

# Computing at DESY Zeuthen.



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# General information

- The computer center provides

- All required computing resources for the research groups and all other groups

- ◆ CPU
    - ◆ disk space
    - ◆ network bandwidth
    - ◆ Printers
    - ◆ communication equipment

- All computing services for users

- ◆ File services (storage on disk and tape, backup)
    - ◆ Batch processing for CPU or I/O intense work
    - ◆ Access to Grid computing
    - ◆ Email
    - ◆ Printing
    - ◆ And many more (LAN and WLAN access, databases, monitoring, reporting, ...)

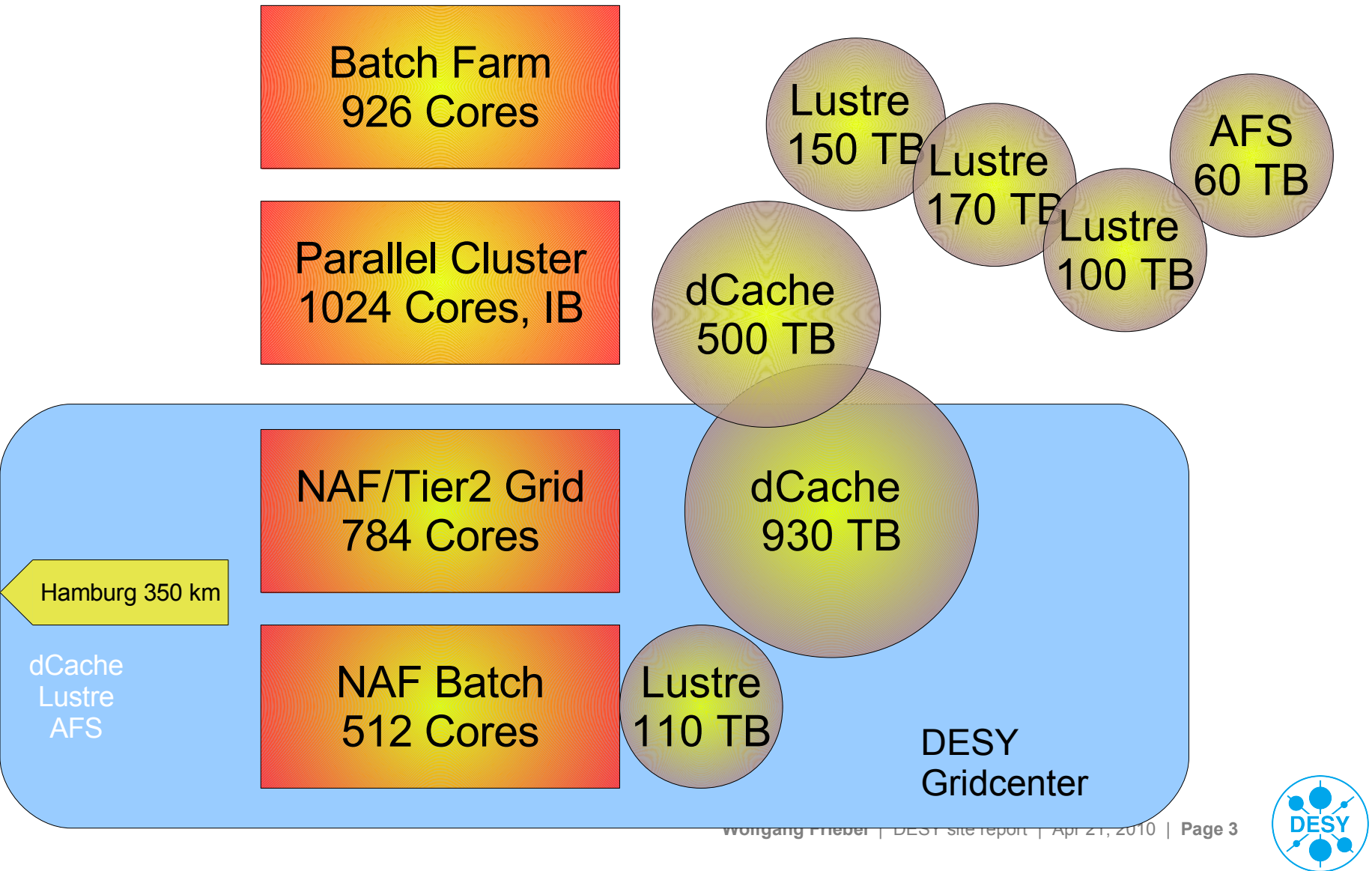
- Centrally managed desktops

- ◆ Running Scientific Linux 5 or 6 (clone of RedHat Enterprise Linux) or Windows XP or 7
    - ◆ Equipped with the latest security fixes
    - ◆ Ready to use





