

# RO-14-ITIM, upgrades for a diskless site

Mr. Jefe NAGY



Dr. Felix Fărcaș

# Location

***National Institute for R&D  
of Isotopic and Molecular Technology  
CLUJ-NAPOCA, ROMÂNIA***

web: [www.itim-cj.ro](http://www.itim-cj.ro) , e-mail: [itim@itim-cj.ro](mailto:itim@itim-cj.ro)

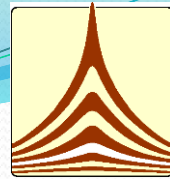




# Datacenter



# Datacenter Logical Schema



INCDTIM

## RoEduNet

### CISCO Catalyst 6509

IPv4 and IPv6 addressing

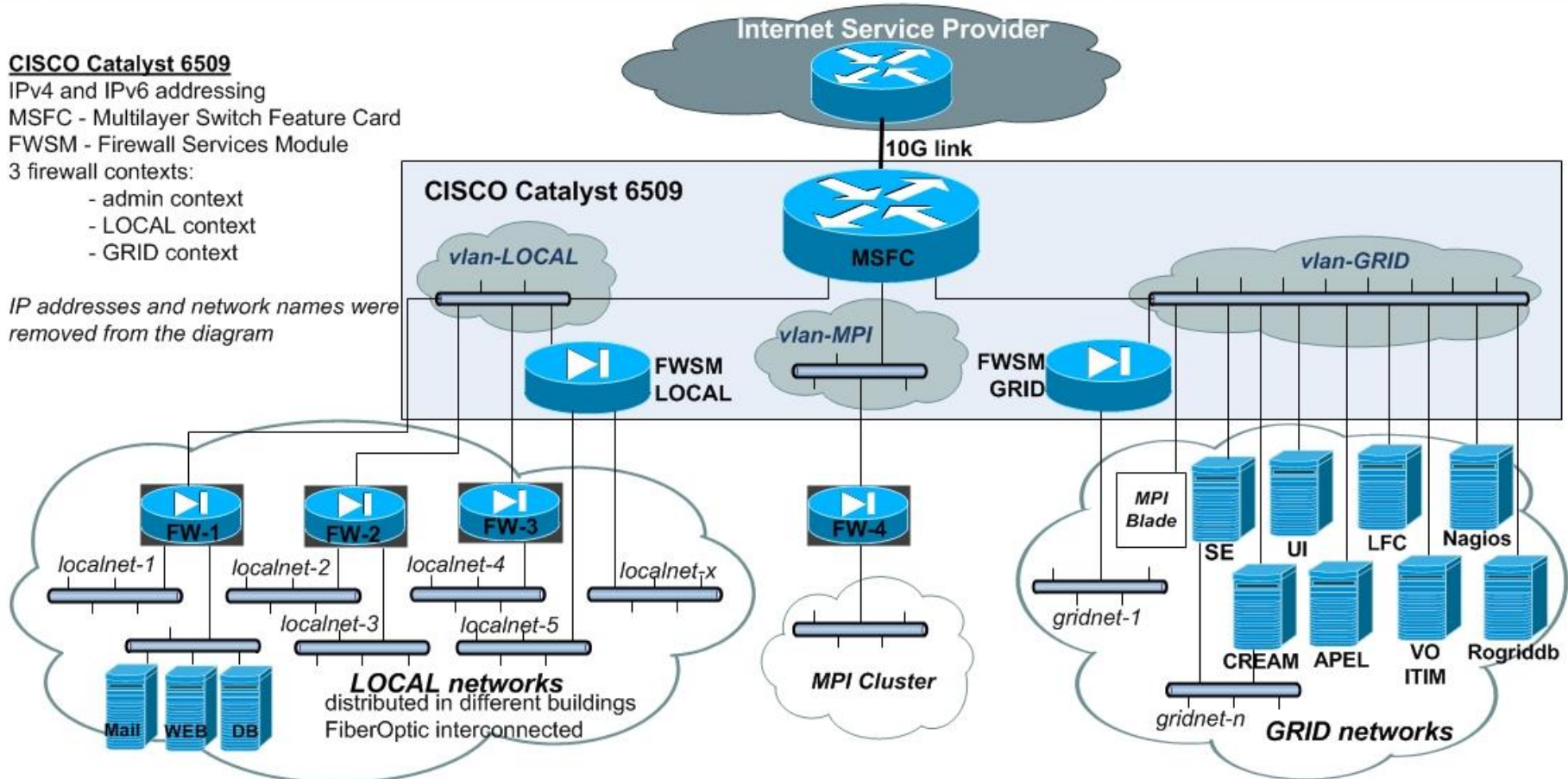
MSFC - Multilayer Switch Feature Card

FWSM - Firewall Services Module

3 firewall contexts:

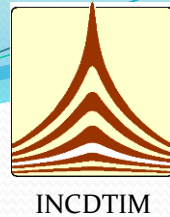
- admin context
- LOCAL context
- GRID context

IP addresses and network names were removed from the diagram





# Other datacenter Information



- Beginning with Oct 2014, RO-14-ITIM Grid site is part of the **Installation of National Interest**,
- A stable network link of **10 GBps**
- One IBM system of **7 Pflops** dedicated for **MPI** processing
- A **private storage** for backup, just for internal use



# Grid Site

- Name: **RO-14-ITIM**
- **64** Processing work-nodes,
- **Storage capacity**: 100TB, online 70 **TB**,  
**were**
- Virtual Organization: **ATLAS, ops**
- Used Technology: Intel & IBM, HP Blade systems
- Operating system: **SL 6.7**



# Team modification in time

**Team in 2014**



**Team in 2017**



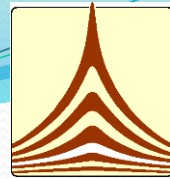




