

CMS Global Computing System Commissioning

DOSAR Meeting 2007

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UCSD

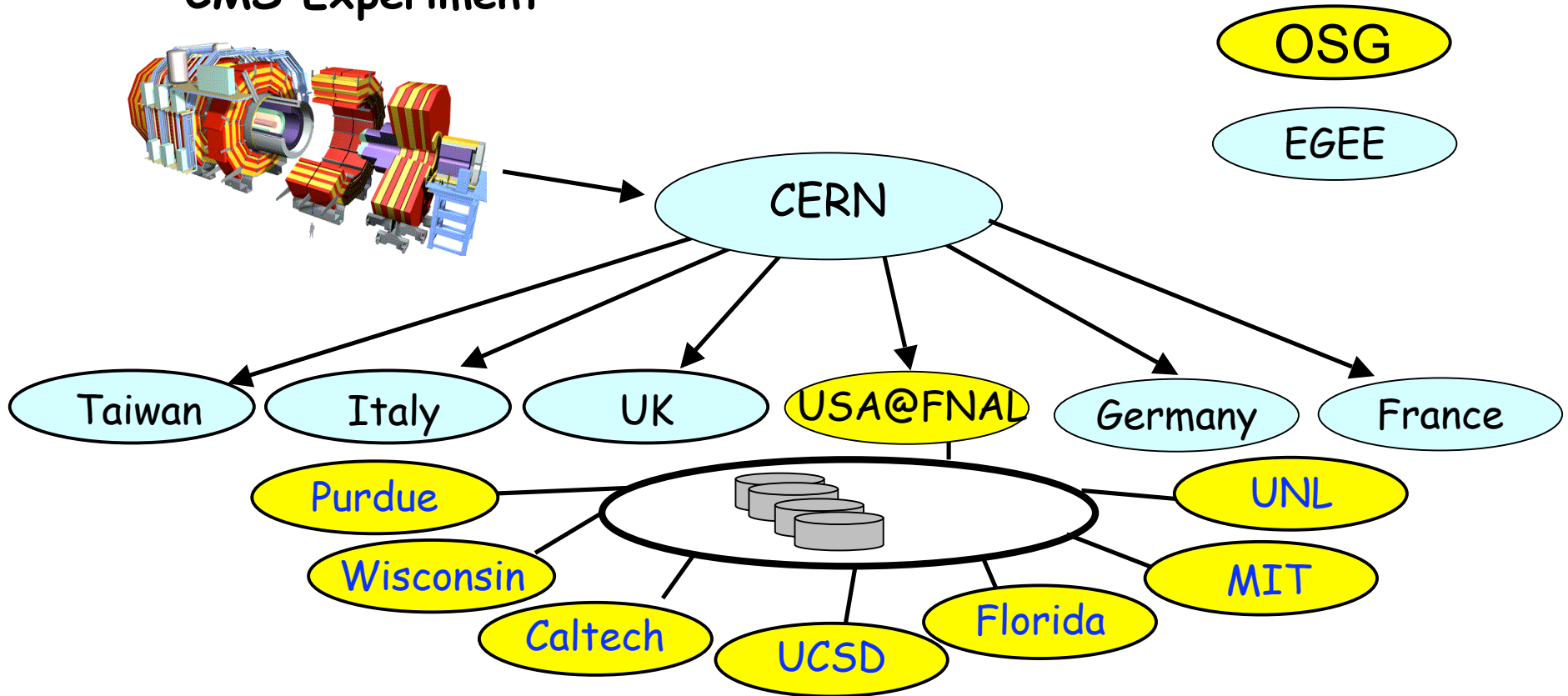


A word about CMS Organization

- Global CMS
 - Computing
 - Facility
 - Data Operations
 - Commissioning
 - Offline
 - Software, including all computing infrastructure software.
 - Joint Integration Activity between Offline & Computing
- Add to this a strong and very coherent T2 program in the US with bi-weekly operations meetings.

CMS Experiment - a global community grid

CMS Experiment



Data & jobs moving locally, regionally & globally within CMS grid.
Transparently across grid boundaries from campus to globus.

