

Hungarian National development and investment on e-infrastructure services

Network, HTC and HPC, data and open science

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service owner, GÉANT Board member

<https://researchinfrastructures.hu/> - database of Hungarian Research Infrastructures

Infrastructure Name	Network	HPC	HTC	Data	E-infra related Membership
KIFÜ (Hungarian NREN)	Yes	Yes	Yes	Some	GÉANT, EOSC, PRACE, EuroHPC, RDA
HUN-REN (SZTAKI and Wigner)	-	-	Yes	Yes	EGI, SLICES-RI, RDA
DEENK	-	-	-	Yes	OpenAIRE NOAD
DH-LAB+MTMT				Yes	DARIAH,

The Hungarian Government and EC agreement on the National Recovery and Resilience Plan (NRRP) and European Structural and Investment Funds (ESIF) is still under discussion.



NIIF Program since 1986

Member of NREN community since 1992

NIIFI + KIFU merger 2016

KIFÜ split at the end of 2024

Services

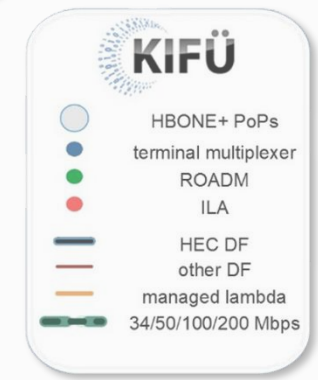
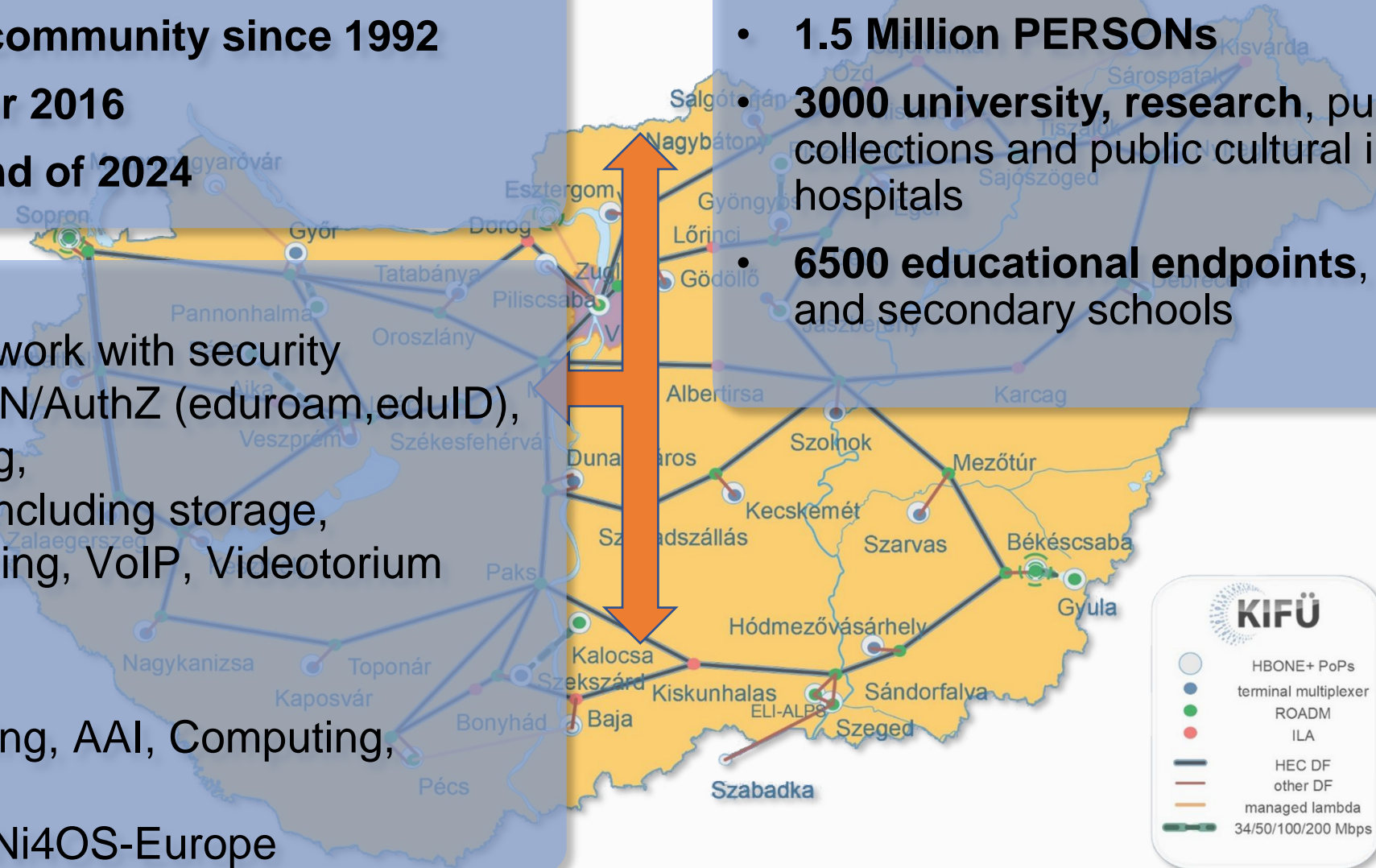
- High speed network with security
- Federated AuthN/AuthZ (eduroam, eduID),
- Supercomputing,
- cloud (IaaS) – including storage,
- Videoconferencing, VoIP, Videotorium

