

LISHEP 2006

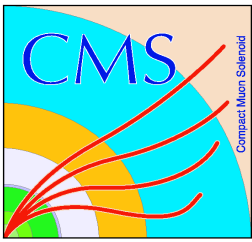
Rio de Janeiro



PhEDEx - reliable and scalable data distribution on the Grid

Jens Rehn, CERN

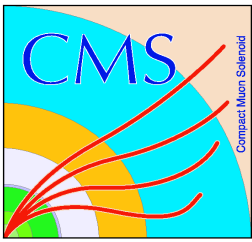
On behalf of numerous
PhEDEx contributors



Outline



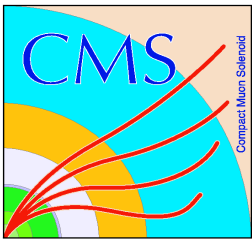
- ★ Introduction to PhEDEx
 - ➔ Traditional and PhEDEx data transfers
 - ➔ Features and functionality
- ★ Operating and monitoring a live PhEDEx system
- ★ Practical examples from the last service challenge
 - ➔ Performance and scalability
 - ➔ Analysis of transfer related problems
- ★ How to set-up and run PhEDEx
- ★ Conclusions and outlook



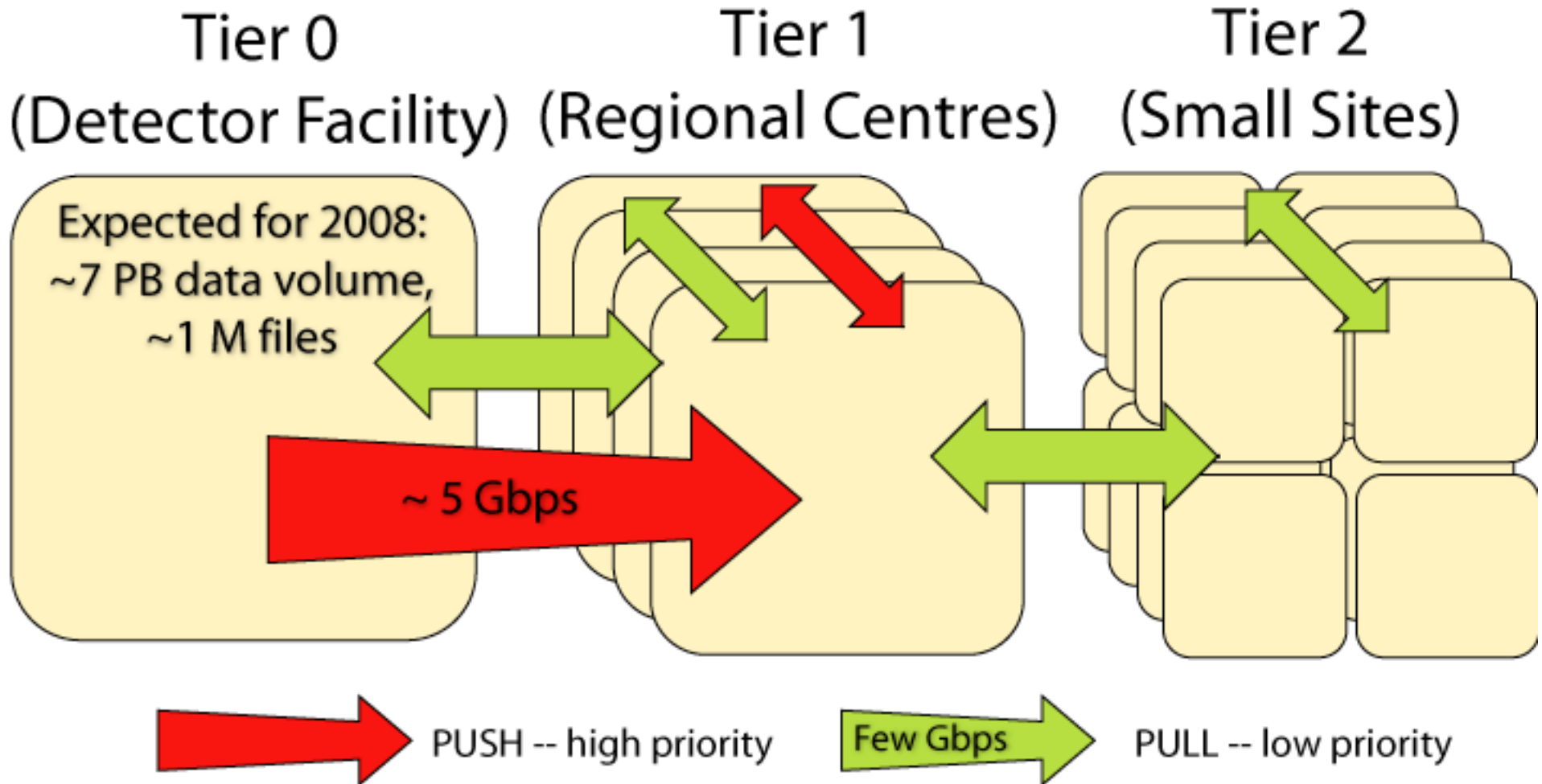
CMS data flow



- ★ Detector data distribution @ high priority
 - ➔ One copy at Cern; one distributed copy at regional centres
 - ➔ Expected transfer volume for 2008: $\sim 7 \text{ PB} \approx O(10^7)$ files
 - ➔ Required transfer speed for 2008: $\sim 5 \text{ Gb/s}$
- ★ Simulated data distribution @ low priority
 - ➔ Among and between regional and local centres
 - ➔ Expected bandwidth utilisation: few Gb/s per regional centre
- ★ Data structured in blocks of files
 - ➔ dataset, datatiers



