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**The Tier-3 GRID site at the UOI HEP Laboratory:
a platform for CMS data analysis and trigger data monitoring**



GR-07-UOI-HEPLAB history (1/2)

- ✘ end of 2006:
 - + started as a HEP Laboratory cluster of 5 dual core PCs
 - + installation of the CMSSW software packages
 - + system testing (with SLC3 / SLC4 and gLite 3.0)
- ✘ 2007:
 - + registration as a grid site under certification with the name **GR-07-UOI-HEPLAB**
 - + HEPLAB becomes the *HellasGrid CA Registration Authority* for the University of Ioannina
 - + installation / testing of the GRID middleware (gLite 3.1 / SLC 4)
 - + 9 more dual-core PCs added to the cluster
 - + installation of the system on a mechanical structure
- ✘ **January 2008:**
 - + conclusion of the site certification
 - + **GR-07-UOI-HEPLAB in production status**
 - + support for the CMS VO
- ✘ June 2008:
 - + installation of two air-condition units for the cooling of the system
- ✘ **October 2008:**
 - + the site joins the **Tier-3 CMS** GRID sites under the name **T3_GR_Ioannina**



GR-07-UOI-HEPLAB history (2/2)

- ✘ December 2009
 - + received 2 quad-core PCs
 - ✘ installation/configuration/testing of SLC5 / gLite 3.2
 - ✘ joined the existing Storage Element (34 Tbyte → 40 TByte)
 - ✘ installation of SLC4 CMSSW versions (running in compatibility mode)

- ✘ March – April 2010
 - + received 20 high performance quad-core PCs with 8 TByte disk space each
 - ✘ PCs mounted on a mechanical structure
 - ✘ performed hardware tests
 - ✘ installation/configuration of SLC5 / gLite 3.2
 - ✘ installation/configuration/testing of SLC5 CMSSW (32- and 64-bit)
 - ✘ all new PCs in production

- ✘ May 2010
 - + Upgrade of 10 older PCs (out of 14) to SLC5 / gLite 3.2 / SLC5 CMSSW

- ✘ T3_GR_Ioannina now provides
 - + **116 CPUs**
 - + **~200 TByte** of storage space



GR-07-UOI-HEPLAB current status

- ✗ Site nodes :

1	CE + WN	gLite 3.1 / SLC4
1	SE + WN	gLite 3.1 / SLC4
2	WNs	gLite 3.1 / SLC4
34	WNs	gLite 3.2 / SLC5
1	UI + MON	gLite 3.1 / SLC4

 - + All WNs connect to a gigabit LAN
 - + CE, SE and UI/MON connect to the Internet through the UOI 100Mbps network infrastructure
- ✗ Middleware support :

Installation/configuration of gLite updates as soon as they become available
- ✗ **Computing power: 116 CPUs**
- ✗ Storage Element → DPM mysql
DPM Pool: 123 NFS mounted disks/partitions
Total storage space: ~200 TB
- ✗ Temperature control: 2 air-condition units
- ✗ Middleware :
- ✗ Manpower :

The system was designed, installed, configured and is being maintained by Dr Ioannis Papadopoulos with the support of one technician
- ✗ Supported VOs :

cms, ops, dteam, ops.vo.egee-see.org
- ✗ Site monitoring :

development of custom made software that allows continuous monitoring of the site and provides automatic notifications
- ✗ Site status is continuously published on the web
<https://alpha.physics.uoi.gr/twiki/bin/view/HEPLAB/T3GrIoannina>
<http://cern.ch/pyannis/GRID-stuff.php>
- ✗ EGEE links about GR-07-UOI-HEPLAB :
<https://goc.gridops.org/site/list?id=407>
<http://gstat.gridops.org/gstat/GR-07-UOI-HEPLAB>



CMS VO specific services

- ✘ CMS GRID site classification: **Tier-3**
 - + GR-07-UOI-HEPLAB is referenced by CMS as T3_GR Ioannina
 - + the site operates and is treated as a Tier-2 site
 - + it is officially a Tier-3 site mainly due to the network link limitations (100Mbps)

