GEM TN-93-462

Computing Subsystem Acting Steering Committee Meeting

August 26, 1993

Abstract:

Minutes and attendees of the Computing Subsystem Acting Steering Committee Meeting held August 26, 1993.

Minutes of the Computing Subsystem Acting Steering Committee of Aug 26th, 1993

Present:

Barry Barish
Larry Cormell
Nasser Danesh
John Hilgart
Ken McFarlane
Antonio Morelos
Lee Roberts
Irwin Sheer
(by video conference)
Jim Dunlea
John Womersley
Gary Word

PRCD Update, J. Hilgart

J.H. reported on personnel changes in PRCD, but neglected to mention the most recent changes: Charles Chang has left PDSF support, and Brian Scipioni has left PRCD and the Advanced Projects group. J.H. also mentioned the educational opportunities which have already started up: a course in object-oriented design, aimed at novices. Current projects of CEG are FRAME and Data-modelling, with PASS subsumed by data-modelling. See transparencies for details.

GEM/SDC/PRCD joint meeting, J. Hilgart, I. Sheer

Irwin reviewed the Framework PAP and PEP with a view to provoke discussion within GEM. Is this what we really want? Serious discussion was postponed, however. J.H. reviewed the other talks. Nothing really exciting. See transparencies for details.

PRCD and Test Beam Storage, L. Cormell

Larry gave a high-content talk which showed GEM's and SDC's requirements related to test beam data storage. Transparencies with lots of interesting numbers are included, where GEM and SDC are shown side-by-side. Perhaps the best-known number, the average daily rate, is now 300 (1200) KB/sec for GEM (SDC). Yearly mass storage requirements: 2.5 (10) TBytes. These and other numbers came to Larry from G. Word (A. Fry) for GEM (SDC) in memorandum form.

Mass-storage options were also described in some detail, including prices. A very good system will be offered by ADSTAR-IBM, believe it or not. Under non-disclosure, they presented us a linear-tape system with high capacity tapes, high transfer rates, robotics, for a reasonable price (see transparencies).

The possibilities for a T3 link between SSCL and Fermilab is being studied. Something should exist by next summer. Reliability can be estimated by studying existing T3 lines.

Global Control System work at the SSCL, H. Uijterwaal

Henk announced the installation of a dedicated workstation, controller hardware and software which constitutes an EPICS test stand. The workstation has some hardware problems right now, but he has managed to conduct some tests of EPICS, which is GEM's 'Global Control System Prototype". See transparencies.

System Development, K. McFarlane

Ken likes what he sees in the PRCD PAP and PEPs (for the uninitiated:

Project Assignment Plan, and Project Execution Plan), but GEM needs may demand additional tailoring. His basic suggestion is to start with a project charter, which becomes a PAP, and then eventually a PEP.

Geometry Builder Tool, J. Wommersley

John reported on the outcome of the recent Geometry Builder Meeting which was held at Fermilab. They hammered out a PAP, based on Soren's template. They decided to concentrate on the first turn of the spiral. The internal description of geometry will be based on Saul Youssef's mathematical description. Identified tasks include analyzing user needs, more collaboration, analyze GEANT 320 approach, and better understand SABRINA from LANL. This first phase may take several months.

CS and GEM testbeam @ FNAL proposal, G. Word

Gary agreed to present an outline of the computing chapter of the RDT at GEM's local computing meeting, Tuesday, Aug 31st. Many people would like to look at it before signing up to write something.

a.o.b.: How to sell the Computing Subsystem within GEM, B. Barish
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Ken introduced the discussion by mentioning that the computing subsystem within GEM is able to generate projects, but not to carry them out due to lack of involvement from outside the lab.

Barry suggested the folowing 3 steps to alleviate the situation:

1) Better inform Barry. "Beat up" on him so that he knows the problem.
2) Right away, Ken should make an executive committe presentation to senior GEM people. This serves to raise their consciousness about computing as well as raise their interest.
3) Follow the general GEM strategy: use the stretchout to build a better GEM eperiment.
   a) Make fewer mistakes.
   b) Use better technologies.
   c) Emphasize test beam opportunity. Ex., the space frame for the silicon tracker, understand barrel-endcap overlap region.

