The DESY-Tier-2 during and after CSA07

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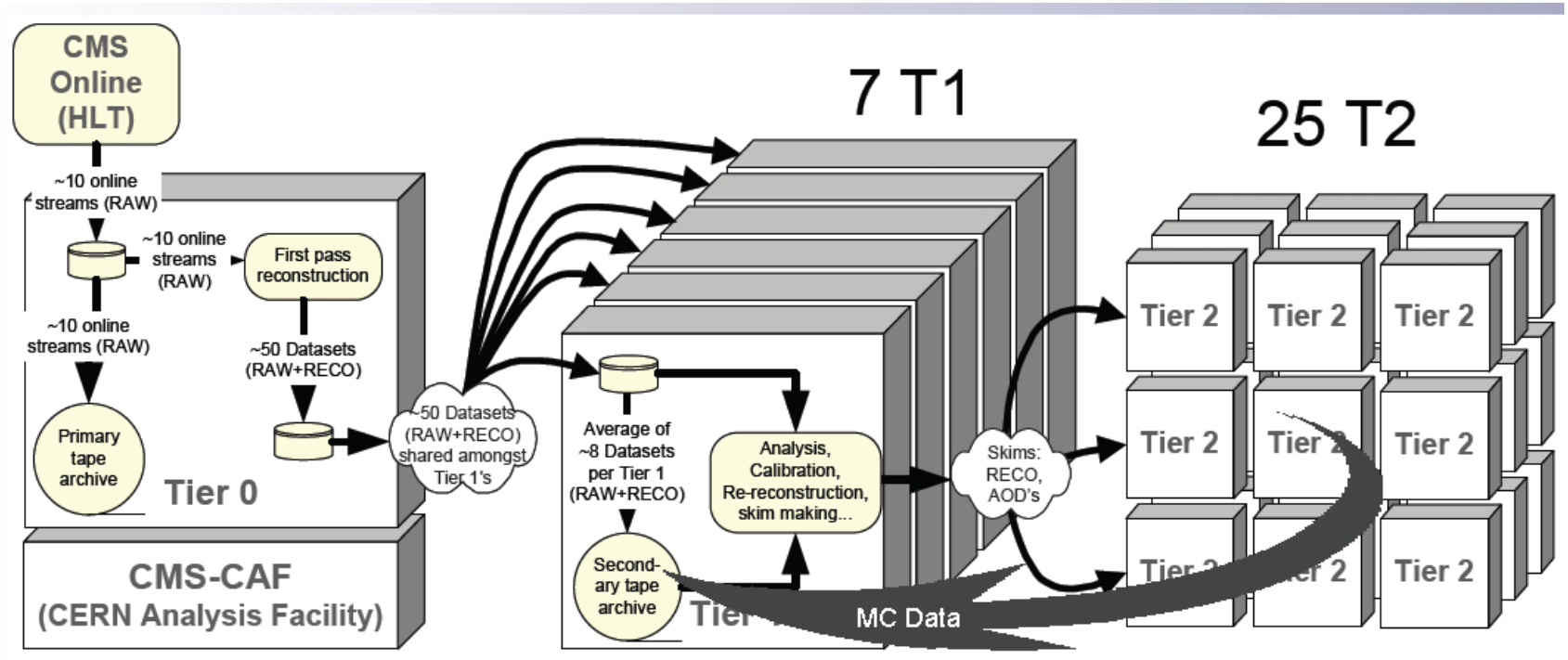
CMS Hamburg Meeting
December, 19th 2007

CMS Computing Model



Computing, Software and Analysis Challenge 07

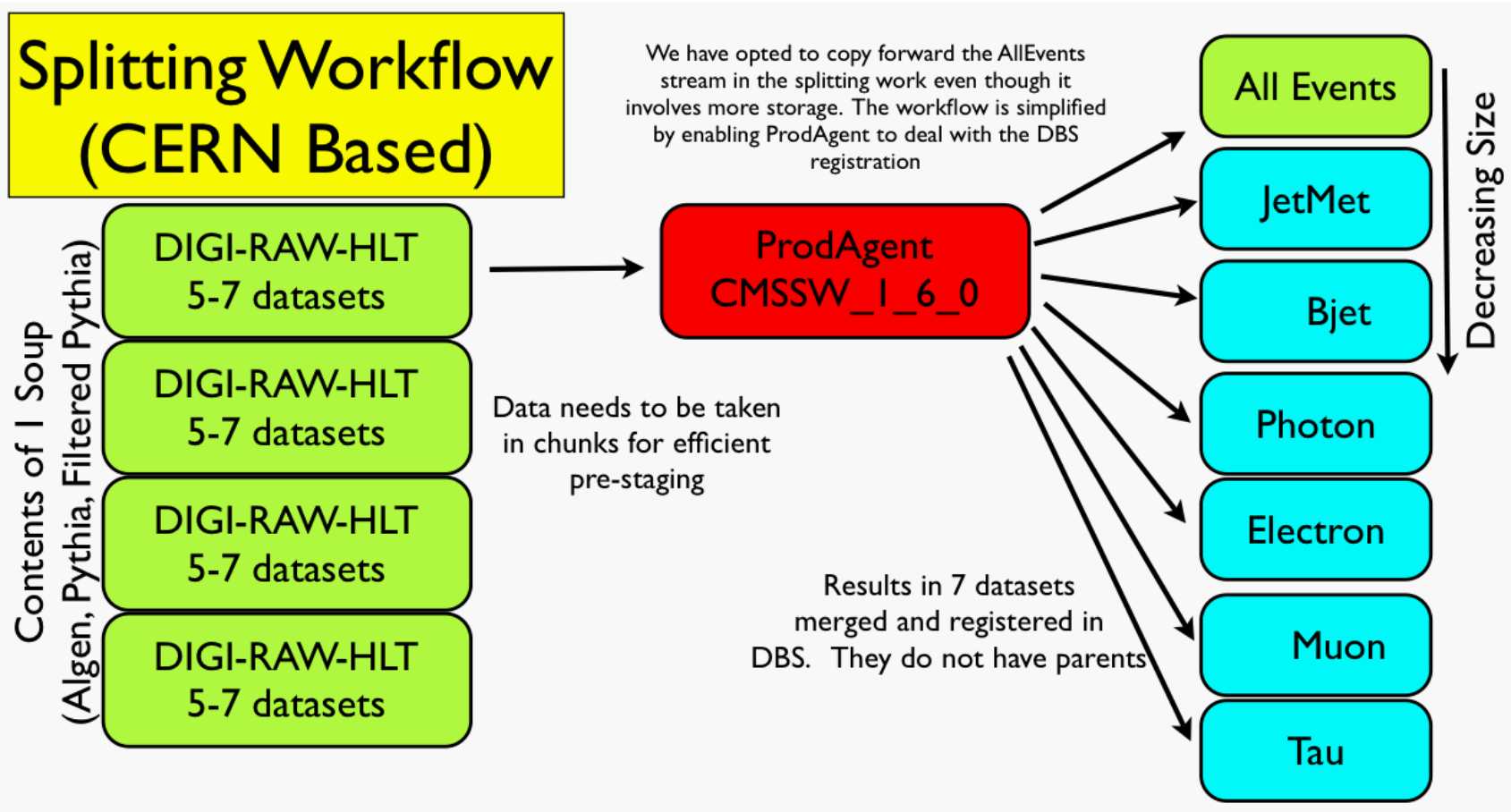
Goals

Test all Elements of CMS computing model at greater than 50 % of the target rate expected from low luminosity data taking.

