CERN-RRB-2007-021 24th April 2007

ATLAS Progress Report (part II)

(The construction and installation status of the detector systems: see Marzio Nessi in part I)

Data Acquisition and Trigger

Computing and physics preparation

LHCC milestones

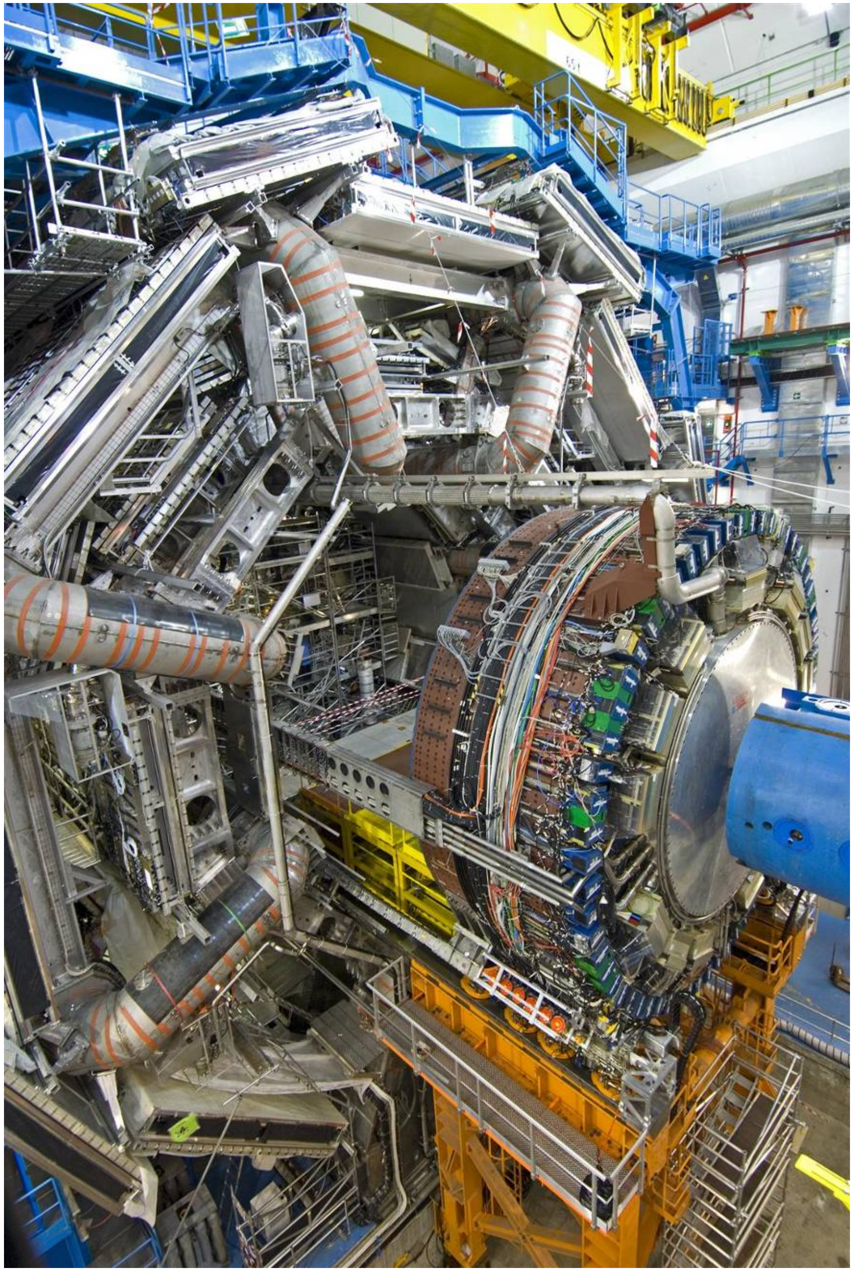
Moving towards operation

Brief account on other activities

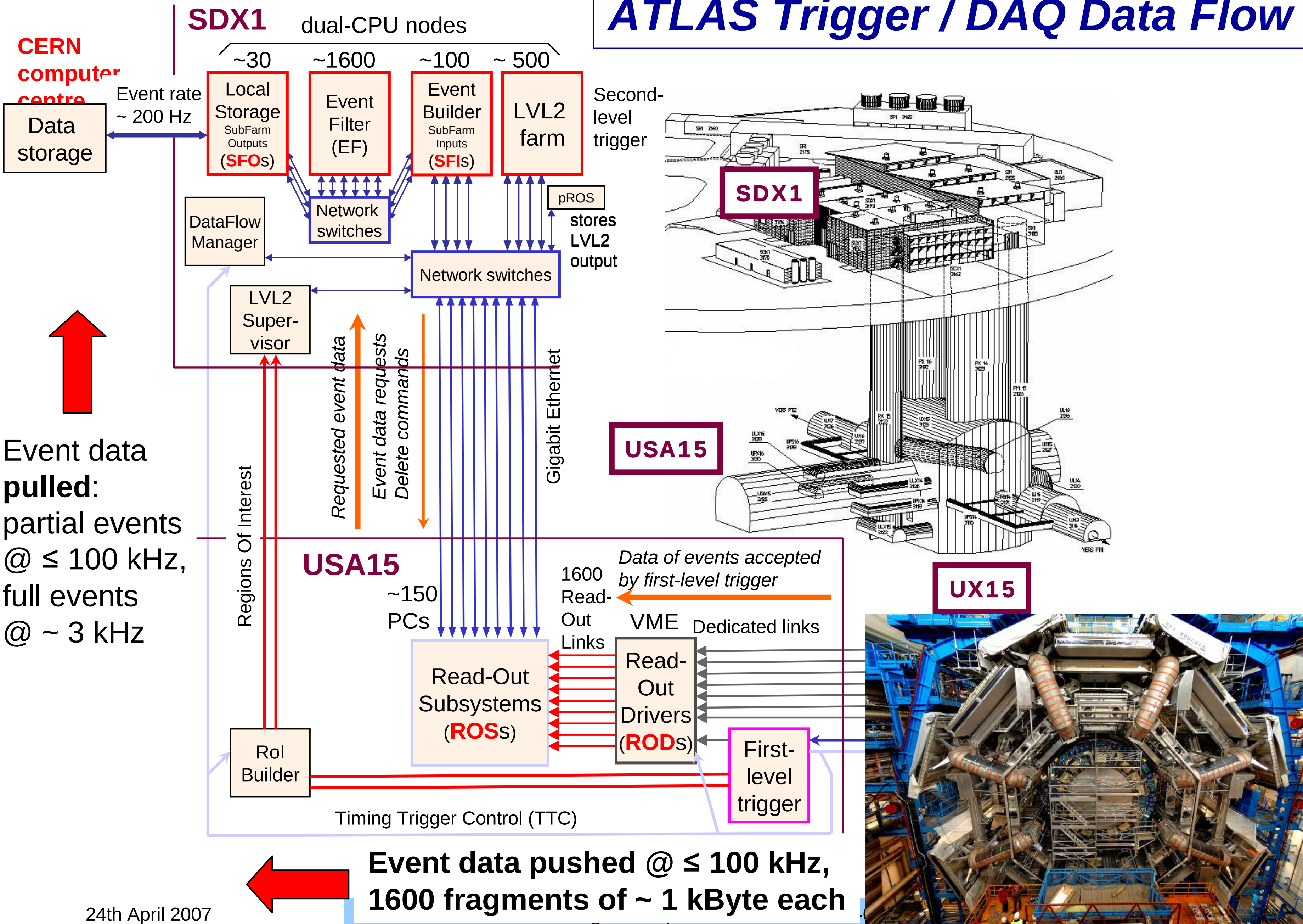
Collaboration and management

Status of completion planning

Conclusions

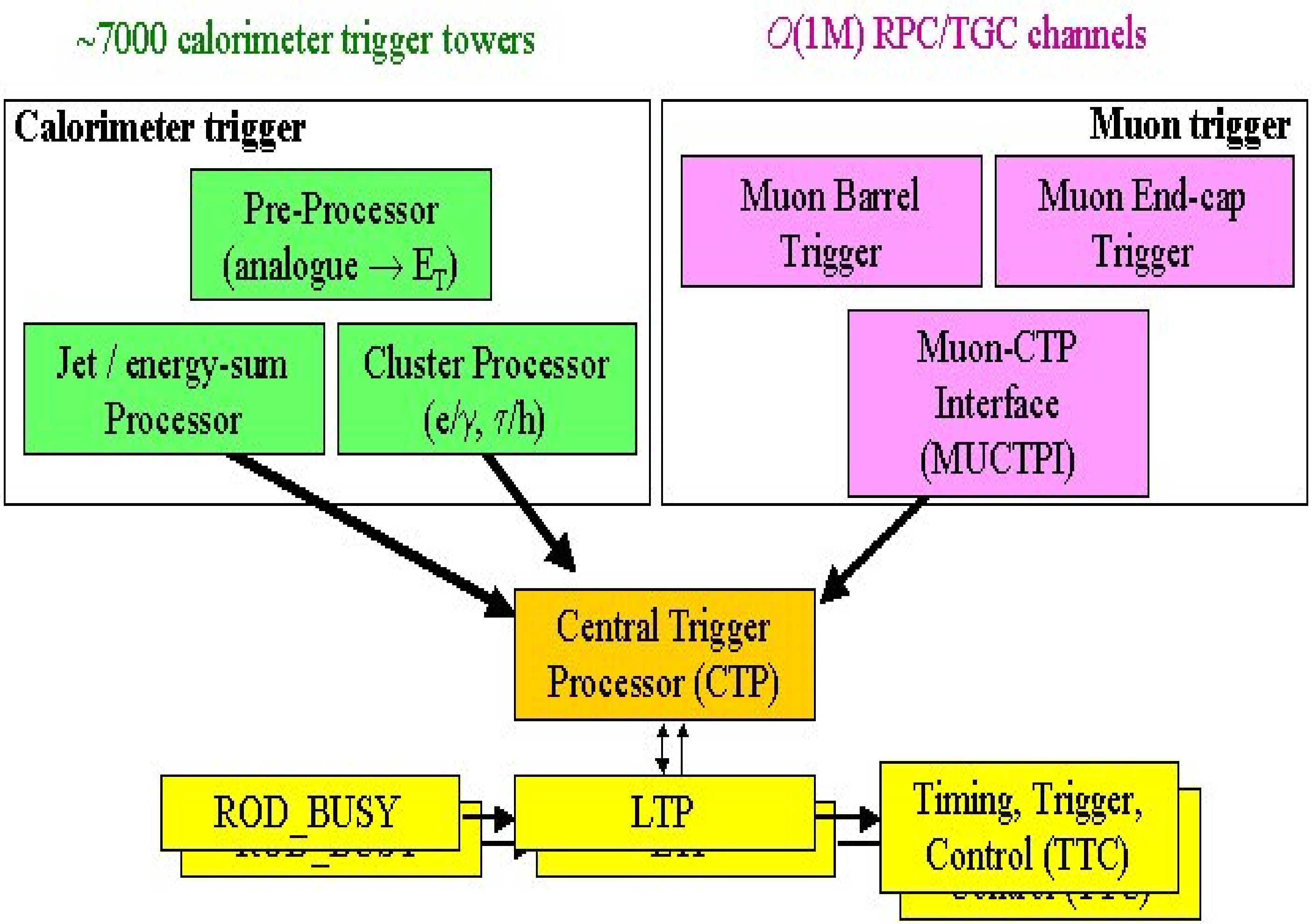


ATLAS Trigger / DAQ Data Flow



Level-1

The level-1 system (calorimeter, muon and central trigger logic) is well advanced in the production and installation phases for both the hardware and software

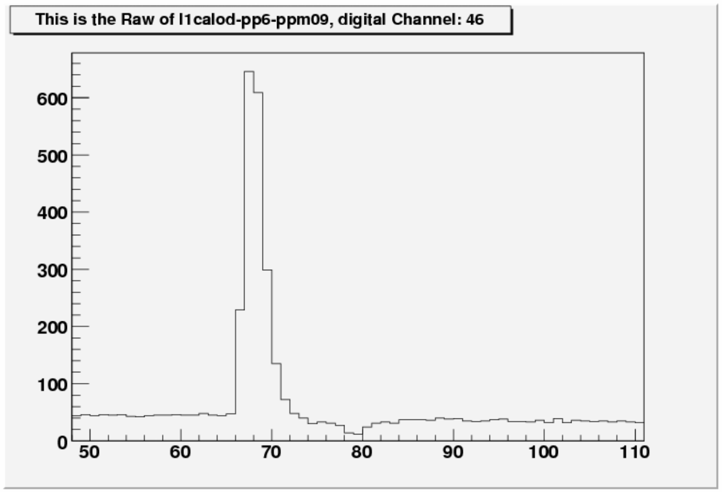


LVL1 calorimeter trigger

Installation in the underground counting room is in progress

- **Cabling, patch panels, tests with test-pulse signals from calorimeters, etc.**
- **About 90% of analog and 70% of digital cables are finished**
- **Also integration with DAQ, HLT and LVL1 CTP is progressing well**

