

# *CESNET's Approach to e-Infrastructure Users*

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## *Presentation overview*

- 1. Infrastructure Environment for R&D in CZ*
- 2. Basic Facts about CESNET, a.l.e.*
- 3. Service Portfolio*
- 4. Approach to Users*
- 5. Implementation of AAI (Perun)*

# *Infrastructure Environment for R&D in CZ*

Comprehensive evaluation of research infrastructures of the Czech Republic in 2014 and 2015 by the International Evaluation Committee

2 stage approach:

the 1st stage of all evaluation was carried by the 6 Scientific Boards

the 2nd stage of evaluation

- international peer-review
- independent expert opinion
- interview with research infrastructure management

Conclusions: 58 infrastructures positively evaluated

42 infrastructures recommended for funding

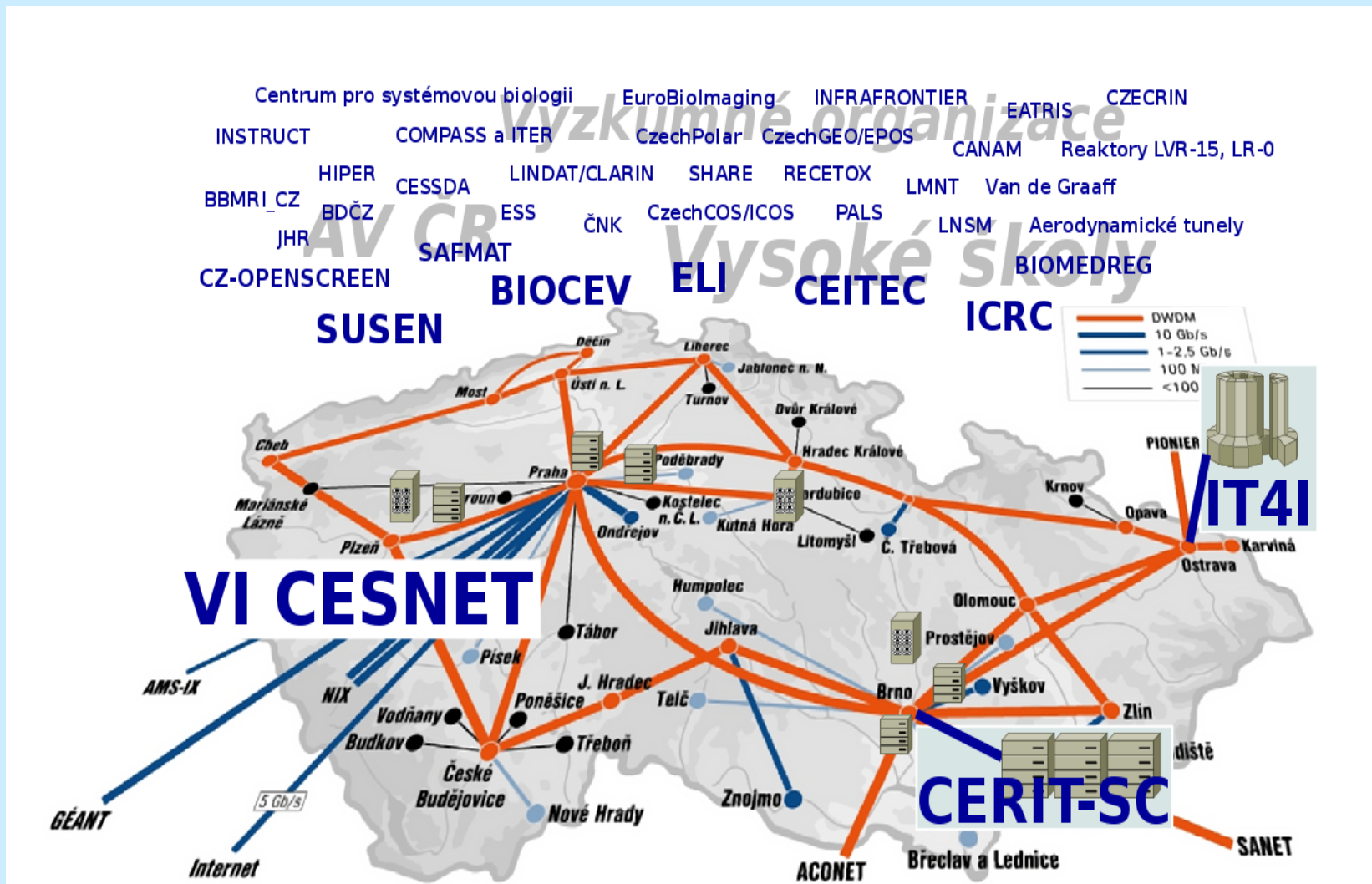
4 performance-related groups (A1, A2, A3, A4)



