

Managed Kubernetes

Next Gen Academic Infrastructure



Containers flooded the world

- Encapsulation of software and its dependencies (optionally data)
- Suitable for traditional HTC/HPC usecases
- Endorse FAIR principles
- Many platforms (grid, VMs, local) and runtimes (Docker, Singularity, and Podman)
- Shiny container orchestration tool Kubernetes (K8s)
- K8s simplifies the execution and management of containers significantly

Welcome aboard

- Running the Kubernetes infrastructure is a challenging task (operation, development)
- Czech NREN „CESNET“ offers its own managed Kubernetes platform
- Not only plain Kubernetes installation but whole service stack accustomed to academic purposes
- Managed Containerized Infrastructure:
 - » Integrated research AAI - EGI, e-INFRA CZ, LifeScience RI
 - » Fast and robust storage
 - » DNS TLS Certificates, Load Balancing, IPV6
 - » Lifecycle management of hardware
 - » Supporting services – Docker registry
 - » SaaS – licensed interactive MATLAB, RDPs, Jupyter Notebooks
 - » Workflow management systems – Nextflow, Snakemake, Galaxy
- Governance of accounting, monitoring, scheduling – research topic



Safe travels!

- Successful collaborations:
 - » Machine learning and general Jupyter Notebooks for education
 - » Batch conversion of pathology images
 - » Genomical processing with Nextflow pipelines (Mendel 200)
 - » Masaryk University SIEM Dashboard
 - » Support of education in field of SOA and Microservices
 - » Sensitive Data processing
 - » Easier procurement of managed services such as Database-as-a-Service