EOSC

- Member
- Services: Training, AAI, Computing, Datatransfer,
- onboarded in Ni4OS-Europe

USERS - ACCESS

- **1.5 Million PERSONS**
- **3000 university, research, public collections and public cultural institutions, hospitals**
- **6500 educational endpoints, all Primary and secondary schools**



20 000+
CPU mag



CPU 0.9
petaflops

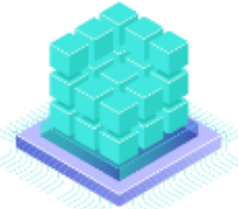
CPU

200+
GPU



GPU 4.6
petaflops


GPU



Big Data 12TB
memória

BIG DATA


4x



8GPU/node


MI

10 PB



Tape

3 PB



Project + scratch
STORAGE

23 552 core

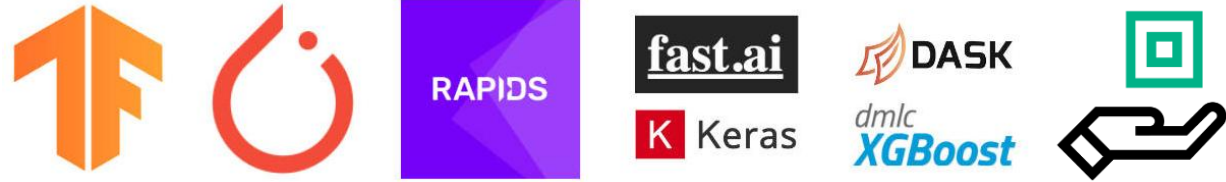
232 GPU
165 AI PF

12 TB

20 AI PF

~ 600 project by 2024

- The Hungarian EuroHPC midrange HPC project (Levente) - still waiting for national funding
- Komondor will be operated at DKF from 1st January 2025



