



Berner Fachhochschule
Haute école spécialisée bernoise
Bern University of Applied Sciences

LFE-Demandmanagement Workshop G

Thursday, 5th November 2019 17:00

Bewegungslabor, Stadbachstrasse Bern

Team Linux Services, IT-Services

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BFH.science Introduction

Overview

Traditional IT

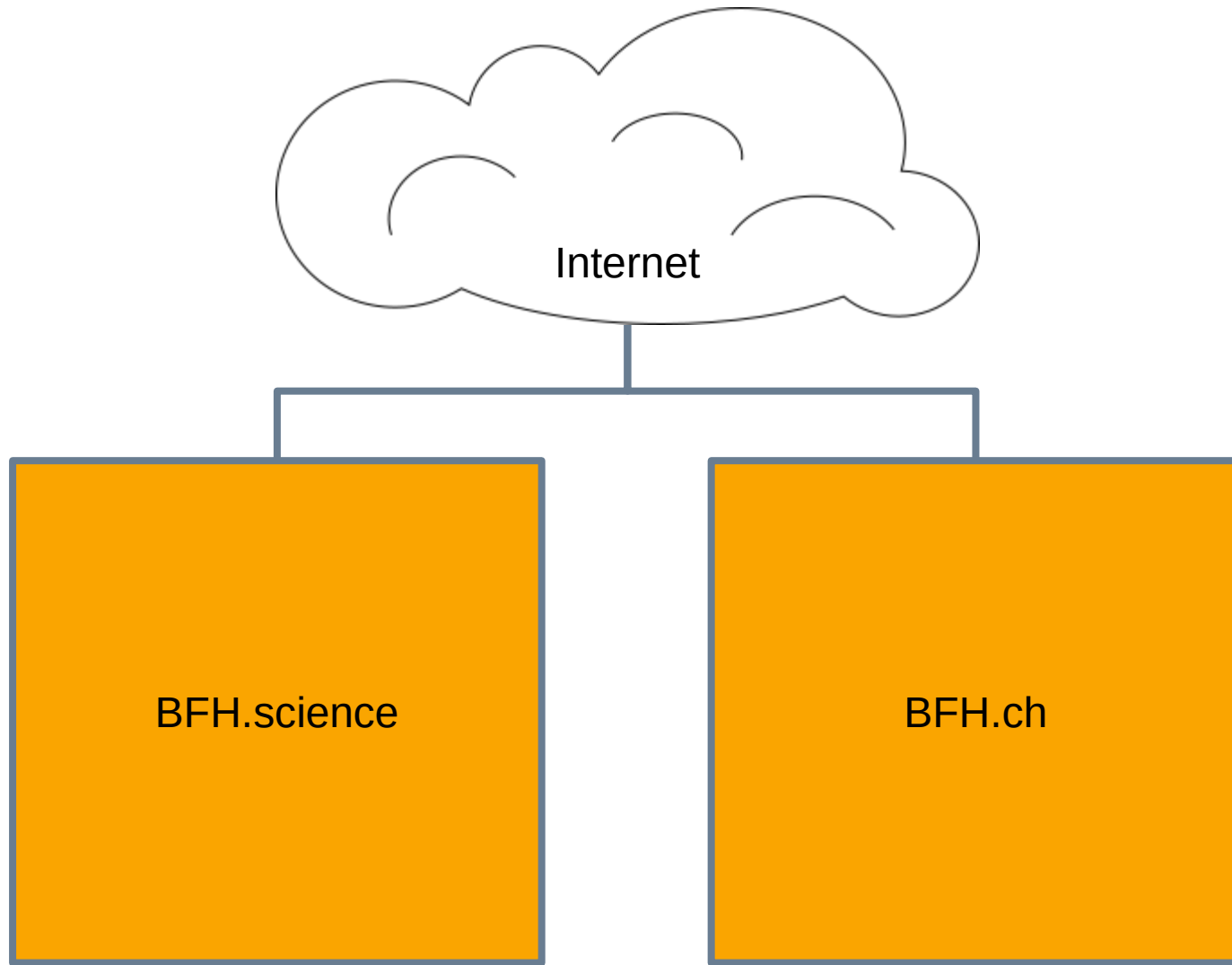
- ▶ Managed clients („you cannot install any software on your computer“)
- ▶ Network behind firewall (access from outside the organisation via VPN)
- ▶ *Taylored towards the needs of office workers*

