Short introduction to KIFÜ services and actions for saving energy

János Mohácsi, Head of International R&D, T&I service owner

12 December 2022

KIFÜ – Hungarian e-infrastructure services

KIFÜ – Hungarian e-infrastructure services

NIIF Program since 1986

Member of NREN community since 1992

NIIFI + KIFU merger 2016

NETWORK technologies

MPLS (2002), IPv6(2003), Segment routing (2013), 100 Gbps (2012)

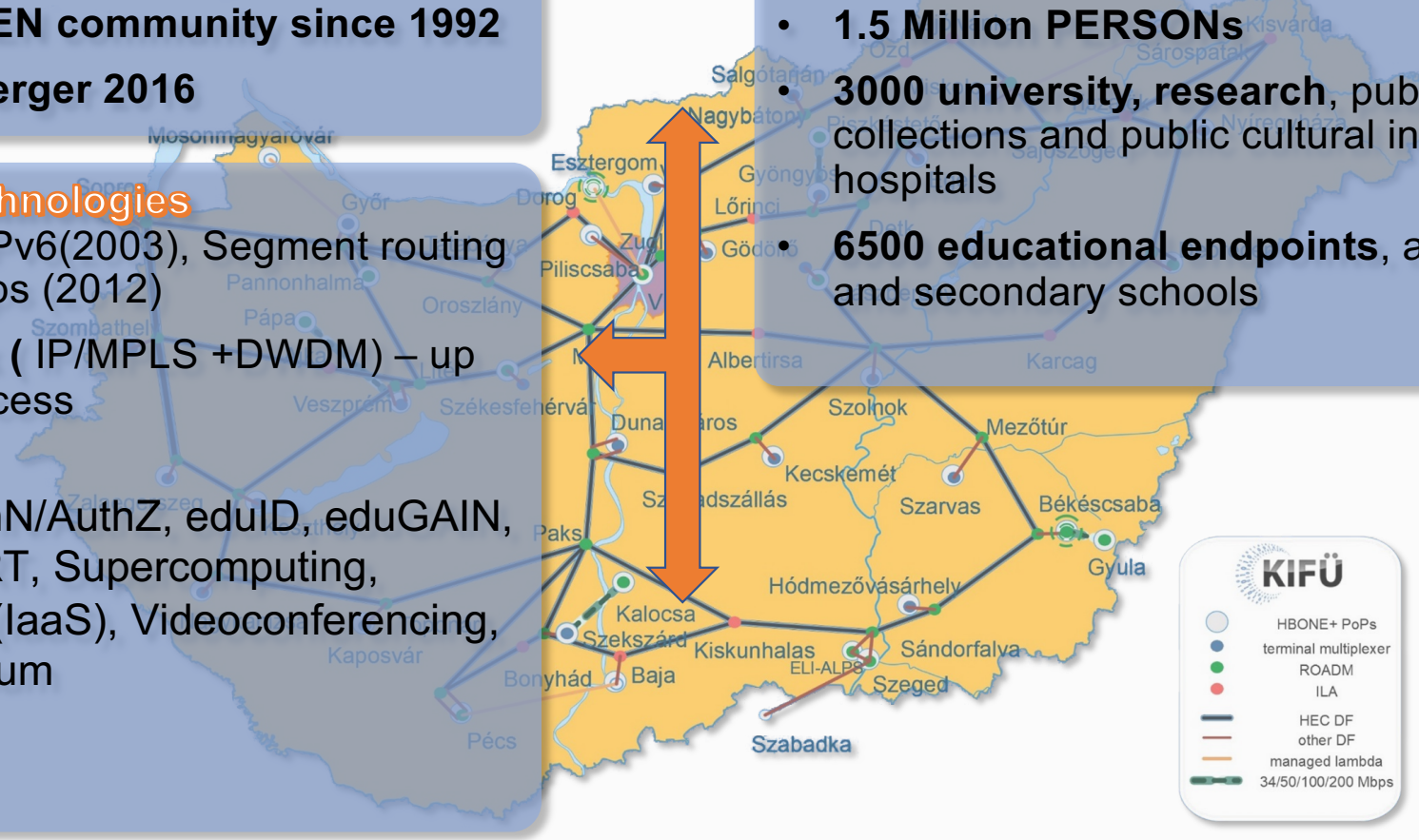
Hibrid network (IP/MPLS +DWDM) – up to 100 Gbps access