- reconstruction at Tier-0
- data transfers from CERN to Tier-1 centers
- data transfers from Tier-1 to Tier-1 centers
- MC production at Tier-2 centers
- reprocessing and skimming at Tier-1 centers
- data transfers (skims) from Tier-2 to Tier-1 centers
- data analysis at Tier-2 centers

Duration: 30 days, start early October

Dataset Splitting



in reality three soups (Chowder, Gumbo, Stew)

Distribution of Primary Datasets

		Tier 1 Streams						
Primary Dataset	**CSA size (TB)**	**ASGC**	**IN2P3**	**CNAF**	**FZK**	**PIC**	**RAL**	**FNAL**
Tau	**3.4**		1					1
Photon	14.6		1				1	1
Muon	10			1		1		1
Electron	14.5		1	1				1
Bjet	27.5				1			1
JetMET	31.2	1						1
AllEvents	83.4		0.2	0.2	0.2		0.2	0.2
Total data volume (inc. copies)	346	31	58	51	53	10	40	127

Transfer Link Commissioning

Rule

No production data transfers via uncommissioned links!

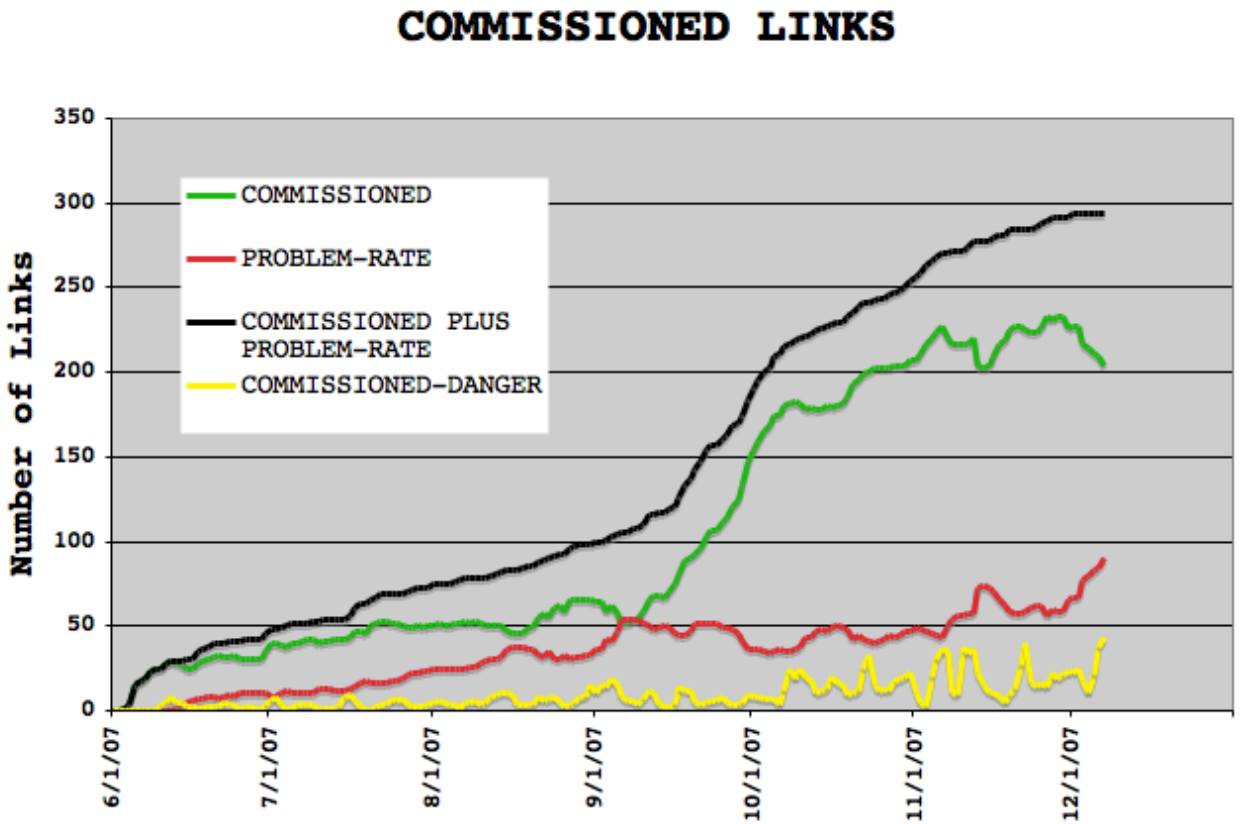
- Tier-1s need links to CERN and other Tier-1s
- Tier-2 centers need down-links from Tier-1 centers to get data sets
- Tier-2 centers need up-links to regional Tier-1 center to copy MC files back

Commissioning Procedure

- *loadtest* transfers in PhEDEx debug instance
- requirements for Tier-2 link commissioning:
  4 out of 5 days with 300GB/day and 1.7 TB in total
- requirements for Tier-2 link decommissioning:
  7 days in a row with less than 300GB/day

Link Commissioning

- the whole procedure is very time intensive for the local admins
- lack of centralized tools



will be changed to overcome these problems

Skims

http://www.hep.wisc.edu/ dasu/skimStatus.html

EWK Single e	EWK Single mu	EWK Single tau	EWK Di-electron	EWK Di-muon	EWK Di-tau	
SUSYBSM ElectronPhoton	SUSYBSM ElectronPhoton_HLT	SUSYBSM Muon	SUSYBSM Muon_HLT	SUSYBSM MuonsHits	SUSYBSM JetMet	SUSYBSM JetMet_HLT
QCD 2mu	QCD Jet+X	QCD High PT Jets	QCD Very High PT Jets	QCD Ultra High PT Jets		
Higgs diphoton	Higgs single lepton	Higgs multilepton	Higgs 2 tau	Higgs tau_jet + MET	Higgs vbf_jets + MET	
topSemiLepElectron	topSemiLepMuon	topDiLepton2Electron	topDiLeptonMuonX	topFullyHadronic		
Diffraction gammagammaEE	Diffraction gammagammaMuMu	Bphysics onia	Bphysics tauTo3Mu			
egamma electron validation AOD	egamma electron validation RECO	egamma electron validation FEVT	egamma high-pT EM validation AOD	egamma high-pT EM validation RECO	egamma W+jet-like events AOD	egamma W+jet-like events RECO
egamma Z+jet-like events AOD	egamma Z+jet-like events RECO	btagDijet	btagElecInJet	btagMuonInJet	PF Jpsiee	L1muon
JetMET 1JET_SKIM	JetMET PHOTON_JET_SKIM	JetMET METLOW_SKIM	JetMET METHIGH_SKIM			

Tier-2 Operation Team

Team:

- coordination: B. Lewendel, C. Wissing, H. Stadie(data manager)
- shifters: C. Autermann, B. Mura, C. Sander, R. Wolf
- PhEDEx: B. Mura, F. Bechtel, (Y. Kemp)
- experts from IT

Shifts (1 person for 2 weeks):

- check: SAM tests, DASHBOARD results, MC production, JobRobot, PhEDEx
- give summary talk in bi-weekly local computing meeting
- https://twiki.cern.ch/twiki/bin/view/CMS/HamburgWikiComputingMonitoring

