

FOCUSFORUM ON COMPUTING: USERS AND SERVICES**MINUTES OF THE 18th MEETING OF FOCUS
HELD ON THURSDAY 8th JUNE 2000**

Present: T.Cass, M.Cattaneo (Secretary), B.Clare, M.Delfino, F.Etienne, F.Gagliardi, B.Gobbo, R.Gokieli, A.Grant, F.Hemmer, H.-F.Hoffmann, S.Jarp, P.Jeffreys (Chairperson), J.Knobloch, L.Mapelli, M.Marquina, N.McCubbin*), E.McIntosh, H.Meinhard, S.O'Neale, M.Pimiä, F.Ranjard, H.Renshall, K.Safarik, P.Vande Vyvre, R.Voss

Invited: R.Cashmore*), L.Cons*), S.Santiago (replacing J.Shiers), D.Stickland

Apologies: M.Ernst, D.Jacobs, A.Norton, L.Robertson, A.Sandoval, J.Shiers

Absent: J.Altaber, W.Lerche, J.May, M.Mazzucato, L.Taylor, E.Valente

*) part time

- 1 AGENDA
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- 3 Linux 2000 project update (L.Cons)
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 - 4.1 Recommendation of 'software validation platform' working group (M. Pimiä)
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 - 9.4 Policy on service change announcements (S.O'Neale)

1.1 CONSIDERATION OF AGENDA

The chairman pointed out that the agenda has changed significantly in recent weeks, with some items moved to the next meeting due to lack of time. The status report from the LHC review of computing was removed from this agenda since the panels have not yet reached their conclusions.

1.2 MINUTES OF THE LAST MEETING

The minutes had already been approved by E-mail. There were no further comments.

1.3 CHAIRMAN'S COMMENTS

Commenting on the agenda, the chairman made the following remarks:

- The Data Grid is a crucial future activity, we should begin to think about the implications for CERN
- The L2K project is essential for determining the environment for this most important operating system.
- We have almost reached the conclusion of the RISC decommissioning discussion, and Paul thanked everybody who contributed.
- There is still some work to do in defining the scope of the second 'software validation' platform.
- There is a clear shift to using the network for import/export of data to/from CERN
- We will probably need to come back to the remote backup and archive issues
- The mock data challenge talks are the most interesting part of the agenda. These activities give the basis for future planning.

2. STATUS OF DATA GRID PROJECT (F.Gagliardi) (see [slides](#))

By way of introduction, Fabrizio quickly flashed many slides that introduce the concept of the grid. An interesting point is that the grid is a perfect match to the MONARC multi-tier model of regional centres; although the idea is not new, the new high performance networks are the enabling technology.

R&D is required both at the local level (management of giant computing fabrics, mass storage) and in the wide-area (workload management, data management, application monitoring). The HEP data grid initiative is intended to co-ordinate at the European level the national initiatives and projects. Goals are to provide 'middleware' for fabric and grid management, a large-scale testbed, production quality HEP demonstrations, as well as other science demonstrations.

The project is split into twelve 'work packages'. CERN is co-ordinating WP2 (Grid Data Management, Ben Segal), WP4 (Fabric Management, Tim Smith), WP8 (HEP applications, Federico Carminati) and WP12 (Project Management, Fabrizio Gagliardi). The details of each work package are shown in the slides.

There are six main partners (CERN, INFN, CNRS, PPARC, NIKHEF and ESA), a number of other sciences and associated partners from many other countries. Industry is represented by CS SI (F), DataMat (I) and IBM (UK). There is in addition an Industry and Research Project Forum with an open participation.

The project is currently under review in the European Union. The plans for test beds and networking will be reviewed at a workshop in Lyon on June 30th, followed by a work packages workshop in September. The project is very large by EU standards, management and co-ordination will be a challenge. We are anxiously waiting for the project's approval!

The discussion raised the following points

- The project's funding is entirely for staff to work on middleware. The equipment is to be provided by the partners
- The formal decision on the project is expected at the end of July.
- HPSS/EuroStore/Castor are not within the scope of the project. WP5 must develop interfaces into these systems.
- Grid R&D so far has concentrated on super-computers. Support for large PC clusters seems to be coming.
- HEP brings a new set of expertise to the Grid community: large data-sets, commodity computing etc.