LFE (Lehre, Forschung, Entwicklung)

- ▶ Install software („quickly try a new program“)
- ▶ Accessible from outside (example: send sensor data to a server)
- ▶ Store large amounts of data, number crunching
- ▶ *Needs flexibility*

Separation

- ▶ Traditional IT: bfh.ch
- ▶ Science DMZ: bfh.science



Science DMZ: bfh.science

- ▶ Different hardware servers
- ▶ Different Infrastructure:
 - Different network (no connection between bfh.science and bfh.ch)
 - Different storage (\\bfh.ch\data\LFE*)
 - Built on Linux (flexibility and scailability)
- => maximum flexibility for you
- ▶ Full stack automatisation
 - => fast response to your demands
- ▶ Initially a lot of work for us.
 - Hardware (servers, cables,...)
 - Software (design, configuration, automatisation,...)



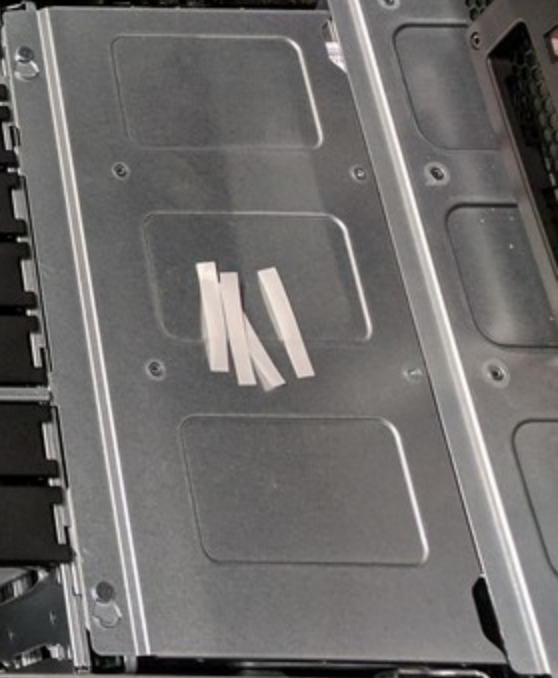
(3.86PB of HDDs)



| | | | | | |
|------------|----|------------|----|------------|----|
| Drive # 01 | 20 | Drive # 18 | 35 | Drive # 32 | 49 |
| Drive # 02 | 21 | Drive # 19 | 36 | Drive # 33 | 50 |
| Drive # 03 | 22 | Drive # 20 | 37 | Drive # 34 | 51 |
| Drive # 04 | 23 | Drive # 21 | 38 | Drive # 35 | 52 |
| Drive # 05 | 24 | Drive # 22 | 39 | Drive # 36 | 53 |
| Drive # 06 | 25 | Drive # 23 | 40 | Drive # 37 | 54 |
| Drive # 07 | 26 | Drive # 24 | 41 | Drive # 38 | 55 |
| Drive # 08 | 27 | Drive # 25 | 42 | Drive # 39 | 56 |
| Drive # 09 | 28 | Drive # 26 | 43 | Drive # 40 | 57 |
| Drive # 10 | 29 | Drive # 27 | 44 | Drive # 41 | 58 |
| Drive # 11 | 30 | Drive # 28 | 45 | Drive # 42 | 59 |
| Drive # 12 | 31 | Drive # 29 | 46 | Drive # 43 | 60 |
| Drive # 13 | 32 | Drive # 30 | 47 | Drive # 44 | 61 |
| Drive # 14 | 33 | Drive # 31 | 48 | Drive # 45 | 62 |
| Drive # 15 | 34 | Drive # 32 | 49 | Drive # 46 | 63 |
| Drive # 16 | 35 | Drive # 33 | 50 | Drive # 47 | 64 |
| Drive # 17 | 36 | Drive # 34 | 51 | Drive # 48 | 65 |