Infrastructure Changes

New Computing Element for Grid Cluster

- new CE: grid-ce3.desy.de
- changed worker nodes to SL4

Dedicated Storage for CMS

- new dCache instance for CMS: dcache-se-cms.desy.de
- new pool setup (current sizes):

store	36.1 TB
unmerged	2.8 TB
loadtest	3.0 TB
analysis	3.5 TB

DESY Tier-2's Role in CSA07

Intentions

- produce Monte Carlo
- host skims copied from the Tier-1 centers
- allow user analysis jobs

Requirements

- pass site availibility tests
- commissioned links
- enough space for skimmed samples
- CPUs for MC production and analysis

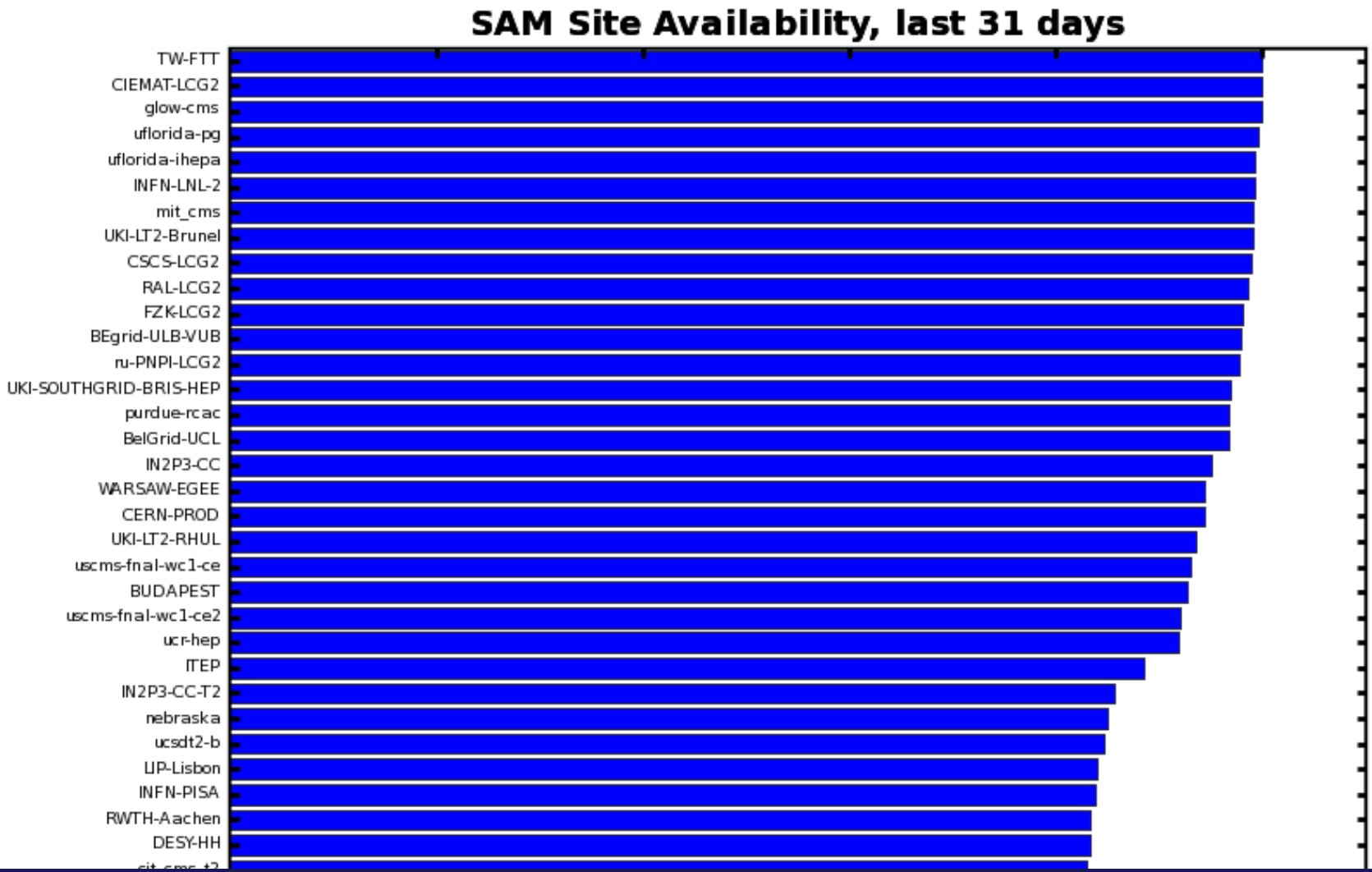
Skims at DESY

Skims (as planned):

name	primary dataset	guessed size
btagDijet	all events	10 TB
1 Jet skim (50 %)	all events	14 TB
high pt jets	JetMet	1.4 TB
very high pt jets	JetMet	286 GB
ultra high pt jets	JetMet	72 GB
topDiLepton2Electron	Electron	238 GB
topDiLeptonMuonX	Muon	243 GB
topSemiLepElectron	Electron	469 GB
topSemiLepMuon	Muon	167 GB
topFullyHadronic	Bjet	150 GB
SUSY JetMET	JetMet, Tau	1 TB