**Are there any  
backup  
solution?**







INC DTIM

# What is Outside the data center?

- **1 Power generator** for emergency situation as power failures;
  - starts in **8 seconds**;
  - Can function up to **8 hours**
- **UPS 96 kVA**, For now the maximum load is **55 kW** for the whole datacenter



Power generator  
275kW

# Monitoring Inside the data center?

- Monitoring system:
  - **Temperature & Humidity** fluctuation;
  - **Movement** and **Fire** sensors for other problem

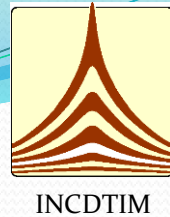


"TIME TO RELOCATE"

BY DIANE ALBER



# Financial Resources over the years



1. 12 EU / 8EU – ConDeGrid / 2009 – present
2. 15 EU/ 7EU 2008 – present
3. POS-CCE 192/2719, Sectorial Operational Program, “Increase of Economic Competitiveness”, **contract 42/11.05.2009** Axis 2, Operation 2.2.3~ *Improving the capacity and reliability of INCDTIM GRID center for integration in international networks (INGRID)*, **Value: 2.345.800 lei ~ 500.000 Euro (2009-2011)**
4. Capacity – Module I – Big Projects and investments, **Molecular and Biomolecular Physics Department Upgrading** – MDFMOLBIO, Project number 2 PM/I/07.10.2008-2010, Value, 30.034.930 lei, The value of the MPI Cluster was **1.000.000 lei**
5. **Romania-LIT cooperation program** “Hulubei-Meshcheryakov”, JINR Orders: 218/10.04.2017, p.22; 219/10.04.2017,p.95 and 220/10.04.2017, p.95