Tiered data flow



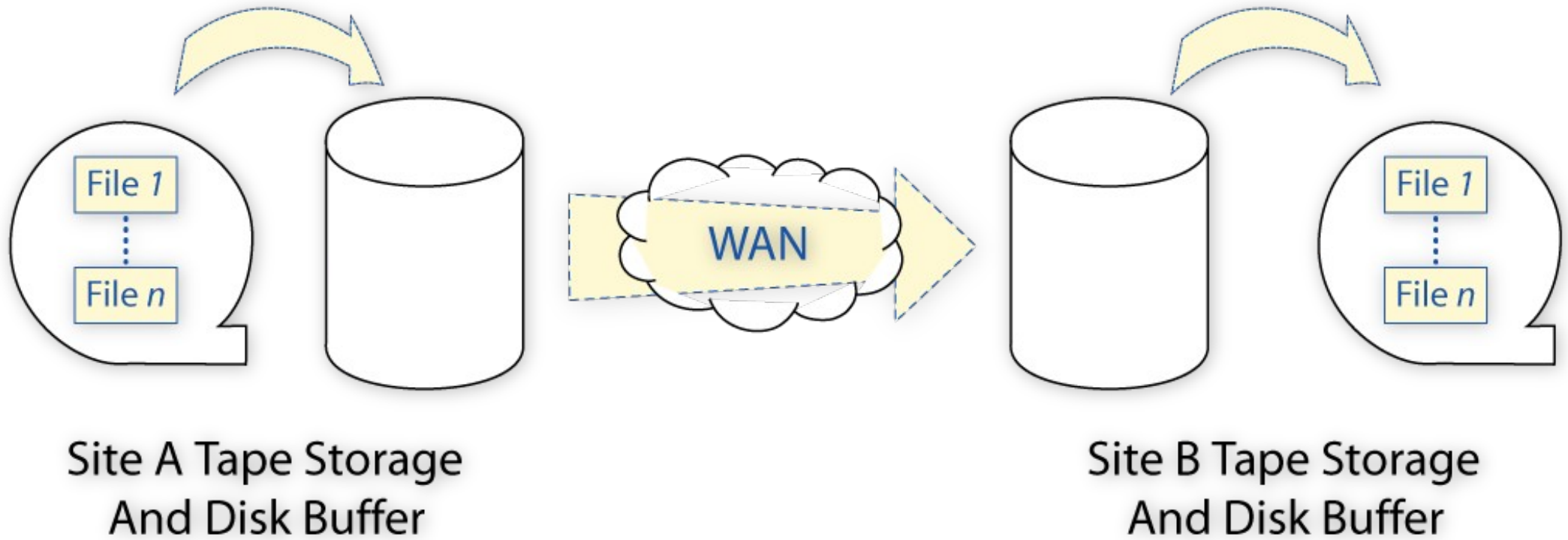
Traditional HEP data replication



Stage On Disk

Validate Transfer

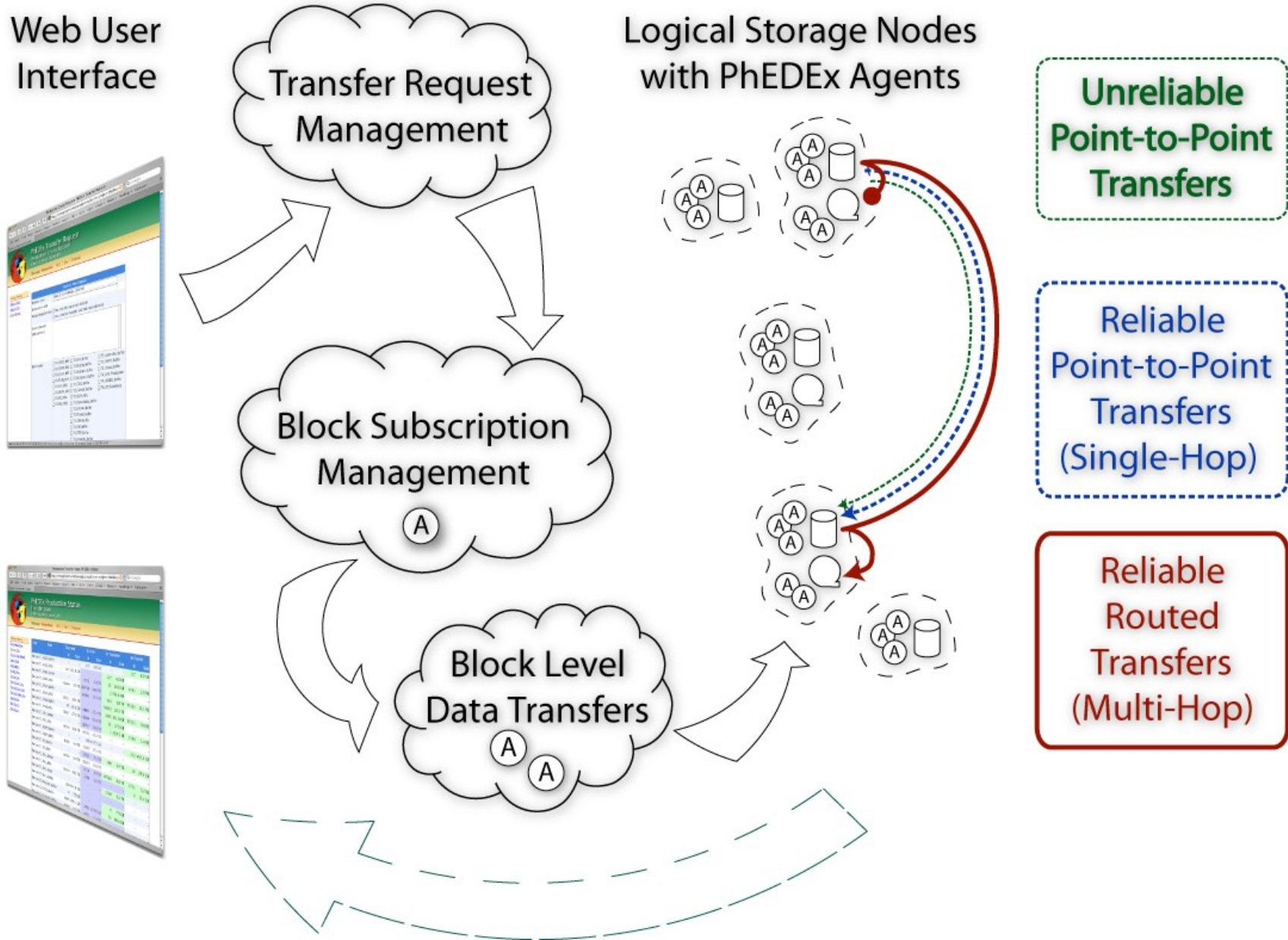
Migrate To Tape



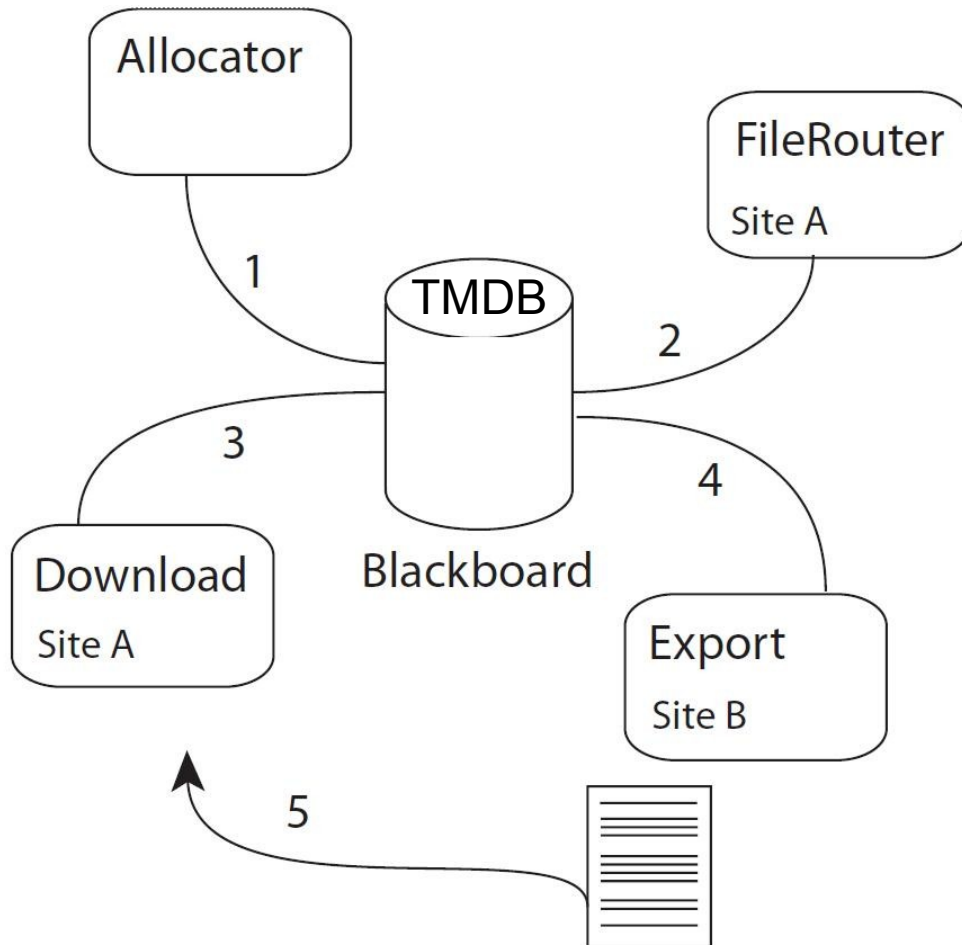
- ★ Each step done by hand
- ★ Manpower-intensive

- ★ Feasible only for small amount of files

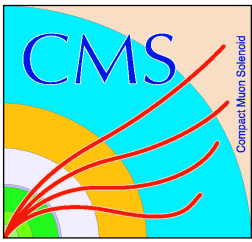
PhEDEx data replication



PhEDEx file replication



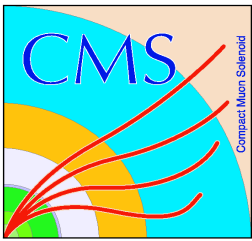
1. Allocator: allocate files to destinations
2. FileRouter: maintains & determines best routes
3. Download: marks files „wanted“ from site B
4. Export: initiate staging & provide contact information
5. Download: transfer file



HEP requirements for a data distribution system



- ★ Managed & structured data flow
- ★ Reliability
 - ➔ Robustness & self-healing
 - Error recovery, automatic back-off, etc
 - ➔ Integrity of replicated data
- ★ Flexibility
 - ➔ Different transfer models: push and pull
 - ➔ Support of common transfer protocols & storage systems
- ★ Monitoring



PhEDEx – design

Key features (1)

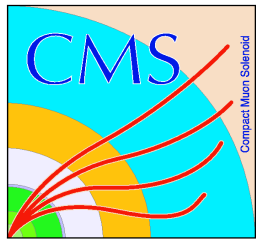


★ Reliability

- ➔ Transfer status monitored
- ➔ File size check after each replication
- ➔ Cksum for every file in TMDB available for further checks
- ➔ Automatic cool off for failed transfers
- ➔ Self-throttling: limits amount of parallel transfers
- ➔ Designed under assumption: any operation might fail

★ Monitoring

- ➔ Status web page: <http://cern.ch/cms-project-phedex>



PhEDEx – design

Key features (2)

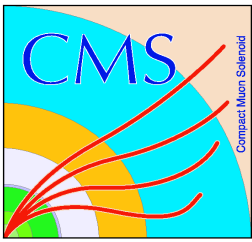


★ Flexibility

- ➔ Push and pull models supported: logical implementation
 - Push: data subscribed to destination by site hosting replica
 - Pull: destination site subscribes data to itself
- ➔ Automatic protocol matching: G-U-C, srmcp, dccp, rfcop, FTS
- ➔ Intelligent routing with fall-back mechanism

★ Operability

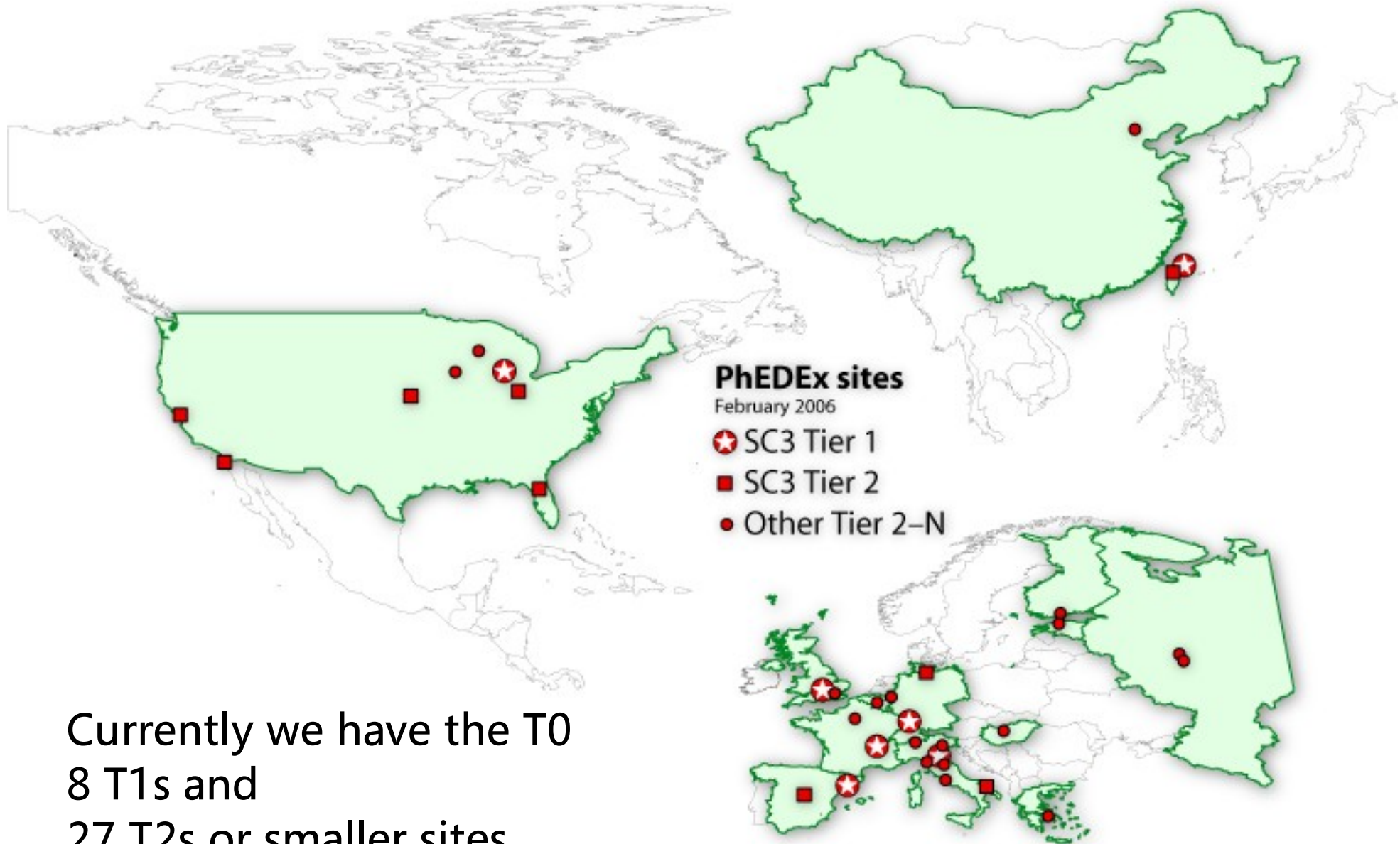
- ➔ Easy to handle deployment
- ➔ Linux *inetd* like start/stop mechanism for agents
- ➔ Try to provide easy to understand log messages



