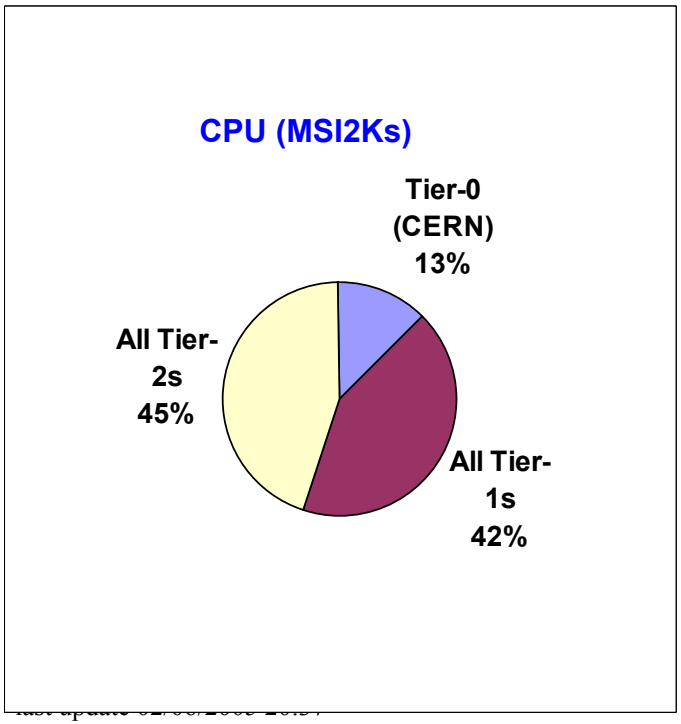
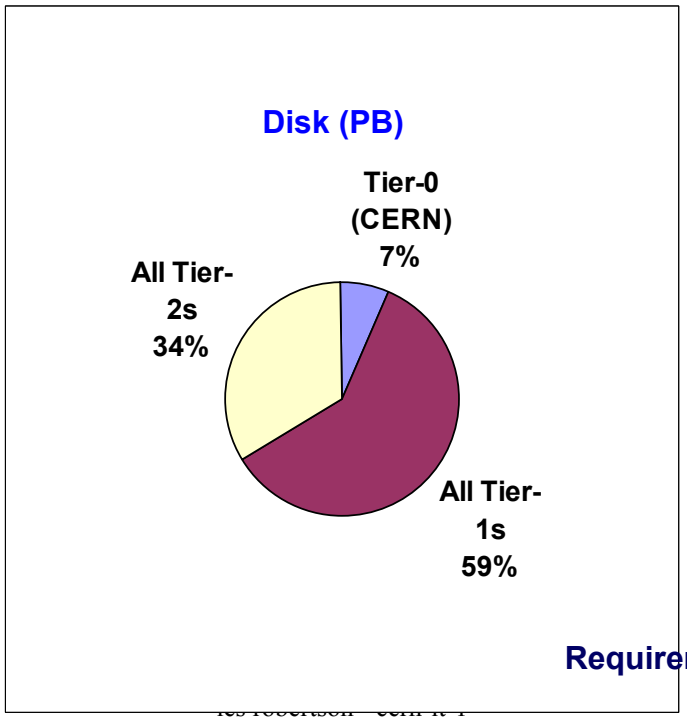
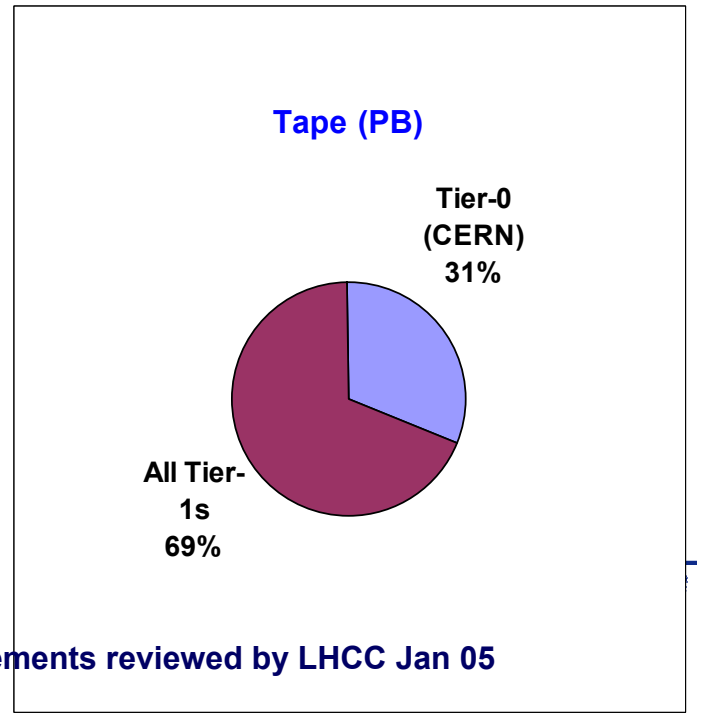
Summary of Computing Resource Requirements