The experience of an integrated GEM will be the best aspect of the test beam, as we learn how to make an experiment. We can learn more if we use the final GEM electronics, hardware, DAQ, computing, but it's a lot of effort up front. For the computing subsystem, this means that to the extent we integrate into the Fermilab test beam, the more relevant we become.

In order to tap into collaboration resources, Barry said he needs to be told, resource-wise, what we need. These should be definite requests generated from project requirements. There are people out there who can be directed. Barry maintains the statement remembered by some of us: the goals we set have to be ambitious, but we have to understand what resources they demand.

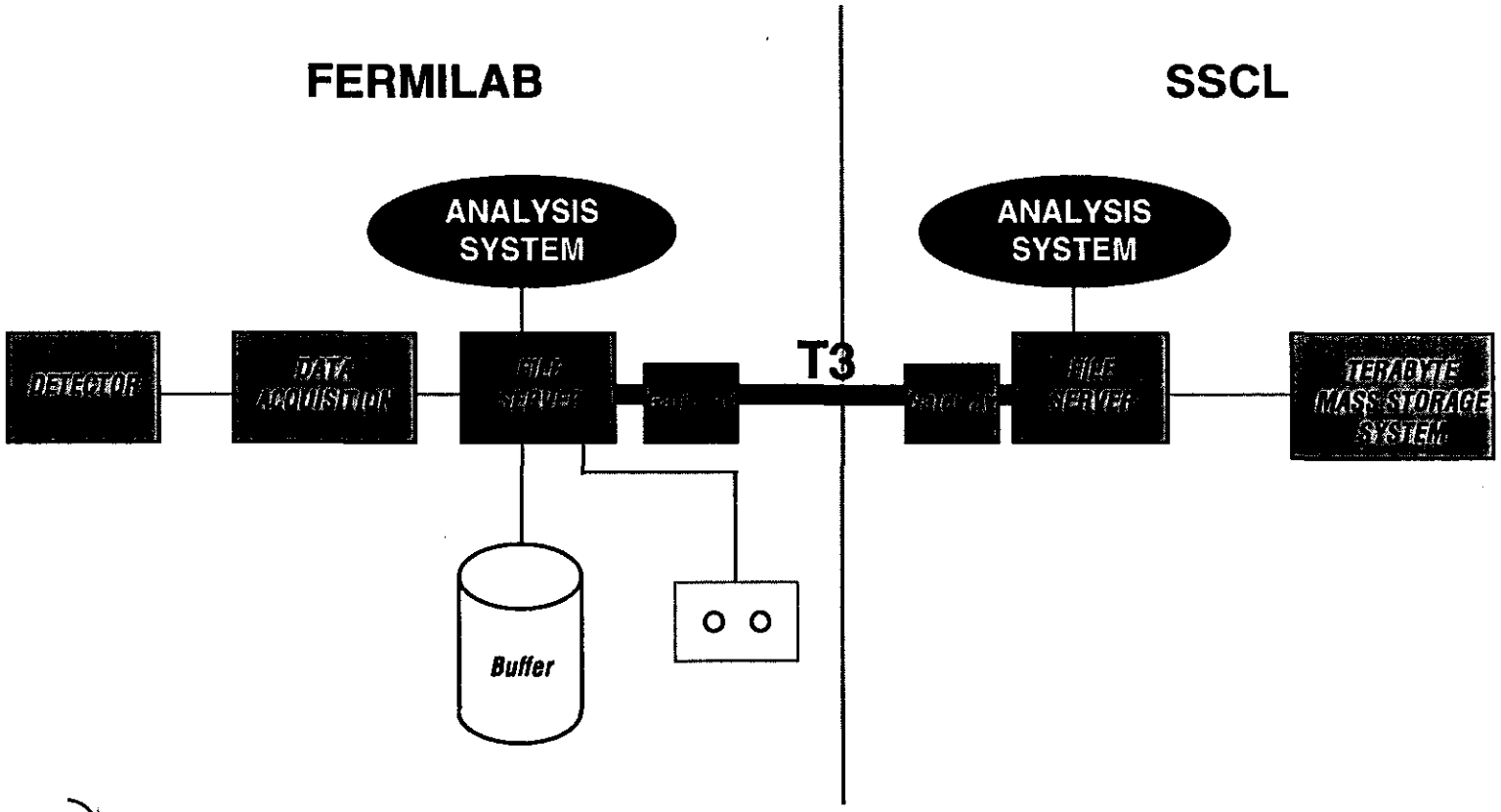
Submitted by J. Hilgart

Off-Line Data Requirements and Parameters for Test Beam Runs

REQUIREMENT/PARAMETER	UNITS	SDC[1]	GEM[2]	TOTAL
Duty Factor: Spill/ramp Experiment		20/70 0.3	20/60 2/3	
Trigger Rate	(Hz)	2000	100	
Event size	(kB)	2 (20)[3]	10	
Peak Data Rate (during spill)	(MB/s)	4 (40)[3]	1	5
Average Data Rate (short term: hourly to daily)	(kB/s)	1200	300	1500
Average Data Rate (long term: weekly to monthly)	(kB/s)	400	100	500
File size	(MB)	~80	20-500	
Yearly Mass Storage	(TB)	10	2.5	12.5
Additional Mass Store	(TB)	1	0.5	1.5
Total Mass Storage	(TB)	11	3	14
Disk Buffer (FNAL)	(GB)		50 (3 days)	
Disk Cache (SSCL)	(GB)		300 (10%)	
Analysis Capacity	(MIPS)	1000	1000 + ???	2000 + ???

1 Alan Fry, Test Beam Computing, Memorandum to PRD Computing Department, August 9, 1993.
2 Gary Word, GEM Test Beam Requirements, Memorandum to PRD Computing Department, August 18, 1993.
