

INTRODUCTION TO LINUX

(in an HPC context)

Version 20.09 | HPC.NRW Competence Network

USERS AND PERMISSIONS

HPC.NRW Competence Network

INTRODUCTION TO LINUX

- Linux is a *multi-user* system
 - Everyone should only be able to access own files
 - Others only see / change what you want them to
 - Some files / directories should only be accessible to admins
- Everyone is logged in as a specific user (account)
 - Every user has certain permissions
- Only admins can set permissions for others

Each file and directory has certain permissions

- Determines what you can do
 - *You can't break what you can't use!*
- `root` user (superuser) can do everything
- Users may get temporary root permissions
 - `sudo <Command>`
- Users belong to groups
 - *Each user has a primary group*

- Read:
 - Who can read contents of file/directory
- Write:
 - Who can change contents of file/directory
- Execute:
 - File: who can execute file (like any program)
 - Directory: who can traverse directory
 - Can execute files inside but not see them

EXAMPLE OUTPUT OF LS -L

Is it a file, link (`l`) or directory (`d`)?

Permissions (not covered: sticky bit, setuid, setgid)

Number of links to this

Owner

Owning group

Size (directories: not size of files inside)

Last modified

Filename

```
[js056352@login1 linux_demo]$ ll
insgesamt 8
```

-rwxr--r--	1	js056352	hpc-gpr-hiwis	85	15. Jan 2019	demofile1.sh
lrwxrwxrwx	1	js056352	hpc-gpr-hiwis	12	15. Jan 2019	ln demo -> demofile1.sh
drwxr-xr-x	2	js056352	hpc-gpr-hiwis	4096	15. Jan 2019	testdir3
-rw-r--r--	1	js056352	hpc-gpr-hiwis	6	15. Jan 2019	var.txt

```
drwxr-xr-x 2 js056352 hpc-gpr-hiwis
-rw-r--r-- 1 js056352 hpc-gpr-hiwis
```

Other (o)

User (u)

Group (g)

- (-) not set
- (r) read
- (w) write
- (x) execute

- Modify owner/group (needs `root`):
 - `chown <NewOwner> <filename>`
 - `chown <NewOwner>:<NewGroup> <filename>`
- Modify permissions:
 - `chmod u+x <Filename>`
`u` = User, `g` = Group, `o` = Other, `a` = All
`+` or `-`
`r` = Read, `w` = Write, `x` = Execute