# Roadmap for Large Research, Development and Innovation Infrastructures in the Czech Republic

Ministry of Education, Youth and Sports

# Projects included in the Czech Road map



## *About CESNET a.l.e.*

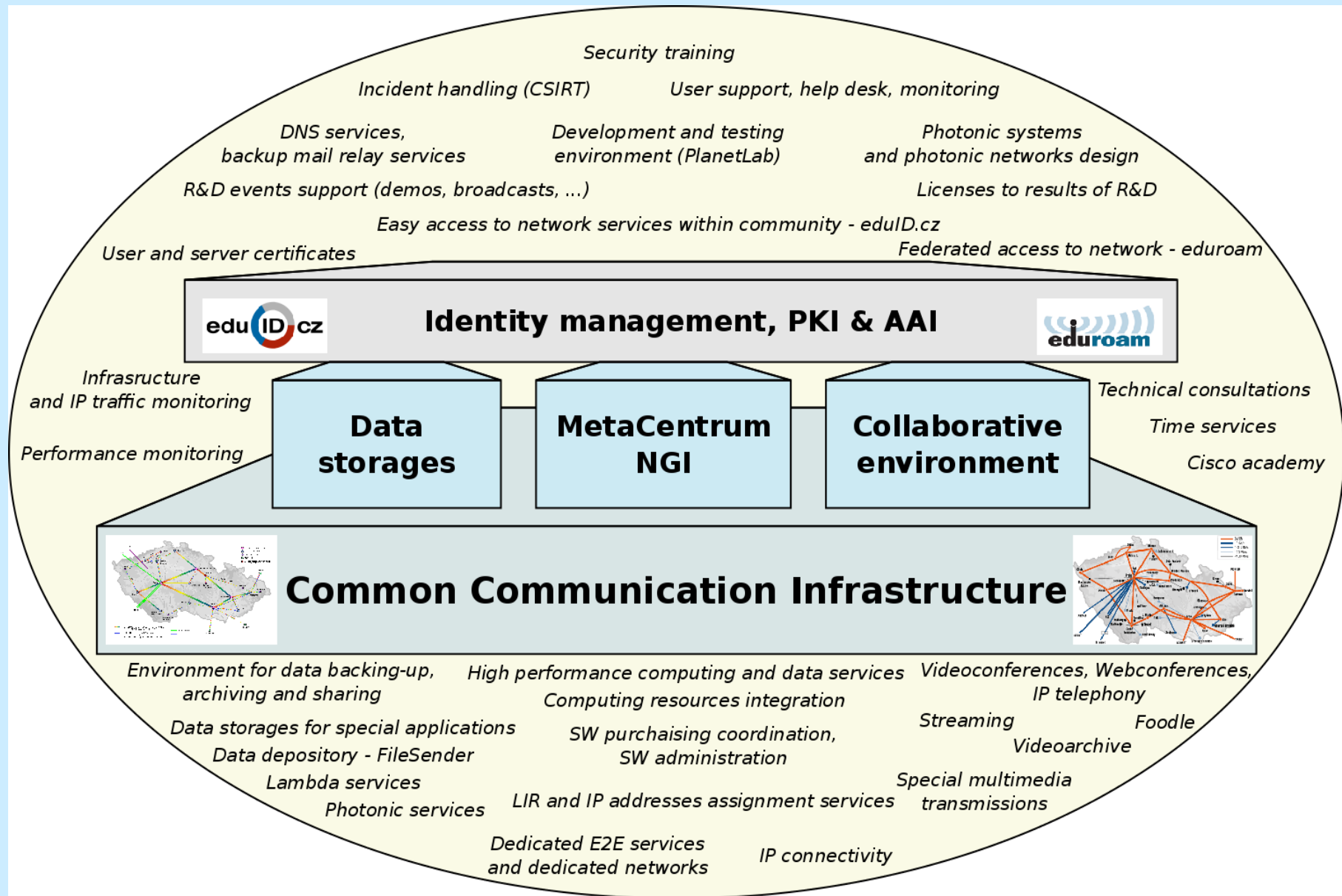
- *CESNET, Association of Legal Entities, was established in 1996 by the Czech universities and Academy of Sciences*
- *Non-profit organization oriented to major activities:*
  - *Development and operations of network communication infrastructure in the Czech Republic to support science and research (non-public operator)*
  - *Research and development of advanced network technologies and applications*
  - *Participation in many international projects*
    - *GNx, GLIF, EGI (European Grid Infrastructure)*
    - *GÉANT Association Member, Internet2 affiliate member*
  - *CESNET members are all government founded Czech universities and Czech Academy of Sciences*
- *More information on <http://www.cesnet.cz>*

