



LCG-ASGC Management Meeting

12 Oct. 2009



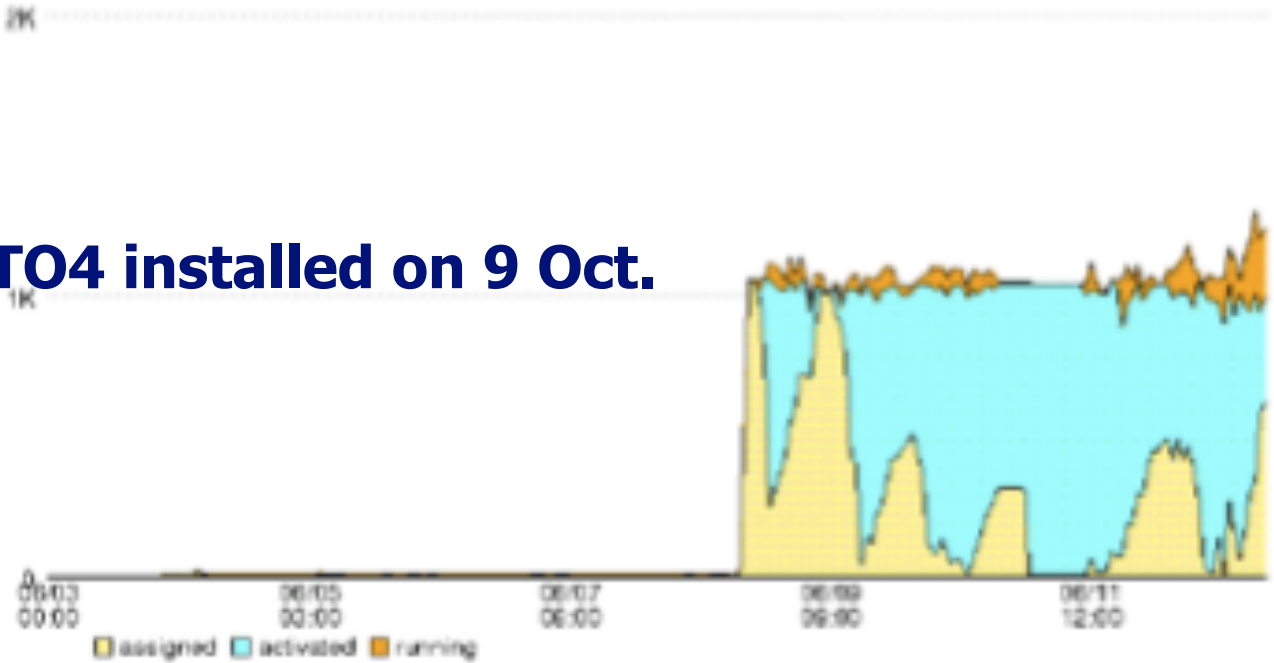
After STEP09

- Issues found at STEP09 Improved
 - Insufficient Tape Drives
 - Job Efficiency
 - Tier1/Tier2 low transmission
 - Prestaging and Reprocessing
- Re-Testing afterwards
- Resources
- Communication and Collaboration
- What's missing still



Issues observed in STEP09

- Limited tape drives
 - 2 LTO3 + 5 LTO4
 - **Action: 18 new LTO4 installed on 9 Oct.**



- Low job efficiency
 - Both for production and analysis jobs
 - conflict with CMS activity
 - Defect in scheduling policy
 - Infrastructure connectivity
 - **Action: Scheduling policy updated and verified (July)**
 - **Action: split T1 and T2 (end of Sept)**



Issues observed in STEP (II)

- Low T2/T1 transfer performance
 - Root cause clarified: old DPM release deployed
 - Revalidated after upgrade from 1.6.11 to 1.7.2 (end of Sept)
- Prestaging and reprocessing
 - Scalable Prestage Pools reorganized and verified (early Sep.)
 - 28TB space by 3 disk servers (2 more backup DS could be online anytime)
 - Will revalidate the processing after 18 LTO4 drives deployed
 - More tape servers added into tape pool