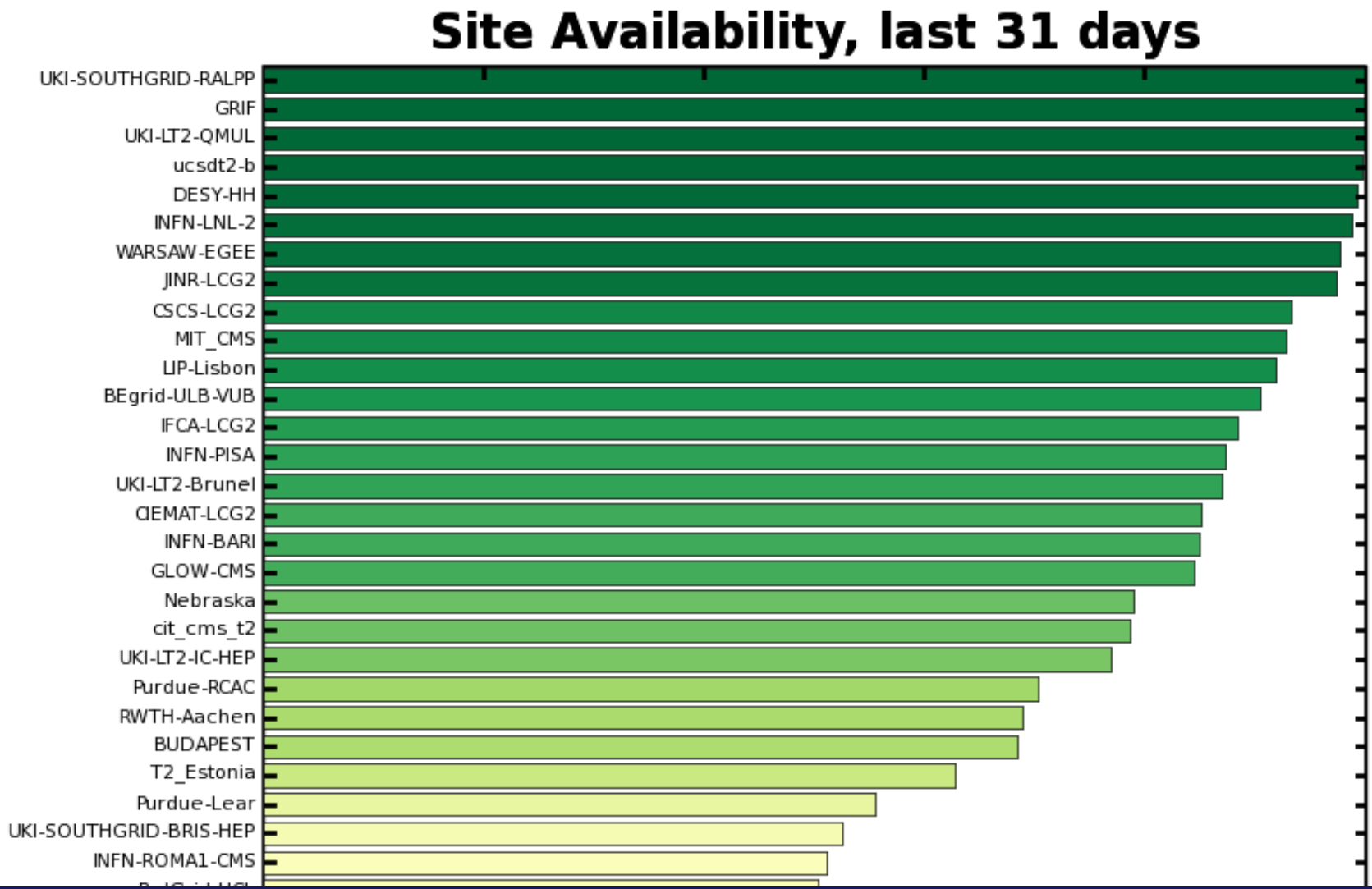
SAM Results up to September 14

Tier-2 goal: $>$ 80(90)%

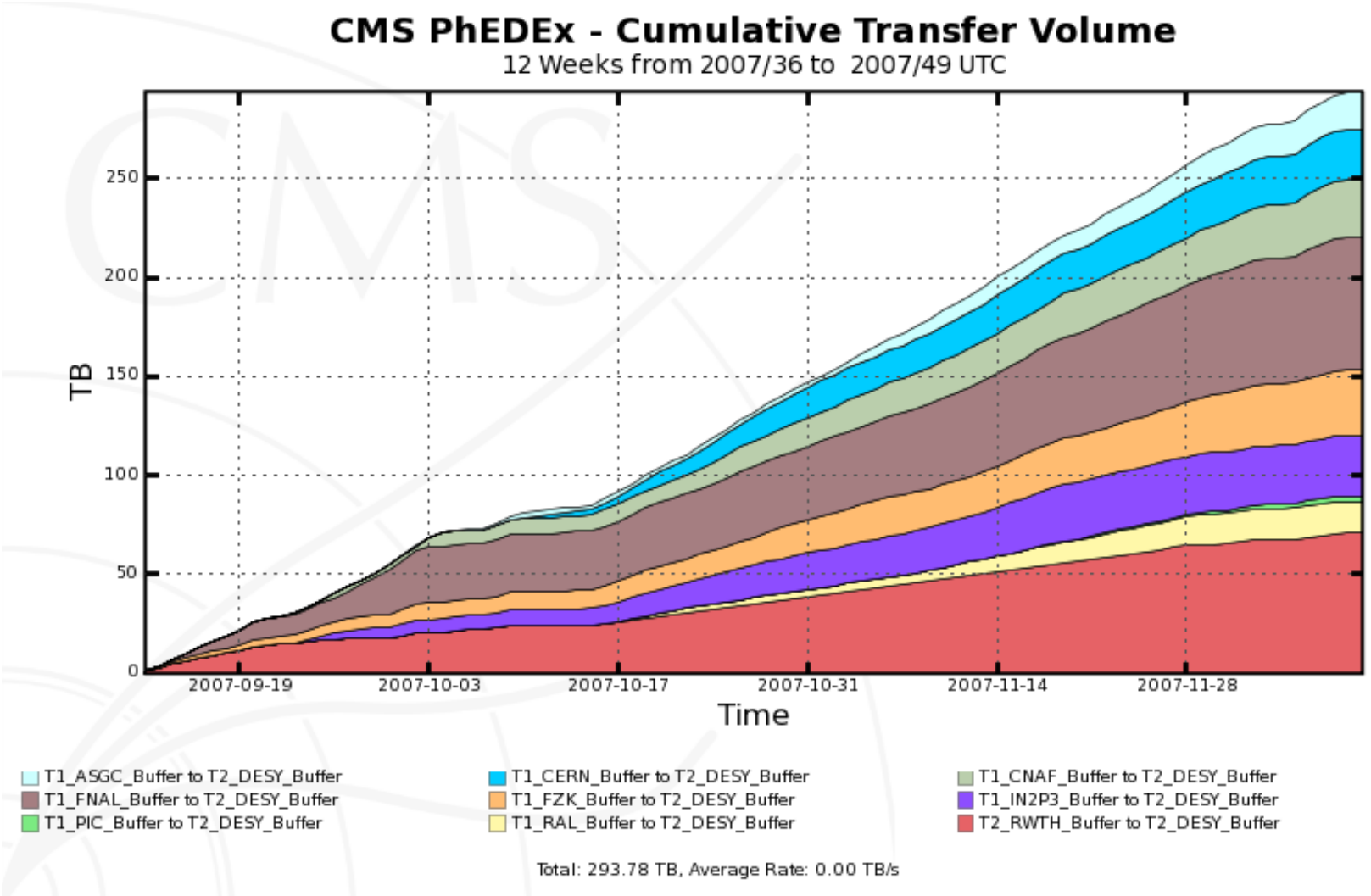


SAM Results up to December 10th

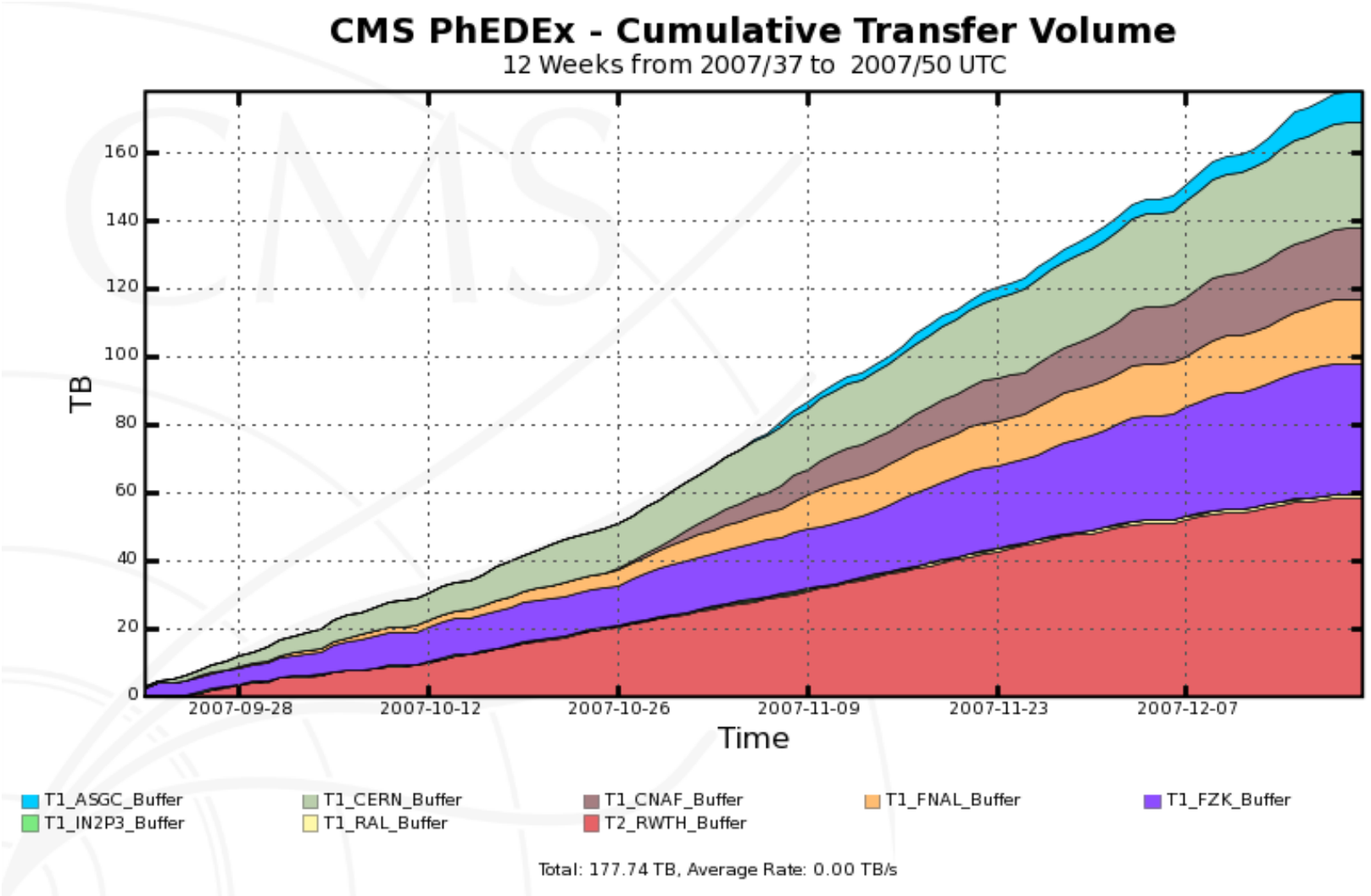
Tier-2 goal: $> 80(90)\%$



Loadtest Transfers to DESY



Loadtest Transfers from DESY



Number of Links Per Site on October 15, 2007

```
41 T1_CERN_Buffer
40 T1_FNAL_Buffer
32 T1_FZK_Buffer
27 T1_IN2P3_Buffer
23 T1_CNAF_Buffer
15 T1_PIC_Buffer
14 T1_RAL_Buffer