FOCUS thanks Fabrizio for the report on the Data Grid project. We note the substantial investment of effort, and recognise the importance of this initiative. There will be direct implications for CERN, and FOCUS will continue to monitor progress and developments.

3. LINUX 2000 PROJECT UPDATE (L.Cons) (see [slides](#))

Lionel introduced his talk by showing the increase in the number of PCs at CERN running Linux. The growth rate **is exponential, with a 50% increase** (about 500 additional PCs) in the last six months. Since the previous presentation at [Focus16](#), activities have included certification of RedHat 6.1 (see <http://cern.ch/linux/l2k/redhat6-certif/>) a survey of Linux activities in CERN/IT (see <http://cern.ch/linux/l2k/docs/ilas.html>) and a number of individual subprojects:

- rethink the certification procedure
- review the Linux installation offering
- next generation system administration (the [PEM](#) project, a replacement for SUE, a replacement for ASIS)
- use at home and on laptops,
- review of the whole environment proposed to users, leading to service level definitions.

The following points arose in the discussion:

- There are several ways to have both Windows and Linux on one PC: dual boot, Windows virtual machine in Linux (or vice versa), Windows terminal server, or use of Linux tools that understand Windows formats. Lionel would like to investigate these options with the help of users, who should clearly state their requirements (**ACTION**).
- Atlas has drafted requirements for Linux on laptops. Helge Meinhard will distribute these to the FOCUS mailing list for feedback from other experiments (**ACTION**).
- It is not feasible to follow all changes to the Linux kernel. There should be about one major certification per year, with patches applied to address specific problems. The role of the L2K project is to define and build the infrastructure necessary for a Linux support service; things such as problem follow-ups should eventually be part of the standard service.

FOCUS thanks Lionel for the update on the Linux project and recognises the importance of the certification procedure pursued. FOCUS notes in particular the remarks made at the end of the talk, and endorses the need to review the future Linux environment supplied at CERN. FOCUS requests a presentation on the Linux/Windows migration at a future meeting (ACTION).

4 RISC UNIX DECOMMISSIONING

4.1 Recommendation of 'software validation platform' working group (M. Pimiä) (see [slides](#))

Martti asked experiments whether they need more than one platform, whether the choice of Linux and Solaris is appropriate, and whether the second platform should be only for development or also for some sizeable production.

The answers (from all the LHC experiments, Opal, Chorus) endorsed Linux as the main platform and Solaris as the second platform, with the exception of LHCb which requires Windows as second platform. OPAL added that they would have problems if some services (e.g. web servers) went entirely to Windows. Agreement was not reached as to the scope of the second platform.

In the discussion it became clear that more work is needed to reach a conclusion.

The reasons for a software validation platform are well understood but a better understanding of the requirements is needed: is a different compiler sufficient? A different OS on the same hardware platform? Or a different hardware architecture as well as a different OS?

The step to a production-sized second platform has major implications on resources because it implies that the entire data management infrastructure must be mirrored. Why should it be deployed at CERN? Are other partners willing to deploy such a major facility at their labs?

Manuel Delfino would like to see a report given to the management where all the experiments write why they think a second production platform is important.

The second software validation platform working group has reached its first conclusion, but FOCUS requests a fuller analysis to be made and documented (ACTION).

4.2 Definition of 'frozen' operating system (M.Cattaneo) (see [slides](#))

The four LEP experiments were asked to define a 'frozen' OS. A range of definitions is possible. One is that all existing experiment software should continue to work without modification, implying that changes in external services should be made in a transparent way. Existing CERN software should be supported on the frozen platform, there is some debate on whether or not bug fixes and compiler patches should be applied, but certainly no new features and no new hardware. Manpower should be kept available in IT to help resolve problems, on the other hand only software actually used by the experiments needs to be supported - a joint effort between IT and the experiments is required to fully identify this software (**ACTION**).