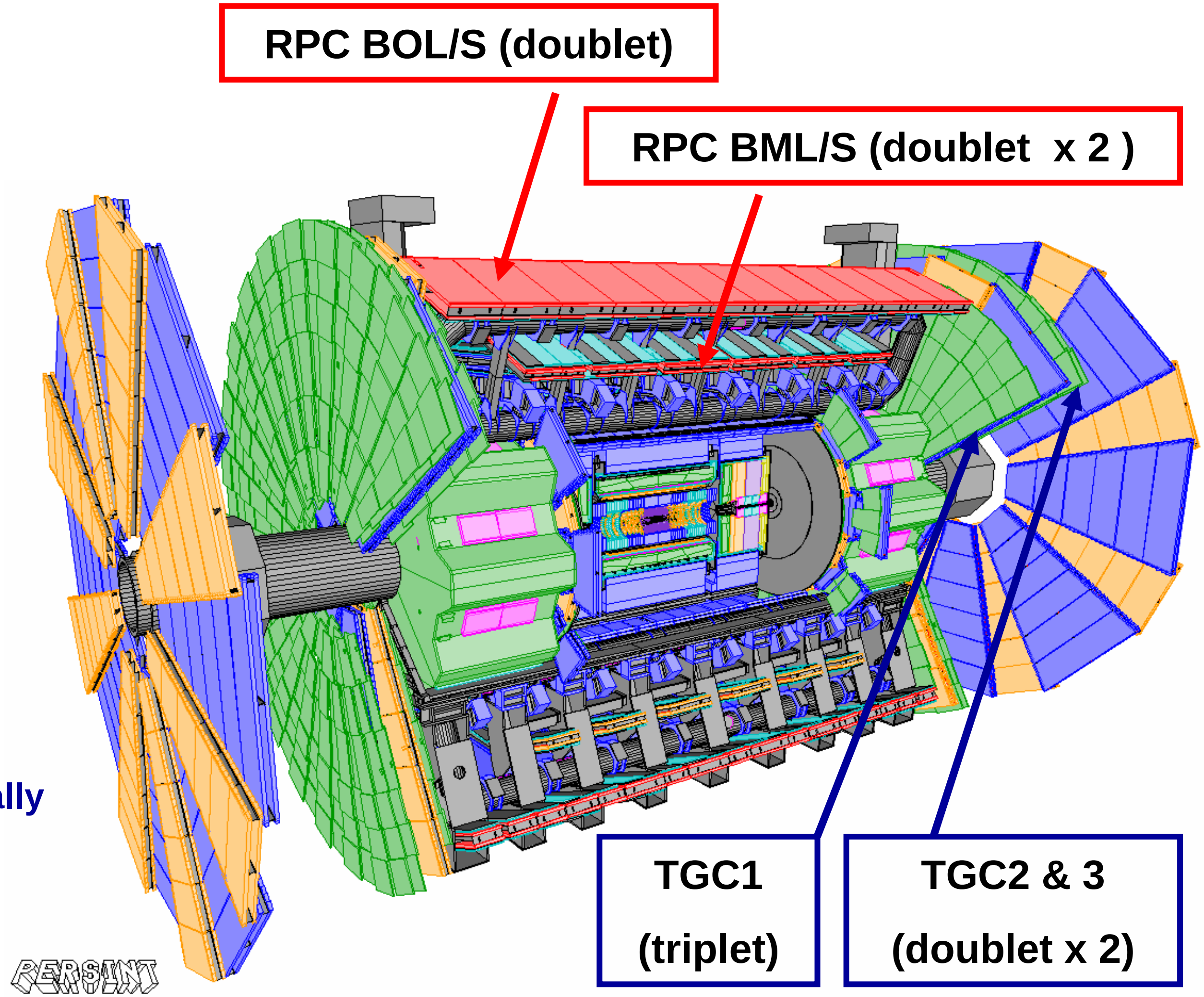
Signal integrity tests are in progress
- Example: connectivity Tiles → Preprocessors
1/8 of the Tile Calorimeter system



Preprocessor & ROD modules are the most schedule-critical items

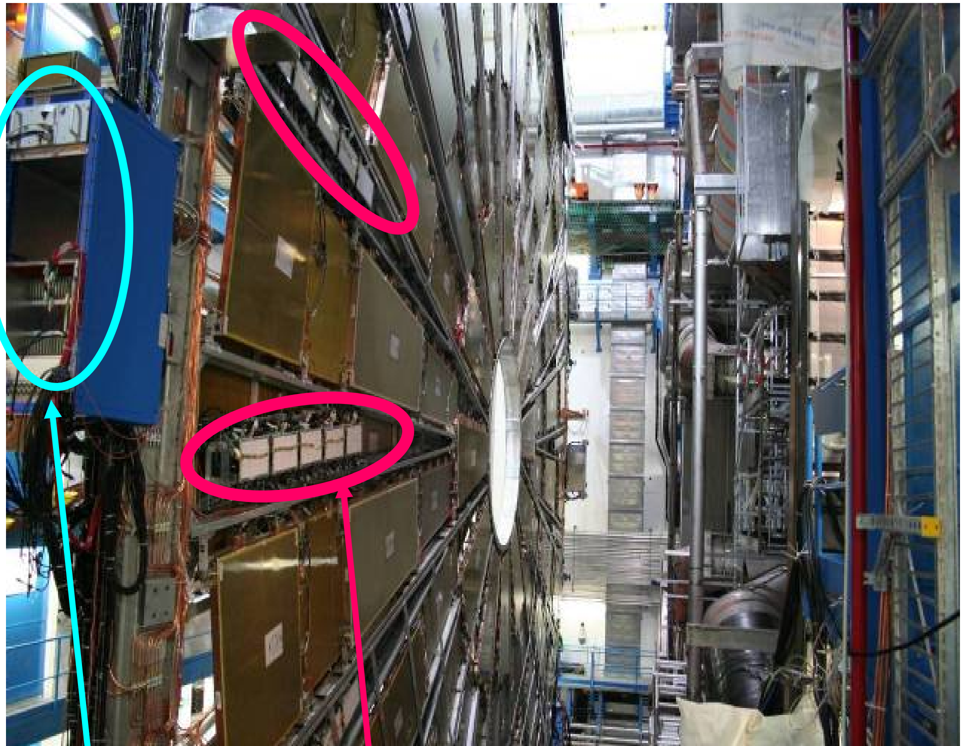
Overview of LVL1 Muon Trigger System

- **End-cap TGCs**
  - **3 Big Wheels for each A and C sides**
  - **12 sectors / wheel**
- **Barrel RPCs**
  - **3 layers of doublet**
  - **16 sectors**
- **Functionality**
  - **Identify bunch crossing having high Pt muons**
  - **Provide RoI for LVL2**
  - **Give hit position (especially 2nd coordinate) for muon tracking**



LVL1 muon trigger

End-cap TGCs



Big Wheel electronics

On-detector electronics

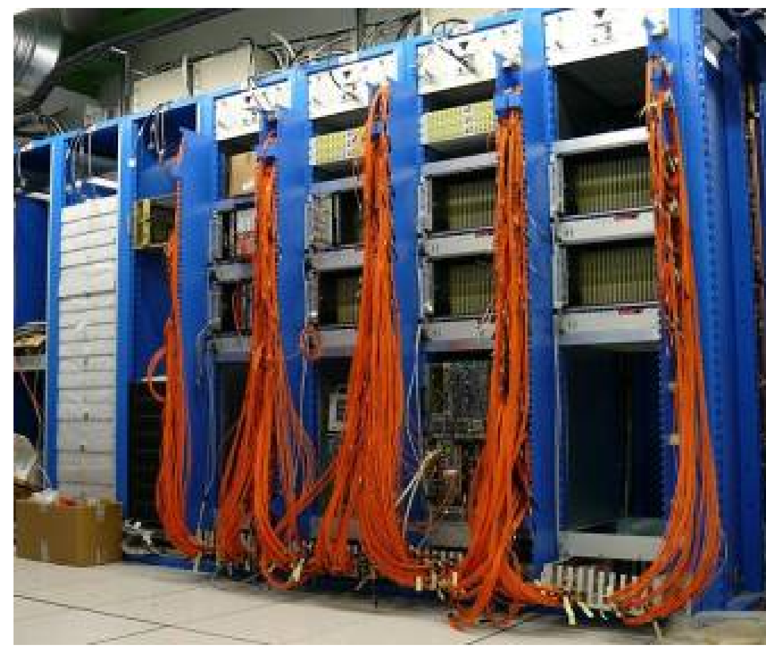
The Big Wheel installation status was given in part I;
on the critical path for commissioning are the power supplies

Barrel RPCs

All RPCs are installed, and about 60% of the detector cabling is done

The RPC trigger electronics in USA15 is progressing according to schedule

Commissioning is limited by the availability of services and power supplies



Racks and optical fibres in USA15

Installation & commissioning - Read-Out System (ROS)

All 153 ROSs are installed and standalone commissioned

- **Each ROS PC is equipped with the final number of ROBIN cards (700 in total including spares, 1600 Read-Out Links total)**

ROBIN

~60% of them connected now to RODs and fully commissioned

- **These are for the full LAr-barrel, Tile, SCT and the CTP**
- **Taking data regularly with final DAQ**

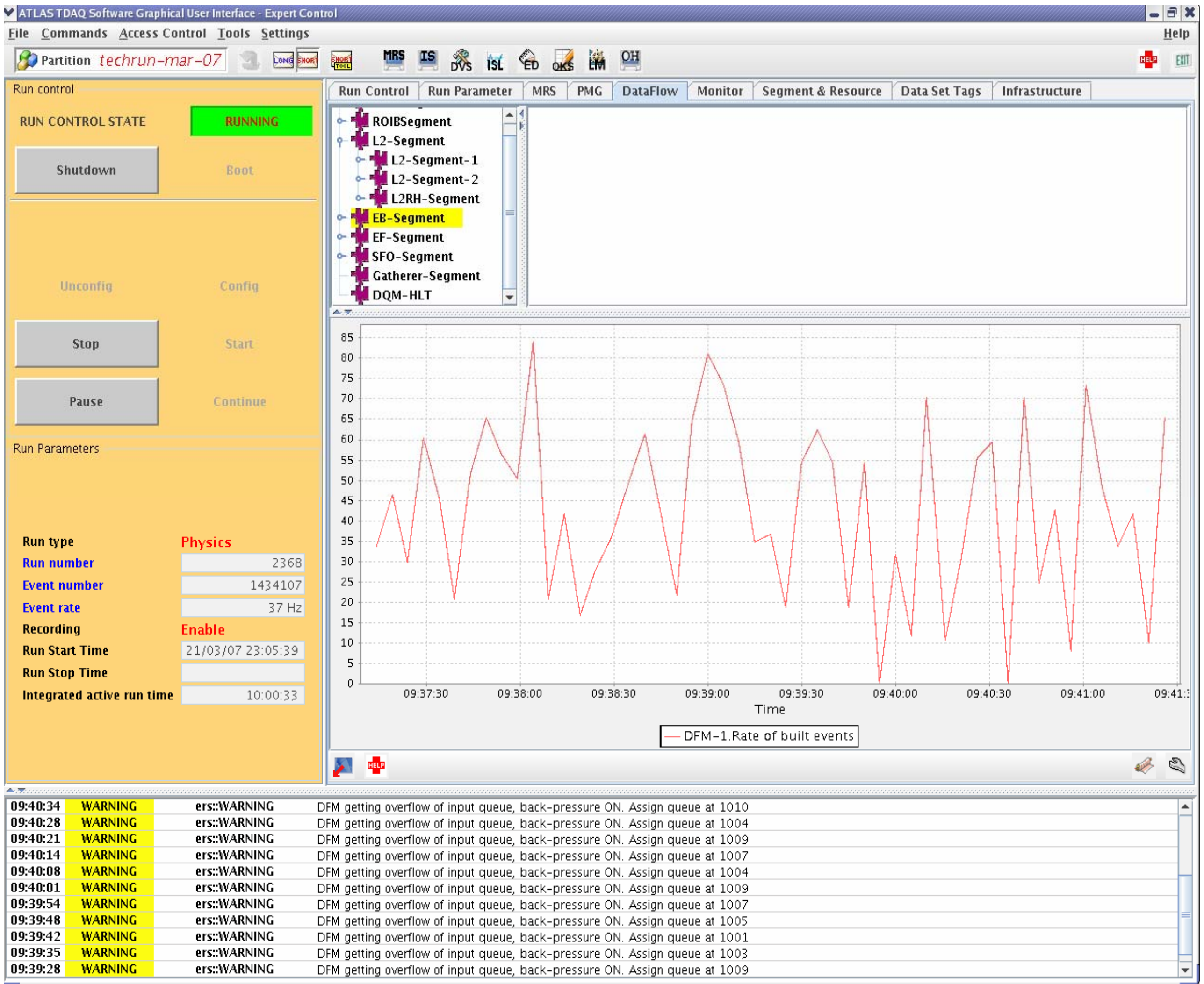
DAQ/HLT pre-series system

- **Pre-series system at Point-1 continued to be extensively used**
  - **For measurements, assessment and validation**
- **HLT algorithms started to be used as well**
  - **Thanks to substantial progress in complex software integration process**
  - **Using physics data-sets pre-loaded in ROSs**
  - **Egamma, muon, tau and jet algorithms have been integrated online**
- **Technical DAQ/HLT-runs are regularly organised**
  - **Use full chain as if it was an ATLAS run**
  - **Force focus on operational issues**
  - **Increase expertise**
  - **Reveal problems not seen on sub-system testing**

