CernVM-FS tutorial

6th EasyBuild User Meeting (EUM'21)

Jan 26-29 2021

https://cvmfs-contrib.github.io/cvmfs-tutorial-2021

https://easybuild.io/eum/#cvmfs-tutorial

Sessions

- [Mon Jan 25 2021, 17:00-17:30 UTC] **Introductory presentation** at EUM'21 *(by Jakob Blomer, CERN)*
  See https://www.youtube.com/watch?v=lxZLS3O9wo4

- [Tue Jan 26 2021, 09:00-10:00 UTC] **CernVM-FS tutorial (part 1/4)**
  - 0. Azure resources
  - 1. Quick CernVM-FS introduction (concepts and terminology)
  - 2. Stratum-0 and client access
  - *hands-on exercise*

- [Wed Jan 27 2021, 09:00-10:00 UTC] **CernVM-FS tutorial (part 2/4)**
  - 3. Stratum-1 + proxies
  - *hands-on exercise*

- [Thu Jan 28 2021, 09:00-10:00 UTC] **CernVM-FS tutorial (part 3/4)**
  - 4. Publishing
  - *hands-on exercise*

- [Fri Jan 29 2021, 09:00-10:00 UTC] **CernVM-FS tutorial (part 4/4)**
  - 5. Advanced topics

problems?

Support available throughout the day, via:

`#eum21-cvmfs-tutorial` in EasyBuild Slack

Email: eum@lists.ugent.be

If necessary, an additional Zoom call can be set up

Q&A at end of each live session

0. Azure resources

https://cvmfs-contrib.github.io/cvmfs-tutorial-2021/00_azure_cloud_resources

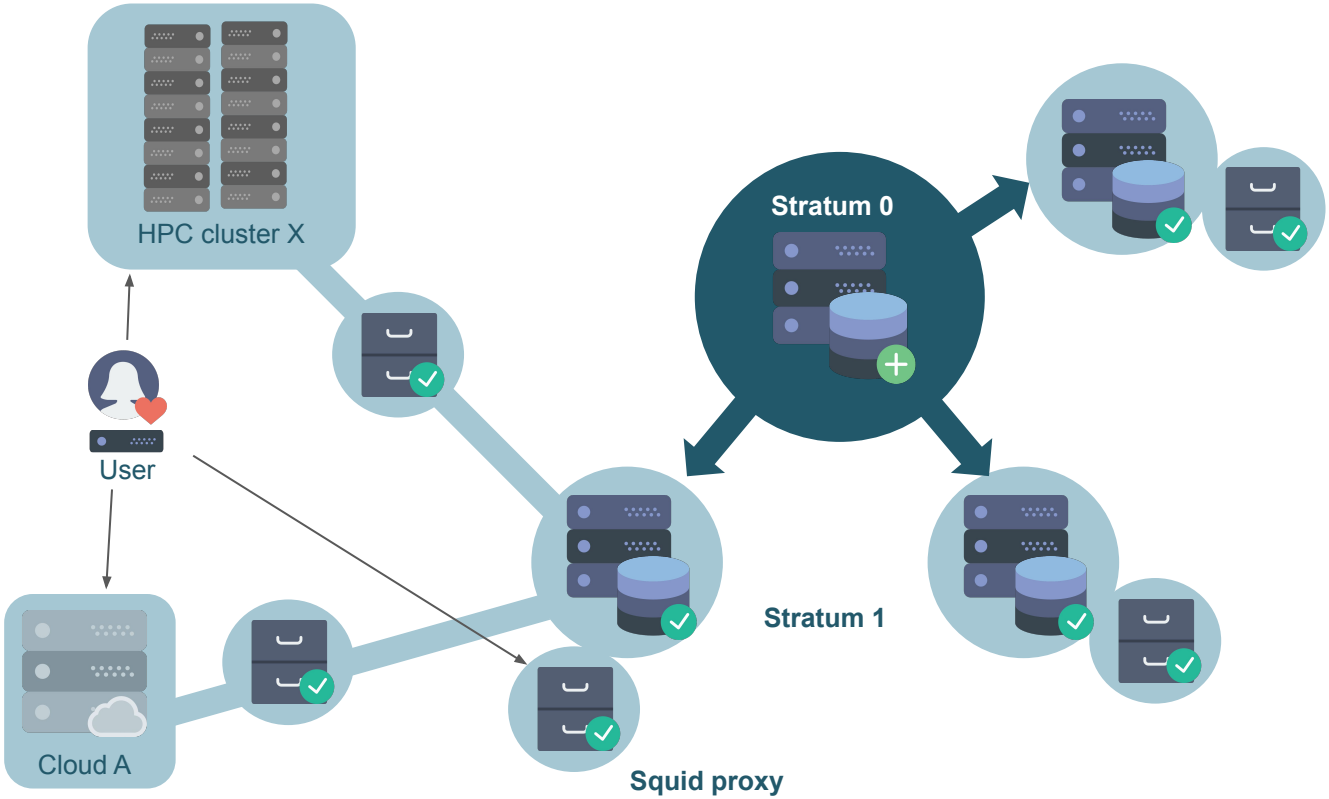
0. **Log in to CycleCloud** via https://cvmfstutorial.westeurope.cloudapp.azure.com
    - Use personal credentials (see email) + pick new password (and remember it!)
1. Add your **SSH public key** (must be RSA!)
2. **Start cluster** (and keep it running until you're done with all exercises)
    - IP addresses are NOT fixed, and will change on reboot