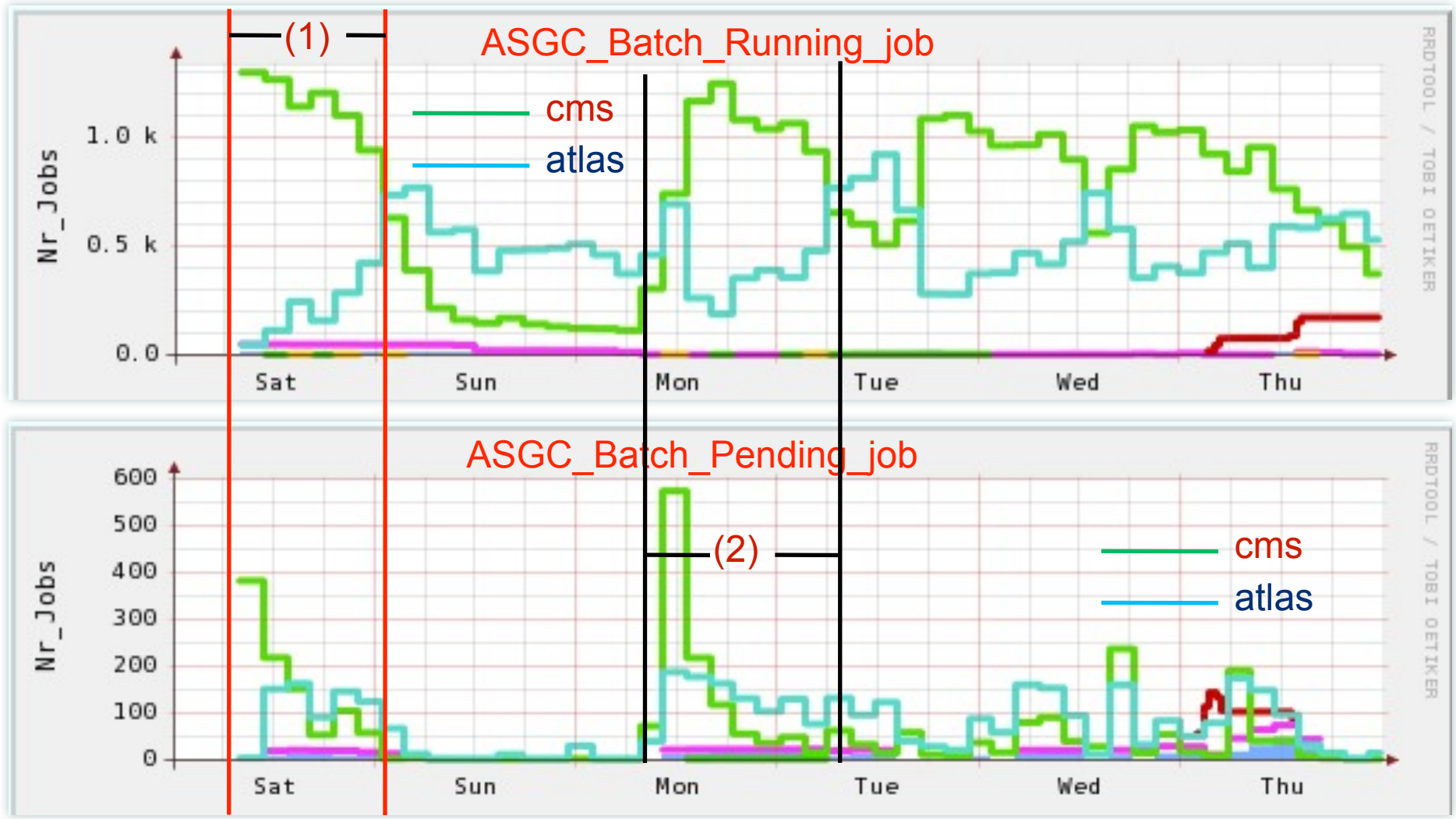
CMS Re-Test at ASGC

- **STEP09: in June**
 - Pre-staging: 73MB/s required, ~160MB/s achieved
 - DDT tests:
 - Inbound from T0: ~300MB/s
 - Inbound from T1s: ~250MB/s
 - Outbound to T1s: ~120MB/s
 - Outbound to regional T2: ~80MB/s
 - **Fairshare:** CMS got 200-250 jobs slots at the beginning due to fairshare problems, up to ~1k job slots at the final 2 days
 - **Cpu efficiency:** not very high, details at next slides
- **Revalidation test:** starting from July 22, and last ~ 1 week
 - Fairshare between ATLAS and CMS worked fine , this was later reported to WLCG
 - **No input** for cpu efficiency
- **Pre-retest:** starting from Oct 3
 - Fairshare: next slide
 - Cpu efficiency: next slides



Fairshare between ATLAS and CMS

Oct 3 – Oct 9: CMS running backfill & reprocessing jobs, ATLAS running mc production

