Summary of SC4 Disk-Disk Transfers

LCG MB, April 18 2006

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Goals of SC4 Disk-Disk Transfers

- Disk - disk Tier0-Tier1 tests at the full nominal rate are scheduled for April.

- The proposed schedule is as follows:
- April 3rd (Monday) - April 13th (Thursday before Easter) - sustain an average daily rate to each Tier1 at or above the full nominal rate. (This is the week of the GDB + HEPiX + LHC OPN meeting in Rome...)

- Any loss of average rate >= 10% needs to be:
  - accounted for *(e.g. explanation / resolution in the operations log)*
  - compensated for by a corresponding increase in rate in the following days

- We should continue to run at the same rates unattended over Easter weekend (14 - 16 April).

Achieved (Nominal) pp data rates (SC3++)

Centre	ALICE	ATLAS	CMS	LHCb	Rate into T1 (pp) Disk-Disk (SRM) rates in MB/s
ASGC, Taipei	-	✓	✓	-	80 (100) (have hit 140)
CNAF, Italy	✓	✓	✓	✓	200
PIC, Spain	-	✓	✓	✓	>30 (100) (network constraints)
IN2P3, Lyon	✓	✓	✓	✓	200
GridKA, Germany	✓	✓	✓	✓	200
RAL, UK	-	✓	✓	✓	200 (150)
BNL, USA	-	✓	-	-	150 (200)
FNAL, USA	-	-	✓	-	>200 (200)
TRIUMF, Canada	-	✓	-	-	140 (50)
SARA, NL	✓	✓	-	✓	250 (150)
Nordic Data Grid Facility	✓	✓	-	-	150 (50)

☺ Meeting or exceeding nominal rate (disk – disk)

☺ Met target rate for SC3 (disk & tape) re-run

Missing: rock solid stability – nominal tape rates

(Still) To come:
Srm copy support in FTS;
CASTOR2 at remote sites;
SLC4 at CERN;
Network upgrades etc.

SC4 T0-T1 throughput goals: nominal rates to disk (April) and tape (July)

All Wikis
ACPP
ADCgroup
AISgroup
ALICE
ALPHA
AliceSPD
AthenaFCalTBAna
Atlas
CERNSearch
CMS
CS
Controls
DESgroup
DbaServices
DefaultWeb
EGEE
ELFms
ETICS
EgeePtf
FIOgroup
HCC
HROnDemand
Know
LAr
LCG
LCGAAWorkbook
LHCAtHome
LHCOPN
LHCb
LHCgas
LcgProcurementInfo
LinuxSupport
Main
PHESS
PSSGroup
Plugins
SPI
SRMDev
Sandbox
SupComp05
TWiki

TWikiGuest

Week two (April 10 on)

- Week 2 average to sum of Tier1 sites is 1262 MB/s - 79% of the target.

Site	Disk-Disk	Week1 Average	Week2 Average	Apr10	Apr11	April12	April13	April14	April15	April16	April17
TRIUMF	50	**54**	**63**	**62**	**69**	**63**	**63**	**60**	**60**	**62**	**63**
BNL	200	***191***	***199***	**220**	***199***	**204**	168	122	139	**284**	**257**
FNAL	200	101	**231**	168	**289**	**224**	159	**218**	**269**	**258**	**261**
PIC	60	49	**78** (5 days)	49	-	24	**72**	**76**	**75**	**84**	**82**
RAL	150	118	***136***	***137***	124	106	***142***	***139***	131	**151**	**160**
SARA	150	120	**178**	**173**	**158**	***135***	**190**	**170**	**175**	**206**	**213**
IN2P3	200	165	157	86	133	157	***183***	***193***	167	166	167
FZK	200	104	142	97	174	141	159	152	144	139	130
CNAF	200	80	88	82	121	96	123	77	44	132	32
ASGC	100		24	22	33	25	26	21	19	22	24
NDGF	50		28 (5 days)	-	-	-	14	38	32	35	20
DESY	60	70	74	71	77	69	72	76	73	76	76
TOTAL (T1s)	**1600**			1096	1300	1175	1046	1266	1255	***1539***	***1409***

Week one (April 3 on)