4.3 Experiments' reactions to decommissioning schedule (M.Cattaneo) (see [slides](#))

Most experiments reacted to the decommissioning schedule presented at [FOCUS17](#), unanimously approving the proposals. A little fine tuning is necessary to complete the migration to Linux, with continued access to AIX for some well identified users. The future availability of CERNLIB causes some concern, as well as the need for a widely accepted PAW replacement.

FOCUS thanks all the contributors to this process. It believes that we have responded to the challenges laid before us at the last meeting to define a 'frozen' operating system, and to comment on the decommissioning schedule. We have reached the point where the overall schedule and definition of frozen O.S. are now basically agreed, and will be documented (ACTION)

5. EXPERIMENTS' ANSWERS TO ADDITIONAL QUESTIONS (M.Cattaneo) (see [slides](#))

5.1 Data import/export

The experiments are making increasing use of network connections for data transfers where this is possible. Bulk data is transferred largely by DLT7000, but DLT2000 is still needed by many LEP and heavy ions labs until at least the end of 2001. There is also a very small number of labs using other media, such as DAT120 and Exabytes. Data volumes are of order one TByte per experiment

and increasing, though it is difficult at this stage to predict the impact of the LHC data challenges and of the Grid.

FOCUS thanks the experiments that replied. FOCUS is interested to note the shift towards use of networking for import/export, and the consequent implications. It encourages IT to optimise the use of network connections for data transfer (ACTION)

5.2 Archiving

The question was not too clear, which led to rather unclear answers. Archiving is important to running experiments and to the many users who were encouraged to archive their files. Retrieval of archived data is needed occasionally but there are no objections to using a different system for new data. There is increasing use being made of HSM, the need for a similar system exists also for smaller files currently located in AFS home directories and project space.

5.3 Remote backup

This question was also poorly answered. There are no changes foreseen for the ADSM backup of a few crucial systems. The backup of L3 home directories in ADSM will stop when the migration to AFS is completed. ALICE appreciate using ADSM to backup laptops.

FOCUS endorses the view that desktops should not be backed up. Windows 2000 will enable files to be automatically copied to servers from laptops. It believes that the questions on archiving and backup need to be refined, and the process repeated. Specific features of ADSM which cannot be provided by other means should be specified (ACTION).

6. RESULTS OF RECENT MOCK DATA CHALLENGES

6.1 ALICE data challenge (P.Vande Vyvre) (see [slides](#))

Pierre gave an overview of the ALICE data challenge (ADC) II performed during April. The goal was to test the full data analysis chain at 100MB/s, using existing hardware as data sources, data destinations and mass storage. Simulated TPC data (4MBytes/sector, 18 sectors) was injected into the DATE DAQ system, performing remote event building over Fast and Gigabit Ethernet. The data were recorded in ROOT, testing both HPSS and Castor as MSS. A first test of the level 3 filter was performed.

A peak throughput in excess of 100 MB/s was achieved but the average was considerably less. This highlighted the need for large scale integration and full size scalability tests. Local expertise on all the critical components was essential and highly appreciated.

Future ADCs should be based on the planned LHC computing test-bed, to overcome problems due to under-dimensioned hardware. It is urgent to set up an experiment-sized facility to be shared by the experiments, since it is too expensive for the experiments to set up meaningful test-beds independently.

ADC III is planned for the beginning of 2001, using PC/Linux and a Gigabit Ethernet network with 300MB/s bandwidth. The software should be more fault tolerant to hardware errors, with better monitoring tools. It is planned to concentrate on Castor for the MSS. The goal is to have a throughput of 100MB/s sustained over 10 days.

6.2 CMS ORCA challenge (D.Stickland) (see [slides](#))

David described the recent CMS data production for High Level Trigger studies, using the object oriented reconstruction program ORCA. The main problem consisted in merging 150 randomly chosen minimum bias events on top of each signal event, leading to 35MB per event. Two million signal events were reconstructed at 1 CPU minute per event, in 140 simultaneous jobs running on 70 nodes of the Event Filter Farm. 30 AMS servers served the pileup events. A peak reading rate of 70MB/s was achieved out of Objectivity, 50MB/s continuous rate.

