Data Challenge Resource Planning for 2004 at CERN

preliminary

Available Budget

1200 KCHF for LHC Experiments → CPU, Disk and Tape costs

500 KCHF for non-LHC experiments → CPU and Disk costs

Known Costs :

- **100 KCHF for the replacement of old equipment (LHC and non-LHC)**
- **150 KCHF for Tape costs in 2004 (LHC experiments)**

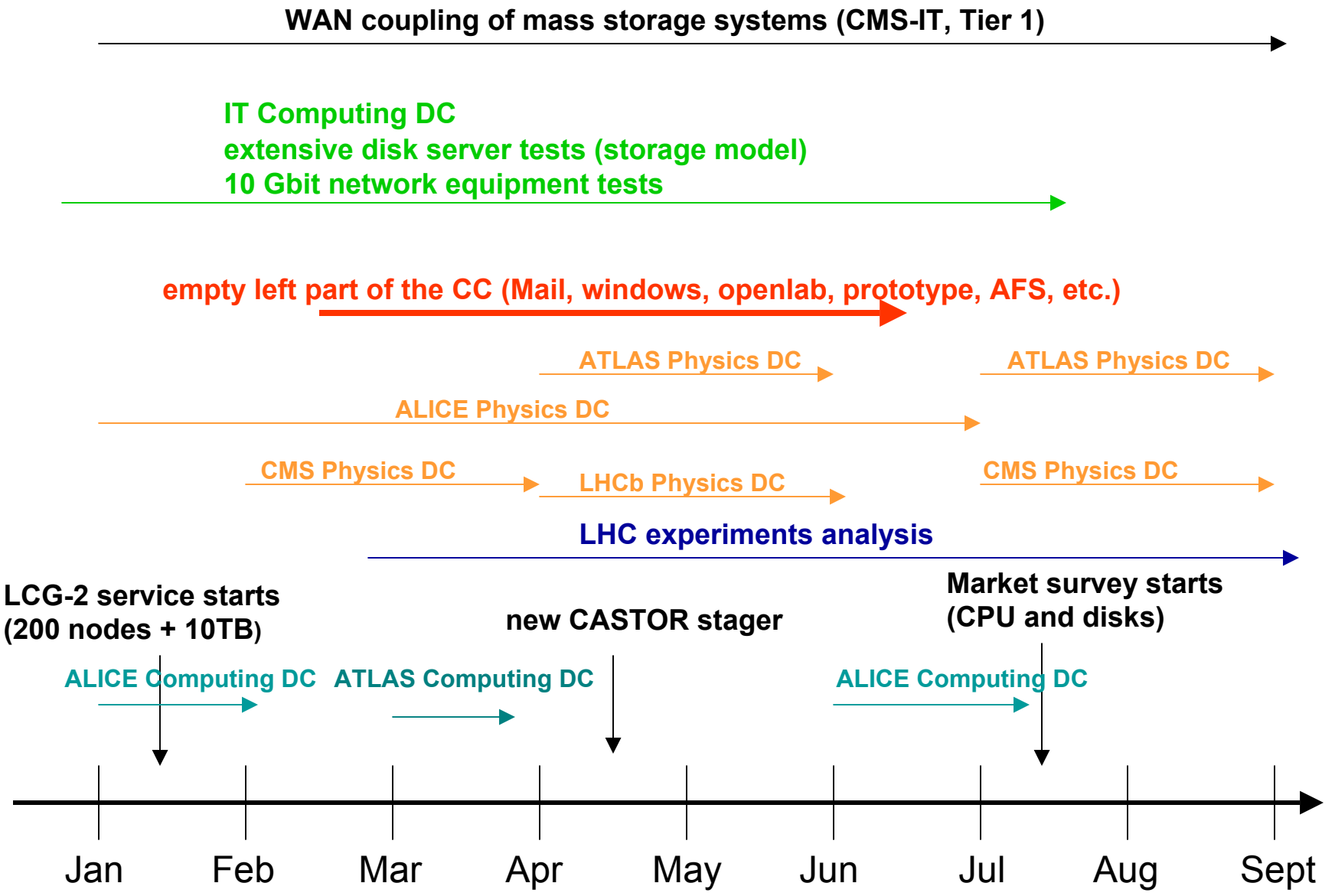
2004 Experiment requests

(rounded , aggregate numbers)

