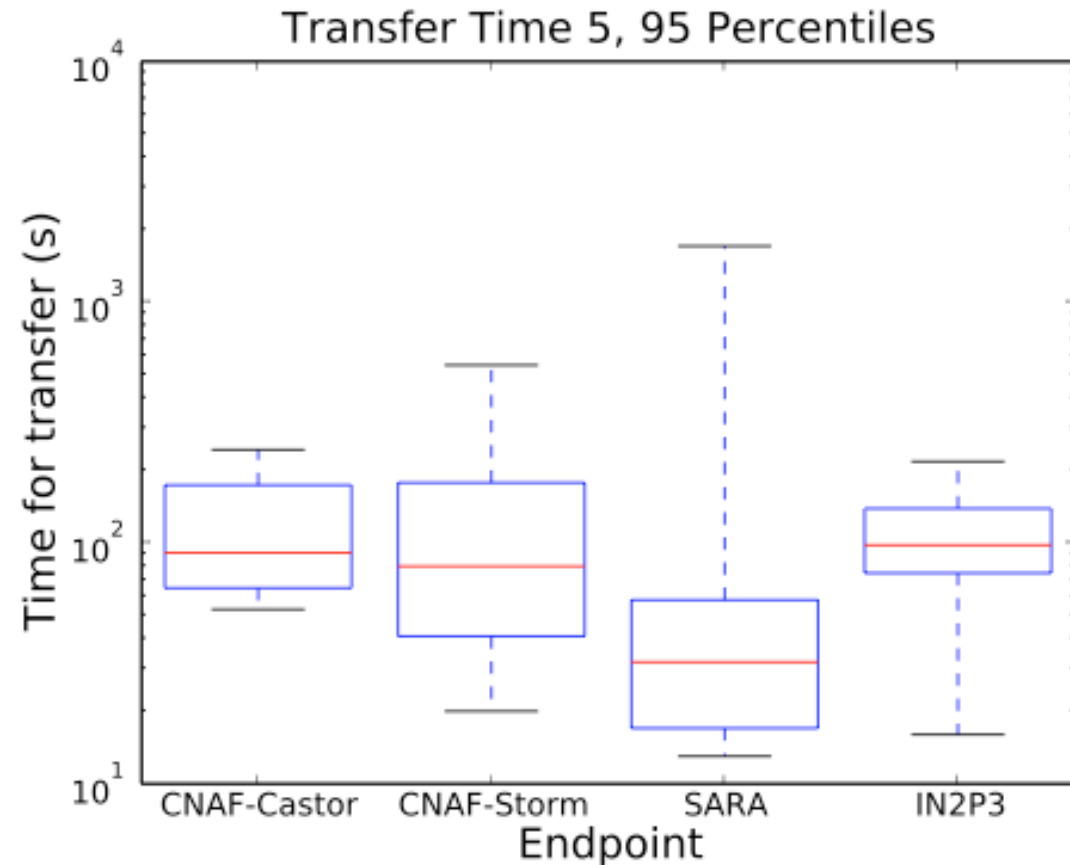Combined Histogram for Transfer Time
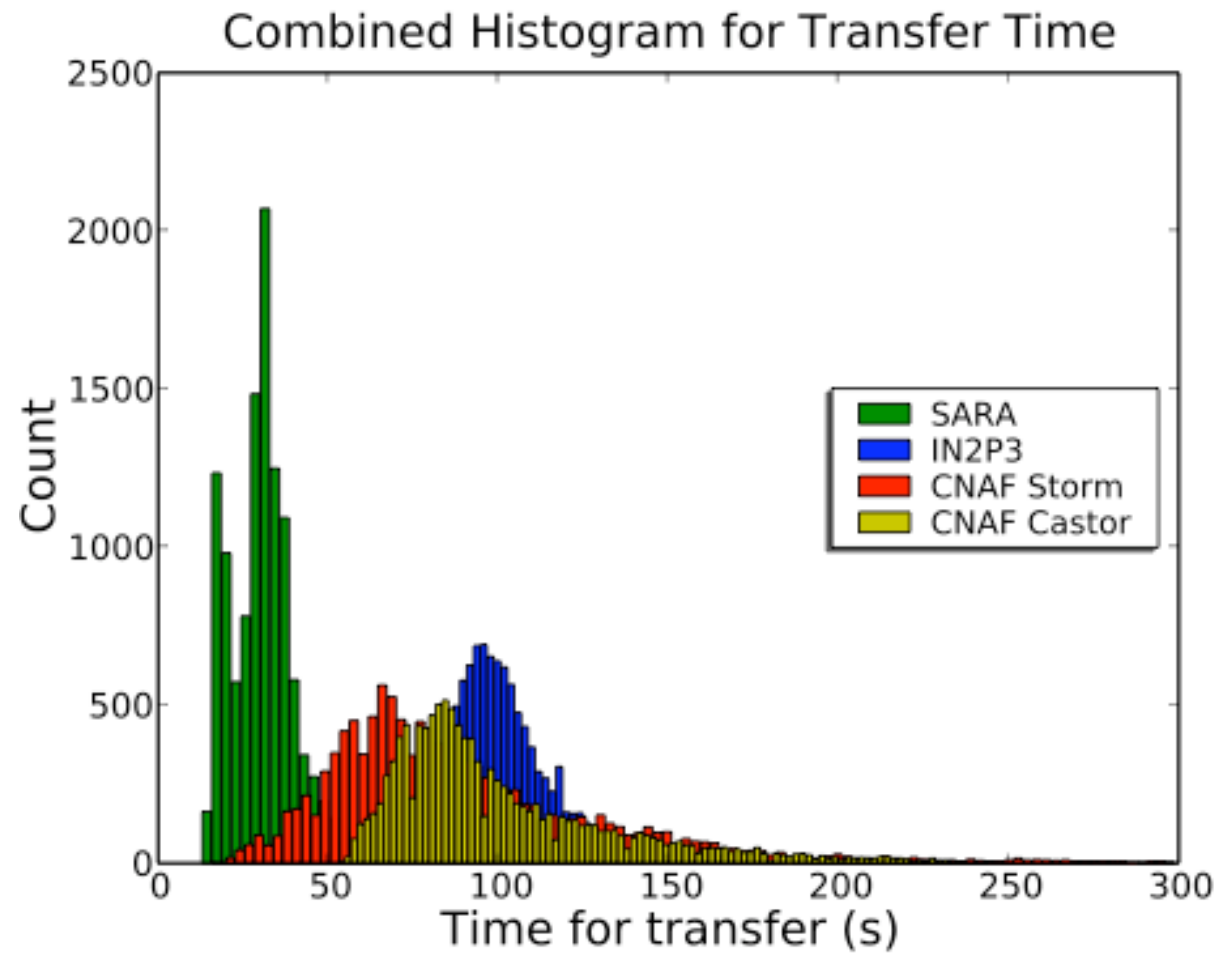
- StdDev misleading in representing the long tail data
- Blue box represents the 5,95 percentiles
  - More defined
- Red line
  - Mean
- Top/bottom ticks
  - Max/Min values