Services

Federated AuthN/AuthZ, eduID, eduGAIN, eduroam, CSIRT, Supercomputing, storage, cloud (IaaS), Videoconferencing, VoIP, Videotorium

USERS - ACCESS

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



ICT services – for users

Network Services

Data network and Internet
(connectivity, VPN, multicast, IP, DNS)
Network security and filtering
Domain name
eduID
eduroam
Managed IdP
TCS
Public IP

Cloud services

Server hosting
Virtualisation
Webhosting
Mail
VoIP
Videoconferencing
Videostreaming
Videorepository
Groupware, Collaboration

Supercomputing

HPC capacity
Competence Centre
Scientific applications

Schoolnet Program

Internet
Managed WiFi
eduID
eduroam, webhosting, Mail

Tisztaszoftver Program

O365/M365 licenses

Consulting and expert service

Web accessebility
Field
system enginiers
quality assurance

Specific services

OSZK
JMCS
DJP
FIR
KÁBER
HUNOR
Hulladék Radar

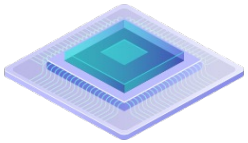
USER SUPPORT

HPC current development phase

- The project: **Komondor**
- A new, ~5PFlops machine (aggregated capacity)
- 4 partitions (CPU only, accelerated, AI, high-mem)
- 20,000+ CPU cores
- 200+ GPU boards
- Free cooling all year round
- Manufacturer: HPE Cray
- To be launched in 2022
- Location: KIFU's Debrecen HPC datacenter - upgraded

