Atlas Computing Planning

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Atlas Software Workshop

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Why?

- We've been asked…
  - CERN review of LHC computing
  - LHCC
  - Atlas Executive Board/TC
- Important for ourselves…
  - Understand scope and size of project
  - Make sure it is in time
  - Prepare for sharing responsibility: Software Agreements, MOUs, ...

How?

- Breakdown of the project “Atlas Computing” $\rightarrow$ Project Breakdown Structure (PBS)
- Work packages defined in Work Breakdown Structure (WBS)
- For all practical purposes of our project: PBS = WBS
- Tasks described in project schedule (MS Project file)

Project breakdown structure

- Mapping of (complex) reality onto (simple) tree structure
- Atlas preference: Tree organised according to lines of responsibility
- Basic layout:
  1. Common items
  2. Physics part
  3. Atlas-specific software
  4. Software support
  5. Infrastructure
  6. Data production

PBS in detail

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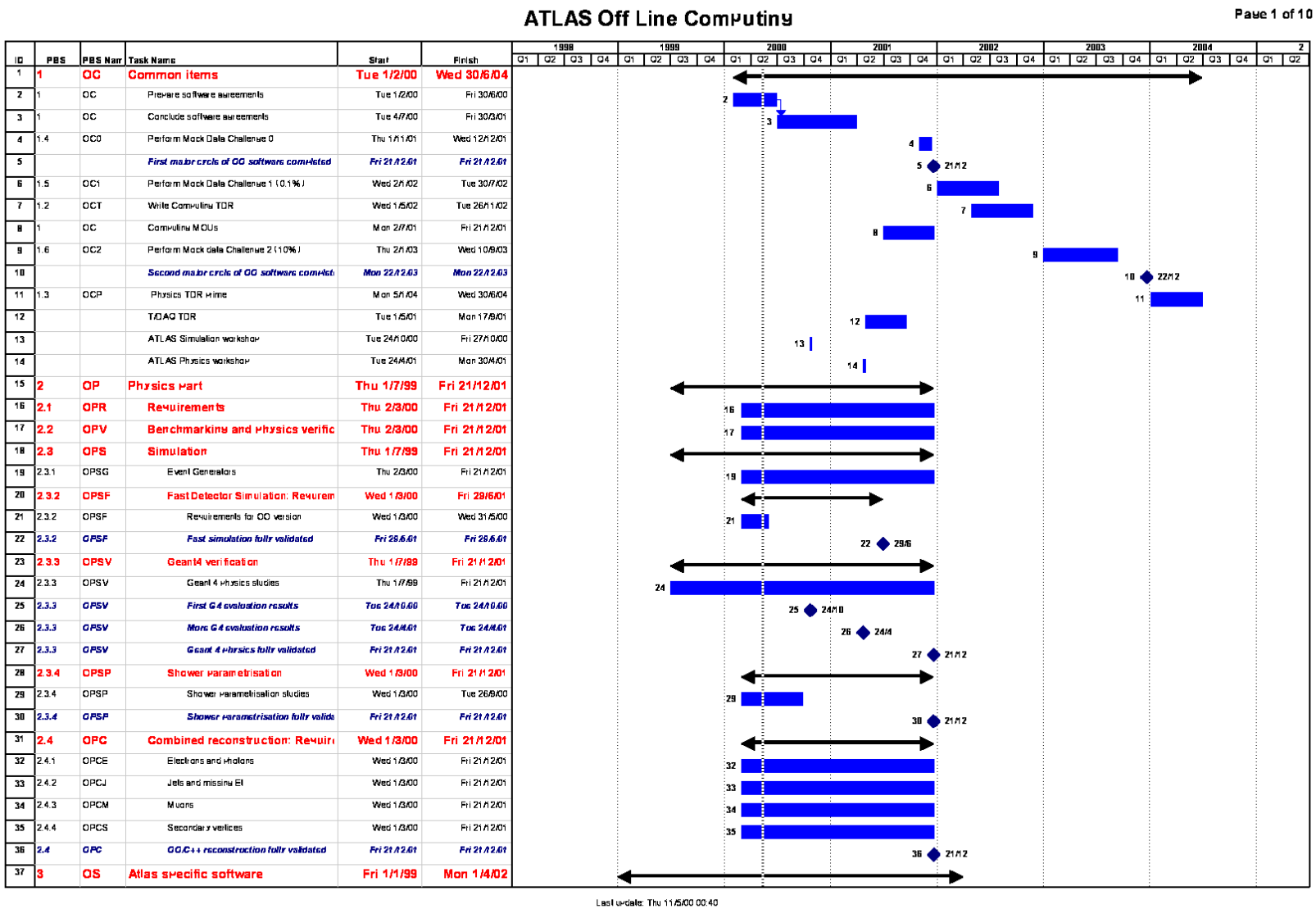
PBS / WBS for Atlas Offline Computing

