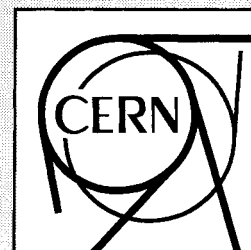


CERN COMPUTER NEWSLETTER



CERN - IT Division
CH-1211 Geneva 23
SWITZERLAND

OCTOBER – DECEMBER 1999

No. 237

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Merry Christmas!

Happy 2000!

Information for Authors and Readers

The CNL Web home page is at URL: <http://consult.cern.ch/cnls>

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 Christmas), unless the number of contributions is such as to make it necessary to have a supplementary issue, or to cancel one. Accordingly,

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

Issue number	Deadline
238	Monday 28th February 2000.

Contributions to the CNL in HTML will be preferred, although plain text is also acceptable. Articles, news items and letters intended for publication in the next issue should be *sent directly to the editor* (Cnl.Editor@cern.ch) with no particular subject line required.

The opinions expressed in this newsletter are those of the contributors and are not necessarily those of the CERN Management. The Editors reserve the right to edit or omit articles, or hold-over copy due to lack of space.

This CNL issue is available on WWW at the URL <http://consult.cern.ch/cnls/237>

This document was produced from HTML files submitted by the authors. They were first transformed to XML with Tidy, and then translated into L^AT_EX with an XSL style sheet. To optimize the printed layout some editing might have been necessary, so that this printable version may differ a little from the original HTML source file. In any case the Web version (HTML) must be taken as the reference. A (compressed) PostScript file, containing the complete printable version of this CNL can be obtained by anonymous ftp to [asisftp.cern.ch](ftp://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/237
ftp> binary
ftp> get cnl237.ps.gz (or get cnl237.ps)
ftp> quit
```

If you do not have the gnu **gunzip** utility on your system you can get the uncompressed PostScript version by typing the command get cnl237.ps, without the **gz** suffix. To save Internet bandwidth we, however, advice you to install the **gunzip** utility since gzipped files are about three times smaller than their unzipped equivalents.

All **subscriptions to our distribution lists** can be made through the CNL "Help&Info" page, at the URL:

<http://consult.cern.ch/cnls/help>

It is possible to subscribe:

- To the *CNL Announcement Distribution List* (<http://consult.cern.ch/cnls/help/announcement>), to receive a mail whenever a new issue of the CERN Computer NewsLetter is available on the Web.
- To the *CNL Paper Version Registration* (<http://consult.cern.ch/cnls/help/register>), to receive the paper version of the CNL at a given address.

You can also cancel your subscription in either case by filling in the appropriate form (same URL as above).

Responsible editor: Nicole Crémel

Technical co-editor: Michel Goossens

IF YOU NEED HELP (Contacts at CERN)

FRONT LINE Services

	Phone	Location	E-mail Address
Computing Help Desk	78888	513/R-052	Helpdesk@cern.ch
Opening hours: 8:30–17:30 (Monday–Friday)			
Satellite Helpdesk@B40 (entrance): Mondays, Wednesdays and Fridays 10:00–12:00			
Administrative Applications (EDH, BHT, etc.)	79933	5/R-021	Ais.Support@cern.ch
Opening hours: 8.30–12:30 and 13:30–17:30			
Central Computer Operators (24/24 hours on call)	75011	513/R-049	Computer.Operations@cern.ch
General Network Operational Problems	74927		Network.Support@cern.ch

CONTACTS at CERN

The “Computing Help Desk” is the proposed central point for help on all computer-related issues. Following is a non-exhaustive list of individual people responsible or assigned to a given service. If you do not find a pointer to the service you need, then contact the “Computing Help Desk” for submitting your request. For all the services listed below please use the generic electronic mail address 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.

Note that in the *Web version* of this page the “Service Definition” can be a *link* to the Welcome page of this service: we invite you to read carefully all the information given in that page before submitting a question/problem.

USER SUPPORT

Service Definition

User Relations and Service Manager
 Help Desk Manager
 User Registration
 Accounting Service
 Computing BookShop

Name	E-mail Address
M. Marquina	user.relations@cern.ch
R. Woolnough	helpdesk@cern.ch
M.C. Perler	user.registration@cern.ch
A. Koppanyi	helpdesk@cern.ch
J. Megies	bookshop@cern.ch

CENTRAL COMPUTERS

Plus Services (Public Login Servers for interactive UNIX) P. Martucci pietro.martucci@cern.ch

CORE Services

– CSF (Simulation Cluster)
 – SHIFT (Reconstruction & Analysis Clusters)
 – PCSF (Windows NT simulation cluster)
 – CORE Operations

V. Doré	csf.support@cern.ch
T. Cass	tony.cass@cern.ch
C. Boissat	pcsf-support@listbox.cern.ch
M. Vergari	mario.vergari@cern.ch

Work Group Servers
 Distributed File Services (incl. AFS)
 NAP and Parallel Applications
 Direct Support for Physics
 Central VMS Services
 Oracle Databases
 CERN-wide Print Service
 Tape Allocations and Vault Space
 Stager, tapes and TMS support
 Central Data Recording (CDR)

T. Cass	tony.cass@cern.ch
	afs.support@cern.ch
E. McIntosh	eric.mcintosh@cern.ch
H. Renshall	harry.rensall@cern.ch
	vxcern.support@cern.ch
S. Santiago	oracle.support@cern.ch
J.L. Vosdey	printer.support@cern.ch
R. Minchin	richard.minchin@cern.ch
	tape.support@cern.ch
	cdr.support@cern.ch

DESKTOP COMPUTING

Service Definition	Name	E-mail Address
NICE (Networked PCs)	F. Hemmer	nice.support@cern.ch
PC Desktop (Repairs and sales)	C. Ball	pc.admin@cern.ch
MACintoshes Support	F. Ovet	mac.support@cern.ch
MACintoshes Sales	W. Hug	waltraud.hug@cern.ch
X Terminals Support		xterminal.support@cern.ch
ASIS Support		asis.support@cern.ch
Operating System Support		
Service Definition		E-mail Address
HP 700 s/w:		hp.support@cern.ch
SUN s/w:		sun.support@cern.ch
Solaris s/w:		solaris.support@cern.ch
RS/6000 s/w:		aix.support@cern.ch
Digital Unix s/w:		dunix.support@cern.ch
Linux:		linux.support@cern.ch

SCIENTIFIC APPLICATIONS & SOFTWARE ENGINEERING

Service Definition	Name	E-mail Address
PaRC Service (Engineering Cluster)	P. Martucci	parc.support@cern.ch
CERN Program Library	L. Besson	heplib.support@cern.ch
PAW Support	O. Couet	paw.support@cern.ch
LHC++ and GEANT		heplib.support@cern.ch
Objectivity DB Service		heplib.support@cern.ch
Software Development Tools		sdt.support@cern.ch
Adobe FrameMaker		docsys.support@cern.ch

COMPUTING FOR ENGINEERING

All comments, problem reports, and suggestions can be reported via the “Feedback” Web form accessible from the “IT-CE Home page” (<http://wwwinfo.cern.ch/ce>, link “Feedback” on the left).

COMMUNICATIONS AND NETWORKS

A complete and up-to-date list of contacts is at the “Communications Systems Group” Home page at the URL: <http://network.cern.ch>

INTERNET APPLICATIONS

Service Definition	Name	E-mail Address
Mail support		mail.support@cern.ch
Web Office (support)	F. Fluckiger	www.support@cern.ch

COMPUTER SECURITY

Computer Security Information	J.Gamble	computer.security@cern.ch
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OTHER COMPUTING NEWSLETTERS

Computing for Engineers (<http://wwwinfo.cern.ch/ce/newsletter/newsletter.html>)

Distribution: M.Tate-Lavergne monique.tate-lavergne@cern.ch
 Editor: L.Pregernig ludwig.pregernig@cern.ch

SERVICE URLs (Some Useful Web Pages)

TvScreen (Systems Status)	http://tvscreen.cern.ch
Network Connection Request Form	http://network.cern.ch/register
Remote/Mobile Computing	http://network.cern.ch/mobile
Computing Helpdesk	http://consult.cern.ch/service/helpdesk
User Registration	http://consult.cern.ch/service/registration
Computing Bookshop	http://consult.cern.ch/service/bookshop
Accounting Service	http://consult.cern.ch/service/accounting/
Mail Services	http://consult.cern.ch/service/mail/
ListBox Mailing List Service	http://consult.cern.ch/service/listbox/
Netscape Service	http://consult.cern.ch/service/net scape/
FrameMaker Support	http://framemaker.cern.ch/
Text Processing related documentation	http://wwwinfo.cern.ch/asdoc/textproc.html
IT Home Page	http://wwwinfo.cern.ch/
User Support	http://wwwinfo.cern.ch/support
NICE Home Page	http://nicewww.cern.ch/
PC Support Service Page	http://pcwww.cern.ch/
PC Farms Homepage	http://wwwinfo.cern.ch/pdp/pc/
UNIX Workstation and X Terminals Support	http://wwwinfo.cern.ch/dis/ose/Support.html
Software Development Tools	http://sdt.cern.ch/
Computing Support for Engineering	http://wwwinfo.cern.ch/ce
Joint Controls Project (LHC Experiments)	http://itcowww.cern.ch/ITC0/jcop/
Web Services	http://www.cern.ch/CERN/Divisions/IT/IA/services/website/
Web Office	http://www.cern.ch/WebOffice
Web Office / DWG	http://www.cern.ch/CERN/meetings/DWG/Members.html
Web Office / Guidelines	http://www.cern.ch/WebOffice/Guidelines/

SEMINARS AND PRESENTATIONS

Designation	Usual Location	Organizer(s)	Tel.	E-mail Address
Computing Colloquia	Auditorium / bldg 500	S. Jarp, IT	74944	sverre.jarp@cern.ch
Computing Seminars	IT Auditorium 31/3-005	G. Folger, IT	79778	computing.seminar@cern.ch
Technical Presentations	IT Auditorium 31/3-005	S. Cannon, IT	75036	stanley.cannon@cern.ch
Informatics Tutorials	IT Auditorium 31/3-005	M. Marquina, R. Ramos, IT		it-training.service@cern.ch

COMPUTER RESOURCES ALLOCATION AND DIVISIONAL CONTACTS**Computer Resources Allocation Committee (COCOTIME):**

Chairman: H. Hoffmann/DG 60/5-006 75458 Hans.Falk.Hoffmann@cern.ch

Secretary: H. Meinhard/EP 1/1-028 76031 Helge.Meinhard@cern.ch

Divisional Representatives for Computing

For questions about new registration and resource allocation please ask the contact person for your division.

Div.	Repres.	Div.	Repres.	Div.	Repres.	Div.	Repres.	Div.	Repres.
AS	M. Draper	AT	P. Heymans	IT	A. Koppanyi	DSU	M. Draper	FI	M. Saitta
EST	Ch. Delamare	PE	D. Duret	EP	A. Bjorkebo	PS	J. Riche	SL	M. Bornand
ST	E. Sanchez-Corral	TH	E. Gianolio	TIS	G.R. Stevenson				

NICE Divisional Representatives

See the URL <http://nicewww.cern.ch/homepage/nicerepr.htm>

Divisional Representatives for Networking

For questions about new installations, testing, local coordination, etc., please ask the contact person for your division (or, if you are an experimental physicist, the networking contact person within your experimental group).

The complete and up-to-date list of contacts is given in the "Communications Systems Group" Home page, at the URL: <http://network.cern.ch>.

Letter from the Editor

This is certainly *too late* now to advertize this last issue of the CNL for the Millennium as a “*special Y2K edition!*”. However I am taking advantage of this section to bring to your attention some articles which are still Y2K-related:

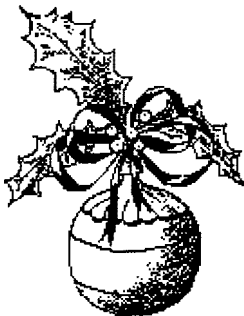
- *Computing Services During the Annual CERN Shutdown*: as you will see, because of the Y2K issue, a brief interruption of the Computing Services is scheduled between the 29th of December and the 2nd of January.
- *VMS XPRINT Interface*: VMS machines at CERN using WPRINT must be upgraded with a new version.
- *Cernlib 2000 News*: 2000 release for the *CERN Program Library*.
- *Y2K Compliant HEPiX Shell Scripts*.

We think and hope that CERN has made all the necessary efforts so that users will not suffer from the Y2K problem. However, in order to prevent any possible and unexpected issues, all staff in IT division have been asked to be present on Monday, January 3rd, so that support for users, in case of problems, is as good as possible.

We remind the users that all information regarding *Y2K efforts at CERN* is available on the Web page maintained by Sverre Jarpe (<http://nicewww.cern.ch/~sverre/SJ.html>), the CERN Y2K coordinator (http://nicewww.cern.ch/~sverre/Y2K_efforts_at_CERN.html), and is accessible from the CERN Home Page (<http://www.cern.ch/>).

In addition, I am happy to see an increasing number of contributions for this CNL, in various areas, which show that the service responsables in IT still consider the *Computing NewsLetter* as a good channel to inform their users. In particular, I am pretty sure that many users will appreciate the two tutorials made in *The Learning Zone* Chapter, one on the new *X11 Desktop Environments (KDE and GNOME)* and *A Guide to Web Colouring*. I can only encourage you, as readers, to provide some feedback in return, and tell us which section you like or find useful (negative feedback is accepted as well!). Your comments will be collected in future CNL issues in the *Letter to the Editor* part (which has been empty for some time).

At this time of the year let me finish by wishing you and your family:



A Happy New Year and New Millenium!



Nicole Crémel
CNL editor, IT/User Support

Michel Goossens
Technical editor, IT/ASD

1. Announcements

This chapter only contains "punctual" (limited in time) or/and divisional announcements.

1.1 Computing Services During the Annual CERN Shutdown

David Underhill, IT/CIO

CERN will close on Friday 17th December at 17:30, and will reopen on Monday 3rd January at 08:30.

As in recent years the Computing Services provided by IT Division will remain available as of Friday 17th at 17:30 but *running unattended*. The exceptions are the database and dedicated engineering services, which will not be available following agreement with their user communities.

This year, however, *is rather special because of the Y2K issue and as such an interruption is scheduled*.

This was decided in order to ensure that services are not affected by any unforeseen Y2K bugs at a time when support is not easily available, and to ensure that all systems can be started cleanly in the year 2000.

All user services will be closed at 18:00 on Wednesday 29th December after which backups will be taken overnight, then checked and the systems closed down. **NO** Computing Services will be available again until CERN reopens at 08:30 on Monday 3rd January. The only exceptions are the networking infrastructure, and the e-mail gateway servers to ensure that no incoming mails are lost.

The systems themselves will be restarted and checked out during Sunday 2nd January in order that services will be available as scheduled when CERN reopens. While all precautions have been taken and possible problems anticipated one never knows and of course this year there are extra risks.

During the "*running unattended*" period (17th–29th December) there is no guarantee that any problems that may arise will be resolved and we cannot guarantee backups for Home Directory files and mailboxes, for either UNIX or PC users. Changes that you may make to your files during this period therefore may be lost in the event of a disk failure.