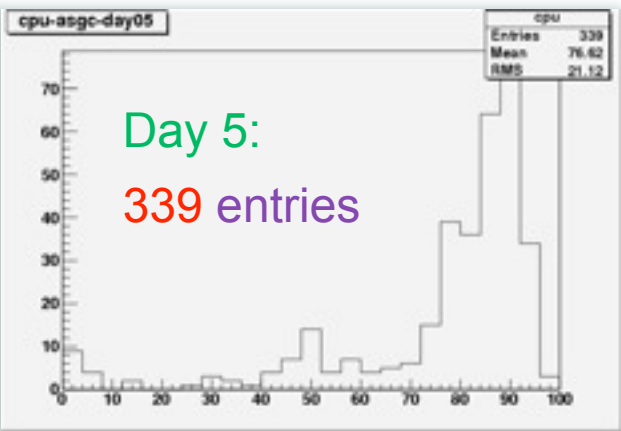
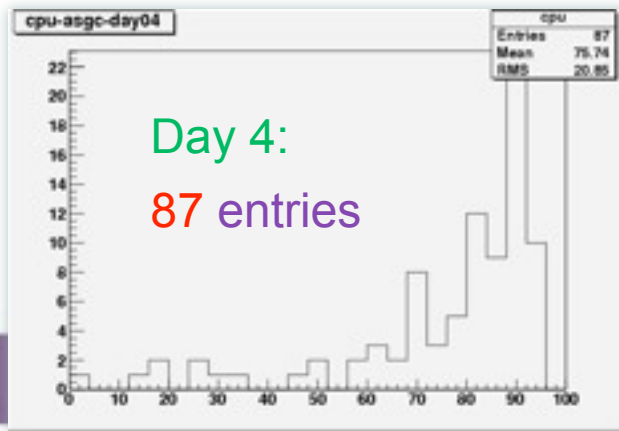
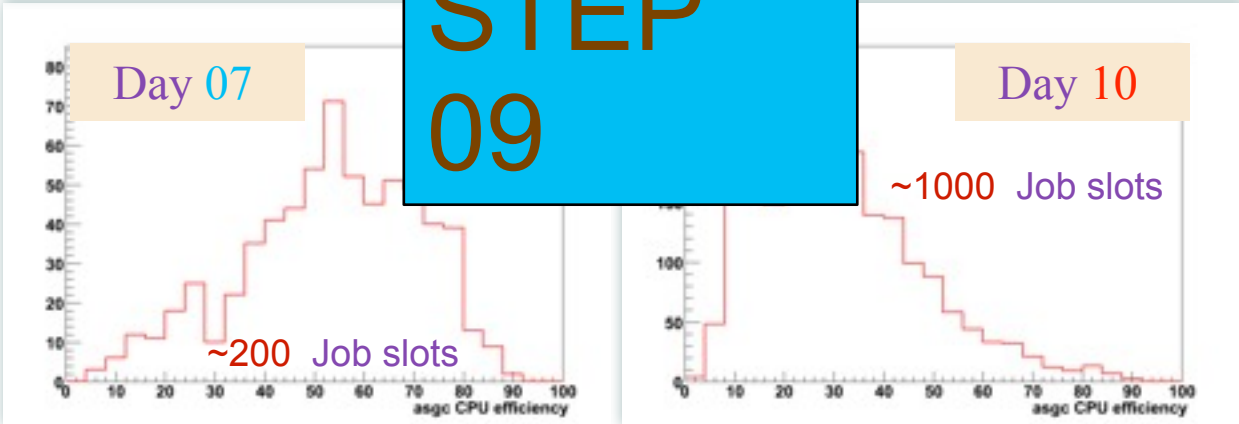
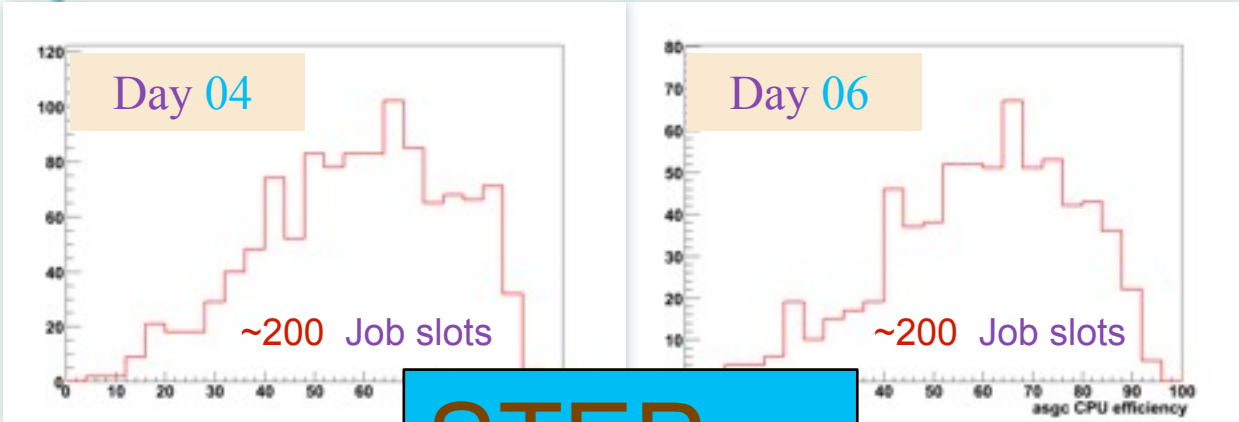


