



Joint Institute for Nuclear Research

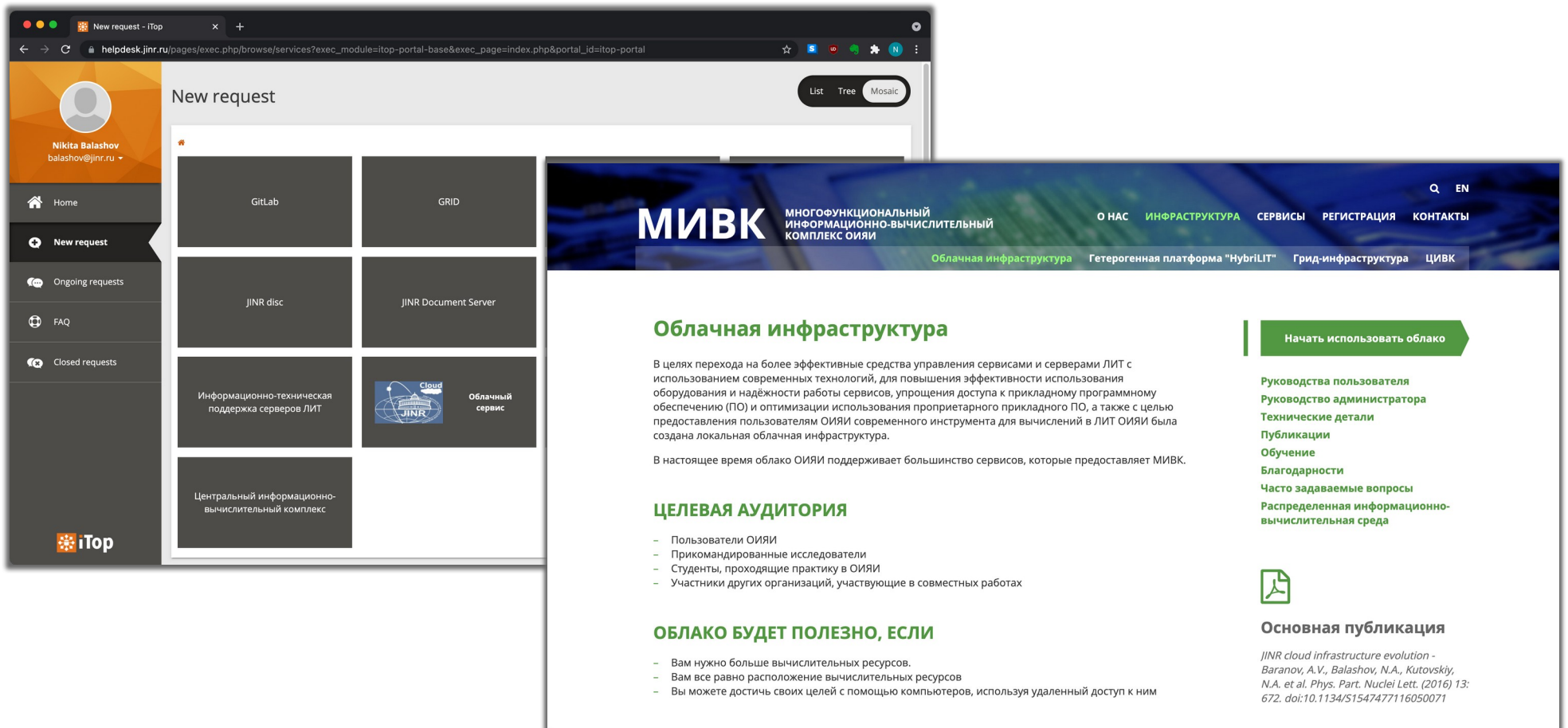
JINR Cloud Services and Infrastructure

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Information and Help

- Basic information can be found at micc.jinr.ru
- We provide support for all of our services at helpdesk.jinr.ru



The image displays two overlapping screenshots from the helpdesk.jinr.ru website. The background screenshot shows a 'New request' form with a sidebar menu containing options like 'Home', 'New request', 'Ongoing requests', 'FAQ', and 'Closed requests'. The foreground screenshot shows a page titled 'Облачная инфраструктура' (Cloud Infrastructure) with the following content:

Облачная инфраструктура

В целях перехода на более эффективные средства управления сервисами и серверами ЛИТ с использованием современных технологий, для повышения эффективности использования оборудования и надёжности работы сервисов, упрощения доступа к прикладному программному обеспечению (ПО) и оптимизации использования проприетарного прикладного ПО, а также с целью предоставления пользователям ОИЯИ современного инструмента для вычислений в ЛИТ ОИЯИ была создана локальная облачная инфраструктура.