14 T1_ASGC_Buffer

 9 T2_Spain_IFCA
 9 T2_Belgium_UCL
 8 T2_UCSD_Buffer
 8 T2_RWTH_Buffer
 8 T2_DESY_Buffer
 7 T2_Nebraska_Buffer
```

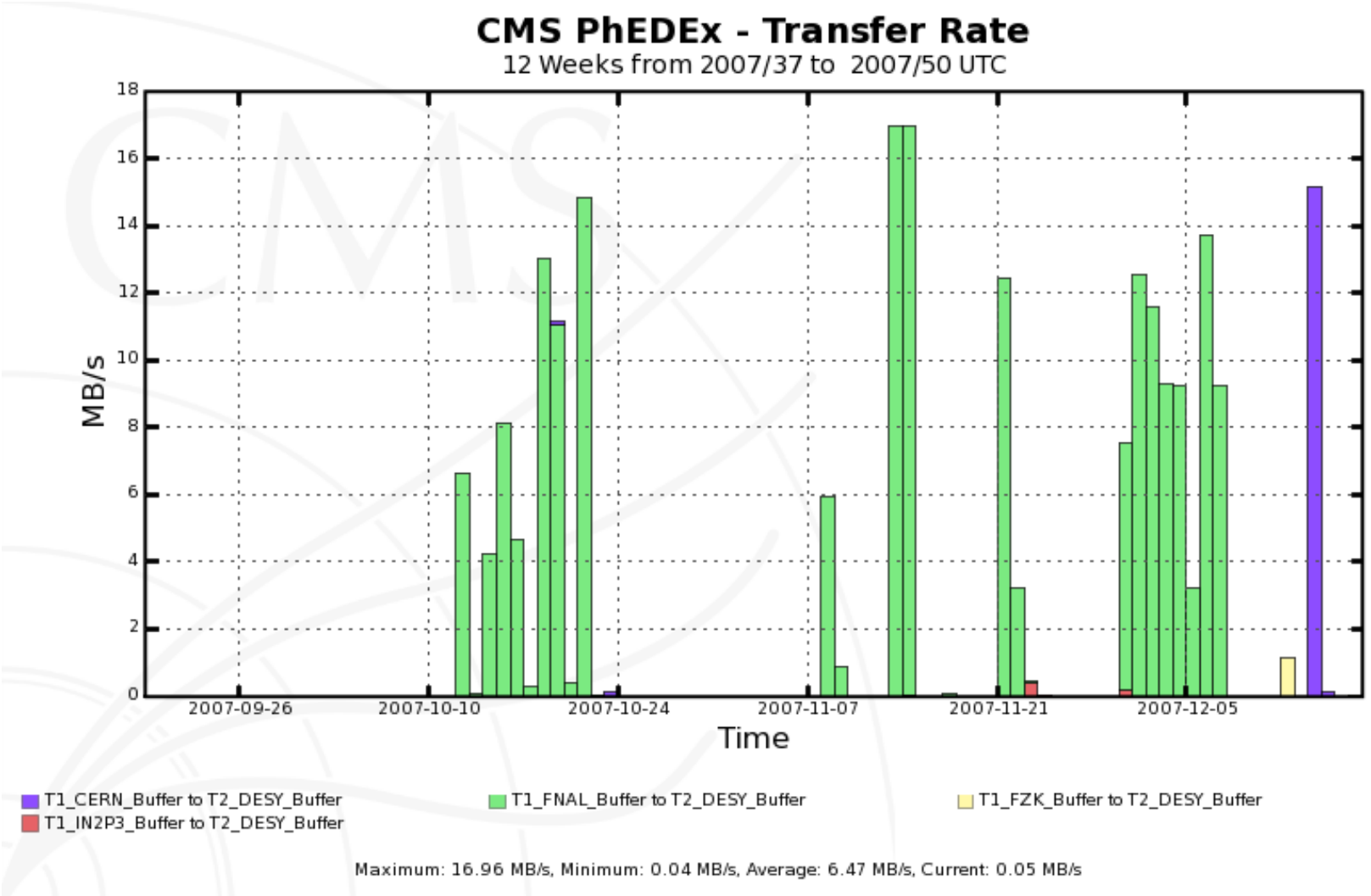
Number of Links Per Site on November 6, 2007

```
53 T1_CERN_Buffer
47 T1_FNAL_Buffer
37 T1_FZK_Buffer
35 T1_CNAF_Buffer
29 T1_IN2P3_Buffer
20 T1_PIC_Buffer
19 T1_RAL_Buffer
15 T1_ASGC_Buffer

12 T2_RWTH_Buffer
12 T2_DESY_Buffer
10 T2_Nebraska_Buffer
 9 T2_Taiwan_Buffer
 9 T2_Belgium_IIHE
 8 T2_Spain_IFCA
```