The fairshare is on a 7 days weighted average at ASGC batch system

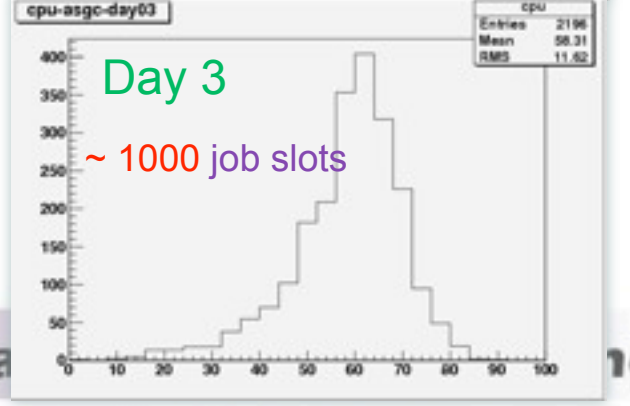
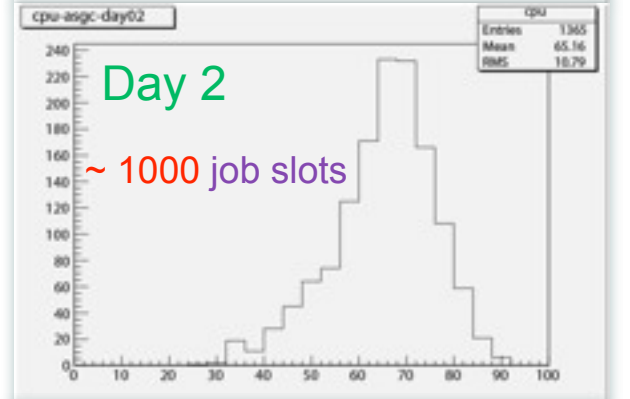
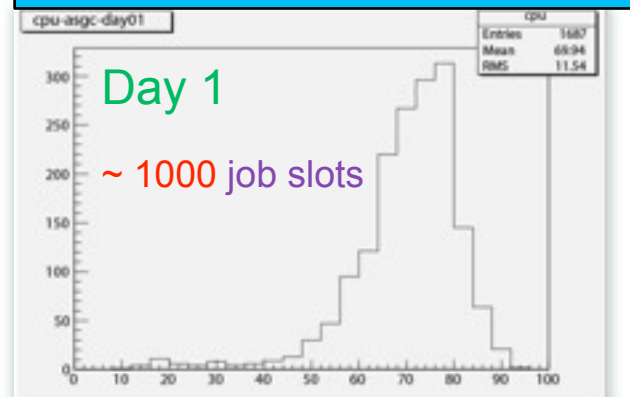


CPU Efficiency

**STEP
09**



Pre-retest (Oct 3 - 11)





Atlas DDM Throughput Test in Oct.

Activity Summary ('2009-10-05 10:00 to '2009-10-08 09:10')

Click on the cloud name to view list of sites

Cloud	Transfers			Registrations		Errors			Services
	Efficiency	Throughput	Successes	Datasets	Files	Transfer	Registration	Services	Grid
ASGC	95%	187 MB/s	82145	11074	55887	4154	0	0	
BNL	88%	260 MB/s	262749	26191	189361	36350	0	0	
CERN	54%	4 MB/s	24944	106	24942	21275	0	0	
CNAF	59%	132 MB/s	47932	9390	33062	33987	0	0	
FZK	98%	215 MB/s	136316	15562	104492	2926	0	0	
LYON	69%	165 MB/s	160751	17413	123635	72273	0	0	
NDGF	95%	87 MB/s	32239	9785	24921	1716	0	0	
PIC	100%	72 MB/s	27498	8602	19465	50	0	0	
RAL	0%	1 MB/s	228	24	228	49379	0	0	
SARA	92%	216 MB/s	120959	17608	84721	10645	0	0	
TRIUMF	77%	108 MB/s	69809	9040	56443	20647	0	0	