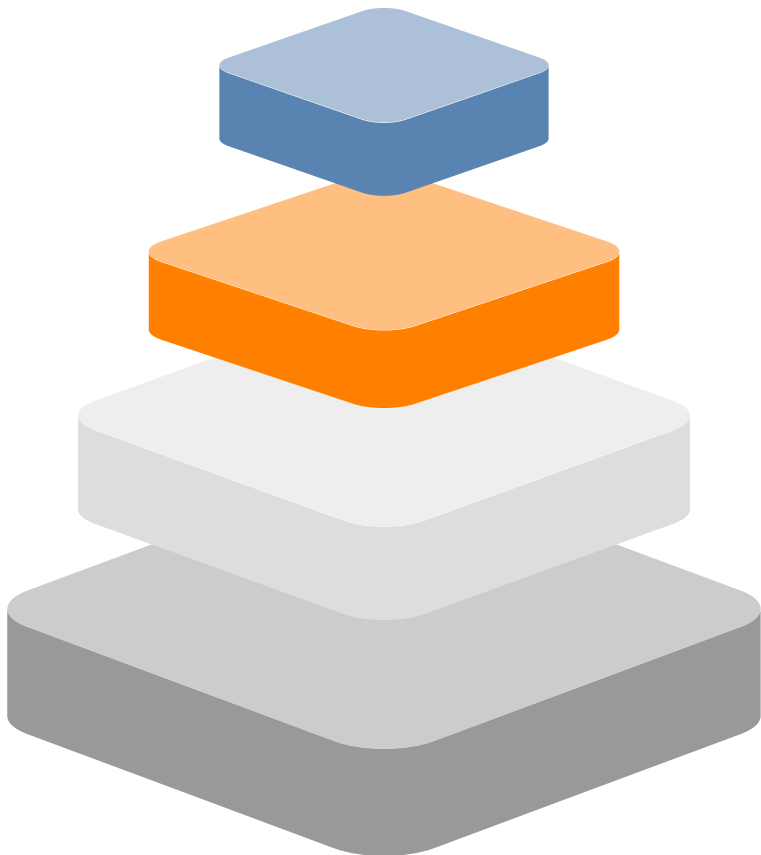
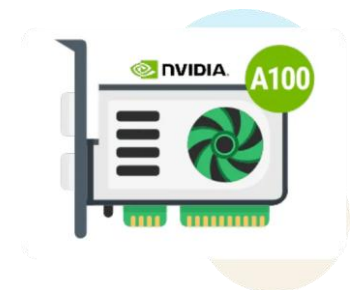
Development Libraries (Python, Nvidia, HPE CPE)

Jupyterlab   SciPy IP[y]:  

Singularity Container



Compute Node - Nvidia Driver





- Regional EOSC event in September 2022 with DEENK – with support of Ni4OS-Europe
- Champion program to Support Researchers and academic staff to transfer of open science-related knowledge materials in their own institutions (2021)
- KIFÜ Open science workshops 40+ workshops on 30+ more than 450 participants. Online, hybrid and in-person. Partners:



NYELVTUDOMÁNYI KUTATÓKÖZPONT



Károli Gáspár Református Egyetem



PÁZMÁNY PÉTER
KATOLIKUS EGYETEM



SZÉCHENYI
EGYETEM
UNIVERSITY OF GNÖR



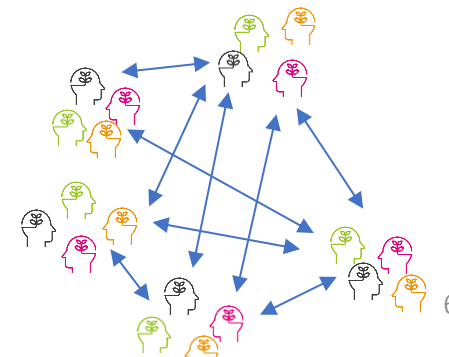
NYÍREGYHÁZI
EGYETEM



- E-learning in Hungarian: <https://elearning.kifu.hu/> - > datasteward training
- Interviews with well known researchers about Open Science and RDM (2021)
- Open Science Forums ~3-4 times a year
- Skills4eosC

Skills4eosC
Competence Center Node

Skills4eosC
Competence Center Network



- HUN-REN - new name of ELKH
 - 19 Main Research Institutions
 - New structure being discussed - operational April 2025
- HUN-REN Cloud
 - 7344 vCPU, 72 GPU, 35 TB RAM, 338 TB SSD storage, 1.25 PB HDD
 - 367 project
 - Reference architecture , AI services
 - Engaged with EGI, EOSC via EGI-ACE, SLICES
 - Trainings on HUN-REN Cloud, GPU programming, AI programming
- ARP – Data Repository Project
 - Official opening 25 November 2024.
 - Federated search for Hungarian data repositories
 - Data steward training



HUN-REN Cloud



AI 4 Science Program Service Map



INSTITUTIONAL AI AMBASSADOR NETWORK



What topics can researchers bring to the AI Ambassador?

Each research site has a dedicated AI Ambassador to help researchers integrate AI into their research. The Ambassadors offer inspiration for using AI, help researchers explore new methods, and provide support in identifying the greatest potential benefits AI can bring to their research.

Planned Budget:
4+MEuro

AI EDUCATION AND INSPIRATION



PERSONAL AI SUPPORT



AVAILABLE AI TECHNOLOGIES



In what AI areas can researchers deepen their knowledge?