If you experience any problems, let us know (via eum@lists.ugent.be or Slack)!

Sponsored by Microsoft Azure

1. CernVM-FS introduction

https://cvmfs-contrib.github.io/cvmfs-tutorial-2021/01_introduction



CernVM-FS

(icons via https://www.flaticon.com/authors/smashicons)

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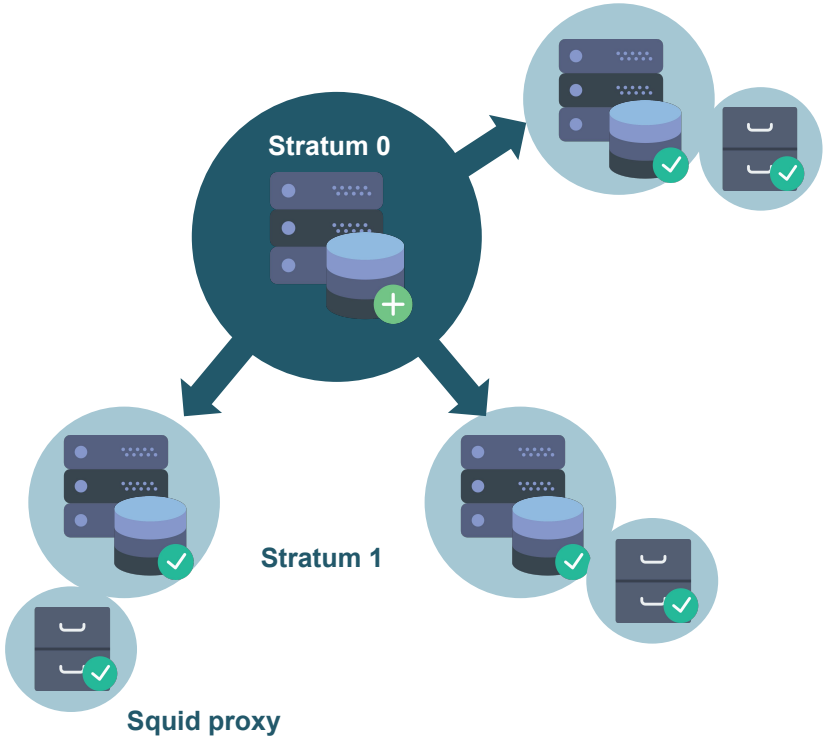

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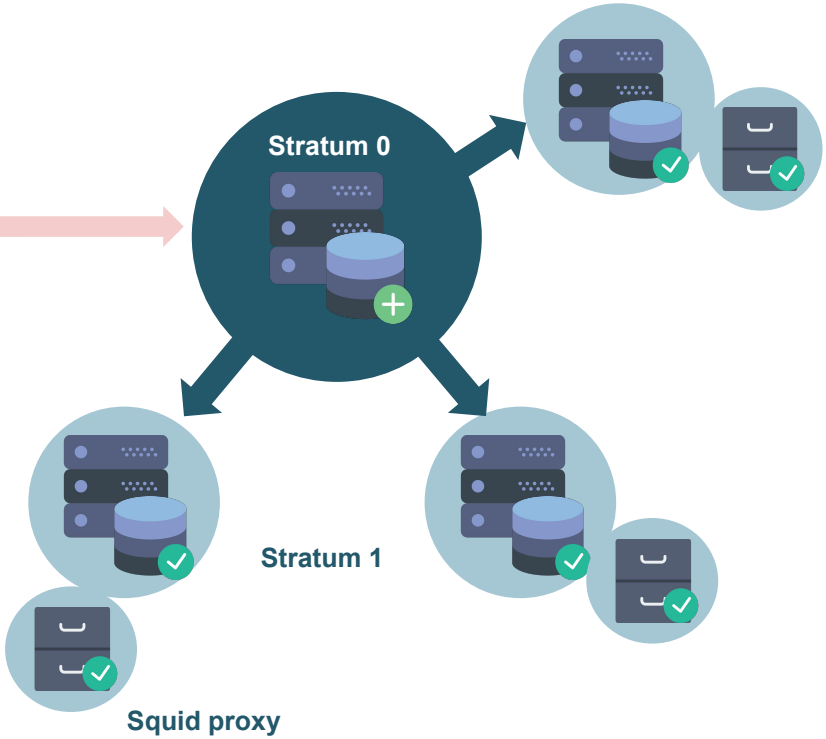
Stratum 0

