# COMPUTER NEWSLETTER

## JANUARY – MARCH 1995
No. 219

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UCO Book Catalogue: 34
Editorial Notes

Past experience shows that it is a good policy to have four CNL editions per year (one around Easter, one before and one after the summer, and the last one just before Xmas), unless the number of contributions makes it necessary to have a supplementary issue, or to cancel one. Thus,

the date of the deadline for contributions to the next issue of the CNL is:

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Contributions to the CNL are accepted as plain text, although marked-up text in \LaTeX{} is preferred. Articles, news items and letters intended for publication in the next issue should be sent directly to the editor (cnl.editor@cern.ch) without particular controls on the mail subject line.

The opinions expressed in this newsletter are those of the contributors and are not necessarily those of the CERN management. The editorial board reserves the right to edit, omit or hold-over copy due to lack of space.

This document was produced with \LaTeX{} and the cerncn1 style. Compressed PostScript files, containing the complete printable version of this CNL or parts of it can be obtained by anonymous ftp to asisftp.cern.ch as follows (commands to be typed by the user are underlined):

```
ftp asisftp.cern.ch
Name (asisftp:username): anonymous
331 Guest login ok, send your complete e-mail address as password.
Password: yourusername@yournode.domain.country
ftp> cd cnl/219
ftp> binary
ftp> get cnl219.ps.gz (or get cnl219.ps)
ftp> quit
```

Please note that, if you do not have the gnu gunzip utility on your system you can get the uncompressed PostScript Version by typing the command `get cnl219.ps`, without the `.gz` suffix. In order to save Internet bandwidth, you are, however, strongly urged to try and install the gunzip utility since gzipped files are about three times smaller than their unzipped equivalents.

The following files related to the present CNL are available in that directory:

- `cnl219.ps.gz` Complete CNL
- `general.ps.gz` “General”
- `desktop.ps.gz` “Desktop Computing”
- `asad.ps.gz` “Application Software & Databases”
- `qa.ps.gz` “Questions and Answers from the UCO”
- `edithelp.ps.gz`
- `central.ps.gz`
- `network.ps.gz`
- `textproc.ps.gz`
- `tutor.ps.gz`

We would like to encourage you to subscribe to the announcement of the PostScript version, a service which is becoming more and more popular. You just have to send a mail to cnl@cern.ch (the “CNL server” machine) with the subject line being:

```
Subject: ANNOUNCE POSTSCRIPT CNL
```

The CNL server will then send you a mail whenever there is a new CNL ready as a PostScript file.

The CNL is available on WWW at the URL http://consult.cern.ch/cnl/219.

A terminal browsable version can be accessed on all central systems via the command:

```
XFIND CNL 219
```

On CERNVM \XFIND will give access to the printable (usually PostScript) version as well.

Responsible editor: Nicole Cremel
Technical co-editor: Michel Goossens
## IF YOU NEED HELP (Contacts at CERN)

<table>
<thead>
<tr>
<th>Service</th>
<th>Name</th>
<th>Address 1</th>
<th>Address 2</th>
<th>Telephone</th>
<th>E-mail Address</th>
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</thead>
<tbody>
<tr>
<td><strong>USER CONSULTANCY OFFICE (UCO)</strong></td>
<td></td>
<td>513/R-052</td>
<td></td>
<td>4952</td>
<td><a href="mailto:user.support@cern.ch">user.support@cern.ch</a></td>
</tr>
<tr>
<td>Opening hours 9.00-17.00 (except Mondays 10:00-17:00)</td>
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<tr>
<td>All aspects</td>
<td>Miguel Marquina</td>
<td>513/1-020</td>
<td></td>
<td>4912</td>
<td><a href="mailto:user.support@cern.ch">user.support@cern.ch</a></td>
</tr>
<tr>
<td>Accounting Service</td>
<td>Attila Koppanyi</td>
<td>513/1-019</td>
<td></td>
<td>4933</td>
<td><a href="mailto:user.support@cern.ch">user.support@cern.ch</a></td>
</tr>
<tr>
<td>User Registration</td>
<td>M.C. Perler</td>
<td>513/1-017</td>
<td></td>
<td>5004</td>
<td><a href="mailto:user.support@cern.ch">user.support@cern.ch</a></td>
</tr>
<tr>
<td>Consultancy Office</td>
<td>R. Woolnough</td>
<td>513/1-020</td>
<td></td>
<td>9156</td>
<td><a href="mailto:user.support@cern.ch">user.support@cern.ch</a></td>
</tr>
<tr>
<td>Computer Documentation Office</td>
<td>M. Franceschi</td>
<td>513/1-022</td>
<td></td>
<td>2371</td>
<td><a href="mailto:user.support@cern.ch">user.support@cern.ch</a></td>
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<td><strong>CENTRAL COMPUTER OPERATIONS (24 HOURS)</strong></td>
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<td>513/R-066</td>
<td></td>
<td>5011</td>
<td>operator@cernvm</td>
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<tr>
<td>All aspects &amp; IBM</td>
<td>David Underhill</td>
<td>513/3-035</td>
<td></td>
<td>4920</td>
<td><a href="mailto:d.underhill@cern.ch">d.underhill@cern.ch</a></td>
</tr>
<tr>
<td>Central VAXes</td>
<td>Tim Whibley</td>
<td>513/R-033</td>
<td></td>
<td>4849</td>
<td><a href="mailto:t.whibley@cern.ch">t.whibley@cern.ch</a></td>
</tr>
<tr>
<td>CORE services - CSF</td>
<td>Vincent Doré</td>
<td>513/R-031</td>
<td></td>
<td>2397,13+3830</td>
<td><a href="mailto:v.dore@cern.ch">v.dore@cern.ch</a></td>
</tr>
<tr>
<td>CORE services - SHIFT</td>
<td>Gordon Lee</td>
<td>513/1-020</td>
<td></td>
<td>4974</td>
<td><a href="mailto:g.lee@cern.ch">g.lee@cern.ch</a></td>
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<td>Distributed Printing</td>
<td>Jean-Louis Vosdey</td>
<td>513/R-049</td>
<td></td>
<td>5011</td>
<td><a href="mailto:Printer.Support@cern.ch">Printer.Support@cern.ch</a></td>
</tr>
<tr>
<td>Networks</td>
<td>Alasdair Ross</td>
<td>513/R-034</td>
<td></td>
<td>4927</td>
<td><a href="mailto:netops@cern.ch">netops@cern.ch</a></td>
</tr>
<tr>
<td><strong>CERN PROGRAM LIBRARY OFFICE</strong></td>
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<tr>
<td>All aspects</td>
<td>Jamie Shiers</td>
<td>513/1-002</td>
<td></td>
<td>4928</td>
<td><a href="mailto:cernlib@cern.ch">cernlib@cern.ch</a></td>
</tr>
<tr>
<td>VMS, VM/CMS</td>
<td>Jamie Shiers</td>
<td>513/1-002</td>
<td></td>
<td>4928</td>
<td><a href="mailto:cernlib@cern.ch">cernlib@cern.ch</a></td>
</tr>
<tr>
<td>Apollo, HP/UX Support, SHIFT, CSF</td>
<td>Gunter Folger</td>
<td>513/1-003</td>
<td></td>
<td>5010</td>
<td><a href="mailto:cernlib@cern.ch">cernlib@cern.ch</a></td>
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<tr>
<td>DECstation, Sun Support</td>
<td>Ian Mclaren</td>
<td>513/1-003</td>
<td></td>
<td>5010</td>
<td><a href="mailto:cernlib@cern.ch">cernlib@cern.ch</a></td>
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<tr>
<td>Distribution of CERNlib material</td>
<td>Lysiane Besson</td>
<td>513/1-014</td>
<td></td>
<td>4951</td>
<td><a href="mailto:cernlib@cern.ch">cernlib@cern.ch</a></td>
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<tr>
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<td></td>
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<tr>
<td>Desktop Computing</td>
<td>Chris Jones</td>
<td>31/2-020</td>
<td></td>
<td>4884</td>
<td><a href="mailto:chris.jones@cern.ch">chris.jones@cern.ch</a></td>
</tr>
<tr>
<td>Operating Systems</td>
<td>Les Robertson</td>
<td>31/3-007</td>
<td></td>
<td>4916</td>
<td><a href="mailto:les.robertson@cern.ch">les.robertson@cern.ch</a></td>
</tr>
<tr>
<td>Vault &amp; Cartridge operations</td>
<td>R.P. Minchin</td>
<td>513/R-009</td>
<td></td>
<td>13+5559</td>
<td><a href="mailto:ric.minchin@cern.ch">ric.minchin@cern.ch</a></td>
</tr>
<tr>
<td>Cartridge purchase</td>
<td>Jean-Francois Lachavanne</td>
<td>513/R-038</td>
<td></td>
<td>4973 or 13+5617</td>
<td><a href="mailto:j-f.lachavanne@cern.ch">j-f.lachavanne@cern.ch</a></td>
</tr>
<tr>
<td>Experimental Tape Allocation</td>
<td>Hansjorg Klein</td>
<td>13/3-024</td>
<td></td>
<td>2124,2060</td>
<td><a href="mailto:hans.klein@cern.ch">hans.klein@cern.ch</a></td>
</tr>
<tr>
<td>Computer Science Library, mornings only</td>
<td>Jutta Megies</td>
<td>513/1-024</td>
<td></td>
<td>2379</td>
<td><a href="mailto:j.megies@cern.ch">j.megies@cern.ch</a></td>
</tr>
<tr>
<td>Oracle</td>
<td>Sergio Santiago</td>
<td>31/3-011</td>
<td></td>
<td>4134,13+5580</td>
<td><a href="mailto:oracle.support@cern.ch">oracle.support@cern.ch</a></td>
</tr>
<tr>
<td>Computer Security</td>
<td>John Gamble</td>
<td>31/3-030</td>
<td></td>
<td>3105</td>
<td><a href="mailto:j.gamble@cern.ch">j.gamble@cern.ch</a></td>
</tr>
<tr>
<td>Central VMS Service Manager</td>
<td>Judy Richards</td>
<td>31/3-009</td>
<td></td>
<td>4983</td>
<td><a href="mailto:j.richards@cern.ch">j.richards@cern.ch</a></td>
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**ONLINE COMPUTING:** See “ONLINE”, the Newsletter of Data acquisition and Computing for Experiments,

Available from Anne Perrelle 31/1-003 2406 a.perrelle@cern.ch

**COMPUTING FOR ENGINEERING:** See the CERN Computing Support for Engineering Newsletter,

Available from Monique Tate-Lavergne 513/2-010 2863 m.tate@cern.ch

**COMPUTER TIME ALLOCATION GROUP (COCOTIME):**

Secretary: A.E. Ball/ECP 14/6-023 3849 alan.ball@cern.ch

## DIVISIONAL REPRESENTATIVES FOR COMPUTING

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<td>AS</td>
<td>M. Draper</td>
<td>AT</td>
<td>P. Heymans</td>
<td>CN</td>
<td>A. Koppanyi</td>
<td>DSU</td>
<td>M. Draper</td>
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<td>S. Lauper</td>
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<td>SL</td>
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<td>ST</td>
<td>G. Martin</td>
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<td>G.R. Stevenson</td>
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<td>R. Saban</td>
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<td>M. Moller</td>
<td>ECP</td>
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<td>MT</td>
<td>C. Andrews</td>
<td>PE</td>
<td>D. Duret</td>
<td>PPE</td>
<td>E. Pagliola</td>
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<tr>
<td>PS</td>
<td>A. Pace</td>
<td>SL</td>
<td>P. Lienard</td>
<td>ST</td>
<td>P. Ciriani</td>
<td>TH</td>
<td>R. Sommer</td>
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<tr>
<td>TIS</td>
<td>B. Moy</td>
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UNIX Workstations and X Terminals Support

List of Contact Accounts

Team Leader        Alan Silverman 31-1-030 tel 4955
e-mail - Workstation.support@cern.ch

UNIX Workstations and X Terminals Front Desk

Christiane Ball 31-1-015 tel 3349
e-mail - Workstation.frontdesk@cern.ch

SUN software      e-mail - sun.support@cern.ch
DEC's OSF/1 s/w    e-mail - osf.support@cern.ch
RS/6000 s/w        e-mail - aix.support@cern.ch
ULTRIX s/w         e-mail - ultrix.support@cern.ch
HP 700 s/w         e-mail - hp.support@cern.ch
Apollo/Domain      e-mail - apollo.support@cern.ch
X terminals        e-mail - xterminal.support@cern.ch
SGI software       e-mail - sgi.support@cern.ch
AFS                e-mail - afs.support@cern.ch
Printers           e-mail - printer.support@cern.ch

COMMUNICATIONS AND NETWORKS

Please use generic electronic mail addresses whenever possible. These mailboxes will be read even when the usual specialist is absent. It is helpful to use relevant keywords in the subject field of your message. Contact specialists directly only for very urgent cases or for very general consultations.

Service

Software and interface consultancy
Network infrastructure consultancy (backbone and FDDI)
Network infrastructure consultancy (Ethernet in buildings)
Network security alerts (hacking attacks)

General network operational problems

Specific Ethernet problems
Internet (TCP/IP) registration requests
LAT terminal server registration requests
DECFnet Registration Requests and Queries
Other registration requests
Queries about electronic mail
Novell coordination and general PC networking advice
Advice on Macintosh networking

E-mail Address

John.Gamble@cern.ch or Mike.Gerard@cern.ch
Joop.Joosten@cern.ch or Jacques.Rochez@cern.ch
George.Snyris@cern.ch
cert@cern.ch (if urgent: 4927 or 8665)
[5011 night/weekend]
etops@cern.ch (if urgent: 4927 or 8665)
[5011 night/weekend]
eternet.support@cern.ch or 2299
tcpi@cern.ch
lat.support@cern.ch (2299 for problems)
decnet.support@cern.ch (dxminta::decnet-support)
etops@cern.ch
mail.support@cern.ch
nice@cern.ch
macnet@cern.ch (2299 for problems)
[4366 for general Macintosh problems]

SEMINARS AND PRESENTATIONS

Designation

Computing Colloquia (Auditorium / bldg 500)
Computing Seminars (CN Auditorium 31/3-005)
Technical Presentations (CN Auditorium 31/3-005)

Organizer          Div.  Address  Telephone  E-mail Address
Sverre Jarp        CN  31/1-019  4944  s.jarp@cern.ch
Douglas Kemp       CN  31/1-011  5024  d.kemp@cern.ch
Jean-Pierre Porte  ECP  32/2-C07  3457  j.pierre.porte@cern.ch
Richard Keyser     SL  864/1-B23  4363  r.keyser@cern.ch
Stanley Cannon     CN  513/S-014  5036  stan.cannon@cern.ch
Letters to the Editor

Computer Documentation

I've two remarks or wish-list items:

- The CNL page that used to announce new/updated manuals seems to have disappeared. Could we have some mechanism that tells whenever a new/updated manual becomes available?
- I strongly suggest including a history of changes in the manuals.