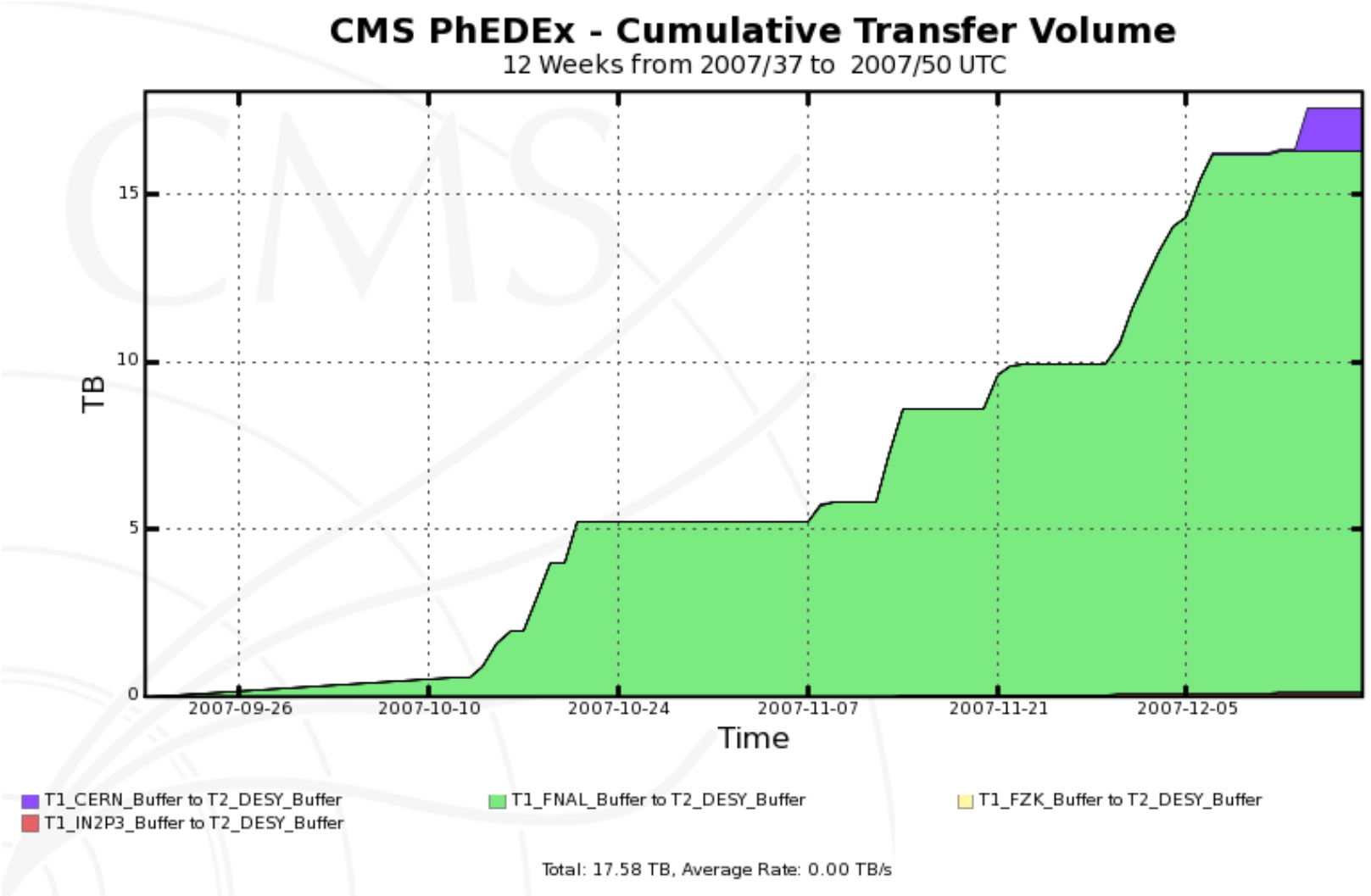
Number of Links Per Site on November 26, 2007

```
57 T1_CERN_Buffer
50 T1_FNAL_Buffer
34 T1_CNAF_Buffer
33 T1_FZK_Buffer
29 T1_IN2P3_Buffer
25 T1_RAL_Buffer
18 T1_ASGC_Buffer
17 T1_PIC_Buffer

14 T2_DESY_Buffer
11 T2_Nebraska_Buffer
11 T2_Belgium_UCL
10 T2_Spain_IFCA
 9 T2_Taiwan_Buffer
 9 T2_RWTH_Buffer
```