David thanked the excellent response from the many IT services involved. He stressed that the production depended completely on the simultaneous operation of all the services: AFS, AMS, RFIOD, HPSS, CDR, LSF; a breakdown of any part could cause the failure of the whole system.

The production was I/O bound at all stages: reading in and out of the MSS for hit formatting, reading of the pileup events into the reconstruction jobs, and continuous staging out of HPSS for the analysis, due to limited disk space. Better configured data servers will be used in future, purchased out of COCOTIME funds. Monitoring is crucial; control and signalling (to pause jobs for example) will be implemented next time. David also showed the excellent agreement between measurements he made and predictions from a MONARC simulation of the system, and concluded by showing the plans for future tests.

The discussion concentrated on the need for a large scale, shared, test facility. The same hardware could be configured differently for DAQ, trigger and offline tests. Scheduling would be based on well documented requests, as already happens for beam time. System management tests, such as how to evolve the systems while they are running, could also be performed on such a facility. It is significant that the experiments are agreeing on the need for a single facility of size 50%-100% of that needed by a single experiment, rather than four smaller dedicated systems.

FOCUS thanks Pierre and David for their presentations, which are revealing and offer interesting insights. It supports the requirement for a stable, shared, large test-bed, and FOCUS will request the experiments to specify their requirements for this. (ACTION)

7. UPDATE ON ONGOING IT ACTIVITIES

7.1 Status of problem tracking software (T.Cass) (see [slides](#))

Tony described the PRMS Remedy problem tracking application supported by IT/TS/IR section, originally designed for the out-sourced desktop support contract, and now extended to the experiments. Current problems are the complexity of the application, causing long development times, and its inflexibility with respect to administrative changes.

An external consultant has made a positive review of the Remedy service, but also concluded that a backup server and disaster recovery plan are needed, and that the PRMS application should be detached from the underlying Remedy HelpDesk example application.

The latter will be done in July, reducing the complexity by an order of magnitude. This and other PRMS developments are reviewed at monthly user meetings, with the schedule regularly updated on the web.

An ARWeb interface to the PRMS has been developed and is being improved with active collaboration from some experiments.

7.2 Proposed mechanism to handle files belonging to deleted user accounts (M.Marquina) (slides)
Miguel's presentation addressed the problem of deletion of accounts belonging to users who have left CERN, without losing files that may be important to the experiments. To alleviate the problem he suggests that shared data and software should always be installed and maintained directly in collaboration "project" areas, and that existing temporary staff and their supervisors should ensure that no shared data relies on access to individual accounts.

It is suggested that all known shared accounts be relocated under a single entry point, with ownership reassigned to the group administrators. Affected users will be notified and given three months to state their relationship with CERN. In the absence of replies, the account rundown sequence will be started.

For the future it is proposed to make the cancellation of accounts part of the staff "check-out" process, triggered by the contract expiry date in the PIE database of CERN personnel. At arrival all users have to be registered in PIE, including a departure date, before any computer account can be opened. Upon departure a rundown sequence of warning/blocking/deletion would be followed, with mail warnings at each stage both to the user and the group administrator. The process can be stopped at any time with appropriate justification.

In the discussion some concern was expressed about the treatment of external users, whose contracts expire every year. This issue is being taken up with the users office and ACCU. The important point is that a process for account deletion has to be defined, because of the security implications of leaving accounts open indefinitely. The new responsibilities that the group administrators would acquire in this process replace the need for an annual review of accounts.

One point to consider is what to do about files archived in pubarch. One reason for keeping obsolete accounts open is that files in pubarch can only be retrieved by their owner.

Manuel Delfino suggested reporting back on the fine tuning of this policy following discussions with ACCU (**ACTION**).