CRITICAL
WARNING
NORMAL
GOOD
NO_ACTIVITY
SCHED DOWNTIME



Throughput view in 1 hour

Activity Summary ('2009-10-08 21:40' to '2009-10-08 22:40')

Click on the cloud name to view list of sites

Cloud	Transfers			Registrations		Errors			Services
	Efficiency	Throughput	Successes	Datasets	Files	Transfer	Registration	Services	Grid
ASGC	98%	728 MB/s	881	285	875	16	0	0	
BNL	49%	44 MB/s	986	13	990	1030	0	0	
CERN	0%	0 MB/s	0	0	0	993	0	0	
CNAF	93%	355 MB/s	463	1	464	36	0	0	
FZK	100%	809 MB/s	1141	301	1134	1	0	0	
LYON	69%	537 MB/s	1282	17	1289	567	0	0	
NDGF	88%	338 MB/s	381	0	381	51	0	0	
PIC	100%	162 MB/s	185	3	185	0	0	0	
RAL	0%	0 MB/s	0	0	0	0	0	0	
SARA	88%	412 MB/s	1469	191	1503	196	0	0	
TRIUMF	62%	260 MB/s	365	20	370	228	0	0	

CRITICAL
WARNING
NORMAL
GOOD
NO_ACTIVITY
SCHED DOWNTIME

+ AUSTRALIA-ATLAS_USERDISK	0%	0 MB/s	0	0	0	0	0	0	ok
- TAIWAN-LCG2_DATADISK	98%	727 MB/s	856	285	850	16	0	0	ok
CERN-PROD_DATATAPE	98%	727 MB/s	856			16			
+ TAIWAN-LCG2_DATATAPE	0%	0 MB/s	0	0	0	0	0	0	ok
+ TAIWAN-LCG2_MCDISK	100%	1 MB/s	25	0	25	0	0	0	ok



Re-Testing Afterwards Summary

- Grid Services
 - 3D and FTT job stuck Problems
 - Tape System Capacity and Performance
- Grid Operation
 - 24x7
- Experiment Support
 - Regional coordination on HC-like testing
 - Join Operation Shift and Offline Shift
- Management
 - Pledged Resources and Status
 - Human Resource & Organization
 - Communication



ASGC Resource Status

Date	CPU (HEP2k6)	Disk (PB)	Tape (PB)
Current	20.6K	1.8	1.6
End 2009	29.5K	2.6	2.4
MoU 2009	20K	3.0	3.0
MoU 2010	28K	3.5	3.5

- 2k8
 - 0.5PB expansion of Tape system in Q2
 - Meet MOU target mid of Nov.
 - 1.3MSI2k per rack base on recent E5450 processor.
- 2k9 Q1
 - 150 QC blade servers
 - 2TB per drives for raid subsystem
 - 42TB net capacity per chassis and 0.75PB in total
- 2k9 Q3-4
 - 18 LTO4 drives – mid of Oct
 - 150 Xeon QC (SMP, Intel 5520) blades servers will be installed by end Nov.
 - 2nd phase TAPE MES - 6 LTO4 drives + HA by end Nov.
 - 3rd phase TAPE MES – 6 LTO4 drives by end Nov.

28-30 Sept. APRWS09

ETA 0.8PB expansion delivery: mid of Nov

Academia Sinica Grid Computing



Communication Issues

- Already have direct connection with WLCG by Tier1 manager, ROC, LHCOPN and experiment support and join collaboration meetings routinely.
- Enhancement
 - Change management: improve internal decision cycle.
 - Sending more people joining ATLAS and CMS Computing Operation shift at CERN (around 3 months per turn), to understand requirements of experiments at once and also to verify the Tier1 quality.
 - Will take ATLAS/CMS offline computing shift regionally soon.
- More contact required with ASGC Service manager ?



24x7 Operation

- Well Designed 24x7 Operation Model Established
- Has been implemented from 16x5 to 16x7 and to 24x7
- We will be continuous improving Operation procedure and manuals