1 Common items	OC
1.1 Co-ordination and planning	OCC
1.2 Computing TDR	OCT
1.3 "Physics TDR prime"	OCP
1.4 Mock Data Challenge 0	OC0
1.5 Mock Data Challenge 1	OC1
1.6 Mock Data Challenge 2	OC2
2 Physics part	OP
2.1 Requirements	OPR
2.2 Benchmarking and physics verification	OPV
2.3 Simulation	OPS
2.3.1 Event generators	OPSG
2.3.2 Fast detector simulation	OPSF
2.3.3 Geant4 verification	OPSV
2.3.4 Shower parametrisation	OPSP
3 Atlas-specific software	OS
3.1 Common items	OSC
3.1.1 Architecture	OSCA
3.1.2 Framework	OSCF
3.1.3 Data base	OSCB
3.1.4 Event	OSCE
3.1.5 Detector description	OSCD
3.1.6 Calibration infrastructure	OSCC
3.1.7 Graphics	OSCG
3.1.8 Analysis tools	OSCT
3.2 Inner Detector software	OSI
3.2.1 Common items	OSIC
3.2.2 Simulation	OSIS
3.2.3 Reconstruction	OSIR
3.2.3.1 Common items	OSIRC
3.2.3.1.1 Track class	OSIRCT
3.2.3.1.2 Clustering and 3D points	OSIRCC
3.2.3.1.3 External seeds	OSIRCS
3.2.3.1.4 Track finding	OSIRCP
3.2.3.1.5 Track extrapolation	OSIRCE
3.2.3.1.6 Track fitting	OSIRCF
3.2.3.1.7 TRT hit association	OSIRCA
3.2.3.1.8 Particle identification	OSIRCI
3.2.3.2 iPatRec	OSIRI
3.2.3.3 xKalman	OSIRX
3.2.3.4 Pixlrec	OSIRP
3.2.3.5 xHourec	OSIRH
3.2.3.6 ASTRA	OSIRA
3.2.3.7 Overall strategy	OSIRO
3.2.3.8 Vertex fitting	OSIRV
3.2.3.8.1 Vertex class	SIRVV
3.2.3.8.2 Multitrack vertex	SIRVM
3.2.3.8.3 Primary vertex	OSIRVP
3.2.3.8.4 Photon conversion	OSIRVC
3.2.3.8.5 K0s and Lambda vertex	OSIRVK
3.2.3.8.6 Hadronic interaction	OSIRVH
3.2.3.9 Kink finding	OSIRK
3.2.4 Data base interface	OSID
3.2.5 Test beams	0SIB
3.2.6 Alignment and calibration	OSIA
3.2.6.1 Pixl	OSIAP
3.2.6.2 SCT	OSIAS
3.2.6.3 TRT	OSIAT
3.3 Liquid Argon Calorimeter software	OSL
3.3.1 Common items	OSLC
3.3.2 Simulation	OSLS
3.3.3 Reconstruction	OSLR
3.3.3.1 Cell and Cluster classes	OSLRC

Gantt chart (1/10)



