

# **Kubernetes development**

VS

# Kubernetes development — fronty

MASARYK UNIVERSITY  
FACULTY OF INFORMATICS



## Containers in e-infrastructure

MASTER'S THESIS

```

[root@kube ~]# kubectl get pods -n jupyterhub-prod-ns --context hdha-cluster
NAME                                READY   STATUS    RESTARTS   AGE
continuous-image-puller-6xrwz       1/1    Running   0           6d1h
continuous-image-puller-hl79x       1/1    Running   0           6d1h
continuous-image-puller-mn2tf       1/1    Running   0           6d1h
continuous-image-puller-rlsr2       1/1    Running   0           6d1h
continuous-image-puller-tkzhh       1/1    Running   0           6d1h
hub-6945d5cb5-x98mz                 1/1    Running   0           3d5h
jupyter-rnaseq                      1/1    Running   1           4d2h
jupyter-rnaseq--boris-5fgpu         1/1    Running   0           10d
jupyter-viktorias                   1/1    Running   0           13d
jupyter-viktorias--c                1/1    Running   0           5h12m
jupyter-xhejtman                    1/1    Running   0           4h26m
proxy-85bf8c7f5d-7qgcm             1/1    Running   0           14d
[root@kube ~]# kubectl logs hub-6945d5cb5-x98mz -n jupyterhub-prod-ns --context hdha-cluster --tail 8
[D 2021-09-09 15:06:10.675 JupyterHub reflector:353] events watcher timeout
[D 2021-09-09 15:06:10.675 JupyterHub reflector:278] Connecting events watcher
[D 2021-09-09 15:06:10.682 JupyterHub reflector:353] pods watcher timeout
[D 2021-09-09 15:06:10.682 JupyterHub reflector:278] Connecting pods watcher
[D 2021-09-09 15:06:11.005 JupyterHub log:189] 200 GET /hub/health (@192.168.2.160) 0.99ms
[D 2021-09-09 15:06:13.005 JupyterHub log:189] 200 GET /hub/health (@192.168.2.160) 1.69ms
[D 2021-09-09 15:06:13.316 JupyterHub log:189] 200 GET /hub/health (@192.168.2.160) 1.63ms
[D 2021-09-09 15:06:15.006 JupyterHub log:189] 200 GET /hub/health (@192.168.2.160) 1.89ms
[root@kube ~]# kubectl describe pod hub-6945d5cb5-x98mz -n jupyterhub-prod-ns --context hdha-cluster
Name:                                hub-6945d5cb5-x98mz
Namespace:                            jupyterhub-prod-ns
Priority:                               0
Node:                                  hda-worker-a1.priv.cerit-sc.cz/192.168.2.160
Start Time:                            Mon, 06 Sep 2021 11:53:35 +0200
Labels:                                 app=jupyterhub
                                         component=hub
                                         hub.jupyter.org/network-access-proxy-api=true
                                         hub.jupyter.org/network-access-proxy-http=true
                                         hub.jupyter.org/network-access-singleuser=true
                                         pod-template-hash=6945d5cb5
                                         release=jupyterhub
Annotations:                            checksum/config-map: 8b875cfa12b754becb2d5bf5b191587e37c56a06f92a8a94a614b0c0ffc29763
                                         checksum/secret: e3000bce48965b5b18f2ecac06bab70db548bf6973cd903376b3cd429625ae81
                                         cni.projectcalico.org/podIP: 10.42.4.221/32
                                         cni.projectcalico.org/podIPs: 10.42.4.221/32
                                         kubernetes.io/psp: global-unrestricted-pp
Status:                                Running
IP:                                    10.42.4.221
IPs:
  IP: 10.42.4.221
Controlled By:                          ReplicaSet/hub-6945d5cb5
Containers:
  hub:
    Container ID:  containerd://1cd867248857e40c0c4fd615db7db42af9dcd7aee105442246c752131c2f70a1
    Image:          cerit.io/jupyterhub:22-06-2021
    Image ID:      cerit.io/jupyterhub@sha256:f9cd2a3e240400a691501e32350d42914f4e04717bfa9779ea9ee8f6a5f8a069
    Port:          8081/TCP
    Host Port:     0/TCP
    Args:

```



hdha-cluster  
jupyterhub-prod

Resources Apps Namespaces Members Tools

Cluster Explorer



Workloads Load Balancing Service Discovery Volumes

Import YAML Deploy

Redeploy Pause Orchestration Download YAML Delete

Search

| State                         | Name                        | Image   | Scale      |
|-------------------------------|-----------------------------|---|------------|
| Namespace: jupyterhub-prod-ns |                             |   |            |
| Active                        | continuous-image-puller     | k8s.gcr.io/pause:3.5 + 2 images<br>5 Pods / Created 2 months ago / Pod Restarts: 0  | 1 per node |
| Active                        | hub                         | cerit.io/jupyterhub:22-06-2021<br>1 Pod / Created 2 months ago / Pod Restarts: 0  | 1          |
| Running                       | jupyter-rnaseq              | cschranz/gpu-jupyter:v1.4_cuda-10.1_ubuntu-18.04 + 1 image<br>10.42.3.108 / glados-worker-a1 / Created 4 days ago / Restarts: 1 | Pod        |
| Running                       | jupyter-rnaseq--boris-5fgpu | cschranz/gpu-jupyter:v1.4_cuda-10.1_ubuntu-18.04 + 1 image<br>10.42.5.170 / hdg-worker-a1 / Created 10 days ago / Restarts: 0   | Pod        |
| Running                       | jupyter-viktorias           | cerit/minimal-nb-jh:v0.2 + 1 image<br>10.42.5.166 / hdg-worker-a1 / Created 13 days ago / Restarts: 0                           | Pod        |
| Running                       | jupyter-viktorias--c        | cerit/minimal-nb-jh:v0.2 + 1 image<br>10.42.4.227 / hda-worker-a1 / Created 5 hours ago / Restarts: 0                           | Pod        |
| Running                       | jupyter-xhejtman            | cerit/minimal-nb-jh:v0.2 + 1 image<br>10.42.6.242 / hdg-worker-a2 / Created 4 hours ago / Restarts: 0                           | Pod        |
| Active                        | proxy<br>443/https, 80/tcp  | jupyterhub/configurable-http-proxy:4.5.0<br>1 Pod / Created 2 months ago / Pod Restarts: 0                                      | 1          |
| Active                        | user-placeholder            | k8s.gcr.io/pause:3.5<br>0 Pods / Created 2 months ago / Pod Restarts: 0   | 0          |



Adrián Rošinec 03.08 12:42  
mas na mna sekundu?

03.08 12:42  
jo



Adrián Rošinec 03.08 12:42  
i need help

# Kubernetes development — low level

```
[root@puppet k8s-prod]# tree .
.
|-- control
|   |-- balancer.sh
|   |-- control-a.tf
|   |-- control-sys.tf
|   |-- control-t.tf
|   |-- control-u.tf
|   |-- provider.tf
|   |-- puppet6_autorun.sh
|   |-- terraform.tfstate
|   |-- terraform.tfstate.backup
|   `-- terraform.tfstate.old
-- control-u.tf
-- fp
|   |-- control.tf
|   |-- provider.tf
|   |-- puppet6_autorun.sh
|   |-- terraform.tfstate
|   |-- terraform.tfstate.backup
|   |-- workers1.tf
|   `-- workers.tf
-- glados
|   |-- provider.tf
|   |-- puppet6_autorun.sh
|   |-- terraform.tfstate
|   |-- terraform.tfstate.backup
|   `-- workers-a.tf
-- hda
|   |-- provider.tf
|   |-- puppet6_autorun.sh
|   |-- terraform.tfstate
|   |-- terraform.tfstate.backup
|   |-- workers-a.tf
|   `-- workers-u.tf
-- hde
```