However, there will be limited operator coverage during this period and users should call the operator (75011) (<http://consult.cern.ch/xwho/people/51>) or send an e-mail to Computer.Operations@cern.ch if they encounter problems. An answering machine will respond during times when no operator is present. Users who suspect a problem with networking equipment should call Network Support (74927) (<http://consult.cern.ch/xwho/people/44861>).

Service information will be viewable (as now) at the URL <http://tvscreen.cern.ch/>.

1.2 Help Desk and User Area Refurbishment (Bldg. 513)

Roger Woolnough, IT/User Support and Dave Underhill, IT/CIO

Since 1972 the decoration in the User Area has been unchanged. The lighting especially is now outdated and the whole area would benefit from a thorough modernisation. With a move of the *Computing Helpdesk* into the Computer Operations room planned we have scheduled all the work for the New Year shutdown period.

The work falls into two sections.

A new Helpdesk window

Despite working in close proximity it is often difficult for the Helpdesk staff to liaise with the Console Operator. We have therefore decided the merging of the two services into one Room, as communication through one window would be more efficient for users and support staff alike. The delivery and collection of some PC material not involving transport will also be facilitated by

this move. The planned change involves the creation of a sliding window for communication. Outside of Helpdesk hours the Operator on shift will reply to questions on a best effort basis, and will be able to record questions for resolution at the next available Helpdesk session. We trust that this new situation will benefit everyone concerned. The move is planned to take place on the last afternoon of the year (when the Helpdesk is closed anyway) such that everything is in place for the start of the New Year, on January 3rd.

The User Area Refurbishment

Now some 28 years have passed since the Area was created and clearly the time has come for modernisation and further improvements. As of Friday December 17th, the User Area in building 513 will be unavailable and

the self-service machines disconnected and moved to the Computer Room. Over the New Year shutdown the false ceiling and lighting will be replaced by a new modern installation. The walls will be redecorated in neutral colours and the present configuration of the Room up-

dated. The work should be completed for the start of the New Year and the 5 PCs, 2 Macintoshes and 9 X-terminals should be available for self-service during the first CERN working day of 2000.

1.3 Termination of DECdns and DECdts Services

Denise Heagerty, IT/IA

**Reminder for VMS System Managers
running *DECnet-Plus***

Due to Y2K problems, the DECdns and DECdts services will terminate on 17 December, 1999. VMS systems running *DECnet-Plus* (previously called *DECnet/OSI* and *DECnet Phase V*) must be re-configured before that date.

Instructions on how to re-configure DECdns and DECdts are available on the Web as follows:

From the URL <http://network.cern.ch>, select the Service DECnet

(<http://wwwcs.cern.ch/public/services/decnet/Welcome.html>).

No change is required for *DECnet PhaseIV* systems.

If you have any questions please contact the e-mail address DECnet.Support@cern.ch.

This article was first published in CNL 234 (Section 2.4, page 4, see also the URL

http://consult.cern.ch/cnl/234/art_vms.html).

2. Physics Computing

Functional description of all the Central Public Services, specifically oriented to use by the Research sector, either for interactive (central and CPU intensive) or batch processing.

2.1 Major New Linux Public Interactive and Batch Services (lxplus and lxbatch)

Pietro Paolo Martucci, IT/PDP

From December 9th, the family of public computing clusters in the computer centre will be expanded to include Linux services. There will be a new interactive cluster, lxplus, and also a new public batch cluster running Linux, lxbatch. From December 9th, therefore, the following public services will be available.

Interactive Clusters

Service	Configuration
lxplus	15 dual CPU PCs (with 550MHz Intel PIII processors)
rsplus	15 dual CPU IBM 43P-240 workstations
hplus	5 dual CPU HP J2240 workstations
dxplus	5 dual CPU DEC PWS500 workstations

Batch Clusters

Service	Configuration
lxbatch	20 dual CPU PCs (with 550MHz Intel PIII processors) Capacity: 5000 CERN Units
rsbatch	15 IBM 43P-140 workstations (with one 332MHz PowerPC processors) 18 IBM 43P-850 workstations (with one 166MHz PowerPC processors) Capacity: 2040 CERN Units

The above table shows clearly that these new services are a major addition to the public service family. The relatively low price of PCs has allowed us to significantly increase the available batch capacity and Cocotime has agreed to increase the Linux based batch capacity to at least 10,000 CERN Units next year if there is a demand for this service. So, it may take a bit of effort to convert your programs to Linux but the rewards in terms of improved turnaround and capacity should make the effort worthwhile!

The AIX based public interactive and batch services will be in the last year of their normal lifetime during 2000. The maturity of PC and Linux systems is such that we expect lxplus and lxbatch to take over. But remember *they are PCs*, so please use your "Desktop PC" (in

local mode) for *Netscape*, mail and other interactive applications.

Linux has become a major operating system at CERN. Why?

Linux is a freely distributed multi-tasking multi-user Operating System that behaves like the UNIX operating system in terms of kernel behaviour and peripheral support. Linux has all the features of UNIX, plus several recent extensions that add new versatility to Linux. All source code for Linux and its utilities is freely distributed. Linux was designed specifically for the PC (*Intel* CPU) platform and takes advantage of its architecture to give you performance similar to high-end UNIX workstations. A number of ports of Linux to other hardware platform have also appeared, and they work much like the PC version. It has all the features you would expect in a modern fully-fledged UNIX, including:

- true multi-tasking,
- virtual memory,
- shared libraries,
- demand loading,
- shared copy-on-write executables,
- proper memory management,
- and TCP/IP networking.

Most of the software running under Linux is either free or cheap. Although it is not officially supported, there are enough people in the world to take care of it, with a fast response time, and solve problems.

Here, at CERN, Linux is now well supported and all the major software including CERNLIB, AFS, LSF, GNU and the public domain software from ASIS is available. In the past access to Linux was restricted to experiments with dedicated servers. With the introduction of the lxplus and lxbatch services, all users have access to a Linux platform. In particular, we hope that the significant batch capacity will make these services attractive for physics applications. The new services will be available from December 9th.

2.2 Physics Data Processing Group Data Management Plans

Harry Renshall, IT/PDP

The Data Management section of PDP group is responsible for four services of IT division namely

1. the AFS file system,
2. the High Performance Storage System (HPSS) and its Cern interfaces (RFIO and HSM),
3. the SHIFT tape staging software and its enhancement (the CASTOR project)
4. and the magnetic tape infrastructure of cartridges, drives and robotics.

Changes have been underway in all of these areas and are reaching the stage of real impact on users so it is timely to report on them (in this article for points 1 and 2, and the next two articles for point 3 and 4).

The AFS File System

The current CERN implementation of AFS, the *Andrew file system*, where users see their home directory and project space under the `/afs/cern.ch/` tree runs on 33 servers under different operating systems. There are about 2000 Gigabytes of total disk space on these systems in a wide variety of configurations and there are hundreds of thousands of successful accesses per day. This has been built up incrementally over many years but recently various parts of the server infrastructure have not kept up with the ever increasing number of clients.

One result of this is recurring periods when some servers become temporarily overloaded and user applications lose contact with them. This is notably seen when many clients run their overnight ASIS updates in the same period. A program of modernisation of the infrastructure has already started and we should improve this situation very soon by making multiple duplicate copies of heavily used volumes spread over the network (this is already done to some extent). Note that failure or congestion on the networks can give the same effect on a client as overload of an AFS server.

When the AFS service was built up disks were more expensive than is now the case and in particular secure disk space, RAID arrays or mirroring (two copies of a disk), could only be afforded for home directory space. Project space, which is divided into scratch (not backed up) and backed up, is on cheaper raw disk. We now intend over the next year to replace the raw disk of backed up project space (so called *p.* volumes) with secure disk using fewer and more homogeneous servers to reduce complexity. We will move the non-backed up space (so called *q.* volumes) onto separate raw disk only servers. The requests from experiments for AFS project space for next year are about 1 Terabyte with half to be backed up. By using cheap Linux PCs with internal

EIDE disks, 100GB on each PC, for the non-backed up space we can afford to put the rest on secure disk. The same PCs will be used for the multiple duplicate copies as fail-over to another copy is transparent to the end user.

Finally the heart of the AFS service, the entry point for all file accesses, are 3 *Volume Location Data Base* servers. These are currently rather old machines on old FDDI networking and will be replaced early in 2000 by new fast, compact machines on *Fast Ethernet* doing nothing but function as the VLDB servers. A security feature of AFS is that the TCP/IP addresses of these servers are hardwired into each client in a system file called *CellServDB*. When we replace our machines this file has to be changed because two of them will have to have new TCP/IP addresses. For machines running the Cern SUE environment this will be transparent as SUE will do it. Other machines, e.g. those outside Cern, will have to reboot. We will issue appropriate warning. Note that failure to update will not be fatal as one server will keep its address but users will get error messages from the AFS client software.

AFS Client Licences for Outside Sites – Change in Cern Support

Some years ago CERN arranged to centralise client licence support for member state outside sites by redistributing binaries and billing on behalf of *Transarc*, the authors of AFS, in return for improved licence conditions. Several factors mean this policy will be stopped but in a gradual way.

Transarc have now been fully taken over by IBM and have revised their licencing strategy. They no longer support new site-wide licences, and the site licence CERN has does not include new Linux or NT workstations, though a replacement of an existing UNIX client by Linux or NT is covered. They have been unable up to now to tell us how this affects the licences for outside sites which, the deal was, became unlimited for more than three clients. We do not know if the rule on replacing an existing UNIX box by Linux or NT applies to outside sites in spite of having asked. We also were informed AFS is now marketed through country IBM software sales implying our centralised licencing is no longer available. In addition some sites have, at our suggestion, asked *Transarc* for licences for new clients and obtained better terms than the current CERN arranged licence.

We will continue to handle the existing licences but any new requests, from new sites or for new licences at existing sites, must be referred to *Transarc*. We have e-mail addresses of their world wide sales coordinators and they have proved responsive. In addition any sites who fail

to pay us their annual fee will have the licence arrangement terminated, and *Transarc* so informed, at the end of the licence year, normally the 9th of March.

High Performance Storage System Plans

The HPSS system, from a consortium managed by IBM, is used extensively at CERN for storing bulk data from many test beams and for the NA57 heavy ion experiment. It is also the system currently underlying the HSM service for long term storage of large (20 MB to 2 GB) individual or experiment disk files (this is a copy in/copy out mechanism). Currently there are about 65000 files in HPSS occupying some 10 TB of space on IBM or STK tapes.

We are running version 3.2 of this product on a combination of IBM and *Compaq* disk and tape servers and this is not Y2K certified though it is believed it would work. We have been planning to upgrade to the Y2K compliant version 4.1, which also brings increased functionality and performance, after the heavy ion run ends on 1 December.

The update is rather complicated as there are prerequisite upgrades to the DCE (*Distributed Computing environment*) and the *Encina* transactional data base used by HPSS. The upgrade has already been performed on a parallel test HPSS service we run so we have a good estimate of the time needed. It is divisional policy to make no significant system changes between 16 December and 15 January that might provoke, or be confused with, Y2K problems so, with apologies, we are scheduling the necessary stoppages to HPSS before then. Note that many IT staff will be working over the holidays to keep the services running on a best efforts basis and, in particular, to perform the close-down on 29/30 December and restart on 2 January.

The DCE upgrades will be done from 1 December as these should be transparent to HPSS users. The *Encina* data base upgrade will take up to one day and we are scheduling this for Monday 6 December.

The HPSS upgrade will take up to two days and we are scheduling this for Monday 13 and Tuesday 14 December 1999. We will issue appropriate news as the work progresses.

2.3 SHIFT Software Evolution: CASTOR

Jean-Philippe Baud, IT/PDP