	non-LHC	LHC
new CPU capacity	**50 KSI2000**	**450 KSI2000**
new disk capacity	**40 TB**	**100 TB**
new AFS capacity	**2.3 TB**	**2.3 TB**

remark : AFS is not part of the 500 + 1200 KCHF budget
4.6 TB is a 60 % increase of the current AFS space (7.6 TB)
AFS costs (new acquisition, maintenance, backup tapes, replacement) will be about 700 KCHF in 2004, personnel not included

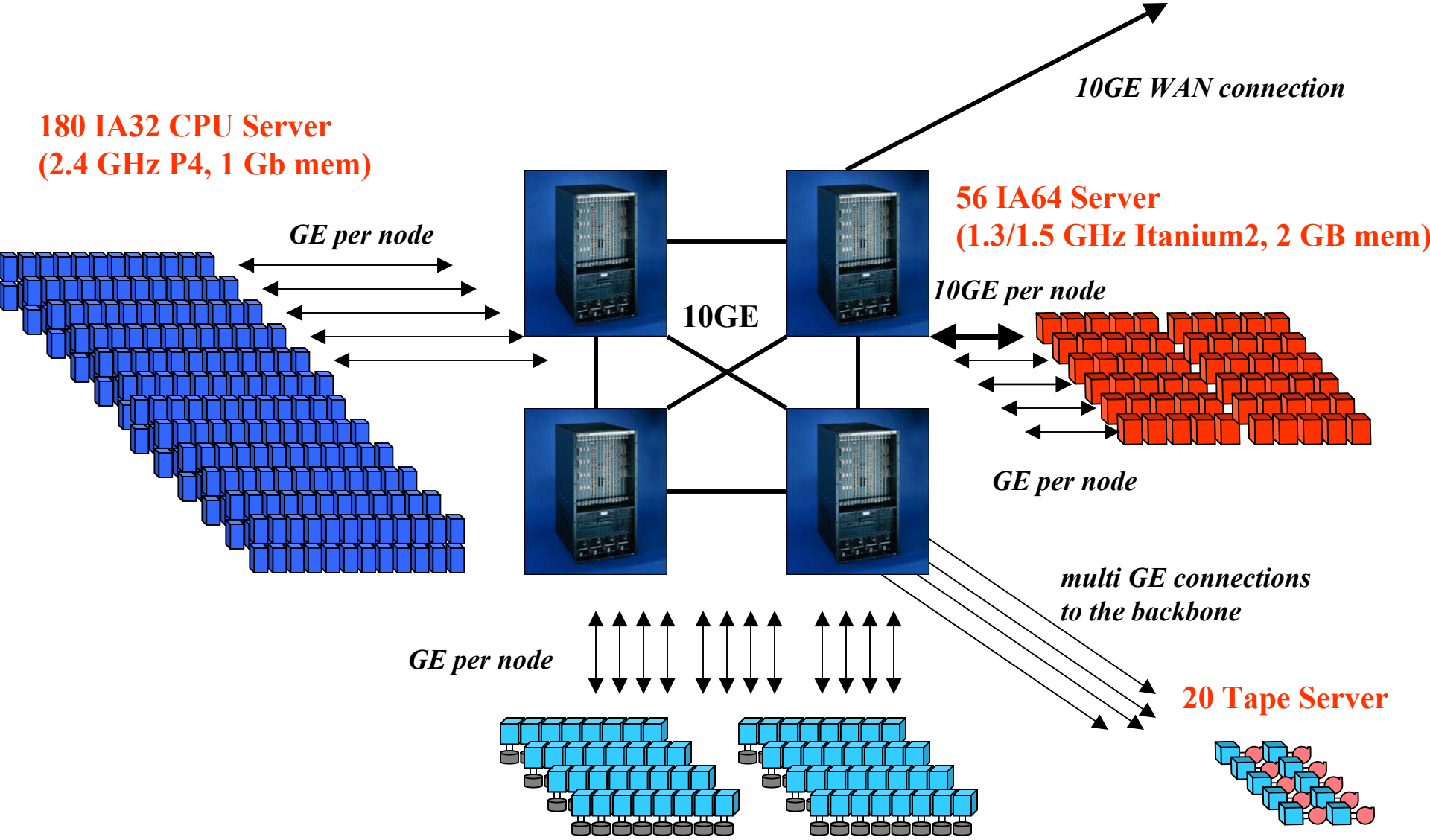
Time schedule 2004



Computing Data Challenges

- WAN coupling of Tiers → data import/export, HSM coupling, protocols, etc.
- Reliability and performance of storage hardware and software
- 10 Gbit network equipment, performance and reliability
- Mass Storage, CDR → ALICE – IT DC
- Online tests → DAQ and event building (ALICE, ATLAS)
- LCG testbeds
- EGEE / ARDA testbeds
- Database tests (ORACLE, POOL, ROOT)

New High Througput Prototype (→ Feb. 2004)