Transfer Time 5, 95 Percentiles

- **SARA**
  - lcg-gt followed by dccp
  - OK
- **IN2P3**
  - lcg-gt followed by dccp
  - OK
- **GRIDKA**
  - WN running old gLite version
  - lcg-utils incompatible
- **CNAF Castor**
  - lcg-gt followed by rfcp
  - OK
- **CNAF Storm**
  - Still being tested
  - Read from ROOT application

- Perform the same test with GridKA

- Experience gained with the destination SRMs
  - Repeat the same test using CERN SRM2 as source
    - ➤ Waiting for some configuration to be resolved

- Tools ready to perform bulk removal
  - Using the gfal libraries
  - Plan to remove data immediately after transfer
    - ➤ Determine the performance of this operation
    - ➤ From initial tests should be able to remove faster than transferring
  - Continual transfer-removal over sustained period
    - ➤ How long? 1 week? 1 month?

- **Stress tests**
  - LHCb throughput requirements (40MB/s aggregated) already met
  - Certainly not the other VOs
  - Space shouldn't be a problem
    - ➤ FTS Transfer slots are
    - ➤ LHCb share on production channels modest
    - ➤ Testing activities shouldn't interfere with production activities

- **Comparative studies**
  - Hard to draw comparisons between different instances
    - ➤ Configuration different for each channel
    - ➤ Dedicated testing channels?
  - Testing different parameters for individual SRMs
    - ➤ Nice to have testing channels
    - ➤ Modify channel parameters and gauge performance

- **Are we aiming to break the SRMs?**

- Questions?