- ✘ CMS FroNTier / Squid (conditions DB access)
 - + installed and commissioned in October 2008

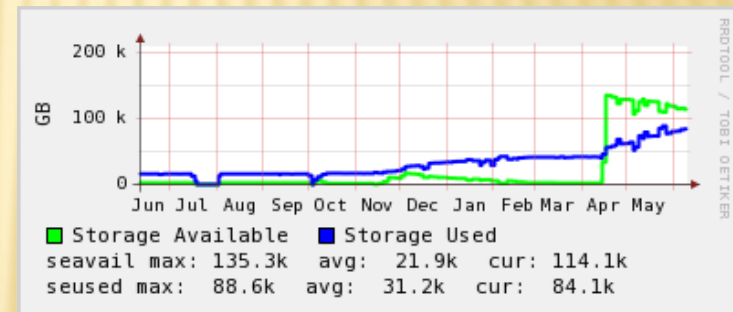
- ✘ PhEDEx – CMS Data Transfers
 - + installed and commissioned in November 2008

- ✘ CMSSW versions installed :
 - <https://alpha.physics.uoi.gr/twiki/bin/view/HEPLAB/T3GrIoannina>
 - + all production versions are installed as soon as they become available



CMS data on T3_GR_Ioannina

- ✘ Storage Element size : ~200 TB
- ✘ Data transferred using the **PhEDEx** system, installed on the Storage Element
 - + transfer rate reached 12 Mbyte/s
 - + rate is limited by the UOI intranet (100Mbps link)
 - + software development for the transfer monitoring and data recovery
- ✘ Datasets hosted: <https://cmsweb.cern.ch/phedex/prod/Data::Subscriptions?node=761>
 - + QCD Monte Carlo samples
 - ✘ serves the QCD group of CMS
 - ✘ Studies of the ratio of 3 jets / 2 jets
 - ✘ MC generator comparison / evaluation
 - * PYTHIA
 - * MadGraph
 - * HERWIG
 - * ALPGEN
 - + Photon+Jets Monte Carlo samples
 - ✘ serves the e- γ /ECAL group of CMS
 - + LHC startup data
 - ✘ RAW data
 - * Global Calorimeter Trigger (GCT) efficiency studies to provide a good-runs list
 - ✘ Reconstructed data
 - * Studies of the ratio of 3 jets / 2 jets