В настоящее время облако ОИЯИ поддерживает большинство сервисов, которые предоставляет МИВК.

ЦЕЛЕВАЯ АУДИТОРИЯ

- Пользователи ОИЯИ
- Прикомандированные исследователи
- Студенты, проходящие практику в ОИЯИ
- Участники других организаций, участвующие в совместных работах

ОБЛАКО БУДЕТ ПОЛЕЗНО, ЕСЛИ

- Вам нужно больше вычислительных ресурсов.
- Вам все равно расположение вычислительных ресурсов
- Вы можете достичь своих целей с помощью компьютеров, используя удаленный доступ к ним

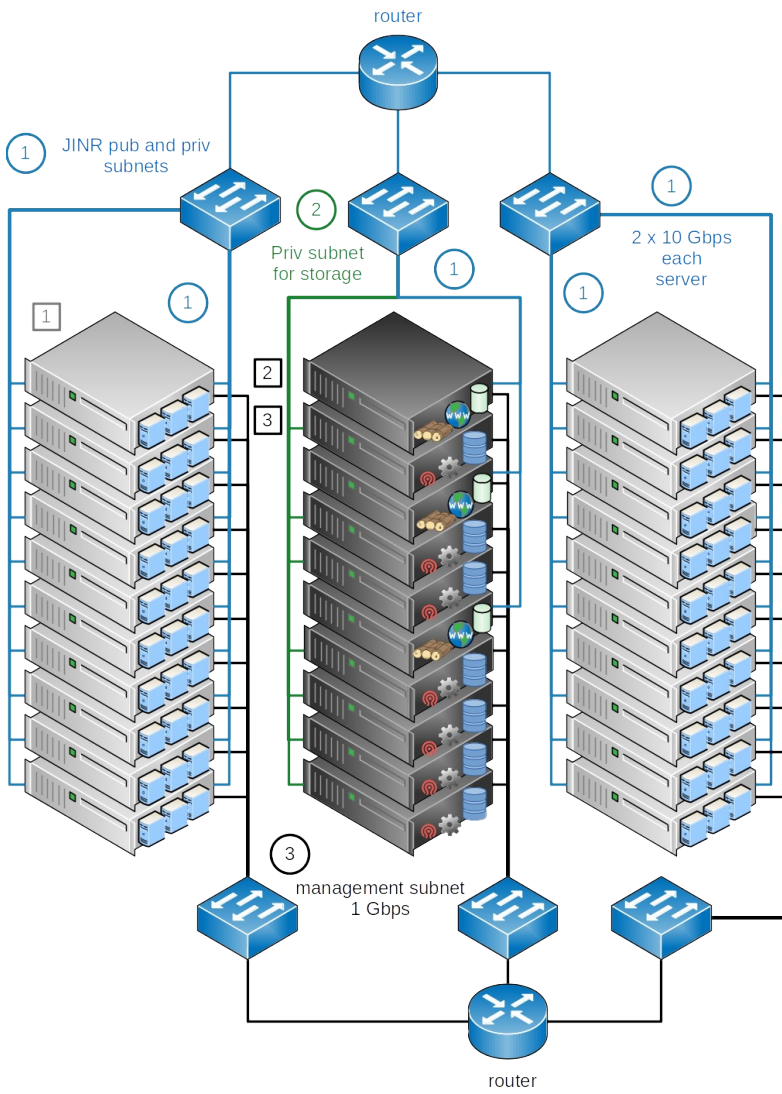
[Начать использовать облако](#)

Руководства пользователя
Руководство администратора
Технические детали
Публикации
Обучение
Благодарности
Часто задаваемые вопросы
Распределенная информационно-вычислительная среда

Основная публикация

JINR cloud infrastructure evolution - Baranov, A.V., Balashov, N.A., Kutovskiy, N.A. et al. Phys. Part. Nuclei Lett. (2016) 13: 672. doi:10.1134/S1547477116050071