lmiau@vega ~/puppet/site production tree tesk

```
les
- ingress-nginx.yaml
-
- factor
  |— kube_annotations.rb
  |— kube_contexts.rb
  |— openstack_subnet.rb
  |— rke2_token.rb
- manifests
- README.md
- config.pp
- init.pp
- install.pp
- k8sresource
  |— annotation.pp
  |— deploy.pp
  |— namespace.pp
- params.pp
- rke2
  |— config.pp
  |— install.pp
  |— token.pp
- rke2.pp
- role
  |— controlnode.pp
  |— gpunode.pp
  |— ksetupnode.pp
  |— openstacknode.pp
  |— ranchernode.pp
  |— storagenode.pp
- templates
- ceph-csi-rbd-values.yaml.epp
- ceph-secret.yaml.epp
- ceph-secret2.yaml.epp
- ceph-storage.yaml.epp
- ceph-storage2.yaml.epp
- cloud-controller-manager-ds.yaml.epp
- cloud.conf.epp
- cluster-lb.yaml.epp
- cluster-template.yml.epp
- clusterissuer-cr.yaml.epp
- clusterissuer-crb.yaml.epp
- dns-secret.yaml.epp
- dns.yaml.epp
- encryption-provider-config.json.epp
- ftp-secret.yaml.epp
- gpu-docker-daemon.json.epp
- le-server-secret.yaml.epp
- nfs-storageclass.yaml.epp
- oidc-secret.yaml.epp
- openstack-cr.yaml.epp
- openstack-crb.yaml.epp
```

```
[root@kube ~]# tree scripts/
scripts/
|-- cleanup_rancher.sh
|-- cluster_api_interaction.sh
|-- cluster-operations
|   |-- add_cluster_admins.sh
|   |-- create_cluster_full.sh
|   |-- create_cluster_only.sh
|   `-- registrate.sh
|-- create_user.sh
|-- endlessly-terminating
|   |-- csi-nfs_pvc.sh
|   |-- terminating_common.sh
|   |-- terminating_pod.sh
|   |-- terminating_pvc.sh
|   |-- volume_backup
|   `-- volume_backup2
|-- helpers
|   |-- addressource.rb
|   |-- setup_members.sh
|   |-- setup_namespace.sh
|   |-- setup_ns_permissions.sh
|   |-- setup_project.sh
|   `-- tw_setup.sh
|-- nfs-error-handling
|   `-- umount_stale_handles.sh
|-- projects-operations
|   |-- assign_admin_project.sh
|   |-- assign_default_project.rb
|   `-- assign_group_project.sh
|-- rancher-elixir
|   |-- create_user.sh
|   `-- registrate.sh
|-- shibboleth
|   |-- certs
|   |   |-- server.crt
|   |   `-- server.pem
|   |-- configure_shibboleth.sh
|   |-- metadata.xml
|   `-- rancher
|       `-- rancher-proxy.cerit-sc.cz.crt
```



```
[root@kube ~]# tree internal-projects/
internal-projects/
|-- binderhub
|   |-- krb5.conf
|   |-- krb5.keytab
|   `-- val.yaml
|-- jupyterhub
|   |-- deploy.sh
|   |-- krb5.conf
|   |-- krb5.keytab
|   |-- pv-cr.yaml