# Computing & Storage infrastructure



# Used hardware – typical examples



Vendor for most systems: DELL



R510 – storage brick  
Or virtualisation node



R610 - service node

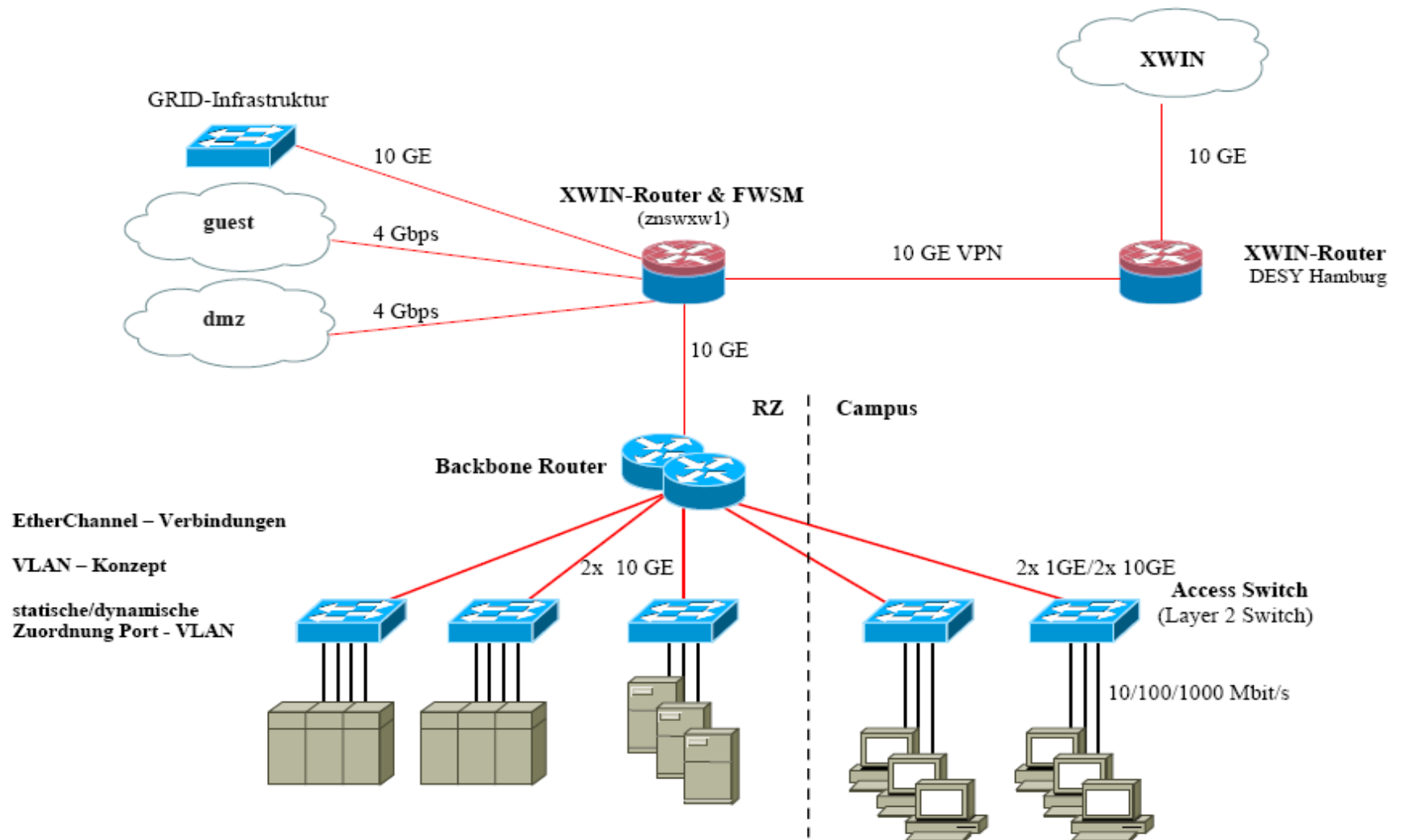


M610 – compute / wgs nodes



R610 + MD1000 JBOD  
Storage brick

# Network infrastructure – overview Zeuthen



# Access to DESY computers

- You will get assigned a desktop PC running Linux or Windows
  - You should have already assigned an account for login to DESY computers
  - The account is **strictly personal** and must not be used by other users
  - You should have gotten an initial password that is valid for 5 days and need to be changed quickly (see next slide)
  - The PC is for accessing the DESY computing infrastructure, not for heavily working on it (see later)
- Wireless access
  - Access using registered hardware to “guest” network, to “eduroam” and “desy”
  - Make sure to read [https://dvinfo.ifh.de/NoteBook\\_Registration](https://dvinfo.ifh.de/NoteBook_Registration) for more details
- In case something does not work as intended
  - Don't try to fix hardware problems, please contact [uco-zn@desy.de](mailto:uco-zn@desy.de) instead
  - When you encounter problems with software, do ask your supervisors if they can help you. If the software is not working properly, do not just try to work around it, please let [uco-zn@desy.de](mailto:uco-zn@desy.de) know about it, maybe we do have already a fix

# Password policy

- You have to change your initial password within 5 days
  - Using the web (from within the DESY network): <https://registry.desy.de/registry>
  - Using the Linux command (by logging in into your PC or into pub.ifh.de): `passwd`