What is JINR Cloud



- Provides virtual machines on-demand
- Powered by OpenNebula platform
- Public network interfaces for Internet access and private for JINR local network only
- 176 servers for VMs
 - Over 5000 non-HT CPU cores (20 to 32 cores per server)
 - Over 60 TB of RAM (5 to 16 GB per CPU core)
- 2 Ceph based distributed storages:
 - SSD cluster for data-intensive and production services
 - Larger-scale HDD cluster for generic workloads

JINR Cloud Use Cases

- Software developers
 - Develop, test and debug apps in various environments
- System administrators
 - Host IT systems and virtual computing environments
 - Test and study specifics of installation and operation of new apps or updates
- PC-style users
 - Use as personal remote machines for anything
- Automated systems
 - Provision VMs from external systems, e.g. worker-nodes form DIRAC or runners for CI jobs from GitLab

General Considerations

- We don't generally provide support of internal VM functioning – that's the user's responsibility
- Users are also responsible for securing their VMs
- Use private IP network when possible to minimize security risks
- Clean up unused VMs
- Undeploy VMs for long periods of idleness
- Consider co-sharing VMs with colleagues
- Minimize resource requirements
- Ceph-storage can be also used separately as a network filesystem (CephFS) or via S3 protocol

JINR Cloud Access

- Web-interface is at cloud.jinr.ru
- CLI over SSH is available on request
- Login with standard JINR computing account
- Support and information:
 - helpdesk.jinr.ru
 - cloud-info@jinr.ru
 - [MICC portal](#)
 - OpenNebula [documentation](#)
 - Internals insight in [GRID'21 talk](#)

The screenshot displays the JINR Cloud Dashboard. On the left is a navigation sidebar with the following menu items: Dashboard, Instances, Templates, Storage, Network, and Settings. Below the settings menu, there is a red warning box that says "Not officially supported" and a version notice: "OpenNebula 5.12.0.4 (new version available: 6.0.0.2)".

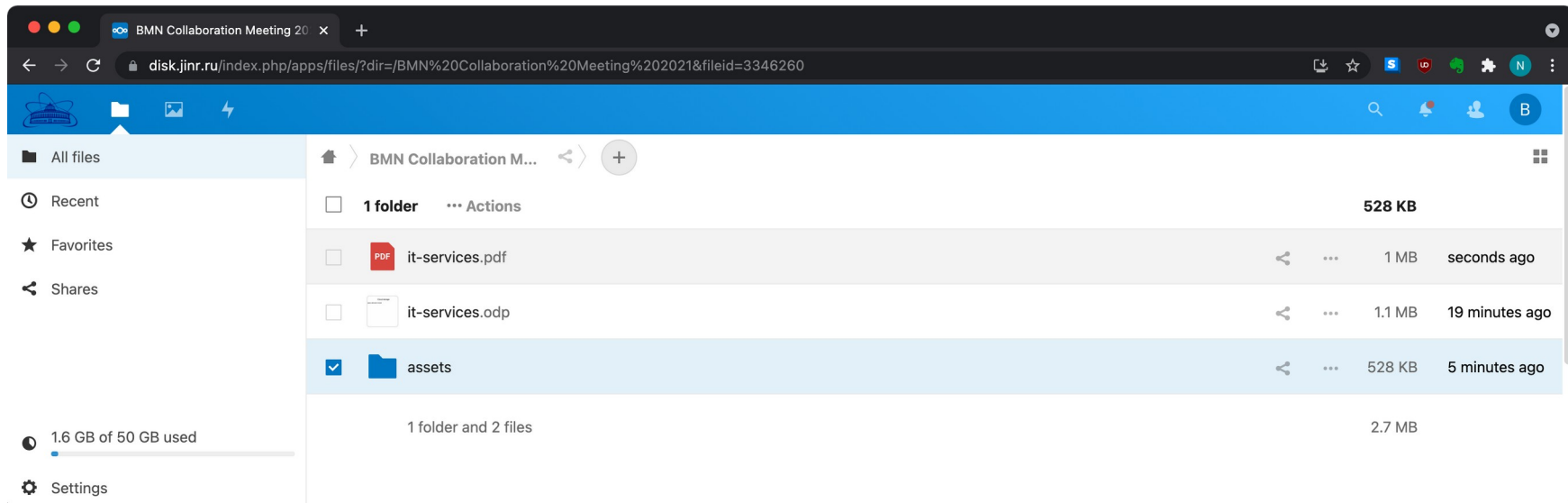
The main dashboard area is titled "Dashboard" and features three summary cards:

- Virtual Networks:** 18 VNETS, 827 USED IPs.
- Images:** 141 IMAGES, 76 TB USED.
- Virtual Machines:** 72 TOTAL, 0 PENDING, 0 FAILED.