|   `-- values.yaml
|-- mff-prod
|   |-- config.yaml
|   |-- deploy.sh
|   |-- permissions
|   |   `-- cerit-user-rbac.yaml
|   `-- web
|       |-- deployment.yaml
|       |-- ingress.yaml
|       |-- pvc.yaml
|       |-- secrets.yaml
|       `-- service.yaml
```

```
[root@kube ~]# helm upgrade jupyterhub --cleanup-on-fail --install jupyterhub/jupyterhub -n jupyterhub-prod-ns --values values.yaml --kube-context hdha-cluster
```

```
[root@docker:~# cd dockerfiles/
[root@docker:~/dockerfiles# ls
additional_files          Debian9XfceGL.Dockerfile      Fireprot-mad.Dockerfile      MinimalNB.Dockerfile        Spec.Dockerfile
Benchmark.Dockerfile     DesktopXfce2.Dockerfile      Fireprot-parseAncestrals.Dockerfile  Nextflow.Dockerfile        TensorflowNB.Dockerfile
Browsh.Dockerfile        DesktopXfce.Dockerfile       Fireprot-parseEM.Dockerfile  NginxEuopdx.Dockerfile     TensorRT-7.0.0.11.Ubuntu-16.04.x86_64-gnu.cuda-9.0.cudnn7.6.tar.gz
Centos7CeritSC.Dockerfile  Failure.Dockerfile           Fireprot-pasta.Dockerfile    Openssh-server.Dockerfile  Ubuntu.Dockerfile
Centos7Dev.Dockerfile     Fireprot-clustal.Dockerfile   Fireprot-raxml.Dockerfile     Pulseaudio.Dockerfile      UbuntuXfceNvidia.Dockerfile
Centos7XfceGL.Dockerfile  Fireprot-combineTrees.Dockerfile  Fireprot-treemer.Dockerfile  QualStat.Dockerfile        Webrtc-app.Dockerfile
Centos8Dev.Dockerfile     Fireprot-createClustered.Dockerfile  Fireprot-usearch.Dockerfile  README.md                   Webrtc-web.Dockerfile
CZIConv.Dockerfile        Fireprot.Dockerfile           Gst-base2-mtu.Dockerfile     RSEM2.Dockerfile           XENOME.Dockerfile
DatascienceNB.Dockerfile  Fireprot-filterByLength.Dockerfile  Gst-base.Dockerfile          RSEM.Dockerfile            Xserver.Dockerfile
Deb10Dev.Dockerfile       Fireprot-fishSequences.Dockerfile  Gst-base-mtu.Dockerfile     Rstudio.Dockerfile         image_names
Debian10Xfce.Dockerfile   Fireprot-gapCorrection.Dockerfile  image_names                  RTammy.Dockerfile          JupyterHub.Dockerfile
Debian10XfceGL.Dockerfile  Fireprot-iqtree.Dockerfile      JupyterHub.Dockerfile       ScipyNB.Dockerfile         Kale.Dockerfile
Debian9Xfce.Dockerfile    Fireprot-lazarus.Dockerfile      Kale.Dockerfile              Signalling.Dockerfile
root@docker:~/dockerfiles#
```