→ *extremely valuable!*

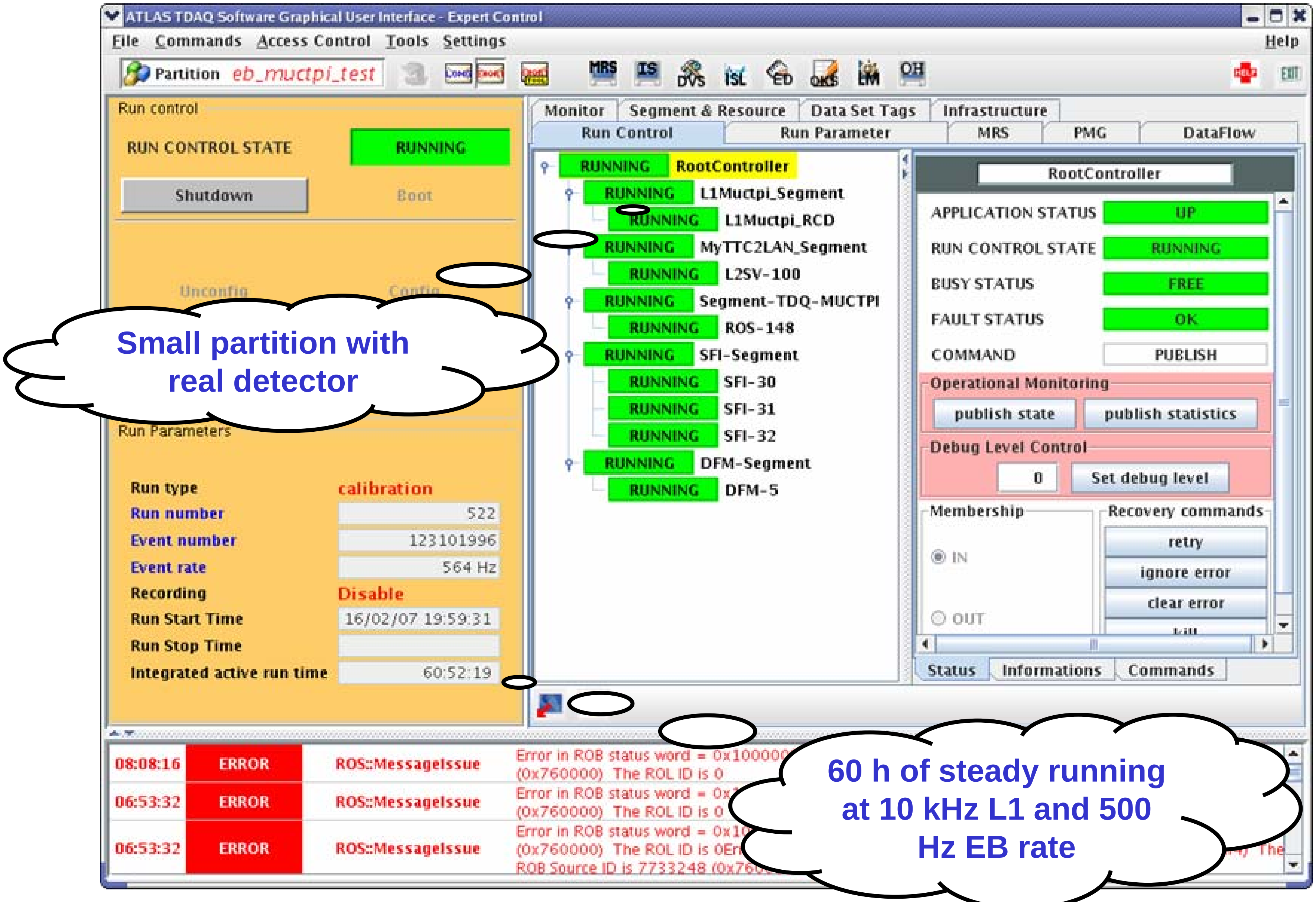
Simulated events, preloaded into the ROSs:

e/gamma - muon - jet - tau - cosmic-ray algorithms in LVL2 and Event Filter
→ Complete online validation of High-Level Trigger algorithms

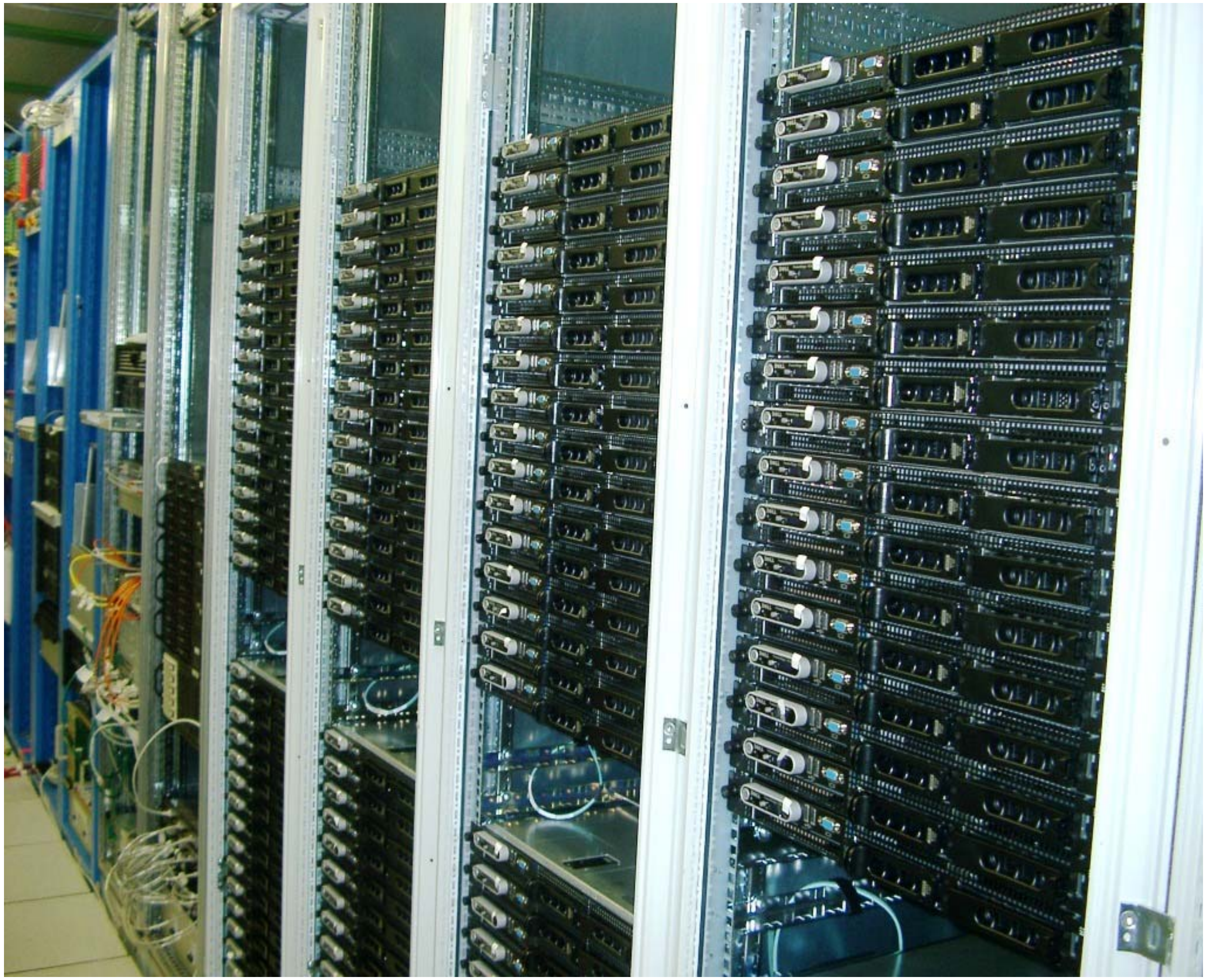


Run Control panel showing system running for ~10 h all time pushed to its limit (37 Hz average built events for this test configuration)

From a technical DAQ run … (based on 30% of the final Event Builders)



Installation & commissioning - SDX1 (surface HLT/DAQ room)



Installed in March

Ready for commissioning

Will be used in next TDAQ Technical Run in May and next ATLAS Commissioning Run in June

The first 130 HLT nodes

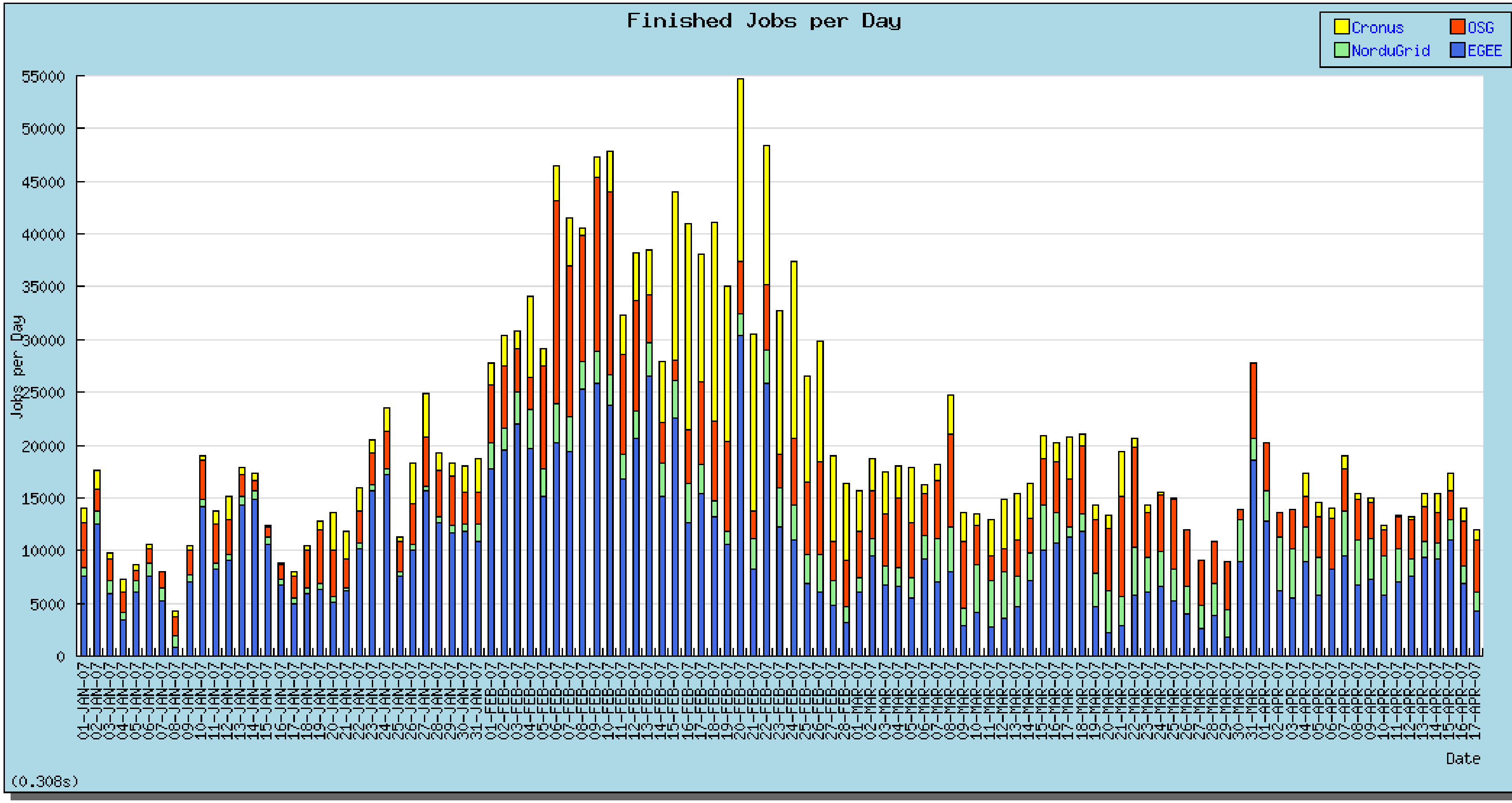
Final system: A total of ~100 racks / 2500 highest-performance multi-core PCs in final system

ATLAS Computing and Software: Timeline 2007

- Running continuously throughout the year (increasing rates):
  - Simulation production
  - Cosmic ray data-taking (detector commissioning)
- January to June:
  - Data streaming tests
- February through May:
  - Intensive Tier-0 tests
- From February onwards:
  - Data Distribution tests
- From March onwards:
  - Distributed Analysis (intensive tests)
- May to July:
  - Calibration Data Challenge

- June to October:
  - Full Dress Rehearsal
- November:
  - GO!

Example: Finished Grid production jobs since the beginning of the year

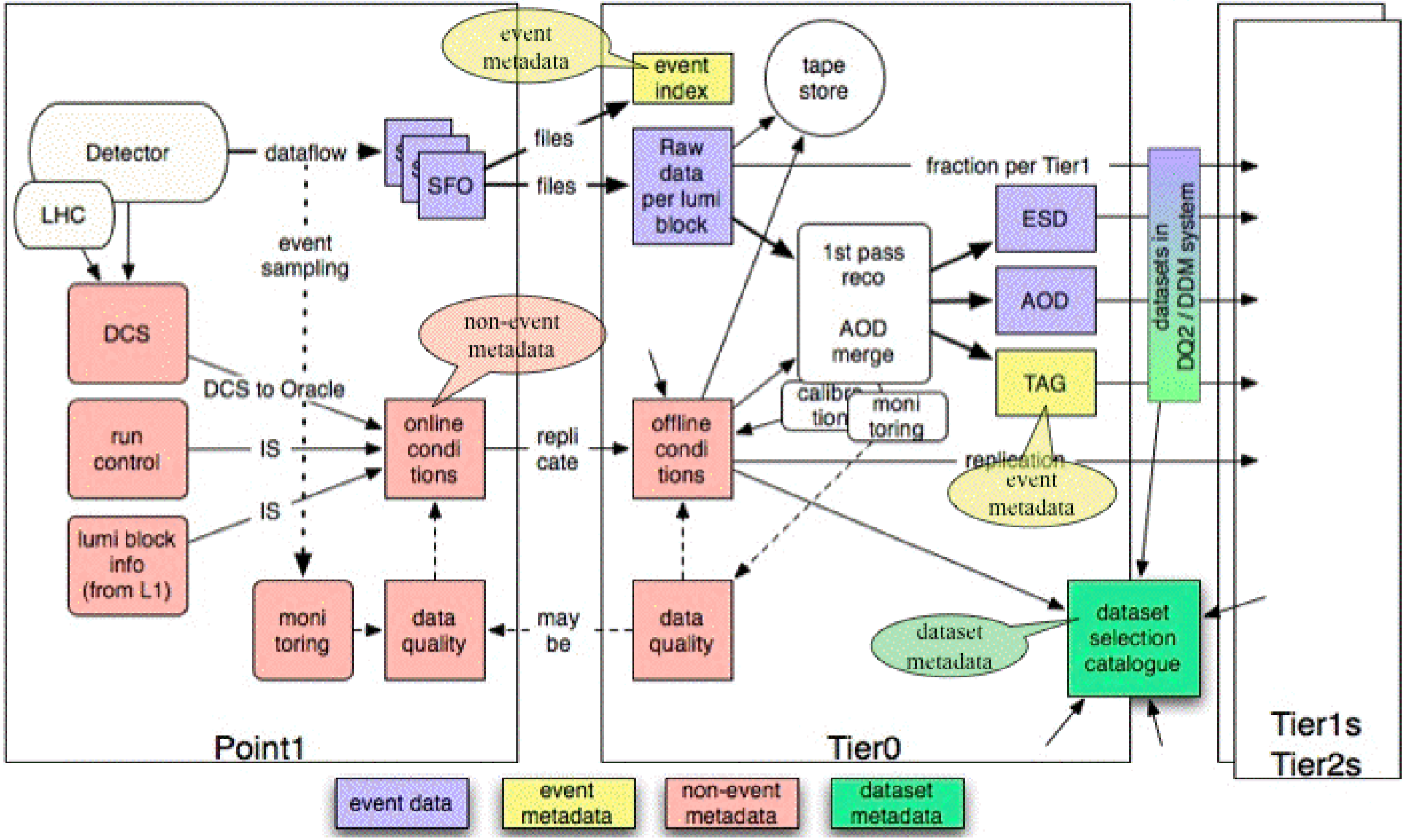


(This corresponds to about 6000 cpu-days per day, or about 3000 processors ('wall-time' per day)