Each card includes a list icon and a plus sign icon for further actions. The top right of the dashboard shows a user profile icon and a globe icon.

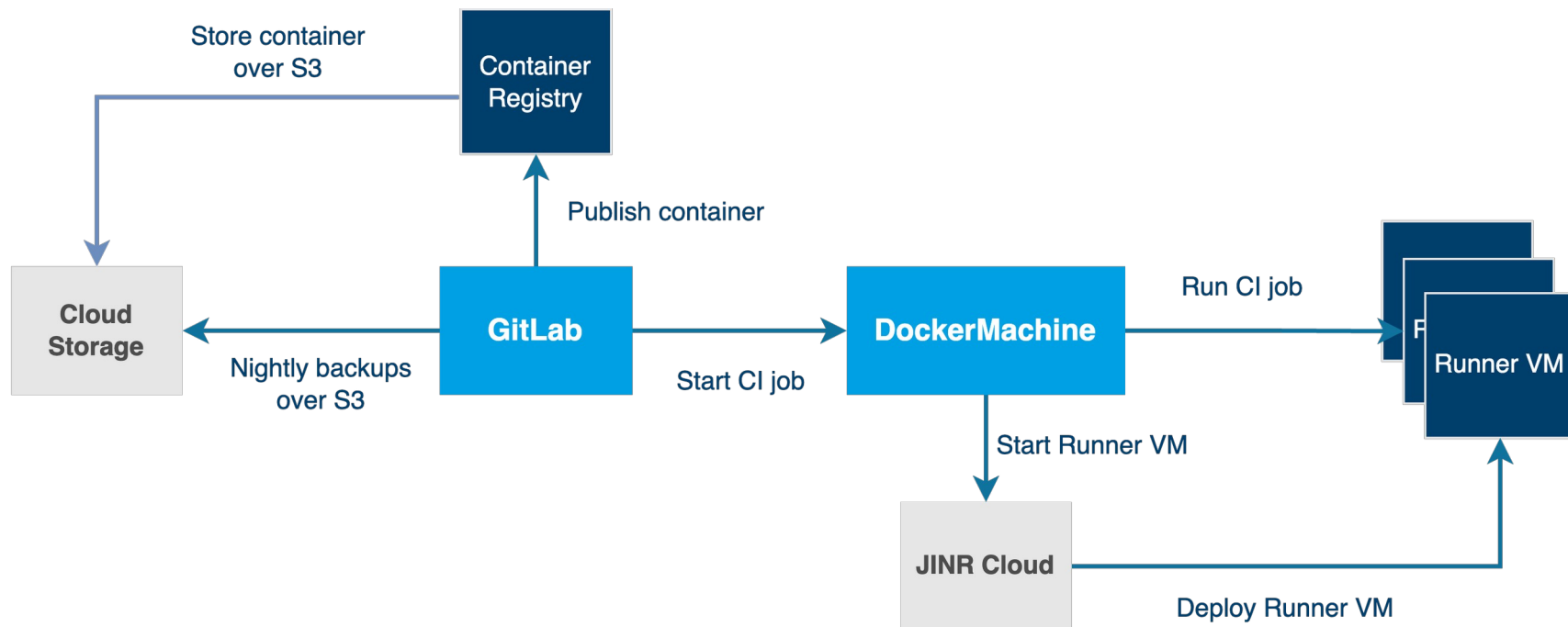
Cloud Storage at disk.jinr.ru

- Dropbox alternative based on NextCloud
- MooseFS as a backend with triple replication
- Store and share any files via browser access, WebDAV or clients
- Clients for Windows, Mac OS X, Linux, Android or iOS
- 50 GB of storage by default, but can be increased on request
- Collabora integration for online collaborative documents editing
- Support at helpdesk.jinr.ru