| <b>Operating Status</b> | <b>Provisioning Status</b> |
|-------------------------|----------------------------|
| Online                  | Error                      |
| Online                  | Active                     |
| Online                  | Error                      |
| Online                  | Error                      |
| Online                  | Active                     |
| Online                  | Error                      |
| Online                  | Error                      |

# Kubernetes development — high level



## Select your identity provider

Please select the identity provider where you want to authenticate:

- ✓ EGI AAI CheckIn Select
- eInfra CESNET
- ELIXIR research infrastructure AAI

---

Masaryk University, Žerotínovo nám. 9, 601 77 Brno, Czech Republic +420 549 491 111 [root@cerit-sc.cz](mailto:root@cerit-sc.cz)

CESNET, Zikova 1903/4, 160 00 Praha 6, Czech Republic +420 234 680 222 [info@cesnet.cz](mailto:info@cesnet.cz)

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## EurOPDX Pipelines

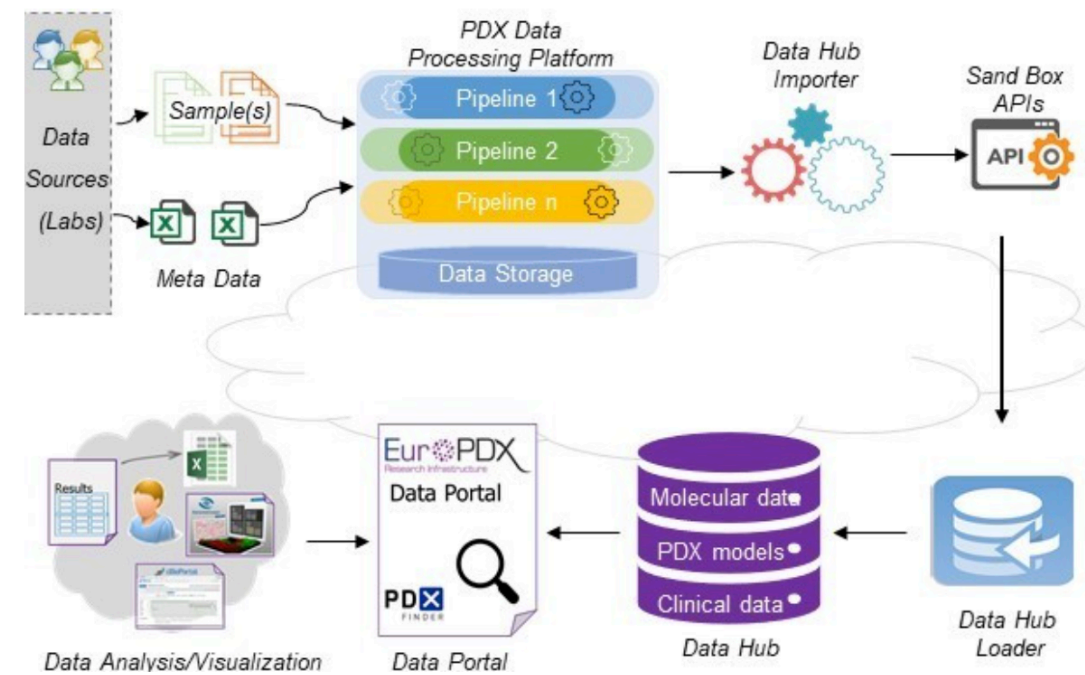
[EurOPDX Galaxy bioinformatics pipelines](#) are designed to process raw sequencing data with standardized, well known workflows allowing to export the data into formats that can be easily processed within EurOPDX research infrastructure.

Instead of filling a .xlsx template with g.g. mutation and CNA values, a PDX data provider can upload raw experimental data files acquired according to standardized procedures (currently RNAseq and Mutation are supported), together with the required data on samples, patient, diagnosis, treatment etc.

The computational pipeline processes the raw data files, deriving the quantities of interest (gene mutation, CNA values, gene expression etc.). The final step of the workflow is the upload of the results to the sandbox [DataPortal](#), Data Hub and [cBioPortal](#) where the PDX data provider can analyze, visualize and test the data as a whole before making the resulting data set available to the other users.

EurOPDX Galaxy Pipelines are available at [pipeline-prod.edirex.ics.muni.cz](http://pipeline-prod.edirex.ics.muni.cz)

### Overview of bioinformatic pipeline integration



### Start exploring the EurOPDX Pipelines potential now

Are you interested in using EurOPDX Pipelines for PDX data preparation or want additional

Tools

search tools

Upload Data

Get Data

Collection Operations

GENERAL TEXT TOOLS

Text Manipulation

Filter and Sort

Join, Subtract and Group

GENOMIC FILE MANIPULATION

FASTQ Quality Control

SAM/BAM

BED

VCF/BCF

Nanopore

Convert Formats

Lift-Over

MISCELLANEOUS TOOLS

Virology

COMMON GENOMICS TOOLS

Operate on Genomic Intervals

Fetch Sequences/Alignments

GENOMICS ANALYSIS

Assembly

Mapping

Variant Calling

RNA-seq

Multiple Alignments

Phenotype Association

deepTools

RSeQC

STATISTICS AND VISUALIZATION

Statistics

Graph/Display Data

WORKFLOWS

All workflows

## Welcome to Galaxy v21.05

Documentation » Community Hub »