(post) CSA07 Data Transfers to DESY



(post) CSA07 Data Transfers to DESY

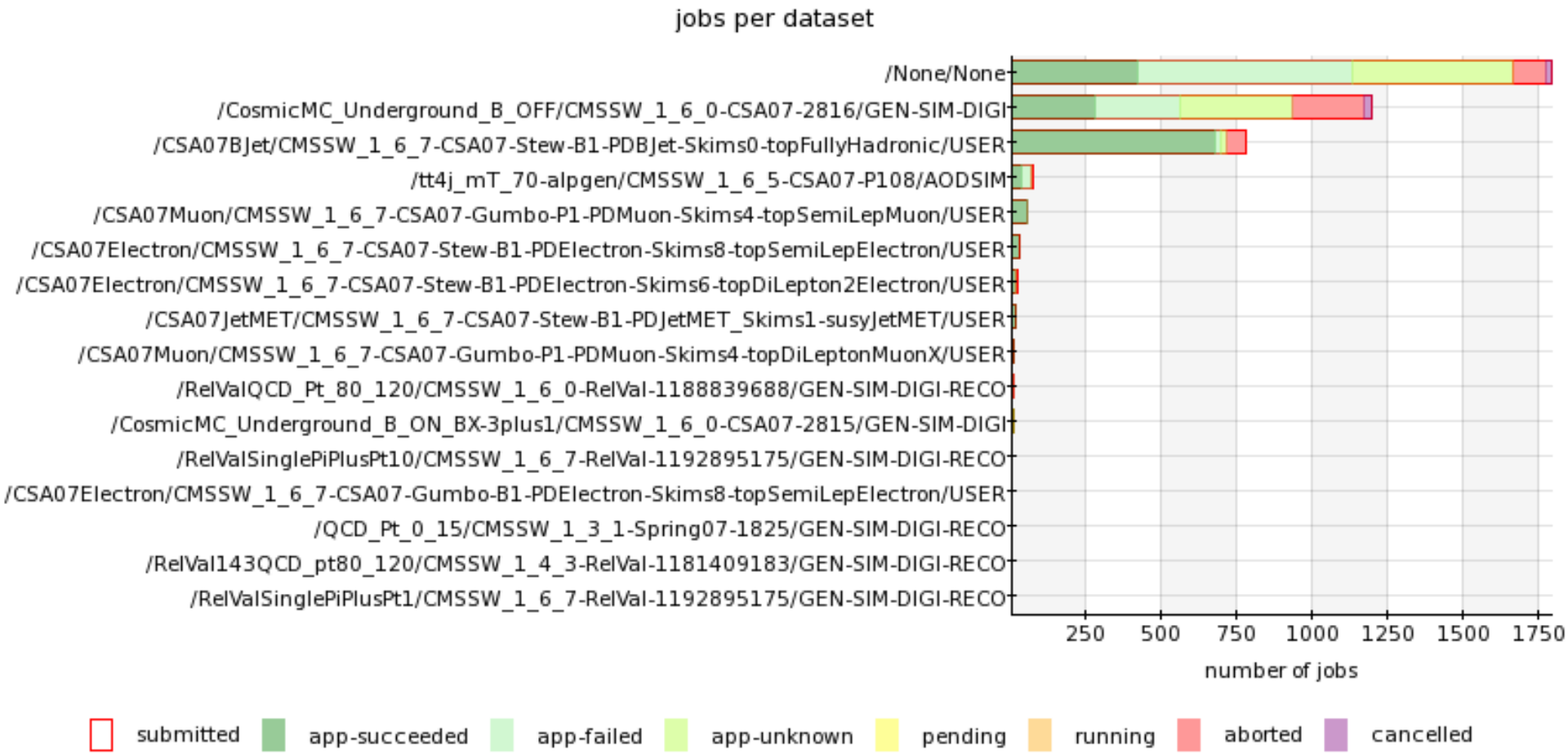


CSA07 Data Sets at DESY

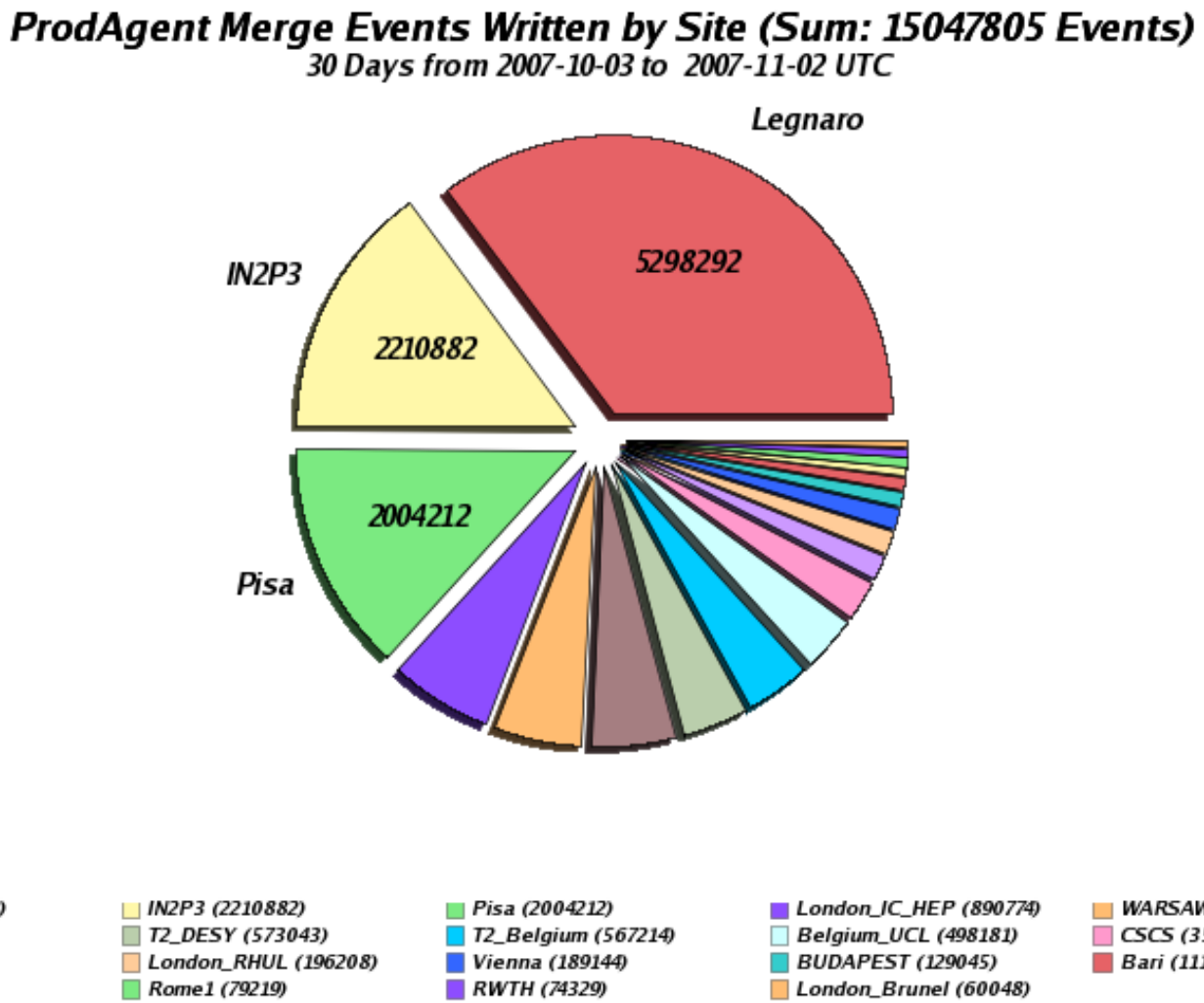
Name /CSA07 Filter	Blocks	Files	Bytes	T2_DESY_Buffer Bytes
» /CSA07AllEvents/CMSSW_1_6_5-CSA07-Chowder-B2-PDAllEvents-Skims0-btagDijetAODSIM/USER	9	771	1.2 TB	1.2 TB
» /CSA07AllEvents/CMSSW_1_6_5-CSA07-Chowder-B2-PDAllEvents-Skims1-onejet_AODSIM/USER	7	545	870.2 GB	870.2 GB
» /CSA07AllEvents/CMSSW_1_6_7-CSA07-Chowder-A3-PDAllEvents-Skims0-btagDijetAODSIM/USER	21	1941	1.3 TB	1.3 TB
» /CSA07AllEvents/CMSSW_1_6_7-CSA07-Gumbo-B1-PDAllEvents-Skims0-btagDijetAODSIM/USER	21	1904	3.0 TB	2.8 TB
» /CSA07AllEvents/CMSSW_1_6_7-CSA07-Stew-B1-PDAllEvents-Skims0-btagDijetAODSIM/USER	11	836	1.2 TB	1.2 TB
» /CSA07AllEvents/CMSSW_1_6_7-CSA07-Stew-B1-PDAllEvents-Skims1-onejet_AODSIM/USER	17	1492	2.1 TB	2.1 TB
» /CSA07BJet/CMSSW_1_6_7-CSA07-Chowder-F1-PDBJet-Skims0-topFullyHadronic/USER	6	68	102.6 GB	102.6 GB
» /CSA07BJet/CMSSW_1_6_7-CSA07-Gumbo-B1-PDBJet-Skims0-topFullyHadronic/USER	2	87	144.1 GB	142.4 GB
» /CSA07BJet/CMSSW_1_6_7-CSA07-Stew-B1-PDBJet-Skims0-topFullyHadronic/USER	2	124	189.4 GB	189.4 GB
» /CSA07Electron/CMSSW_1_6_7-CSA07-Gumbo-B1-PDElectron-Skims6-topDiLepton2Electron/USER	1	2	2.8 GB	2.8 GB
» /CSA07Electron/CMSSW_1_6_7-CSA07-Gumbo-B1-PDElectron-Skims8-topSemiLepElectron/USER	1	6	8.1 GB	8.1 GB
» /CSA07Electron/CMSSW_1_6_7-CSA07-Stew-B1-PDElectron-Skims6-topDiLepton2Electron/USER	1	1	1.3 GB	1.3 GB
» /CSA07Electron/CMSSW_1_6_7-CSA07-Stew-B1-PDElectron-Skims8-topSemiLepElectron/USER	2	5	7.0 GB	7.0 GB
» /CSA07JetMET/CMSSW_1_6_7-CSA07-Gumbo-B1-PDJetMET_Skims1-susyJetMET/USER	11	987	1.8 TB	1.7 TB
» /CSA07JetMET/CMSSW_1_6_7-CSA07-Gumbo-B1-PDJetMET_Skims2-qcdJetFilterStreamHiPath/USER	2	28	47.0 GB	45.1 GB
» /CSA07JetMET/CMSSW_1_6_7-CSA07-Gumbo-B1-PDJetMET_Skims2-qcdJetFilterStreamLoPath/USER	11	1000	1.8 TB	1.8 TB
» /CSA07JetMET/CMSSW_1_6_7-CSA07-Gumbo-B1-PDJetMET_Skims2-qcdJetFilterStreamMedPath/USER	3	205	327.6 GB	317.5 GB
» /CSA07JetMET/CMSSW_1_6_7-CSA07-Stew-B1-PDJetMET_Skims1-susyJetMET/USER	4	284	440.8 GB	440.8 GB
» /CSA07JetMET/CMSSW_1_6_7-CSA07-Stew-B1-PDJetMET_Skims2-qcdJetFilterStreamLoPath/USER	3	289	448.7 GB	448.7 GB
» /CSA07JetMET/CMSSW_1_6_7-CSA07-Stew-B1-PDJetMET_Skims2-qcdJetFilterStreamMedPath/USER	1	2	2.7 GB	2.7 GB
» /CSA07Muon/CMSSW_1_6_7-CSA07-Chowder-P1-PDMuon-Skims4-topDiLeptonMuonX/USER	4	67	61.7 GB	–
» /CSA07Muon/CMSSW_1_6_7-CSA07-Chowder-P1-PDMuon-Skims4-topSemiLepMuon/USER	5	118	113.8 GB	–
» /CSA07Muon/CMSSW_1_6_7-CSA07-Gumbo-P1-PDMuon-Skims4-topDiLeptonMuonX/USER	2	11	9.9 GB	9.9 GB
» /CSA07Muon/CMSSW_1_6_7-CSA07-Gumbo-P1-PDMuon-Skims4-topSemiLepMuon/USER	2	26	28.0 GB	28.0 GB
» /CSA07Muon/CMSSW_1_6_7-CSA07-Stew-P1-PDMuon-Skims4-topDiLeptonMuonX/USER	4	16	13.0 GB	13.0 GB
» /CSA07Muon/CMSSW_1_6_7-CSA07-Stew-P1-PDMuon-Skims4-topSemiLepMuon/USER	4	36	31.4 GB	31.4 GB
» /CSA07Tau/CMSSW_1_6_7-CSA07-Gumbo-I1-PDTau-Skims1-susyJetMET/USER	2	12	16.0 GB	16.0 GB
» /CSA07Tau/CMSSW_1_6_7-CSA07-Stew-I1-PDTau-Skims1-susyJetMET/USER	1	3	4.2 GB	4.2 GB
Total	160	**10866**	**15.2 TB**	14.7 TB