## *About CESNET a.l.e.*

- *In 2011 started new projects to develop e - infrastructure for research and development community of the Czech Republic (transformation of CESNET NREN to e-infrastructure provider)*
- *eIGeR project (e-Infrastructure and Grids for e-Regions)*
  - *Two-year project (2011-2013) funded by the Ministry of Education, Youth and Sports (15%) and EC structural funds (85%)*
  - *CAPEX mostly (regions support, not main PoPs in Prague, cca 20,4 mil. EUR total)*
- *CESNET Large Infrastructure Project*
  - *Five-year strategic project (2011 -2015, approved by the government, funded by the Ministry of Education, Youth and Sports and co-funded by the users - cca 16 mil.EUR/ year)*
  - *Its major goal is to develop and operate e-infrastructure in order to provide high quality services to the R&D community in CZ and enable international cooperation*
  - *CAPEX and OPEX*

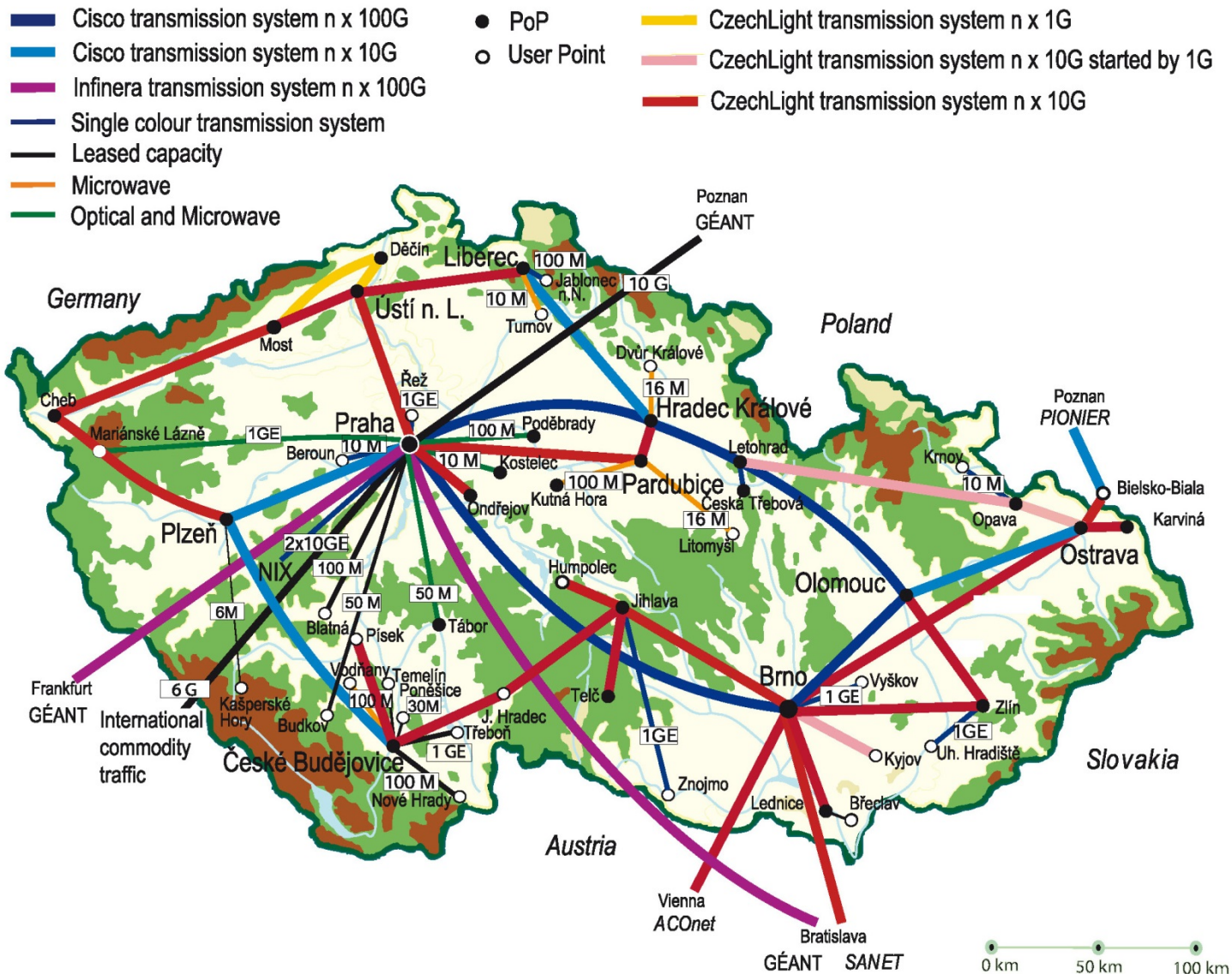


# Service Portfolio





# CESNET2 Optical Topology



## *National Grid Infrastructure (NGI) in CZ*

- *clusters and powerful servers, storage facility*
  - *11 centers – Plzeň, Prague, Brno, České Budějovice*
- *currently 11 500 cores (4 734 CESNET, 4 936 CERIT-SC)*
- *2,5 PB of disk storage (scratch, semi-permanent)*
- *permanent storage provided by CESNET directly accessible from all NGI resources*
- *central management of clusters, accounts, software, computational jobs*
- *another 4000 cores and 2 PB accessible via Institute of High Energy Physics to EGI (LHC)*
- *Access provided via grid, cloud and Hadoop interfaces*

