okeanos

Η υπηρεσία Public IaaS Cloud @ ΕΔΕΤ
ανάπτυξη και λειτουργία για χιλιάδες χρήστες

Nectarios Koziris, GRNET

National Technical University of Athens
CSLab

grnet
Networking Research and Education

What is Okeanos?

- ‘Okeanos’ is the Greek word for ‘ocean’

Oceans capture, store and deliver energy, oxygen and life around the planet.

Late 2010: The challenge

- Goals
  - Production-quality IaaS cloud similar to Amazon AWS
  - Scalability to thousands users/nodes/VMs
  - Persistent VMs
  - Commodity components
  - Everyone can use it
  - No vendor lock-in
  - Low admin costs, manageable by a small team

Late 2010: The available offerings

- Reviewed open source ones
  - Eucalyptus
  - Cloudstack
  - Opennebula
  - Openstack

    ..etc..
- Still evolving systems, silo ones (touching every layer)
- No turnkey solutions

The ~okeanos approach

- Features:
  - Production-quality IaaS cloud
  - Everything open source:

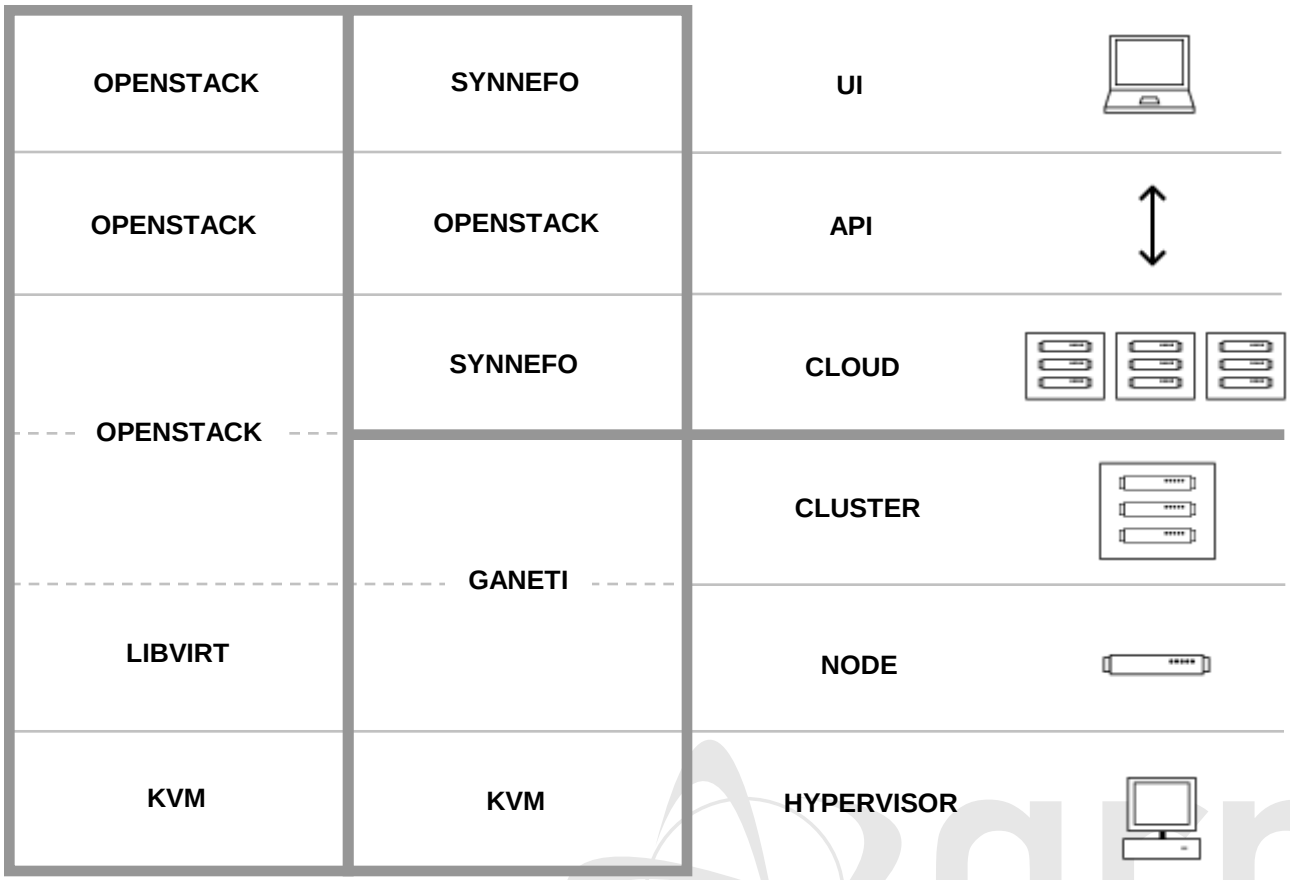
synnefo by grnet Networking Research and Education

Ganeti by Google

  - Persistent VMs
  - Commodity Hardware – No SAN, No exotic network hw
  - Add plain servers/disks/switches to scale up
  - Three clicks to start 1 or 10s of VMs, in 15 secs
  - Simple to operate

Key decision: Decompose the problem into layers

‘Building a Cloud, cluster by cluster’



A small story: Why Google Ganeti?

- No need to reinvent the wheel
- Scalable, proven software infrastructure
  - VM cluster management in production is serious business
  - Built with reliability and redundancy in mind
  - Combines open components (KVM, LVM, DRBD)
- GRNET biggest (worldwide) external contributor to Google Ganeti (from 2009)
- http://code.google.com/p/ganeti
  - For more, see 'Running Google on Google' by Jeff Bates and Iustin Pop (Google I/O 2012- https://developers.google.com/io/)

….to scale up to tens of thousands VMs and users?

simplicity

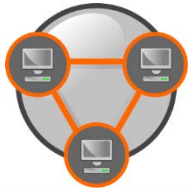

LEGO
4+
5576
375
pcs/Stck./pzs/db

flexibility


HOTEL

~okeanos IaaS

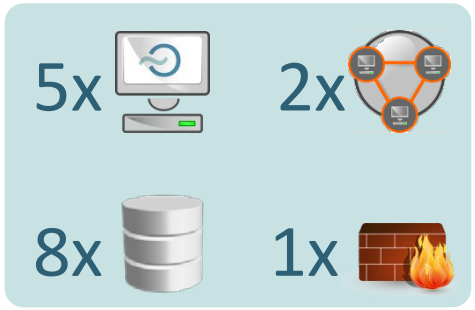
Compute

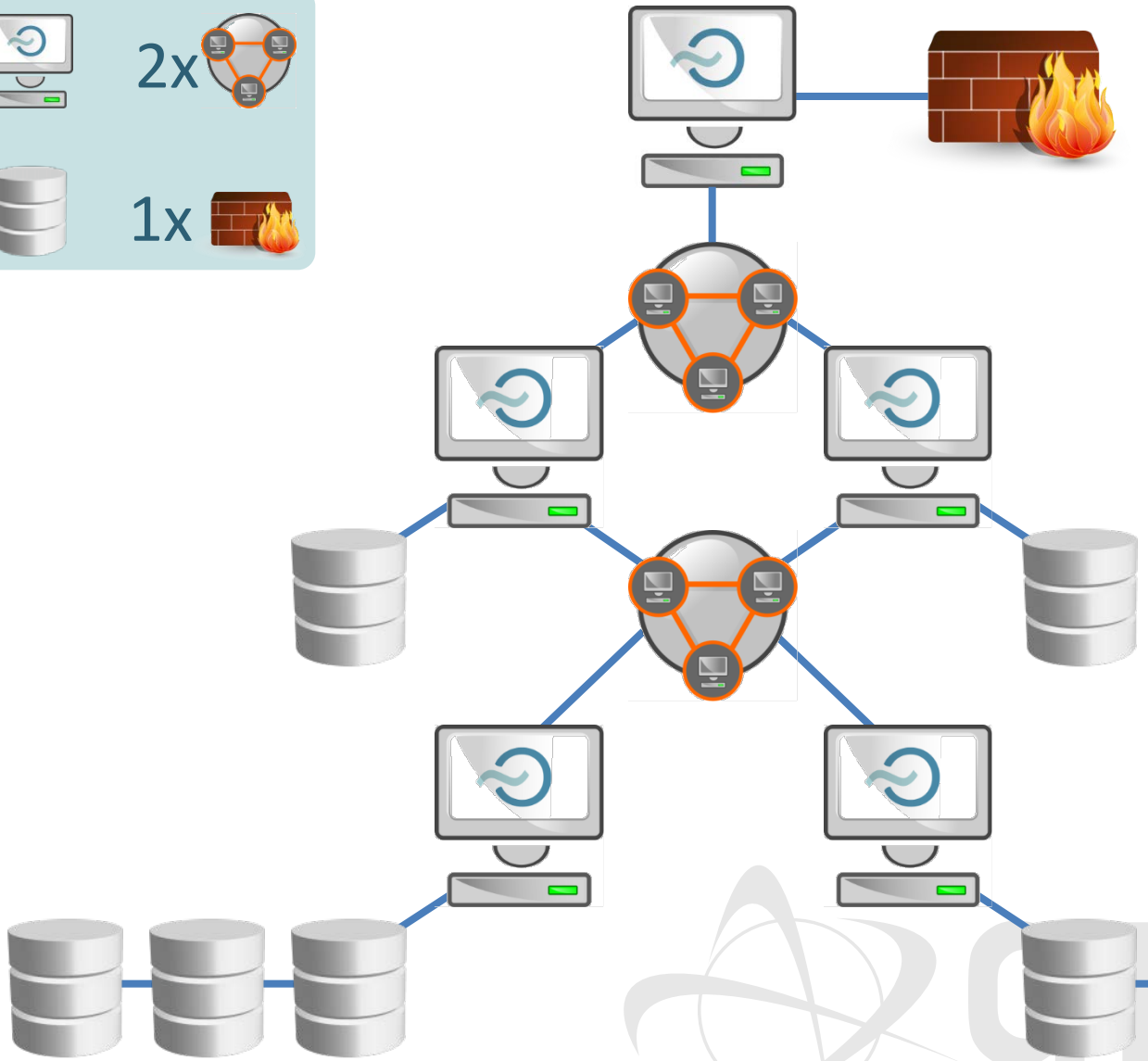


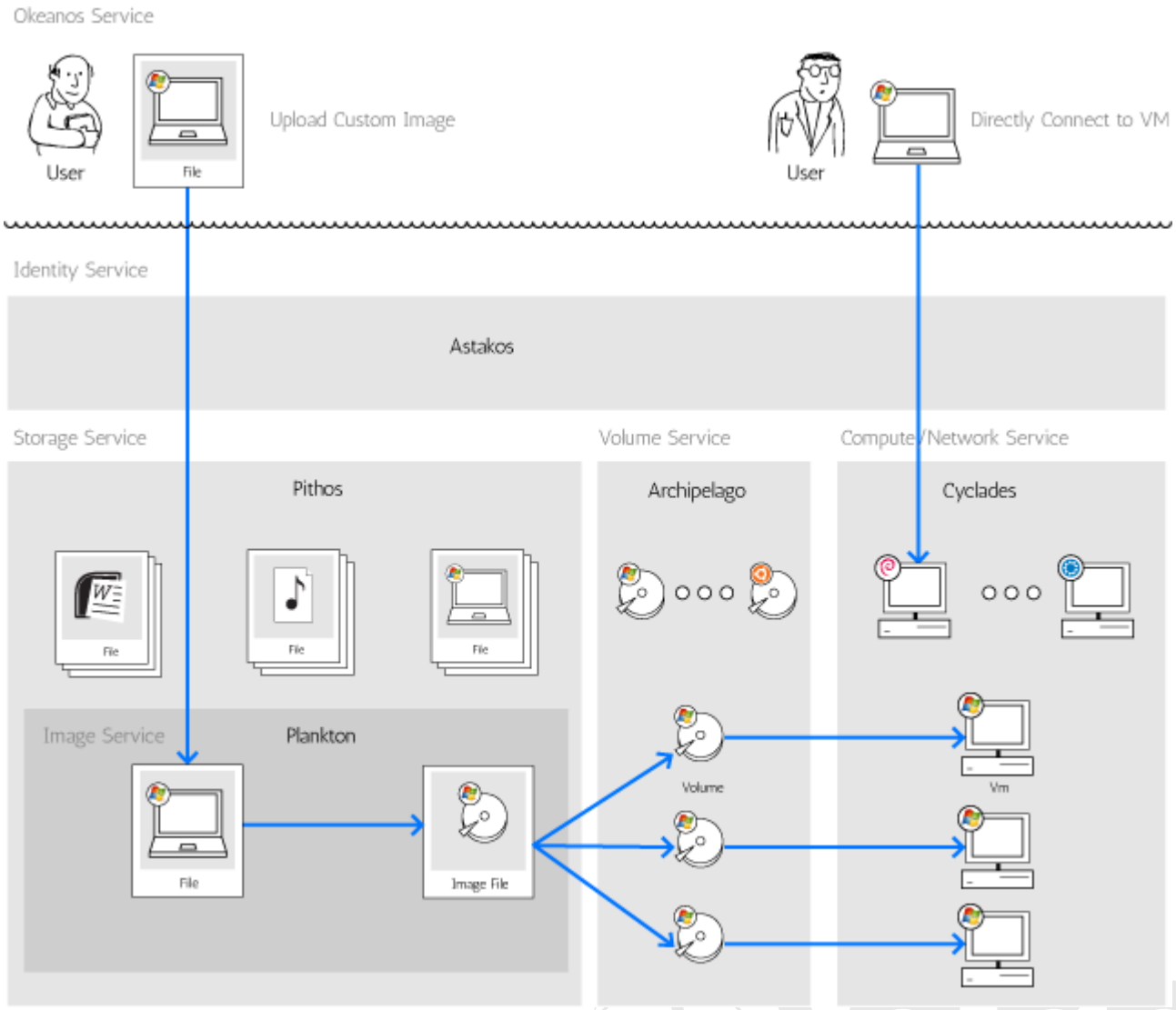
Network

Storage

firewall


5x
2x
8x
1x




Okeanos Service
User
File
Upload Custom Image
User
Directly Connect to VM
Identity Service
Astakos
Storage Service
Volume Service
Compute/Network Service
Pithos
Archipelago
Cyclades
File
File
File
Image Service
Plankton
File
Image File
Volume
Vm

Compute – Network: Cyclades

- Thin Compute layer over Ganeti
  - Python/Django
  - Supports *multiple* Ganeti clusters, for scaling
  - OpenStack Compute API
- Networking
  - No restrictions on deployment – it's the *Ganeti* side
  - IPv4/IPv6 public networks, complete isolation among VMs
  - Thousands of private networks, private L2 segments over single VLAN

Virtual Machine Actions

My_windows_Desktop

Start

Console

Reboot

Shutdown

Shutdown

Networks

- Public networking: Full IPv4/IPv6 support
- Private networks: isolated L2 segments
- Arbitrary virtual network topologies
- Scalable to thousands of private networks
  - Multiple physical VLANs
  - Single VLAN with MAC prefix-based filtering
  - VXLAN, encapsulation over IPv6 multicast, with MAC learning
- Flexible implementations at backend (SDN?)