Helge Meinhard ECP/SA

Both remarks are probably a good idea. You will see, in this issue of the CNL, a new chapter, at the end, on “Computer Documentation”, concerning the CERN writeups and manuals, and also all the computing books which are purchasable from the UCO (Computer Documentation Office).

From now on, this chapter will appear on a regular basis, and will contain announcements concerning new documentation (e.g. the “Guide for the Usage of X at CERN” in this CNL issue), or the availability of new books (the “UCO Book Catalogue” will also be put regularly at the end of the CNL).

For the second point, it will be up to the author or the person responsible for the writeups and manuals to send me a short article to be put in this dedicated chapter whenever they feel some information has to be given (new version, history of changes, etc.). On the other hand, the old way of indicating changes is probably no longer adequate, as explained by Michel hereafter.

Nicole Cremel

Faced with an ever increasing flow of information it has become even more necessary to have access to the latest version of the description of a program, detector, the phone book, etc. Guaranteeing the correctness of this information and keeping it up-to-date is one of the main tasks that any organization is facing nowadays. New tools, like printing on demand, electronic documents, multi-purpose publishing formats, are becoming available (see my article on Acrobat for a promising commercial solution), and CERN is looking at how best to apply these emerging technologies. As far as your second point goes, it no longer makes sense to have “change bars” a “history section” in manuals, since we are continuously making updates to them. In some cases the documentation is even being integrated with the actual computer code, and modifications are made together to the code and the documentation, so that the notion of an “old” and “new” copy of a reference manual is no longer applicable. Also, since we make small print runs for the various manuals, we always print the most up-to-date version, and it would be uninformative to mark changes with the version of a few days earlier. And finally, we are moving more and more away from “paper” printing, and want to introduce tools based on data-base publishing, that allow the user to interrogate a data-base of keywords, routines, procedural parameters, etc., thus making it easier to retrieve the information one is after.

All this will take us a long way from the traditional paper-copy paradigm, but I am confident that the change will be for the better, by ensuring that the user always gets the most up-to-date version of the information required.

Michel Goossens
1. General

1.1 CERNVM Rundown Schedule — Request for Input

David Jacobs CN/DI

The following memorandum was recently sent by the Director of Research and the Technical Director to Division Leaders and the Spokespersons of experiments. It is copied here in order also to give individual users the chance to comment.

- Batch
  Harry Renshall  harry.renshall@cern.ch

- Interactive user migration
  Miguel Marquina  miguel.marquina@cern.ch

- Workgroup Services
  Tony Cass  tony.cass@cern.ch

- Databases
  Sergio Santiago  sergio.santiago@cern.ch

I would be pleased to receive your comments as soon as is convenient (e-mail david.jacobs@cern.ch).

If you have questions on specific aspects of the rundown, please contact:

For general questions, you may of course also contact me.

MEMORANDUM

To/A: Division Leaders, Spokespersons of Experiments

cc: Directorate, COCOTIME membership, M-C membership

From/De: L. Foa, H. Wenninger

Subject/Objet: CERNVM rundown schedule

You will certainly be aware that the financial conditions surrounding the approval of the LHC project by Council in December 1994 are forcing the Laboratory to look very seriously at all possible measures to improve efficiency and reduce costs. A “brainstorming” meeting of the CERN management (DG, Directors, Division Leaders and some others) was held at Chavannes in mid-February to generate ideas for possible savings.

One outcome of this meeting was a strong request for CN Division to examine the feasibility of turning off the CERNVM service earlier than the previously announced date of end-1996.

The considered opinion of CN, based on input from experiments as expressed at the M-C meeting on 24 February and elsewhere, and on its own view of the feasible rate of introduction of replacement Unix- and Novell-based services, is that economies can be made as follows:

- Stop all physics batch services on CERNVM at the end of 1995. Most major experiments now have significant SHiFT capacity available and additional batch processing capacity is being brought into service on the new SP-2 that should cater for the CERN-based processing needs of the many smaller experiments. Compared with 1994, more than 50% of the physics batch load has already been migrated away from CERNVM and the move is being matched by progressive re-allocation of the tape mounting capacity to SHiFT.

- At Christmas 1995, remove most of the remaining disk capacity and tape units, and make a further substantial downsizing of the 3090 processor. The resulting configuration would be needed only to run the interactive service, and would offer a rather poor response.

- Maintain the vigorous campaign already under way to migrate the interactive users to other platforms in an orderly manner which does not create artificial crises either for the users in transferring their applications or for CN in providing the replacement services. This interactive service should terminate at some point in 1996, as soon as the bulk of the 5'000 users have migrated to alternative platforms.

While we agree with the general philosophy proposed by CN, we would like to insist that the target date for making a complete stop of the CERNVM service should be no later than summer 1996.
You will probably be interested to understand the general financial implications of the various alternatives that need to be considered. The total materials cost of the CERNV VM service for 1994 was 6.8 MCHF, and this has dropped to 2.1 MCHF for 1995. The further downsizing discussed on the previous page would lead to savings of some 0.4 MCHF in 1996, while a complete stop of CERNV at Christmas 1995 would increase these savings to about 1.1 MCHF.

You will appreciate that these potential savings, while not huge, are nevertheless very significant in the overall financial context in which CERN finds itself.

In order to try to reach a clear decision on this timescale for running down CERNV at the CERN Management Board on 14 April, we would like to request your comments on the proposed actions. For many users the move will be relatively painless, but there will undoubtedly be some CERNVM applications on which you depend, and which you must quickly identify, in order that you can adequately plan for their timely replacement. Please consider the position of your Division or Experiment and send your response to us as soon as possible, and in any case before 7 April, since an early clear decision will facilitate the planning required from users and CN alike. You should of course contact CN (David Jacobs - internal phone 5030, e-mail djadj@cernvm.cern.ch) for clarification of any technical questions that may influence your point of view.

1.2 The 1995 CERN School of Computing – Detailed Programme

Arles, France, 20 August - 2 September, 1995

Carlo Vandoni CN/ASD

The preliminary announcement for the 1995 CERN School of Computing already appeared in CNL 218. Please find below the detailed programme of the School.

CERN organises annually a School of Computing, which lasts two weeks and is held each year in a different Member State of the Organisation, traditionally during August or September. The School is open to postgraduate students and research workers with a few years' experience in elementary particle physics, in computing, or in related fields. The participants come mainly from the CERN Member States or from laboratories closely associated with CERN, but a few may come from countries which are not Member States of CERN. The School attracts normally between 50 and 60 students, who work in the field of computing, mostly on applications for High Energy Particle Physics.

The eighteenth CERN School of Computing will be held at the Centre Van Gogh in Arles, France, from Sunday 20 August to Saturday 2 September 1995.

SCIENTIFIC PROGRAMME

The programme will be dedicated to the following themes:

- Human Computer Interfaces
- Collaborative Software Engineering
- Information Super Highways
- Trends in Computer Architecture/Industry
- Parallel Architectures (MPP)
- Mathematical Computing
- Data Acquisition Systems
- WorldWideWeb for Physics

The following lectures are now confirmed:

- Human Computer Interfaces
  Julian Gallop (Rutherford Appleton Laboratory, Didcot, UK). An Introduction to Graphics and User Interface Tools.
  Silvano de Gennaro (CERN, Geneva, Switzerland). Virtual Reality at CERN.
  Hans Drevermann (CERN, Geneva, Switzerland). Is There a Future for Events Display?

- Collaborative Software Engineering
  David R. Quarrie (Lawrence Berkeley Laboratory, Berkeley, USA). OOP in HEP: Evolution or Revolution? From Abstraction to Implementation — Some Case Studies.

- Information Super Highways
  David C. De Roure (University of Southampton, Southampton, UK). Information Highway Applications.
  Wulf Bauerfeld (DeTeBerkom, Berlin, Germany). Information Highway Technologies.

- Trends in Computer Architecture/Industry
  Ton Egbersen (IBM Rueschlikon, Switzerland). ATM Switches — Basic Principles and Examples.

- Parallel Architectures (MPP)
  Randy Groves (IBM, Austin, USA). History and Future of Computer System Architecture.
  David Walker (Oak Ridge Laboratory, Oak Ridge, USA). The Message Passing Paradigm. Features and
Use of PVM. An Introduction to MPI. Message Passing in Application Programs.

Mathematical Computing


Roger Barlow (Manchester University, Manchester, UK). Painless Statistics – “What a Statistics Package can do for you”.

Data Acquisition Systems


WordWideWeb for Physics

Lecturers and titles to be announced later.

Tutorials and demonstrations are expected to be a complement to these lectures. Additional lectures will be announced later.

Detailed information on the Scientific Programme is kept up to date on the WorldWideWeb at the following URL:
http://www.cern.ch/Physics/Conferences/C1995/CSC/

APPLICATION

Application forms can be obtained from J. Turner, CN Division, CERN, e-mail: school@cernvm.cern.ch. or via the Web (see above).

Applications, together with a letter of reference, must reach this address at the latest by 31 May 1995. Applications received after this date will not be considered.
2. Central Computing Services

2.1 Introduction of Production Services on the SP2 (CERNSP)

Tony Cass CN/DCI and Harry Renshall CN/PDP

The CERNSP service is now in production for physics applications such as raw data analysis, DST production, DST analysis, Monte Carlo event generation and program development. This service is intended primarily for experiments which do not have independent CORE or Work Group Server capacity though, being public, there are no restrictions on which users or groups can have accounts. Allocation of CERNSP resources will be done by the Coctotime committee and it is intended to start the usual monitoring and control from 1 April. Only batch time will be budgeted, representing just under half of the total capacity. About ten times as much CPU time is available than on the current CERNVM service; we do not anticipate it will be full of approved work initially and thus there will be some free time available on a non-guaranteed basis. Note that the main Monte Carlo event generator service is the CSF cluster, currently awaiting a 50% capacity upgrade.

We have enabled all groups which have any CERNVM accounts to be able to register accounts on CERNSP. A group administrator who already can register accounts on CERNVM can now also register on CERNSP. On entering USERREG they should first select the CUTE general service then CERNSP out of the second list presented. Groups without such an administrator should contact Attila Koppanyi, Attila.Koppanyi@cern.ch, stating who should be enabled to register on CERNSP (this must come from a group computing contact or an existing administrator). Groups should also nominate an AFS Space Administrator as the SP2 users, like those on existing Work Group Servers, have an AFS rather than a local home directory. Again, A. Koppanyi should be contacted to register, or provide a guide for, the AFS Space Administrator. Finally groups should submit to Alan Ball, AEB@CERNVM, the Coctotime secretary, their CERNSP computer time requests for the last three quarters of 1995.

The SP2 is a 64-processor Unix system using IBM RS/6000 nodes linked by an internal high speed network and with a centrally managed software environment. The nodes are functionally divided into four groups of 16 each for different types of work namely interactive logins, sequential job batch processing, parallel job batch processing and data, tape and network services. Each node is rated at 25 CERN units (the six nodes of CERNVM are each 10 units).

Access to the interactive nodes is via the single name CERNSP which uses a load balancing mechanism to distribute users among the 16 interactive nodes. Either telnet to CERNSP or use an X-terminal login window to connect. Users from outside CERN will need to use the fully qualified name, cernsp.cern.ch. All SP2 accounts have their home directory space in the CERN AFS file system which means that password changing is done using the kpasswd command. Your password and files are common to any CERN computer which is connected to the CERN AFS system. A feature of this is that you must renew what is termed your AFS token, given to you at login, each 24 hours else you lose access to your files. To renew your token either systematically logout at the end of your work or type klog when you start each morning. A user guide to AFS is available from the User Consultancy Office and help fs shows the afs commands available.

Batch work is run under the control of the IBM Loadleveler product, so batch job scripts are submitted via the lsubmit command and the queues can be seen via lq (type man command as appropriate). This system returns files to a job subdirectory created under the submitted batch job script file with a different number for each job. Job times are specified, and given in accounting reports, in CERN Units. The command ll: class returns the current job class definitions. The IBM Loadleveler User’s Guide is available on request from the UCO. Tape access is via the STAGE commands documented in the two guides “An Overview of the CORE Computing Services” and “A Reference Manual for SHIFT Software”, also to be found in the UCO.

The Fortran compiler is the IBM xlf product. This is a full Fortran 90 compiler with a Fortran 77 language level which is the default. By default it compiles at a low optimisation, an important slow-down, and without appending an underscore to external references as required for the CERN Program Library. We have hence made a front end to xlf, called hept77, which supplies sensible defaults. You can obtain copies of the xlf User’s Guide and Reference from the UCO either by purchasing the IBM manuals or asking for the locally printed copies (much bulkier and without colour).

As an aid to migration from VM, many familiar VM tools have been migrated to Unix and are available on CERNSP. They can be executed with their usual names prefixed by the letters “vm” e.g. vmxedit, vmrex, vmnews or, by executing a command, aliases that do not need the vm prefix can be built. Type man vm on CERNSP for information on these tools and for practical advice on user level differences between CERNVM and Unix.

A new news-group, cern.cernsp, has been created for items specifically about the CERNSP service, though users should also look at the cern unix and cern.computing groups. Urgent messages relevant to the CERNSP service are issued through the Zephyr system. This sends messages to subscribing users wherever they are logged in if the Zephyr client, zwgc, is started. (The workstation also needs to be running the Zephyr host manager; this is configured on the CERNSP and other Work Group Servers.) If you are interested in receiving messages about the CERNSP service you should subscribe to the CERNSP Zephyr class with the com-
mand "zctl subscribe cernsp *". The Zephyr client is started automatically for users connecting to the CERNSP with an adm login session from an X-terminal with a subscription to the CERNSP class.

Further details about Zephyr are given in the "Zephyr at CERN" guide available from the UCO and additional information about the CERNSP service can be found in the WWW system at the URL:


Some parts of the CERNSP World Wide Web pages, are also available in printed form at the UCO as the CERNSP Introductory User Guide.

2.2 Submission of 1995 Computing Time Requests for CERNSP

Harry Renshall CN/PDP (CN Physics Services Coordinator)

Alan Ball ECP/DS (COCOTIME Secretary)

The new CERNSP service, running on the 64-node IBM SP2, will shortly be available for physics data processing production (as opposed to desktop applications). As usual with shared public services, COCOTIME will allocate time for batch work starting from 1st April. Initially the equivalent of 24 nodes will be made available giving about 1 million CERN-unit hours per quarter, almost ten times that of the current CERNVM service.

Priority on the batch resources will go to experiments without other CORE capacity and notably those migrating from CERNVM. Unallocated time will be available, as now without guarantees, for non-priority applications such as background Monte-Carlo.

Group administrators are asked to mail their estimates for the remaining three quarters of 1995 to Alan Ball, AEB@CERN.CH, clearly stating the name of the experiment or project and the Computer Group code. Time should be expressed in CERN-unit hours per quarter. A percentage breakdown of intended use under the usual broad categories of programme development, experiment preparation, Monte-Carlo simulation, data processing and data analysis should also be given.