Some Details of CMS Computing Model

- Archival Copy of Data is distributed globally across T1 centers.
 - Each T1 center is responsible for reprocessing of all the data they archive!
 - ***All T2's must have access to all T1's !***
- Data is distributed based on subscription model.
 - Any user can request subscription of data to a site.
 - Minimum size is data block: ~1TB
 - Few people, including one per site, are allowed to sign off on the subscription request to a given site.
- Jobs are routed to sites that have the data.

Global Systems Commissioning

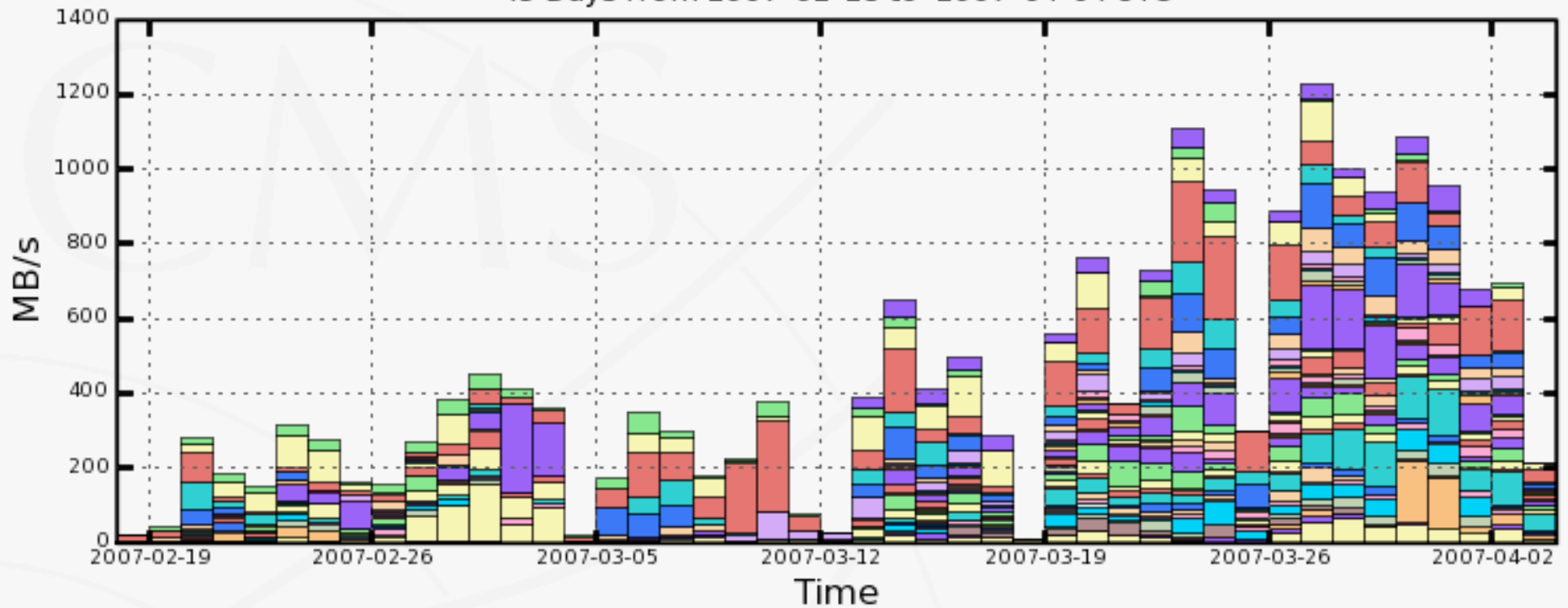
- Transition from Service Challenges (CSA06, CSA07) to continued operations.
- CSA07 as focal point, but continued operations commissioning on path to it.
 - Data Transfer Testing
 - Site Availability Monitoring
 - Job Submissions at Scale

Data Transfer Testing

- Coordinated by Facility Operations
 - Go through 5 week cycles with different goals each week.
 - T0 -> T1 in good shape
 - T1 -> T2 within region in varying shape depending on region. Excellent in US.
 - Any T1 -> any T2 still lots of work to do!