Foundational training
The goal is to acquire general basics to progress towards their own specific topics.

Specialist training
Internal courses focusing on the unique issues of specific scientific fields.

Where can you turn with AI-driven research ideas?

HUN-REN HQ AI expert team

1. Research idea validation and planning support
2. Infrastructure support
3. Application support

External expert team
Neuron Solutions as an external contractual partner

AI Research Partner Finder
Researchers with AI competencies who are open to other research fields + Researchers with ideas for AI applications

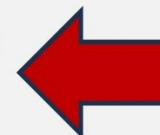
What secure AI technologies are available for sensitive research areas?

Computing Infrastructure

1. Secure GenAI operation, even in your own environment
2. Machine learning support with distributed multi-GPU cards

Own AI framework on

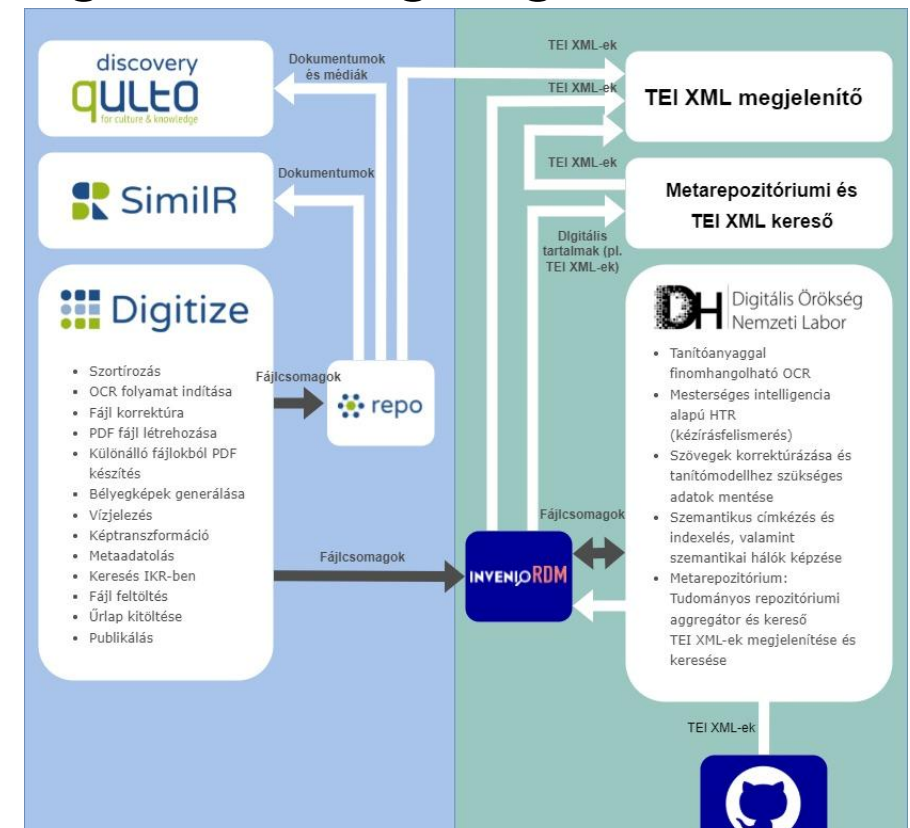
1. **HUN-REN Cloud**
2. Komondor (HPC)



- University of Debrecen University and National Library in Hungary (DEENK) joined OpenAIRE in 2012
- Acting as OpenAIRE Noad
- Support open science
 - DMP, research support
 - Open science blog and portal
 - Data repository
 - Member Confederation of Open Access Repositories



- National Laboratory for Digital Heritage (ELTE, ME, HUNREN BTK, National Archives of Hungary)
- Maintenance of Hungarian text corpus, development of language processing algorithms optimized for the Hungarian language
- Literary Corpus for Hungarian Poetry
- Hungarian webarchive
- AI tools for Digital Heritage
- Hungarian handwriting recognition
- Organising data steward curriculum
- Member of DARIAH



- Hungarian EOSC activities
 - All above e-infrastructures contributing to open science
 - Currently only 1 EOSC member
- National EOSC Node
 - Coalition of various national players (HUN-REN HQ, HUN-REN cloud, MTAK, DEENK) proposed a Hungarian EOSC Node

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