- Choosing a password
  - See also [http://rechnersicherheit.desy.de/e8/e83/e262/index\\_eng.html](http://rechnersicherheit.desy.de/e8/e83/e262/index_eng.html)
  - The password must have at least 7 chars containing chars from 3 out of the four char classes: upper/lower case letters, numbers, special characters
  - The password must not contain (parts of) words from dictionaries or other easily guessable information (birthday, car plate, ...)
  - There are checks to enforce this policy and weak passwords (not always obvious to see) are rejected
  - The password must not be used for other accounts outside DESY
  - The password must not be disclosed to anyone, not be recorded on the PC, not be sent by email or entered in non DESY web forms

# Computer security

- It is important to prevent unauthorized access to DESY computers
  - You can actively contribute to prevent security attacks being successful:
  - Do not download, install and run software from dubious sources
  - Do not use software not related to your work at DESY
  - Keep your private computing environment up to date by installing security fixes
- Help keeping precious resources available for work related purposes
  - Do not abuse network bandwidth or disk space (illegal downloads etc.)
  - Do run CPU or I/O intense programs only on dedicated computers (batch farm)
- Do not store or distribute DESY internal information elsewhere
  - Single pieces of information do usually not contain many facts, but combining lots of them may reveal secrets (birthdays, names of friends, names and responsibilities within DESY, phone and room numbers, address information etc.)