Successful grid operations, but creating a disk space crisis being addressed with high priority (work on reducing event size at all stages, but also changing plans for disk/cpu purchasing ratios)

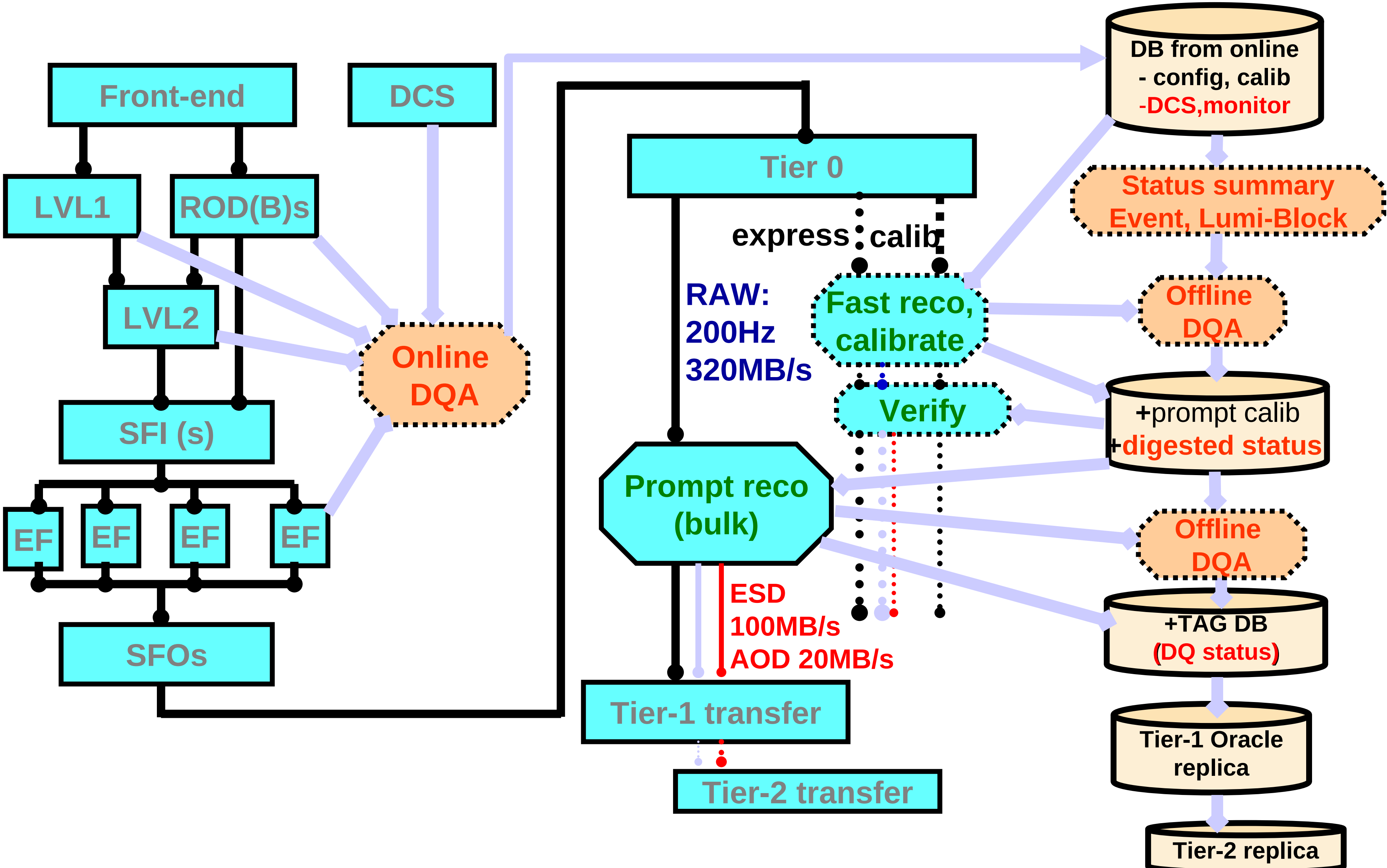
The computing M&O A service tasks were crucial for the good progress, and the increase for 2008 that will be discussed with the RRB Scrutiny Group, will address remaining operation inefficiencies

Data + Metadata from Point-1 to Tier-2s



Lots of work was done to understand and implement all needed metadata (this is all additional information needed to characterize an event or a set of events, which does not come from the main detector readout path)
Examples: run number, run type (cosmics, physics, calibration, …), detector status flag, etc.

Example from the Data Preparation: A lot of effort being made to record data quality information (at all levels of data flows) into databases (work in progress ….)

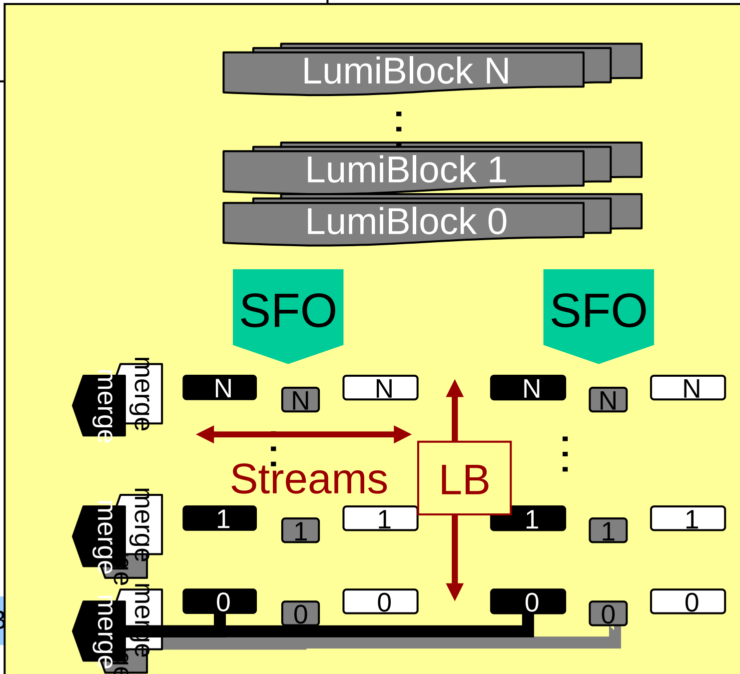


The ‘Full Dress Rehearsal’

A complete test of the final chain of data handling, distribution and analysis from last stage of TDAQ to the user’s laptop

- **Simulate 1 complete LHC fill (~10 hours of data taking) → ~7 x 10^6 events**
- **Mix and filter events at MC generator level to get correct physics mixture as expected at HLT output**
- **Pass events through G4 simulation (realistic “as installed” detector geometry)**
- **Produce byte streams → emulate raw data format**
- **Send “raw data” to Point 1, inject at Sub-Farm Output (SFO), write out events to separate streams, closing files at boundary of luminosity blocks**
- **Send events from Point 1 to Tier-0; imitate final file structure and movement**
- **Perform calibration and alignment at Tier-0/Tier-1s/Tier-2s**
- **Run reconstruction at Tier-0/Tier-1s → produce ESD, AOD, TAGs**
- **Distribute ESD, AOD, TAGs to Tier-1s and Tier-2s**
- **Perform distributed analysis**

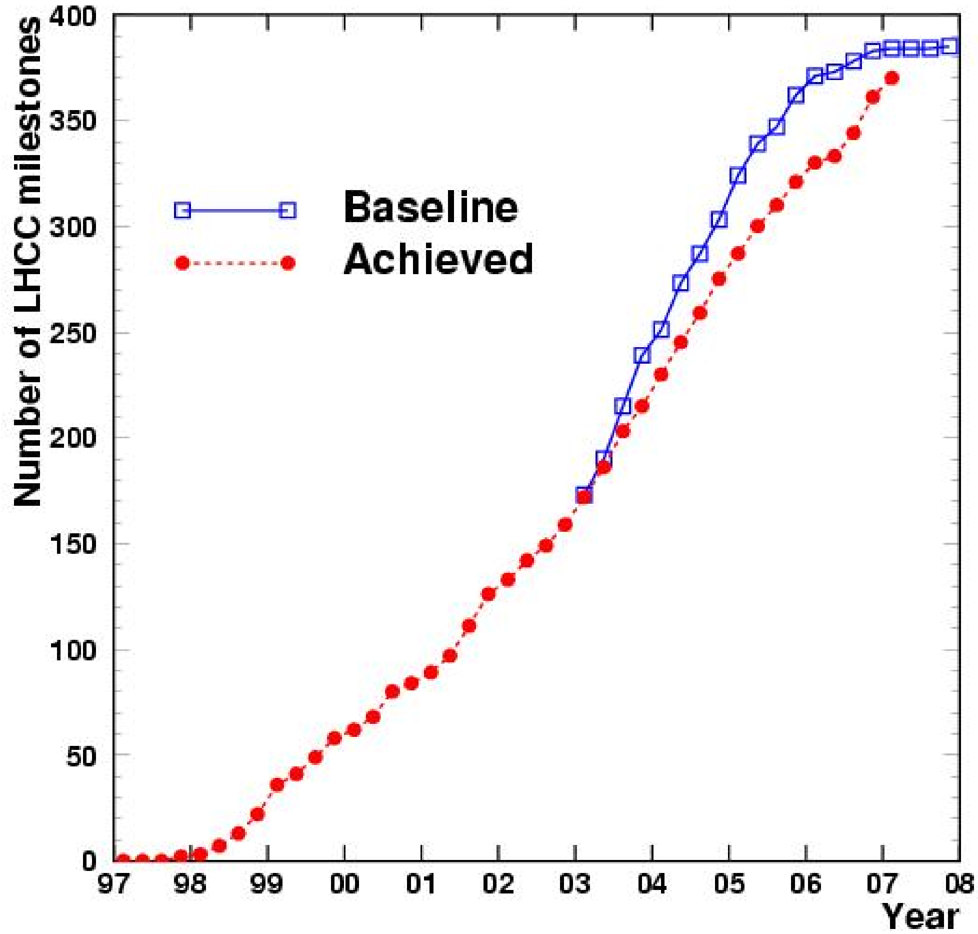
First test with 3.6 million events started (events being reconstructed now)



LHCC milestones evolution

Construction, TDAQ and computing/software had milestones agreed with the LHCC

Integrated progress plot since the baseline change in 2003



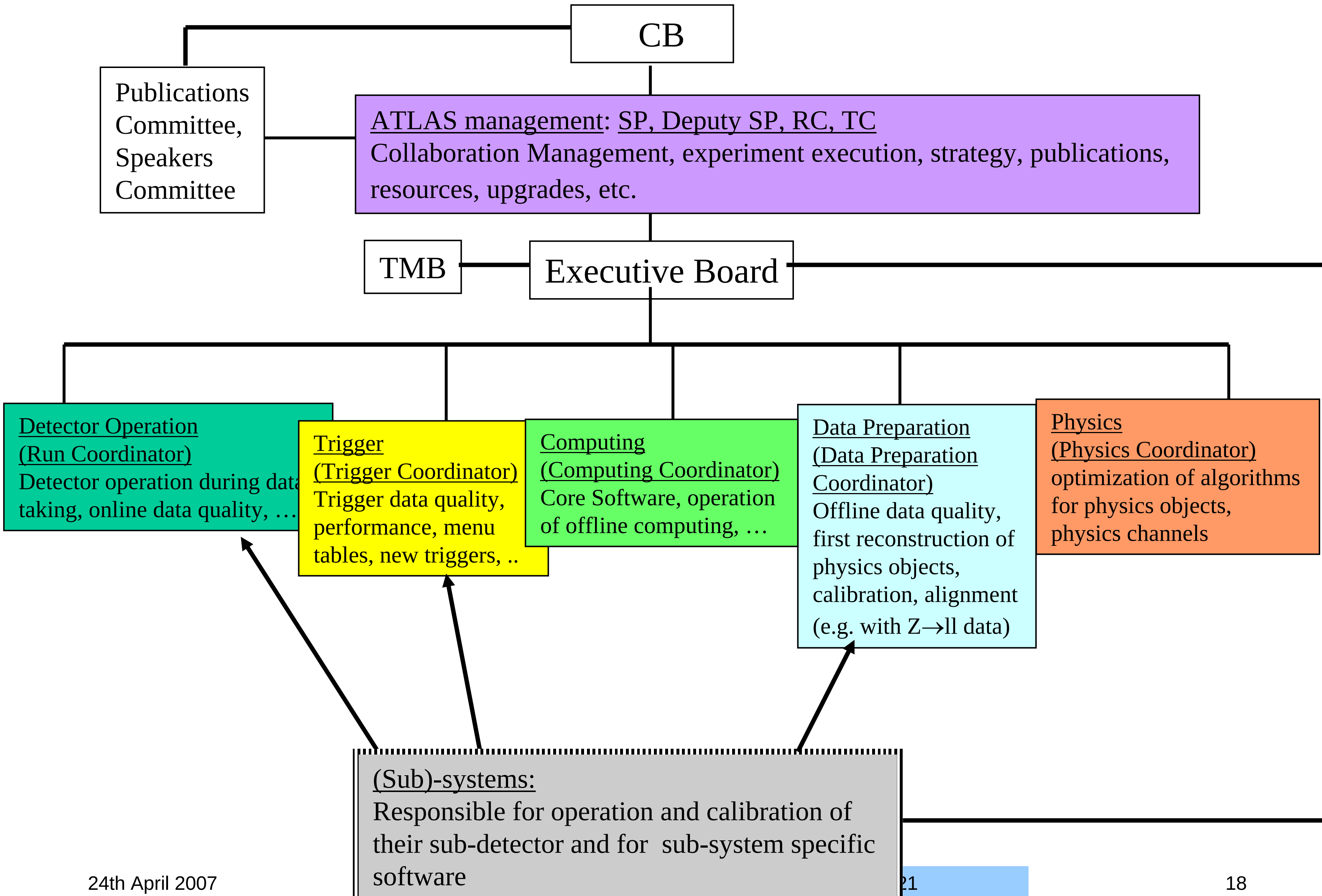
Construction/installation issues and risks ('Top-Watch List')