It is understood that groups will refine their requirements during the course of the year, as they gain experience with this new system, and establish their migration time-scales. The COCOTIME meeting on Thursday March 30th made initial allocations for the second quarter of 1995: the intention is to remain flexible and adjustments can be made at future meetings.

2.3 AXLDB, the replacement for the Engineering Database (VXENG/VXLDL)

Josi Schinzel AT/DI

VXCERN users may have noticed that a new machine, AXLDB, has been added to the VXCERN cluster. This machine is a replacement for the two VAX 6420's which are installed in the VXENG cluster and which are to be phased out as soon as possible. The engineering ORACLE database has been moved to a SUN database server, DBLHC01, which is also installed in the Computer Centre. AXLDB has been acquired by AT Division and is reserved for ORACLE database users in the Accelerator and Technical Sectors to manage engineering data.
3. Desktop Computing

3.1 AFS Disk Space Administration

Judy Richards CN/DCI

3.1.1 AFS Disk Space Administration

AFS disk space falls into four categories.

Home directories

Space allocated to a user for his personnel needs. It would normally to measured in Mbytes. The pathname is /afs/cern.ch/~a/~userid where a is the first letter of the userid of the user.

Group directory

This space can in some way be thought of as the "home directory of the group". It is the directory where one would normally put files associated with the group’s working environment at CERN. This would include things like start-up scripts, group shell scripts, and sample jobs. For example the standard start-up scripts expect to find "group profiles" in this directory. Groups receive an initial allocation of 100MB for this when their first group administrator is registered. The pathname is /afs/cern.ch/group/gg where gg is the two letter group code.

Backup-up Project space

This is allocated to major projects like axis or cerlib and to all experiments involving a reasonable number of people (CHORUS, CMS, NA49,..) It would normally be used for storing files of interest to members of the collaboration both inside and outside CERN, particularly things like program source files, libraries, documentation. The pathname is /afs/cern.ch/projectname, e.g., /afs/cern.ch/atlas. For smaller projects, space is allocated under the directory /afs/cern.ch/project/projectname, e.g., /afs/cern.ch/project/fatmen.

Non backup-up Project space

This will probably be used only by experiments for storing relatively small amounts of heavily used data that can be easily recreated or restored from one of the group’s tapes. This is similar to VM maxidiks. The pathname is /afs/cern.ch/projectname, e.g., /afs/cern.ch/cms.

Home directory space is managed in conjunction with the Central Computer User Database, CCDB. Currently the other space is managed by the CERN AFS Space Administrator.

3.1.2 AFS Space Administrators

Group quotas and allocations of project space are determined by the CERN AFS Space Administrator, Judy Richards, Judy.Richards@cern.ch, tel 4983. Requests for project space should distinguish between backed-up and non-backed up space, the later being in some way "cheaper".

A group AFS Space Administrator is logically distinct from the Group Administrator, although in many case the same person will have both roles. A group can have multiple AFS Space Administrators and they are created on the request of the Group Administrator to Attila Koppanyi, Attila.Koppanyi@cern.ch, tel 4933. WHO can be used to find existing administrators.

To administer more than one group, a person must use a different userid for each group. A small number of users have the same AFS userid associated with multiple groups. To be a SPACE administrator, the HOME group of the person concerned must be the same as the group which he is administering. (Note that due to practical limitations, and particularly if you need to use magnetic tapes, it’s currently not recommended to use the same AFS userid in multiple groups.)

3.1.3 Home Directory Space and CCDB

For each computing GROUP the CCDB stores four values:

- Total_AFS.quota. The total physical space that a group is allowed to occupy in GBytes. It is agreed with the AFS Space Administrator.
- AFS.default.quota. The default quota given to a new user in MBytes (default 50MBytes). It can be changed by the AFS Space Administrator on the request of the group administrator.
- AFS.used. The physical space used by the group in GBytes. It is calculated once a day by CCDB from figures generated by AFS.
- Total_AFS.allocated. The sum of user quotas in GBytes. It is adjusted automatically by CCDB as quotas are changed/new users added.

For each USER the CCDB stores two values:

- quota. This is the user’s quota (in MBytes).

  When a user gets his first AFS account this can be set to any value between 10MB and 100MB. By default, it is set to the corresponding group’s AFS.default.quota. It can be changed using USERNREG by the groups AFS Space Administrator to any value between the space actually used and 1GB.

  This value is cross-checked nightly by CCDB against the value defined in AFS and CCDB will report to the
AFS System Administrator any discrepancies resulting, for example, from a requested change of quota that hasn’t been executed in AFS.

**used.** The space physically used (in MBytes). It is updated every night from data generated by AFS.

The Group AFS Administrator can give out new space using **USERREG**

- to increase the quota of an existing user
- to create a new user account

provided the group has sufficient free space to cover the requested increase in quota where

\[ \text{'free space'} = \text{Total.AFS.quota} - \text{AFS.used} \]

e.g., to increase a user quota by 100MB

\[ \text{Total.AFS.quota} - \text{AFS.used} \geq 100 \text{MB} \]

For the moment groups are expected to function with “Total.AFS.Allocated > Total.AFS.quota”. The “Total.AFS.Quota” should reflect what groups can expect to be able to use from the currently installed AFS disk space but they can also expect that their quota will steadily increase as users become more active in AFS and new AFS disk space is installed.

The VM exec, SPACEAFS, on the P disk, allows anyone to see the quota and space used by everyone in his group. It also shows use by people who have an account in his group but whose space is accounted in another group.

### 3.1.4 Project space

Project space in AFS is not associated with any specific userid/logon account. Use of the space is controlled by setting up an access control list that determines who has read/write permissions. In order to ease longer term maintenance, groups are encouraged to define and use a few ACL protection groups rather than putting individual userid in the ACL. See the AFS User’s Guide for further information.

Project space is allocated in the form of AFS volumes, with an agreed quota and placed anywhere in the experiment’s directory hierarchy. (To move quota from one volume to another you should contact the same person as for creating a new volume.) Volumes are normally allocated in multiples of 50 or 100MB. Note that for practical reasons (physical disk management, backup) individual volumes should have a maximum size of about 500MB and cannot exceed 1GB. Allocation of a number of small volumes is preferred to a single large volume.

A request for project space should include the following information:

- backed up or not
- mount point – i.e. the name of the top level directory
- requested quota in Mbytes.

Tools for managing project space are currently in a very rudimentary state. Allocation of project space entails creating an AFS volume on an appropriate disk with an appropriate mount point and quota. Currently this can only be done by

- Tony Cass for Chorus, TIS
- Michel Dodgeason for ATLAS, NA48, NA49
- Alessandro Miotto for CMS
- AFS.support@cern.ch for all others.

This article is a slightly reduced version of the first edition of the AFS Administrator’s Guide which can be found in WWW under the AFS home page or directly via the URL

www:consult.cern.ch/writeup/afsadmin/main.html

### 3.2 News from the X11 Working-Groups

**Arnaud Taddei CN/DCI**

*(on behalf of the UMTF-X11 and HEPiX-X11 working-groups)*

Whilst Graphical User Interfaces such as the X Window System are attractive, it is not always easy to ensure that all users have a well configured, preferably standard, environment.

Moreover, in contrast with the usual terminal access which is “well-known” and does not consume too many resources, X terminal access in particular and graphical environments in general are new and consume more resources.

With this in mind, two working groups have been formed to coordinate the work on some aspects of the X Window system, now the “de-facto” UNIX graphical system. Although it is mainly UNIX oriented, we are looking closely at other “realms”, like the PC world, and are checking the integration of some solutions with Windows because a lot of PCs are accessing UNIX servers. Thus, we hope to be able to provide a system like the HEPiX startup scripts which provide a common user environment at the shell level. See:


The first group is the so called UMTF-X11 working group which is a CERN specific group in the context of the Unix Migration Task Force. The second group is the HEPiX-X11 working group where HEPiX is the group of UNIX users in the High Energy Physics community. The necessary coordi-
nation is ensured by regular relations and communication between these two working groups.

These groups are in a "learning" and "design" phase, and our goal is firstly to list and understand the experience and problems met at CERN and in the HEP community concerning strategies and deployments of X11 services for a (small or large) group of users. Thus anybody who feels close to this problem (somebody who customised an X session file for a "production service" for X Window for example) can contact us to share their experience and give us their requirements and expectations. The second phase is to make a proposal of how we intend to solve the problems, how we allow sites, systems, groups of users and users to customise and tune the default HEP settings.

Indeed, the overall aim is to provide a HEPiX standardised way for users to customise their graphical environment (X Window), the HEPiX shell startup-scripts project being a model for this new project.

A certain number of meetings and presentations have been held already and you can consult the minutes, reports and studies in:

http://www.cern.ch/umtf/working-groups

In the HEPiX context a first meeting has been held at DESY and another working group session will be held in Prague at the end of May. See:

http://www-hep.fzu.cz/computing/HEPiX/HEPiX95.html

You will find that various topics are being discussed, investigated and developed. They are listed below. It might be a bit cryptic but it gives a feeling for what is going on.

- What are the System recommendations? X11 Components
  - Startup Method: Xinit, XDM, others?
  - XDM
  - Xservers
  - Security

- How do we specify the overall architecture?
  - Window Manager
  - Connectivity
  - X login
  - X session

- How do we define a User Graphical Environment?
  - Applications
  - Resources (Xresources)
  - Access to desktops
  - Startup clients
  - Window Manager Menus
  - User support

The latest version of the HEPiX scripts include a first prototype of Xsession support for some systems (AIX, Solaris), and they are already used by some services. The CERN SP2 service for example, is using a HEP_Xsession which will evolve in the future to converge to an agreed HEPiX and CERN Xsession. (By the time this article is published, the first draft of a HEPiX proposal will have been shipped.)

We will try to provide regularly to a wider audience all the results of these working groups which might be of general interest to the user community. This can be done, for instance, as tutorial sections in the Computer Newsletter, as is the case in this issue of the CNL with the article "Setting X Window Resources on POSIX-based Systems" produced from the UMTF-X11 working group document CN/UMTF/95/21 available in WWW/Mosaic with URL:


You can contact us at the following mail address:
<umtf-x11@listbox.cern.ch>

3.3 X Terminal Boot Servers

Lionel Cons CN/DCI

A "boot server" is a machine that provides the following services:

- **boot**: any supported X terminal (currently NCD or HP) can boot from the server and get the latest version of the software provided by the vendors; the procedure is described in the "CERN X Terminal Guide";
- **configuration**: the server will provide a default configuration tailored to the CERN environment;
- **fonts**: a wide range of fonts are available for the X terminals.

Three new machines have been configured as X terminal boot servers: *xsoft1* [128.141.237.227], *xsoft2* [128.141.237.228] (CN, in the Computer Center), and *sunecp05* [128.141.237.248] (ECP, building 11). These machines have a similar configuration and offer the same version of the X terminal software. New servers of this kind will be announced in the newsletters and in the CERN.XTERM newsgroup.

X terminal users belonging to a particular group or experiment may have a dedicated boot server. Otherwise users should use the boot server that is geographically closest to their office.

For more information on these servers and on the X terminal support at CERN, please read the "CERN X Terminal Guide", available at the UCO or in the World-Wide Web.
3.4 PINE: How to Start Using it?

*Miguel Marquina CN/DCI*

PINE (the University of Washington’s “Program for Internet News and Email”) is a screen-oriented UNIX based message-handling (e-mail) tool. In its default configuration, PINE offers an intentionally limited set of functions geared toward the novice user, but it also has a growing list of “power-user” and personal-preference features. It is the system which will be probably supported at CERN as the “standard mail tool” on UNIX systems.

You can find more information on this system:

- by typing `man pine` on any Unix node that has access to the `asis` file base.
- via anonymous FTP or WWW/Mosaic in the “Pine Information Center”:
  - http://www.cac.washington.edu/pine
- in the following “Pine Course” accessible from WWW/Mosaic, in URL:

You have two ways to start using PINE on your Unix node:

- with your local UNIX mailbox (typically `MAIL=/var/spool/mail`), assuming you have the ASIS environment, simply type “pine”,
- with your AFS mailbox; for example taking “martin” as AFS account (change it according to your ID):

```
1- export MAIL=/afs/cern.ch/mail/
   /u/martin/spoolfile
   setenv MAIL /afs/...
   (zsh,ksh)
   (tcsh,csh)
```

in your login procedure or manually in the current window.

2- mailfwd "martin@afsmail.cern.ch"

to set up the incoming mail arriving to your workstation to be rerouted to your AFS mailbox.

3- type “pine”.

---

3.5 VM to UNIX Transition Tools

*Bernard Antoine CN/PDP and Pierantonio Marchesini PPE/LE*

3.5.1 Why transition tools?

After 10 years of faithful service, VM has to disappear and give way to services based on cheaper and faster hardware. Such services are based on one or another flavour of UNIX, which means that CERNVM users will sooner or later have to learn how to use that operating system.

However, considering the timescale of the conversion, and the lack of manpower available to train people, we think that we can help VM users by giving them tools similar to what they are using now, like REXX, XEDIT or popular fullscreen application, like XNEWS.

This should ease their transition to UNIX, and allow them more time to discover and learn more modern (generally X-Windows based) applications.

**History of the tools?**

The first thing was to identify good replacements for REXX and XEDIT, which are the base for most VM applications. Pierantonio Marchesini, from ETH Zurich, after testing various contenders from the commercial market and public domain, has identified 'Regina' and 'THE' as good candidates.

'Regina' is a public-domain implementation of the REXX language, written by Anders Christensen, from Nit, Norway. This interpreter is well written, very fast and easily extendable. In addition, the author has always reacted very rapidly to our remarks and bug reports. On top of the standard 'Regina' distribution code, Pierantonio has written a comprehensive set of extensions containing most of the CERN REXX function-package, as well as a good interface to the curses library for full-screen applications, and replacements for some popular VM functions, like EXECIO.

‘THE’ is a good XEDIT-like editor, written by Mark Hessling. The author is actively enhancing his product, to reach as wide a compatibility as possible.

**VM-looking tools**

Using 'Regina', the authors have written a set of full-screen UNIX applications, based on a common set of REXX tools. These applications display information the same way their VM counterparts do, so users see something familiar.

Most applications have a name starting in 'vm', to avoid clashes with other UNIX names. To make them more usable, a user converting from VM to UNIX can easily access them by their VM name through aliases. Are available today:

```
vmsnews, vmbatch, vmbrowse, vmdefaults, vmfilelist, vmhelp
```
Some applications, which could be of wider use than just VM-to-UNIX transition, have kept their original VM name. Are available today:

`page1`, `leppage1`, `tvscreen`.

HEPIX scripts will provide transparent access to this toolkit. Further information will be posted to the usual CERN newsgroups.

**How to obtain the 'VM tools'?**

'REgina', 'THE', the Regina extensions as well as all the programs developed using the above tools are all freely available under the "GNU Generic Public License" agreement, as are most standard Public-Domain UNIX tools.