# Security policies

- Networking is strictly restricted to registered computers
  - WLAN access will work only after registration
  - Connecting your PC by cable to the LAN will normally not work and will cause the corresponding plug to block, making it unusable for the previously attached device
- Do not try to configure IP or even MAC addresses, use DHCP
- It is forbidden to run hacker tools or trying to run security exploits
  - In case you observe a weakness or abnormal activity please contact [uco-zn@desy.de](mailto:uco-zn@desy.de) or [security@ifh.de](mailto:security@ifh.de)
- You are not allowed to collect private information of other users
- Do not loose access rights on computers, directories or files
  - Access to your desktop, to your private PC
  - Rights in home directory and its subdirectories are protected by ACLs

# Security policies (2)

- Do not use clear text protocols to use services on other computers
  - Especially important for computers outside DESY or when using WLAN, as account names and passwords are easily sniffable
  - Most insecure protocols are blocked at DESY anyway (telnet, rsh, pop, x11)

# Login to a computer

- Use your desktop to login
  - Other users will normally not be able to use your desktop for login
  - The desktop is not accessible from outside DESY
  - Do not store data on discs local to this desktop, high risk of losing data
  - Do not work on desktops of other users
- Login to pub.ifh.de computers (accessible for all users)
  - Use **ssh** to connect, **scp** to transfer data
  - On Windows **putty** is a recommended ssh client to connect to Linux
  - Redirects you to the least loaded of several computers (pub1..7)
  - Do **never** use these computers for CPU or I/O intense work
  - Most groups (not FLASH) should have a work group server for that
    - ◆ These groups should not use pub at all
  - Access to computers in desy.de domain is via bastion.desy.de
    - ◆ From there you can logon to pal.desy.de (same concept as pub.ifh.de)

# Login to a Workgroup Server and to Farm computers

- Login from your desktop to a workgroup server
  - Using **ssh** warp.ifh.de (can be used from outside as well)  
see documentation on [https://dvinfo.ifh.de/Warp\\_Login\\_Usage](https://dvinfo.ifh.de/Warp_Login_Usage)
  - Can also be used to access DESY internal web pages from outside DESY
  - Directs you to the (or one of the) workgroup servers belonging to your group
    - ◆ The workgroup servers are usually called <groupname>-wgs|wgs1|wgs2
  - Workgroup servers have a faster network connection and several fast CPUs
- Using Farm computers
  - Using **qssh** and **qsub** to access farm computers, for details see later and read [https://dvinfo.ifh.de/Batch\\_System\\_Usage](https://dvinfo.ifh.de/Batch_System_Usage)
  - Using **qssh** and **qsub** to access the parallel cluster and a computer with a C2050 GPU (not generally available, requires additional privileges)

# Linux/Windows connectivity

- Login from Linux to Windows
  - Using **winscp** to get access to a windows XP computer from Linux (only available after **registration** for that service, Win 7 is possible as well)
- Login from Windows to Linux
  - Use **ssh** as described before (no graphics)
  - Use **xwin32** (netinstall application: Start->All programs->Netinstall)
- Exchanging data between Windows and Linux
  - The AFS file system `/afs/ihf.de/..` is visible on both worlds with identical access rights
  - A file `~user/www/fname` is even visible on <http://www-zeuthen.desy.de/~user/fname> where `~user` is the home directory of a user whose account name is 'user'
  - Groups may have additional space elsewhere accessible by http
  - On windows computers variants of the **scp** command (e.g. **Winscp**) may be available



# Installed software

- Depending on the computer different software is installed
  - On Windows most software is available as **netinstall** package, some programs are available only on request
  - On Linux different programs are installed depending on the foreseen usage (graphics programs, desktop publishing etc. on desktop PCs, typically not found on server machines)
  - On Linux the versions (and sometimes functionality) differ depending on the OS installed (SL5 or SL6)
  - The OS of the computer will be displayed when logging in and can be found in the files `/etc/redhat-release` and `/etc/issue`
  - On Linux not all programs are in the search PATH, additional programs may be listed by typing the command `'ini'`
  - A list of installed and frequently used linux commands may be found on <http://www-zeuthen.desy.de/dv/documentation/unixguide/>

# Larger software packages

- Most packages require additional settings (use the **ini** command)
- Mathematical software, formula manipulation
  - **maple**, **mathematica**, **matlab**
- Additional compilers
  - pgi, intel (check [http://dv-zeuthen.desy.de/documentation/commercial\\_\\_compilers/](http://dv-zeuthen.desy.de/documentation/commercial__compilers/))
- HEP specific packages
  - **geant**, **root**, packages for simulation
- Access to Grid services
  - **ganga**, **glite**, **dq2**, ...

