CMS Pre-Staging Test @ CC-IN2P3

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CMS meeting, Feb. 19th 2008

2/19/2008

Overview (I)

- Pre-staging/Tape test was proposed by the collaboration
- The goal: measure the pre-staging time from HPSS to dCache, for data kept only on Tape
- > At CC-IN2P3 two tests were performed for the staging purpose:
 - Based on dccp command: it consists in copying the files/dataset from HPSS to local disk, via dCache
 - Base on open/close function: it consists in measuring the file staging statistics for HPSS to dCache transfers
- More details and the test results from other CMS Ts1:
- https://twiki.cern.ch/twiki/bin/view/CMS/T1ReprocessingCCRC08

Overview (II)

- A complete RECO dataset of ~10TB size was chosen:
- > (/CSA07Electron/CMSSW_1_6_7-CSA07-Tier0-A1-Chowder/RECO)
- The dataset is kept in our HPSS
- It contains "11061" files of 1GB size each
- > The files are distributed among 68 Tapes as follows:
 - 22 tapes have fewer than 10 files
 - 16 tapes have from 10 to 100 files
 - 30 tapes have more than 100 files

Pre-staging:Test-1 (I)

• Plan:

- All dataset files were removed from dcache
- A script based on "dccp" command was implemented
- The test was sequentially performed over the complete list

• Procedure:

- The script was executed on CMS VO BO
 - HPSS \rightarrow dCache pools \rightarrow local disk
- dCache \rightarrow VO BOX bandwidth is 100MB/s
 - ~10 sec per file (1GB)

Pre-staging:Test-1 (II)

• Results:

 The time required to copy 2228 files from HPSS to local disk , via dCache is:

• 70 hours

- The estimated time needed to copy the complete dataset
 - Two weeks (Test was stopped because of these results)
- More details were presented by Nelli in the CMS meeting:
 - http://indico.cern.ch/conferenceDisplay.py?confld=29005

Pre-staging Test-2 (I)

- Plan and Procedure:
 - Removed the pre-staged files from dcache
 - Split the list of files to four separated lists (2765 files/list)
 - Implemented some scripts to perform the test
 - Submission the jobs to BQS, each one run over one list

Jobs/lists	Job_1	Job_2	Job_3	Job_4
Date Start	Feb 12	Feb 12	Feb12	Feb 12
	14:37:54	14:39:50	14:39:50	14:39:55
Date End	Feb 13	Feb 17	Feb 17	Feb 17
	21:20	04:15	00:15	03:47

Pre-staging Test-2 (II)

Results:

- For JOB-1 the 2765 files were already in the HPSS disk (test-1)
 - To transfer 2765 files from HPSS disk to dcache disk
 ~35h were needed
- For Jobs-2,3,4 the pre-staging time per subset is:
 - 84h
- The Average staging time per file is
 - 140 sec, (job-1 result was excluded)

CONCLUSION

- The Pre-staging time per file (on tape) of 1GB size is 140 sec
- The Pre-staging time could be marginally improved
 - If the list of files is correctly sorted
- The Staging process from tape is inherently sequential (file by file)
- No errors happened during the whole process
 There will be more than 3PB of disks in dCache
 No need for Pre-staging