# Tutorat O SSH und PuTTY

# Organisatorisches

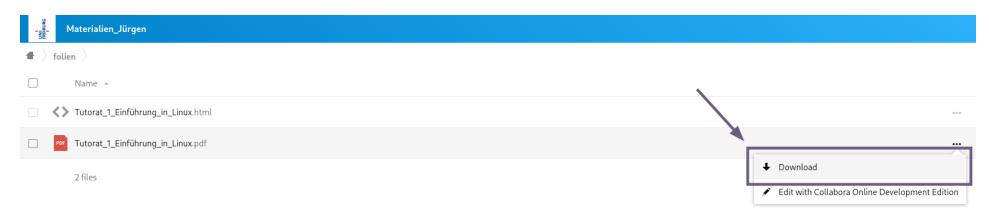


## Organisatorisches Studienleistung

- Anmeldezeitraum 18.10.2021 -12.02.2022
- Anmelden zur Studienleistung in HISinOne
- Voraussetzung zur Anmeldung zur Studienleistung ist Anmeldung zur Übung in HISinOne
- 12 von 15 Übungsblättern sinnvoll bearbeitet
- Regelmäßige aktive Teilnahme an den Tutoraten
  - aber keine Anwesenheitspflicht!
  - Vorrechnen freiwillig
- 🗪 zeigt einfach, dass ihr bemüht seid 👍

# Organisatorisches Tutorat und Materialien

- Uhrzeit: 8:15 bis 9:30 (8:00 s.t geht auch, da ich sowieso da bin)
- Materialien: <a href="https://nc.informatik.uni-freiburg.de/index.php/s/eWsZk9C5ceGTT44">https://nc.informatik.uni-freiburg.de/index.php/s/eWsZk9C5ceGTT44</a>



Folien downloaden

## Organisatorisches Feedback

https://forms.gle/2tGvF4ao5hAVNeRs5

#### Betriebssysteme Tutorat Gruppe 6

Anonyme Möglichkeit Kritik am Tutorat loszuwerden.

Willst du irgendwas zum Tutorat loswerden?

Das Tutorat ist ja sowas von unter aller Sau, sowas hab ich ja noch nie erlebt!

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Ich wünsche noch einen schönen Tag.

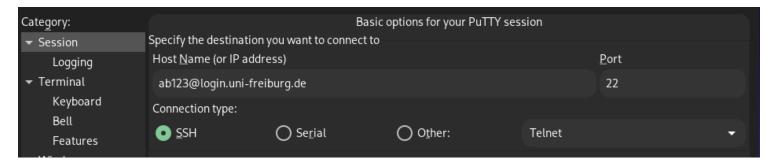
Senden

Alle Eingaben löschen



#### Mit Server verbinden über PuTTY

- Uni-Account: ssh ab123@login.uni-freiburg.de
  - Passwort, dass man bei HISinOne, Ilias usw. eingibt
- Poolaccount: ssh <poollogin>@login.informatik.uni-freiburg.de
  - Passwort, dass man an den PoolPC's eingibt
  - Zugriff auf Daten von Poolaccount möglch



**PuTTY** 

• zum Verlassen exit, logout, ctrl + d eingeben

#### Es sich bequem machen

~/.ssh/config:

```
HostName login.uni-freiburg.de
    Host uni
    User ab123
Host tf
HostName login.informatik.uni-freiburg.de
User <poollogin>
```

• ssh uni oder ssh tf und dann da enstprechende Passwort eingeben

# **SSH**SSH-Key generieren

- ssh-keygen -t rsa -b 4096 -C "username@servername.com" : generate a new SSH key. When "Enter a file in which to save the key" is prompted press Enter. This accepts the default filename. The passphrase can also be ignored with enter, thus a pasphrase doesn't have to be typed in everytime the ssh key gets used
- existing SSH keys in ~/.ssh
  - private key: ~/.ssh/id\_rsa
  - public key: ~/.ssh/id\_rsa.pub

#### SSH-Key für eine Zeit merken

- eval \$(ssh-agent -s): ensure the ssh-agent is running
- ssh-add ~/.ssh/id\_rsa: add SSH private key to the ssh-agent