# Finding information



- On Linux/UNIX systems most commands have a manual page
  - **man** <command> get a description of a command (arguments, options, ...)
  - **man** -k <keyword> list commands that are related to <keyword> (e.g. editor)
  - Many commands have options that alter its behavior, it is worth knowing them
- The Scientific Linux quick reference guide is also online
  - <http://www-zeuthen.desy.de/dv/documentation/unixguide/>
- More information on the web pages of the computer center
  - <https://dvinfo.ifh.de/DVInfo>
  - <http://dv-zeuthen.desy.de/>
- If you need help from the computer center
  - mail to [uco-zn@desy.de](mailto:uco-zn@desy.de) and describe as detailed as possible your problem

# Storing data: AFS

- Several types of storage for users available for different purposes
  - For an overview see [https://dvinfo.ifh.de/Storage\\_Resources\\_Usage](https://dvinfo.ifh.de/Storage_Resources_Usage)
- AFS (Andrew File System)
  - distributed filesystem accessible on most DESY computers, highly reliable, partly replicated, secure file system, used e.g. for the Linux home directories, personal web space, group space
  - Currently about 60 TB on 26 file servers available
  - For daily use most important file system
  - Some differences to other file systems, see later
  - More information on AFS can be found on the web:  
[http://dv-zeuthen.desy.de/services/afs/afs\\_users\\_guide/](http://dv-zeuthen.desy.de/services/afs/afs_users_guide/)



# Storing data: other options

- **Lustre**: fast parallel file system, only available on batch farm computers) 
  - ◆ Capacity currently about 420 TB
- **dCache**: for large amounts of data, not available on desktops, not accessible with standard UNIX commands like cp 
  - ◆ About 1.5 PB on 90 file servers
- **Storage on Network drives** (Windows only): similar purpose as for AFS file system
- **Local disks** (Windows and Linux): should be used as **scratch space only**, not remotely accessible, not in backup, weak data protection, storage less reliable than storage on file servers
- **Removable media**: will be mounted on Linux at /media, do not forget to unmount when removing
- **Tape library**: for long time storage of bulk data, backup, archiving
  - ◆ Holds up to 4 PB of data
  - ◆ No direct user access, automated backups go there





# Other storage locations

- Local disks

- Usually only /tmp writable by you, will be regularly wiped (after 10 days)
- Do not use /tmp on computers controlled by the batch farm, as these computers will be used by many people and want to use local disk space as well. Use \$TMPDIR

- Lustre storage

- Can not be accessed on the desktop, found on /lustre/fs\*/<groupname>
- Ask your advisor before trying to use it

- Dcache

- Ask your advisor before trying to use it

# Email

## ■ The email addresses

- Your email address to be used in communications is **firstname.lastname@desy.de**
- The mail infrastructure has to know where your INBOX resides, therefore you have a second address **accountname@mail.ifh.de** that is stored in the DESY registry
- If your mail should be forwarded elsewhere you have to change this physical email address in the 'Modify person' dialog using <https://registry.desy.de/registry/>
- If you want to get an additional copy of the mail, a mail forward has to be set in the 'Mail forwards' dialogue. Use with care, danger of creating mail loops

## ■ Mailing lists

- Mailing lists managed using sympa: <https://lists.desy.de/sympa>
- Has a very long list of all mailing lists hosted at DESY (usually access restricted)
- Subscription to a list using the web interface (needs self service registration) or by sending a mail containing a subscribe request to [sympa@desy.de](mailto:sympa@desy.de)