| | | | |
|-------------|-------------|-------------|-------------|
| ST: ZA28X0M | ST: ZA28X0L | ST: ZA28X0S | ST: ZA28X0A |
| ST: ZA28X0G | ST: ZA28X0W | ST: ZA28X07 | ST: ZA28X0P |
| ST: ZA28X0C | ST: ZA28X0H | ST: ZA28X0T | ST: ZA28X0K |
| ST: ZA28X0A | ST: ZA28X0E | ST: ZA28X0K | ST: ZA28X0L |
| ST: ZA28X0V | ST: ZA28X0Q | ST: ZA28X0K | ST: ZA28X0L |
| ST: ZA28X0J | ST: ZA28X0R | ST: ZA28X0K | ST: ZA28X0L |
| ST: ZA28X0Y | ST: ZA28X0P | ST: ZA28X0K | ST: ZA28X0L |
| ST: ZA28X0B | ST: ZA28X0E | ST: ZA28X0K | ST: ZA28X0L |
| ST: ZA28X0I | ST: ZA28X0K | ST: ZA28X0K | ST: ZA28X0L |
| ST: ZA28X0Q | ST: ZA28X0J | ST: ZA28X0K | ST: ZA28X0L |
| ST: ZA28X0C | ST: ZA28X0C | ST: ZA28X0Y | ST: ZA28X0Y |
| ST: ZA28X0K | ST: ZA28T0Y | ST: ZA28X0S | ST: ZA28V1E |
| ST: ZA28X0Z | ST: ZA28X0S | ST: ZA28X0V | ST: ZA28X0Q |
| ST: ZA28X0H | ST: ZA28X0V | ST: ZA28X0E | |









*Imagine photos of software configuration
here*

Timeline

2019

- ▶ January: Start
- ▶ Network („Internet access“)
- ▶ Basic services („What is needed to install Linux servers“)
- ▶ Storage („Ceph cluster“)
- ▶ Linux („Platform for R“)
- ▶ Number cruncher („R“)
- ▶ Nextcloud („Fileshare“, like SWITCHdrive or Dropbox)

2020

- ▶ Cloud / Virtualisation („Click your own server“)
- ▶ ... *Tbd*

See: <https://timeline.bfh.science/> for more details

Nextcloud Introduction

Overview

Filesharing

- ▶ General, ways to go
- ▶ Alternatives

Nextcloud

- ▶ Demo
- ▶ Prospect

Filesharing - General



?

Filesharing - Ways-to-go



- attachment too big
- considered as spam
- asynchronous handling
- inconsistency

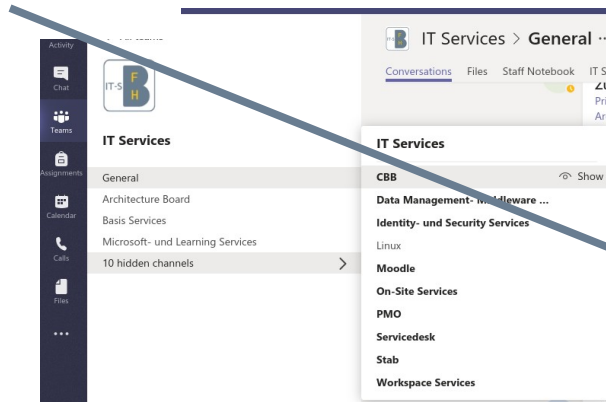


Laufwerk P:

Das Laufwerk P: dient zur Ablage der elektronischen Dateien, die bei der täglichen Arbeit anfallen.

