



RO-03-UPB in ALICE

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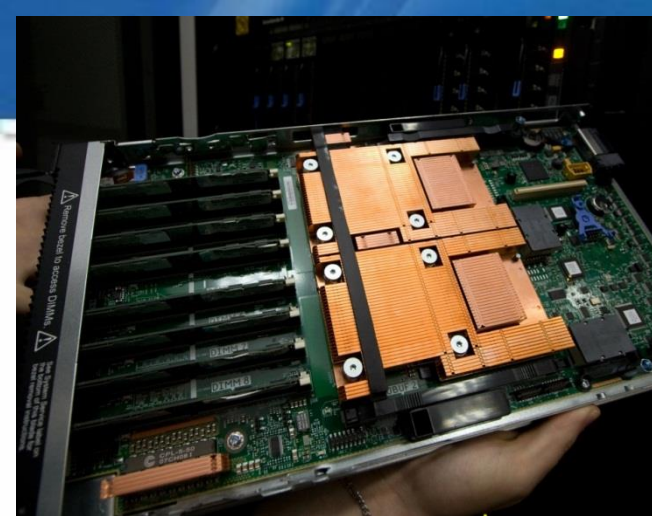
Agenda

- Infrastructure
 - NCIT
 - PRECIS
 - CAMPUS

- Software stacks
 - OpenStack
 - Hyper-V Cluster

- ALICE status





UPB





PRECIS Project

28 New Research Labs
for Academia & Industry
1 new DataCenter



P•R•E•C•I•S



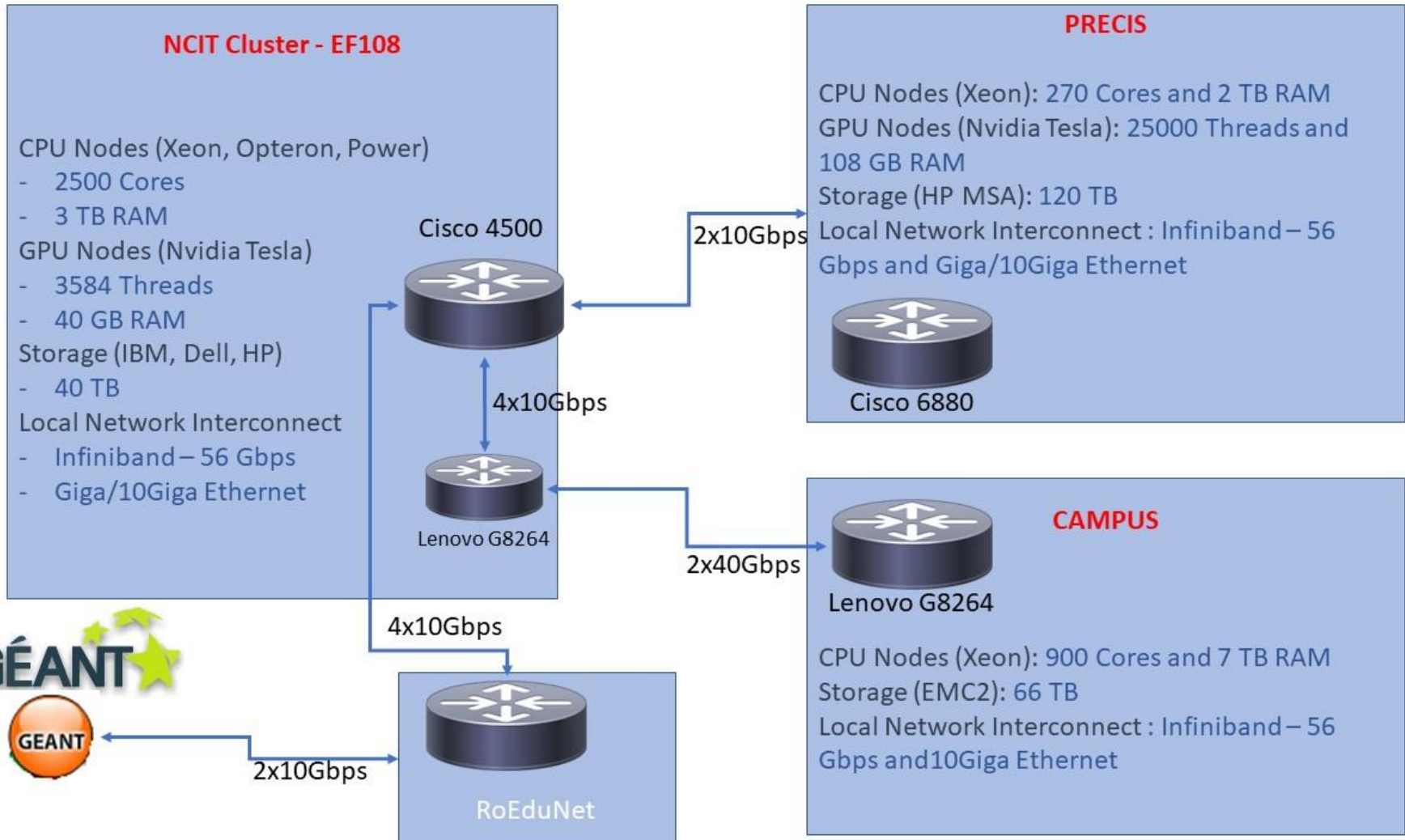
CAMPUS Project

Another new
DataCenter





RO-03-UPB Datacenters





Hyper-V Cluster

- High Availability Cluster
 - Live Migration
 - Fibre Channel Shared Storage
 - Multiple 10Gbps Network Upstream
 - Live Virtual Machine Replication for Disaster Recovery

- Hosting Production Services for the whole University
 - e-Learning Platforms
 - Identity Management System (hybrid LDAP/AD)
 - Cloud Controller Services
 - Grid Services (CE, SE, WMS, LFC, ARGUS, VOBOX)



OpenStack

- Private Cloud Service
- Used as an Overlay over Our Whole Infrastructure
- Trying to run as Many Services as We Can as OpenStack Virtual Machines
- Every person affiliated to UPB has access to a default tenant (3 instances, 4GB of RAM)
- <http://cloud.curs.pub.ro>



Grid Nodes as OpenStack VMs

- Worker Grid Nodes running on top of OpenStack
- Prepared Cloud Image with all the necessary packages
- Able to Run Scripts after VM creation
- Provide elasticity
 - easily increase or decrease the capacity of the Grid
- No performance issues
 - jobs are running with no cost of performance in terms of CPU
 - performant virtualized I/O operations using Virt I/O



Grid Nodes as OpenStack VMs

openstack grid-user_prj grid-user

Project / Compute / Overview

Overview

- Overview
- Instances