Galaxy v21.05, Helm Chart v4.1.1

History

search datasets

Unnamed history

(empty)

This history is empty. You can load your own data or get data from an external source

File Edit View Run Kernel Tabs Settings Help

Filter files by name

| Name           | Last Modified |
|----------------|---------------|
| my-conda...    | 2 months ago  |
| config.json    | a month ago   |
| environme...   | 2 months ago  |
| logtime.txt    | a month ago   |
| Untitled.ip... | 6 hours ago   |
| Untitled1.i... | 3 days ago    |
| Untitled2.i... | 3 days ago    |
| Untitled3.i... | seconds ago   |
| Untitled4.i... | 6 hours ago   |
| viktorias      | 2 months ago  |

Untitled3.ipynb x Untitled1.ipynb Python 3

```
[1]: import torch

t = torch.cuda.get_device_properties(0).total_memory
r = torch.cuda.memory_reserved(0)
a = torch.cuda.memory_allocated(0)
print(f"GPU info:\nTotal memory {t}\tReserved: {r}\tAllocated: {a}")
print(torch.cuda.get_device_properties(0))
print(torch.cuda.is_available())

GPU info:
Total memory 11554717696      Reserved: 0      Allocated: 0
_CudaDeviceProperties(name='GeForce RTX 2080 Ti', major=7, minor=5, total_memory=11019MB, multi_processor
_count=68)
True

[1]: import torch
for i in range(20000, 10000000):
    print(f"Trying {i}x{i} matrix multiplication.")
    t = torch.cuda.get_device_properties(0).total_memory
    r = torch.cuda.memory_reserved(0)
    a = torch.cuda.memory_allocated(0)
    print(f"GPU info:\n {t} Total memory {t}\tReserved: {r}\tAllocated: {a}")
    t1 = torch.randn(i,i).cuda()
    t2 = torch.randn(i,i).cuda()
    print(f"Passed")

Trying 20000x20000 matrix multiplication.
GPU info:
11554717696 Total memory 11554717696      Reserved: 0      Allocated: 0
Passed
Trying 20001x20001 matrix multiplication.
GPU info:
11554717696 Total memory 11554717696      Reserved: 3200253952      Allocated: 3200253952
Passed
Trying 20002x20002 matrix multiplication.
GPU info:
11554717696 Total memory 11554717696      Reserved: 4804575232      Allocated: 3200320512
Passed
Trying 20003x20003 matrix multiplication.
GPU info:
11554717696 Total memory 11554717696      Reserved: 4806672384      Allocated: 3200641024
Passed
Trying 20004x20004 matrix multiplication.
GPU info:
11554717696 Total memory 11554717696      Reserved: 4806672384      Allocated: 3200960512
Passed
Trying 20005x20005 matrix multiplication.
GPU info:
11554717696 Total memory 11554717696      Reserved: 4806672384      Allocated: 3201281024
Passed
Trying 20006x20006 matrix multiplication.
GPU info:
11554717696 Total memory 11554717696      Reserved: 4806672384      Allocated: 3201600512
Passed
Trying 20007x20007 matrix multiplication.
GPU info:
11554717696 Total memory 11554717696      Reserved: 4806672384      Allocated: 3201921024
Passed
Trying 20008x20008 matrix multiplication.
GPU info:
11554717696 Total memory 11554717696      Reserved: 4806672384      Allocated: 3202240512
Passed
Trying 20009x20009 matrix multiplication.
GPU info:
11554717696 Total memory 11554717696      Reserved: 4806672384      Allocated: 3204448256
Passed
Trying 20010x20010 matrix multiplication.
```