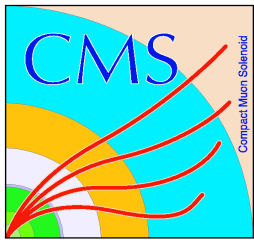
PhEDEx distribution network



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Currently we have the T0
8 T1s and
27 T2s or smaller sites

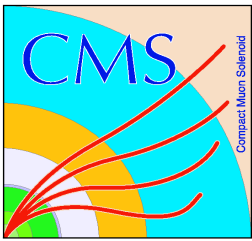


PhEDEx – design

Intelligent routing



- ★ Routing agent determines best route: source → destination
- ★ Routes are ranked automatically
 - ➔ According to amount of intermediate nodes: hops
 - ➔ Hops can be weighted
- ★ IP-like routing to route files to destination
 - ➔ In case of outage, fallback routes chosen via other nodes
 - ➔ Dead nodes noticed by neighbours; no heartbeat



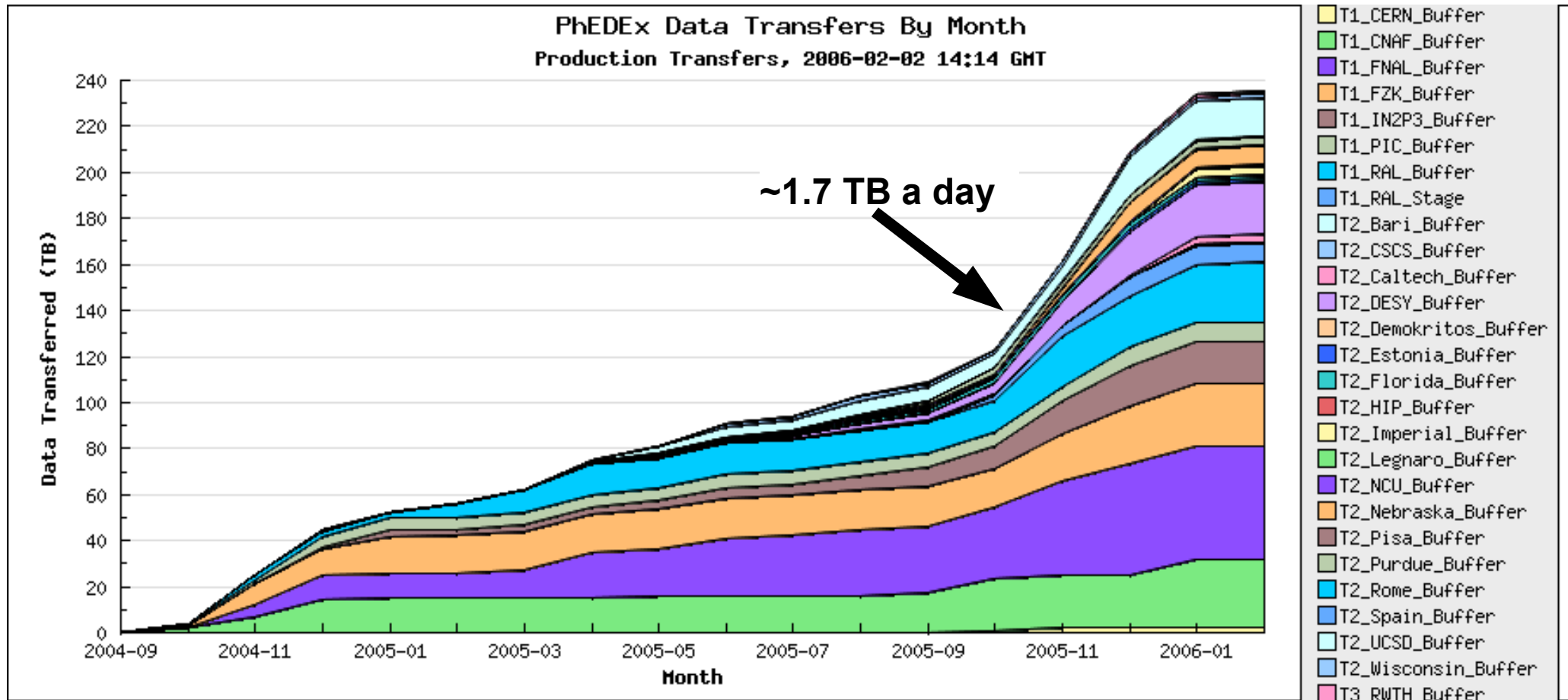
PhEDEx transfer volume last 17 month

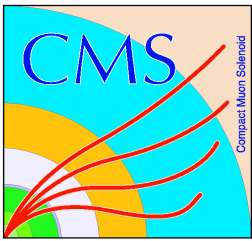


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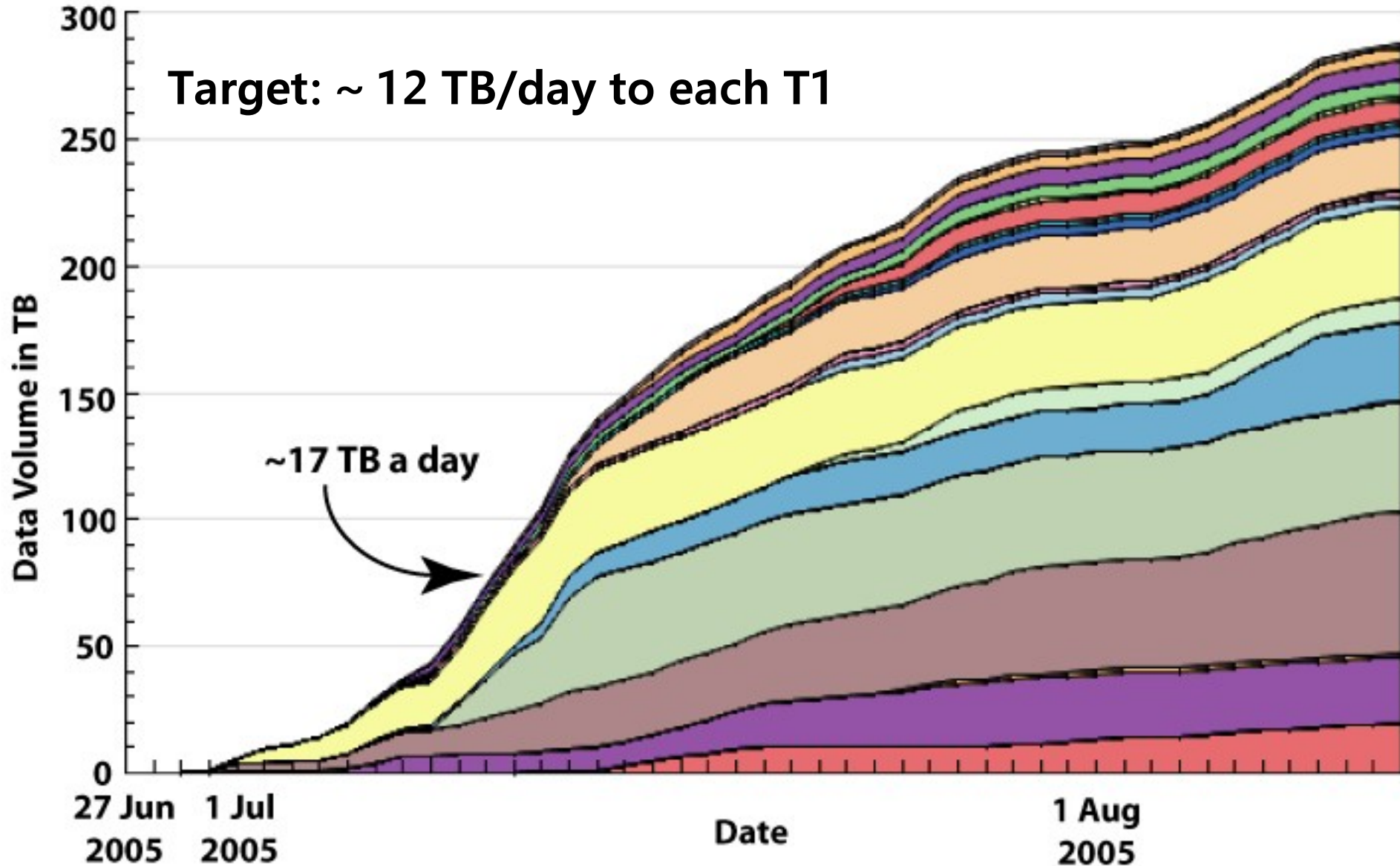