- Images
- Key Pairs
- Volumes
- Network
- Orchestration
- Identity

Limit Summary

Instances Used 66 of 128	VCPUs Used 528 of 1,000	RAM Used 2.1TB of 3.9TB	Floating IPs Allocated 0 of 128	Security Groups Used 1 of 10	Volumes Used 0 of 2

Volume Storage
Used 0Bytes of 5GB

Usage Summary

Select a period of time to query its usage:
The date should be in YYYY-MM-DD format.

2019-05-14 to 2019-05-15

Active Instances:	66
Active RAM:	2.1TB
This Period's VCPU-Hours:	15990.41
This Period's GB-Hours:	159904.08
This Period's RAM-Hours:	65496712.82



RO-03-UPB in Alice

- Started from November 2016
- Pilot Test with 168 cores
- From January 2017 increased at 448 cores on top of OpenStack
 - At any time we can scale-up up very fast
 - E.g.: during the summer the resources aren't used by students and can be shared in the Grid
- From February 2019 increased at 528 cores



RO-03-UPB in Alice

- Status of Networking - IPv6 readiness
 - UPB infrastructure is IPv6 ready
 - CE, SE, VOBOX on IPv6.
- Perfsonar
 - <https://perfsonar-bandwidth.grid.pub.ro>
 - <https://perfsonar-latency.grid.pub.ro>
 - https://twiki.cern.ch/twiki/bin/view/LCG/WlcpIpv6#WLCG_Tier_2_IPv6_deployment_stat

RO-03-UPB	RO	Y				Done	Dual stack	Tested
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EOS at RO-03-UPB

- 66TB
- History:
 - given a small capacity, xrootd was initially pointed-out
 - Latchezar came and said: Mihai deploy EOS
 - Ok let's go with EOS
- 1 MGM and 3 FST
 - eos-mgm.grid.pub.ro (IPv4 and IPv6)
 - Hyper-V VM
 - eos-fst{1-3}.grid.pub.ro (IPv4 and IPv6)
 - Each with 2 mounts of 11 TB
 - Each volume of 11TB is a RAID 5 (old hardware) with 1 spare





