



User Facilities Project Status

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Progress Since Last PMG

- ◆ **Schedule Overview**
- ◆ **Current Status of Hardware R&D**
- ◆ **Quarterly Summary (Q1 FY02)**
- ◆ **Summary**



Major Milestones

		FY2002				FY2003				FY2004				FY2005				FY2006				FY2007				FY2008			
		1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
1-2% Data Challenge	12/1/2001	█																											
User Analysis Cluster Commissioned	6/1/2002	█	█	█																									
FY02 Hardware Upgrade	8/1/2002				█																								
DAQ TDR	11/1/2002				█																								
Software Baseline: persistency choice	12/1/2002				█																								
5 % Data Challenge	1/1/2003					█																							
Design of T1 5% prototype	6/1/2003						█																						
Implementation of 5 % prototype	3/1/2004							█	█																				
Software and Computing TDR	12/1/2003							█																					
1st Pilot Tier 2 center	1/1/2004								█																				
20 % Data Challenge	6/1/2004								█	█																			
Physics TDR	12/1/2004											█																	
10 % Tier 1 RC	1/1/2005												█	█															
2nd Tier 2 Center	3/1/2005													█	█														
3rd Tier 2 Center	3/1/2005													█	█														
40 % Tier 1 online	10/1/2005																█	█											
4th Tier 2 Center	1/1/2006																	█											
LHC Running	4/1/2006																		█	█									
5th Tier 2 Center	10/1/2006																				█								
100 % Tier 1 online																											█		



R&D Phase Plans

Need R&D to convince ourselves we know how to solve these problems

R&D Activities and Milestones

→ Monte Carlo Productions and Data Challenges

- Making Monte Carlo “grid enabled” helps research distributed computing issues
- Integrating Tier 1 and Tier 2 sites in US – prototype Tier 2 sites very important for this research

→ User Analysis cluster

- Building a user analysis cluster from commodity boxes
- Getting input from users EARLY

→ Disk

- Researching disk performance/reliability
- Input from US-ATLAS, US labs and computing centers

→ Tape

- Researching hardware/software for faster, easier tape access

→ Collaboratory

- Investigating Control Room Logbook
- VRVS (CalTech/CERN)



R&D Activities/Milestones

Distributed Monte Carlo production

Goals:

- Integration with T2's
- Development of Distributed production system
- Facilitate software deployment at remote sites
- Produce useful Monte Carlo for Physics Groups
- Develop tools for producing ntuple replacement
- Event documentation and databasing for users

For user facilities, this means supporting testbeds, supporting users, deploying software

Schedule of hardware/software upgrades and installation is in sync with CMS Mock Data Challenge Schedule



User Analysis Cluster Schedule

Milestones for FY02

➔ **02/01/2002**

- Prototype User Analysis Cluster R&D finished.**
- Design report released.**

➔ **03/01/2002**

- Commission User Analysis Cluster for ntuple analyses.**
- Release cluster to “experts”**

➔ **04/01/2002**

- Release cluster to users**

➔ **06/01/2002**

- Experience with User Analysis Cluster report released.**

➔ **07/01/2002**

- Design UAC upgrade**



Disk Project Schedule

Milestones for FY02

➔ 12/01/2002

- Finish testing new arrays (Winchester, Zyzzx, RAIDzone)
- Publish results
- Start long term (“acceptance-like”) test suites

➔ 02/01/2002

- Finish acceptance tests
- Publish results
- Release R&D raid arrays for use in UAC/production

➔ 03/01/2002

- Complete monitoring suite for measuring performance of RAID arrays in situ

➔ 05/01/2002

- Experience with RAID arrays in production/UAC and compare with test results

➔ 06/01/2002

- Finish small raid array experience survey document

➔ 07/01/2002

- Plan large RAID acquisition for FY03



Tier 1 Work Plan 2002

FY02:

- ➔ For 2002 we have descoped and will try to limp along with our small staff.
 - ❑ No network WAN monitoring
 - ❑ R&D slowed – not sure we will make projected schedules
 - R&D equipment waiting for testing
 - User analysis cluster schedule likely to be delayed
 - “reference” clusters not being kept in tune
 - Trying to support users – but installing debuggers, etc. takes more time than it should
 - Computer security issues being addressed very slowly
 - Abandoned T1/T2/T0 simulation efforts altogether for lack of manpower
 - Collaboratory, web support and documentation also suffering
- ➔ We are really short on networking and system management (relying heavily on current CD staff working off project)
- ➔ Both R&D and production efforts are suffering from lack of people.
- ➔ We are trying to keep a good balance between supporting current work and R&D projects.
- ➔ We have attracted a couple of guest scientists/engineers and hope that will help



T1 UF Milestones for Q1FY02

WBS Number	Milestone Description	Milestone Date	Completion Date
1.2.2	Adapting CRL for production at Fermilab	9/30/2001	1/15/2002
1.2.6.1	User Training workshop	9/30/2001	No workshop planned
1.2.8	Kerberization of CMS	11/01/2001	12/15/2001
1.5.3	Upgrade CMS networking for FY01 purchases	8/01/2001	11/15/2001
1.6.2.2.1	Commissioning User Cluster and investigating issues	12/30/2001	1/15/2002
1.6.2.2.3	Finish testing new arrays. Publish results	12/01/2001	1/15/2002
1.7.1	Tier 1 User Facilities upgrades finished	11/15/2001	1/15/2001

