

The FLC Computing Environment

Things Which You Might Already Know

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Introduction

Who should listen?

- newcomers: get an overview of some peculiarities of the DESY and the FLC computing environment
- experienced FLC members: maybe you'll discover something which you've never heard of before
- computing experts: please correct me if I'm wrong

This talk assumes that . . .

- you have a basic knowledge of some computing terms
- you have used a Unix-like operating system before

Basic Information

The User Consulting Office (building 2b, ground floor) provides lots of documentation

- “The First Three Days at DESY Hamburg”
- “Notebooks at DESY”
- “Scientific Linux at DESY”
- software manuals (ROOT, Pythia, L^AT_EX, Cernlib, . . .)
- computing services (mail, AFS, fax, scanning, . . .)

You can find this information on the UCO web pages and also as hardcopies (leaflets and whole books!)

Getting an Account

- Ties or Felix can create user accounts
- Have the completed registration form printed out
- Drop the signed paper form in the UCO mailbox
- Change the temporary password as soon as possible

Whom to Ask

Your officemates

- will often have solved the same problem before

The FLC administrators

- have in-depth knowlegde of the FLC infrastructure
- will handle communication with the central DESY IT
- have superuser privileges
- will help you with hardware problems

The UCO

- can answer general questions on the phone (5005)
- will file written requests in a ticketing system (“RT”)

The FLC Administrators

- Benjamin and Christian: Linux systems
- Dirk and Freddy: Windows systems
- Oliver Wendt: FLC backup
- Nanda: FLC web pages
- Blanka: mass storage, old batch cluster
- Philip and Wolfgang: new batch cluster
- Ties and Felix: official business

The FLC Hosts

flc01 through flc48

- desktop computers in the offices

Group server flc101

- accessible for remote login
- data storage, included in the central backup

File servers lc1 through lc4

- large amounts of data storage
- submit hosts for the batch clusters

Web server flcweb01 (www-flc.desy.de)

- hosts the web pages of FLC and its subgroups

Operating Systems at DESY

DESY Scientific Linux 4 (SLD4)

- based on Red Hat Enterprise Linux 4
- the latest operating system in the DESY environment
- upgrading from older systems is in progress

DESY Scientific Linux 3 (SLD3)

- based on Red Hat Enterprise Linux 3

DESY Linux 5 (DL5)

- based on SuSE Linux 8.2, still common

DESY Linux 4 (DL4)

- based on SuSE Linux 7.2, outdated

Internal and Remote Login

- Login only with `ssh`, file transfer with `scp` or `sftp`
- Remote login to `flc101.desy.de` (for FLC) or `bastion.desy.de` (for all DESY users)
- The bastion web page offers a Java terminal emulation (“MindTerm”) if you don’t have an SSH client at hand
- DESY offers VPN connections
- Use `flc101` as an SSH proxy or for port forwarding
- XDMCP login (from “true” X terminals) to `flc101`

Local Data Storage

- The local hard disk is available under `/scratch`
- The `/data` directory is included in the FLC backup and automounted on `flc101` via NFS
- Local media (floppy disks or CD-ROMs) can be used with the `mount` command or the `mtools`
- USB storage devices can easily be used under SLD4 and DL5 – SLD3 is known to have problems
- Some FLC computers have special devices, such as disk writers or tape drives – ask the administrators

Shared Data Storage

- The `/data` directory of `flc101` is automounted via NFS under `/nfs/flc/flc101/data`
- The four file servers are available under `/nfs/flc/lc1/pool` through `/nfs/flc/lc4/pool`
- The `/data` directories of all FLC desktops appear on `flc101` under `/nfs/flc/hostname/data`
- All servers have access to the DESY dCache via PNFS under `/pnfs/desy.de/flc`
- FLC has a common AFS directory under `/afs/desy.de/group/flc` (or just `/group`)
- Ask the administrators if you need storage space

dCache and the PNFS

- dCache is the central mass storage system for DESY
- PNFS is a pseudo-filesystem which allows access to the dCache in a human-readable form
- PNFS provides the file catalogue, but not the data itself
- Use dccp to copy data to and from the dCache
- Take ordinary programs and preload `libpdcap.so`
- Develop your own software which makes use of the “dcap” library libdcap.so