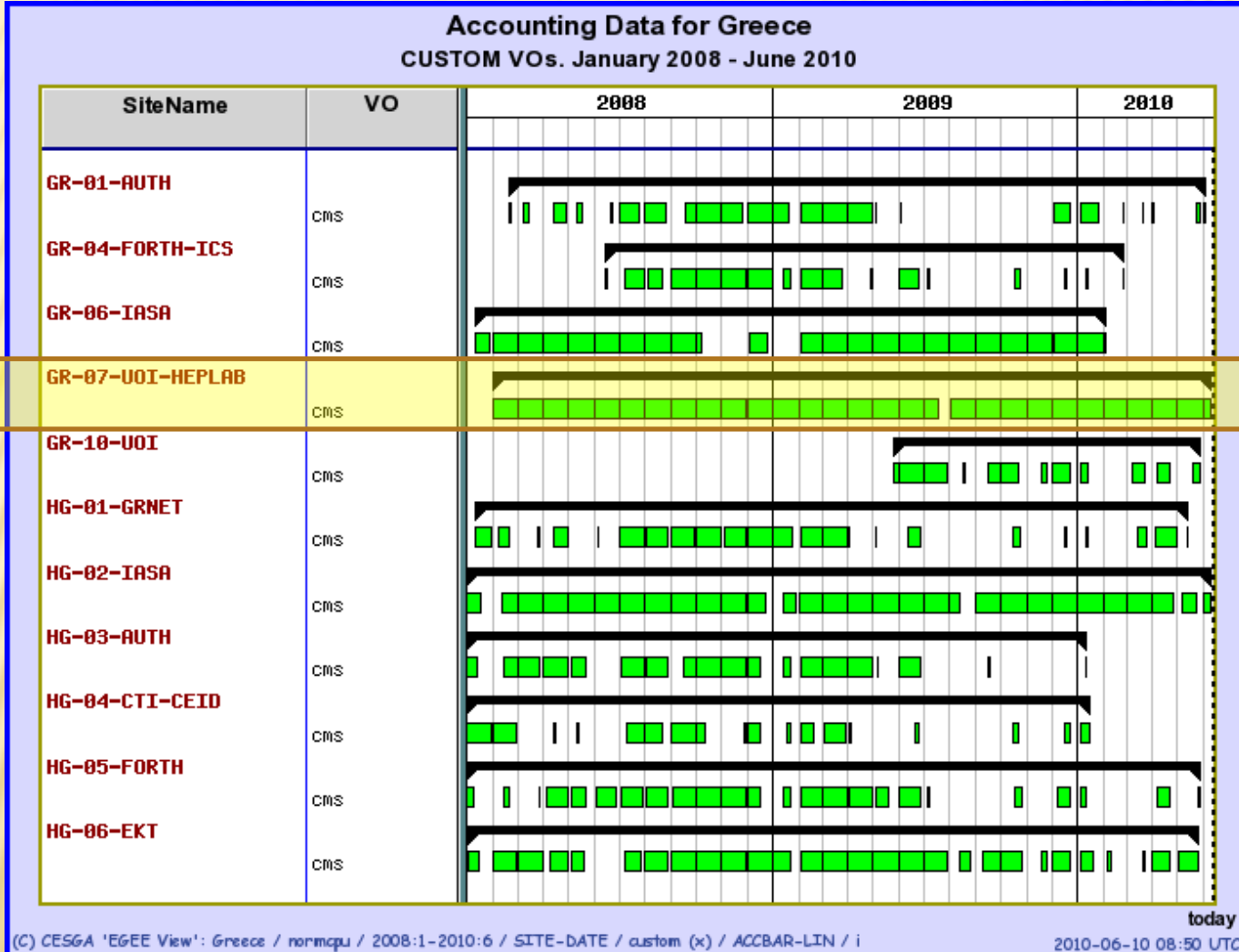


CMS data on T3_GR_Ioannina

Data Item	CMS group	Generator	files	size (GB)
SAM datasets	FacOps	PYTHIA	44	34
QCD DiJet Summer08_IDEAL_V9_v1/GEN-SIM-RECO	qcd	PYTHIA	456	484
QCD DiJet Summer09-MC_31X_V3_7TeV-v1/GEN-SIM-RECO	qcd	PYTHIA	1423	2483
QCD DiJet Summer09-MC_31X_V9_7TeV-v1/GEN-SIM-RECO	qcd	PYTHIA	1640	2359
QCD DiJet Summer09-MC_31X_V3-v1/GEN-SIM-RECO	qcd	PYTHIA	2852	2655
ZmumuJet Winter09_IDEAL_V11_FastSim_v1/GEN-SIM-DIGI-RECO		PYTHIA	163	217
QCD DiJet Summer09-DESIGN_3X_V8A_900GeV-v1/GEN-SIM-RECO	qcd	PYTHIA	1082	1095
QCD DiJet Summer09-DESIGN_3X_V8A_2360GeV-v1/GEN-SIM-RECO	qcd	PYTHIA	1044	1369
MinBias Summer09-STARTUP3X_*GeV-v1/GEN-SIM-RECO		PYTHIA	1186	2161
QCD DiJet Spring10-START3X_V26_S09-v1/GEN-SIM-RECO	qcd	PYTHIA	1609	2770
PhotonJet Spring10-START3X_V26_S09-v1/GEN-SIM-RECO	e-gamma_ecal	PYTHIA	241	479
QCD Fall08_IDEAL_V9_v1/GEN-SIM-RECO	qcd	MADGRAPH	3172	6693
QCD Spring10-START3X_V26_S09-v1/GEN-SIM-RECO	qcd	MADGRAPH	6209	12140
PhotonJets Spring10-START3X_V26_S09-v1/GEN-SIM-RECO	e-gamma_ecal	MADGRAPH	939	2009
MinBias Summer09-MC_31X_V3_7TeV-v1/GEN-SIM-RECO		HERWIG	116	218
QCD Summer09-MC_31X_V3_7TeV-v1/GEN-SIM-RECO	qcd	HERWIG	2413	3344
QCD Spring10-START3X_V26_S09-v1/GEN-SIM-RECO	qcd	HERWIG	2463	3830
QCDnJets Spring10-START3X_V26_S09-v1/GEN-SIM-RECO	qcd	ALPGEN	646	1448
GammanJets Spring10-START3X_V26_S09-v1/GEN-SIM-RECO	e-gamma_ecal	ALPGEN	3301	4188
MinimumBias Beam Commissioning 2009 (reconstructed data)		real data	2970	8750
MinimumBias Beam Commissioning 2009 (RAW data)		real data	608	1879