Note: Marked in red are milestones missed by more than 2 months



T1 UF Milestones for rest of FY02

WBS Number	Milestone Description	Milestone Date	Completion Date
1.2.2	CRL in use for production US-CMS wide	3/01/2002	
1.3.3.2	Space/Site planning for FY02 UF upgrade	06/01/2002	
1.5.3	Upgrade CMS networking for FY02 purchases	8/01/2002	
1.6.2.2.1	Prototype User Analysis Cluster R&D finished. Design Report Released.	02/01/2002	Delayed due to lack of manpower
1.6.2.2.1	Commission UAC for ntuple analyses. Release cluster to "experts".	03/01/2002	
1.6.2.2.1	Release UAC to users	04/01/2002	
1.6.2.2.1	Experience with UAC report released	06/01/2002	
1.6.2.2.1	Design UAC upgrade	07/01/2002	



T1 UF Milestones for rest of FY02

WBS Number	Milestone Description	Milestone Date	Completion Date
1.6.2.2.3	Finish long-term “acceptance” tests. Publish results. Release R&D RAID arrays for general use.	2/01/2002	Nearly done – new estimate 2/22/2002
1.6.2.2.3	Complete monitoring suite for measuring performance of RAID arrays in situ	03/01/2002	
1.6.2.2.3	Collect experience with RAID arrays in production/UAC and compare with test results	5/01/2002	
1.6.2.2.3	Finish small raid array experience survey document	06/01/2002	
1.6.2.2.3	Plan large RAID acquisition for FY03	07/01/2002	



Tier 2 UF Milestones for FY01

1st prototype Tier 2 (UCSD/CIT)

WBS Number	Milestone Description	Milestone Date	Completion Date
1.4.1.2.1.2.	Procure Remaining CPU nodes	10/02/2001	? Funding ?
4 1.4.1.22.3. 1	Hardware Testing and Commissioning Completed (CIT)	10/16/2001	? Funding ?
1.4.1.2.2.4. 5	Hardware Testing and Commissioning Completed (UCSD)	10/08/2001	? Funding ?
1.4.1.2.5	Interface to the Distributed Terascale Facility (DTF)		
1.4.1.2.5.1	Integration with facilities at Caltech	06/03/2002	
1.4.1.2.5.1	Integration with facilities at Caltech	06/03/2002	



Tier 2 UF Milestones for FY01

2nd prototype Tier 2 (University of Florida)

WBS Number	Milestone Description	Milestone Date	Completion Date
1.4.2.5.3.1.1.3	Rocks report completed	12/17/2001	
1.4.2.5.3.1.2.3	Networking report	02/11/2002	
1.4.2.5.3.1.3.4	Scheduler Report	02/18/2002	
1.4.2.5.3.2.1.2	100GB Milestone	10/15/2001	
1.4.2.5.3.2.2.1.6	Production Script evaluation report complete	12/26/2001	
1.4.2.5.3.2.2.2.2	First Production Runs Submit Through FNAL	11/12/2001	
1.4.2.5.3.3.4	Monitoring evaluation report	01/25/2002	



FY02Q1 Summary

Major Tier 1 Activities:

- ➔ **User Analysis Cluster R&D**
- ➔ **Disk Test Suites and RAID R&D**
 - ☐ **Studies published on the web. Working on completing a documented test suite.**
- ➔ **Monte Carlo Production & Coordination**
 - ☐ **testing for new production using MOP/BOSS/IMPALA – the CMS GRID tools**
- ➔ **Software distribution and deployment**
- ➔ **Documentation, collaboratory, web servers, etc.**



FY02Q1 Summary

Major Tier 2 Activities:

→ Caltech/UCSD

- Some hardware upgrades
 - New RAID array at UCSD/Upgrade existing arrays at CalTech
 - Networking upgrade at CalTech
- Software deployment and testing
 - Linux upgrades
 - testing for new production using MOP/BOSS/IMPALA – the CMS GRID tools
- Security issues (UCSD was hacked)

→ University of Florida

- Production
 - Minimum Bias production (4M events)
 - testing for new production using MOP/BOSS/IMPALA – the CMS GRID tools
- System administration and maintenance



Status Report FY2001Q1

User Facilities Effort Summary

WBS item	FY2002Q1	Total effort projected FY2002
WBS 1.1 Tier 1 Regional Center		inactive
WBS 1.2 User Support	0.3236	1.1875
WBS 1.3 Maintenance and Operations	0.0375	0.875
WBS 1.4 Tier 2 Regional Centers	0.541	3.50
WBS 1.5 Tier 1 Network	0.025	0.50
WBS 1.6 Software and Computing R&D	0.5932	1.9375
WBS 1.7 Detector Construction Phase Computing	0.4417	0.875
WBS 1.8 Support for Fermilab based computing	0.0412	0.1875
Total FTEs at Fermilab Regional Center	1.46	5.56
Total FTEs	2.00	9.06



Summary

US User Facilities are gearing up for the next major CMS Monte Carlo production

- International CMS has agreed upon the software versions and set of tools to use for production
- US production will be centralized and many GRID tools used
- Much more of an international effort than ever before!

Tier 1/Tier 2 continue R&D in computing

- Major focus for Tier 1
- Collaborating more with Tier 2 + Atlas T1/T2 through iVDGL initiative

User Facility Project Management still needs to:

- Refine MS project plan (w/B. Banerjee)
- Complete T2 WBS for 1st prototype
 - Write/Sign SoW by end of the year – delayed
- Complete WBS for 2nd prototype
 - Write/Sign SoW by end of the year – delayed
- Implement better project tracking (especially w/T2's) – started implementing
 - Tracking personnel against project projections
 - Tracking hardware against project projections
 - Update project from tracking experience