All experiments - 2008

	Tier-0 (CERN)	*All Tier-1s*	*All Tier-2s*	*Total*
CPU (MSI2Ks)	15	51	55	122
Disk (PB)	3	29	17	49
Tape (PB)	13	28		41

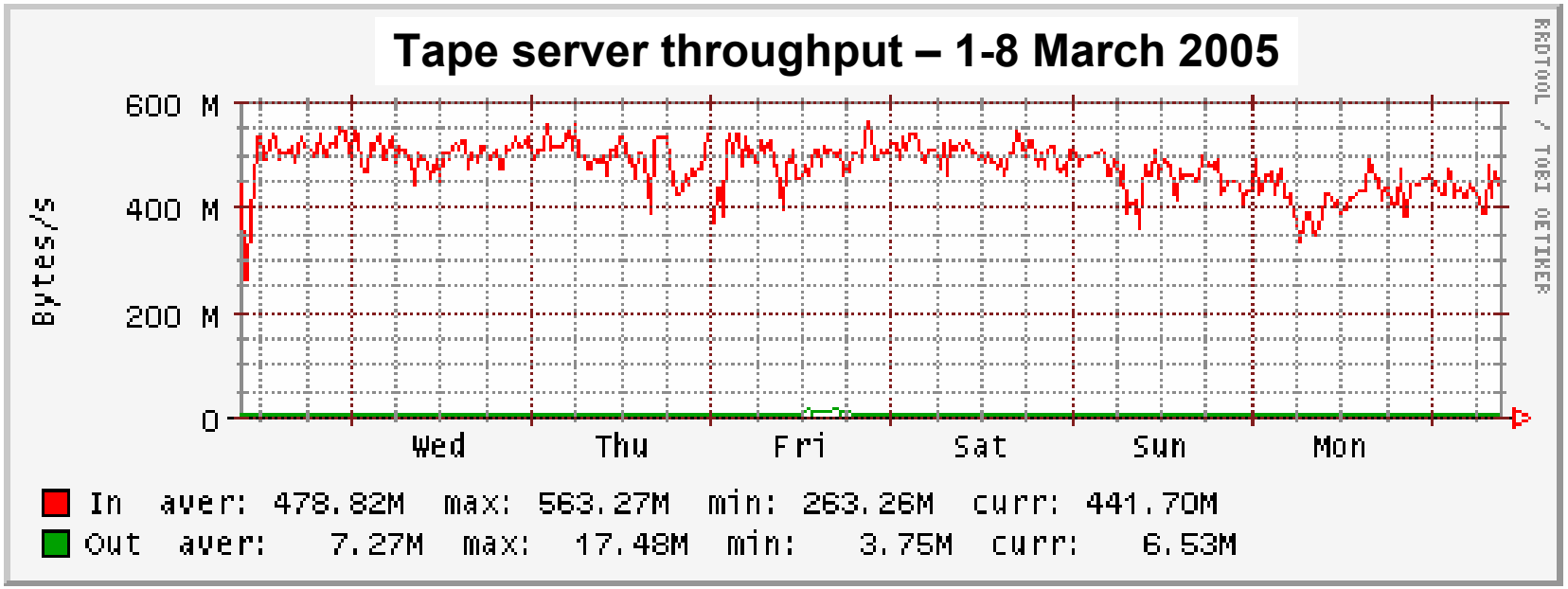






Requirements reviewed by LHCC Jan 05

LCG Data Recording Challenge