Site	Disk-Disk	Apr3	Apr4	Apr5	Apr6	Apr7	Apr8	Apr9	Weekly average	Average from startup	Target
TRIUMF	50	44	42	**55**	**62**	**56**	**55**	**61**	**54**	**54** (>100%)	50
BNL	200	170	103	173	**218**	**227**	**205**	**239**	***191***	***191*** (>95%)	200
FNAL	200	-	-	38	80	**145**	**247**	**198**	101	141 (>70%)	200
PIC	60	-	18	41	22	58	**75**	**80**	49	42 (70%)	60
RAL	150	129	86	117	***128***	***137***	109	117	118	118 (~80%)	150
SARA	150	30	78	106	***140***	**176**	***130***	**179**	120	120 (80%)	150
IN2P3	200	**200**	114	148	***179***	***193***	137	***182***	165	165 (>80%)	200
FZK	200	81	80	118	142	140	127	38	104	104	200
CNAF	200	55	71	92	95	83	80	81	80	80	200
ASGC	100	-	7	23	23	-	-	12			100
NDGF	50	-	-	-	-	-	14	-			50
DESY	60	-	68	63	75	74	68	74		70	60
TOTAL (T1s)	1600	709	599	911	1089	1215	1179	1187		984 (61.5% of target)	

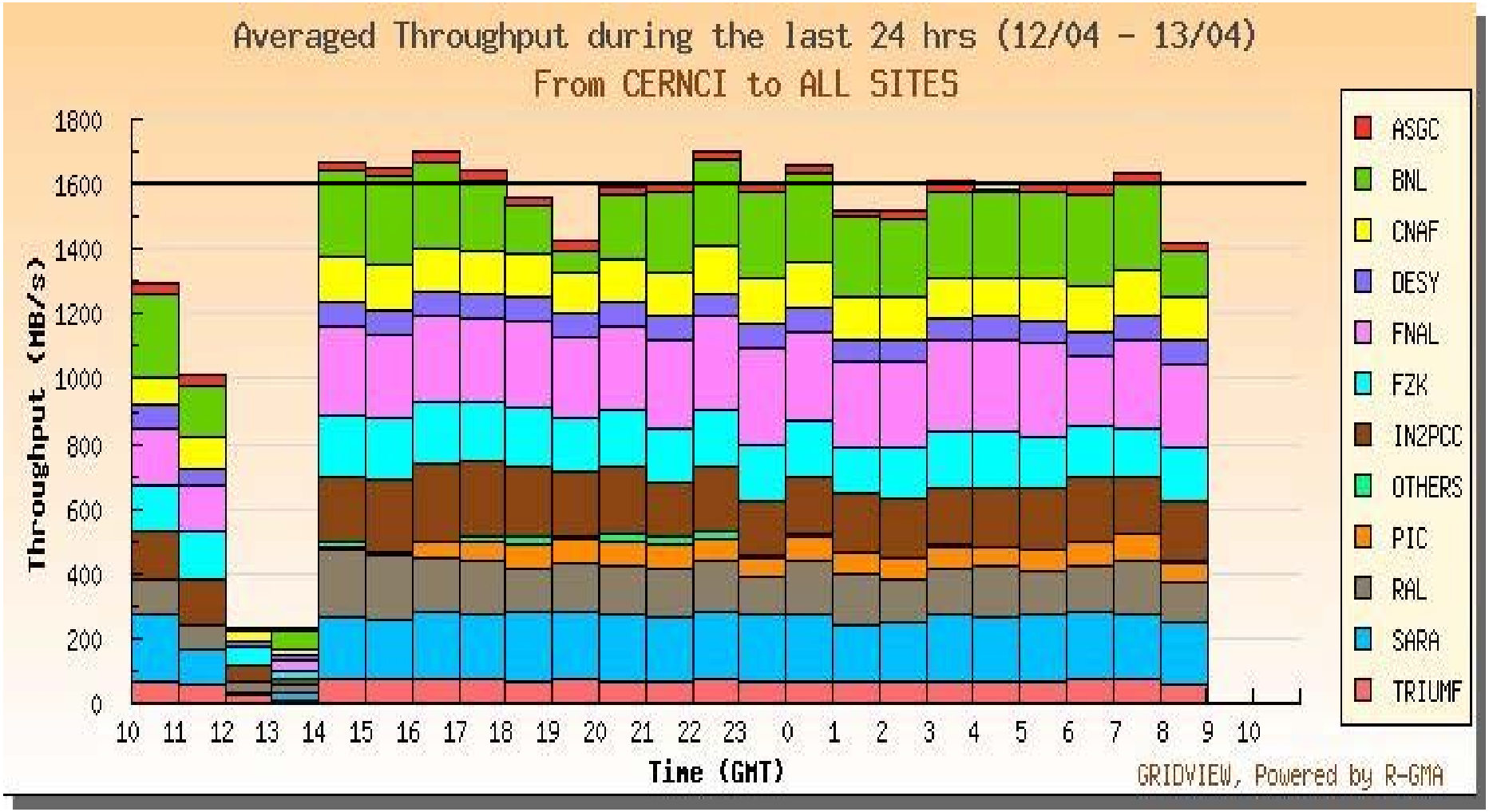
SC4 Blog

- 18/04 01:30 Easter Monday has been above 1.4 GB/s for most of the day, averaging about 1.5 GB/s, peaking at 1.6 GB/s right after the CNAF channel was switched on again. The problems of the day were with the CNAF channel, which was off except for a 6-hour spell, and with the BNL channel, which experienced many errors that were not very much reflected in the rate until 22:00 GMT. NDGF experimenting with dCache parameters. *Maarten*

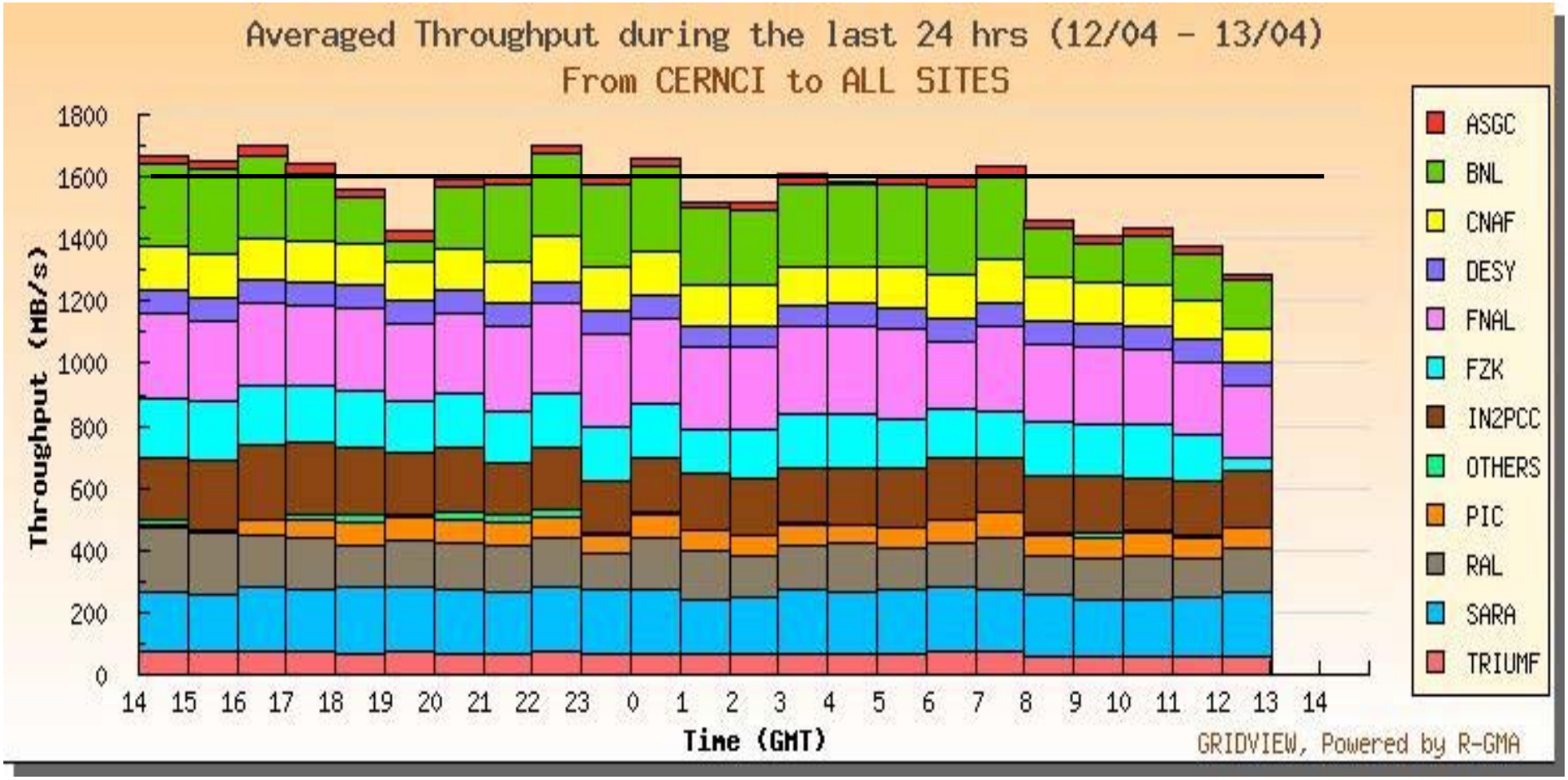
- 17/04 02:30 Easter Sunday was the first full day averaging 1.6 GB/s! All channels were stable except for CNAF, whose LSF queue got full with stuck jobs a few times, requiring admin interventions. *Maarten*