A list of these issues is monitored monthly by the TMB and EB, and it is publicly visible on the Web, including a description of the corrective actions undertaken:

http://atlas.web.cern.ch/Atlas/TCOORD/TMB/

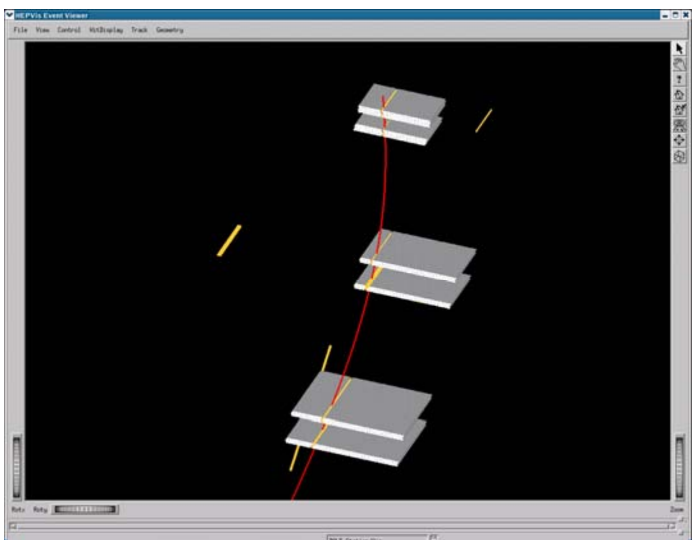
Operation Model (Organization for LHC Exploitation)

(Details can be found at http://uimon.cern.ch/twiki//bin/view/Main/OperationModel)

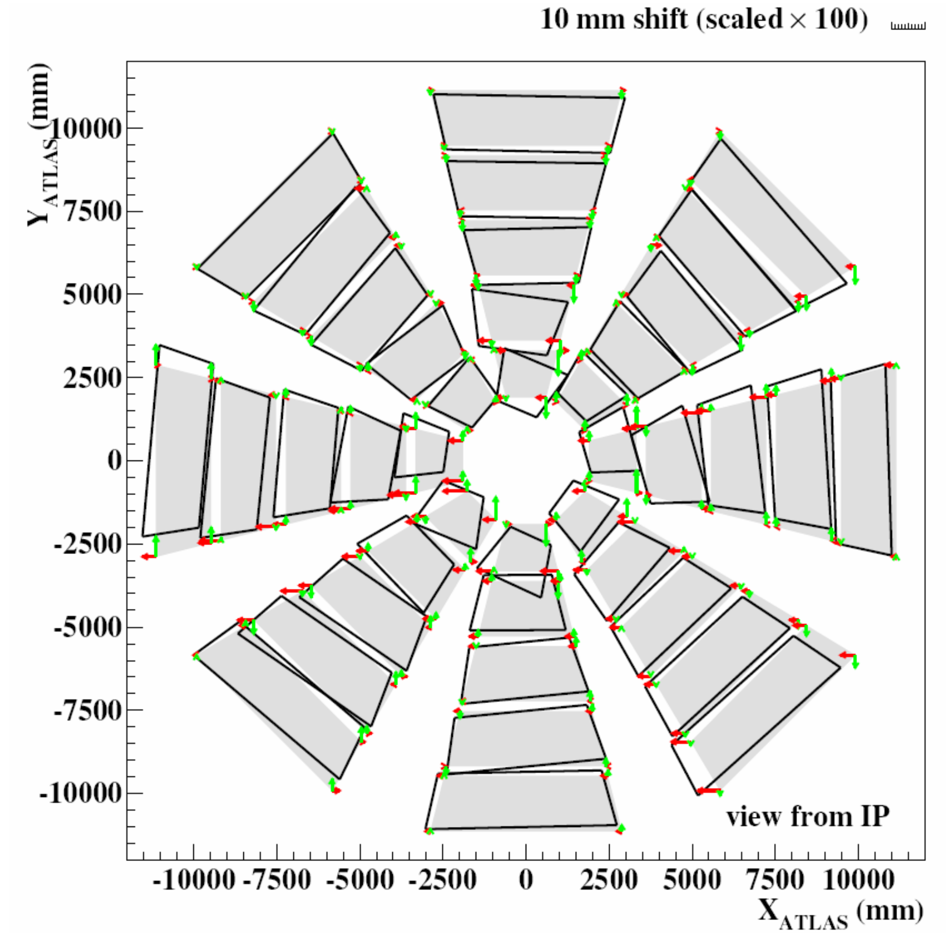


Data Preparation activities are in full swing, and now visibly under a coherent framework, spanning many areas

- *Monitoring*
- *Quality Assessment*
- *Offline Commissioning*
- *Calibration*
- *Alignment*
- *B-fields*
- *Event Display*
- *…*



Cosmic muon during BT test



Example: The TGC and MDT Big Wheel alignment checks during mounting and displacements are operational

The ATLAS Experiment

OPERATION | ATLAS Cavern Webcam | Collaboration

Operation Meetings | Commissioning Pages

LHC Members

Phones

Search

Services

EDH | EDMS | CATIA | Rack | TWiki

- Operation Schedule
- E-logbook
- On Call Phones
- Piquet services
- Support services
- Shifts
- Working at Point 1
- Safety in ATLAS
- Documentation
- Wiki Pages
- LINKS

Desktops WWW	Status	Status
• Run Control • DATA Quality • Controls (DCS) • SLIMOS (DSS, infrastructure, magnets, cryogenics, services,...) • Inner Detector • LArg Calorimeter • Tile Calorimeter • Muon Spectrometer • LVL1 Trigger • HLT • DAQ • Tier0	**Overall** Inner Detector LArg Calorimeter Tile Calorimeter Muon Spectrometer LVL1 Trigger HLT DAQ DCS Data Quality	**SLIMOS** Magnets Luminosity LHC-machine Counting rooms Gas Distribution Detector Cooling Sysadmin

Posted News

Monday March 26, 2007

08:00 / Interventions / DSS commissioning of US15/US15 level 2

08:00 / Interventions / Exchange of primary DNS server - point 1/CR

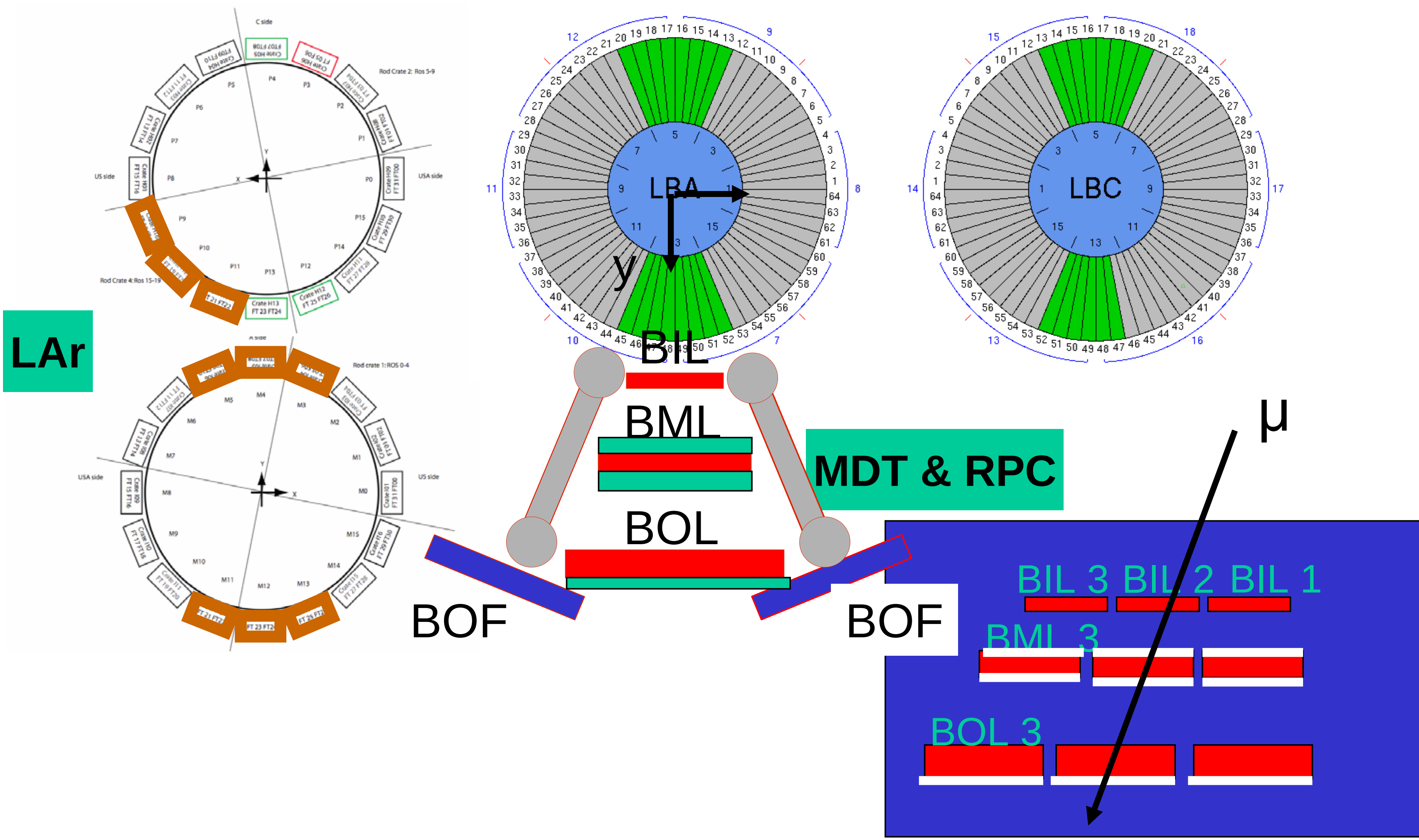
08:00 / Interventions / Front End Cooling Intervention/USA15 - CV area

ATLAS Main Control Room

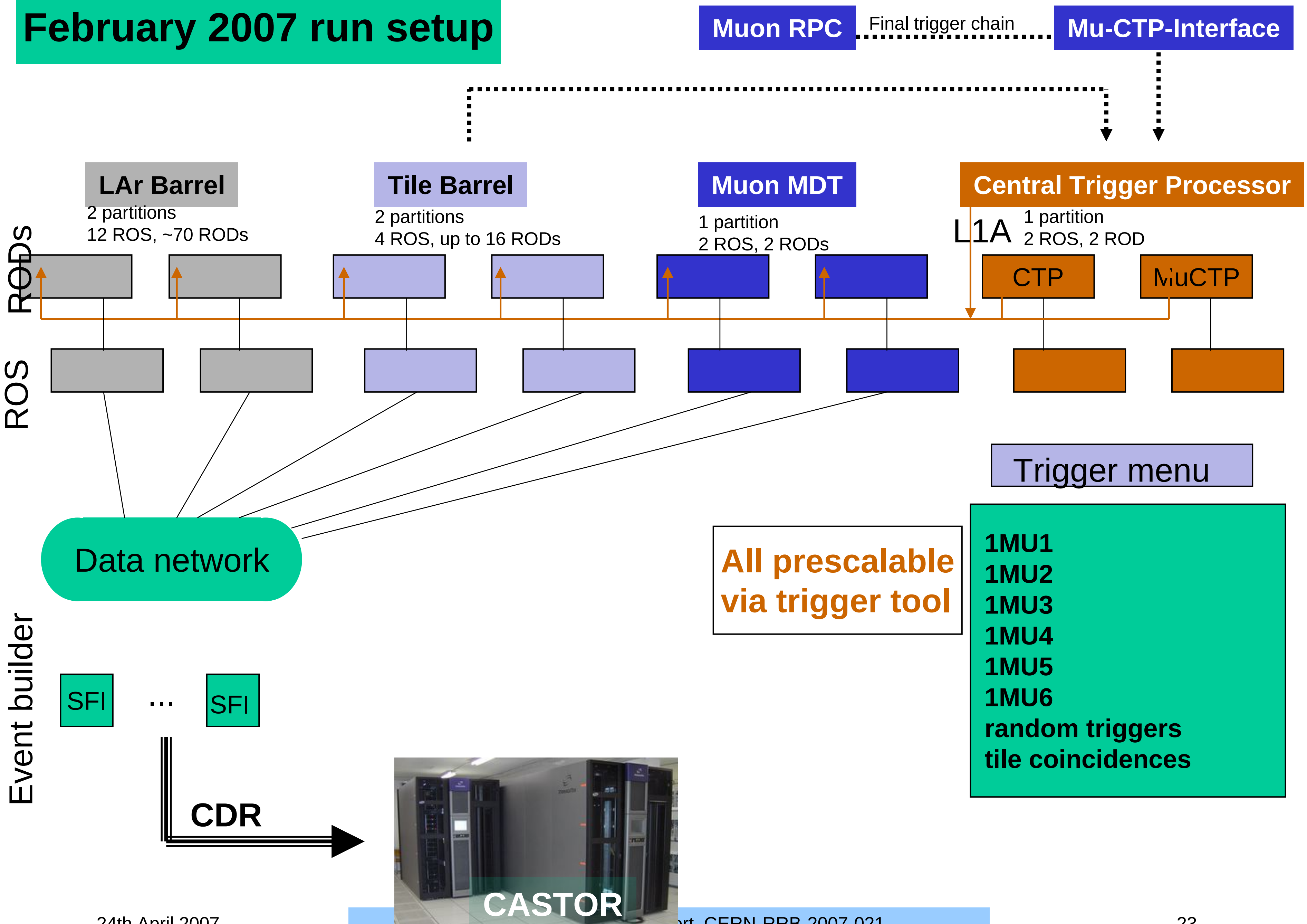
The control room is operational and used during the cosmic ray commissioning runs which are integrating gradually more and more detector components