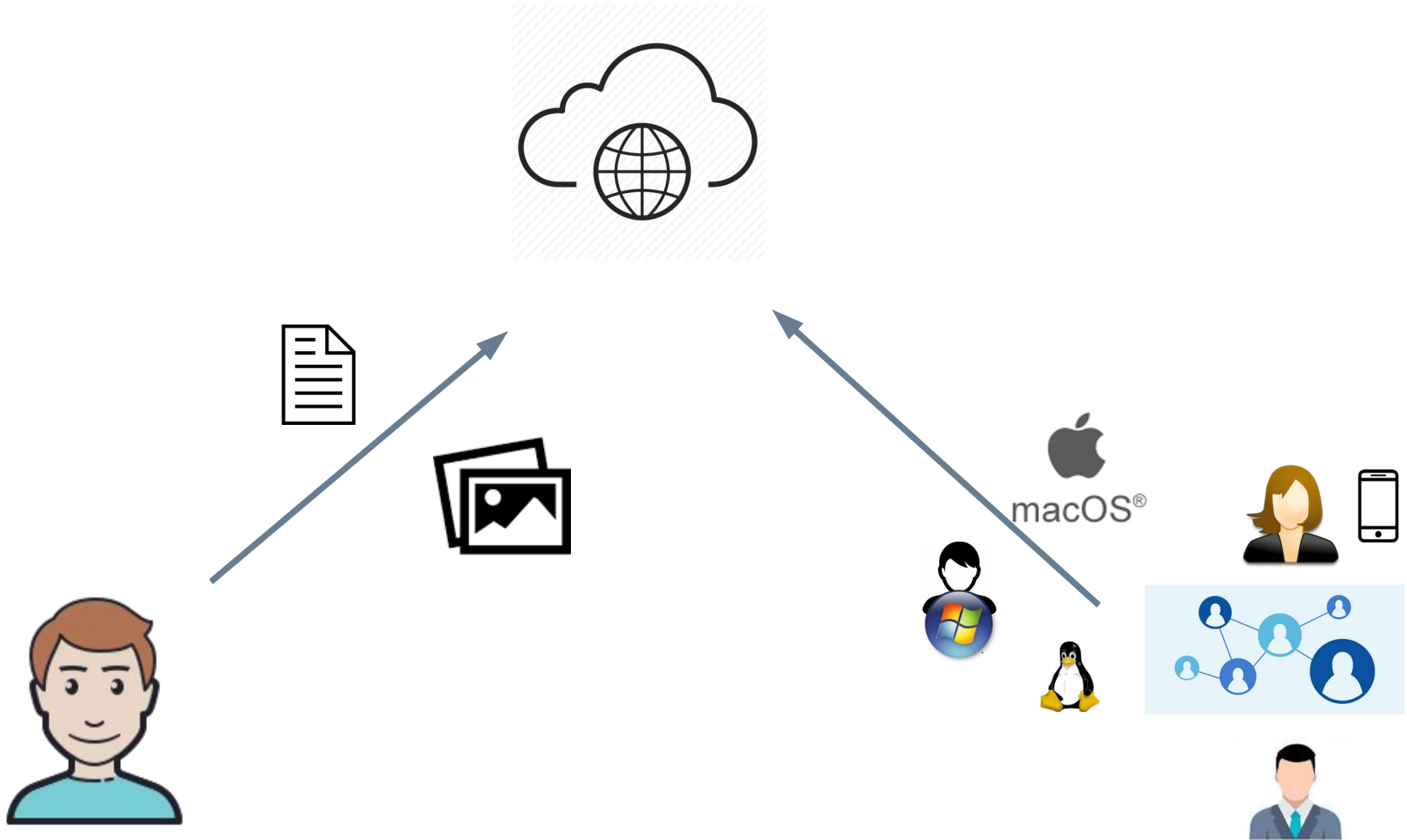
Ziel!
Die Mitarbeiterinnen und Mitarbeiter der HAFL sollen die Dateien auf der Ablage P: finden und darauf zuzurufen können

```
sudo mount -t cifs //bfh.ch/data /mnt user=  
sudo mount -t nfs 147.87.244.61:/Users/d/mnt
```



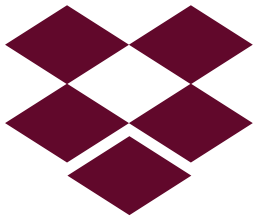
Who is who ?

