THE CN DIVISIONAL PLANNING GROUP

Minutes of the Meeting held on 27th. April 1992

PRESENT: J.J.Bunn(Secretary), B.Carpenter, R.Dobinson(ECP), F.Gagliardi, J.Gamble, D.Jacobs, C.M.S.Jones, J.–C.Juvet, M.Metcalf, A.Osborne(Acting Chairman), H.R.Renshall, L.M.Robertson, A.G.Silverman, I.M.Willers(ECP).

- *MINUTES OF LAST MEETING (CN/DPG/92/MIN/3), AND MATTERS ARISING*

The action on J.Joosten would be covered by B.Carpenter's presentation. The remaining action items remain pending.

- *CHAIRMAN'S REPORT*

A.Osborne presented the report on behalf of D.O.Williams.

1. He circulated the Report on Future Security by D.Lord at al. This was to be the subject of a future DPG discussion.
2. J.Richards was running a Kerberos implementation fact–finding exercise.
3. L.Robertson would take charge of the investigations into MP (Massively Parallel) machines.
4. After discussion with the French company Alcatel, it had been decided to set up a joint project with them to implement ATM on the CERN site.
5. D.O.Williams had attended a computing review board at IN2P3.
6. A.Osborne asked that the note from S.Jarp on joint projects between CERN and the computer industry be circulated to the DPG.
7. He had received a paper concerning a proposal to set up a distributed storage system at a U.S. "National Storage Laboratory" to be located at Lawrence Livermore Laboratories.

- *INTERNAL NETWORK STRATEGY*

B.Carpenter presented the strategy for the coming years with regard to networks on the CERN site. Today, there were around four thousand active Ethernet stations on roughly eight hundred cables, logically partitioned into seventy segments. At peak times, the data rate on the main CERN backbone rose to 24 MBits/sec.

The prediction for the dominant protocol was TCP/IP, but with significant traffic in DECnet, Novell and Appletalk. However, although this was fairly clear, it was hard to say just *where* the majority of traffic would occur; where would the bulk of the physics data be stored in years to come?

A sensible goal was a bandwidth of 10 MBytes/sec everywhere, and to target specific high traffic areas for improvement, as they appeared. It was widely held that each large experiment should have its "own" network, with appropriately performant connections into the rest of the infrastructure. Fortunately, 10 MBytes/sec technology is readily available "off the shelf".

By extrapolating current growth rates into the year 1995, and following B.Carpenter's model, it was expected that a 500 Mbit/sec backbone would be required then. It seemed clear that the enabling hardware would be fibre optic cable, although maybe not with FDDI since this only seemed to yield a factor three improvement over Ethernet data rates. Maybe improvements in FDDI software, or moving protocol processing outboard to dedicated interfaces would improve this factor in the future.

It was remarked that to cable an office for fibre at today's prices cost about 5000 SFR, clearly prohibitive on a large scale.

Finally, he predicted a move away from shared links to network switches in the coming years, but said we would have to wait some time for widespread use of Gbit technology at CERN.

- *GP–MIMD*

R.Dobinson, who was supported by I.Willers, presented an overview of ECP Division's involvement in the GP–MIMD and associated projects. Copies of his transparencies, which have been vetted before inclusion, are attached to these Minutes.

Three projects were described: GP–MIMD–1 (T9000 CPU chips and C104 switching chips), HARMONY (a distributed operating system for Transputers based on the CHORUS operating system), and GP–MIMD–2 (a proposal to put a 1024–node T9000 machine at CERN). The consortium tackling these projects included three commercial companies. There were four people involved in ECP Division, with extra help coming in the form of CERN Fellows.

The GP–MIMD–1 project had begun in January 1991. CERN work had involved the design of a VME Transputer board, with HIPPI channels and fibre optic links, a real time DAQ system written for CHORUS in T800 chips (as an interim test until the T9000 chips are available), investigations into parallel–processing paradigms for large Fortran programs, including work that was just starting on the ALEPH reconstruction program called JULIA.

The HARMONY project was proposed in 1991, and was just starting. By 1995 it was hoped that full Unix functionality across a network of transputers with access to local servers, would be ready. The CERN contribution would be in a real time Application Programmer's Interface (API), and work on a real application such as the PET scanner system at the Cantonal Hospital. The expected benefits of the work were increased experience with Unix micro–kernel coding for real applications.

The GP–MIMD–2 project was a proposal for a massively parallel array of Transputer chips offering 25 GFLOPS of performance, and 500 GBytes of disk space, running Unix SVR3.2. It was proposed to install and test the machine in the CERN Computer Centre, and provide connections to it from the major networks. The estimated date on which the machine would be installed and running applications was the beginning of 1995. The benefits to CERN of allowing the machine to be housed here, included twenty man–years of funding for Fellows, the availability of its significant processing power (for a few suitable applications!), and experience in parallel processing practices and techniques. However, the details of the project were still under negotiation.

In discussion, L.Robertson remarked that, in fact, the machine seemed likely to be much less general purpose than had originally been supposed. Applications would need to be developed carefully before they could make use of the system, and this surely implied a major effort from staff in CN Division. He worried about the possibility of becoming tied to this one, rather particular, MPP architecture.

M.Metcalf said that, although interesting, paralellising one particular experiment's reconstruction program is a rather transient activity, since the need for that program probably dies with the experiment. However, paralellising a program like GEANT would be of much longer lasting utility, and thus a better return on the manpower investment, which was surely considerable. He mentioned applications like Sixtrack and Lattice Gauge calculation software as other good examples.

B.Carpenter echoed R.Dobinson's statement that collaboration with industry is important for CERN's future, particularly *vis a vis* the EEC. He believed that application portability was as important to industry as it was to CERN.

Finally, H.Renshall stated that he would expect the twenty man years of provided effort to include user–support.

- *ANY OTHER BUSINESS*

  None.

- *NEXT MEETING*

  The next meeting will be held on 15th. June at the usual time and place.

Table 1: Action Items

Name	Entry Date	Target Date	Task
D.Williams	April 1991	Summer 1991	Produce cover note for Costs paper
F.Fluckiger	November 1991	1992	Give Computer Colloquium on Multimedia
J.Bunn	November 1991	June 1992	Present VMS/RISC
R.Brun	January 1992	1992	Task Force on Computing Models
J.Joosten	March 1992	1992	FDDI costs and issues