---

### 3.6 An Update on ASIS and ASISUpdate

**Alain Peyrat and Philippe Defert CN/DCI**

The complete documentation is available as "ASIS, the User's and reference guide" (formerly "ASIS, the Installer's Guide") from the User Consultancy Office or at the URLs

http://consult.cern.ch/writeups/asis

and

ftp://asisftp.cern.ch/writeups/asis.ps

**A brief description**

ASIS contains "ready-to-use" software that can be freely distributed at CERN and in the High Energy Physics community. It contains no commercial licensed software. For convenience, the software is divided into families the main ones of which are CERNLIB, the CERN Program Library, CERN specific software, SHIFT, GNU, 'TEx, TCL, X11, etc...

**Using ASISUpdate and EPIP**

On the CERN site, the ASIS repository is available on both distributed file systems: AFS, the Andrew File System and NFS, the networked file system. It is replicated on all AFS Servers and on one NFS server. The situation may be different in other HEP centres. Outside users can access it also via anonymous ftp on asisftp.cern.ch.

ASISUpdate is the follow-up of the script "make.asis" developed by R. Többicke. This script created links to every file in the /afs/cern.ch/asis/@sys/usr.local tree from /usr/local. The main improvement is that ASISUpdate is aware of the structure and the contents of every package. The creation of the links is decided by the ASIS database which records all products and versions. ASISUpdate thus allows access to old or new versions or to copy packages selectively. Moreover it supports AFS as well as NFS. The script can easily be configured for other sites. The primary goal of ASISUpdate is to build the directories /usr/local for the UNIX programs and, in the near future, /cern for the CERN Program Library utilities, on a workstation in such a way that all users of that workstation can run the UNIX and CERNLIB tools in a reliable mode. By default, ASISUpdate creates links from /usr/local towards the distributed file systems /afs/cern.ch/asis or /nfs/cern.ch/asis for all packages introduced in production in these categories. It optimizes the number of links, by linking to directories wherever possible instead of creating one link per file. ASISUpdate never overwrites files that do not belong to an ASIS product but will report the collisions to the system administrator using electronic mail.

As the ASIS repository evolves rapidly, links should be updated every night. System administrators should edit the "crontab" of their workstation to insert a line for ASISUpdate. The behaviour of ASISUpdate can be altered by giving it a configuration file. The configuration options can be:

- to change the way to access a particular product, for instance the update procedure can ignore a product, can copy it instead of linking it or can only create links whatever the default operation is.

- to change the version that will be installed on that particular workstation. By default the version "InProduction" is accessible, i.e. the "supported" one; the system manager may want to get access to an older or newer version, or even always to the latest.

- to tell ASISUpdate not to report collisions or to force it to overwrite the files that were subject to collisions.

EPIP, the Easy Product Installation Procedure, is an X-windows application that allows a system manager to edit the configuration file of ASISUpdate for his station. It is in fact the only way to edit such a file. It can also execute ASISUpdate and edit the crontab of your host to execute the updates every night.
The full description of EPIP, including examples of its use, is contained in the ASIS documentation. In addition, EPIP is self documented. When the cursor is in any of the EPIP windows, if the F1 or Help key is pressed, a text window will display an explanation on what is pointed to by the cursor and the operations that can be performed with it. Thus, placing the cursor on the menu bar of the main window displayed below (Fig. 3.1) and hitting F1 pops up the list of all displayed operations in EPIP.

The configuration edit window is also shown below (Fig. 3.2) and gives a nice overview of all the possible options that can be changed in the behaviour of ASISUpdate. Asking for help in this window will give a description on these options.

**ASISUpdate Primer**

Installation of ASISUpdate for the first time is described in ftp://asisftp.cern.ch/messwraps/asis/Primer, and also the end of the guide. It also tries to give some hints about what to do when problems arise.

![Figure 3.1: The “main” window](image1)

![Figure 3.2: The “config” window](image2)

### 3.7 ListBox Service for Experiments

**Miguel Marquina CN/DCI**

#### 3.7.1 Introduction

This work has been developed as part of the effort to provide a migration path from the LISTSERV facility currently available at CERNVM. After evaluation of several UNIX products (including a commercial version of LISTSERV), we have finally set our preference for the Public Domain software majordomo (currently version 1.92).

However, the design of the service and associated user interfaces has been done with the aim to accommodate software of better quality and similar functionality which might replace majordomo in the future.

What follows is the description of the environment developed to create and maintain Mailing Lists for working teams (CERN Collaborations, experiment working groups, CERN groups and sections, etc.).

#### 3.7.2 ListBox Setup

The name of the ListBox server hosting the team mailing lists is team-lb.cern.ch. Whether the name identifies a real machine or just an alias to another existing one is an internal arrangement between the team concerned and CN/DCI. Currently all team ListBox servers point to the central server listbox.cern.ch.

The naming convention for all team mailing lists is team-listame@team-lb.cern.ch.

This makes them server independent, and allow lists for different teams to coexist in the same server. Other than that, listname is free character- and lengthwise (except for the "\_" character which is treated specially by majordomo). The only exception is the Mailing List representing the complete team, which is called team@team-lb.cern.ch.

For instance, isolde@isolde-lb.cern.ch is the mailing list for the ISOLDE collaboration, and isolde-dag@isolde-lb.cern.ch for the dag subgroup.

Data Storage is done in AFS, with files conveniently protected via adequate ACL rights on a team-by-team basis. The following structure and ACL rights are in place:

- **Top Directory:**
  /afs/cern.ch/user/m/majordom/listbox/Lists/

- **Lists and config files:**
  - team/
    - majordom:team write
  - team.archives/
    - majordom:team write
cern:team read

- **List aliases and other public data:**
  - team.public/
    - majordom:team write
cern:nodes read
List.config filenames:
  team./listname, team./listname.config

Maintenance is performed by the designated team ListBox administrators, whose AFS account will be registered as part of the AFS group major dom:team. Thus each team will be able to influence at any time the registration and/or behaviour of its mailing lists.

Once one has prepared the files team./listname and team./listname.config the registration of new mailing lists is performed by a ListBox administrator by sending an e-mail to

ListBox.Support@cern.ch

3.7.3 The listquest interface

The UMTF Task Force has developed an interface in order to simplify the Handling of Mailing Lists when dialoguing with the ListBox server. The listquest interface, available in ASIS, provides the following functionality:

- Management of the Mailing Lists for the ListBox administrators.
- Interface to user requests of administrative nature (subscription, information, list indexes, etc).
- Simplified posting to Mailing Lists via aliases.

3.7.4 Posting to a Mailing List

This operation is typically performed by sending an electronic mail to the address of the mailing list, using the standard Mail Agent. However the listquest tool allows “shortcut” specifications of such addresses via the setting and handling of list aliases.

listquest provides three levels of customization: user, group and system defaults. The settings may be displayed via the command: listquest -query

Access to predefined aliases to team mailing lists is done as follows: listquest -setgroup team. Such aliases are installed automatically in the team.public directory for every newly registered mailing list.

Users may also define their own list aliases via the command:

listquest -addlist listalias listaddress.

From that moment on posting may be performed by using the command: listquest -post:listalias

3.7.5 Administering a Mailing List

The listquest command is described briefly by typing:

listquest -h [help] and in further detail in the corresponding man pages.

Service Support

Any administrative and user questions may be addressed to ListBox.Support@cern.ch or to the User Consultancy Office (User.Support@cern.ch, x4952)

3.8 Using CERNVM to Reroute your E-Mail

Miguel Marquina CN/DCI

For many years CERNVM has been a focal point of the central computing services, and consequently many people have been using their CERNVM account as the official e-mail address for contacts.

Many of these users have already moved to another platform, typically UNIX. Their CERNVM addresses are the only remnant of what once was an active account. This article is addressed to these users. In the following we clarify that one does not necessarily require the CERNVM account to exist for the mail routing to work.

3.8.1 Re-routing your CERNVM mail

CERNVM has two mechanisms to re-route incoming mail: via MAILER/VM and via LISTSERV. They are almost equivalent, except for one fact: the first re-routes the incoming mail BEFORE it is deposited on the VM READER (your incoming mailbox in this case), while the second takes the e-mail from the VM READER AFTER it has been deposited. This second method implies that a real VM account exists.

The subtle difference becomes obvious only when you have correspondants from another VM system using the IBM NOTE command, because that interface does not use MAILER/VM. All other re-routings (to MS-Mail, QuickMail, UNIX mailboxes..) are handled properly.

The MAILFWD command was introduced on CERNVM about one year ago to make both techniques equivalent, and it is the recommended interface to modify your forwarding route. Its syntax is explained in the relevant HELP file (through XFIND MAIL FORWARD):

mailfwd [query]
mailfwd off
mailfwd new-email-address

3.8.2 Do you need your CERNVM account at all?

About 30% of CERNVM accounts have not been used in the past six months. Many of them are probably owned by users just to make sure that their “published” e-mail address is still valid. If you have already re-routed your VM mail elsewhere
and you are not connecting anymore to the CERNVM system, you may safely request the deletion of your account because:

- your VM files are still stored on tape via VMBACKUP, should you ever come to need any of them again;
- MAILER/VM assures that all your incoming mail, except the one sent via the NOTE command (see above) is delivered to its final destination;
- in the rare cases where NOTE is used, the sender would be notified of the non-existence of the VM account with the following message:

```
FROM CERNVM:
User XXXXX not in CP directory
-- file (nnnn) spooled
to SYSTEM
```

and the CERNVM Postmaster would re-route manually the mail to its final destination

---

### 3.8.3 Clean up your account if you don’t need it...

CERNVM is nearing the end of its lifetime. You could help us save system resources which are at present unnecessarily assigned to you. If you wish to contribute to this clean-up campaign, just drop an e-mail to User.Support@cern.ch stating:

- your current preference concerning the VM mail forwarding;
- your permission to remove the CERNVM account;

and we will take all necessary steps. You may of course contact the same address any time later in order to modify the forwarding route.

---

### 3.9 Using XPRINT to Print from Unix Systems

**Rainer Többicke CN/DCI**

A new version of the `xprint` command has recently been introduced. It is available automatically on all AFS client machines (usually in `/usr/local/bin`) or through installation from ASIS.

`xprint` can be used to print from Unix machines (such as workstations or servers like the IBM SP2) on printers registered in the central `springer` print server.

An (unordered) list of over 500 registered printers at CERN and remote sites is available via www, URL:

```
http://wesinfo.cern.ch/file/printsp.html
```

Printer names usually give a good idea where the printer is actually located. Additional information, however, on where exactly the printer is located and who is responsible for it, is subject to the willingness of owners to keep this information up to date.

#### Command syntax

Aside from submitting print jobs, the `xprint` command is also used for displaying print queues and cancelling print jobs. `cancel` is restricted to the user on the machine on which the original `xprint` print request originated. The basic command syntax for `xprint` is:

```
xprint [-Pprinter] [options] [filename|-q-cspoolid]
```

The `-q` and `-c` options specify `query` (display queue) and `cancel`, respectively. If the `-Pprinter` option is not specified, `xprint` uses the value of the XPRINTER or PRINTER environment variables (if they exist).

Further `options` can be specified, such as to control text formatting (except for already formatted documents, e.g. PostScript) or paper handling:

- `-h` suppresses printing of the banner page,
- `-v num` number of characters per line,
- `-l num` number of lines per page,
- `-o landscape` selects "landscape" paper orientation,
- `-o simplex` prints on one side of the paper only instead of both sides (on printers where this is supported),
- `-f 3812-forms-code` is only for compatibility with applications written for the 3812 or XEROX printers; this option should otherwise be avoided.

More options exist, some only applicable to certain printer models. `xprint-help` will display a short summary of available options. For complete information please refer to `man xprint`.

#### `xprint` installation/setup

`xprint` does not require any specific configuration on the machine it is invoked on, and is therefore easier to set up than its traditional Unix counterparts `lpr` or `lp`.

While most printers are served directly by `springer`, sometimes `springer` simply acts as a relay host to other print servers. This makes it possible to print on printers connected to Novell servers or printers off the CERN site. However, text formatting or print job cancelling are generally ignored or refused in those cases, depending on the capabilities of the print server.
3.10 The New Software Development Tools Service

Arash Khodabandeh ECP/PT

The ECP/PT Software Development Tools Service offers CERN users the possibility to evaluate and use a wide range of CASE tools. During the first year that the Service has been in production, the number of users and tools have grown steadily. For its second, and current year, we are pleased to announce the NEW Software Development Tools Service.

The improvements include:

- a new Web (http://www.cern.ch/PTTOOL) with complete information on what we have and how to use it,
- a new server with up to 30Gb of disk space,
- new products,
- more platforms supported.

We currently offer the following products (N = new, + = new version/platform):

Analysis & design

- ADAMO: ER design and programming system (group product). Available on UNIX, VMS, VM.
- Objecteering: Class Relation Object Oriented design, with C++ code generation. Available on SunOS, Solaris, HPUX.
- OMTool: OMT analysis and design with some C++ and SQL code generation. Available on SunOS.
- OMW: Martin/Odell analysis and design tool with C code generation. Available on SunOS, soon for Solaris, HPUX.
- StP: SAST analysis and design with real time extensions. Available on SunOS, Solaris, ULTRIX.

Modelling & simulation

- Modsim: Discrete event modeling and simulation tool. Available on SunOS.

Programming & debugging

- Eiffel/S: Eiffel 3 compiler and its library of reusable classes. Available on SunOS, Solaris, HPUX, soon for AIX.
- ISE-Eiffel: Complete Eiffel development environment. Available on SunOS.
- LispWorks: Programming environment for development in Lisp and CLOS. Available on SunOS, Solaris, HPUX, ULTRIX, OSF1, AIX, IRIX.
- ObjectCenter: Complete programming environment for C++ with Tools.h++ library. Available on SunOS, Solaris, HPUX.
- SNIFF+: Open C/C++ programming environment. Available on SunOS, Solaris, HPUX, ULTRIX, OSF1, AIX, IRIX.

Graphical user interface builder


Quality, metrics & testing

- Purify: Memory leaks and access errors detector for C/C++/Fortran programs. Available on SunOS, Solaris, HPUX.
- TestCenter: Memory leak, run time error, test coverage/simulation for C/C++. Available on SunOS, Solaris, HPUX.

Documentation

- FrameMaker: Complete and integrated publishing tool. Available on UNIX.
- WebMaker: FrameMaker to WWW converter (group product). Available on UNIX.

Meta tools

- ToolBuilder / TBK: ER based Meta-CASE Tool with executable code generation. Available on SunOS.

Online courses

- CTI: Self teaching UNIX course. Available on SunOS.
4. Communications and Networks

4.1 Internal Network Connections

Brian Carpenter CN/CS

Several recent incidents have shown that the procedures for connecting devices to the CERN internal Local Area Networks (Ethernet) need to be better publicised. The same applies to installation or updating of network software. The objective is to minimise the number of interventions in which equipment that perturbs other users has to be disconnected without notice.