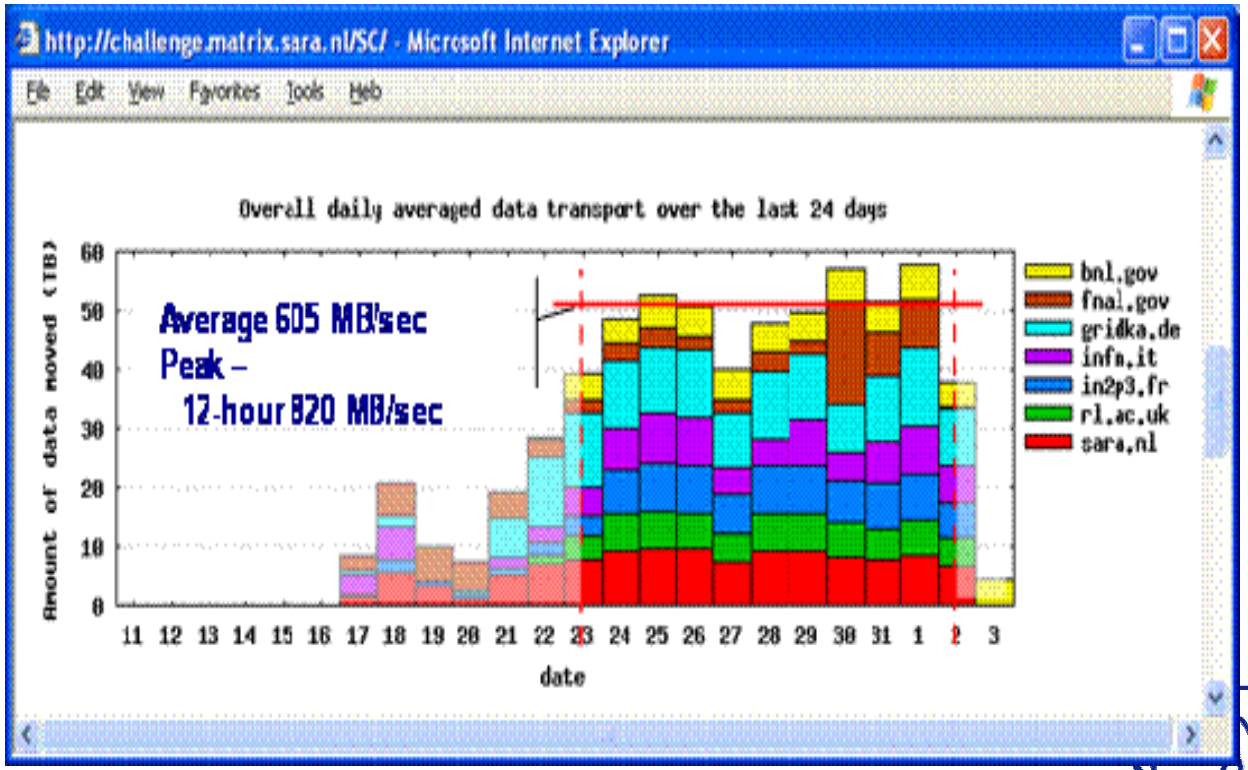


- Simulated data acquisition system to tape at CERB
- In collaboration with ALICE – as part of their 450 M B/sec data challenge
- Target – one week sustained at 450 MB/sec – achieved 8 March