Virtual Networks

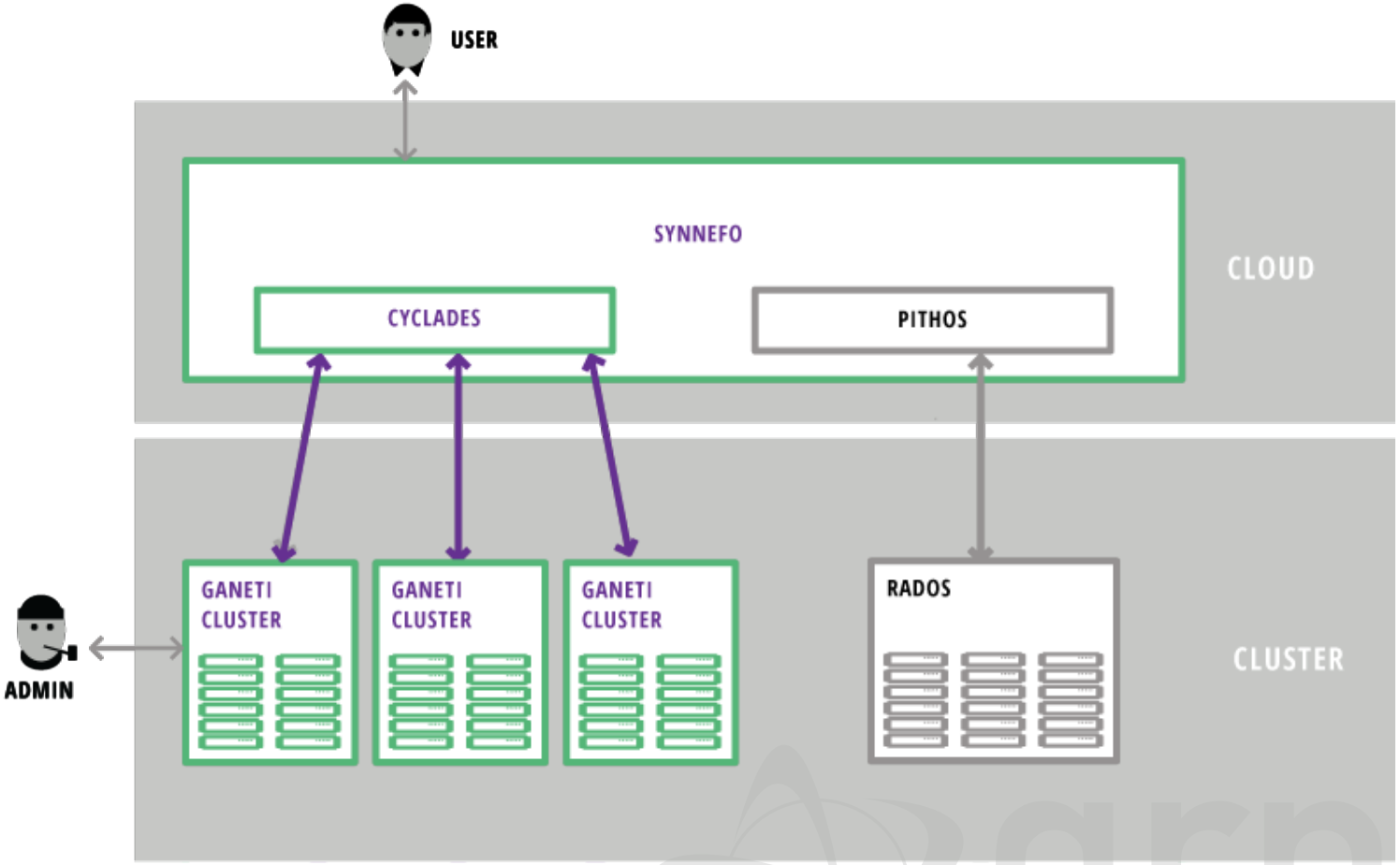
Internet

Private Network 1

Private Network 2

Private Network 3

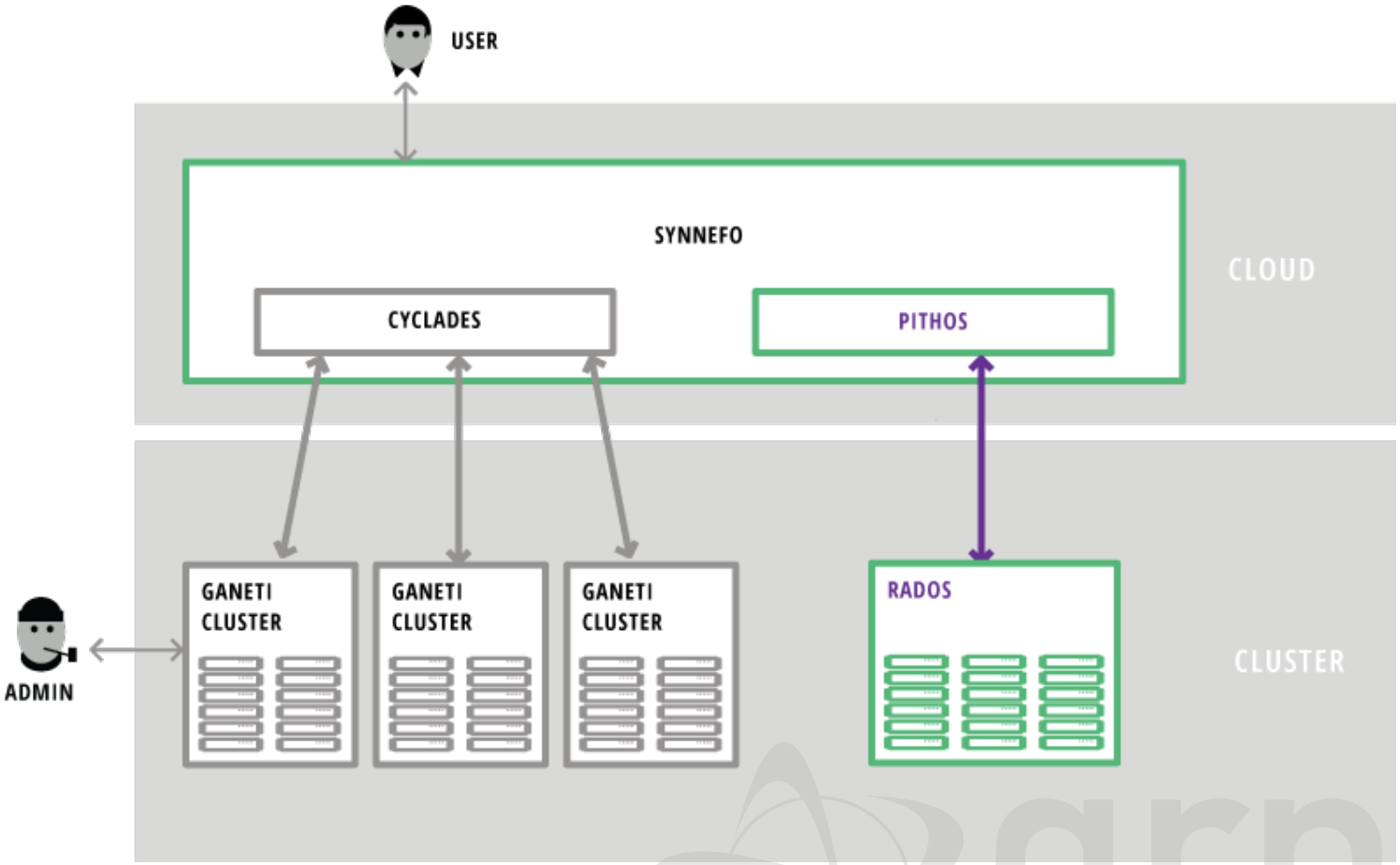
Cyclades


USER
SYNNEFO
CYCLADES
PITHOS
CLOUD
GANETI CLUSTER
GANETI CLUSTER
GANETI CLUSTER
RADOS
CLUSTER
ADMIN

Storage: pithos+

- Every file is a collection of blocks
- Content-based addressing for blocks
- Partial file transfers, deduplication, efficient syncing
- Independent of storage backend (NFS, RADOS, …)
- OpenStack Object Storage API plus extensions
- An integral part of Synnefo
- - Single store for Files, VM Images
- - Uses common backend with Archipelago

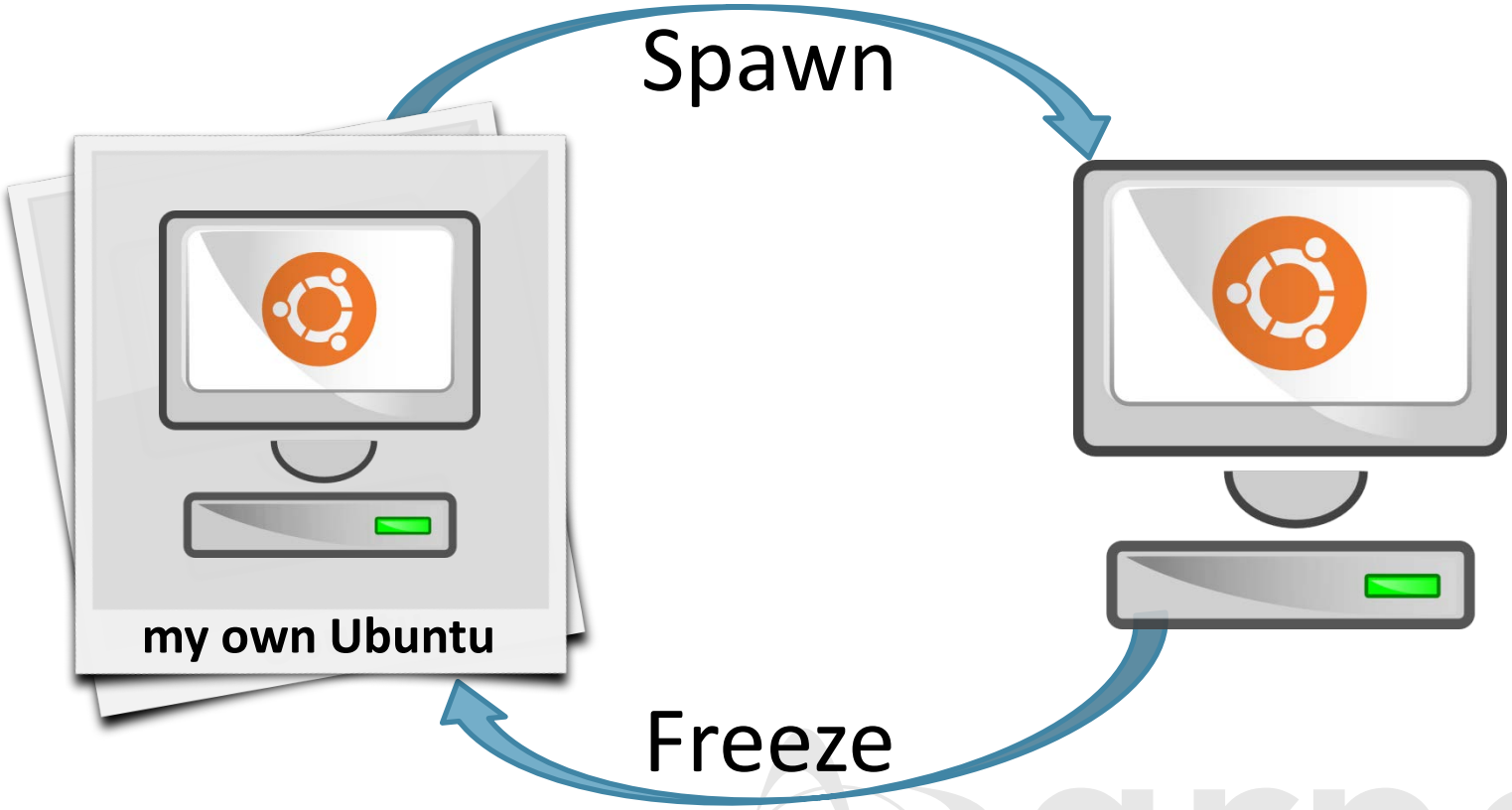
pithos+


USER
SYNNEFO
CYCLADES
PITHOS
CLOUD
GANETI CLUSTER
GANETI CLUSTER
GANETI CLUSTER
RADOS
CLUSTER
ADMIN

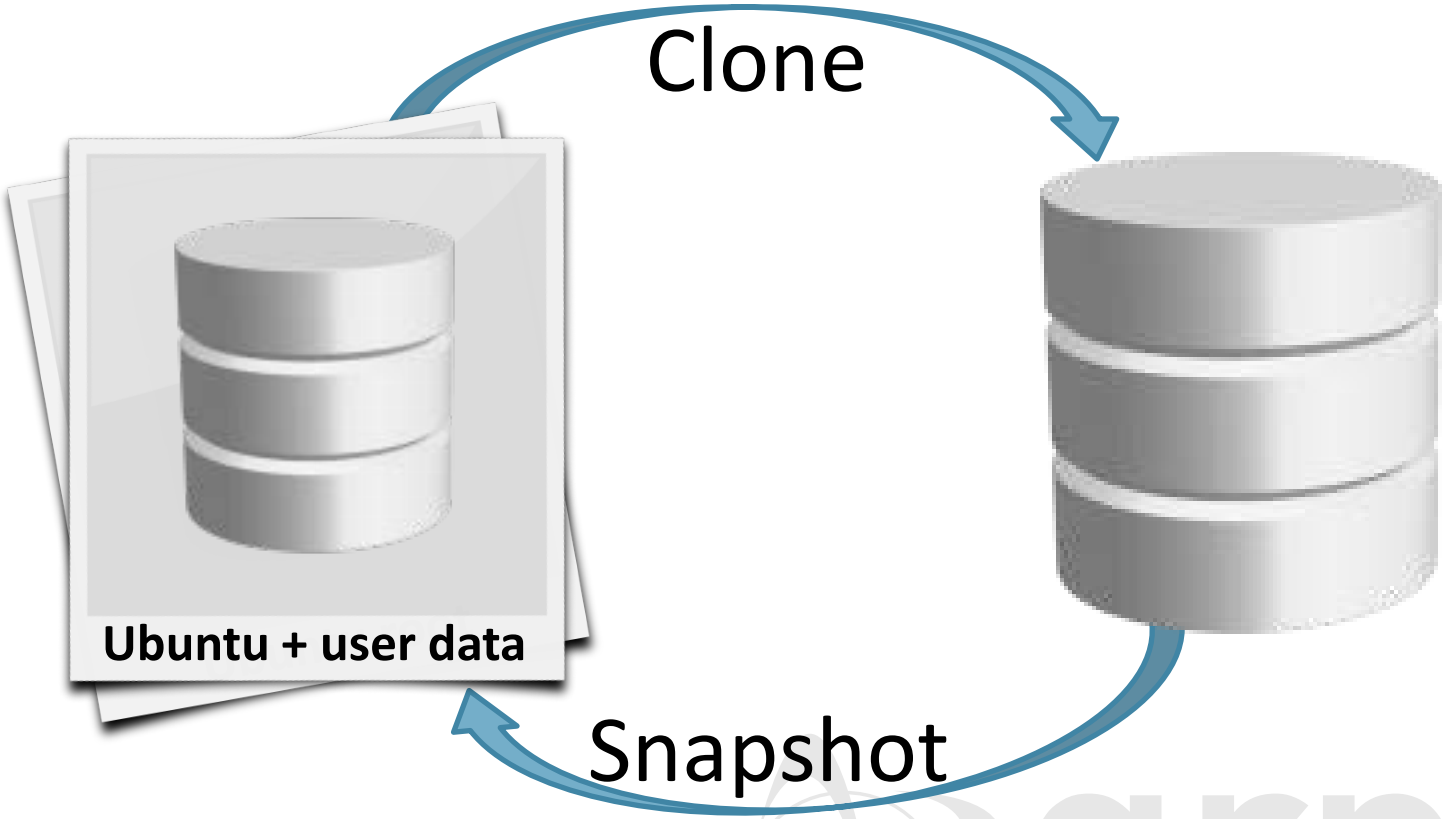
Storage: Archipelago

- Unified storage for Files, Images ↔ Volumes
- Thin layer over the actual storage cluster
- Storage backend agnostic
- Efficient syncing / sharing of Images as files on Pithos
- Zero-copy cloning of volumes from Images

