



CESNET E-INFRASTRUCTURE SERVICES

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CESNET

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■ CESNET Association

- founded 1996 – universities, Academy of Science
- originally as a network provider (NREN)
- Large Infrastructure since 2011
- today CESNET e-Infrastructure

■ coordinator of the national e-infra

- + CERIT-SC (MUNI) + IT4I (VŠB-TUO)

■ national representative in EOSC

■ 300+ user organisations

- potentially 450k+ individual users
- “private network”—only AUP-compliant users

■ CESNET as a research organisation

- taking part in international projects
- aimed at infrastructure development

- common communication infrastructure
- data services
 - data storage
 - intensive computing environment
 - IT4I
 - MetaCentrum
 - CERIT-SC
- collaborative environment

- academic backbone network
 - core 400Gbit/s
- in-house operations and equipment
 - leased dark fibre
- connection to partners and to the public Internet

- MetaCentrum: collection of community computation resources
- grid + cloud + MapReduce
- applications
- open access to computation resources
 - larger share for “publications with acknowledgements”
- CERIT-SC: computation resources, cooperation with user groups
- IT4I: “classic” supercomputing centre

- videoconferencing, webconferencing, streaming, video archives
- special video transmissions and visualisations
- IP telephony

- typical use cases
- data storage services
- and infrastructure
 - distributed throughout the Czech Republic (Plzeň, Jihlava, Brno, Ostrava)
 - hierarchical storage
 - disk arrays
 - object storage
 - currently about 67 PB physical space in total

- users prefer keeping data on their devices...
 - no guarantee of long term storage
 - unsuitable media, lack of systematic care
 - data should reside in a living system
- resource consolidation—national storage for scientific data
 - allowing to have reasonably sized resources
 - operated by a specialised team
 - supporting sharing data throughout institutions

- data is treated as a bit-stream
 - storage facility operator does not understand the meaning of the data
 - cannot curate the data
 - preserving the bit-stream is a basis for full Long-Term Preservation (LTP)
 - multiple copies, geographical replicas, system redundancy, checksums
 - curation is (must be) a role of the user group

- FileSender: web service for simple transfer of (large) files
 - “large”: currently 500GB
- we’re active in development of the tool
- <http://filesender.cesnet.cz>
- at least one side of the transfer must be an eligible infra user
 - i.e. using eduID.cz federation
- uploading a file sends a download link
- invitation to upload a file

- searching for a tool to
 - synchronise data between computers
 - and mobile devices
 - have them accessible through web
 - be able to share the data
- and the data is not very big
- ~→ownCloud

- sync'n'share (“cloud”) storage
 - for personal computers (Windows, Linux, Mac OS X)
 - mobile apps for Android and Apple (client under EUR 1)
 - and a web interface
- data is synchronised to server
 - and kept locally on computers
 - downloaded on demand on mobile devices
- data can be shared
 - to another user and/or “by link”
- register at <http://owncloud.cesnet.cz>
- 100GB limit per user by default

■ file system access

- NFSv4
- rsync, scp, FTPS
- usually through Kerberos
- GUI and CLI clients for all platforms available
- CIFS (“Windows network disk”)
- Globus—high-speed transfers

- file system, individual data, TB range
 - available through registration on <http://du.cesnet.cz>
 - code name VO Storage
- requirements exceeding that \rightsquigarrow special Virtual Organisation
 - we need to understand the requirements and use cases
 - discuss storage parameters
 - we prepare the facility
 - user management delegated to the user group

- Ceph technology
- we operate
 - RBD for backups
 - S3 for individual users and backups
 - file system emulation
- access control similar to file storage
- allows for easy integration of user group storage resources

- repository for guaranteed long-term storage
 - binary-safe storage
 - accepting Archival Information Packages (OAIS)
 - that is verified in regular intervals
 - audited
 - errors are corrected from other package replicas
- can be used as a bit-safe storage for full OAIS repository

- in preparation
 - together with the National Library of Technology and Uni. of Chemistry and Technology Prague
- classic OA repository for publications
 - long-tail
 - including metadata
- gradually for scientific data as well
 - support for large data
 - including metadata
- integrated in the national e-infrastructure
- supporting specialised user interfaces tailored for scientific field needs

- computation environment—MetaCentrum
- collaborative environment
- storage services
 - transferring files—FileSender
 - sync'n'share—ownCloud
 - standard file and object storage
 - long-term binary guaranteed storage
 - OpenAccess repository (under development)

- <http://du.cesnet.cz>
- user support: support@cesnet.cz