# What is the idea for discarding the storage

**No financial support for proper maintenance of the storage system**



# Results through time

## Algorithm for calculating the Site and Service Availability

### Legends for Metric Result Status

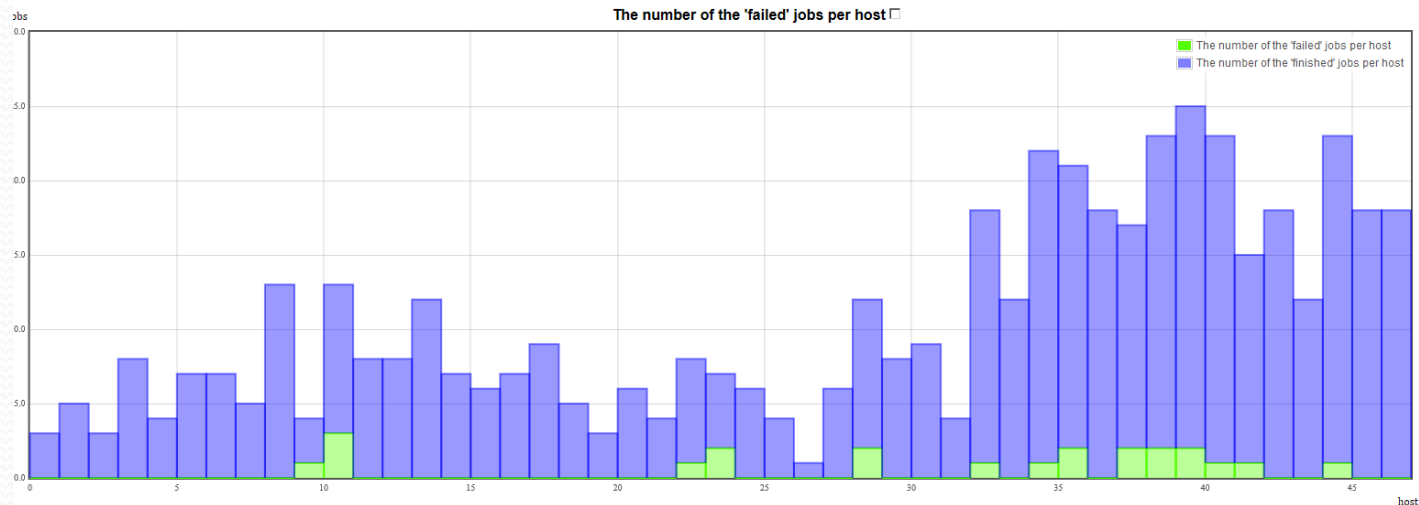
Status:	OK	WARNING	CRITICAL	UNKNOWN	MAINTENANCE
Legend:	OK	W	C	U	MT
Note: darkest colors: test is 0 - 12 hours old, ... lightest colors: test is more that 12 hours old					

Legend	Metric Name
1	org.atlas.WN-swspace (/atlas/Role_lcgadmin)
4	org.sam.CONDOR-JobSubmit (/atlas/Role_lcgadmin)

[Link to data](#)