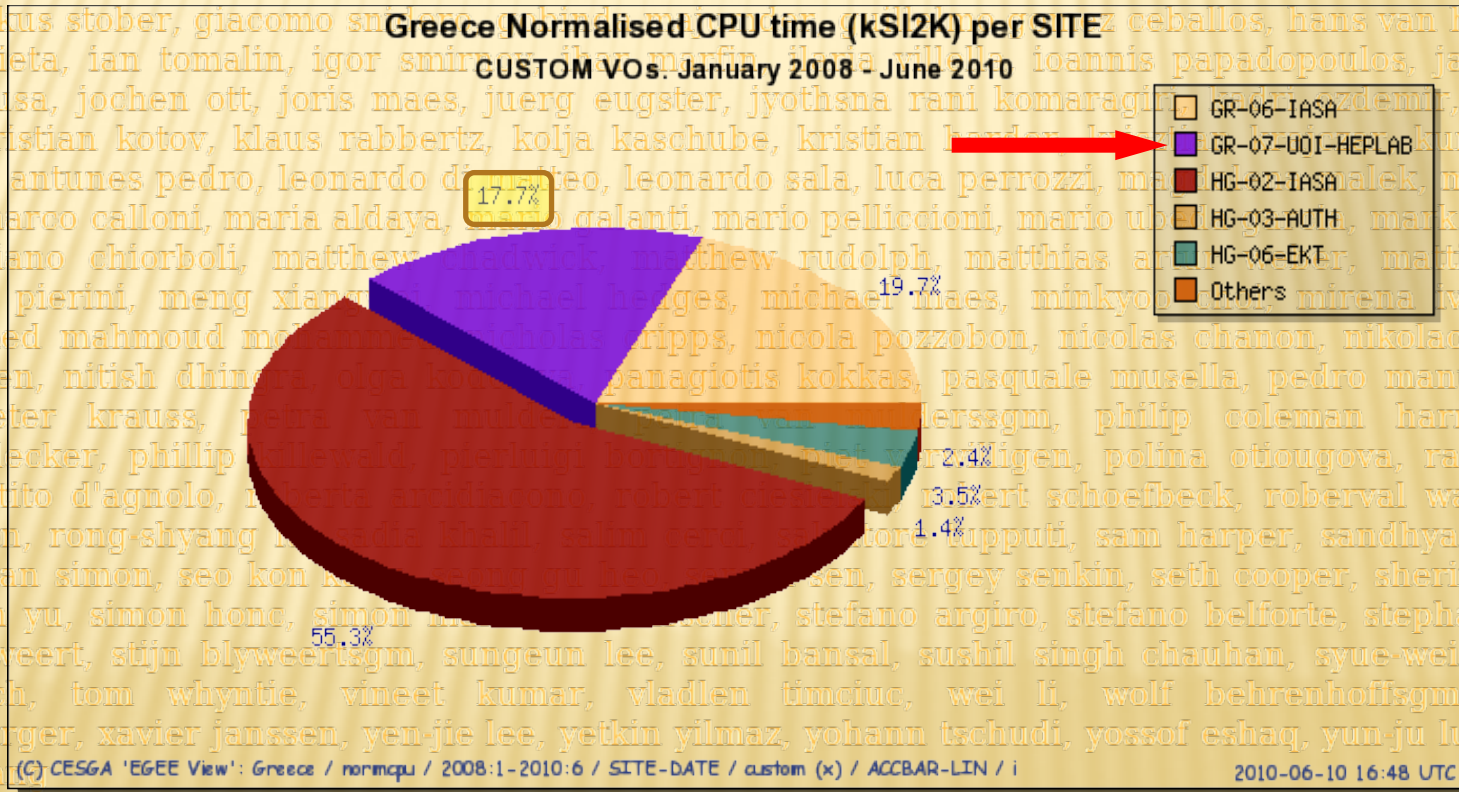
GR-07-UOI-HEPLAB statistics (CMS VO)





