



Cloud for Innovation

KIFÜ 2024.

Molnár Péter

Hungarian NREN

- New regions
- OpenStack version upgrade
- C4I Classroom
- Operation

- One „big” region
 - 18 compute nodes, 9 storage nodes
 - 936 core
 - 4.6 TB RAM
 - 126 TB SSD
 - 864 TB HDD
- Two „small” regions
 - 6 compute nodes, 6 storage nodes
 - 240 core
 - 1.5 TB RAM
 - 126 TB SSD
- Dedicated network nodes, OpenStack regions, no zoneing

Data center selection considerations

- Network: at least two independent optical interconnect direction
- Network: 100 Gbps speed availability
- Servers are installed in our own and in partner university datacenters

Regions on map



- **Compute: Dell R640 1U two socket**
 - Intel Xeon 6230 20 C, Intel Xeon 6230R 26 C
 - 256 GB RAM
 - 6.4 GB RAM/core, 4.9 GB RAM/core, no cpu overbooking
- **Storage: Dell R740xd 2U two socket**
 - Intel Xeon 5218 16C
 - 256 GB RAM
 - 21 TB SSD
 - 24 SSD OSD or 12 SSD OSD, 12 external HDD+12 SSD cache drive
 - 1.3 core, 10 GB RAM / OSD
- **MD1400 DAS**
 - 12 x 12 TB Nearline SAS 7k2 HDD

Upgrade goals

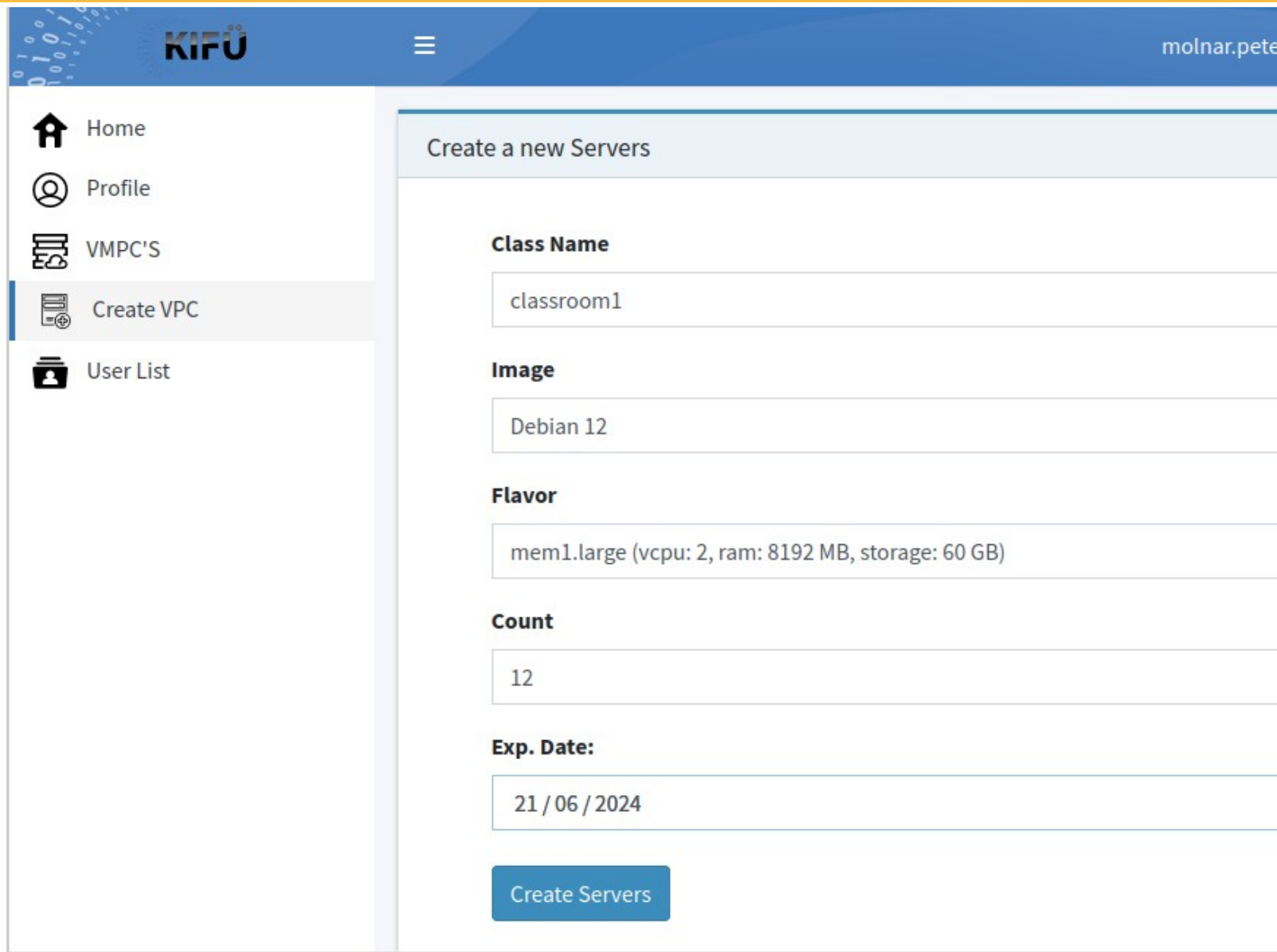
- Online upgrade for the first time, no planned service interruption
- OpenStack Ussuri to Victoria
- Ceph Nautilus to Octopus
- Ubuntu 18.04 (bionic) to Ubuntu 20.04 (focal)