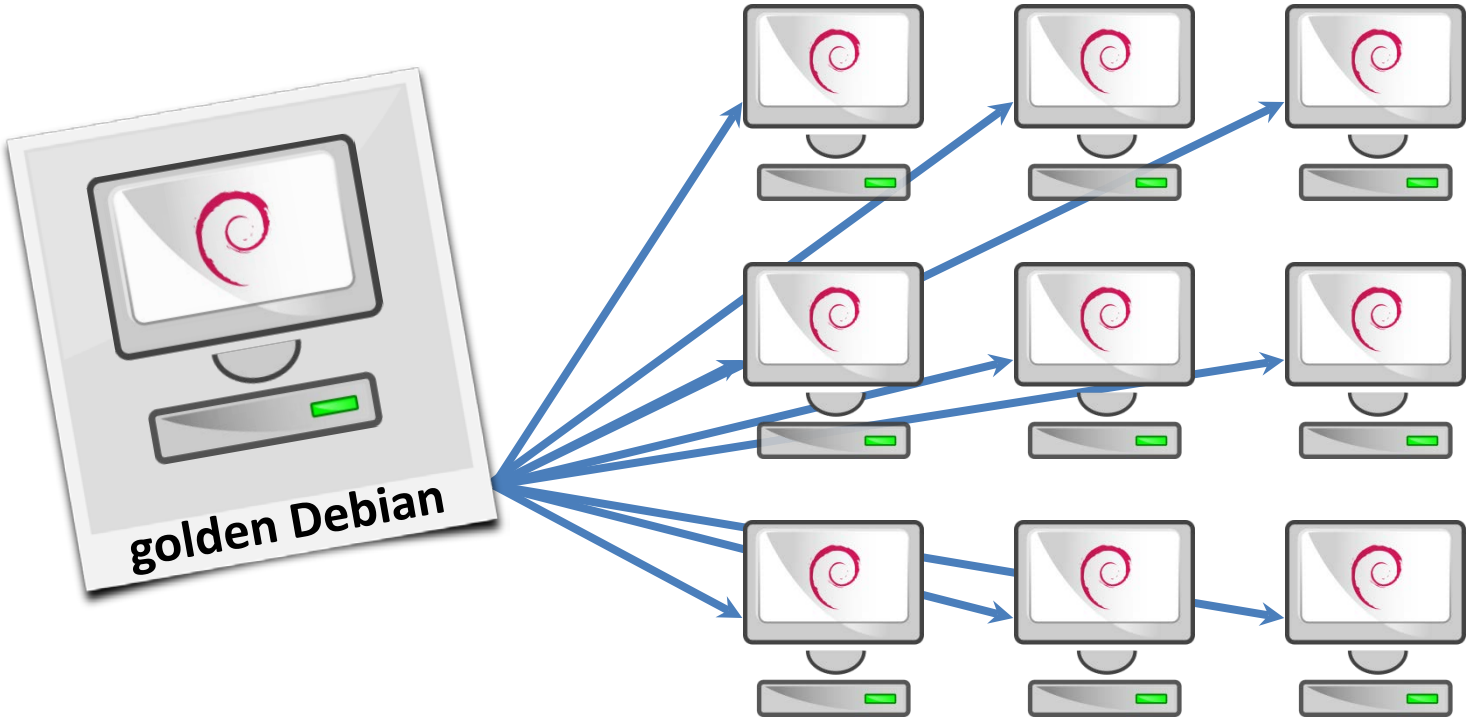
Images



Images ↔ Storage



Images – Golden Image



synnefo

GRNETs opensource IaaS platform (Python)

http://www.synnefo.org

See FOSDEM presentation in Brussels, Feb 2013:

INTRODUCING THE SYNNEFO OPEN SOURCE IAAS PLATFORM,
by VANGELIS KOUKIS

Some Numbers (alpha phase-24.2.2012)

2100 users

2941 VMs

10119 Virtual CPUS

5819.76 GB Used Memory

174273.8 GB Used Disk

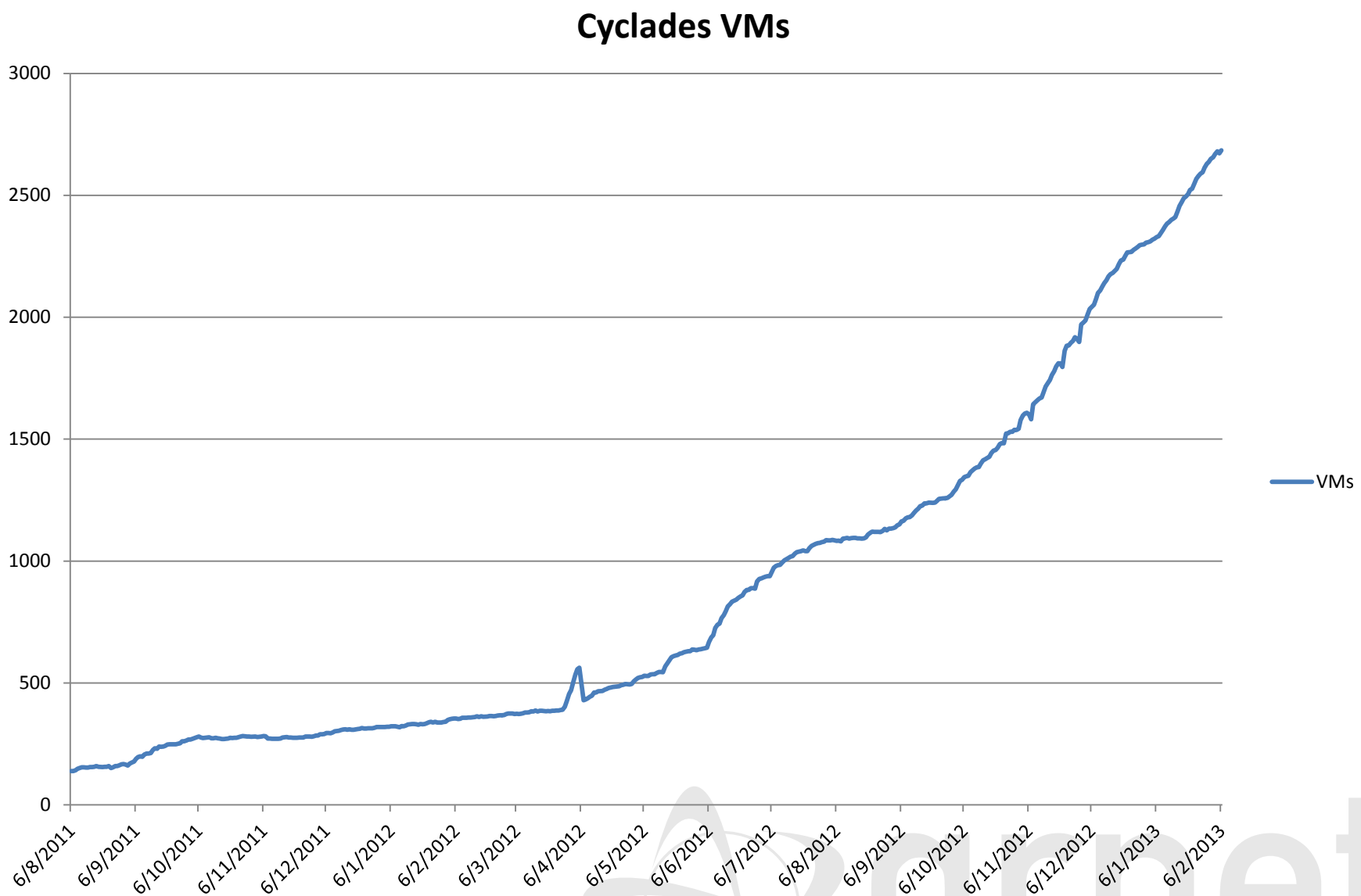
7 Ganeti clusters currently

>100 ‘fat’ nodes

move to > 10.000 VMs

System OS Images

- Windows Server 2012
- Windows Server 2008R2
- CentOS 6.3
- Fedora 17
- Ubuntu 12.04 LTS
- Kubuntu 12.04 LTS
- Ubuntu 12.10
- Kubuntu 12.10
- Debian Desktop Squeeze
- Debian Base Squeeze
- ….more…


Cyclades VMs
3000
2500
2000
1500
1000
500
0
6/8/2011
6/9/2011
6/10/2011
6/11/2011
6/12/2011
6/1/2012
6/2/2012
6/3/2012
6/4/2012
6/5/2012
6/6/2012
6/7/2012
6/8/2012
6/9/2012
6/10/2012
6/11/2012
6/12/2012
6/1/2013
6/2/2013
VMs

- main Datacenter (40 racks)
  - green architecture
  - PUE <1.6 / 1600KVA
  - In-row cooling
  - Fully virtualized

- ‘High’ Density (but not too dense…)

  ~20.000 VMs (20 racks, 1000 VM/rack)
  - VMs with average 2GB RAM (flavors up to 8 cores &16GB/VM)
  - QoS in disk/core overcommitment

Cloud Facilities (cont.)

- Disaster Recovery DC (@procurement stage)
  - Container based solution
  - ‘Louros’ river hydroelectric plant area
  - Up to 320KW
  - Low PUE (<1.3)
  - Outdoor installation (close to hydroelectric plant facility)
  - Water cooling per rack / Freecooling

Design Specs for a Public Cloud Provider

Common denominator:

#VM instances (in various VM ‘flavors’)

Guaranteed ratios:

VMs/Core, RAM/Core, disks(spindle)/core

€/VM?

okeanos

See more on http://okeanos.grnet.gr

GO http://okeanos.io for a quick tryout!

follow us on twitter @grnet_gr #okeanos

European Union
European Regional Development Fund

digitalgreece
Everything is possible
Operational Programme
"Digital Convergence"