3 Zero-suppressed and unsupressed event sizes. The runs without zero-supression will be short and will be stored locally.

MASS STORAGE SYSTEM FOR SSC TEST BEAM RUN



Superconducting **Super Collider** Laboratory

RW:bb 8/26/93 RW03

MASS STORAGE OPTIONS

OPTION	TRANSFER RATE	CAPACITY	APPROXIMATE COST
• SONY D-1			
DIR-1000L	8 MBYTES/Sec		$128K/Drive
DIR-1000M	16 MBYTES/Sec		$185K/Drive
DIR-1000	32 MBYTES/Sec		$295K/Drive
DMS-24		2.3 TBYTES	350K/System
DMS-300M		13 TBYTES	$1080K/System
DMS-700M		30 TBYTES	$1,220K/System
• AMPEX D-2			
ER90			$200K/Drive
Sun Server	6 MBYTES/Sec		
SGI Server	15 MBYTES/Sec		
DST 800		6 TBYTES	$800K/System
• ADSTAR LINEAR	9 MBYTES/Sec		$40K/Drive
		6 TBYTES	$200K/System

MASS STORAGE OPTIONS Cont.

OPTION	TRANSFER RATE	CAPACITY	APPROXIMATE COST
• METRUM VHS			
RSP-2150	2 MBYTES/Sec		$33K/Drive
RSS-600		8.7 TBYTES	$600K/System
• IGM 8mm			
ATL-TT-8500	0.5 MBYTE/Sec		$45K/2-Drive Robots
		6 TBYTES	$1,080K/24 Robots

GCS Work at the SSCL.

Henk Uijterwaal, SSCL, August 26, 1993.

- About 2 weeks ago, LANL installed a EPICS test stand at the SSCL. This system is also known as the Global Control System Prototype.

- The system consists of:

  a) A SUN SPARC IPX station, with a monitor, disk- and tape-drive.

  b) A 167 I/O Controller (IOC)

  c) Some hardware to control: programmable power supplies, steppermotor, resistor and thermocouple,....

  d) The EPICS software, including a demo package.

  e) A pile (≈30 cm) of manuals.

- Short term plans:

  1) Go through the learning curve of EPICS. So far, EPICS seems relatively easy to use but I haven't tried everything or read all the manuals. Report on this in a few weeks.