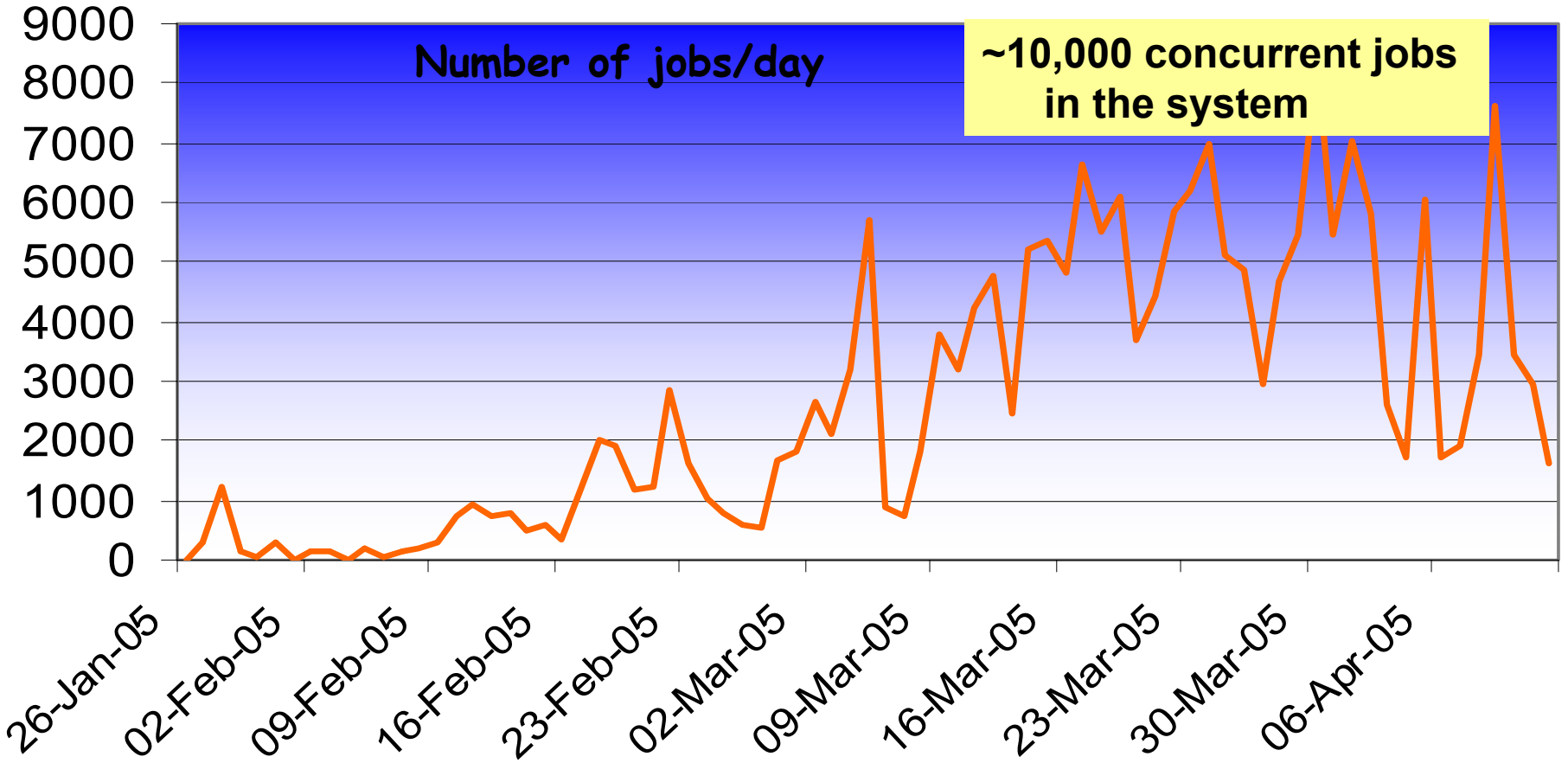
Service Challenge 2

- Data distribution from CERN to Tier-1 sites
- Original target – sustain daily average of 500 MByte/sec from CERN to at least 5 Tier-1 sites for one week by the end of April
- Target raised to include 7 sites and run for 10 days

- BNL, CCIN2P3, CNAF, FNAL, GridKa, RAL, NIKHEF/SARA
- Achieved on 2 April –
  -- average 600 MB/sec
  -- peak 820 MB/sec
- 500 MB/sec is 30% of the data distribution throughput required for LHC



Recent ATLAS work



- ATLAS jobs in EGEE/LCG-2 in 2005
  - In latest period up to 8K jobs/day
- Several times the current capacity for ATLAS at CERN alone – shows the reality of the grid solution