NSRF 2007-2013
programme for development
Quality of life for everyone

The project is co-financed by Greece and the European Union

cyclades pithos+ Sign in

accounts

LOGIN

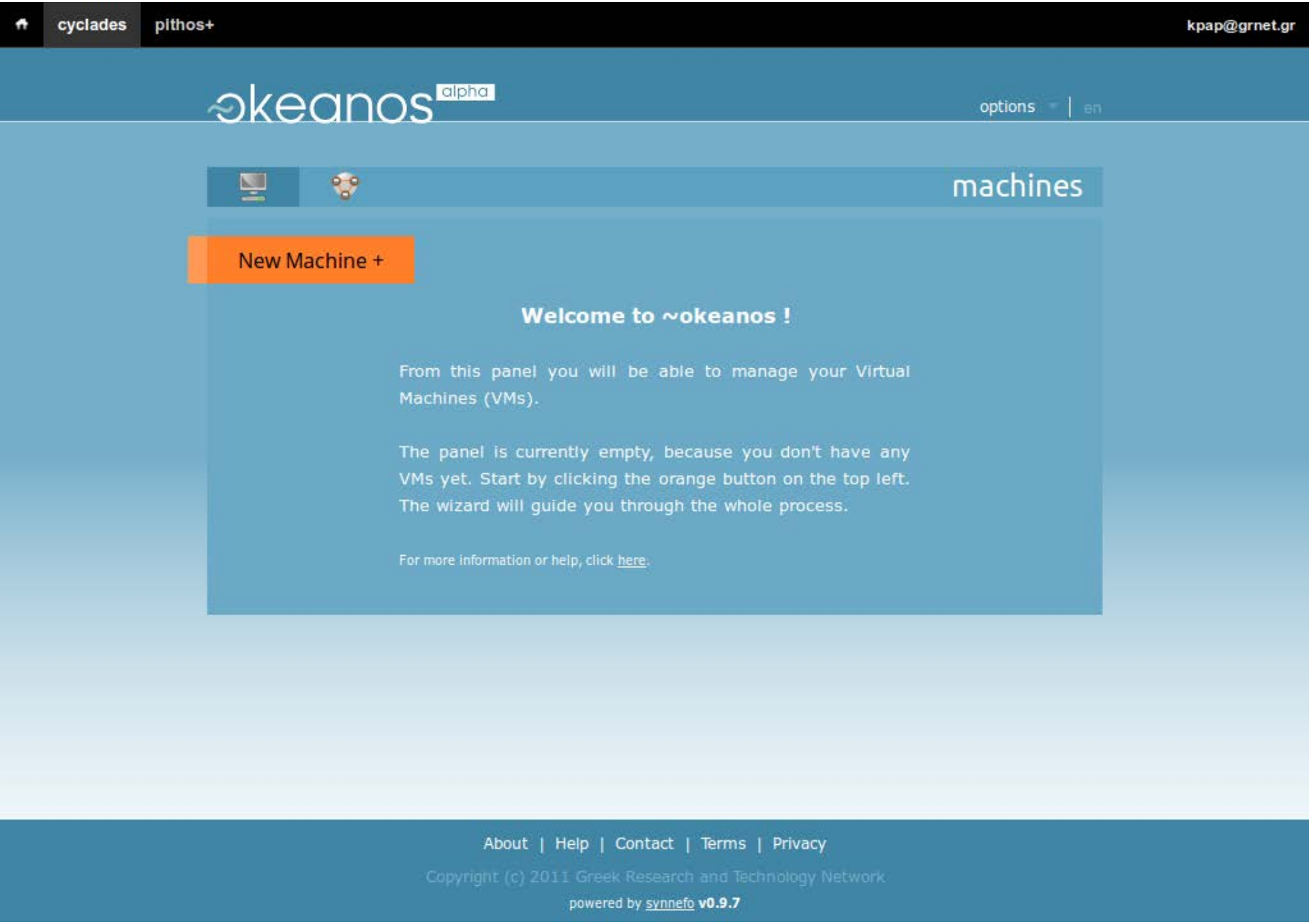
kpap@grnet.gr

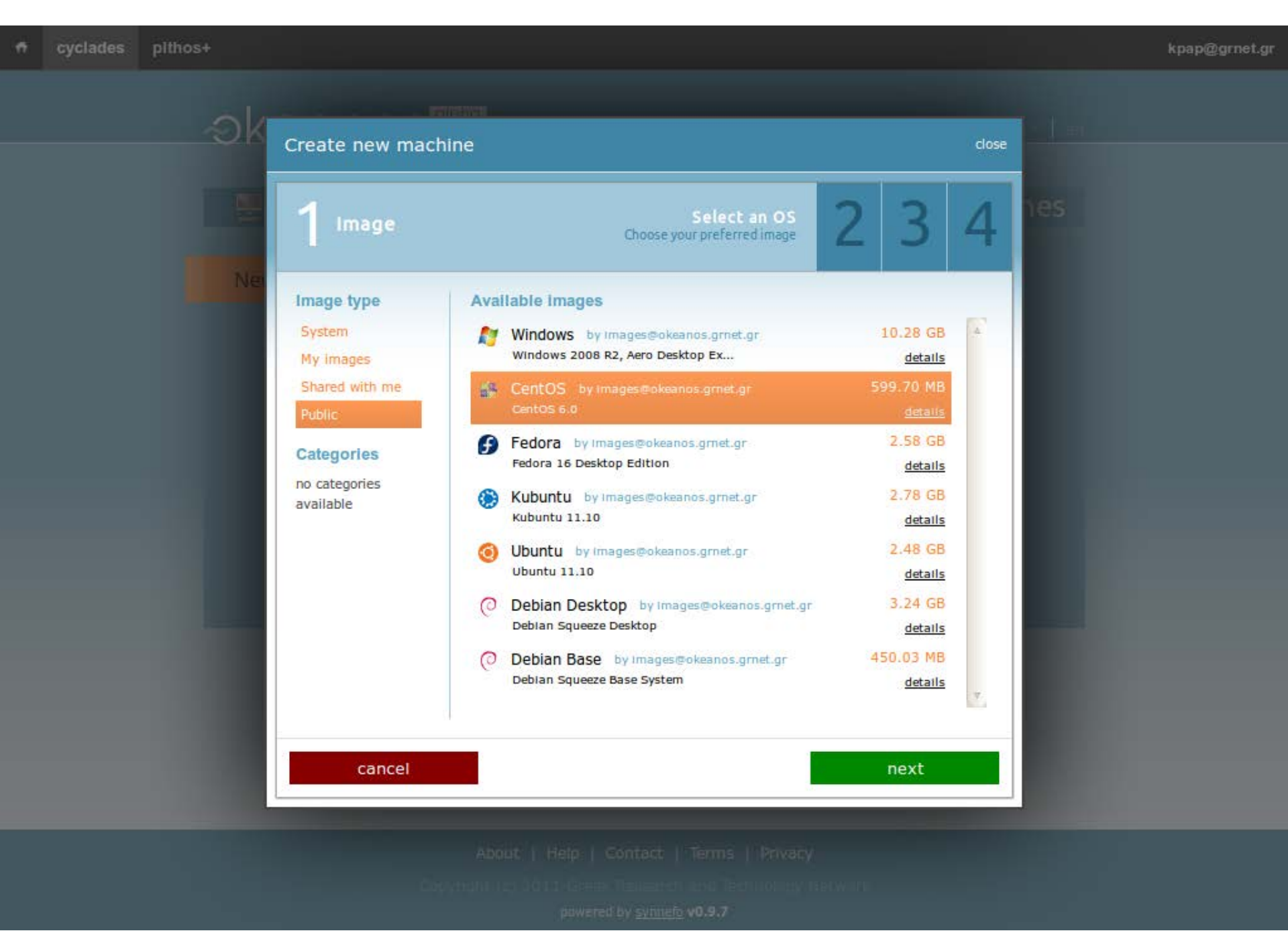
●●●●●

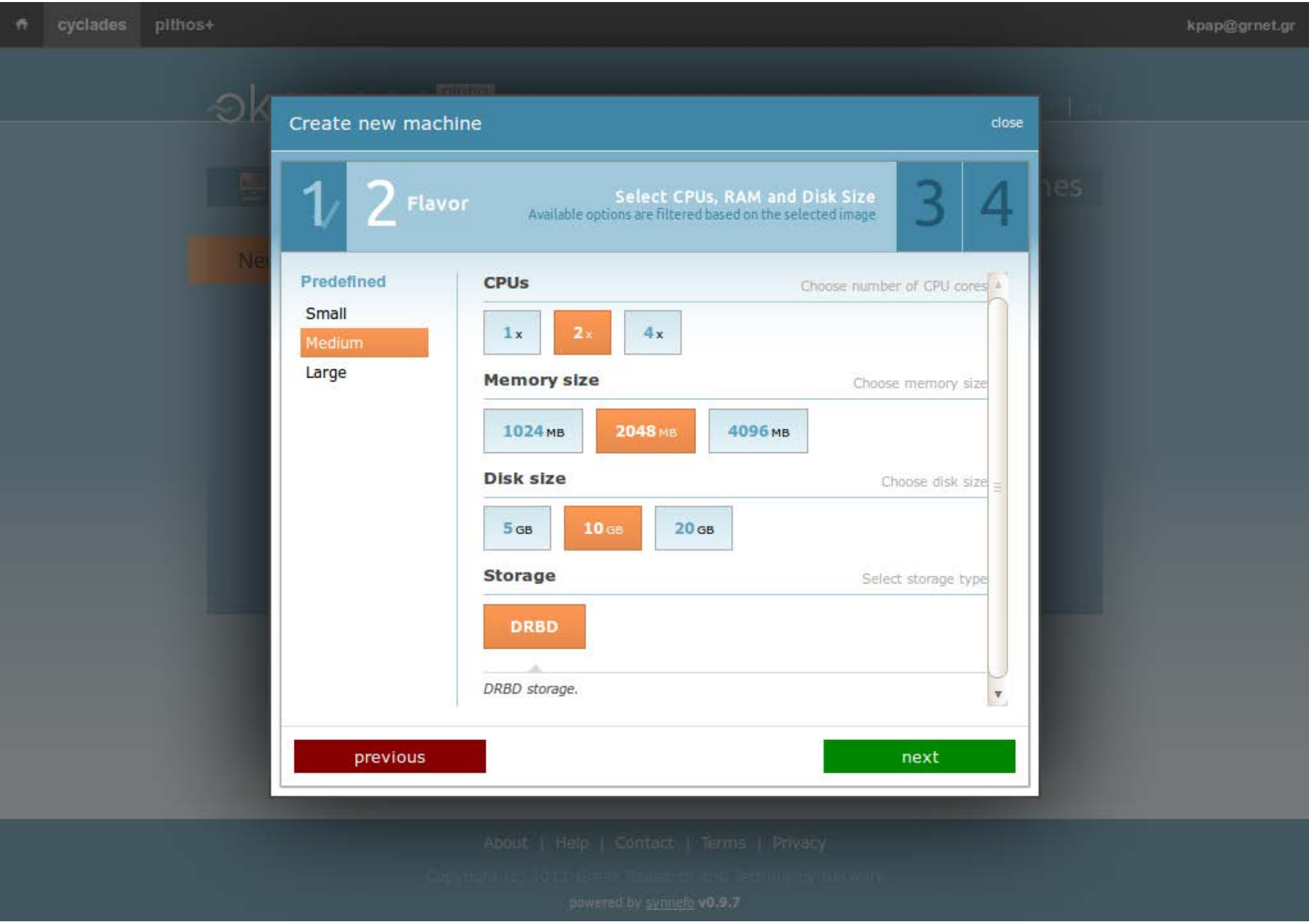
SUBMIT

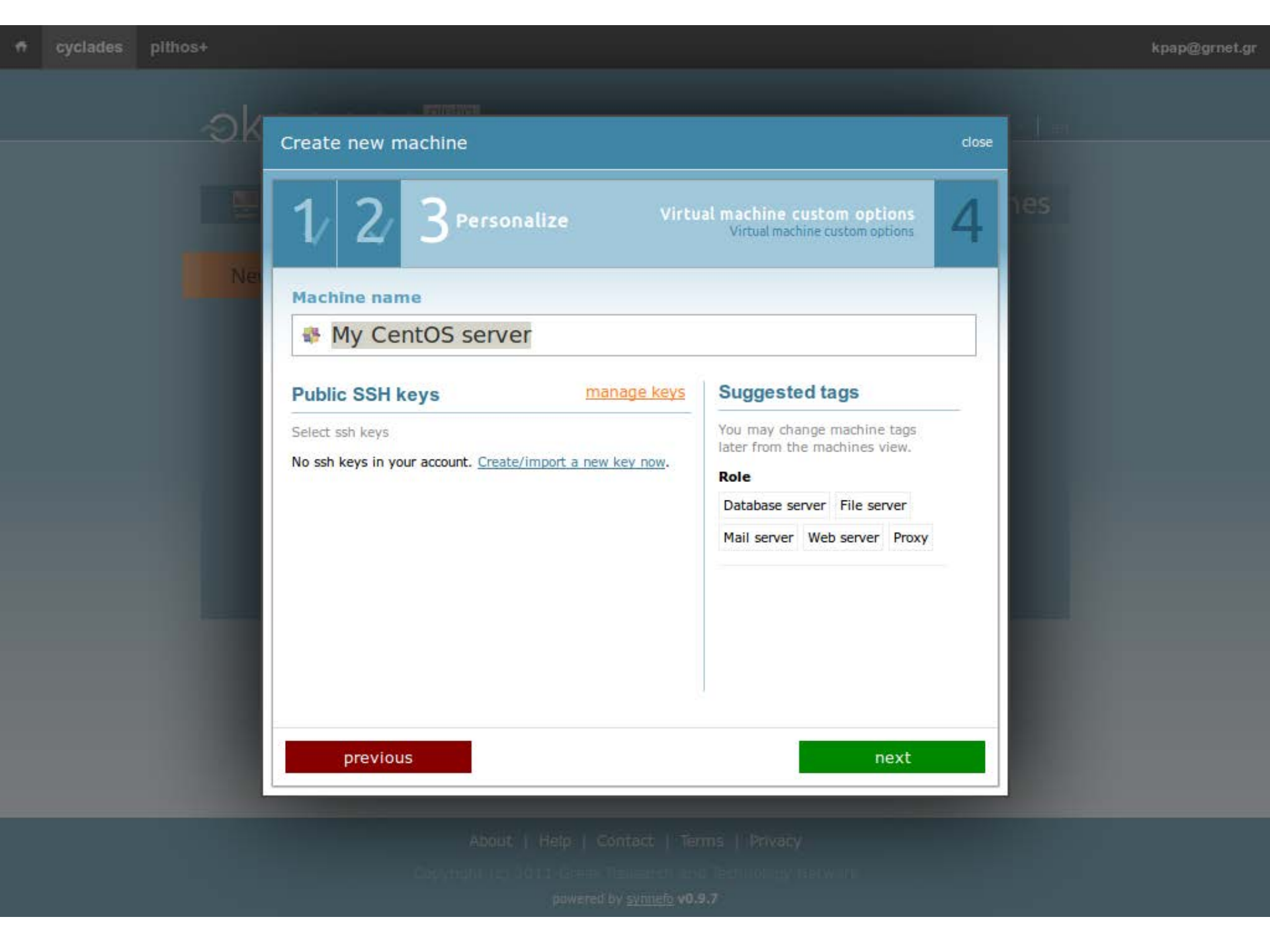
Forgot your password?