In January 1999 CERN began to develop CASTOR (*CERN Advanced STORage manager*). It is an evolution of SHIFT, which has been used at CERN for all experiments in the 1990's. CASTOR is more scalable than SHIFT and should be able to handle data for the overlapping run of the NA48 and COMPASS experiments, the latter starting in 2000. Scalability issues are solved by using multi-threading and database technology instead of a flat file for the stager catalog. The first tests show that we get for the first time the full bandwidth of the drives and of the network. The software can be installed on any platform running UNIX or Windows/NT.

New features:

- better resilience, better immunity to network hiccups;
- general use of APIs (*Application Programming Interfaces*) to avoid command line size limitations;
- better load balancing of the requests between Tape Servers;
- tapes are not dismounted if other requests are waiting for them;
- basic *Hierarchical Storage Manager* facility. Physicists can choose to work either explicitly with tapes, as with SHIFT, or reference files by name:

- global name space implemented through a Name Server;
- automatic tape volume allocation;
- explicit migration and recall of files.

Current status:

The Tape Server software, the new stager with its new Database Server and the Name Server are being extensively tested. The Tape Volume Allocator is under development (see <http://wwwinfo.cern.ch/pdp/castor/>).

Deployment:

The CASTOR User Interface is fully backwards compatible with SHIFT and the product itself is very modular, so we will be able to put it in production component by component over the winter 1999/2000. The new stager will be tested in January by one of the LEP experiments. The introduction of the software will be done experiment by experiment with their approval, but the goal is to have all experiments running the new software before the accelerator startup.

A "Data Challenge" test (7 days at 100MB/s sustained, i.e., around 60TB) will be attempted for ALICE in February or March 2000.

Note that a possible common approach for the future of the Data Management software in HEP is currently

being discussed by the major HEP institutes.

2.4 Second Tape Library for CERN

Charles Curran, IT/PDP

Disaster Avoidance and Recovery for CERN Data

Almost all of CERN's active data is now stored in one large STK automated library in the Computer Centre (building 513). Concentrated into this small area are the results of many years of costly work, so the consequences of an accident or malicious act involving this library could be very severe. Proposals for disaster avoidance and disaster recovery for this data are now being implemented.

Damage or loss of data can be caused maliciously or accidentally as a result of "normal" risks. Basic measures have been in place for some time to reduce some of the obvious of these. The Tape Management System (TMS) controls access to tapes as far as writing is concerned, and physical access to the Computer Room and the Tape Vault is also controlled. Individual tapes always provide a "switch" to prevent writing, which can be set on user request, although a manual intervention is required. Tapes containing migrated 3480, 3490 and 3590 data are for example given this extra protection against accidental overwriting. Accidental damage to data may occur on a large scale as a result of "normal" accidents. Obvious examples of these are damage due to fire, smoke particles or flooding.

An effective method of reducing exposure to such accidental data loss is the division of important data between two or more physically separate libraries. Most accidents or extensive periods of "down time" can be expected to affect just one of the libraries: user can continue to work with the other, with 50% or more of their data accessible, depending on their organisation of its distribution between the libraries. This organisation can be done reasonably effectively in a "passive" manner, by for example placing every "even numbered" volume in one library and every "odd numbered" cartridge in another. On average, half of any given set of data will be in one library and half in the other (supposing it occupies several physical volumes). Alternatively, data might be split between the two libraries on run criteria, if a user wished to do this.

Users or experiments can do even better by explicitly making copies of vital data, locating the active copies in one library and the "backup copies" in the other. At the expense of using more cartridges, all such vital data would be present in both libraries. Products such as HPSS also allow multiple copies of data, and these will

be split between the physical libraries.

IT will begin to provide such a dual library facility in December 1999. Building 186, which until now offered a physically separate archive, has been cleared for a new EP facility. Plans are however being made for an annex to building 186, which will support this physically separate robot installation. This work will hopefully be completed during 2000. In the short term, *the second library will begin to be installed in the Computer Centre Tape Vault*. Of course, once the preliminary installation has been tested, we will start to move user cartridges to the new library.

Default moves of cartridges

Users or experiments who would prefer a move tailored to their specific needs or requirements are requested to contact Tape.Support@cern.ch. By default, we propose to:

- Split 9840 volumes equally between the old and new libraries, "even" VIDs such as "R01002" to one and "odd" VIDs such as "R01003" to the other.
- Split 10 GB *Redwood* volumes equally between the old and new libraries in a similar way.
- Split 25 GB *Redwood* volumes equally between the old and new libraries in a similar way.

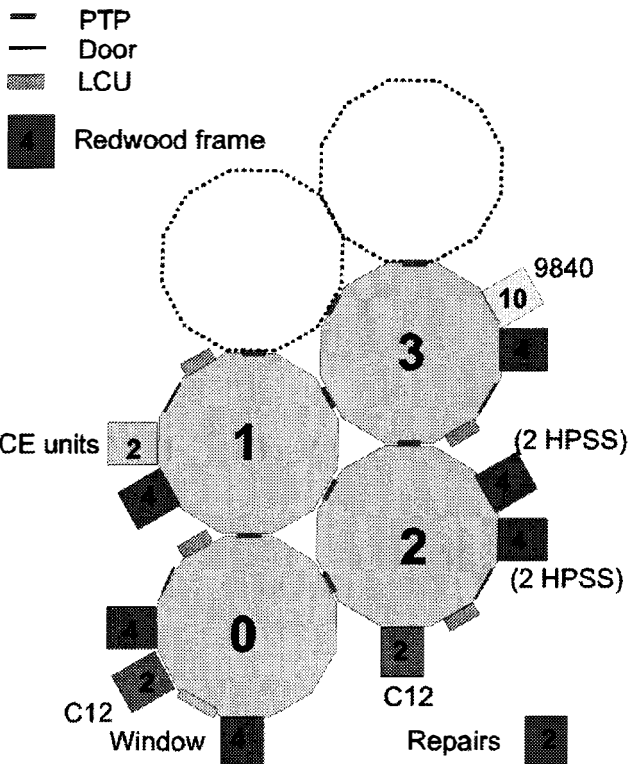
Currently this implies the ejection and re-insertion in the new library of about 300 9840s, 1200 10 GB *Redwoods* and 3300 25 GB *Redwoods*. This operation will be done over several days in small batches of cartridges, and should be transparent to the users. The more numerous 50 GB *Redwoods* (about 11000 in total) will initially remain in the existing library, while we discuss their requirements with the experiments that own them.

You may see the proposed configuration at the end of 1999/early 2000 below. Note that the "Vault" configuration shows how the two *Powderhorns* will eventually be expanded to four in the "remote" location, and possibly to six. The "centre" configuration shows how it could also be expanded to six *Powderhorns*. Figure 2.1 (see also the Web pages at the URL <http://wwwinfo.cern.ch/pdp/vm/guide/avoidance.html>) shows all the moves of equipment that are currently planned to reach the final configurations of the two libraries, each of four *Powderhorn* silos (optionally six).

Users should note that our strong dependence on a single media type is also being reduced. The STK 9840

Bldg. 513 - Centre
STK silo (centre) layout

December 1999



Bldg. 513 - Vault
STK silo layout Vault

December 1999

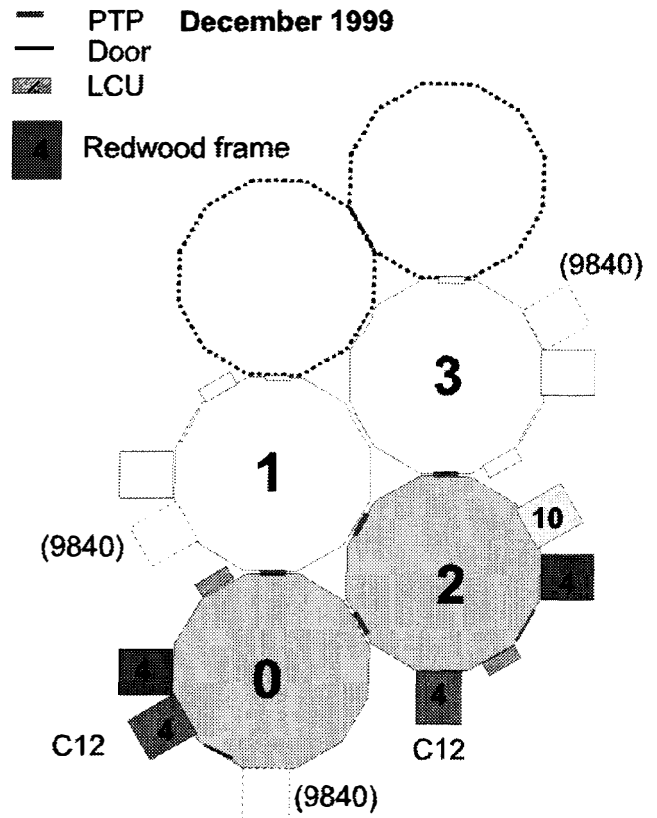


Figure 2.1: Arrangement of the StorageTek Silo systems (Dec. 1999/Jan. 2000)

service is now used extensively for storing data other than "bulk raw data". It offers a choice of media to the user, although more costly per GByte in terms of media, and provides much faster access to files on tape than other media we currently offer. The low cost of these units (compared with *Redwood*) makes it an affordable device for installation by CERN's collaborating laboratories and institutes. You will see also above that we intend to install IBM units in the silos. These will initially be our existing 3590 units, which can be attached to STK silos using IBM's "C12" drive frame. Upgrades

of these units to the 3590E model are under active consideration. The upgrade doubles the track density on the "J" media, enabling it (if rewritten) to store a nominal 20 GB of data rather than 10 GB. Data rate also increases from about 9 MBytes/s to about 14 MBytes/s for read and write.

We will choose a suitable moment to move or reconfigure the 4 HPSS *Redwood* units, which should also be split between the two libraries. However, it is possible that these *Redwoods* will in fact be released during 2000, replaced by 9840s or 3590Es.

3. Desktop Computing

It includes CERN desktop environment centrally provided on UNIX and PCs (NICE95 and NICE-NT), desktop software strategy, etc.

3.1 Improved phone and xwho commands

Bernd Pollermann, IT/User Support

A couple of changes and real improvements have been introduced in the context of the UNIX phone command and the Web page at the URL <http://consult.cern.ch/xwho>, which correspond to the two ways of accessing phone numbers, e-mail, login-ids, etc.

While this article might be of general interest to all users, it is essential for those who use the phone command from programs or in cronjobs!

Here a summary of what was done:

- faster update of phone data;
- guaranteed access to phone data during AFS problems;
- platform-name substituted by '-loginid';
- search via PEM or GEM;
- Y2K update: year in date of last login now has four digits;
- bug fixed for ccid search;
- the phone command is running in a *new server*.

More details follow.

Faster update of phone data

The preparation of the data used for consult/xwho and the phone command has been speeded up considerably, by making the code more efficient and running the update in a more powerful machine (Linux).

You can now expect the update to have finished between 5:30 and 6:00 each morning.

Guaranteed access to phone data during AFS problems

All data and programs used for consult/xwho and the phone command have been moved to local files of the server. This will guarantee fast and undisturbed access to the data, even during periods of AFS problems.

Platform-name substituted by '-loginid'

Up to now it was necessary to specify the name of the platform (-afs, -novell or -otheraccount) to find a person by his/her loginid. From now on one only needs to specify the "generic" term -loginid.

Example: Instead of the form phone -afs wcncron or the form phone -novell spmail you can now use phone -loginid wcncron or phone -loginid spmail with wcncron or spmail existing on at least one platform. As usual -loginid can be abbreviated to -log, i.e., the first three letters.

Important note: For backward compatibility the parameters -afs, -novell or -otheraccount will still work, but will be removed from the phone command on the 26th January of 2000.

Background information: In the past one could have found cases in which two persons have the same login-id on different platforms, for example: user A had "myown" on AFS, whereas person B had the same login-id, i.e., "myown" on NOVELL. Such cases are no longer possible and a login-id on its own, i.e., without having to know on which platform it exists, determines unambiguously the owner. For this reason it had become desirable to simplify the list of tags of the phone command. At the same time it was possible to also reduce the number of fields in xwho top page (<http://consult.cern.ch/xwho>).

Search via PEM or GEM

Using the tag -mail it is now possible to find with the phone command the owner of an e-mail address. This will work under the condition that the address is either a valid physical e-mail (PEM) or generic e-mail (GEM).

For example, phone -mail cremel@mail.cern.ch or phone -mail Nicole.Cremel@cern.ch will find in an unambiguous way the owner of this address. As usual, the search is not case-sensitive, and, in the case of "@cern.ch" the node name can be omitted.

Important note: Although many forms of mail addresses other than the correctly spelt PEM or GEM may work, in the sense that mail sent to them will arrive, phone -mail will not work for those. The main application of the -mail option would be therefore to:

- find the people from a list of correct PEMs or GEMs, or,
- identify—from a list of "suspect" mail-addresses—those which are correct and those which are not.

One could envisage a program which *does its best* to read in a list of mail addresses and produces a list with the recommended, or correct(ed) version. However, this would not be done within the phone command itself, but in an extra version of it.

In case you have need for such a program, please address this point to the author.

Year in date of last login has four digits now

For obvious reasons, the date indicating when the user had last logged in, has changed its format:

Instead of dd-Mmm-yy it is now dd-Mmm-yyyy.

This is relevant only for users who analyze the output of the phone command with the parameter -account.

Bug fixed for ccid search

In some cases, the search of a person via a non-existent *ccid* gave either trouble to the server, or returned the person who had the next *ccid* following the non-existing one.

This is now fixed: Whenever the *ccid* is wrong or doesn't exist you get an error message.

phone command running in a new server

I mention this just for completeness, but it should be totally transparent to the users, i.e., nobody should notice anything (apart from a slightly faster access and higher stability).

3.2 VMS XPRINT Interface

Tami Kramer, EP/LE

Notice: If you have trouble with the procedures described herein, please contact Tami Kramer directly (Tami.Kramer@cern.ch) and not *Print Support*. This is the UPGRADE procedure for users already running WPRINT. If you do not yet have access to the central Print Servers from your VMS machine, you should follow the instructions detailed at the URL <http://wprint.web.cern.ch/wprint/InstallWprint.htm> first (for the initial installation).

Why Upgrade?

Presently, VMS machines at CERN using WPRINT use a machine called *Springer* as the Print Server. Because *Springer* runs Digital Ultrix, and Ultrix is not Year 2000 compliant, it is necessary to upgrade the underlying VMS version of XPRINT in order to use the new Print Servers before the year 2000.

What changes must be made?

In the present version of WPRINT the underlying symbol XPRINT was defined to execute a program (XPRINT.EXE), one for Vax and another for Alpha, but it now will invoke a PERL script (similar to what is done for Windows clients on NICE). The PERL executable (PERL.EXE) is different for Vax and Alpha, but the PERL script XPRINT.PL is the same. This change requires that VMS System Managers install PERL for VMS (for Vax and Alpha) and then change the XPRINT symbol to invoke the PERL script. This is not so dangerous, since one can always change the symbol XPRINT back to its original state if things do not work as expected. It is not clear that all permutations of FORMS

have been tested, so we are asking for feedback.

Detailed Procedure:

Install the correct version of PERL (already compiled) for your version of the VMS operating system. PERL 5 for VMS 6.2 (Alpha and Vax) and VMS 7.1 (Alpha) in ZIP format are available at:

```
VSCRNA::DISK$KITS:[VMSKITS.PERL]
```

Create a directory somewhere and define the concealed logical name PERL_ROOT to point to it. For Example:

```
DEFINE/TRANS=(CONC,TERM) PERL_ROOT DKA0:[PERL.]
```

In a mixed cluster (Vax and AXP) you may want to use the CERN\$CERNEXE root logicals so that for AXP one has respectively one has:

```
PERL_ROOT = DKA0:[CERNO.CERNEXE.ALPHA.PERL.]
```

and for VAX

```
PERL_ROOT = DKA0:[CERNO.CERNEXE.PERL.]
```

- Copy the PERL distribution for your VMS version, for example,

```
VSCRNA::DISK$KITS:[VMSKITS.PERL]PERL5_004_04_VMSAXP6_2.ZIP
```

to the newly created PERL directory. UNZIP this file using GNU ZIP to the directory DKA0:[PERL] (if you do not have GNU ZIP for AXP you can get it in the directory VSCRNA::DISK\$CERN:[GUNZIP]).
- Copy PERLSHR.EXE to SYS\$SHARE on each platform. The PERLSHR image should have W:RE protection on it (as should all files in PERL_ROOT:[LIB...]*.*).

- Define the symbol PERL somewhere, such as `SY$MANAGER:SYLOGIN.COM`, to be `"PERL := $PERL_ROOT:[000000]PERL.EXE"` (or install PERL into the DCLTABLES as described in the file `AAAREADME.TXT` in the top level directory).
- Copy `V$CRNA::CERN$CERNEXE:XXPRINT.PL` to `CERN$CERNEXE` once for each platform (VAX and

AXP).

- `SHOW SYMB XXPRINT` should show you something like: `$CERN$CERNEXE:XXPRINT.EXE`. Remember this in case you want to revert!
- Define `XXPRINT := "$PERL_ROOT:[000000]perl.exe cern$cernexe:xxprint.pl"`

3.3 Springer UNIX Print Server Removal

Jean-Louis Vosdey, IT/CIO for the Printer Support Team

This article is mainly a reprint of an article that has already been published in CNL 235, Section 3.1, page 6 (see also http://consult.cern.ch/cnl/235/art_spring.html). However as part of the information in that article is no longer valid we present here a new up-to-date version.

SPINGER: For a long time now *Springer* has been the major Print Server in the computer centre. It continues however to run a very old version of Ultrix that is not Y2K compliant. For this reason every effort is being made to move printers away from this particular server and onto the new PRINT service composed of a series of LINUX PC's which are Y2K compliant. Following the current schedule this move should be completed by December 1999 and *Springer* taken out of service.

As a result of these changes the following has become necessary: the `xprint` command as used by UNIX users has been rewritten.

- Supported platforms can use the `xprint` command in the `PATH /usr/local/bin/xprint` from the ASIS software repository.
- If your UNIX environment is not standard you have to download `xprint` by anonymous ftp to `asisftp`.

From now on, the new *PRINTER WIZARD* enables users to print from W95, W98 and WNT PC platforms, whether they are connected to NICE or not.

Additionally, there is now only one print queue from both platforms (PC and UNIX).

WPRINT for VMS:

The new version of WPRINT (the VMS equivalent of xprint) uses PERL to access the new print servers (and is already running on VXCERN), so it requires the installation of PERL on your VMS machines, once per architecture (VAX or Alpha).

Additional explanations and answers to your questions are available at the URL <http://wwwcio.cern.ch/Printers/cnl.html>.

Furthermore, the gateway (PCCI004) between *Windows NT* users and *Springer* has become redundant and has been taken out of service at the end of September. Consequently we strongly recommend users to use *PRINTER WIZARD* on *Windows NT*.

An update of any further modifications or new features, where printing is concerned, will appear in future issues of the Cern Computing Newsletter.

3.4 Y2K Compliant HEPiX Shell Scripts

Tim Smith, IT/PDP

A new version of the HEPiX shell scripts was released at the beginning of December. It contains a fix to make the scripts Y2K compliant. This release (version 3.4) contains both the HEP and CERN parts of the scripts. In addition to the necessary Y2K fix to the *ticket life-time reporting program* (`tklife`), a few bug fixes were included (to `pp` on Linux and `nroff` on IRIX), as well as some new environment variables for use with the CERN mail service and the new hsm archive command.

- For the mail service the following obsolete variables have been removed: `MAIL`, `MAILBOX`, `MAILSERVER`, and `MAILAUXSERVER`.
- And replaced by call to the `/usr/local/bin/mailreg` program whose output is used to set variables used by the cern wrappers for `pine`, `Netscape`, etc., namely, `MAILSERV_USER`, `MAILSERV_NAME`, and `MAILSERV_GEM`.
- For the hsm archive command the following variables have been introduced: `HPSS_HOME` and

HSM_HOME.

In addition a change was made in the previous version (3.3) of the HEPiX shell scripts which only becomes visible on most platforms with this release, since cir-

cumstance resulted in the previous version only being released into production on Linux and left as optional on all other platforms. Namely, the logic which selects the group scripts was changed to only use the AFS group files if the user's home directory is in AFS.

3.5 *StarOffice* Package in ASIS

German Cancio Melia, IT/DIS

Sun's *StarOffice* office package has been put *in production* in ASIS since October, 23th.

On which platforms?

Solaris 2.6 and *Linux RedHat 5.1*.

Unfortunately, we experience problems in having *StarOffice* running on *RedHat 6.0/6.1*. This is due to problems with the AFS client; *Transarc* has already acknowledged the problem but has not delivered a patch yet. It is possible to run *StarOffice* from non-AFS based home directories, though.

StarOffice is not available (yet?) for other UNIXes.

How do I start it?

You can enter the command `/usr/local/bin/soffice` (or alternatively `/usr/local/bin/staroffice`), which

is a wrapper which will set up *StarOffice* for you.

What support do I get?

Right now, only issues regarding the installation (and the default configuration) will be handled by Asis Support. We are looking to improve this situation and hope to be able to have a support contract soon. *StarDivision* was recently taken over by Sun, and support modalities are still to be defined. We are also in touch with other companies to see what those can offer.

SUN has set up a Web page with mailing lists and a knowledge database at the URL <http://www.sun.com/products/staroffice/newsgroups.html>

Please check it out if you have problems.

3.6 Web Form for Password Change or Quota Increase

Nicole Crémel and Roger Woolnough, IT/User Support

Users who have forgotten their password and users who are short of quota on a central system (and need some urgent help until they can contact their computer group administrator) are used to contact the Computing Helpdesk, either by phone call or e-mail. In the coming months, this will change and CERN users will be invited to submit such requests via a Web form, where they will have to provide all the mandatory data necessary to perform the change, plus some personal and confidential data for security issues.

Several objectives will be met with this change:

- avoid over-loading the Helpdesk with trivial requests, and make it more available for other problems,
- users will not suffer anymore from the "opening hours" of the Helpdesk, or the un-availability of the "User Registration" staff members,
- speed-up the process as the request will be directly submitted by the users themselves through this

form.

Password Change Request Web Form

The added value provided by this Web Form will be to force the user to give some confidential data so that a check can be performed. This form will be fairly simple and basically the user will have to provide:

- the name of the *service* (AFS, Mail Server, NICE or EDMS);
- user loginid;
- *e-mail* address;
- some confidential data.

All data will be checked and if they are compatible with CERN *Human Resource* database the change will be performed, and a new password value will be given to the user. Obviously, still for security reasons, the user

will be invited to change this password as soon as possible. If, for some reason, the user will be informed about the problem and which action has to be taken.

As soon as this Web Form is in production, the Helpdesk will reject any “password change” requests that are simply sent by e-mail and do not contain all the data. Users will be prompted to submit their request using the appropriate Web form instead.

Note: “password change” requests by phone will still be valid and the user will be asked to provide all data on the phone. However, in “over-busy” periods at the Helpdesk, users will again be invited to fill in the Web form.

Quota Increase Request

As it has been explained in a previously (*Computer Space Management Policy*, Section 3.4 on page 7 in CNL 232, see also http://consult.cern.ch/cnls/232/art_space.html) users should contact their “space administrator” to have their quota increased on any central service. However, to answer to “urgent need”, the Helpdesk has the possibility to grant space for *all* Computing Groups but *only within pre-established limits*,

which are:

- Mail Server (MAILSERV): 1MB more of quota;
- AFS (UNIX): 20MB more of quota;
- NICE (PCs): 10MB more than the space currently occupied.

For convenience, and in parallel with the *Password Change Request* Web Form, users will be able to use the same form to submit and validate such requests from the Web.

When and where?

This change is foreseen on February, 1st. However, news will be issued in the `cern.computing` newsgroup in due time so that users will be informed and the detailed procedure explained.

This form will be included in the Consult server (see the article *Consult - the User Oriented Entry Point to Computer related Information* page 28 in this CNL), as part of the *registration* service, at the URL <http://consult/service/registration/>.

4. Internet Services

Everything related to Internet in a large sense: i.e., all technical Web issues, electronic mail, Internet news, home access to CERN facilities, video conferencing and multi-media, network security, etc. Incidentally please note that all Web activity at CERN is governed by the Web Policy Group (WPG) and the Divisional Webmasters Group (DWG). The Web Office coordinates the day-to-day tasks. The DWG provides Guidelines for Web sites at CERN; when in doubt, consult your Division's responsible member.

4.1 LDAP Protocol Deployment at CERN

Ray Jackson, IT/IA

What is LDAP?

LDAP stands for *Lightweight Directory Access Protocol* and is a software protocol for enabling applications to look up information on objects across the *Internet* in a standard way. LDAP originated from the University of Michigan and was created to provide a "lightweight" (reduced code and network traffic) version of DAP (*Directory Access Protocol*), which is part of X.500, a standard for directory services in a network. LDAP is an Open Standard protocol (such as *HTTP*, *FTP*, etc.) and is the official IETF standard for directory access across the *Internet*. It is not surprising then that all the leading *Internet* companies, including *Microsoft*, *Sun/Netscape*, and *Novell* are providing extensive support for the LDAP protocol in their Directory Service products in order that they may in turn operate with each other and integrate with the *Internet*. In fact, LDAP has already been implemented by leading *Internet browsers* and *Mail* products which are already using the protocol in their shared address books. Furthermore, LDAP also has the ability to link together distributed directories in a transparent way to the user, which is an important feature when building a global directory service.

LDAP at CERN

LDAP was first deployed at CERN over a year ago to enable *Netscape* users to search for people in the CERN address book and to help auto-complete e-mail addresses when composing a message. However, the new LDAP service means that users now have an even richer and more powerful search tool which allows them to search for other users by specifying more than just their name. For example, with the new service one can search for a person's e-mail address, telephone number, organisational group, home institute, office number and so on. It is also possible to combine a number of search criteria to help limit the number of possible matches. For example, you may want to get in touch with a person called "Peter" but you have forgotten his surname. However, you also know that Peter is in LHC division and works

in building 30. The new LDAP search enables you to enter all the information you know about a person or group to focus your search and help you find exactly what you need.

Another important addition to the LDAP search is the inclusion of mailing lists to the CERN address book. The new service enables users to search for a mailing list address by specifying a simple "keyword" such as "Java" or "Beam". Not only will this show users the mailing list address they require it will also tell them who to contact if they wish to find out more information about the list. Another addition is the "Services & Support" directory which enables users to search for appropriate entries when it is not a person they wish to contact but a support line or a specific service. Another important change is the inclusion of a new "HEP" directory. In collaboration with laboratories (currently IN2P3 and DESY), we have started to build a global address book which will help users search for people across the whole particle physics community. This global address book is achieved by sending search requests in parallel to other LDAP servers being deployed at other laboratories.

As LDAP services start to be implemented at different laboratories we hope this will bring the whole particle physics community together into one common global address book. Figure 4.1 on page 14 shows a screenshot of an address book.

The Future

However, LDAP is far more than just a tool for looking up a person's e-mail address. In IT division there are a number of planned projects which will benefit from the flexibility and platform-independent nature of the LDAP protocol, such as *Roaming*, *Calendaring* and other Web applications. Furthermore, all of the major Operating System vendors have also given their support to the LDAP protocol, including *Windows 2000 Active Directory*, *Solaris* and *Linux*. This could mean that in the near future a number of interoperability issues between different systems could be resolved in a standardised way, opening up a whole host of opportunities here at CERN and across the HEP community in general.

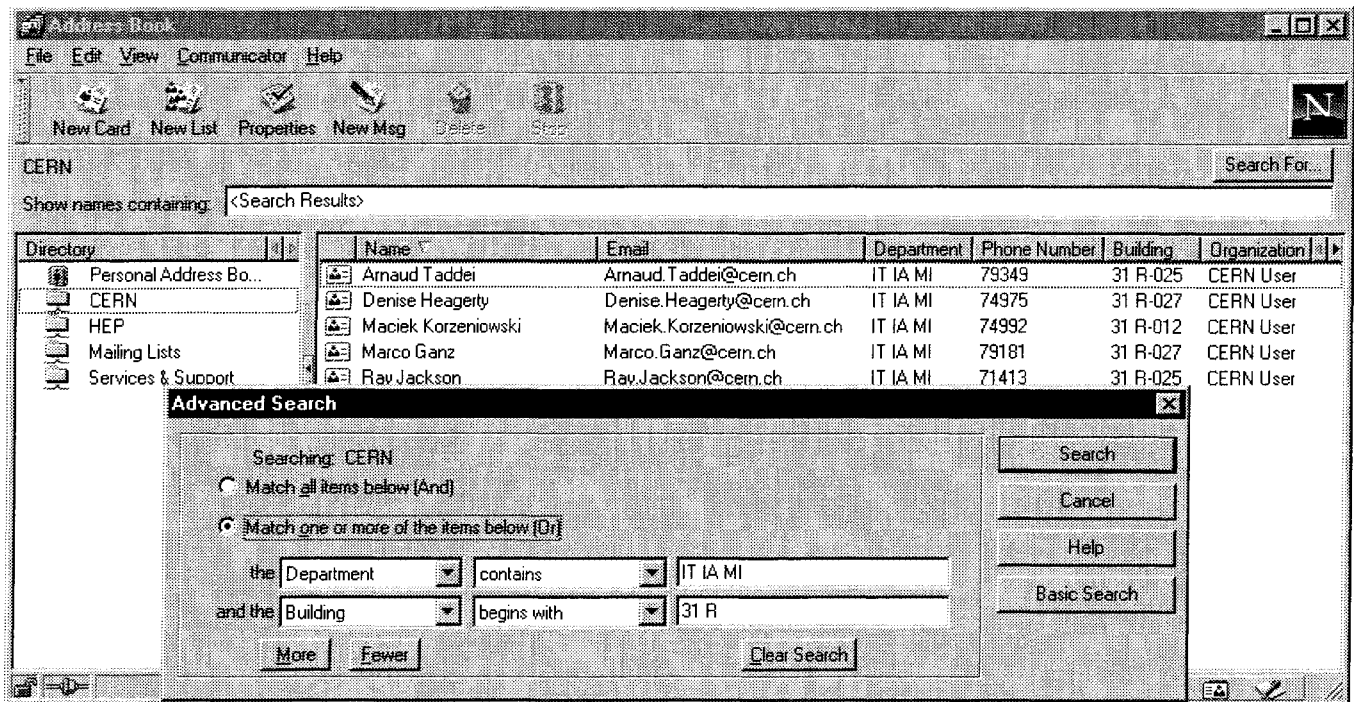


Figure 4.1: Screenshot of the Netscape Address Book

4.2 Remote Access to CERN SMTP Server

Marco Ganz, IT/IA

Outgoing e-mails are sent to their destinations through an SMTP server which in the standard CERN configuration for mail clients set to "smtp.cern.ch". To prevent spammers from routing unsolicited messages through CERN machines e-mails are rejected if neither the sender machine nor the recipient address is in the CERN domain. As a side effect users who are at home or travelling will not be able to send mail to someone outside CERN using a CERN machine as their SMTP server. Two solutions are possible for this problem:

- if you are outside CERN you must configure your mail client to use the SMTP server of your Internet provider or the lab where you are physically.
- for sites where CERN staff are frequent visitors

and the domain can be trusted we can add it to a list of domains that do not undergo the relaying check.

This second possibility can also be extended to conferences, schools or workshops in which CERN staff are participating. If you are an organizer of such an event you can contact us in advance to allow relaying for the duration of the event. If you are simply a participant, when you arrive and find a problem send a mail to postmaster@cern.ch, requesting the relay to be allowed and stating when the event will end. Note that, by default, relaying will be allowed for one week.

In case of further questions please contact Mail.Support@cern.ch.

5. Scientific Applications and Software Engineering

This includes descriptions of: scientific applications and libraries from CERNLIB and LHC++, mainly used by the Physicists, engineering applications like the ones on PaRC or those associated to online controls, software development environment.

5.1 Cernlib 2000 News

Ian McLaren, IT/ASD

Y2K update

With many parts of the Cernlib Fortran library more than 20 years old, it is not surprising that changes have been required to fix Y2K problems. This led us to make the 2000 release on Tuesday, November 30th, so that we would enter the new millennium with a conventionally tested version ready to meet any surprises in Cernlib and its user applications. The 98 release had important corrections to DATIME and the Zebra routine RZDATE. Based on these new routines, more improvements were made in the 99 release which was also tested thoroughly on the CERN Y2K cluster in user applications, revealing serious problems with HEPDB and FATMEN and formatting deficiencies in a number of other packages. The final list of libraries and packages affected by all these modifications is:

- PACKLIB: HBOOK, HEPDB, KERNLIB, KUIP, ZEBRA;
- GRAFLIB: HPLOT, HIGZ;
- PAWLIB: PAW, COMIS, SIGMA;
- GEANT321;
- and the programs: PAW, Paw++, FATMEN

For more details on all matters related to Cernlib please follow links from the Cernlib Web Page (<http://wwwinfo.cern.ch/asd/cernlib/index.html>).

Cernlib Distribution

The CERN management has decided to relax the registration requirements for the Cernlib Fortran libraries and the HEP components of LHC++. Now, permission to use and/or redistribute them is granted under the terms of the GNU General Public License (<http://www.gnu.org/copyleft/gpl.html>), with the exception that any usage related to military applications and/or purposes is expressly forbidden.

As priority has been given to getting Cernlib 2000 released, there will be a short delay in changing the registration machinery for the classic Fortran libraries. Checks have to be made that commercial components do not slip through and agreement has to be reached with some of our contributors for their products. We are pleased to announce that we can continue to distribute `stdhep` in binary form.

5.2 Java Utilities in the ASIS Software Repository

Ignacio Reguero, German Cancio Melia, IT/DIS and Mark Donszelmann, IT/IPT

Due to the growing interest of the Physics community in Java, the SUN Java development kit (JDK) has been installed in the ASIS and NICE software repositories since mid 1998.

A Perl wrapper to the JDK has been provided in order to ease version switching. The `-version` option or `JDKVERSION` environment variable allow to point to different JDK kits as the references to the system classes and shared libraries are handled by the wrapper. The same wrapper is in production both for *Windows* and UNIX systems.