# *NGI in the Czech Republic*

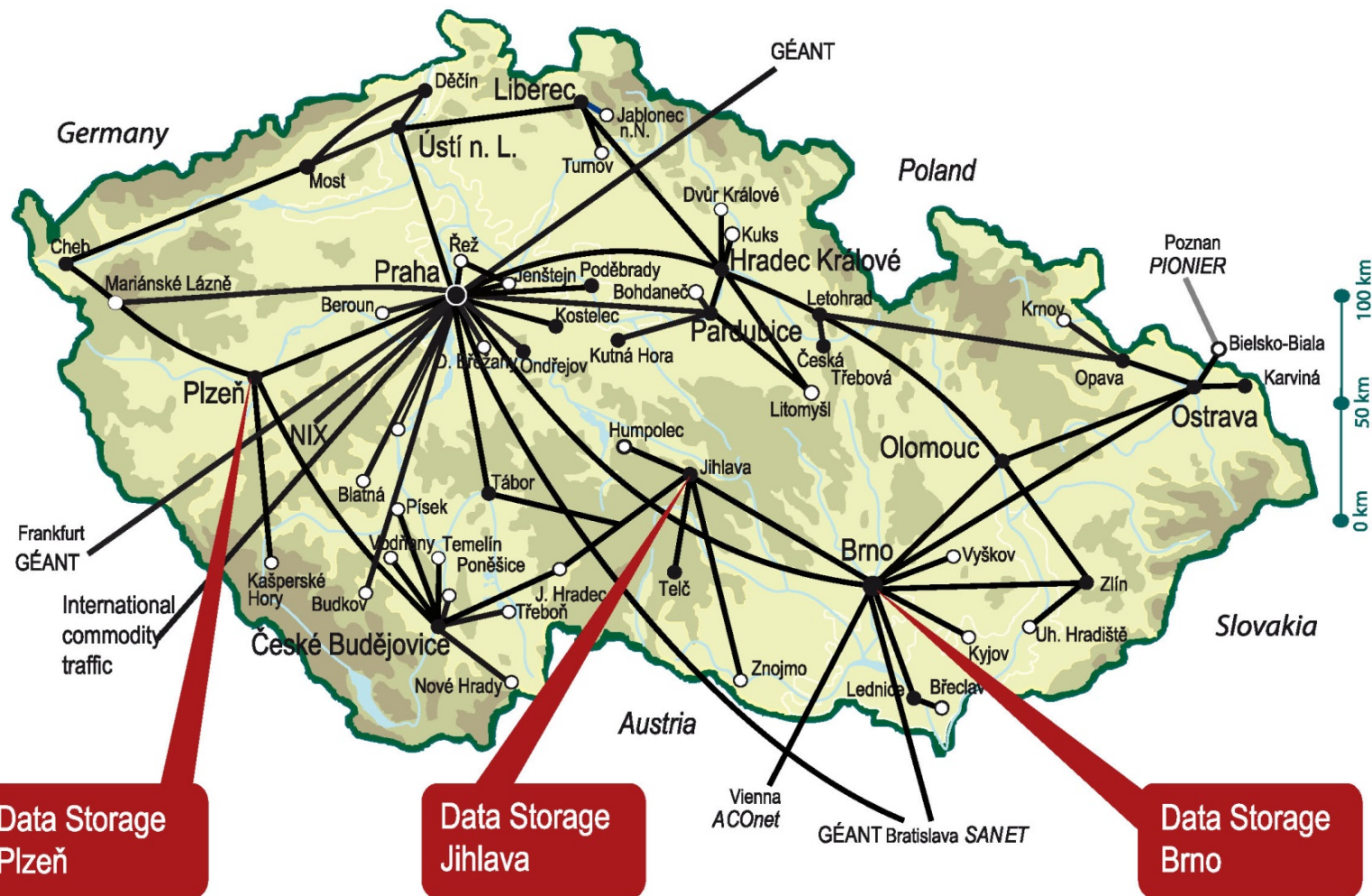


# *Data storage infrastructure*

- *three storage sites: Plzeň, Jihlava, Brno*
- *hierarchical storages: disks/tape library/MAID*
- *total raw capacity approx. 21 PB*
  
- *facility in Plzeň (approx. 9 PB) in operation since May 2012*
- *500 TB disks, 4800 TB tapes, 3584 TB MAID*
- *SGI data migration facility, CXFS*
- *Jihlava and Brno (about 6 PB each)*
- *installed in 2013*
- *2.4 PB disks+3.7 PB tapes in Jihlava, 2.6+3.5 in Brno*
- *both based on IBM GPFS and TSM*
- *utilization 60 % Plzeň, 62 % Jihlava, 80 % Brno*
  
- *available through various protocols for file system access*
- *special services: FileSender, ownCloud*



# CESNET data storage





## *Approach to e-Infrastructure Users*

CESNET is one-stop shop point for use of all services (except HPC).

All academic users have open access to e-infrastructure services.

Feedback from users e.g. via CESNET Users Advisory Board.

Co-funding (cca 15%) is provided by user organizations based on organizations budgets (currently no relation to infrastructure use).

New model of co-funding that will relate also use of infrastructure is under preparation (e.g. storage, clouds,...).

AAI is the key element for access of users to services.



# AAI

*Authentication and Authorization Infrastructure  
operated by CESNET*



[\*http://www.eduid.cz\*](http://www.eduid.cz)



[\*http://perun.cesnet.cz\*](http://perun.cesnet.cz)