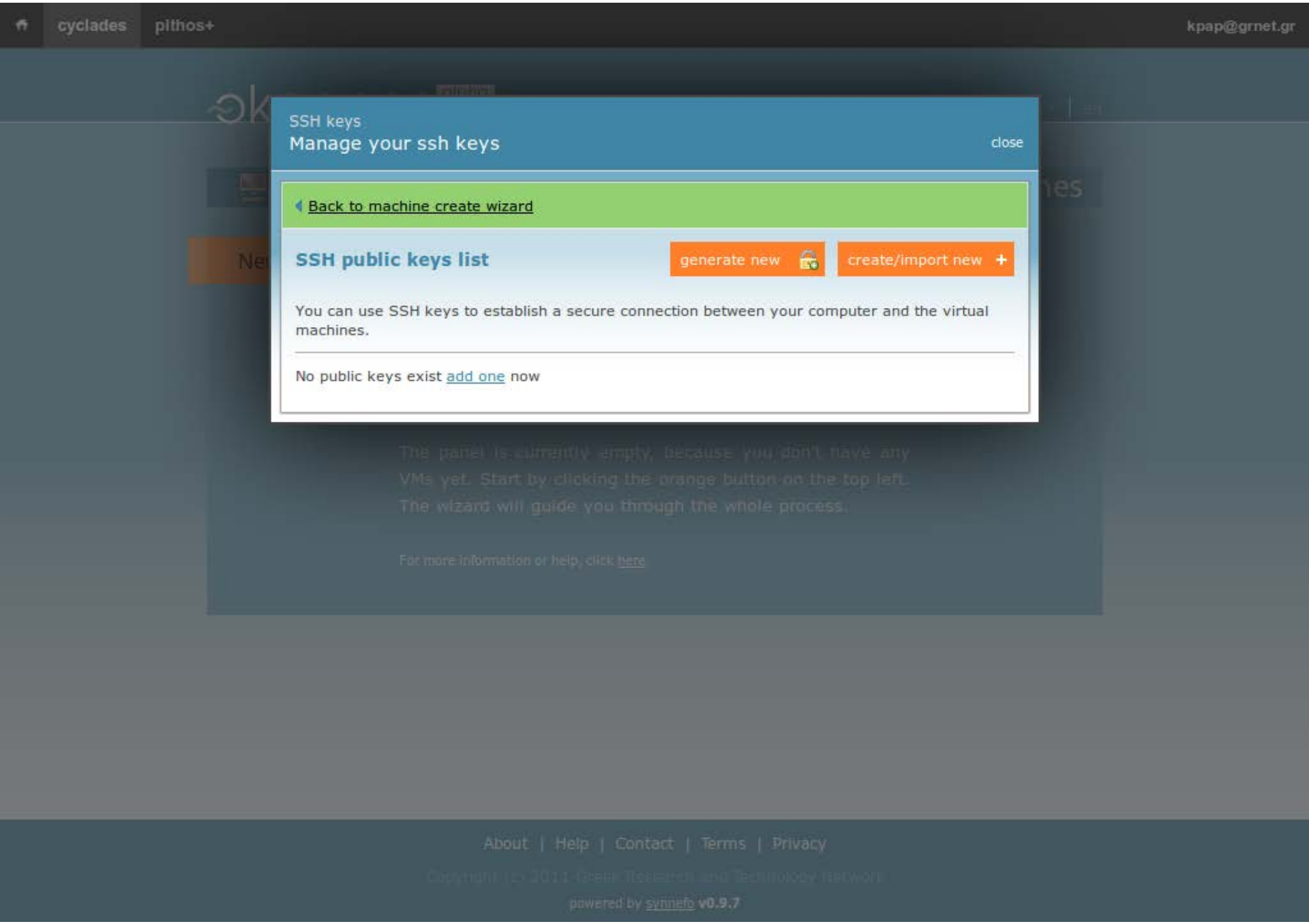
new to okeanos ? CREATE ACCOUNT

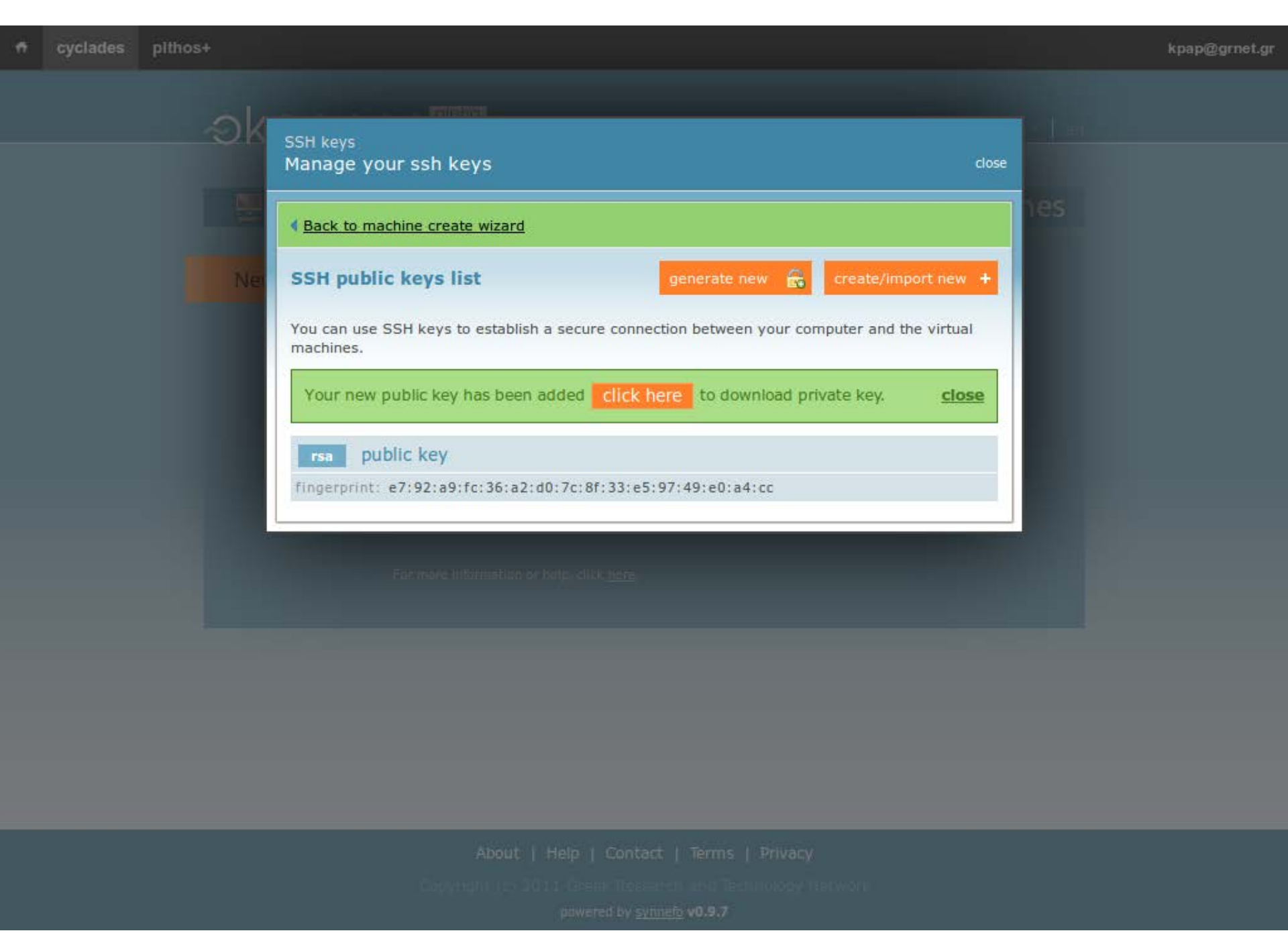

cyclades
pithos+
kpap@grnet.gr
okeanos alpha
options
en
machines
New Machine +
Welcome to ~okeanos !
From this panel you will be able to manage your Virtual Machines (VMs).
The panel is currently empty, because you don't have any VMs yet. Start by clicking the orange button on the top left. The wizard will guide you through the whole process.
For more information or help, click here.
About | Help | Contact | Terms | Privacy
Copyright (c) 2011 Greek Research and Technology Network
powered by synnefo v0.9.7

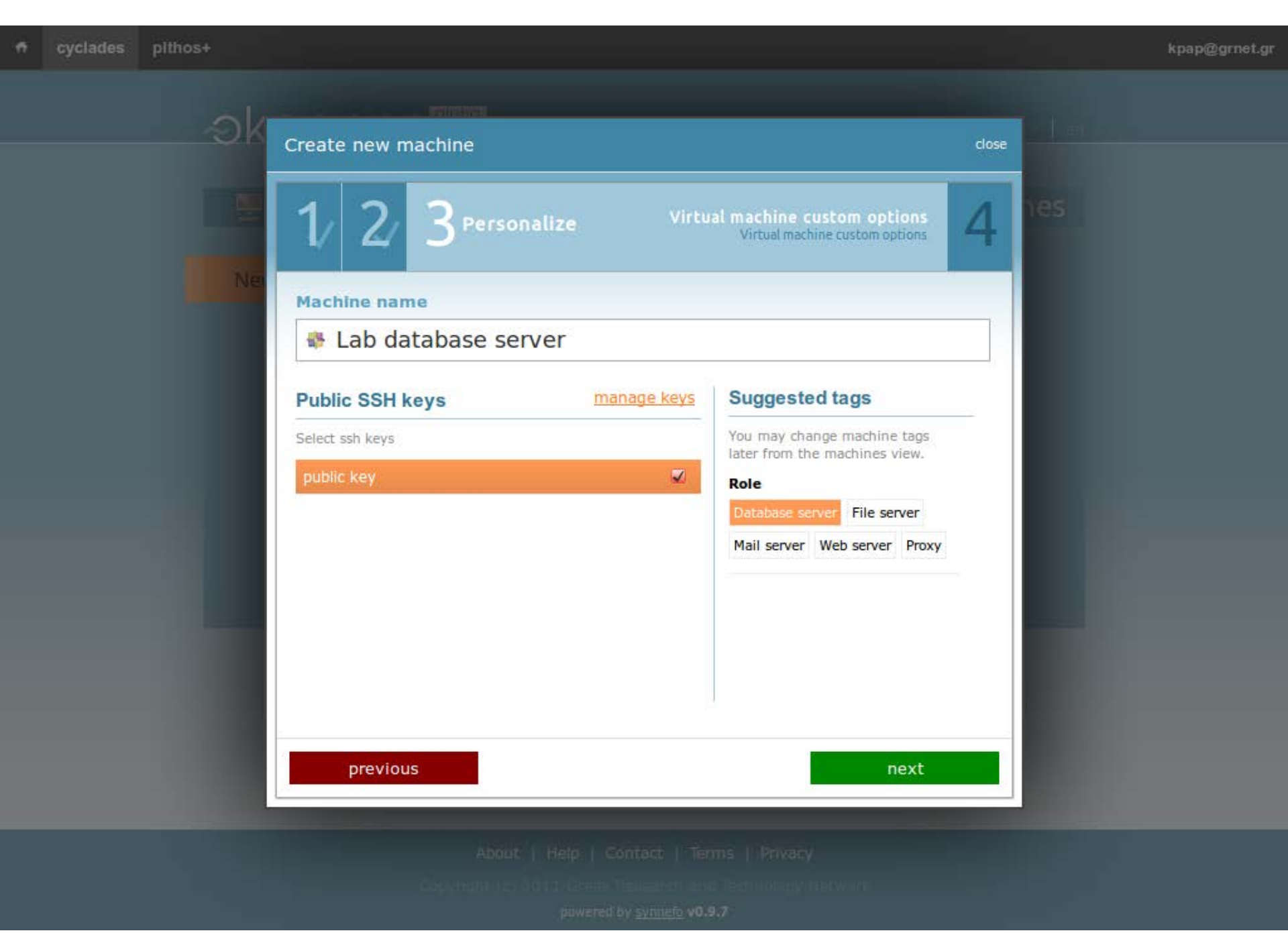

cyclades
pithos+
kpap@grnet.gr
Create new machine
close
1 Image
Select an OS
Choose your preferred image
2
3
4
Image type
System
My images
Shared with me
Public
Categories
no categories available
Available images
Windows by images@okeanos.grnet.gr
Windows 2008 R2, Aero Desktop Ex...
10.28 GB
details
CentOS by images@okeanos.grnet.gr
CentOS 6.0
599.70 MB
details
Fedora by images@okeanos.grnet.gr
Fedora 16 Desktop Edition
2.58 GB
details
Kubuntu by images@okeanos.grnet.gr
Kubuntu 11.10
2.78 GB
details
Ubuntu by images@okeanos.grnet.gr
Ubuntu 11.10
2.48 GB
details
Debian Desktop by images@okeanos.grnet.gr
Debian Squeeze Desktop
3.24 GB
details
Debian Base by images@okeanos.grnet.gr
Debian Squeeze Base System
450.03 MB
details
cancel
next
About | Help | Contact | Terms | Privacy
powered by synnefo v0.9.7

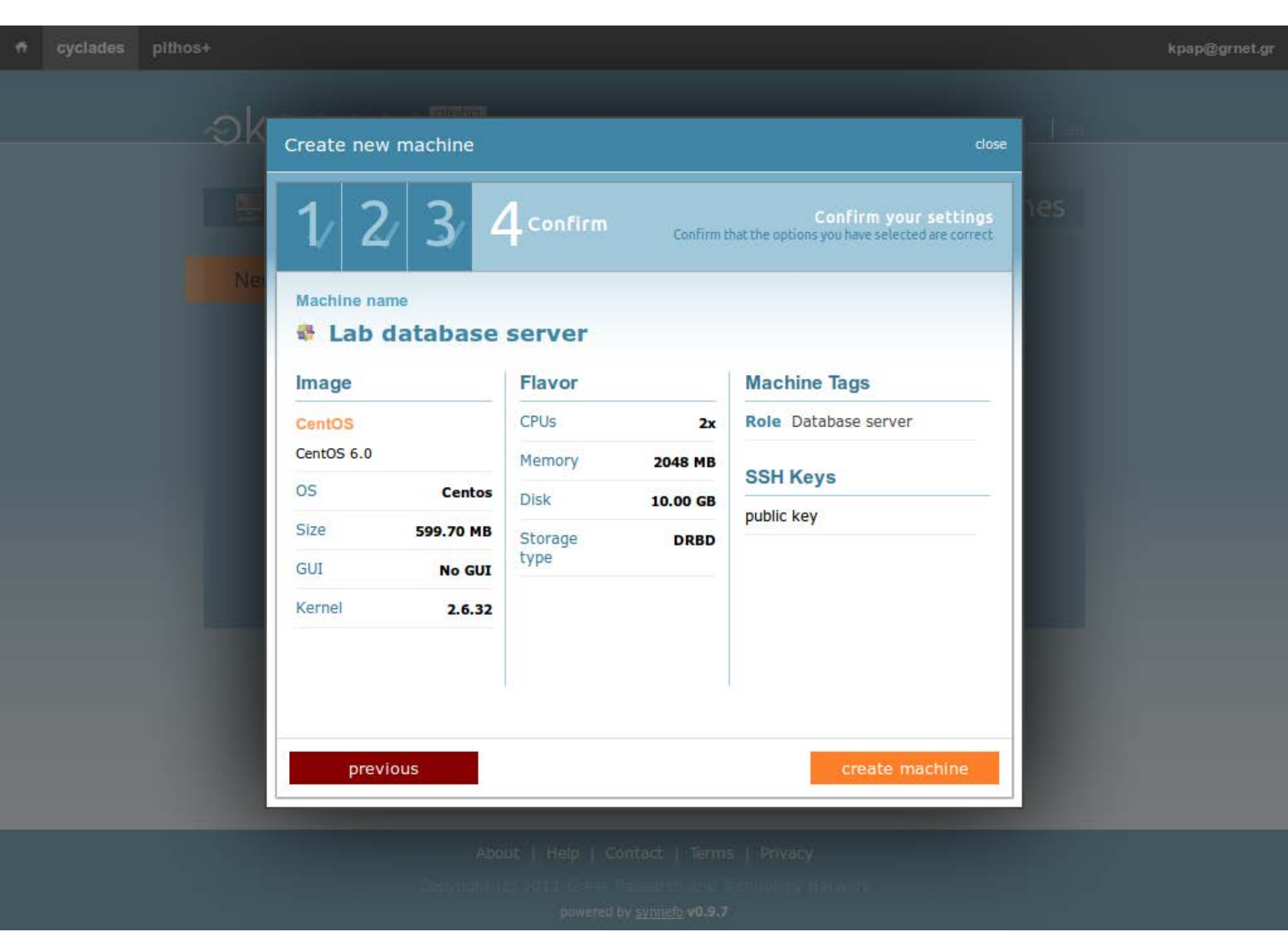

cyclades
pithos+
kpap@grnet.gr
Create new machine
close
1
2 Flavor
Select CPUs, RAM and Disk Size
Available options are filtered based on the selected image
3
4
Predefined
Small
Medium
Large
CPUs
Choose number of CPU cores
1 x
2 x
4 x
Memory size
Choose memory size
1024 MB
2048 MB
4096 MB
Disk size
Choose disk size
5 GB
10 GB
20 GB
Storage
Select storage type
DRBD
DRBD storage.
previous
next
About | Help | Contact | Terms | Privacy
powered by synnefo v0.9.7

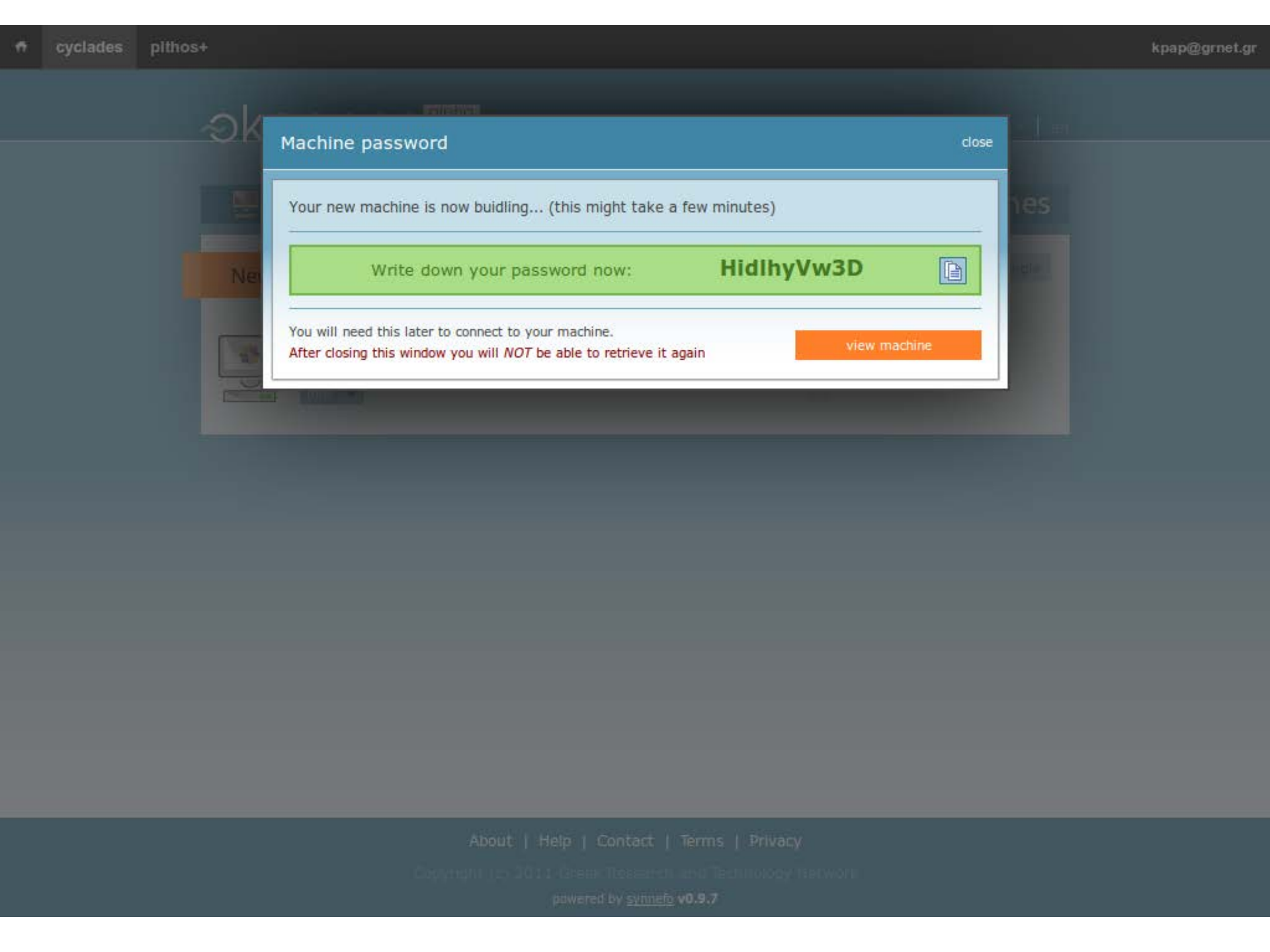

cyclades
pithos+
kpap@grnet.gr
Create new machine
close
1
2
3 Personalize
Virtual machine custom options
Virtual machine custom options
4
Machine name
My CentOS server
Public SSH keys
manage keys
Select ssh keys
No ssh keys in your account. Create/import a new key now.
Suggested tags
You may change machine tags later from the machines view.
Role
Database server
File server
Mail server
Web server
Proxy
previous
next
About | Help | Contact | Terms | Privacy
powered by synnefo v0.9.7