8. ACTIONS OUTSTANDING

Minuted/Section	Action	Who	Status
01/07/1999 14/2	Organise discussion of Storage Area Networks at a future meeting	M.Cattaneo, P.Jeffreys	Moved to FOCUS 19
01/07/1999 14/2	Organise review of Mass Storage technologies at October 2000 meeting	M.Cattaneo, P.Jeffreys	Planned for FOCUS 19
01/07/1999 14/3	Investigate mechanism to keep for some time archived files belonging to a deleted account	IT Division	See these minutes, section 7.2
01/07/1999 14/4	Look into new representation on DTF	P.Jeffreys M.Delfino	Steve O'Neale identified as FOCUS representative. Find out how to ask DTF to nominate him
02/12/1999 16/2	Provide feedback to Paul on his review of FOCUS in 1999	All FOCUS members	Expired
02/12/1999 16/3	Organise review of progress of L2K project	M.Cattaneo, P.Jeffreys	See these minutes, section 3
02/12/1999 16/4	Determine policy for future use of FORTRAN CERN libraries	IT Division, FOCUS	Review of requirements moved to FOCUS 20
02/12/1999 16/6 02/03/2000 17/5	Working group to make recommendations for a 'software validation' platform other than Linux, to be presented at FOCUS 18	M.Pimiä	See these minutes, section 4.1

02/03/2000- 17/2	Report on LHC Computing Review at next meeting	D.Jacobs	Moved to FOCUS 19
02/03/2000- 17/4	Organise discussion on freezing of NICE95/NT	M.Cattaneo, P.Jeffreys	Planned for FOCUS 20
02/03/2000- 17/4	Proposal for centralised migration of Windows home directories to DFS	IT Division	To be included in NICE discussion in FOCUS 20
02/03/2000- 17/4	Organise discussion of remote access to Windows home directories	M.Cattaneo, P.Jeffreys	To be included in NICE discussion in FOCUS 20
02/03/2000- 17/5	LEP experiments to define 'frozen OS support', for presentation at FOCUS 18	M.Cattaneo, P.Jeffreys, LEP expt. reps.	See these minutes, section 4.2
02/03/2000- 17/5	LEP experiments to define long term analysis strategy by end 2000	LEP expt. reps.	Planned for FOCUS 20
02/03/2000- 17/5	Review RISC decommissioning timetable, for final approval at FOCUS 18	Experiment reps.	See these minutes, section 4
02/03/2000- 17/6	Experiments to decide how to split their tapes between the different libraries	Experiment reps.	Feedback received from some experiments. Harry requests others to please do so
02/03/2000- 17/6	Modify TMS to handle split tape libraries transparently	H.Renshall	Done
02/03/2000- 17/6	Determine future tape import/export requirements	Expt. reps., M.Cattaneo, P.Jeffreys	See these minutes, section 5.1
02/03/2000- 17/10	Send feedback on archiving and remote backup requirements to Les Robertson	Experiment reps.	See these minutes, sections 5.2 and 5.3

9. A.O.B.

9.1 Status of AFS (E.McIntosh) (see [slides](#))

Eric gave an update of the status of AFS. The hardware consolidation is almost complete, two (reliable) servers remain to be replaced to converge on a uniform Solaris configuration. In Eric's opinion the service is adequately staffed, but it does take time to fix problems. He also highlighted some misuses of the system: thousands of cron jobs, the existence of AFS scratch areas.

He thinks AFS has to be the primary home directory storage solution for at least two more years, but there are plans to actively seek alternatives in the longer term.

Concerning performance, in the first 5 months of 2000 there were the following incidents:

- 3 "Very Serious" incidents (one of which was in fact a network problem)
- 10 "Serious" incidents (of which the first 6 were due to the hardware now replaced, while the last 4 were due to a memory leak in the latest version of AFS, for which a workaround is in place);
- 12 "Annoying" incidents

The severity level reflects the amount of production time lost.

9.2 Updated IT organisational chart (M.Delfino) (see [slide](#))

Manuel showed the updated IT organisational chart. The IA and WIN groups have been merged into a single Internet Services (IS) group, led by Frederic Hemmer. Denise Heagerty is the new CERN wide computer security officer.

9.3 ASIS user support (F.Ranjard)

Florence complained about the response time of the ASIS support service. It seems however that the poor response was due to her mail being lost in the HelpDesk system, and that the ASIS team responded immediately they were aware of Florence's problem. Manuel confirmed that ASIS is a

production service, so it is reasonable to expect that problems be dealt with in a timely fashion. He also pointed out that ASIS and SUE were intended to make all Unix platforms look the same to users. In a future where the vast majority of systems will be Linux this will no longer be needed, hence there are no plans to develop ASIS further. The investment in certification processes is intended to reduce the need for ad hoc debugging.