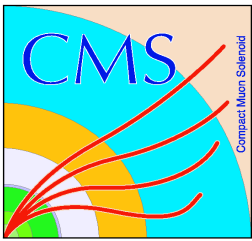


PhEDEx in LCG SC3 throughput phase



Target: ~ 12 TB/day to each T1





PhEDEx scalability exercise

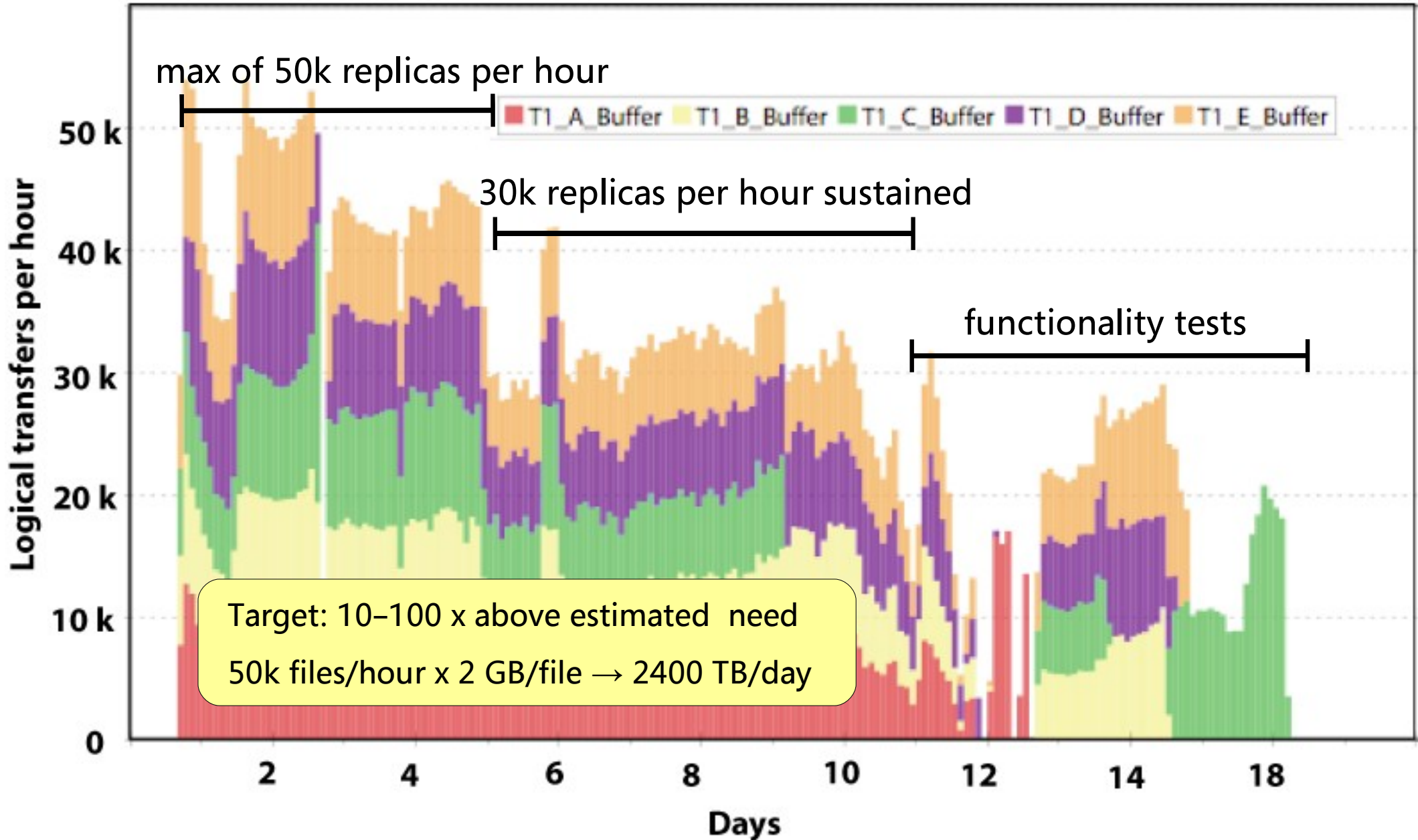


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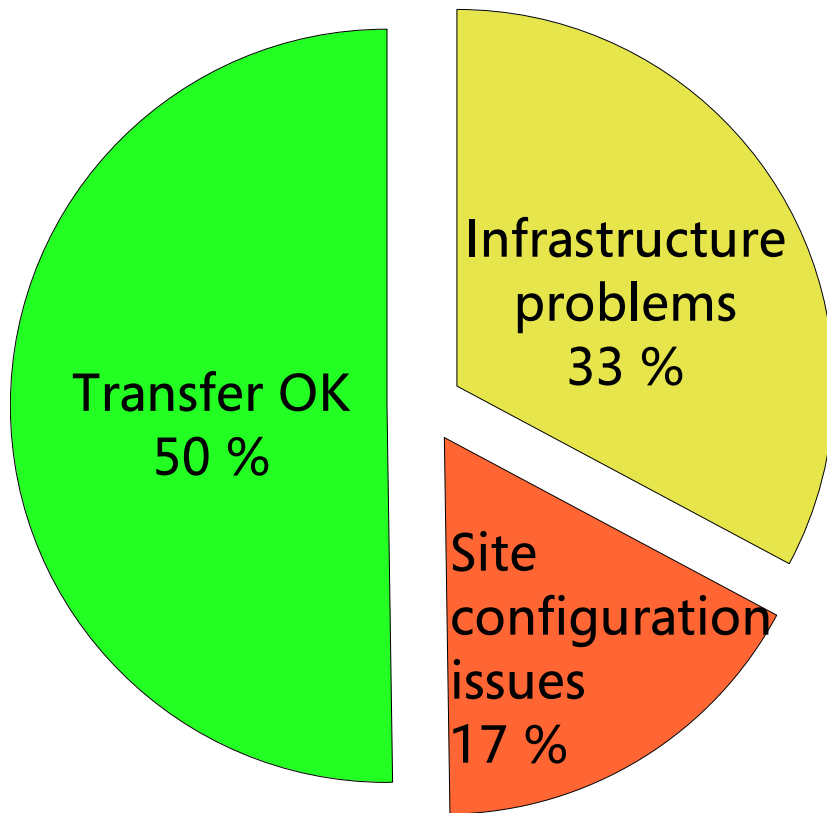
15



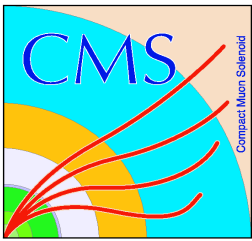
Reliability: impossible odds?



Case study: transfer level



- ★ High failure rate on new SRM/storage infrastructure
- ★ 50% of the transfers successful on the first try
- ★ Main problems
 - ➔ Configurations changed or wrong at sites
 - ➔ Problems related to network or storage infrastructure



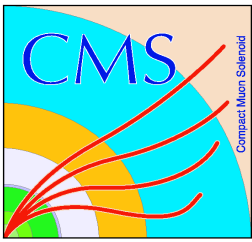
Reliability: against the odds!



Case study: after
PhEDEx failure recovery

Replication OK
100 %

- ★ All failures recovered, eventually
- ★ Files retransferred
- ★ No data lost :-)
- ★ Recovery fully automatic
- ➔ Absolute must: in 2007 CMS will transfer ~2-10k files per day
- ➔ Manual recovery infeasible: 1 ‰ permanent error rate \simeq 2 hrs daily maintenance



PhEDEx – in practice

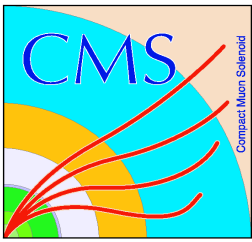
Monitoring & subscription



How to monitor transfers

How to subscribe to CMS datasets

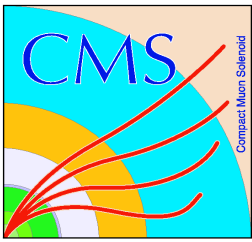
<http://cern.ch/cms-project-phedex>



PhEDEx – deployment Overview



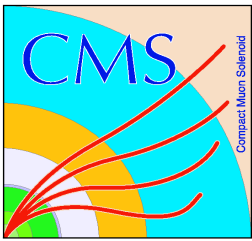
- ★ Each site runs agents close to their storage
 - ➔ Modest resource requirements
 - ➔ Usually hosted on CMS-dedicated server
 - ➔ PhEDEx and tool installation with XCMSi
 - ➔ Underlying transfer utilities like srmcp, fts, etc.
 - ➔ Grid services: certificates and proxy renewal
 - ➔ Configuration: site registration and site specific settings
- ★ Operated by local CMS community, in close communication with site's administrators



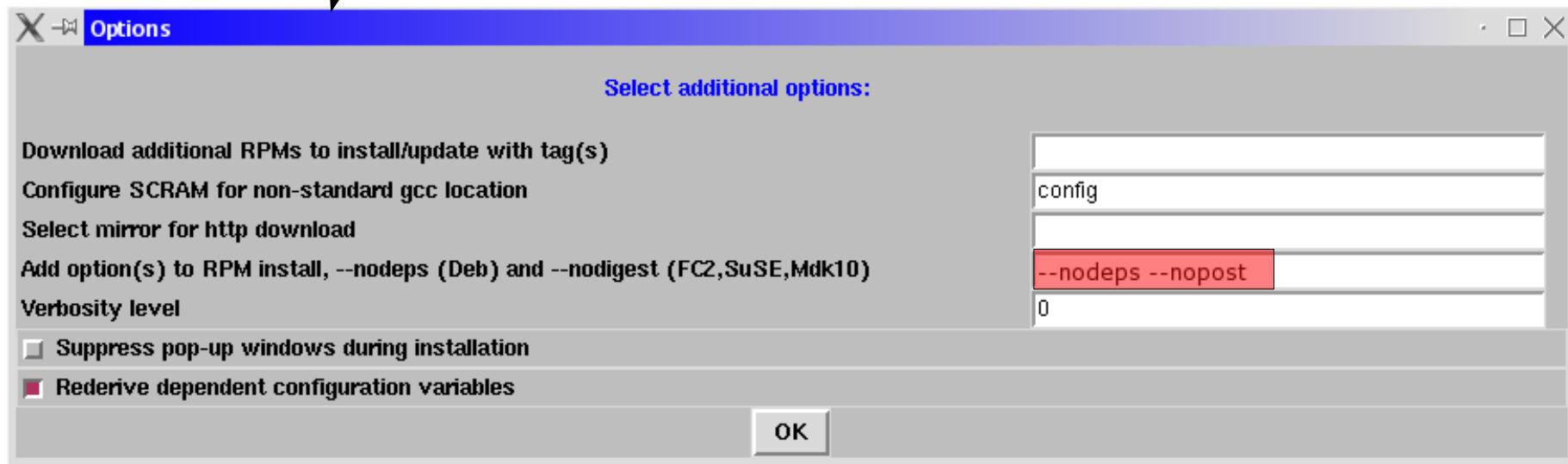
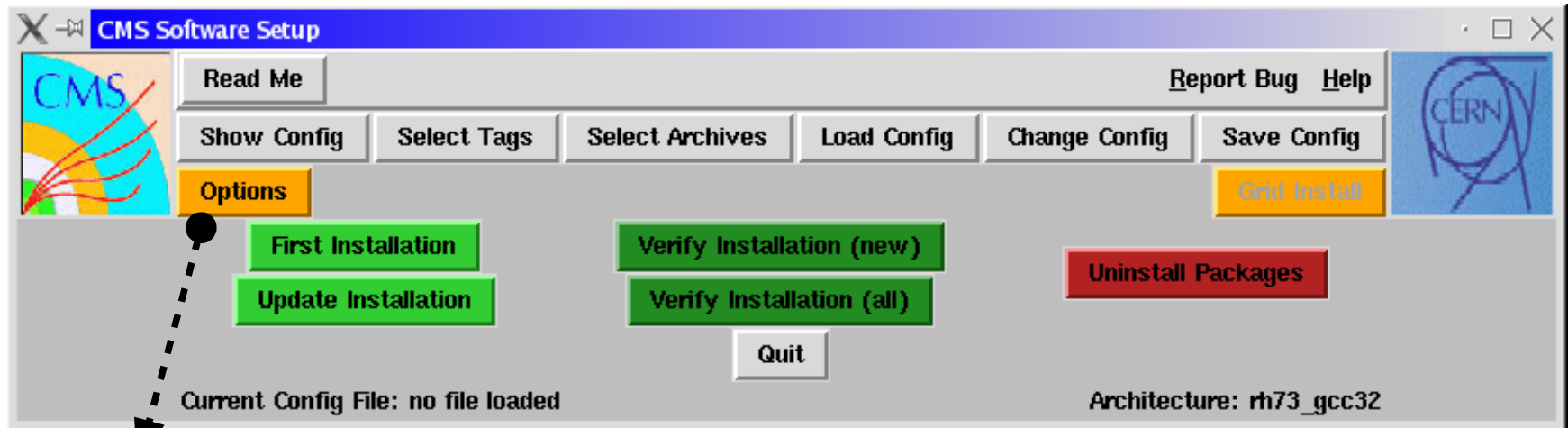
PhEDEx – deployment Software via XCMSi (1)