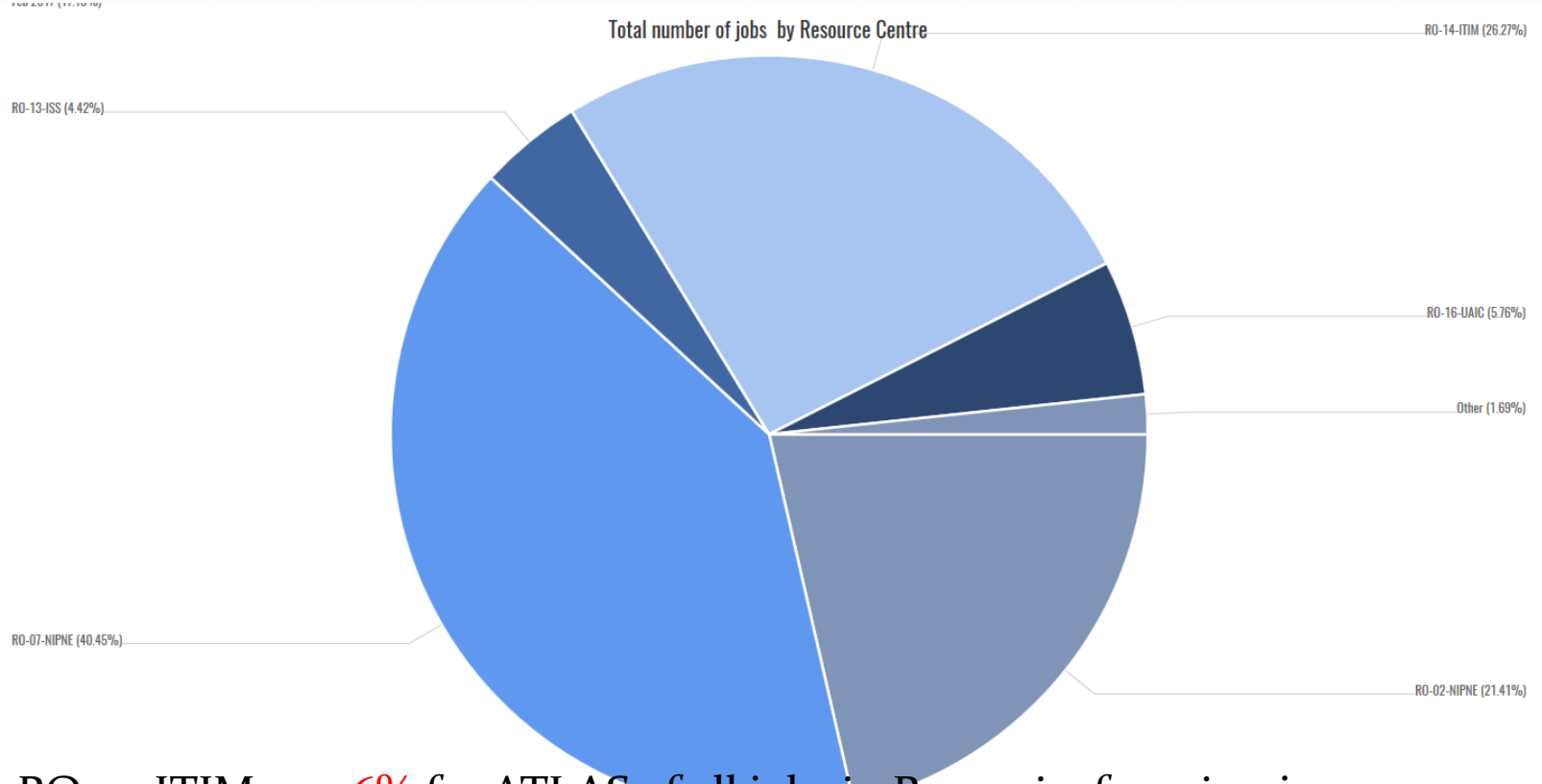
Sitename	Flavour	Host status in profile	Hosts	1	4
RO-14-ITIM	CREAM-CE	OK	ecream.itim-cj.ro	OK	OK

