

Joint Institute for Nuclear Research

Optimization of the JINR Cloud's Efficiency

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NEC'2017, Budva, 28 September 2017



Our users

- Developers
 - development, testing and debugging various apps in various environments.

System administrators

- testing and studying specifics of installation and operation of new apps or testing updates
- PC-style users
 - Physicists
- Automated systems
 - BES-III, NOvA

Workloads





Overcommitment ratios

Capacity	
Allocated Memory	35GB / 35.2GB (99%)
Allocated CPU	1900 / 1200 (158%)
Real Memory	4.8GB / 35.2GB (14%)
Real CPU	121 / 1200 (10%)

Host 1:

High CPU overcommitmentNo memory overcommitment

	Allocated Memory	36.5GB / 23.4GB (156%)
Host 2:	Allocated CPU	2700 / 2400 (113%)
- Low CPU overcommitment	Real Memory	6.3GB / 23.4GB (27%)
- High memory overcommitment	Real CPU	7 / 2400 (0%)
	Running VMs	24

Possible solutions

OpenStack Neat

- Supports OpenStack only
- Development has stopped
- Green Cloud Scheduler for OpenNebula
 - Outdated

The goal: minimize energy consumption

Scheduler scheme



Monitoring



Administrative web-interface

5.0

5.0

5.0

SmartScheduler administration	Welcome, root -	Recent Actions -
Home		
Site administration Applications -		

33659

33660

33661

Yes, I'm sure Take me back

Authentication and Authorization

Users

Smartsched_Admin

Load config	Drop config
Clusters	
Host group	S
Hosts	
Vms	

Home / Load cloud configuration Are you sure? Your configuration is not empty Show me the differences Changes in clusters: No changes. Changes in hosts: ID Old CPU New CPU Old RAM New RAM Old cluster New cluster 92 2000 98583256 106 --Changes in VMs: ID Old CPU New CPU Old RAM New RAM Old host New host 92 33666 5.0 23552

23552

23552

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92

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92

VMs classification



Dynamic VM re-allocation

New VM





Summary

- The goal of the project is to optimize cloud resources utilization
- A basic software framework was designed
 - Open-source: github.com/jinr-lit

Thanks!

The project was supported by the RFBR grant 15-29-07027