Transfers by Destination

CMS PhEDEx - Transfer Rate
45 Days from 2007-02-18 to 2007-04-04 UTC

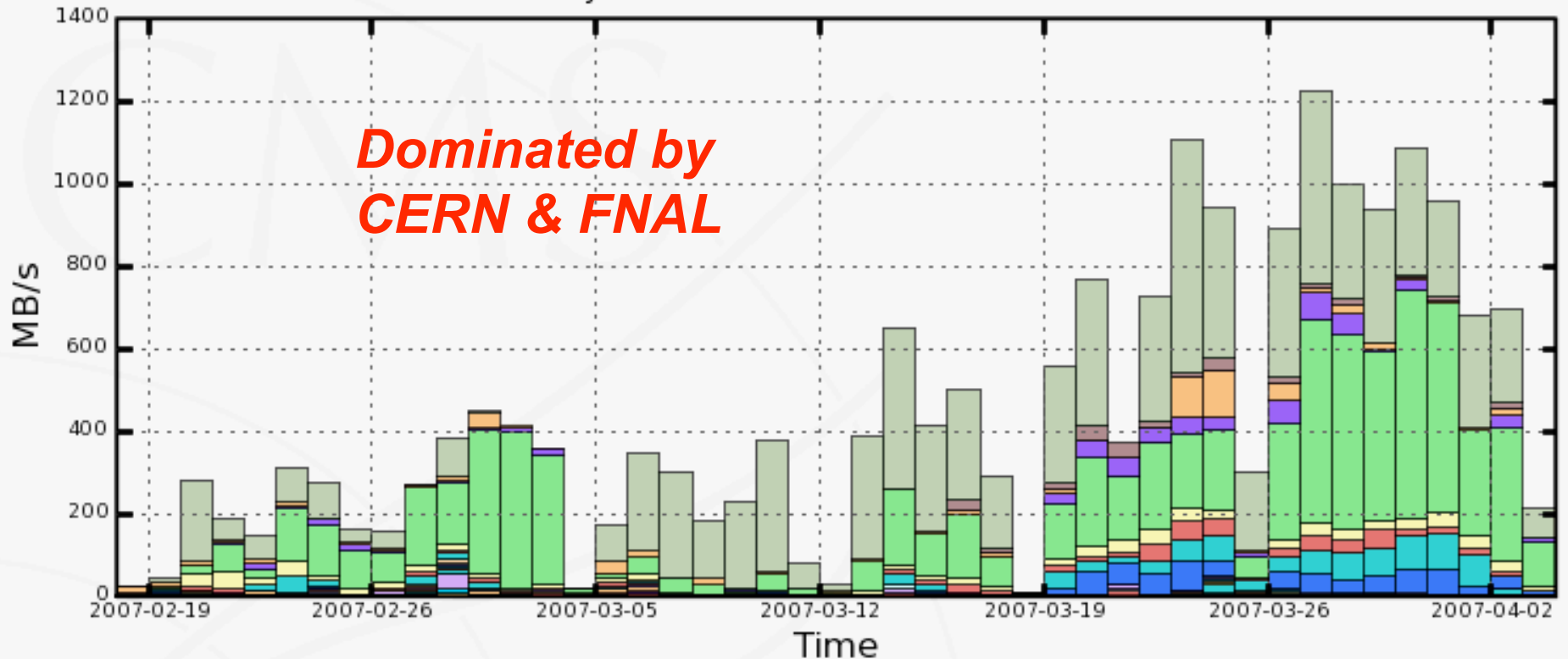


- | | | | | |
|--------------------|-------------------|----------------------|------------------|-------------------|
| T1_ASGC_Buffer | T1_CERN_Buffer | T1_CNAF_Buffer | T1_FNAL_Buffer | T1_FZK_Buffer |
| T1_IN2P3_Buffer | T1_PIC_Disk | T1_RAL_Buffer | T2_Bari_Buffer | T2_Beijing_Buffer |
| T2_Belgium_IHE | T2_Belgium_UCL | T2_Budapest_Buffer | T2_CSCS_Buffer | T2_Caltech_Buffer |
| T2_DESY_Buffer | T2_Estonia_Buffer | T2_Florida_Buffer | T2_GRIF_DAPNIA | T2_GRIF_LAL |
| T2_GRIF_LLR | T2_GRIF_LPNHE | T2_HEPGRID_UERJ | T2_IHEP_Disk | T2_ITEP_Buffer |
| T2_JINR_Buffer | T2_Legnaro_Buffer | T2_London_Brunel | T2_London_IC_HEP | T2_MIT_Buffer |
| T2_Nebraska_Buffer | T2_Pisa_Buffer | T2_Purdue_Buffer | T2_RWTH_Buffer | T2_Rome_Buffer |
| T2_SINP_Buffer | T2_SPRACE_Buffer | T2_SouthGrid_Bristol | T2_Spain_CIEMAT | T2_Spain_IFCA |
| T2_Taiwan_Buffer | T2_UCSD_Buffer | T2_Vienna_Buffer | T2_Warsaw_Buffer | ... plus 2 more |

Maximum: 1225.32 MB/s, Minimum: 9.41 MB/s, Average: 441.51 MB/s, Current: 210.65 MB/s

Transfer by Source

CMS PhEDEx - Transfer Rate
45 Days from 2007-02-18 to 2007-04-04 UTC



Maximum: 1225.32 MB/s, Minimum: 9.41 MB/s, Average: 441.52 MB/s, Current: 211.12 MB/s

Site Availability Monitoring

- Define CMS specific tests
- Run tests every 4hours via EGEE SAM system.
- This tests CMS workflows, software installation, trivial file catalogue, CE, SE, SQUID, ..., uniformly across both grids.
- Everything documented via CMS Twiki
 - Explanation of tests, including hints about what to do when tests fail
 - Link to src in cvs
 - Link to monitoring results
- Sites are going to be judged based on SAM.
 - CMS wide defined uptime goals

What tests are run

Tests we use

Name	Live Status	Description	Provided by	Status
Basic	SAM page	minimal "site is alive" test. Verify local site configuration, SW installation and TFC	Stefano Belforte / Andrea Sciaba	Done/Running