- 16/04 03:50 A rocky night with…

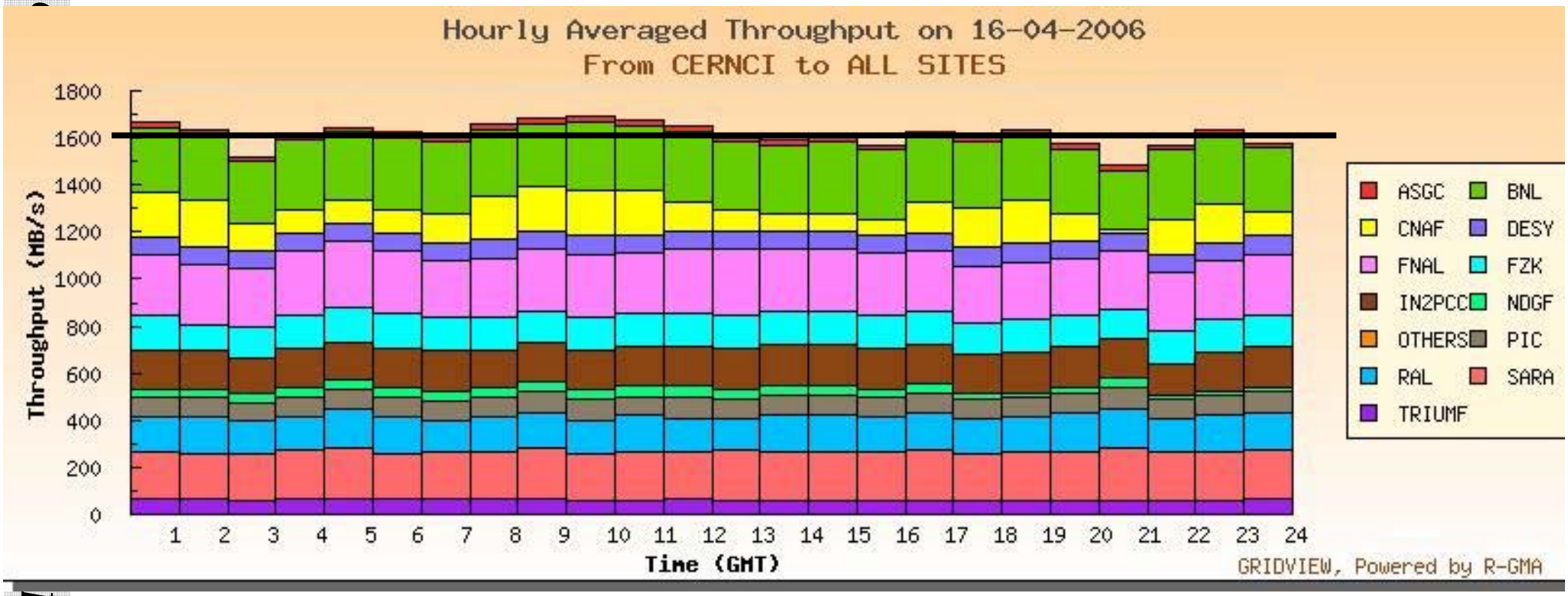
Effect of FTS DB Cleanup



24 hours since DB Cleanup

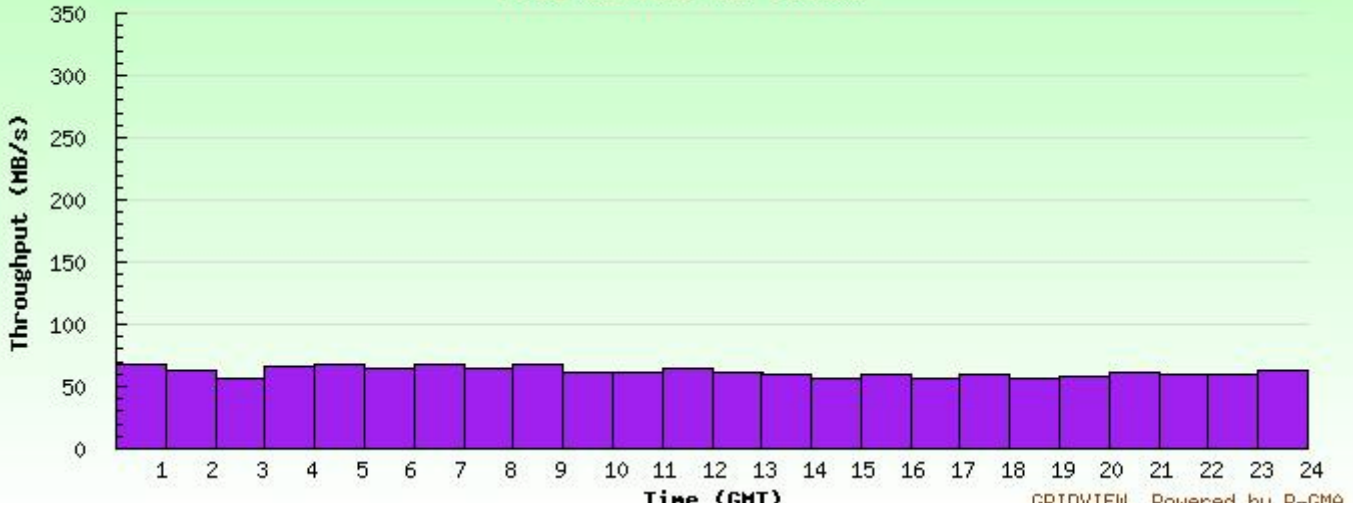


Easter Sunday:
> 1.6GB/s including DESY

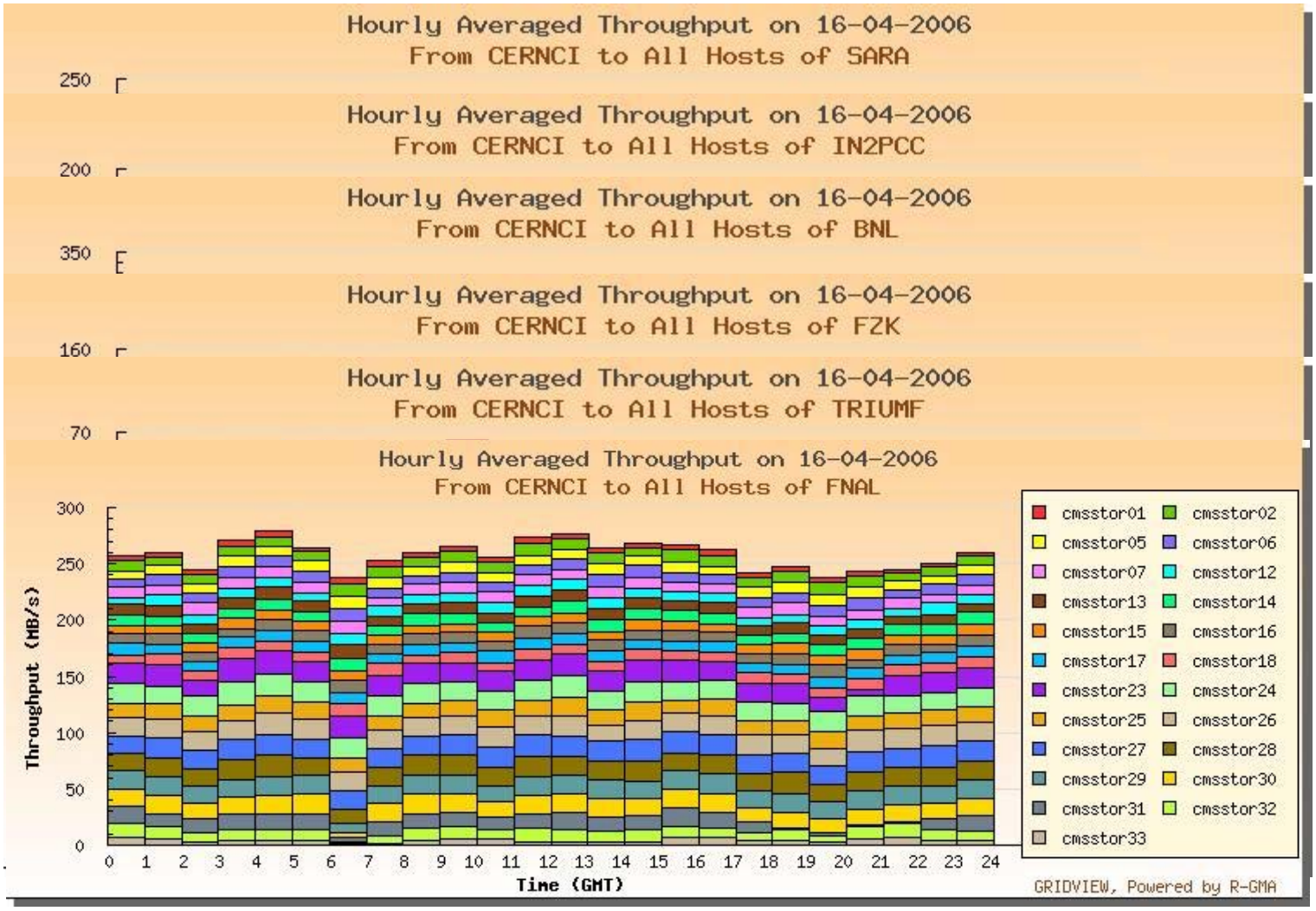


GridView reports 1614.5MB/s as daily average for 16-04/2006

Hourly Averaged Throughput on 16-04-2006
From CERNCI to ASGC
Hourly Averaged Throughput on 16-04-2006
From CERNCI to BNL
Hourly Averaged Throughput on 16-04-2006
From CERNCI to CNAF
Hourly Averaged Throughput on 16-04-2006
From CERNCI to FNAL
Hourly Averaged Throughput on 16-04-2006
From CERNCI to FZK
Hourly Averaged Throughput on 16-04-2006
From CERNCI to IN2PCC
Hourly Averaged Throughput on 16-04-2006
From CERNCI to NDGF
Hourly Averaged Throughput on 16-04-2006
From CERNCI to PIC
Hourly Averaged Throughput on 16-04-2006
From CERNCI to RAL
Hourly Averaged Throughput on 16-04-2006
From CERNCI to SARA
Hourly Averaged Throughput on 16-04-2006