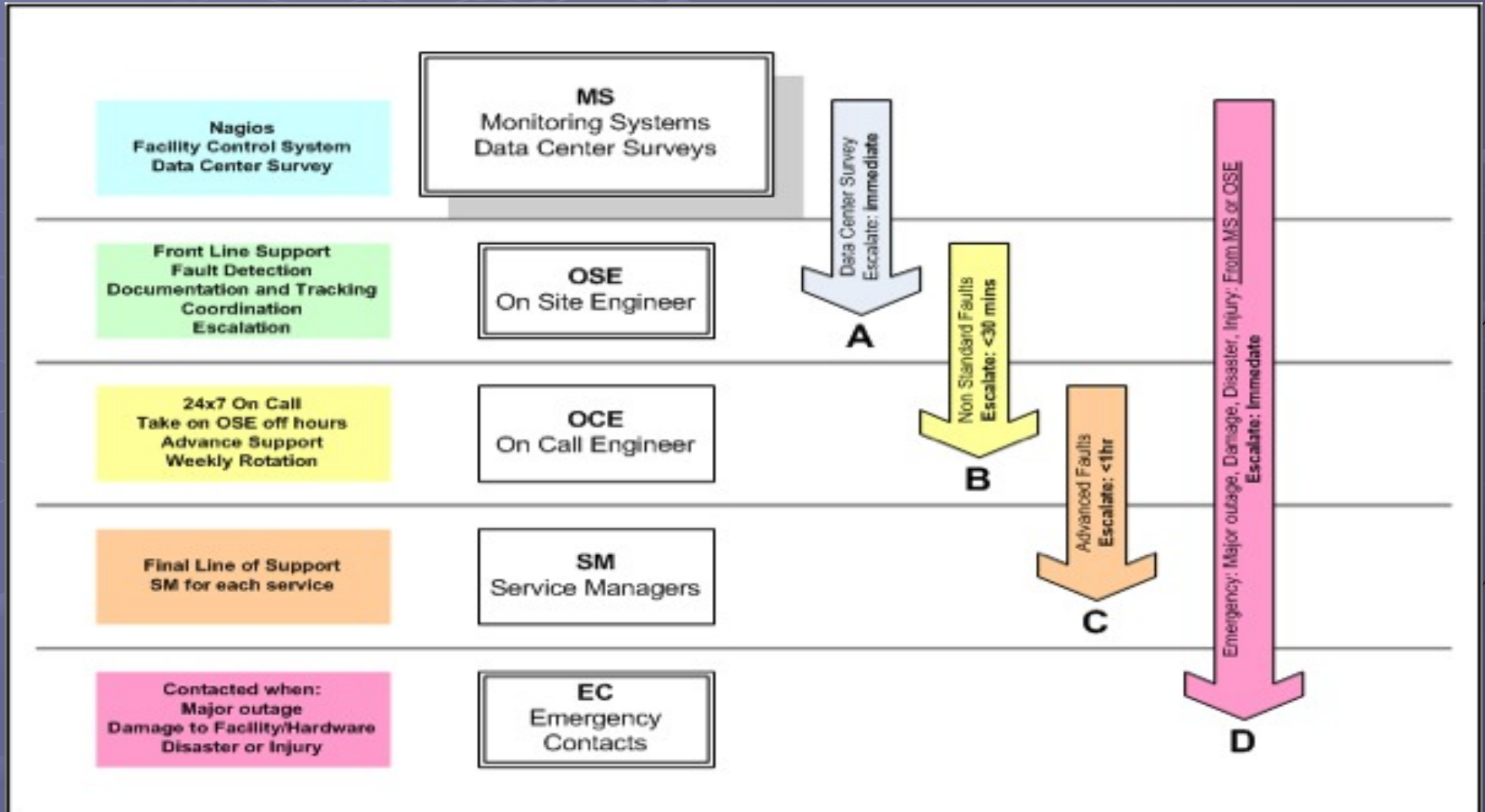
24x7 Roles

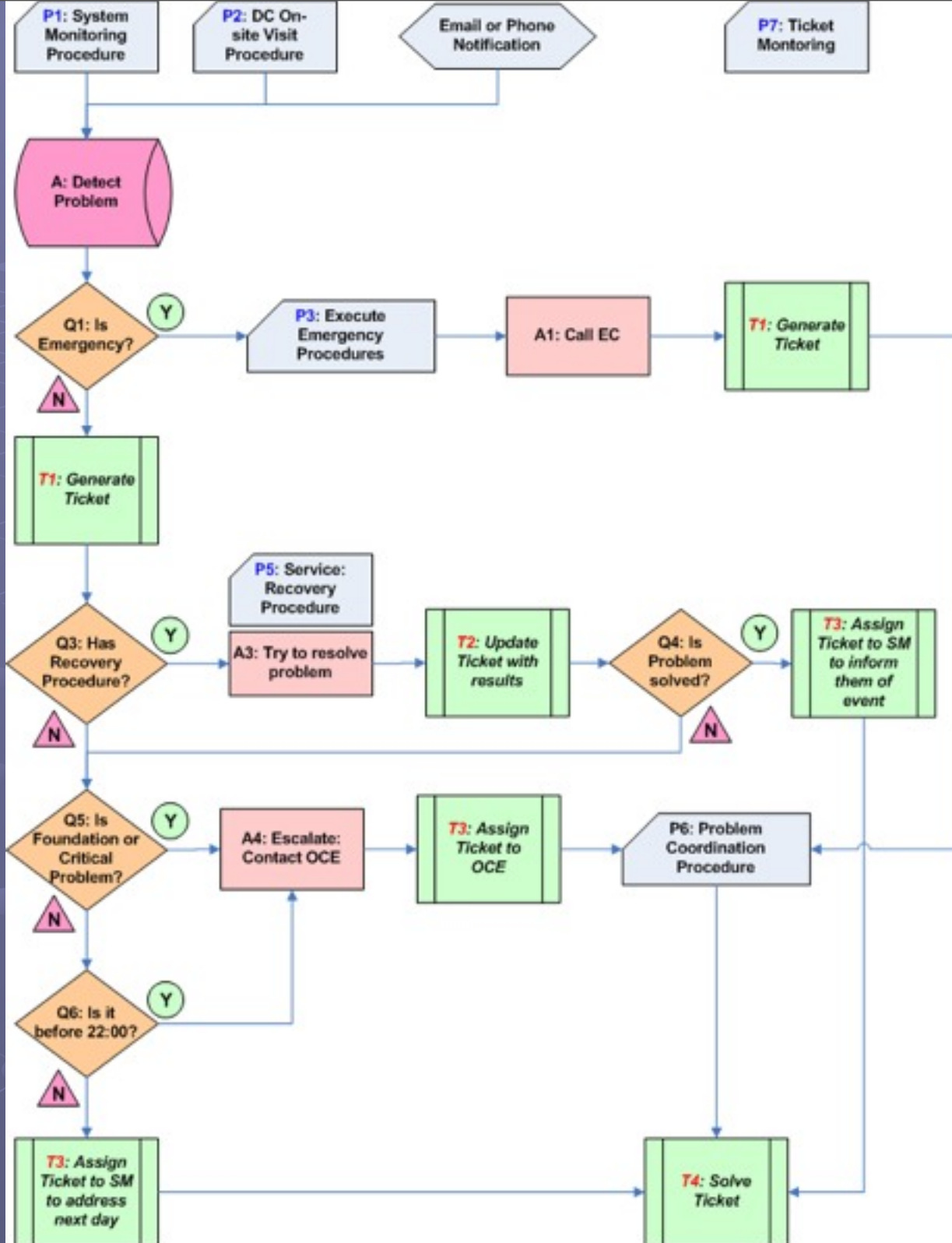
- **On Site Engineers (OSE): 16 hrs (9:00am ~ 02:00am) a day, 5 days a week**
 - On-site visit of data center
 - Detect faults and issues
 - First line troubleshooting
 - Problem coordination of open issues
 - Ticket management
- **On Call Engineers (OCE): 24x7**
 - Support OSE to resolve issues
 - Provide coverage when OSE not available
- **Service Manager (SM): 24x7**
 - Service experts and last line of support to resolve complex issues
- **Emergency Contacts (EC): 24x7**
 - a major outage occurs
 - damage occurs to hardware and Data center facilities
 - major physical damage, disaster or injury

Service Classes

- **Foundation services: 99.9%**
 - Data center, DB, Network, DNS
- **Critical services: 99%**
 - T1, T2, CA, EGEE, Ticketing System, Nagios, Mail
- **Best effort: Next business day**
 - UI, RGMA, IT, etc.