Ceph Luminous 12.2.x		Ceph Octopus 15.2.x		Ceph Pacific 16.2.x		Ceph Quincy 17.2.x			Ceph Reef 18.2.x
Distro	UCA OpenStack Ussuri	Distro	UCA OpenStack Wallaby	UCA OpenStack Xena	UCA OpenStack Yoga	Distro	UCA OpenStack Zed	UCA OpenStack 2023.1 (Antelope)	UCA OpenStack 2023.2 (Bobcat)
Ubuntu 18.04 LTS Bionic		Ubuntu 20.04 LTS Focal				Ubuntu 22.04 LTS Jammy			

- We start with central Keystone and Horizon
- Then we continue the upgrade in each region according to our update cycle scheduling
- In-house developed Ansible scripts, dpkg based installation
- Lot of testing in the bionic-focal-ussuri-victoria version matrix
- Careful testing with Fujitsu and EMC SAN storages

- Simplifying educational and research work.
- Provide students and researchers with up-to-date software running on powerful hardwares.
- Classroom is a virtual educational computer room or lab.
- Teachers can use ready-to-use software packages on cloud virtual machines.
- This service can be useful when an educational institution wants to use more powerful hardware for a given course.

- On-line, hibrid courses, homework
- Resources can be deleted at the end of the semester by an automatic scheduler.



The screenshot displays the KIFÜ Classroom interface. The top navigation bar includes the KIFÜ logo, a hamburger menu icon, and the user name 'molnar.pete'. The left sidebar contains a navigation menu with the following items: Home, Profile, VMPC'S, Create VPC (highlighted), and User List. The main content area is titled 'Create a new Servers' and contains a form with the following fields:

- Class Name:** classroom1
- Image:** Debian 12
- Flavor:** mem1.large (vcpu: 2, ram: 8192 MB, storage: 60 GB)
- Count:** 12
- Exp. Date:** 21 / 06 / 2024

A blue 'Create Servers' button is located at the bottom of the form.

- E-mail, eduID based invitation

Server Status					
<input type="text" value="Search Name..."/>		<input type="text" value="Search Ip..."/>		<input type="button" value="Search"/>	<input type="button" value="Reset"/>
Server Name	IP	Expired Time	Status	Distributed	Action
[teacher]-okt-26-1	193.224.23.231	31 Oct 2024, midnight	stopped	<input type="text" value="email"/> <input type="button" value="Send"/>	<input type="button" value="Start"/> <input type="button" value="Stop"/> <input type="button" value="Restart"/> <input type="button" value="Delete"/>
[admin@admin.com]-norbi-test-0	193.224.23.205	7 Feb 2024, midnight	active	czier.norbert@kifu.gov.hu	<input type="button" value="Start"/> <input type="button" value="Stop"/> <input type="button" value="Restart"/> <input type="button" value="Delete"/>
[admin@admin.com]-norbi-test2-0	193.224.23.142	7 Feb 2024, midnight	active	<input type="text" value="email"/> <input type="button" value="Send"/>	<input type="button" value="Start"/> <input type="button" value="Stop"/> <input type="button" value="Restart"/> <input type="button" value="Delete"/>
[kerecsen.gergo@kifu.gov.hu]-test-0	193.224.23.42	1 Feb 2024, midnight	stopped	kerecsen.gergo@kifu.gov.hu	<input type="button" value="Start"/> <input type="button" value="Stop"/> <input type="button" value="Restart"/> <input type="button" value="Delete"/>

- Web VNC
- Web SSH

Server Information

VNC SSH Start Stop Restart Delete

Server Name: [teacher]-okt-26-1

IP Address: 193.224.23.231

Server Status: SHUTOFF

Server Creation Time: 28/11/2023

Server Expired Time:

current Exp. Time:	31/10/2024	
New Exp time:	<input type="text" value="jj / mm / aaaa"/>	<input type="button" value="Change"/>

Server Distributed:

Server Admin: teacher@teacher.com

Private Key's:

Private Key Name:	okt-2683651
Private Key:	<pre>-----BEGIN RSA PRIVATE KEY----- MIIEowIBAAKCAQEAvNbjXw++Trx6U0KdUQasJCwMzR+w7WZh8j8b23JhHQqI4UGQ 2oTFP9pSFdr0Bv+0wq716RP2aybwyd6KUoBwp7sUV1so2AdmZeXf4miu4SbCa4jP D0U2CmeF7Vzn1GeH/rQT7KtKwc9Qs77rC0Xkf93Dko08LpSJ3V25kkL6eVZC2/Eo 07IWHHjk31Ka71Gu7kGKpMLX7mb5T4i/vT9JMW6WoZ8PeHki0ccRFV0/6qYna7qJ</pre>

- Basic user information
- Teachers have a quota

Profile	
User Name:	None
User Email:	molnar.peter@kifu.gov.hu
User Eppn:	molnarp@niif.hu
Roles:	Teacher, Student
User Quota:	
Quota Cpu:	10
Quota Ram:	16000
Quota Storage:	300

- Separate development (3) and operational team (2)
- We have commercial support contract for all production hardwares. Local company provide support for old dev/test EOS hardwares also.
- Fujitsu SAN storage battery replacement trouble:
 - Storage controller BBU replacement is not included in Fujitsu hardware support because it's „standard wearing”, with predefined lifetime.
 - Dell replaces batteries if customer pay for ProSupport.



Thank you!
www.kifu.gov.hu

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