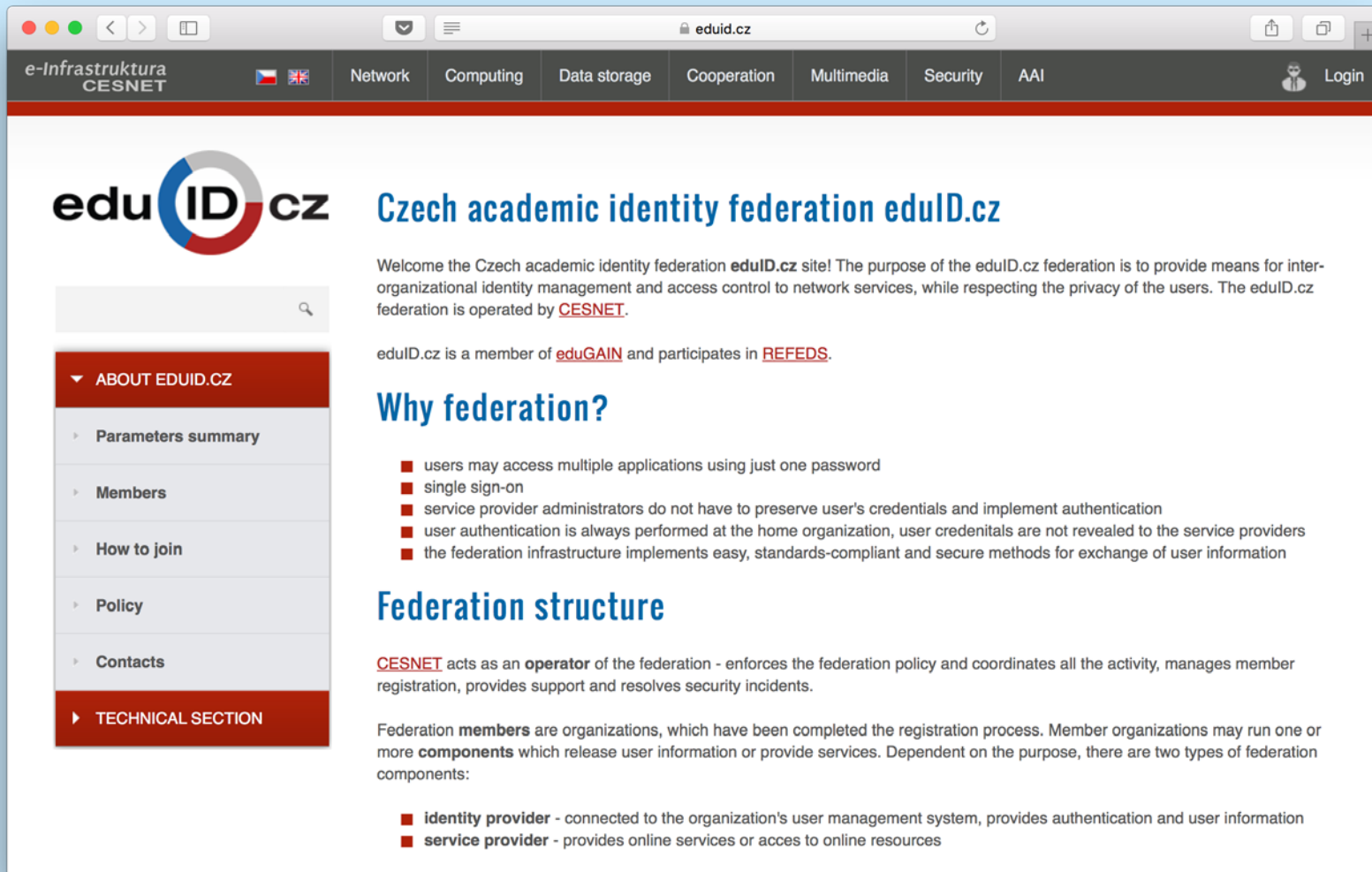
- Czech Academic Identity Federation
  - 206 services
  - 66 organizations
- Participating in eduGAIN
  - 1297 services
  - 951 organizations

## *eduID.cz — Services*

- E-books, E-journals & E-learning
- FileSender & ownCloud
- Computational Grid
- IP telephony
- Video Conferences
- Foodle
- Certificates (GÉANT TCS)
- ...

## *eduID.cz — Organizations*

- Universities (public & private)
- Czech Academy of Sciences
- Hospitals
- Libraries
- BBMRI
- ELI
- ...