Escalation





Problem Coordination Procedure

● Non Emergencies

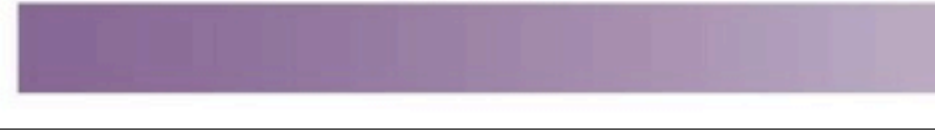
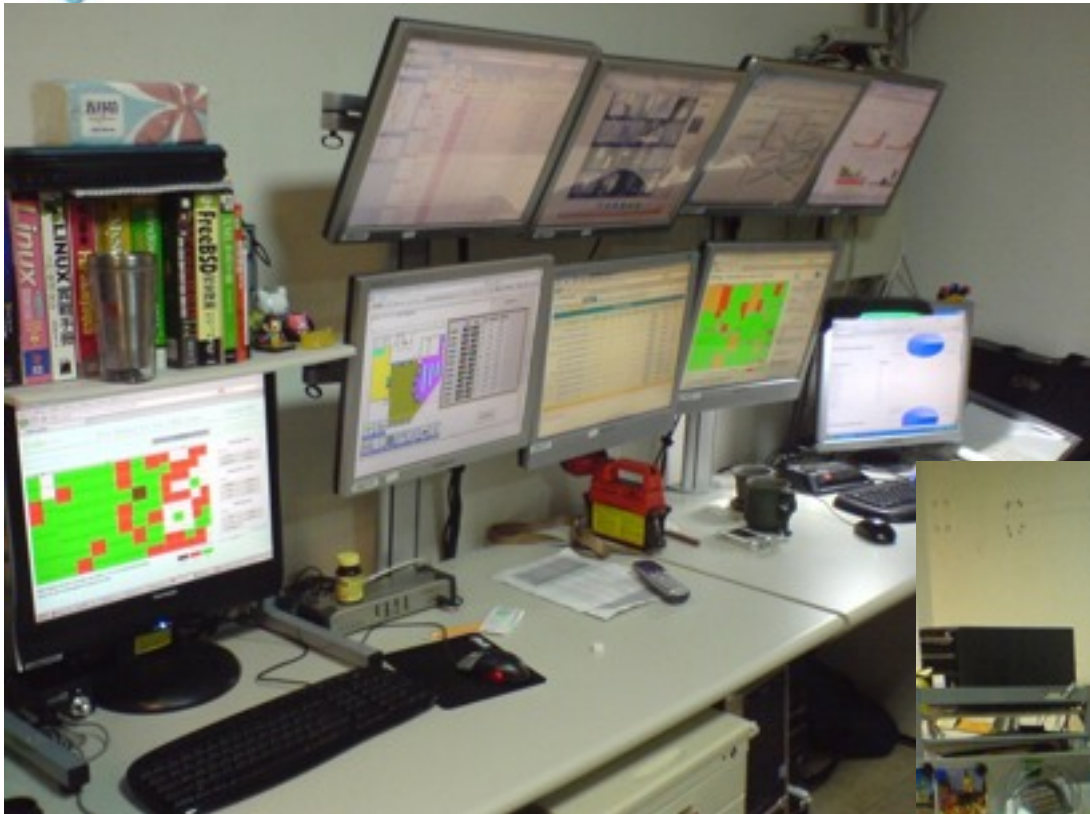
- Use MSN/phone to coordinate with OCE/SM
- Update all changes and results to ticketing system
- If it is not possible to resolve the problem off hours
 - then assign ticket to SM to resolve on the next day

● Emergencies

- Follow emergencies procedures: See YiHan talk
- Update Emergency Contacts with latest info
- Create and update tickets when time allows



24x7 Shift Monitoring





Organization Issues

- Site quality and performance metrics are our primary focus
 - Tier1 manager in charge of the first diagnosis and verification of process (for training and QC)
- Understanding root cause of system problem is essential
 - Enhancing Site problem solving capability
 - Exploring site bottleneck and get it removed
 - Improving coverage of service monitoring and operation automation
- Backup is implemented by Rotating Shift between jobs
- Human Resource Issues
 - Experienced senior engineers are easier to get much higher-paid offer outside
 - Established training and supporting model
 - 3~4 years work time in average, but in most cases we have to start from new-hire training until they become experienced in operation
- Strengthen direct communication with experiments
 - Sending more young staffs joining experiment computing operations at CERN
- Language Barrier ?



ASGC Tier1/Tier2 Operation Organization

Group	Sub-Group	Tasks	Members	Rotation	Recruitment
Grid Operation	Grid System & Service (GSS)	MW, Monitoring, CA, OAT	Jason, Jhen-Wei, Jinny, Albert, Joanna	Y	+1
	Regional Operation Center (ROC)	COD, TPM, Site Cert, 24x7	Shu-Ting, Todd, Yuan-pin, Young	Y	+1
	Mass Storage System (MSS)	Castor	Net	Y	
	Experiment User Support (EUS)	CMS, ATLAS	Suijian, Gang	Y	
Fabrics Management	System Adm & Operation	SA, FS, IT, Monitoring, OAT	Felix,	Y	+1
	DBM	DBA	Jhen-Wei, HungChe + Consultant	N	+1.5
	Network Operation Center (NOC)	Networking	Aries	N	+1
	Data Center Management (DCM)	DCM	George, Young	N	+1
Task Force	Procurement				
	Critical Event				