ID	PBS	PBS Narr	Task Name	Start	Finish
1	1	OC	Common items	Tue 1/2/00	Wed 30/6/04
2	1	OC	Prepare software agreements	Tue 1/2/00	Fri 30/6/00
3	1	OC	Conclude software agreements	Tue 4/7/00	Fri 30/3/01
4	1.4	OC0	Perform Mock Data Challenge 0	Thu 1/11/01	Wed 12/12/01
5			First major cycle of OO software completed	Fri 21/12/01	Fri 21/12/01
6	1.5	OC1	Perform Mock Data Challenge 1 (0.1%)	Wed 2/1/02	Tue 30/7/02
7	1.2	OCT	Write Computing TDR	Wed 1/5/02	Tue 26/11/02
8	1	OC	Computing MOUs	Mon 2/7/01	Fri 21/12/01
9	1.6	OC2	Perform Mock data Challenge 2 (10%)	Thu 2/1/03	Wed 10/9/03
10			Second major cycle of OO software completed	Mon 22/12/03	Mon 22/12/03
11	1.3	OCP	Physics TDR done	Mon 5/1/04	Wed 30/6/04
12			TDAQ TDR	Tue 1/5/01	Mon 17/9/01
13			ATLAS Simulation workshop	Tue 24/10/00	Fri 27/10/00
14			ATLAS Physics workshop	Tue 24/4/01	Mon 30/4/01
15	2	OP	Physics Part	Thu 1/7/99	Fri 21/12/01
16	2.1	OPR	Requirements	Thu 2/3/00	Fri 21/12/01
17	2.2	OPV	Benchmarking and Physics verific	Thu 2/3/00	Fri 21/12/01
18	2.3	OPS	Simulation	Thu 1/7/99	Fri 21/12/01
19	2.3.1	OPSG	Event Generators	Thu 2/3/00	Fri 21/12/01
20	2.3.2	OPSF	Fast Detector Simulation: Requirem	Wed 1/3/00	Fri 29/6/01
21	2.3.2	OPSF	Requirements for OO version	Wed 1/3/00	Wed 31/5/00
22	2.3.2	OPSF	Fast simulation fully validated	Fri 29/6/01	Fri 29/6/01
23	2.3.3	OPSV	Geant4 verification	Thu 1/7/99	Fri 21/12/01
24	2.3.3	OPSV	Geant 4 physics studies	Thu 1/7/99	Fri 21/12/01
25	2.3.3	OPSV	First G4 evaluation results	Tue 24/10/00	Tue 24/10/00
26	2.3.3	OPSV	More G4 evaluation results	Tue 24/4/01	Tue 24/4/01
27	2.3.3	OPSV	Geant 4 physics fully validated	Fri 21/12/01	Fri 21/12/01
28	2.3.4	OPSP	Shower parametrisation	Wed 1/3/00	Fri 21/12/01
29	2.3.4	OPSP	Shower parametrisation studies	Wed 1/3/00	Tue 26/9/00
30	2.3.4	OPSP	Shower parametrisation fully valida	Fri 21/12/01	Fri 21/12/01
31	2.4	OPC	Combined reconstruction: Requir	Wed 1/3/00	Fri 21/12/01
32	2.4.1	OPCE	Electrons and Photons	Wed 1/3/00	Fri 21/12/01
33	2.4.2	OPCJ	Jets and missing Et	Wed 1/3/00	Fri 21/12/01
34	2.4.3	OPCM	Muons	Wed 1/3/00	Fri 21/12/01
35	2.4.4	OPCS	Secondary vertices	Wed 1/3/00	Fri 21/12/01
36	2.4	OPC	OO/C++ reconstruction fully validated	Fri 21/12/01	Fri 21/12/01
37	3	OS	Atlas specific software	Fri 1/1/99	Mon 1/4/02

Task report (1/27)

ID	PBS	PBS-Name	Task Name	Start	Finish
1	1	OC	Common items	Tue 1/2/00	Wed 30/6/04
2	1	OC	Prepare software agreements	Tue 1/2/00	Fri 30/6/00