Komondor 2022 5+ petaflops

20 000+
CPU mag



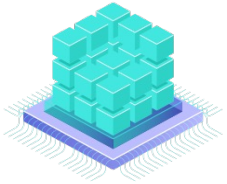
CPU 0,7+
petaflops

CPU ONLY

200+
GPU

GPU 4+
petaflops

ACCELERATED



Big Data 9+ TB
memória

BIG DATA

8GPU/node

AI

10 PB

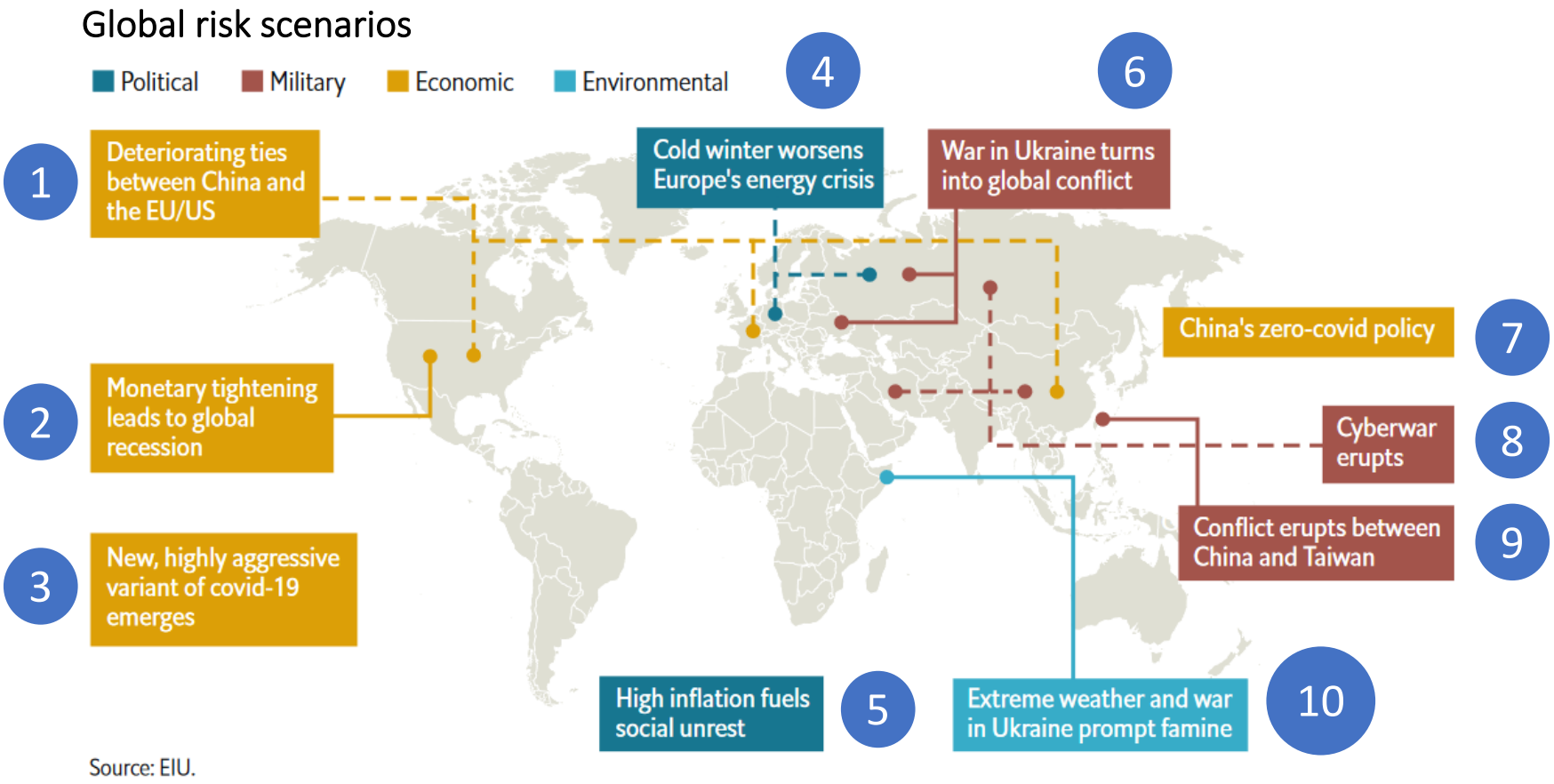
hosszútávú
archiválás

2 PB

szupergyors
storage

STORAGE

Global Risks (Slide from Cathrin Stover)



Energy situations in Hungary

New challenges

1. COVID pandemic
   - accelerate digital transformation, home office more frequently applied - reduced office space
   - semiconductor shortage, supply chain difficulties
2. Increased energy prices
   - Electricity prices: 2x-5x increase in the past 12 months
     - Support for citiizens – capped prices
     - No support for enterprises – even for governmental organisations – schock therapy?
   - Gas and central heating prices: 1.5x – 16x increase in the 12 months
     - Support for citiizens – capped prices
     - No support for enterprises – even for governmental organisations

Solutions?

- Longer term energy supply contracts?
- Make everything more energy efficient
- Support of employees?

KIFÜ steps for handling energy crisis

1. Energy efficiency first considered 7-10 years ago – tender evaluation
2. Billing analysis
3. Accelerate moving to more energy efficient devices
4. KIFÜ attempts to quantify power efficiency
   - Measure – PDU and equipment level
   - Assess
   - Act
5. Projects tend to ask for power KPIs

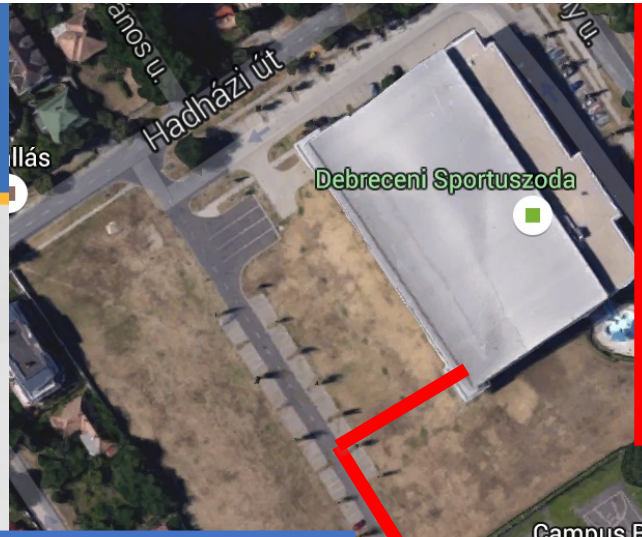
6. Future:
   - Equipment Procurements - Increased weighting the energy efficiency
   - Sustainability - Social Responsibility Policy
   - Collect more power draw data and use for decisions and control
   - Bit/power draw will be increasingly important