Who is concerned? Where a Division or group has its own internal service for local network support, this note concerns that service. Where no such service exists, or in case of doubt, it concerns anybody planning the acquisition of any device connected to the general-purpose Ethernet.

What equipment is concerned? PCs, Macintosches, gateways, workstations, computers, printers, terminal servers, X terminals, and any other device connected directly to the general-purpose Ethernet. Equipment connected only to an accelerator controls network is not concerned.

What should be done? BEFORE deciding to acquire any such device, or related network software, particularly of a new type, make contact with the CN/CS group. You will be advised whether the device is known to cause problems and whether any support is available. You will also be advised on the steps to be taken when the device is installed.

For more details: obtain a copy of the "CERN Internal Network Brochure" (CN/CS/155) from the User Consultancy Office in Building 513.

Who to contact in case you do not know the specialist concerned?

J.Gamble, email gamble@vxcern.cern.ch
or J.M.Gerard, email jmg@dxcoms.cern.ch.

For a full list of contacts, see the WWW page
http://vscoms.cern.ch:8000/contacts.html
5. Application Software & Databases

5.1 PAW Release (2.06/20)

Julian Bunn and the PAW Team CN/ASD

A new version of PAW (2.06/20) is being released together with CERNLIB 95A. The source files, binaries and libraries will be available, as usual, via anonymous ftp, on asix.

Release Highlights

This release is a bug fixes and consolidation release. We intend to continue this effort of reliability and better documentation in the next releases also. In this release some important points are:

- New behaviour of the option E in HIS/PLOT.
- New command VERSION.
- HELP improvements in many areas.
- New user routines HIJE and HXYE.
- HREBIN allows non-equidwidth bins.
- New Option E in HPLTAB and IGTABL.
- No array limitation in HPLFUN.
- Many improvements in IGAXIS.
- New commands for handling global variables

For more precise information we invite people to refer to our PAW WWW server at the URL:
http://aseww.cern.ch/pl/paw/index.html
and select the section “PAW Release Notes”, where the first file is always referring to the latest PAW release (Version 2.06/20 in this case).

5.2 The PAW Medium Term Plan for 1995/1996

Julian Bunn CN/ASD

This section describes the medium term plans for work on the PAW system. This plan will be implemented during 1995 and 1996.

5.2.1 Scope of the Plan

PAW (Physics Analysis Workstation) is a software system designed for the analysis and presentation of scientific data, with a particular emphasis on High Energy Physics event data.

This work plan has been drawn up by the PAW development team, which currently comprises: M.Ballintijn, J.J.Bunn, O.Couet, N.Cremel, G.Folger, and F.James. Other people who developed significant fractions of PAW over the years, but are now no longer in the team, include R.Brun, A.Nathaniel, F.Rademakers, C.Vandoni and P.Zanarini.

The work plan draws heavily on the input received from PAW users in the form of replies to the PAW Questionnaire. When reviewing these replies we have deliberately concentrated on the complaints made by users, rather than any praise offered! We would like to take this opportunity of thanking everyone who filled out the Questionnaire.

On the basis of the Questionnaire data, user input received via mail, the Usenet news group cern.heplib, and also the "bugreport" mechanism in PAW itself, we have drawn up the following list of areas which require work. The list is in order of priority, and is based on the level of user comments:

- CONSISTENCY
- ON-LINE HELP
- N-TUPLE SELECTION MECHANISM
- NEW FEATURES
- FITTING

Each of these areas is covered below in detail.

5.2.2 PAW Manual

The PAW manual will be split into two documents: a Beginner's Guide and a Reference Manual. The Beginner's Guide will be targeted at the casual or first-time user, who needs to get started as quickly as possible, and to work within these constraints as efficiently as possible. The Beginner's Guide will focus on what such users typically want to do, rather than describing the components of the PAW system. It will be a short document, that will refer the inquisitive user to the Reference Manual wherever necessary. It will be liberally peppered with working examples.

The Reference Manual will contain a full description of all PAW commands. It will be laid out by function (e.g. Booking histograms, Ntuples, Fitting, Plotting, using Vectors). The Reference Manual will largely be generated from the CDF files and embedded help in PAW itself. An effort will be made to document commands that are currently undocumented.

Both manuals will include rich indexes.

Both manuals will be maintained using the CVS scheme.

Both manuals will be made available in HTML versions as well as the more traditional forms.
5.2.3 Reliability

A major source of criticism of PAW comes from its perceived lack of reliability. This is manifested in the form of unexpected crashes of the program, results that differ from session to session, and so on. For some users, this lack of perceived reliability mitigates strongly against its use as an analysis package in a production environment.

We have determined that the following two areas of the PAW system give rise to the most reports of poor reliability:

- **COMIS** – The COMIS package interprets user Fortran code. We have begun work on a small new package that will enable the PAW system to use dynamic compilation and linking, offered now by the vendors on most popular supported platforms. This package will be maintained as a separate entity from PAW. We intend, in the longer term, to terminate support of PAW on platforms that do not have dynamic linking capability. In the meantime, the existing COMIS will be kept at a maintenance level.

- **PIAF** – The PIAF system runs on a set of dedicated HP machines in the CERN Computer Centre. The plans for PIAF itself are not covered in this document, but include improving the robustness of the system against runaway processes, full disk devices, lack of file backups, and so on.

A systematic inspection of the PAW code will be undertaken as a background activity, with the purpose of improving the protection of the system against bad input and run time errors. To facilitate this, the code will be reverse-engineered using a mixture of tools, namely Logiscope (for static analysis) and compilers offering run time test coverage statistics.

5.2.4 Consistency

As the PAW system is built up from several individual component packages, which have themselves been developed in the past as stand-alone programs, there is occasionally an unfortunate lack of consistency between how the PAW user is expected to call them. In other cases, there seems to be duplication of functionality (e.g., creating vectors).

The long-term goal is to rationalise the user’s view of the functionality of the whole of PAW by standardising the calls to the component packages. To a large extent, the use of the Motif version of PAW satisfies this goal, and its use will be encouraged. Effort will thus be put into improving the “standard” version of PAW, so that its users enjoy a more intuitive user interface. Where true duplication of function exists, the function offering the richer or more mainstream possibilities will be chosen, and the other function(s) disabled from within PAW.

In addition to standardising the calling semantics, an effort will be made to present all error message generated by the PAW system in a uniform style.

5.2.5 Online Help

The existing on-line help system in PAW requires that, to find help on a particular command, the user knows the name of that command. Work has already started to implement instead a keyword-based help (see article in section 5.3), which will fully replace the existing help command. The user will be able to view a list of all PAW commands that have the user’s given keyword(s) associated with them. In addition, there will be “See Also” information shown, allowing the user to navigate to related topics. It is intended to instrument the help database with URLs where possible, in anticipation of a future need for full WWW browser access to PAW.

The “Usage” command, which displays simply the syntax for a given PAW command, will remain. All PAW commands will have associated with them an example, as part of the help file information.

5.2.6 Ntuple Selection Mechanism

There is mismatch between the features offered by Column-Wise Ntuples (CWNs) and the scope of selection expressions currently allowed in PAW. The existing expression analyser has many weaknesses, and has poor error reporting. We are thus re-writing the selection function interpreter to incorporate the following features:

- Full support for all types allowed by CWNs.
- No limits on expression size (up to the available memory on the host processor).
- Full expressions for array indices, checking of array bounds only when needed, e.g. `nt/pl 10.Mass(iBest) iBest>0'` or `nt/pl 10.Adc(1:nHit) abs(Tdc(1:nHit))<10.'`

- Speed, through optimisation of the expressions:
  - evaluation of constant subexpressions
  - reordering of terms
  - caching of terms for repeated query optimization ("real-life" expressions will be examined to ensure good metrics).
  - accepting the existing selection syntax, i.e. backwards compatibility (for a certain period at least.)

5.2.7 New Features

The PAW system is already richly featured. No major new features are thus foreseen to be included in PAW in the medium term. The emphasis is now on consolidation of the system. However, where a component of PAW needs to be rewritten or reworked to satisfy the other requirements detailed in this document, then the opportunity will be taken to include a new feature provided that it is required by a significant number of PAW users, properly structured to fit into the PAW framework, and suitably stress-tested.

An example that fits the above criteria is the peak-search and fitting add-on package to PAW developed at GSI, Darmstadt
5.2.8 Fitting

We see from the Questionnaire results that, for a significant fraction of users, PAW is being used as a front-end to MINUIT. Additionally, some users make use of a separate package called Mn_Fit to perform fits. The Mn_Fit package is completely separate from CERNLIB, but is based upon HBOOK and MINUIT (the author is Ian Brock). We will decide whether it makes sense to combine Mn_Fit with PAW, or whether to host Mn_Fit in CERNLIB, or whether the attractiveness of Mn_Fit can be matched by improving PAW’s interface to MINUIT.

In addition to the investigation of Mn_Fit, we will include the GSI add-on, described in the section on New Features.

5.3 A New “HELP Mechanism” in KUIP

Nicole Cremel CN/ASD

As reported in the article “The PAW Medium Term Plan for 1995/1996” (section 5.2), one of the complaints made by PAW users resulting from the “PAW Questionnaire” concerned the “on-line” help, which, with the current implementation, requires that users know the exact name of a command in order to find some help information. The first step towards an improvement in that area has been to implement a new “help mechanism” based on keywords rather than exact command names. This new feature will be available in a new version of KUIP which will be put in the “new” area (usually /cern/new/lib/ on Unix) quickly after the release of the CERN Program Library (i.e. around the 1st or 2nd week of April).

The major change is the introduction of a new directive in the KUIP “Command Definition File” (CDF):

>Keyword
keyw1 keyw2 keyw3 ...
...
keywn

Where keyw1, keyw2, ..., keywn are a list of (significant) keywords to be associated to a particular command. For instance, in the KUIP CDF itself, we have:

>Command PSVIEW
>Parameters
FRAME 'File name' C

5.2.9 Obsolescence

Certain parts of the PAW system are now unused or are so little used that their inclusion should be questioned. Some parts of PAW require rewriting to benefit from the latest versions of, for example, X Window.

Notes:

Please note that this document is fully available in WWW/Mosaic by opening the URL file:
http://asdwww.cern.ch/pl/paw/plans.html

In addition, the PAW Home Page contains a pointer to the full results of our analysis of the Questionnaire, which you may find of interest:
Pawl Home Page:
http://asdwww.cern.ch/pl/paw/index.html
Questionnaire Results:
http://asdwww.cern.ch/pl/paw/questionnaire/results.html

---

1 This explains why it has been decided not to introduce this version of KUIP in the current Program Library release, but only the next one, probably in autumn, in order to give enough time to all the application programmers who based their application on KUIP to re-compile their CDF.

2 The translation into FORTRAN, which is frozen, will not understand this new directive.
the users to keep it.
This important change will affect all applications based on KUIP, for example, those applications which are part of the CERN library, PAW (and Paw++), GEANT (and Geant++) or FATMEN. Application programmers who based their own application on KUIP, for the user interface, must **not forget to re-compile their CDF** as soon as they link their application with this new version.
Please note that more work will be done in this area in the future, in order to facilitate the “navigation” between related topics, and implement some **hypertext** capabilities. A new directive >Link followed by the information required to create an hypertext link has already been implemented in the CDF but is not yet operational.

5.4 Fortran 90 Progress

*Michael Metcalf CN/ASD*

Since the publication of the Fortran 90 standard nearly four years ago, there has been a lot of activity. Much of this is detailed in Fortran Market, available on the World Wide Web with the URL


What follows is just a summary.


Books are available in Chinese, Dutch, English, French, German, Japanese and, soon, Russian.

You can keep in touch with other Fortran 90 users by joining a mailbase list, comp-fortran-90. To do this, send an e-mail message to mailbase@uk.ac.mailbase, containing the only line:

join comp-fortran-90 <firstname> <lastname>

Files for a Fortran 90 emacs mode can be retrieved by ftp to mailbase.ac.uk, directory

/pub/lists/comp-fortran-90/files/

or by Gopher and WWW with URL

gopher://nipr.ncl.ac.uk/11/...

...lists-a-e/comp-fortran-90/files

or by sending an e-mail to mailbase@mailbase.ac.uk, containing the command send <listname> <filename>

(e.g. send comp-fortran-90 f90.el).

Material for teaching is available. For example, copyright but freely available course material is available from Manchester Computer Centre on the WWW with the URL:

http://www.hptec.mcc.ac.uk/...

...hptec/courses/Fortran90/F90course.html

The ftp address is ftp.mcc.ac.uk and the directory /pub/mantec/Fortran90. A complete tutorial is available with the URL

http://asis01.cern.ch/CN/CNTUT/F90/Overview.html

or via anonymous ftp from cernvm.cern.ch in the directory

cnl.200 and as the file f90tutorial.ps.

Courses are available from a number of companies in the US and Europe.

Finally, the Fortran 90 standard, ISO/IEC 1539:1991, is obtainable for 185CHF from

ISO Publications, 1 rue de Varembe, Case postale 56
CH-1211 Geneva 20, Switzerland
Fax. + 41 22 734 10 79

and, more expensively, from national member bodies such as ANSI, DIN, BSI and AFNOR.

For full details of all this, please consult Fortran Market.

5.5 ORACLE World Wide Web Interface Kit

*Sergio Santiago CN/ASD*

The ORACLE Corporation recently unveiled the availability of its “World Wide Web Interface Kit”, which is intended to “Bring the Power of Oracle7 to the World Wide Web”. Below are excerpts from the announcement about the availability of an Oracle WWW server an Oracle WWW Interface Kit.

The server (Oracle Home Page) can be found at the URL:

http://www.oracle.com

From this page you can find more precise information on the “Oracle WWW Interface Kit” if you select the “Table of Contents” (at the bottom), and, after selecting any one of the countries listed, you will find at the bottom, in a section “Developer’s Corner” the Home Page for the “Oracle World Wide Web Interface Kit” with the relevant information.

Oracle Corp. has announced the immediate availability of the Oracle World Wide Web Interface Kit which enables develop-
ers and World Wide Web server administrators to tightly integrate Oracle7 databases with Web servers. The Kit, available free of charge on the Internet, includes real-life examples of linked Oracle7 databases with Web servers created by Web developers from around the world. Also included is a powerful Oracle gateway for Web servers, which translates Oracle standard database language (PL/SQL) to Internet-standard language (HTML).

Using the Kit, developers can now create links between Web servers and Oracle7 databases to bring to the Internet exciting new services and information systems. Potential uses for the Kit include the capability to make Oracle7 databases accessible to users of Web servers, as well as enabling new applications that integrate Web server transactions into existing business processes using Oracle7 databases.