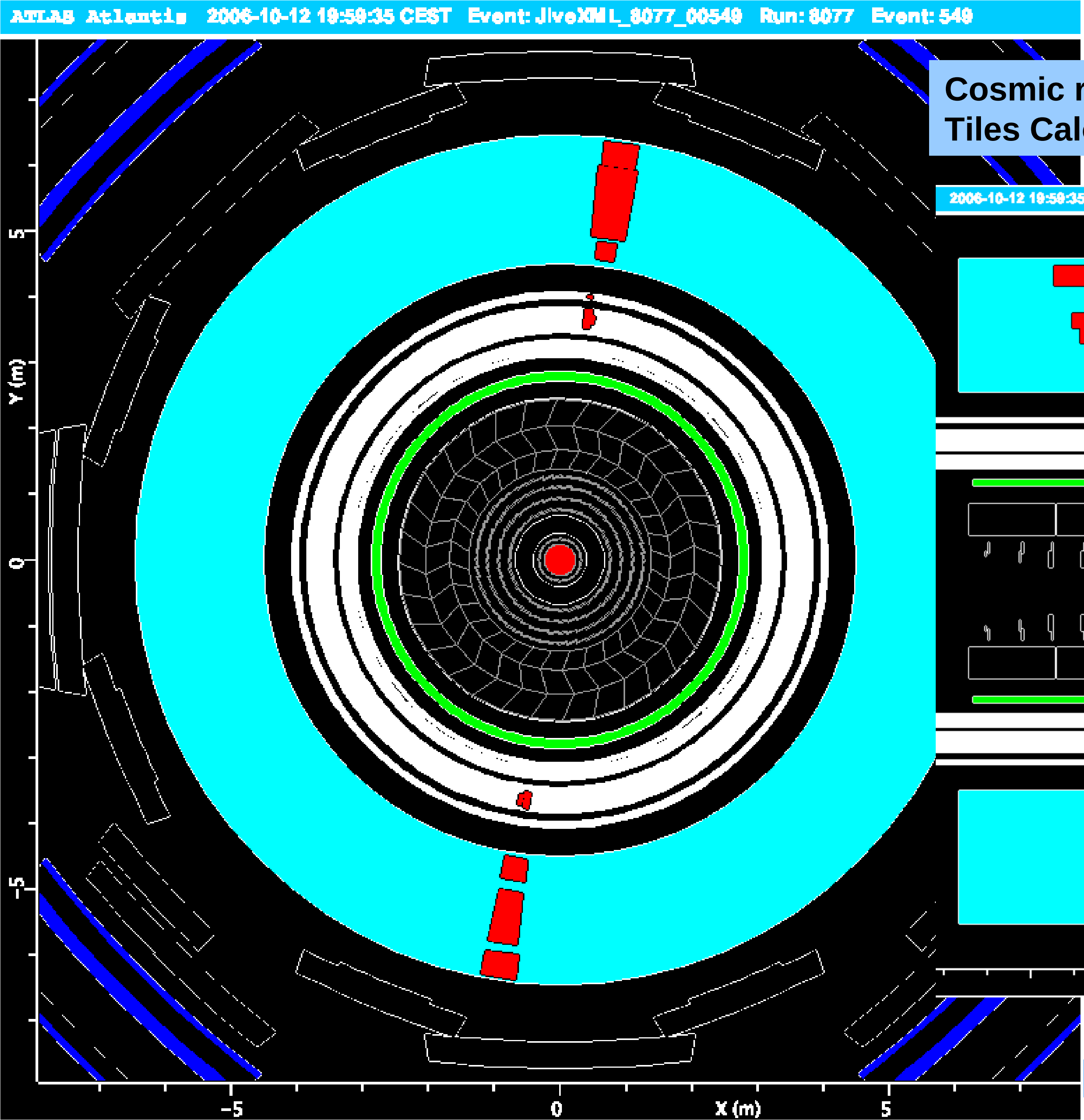
Cosmic ray data are collected through segments of the full final Event Building and DAQ system

Subdetectors involved in the February - March 2007 combined run

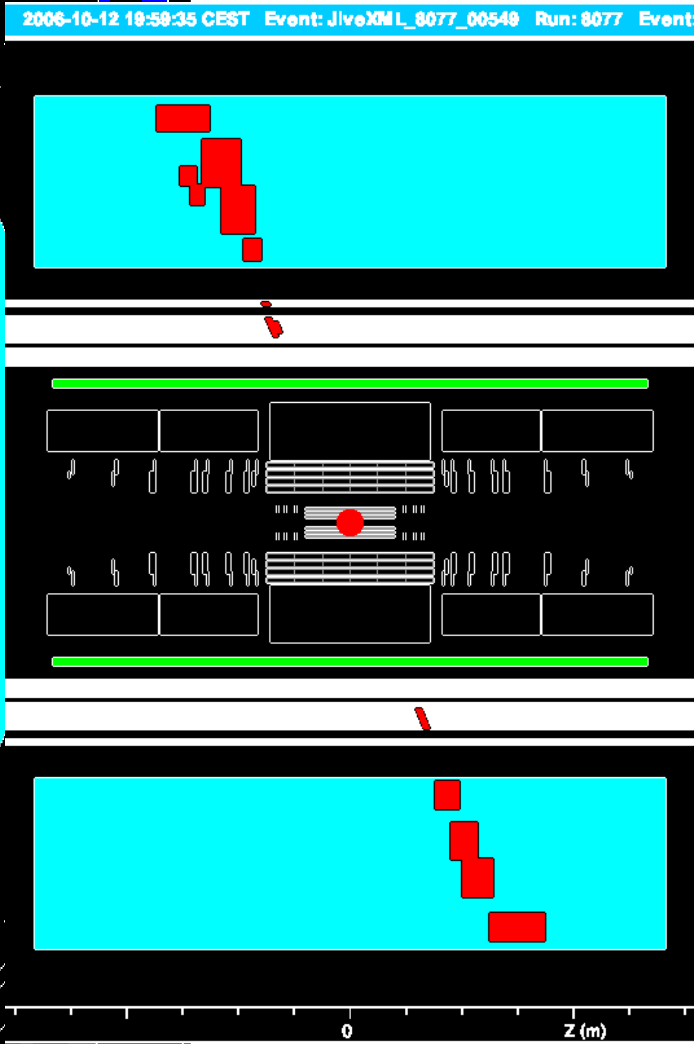


February 2007 run setup

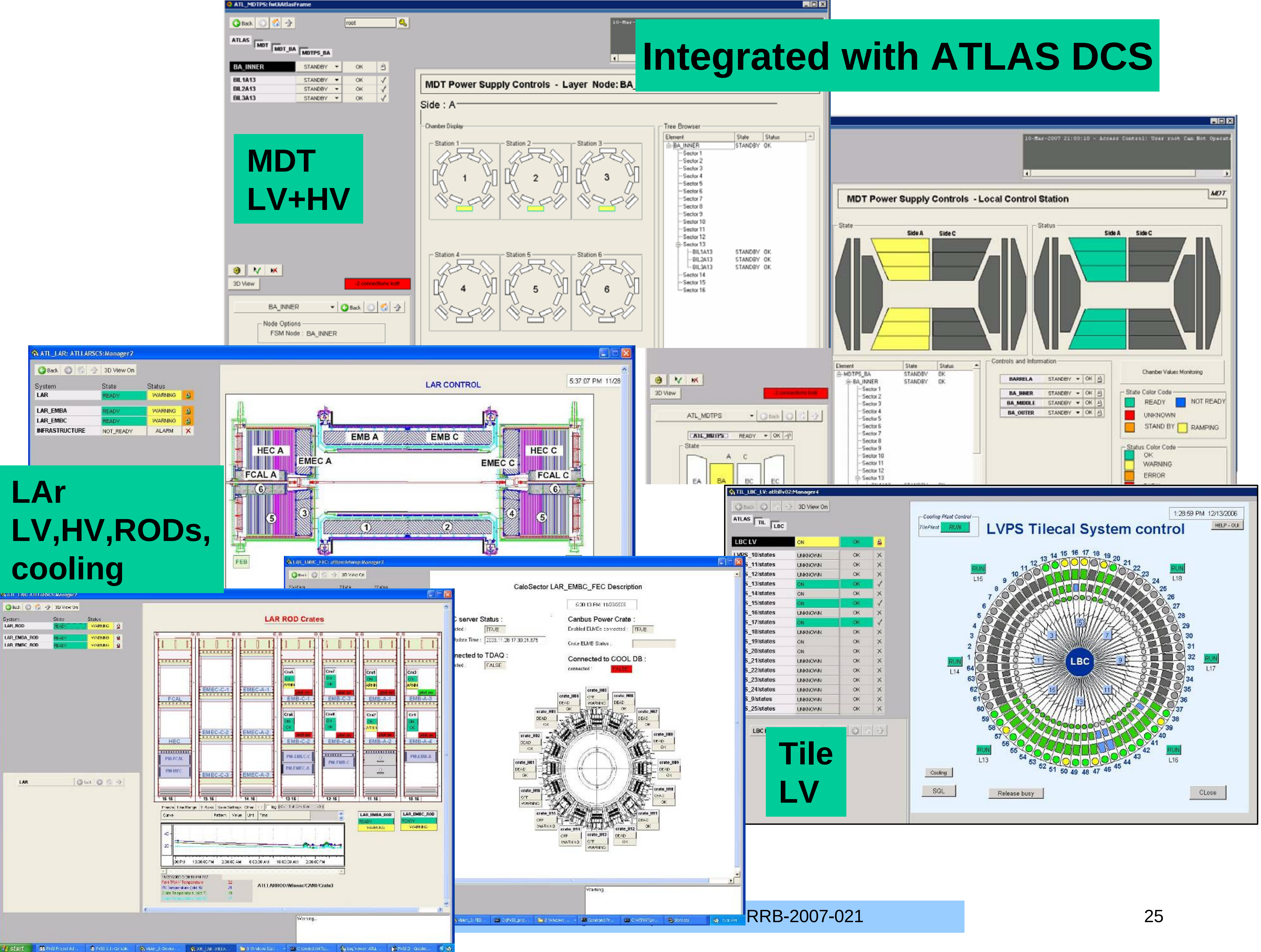




Cosmic ray event triggered by the Tiles Calorimeter



Integrated with ATLAS DCS



Operation Task Sharing

The operation of the ATLAS experiment, spanning from detector operation to computing and data preparation, will require a very large effort across the full Collaboration (estimated at ~600 FTE effort per year)

Over part of the last year a working group has elaborated a framework that has been approved by the Collaboration Board in February 2007 aiming at a fair sharing of these duty tasks (‘Operation Tasks’, OT)

The main elements are:

- OTs needs and accounting are reviewed and updated annually
- OTs are defined under the auspices of the sub-system and activity managements
- Allocations are made in two steps, expert tasks first, and then non-expert tasks

- The ‘fair share’ is proportional to the number of ATLAS members (per Institution or Country)
- Students are ‘favoured’ by a weight factor 0.75
- New Institutions will have to contribute more in the first two years (weight factors 1.5 and 1.25)

Note that physics analysis tasks, and other privileged tasks, are not OTs, of course

An important effort is now going on to define the OTs, to set up the Web tools to manage the OT planning, and to gradually implement the sharing procedure

Operation Tasks Planning: Overview and Status

Overview

Headings	Examples, comments	General tasks	DAQ specific	LVL1	ID GEN/PIXEL/ SCT and TRT	LAr	TILES	MUONs
Detector Operation tasks		Fairly detailed breakdown exists, being implemented in commissioing	Many DAQ areas already in general tasks, but some specific remain to be specified	Tasks specific for operating LVL1 trigger in pit	Breakdown made, being used during ID work in pit	LAr already very active in pit commissioning - many tasks already filled	Tiles already very active in pit commissioning - many tasks already filled	Muons are following, commissioning work already ongoing
Organisational/managerial tasks	Run Coordinator, System Operation Chiefs, GLIMOS,							
Shift-tasks	ACR shifts, satelite CR shifts							
Expert-tasks for det. Operation								
...Detector	Detector and opening experts, incl calibration and alignment syste							
...Monitoring	Part of data-preparation							
...Trigger	Part of trigger							
...Tier 0 operation	Tier 0 expertise, part of computing							
...DAQ related	General DAQ and system DAQ experts							
...DB	Online DB							
...DCS/DSS/safety/power	Overall DCS and system DCS and power							
...Cooling/Gas	Overall gas/cooling co-ord and experts							
...Control/counting rooms	Control and couiting room incl. racks and services							
...Infrastructure and common systems	Common systems, magnet, cryo, beampipe							
M&O facilities	SR1, EMF for LAR, testbeams, testbeds …							
PIT infrastructure (general ATLAS tasks,)	Many arranged as Services Agreements and partly covered by M&							
Computing and software		Breakdown exists in the form of M&O A and B and description of shifts		Software tasks specific for system	Software tasks specific for system	Software tasks specific for system	Software tasks specific for system	Software tasks specific for system
Managerial and organsational tasks								
Central Computing Environment	M&O A tasks							
User support	M&O A tasks							
Software Process Services	M&O A tasks							
Central Production Operation	M&O A tasks							
M&O B tasks	M&O B tasks							
Shifts	Shifts for Tier O, reproccessing and simulation, plus on call							
Trigger tasks		Overall trigger organisation tasks in the areas mention		Performance part of LVL1	System trigger expert tasks	System trigger expert tasks	System trigger expert tasks	System trigger expert tasks
Management/Organisational tasks								
Shifts	Shifts in pit							
LVL 1								
LVL2								
EF								
Menus								
Performance								
Trigger Monitoring								
Trigger Calibration								
Other								
Data Preparation		Overall tasks being defined - many already active		Activities related to data QA, calibraton, alignment,	Activities related to data QA, calibraton, alignment,	Activities related to data QA, calibraton, alignment, simulation	Activities related to data QA, calibraton, alignment,	System activities related to data QA, calibraton,
Management/Organisational tasks								
Calibration								
Alignment								
Simulation								
Data Quality/monitoring including shifts	Inc shifts in pit							

Grant total 556 **FTE**
(also possible to calculate CERN fraction, and shifts versus experts)