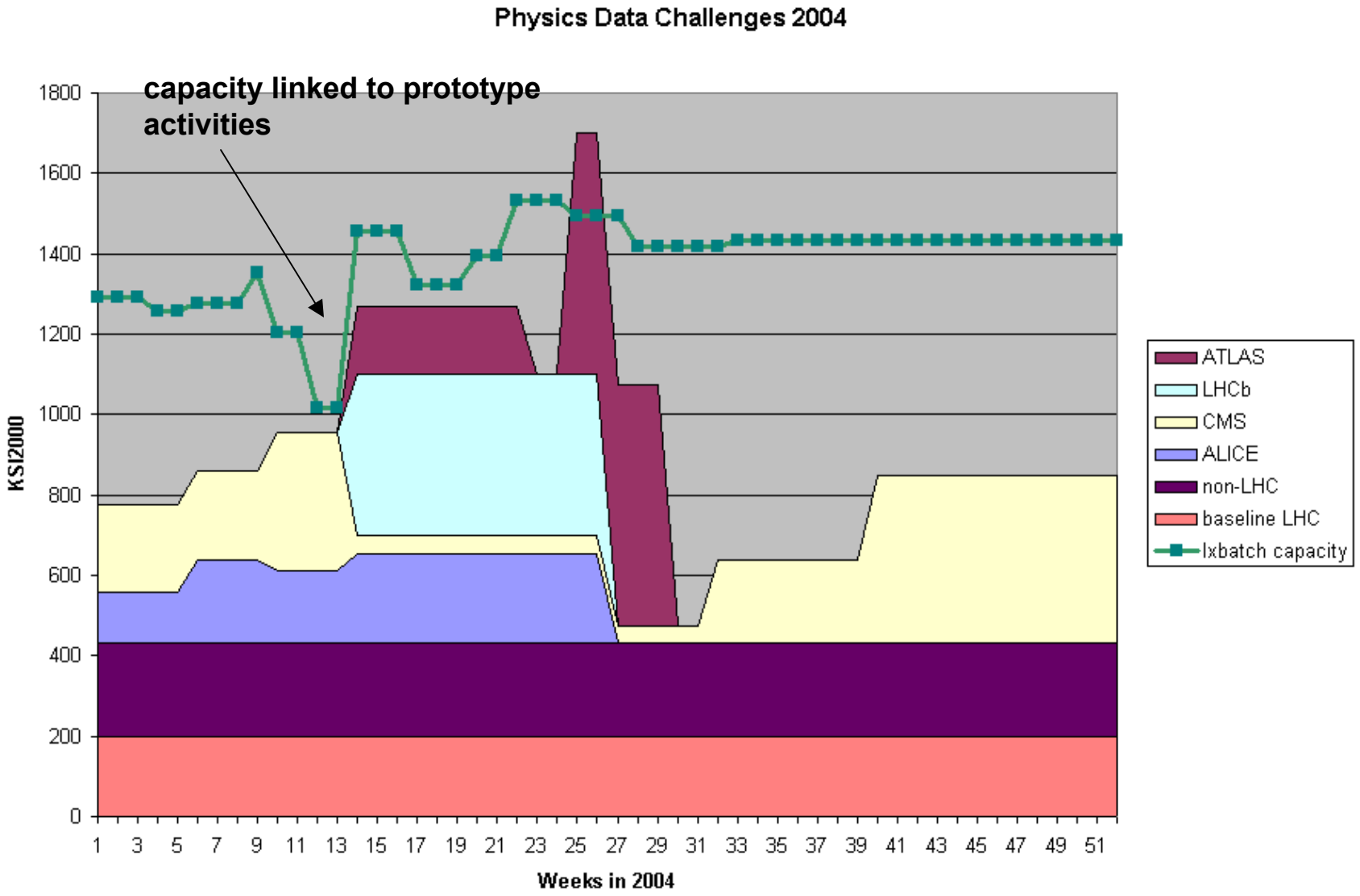
Boundary Conditions

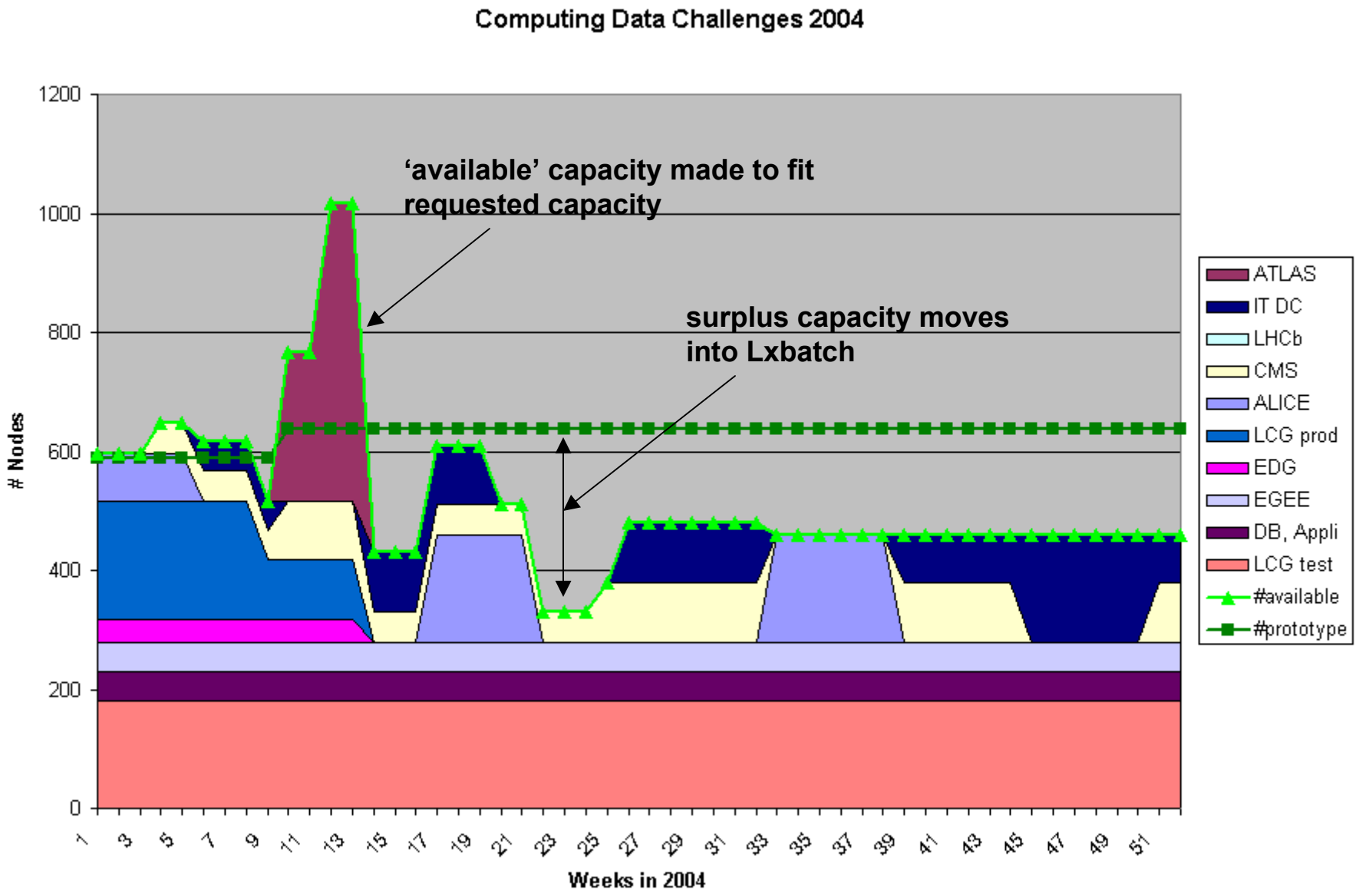
- The planning and implementation of the CC upgrade
  → move all equipment from the left side of the CC to the right side during February to June
  services effected : Mail, Web, Windows, AFS, prototype, openlab, testbeds