The FLC Batch Cluster

Preparations

- have the resource “batch” added to the registry
- have your name added to the list of batch users

Running a job

- log in to `lc3` or `lc4`
- read in some settings for the cluster
- write a shell script which does your work
- submit the jobs with `qsub` (plus arguments)
- examine the job status with `qstat`

More information is available from Philip, Wolfgang, and the [documentation](#) on the DESY IT web pages

The FLC Backup

Home directories are backed up centrally every night

- latest version is available under `~/oldFiles`
- earlier versions can be retrieved with `dsm_afs`

Local disks are regularly backed up by FLC

- three stages: full, differential, incremental
- put files and directories which need not be backed up in `.nobackup` files
- make sure your backup does not exceed 10 GB

`flc101` is included in the central backup

The FLC Web Pages

The FLC web pages provide

- general information about FLC and its subgroups
- a list of group members
- the “LC Notes” repository
- an archive of theses and talks (including this meeting)
- further information about computing issues

The FLC database (password-protected) contains

- a detailed list of group members
- the absence list (maintained by Ramona)
- the organisation of the Sommerfest / X-Mas Party

Kerberos

Kerberos is an authentication service

- asks for your password once
- proves your identity towards other services

Kerberos 4 tokens (needed for AFS access)

- `klog`, `tokens`, `unlog`

Kerberos 5 tickets (useful e. g. for SSH login)

- `kinit`, `klist`, `kdestroy`

Kerberos tokens and tickets have a lifetime of 25 hours

- refreshed (locally) when you unlock your screen

AFS – General

AFS is a network-based filesystem

- world-wide access to files
- subdivided in cells (one of which is `desy.de`)
- works completely transparently (apart from speed)

AFS is heavily used at DESY

- for the home directories of all users
- for the distribution of centrally provided software
- for common directories of all major groups
- usually the culprit in case of “rien ne va plus”

AFS has some things to keep in mind!

AFS – Quota

- Home directories have a quota (100 MB by default)
- Examine your usage with `fs quota`
- If your quota is exceeded, you cannot write to the AFS anymore – logging in may become impossible!
- In that case, log in to a plain terminal (`tt y`) and free up some space first
- Keep cache files and temporary data out of your home directory – also for reasons of speed

AFS – Access Control Lists

Access permissions are managed with ACLs

- set for every directory
- contains permissions for single users and/or groups
- inherited from the parent directory upon creation
- display with `fs listacl`, modify with `fs setacl`

Unix access permissions (`rxw`) are almost meaningless!

- completely ignored for directories in the AFS
- “user” part (first `rxw` triplet) acts as a master switch for files in the AFS – Unix ownership is ignored
- “group” and “other” parts are ignored for files

AFS – Access Permissions

ACLs consist of up to seven attributes

- `r` – read files
- `l` – lookup directory contents and the ACL
- `i` – insert files and subdirectories
- `d` – delete files and subdirectories
- `w` – write to files and change Unix permissions
- `k` – lock files
- `a` – administer directory (change the ACL)

“`l`” is needed along the whole path of a file!

AFS – Users and Groups

- single users (including yourself)
- pseudo-users, e. g. `wwwzdvr` (the DESY web server)
- DESY-specific groups, e. g. `usg:flc` (FLC)
- all hosts in the DESY network: `desy-hosts` (by IP)
- predefined groups: `system:anyuser`,
`system:authuser`, `system:administrators`
- your personal AFS groups (managed with `pts`)

AFS – Miscellaneous

New accounts have some predefined directories

- `~/public` is readable for everybody
- `~/private` is accessible only to yourself
- `~/flc` is readable for members of FLC

The AFS administrators have all permissions by default

The character sequence “@sys” is treated specially inside paths and file names

- replaced with the name of the operating system
- most often used in targets of symbolic links