The modules in the Oracle WWW Interface Kit include the following:

- **WOW**, Oracle's Web-Oracle-Web PL/SQL gateway to Web servers,
- Oracle's **PL/SQL Editor** and Development tool for the creation of dynamic PL/SQL code,
- **ORAYWWW**, a PERL gateway contributed by Mr. Arthur Yasinski of the Department of Natural Resources, Canadian Forest Service,
- **WORA**, a user-friendly database browser written in Pro*C by Constantine Ocarinets of JINR, Russia,
- **Decoux**, a post-processing gateway that inserts query results from an Oracle7 database into HTML documents, contributed by Guy Decoux of France,
- **Navigator**, a collection of PERL scripts and one Pro*C module that allows administrators to quickly configure HTML forms for end-user queries of Oracle7 databases; this gateway was contributed by Rick Hudson of the University of Massachusetts,
- **TSS**, Text Search System, a full-scale indexing and free-text search system contributed by Peter Larsson of AstraKan, Sweden,
- **MORE**, a collection of Pro*C gateways for maintaining an information repository contributed by David Eichmann of the University of Texas,
- **HotMetal**, an HTML editor from SoftQuad,
- **PERL**, a freeware interpreting programming language developed by Larry Wall,
- **ORAPERL**, an extension to PERL for use with Oracle7 databases including user exits developed by Kevin Stock.

### 5.6 PDFLIB: New Version 6.06

**Hartmut Plotrow-Besch PPE/HL**

The major differences between the new version 6.06 and the previous version 5.02 of W5051 PDF, the Parton Density Functions package are listed below:

- A **NEW** group of PHOTON structure function sets have been added:
  - the six NLL sets of Hagiwara, Tanaka, Watanabe and Izubuchi, the WHIT group, (WHIT1=6 to WHIT6=6).

Several **NUCLEON** structure function sets have been added:

- NLL sets A' and G of Martin, Roberts and Stirling (MRS-AP) and (MRS-G) of February 1995 with grid data as well as in its parametrized version (MRS-AP-F) and (MRS-G-Fit);
- version 3 of the CTEQ group of October 1994 as NLL parametrisation in the MS as well as in the DIS renormalisation scheme and as LO (CTEQ3M, CTEQ3D, CTEQ3L);
- new sets of Glück, Reya and Vogt of November 1994 as NLL in the MS as well as in the DIS renormalisation scheme and as LO (GRV94-MS, GRV94-DR, GRV-LO).

Please note that as new default set, the MRS set (G) has been chosen (NPTYPE=1, NGROUP=3, NSET=41).

*For more details see the updated User's Manual.*

The response from the Physics community is strongly encouraging us to keep up-to-date with the latest developments in this area. The author will be pleased to learn about new parton density functions, as well as to receive suggestions on how to improve both the usage and the documentation.
5.7 Documentation for Patchy 5

*Julius Zoll / ECP*

Patchy version 5.03 is presently in the 'new' area of Cernlib, and will be moved to the 'pro' area with release 95A of the CERN Program Library.

A pre-print of the Reference Manual for Patchy 5 is available with WWW from the URL http://www.cern.ch/asdoc/ or via ftp at ftp://asiftp.cern.ch/cernlib/doc/ps.dir/p5refman.ps.gz

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5.8 Program Library

*K.S. Kölblig and J. Shiers CN/ASD*

Whilst we are aware that some of the subprograms listed below are still widely used, e.g. FFREAD, these subprograms have not been modified for a long period of time and are not recommended for new applications. A replacement is suggested where available/appropriate.

Please note that even "deleted" subprograms continue to exist in source form. However, they are no longer made available in compiled form and are not ported to new platforms. (Obsoleted routines continue to exist in both source and compiled form).

Should you still rely on any of the subprograms in the list, please send a mail to cernlib@cern.ch indicating for how long and on which platforms you require the subprogram(s) in question.

### Obsolete subprograms

The following packages are declared obsolete and scheduled for eventual deletion:

<table>
<thead>
<tr>
<th>Code</th>
<th>Package</th>
<th>Library</th>
<th>Last Revision</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>D701</td>
<td>FFTRC</td>
<td>MATHLIB</td>
<td>1973</td>
<td>Use D700 RFT or D703 RFFT or D704 CFFT</td>
</tr>
<tr>
<td>D702</td>
<td>CFT</td>
<td>MATHLIB</td>
<td>1974</td>
<td>Use D704 CFFT</td>
</tr>
<tr>
<td>I302</td>
<td>FFREAD</td>
<td>PACKLIB</td>
<td>1991</td>
<td>Use I202 KUIP</td>
</tr>
<tr>
<td>I303</td>
<td>RDWORD</td>
<td>KERNLIB</td>
<td>1986</td>
<td>Use M432 CHPACK</td>
</tr>
<tr>
<td>J401</td>
<td>BANNER</td>
<td>PGMLIB</td>
<td>1986</td>
<td>Use J403 XBANNER</td>
</tr>
<tr>
<td>M214</td>
<td>CVTAX</td>
<td>KERNLIB</td>
<td>1986</td>
<td>Use M220 IE3CONV</td>
</tr>
<tr>
<td>M216</td>
<td>GETWI</td>
<td>KERNLIB</td>
<td>1989</td>
<td>Obsolete</td>
</tr>
<tr>
<td>M218</td>
<td>CVTCC</td>
<td>KERNLIB</td>
<td>1986</td>
<td>Use M220 IE3CONV</td>
</tr>
<tr>
<td>M232</td>
<td>CVTND</td>
<td>KERNLIB</td>
<td>1980</td>
<td>Use M220 IE3CONV</td>
</tr>
<tr>
<td>M233</td>
<td>TRTCH</td>
<td>KERNLIB</td>
<td>1984</td>
<td>Obsolete</td>
</tr>
<tr>
<td>M409</td>
<td>UBUNCH</td>
<td>KERNLIB</td>
<td>1991</td>
<td>(partially) Use M432 CHPACK</td>
</tr>
<tr>
<td>M410</td>
<td>A1MARI</td>
<td>KERNLIB</td>
<td>1978</td>
<td>Use M432 CHPACK</td>
</tr>
<tr>
<td>Q210</td>
<td>ZBOOK</td>
<td>PACKLIB</td>
<td>1991</td>
<td>Use Q100 ZEBRA</td>
</tr>
<tr>
<td>R205</td>
<td>REDUCE</td>
<td>None</td>
<td>1985</td>
<td>Use, e.g., <em>Mathematica</em></td>
</tr>
<tr>
<td>Z008</td>
<td>TIMAL</td>
<td>KERNLIB</td>
<td>1985</td>
<td>Obsolete</td>
</tr>
<tr>
<td>Z034</td>
<td>WHICH</td>
<td>KERNLIB</td>
<td>1986</td>
<td>Obsolete</td>
</tr>
<tr>
<td>Z100</td>
<td>JOBSAM</td>
<td>KERNLIB</td>
<td>1978</td>
<td>Obsolete</td>
</tr>
<tr>
<td>Z204</td>
<td>FNZERO</td>
<td>KERNLIB</td>
<td>1981</td>
<td>Obsolete</td>
</tr>
<tr>
<td>Z262</td>
<td>GOPARM</td>
<td>KERNLIB</td>
<td>1985</td>
<td>Use Z264 IARGC</td>
</tr>
<tr>
<td>Z300</td>
<td>IOPACK</td>
<td>PACKLIB</td>
<td>1981</td>
<td>Obsolete</td>
</tr>
<tr>
<td>Z303</td>
<td>KAPACK</td>
<td>PACKLIB</td>
<td>1986</td>
<td>Use Q100 ZEBRA or Q180 HEPDB</td>
</tr>
<tr>
<td>Z304</td>
<td>IOSPACK</td>
<td>KERNLIB</td>
<td>1985</td>
<td>Obsolete</td>
</tr>
<tr>
<td>Z305</td>
<td>WMPACK</td>
<td>KERNLIB</td>
<td>1989</td>
<td>Obsolete</td>
</tr>
<tr>
<td>Z306</td>
<td>MAXDSK</td>
<td>KERNLIB</td>
<td>1989</td>
<td>Obsolete</td>
</tr>
<tr>
<td>Z307</td>
<td>JOBSYM</td>
<td>KERNLIB</td>
<td>1989</td>
<td>Obsolete</td>
</tr>
<tr>
<td>Z308</td>
<td>IOSPAK2</td>
<td>KERNLIB</td>
<td>1988</td>
<td>Obsolete</td>
</tr>
<tr>
<td>Z309</td>
<td>VMIO</td>
<td>PACKLIB</td>
<td>1989</td>
<td>Obsolete</td>
</tr>
<tr>
<td>Z312</td>
<td>VAXTAP</td>
<td>PACKLIB</td>
<td>1989</td>
<td>Obsolete</td>
</tr>
</tbody>
</table>
6. Tutorial Section

6.1 Setting X Window Resources on POSIX-based Systems

Nicole Cremel CN/ASD and Alessandro Miotto CN/DCI

We will restrict ourselves to X Window applications which are based on the X Toolkit Intrinsics (the more usual case), and not to applications using directly Xlib (like tk/tcl applications for instance), for which the "resource setting" mechanism does not obey to any fixed rules.

In X11R5 and for POSIX-based systems\(^1\), the resource database is constructed when an application is launched by consulting the following sources of resource settings, in the order shown below. If a specification applies to a particular resource in more than one of these locations, then the first one in the list has priority (no override). The order of priority in resource setting is:

1- Command line options bound to resources through an option table passed to XtAppInitialize() (called in the application main program).

E.g. as -sb in xterm is bound to +scrollBar, a -sb or +sb in the command line would apply independently of any other setting.

N.B. All application written with the X Toolkit Intrinsics accept the options described in the X manual page. Additional options, but generally limited to a small subset of resources, may be added by the application programmer, on a per-application basis.

2- Resources specified explicitly with the -xrm option on the command line.

3- "Per-screen" specifications stored in the SCREEN. RESOURCES property are merged. The property can be set by the user using `xrdb -load -screen` (and displayed with `xrdb -query -screen`).

Resources contained in the "screen-independent" RESOURCE_MANAGER property\(^2\) can be set by the user using `xrdb -load -global` (and displayed with `xrdb -query -global`). Note that there is only one screen SCREEN. RESOURCES property is normally not used.

If the RESOURCE_MANAGER property does not exist (command `xrdb -query -global` gives nothing), then the contents of the file $HOME/.Xdefaults is used instead\(^3\).

N.B. X11R5 introduced the file .Xresources whose contents are read by `xrdb` in the Xsession startup file. Nevertheless, it is up to the Xsession scripts to have explicitly a line like `xrdb -load $HOME/.Xresources` (which will be the case at CERN with the HEPI scripts for a "Common X Environment"). Also, as it is not mentioned whether .Xresources is loaded with the -global or -screen flag, it can make a difference whether the file .Xdefaults is used or not (if -global is used then .Xdefaults is ignored and .Xresources used instead).

4- The user specific "app-defaults" file is searched calling XtResolvePathname() with the path

- specified by USERFILESEARCHPATH, if defined,
- XAPPLRSDIR/$L%N;XAPPLRSDIR/$L%N:\$XAPPLRSDIR/$L%N
  if XAPPLRSDIR is defined,
- or
  $HOME/$L%N;SHOME/$L%N;SHOME/$N

Macros are substituted as follows:

\(\%N\) – application class name\(^4\).

\(\%T\) – type.

\(\%S\) – suffix.

\(\%L\) – language.

\(\%I\) – display language.

\(\%d\) – display territory.

\(\%c\) – display codestset.

The application "app-defaults" file is searched calling XtResolvePathname() with the path specified by XFILESEARCHPATH, if defined, and type (%T), otherwise a system specific path (defined when building the X libraries) is used\(^5\) (typically /usr/lib/X11/app-defaults).

E.g. the files /usr/lib/X11/app-defaults/Xlock or /usr/lib/X11/app-defaults/Mwm set up system-wide resources for the X application xlock and the window manager Mwm.

For more precise information from a programmer's point of view type man XtResolvePathname (this manual page is available a least on HPs).

5- If no "app-defaults" is located, any fallback resources registered by the application with XtAppSetFallbackResources() are used. (It is the way, for the application programmer, to set-up default values that seem to

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\(^1\) The main principles are already valid for previous X11 releases and other UNIX compliant systems.

\(^2\) One should note here that, in X Window, it is possible to have several screens attached to the same display, hence the necessity to make a distinction between the SCREEN. RESOURCES properties (option -screen) and the RESOURCE_MANAGER properties (option -global).

\(^3\) N.B. To merge with, instead of replacing, the current contents of the specified properties, you can use the command `xrdb -merge .Xdefaults`.

\(^4\) The application class name is normally the program name with the first (and possibly the second) letter in uppercase (e.g. Xlock for xlock, XTerm for xterm, or Mwm for mwm, the Motif Window Manager).

\(^5\) For more efficiency it is often better to keep this "system-wide" resource file small with only the minimum number of resources that you want to have available to all of your applications, e.g.: -reverseVideo: true, or for clients that you are using heavily.
be the most suitable for a given application, without the user having to do anything, usually for a restricted list of resources.)

Notes: These notes are comments pointed out by various users. We put them here just for information.

1. HP does not use $HOME/.Xdefaults because all resources are set in the RESOURCE_MANAGER rather than SCREEN_RESOURCES property, which is not what every other platform does, but it is consistent with the standard.

2. Only the first resource file found in XFILESEARCPATH and $USERFILESEARCPATH is used.
3. Sun oddly uses /usr/lib/X11/app-defaults as default directory when XFILESEARCPATH is not defined (instead of /usr/openwin/lib/app-defaults).

We must add for completeness that the environment variable (XENVIRONMENT) may also be defined to override screen or global resources, using a file rather than the command line. But as its use is redundant when the user has full control over them (i.e. if xdb sources the .resources file at session startup, as done in the HEPFIX scripts) we will recommend, at CERN, not to use this variable.

6.2 Paperless Publishing with Adobe Acrobat

Michel Goossens CN/ASD

Adobe Acrobat software is a fast, low-cost way to move your publishing beyond paper. By generating documents in PDF (Portable Document Format) one gets colour, graphics, fonts, easy navigation and printing, and the efficiency of electronic access.

6.2.1 Moving beyond Paper

From the simplest memos to the most complex article, or richest colour brochures, Adobe Acrobat software offers instant access to documents in their original form, independent of computer platform. And, more importantly, it lets you distribute and manage those documents electronically.

Acrobat software is based on the PostScript page-description language, the de-facto industry standard for printing. Hence, PDF documents appear on-screen at the highest possible resolution, and print perfectly in colour or black and white on any PostScript printer. Viewed with the free Acrobat Reader (presently available for Macintosh, DOS, MS-Windows, and Suns—both SunOS and Solaris, with HP coming soon) pages retain their original look and feel. Acrobat preserves Type 1 and TrueType fonts.

6.2.2 Accessing the Information

With Acrobat software, one can find information instantly. Full-text search capabilities across multiple documents allow one to retrieve exactly what one needs. Hypertext links simplify browsing across the network. Navigation features, such as bookmarks and cross-document links, help one move through electronic documents faster than printed versions.