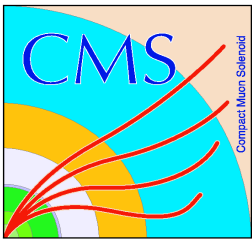
- ★ Decide where to install Phedex
 - ➔ Create install dir for XCMSi ($\$xcmsi$ -base)
 - ➔ Create basedir for PhEDEx ($\$phedex$ -base)
- ★ Download packages
 - ➔ XCMSi from <http://cern.ch/cms-xcmsi>
 - ➔ Untar XCMSi to $\$xcmsi$ -base
 - ➔ Get Oracle client libraries (zip): <http://www.oracle.com>
 - put them in sub-dir $\$xcmsi$ -base/ZIPS
- ★ Start the installation GUI
 - ➔ `cd $\$xcmsi$ -base; ./xcmsi.pl`



PhEDEx – deployment Software via XCMSi (2)



No post installation scripts and no dependency checking



PhEDEx – deployment Software via XCMSi (3)



Jens Rehn

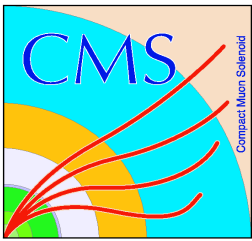
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The screenshot shows the 'CMS Software Setup' window. The 'Select Tags' button is highlighted with a black circle, and a dashed arrow points from it to a 'Select download tags' dialog box. The dialog box contains a list of download tags with checkboxes. The 'PHEDEX_2_2_0' tag is selected. Other tags include OSCAR_3_7_0 through OSCAR_3_9_6, PHYSH_0_0_1 through PHYSH_0_2_1, and PI_1_2_5_sv1 and PI_1_3_1. A 'Select' button is at the bottom of the dialog.

Current Config File: no file loaded
Architecture: rh73_gcc32

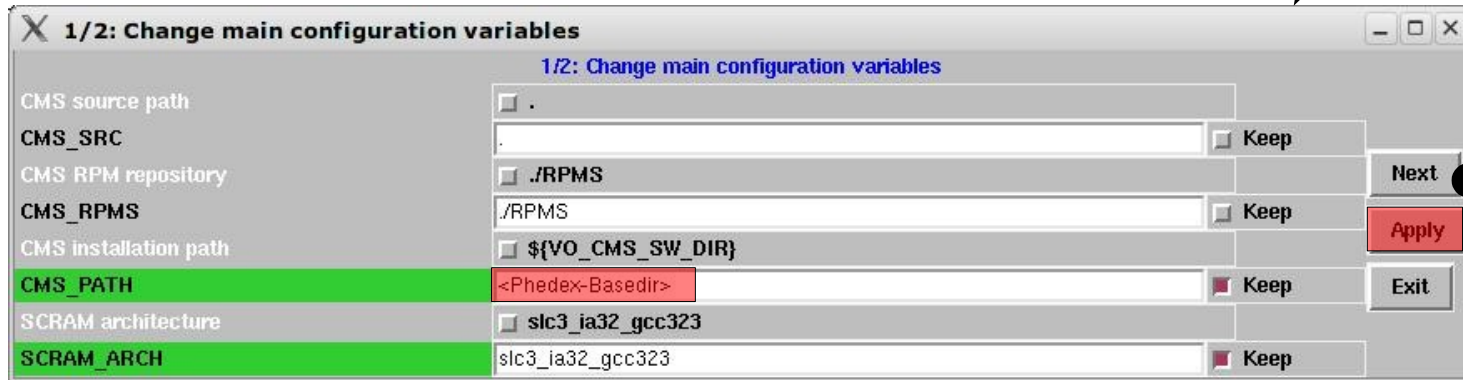
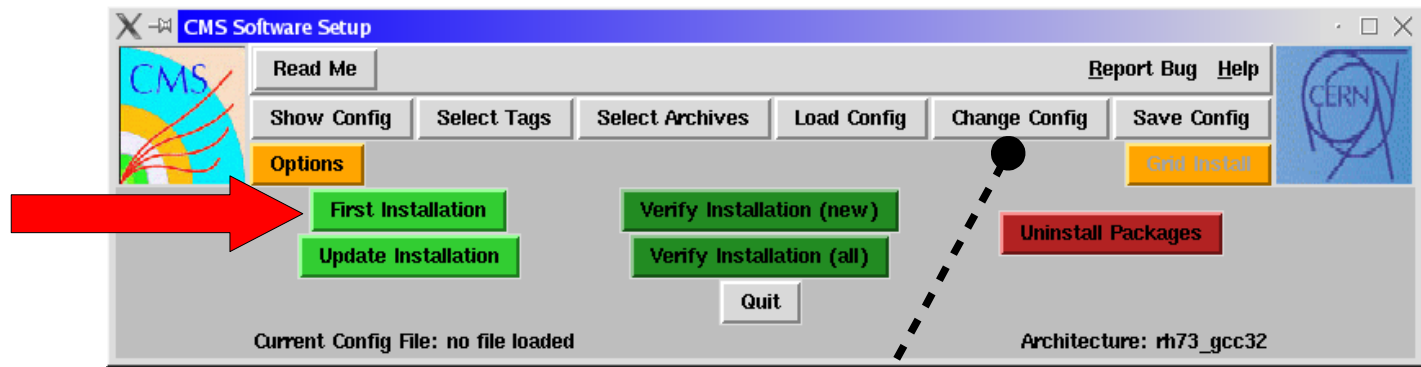
Select PhEDEx version



PhEDEx – deployment Software via XCMSi (4)

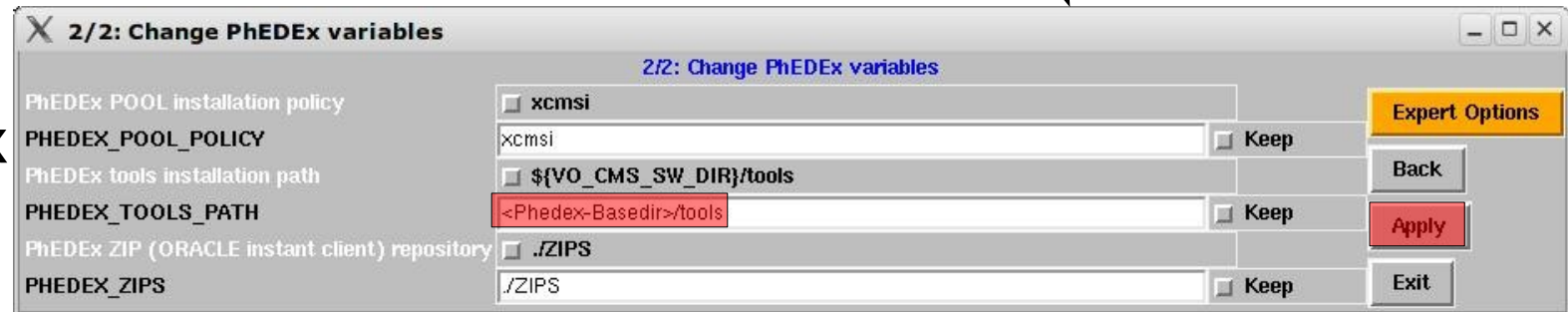


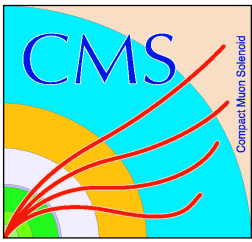
3. Finally start installation



1. Select PhEDEx installation dir

2. Select PhEDEx tools dir

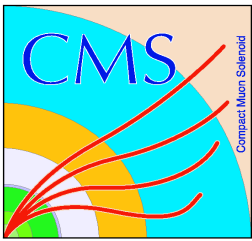




PhEDEx – deployment Grid services



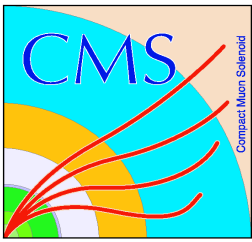
- ★ Site local file catalogue – if you don't have one already
 - ➔ Any catalogue type is fine
 - ➔ MySQL based POOL file catalogue recommended:
 - Helper script PHEDEX/Deployment/SetupPOOLFileCatalogue
- ★ Certificate management
 - ➔ Valid Grid certificate proxy: grid-proxy-init
 - ➔ Recommended auto-renewal via myproxy