SW Installation		thorough verification of SW installation and that CMSSW can be installed remotely	Klaus Rabbertz + SB	Planned
Monte Carlo		verify site is OK for MC Production. Check stage out and clean up	Guillermo + Dave	Done/Running
Squid		verify Squid is working and can fetch from ORCOFF	Eric Wicklund	Done/Running
Frontier		verify CMSSW jobs access non-event data via Frontier	Eric Wicklund	Done/Running
SRM		verify site SRM from the SAM UI, w/o relying on other sites	Nicolo' Magini	Started
LocalFileRead?		verify file reading from local SE	ProdTool?	Planned
Analysis OK?		site is validated for user/organised Data Analysis	Data Operation	Planned
GridInformation?		verify site publishes correct info	Computing Commissioning	Do we want this?

Click on a test and you get an explanation of what it does!

SAM

- Tests documented
 - Description
 - Test scripts available from cvs
 - Suggestions for how to resolve failures
- Monitoring coupled to milestones
 - Everybody can see success/failure history
 - Uptime expectations for sites defined by as fraction of time SAM succeeds.

Job Submissions @ Scale

- Dual Strategies
 - Work with gLite WMS developers
 - Condor-G & glidein based system
- All jobs report to CMS Dashboard
- Two Job Robots for commissioning
 - One for regular small loads
 - One for short (~day or so) scalability tests
- Next Milestones:
 - 100,000 jobs per day
 - Keep all CPUs busy

MC Production Operations

- Presently 6 teams
 - 5 on LCG
 - 1 on OSG
- Generate roughly 30 Million events per month.
- Starting to keep track of each sites production records to understand pledged vs actual resources.
- Working on productivity of production teams



Summary



- CMS Computing Systems Commissioning ongoing now continuously.
 - Data Transfer Tests
 - Site Availability Monitoring
 - Job Submission Scaling
- In addition, Production Operations and work on T0 ongoing.
- Starting to keep track of each site's contribution to global CMS.
- Making good progress ... but lot of work left to do !!!