In dashboard RO-14-ITIM has no storage



Now we are processing ~ 4000 jobs / day may be more

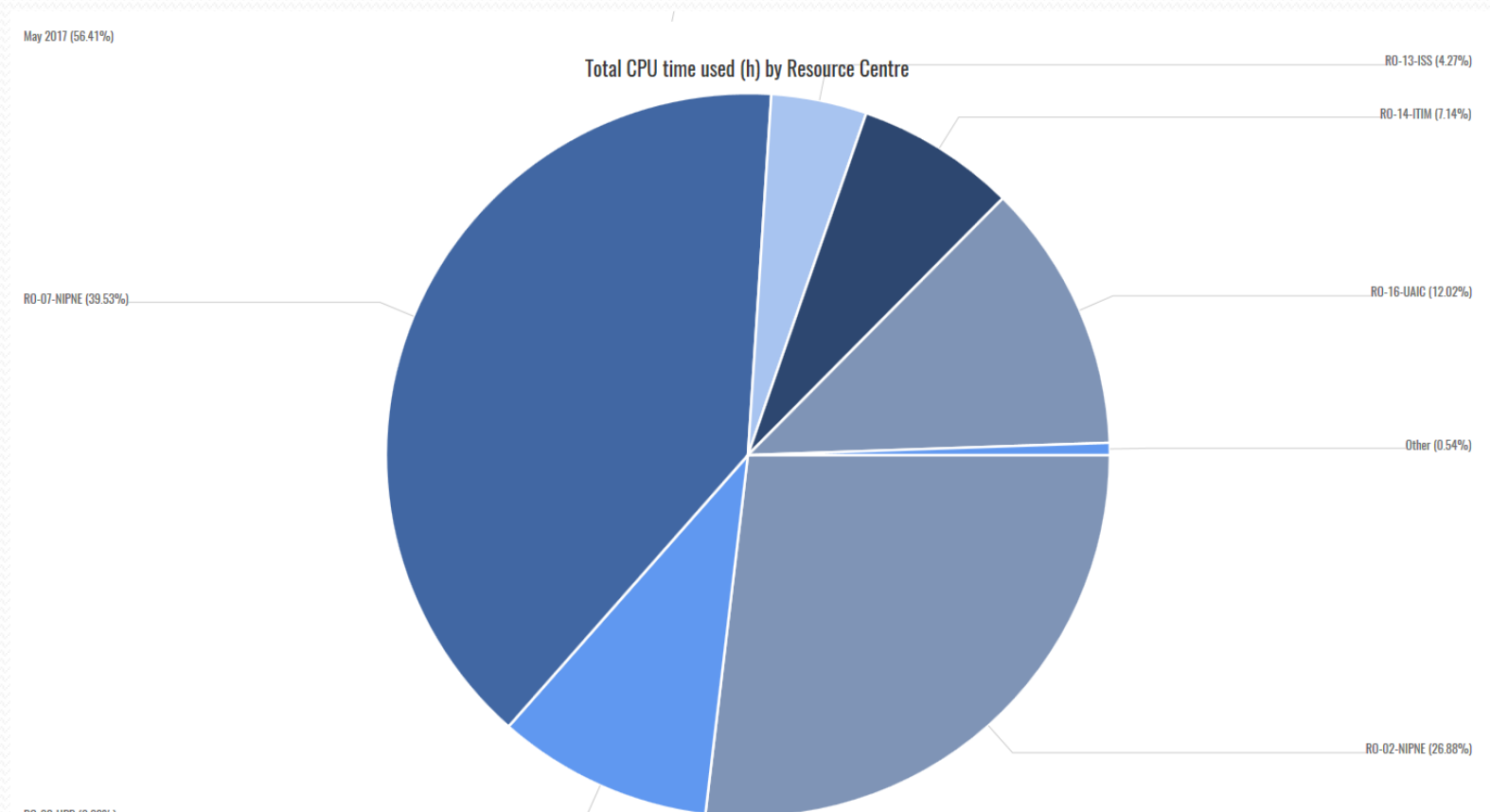
Total number of jobs by Resource Centre



RO-14-ITIM ~= 26% for ATLAS of all jobs in Romania, from ian-june



- May – June, the time we were in the process of discarding the storage element we had a 7.4 % CPU time used of all ATLAS jobs in Romania.
- That is much better than in the last year, when we had less than 1% in CPU time



# Perspectives

- If there will be financial resources we will
  - improve the processing power with minimum 2000 core for the next 3 years
  - Improve the UPS capacity for holding the datacenter online if any power surges would appear , now they are functioning at 65% of the whole capacity
  - Improve the air conditioning in the datacenter for enlarging the space where all the station would fit in
  - Improving the electric power for the future processing power
  - Improving the communication speed to 100 GBps
- If not then we will maintain the functionality of the datacenter to the actual size of 64 worker nodes ... ☺



Thank you for your  
attention!

For any **HARD** question please  
ask: [felix@itim-cj.ro](mailto:felix@itim-cj.ro) ☺ ☺ ☺ ☺