Analysis Jobs at DESY

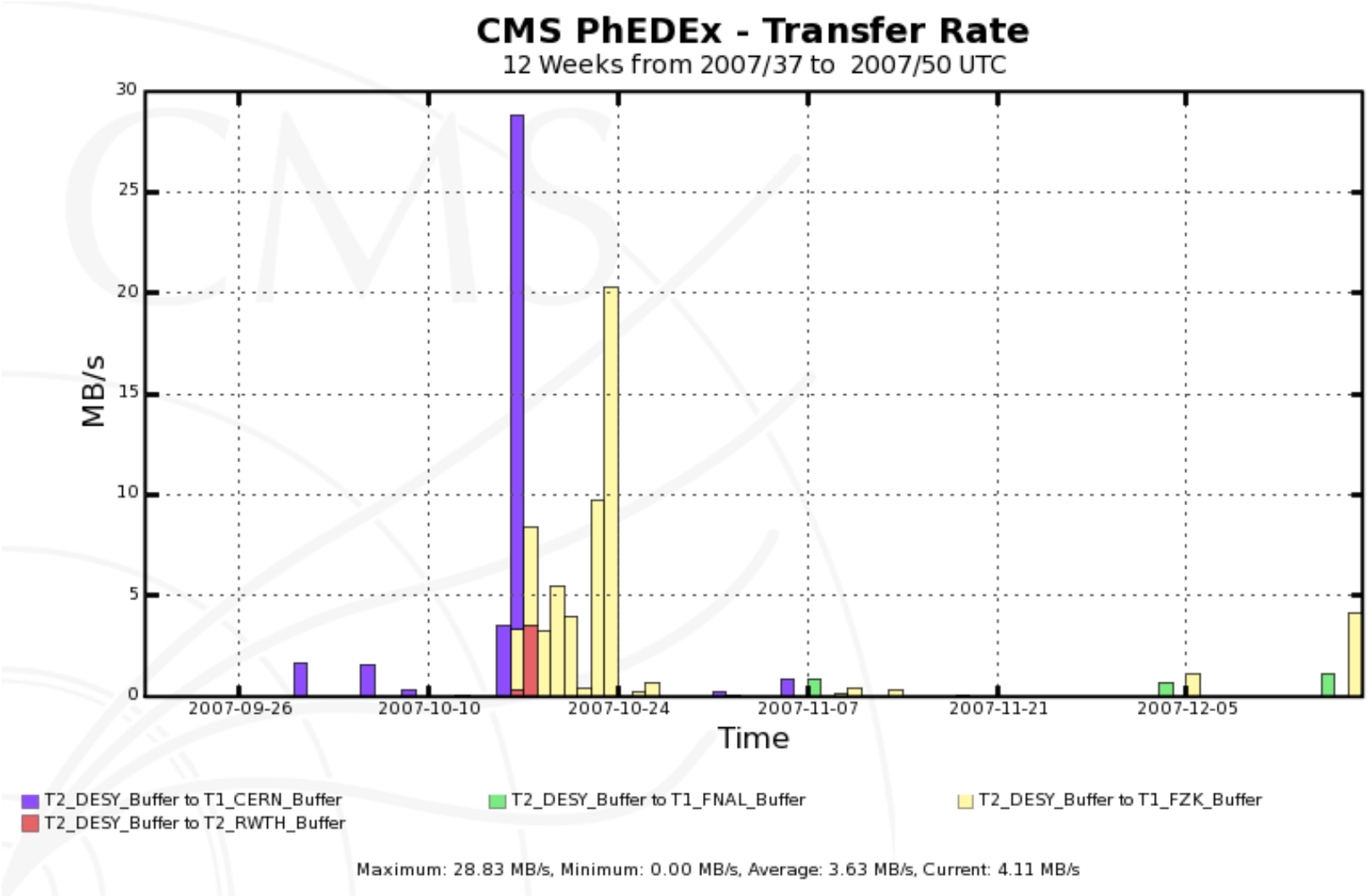
last two months



Monte Carlo Production



(post) CSA07 Data Transfers from DESY



Summary

Conclusions and Outlook

- DESY Tier-2 shows good performance in site availibility and data transfers
- large number of analysis samples copied to DESY
- samples used in analysis, validation done
- skims and MC production still ongoing
- no real Tier-2 tests during CSA07
- post CSA07 indicates: site in good shape for real data