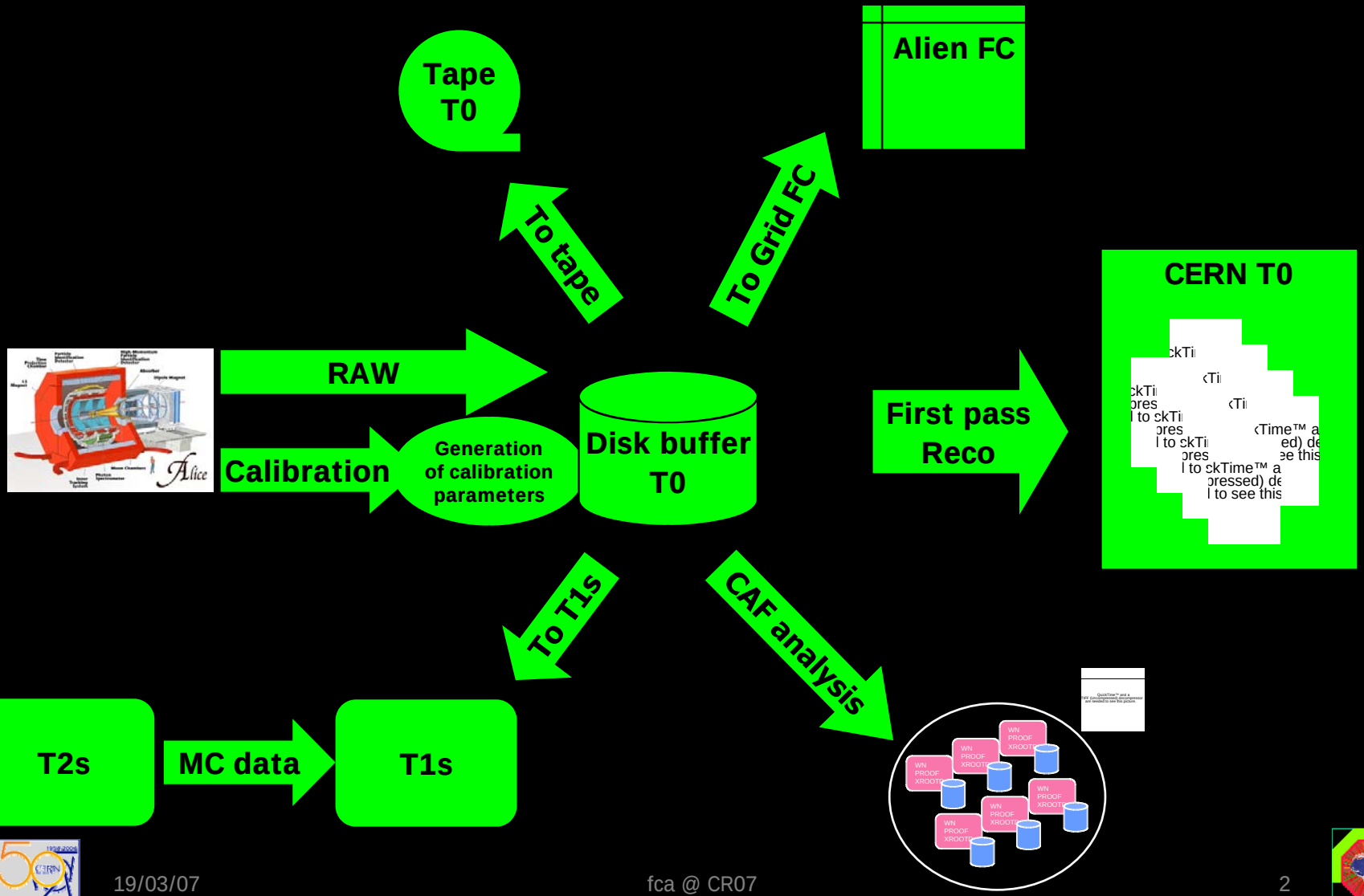
ALICE Computing Resources

Federico Carminati

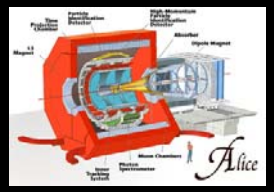
LHCC – March 19, 2007

Computing model – pp



Computing model – AA

HI data taking



RAW

Calibration

Generation of calibration parameters

Disk buffer T0

Tape T0

From tape

To Grid FC

Alien FC

First pass Reco

CERN T0

LHC shutdown

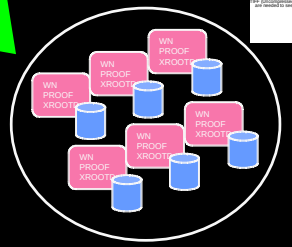
T2s

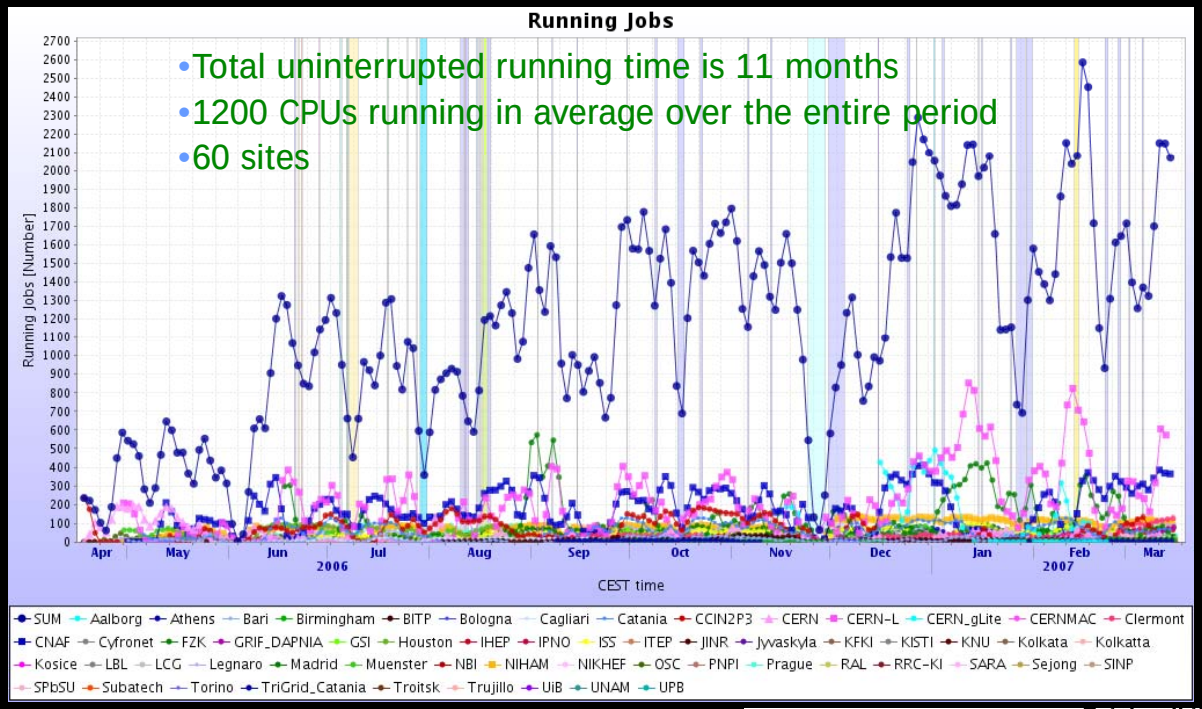
MC data

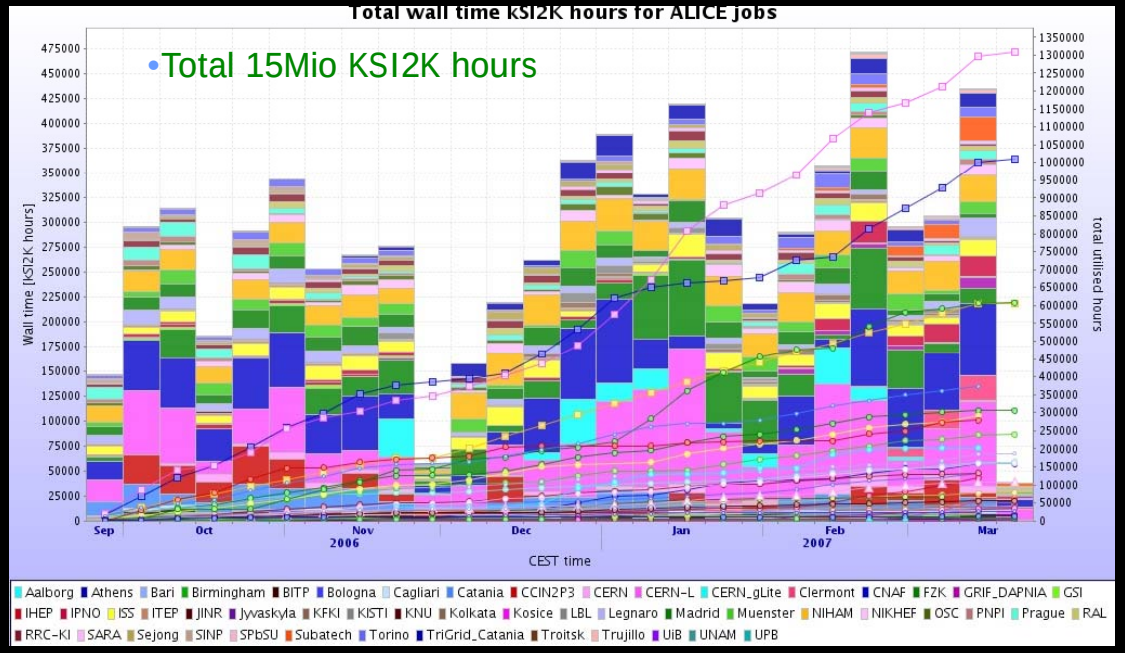
T1s

To T1s

CAF analysis




Running Jobs
•Total uninterrupted running time is 11 months
•1200 CPUs running in average over the entire period
•60 sites
Running jobs [Number]
CEST time
Apr May Jun Jul Aug Sep Oct Nov Dec Jan Feb Mar
2006
2007
SUM Aalborg Athens Bari Birmingham BITP Bologna Cagliari Catania CCIN2P3 CERN CERN-L CERN_gLite CERNMAC Clermont
CNAF Cyfronet FZK GRIF_DAPNIA GSI Houston IHEP IPNO ISS ITEP JINR Jyvaskyla KFKI KISTI KNU Kolkata Kolkatta
Kosice LBL LCG Legnaro Madrid Muenster NBI NIHAM NIKHEF OSC PNPI Prague RAL RRC-KI SARA Sejong SINP