From CERNCI to TRIUMF



Site by Site Detail



Next targets (backlog)

Centre	ALICE	ATLAS	CMS	LHCb	Rate into T1 (pp) Disk-Disk (SRM) rates in MB/s
ASGC, Taipei	-	✓	✓	-	150
CNAF, Italy	✓	✓	✓	✓	300
PIC, Spain	-	✓	✓	✓	150
IN2P3, Lyon	✓	✓	✓	✓	300
GridKA, Germany	✓	✓	✓	✓	300
RAL, UK	-	✓	✓	✓	225
BNL, USA	-	✓	-	-	300
FNAL, USA	-	-	✓	-	300
TRIUMF, Canada	-	✓	-	-	75
SARA, NL	✓	✓	-	✓	225
Nordic Data Grid Facility	✓	✓	-	-	75

Need to vary some key parameters (filesize, number of streams etc) to find sweet spot / plateau.
Needs to be consistent with actual transfers during data taking

Summary

- We did not sustain a daily average of 1.6MB/s out of CERN nor the full nominal rates to all Tier1s for the period
  - Just under 80% of target in week 2
- Things clearly improved --- both since SC3 and during SC4:
  - Some sites meeting the targets!
  - Some sites 'within spitting distance' – optimisations? Bug-fixes?
    - See blog for CNAF castor2 issues for example…
  - Some sites still with a way to go…
- "Operations" of Service Challenges still very heavy
  - Special thanks to Maarten Litmaath for working > double shifts…
  - Need more rigour in announcing / handling problems, site reports, convergence with standard operations etc.
- Remember the "Carminati Maxim":

"If its not there for SC4, it won't be for the production service in October…"

(and vice-versa)

Postscript

- Q: Well, 80% of target is pretty good isn't it?
- A: Yes and no.
- We are still testing a simple (in theory) case.
- How will this work under realistic conditions, including other concurrent (and directly related) activities at the T0 and T1s?
  - See Bernd's tests…
- We need to be running comfortably at 2-2.5GB/s day-in, day-out and add complexity step by step as things become understood and stable.
- And anything requiring >16 hours of attention a day is not going to work in the long term…