PhEDEx – deployment Configuration



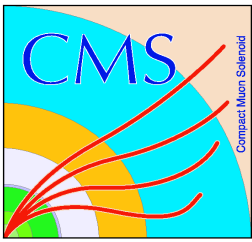
- ★ Site registration in central DB
 - ➔ Obligatory: Documents/README/README-Deployment
 - ➔ Currently: send mail to hn-cms-phedex@cern.ch
- ★ Site local glue scripts
 - ➔ Get a copy of templates provided in
 - Custom/Template
 - ➔ Adjust them to meet your site's requirements
 - Remove all not needed agents ! Typically only ~ 5 are needed
- ★ Testing your installation
 - ➔ Run Deployment/TestInstallation



Summary and outlook



- ★ PhEDEx provides
 - ➔ Reliable and scalable data distribution on the grid
 - ➔ Flexibility to use any file replication tool, especially grid tools
 - ➔ Real life monitoring through a web status display
- ★ Plans
 - ➔ More and improved web based data management tools
 - data subscriptions, transfer requests, agent management, deployment
 - ➔ Support transfers for physics groups and individual physicists
 - decentralisation of central database
- ★ Hope to bring many new sites onboard :-)

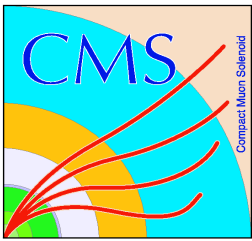


Useful links & contacts



- ★ PhEDEx project web page:
 - ➔ <http://cern.ch/cms-project-phedex>
 - ➔ links to documentation, monitoring & CVS repository
- ★ PhEDEx mailing list:
 - ➔ hn-cms-phedex@cern.ch

Big Thank You to the organizers!!



PhEDEx – monitoring Transfer state



SC3 Transfer State: PhEDEx Status - Mozilla Firefox

http://cms-project-phedex.web.cern.ch/cms-project-phedex/cgi-bin/browser?db=sc;page=ti

LEO English/Germa... Lexika

PhEDEx SC3 Status
Transfer State
2005-09-25 17:04:40 GMT

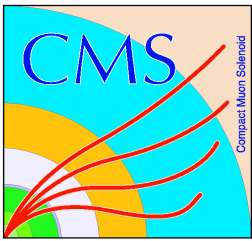
Database: Production | SC3 | Dev | Testbed

Monitor Options

- [Component Status](#)
- [Transfer State](#)
- [Transfer State Details](#)
- [Replica State](#)
- [Subscriptions](#)
- [File Size Stats](#)
- [Transfer Rate](#)
- [Transfer Rate Plots](#)
- [Transfer Quality Plots](#)
- [Agent Status](#)
- [Daily Reports](#)
- [Daily Report](#)

Age	Node	Destined		On Site		In Transfer		In Export	
		N	Size	N	Size	N	Size	N	Size
Current	T1_ASCC_Buffer	-	-	2287	4.0 TB	158	278.8 GB	2733	4.8 TB
Current	T1_ASCC_MSS	2446	4.3 TB	-	-	2287	4.0 TB	-	-
Current	T1_CERN_Buffer	-	-	5881	10.6 TB	-	-	5893	10.6 TB
Current	T1_CERN_MSS	-	-	26447	47.0 TB	-	-	-	-
Current	T1_CNAF_Buffer	-	-	338	600.0 GB	1681	2.9 TB	530	952.3 GB
Current	T1_CNAF_MSS	2020	3.5 TB	329	584.0 GB	9	16.0 GB	-	-
Current	T1_FNAL_Buffer	-	-	1600	3.0 TB	3300	6.0 TB	1002	1.7 TB
Current	T1_FNAL_MSS	4738	8.8 TB	1551	2.9 TB	-	-	-	-
Current	T1_FZK_Buffer	-	-	135	249.5 GB	214	372.3 GB	92	170.2 GB
Current	T1_FZK_MSS	349	621.8 GB	43	79.3 GB	92	170.2 GB	-	-
Current	T1_IN2P3_Buffer	-	-	10	13.1 GB	-	-	-	-
Current	T1_IN2P3_MSS	179	329.3 GB	10	13.1 GB	-	-	-	-
Current	T1_PIC_Buffer	-	-	1177	2.1 TB	535	1010.8 GB	18	32.2 GB
Current	T1_PIC_MSS	1718	3.1 TB	1167	2.1 TB	18	32.2 GB	-	-
Current	T1_RAL_MSS	316	501.1 GB	-	-	-	-	-	-
Current	T2_Bari_Buffer	558	959.0 GB	87	160.5 GB	221	393.4 GB	-	-
Current	T2_Caltech_Buffer	1132	1.9 TB	254	421.9 GB	81	145.1 GB	-	-
Current	T2_DESY_Buffer	-	-	135	249.5 GB	-	-	-	-
Current	T2_DESY_MSS	179	329.3 GB	135	249.5 GB	-	-	-	-
Current	T2_Florida_Buffer	1132	1.9 TB	-	-	335	567.0 GB	-	-
Current	T2_Imperial_Buffer	316	501.1 GB	-	-	-	-	-	-
Current	T2_Legnaro_Buffer	548	945.9 GB	-	-	300	542.9 GB	-	-
Current	T2_NCU_Buffer	666	1.2 TB	160	295.2 GB	446	790.8 GB	-	-
Current	T2_Nebraska_Buffer	4900	9.0 TB	1441	2.7 TB	149	278.0 GB	-	-
Current	T2_Purdue_Buffer	1132	1.9 TB	252	418.9 GB	83	148.2 GB	-	-

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PhEDEx – monitoring Transfer state details



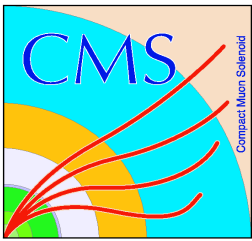
PhEDEx Dev Status
Transfer State Details
2006-04-04 11:24:14 GMT
Database: Production | SC3 | Dev | Testbed

Monitor Options

- [Component Status](#)
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- [Transfer Quality Plots](#)
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- [Daily Report](#)

Age	To		From		Files	
	Node	State	Node	State	N	Size
Current	T1_ASGC_MSS	0	T1_ASGC_Buffer	0	979	1.8 TB
Current	T1_CERN_Buffer	0	T2_Rio_Buffer	0	1	651.2 MB
Current	T1_CNAF_Buffer	90	T1_CERN_Buffer	90	978	1.8 TB
Current	T1_CNAF_Buffer	0	T1_FNAL_Buffer	0	193	326.6 GB
Current	T1_CNAF_MSS	0	T1_CNAF_Buffer	0	43	34.9 GB
Current	T1_FNAL_MSS	0	T1_FNAL_Buffer	0	43	34.9 GB
Current	T1_FZK_Buffer	0	T1_CERN_Buffer	1	199	356.8 GB
Current	T1_FZK_Buffer	0	T1_FNAL_Buffer	1	5	6.2 GB
Current	T1_FZK_MSS	0	T1_FZK_Buffer	0	3	3.1 GB
Current	T2_Caltech_Buffer	0	T1_FNAL_Buffer	1	10	13.1 GB
Current	T2_Estonia_Buffer	1	T1_CERN_Buffer	1	3	2.8 GB
Current	T2_Estonia_Buffer	170	T1_CERN_Buffer	1	1	566.6 MB
Current	T2_Estonia_Buffer	190	T1_CERN_Buffer	1	1	13.0 MB
Current	T2_Estonia_Buffer	220	T1_CERN_Buffer	1	1	1.9 GB
Current	T2_Estonia_Buffer	230	T1_CERN_Buffer	1	2	1.9 GB
Current	T2_Estonia_Buffer	320	T1_CERN_Buffer	1	1	1.7 GB
Current	T2_Estonia_Buffer	340	T1_CERN_Buffer	1	1	16.0 MB
Current	T2_Estonia_Buffer	350	T1_CERN_Buffer	1	1	19.0 MB
Current	T2_Estonia_Buffer	390	T1_CERN_Buffer	1	2	1.9 GB
Current	T2_Estonia_Buffer	410	T1_CERN_Buffer	1	1	1.7 GB
Current	T2_Estonia_Buffer	420	T1_CERN_Buffer	1	1	12.0 MB
Current	T2_Estonia_Buffer	200	T1_FNAL_Buffer	1	1	651.2 MB
Current	T2_GRIF_Buffer	0	T1_IN2P3_Buffer	1	9	12.7 GB
Current	T2_Legnano_Buffer	1	T1_CNAF_Buffer	0	22	15.2 GB

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PhEDEx – monitoring Subscriptions



[Datei](#) [Bearbeiten](#) [Ansicht](#) [Gehe](#) [Lesezeichen](#) [Extras](#) [Hilfe](#)

[http://cms-project-phedex.web.cern.ch/cms-project-phedex/cgi-bin/browser?page=subs&db=test&data](#)

[LEO English/Germa...](#) [Lexika](#)

PhEDEx Dev Status

Subscriptions

2006-04-04 11:26:27 GMT

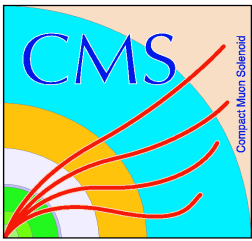
Database: [Production](#) | [SC3](#) | [Dev](#) | [Testbed](#)

Monitor Options

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- [Transfer Quality Plots](#)
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- [Daily Reports](#)
- [Daily Report](#)

Filter: Data Nodes [CERN](#) | [FNAL](#) | [Rio](#) [Update](#)

Owner	Dataset	Files T1_FNAL_MSS T2_Rio_Buffer			
		N	Size		
bt 2x1033PU761 TkMu 2 3 4 g133 CMS	bt03 gg bbh200 2taujmu	4	6.3 GB	1.00 / 1.00	0.25 / 0.10
bt DST8713 2x1033PU g133 CMS	bt03 gg bbh200 2taujmu	2	2.5 GB	1.00 / 1.00	0.00 / 0.00
bt Hit750 g133	bt03 gg bbh200 2taujmu	4	4.3 GB	1.00 / 1.00	0.00 / 0.00
_mtcc test01	express	7	92.0 MB	0.00 / 0.00	
_mtcc test02	express	15	21.8 GB	0.00 / 0.00	
mtcc test01	express	4	70.0 MB	0.00 / 0.00	
test01	express	3	40.0 MB	0.00 / 0.00	
_mtcc test01	normal	6	93.0 MB	0.00 / 0.00	
_mtcc test02	normal	9	12.8 GB	0.00 / 0.00	
mtcc test01	normal	8	110.0 MB	0.00 / 0.00	
test01	normal	2	30.0 MB	0.00 / 0.00	