Adobe Acrobat features

- Copy and paste formatted text and graphics into other applications.
- Leave notes anywhere in a document—even customize them with a personal label and colour. Recipients can merge notes from multiple sources into a single PDF file for review.
- Full-text search capabilities let you quickly find words and phrases—even in illustrations, charts and tables—of documents indexed with Acrobat Catalog.
- Use thumbnails to rearrange pages or drag and drop pages between PDF files.
- Links and bookmarks instantly take you to related information, even in other PDF files or files from other applications.
- One can password-protect PDF files. One can also enable or disable printing, changing the document, adding and changing notes, and selecting text and graphics.
- Print or fax on demand to Adobe PostScript and non-PostScript printers—colour or black and white, at any resolution.

The Acrobat suite of programs

Acrobat Reader

Enables Macintosh, Windows, DOS and (Sun) Unix users to view, navigate and print any PDF files they receive. This program is freely available.

Acrobat PDF Writer

A driver program enabling “printing” PDF files from common desktop applications, such as word processing and spreadsheets.

Acrobat Exchange

Like Acrobat Reader, but it allows one to “add value” to documents and share them with other Acrobat users by enabling annotations, building navigational links into, and add security controls to PDF files.

Acrobat Search

Provides full-text search capabilities for PDF files that have been indexed with Acrobat Catalog.

Acrobat Distiller

Converts any PostScript language file into PDF. This program can be used on output generated by any ap-
Chapter 8: Memory Management and input/output Routines

8.1 Memory usage and ZEBRA

The HBOOK system uses the ZEBRA data manager to store its data elements in a COMMON block /PAMC/ (shared with the HIHZ and KUP packages, when the latter two are also used, as is the case in PAMC). In fact, the first task of a PAMC user is to declare the length of this common to ZEBRA by a call to HLIMIT, as is seen in figures 8.3 and 8.4.

In the /PAMC/ data store, the HBOOK, HIHZ and KUP packages have their own division (see figure 8.5 for more details on the notion of division) as follows (see figure 8.6):

- LINKS Some locations at the beginning of /PAMC/ for ZEBRA pointers.
- WORKS Working space (or division 1) used by the various packages storing information in /PAMC/.
- HBOOK Division 2 of the store. Reserved to HBOOK.
- HIHZ A division reserved for the HIHZ graphics package. This division only exists when HIHZ is called.
- KUP A division reserved for the KUP user interface package. This division only exists when KUP is called.
- SYSTEM The ZEBRA system division. It contains some tables, as well as the input/output buffers for HRIN and HROUT.

```
COMMON/PAMC/INFAM, INFAC, INDIV, INHIHZ, ZEBR, FENC(5), LMNX, HCV(9000)
DIMENSION IQ(2), IQ(2), IQ(4000)
EQUIVALENCE (IQ(1), LMNX), (IQ(1), IQ(2)), (IQ(1), IQ(2))
```

Figure 8.1: The layout of the /PAMC/ dynamic store

Figure 6.1: Example of a page of the HBOOK manual viewed with Acrobat. Note the thumbnails of the pages at the left, and the boxed hyperlinks, allowing one to jump straight to a bibliographic reference, or a figure, table or section. At the top one sees the toolbar, with the possibility, amongst other, to magnify pages for easier viewing.

This program creates full-text indexes for collections of PDF files shared over a network of Macintosh and Windows users, who can find information instantly with Acrobat Search.

Further reading


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*A package hyperref translates many of \[\text{Latex}\]'s cross-reference commands into parameters that can be interpreted by the PDF command pdfmark, to allow hypertext navigation through pdf documents. To pick up and translate these pdf-specific commands one should use a special version of dvips, called dvips. The functionality of this suite of programs is presently being tested, and figure 6.1 shows a "hyper" view of the HBOOK manual with Acrobat Reader. More information is available in an article (in French) by Yannis Haralambous HTML. — \[\text{Latex}\] — PDF, ou l'entrée de \[\text{Lattez}\] dans l'ère de l'hypertexte, Cahiers GU?tenberg 19, pages 127–147.*
7. Text Processing

7.1 Producing HTML3 with \texttt{latex2html}

Janne Saarela CN/ASD

7.1.1 HTML3, a New Version of HTML

HTML, the Hypertext Markup Language (see CNL 213, page 25 for an introduction), is the hypertext markup language used for documents on WWW. The HTML language is an instance of SGML, and hence defined formally via a DTD (Document Type Definition) that describes the possible names for the markup commands, their attributes, as well as the entity names—ways for specifying external material, foreign characters, etc.). HTML has been continuously improved over the last few years, as ever more users use WWW (mostly via the Mosaic-family of browsers) as their window to Internet. Therefore, other application areas that have nothing to do with (high energy) physics had to be addressed by the HTML language. Already in the present, HTML2, version forms have been introduced, while the latest version, HTML3, that is still under discussion, has support for (simple) mathematics and tables (see ftp://ftp.w3.org/pub/www/area/html3-dtd.txt for the latest version of the DTD). The development of HTML3, and browsers that are able to interpret HTML3 code, is important for the visualization of scientific information, and thus in particular for CERN.

7.1.2 Producing HTML3 with \texttt{latex2html}

An extension to Nikos Drakos' \texttt{latex2html} translator\footnote{See CNL 213, page 28, or the URL http://cbl.leeds.ac.uk/nikos/latex2html/doc/latex2html/latex2html.html} has been developed to convert mathematics and simple tables to HTML3. As the basic strategy of the \texttt{latex2html} translator is to generate bitmap (often gif) images for all environments or commands that cannot be expressed in the target language, most documents containing mathematics (also common particle names, like $Z^0$) contain an unnecessarily large amount of such images.

The program implementing this translation from \LaTeX{} into HTML3, \texttt{math2html}, is written as a combination of the gnu utilities \texttt{flex}, \texttt{bison} and a set of C++ procedures. It has been compiled on most of the CERN reference Unix platforms and can be found in the directory \texttt{/usr/local/bin}

**Usage**

The extended version of the translator is based on version 95.1 of \texttt{latex2html} and has been called \texttt{12hcern}. It can be found in directory \texttt{/usr/local/bin} and it can be run with the command

\texttt{12hcern [switches] latex-sourcefile.tex}

With respect to the standard version of \texttt{latex2html} two new switches have been introduced.

\texttt{-thumbnails}

Specifying this switch will cause all Encapsulated PostScript (EPS) pictures that are included with either a $\texttt{\verb!\epsfig!}$ or $\texttt{\verb!\includegraphics!}$ command, to appear as small thumbnail bitmap images in the produced HTML documents. Each thumbnail will be a link to the PostScript version of the corresponding EPS picture.

The size of the thumbnail image can be controlled in the configuration file with the \texttt{\$THUMBFAILSIZE} variable. By default it is set to 0.30 which corresponds to 30 percent of the size of the original image.

The \texttt{\$THUMBFAILSIZE} and \texttt{\$THUMBFAILS} variables (the latter being set to 0, by default, indicating that thumbnails are not desired) are both set in the \texttt{12hcern} configuration file that resides in directory

\texttt{/usr/local/lib/latex2html}

\texttt{-html3}

As mentioned above, standard \texttt{latex2html} turns all mathematics into bitmap images. By specifying the \texttt{-html3} switch, \LaTeX{}'s mathematics constructs shown below will be parsed by the \texttt{math2html} program.

$\texttt{\begin{math}\ldots\end{math}, \ldots,}$

$\texttt{\begin{equation}\ldots\end{equation},}$

$\texttt{\begin{displaymath}\ldots\end{displaymath},}$

$\texttt{\ldots, \ldots, \ldots, \ldots, \ldots,}$

$\texttt{\begin{array}\ldots\end{array},}$

$\texttt{\begin{eqarray}\ldots\end{eqarray}}$

\texttt{math2html} will try to parse the mathematics and transform the input into HTML3. If this is possible, the produced document will contain HTML3 mathematics. If the mathematics notation is too complex to be parsed by the program or cannot be expressed through the HTML3 DTD, the input will be handed to \LaTeX{} and a bitmap image will be generated, as previously, thus guaranteeing that the generated output document is complete.

Similarly, tabular information defined with the \LaTeX{} environments \texttt{array} and \texttt{tabular} will also first be handled by the \texttt{math2html} program. If they are not too complex, they will also be translated into HTML3 source form. Otherwise they will be handed down to \LaTeX{} for generation of a bitmap representation, as previously (see also 7.1.2 below).
Mapping control sequences

The control sequences, which any mathematics environment may contain, can be mapped to their HTML3 counterparts with the help of a configuration file. math2html reads a default configuration file every time it is run. This file is located in

```
/usr/local/lib/latex2html/math2html.cfg
```

A similar file can be placed into the user's home directory. In this case the call to math2html has to be changed accordingly, namely on the command line use:

```
math2html -c myconfigfile sourcefile
```

Alternatively, in the initialization file .12hcern-init in one's home directory one can enter a line like:

```
$MATH2HTML = "math2html -c $HOME/myconfigfile";
```

The format of the math2html configuration file is quite simple. In the left column one specifies the \LaTeX\ control sequence and in the right column the translation into HTML. The HTML (translated) part can contain two special strings:

- \verb|\%s| This string represents the argument of the command specified on the left-hand side, e.g., the following instructs the translator to ignore the argument of the \verb|label| command:

  \begin{verbatim}
  \label   <noparam>
  \%s
  \end{verbatim}

- \verb|\%s| This string represents the argument of the command specified on the left-hand side, e.g., the following says that the argument of the \verb|mathrm| command will be bracketed inside a \verb|<tt> </tt>| HTML pair:

  \begin{verbatim}
  \mathrm \quad <tt>\%s</tt>
  \end{verbatim}

Known restrictions of math2html

- Nested arrays

The translator cannot correctly handle nested environments such as arrays or inline mathematics inside an eqnarray.

Mathematics shorthand

Some people write the base of an exponentiation outside inline mathematics (e.g., \verb|cm``{-2}`|) and this cannot be handled by the parser. In order to avoid generating pictures for those exponents, please put everything inside maths mode, taking into the account the fact that units, particle names, etc., should be in Roman type (see CNL 202, page 19, and CNL 203, page 8). For instance, use \verb|$x^{-2}$| instead of \verb|x``{-2}|

and \verb|$\sqrt{cm}`\times4$| instead of \verb|cm``{2},| or even \verb|$cm``{4}$|, which is also wrong since units must be in Roman, see above.

Non-trivial tables

At present the program cannot parse preambles for tabular or array environments when they are too complex.

7.1.3 Viewing HTML3 Documents

To browse HTML3 documents, at present one can only use the Arena browser (described at the URL http://www.w3.org/hypertext/WWW/Arena/). It supports HTML3, including tables, maths and an experimental style sheet mechanism. Binaries are available for several Unix platforms (including Sun4, HP, SGI, IBM rs6000), and can be transferred from http://www.w3.org/pub/arena/or ftp://ftp.w3.org/pub/www/arena/.

Two other browsers, Mosaic v2.5 and Netscape 1.1, are also able to handle HTML3 DTD tables. These browsers can be found, respectively, at URLs:

- ftp://ftp.ncsa.uiuc.edu/Mosaic/Unix/binaries/2.5/
- http://home.mcom.com/;

the latter is a commercial product.

Part of the CERNLIB documentation has been converted into HTML3 and these documents can be accessed from WWW following the links Computing - CERNLIB - Documentation from the CERN home page, or directly via the URL

http://w3w3n.cern.ch/asdoc/Welcome.html

Examples

Figure 7.1 shows a few examples of \LaTeX\ input source code together with its translation into HTML3 as rendered by the Arena browser. Figure 7.2 shows a page taken from the HTML3 version of the GEANT manual.

Questions

All feedback on the program's functionality should be sent to the author Janne Saarela (janne.saarela@cern.ch). A specific Web page giving up-to-update information on this application is available at the URL

\[
\frac{2}{3} \phi^2 \gamma \left( \frac{1}{Z_1} \right) \left( \frac{1}{Z_2} \right) \beta^2 \gamma^4
\]

\[
\psi_0 = \frac{15 \text{ MeV}}{\beta^2 X_0}
\]

\begin{tabular}{|c|c|}
\hline
Mixed maths and text & inside table \\
\hline
\end{tabular}

\[
y = x^{-2}, \quad \alpha + \beta = \gamma, \quad \psi = \sum_{n=0}^{\infty} n
\]

Figure 7.1: \LaTeX source with HTML counterparts

This is the classical Rutherford cross section corrected by the screening angle $\chi_a$. This angle is described by Molière as a correction to the Born approximation used to derive the quantum mechanical form of the Rutherford cross section. We have then:

\[
\sigma = \int \frac{d\mathcal{O}}{d\mathcal{O}} = 2 \frac{\left(2 \pi \frac{Z_1 Z_2}{\mu \rho^2}ight)^2}{(1 + \phi_a)}
\]

and so equation (2.1) becomes:

\[
\mathcal{O} = \chi_a \left( \frac{2 \pi \frac{Z_1 Z_2}{\mu \rho^2}}{1 + \phi_a} \right)
\]

where we have set $\phi = \phi / \chi_a$. To sample from this distribution we calculate the inverse of the distribution function:

\[
\eta = \int_{0}^{1} \frac{2 \pi \frac{Z_1 Z_2}{\mu \rho^2}}{1 + \phi_a} = 1
\]

where $\eta$ is a number uniformly distributed between 0 and 1. If we observe that also $1 - \eta$ is uniformly distributed between 0 and 1 and we remember the definition of $\phi$, we obtain:

\[
\phi = \chi_a \left( \frac{1}{\eta} - 1 \right)
\]

Figure 7.2: Extract from the GEANT manual
8. Questions and Answers from the UCO

8.1 About News

**Question**

How can I put a news in the news group \textit{"MARKET"}?

\texttt{---------------------------------------------------------- \ "CERN"? \ 
\---------------------------------------------------------- \ "COMPUTING" ?}

**Answer**

There are two kind of news groups: \textit{moderated} news groups and \textit{unmoderated} news groups. A news group is moderated when there is a well defined group of people who are allowed to post articles into it. Examples of a moderated news group are: COMPUTING and CERN. An example of an unmoderated news group is: MARKET. Everyone is allowed to post a news in an unmoderated news group like MARKET.

On CERNVM the command to submit a news is \texttt{POST}. When you type "\texttt{POST}" without any parameter, you are given a self-documented panel to be filled; by pressing \texttt{P5} (Send) twice you will actually post the news which will be visible about an hour later. N:B.: It is not necessary to go through a panel and one can launch news via the \texttt{POST EXEC}, but then people should read the help file (type \texttt{"XFIND POST NEWS"}).

On UNIX just go to your favourite newsreader and use the "post" option in a similar way.

To submit a news into a "moderated" news group (like CERN or COMPUTING) you must either send the article to one of the administrators or senders (people allowed to post articles into a given news group), or send the article from the account of a sender or administrator.