Simple 0 4 Python 3 | Idle Saving completed Mode: Command Ln 1, Col 1 Untitled3.ipynb

# Server Options

## Choosing image

Predefined images are:

- Minimal NB - Jupyter minimal notebook
- Datascience NB - Jupyter datascience NB (Python, R, Julia)
- Scipy NB - Jupyter scipy NB (minimal NB + interactive visualizations and plots in Python)
- Tensorflow NB - Jupyter TensorFlow NB (scipy NB + tensorflow and keras)
- Tensorflow GPU NB - Jupyter TensorFlow NB on GPU (Jupyter Notebooks with the power of GPU, perform GPU calculations using Tensorflow and Pytorch in collaborative notebooks. Displayed device is XLA\_GPU)

If you want to run custom image, write its name into the text field in format `repo/image_name:tag` or `repo/image_name`. Images with no tag will be treated as latest, default image is set to Minimal NB.

Select an image:

## Choosing storage

The notebook will spawn with default persistent volume which will be mounted into `/home/jovyan`. This means that even when notebook gets deleted, the data will persist and can be used again.

If you are interested, mounting your MetaCentrum home is possible. If you choose to mount home but you won't select any particular option, `brno3-cerit` is set as default. Home is mounted in `/home/meta/username`

I want MetaCentrum home

## Resources

### CPU

By default, 1 CPU is assigned to notebooks.

Select number of CPU (1-32):

### Memory

Please choose upper memory limit (in GB) which will be assigned to notebook.

### GPU

By default, no GPU is assigned. If you want to use a GPU, there are two possible ways. You can request:

- part of GPU
- whole GPU

*GPU parts* are better option when you don't need a lot of GPU memory. Their disadvantage is that crossing memory boundary results in killing all processes running on that GPU. However, an advantage is that you will get the GPU immediately and there are far more GPUs available as parts. This is an EXPERIMENTAL feature.

*Whole GPU* is better when you need full reliability and power. However, it is possible you won't get a notebook right away because all GPUs might be allocated. If that's the case, you can try again later or use a GPU part.

Select GPU usage type:

## Multiple named servers per user

It is possible to run multiple servers per one user. For more information please consult [documentation](#).

If you experience `HTTP 500:Internal Server Error` or error while spawning, consult [documentation](#) for help. If you experience any other errors, please issue a new ticket and we will handle it as soon as possible.

Start



ansys  
ANSYS 2021R1



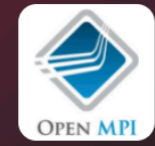
bioconductor  
R Studio



desktop-server  
GPU-accelerated streaming using WebRTC



matlab  
Matlab 9.9



mpijob



rstudio-server



vmd  
VMD 1.9.4



wordpress  
Web publishing platform for building blogs and websites.



## Best coffee drinkers

**Peter Balčírák**

MUNI ICS

7 ☕

**Radko Krkoš**

CESNET

9 ☕

**Pavel Broušek**

MUNI ICS

7 ☕

| #  | Name                    | Total coffees/month | Organization |
|----|-------------------------|---------------------|--------------|
| 1  | Radko Krkoš             | 9                   | CESNET       |
| 2  | Peter Balčírák          | 7                   | MUNI ICS     |
| 3  | Pavel Broušek           | 7                   | MUNI ICS     |
| 4  | Pavel Zlámal            | 6                   | CESNET       |
| 5  | Adrián Rošinec          | 5                   | MUNI ICS     |
| 6  | Ondřej Melichar         | 4                   | MUNI ICS     |
| 7  | Pavel Vyskočil          | 4                   | CESNET       |
| 8  | Vojtěch Sassmann        | 4                   | MUNI ICS     |
| 9  | Anežka Melounová        | 2                   | CESNET       |
| 10 | Jana Broncová           | 2                   | MUNI ICS     |
| 11 | Tomáš Svoboda           | 2                   | MUNI ICS     |
| 12 | Dominik František Bučík | 2                   | MUNI ICS     |
| 13 | Jan Pavlíček            | 2                   | MUNI ICS     |
| 14 | Martin Kostka           | 1                   | MUNI ICS     |
| 15 | Markéta Křenková        | 1                   | MUNI ICS     |
| 16 | Matej Antol             | 1                   | MUNI ICS     |
| 17 | Daniel Kouřil           | 1                   | CESNET       |