Software in the DESY Environment

- Core software in the usual locations `/bin`, `/usr/bin`, `/usr/local/bin`, `/usr/X11/bin`, ...
- Frequently-used programs available under `/opt/products/bin`, `/group/bin`, `/cern/pro/bin`
- More preinstalled software packages under `/opt/products` and `/group/opt`
- Ask your colleagues where to find special software (e. g. ILC software, Grid middleware)
- DESY-specific commands: `phone`, `today`, `inq`, `ini`

DESY SSL Certificates

- Some web pages require SSL encryption (`https`)
- Browsers will usually show a security warning because they don't know the signer of the digital certificate
- Solution: Import the certificates of the DESY CA and the DFN PCA into your browser (“DESY CA – G01” and “DFN-Verein PCA Classic – G01”)

The DESY Registry

Central administration tool for all accounts

- management of passwords
- settings for your account
- personal information

You have to change your password regularly

- only valid for 180 days (e-mail reminder)
- can be changed using the web interface or with the Unix `passwd` command
- passwords have to meet certain requirements

Passwords are the same under Unix and Windows

Mail Server and Mailing Lists

Mail server `imap.desy.de`

- supports SSL-encrypted IMAP
- accessible from outside the DESY network
- mail must be delivered to `username@mail.desy.de`

Outgoing mail server `smtp.desy.de`

- restricted from outside the DESY network

Lists server `lists.desy.de`

- log in with your mail address and an arbitrary password
- make sure you are included in the list `flc@desy.de`
- ask your colleagues about other interesting lists

Windows Terminal Server

Preparations

- have the resource “ts_hamburg” added to the registry

Connecting

- `rdesktop adterm.win.desy.de`, log on to “WIN”
- option `-f` – go to fullscreen mode
- option `-a` – set the colour depth
- option `-r` – use device redirection, e. g. disks:
`-r disk:home=$HOME,scratch=/scratch`
- log off when you’re finished

More documentation is available from DESY IT

Printing

DESY provides a set of public printers

- `lpr` – submit a print job
- `lpq` – inspect the status of the queue
- `lprm` – cancel a waiting job

Printers for FLC (select with `-Pprinter_name`)

- `pubps6` and `pubcp6` in 1d/20
- `pubps2` and `pubcp1` behind the UCO
(please use these printer clusters for large jobs!)
- append “s” for single-sided printouts
- append “t” for transparencies
- append another paper size, if available

Network Access

You can connect your own laptop to the DESY network

- WLAN for guests (SSID “ANY”, no encryption)
- WLAN for registered users (encrypted)
- cable connection to a wall outlet

Hosts have to be registered

- guests have to fill in a short online form
- permanent users will get a static IP address

WLAN coverage is rather good, wall outlets are available in every office (but not all sockets behave the same)

Personal Web Pages

- Create a directory `~/www`
- Set read permissions for `desy-hosts` in the ACL:
`fs setacl ~/www desy-hosts read`
- Design a nice welcome page `~/www/index.html`
- Create a (possibly empty) file `~/www/.public`
to make your pages appear in the DESY phone book
- Provide special settings using `.htaccess` files
- Read the documentation for further information

The DESY Telephone System

- You can directly reach any DESY extension in Hamburg and Zeuthen
- Dial 0 to get an outbound connection (may be restricted for long-distance calls)
- Quick dialling numbers to certain institutions and companies are available (including CERN)
- Use the prefix 9 to reach DESY mobile phones
- Dial 11 for an operator (e. g. for international calls)
- The phone book is available on the DESY web pages and through the `phone` command

Other Means of Communication

- Every office has a mailbox for incoming snail mail on the ground floor of the staircase in 1d
- The large box in the bottom is for outgoing mail
- Fax machines are available in 1d/26 and 1d/20
- The next pneumatic post station (number 720) is on the ground floor of the staircase in 1d
- A list with all destinations is fixed to the box
- Call the post office (3384) if you need shells
- Incoming postings will fall in the basket below the box

What's Missing?

- The Windows domain
- Usage of the Grid
- ...

Message of the Day

Have a lot of fun...

[f1c101] ~>_