EOS Deployment at RO-03-UPB

```
[root@eos-mgm ~]# eos fs ls
```

host	port	id	path	schedgroup	geotag	boot	configstatus	drainstatus	active	health
eos-fst-storage2.grid.pub.ro	1095	1	/data/vol1	default.0	BUC-UPB	booted	rw	nodrain	online	N/A
eos-fst-storage2.grid.pub.ro	1095	2	/data/vol2	default.1	BUC-UPB	booted	rw	nodrain	online	N/A
eos-fst-storage3.grid.pub.ro	1095	3	/data/vol1	default.0	BUC-UPB	booted	rw	nodrain	online	N/A
eos-fst-storage3.grid.pub.ro	1095	4	/data/vol2	default.1	BUC-UPB	booted	rw	nodrain	online	N/A
eos-fst-storage4.grid.pub.ro	1095	5	/data/vol1	default.0	BUC-UPB	booted	rw	nodrain	online	N/A
eos-fst-storage4.grid.pub.ro	1095	6	/data/vol2	default.1	BUC-UPB	booted	rw	nodrain	online	N/A





EOS email thread

☆	Subject	∞	Corespondenți	🕒	Data
☆	Re: Xrootd at UPB	•	Latchezar Betev	🕒	02.11.2017, 13:14
☆	Re: Xrootd at UPB	•	Adrian Sevcenco	🕒	02.11.2017, 14:08
☆	Re: Xrootd at UPB	•	Latchezar Betev	🕒	02.11.2017, 15:16
☆	Re: Xrootd at UPB	•	Miguel Martinez Pedreira	🕒	29.11.2017, 18:51
☆	Re: Xrootd at UPB	•	Adrian Sevcenco	🕒	08.01.2018, 20:31
☆	Re: Xrootd at UPB	•	Herve Rousseau	🕒	29.11.2017, 18:52
☆	Re: Xrootd at UPB	•	Miguel Martinez Pedreira	🕒	29.11.2017, 19:05
☆	Re: Xrootd at UPB	•	Miguel Martinez Pedreira	🕒	30.11.2017, 12:36
☆	Re: Xrootd at UPB	•	Miguel Martinez Pedreira	🕒	30.11.2017, 16:43
☆	Re: Xrootd at UPB	•	Miguel Martinez Pedreira	🕒	30.11.2017, 19:13
☆	Re: Xrootd at UPB	•	Miguel Martinez Pedreira	🕒	01.12.2017, 11:14
☆	Re: Xrootd at UPB	•	Herve Rousseau	🕒	01.12.2017, 11:20
☆	Re: Xrootd at UPB	•	Latchezar Betev	🕒	10.01.2018, 11:34
☆	Re: Xrootd at UPB	•	Latchezar Betev	🕒	10.01.2018, 12:38
☆	Re: Xrootd at UPB	•	Costin Grigoraș	🕒	10.01.2018, 14:08
☆	Re: Xrootd at UPB	•	Andreas-Joachim Peters	🕒	10.01.2018, 15:57
☆	Re: Xrootd at UPB	•	Latchezar Betev	🕒	11.01.2018, 15:13
☆	Re: Xrootd at UPB	•	Latchezar Betev	🕒	11.01.2018, 16:52
☆	Re: Xrootd at UPB	•	Latchezar Betev	🕒	13.01.2018, 18:25
☆	Re: Xrootd at UPB	•	Latchezar Betev	🕒	17.01.2018, 12:06
☆	Re: Xrootd at UPB	•	Luca Mascetti	🕒	12.02.2018, 21:47
☆	Re: Xrootd at UPB	•	Elvin Alin Sindrilaru	🕒	12.02.2018, 23:02
☆	Re: Xrootd at UPB	•	Miguel Martinez Pedreira	🕒	13.02.2018, 09:55





RO-03-UPB in Alice

- Future development
 - Plan for 2020 to increase at 1500 cores (already have the resources as you have seen)
 - Plan to increase storage with a ~300TB this year
 - We need to upgrade WN/CE/SE to CentOS7
 - EOS nodes and VOBOX are CentOS7 at this point



Thank you for your attention

Q & A

cluster.grid.pub.ro
cs.pub.ro