The JDK commands are available in `/usr/local/bin`. The default version is 1.1.6 (1.1.5 on HP-UX). The JDK 1.2 is available for Solaris, Linux, and AIX.

A set of Java libraries and utilities have also been installed in ASIS. It is planned to mirror these libraries and utilities in the NICE repository for *Windows* systems.

These products are maintained by the persons having strong interest in them. The ASIS team provides these persons with support and tools to update the products in the ASIS repository.

The CERN *Wired* (<http://wired.cern.ch/>) project has provided a broad set of Java utilities and components used in their framework. These include:

- the *Orbacus* CORBA object request broker;
- the *Aelfred* SAX compliant XML Parser;
- the *Javamail* Java Mail interface using the SMTP and/or IMAP protocols;

- the *Java Activation Framework*, needed by *Java-Mail*;
- the *BeanShell* Java interpreter;
- the *Infobus* to communicate between Java Components;
- the *Jikes* Java compiler;
- the *Java Unit Testing* library;
- the *Swing Graphical User Interface* kit, supplied with JDK 1.2, but needed for JDK 1.1;
- the *xml4j* SAX and DOM compliant XML Parser.

Notable Java objects in use by other projects are also available:

- the *Colt Scientific Java Foundation Libraries*;
- the *Jprint* Java CERN print client;
- the *Lotus XSL* processor;
- the *xt* XSL transformations processor by James Clark.

The main directory under which these components are found is

`/usr/local/share/java.`

Their documentation can be found under

`/usr/local/doc/JAVA.`

To conclude, here follow the products currently available in the JAVA ASIS “family”:

jdk-1.0.2	jdk-1.2alpha	lotusxsl-0.18.3	junit-2.1
aelfred-1.2a	jdk-1.0.3	jdk-1.2beta3	orbacus-3.2
bsh-0.96	jdk-1.1.3	jdk-1.2beta4	swing-1.1.1
colt-1.0b3	jdk-1.1.4	jdkwrap-1.0	xml4j-2.0.15
infobus-1.2	jdk-1.1.5	jikes-1.06	xt-19991102
javamail-1.1.2	jdk-1.1.6	jprint-0.9	jdk-1.2.2
jaf-1.0.1	jdk-1.2	jprint-1.0	

5.3 Garfield Version 6.33

Rob Veenhof, GSI (Darmstadt, Germany)

Garfield version 6.33 provides additional functionality for the simulation of avalanche processes. This version is able to compute the signals induced by a single track in several electrodes, such as a collection of strips in a CSC.

CELL section:

Maxwell generated field maps with rotational symmetry around an axis can now be read. Also, 2-dimensional r-z maps are now accepted.

MAGNETIC-FIELD section:

No changes.

OPTIMISATION section:

The **FORCES** command plots, on request, a diagram which shows whether a wire is in stable or labile equilibrium.

The **CHANGE-VOLTAGES** command now also works for planes and for the tube.

FIELD and GAS sections:

No changes.

DRIFT section:

In collaboration with Peter Cwetanski and Ulrich Moosbrugger, considerable progress has been made in the un-

derstanding of avalanche statistics on small scales. This has on the one hand resulted in the **PROJECTED-PATH** integration parameter, which to a large extent eliminates the dependence of the avalanche size on the Monte Carlo step size. On the other hand, a new procedure **RND_MULTIPLICATION** has been written which simulates the avalanche fluctuation over a fixed path, taking attachment and multiplication into account.

SIGNAL section:

Multiple weighting field maps computed by finite element programs are now accepted. This should simplify the computation of response functions of cathodes segmented in strips and pads.

Graphics:

A limited amount of user control of the layout of Cartesian plots is provided through the **LAYOUT** graphics command.

Histograms, Matrices, Formulae and Calls:

As usual, many procedures have been added. Of particular importance are the **RND_MULTIPLICATION** mentioned before, and random number generators according to functions and histograms (**RND_FUNCTION** and **RND_HISTOGRAM**). The function random number generator is based on the **FUNLUX** routine from

the CERN program library (<http://wwwinfo.cern.ch/asdoc/shortwrupsdir/v152/top.html>).

Garbage collect for matrix assignments in loops has been improved.

Datasets, input/output and compilation, batch:

No changes.

Documentation

Currently, the most accurate information can be found in the help pages (<http://consult.cern.ch/writeup/garfield/help>) and the description of the command line (<http://consult.cern.ch/writeup/garfield/command/command.html>).

5.4 Software Development Tools Service

Eric Poinsignon, IT/IPT (Sdt.Support@cern.ch)

In IPT Group we actively help software projects in CERN experiments to identify, evaluate, purchase and use industrial software development tools. Network floating licences are used as much as possible, so that the tools can be run remotely. We can also, if you have an AFS account, give you access to our Solaris server in case the binary for your platform is not available. You can find the complete information on what we have and how to use it at URL: <http://sdt.cern.ch/>.

Below is the complete list of our tools. For the latest information watch our News page which is updated as things happen (<http://sdt.cern.ch/SoftNew.html>):

Analysis and Design

- *Rose* (<http://sdt.cern.ch/Rose/>): OMT/Booch/UML analysis and design tool with C++, Java, Ada code generation.
- *StP* (<http://sdt.cern.ch/Stp/>): OMT/Booch/UML analysis and design with C++ code generation.

Modelling and Simulation

- *Modsim* (<http://sdt.cern.ch/Modsim/>): Discrete event modelling and simulation tool.

Programming and Debugging

- *SNiFF+* (<http://sdt.cern.ch/Sniff/>): Integrated development environment for C, C++, Java, Fortran and CORBA IDL

Graphical User Interface Builder

- *X-Designer* (<http://sdt.cern.ch/XDesigner/>):

Interactive X-platform GUI builder with OSF / Motif toolkit widgets, C, JAVA and Windows code generation.

Quality, Metrics and Testing

- *Logiscope Tool Kit* (<http://sdt.cern.ch/Logiscope/>): Source code analyser and test coverage for C/C++/Fortran.
- *Look!* (<http://sdt.cern.ch/Look/>): C++ dynamic visualization system.
- *Insure++* (<http://sdt.cern.ch/Insure/>): Comprehensive tool for error detection in C/C++ programs.

Documentation

- *FrameMaker* (<http://sdt.cern.ch/FrameMaker/>): Complete and integrated publishing tool.
- *IXgen* (<http://sdt.cern.ch/IXgen/>): Indexing and marker management tools for FrameMaker.
- *SoDA* (<http://sdt.cern.ch/Soda/>): Software Documentation Automation.
- *VisualThought* (<http://sdt.cern.ch/VisualThought/>): Multipurpose drawing, diagramming and flowcharting tool.
- *SDLT* (<http://framemaker.cern.ch/sdlt>) (IPT product): Software Documentation Layout Templates, for FrameMaker.
- *User Guide Templates* (<http://framemaker.cern.ch/GuideTemplates>) (IPT product): For FrameMaker.

6. The Learning Zone

All kinds of computing issues which are not necessarily directly CERN-related, such as computing news from the Press and tutorials on various subjects.

6.1 X11 Desktop Environments (KDE and GNOME)

Victor Robles and German Cancio Melia, IT/DIS

UNIX/Linux operating systems are known to be stable and reliable, but one of its unfortunate characteristics has been the lack of a easy to use and homogeneous end-user interface. Two Open Source projects, KDE and GNOME, are addressing this problem with the development of user friendly desktop environments. In a series of three articles (here is the first part, and the next two will be included in future CNL issues), we are going to explain what a desktop environment is, what the differences and similarities between KDE and GNOME are, and what the internal architecture looks like.

What is a Desktop Environment?

If you use *UNIX/Linux* systems for your work, you will probably be used to running the *X Window System* with a *Window Manager*.

X-Windows is a client/server, network-transparent, operating-system independent windowing system. It provides the base technology for developing and displaying graphical user interfaces. A developer may use its native libraries, or higher-level libraries (like *Motif*, *Qt* or *Gtk*) for creating applications. Those applications, also called clients, communicate using the *X protocol* with the *X Server*, which visualises them on the display inside a window.

X-Windows only provides the base mechanisms for displaying and manipulating windows. A *Window Manager* is needed in order to allow the user to control the layout of the windows, providing at least these operations: Create, move and delete windows, change their size, iconify and deiconify them. Usually it also gives each window its own borders and a title bar.

There are several Window Managers available, the choice going from very simple ones (like *twm*) to extremely sophisticated ones, like *Enlightenment*.

A Window Manager does not care about the actual contents of each window, e.g., each client application. As *X-Windows* provides a rather low level protocol, each application may have its own look and feel, own behaviour and characteristics. Communication between the applications running on a display is rudimentary and usually limited to copy and paste of text strings. Maybe you already experienced frustration when trying to insert a picture from your favourite image editor into your text edition application; usually you will have to save the image to a file and then load this file into the

editor, instead of just selecting and grabbing the image with your mouse and dropping it into the editor as you would do when using *MS Windows*.

A *Desktop Environment* addresses all these interoperability problems and other issues. Essentially, it is intended to be the glue between all the applications running on your display. Some of its main features are:

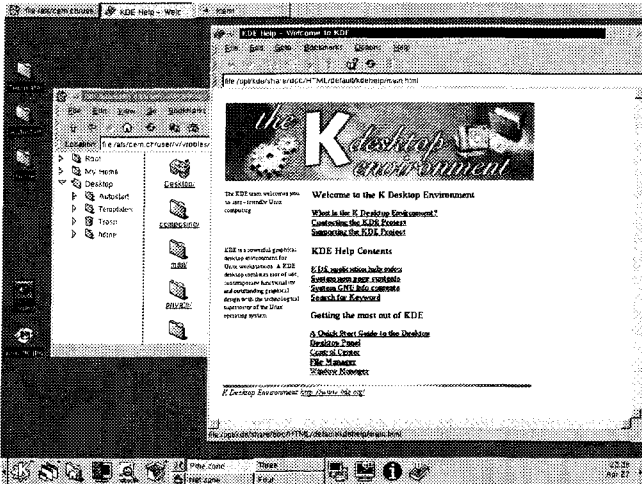
- *Consistent look and feel:* all applications use similar menu layouts, icons, scroll boxes, etc.
- *Common Drag and Drop protocol:* applications may interchange objects among themselves.
- *Easy dialog based desktop configuration:* mouse-driven configuration instead of editing text files, etc.
- *Unified application help system:* the applications are going to have access to the same help system.
- *Common application development framework:* libraries for making programs for the desktop. Using these libraries you will have easy access to all the features that the desktop can provide.
- *Compound documents:* documents may contain objects handled by several applications.
- *Common session management:* uniform mechanism for saving and restoring sessions by storing the internal state of each application on the desktop.

MS Windows, and *CDE* for *UNIX* machines, are examples of desktop environment which include several of these features. *KDE* and *GNOME* are two projects which are aimed towards the same target: to offer a free, open-source based desktop environment to *UNIX/Linux* users. Their development started one or two years ago and now they are reaching maturity.

KDE

KDE stands for Kool (or Kommon) Desktop Environment. The following definition is taken from their Web page: "*KDE is a powerful graphical desktop environment for UNIX workstations. It combines ease of use, contemporary functionality and outstanding graphical design with the technological superiority of the UNIX operating system.*"

The main idea of KDE is to make Linux accessible for everybody. The KDE project began in October 96, and the first version was ready in July 98. Right now, version 1.1.2 is available. Version 2.0 is under heavy development and is expected around the first half of the year 2000. KDE runs with its own Window Manager (KWM).



GNOME

GNOME stands for GNU Network Object Model Environment. Definition (taken from their Web page): *"GNOME is a user-friendly desktop environment that enables users to easily use and configure their computers. GNOME includes... a set of conventions that make it easy for applications to cooperate and be consistent with each other."*

GNOME was started in August 1997 and runs now version 1.0.54. Theoretically, it does not depend on the Window Manager as long as you are using a "gnome-compliant" one (like Enlightenment, but not fvwm).



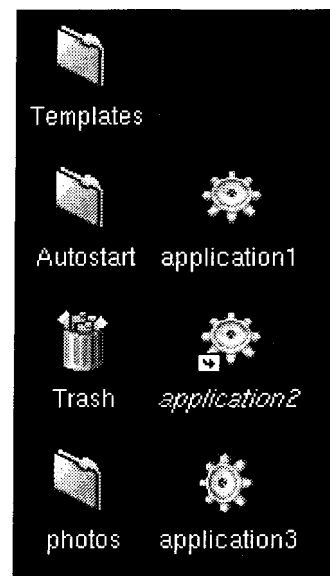
User Interface Characteristics

At a first glance, KDE and GNOME do look very similar and have obviously been inspired by Microsoft's Win-

dows graphical user interface. Both desktop environments offer a *Desktop* (where data and applications can be placed), a *Panel* (for starting applications and displaying status information), a *File Manager* for manipulating file objects, and a *Control Center* for central configuration.

The Desktop

The desktop is the screen area where we can put icons containing objects like pictures, applications, folders with files, etc. In KDE you may also have device templates on the desktop which allow you to mount and unmount devices (provided you have the appropriate rights on them). You may achieve the same in GNOME using a panel applet. KDE also offers a trash bin à la Windows.



The Panel

While the KDE interface is based on two bars, the *Panel* bar and the *Task bar* (where the currently running applications are listed), in GNOME you may have a task bar inside the panel bar.

The panel is the core of the user interface. Panels, in general, will give you the same functionality as MS Windows's task bar. Thus, through the panel you can have access to running tasks, change the focus application, change the virtual desktop in use, start applications, etc.

KDE's panel is intuitive and has a good design. You can put the panel in all screen borders and you may select up to three different sizes. You can also hide the panel using the corner buttons. There are small applications like xload or xbiff that can be embedded into the panel. Within the panel we have a pager, the utility to change between virtual desktops.

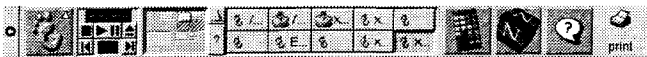
In KDE you can at any moment see all the running applications through the task bar. Like the panel, the task

bar can be placed in any border of the window and can be hidden automatically.

The main disadvantages of KDE's panel are that it is not very customisable and that you cannot use more than 8 virtual desktops.

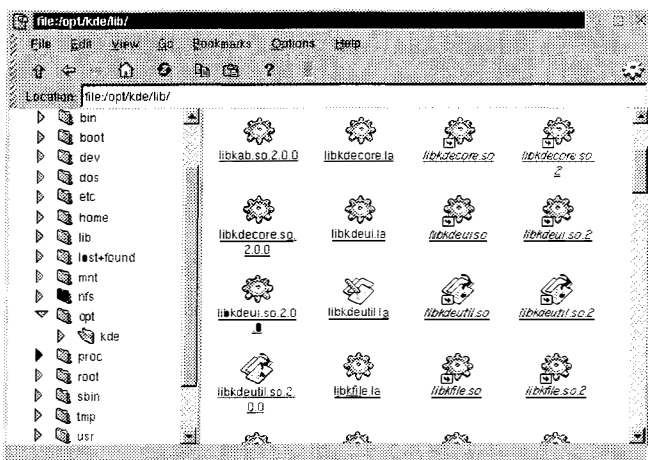


GNOME's panel allows more freedom than KDE's, being highly customisable and at the same time intuitive. You can put the panel in any place on the screen and you can have multiple panels. With the standard distribution of GNOME you have a lot of applets available, which are small applications that can run inside the panel. The applets communicate with the panel using CORBA. An important applet is the pager, from where you select the virtual window. The printer applet allows you to print any type of file directly, independent of its type, by simply dragging and dropping the file into it. The main disadvantage of the GNOME panel is that you cannot resize it.



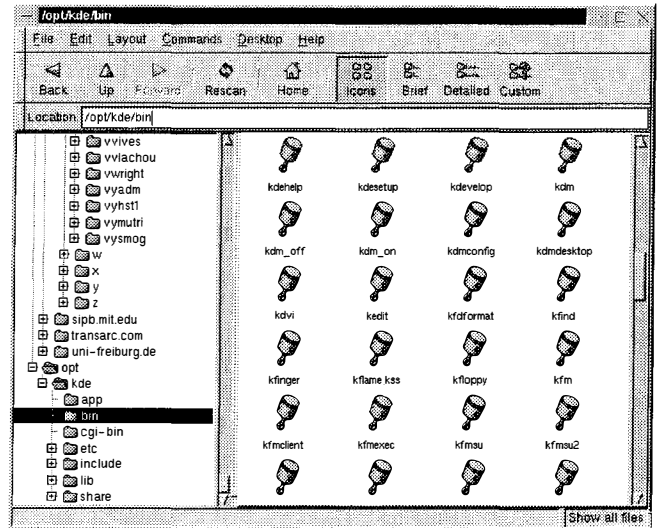
The File Manager

The KDE File Manager (KFM) is quite similar to *Internet Explorer 4.0* and can be used for surfing our file system (or even the Web) and to make **ftp** connections. A powerful feature is its *network transparency*. With KFM we can surf any remote file system via **ftp** as if we were in our local file system, allowing even drag and drop files from one location to another. Currently KFM also supports tar archive browsing, even on **ftp** sites. Unfortunately, the Web navigator is not very stable and it will sometimes crash.



GNOME also has its own File Manager, an evolution of the classic *Midnight Commander* (GMC - GNU Midnight Commander). GMC is quite similar to KFM but perhaps more comfortable and intuitive due to its graphical interface.

The common aspects between KFM and GMC are that both allow browsing local file systems and remote file systems as well as tar files. However GMC cannot be used as a Web browser and does not allow the use of drag and drop while browsing remote systems.



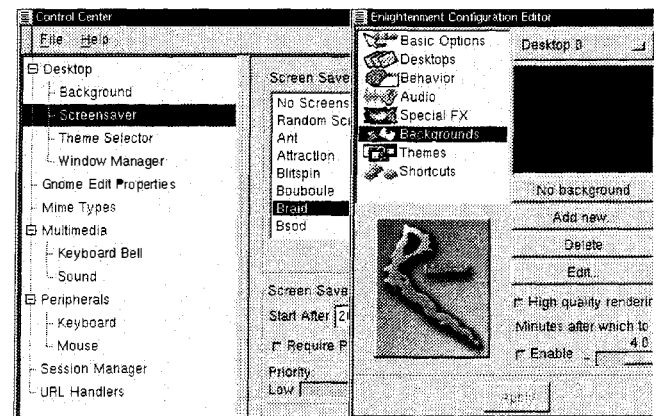
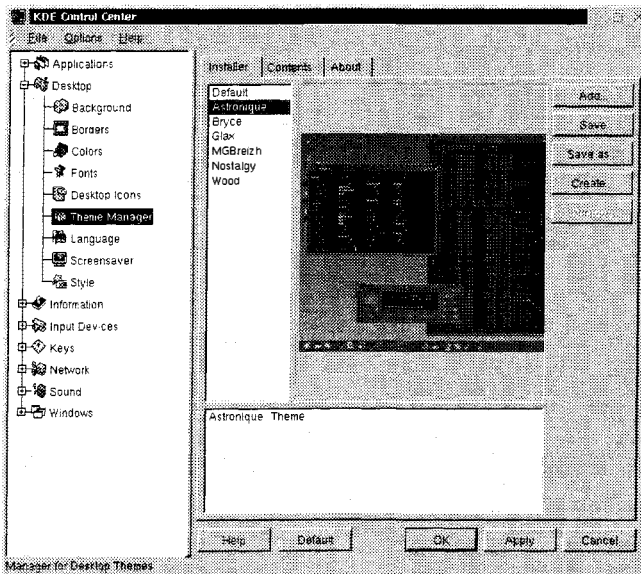
Themes

Themes allow us to make visual and functional changes to the desktop. Examples of visual changes can be window decorations, the icons linked to some kinds of files, the fonts and colours, the appearance of widgets like scroll boxes etc. Functional changes are for example desktop elements positions, Window Manager functionalities or mouse buttons bindings.

With KDE we have a theme Manager completely integrated inside the Control Center. GNOME theme support is quite similar to KDE's. Unfortunately, some Window Managers like *Enlightenment* provide their own themes, which may lead sometimes to confusion. There are many themes available both for KDE and GNOME, but actually only few themes are usable. The rest have a great computational cost and are not useful for daily work.

The Control Center

The control center allows a user to carry out desktop configuration through a graphical front end. For example, we can change the desktop language, select a screen saver, put the panel in our favourite shape, select themes and helper applications, choose programs to be launched on startup, etc.



In general, KDE's and GNOME's control centers are quite powerful and intuitive and offer similar functionalities. A major difference is that in KDE all the Window Manager features are included while in GNOME the Window Manager configuration takes place independently. Sometimes, this may cause conflicts. For example, it is possible to change the background in the Enlightenment configuration and in the GNOME Window Manager control center. Then, what background I am really using? From this point of view KDE offers a more consistent desktop.

Coming soon

In the next part of this article, we will analyse GNOME and KDE from a more technical point of view, looking in more detail at the internal architecture, usage of protocols and standards, etc.

If you want to know more:

Bibliography

- [1] KDE homepage <http://www.kde.org>.
- [2] GNOME homepage <http://www.gnome.org>.
- [3] Desktops at CERN <http://home.cern.ch/v/vroble/ww/>.

6.2 A Guide to Web Colouring

Maria Dimou, IT/User Support

This article explains how to introduce colour on Web pages. People who use proper authoring tools like *Dreamweaver* or *Frontpage* need to read only the instructions for using the colouring palette offered with these products. For users who edit a limited amount of single Web pages, the way to introduce colour with the *Netscape Composer* is also included. The rest of the article is mostly for "real" HTML editors. It is based on Web documents listed in the references list at the end. *N.B. The Web version of this document is made in colour with the following specification:*