The screenshot shows a web browser window with the address bar displaying "eduid.cz". The browser's address bar also shows navigation buttons (back, forward, home) and a search icon. The website's header features the "e-Infrastruktura CESNET" logo on the left and a navigation menu with links: Network, Computing, Data storage, Cooperation, Multimedia, Security, AAI, and a Login button. The main content area has the "eduID.cz" logo on the left, which consists of the text "eduID.cz" with a circular graphic around "ID". To the right of the logo is the heading "Czech academic identity federation eduID.cz". Below this is a welcome message: "Welcome the Czech academic identity federation **eduID.cz** site! The purpose of the eduID.cz federation is to provide means for inter-organizational identity management and access control to network services, while respecting the privacy of the users. The eduID.cz federation is operated by [CESNET](#)." Below the welcome message is a line stating "eduID.cz is a member of [eduGAIN](#) and participates in [REFEDS](#)." To the left of the main content is a sidebar with a search bar and a list of links: "ABOUT EDUID.CZ" (expanded), "Parameters summary", "Members", "How to join", "Policy", "Contacts", and "TECHNICAL SECTION". The main content area continues with the heading "Why federation?" followed by a bulleted list: "users may access multiple applications using just one password", "single sign-on", "service provider administrators do not have to preserve user's credentials and implement authentication", "user authentication is always performed at the home organization, user credentials are not revealed to the service providers", and "the federation infrastructure implements easy, standards-compliant and secure methods for exchange of user information". Below this is the heading "Federation structure" followed by a paragraph: "[CESNET](#) acts as an **operator** of the federation - enforces the federation policy and coordinates all the activity, manages member registration, provides support and resolves security incidents." Below this is another paragraph: "Federation **members** are organizations, which have been completed the registration process. Member organizations may run one or more **components** which release user information or provide services. Dependent on the purpose, there are two types of federation components:" followed by a bulleted list: "identity provider - connected to the organization's user management system, provides authentication and user information" and "service provider - provides online services or acces to online resources".

e-Infrastruktura  
CESNET

Network Computing Data storage Cooperation Multimedia Security AAI Login

**eduID.cz**

Czech academic identity federation eduID.cz

Welcome the Czech academic identity federation **eduID.cz** site! The purpose of the eduID.cz federation is to provide means for inter-organizational identity management and access control to network services, while respecting the privacy of the users. The eduID.cz federation is operated by [CESNET](#).

eduID.cz is a member of [eduGAIN](#) and participates in [REFEDS](#).

**Why federation?**

- users may access multiple applications using just one password
- single sign-on
- service provider administrators do not have to preserve user's credentials and implement authentication
- user authentication is always performed at the home organization, user credentials are not revealed to the service providers
- the federation infrastructure implements easy, standards-compliant and secure methods for exchange of user information

**Federation structure**

[CESNET](#) acts as an **operator** of the federation - enforces the federation policy and coordinates all the activity, manages member registration, provides support and resolves security incidents.

Federation **members** are organizations, which have been completed the registration process. Member organizations may run one or more **components** which release user information or provide services. Dependent on the purpose, there are two types of federation components:

- **identity provider** - connected to the organization's user management system, provides authentication and user information
- **service provider** - provides online services or acces to online resources

*<http://www.eduid.cz/>*

## *Perun*

- Identity and Access Management System
- Developed by
  - CESNET
  - Masaryk University

## *Perun — Overview*

- *"Perun covers management of the whole ecosystem around the users' identities, groups, resources and services."*
- *"Perun is well suited for managing users within organizations and projects, managing access rights to the services."*

## *Perun — Use Cases*

- CESNET e-Infrastructure
  - Services access management
- Masaryk University
  - Services access management
  - Cooperation with existing user database
- CEITEC
  - Intranet users management for a scientific centre
- EGI fedCloud
  - Users management in federated cloud infrastructure for [EGLeu](#)
- ELIXIR
  - Users and service access management for European project
- SAGrid
  - Users management for South African National Grid