To find who the senders or administrators are for a given news group, on CERNVM, do the following:

1. type \texttt{IXNEWS \ n ewsgroup},
2. move cursor to the line describing the newsgroup,
3. press \texttt{F12},
4. type "\texttt{QUERY}" as the response to the questions coming up.

You will find in that way that the administrator of the CERN news group (general information for CERN users, not related to computing issues) is Bryan Pattison (\texttt{BRYAN@CERNVM}). To put a news in this group you should either contact him or the CERN Users' office (\texttt{CERN@CERNVM}). To put a news in the COMPUTING news group, the easiest solution is to send a mail to the User Consultancy Office (UCO@CERNVM).

8.2 About Electronic Mail

**Question**

I have forwarded, a long time ago, the electronic mail I was receiving on CERNVM, to my new e-mail address. It does not seem to work anymore (senders get the message "No such local user on CERNVM"). Could you please explain why?

**Answer**

This question may become more and more "frequently asked", with the imminent death of CERNVM as a central service at CERN, and the migration to UNIX.

The answer is very presumably that the account of the user had been BLOCKed (following the Annual Review process) and that incoming mail had been re-routed via LISTSERV but not MAILER (for more detailed technical information see the article on "Using CERNVM to Reroute your E-Mail", section 3.8).

**Question**

I have a computer account only on a PC. I would like that my local e-mail address on the PC be displayed when using XWHO. Is it possible?

**Answer**

Yes. The normal way for a user to set his "preferred e-mail address" (the one which is registered in the personnel database and displayed with XWHO) is to run, himself, the program "emdir", available on most systems (VM, VMS and UNIX), but not on PCs. In such a case the user must contact his "group administrator" for the computer (see CNL 218, the article on "About User Registration, Accounting"), who will be able to change it via the "USERREG" procedure (standard tool for a user registration).

**Question**

My friends tell me that they cannot send mail to me (userid@afsmail.cern.ch) although I have a valid AFS account. Why?

**Answer**

Mail to userid@afsmail.cern.ch only works if the AFS mailbox \texttt{/afs/cern.ch/mail/u/userid/spoolfile} (which should be the value of the \texttt{MAIL} environment variable) exists, even if empty.

So, just do \texttt{touch $MAIL} and then users will not get their mail rejected anymore.
8.3 About Printing

**Question**

*How can I print a colour PostScript file on transparencies?*

**Answer**

There are two public printers, provided by the CN division, that "understand" colour PostScript. They are located in building 513 (R-052, in the printer area). One is dedicated to paper, the other to transparencies. These printers share a common name "s13-cp2" and you can submit your print job with the standard command `xprint`, normally available on any computer. For example, to print the PostScript file "myfile.ps", you just type:

- `xprint -P s13-cp2 myfile.ps`, on a Unix workstation.
- `XPRINT MYFILE.PS (PR. s13-cp2, on CERNVM,`  
- `XPRINT/PR=s13-cp2 MYFILE.PS, on VXCEPN,`  

For economic reasons (printing in colour is still quite expensive), after submitting your job you must go physically to building 513, where the printers are situated, in order to select your job on a NCD X terminal, located next to the printers. On this terminal there is a simple tool which allows you to select the "PostScriptPrinter" you want to use (by default "s13-cp2"), to enter your "UserLogin" (the login of the account from which you submitted the print), and after pressing <CR> it will display the file names you have submitted to these printers. You just have to select (by clicking with the mouse) the file you want to print, which will be automatically displayed through "Ghostview" for you to check whether it is really the stuff you want to print. By selecting "Proceed" you will get a small window asking you: "Select a queue to print...", with the two possible choices "s13-cp2_Paper" or "s13-cp2_Transparencies". You have to validate your choice by clicking on one of these entries and pressing the <Print> button. (N.B. the button <Cancel> allows you to cancel your request, but the job will stay in the queue, while <Discard> can be pressed to delete you print job from the queue.)

8.4 About X Window (X Terminals and Applications)

**Question**

*How do I run PAW on an X-terminal?*

**Answer**

This answer is valid for any X-Window based application you run on your X-terminal.

There are two ways to connect to a computer from an X-terminal. The way to run PAW depends on the connect method:

1. **"Login new X session"** from the "Login" menu:
   The user accesses as if he were at the console of the workstation service. After the session is established, the DISPLAY variable should be correctly set (N.B. the HEPX startup environment takes care of it).

   If it is not, you type "who", see the name of the terminal from which you are connecting and type:

   ```
   setenv DISPLAY terminalname:0
   (tcsh,csh shells)
   export DISPLAY=terminalname:0
   (zsh,ksh,bash)
   ```

   Then run PAW in the usual way.

2. **"New Terminal"** from the "Terminals" menu:
   The user makes a telnet connection to the relevant machine. In this case the DISPLAY variable is not set. Do as above to set it, then run PAW.

Two problems may arise:

1. That PAW does not complain but the graphics window does not show up.
   This is most probably due to the fact that the file $HOME/hige_windows.dat contains in its first line the name of the computer to which graphics should be directed. In that case, delete that file or force the X-terminal name by answering "1. terminalname" to the PAW prompt:
   "Workstation type <CR>=1 ;"

2. That PAW complains "Xclient not authorized to connect".
   In that case the X-terminal is stopping the window because it has the "Access Control" enabled. One must do the equivalent of the UNIX command "$host +" as follows:

   Select "Change Setup parameters..." from the "Setup" Menu. Click the "Access Control" button (found down the screen). Push-off the "Enable X Access Control" button in the obtained panel.

   The above will disable access control, that is, any machine may now send an X window to your X-terminal.
8.5 About Macintoshes

Question

How do I switch off the irritating “Session: Invalid keyword in configuration file” messages which come up every time I connect to CERNVM?

Answer

The tn3270 application uses the same configuration file “config.tel” as NCSA Telnet. As of version 2.5.1, the latter accepts three new keywords: tektype, forcesave and eightbit, which tn3270 does not understand.

Just comment out the following three lines:

```
tektype=4105
forcesave=n
eightbit=no
```

in the COPY of config.tel associated to tn3270.

Question

I want my Mac to remember my usual connections to other computers. How do I do that?

Answer

Launch “NCSA Telnet”. Under the “File” menu you can find “Open connection”. Select that and you will be presented a window with two parameters to type:

Session Name: here you type the name of the computer you want to connect to, e.g. vxcern.cern.ch

Window Name: What you want to see at the top of the window giving you the connection.

Once the connection is established, you may “record” your choice for future use. Select “Save Set” under the “File” menu, and give the resulting file a valid name (in our example, “vxcem”).

You have now created a small “Telnet” document, which will give you an automatic connection to “vxcern” when double-clicked.

Question

How do I transfer files to/from my Mac?

Answer

There are several ways. For instance, NCSA Telnet offers you an “FTP session” option when opening a connection to a computer. That gives you a traditional “ftp” connection. However there is a much more user-friendly way, through the excellent “Fetch” public-domain product from Dartmouth College. Available from the usual Mac servers and also at the “User Support” Macintosh in Appletalk zone “CO - Bat 513” (connect as “guest” to disk “/pub”).
9. Computer Documentation

9.1 X Window Documentation

Nicole Cremel CN/ASD

In order to give people who are not familiar with the "X Window System" a better idea, and as much practical knowledge as possible, of what this rather complex system (more concisely called X or X11) is, a new guide

Guide for the Usage of X at CERN (X Window System and X Terminals)

is now available. The main idea is that, as more and more users have to deal with this system (at different levels), due to the growing number of personal workstations and X terminals, we would like to try and answer all the basic and "frequently asked" questions that may arise, especially in the CERN environment.

Copies of this Guide can be found as follows:

- AFS as a PostScript file:
  /afs/cern.ch/project/writeups/xusage/main.ps

- Anonymous ftp as a PostScript file:
  asiisftp.cern.ch/writeups/xusage.ps

- WWW as a PostScript file in the "Writeups at CERN" page, at the URL:
  http://consult.cern.ch/writeups/xusage


Please note that, due to the large number of pictures (screen bitmaps), in order to print the PostScript file a printer with a fair amount of memory is needed. Otherwise you will have to split the file and suppress the pages (generally with pictures) which cause problems. For information, it is possible to print it at CERN (recto-verso, and good resolution) on the new HP printer which is publicly available and located in the printing area of building 513, with name 513-hp.

9.2 News from the Computer Documentation Office

Michel Franceschi and Roger Woolnough CN/DCI

9.2.1 Mathematica Books from the UCO

Mathematica book sales from CN/CE have now been transferred to the UCO to centralise the service. The UCO will continue to sell the standard "Mathematica Reference Manual" from Wolfram and along with that will offer new titles: "Mathematica for Scientists and Engineers" by Thomas B. Bahder, "Mathematica for Physics" by Robert L. Zimmermann and "The Mathematica Graphics Guidebook" (which has just been published) Mathematica Graphics by Cameron Smith and Nancy Blachman.

Further information is available on WWW as well as the full list of titles at your disposal using URL:
http://consult.cern.ch/UCO/Books.html
or at the last page of this CNL.

9.2.2 New Books Titles

There are several new books now available from the UCO. Here is a list of the most recent titles:

- X User Tools
- Motif Tools
- Making TEX work

Exploring Expect
TCP/IP Illustrated Vol 2. – The Implementation
Mathematica for Physicists
Pretty Good Privacy
Managing Internet Information

The last two books are the newest ones: "Pretty Good Privacy" explains the freely available encryption which one can use on files and mail alike. It contains all you need to know to install, configure and use the program effectively. "Managing Internet Information" deals with setup and maintenance of server software as well as data management.

All these books are available from the UCO via TID, EDH or cash. For further details and a full list of titles see the following WWW page:
http://consult.cern.ch/UCO/Books.html

9.2.3 TeX CD-ROM out of stock

Please note that the TeX CD-ROM that was for sale via the UCO is now out of stock until May when a new version will be produced. There will be a news when we have the CD-ROM in stock again so please do not place orders with the UCO.
9.3 The UCO Reference Cards – Current List

Catherine Delamare CN/ASD

The User Consultancy Office offers a collection of short documents, most related to UNIX, which help a first-time user to move along without going to the full details of the reference documentation. Notice however that we strongly recommend you to look at the reference manuals if you intend to make serious use of the application or facility documented in such cards.

We would like to thank the DESY User Support Group for providing several of the documents we are making available. Here follows the current list. You can URL it via:

http://consult.cern.ch/UCO/refcards/Welcome.html

These are documents available in PostScript format. To view them, you need to use a WWW browser (like Mosaic) that can spawn a PostScript previewer.

1 Vax/VMS pocket card
2 VM/CMS pocket card
3 UNIX commands for VM and VMS users
4 GNU Emacs reference card(v.19)
5 CMZ QuickGuide
6 Zephyr flyer
7 Using QuickMail at CERN
8 How do I submit a batch job to the SP2?
9 Should I have a dot in my path?
10 Customizing your shell/zsh specific
11 Customizing your shell/tcsh specific
12 Customizing your shell/zsh options
13 UNIX connectivity from FALCO terminals
14 Unix introduction
15 vi editor
16 emacs mini-reference
17 xdvi and ghostview
18 The make command
19 Include ps and eps files into LATEX
20 NCSA mosaic
21 Basic introduction to SQL*Plus
UCO Book Catalogue

Books available through the UCO

Text Processing
PostScript Reference Manual by Adobe
\TeX\ User Guide (2nd. Edition) by L.Lamport
The \TeX\ Companion by Goossens/Mittlebach/Samarin
Making \TeX\ Work by Walsh

Unix
A Practical Guide to the Unix System by M.Sobell
A Practical Guide to Unix System 5 by M.Sobell
Unix for the Impatient by Abrahams/Larson
Unix for VMS users by Bourne
Advanced Programming In Unix Env. by Stevens
Unix for Fortran Programmers by Loukides
Unix in a Nutshell, system V by Gilly/O'Reilly

Unix tools and utilities
GNU Emacs manual by R.Stallman
GNU Make by Stallman/McGrath
Learning Perl by Schwarz
Programming Perl by O'Reilly and Associates
Unix Power Tools by Peak/Loukides/O'Reilly
Essential System Administration by Frisch
System Performance Tuning by Loukides
Pretty Good Privacy by Garfinkel
Practical Unix Security by Garfinkel/Spafford
Learning the vi editor by Lamb
sed by awk by Dougherty
The AWK programming language by Aho/Kernighan/Weinberger
Power programming with RPC by Bloomer
sendmail by Costales/Allman/Rickert
make by Oram/Talbot
imake by Dubois
Expect by Libes

Programming languages
Practical C by Oualine
A Book on C by Pohl
The Art and Science of C by Roberts
The C Programming Language by Kernighan/Ritchie
C++ Primer by S.Lippman
Scientific and Engineering C++ by Barton/Nackman
C++ Programming Language by Stroustrup
Object Oriented Programming C++ by Pohl
Fortran 90 explained by Metcalf/Reid
Migrating to Fortran 90 by Kerrigan
XL Fortran for AIX User Guide by IBM
XL Fortran for AIX Language Ref. by IBM

General computing
Encyclopedia of Graphics by Murray/VanRyper
X User Tools by Mui/Quercia
Motif Tools by Flanagan
Mosaic Handbook for X windows by Koman/Ferguson
Mosaic Handbook for Macintosh by Koman
Mosaic Handbook for Windows on PC by Koman
The Whole Internet by Ed Krol
Managing Internet Information Services by Liu/Peek/Jones/Bus/Nye
Lapack Users Guide by Several authors
Tcl and Tk Toolkit by Ousterhout
TCP/IP Network Admin by Hunt
TCP/IP Illustrated Vol.1 The Protocols by Stevens
TCP/IP Illustrated Vol.2 The Implementation by Stevens

Mathematica
Mathematica for Scientists and Engineers by Bahder
Mathematica for Physics by Zimmerman
Mathematica by Stephen Wolfram
The Mathematica Graphics Guidebook by Smith/Blachman

Software Packages
GPHIGS V3.0 (F77 and C) Manual and User Guide
Lapack Users Guide by The Lapack Team
PC and Mac applications
Word 6 for Windows essentials by Mandel
Quickstart Excel 5 for windows by Webster
CD-ROMS
Inside Macintosh by Apple Computer Inc.

The opening hours of the UCO (Bld. 513/R-052, Tel. 4952) are: Mon. 10.00-17.00 – Tue.-Fri. 9.00-17.00.

Payment for books is possible in three different ways:

- paper TID,
- the EDH system,
- cash payment to the SBS account 00-148 556.0, controlled by Finance Division (quote reference “UCO BOOK”).

The last alternative has been set up for those willing to purchase items from our offering for private purposes or when there is no defined procedure (short-term visitors like summer students, etc).

In order to pay the books via paper TID, you must be authorized to sign it or bring one already signed by one of your budget holders. The EDH system is just the production of an electronic TID: at least the Divisional Secretariats have authorization to enter transactions in this system.