PhEDEx - monitoring Replica state



SC3 Replica State: PhEDEx Status - Mozilla Firefox

http://cms-project-phedex.web.cern.ch/cms-project-phedex/cgi-bin/browser?page=replicas&

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PhEDEx SC3 Status
Replica State
2005-09-25 17:06:11 GMT

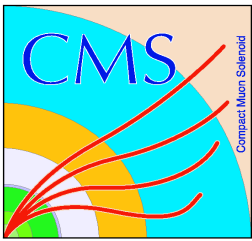
Database: Production | SC3 | Dev | Testbed

Monitor Options

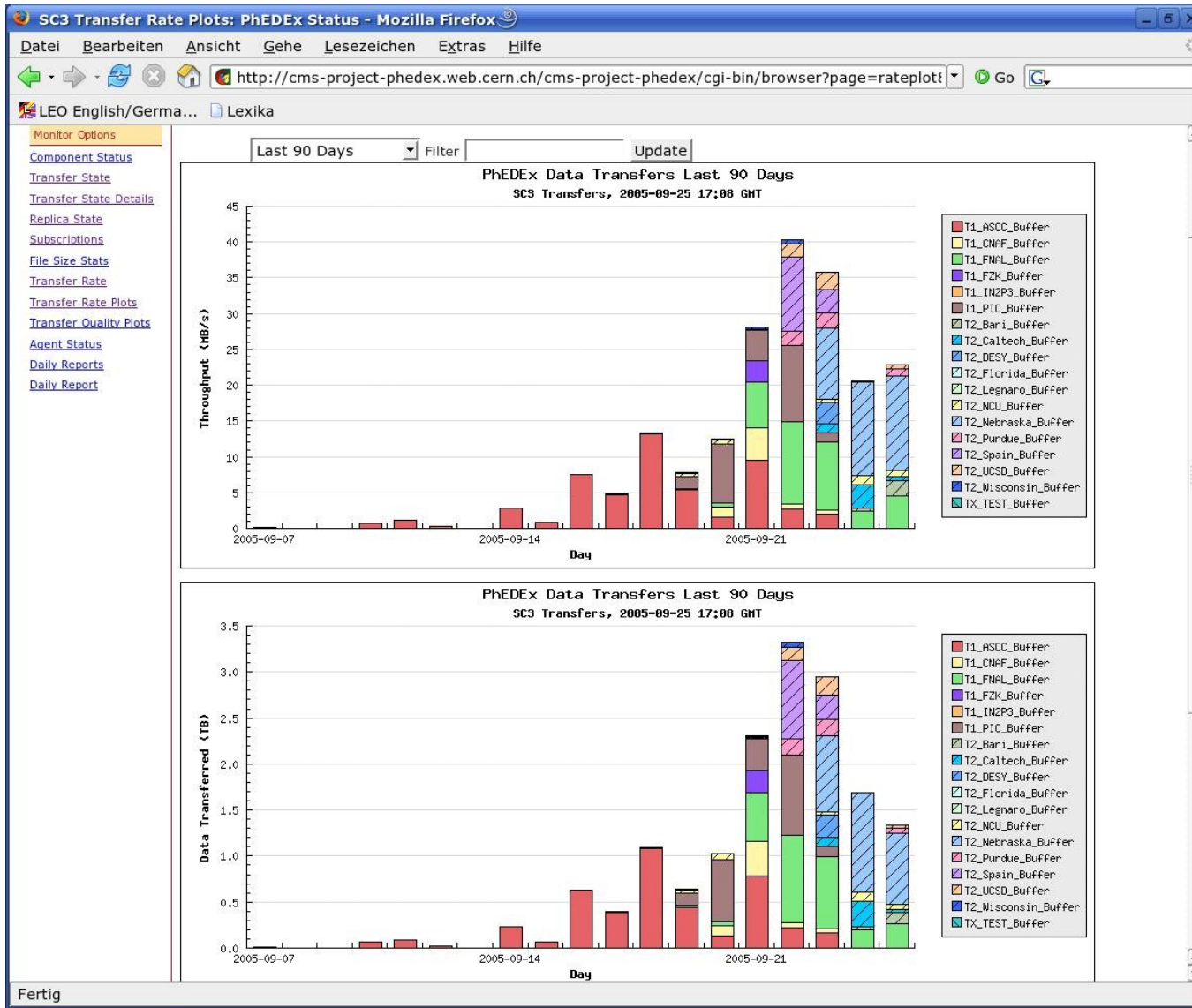
Filter: Data Nodes Update

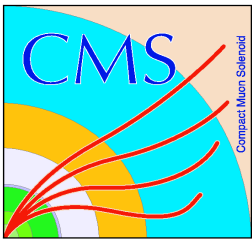
Owner	Dataset	Runs	Files T1_FNAL_Buffer T1_FNAL_MSS					
			N	Size	N	Size	N	Size
bt_2x1033PU761_TkMu_2_3_4_g133_CMS	bt03_gg_bbh200_2taujmu	4 4	6.3 GB	4	6.3 GB	4	6.3 GB	
bt_DST8713_2x1033PU_g133_CMS	bt03_gg_bbh200_2taujmu	2 2	2.5 GB	2	2.5 GB	2	2.5 GB	
bt_Hit750_g133	bt03_gg_bbh200_2taujmu	4 4	4.3 GB	2	2.1 GB	2	2.1 GB	
eg_2x1033PU761_TkMu_2_g133_OSC	eg03_jets_2g_pt50170	1508 1529	2.9 TB	842	1.6 TB	842	1.6 TB	
eg_DST8713_2x1033PU_g133_OSC	eg03_jets_2g_pt50170	607 623	1.2 TB	381	751.2 GB	381	751.2 GB	
eg_L25s8713_2x1033PU_g133_OSC	eg03_jets_2g_pt50170	83 83	163.2 GB	42	82.2 GB	42	82.2 GB	
hg_2x1033PU761_TkMu_2_g133_OSC	hg03_H2mu_ma125_tb30	5 5	9.0 GB	1	1.9 GB	1	1.9 GB	
hg_2x1033PU761_TkMu_2_g133_OSC	hg03_H2mu_ma130_tb30	5 5	9.4 GB	3	5.7 GB	3	5.7 GB	
hg_2x1033PU761_TkMu_2_g133_OSC	hg03_H2mu_ma135_tb30	5 5	9.2 GB	3	5.7 GB	3	5.7 GB	
hg_2x1033PU761_TkMu_2_g133_OSC	hg03_H2mu_ma150_tb15	4 4	6.0 GB	1	478.8 MB	1	478.8 MB	
hg_2x1033PU761_TkMu_2_g133_OSC	hg03_H2mu_ma150_tb40	4 4	5.7 GB	1	1.9 GB	1	1.9 GB	
hg_2x1033PU761_TkMu_2_g133_OSC	hg03_H2mu_ma150_tb50	4 4	6.2 GB	2	2.5 GB	2	2.5 GB	
hg_2x1033PU761_TkMu_2_g133_OSC	hg03_H2mu_ma200_tb15	4 4	6.2 GB	1	1.9 GB	1	1.9 GB	
hg_2x1033PU761_TkMu_2_g133_OSC	hg03_H2mu_ma200_tb40	4 4	6.2 GB	2	2.5 GB	2	2.5 GB	
hg_2x1033PU761_TkMu_2_g133_OSC	hg03_H2mu_ma300_tb15	4 4	6.2 GB	1	635.2 MB	1	635.2 MB	
hg_2x1033PU761_TkMu_2_g133_OSC	hg03_H2mu_ma300_tb30	4 4	6.2 GB	1	1.8 GB	1	1.8 GB	
hg_2x1033PU761_TkMu_2_g133_OSC	hg03_H2mu_ma300_tb40	4 4	6.2 GB	1	639.5 MB	1	639.5 MB	
hg_2x1033PU761_TkMu_2_g133_OSC	hg03_H2mu_ma300_tb50	4 4	6.0 GB	1	476.5 MB	1	476.5 MB	
hg_2x1033PU761_TkMu_2_g133_OSC	hg03_H2mu_ma400_tb15	4 4	6.0 GB	4	6.0 GB	4	6.0 GB	
hg_2x1033PU761_TkMu_2_g133_OSC	hg03_H2mu_ma400_tb30	4 4	6.0 GB	1	473.9 MB	1	473.9 MB	
hg_2x1033PU761_TkMu_2_g133_OSC	hg03_qq_qqh120_inv	4 4	6.0 GB	2	2.4 GB	2	2.4 GB	
hg_2x1033PU761_TkMu_2_g133_OSC	hg03_qq_qqh135_2taull	14 14	25.2 GB	9	16.6 GB	9	16.6 GB	
hg_2x1033PU761_TkMu_2_g133_OSC	hg03_qq_qqh200_inv	4 4	6.0 GB	4	6.0 GB	4	6.0 GB	
hg_2x1033PU761_TkMu_g133_CMS	hg03_gg_ch_170_tb20	3 3	2.9 GB	3	2.9 GB	3	2.9 GB	
hg_2x1033PU761_TkMu_g133_CMS	hg03_hzz_2e2mu_130a	4 4	6.3 GB	2	3.8 GB	2	3.8 GB	
hg_2x1033PU761_TkMu_g133_CMS	hg03_hzz_4e_150	4 4	5.8 GB	1	1.9 GB	1	1.9 GB	

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PhEDEx - monitoring Transfer rate





PhEDEx - monitoring

Agent status



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File Bearbeiten Ansicht Gehe Lesezeichen Extras Hilfe

http://cms-project-phedex.web.cern.ch/cms-project-phedex/cgi-bin/browser?page=agents;db=test

LEO English/Germa... Lexika

 **PhEDEx Dev Status**
Agent Status
2006-04-04 11:28:57 GMT

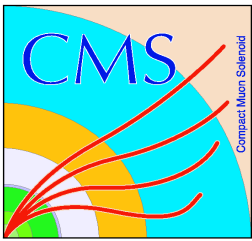
Database: Production | SC3 | **Dev** | Testbed