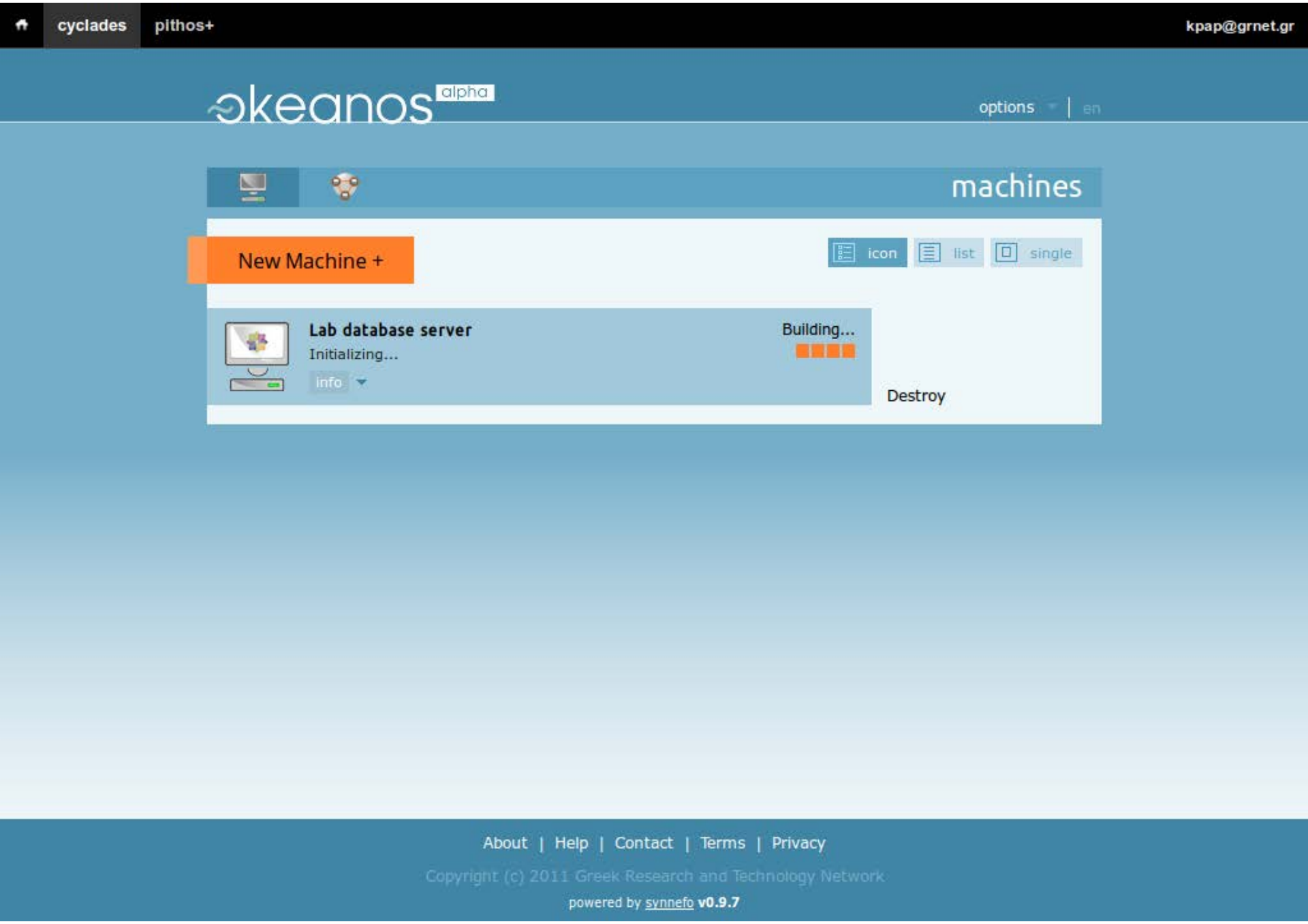

cyclades
pithos+
kpap@grnet.gr
SSH keys
Manage your ssh keys
close
Back to machine create wizard
SSH public keys list
generate new
create/import new +
You can use SSH keys to establish a secure connection between your computer and the virtual machines.
No public keys exist add one now
The panel is currently empty, because you don't have any VMs yet. Start by clicking the orange button on the top left. The wizard will guide you through the whole process.
For more information or help, click here
About | Help | Contact | Terms | Privacy
powered by synnefo v0.9.7


cyclades
pithos+
kpap@grnet.gr
SSH keys
Manage your ssh keys
close
Back to machine create wizard
SSH public keys list
generate new
create/import new +
You can use SSH keys to establish a secure connection between your computer and the virtual machines.
Your new public key has been added
click here
to download private key.
close
rsa
public key
fingerprint: e7:92:a9:fc:36:a2:d0:7c:8f:33:e5:97:49:e0:a4:cc
About | Help | Contact | Terms | Privacy
powered by synnefo v0.9.7

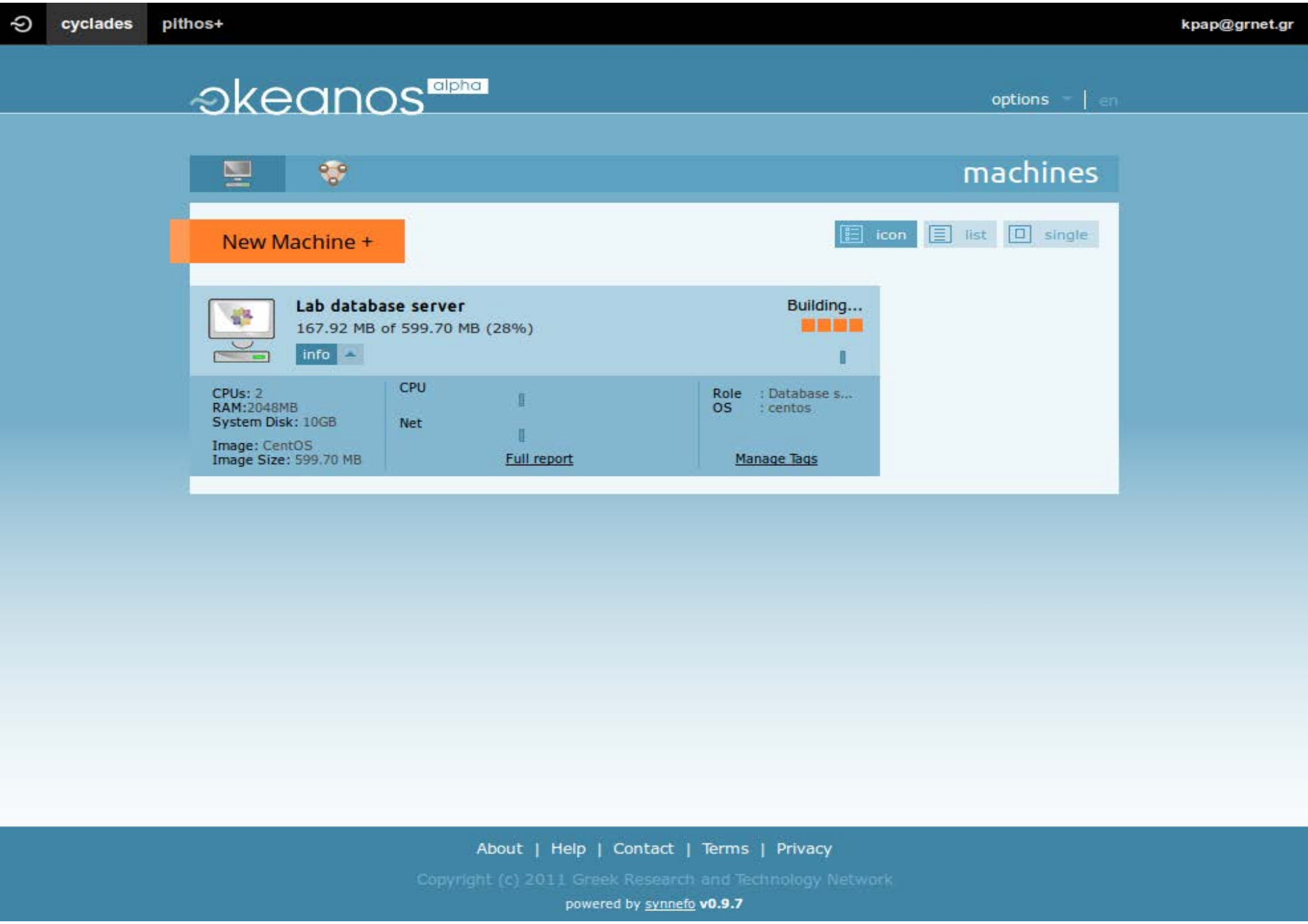

cyclades
pithos+
kpap@grnet.gr
Create new machine
close
1
2
3 Personalize
Virtual machine custom options
Virtual machine custom options
4
Machine name
Lab database server
Public SSH keys
manage keys
Select ssh keys
public key
Suggested tags
You may change machine tags later from the machines view.
Role
Database server
File server
Mail server
Web server
Proxy
previous
next
About | Help | Contact | Terms | Privacy
powered by synnefo v0.9.7

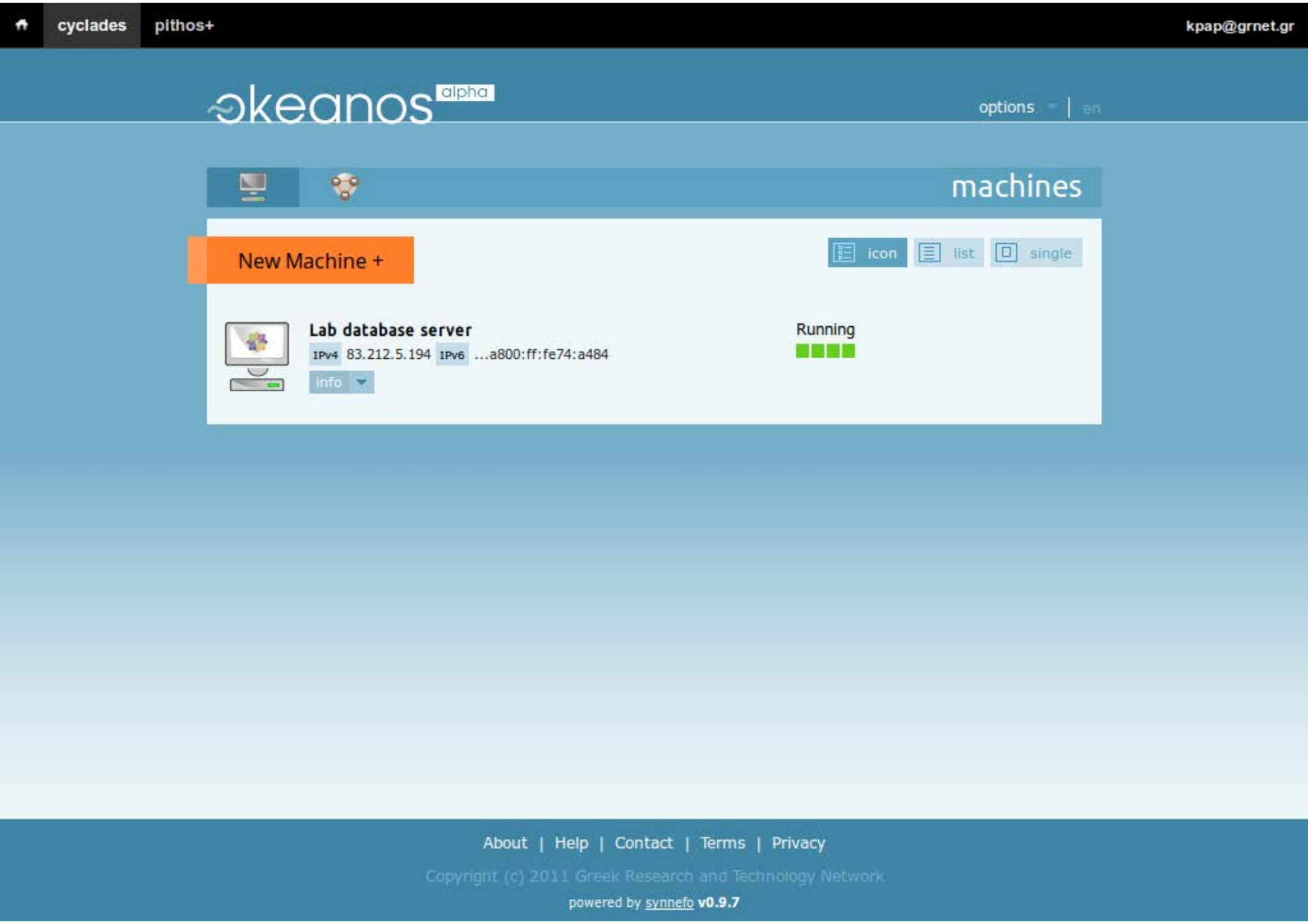

cyclades
pithos+
kpap@grnet.gr
Create new machine
close
1
2
3
4 Confirm
Confirm your settings
Confirm that the options you have selected are correct
Machine name
Lab database server
Image
CentOS
CentOS 6.0
OS Centos
Size 599.70 MB
GUI No GUI
Kernel 2.6.32
Flavor
CPUs 2x
Memory 2048 MB
Disk 10.00 GB
Storage type DRBD
Machine Tags
Role Database server
SSH Keys
public key
previous
create machine
About | Help | Contact | Terms | Privacy
powered by synnefo v0.9.7