ID	Successor Name	Type	Lag
3	Conclude software agreements	FS	0 days

Notes

Discuss and decide on general policy, where Software Agreements are applicable etc; provide standard blueprint text

3	1	OC	Conclude software agreements	Tue 4/7/00	Fri 30/3/01

ID	Predecessor Name	Type	Lag
2	Prepare software agreements	FS	0 days

Notes

Discuss and conclude the various Software Agreements to be put in place

4	1.4	OC0	Perform Mock Data Challenge 0	Thu 1/11/01	Wed 12/12/01

Notes

The "Zero" Data Challenge comprises a 'continuity' test through the software chain, including trigger simulation. The "Zero" implies a relatively small number of events, e.g. 20k Z+Jet, or similar. Of course the challenge includes read/write of data to database.

5			First major cycle of OO software completed	Fri 21/12/01	Fri 21/12/01
6	1.5	OC1	Perform Mock Data Challenge 1 ('0.1%')	Wed 2/1/02	Tue 30/7/02

Notes

MDC1 is thought of as 0.1% of a year's raw data. (i.e. about a 1TB)
The MDC1 should of course be based on G4 simulation, and some
(but not all!) PTDR plots should be re-checked.
The hope would be that a 'signal' buried in the MDC 1 data can be found
in the analysis. Unlikely to have all 'bells and whistles' of calibration etc.,
but some claibration software machinery should be exercised.
Hardware resources for MDC1 are not likely to be a problem. Analysis will surely not enjoy full-blown GRID features.....

7	1.2	OCT	Write Computing TDR	Wed 1/5/02	Tue 26/11/02

Notes

Scope of Computing TDR (CTDR) covers both software and hardware. I suppose idea is that it TDR should demonstrate sufficient progress and rate of progress that Funding Agencies will feel happy to see major computing expenditure (hardware and more software expertise) start...during 2003.
The precise timing of the CTDR is at least partyl 'political'. US Funding
Agencies have suggested wanting it not later than 2002. CMS plan theirs
for early 2002.

8	1	OC	Computing MOUs	Mon 2/7/01	Fri 21/12/01

Notes

It is unclear whether the Computting MOUs will require the Computing TDR; for the purposes of this planning and in line with the current state of discussion in the CERN review of LHC computing, we assume that the MOUs will precede the Computing TDR. However, this is still being discussed by the CERN review of LHC computing, and subject to change. If the MOU is to follow the TDR, interim MOUs to precede the TDR may be considered.

Basic assumptions

- Near-term planning (until end 2001) more precise
- Major cycles of effort - one until end 2001, next one until ~ end 2003
- ‘Driving’ events are under common items
  - Mock data challenges
  - TDRs: Trigger/DAQ, Computing, Readiness
  - Software agreements and MOUs

History and current status

- Effort started in February 2000
- Contributions by all CSG parties involved, and others
- Two versions circulated and discussed in CSG, present one in EB and SW workshop
- Schedule (and PBS) are snapshot of on-going work
  - ~ 150 items in PBS, ~ 350 items in schedule
  - Missing items
  - Inconsistencies

To be done (1)

- Understand and enter dependencies
- Understand and enter resources
- More homogeneous handling of sub-projects
  - Level of detail
  - Tasks vs milestones (LHCC, EB/TC, CSG, sub-project)
  - Sub-project schedules to be maintained separately?

To be done (2)

- Simulation
- Mechanisms for follow-up and modification
- More and better options for presentation
  - Notes
  - Summary of tasks and milestones
- Integration with Atlas Technical Coordination
- …

Software agreements

- Mechanism to ensure that all parts of the software are written, maintained etc. in time
- Between Atlas and (group of) institute(s)
- Does not affect openness
  - Sources in central repository
  - Contributions always welcome
- Policy document being discussed in NCB
- Aim: first Software Agreement concluded by October 2000 (next RRB)

Conclusions

- Planning process potentially very useful and beneficial
- Requires a lot of work
- Help improve and follow up

http://cern.ch/Atlas/GROUPS/SOFTWARE/OO/planning