Monitor Options

- [Component Status](#)
- [Transfer State](#)
- [Transfer State Details](#)
- [Replica State](#)
- [Subscriptions](#)
- [File Size Stats](#)
- [Transfer Rate](#)
- [Transfer Rate Plots](#)
- [Transfer Queue Plots](#)
- [Transfer Quality Plots](#)
- [Agent Status](#)
- [Daily Reports](#)
- [Daily Report](#)

Age	Site	Agent	Process	Host	Worker	pending	received	work	completed	bad	outgoing	Path
21h12	Estonia	download	3068	jupiter.hep.kbfi.ee	M	0	0	0	0	0	0	/jupiter/PhEDEx/PHEDEX/Estonia/Dev/incoming
21h12	Estonia	info-ds	3083	jupiter.hep.kbfi.ee	M	0	0	0	0	0	0	/jupiter/PhEDEx/PHEDEX/Estonia/Dev/incoming
21h12	Estonia	mgmt-router	3078	jupiter.hep.kbfi.ee	M	0	0	0	0	0	0	/jupiter/PhEDEx/PHEDEX/Estonia/Dev/incoming
21h12	Estonia	mgmt-rtab	3073	jupiter.hep.kbfi.ee	M	0	0	0	0	0	0	/jupiter/PhEDEx/PHEDEX/Estonia/Dev/incoming
0h00	T1_CERN	download-migrate	1140	lxgate10.cern.ch	M	0	0	0	0	0	0	/data/DevNodes/CERN/incoming
0h00	T1_CERN	entry	1113	lxgate10.cern.ch	M	0	0	0	0	0	0	/data/DevNodes/CERN/incoming
0h00	T1_CERN	exp-checksum	1135	lxgate10.cern.ch	M	0	0	0	0	0	0	/data/DevNodes/CERN/incoming
0h00	T1_CERN	exp-clean	1130	lxgate10.cern.ch	M	0	0	0	0	0	0	/data/DevNodes/CERN/incoming
0h00	T1_CERN	exp-master	1477	lxgate10.cern.ch	M	0	0	0	0	0	0	/data/DevNodes/CERN/incoming
0h00	T1_CERN	exp-pfn	1124	lxgate10.cern.ch	M	0	0	0	0	0	0	/data/DevNodes/CERN/incoming
0h00	T1_CERN	exp-stager	1482	lxgate10.cern.ch	M	0	0	0	0	0	0	/data/DevNodes/CERN/incoming
0h00	T1_CERN	exp-upload	1117	lxgate10.cern.ch	M	0	0	0	0	0	0	/data/DevNodes/CERN/incoming
0h00	T1_CERN	info-ar	1452	lxgate10.cern.ch	M	0	0	0	0	0	0	/data/DevNodes/CERN/incoming
0h00	T1_CERN	info-ds	1399	lxgate10.cern.ch	M	0	0	0	0	0	0	/data/DevNodes/CERN/incoming
0h00	T1_CERN	info-fs	1386	lxgate10.cern.ch	M	0	0	0	0	0	0	/data/DevNodes/CERN/incoming
0h00	T1_CERN	info-pm	1237	lxgate10.cern.ch	M	0	0	0	0	0	0	/data/DevNodes/CERN/incoming
0h00	T1_CERN	info-rs	1447	lxgate10.cern.ch	M	0	0	0	0	0	0	/data/DevNodes/CERN/incoming
0h00	T1_CERN	info-rt	1306	lxgate10.cern.ch	M	0	0	0	0	0	0	/data/DevNodes/CERN/incoming
0h00	T1_CERN	info-sub	1420	lxgate10.cern.ch	M	0	0	0	0	0	0	/data/DevNodes/CERN/incoming
0h00	T1_CERN	info-tc	1268	lxgate10.cern.ch	M	0	0	0	0	0	0	/data/DevNodes/CERN/incoming
0h00	T1_CERN	info-tr	1381	lxgate10.cern.ch	M	0	0	0	0	0	0	/data/DevNodes/CERN/incoming
0h00	T1_CERN	info-ts	1276	lxgate10.cern.ch	M	0	0	0	0	0	0	/data/DevNodes/CERN/incoming
0h00	T1_CERN	info-tt	1337	lxgate10.cern.ch	M	0	0	0	0	0	0	/data/DevNodes/CERN/incoming
0h00	T1_CERN	inject-tmdb	1113	lxgate10.cern.ch	M	0	0	0	0	0	0	/data/DevNodes/CERN/incoming
0h00	T1_CERN	mgmt-blockactiv	1166	lxgate10.cern.ch	M	0	0	0	0	0	0	/data/DevNodes/CERN/incoming
0h00	T1_CERN	mgmt-blockalloc	1157	lxgate10.cern.ch	M	0	0	0	0	0	0	/data/DevNodes/CERN/incoming

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PhEDEx – subscription

Create request



Production Create Request: PhEDEx Transfer Request - Mozilla Firefox

http://cms-project-phedex.web.cern.ch/cms-project-phedex/cgi-bin/requests?db=prod;page

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PhEDEx Transfer Request

Production Create Request
2005-09-25 17:14:26 GMT

Database: **Production** | SC3 | Dev | Testbed

[Request Options](#)
[Request Status](#)
[Request Data](#)
[Create Request](#)

Create a new request

Request name: 2005-09-25-PURPOSE-CREATOR

Requestor: _____

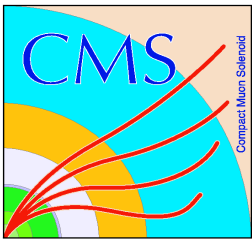
e-mail: _____

Owner/datasets (glob patterns): _____

Destinations:

<input type="checkbox"/> T1_ASCC_MSS	<input type="checkbox"/> T2_Bari_Buffer	<input type="checkbox"/> T3_Karlsruhe_Buffer
<input type="checkbox"/> T1_CERN_MSS	<input type="checkbox"/> T2_CIEMAT_Buffer	<input type="checkbox"/> TV_LCG_Production
<input type="checkbox"/> T1_CNAF_MSS	<input type="checkbox"/> T2_CSCS_Buffer	<input type="checkbox"/> TX_LCGBO_Buffer
<input type="checkbox"/> T1_FNAL_MSS	<input type="checkbox"/> T2_Caltech_Buffer	
<input type="checkbox"/> T1_FZK_MSS	<input type="checkbox"/> T2_DESY_MSS	
<input type="checkbox"/> T1_IN2P3_MSS	<input type="checkbox"/> T2_Demokritos_Buffer	
<input type="checkbox"/> T1_PIC_MSS	<input type="checkbox"/> T2_Estonia_Buffer	
<input type="checkbox"/> T1_RAL_MSS	<input type="checkbox"/> T2_Florida_Buffer	
	<input type="checkbox"/> T2_Imperial_Buffer	
	<input type="checkbox"/> T2_Legnaro_Buffer	
	<input type="checkbox"/> T2_NCU_Buffer	
	<input type="checkbox"/> T2_Nebraska_Buffer	
	<input type="checkbox"/> T2_Pisa_Buffer	
	<input type="checkbox"/> T2_Purdue_Buffer	
	<input type="checkbox"/> T2_Rome_Buffer	
	<input type="checkbox"/> T2_SINP_MSS	
	<input type="checkbox"/> T2_UCSD_Buffer	
	<input type="checkbox"/> T2_Wisconsin_Buffer	

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PhEDEx – subscription Monitor request



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PhEDEx Transfer Request
Production Request Status
2006-03-20 18:30:55 GMT
Database: **Production** | SC3 | Dev | Testbed

Request Options
[Request Status](#)
[Request Data](#)
[Create Request](#)

Request	Destination	Known Files		Destination	
		Files	Size	Files	Size
2006-03-17-PTDRPerugia1-DBonac	T1_CNAF_MSS	-	-	-	-
2006-03-17-Hosting-SureshSingh	T1_FNAL_MSS	407	621.2 GB	407	621.2 GB
	T2_Caltech_Buffer	407	621.2 GB	76	139.0 GB
2006-03-10-Hosting-SureshSingh	T1_FNAL_MSS	148	257.9 GB	148	257.9 GB
	T2_Caltech_Buffer	148	257.9 GB	145	252.8 GB
2006-03-03-vertex-bbockelm	T1_FNAL_MSS	1208	1.3 TB	799	674.1 GB
	T2_Nebraska_Buffer	1208	1.3 TB	-	-
2006-03-03-gennai	T1_CNAF_MSS	-	-	-	-
2006-03-03-fill-bbockelm	T1_FNAL_MSS	6204	5.9 TB	6070	5.7 TB
	T2_Nebraska_Buffer	6204	5.9 TB	2278	3.5 TB
2006-03-02-datatransfer-gennai	T1_CNAF_MSS	-	-	-	-
2006-02-28-test3-stdweird	T2_Belgium_Buffer	864	174.5 GB	-	-
2006-02-27-su05-flippidis	T2_Demokritos_Buffer	65	119.7 GB	-	-
2006-02-19-TransferHighLumiSingleMuonsToCERN-Kodolova	T1_CERN_MSS	379	530.2 GB	-	-
2006-02-18-Hosting-SureshSingh	T1_FNAL_MSS	51	92.0 GB	51	92.0 GB
	T2_Caltech_Buffer	51	92.0 GB	51	92.0 GB
2006-02-15-stdweird-test2	T2_Belgium_Buffer	68	127.7 GB	68	127.7 GB
2006-02-13-hit-gennai	T1_CNAF_MSS	-	-	-	-
2006-02-13-dst-gennai	T1_CNAF_MSS	-	-	-	-
2006-02-13-digi-gennai	T1_CNAF_MSS	-	-	-	-
2006-02-09-SUSYBSM-Charlot	T1_IN2P3_MSS	1200	58.5 GB	1200	58.5 GB
2006-02-09-EGAMMA-Charlot	T1_IN2P3_MSS	1002	102.7 GB	1002	102.7 GB
2006-02-08-LCGharvesting-JoseHernandez	T2_Spain_Buffer	30	21.8 GB	30	21.8 GB
2006-02-08-Enrill-langeegger-dfaich	T2_CSCS_Buffer	44	83.3 GB	44	83.3 GB

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