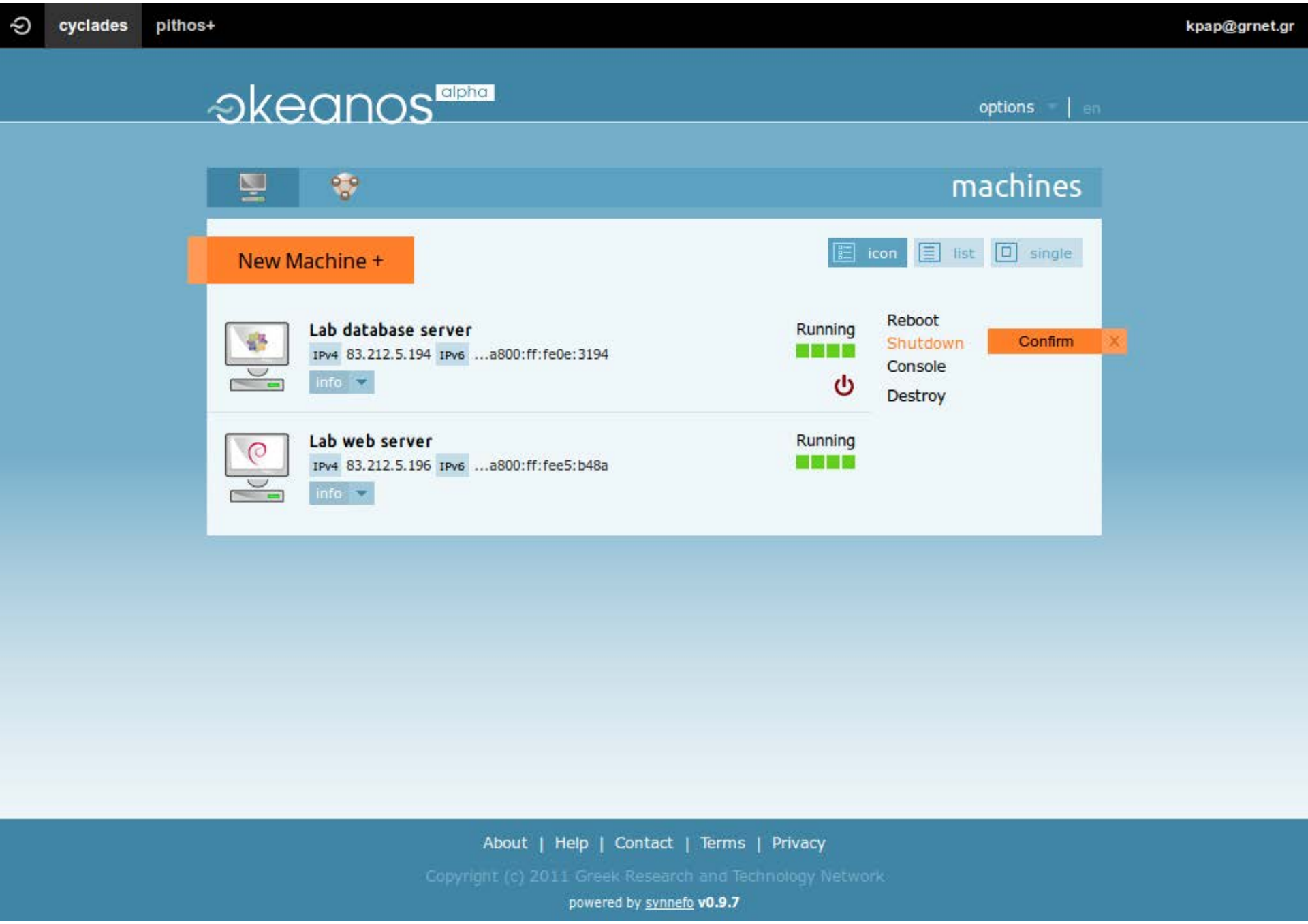

cyclades
pithos+
kpap@grnet.gr
Machine password
close
Your new machine is now buidling... (this might take a few minutes)
Write down your password now:
HidlhyVw3D
You will need this later to connect to your machine.
After closing this window you will NOT be able to retrieve it again
view machine
About | Help | Contact | Terms | Privacy
powered by synnefo v0.9.7

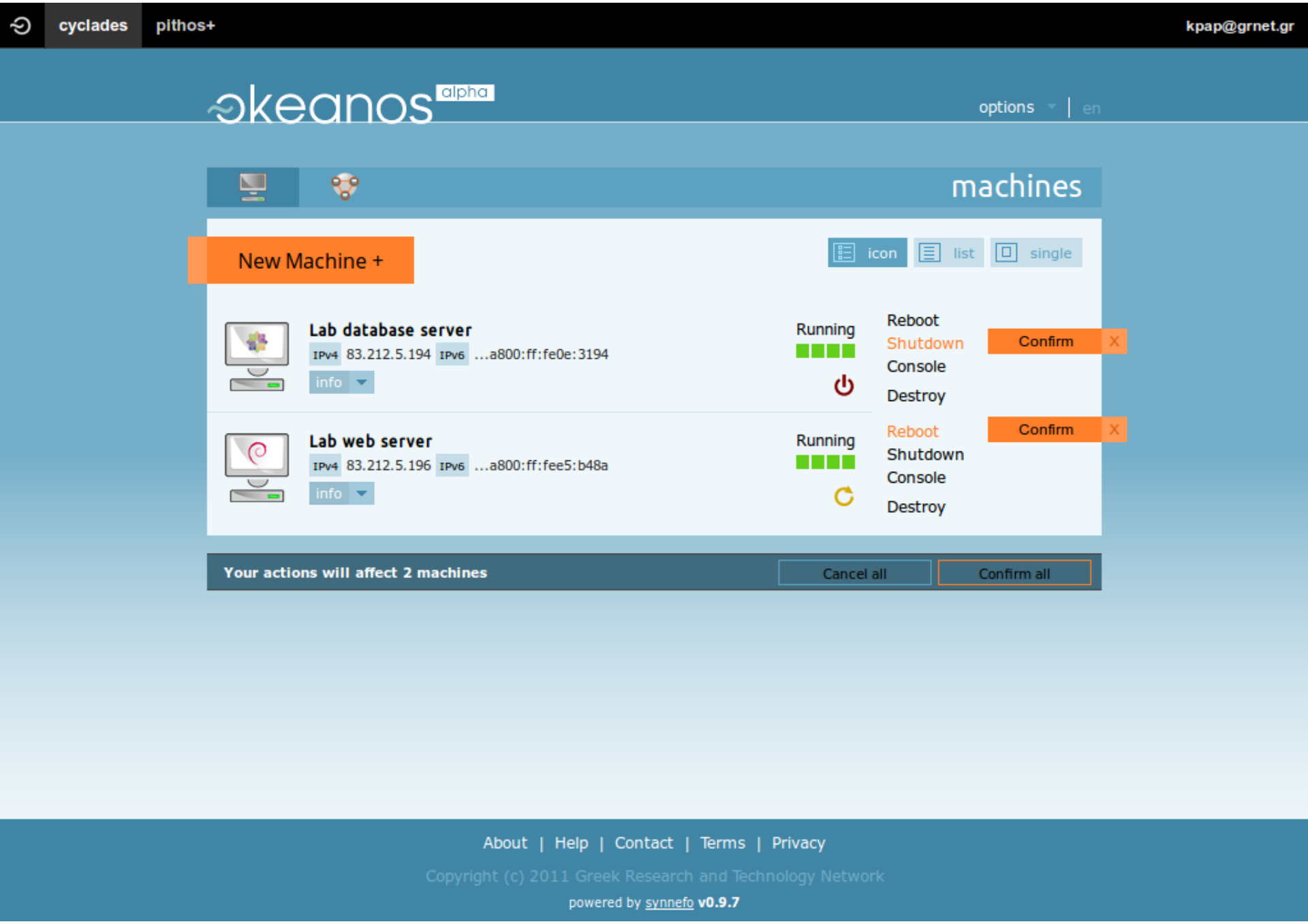

cyclades
pithos+
kpap@grnet.gr
okeanos
alpha
options
en
machines
New Machine +
icon
list
single
Lab database server
Initializing...
info
Building...
Destroy
About | Help | Contact | Terms | Privacy
Copyright (c) 2011 Greek Research and Technology Network
powered by synnefo v0.9.7

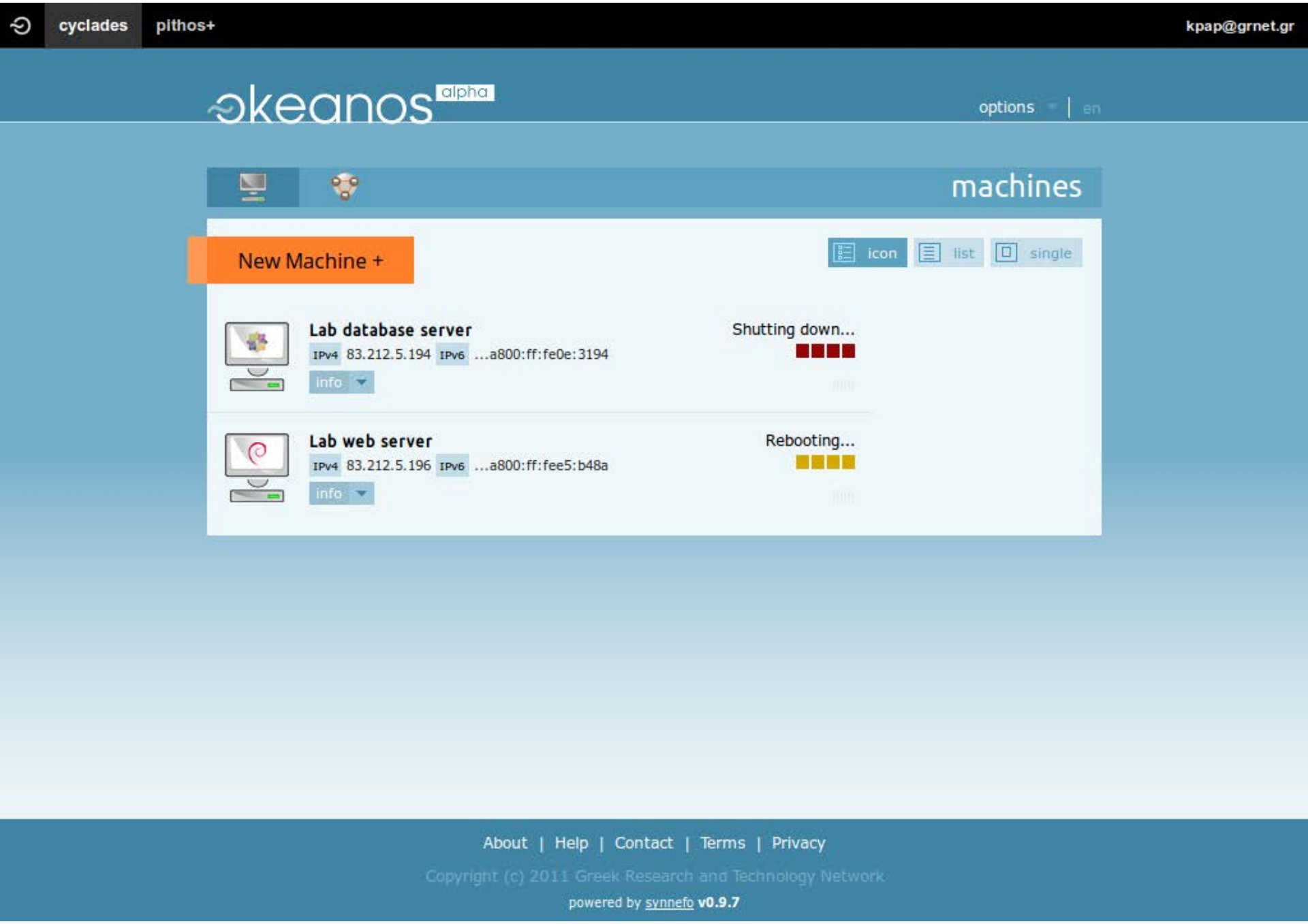

cyclades
pithos+
kpap@grnet.gr
okeanos alpha
options
en
machines
New Machine +
icon
list
single
Lab database server
CPUs: 2
RAM (MB): 2048
System Disk (GB): 10
Image Name: CentOS
Image Size (MB): 599.70 MB
Public IPv4: not set
Public IPv6: not set
tags
Destroy
previous
next
Lab database ...
Building...
Finalizing...
CPU Utilization
Network Utilization

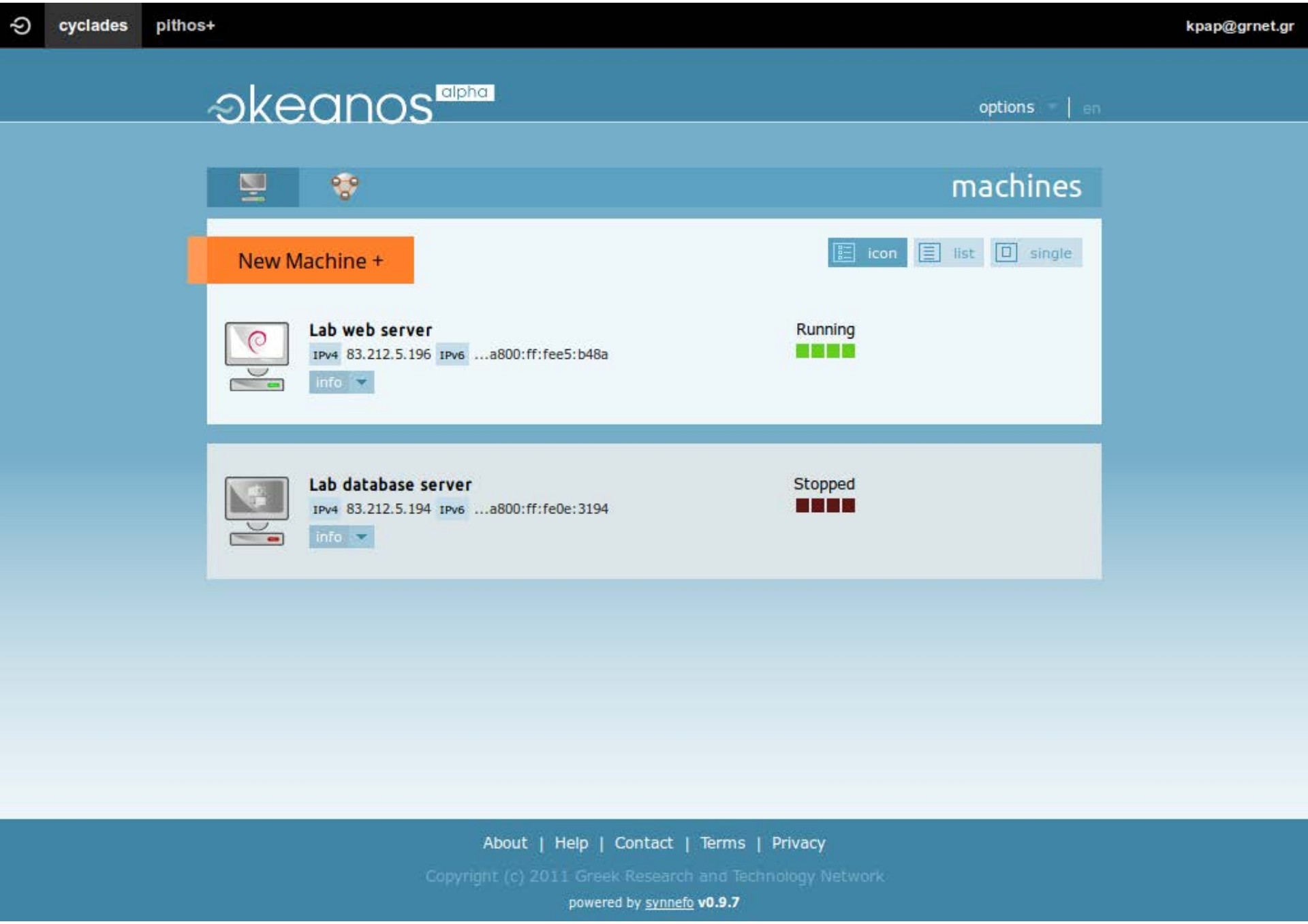

cyclades
pithos+
kpap@grnet.gr
okeanos alpha
options
en
machines
New Machine +
icon
list
single
Lab database server
167.92 MB of 599.70 MB (28%)
Building...
info
CPUs: 2
RAM:2048MB
System Disk: 10GB
Image: CentOS
Image Size: 599.70 MB
CPU
Net
Full report
Role : Database s...
OS : centos
Manage Tags
About | Help | Contact | Terms | Privacy
Copyright (c) 2011 Greek Research and Technology Network
powered by synnefo v0.9.7