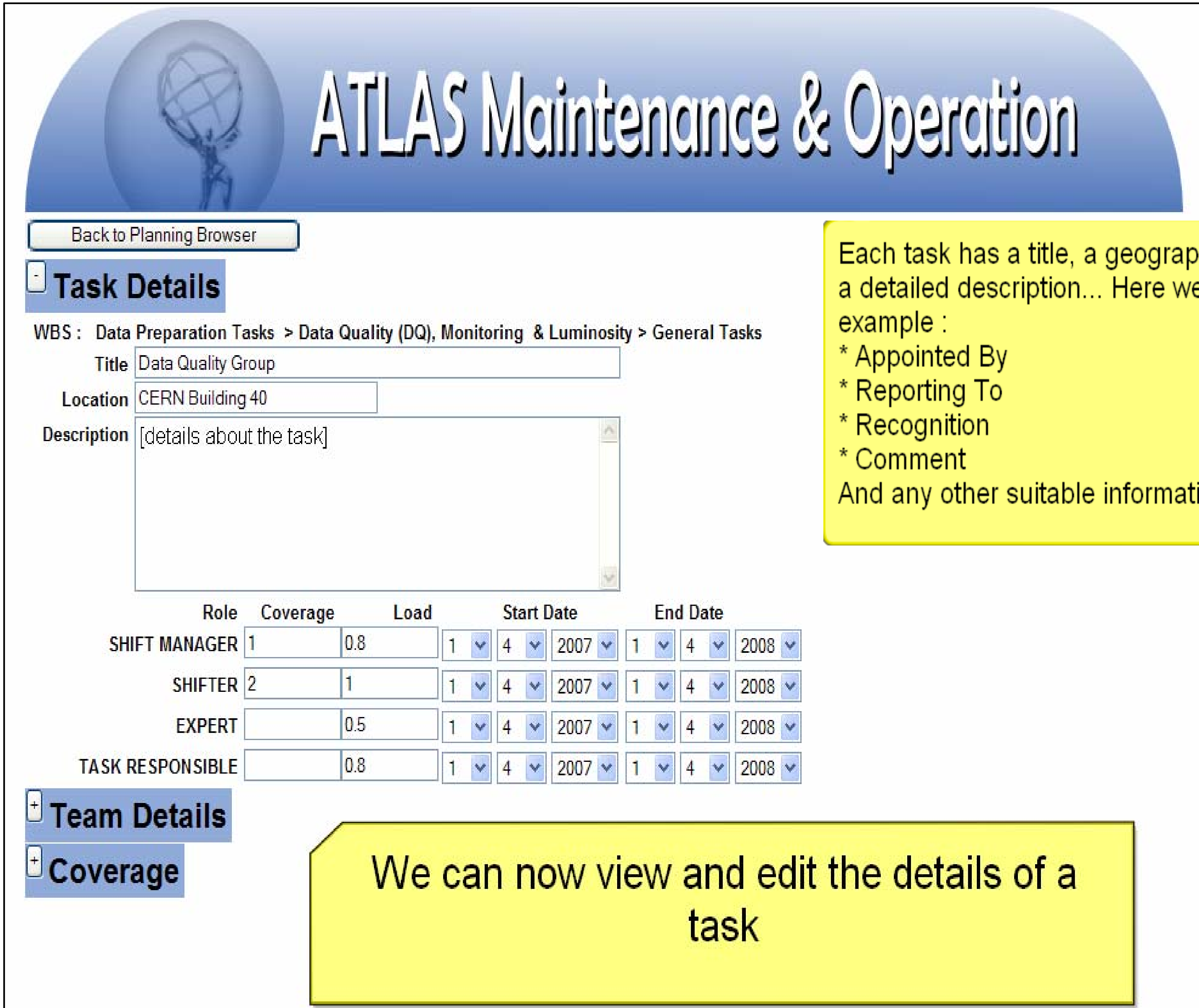
Example: Web tool in development

ATLAS Maintenance & Operation

Detector operation tasks | Trigger tasks | Computing tasks | **Data Preparation Tasks**

	General tasks	DAQ specific	LVL1	ID GEN/PIXEL/SCT/TR	LAr
Management/Organisational Tasks	Data Preparation Coordinator and Deputy	Overall system DP responsible	Overall system DP responsible	Overall system DP responsible	Overall system DP responsible
Data Quality (DQ), Monitoring & Luminosity	Data Quality Group	System DQ representatives	System DQ representatives	System DQ representatives	System DQ representatives
Calibration & Alignment	Overall alignment	Online calibration	Online calibration	Online calibration	Online calibration
Detector Response Simulation	Simulation Validation Coordinator	System Simulation Coordinator	System Simulation Coordinator	System Simulation Coordinator	System Simulation Coordinator
Data Streaming Operations	Data streaming coordinator				

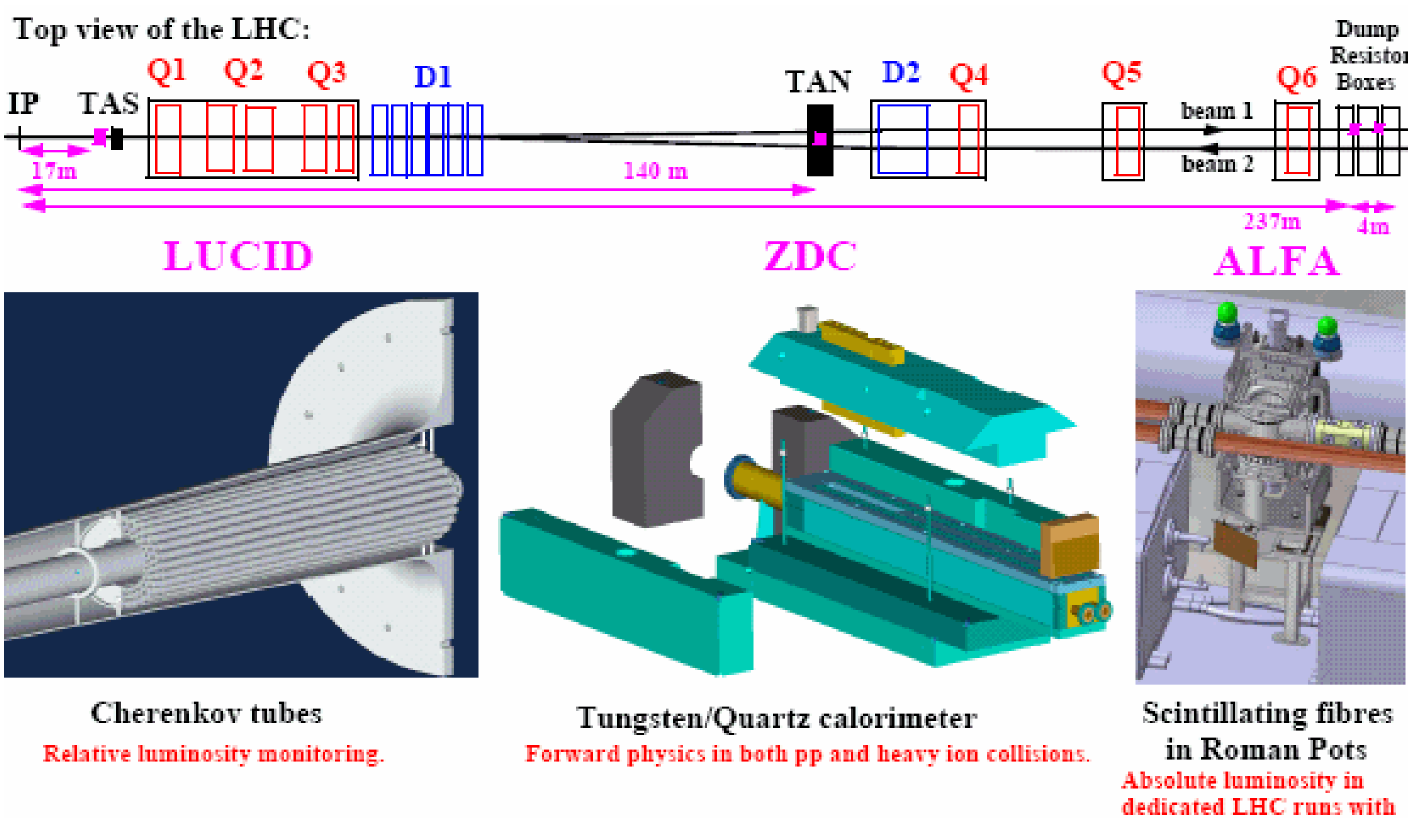
Example: Web tool in development



Each task has a title, a geographical location and a detailed description... Here we will add later for example :
* Appointed By
* Reporting To
* Recognition
* Comment
And any other suitable information

We can now view and edit the details of a task

ATLAS Forward Detectors



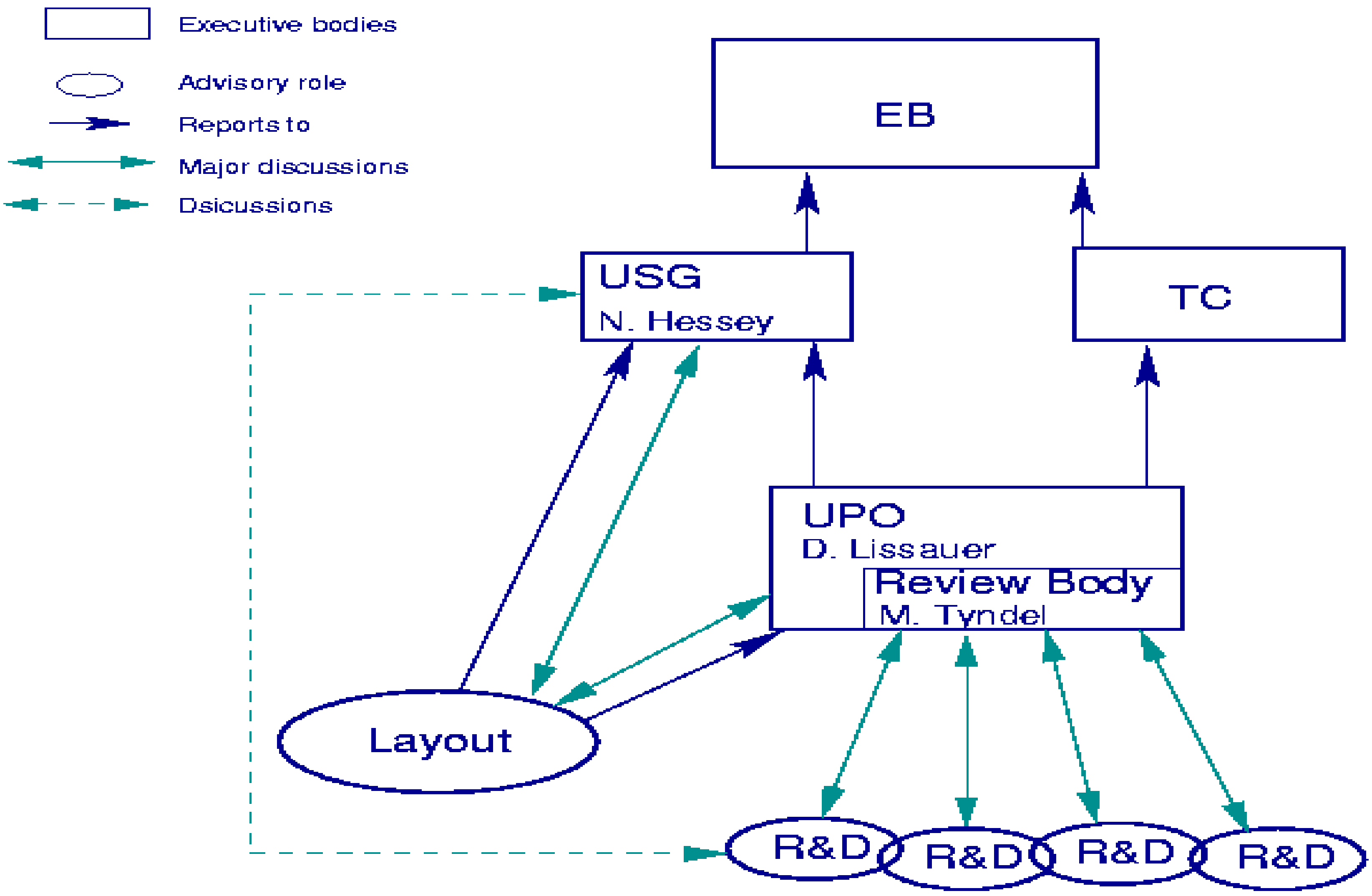
Very Forward Detectors

There is considerable progress in this area as well, in particular the ZDC proposed by US HI colleagues has been presented to the LHCC, and was well received (ATLAS and LHCC)

Not all financing is assured yet for the other FWD detectors, and new contributions are actively invited and sought for

Note: ***ATLAS forward detector and physics efforts are treated as an integral part of ATLAS***

ATLAS Upgrade Organisation



List of ATLAS sLHC R&D proposals

Short name	Title	Principle contacts	Status
			03/04/07
Opto	Radiation Test Programme for the ATLAS Opto-Electronic Readout System for the SLHC for ATLAS upgrades	Cigdem Issever	Approved by EB
Staves	Development and Integration of Modular Assemblies with Reduced Services for the ATLAS Silicon Strip Tracking Layers	C. Haber, M. Gilchriese	Recommended for approval by USG, awaiting comments from CB
ABC-Next	Proposal to develop ABC-Next, a readout ASIC for the S-ATLAS Silicon Tracker Module Design	Francis Anghinolfi, Wladek Dabrowski	Approved by EB
Radiation BG	Radiation background benchmarking at the LHC and simulations for an ATLAS upgrade at the SLHC	Ian Dawson	Approved by EB
n-on-p sensors	Development of non-inverting Silicon strip detectors for the ATLAS ID upgrade	Hartmut Sadrozinski	Recommended for approval by USG, awaiting comments from CB
SiGe chips	Evaluation of Silicon-Germanium (SiGe) Bipolar Technologies for Use in an Upgraded ATLAS Detector	Alex Grillo, S. Rescia	Recommended for approval by USG, awaiting comments from CB
3D sensors	Development, Testing, and Industrialization of 3D Active-Edge Silicon Radiation Sensors with Extreme Radiation Hardness: Results, Plans	Sherwood Parker now Cinzia Da Via	Under review by USG
Modules	Research towards the Module and Services Structure Design for the ATLAS Inner Tracker at the Super LHC	Nobu Unno	Under review by USG