- Central server
- **Only one**
- Hosts CVMFS “repositories”
- New software is added here
- Usually restricted access



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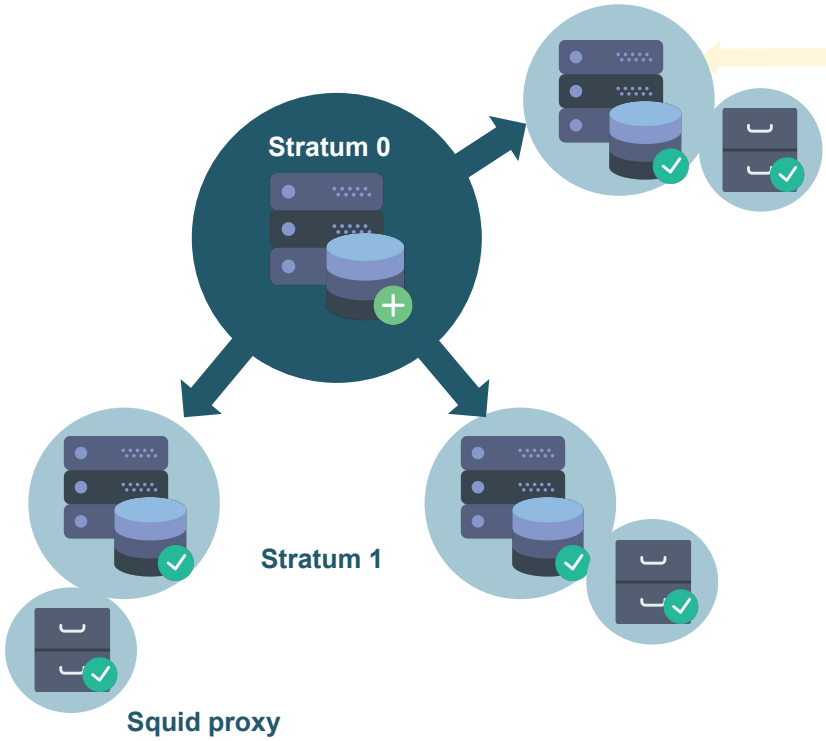

Stratum 1

- CernVM-FS “replica”
- Full copy of repositories (mirror)
- **Read-only**
- **Multiple servers**
- Geographically distributed
- Standard web server (HTTP)
- Reduce load on Stratum 0
- Improve reliability
- Clients *may* connect here

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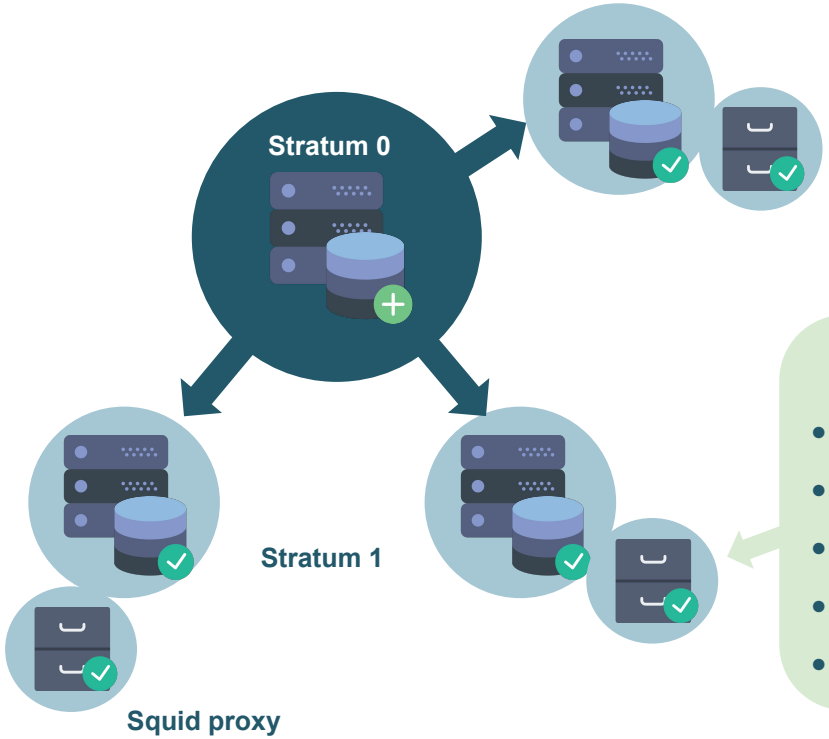