SPbSU Subatech Torino TriGrid_Catania Troitsk Trujillo UiB UNAM UPB


Total wall time kSI2K hours for ALICE jobs
•Total 15Mio KSI2K hours
Wall time [kSI2K hours]
total utilised hours
CEST time
Sep Oct Nov Dec Jan Feb Mar
2006
2007
Aalborg Athens Bari Birmingham BITP Bologna Cagliari Catania CCIN2P3 CERN CERN-L CERN_gLite Clermont CNAF FZK GRIF_DAPNIA GSI
IHEP IPNO ISS ITEP JINR Jyvaskyla KFKI KISTI KNU Kolkata Kosice LBL Legnaro Madrid Muenster NIHAM NIKHEF OSC PNPI Prague RAL
RRC-KI SARA Sejong SINP SPbSU Subatech Torino TriGrid_Catania Troitsk Trujillo UiB UNAM UPB

Inter-Site Rates – Revised Megatable

Centre	T0->T1	T1->T2	T2->T1	T1<->T1
	Predictable – Data Taking	*Bursty – User Needs*	Predictable – Simulation	Scheduled Reprocessing
IN2P3, Lyon	220	286.2	85.5	496.0
GridKA, Germany	220	384.9	84.1	395.6
CNAF, Italy	190	321.3	58.4	583.8
FNAL, USA	110	415.0	52.6	417.0
BNL, USA	300	137.7	24.8	358.0
RAL, UK	120	108.3	36.0	479.4
NIKHEF, NL	160	34.1	6.1	310.4
ASGC, Taipei	120	126.5	19.3	241.2
PIC, Spain	100	167.1	23.3	294.5
Nordic Data Grid Facility	60	-	-	62.4
TRIUMF, Canada	60	-	-	59.0

Courtesy of J.Shiers

WLCG Commissioning Schedule

2006

2007

2008

Continued testing of computing models, basic services

Testing DAQ → Tier-0 (? ?) & integrating into DAQ → Tier-0 → Tier-1 data flow

Building up end-user analysis support

Exercising the computing systems, ramping up job rates, data management performance, ….

AliRoot & Conditions fwks

SEs & Job priorities

Continue DC mode, as per WLCG commissioning

Combined T0 test

DA for calibration ready

Finalisation of CAF & Grid

The real thing

SC4 – becomes initial service when reliability and performance goals met

Introduce residual services
Full FTS services; 3D; gLite 3.x; SRM v2.2; VOMS roles; SL(C)4

Initial service commissioning – increase performance, reliability, capacity to target levels, experience in monitoring, 24 x 7 operation, ….

01jul07 - service commissioned - full 2007 capacity, performance

first collisions in the LHC. Full FTS services demonstrated at 2008 data rates for all required Tx-Ty channels, over extended periods, including recovery (T0-T1).