List of ATLAS sLHC R&D proposals (cont'd)

Powering	Research and Development of power distribution schemes for the ATLAS Silicon Tracker Upgrade	Marc Weber	Under review by USG
TRT	R&D of segmented straw tracker detector for the ATLAS Inner Detector Upgrade	Vladimir Peshekhonov	Under review by USG
Gossip	R&D proposal to develop the gaseous pixel detector Gossip for the ATLAS Inner Tracker at the Super LHC	H van der Graaf	Expression of interest received
SoS	Expression of Interest: Evaluations on the Silicon on Sapphire 0.25 micron technology for ASIC developments in the ATLAS electronics readout upgrade	Ping Gui and Jingbo Ye	Expression of interest received
Thin pixels	R&D on thin pixel sensors and a novel interconnection technology for 3D integration of sensors and electronics	H-G. Moser	Under review by USG
Muon Microomegas	R&D project on micropattern muon chambers	V. Polychronakos	Expression of interest received
TGC	R&D on optimizing a detector based on TGC technology to provide tracking and trigger capabilities in the MUON Small-Wheel region at SLHC	G. Mikenberg	Expression of interest received
MDTReadout	Upgrade of the MDT Readout Chain for the SLHC	R. Richter	Expression of interest received
MDTGas	R&D for gas mixtures for the MDT detectors of the Muon Spectrometer	P. Branchini	Expression of interest received
Selective Readout	Upgrade of the MDT Electronics for SLHC using Selective Readout	R. Richter	Expression of interest received
High Rate MDT	R&D on Precision Drift-Tube Detectors for Very High Background Rates at SLHC	R. Richter	Expression of interest received

Collaboration composition

Since the last RRB in October 2006 no new Institution has been admitted in the Collaboration

The Collaboration Board will consider a new Expression of Interest (EoI) at its next meeting in July that has been submitted by the

University of Göttingen, Germany

following the standard procedures defined in the Construction MoU

The RRB can also be informed that constructive contacts are being pursued with two universities in Chile (PUC Santiago and UTFSM Valparaiso) which will submit in due time an EoI as a joint team, and with a university in Colombia (UAN Bogota) for which an EoI is also in preparation

At this stage no action is requested from the RRB

ATLAS Collaboration

(As of the April 2007)

35 Countries
164 Institutions
1900 Scientific Authors total
(1500 with a PhD, for M&O share)

Albany, Alberta, NIKHEF Amsterdam, Ankara, LAPP Annecy, Argonne NL, Arizona, UT Arlington, Athens, NTU Athens, Baku, IFAE Barcelona, Belgrade, Bergen, Berkeley LBL and UC, HU Berlin, Bern, Birmingham, Bologna, Bonn, Boston, Brandeis, Bratislava/SAS Kosice, Brookhaven NL, Buenos Aires, Bucharest, Cambridge, Carleton, Casablanca/Rabat, CERN, Chinese Cluster, Chicago, Clermont-Ferrand, Columbia, NBI Copenhagen, Cosenza, AGH UST Cracow, IFJ PAN Cracow, DESY, Dortmund, TU Dresden, JINR Dubna, Duke, Frascati, Freiburg, Geneva, Genoa, Giessen, Glasgow, LPSC Grenoble, Technion Haifa, Hampton, Harvard, Heidelberg, Hiroshima, Hiroshima IT, Indiana, Innsbruck, Iowa SU, Irvine UC, Istanbul Bogazici, KEK, Kobe, Kyoto, Kyoto UE, Lancaster, UN La Plata, Lecce, Lisbon LIP, Liverpool, Ljubljana, QMW London, RHBNC London, UC London, Lund, UA Madrid, Mainz, Manchester, Mannheim, CPPM Marseille, Massachusetts, MIT, Melbourne, Michigan, Michigan SU, Milano, Minsk NAS, Minsk NCPHEP, Montreal, McGill Montreal, FIAN Moscow, ITEP Moscow, MEPhI Moscow, MSU Moscow, Munich LMU, MPI Munich, Nagasaki IAS, Nagoya, Naples, New Mexico, New York, Nijmegen, BINP Novosibirsk, Ohio SU, Okayama, Oklahoma, Oklahoma SU, Oregon, LAL Orsay, Osaka, Oslo, Oxford, Paris VI and VII, Pavia, Pennsylvania, Pisa, Pittsburgh, CAS Prague, CU Prague, TU Prague, IHEP Protvino, Regina, Ritsumeikan, UFRJ Rio de Janeiro, Rochester, Rome I, Rome II, Rome III, Rutherford Appleton Laboratory, DAPNIA Saclay, Santa Cruz UC, Sheffield, Shinshu, Siegen, Simon Fraser Burnaby, SLAC, Southern Methodist Dallas, NPI Petersburg, Stockholm, KTH Stockholm, Stony Brook, Sydney, AS Taipei, Tbilisi, Tel Aviv, Thessaloniki, Tokyo ICEPP, Tokyo MU, Toronto, TRIUMF, Tsukuba, Tufts, Udine, Uppsala, Urbana UI, Valencia, UBC Vancouver, Victoria, Washington, Weizmann Rehovot, FH Wiener Neustadt, Wisconsin, Wuppertal, Yale, Yerevan

Management

At the last two Collaboration Boards the ATLAS Management was re-appointed, all with a term of office ending in February 2009

(This corresponds to a partial mandate period for the spokesperson and deputies)

Also the Executive Board composition has been completed, and adapted where necessary, following the planned smooth transition into the commissioning and operation phases as outlined in the ATLAS Operation Model

The present composition is shown in the following Organization Chart

The Collaboration has also approved some constitutional changes in view of the forthcoming operation phase

The most prominent change is that the future spokesperson's term of office will be

2 years, renewable once with a 2/3 majority

(During the construction phase it was 3 years, renewable with 2/3 majority)

ATLAS Organization
April 2007

Collaboration Board
(Chair: C. Oram
Deputy: K. Jon-And)

ATLAS Plenary Meeting

Resources Review Board

CB Chair Advisory Group

Spokesperson
(P. Jenni
Deputies: F. Gianotti
and S. Stapnes)

Technical Coordinator
(M. Nessi)

Resources Coordinator
(M. Nordberg)

Executive Board

Inner Detector
(L. Rossi,
K. Einsweiler
P. Wells, F. Dittus)

Tile Calorimeter
(B. Stanek)

Magnet System
(H. ten Kate)

Electronics Coordination
(P. Farthouat)

Computing Coordination
(D. Barberis,
D. Quarrie)

Physics Coordination
(I. Hinchliffe)

LAr Calorimeter
(H. Oberlack,
D. Fournier,
J. Parsons)

Muon Instrum.
(G. Mikenberg,
F. Taylor,
S. Palestini)

Trigger/DAQ
(N. Ellis,
L. Mapelli)

Commissioning/ Run Coordination
(G. Mornacchi)

Data Prep. Coordination
(C. Guyot)

Additional Members
(T. Kobayashi,
M. Tuts, A. Zaitsev)

Cost to Completion, and initial staged detector configuration

As a reminder from previous RRB meetings:

The Cost to Completion (CtC) is defined as the sum of Commissioning and Integration (C&I) pre-operation costs plus the Construction Completion (CC) cost in addition to the deliverables

The following framework was accepted at the October 2002 RRB (ATLAS Completion Plan, CERN-RRB-2002-114rev.):

CtC	**68.2 MCHF**	**(sum of CC = 47.3 MCHF and C&I = 20.9 MCHF)**

Commitments from Funding Agencies for fresh resources (category 1)	**46.5 MCHF**
Further prospects, but without commitments at this stage (category 2)	**13.6 MCHF**

The missing resources, 21.7 MCHF, have to be covered by redirecting resources from staging and deferrals

The funding situation will be reviewed regularly at each RRB, and is expected to evolve as soon as further resources commitments will become available

The physics impact of the staging and deferrals was discussed in detail with the LHCC previously

It had to be clearly understood that the full potential of the ATLAS detector will need to be restored for the high luminosity running, which is expected to start only very few years after turn-on of the LHC, and to last for at least a decade

Main funding issues today

There are outstanding contributions to the baseline & Common Fund at risk 9 MCHF
(of which 4 MCHF are in progress of being paid)

Furthermore, not all the calculated 2002 CtC (CC and C&I) shares have been pledged, in fact the situation only looks quite good because CERN has committed 5 MCHF more than its calculated share 3 MCHF

The following table shows the details

Strategy proposed to the RRB to cover the remaining funding gap, including the new 2006 CtC

1) Expect all outstanding baseline and Common Fund contributions according to the Construction MoU

2) Urge all FAs to pledge their full CtC share as determined in October 2002

3) As CERN has committed 5 MCHF above its calculated share, this will cover the new 2006 additional CtC costs of 4.4 MCHF

Clearly, a strong solidarity from all funding partners is needed to overcome this last financial hurdle!

Status of the Cost to Completion funding (CERN-RRB-2007-016, 31st March 2007)

Funding Agency	Cost to Completion 2002 (CtC) calculated share			Member Fee 2004-6 (incl. in CC)	New funding (category 1) incl. Member F	New funding requests (category 2)	CtC 2006 proposed sharing
	Total	CC	C&I		Total	Total	Total
Argentina					**75**		
Armenia	**66**	48	18	38	**45**		
Australia	**357**	242	115	75	**357**		
Austria	**67**	52	15	38	**67**		
Azerbaijan	**43**	38	5	38	**38**		
Belarus	**85**	75	10	75	**75**		
Brazil	**64**	47	17	38	**41**		
Canada	**2090**	1528	562	263	**2090**		
China NSFC+MSTC	**141**	99	42	38	**141**		
Czech Republic	**316**	196	120	113	**316**		
Denmark	**422**	290	132	38	**58**	375	
France IN2P3	**5890**	4176	1714	225	**5890**		
France CEA (1)	**1940**	1379	561	38	**1940**		
Georgia	**42**	37	5	38	**38**		
Germany BMBF	**4531**	3250	1281	338	**4531**		
Germany DESY					**38**		
Germany MPI	**1093**	761	332	38	**1093**		
Greece	**261**	173	88	113	**261**		
Israel	**739**	497	242	113	**739**		
Italy	**6638**	4650	1988	450	**6288**		
Japan	**4362**	3029	1333	563	**4362**		
Morocco	**57**	47	10	38	**41**		
Netherlands	**1934**	1368	566	75	**1934**		
Norway	**581**	391	190	75	**581**		
Poland	**136**	94	42	75	**136**		
Portugal	**446**	265	181	38	**339**	107	
Romania	**140**	85	55	38	**140**		
Russia	**2991**	1995	996	263	**1759**		
JINR	**1066**	660	406	38	**521**		
Serbia					**300**		
Slovak Republic	**72**	53	19	38	**82**		
Slovenia	**223**	152	71	38	**223**		
Spain	**1706**	1109	597	113	**1706**		
Sweden	**1691**	1121	570	150	**1691**		
Switzerland	**2372**	1701	671	75	**2372**		
Taipei	**445**	318	127	38	**445**		
Turkey	**85**	75	10	75	**75**		
United Kingdom	**4387**	3063	1324	450	**4387**		
US DOE + NSF (2)	**12245**	8438	3807	1238	**12245**		
CERN	**8452**	5770	2682	38	**9300**		4400
Total	**68176**	47272	20904	5563	**66685**	482	**4400**

(1) The commitment shown does not include a 1 MCHF additional engineering contribution provided on the initial BT contract (see MoU Annex 8.A)

(2) The remaining 4.5 MCHF to C&I is provided on a best effort basis

New funding requests as prospects (category 2) are without firm commitment from the Funding Agencies

Updated Financial Overview

Financial framework

Initial Construction MoU 1995	**475 MCHF**
Updated construction baseline	**468.5 MCHF**
Additional Cost to Completion (accepted in RRB October 2002) based on the Completion Plan (CERN-RRB-2002-114)	**68.2 MCHF**
Additional CtC identified (mentioned at the last RRB, and now announced in CERN-RRB-2006-069)	**4.4 MCHF**
Total costs for the initial detector	**541.1 MCHF**

Missing funding at this stage for the initial detector:

Baseline Construction MoU, mainly Common Fund (of which 4 MCHF are in progress of being paid)	**9 MCHF**
2002 Cost to Completion (CC and C&I) calculated shares (assuming that the U.S. will provide their remaining 4.5 MCHF on a best effort basis)	**3 MCHF**

It must be stressed that all these resources, already specified in the 2002 Completion Plan, are needed to complete the initial detector

Note for planning purposes that not included are:

- This assumes beam pipe closure end August 2007, later dates would imply additional manpower costs of 200-400 kCHF per month

- No provision for future 'force majeure' cost overruns

- Restoration of the design-luminosity detector, estimated material costs of parts not included in present initial detector (CERN-RRB-2002-114) ***20 MCHF***

- Forward detectors parts (luminosity) not funded yet ***1.5 MCHF***

Conclusions

The ATLAS project is proceeding within the framework of the accepted 2002 Completion Plan, and all the resources requested in that framework are needed now to complete the initial detector

Construction milestones are now ending, and the emphasis has fully shifted onto the installation, the commissioning, and the start-up of operation

The most critical detector issue is the delay of the Inner Detector installation, which has an impact on the overall installation completion as Marzio Nessi has shown (other critical issues remain the calorimeter and muon power supplies)

Very major software, computing and physics preparation activities are underway as well, using the Worldwide LHC Computing Grid (WLCG) for distributed computing resources

Commissioning and planning for the early physics phases are in full swing

ATLAS is eager, and on track, for LHC physics

(ATLAS expects to remain at the energy frontier of HEP for the next 10 – 15 years, and the Collaboration has already set in place a coherent organization to evaluate and plan for future upgrades in order to exploit future LHC machine high-luminosity upgrades)

(Informal news on ATLAS is available in the ATLAS eNews letter at http://aenews.cern.ch/)