```
<body bgcolor="#692CCF" text="#FFFF66"
      link="#FF9900" alink="#FF00FF"
      vlink="#66FFFF">
```

Use of colours with *Dreamweaver*

From the menu "Modify" select "Page Properties". You will get a full palette of colours for the background, text and links to choose from. By clicking on the actual palette image you can create your own nuances.

Use of colours with *Frontpage*

From the menu "File" select "Page Properties" and then "Background". You will get a small list of colours and the possibility to create yours (by selecting "Custom").

Use of colours with *Netscape Composer*

If one has only a few independent pages to maintain the *Netscape Composer* is just fine, i.e., disguises the HTML syntax without the overhead of learning to use a complete tool. From the browser top menu click on

"File" -> "Edit"

and you are in the *Composer* page. Colours can be selected by clicking on

"Format" -> "Page Color and Properties"

at the page top.

Related HTML tags [1]

The browsers that follow the HTML 3.2 specification allow a few attributes on the BODY element that influence the appearance of the document's background, the text and also the links.

Here is an overview of the attributes:

- **BACKGROUND**: specifies the image that will be used as background of the current document (HTML 3.0);
- **BGCOLOR**: specifies the background color (HTML 3.2);
- **TEXT**: specifies the color of all the normal text (HTML 3.2);
- **LINK**: specifies the colouring of non-visited links (links to documents where you have never been) (HTML 3.2);
- **VLINK**: specifies the colouring of visited links (links to documents where you have been before) (HTML 3.2);
- **ALINK**: specifies the colouring of active links (links you activate by clicking on them) (HTML 3.2).

If "Autoload Images" (*Netscape*) is OFF the background image (if any) will not be shown. Similarly the [A|V]LINK values will be ignored, in case the default background colour with the chosen link colours make the text unreadable.

Syntax example [2]

