Why is my home directory full?
(and what to do about it)

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Home directory ($HOME) in a nutshell

- Path: /users/<username>

- Size: 10 GiB/100 000 files
  - Can not be expanded

- User specific
  - /projappl and /scratch shared by all project member

- Server specific
  - Different home directory on each server (Puhti, Mahti, LUMI)

- Meant for configuration files and other minor personal data
  - Software installations should typically go to /projappl
  - Data should go to /scratch

- Full home directory can cause various problems

Checking quotas

- A quick way to check the current situation is command

```
csc-workspaces
```

```
Disk area              Capacity(used/max)   Files(used/max)
----------------------------------------------------------
Personal home folder

/users/example                  7.8G/10G          69K/100K
----------------------------------------------------------
Project: project_12345 "Example project"

/projappl/project_12345       30M/50G            30/100K
/scratch/project_12345        182M/1.0T        2.3K/1.0M
----------------------------------------------------------
```

Where are all the files?

- Home directory has many "hidden" files and directories

- Files and directories with names starting with a dot are not shown by default by the `ls` command

- Use option `-a` to view them

  Show all files:
  ```
  ls -a
  ```
  Show details for all files:
  ```
  ls -la
  ```
  Show details for all files, sort by time, newest last
  ```
  ls -latr
  ```

Exploring home directory with LUE

- Available as a module: `module load lue`

- Faster than system tools like `stat` or `du`
  - Also puts less load on the file system

- Builds a cache when first run, so any further runs with different options fast
  - Can be rebuilt with option `--refresh`

- Some limitations: See <u>documentation</u> for details

LUE examples

```
lue $HOME

    path, total size, in dir size, % of total, % of dir

    --------------------------------------------------

    /users/example          7.2GB  57MB  100.0 100.0 NOSIZE:72
        .cache              3.8GB  52KB  53.44 53.44


lue --display-level=2 $HOME

    path, total size, in dir size, % of total, % of dir

    --------------------------------------------------

    /users/example          7.2GB  57MB  100.0 100.0
        .cache              3.8GB  52KB  53.44 53.44
            pip             3.6GB  16KB  50.6  94.68
```

.apptainer

- Temporary files for Apptainer

- Can be deleted

- Just delete the contents or use command

```
apptainer cache clean
```

- To avoid using home directory, set variables **$APPTAINER_TMPDIR** and **$APPTAINER_CACHEDIR**, *e.g*:

```
export APPTAINER_TMPDIR=/scratch/project_12345/apptainer

export APPTAINER_CACHEDIR=/scratch/project_12345/apptainer
```

.cache

- Semi-temporary files various programs save to make possible future access faster
  - Common programs taking a lot of storage include Python `pip`
- Can be removed
  - If necessary, will be downloaded/rebuilt
- Some software can be configured to use some other directory than home

.local

- Various self-installed applications and libraries

- Deleting can break existing installations
  - Move or re-install
  - Moving may involve setting/changing some environment variables, *e.g.* **$PATH, $PYTHONPATH**, **$PYTHONUSERBASE**, **$PERL5LIB** *etc.*

- Use *e.g. /projappl* instead
  - You can use <u>Tykky</u> tool to make self-contained, easy to move installations
  - For Python use `venv` or set **$PYTHONUSERBASE** and use `pip install --user`
    - Detailed instructions in <u>Python documentation</u>
  - For R set **libpath** to point to installation directory
    - Detailed instructions in <u>r-env documentation</u>

The short version

1. Check situation with command `csc-workspaces`

2. Use LUE toool to see where the data is

3. Delete files/directories as necessary
   1. If unsure what can be deleted, contact servicedesk@csc.fi

4. Going forward, avoid using home directory for things that take a lot of storage

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