Filesharing - Ways-to-go



Filesharing - Alternatives

Cloud solutions



Nextcloud - Demo



- Demo internal setup

The screenshot shows the Nextcloud file manager interface. On the left, there is a sidebar with navigation options: All files, Recent, Favorites, Shares, and Tags. The main area displays a file list with columns for Name, Size, and Modified. The files listed are:

| Name | Size | Modified |
|---------------------------|----------|---------------|
| BOOKS | 348.4 MB | 2 days ago |
| CONFIG | 0 KB | 3 days ago |
| Documents | 2.5 MB | 7 days ago |
| HowTos | 11.2 MB | 3 days ago |
| Scripts | 6 KB | 2 days ago |
| 0_bfhcloud.jpeg | 130 KB | 3 minutes ago |
| Lenovo-driver-updater.exe | 12.5 MB | 7 days ago |
| Nextcloud Manual.pdf | 6.4 MB | 7 days ago |

At the bottom of the file list, it shows: 5 folders and 4 files (including 1 hidden) 381.1 MB. In the bottom left corner, there is a 'Deleted files' section and a storage usage indicator: 381 MB used.

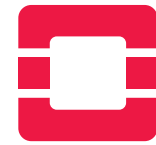
Prospect

- Test setup refinement
- Rollout in production



OpenStack Introduction

OpenStack



openstack®

- ▶ Virtualisation
- ▶ Private cloud
- ▶ Self service

Virtualisation



Now

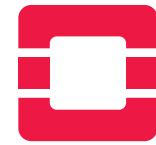
- ▶ „Only“ containers and only Debian

Virtualisation

- ▶ Like VirtualBox and VMware
- ▶ OpenStack allows to run any Linux distribution and Windows the Science DMZ

However, in a first step we will only support Debian!

Private Cloud



openstack®

- ▶ „Having the benefits of a cloud in-house“
- ▶ Manage OpenStack resources as users or groups
- ▶ Cheap and uncomplicated (no billing involved)
- ▶ Fast because everything is close together (Network: High bandwidth and low latency)



- ▶ „Easier and faster for you, better for us“
- ▶ The process is:
 - Login to dashboard with BFH credentials
 - Select what you want (name, public/private, resources, operating system)
 - Click „create“, a few seconds later the „virtual computer“ is ready for you
- ▶ For this to work, behind the scenes some tasks have to be done
- ▶ For containers you have to wait for us to create them, with OpenStack you can do it on your own.

Project time

Available resources

For the period 1. April - 31. July 2020

- ▶ Team Linux (bad9, dxk1, kud3, nas3, shs1) only.
- ▶ For each person: estimated days per week available for projects (=new things we do for you).
- ▶ Subtract holidays and infrastructure maintenance.
- ▶ There is a **total of 20 weeks worktime** available for projects of BFH for this period.
(we count everything in weeks)
- ▶ We will distribute the 20 weeks according to size and users among the BFH departments.
- ▶ You prioritize what we will do in this time for you

Zielperiode: 1. April 2020 bis 31. Juli 2020 = 17 Wochen

| Person | Job | Project work (day/week) | Project time (days) | Project time (weeks) |
|---------------|----------------|--------------------------------|----------------------------|-----------------------------|
| bad9 | 100.00% | 1 | 17 | 3 |
| dxk1 | 90.00% | 3 | 51 | 10 |
| kud3 | 100.00% | 3 | 51 | 10 |
| nas3 | 60.00% | 2 | 34 | 6 |
| shs1 | 80.00% | 3 | 51 | 10 |
| Brutto | 430.00% | | | 39 Weeks |

| Tasks | Work | |
|-------------------------|---------------------|-----------------|
| Holiday proportionately | 1.5w/Person/Quarter | - 8 Weeks |
| Debian infrastructure | 1d/w | - 3 Weeks |
| Base infrascructure | 2d/m | - 2 Weeks |
| other work | | - 6 Weeks |
| Netto | | 20 Weeks |

Thank You for Your Attention.

♥ Source Code is freely available

```
git clone https://git.bfh.science/users/bad9/slides
```