# Keine Passwörter mehr bei SSH Verbindung (Public Key an Server weiterreichen)

- copy all: ssh-copy-id -i ~/.ssh/id\_rsa.pub username@servername.com
- copy single: scp ~/.ssh/id\_rsa.pub username@servername.com:~/.ssh/authorized\_keys
- add single:

```
cat ~/.ssh/id_rsa.pub | ssh username@servername "cat >> ~/.ssh/authorized_keys"
```

#### Keine Passwörter mehr für Git

- xclip < ~/.ssh/id\_rsa.pub : copy the SSH key to clipboard and paste with middle mouse button (primary clipboard) to website field (e.g. Github)
- Github: Account/Settings/SSH and GPG keys>New SSH key

#### **Mehrere Github Keys**

- nicht möglich zwei mal den gleichen Public Key für verschiedene Accounts
- ~/.ssh/config:

```
Host github.com
   Hostname github.com
   User git
   IdentityFile /home/areo/.ssh/id_rsa

Host github.com-2
   Hostname github.com
   User git
   IdentityFile /home/areo/.ssh/id_rsa_2
```

für zweiten Github Account:

```
• git clone git@github.com-2:<username>/<repository-name>.git
git remote (add/set-url) origin git@github.com-2:<username>/<repository-
name>.git
Betriebssysteme, Tutorat O, Gruppe 6, juergmatth@gmail.com, Universität Freiburg Technische Fakultät
```

#### Transfer file to server

- scp path/to/file.txt username@servername.com:~/folder
  - wie beim normalen cp ein Verzeichnis angeben

#### Print file from server

- lpr path/to/file.txt -PhpXX: print command
  - e.g. hp14 / hp15
- lpq -PhpXX: queue

# Vertiefungen



# Vertiefungen xclip

- xclip < ~/.ssh/id\_rsa.pub , xclip -i ~/.ssh/id\_rsa.pub oder echo "asdf" | xclip</pre>
- xclip -selection clipboard /etc/lsb-release (the usual clipboard)
  - primary (default) die primäre Auswahl (Kopie der letzten Markierung)





- secondary anwendungsspezifische Auswahl
- clipboard die eigentliche Zwischenablage
- xclip -o: print out clipboard
- copy image: xclip -selection clipboard -i /home/path/image.png -t image/png

# Vertiefungen Zugriffsrechte für ~/.ssh

- .ssh directory: 700 ( drwx-----)
- public key (.pub file): 644 ( -rw-r--r--)
- private key (id\_rsa): 600 ( -rw-----)
- home directory: at most 755 (drwxr-xr-x)
  - should not be writeable by the group or others
- and the home folder's user and group should be it's user and the user's group ( sudo chown areo:users ./Documents -R)
- (config and know\_hosts are both -r-----)

# Linux Überblick



## Linux Überblick Linux Facts

- Linus Torvalds + Unix → Linux, Tux: Maskottchen
  - Unix wurde August 1969 von Bell Laboratories (Forschungsabteilung der Telefongesellschaft AT&T) entwickelt
  - 1983 startete Richard Stallman das GNU-Projekt
  - 1991 begann Linus Torvalds mit der Entwicklung einer Terminal-Emulation, die sich zu einem Betriebssysteme entwickelte, welches er 1992 unter die GNU GPL stelle
- Verwendung: Server (Kubernetes), Android, "Year of the Linux Desktop"-Meme



## Linux Überblick GNU+Linux 1 von 2

• "To be fair, I'd just like to interject for a moment. What you're referring to as Linux, is in fact, GNU/Linux, or as I've recently taken to calling it, GNU plus Linux. Linux is not an operating system unto itself, but rather another free component of a fully functioning GNU system made useful by the GNU corelibs, shell utilities and vital system components comprising a full OS as defined by POSIX. Many computer users run a modified version of the GNU system every day, without realizing it. Through a peculiar turn of events, the version of GNU which is widely used today is often called "Linux", and many of its users are not aware that it is basically the GNU system, developed by the GNU Project. There really is a Linux, and these people are using it, but it is just a part of the system they use. [...]

## Linux Überblick GNU+Linux 2 von 2

• [...] Linux is the kernel: the program in the system that allocates the machine's resources to the other programs that you run. The kernel is an essential part of an operating system, but useless by itself; it can only function in the context of a complete operating system. Linux is normally used in combination with the GNU operating system: the whole system is basically GNU with Linux added, or GNU/Linux. All the so-called "Linux" distributions are really distributions of GNU/Linux."