GR-07-UOI-HEPLAB statistics (CMS VO)

161 CMS members have used or still using the GR-07-UOI-HEPLAB GRID site since February 2008



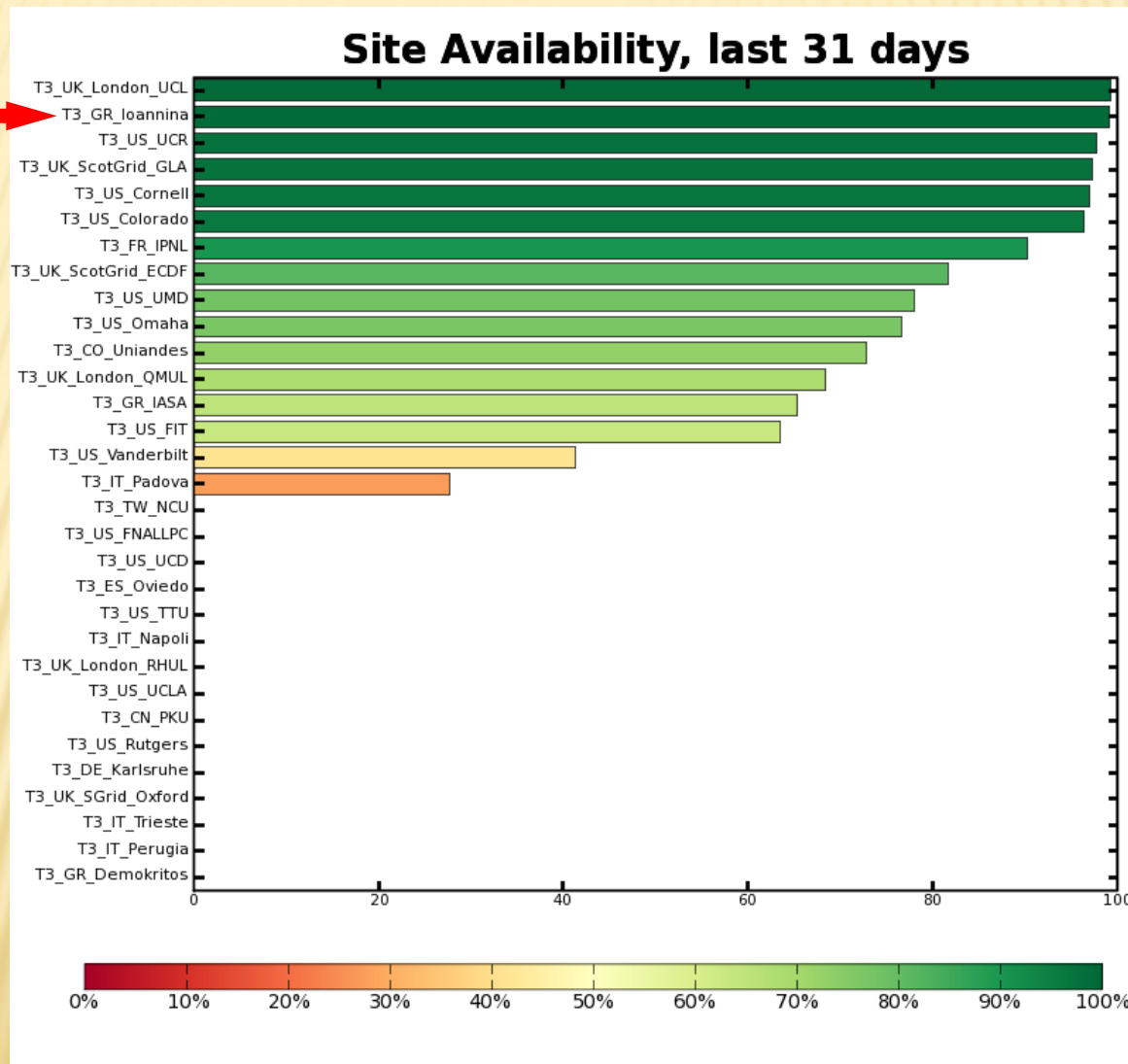


Tier-3 CMS GRID sites status

Sitename	Service Type	Service Name	mc	sft-job	swinst	squid	frontier	basic	analysis	prod	lcg-cp	get-pfn-from-tfc	user
T3_CO_Uniandes	CE	kuragua.uniandes.edu.co	ok	ok	warn	ok	note	ok	note	ok			
	SRMv2	moboro.uniandes.edu.co									ok	ok	ok
T3_FR_IPNL	CE	lyogrid02.in2p3.fr	ok	ok	note	ok	ok	ok	ok	ok			
	SRMv2	lyogrid06.in2p3.fr									ok	ok	ok
T3_GR_IASA	CE	ce01.marie.hellasgrid.gr	ok	ok	warn	ok	warn	ok	warn	ok			
		ce02.marie.hellasgrid.gr	ok	error	note	ok	ok	ok	error	error			
T3_GR_Ioannina	CE	pc139.physics.uoi.gr	ok	ok	ok	ok	ok	ok	ok	ok			
	SRMv2	pc138.physics.uoi.gr									ok	ok	ok
T3_IT_Napoli	CE	cmsce01.na.infn.it	error	ok	warn	error	note	error	note	ok			
T3_IT_Perugia	CE	gridce.pg.infn.it	error	ok	warn	ok	note	ok	note	ok			
	SRMv2	gridse3.pg.infn.it									ok	ok	ok