GitLab Service

- Feature-rich DevOps platform:
 - Issue tracking
 - Git version control system
 - Code Review
 - CI/CD tools for automating operations
 - Registry for packages and containers
 - GitLab Pages for static websites
- Available at git.jinr.ru:
 - Built-in accounts that can be optionally connected to JINR ID
- Support and information
 - helpdesk.jinr.ru
 - MICC portal
 - GitLab documentation



Build Your Own Workflow

- [Pro Git](#) book
- [Introduction to Git workflows](#)
- Explore [public](#) projects to get some examples:
 - [GNA](#)
 - [MPDROOT](#)
- Consider GitLab Flow as a basis for your workflow:
 - Protect main branch from direct changes by anyone
 - Post and discuss features using issues
 - Develop in feature branches
 - Review code in merge requests
 - Merge finished branches into main

JupyterHub

- Web-based interactive programming environment via Jupyter notebooks (similar to [CERN SWAN](#))
- Has support for a large [list of programming languages](#), including ROOT
- Available at jupyter.jinr.ru:
 - JINR SSO account for web access
 - Shared home directories between user servers (CephFS)
 - Has CVMFS mounted
 - Has MLIT EOS instance mounted (do **kinit** manually via terminal to get authenticated)
 - A generic Datascience container from Jupyter Docker Stacks in three sizes (**negotiable**) is available
- Power is limited to the size of a cloud server, but clusters can be potentially connected for distributed computing

JupyterHub Use-cases

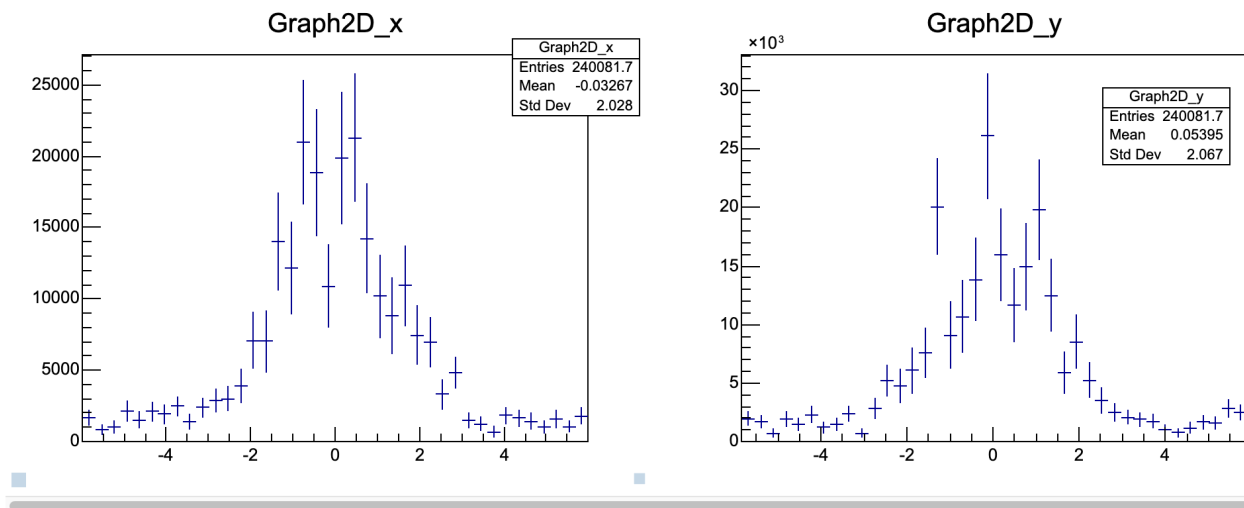
- Convenient interactive plotting and user tutorials are the two obvious use-cases
- Some examples of tutorials from CERN [available](#)

Make the x and y projections.

```
[6]: gStyle->SetPalette(kBird);  
TCanvas c_p("ProjCan", "The Projections", 1000, 400);  
c_p.Divide(2,1);  
c_p.cd(1);  
dte.Project("x")->Draw();  
c_p.cd(2);  
dte.Project("y")->Draw();
```

Activate the JavaScript visualisation mode and display the projections in the notebook.

```
[7]: %jsroot on  
c_p.Draw();
```



Thanks!

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