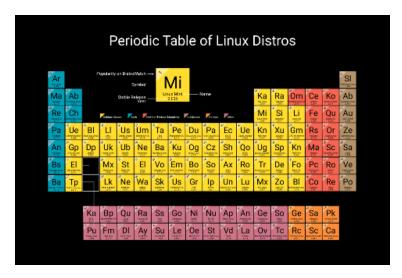
# Linux Überblick Linux in Zahlen



https://netmarketshare.com/operating-system-market-share

# Linux Überblick Begriffe 1 von 4

- Distributionen: Arch, Manjaro, Linux Mint, Ubuntu, NixOS, Debian, Gentoo, LFS
  - <a href="https://upload.wikimedia.org/wikipedia/commons/1/1b/Linux\_Distribution\_T">https://upload.wikimedia.org/wikipedia/commons/1/1b/Linux\_Distribution\_T</a> <a href="mailto:imeline.svg">imeline.svg</a>



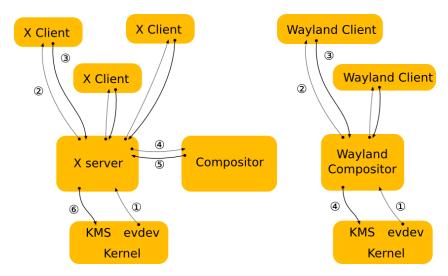
https://distrowatch.com/dwres.php?resource=family-tree

# Linux Überblick Begriffe 2 von 4

- Desktopenvironment: KDE, Gnome, Cinnamon, XFCE, Deepin
  - Window manager: → Fenster managen
    - i3, dwm, Bspwm, KWin (KDE), Qtile, awesome
    - Stacking, Tiling, Dynamic window manager
- Package Manager: pacman, yay (AUR), apt, nix, [...] sudo make install
- Terminal vs Terminal Emulator ( Alacritty, Kitty, urxvt (rxvt-unicode), Yakuake, Guake)
  - Early user terminals connected to computers were electromechanical teleprinters/teletypewriters (TeleTYpewriter, TTY)
  - change tty: ctrl + alt + fX
    - if one is already in a tty one can just use alt + left/right arrow
  - Shell: Zsh, Bash, Fish, (Powershell, Batch → Windows), später mehr dazu

# Linux Überblick Begriffe 3 von 4

- X11: → Netzwerkprotokoll
  - Compositor ⇒ Eye-Candy's für Fenster, finaler Zeichenschritt
  - Picom (fork of Compton), Compiz
- Wayland: → Display-Server-Protokoll



https://www.secjuice.com/wayland-vs-xorg/

# Linux Überblick Begriffe 4 von 4

- **Displaymanager/Loginmanager:** LightDM, GDM (GNOME display manager)
  - displayed at the end of the boot process in place of the default shell
  - starts the display server and loads the desktop environment right after username and password were entered
  - xorg-xinit: xinit program allows a user to manually start an **Xorg display** server, startx (front-end for xinit)
  - xinit-xsession (AUR): provide an option to run ~/.xinitrc as a session with startx
- GTK (lxappereance) vs QT (qt5ct, kvantummanger)
- Pulseaudio: pavucontrol (GTK and QT), pulsemixer (curses)
  - Alsa: alsamixer (alsa-utils package)
- Initsystem: systemd, OpenRC

# Quellen



# Quellen Wissensquellen

• Multiple Github Keys: <a href="https://www.cluemediator.com/multiple-ssh-keys-for-different-github-accounts">https://www.cluemediator.com/multiple-ssh-keys-for-different-github-accounts</a>

#### Bildquellen

- Tux: By Maxo based opoun the work File:Tux-G2.png Own work based uppon the work File:Tux-G2.png, Public Domain, <a href="https://commons.wikimedia.org/w/index.php?curid=10524355">https://commons.wikimedia.org/w/index.php?curid=10524355</a>
- Fuck u Nvidea: <a href="http://lininuxrookies.blogspot.com/2013/06/linus-torvalds-descarga-su-furia-contra.html">http://lininuxrookies.blogspot.com/2013/06/linus-torvalds-descarga-su-furia-contra.html</a>

# Vielen Dank für eure Aufmerksamkeit!