Computing model / resources

year	Time for physics (s)	
	pp	PbPb
2007	7×10^5	0
2008	4×10^6	2×10^5
2009	6×10^6	1×10^6

- Missing computing resources will have an impact on the quality of physics produced by ALICE
- Unclear what is the right path to pass the message effectively
- Computing resource requirements are never reviewed in substance, so we are in a free competition regime

Pledged by external sites versus required (new LHC schedule)
Status Jan'07

		2007		2008		2009		2010	
		T1	T2	T1	T2	T1	T2	T1	T2
CPU	Requirement (MSI2K)	3.0	4.2	10.2	10.2	18.4	16.0	22.9	19.0
	Missing %	-7%	29%	-32%	-13%	-42%	-20%	-34%	-13%
Disk	Requirement (PB)	1.0	0.8	4.2	1.6	7.9	4.0	9.8	5.3
	Missing %	24%	485	-32%	43%	-42%	+2%	-31%	-5%
MS	Requirement (PB)	2.0	-	7.0	-	14.0	-	20.9	-
	Missing %	-26%	-	-42%	-	-53%	-	-53%	-

Resources in 2007

- In 2006, we had only 50% of the pledged resources
  - Integrate the NDGF T1 (at least 4 sites in 4 countries!)
    - Started, we have 3 / 4 sites “activated”
  - Stabilise contribution from The Netherlands T1
    - Ongoing
  - Activate the T2s in Poland
    - Started, we have 2 / 3 sites “activated”
  - Get the pledged resources from Russia
    - Stalling… but still trying
  - Integrate all the promised US resources (LLNL)
    - Slowly ongoing (LLNL) – OSC, Houston and LBNL/NERSC OK
  - Additional resources promised but not yet materialised in Korea, Japan, Mexico, China, India, South Africa, Greece, Brazil
    - Korea OK, Japan coming, for the rest…
- Still the work of bringing in new resources is exhausting
- Some of the pledges have been “decreasing”

Summary of Regional Centre Capacities

1/2/07

Tier-1 Planning for 2008		ALICE	ATLAS	CMS	LHCb	SUM 2008
CPU - MSI2K	Offered	6.7	24.0	12.0	5.0	47.7
	New Requirements	10.1	18.1	12.4	1.8	42.4
	Balance	-33%	32%	-3%	182%	13%
Disk - PBytes	Offered	2.8	13.1	5.7	2.5	24.1
	New Requirements	4.1	9.9	5.6	1.0	20.6
	Balance	-33%	32%	3%	140%	16%
Tape - PBytes	Offered	3.1	9.0	9.6	1.9	23.6
	New Requirements	6.5	7.7	13.1		28.2
	Balance	-52%	17%	-27%		-16%

Includes current planning for all Tier-1 centres

Tier-2 Planning for 2008		ALICE	AT			UM 2008
CPU - MSI2K	Offered	6.0				49.2
	New Requirements					49.8
	Balance					-1%
Disk - PBytes	Offered					13.1
	New Requir				n/a	13.5
	Balanc				n/a	-3%
# Tier-2 federations - inclu				(31)	11 (12)	43 (50)

Tier-0 Plan			LAS	CMS	LHCb	SUM 2008
CPU - M		3	3.7	3.9	0.4	11.3
		1.8	3.7	3.9	0.4	9.8
		83%	0%	0%	0%	15%
Disk - PByt		0.1	0.2	0.3	0.3	0.8
	ments	0.0	0.2	0.3	0.3	0.8
		108%	0%	0%	0%	0%
Tape - PBytes	ered	1.2	2.4	3.6	0.6	7.8
	TDR Requirements	0.8	2.4	3.6	0.6	7.4
	Balance	50%	0%	0%	0%	5%

CAF Planning for 2008		ALICE	ATLAS	CMS	LHCb	SUM 2008
CPU - MSI2K	Offered	3.9	2.1	3.8	0.0	9.8
	TDR Requirements	0.9	2.1	3.8	0.0	6.8
	Balance	333%	0%	0%	0%	44%
Disk - PBytes	Offered	1.0	1.0	1.3	0.1	3.3
	TDR Requirements	1.2	1.0	1.3	0.1	3.6
	Balance	-21%	0%	0%	0%	-7%
Tape - PBytes	Offered	1.2	0.4	1.5	0.0	3.0
	TDR Requirements	1.8	0.4	1.5	0.0	3.6
	Balance	-34%	0%	0%	0%	-17%

This table includes the new ALICE requirements but not the updated pledges: this is why the deficit is different from the one in the previous table

Resource planning in 2008

- Note: the picture for 2009 is probably much worse
- If resources could be moved from other exps to ALICE we would be OK
- If the resources are “reduced” instead of “reassigned”, our deficit will increase!
- We need all the possible pressure on the FAs to move and not just cut resources
- Suggestions welcome!


"That's
all
folks!"