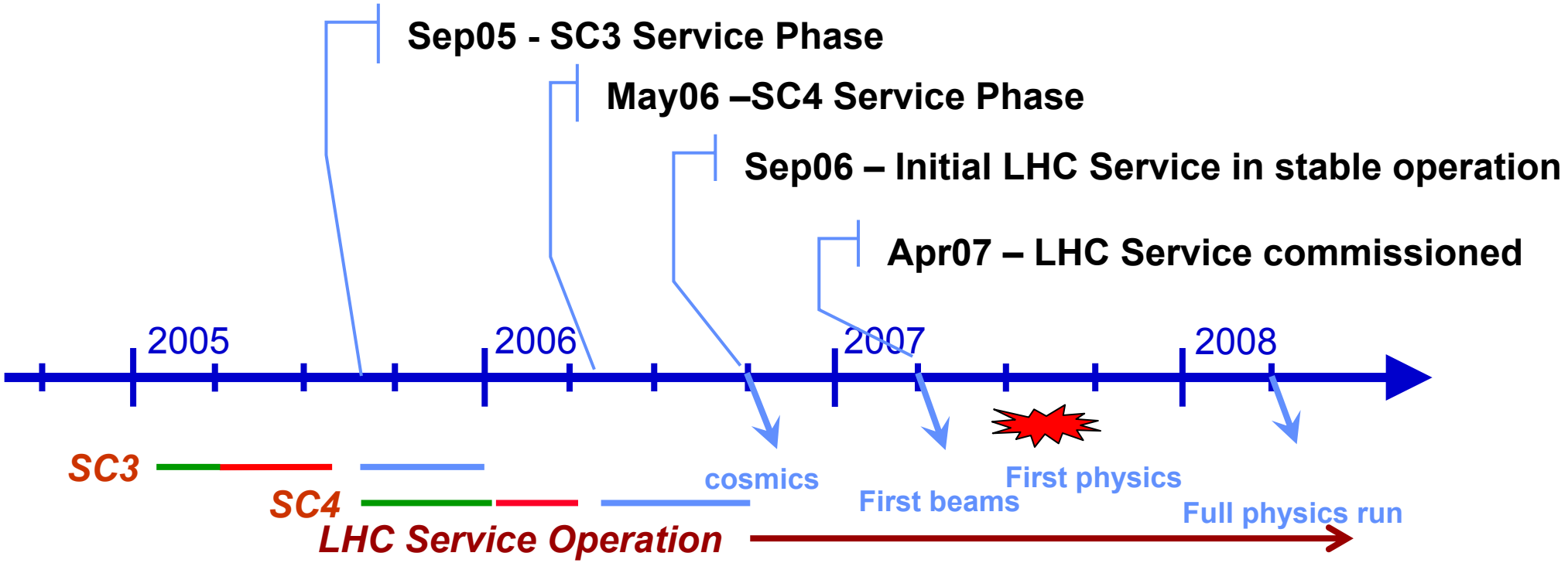
Ramping up to the LHC Service

- The services for Phase 2 will be ramped-up through two **Service Challenges** SC3 this year and SC4 next year
- These will include CERN, the Tier-1s and the major Tier-2s
- Each service Challenge includes –

  -- a set-up period
  - check out the infrastructure/service to iron out the problems *before the experiments get fully involved*
  - schedule allows *time to provide permanent fixes* for problems encountered
  - A throughput test

  -- followed by a long stable period for experiments to check out their computing model and software chain

Key dates for Service Preparation



- **SC3 –** Reliable base service – most Tier-1s, some Tier-2s – basic experiment software chain – grid data throughput 1GB/sec, including mass storage 500 MB/sec (150 MB/sec & 60 MB/sec at Tier-1s)
- **SC4 –** All Tier-1s, major Tier-2s – capable of supporting full experiment software chain inc. analysis – sustain nominal final grid data throughput (~ 1.5 GB/sec mass storage throughput)
- **LHC Service in Operation –** September 2006 – ramp up to full operational capacity by April 2007 – capable of handling twice the nominal data throughput

Grid Status Summary

- May 2005 – running at ~15,000 jobs in the system
- The EGEE grid –
  - many more sites and processors than we anticipated at this stage
    → ~140 sites, ~12,000 processors
    target for end 2004 was 20 sites, 2,000 processors
  - scalability is *already close to that needed for the full LHC grid*
  - Grid operation now working, sharing responsibility between operations centres at CNAF, FZK, IN2P3-Lyon, RAL, MSU-Moscow and CERN
  - Reliability is still a major issue - a focus for work this year
  - Middleware evolution
    → aim for a solid, though basic functionality by end 2005
- 34 countries working together in a consensus based organisation
- At CERN – staff profile and staff budget agreed for Phase 2
  – materials budget not yet fully funded – but CSO giving right signals