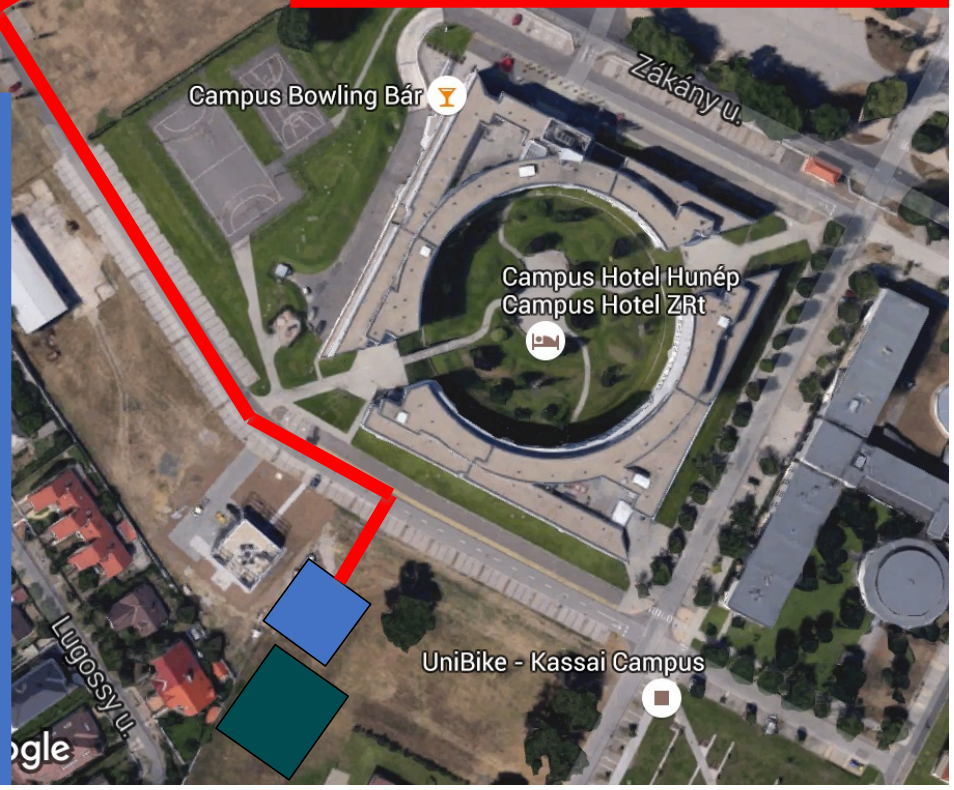
Concrete steps to reduce energy consumption

Action	Savings
Dinamically scale HPC capacity	3 000 000 - 4 000 000 KWh/year
Phase out of old HPC systems	Up to 600 000 KWh/year
On demand service of cloud capacity	Up to 300 000 KWh/year
Reduce redundancy of certain systems – careful architectural planning is needed ~ 2 months	Up to 160 000 KWh/year
Accelerate the architectural changes in cloud services	Up to 40 000 KWh/year
Accelerate the architectural changes in multimedia services	Up to 10 000 KWh/year
Switch off aging Tape systems – service miigration!	Up to 15 0000 KWh/year
Renew ageing UPS system - requires CAPEX	Up to 70 0000 KWh/year
Renew the Cooling with innovative thermal storage - requires CAPEX - 2-3 year ROI	Up to 60 0000 KWh/year
Renew Network eqiupments - requires CAPEX – 5-7 years ROI – side effect: 5x capapcity	Up to 35 0000 KWh/year
Office energy saving – new policies – offsetting to home office	Up to 25% savings
Usage of waste energy – See next slide	

Green DC

- Largely hot water cooling
- 90% free air cooled
- Waste heat usage





Questions?

Mohácsi János
mohacsi.janos@kifu.gov.hu