# Email servers

- For reading email: imap.ifh.de port 143 (TLS) or 993 (with SSL) has to be used
  - The (IMAP) mail server is running dovecot
- For sending mail: smtp.ifh.de ports 25 should be used. Authenticated smtp is supported. If port 25 is blocked, use ports 587 (submission port) or 465 (TLS)
  - The (SMTP) servers are running postfix
  - Individual mails larger than 50MB get rejected
- Both servers do Kerberos authentication, passwordless access may be granted even from outside DESY after a successful **kinit <username>@IFH.DE**
- Individual central mail filters can be defined using a webmail client with support for **server based filtering** (squirrelmail) at <https://imap.ifh.de/webmail>
  - Be very careful defining mail filters, as you can easily lose mail by misconfiguring filters



# Email clients

- Generic configuration information
  - <https://dvinfo.ifh.de/MailReaderConfiguration>
- **alpine**
  - Text based mail reader, preconfigured for the DESY mail server(s)
  - Not a modern look, but very rich functionality, configurable using rules, colors etc.
- **thunderbird, evolution**
  - Popular choices, please read <https://dvinfo.ifh.de/IMAPServer> to avoid warnings about certificates and to configure it for passwordless access using Kerberos
  - Recent versions will autoconfigure the mail servers and protocols to access it
- Other mail clients
  - Using the generic configuration information sending and receiving email should be possible using any client including smartphones etc. even from outside DESY

# Printing, Copying, Scanning

- Default printer is znlo1 (room 2L/01)
  - To set it differently edit ~/.zprofile and set the variable PRINTER
  - A list of printer names can be found on [https://dvinfo.ifh.de/Printing\\_with\\_Cups](https://dvinfo.ifh.de/Printing_with_Cups)
- Printing
  - Printing from applications is straightforward, check settings such as paper size (A4), orientation, duplex, printer name etc.
  - From the command line (Linux) use e.g. `lpr [-P <printer>] <filename>`
  - Avoid printing of large quantities of pages, if absolutely necessary please get it done for you by informing UCO ([uco-zn@desy.de](mailto:uco-zn@desy.de))
  - Printing in color is usually much more expensive than B/W printing
- Copying and Scanning
  - Several printers are multi purpose devices capable of scanning and copying
    - ◆ Scanned documents can be emailed to you (respect the maximum size of emails)



# Foreign language support

- UTF-8 is the best choice for foreign language support
  - Default on Windows, SL6
  - SL5 users have to set `LANG=en_US.UTF-8` in `~/.i18n` (this has been done for you!)
  - Could be set as well in `~/.dmrc` (influences the window manager)
  - Foreign language characters will not be displayed with `LANG=C`
- Only english keyboards available
  - Foreign characters can be “composed” using the right “Alt” key (compose key)
    - ◆ R-Alt “ a becomes ä, R-Alt , c becomes ç etc.
  - A modifier can be configured (e.g. Win-Key) to type umlauts when holding it down
  - Keyboard options can be modified using the corresponding (Gnome) menu entry

# Web pages

- The official DESY web pages are at <http://www.desy.de>
  - Useful information spread over many pages (and several servers, partly maintained by user groups)
- A web page dedicated to the summer students is at <http://www-zeuthen.desy.de/students>
  - Here you will find the lecture material and other useful information
  - This web space can partly be filled and administered by you (interested students should ask us for details)
  - In [/afs/afh.de/www/doc/students/doc/2011](http://afs/afh.de/www/doc/students/doc/2011) web pages can be created
- Personal web pages can be created in addition
  - Its location is in AFS at `~/public/www` (a file `index.html` will be displayed by default)
  - The URL for these pages is <http://www-zeuthen.desy.de/~accountname>

# Outlook

- The next talk will cover working under (Scientific) Linux:
  - Selecting a Windowmanager, a shell
  - Working with the shell
  - The AFS file system
  - Working with files
  - Processes
  - Using the batch system
  - Publishing tools
  - Final remarks

Have a nice day, see you tomorrow