9.4 Policy on service change announcements (S.O'Neale)

Steve followed up on the exchanges of E-mail in the FOCUS mailing list concerning unannounced changes to important services, giving a list of changes that affected Opal. He thinks that the problem is communication. He suggests putting all problems that might affect users (including changes to production systems) into Remedy, thus allowing 'anyone' to review the work and assess its impact. It would then be up to responsible people in the experiments to identify changes that might affect 'their' users and to propagate the information to them. However Steve is worried about the scalability of this approach. He also points to a lack of coherence in information services, with different groups of people using different tools: news, newsgroups, conferences, mailing lists with archives, hypernews etc.

Eric McIntosh confirmed that there is a policy of not making any unannounced changes to production services. The IT-experiment mailing lists are a possible communication channel, another possibility are user meetings along the model of the Remedy user meetings.

The chairman asked for a proposal to be made on how to proceed (**ACTION**).

PENDING ACTIONS

Minuted/Section	Action	Who	Status
01/07/1999 14/2	Organise discussion of Storage Area Networks at a future meeting	M.Cattaneo, P.Jeffreys	Planned for FOCUS 19
01/07/1999 14/2	Organise review of Mass Storage technologies at October 2000 meeting	M.Cattaneo, P.Jeffreys	Planned for FOCUS 19
01/07/1999 14/4	Look into new representation on DTF	P.Jeffreys	Ask DTF to nominate S.O'Neale as FOCUS representative.
02/12/1999 16/4	Determine policy for future use of FORTRAN CERN libraries	IT Division, FOCUS	Review of requirements planned for FOCUS 20
02/12/1999 16/6 02/03/2000 17/5 08/06/2000 18/4.1	Second software validation platform working group to make and document fuller analysis following presentation at FOCUS18	M.Pimiä and experiment reps.	
02/03/2000- 17/2	Report on LHC Computing Review at next meeting	D.Jacobs	Planned for FOCUS 19
02/03/2000- 17/4	Organise discussion on freezing of NICE95/NT	M.Cattaneo, P.Jeffreys	Planned for FOCUS 20
02/03/2000- 17/4	Proposal for centralised migration of Windows home directories to DFS	IT Division	To be included in NICE discussion in FOCUS 20
02/03/2000- 17/4	Organise discussion of remote access to Windows home directories	M.Cattaneo, P.Jeffreys	To be included in NICE discussion in FOCUS 20
02/03/2000- 17/5	LEP experiments to define long term analysis strategy by end 2000	LEP expt. reps.	Planned for FOCUS 20
02/03/2000- 17/6	Experiments to decide how to split their tapes between the different libraries	Experiment reps.	Please send feedback to Harry Renshall if not already done
08/06/2000-18/3	State requirements for interoperability of Linux and Windows	Experiment reps.	Please send feedback to Lionel Cons
08/06/2000-18/3	Distribute ATLAS requirements for Linux on portables to FOCUS mailing list.	Helge Meinhard	Experiment reps. should send their feedback
08/06/2000-18/3	Organise presentation on Linux/Windows migration at a future meeting	M.Cattaneo, P.Jeffreys	
08/06/2000-18/4.2	Identify full set of software to be maintained in frozen operating system	Experiments with IT.	

08/06/2000-18/4	Document RISC decommissioning schedule and definition of frozen O.S.	IT Division	
08/06/2000-18/5.1	Ensure external network connections are optimised and appropriate for import/export data transfers (protection against breaks, reliability, ease of transfers)	IT Division together with external partners	
08/06/2000-18/5	Refine questions on experiments' needs for remote backup and archive, including needs for any features unique to ADSM	IT Division	
08/06/2000-18/6	Request experiments to specify requirements for large shared LHC computing test-bed	M.Cattaneo, P.Jeffreys	
08/06/2000-18/7.2	Report back to FOCUS on details of User Revoking Policy, following ACCU discussion	M.Delfino	
08/06/2000-18/9.4	Make proposal on how to improve service change announcements	M.Marquina, S.O'Neale	