T3_IT_Trieste	CE	grid001.ts.infn.it	ok	ok	ok	ok	ok	ok	ok	ok			
T3_UK_London_QMUL	CE	ce02.esc.qmul.ac.uk	ok	ok	note	ok	ok	ok	ok	warn			
		ce03.esc.qmul.ac.uk	ok	ok	note	ok	ok	ok	ok	warn			
	SRMv2	se03.esc.qmul.ac.uk									ok	ok	ok
T3_UK_London_RHUL	CE	ce2.ppgrid1.rhul.ac.uk	ok	error	error	error	error	error	error	error			
	SRMv2	se2.ppgrid1.rhul.ac.uk									ok	ok	ok
T3_US_Colorado	CE	heposg01.colorado.edu	ok	ok	ok	ok	ok	ok	ok	ok			
	SRMv2	hepose01.colorado.edu									ok	ok	ok
T3_US_TTU	CE	antaeus.hpcc.ttu.edu	ok	ok	error	ok	ok	ok	ok	ok			
	SRMv2	sigmorgh.hpcc.ttu.edu									warn	error	error
T3_US_UCR	CE	top.ucr.edu	ok	ok	ok	ok	ok	ok	ok	ok			
	SRMv2	charm.ucr.edu									ok	ok	ok
T3_US_UMD	CE	hepcms-0.umd.edu	ok	ok	ok	ok	ok	ok	ok	ok			
	SRMv2	hepcms-0.umd.edu									ok	ok	ok
T3_US_Vanderbilt	CE	vampire.accre.vanderbilt.edu	ok	ok	ok	ok	ok	ok	ok	ok			
	SRMv2	se1.accre.vanderbilt.edu									ok	ok	ok



Tier-3 CMS GRID sites availability





CMS GRID sites availability (all Tiers)

Site Availability, last 31 days