  2) Finish installation of the system. There are a few minor problems:

     - The screen sometimes looks like a TV with a bad antenna, Sun maintenance has been notified about this problem.

     - The system has to be connected to the network. This requires some recableing, SSCL-networking is working on this.

     - Not everything works as it should work according to the manuals.Bill Kornke (LANL) and I are working on this.

  All these problems will be solve "soon".

- Longer term plans:

  1) Find something to control and develop the necessary EPICS applications.

     One application of EPICS could be the TTR high voltage supplies but there are probably more things inside the TTR that we can control with EPICS.

     This has both practical use AND will learn us more about EPICS.

  2) Look at the EPICS GUI in more detail. Either try to replace it by something else or see if it can be used as GUI for other GEM projects.

- Those of you interested in working with EPICS should contact me for an account on ssc-epics, a demo and a copy of the *"Introduction to Epics"* by Bill Kornke.
- Warnings:

  1. **There are a few minor problems with the setup itself.**
  2. **There are still a few files that can accidentally be overwritten.** I'm trying to fix that but this is already an improvement over the original situation where everybody could overwrite everything. In the meantime: do not save any modified files unless the text explicitly tells you to do so.
  3. **No backups are being made**, but the LANL system manager will install the necessary utilities as soon as the system is connected to the network.

Projects in CEG

o Framekwork:

CEG	GEM	SDC
S. Frederiksen	G. Word?	D. Adams
T. Song	I. Sheer	U. Morita
J. Pan		M. Selover
J. Burton		

Activities: Project Assignment Plan (PAP), and Project Execution Plan (PEP) being discussed by the above group

o Data Modelling

CEG	GEM	SDC
J. Huang	I. Sheer	E. May
U. Nixdorf	G. Word	A. Gauthier
J. Marstaller		
J. Burton		

Activities: Less advanced than Framework Gp. CEG having internal discussions to determine what they can do. Working on PAP.

PASS is not an independent project. Will have to fit into data modelling efforts, to see how it beneifts us.

o Educational Opportunities

- It is hoped to offer classes at all levels to raise the level of software engineering expertise of physicists in GEM/SDC.

Categories:

CASE	data modelling
docuementation design	database design
project management	analysis and design tools

- A current effort is the "High Tea Software Lecture Series" Local experts rotate lectures.

1st meeting: 6 attendees from GEM/SDC – too little for effort

Meeting this Friday. Please encourage particicpation.

PRCD Events of Interest to GEM

o Personnel Changes

- Cathy Nelson, configuration management, document preparation, has joined the admin. supp. gp.. She has an industry background.

- Shuichi Kunori came from U. Maryland to join the app. support gp. for SDC

- David Liu, formerly in the disbanded "advanced project" group, has joined the PDSF support group. He will also work on test beam support vis-a-vis data transfer between Fermilab and SSCL

GEM/SDC joint Computing Meeting

o CEG update (J. Burton).
  Nothing much occurred since previous joint meeting. Lots of people absent from work. (see PRCD update talk)

o PDSF status (R. White)
  - SPARC 2's have all become SPARC 10's, and run FDDI
  - about 6 HP 720 have been upgraded to 735
  - Rest of HP uprgades have been turned back, but memory upgrade to proceed
  - HP OS upgraded to HP–UX 9.01
  - 100 GBytes of disk has arrived for PDSF usage
  - PDSF reconfiguration can be expected at the end of September
  - SGI 360 for both GEM and SDC groups

o Application Server Stuff
  - Interviews installation (J. Pan)
  - Proposal to rationalize app. server organization (J. Hilgart, M. Selover).
    Well received by GEM, IS.
    SDC basically in agreement.

o SCORPION (J. Marstaller)
  - A public domain software development environment

- o Lab–wide documentation system (B. Brinick)
  - The current database for GEM/SDC tech. notes, DTASS, will be replaced by lab–wide system.
  - The end–users will probably not notice the difference.
  - We should be able to continue exploring the use and role of WWW, esp. xmosaic, with this new system. There will be no inherent incompatibilities.