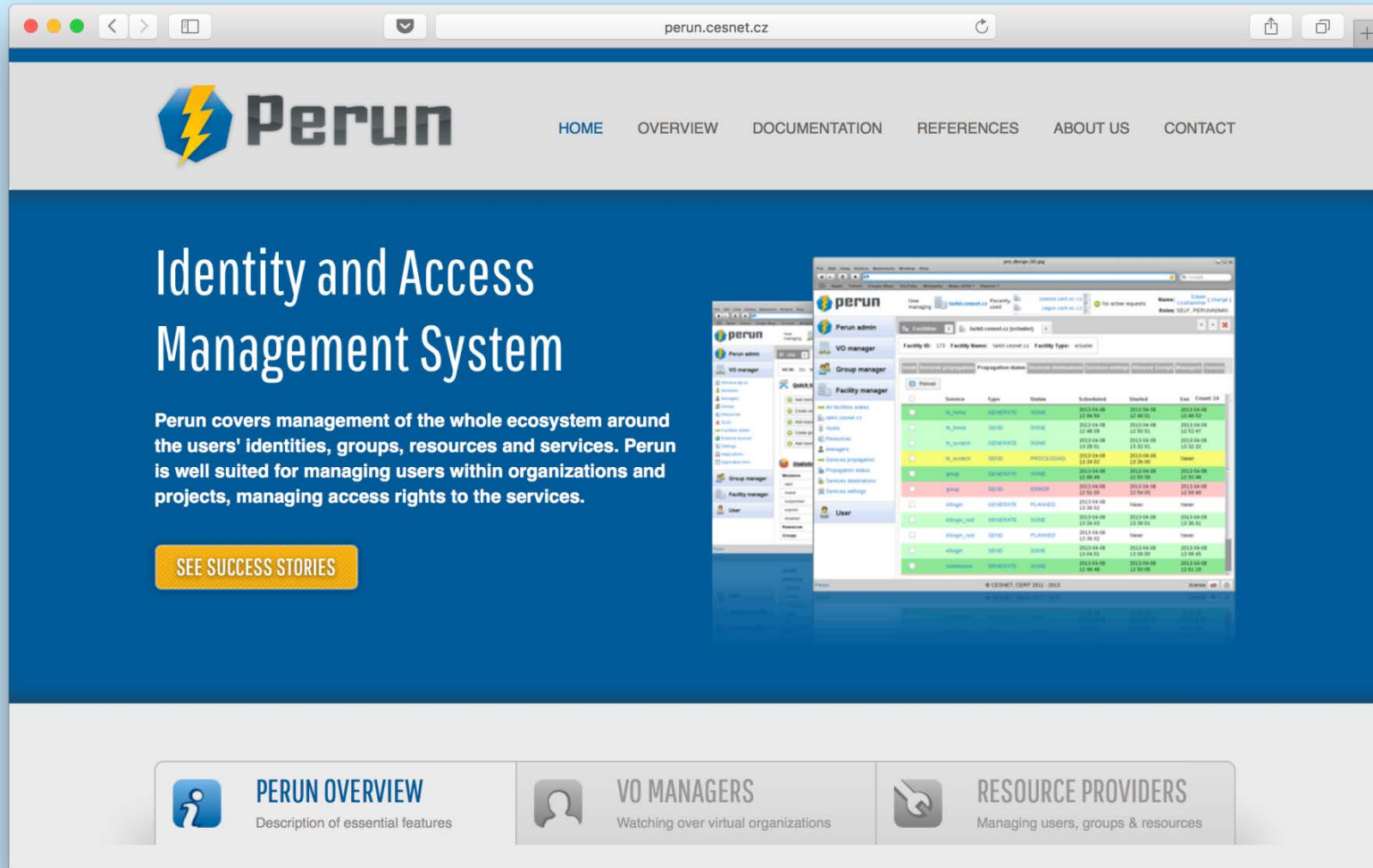


## *Perun — Future*

- FCCN (Portuguese NREN)
- Academy of Arts Architecture & Design in Prague

# *Perun — Collaboration*

- ELIXIR
  - AAI task force
- EGI
  - AAI task force
- GÉANT
  - VOPaaS — VO management platform
  - JRA3 — cooperation between IAM
- INDIGO
  - Complex cloud infrastructure
  - AAI design and realization
- AARC
  - AAI requirements mapping
  - Designing recommendations
- MAGIC
  - Workshop on Joining eduroam and Identity Federation (Jordan)
    - Identity Federation, eduGAIN & eduroam



The screenshot shows the Perun web application running in a browser. The address bar displays `perun.cesnet.cz`. The page features a navigation bar with links: HOME, OVERVIEW, DOCUMENTATION, REFERENCES, ABOUT US, and CONTACT. The main content area has a large heading "Identity and Access Management System" and a descriptive paragraph: "Perun covers management of the whole ecosystem around the users' identities, groups, resources and services. Perun is well suited for managing users within organizations and projects, managing access rights to the services." Below this is a yellow button labeled "SEE SUCCESS STORIES". To the right, there are three overlapping screenshots of the application's administrative interface, showing various management tools like "VO manager", "Group manager", and "Facility manager".

**PERUN OVERVIEW**  
Description of essential features

**VO MANAGERS**  
Watching over virtual organizations

**RESOURCE PROVIDERS**  
Managing users, groups & resources

<http://perun.cesnet.cz/>

*Thank you for your  
attention*