| <input type="checkbox"/>   | State   | Name                                | Image  | Scale |
|----------------------------|---------|-------------------------------------|--|-------|
| Namespace: seq-pipeline-ns |         |                                     |  |       |
| <input type="checkbox"/>   | Running | backstabbing-goldberg               | cerit/nextflow:20.10.0-4<br>10.42.21.40 / hdh-worker-u2 / Created a day ago / Restarts: 0      | Pod   |
| <input type="checkbox"/>   | Running | nf-25e1c6e37df73d6c53842890852d4a38 | nfcore/sarekvep:2.7.GRCh38<br>10.42.22.162 / hdg-worker-u1 / Created a day ago / Restarts: 0   | Pod   |
| <input type="checkbox"/>   | Running | nf-39ddb44fe7ecfde767f6f5017ceb7a08 | nfcore/sarekvep:2.7.GRCh38<br>10.42.22.169 / hdg-worker-u1 / Created a day ago / Restarts: 0   | Pod   |
| <input type="checkbox"/>   | Running | nf-8f257ae66c732bc4525bd1aa7aa8b538 | nfcore/sarekvep:2.7.GRCh38<br>10.42.22.159 / hdg-worker-u1 / Created a day ago / Restarts: 0   | Pod   |
| <input type="checkbox"/>   | Running | nf-9e61d8863206af1bf4f683c44192883e | nfcore/sarekvep:2.7.GRCh38<br>10.42.16.133 / hda-worker-u3 / Created a day ago / Restarts: 0   | Pod   |
| <input type="checkbox"/>   | Running | nf-a7ee353cbcab97e028ae987ea779236c | cerit.io/nfcore/sarek:2.7<br>10.42.21.82 / hdh-worker-u2 / Created 7 minutes ago / Restarts: 0 | Pod   |
| <input type="checkbox"/>   | Active  | nf-core-proxy<br>22/tcp             | cerit.io/nextflowproxy:v0.3<br>1 Pod / Created 21 days ago / Pod Restarts: 0                   | 1     |
| <input type="checkbox"/>   | Running | nf-e9fb8cd8055e2d2f0fd3453899ada313 | nfcore/sarekvep:2.7.GRCh38<br>10.42.20.193 / hdh-worker-u1 / Created a day ago / Restarts: 0   | Pod   |

# Kubernetes development — near future

- Dokumentácia :)
  - admin v Confluence
  - user zatiaľ na Github pages
- Portál s aplikáciami (Rancher je tbh neprehľadný pre užívateľa)
- Sensitive Kubernetes
- Podpora veľkých výpočtov — framework TES + WES (Snakemake, Nextflow, ...)
- Prechádzanie RT
- Monitoring a logging ale top spôsobom

# Kubernetes development — who and when?

- Sploupracujeme so Švajčiarimi, Nemcami — EÚ úroveň
- Chceli by sme ale i s domácimi — česká akademická scéna
- Zatiaľ potrebujeme nápady a požiadavky od vás všetkých
- Niečo nám napadne, niečo nie
  
- Rada vidím študentov sa angažovať!

# FAQ

- Škáluje vám to?
- Kde k nájdem informácie k našemu K8s?
- Kde je user/admin dokumentácia?
- Je ťažké si niečo deploynúť v K8s?
- Kto je support?



Luděk Matyska 12:02

Nice 😄