```
<HTML>

<HEAD>
<TITLE>Color Control Example</TITLE>
</HEAD>

<BODY BGCOLOR="#000000" TEXT="#F0F0F0"
      LINK="#FFFF00" VLINK="#22AA22" ALINK="#0077FF">
```

```
This is an example document. Text is light-gray
on black, and <a href="nowhere.html">anchors</a>
are yellow at first, flashing blue-green when
activated, and pale green if already visited.
</P>
</BODY>
</HTML>
```

As the BODY tag is the place where colour enhancements can be added, no further change is possible until the end of the document. The way to achieve multiple background colours in the same page is to use *Style Sheets* (see [9, 10]).

What are these attributes?

The BACKGROUND attribute requires an image, for example: BACKGROUND="my_image.gif"

All the others require a colour code given in hexadecimal format, for example: BGCOLOR="#FFFFFF"

Netscape and *Internet Explorer* understand colour descriptions, for example: BGCOLOR="Green" but there is no list [3] of colour names that works fine in both browsers.

The easiest way to find the HEX numbers that represent a colour (if one types HTML and does not use an editing tool like the ones mentioned above), is to use some of the matrices on the Web [4, 5, 6, 7, 8].

This value format in hexadecimal corresponds to #RRGGBB, where RR =Red, GG =Green and BB =Blue. All possible colour combinations give, in the decimal system, 256^3 , i.e., about 17 million colours.

However, to achieve sharp colours that show reasonably on all platforms and browsers it is wiser to stick to the 256 of *Netscape* which do not dither [11].

Browser handling

The browsers used at CERN largely support colour handling since the tags appeared as early as HTML 3.0. *Netscape* became compliant already in version 1.1 and *Microsoft Internet Explorer* as of version 2.0. Readers using other browsers can find a complete list at the URL <http://www.two4u.com/bg-faq/#browsers>.

It is possible to define different background colours in TABLE cells. The "HTML source" of the CERN Home page (<http://www.cern.ch>) is an example of how to do that. However, *Netscape* versions prior to 3 cannot distinguish any but the background colour (try to view the CERN Users' Welcome page (<http://www.cern.ch>) with *Netscape* version 2.02). Thus, when using special colours for table cells and links one should make sure readers with old browsers can always read their text.

Bibliography

- [1] Background FAQ (Mark Koenen, bg-faq@two4u.com).
<http://www.two4u.com/bg-faq/>.
- [2] Document specific background and foreground control (*Netscape* assistance).
http://www.netscape.com/assist/net_sites/bg/.
- [3] *Netscape*'s colour table with colour names.
<http://developer.netscape.com/docs/manuals/htmlguid/colortab.htm>
- [4] HYPE's colour specified for *Netscape* >= v.3.
<http://www.users.interport.net/~giant/COLOR/1ColorSpecifier.html>.
- [5] J. Tompkins' HTML colour codes.
<http://home.earthlink.net/~jttompkins/Color.html>.

- | | |
|--|--|
| <p>[6] The <i>Netscape</i> Color Palette Map (Victor S. Engel).
http://the-light.com/colclick.html.</p> <p>[7] Dougie's Color Picker (Douglas R. Jacobson).
http://www.flash.net/~drj2142/pages/colorSel.html.</p> <p>[8] Background colours (1ema@infi.net).
http://www.infi.net/wwwimages/colorindex.html.</p> <p>[9] Web consortium site on Styles.
http://www.w3.org/Style.</p> | <p>[10] Online Course on CSS.
http://www.cern.ch/WebOffice/Doc/Courses/CSS.</p> <p>[11] The 256 colors of <i>Netscape</i>.
http://www.connect.hawaii.com/hc/webmasters/Netscape.colors.html.</p> <p>[12] Poynton's color FAQ.
http://www.inforamp.net/~poynton/notes/colour_and_gamma/ColorFAQ.htm.</p> |
|--|--|

6.3 Questions and Answers from the Computing Helpdesk

Collected by the IT/User Support Team

This is a collection of Questions & Answers that have been treated by the Computing Helpdesk managed by the User Support group. The number in parenthesis refers to its relative numbering in the User Support "Question-Answer" database, at URL <http://consult.cern.ch/qa/NNN>, where NNN is the problem identifier (number).

PC Support

(Hannes Schwarzbauer, IT/User Support)

Question [170] – Install a printer

How do I install a printer on a PC at CERN (on NICE)?

Answer

To do this you must have the *CERN printing Package* installed. If you do, you should see a small printer in your "system tray" which is the area at the bottom right of your screen, where the clock is:

- right click this printer icon and choose "Printer Wizard" from the menu.

When it opens you can browse the buildings for printers.

Note that it is better not to use the "Install a new Printer" option under Control Panel to install a printer at CERN.

Question [178] – FAT partition

How can a FAT partition be converted to an NTFS partition?

Answer

From the command line enter the command `convert d: /fs:ntfs`. This command is one way only, and you cannot convert an NTFS partition to FAT. If the FAT partition is the system partition then the conversion will take place on the next reboot. Be aware that if you have a dual boot installation and convert to NTFS the boot partition where Windows 95 is sitting, you lose it.

Question [182] – Strange characters in my *Word* document

I find very strange characters in my Word document which make it difficult to read (e.g., all spaces contain these characters). However, it is perfectly ok when I print, the characters are not appear then.

Answer

While you view or edit a document on the screen, you can display characters such as tab characters, spaces, and carriage returns that do not appear on the printed page. (For example, *Word* uses arrows to represent tab characters and dots to represent spaces.) That way, you can easily see if you added an extra space between words, typed spaces instead of a tab character, and so on.

- On the Tools menu, click Options, and then click the View tab.
- Under Nonprinting characters, select the check boxes of the characters you want to display.

Tip: To display all nonprinting characters, select the All check box instead of selecting each individual check box, and deselect it when you want to get rid of them.

Question [184] – *Internet Explorer 4 and 5* Installation

I tried to install Internet Explorer 4 from the Start Menu (Start->2->3->1s) but it fails when trying to install the components. All the items are marked with a red cross and I get the error message that the installation failed. Nothing more.

Answer

The last months NICE system people have noticed PCs having corrupted registry settings preventing *MSIE4* or *MSIE5* to be installed. They checked that this problem does not come from NICE itself. The only workaround to this problem is to do a full re-install of *Windows/95*

before installing *MSIE4*. Once this is done the user should not have any further problems.

Question [185] – Internet Explorer on NICE

Which version of Internet Explorer is supported by NICE?

Answer

MSIE4 has been replaced by *MSIE5*. This is the only version you can install from NICE. But people who use *MSIE4* can continue to do so.

Note 1: The default *MSIE3*, which is pre-installed on NICE is 4 years out of date, and does not work correctly with the current NICE nor with numerous Web sites around the world. *MSIE3* will be removed from NICE at some later point.

Note 2: When users complain about *MSIE*, it is important to know which version they run with: Help menu - About

Question [195] – Shutdown Linux

What is the procedure to shutdown a Linux machine? Can I just power it off?

Answer

When on your machine:

- Hit the <CTRL> <ALT> <F6> keys altogether, then you should get a console prompt. Log as root , then execute /sbin/halt.

You can also do it through telnet:

- log on with your `userid` , then as root , then execute, as above, /sbin/halt.

NEVER power off the machine without making a clean halt.

Question [197] – CapsXpert on NICE

CapsXpert is no longer supported/available under NICE. What alternative does the user have?

Answer

The *CAPSXpert* component-data lookup system (previously on NICE) is no longer supported at CERN. The vendor has ceased to support our current installation and cancelled the respective contract. A new local installation (cost more than CHF 100,000) was beyond both available budget and support manpower. Therefore, and in collaboration with the Digital-CAE user group, the decision is to discontinue *CAPSXpert*.

The following alternatives are proposed:

- component-data lookup at the Web sites of the manufacturers or vendors;
- lookup through "consolidator" Web sites, e.g., *IC-Master* (registration required, but free) at: <http://icmaster.com>;
- for equivalents of by now obsolete components: distributors who have access to such systems, e.g., *Avnet* (<http://www.Avnet.com>).

In addition, with SPL Division, a call for tender had been launched for a Web-based equivalent of *CAPSXpert*. The replies have been received and the currently ongoing evaluation (product from the market leader) is quite promising. In the very near future, we expect to offer you access to that Web-based system, at a fraction of the above mentioned cost.

Note: We have sent the message to the registered users of the electronics CAE cluster registered in the list cern-electronics@listbox.cern.ch. But it seems that not everybody concerned has received (or read) the info. People can subscribe themselves to the above mentioned mailing list, if they follow the corresponding link from the Web page:

http://wwwinfo.cern.ch/ce/dc/DUG/DUG_home.html

The "*CapsXpert*" topic has been discussed for quite some while in the Digital-CAE User Group. We expected that this, and sending the details to the cern-electronics mailing list and to the support staff, would cover it pretty much.

We apologize for any inconvenience. If you have questions, please send an e-mail to Ludwig.Pregernig@cern.ch

UNIX Support

(Nicole Crémel and Roger Woolnough, IT/User Support)

Question [172] – System names

On some systems (e.g., RedHat Linux and AIX) there is a difference between the ASIS and AFS system names (e.g., on Linux the ASIS name is `i386_redhat60` and the AFS @sys value is `i386_linux22`. Similarly, on RSPLUS/RSBATCH the ASIS name is `rs_aix43` but the AFS @sys value is `rs_aix42`). Why is this?

Answer

This situation was discussed in detail in August 1999 by those responsible in IT/PDP and IT/DIS Groups and a message had been sent to the physics community at that time. The underlying reason for the difference is that there is no guarantee that AFS and ASIS applications will be affected in the same way by changes to Operating Systems (OS) (for all UNIXes) and by differences between Linux distributions.

AFS is concerned only with the File System interface for the OS. This is the same for AIX 4.3 and AIX 4.2, hence the same value for @sys. Taking a simplistic view, the file system interface for Linux depends only on the Linux kernel and thus *Transarc* (AFS provider for CERN) choose to use the `i386_linux22` name. One might imagine that this could also be used by the AFS software for a future RedHat distribution based on a 2.4 kernel if the File System interface remains unchanged.

Many ASIS applications, however, depend on other aspects of the whole Linux environment—e.g., location/version of system libraries—that differ between the different Linux distributions (*RedHat*, *Suse*, *Debian*). As such ASIS cannot use an AFS @sys name which depends only on the kernel, hence the `i386_redhat60` value set and used at CERN by the ASIS team.

Specialists in IT division are reluctant to force AFS at CERN to use the ASIS name, because they believe that many *physics* applications are much less dependent on the Linux kernel and distribution than ASIS applications (or even AFS releases). They therefore believe it is unwise to create a difference between the @sys value for AFS at CERN and the @sys value for other HEP sites that use different Linux distributions.

Regarding this issue, some practical advice for the users is:

- In most cases, it is sensible for people to use the @sys name in their own PATH variables and directory names.
- However, people who either:
 - have software which depends on the Linux distribution or;
 - need to access software from the ASIS repository without relying on the existence of links in, say, `/usr/local/bin`

will need to use the ASIS system name in PATHs and directory names.

The situation might be improved in the future by defining in the HEPiX environment a variable \$ASIS_SYS, which can be used where necessary.

Question [173] – Special characters on HP

I would like to use special characters in my password but the # is never recognised on HPPLUS.

Answer

Many UNIX systems have different algorithms for special characters and the # character is one of them. Sun and SGI machines have no trouble with this character but for HP it must be preceded by a \ to inform the system that a “special character” is following.

Question [174] – Run ANSYS in batch

When I try to run ANSYS as a batch job with the `ansbatch55` command on `atlas.cern.ch` and after answering the list of questions, I get an error:

```
:hostname=atlas01
:
: REMEMBER !!!!!!!
: In case that no ANSYS license is available, you
: can set the "ANSWAIT" env variable to "TRUE" and
: your ANSYS session will queue for a free license unit
: More info on ANSYS at URL: http://consult/parc/ansys
:
: This system does not have network batch system
: Do you want your job to be executed just in the
: background? [y]/n
```

Answer

We have a dedicated service called PARC setup to run engineering applications. You can submit jobs to it from the RSPLUS cluster. Therefore to successfully run your application you need to get accounts on PARC and RSPLUS and log into RSPLUS and issue the `ansbatch55` command again. You should contact your computer group administrator (using `xwho`) and ask to create these accounts for you.

Question [177] – Anonymous access to files on AFS via ftp

Is it possible to give anonymous access to files on AFS via ftp?

Answer

For security reasons, no anonymous ftp service is offered on any public Service. We discourage creating such access on your private workstation or PC for the same reasons, and if you have to do it, we strongly recommend not to allow file imports, i.e., in the “ftp” terminology, that users may “put” files. This is because hackers often use writable FTP servers as a repository for illegal software. Systems which insist on permitting writable anonymous ftp access should be configured such that the writable directory is not readable by “public”.

You may however export any of your files through WWW following the procedure described below:

- Create a `~/www` directory.
- Then type `fs setacl www cern:nodes read` to give the Web server read rights.
- Now place files or links to files you wish to distribute. These files can be accessed using the link `http://home.cern.ch/~Login_name`.
A more user friendly interface would be to create a `Welcome.html` file in your `~/www` with links to the relevant files.

Question [179] – Linux and ASISwsm

I am working on Linux and get many error messages from ASISwsm which seem to indicate an “AFS cache corruption” problem. What should I do?

Answer

On supported systems using `fs flush` to clean-up AFS cache is discouraged because then no debug is possible. Problems with corrupted cache should be reported to `Afs.Support@cern.ch` who could contact *Transarc*. However `fs flush` could be use in emergency case, to continue working.

Note that on Linux redhat 5.1, AFS is completely unsupported and there are *lots* of cache corruption problems. So it is possible to use `fs flush` (to flush individual files) or `fs flushv` (to flush a volume), or even to clear all the cache (type `rm /usr/vice/cache/*Items`)

and then reboot. This should solve your problem with ASISwsm.

For more information regarding AFS, you could also check what is the recommended AFS level at CERN for your operating system at the URL:

<http://consult.cern.ch/services/afs/afsd/doc/recommended-levels.html>

and see defects corrected in patches release at the URL:

<http://consult.cern.ch/services/afs/defects.html>

Mail Support

(Michel Franceschi and Miguel Marquina, IT/User Support)

Question [148] – Pine version 4.10

Has CERN any project to move to version 4.10 of Pine, where it is possible to use the mouse (WRT Pine)?

Answer

Indeed we have been testing pine 4.10 and its new functionality possibilities here at CERN for several months. It is not in production, but if you really want to, you can start it directly out of the test area. If you do so, then you should bear in mind that it may be modified with no notice, and the version being tested may not be identical to that eventually released... Anyway with those proviso, try if you like:

`/afs/cern.ch/asis/packages/MAIL/pine-4.10/@sys/usr.local/bin/pine`

Presently, as of December 1999, both versions 4.02 and 4.10 are available.

Question [149] – Mis-spelling in the "From:" field

There seems to be a mis-spelling in the "From:" field for users who receive e-mail sent by me. Apparently users are receiving e-mails with:

From: Vassili Marusov <Vassili.Marusov@cern.ch>

instead of:

From: Vassili Maroussov <Vassili.Maroussov@cern.ch>

Obviously this generates "Error: Undelivered mail" messages when they try to reply to my e-mails.

Answer

If you are using Netscape (Messenger) as your mail agent, then it is most probably due to a bad configuration of your "Preferences..." (Menu Edit / Preferences... / Mail & Groups / Identity).

Otherwise it could be a "registration" problem: check if the data are correct in the CERN "Phone book". If there is an error, then the Web page <http://consult.cern.ch/xwho/help/general> will explain you what to do.

Web Publishing

(Maria Dimou, IT/User Support)

Question [147] – Accentuated characters with Netscape 4.05

Netscape is crashing whenever I hit one of the accentuated characters in a text-entry field. Netscape simply closes, and I lose all information entered since the last save.

Answer

There is a bug in Netscape 4.05. Work-around solutions are:

- Use "French" keyboard layout instead of "US International".
- Use WinNT instead of Win95.
- Use a higher version of Netscape.

Question [150] – New version of httpd

We have an old version of the httpd daemon from CERN and have looked many a place for the updated version but it is not to be found. Are there any later versions?

Answer

The development and support of the CERN httpd is no longer made at CERN, but at the W3 Consortium. You can find information on the daemon at the URL:

<http://www.w3.org/hypertext/WWW/Daemon/Status.html>

Please, address your questions or comments directly to httpd@w3.org.

Question [151] – Invalid link

If I see a link out of date on a Web page who do I inform?

Answer

The person who signs the page (if it is signed). Else the owner of the site (who should sign the top page).

Question [153] – Access counter

I want to know the number of accesses for a Web page which is in the www.cern.ch domain, what is recommended?

Answer

Usage of counters on Web page is not recommended at CERN, as you can see in CERN Guidelines for Publishing on the Web (<http://www.cern.ch/WebOffice/Guidelines/>).

However, for www.cern.ch you can use the "statistics service" available at the URL:

<http://www.cern.ch/WebOffice/Services/WWWlogfiles/>

All questions related to this service should be addressed to WWW.Support@cern.ch.

Question [155] – Icons with national flags

Where can I find small icons with national flags (at least of the CERN member states)?

Answer

There is an archive on the Web, with many countries on it:

<http://www.iconbazaar.com/flags/intl/>

In particular, for the CERN member states:

<http://www.cern.ch/Public/CERNOP/memberstates.html>

so that, e.g., for Austria you can use:

<http://www.cern.ch/Public/CERNOP/Austria.gif>

Question [164] – Protect Web pages

Can you help me to password protect a directory (and its contents)?

Answer

This depends on the Web Server software you run and can be done by its maintainer.

For instance, for different protection possibilities with *Apache* look at the URL:

<http://www.cern.ch/WebOffice/Doc/Apache/ProtectData.html>

DeskTop Publishing

(Andreas Wagner, IT/User Support)

Question [157] – PDF

Is there a recommended software at CERN or a site licence for a software product to generate .pdf documents from PostScript files?

Answer

No there is no recommended software. On the NICE PCs, there is the standard software from *Adobe*, “*distiller*”, which convert PostScript to PDF. If you are using $\text{\LaTeX}$ and have no EPS figures to include, then the command `pdflatex` will generate PDF directly from the $\text{\LaTeX}$ source file.

Information about such conversions can be found at URL:

<http://www.cern.ch/WebOffice/Doc/OtherTools/>

7. User Documentation

Everything related to “computer documentation”: updates to computer documentation distributed by IT (including the UCO references cards), book reviews, offerings of the COBS service, etc.

7.1 Consult - the User Oriented Entry Point to Computer related Information

Bernd Pollermann and Andreas Wagner, IT/User Support

A Single Entry Point to user relevant information

With increasing amounts of information published on the Web, it has become more and more difficult to locate the information corresponding to a specific computer related question or task. It is therefore desirable to provide CERN users with a single entry point which will guide them towards the appropriate information.

In this view, the main purpose of `consult.cern.ch` is to make information easily accessible for users, independently of the origin of the information. The users should not need to know which person or group is hosting a given service, in order to be able to find the corresponding information.

What you will find in Consult?

Presently, there are the following main areas available via *Consult* (<http://consult.cern.ch>):

- *Services*: Information about services offered to CERN computer users.
- *Documentation*: Newsletters, user-documentation, program descriptions, etc.
- *Knowledge Base*: Question and answer collections (see CNL 236, Section 8.1 page 26 *Xfind is Expanding: Questions & Answers*, also at the URL <http://consult.cern.ch/cnl/236/xfind.html>).
- *Data associated to persons and teams*: location, phone numbers, loginids, e-mail, etc.

The contents presently available in *Consult* can be seen in Figure 7.1.

How to you find what you are looking for?

There are several possibilities of locating and accessing the information which is available in “*Consult*”.

- *Via keyword based search*:
- The search engine used to find information in *Consult* is called *Xfind* (<http://consult.cern.ch/xfind>).

Xfind is not searching the hole of CERNs Web pages, but on the contrary, it only searches the meta-information of the items available via *Consult*. Therefore you will not be able to find everything, but on the other hand the “signal/noise” ratio will be kept high.

- *Access via various views at the data (i.e., structured lists)*:
- Apart from accessing the information using the search engine *Xfind* also lists are available, which present summaries of the available information and give the opportunity to get an overview of what is available.
- *Access via meaningful, “readable” URLs*:
- Apart from the two mechanisms mentioned above - search and catalogues — a serious effort has been made to organise and label the information in a understandable and meaningful way, which is also reflected in the URLs which are of the type

```
http://consult.cern.ch/area_name/
[sub-area_name]/item_name
```

Here are a few examples:

```
http://consult.cern.ch/service/mail
http://consult.cern.ch/writeups/afsrefcard
http://consult.cern.ch/cnl/236
```

How can you help us to constantly improve *Consult*?

The answer is very simple: *Give us feedback!*

- If you have comments on *Consult*, please let us know!
- If you were looking for something in *Consult* but did not find it, please let us know!
- If you find some information in *Consult* you have problems to apply, please let us know!
- If you have suggestions for additional areas, please let us know!

A simple feedback mechanism is implemented on all pages of *Consult*. It provides you with a Web-form (see Figure 7.2) in which the URL of the page the comments are referring to as well as the author and modification date are already automatically filled in. Just type your comments and suggestions and submit the feedback.

CERN Consult Help

The Consult Page
"the entry point to user relevant information"

Information available via Consult

Search and View:
[xfind](#) Search the information on the Consult pages
[who](#) People and their Location, phone numbers, e-mail, loginids etc.

Services
 Services offered to CERN computer users

Documentation
 Books available at the User Support Bookshop
[CNL](#) Cern Computer Newsletter
[Writups](#) = User Documentation
[CERN program library](#) Short Writups

Knowledge Base
[Question & Answers](#) from the Computing Helpdesk and related

Newsgroups
 A selection of [CERN newsgroups](#)

Other useful information
[Information Technology Home Page](#)
[CERN home page](#) • [CERN Library](#) • [CERN wide search](#)

For comments and feedback, write to: Consult Webmaster
 Last modified: 27. Nov 1999

Figure 7.1: Contents of *Consult*

CERN Consult Feedback

Consult feedback form

Comments referring to : <http://consult.cern.ch/cnl/237>
 Author/Responsible : Consult Webmaster
 Creation date of page : 27. Nov 1999

Please write your comments/suggestions in the field below:

Your name or email address (facultative):

submit feedback

Figure 7.2: Feedback form for *Consult*

7.2 News from the Computing Bookshop

Roger Woolnough and Jutta Megies, IT/User Support

The last article we wrote spoke of problems obtaining books from Pearson (ex Addison Wesley Longman / Prentice Hall etc.). Unfortunately this has not taken a noticeable upturn for the better and we still have longer delivery times than we would like. At the Frankfurt book-fair the management of the company apologised but this does little to appease *our* desire to provide a better service. The only good point is that we are not alone in this area, but I hope next year we can report a considerable improvement.

During past months we have received several new titles and there have been the customary new editions. In response to a large demand we now stock a very comprehensive English dictionary from Oxford. Naturally we will be stocking both French and French / English editions but these are taking a little longer to organise.

We have received new editions of *Linux in a Nutshell*, *UML Distilled* and *Running Linux*. We have in stock

two new books on *Active Server Pages* at the request of the Division. The *Dreamweaver Bible* went out of print and we have to wait some weeks longer to get more stock. In the interim we have an excellent *Tutorial on Dreamweaver* from Addison Wesley. We have a few copies of the book written by Tim Berners-Lee, *Weaving the Web* although these sold at an amazing rate when first offered. We also have a new book called *Red Hat Linux Unleashed* that is a very complete reference and offers a complementary CD of *Red Hat 6*. Again by user request we have the books from O'Reilly on *Qt* and also *MySQL & mSQL*, although we must emphasise that this SQL implementation is *not supported* by the IT/ASD Group.

Please get in touch with us if you have information on new titles that could be interesting to purchase, Bookshop@cern.ch.

7.3 User Support Reference Cards - Current List

Roger Woolnough, IT/User Support

The list can be found at the URL <http://consult.cern.ch/writups/S/RefCatList.html>.

7.4 User Support Book Catalogue

Roger Woolnough and Jutta Megies, IT/User Support

Situated in Building 513 1-022 (tel. 74050) is the Computing Bookshop provided by the *IT / User Support group*, where CERN users can find computer books and CDs at discount prices. The service is open weekdays from 8.30 to 12.30 or contactable by e-mail to Bookshop@cern.ch. Books are purchased from some 15 publishing houses and the catalogue offers a selection of documentation aimed at the range of computing

utilities available at CERN. The service welcomes suggestions from the user community for new acquisitions. Purchasing may be done internally via EDH or TID or alternatively cash payments via the CERN Bank.

The list, with all the relevant information, is compiled regularly and can be found at the URL: <http://consult.cern.ch/books>.

8. Just For Fun...

Some jokes to end this CNL, and to have some more fun ... for those who did not already read them somewhere else!

8.1 The Unusability Study

Richard Topping, Sky's [.tv]

Richard Topping presents Masterclass, a computer tutorial show on Sky's [.tv], the first and only technology channel in the UK dedicated entirely to new technology as an essential part of everyday life. [.tv] is on air 7 days a week, and is currently available via satellite and Sky Digital, 6.00 - 8.00pm in analogue and noon to midnight in digital.

We are very fortunate this week to have with us Professor Francis Lebowitz, President of the International Institute of Software Unusability. It is thanks to the hard work of the Professor and his colleagues that we all enjoy some of the great unusability features of today's computer software. So tell us what it is that you do Professor exactly?

My name's Lebowitz, not Exactly. But that aside, we are a top secret research and development quango funded entirely by the software industry. Our job is to investigate and pioneer exciting and innovative cross-industry standards in unusability.

What do you mean by unusability precisely?

Look, my name's Lebowitz, not Precisely, alright? By unusability, I mean all of those features in software products that make it harder for you to do what you want to do. For example, all those little crosses and squares and lines in the top right corner of each "window" on your PC. It's thanks to our research and brilliant thinking that they're so tiny and close to each other, so when you want to minimise something you actually make it bigger, or when you want to make it bigger you usually close it down.

That's very innovative!

Thankyou! But we don't just work on small, added-value features like that one. We do a great deal of research in core unusability issues. For instance, we're the ones who came up with the idea of putting the "Windows" key on the keyboard right next to the Control button, so that when you're playing certain games and you go to fire, you press it accidentally and dump yourself out of the game.

What can I say Professor? Inspired!

Listen, it's Lebowitz OK, not Inspired.

Sorry. What do you consider to be your greatest achievement?

Oh that's easy. It's General Protection Fault at 00001:0001000E8. This is a great feature that you see

pretty much everywhere now. We tried it out in a few Windows products in the early Nineties, and it proved so popular we've bundled it free with most applications.

Doesn't that message mean your computer's crashed?

Oh goodness no. Ha ha ha.. Oh deary me no, ha! Ho hoo ha ha ha! Ah dear where was I? Oh yes. Computer crashing no, you see that message comes up completely randomly, at any time. There's absolutely nothing wrong with your PC - in the slightest. But you have to turn your machine off to get rid of it. Simple but so effective!

But isn't that the kind of thing a virus does?

Not technically, although you've raised a very important point. You see as well as developing unusability features, we also write all of the world's viruses- especially the really nasty ones. Problem is, there aren't enough good quality unemployed, socially embittered programmers to write all the viruses the industry needs. So the virus protection companies pay us to write their viruses for them. We sneak our little creations onto the Internet, scare everyone poopless and the world and his wife rushes out to buy the latest anti-virus software. Everyone's happy!

What are you working on at the moment?

Well Richard, right now I've got seven separate teams working on voice recognition software. We've created some great unusability features and we're very proud of them. Try one out! Read this card by speaking in a loud, clear voice into this microphone

OK. "Welcome to Masterclass. My name's Richard Topping."

Good. Now read what the screen on my laptop says.

"Hopeless. We come to miss the glass. Mine hay miss wretched hopping." Wow. That's very impressive. Thanks Professor for coming in.

My name's not For Coming In.

Oh shut up. That's all we've got time for today, but if any of our listeners have ideas for unusability features, Professor Lebowitz would love to hear from you. His institute offers a sliding scale of fees, starting at a few pence for a feature which causes "minor irritation" up to millions of pounds for anything that triggers "a complete global economic meltdown". Tell me Professor, who got your last big cheque?

Bill Gates.

Thankyou and goodnight.

8.2 The dangers of the Millennium Bug

And, finally, see what could happen when the Millennium bug catches up with you...
Animated gif at the URL http://www.thesitefights.com/wepatrol/mil_bug.gif.