Squid proxy

- Reverse proxy for Stratum 1 servers
- Caching to improve client I/O performance
- Reduce load on Stratum 1 servers
- Can be used for load balancing
- Clients usually connect to one of these

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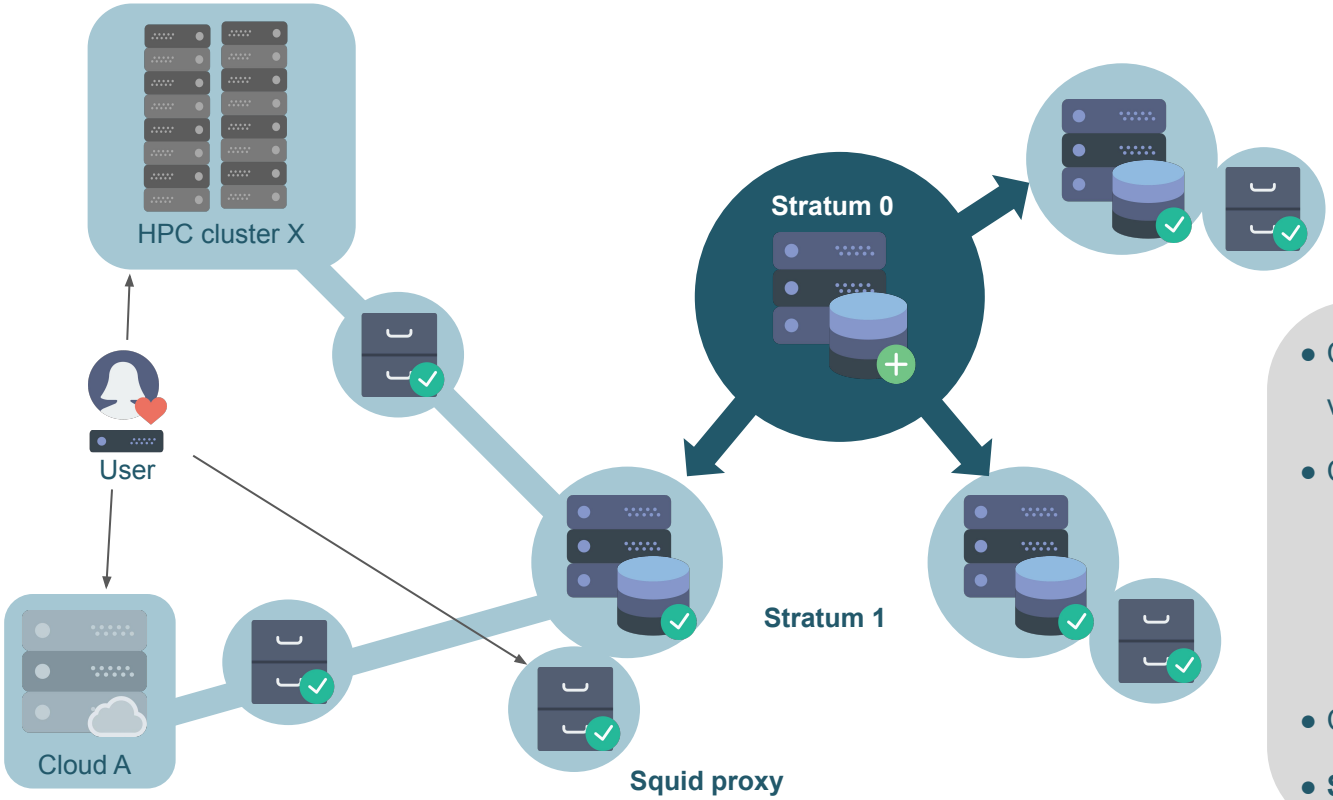

- Clients access software stack via (squid proxy of) a Stratum 1
- Clients include:
  - Laptops
  - Personal workstations
  - HPC clusters
  - Cloud instances
- Clients also use local filesystem cache
- **Same software stack everywhere!**

2. Getting started: Stratum 0 and client

https://cvmfs-contrib.github.io/cvmfs-tutorial-2021/02_stratum0_client

CernVM-FS

- Deploy a fully operational Stratum 0 server
- Make a repository
- Add a file
- Set up a client that connects to the Stratum 0

  (WARNING: you should not do this in production!)
- Exercise