- Efficiencies
  → two jobs or three jobs per node
  memory size, Exp. A : "I don't won't to mix with Exp. B, C or D "
  I/O wait time compensation (mass storage, database, calibration, bookkeeping)
  → dedication of nodes versus dedication of resources in the DC's
  → overall failure rate system versus application

- LCG-2 resources (200 nodes) from the prototype in Jan-Feb, than LCG-2 is part of Lxbatch, sharing decided by Experiements

- Transparent sharing of resources between the prototype and Lxbatch


Physics Data Challenges 2004
capacity linked to prototype activities
KSI2000
1800
1600
1400
1200
1000
800
600
400
200
0
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51
Weeks in 2004
ATLAS
LHCb
CMS
ALICE
non-LHC
baseline LHC
lxbatch capacity


Computing Data Challenges 2004
'available' capacity made to fit requested capacity
surplus capacity moves into Lxbatch
Nodes
Weeks in 2004
ATLAS
IT DC
LHCb
CMS
ALICE
LCG prod
EDG
EGEE
DB, Appli
LCG test
#available
#prototype

Disk Resources

The requests are for 101 TB of disk space for the 4 Experiments

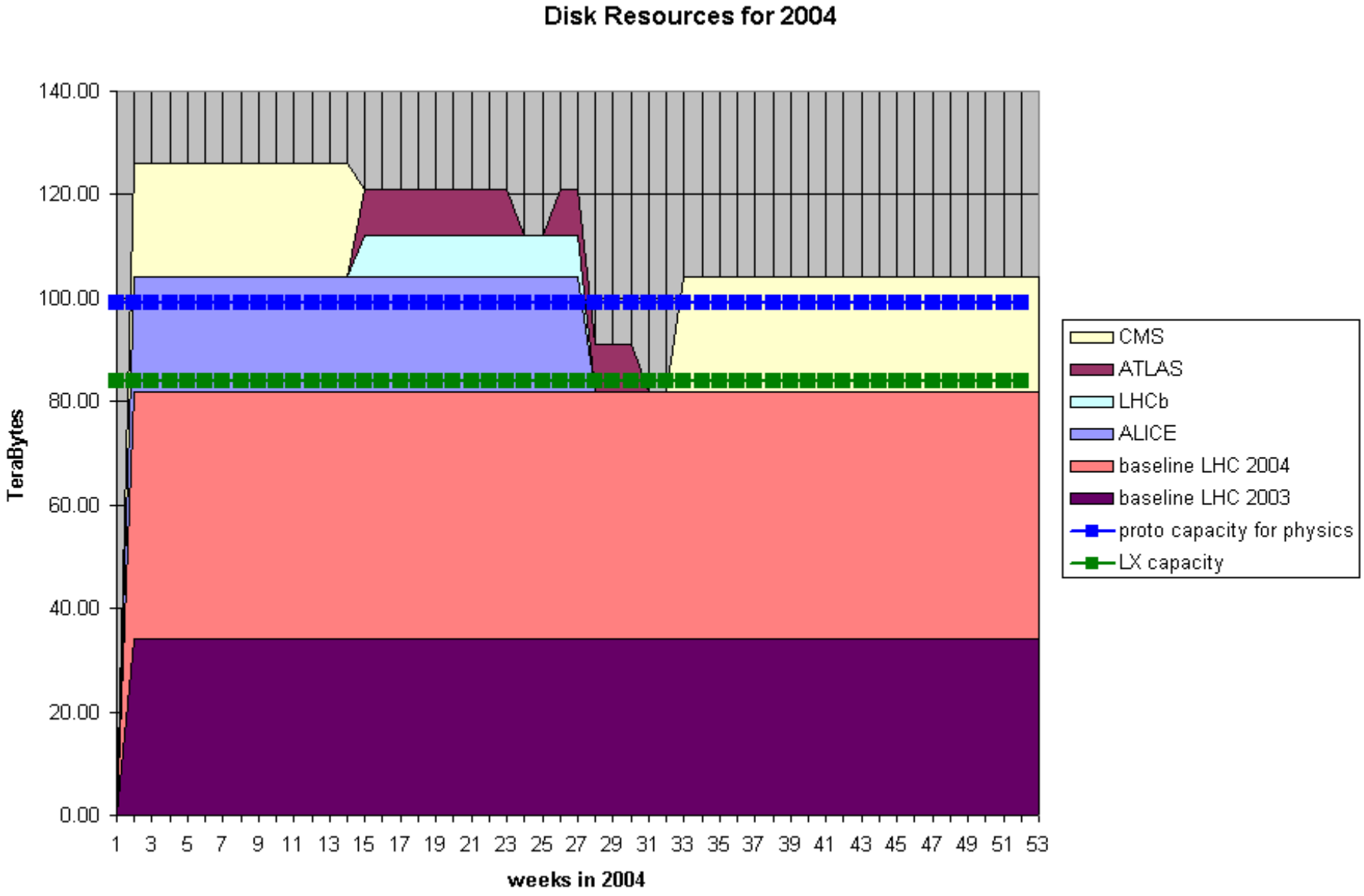
ALICE	**30 TB**
ATLAS	**25 TB**
CMS	**38 TB**
LHCb	**8 TB**

From the 2004 budget we bought so far ~ 50 TB (will arrive end of the year)

→ split the request into base request and specific for DC's

ALICE	**8 TB**	**+**	**22 TB**
ATLAS	**16 TB**	**+**	**9 TB**
CMS	**16 TB**	**+**	**22 TB**
LHCb	**8 TB**	**+**	**0 TB**

→ add some 15 TB from the prototype
→ check possibility to buy another 10 TB from remaining budget
→ add 10 TB from the existing LHC Exper. (2003) disk space into the DC's


Disk Resources for 2004
140.00
120.00
100.00
80.00
60.00
40.00
20.00
0.00
TeraBytes
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47 49 51 53
weeks in 2004
CMS
ATLAS
LHCb
ALICE
baseline LHC 2004
baseline LHC 2003
proto capacity for physics
LX capacity