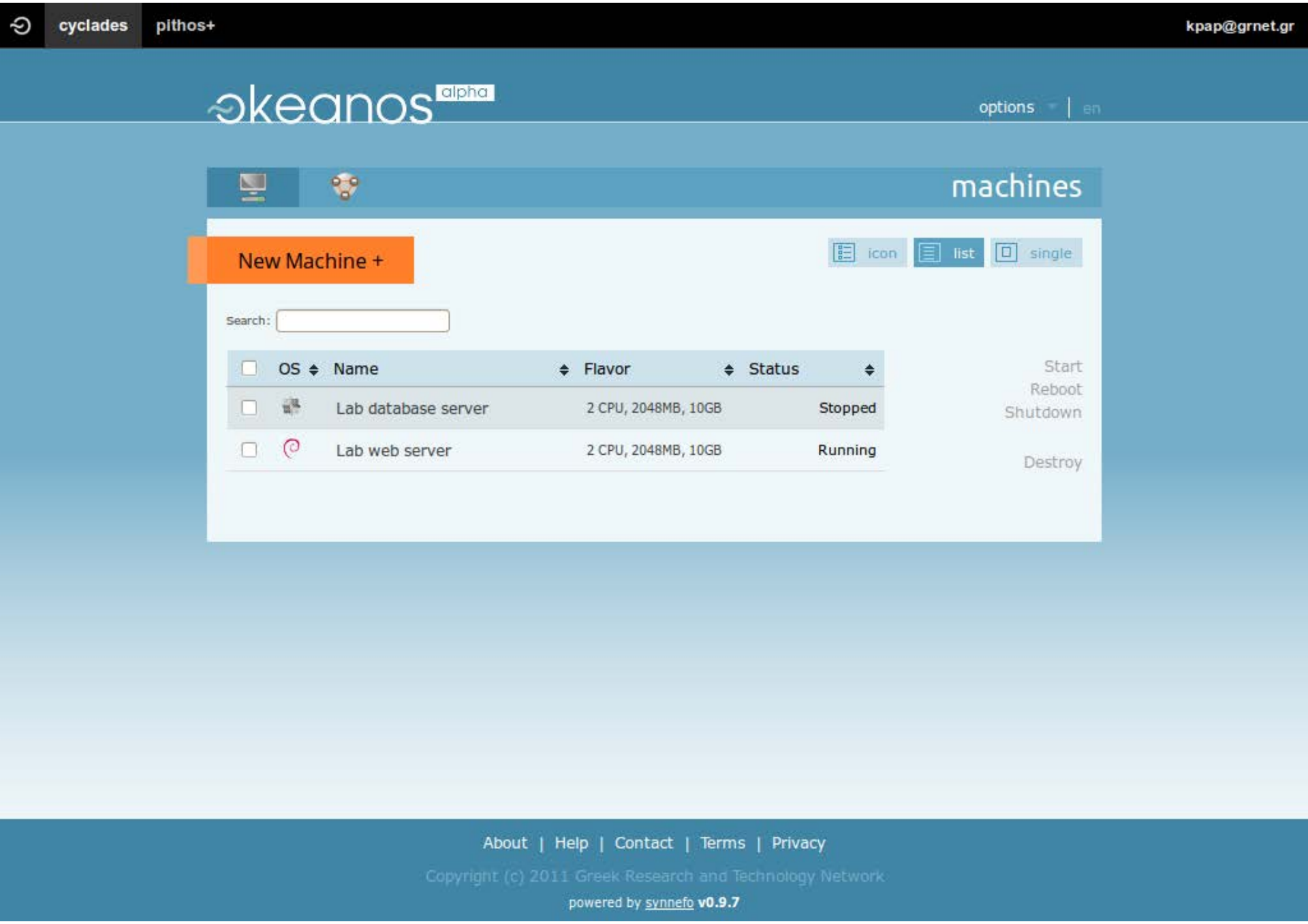

cyclades
pithos+
kpap@grnet.gr
okeanos
alpha
options
en
machines
New Machine +
icon
list
single
Lab database server
IPv4 83.212.5.194 IPv6 ...a800:ff:fe74:a484
info
Running
About | Help | Contact | Terms | Privacy
Copyright (c) 2011 Greek Research and Technology Network
powered by synnefo v0.9.7


cyclades
pithos+
kpap@grnet.gr
okeanos alpha
options | en
machines
New Machine +
icon
list
single
Lab database server
IPv4 83.212.5.194 IPv6 ...a800:ff:fe0e:3194
info
Running
Reboot
Shutdown
Confirm
Console
Destroy
Lab web server
IPv4 83.212.5.196 IPv6 ...a800:ff:fee5:b48a
info
Running
About | Help | Contact | Terms | Privacy
Copyright (c) 2011 Greek Research and Technology Network
powered by synnefo v0.9.7


cyclades
pithos+
kpap@grnet.gr
okeanos alpha
options
en
machines
New Machine +
icon
list
single
Lab database server
IPv4 83.212.5.194 IPv6 ...a800:ff:fe0e:3194
info
Running
Reboot
Shutdown
Confirm
X
Console
Destroy
Lab web server
IPv4 83.212.5.196 IPv6 ...a800:ff:fee5:b48a
info
Running
Reboot
Confirm
X
Shutdown
Console
Destroy
Your actions will affect 2 machines
Cancel all
Confirm all
About | Help | Contact | Terms | Privacy
Copyright (c) 2011 Greek Research and Technology Network
powered by synnefo v0.9.7


cyclades
pithos+
kpap@grnet.gr
okeanos alpha
options | en
machines
New Machine +
icon
list
single
Lab database server
IPv4 83.212.5.194 IPv6 ...a800:ff:fe0e:3194
info
Shutting down...
Lab web server
IPv4 83.212.5.196 IPv6 ...a800:ff:fee5:b48a
info
Rebooting...
About | Help | Contact | Terms | Privacy
Copyright (c) 2011 Greek Research and Technology Network
powered by synnefo v0.9.7


cyclades
pithos+
kpap@grnet.gr
okeanos alpha
options | en
machines
New Machine +
icon
list
single
Lab web server
IPv4 83.212.5.196 IPv6 ...a800:ff:fee5:b48a
info
Running
Lab database server
IPv4 83.212.5.194 IPv6 ...a800:ff:fe0e:3194
info
Stopped
About | Help | Contact | Terms | Privacy
Copyright (c) 2011 Greek Research and Technology Network
powered by synnefo v0.9.7


cyclades
pithos+
kpap@grnet.gr
okeanos alpha
options | en
machines
New Machine +
icon
list
single
Search:
OS
Name
Flavor
Status
Lab database server
2 CPU, 2048MB, 10GB
Stopped
Lab web server
2 CPU, 2048MB, 10GB
Running
Start
Reboot
Shutdown
Destroy
About | Help | Contact | Terms | Privacy
Copyright (c) 2011 Greek Research and Technology Network
powered by synnefo v0.9.7

cyclades pithos+ kpap@grnet.gr

okeanos alpha

options | en

machines

New Machine +

icon list single

Stopped

Lab database server

CPUs:	2
RAM (MB):	2048
System Disk (GB):	10
Image Name:	CentOS
Image Size (MB):	599.70 MB
Public IPv4:	83.212.5.194
Public IPv6:	2001:db8::a800:ff:fe0e:3194

tags

Start

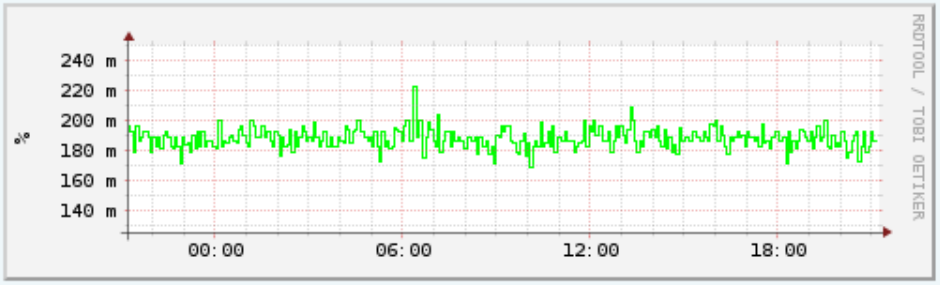
Destroy

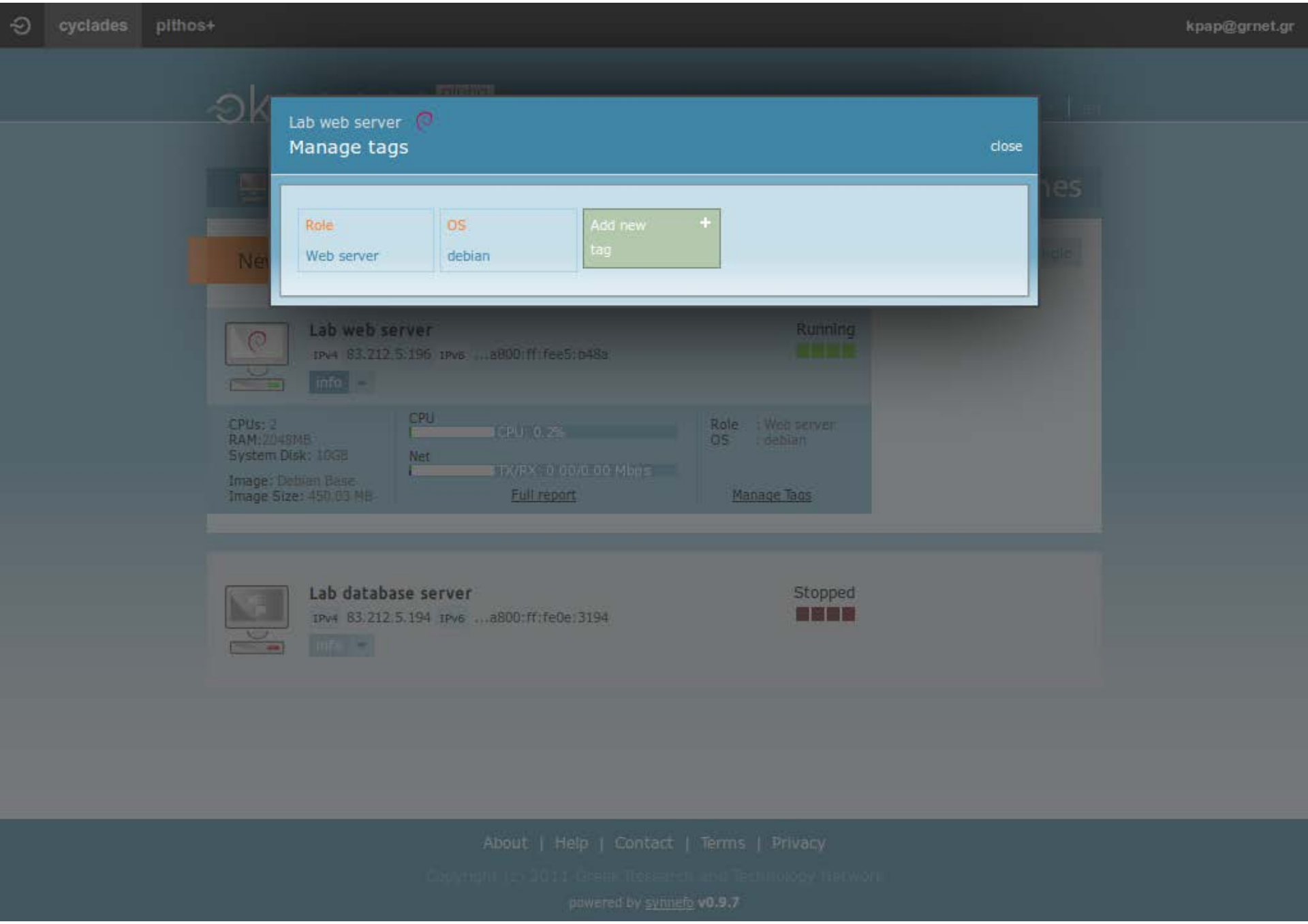
previous next

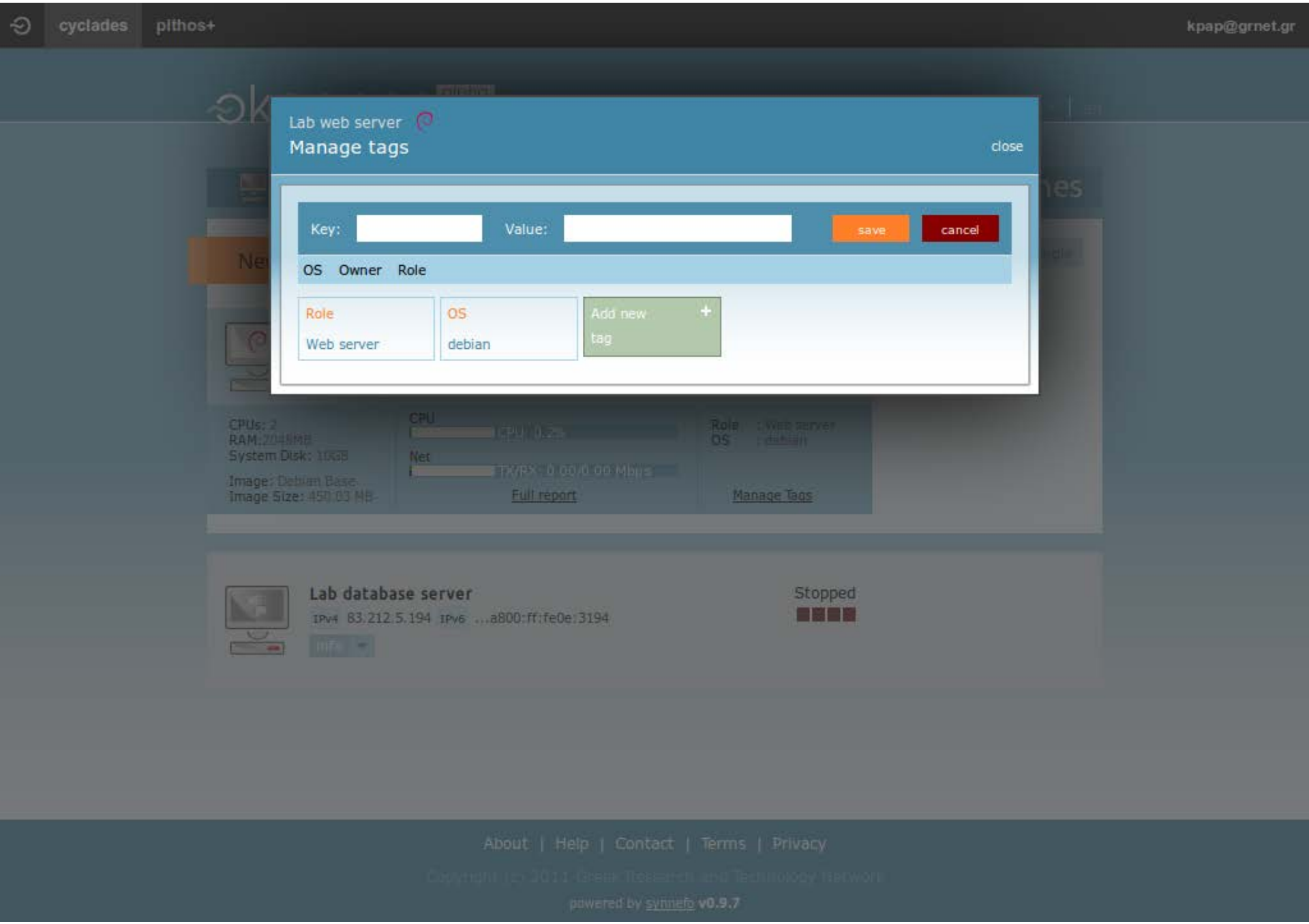
Lab database ...

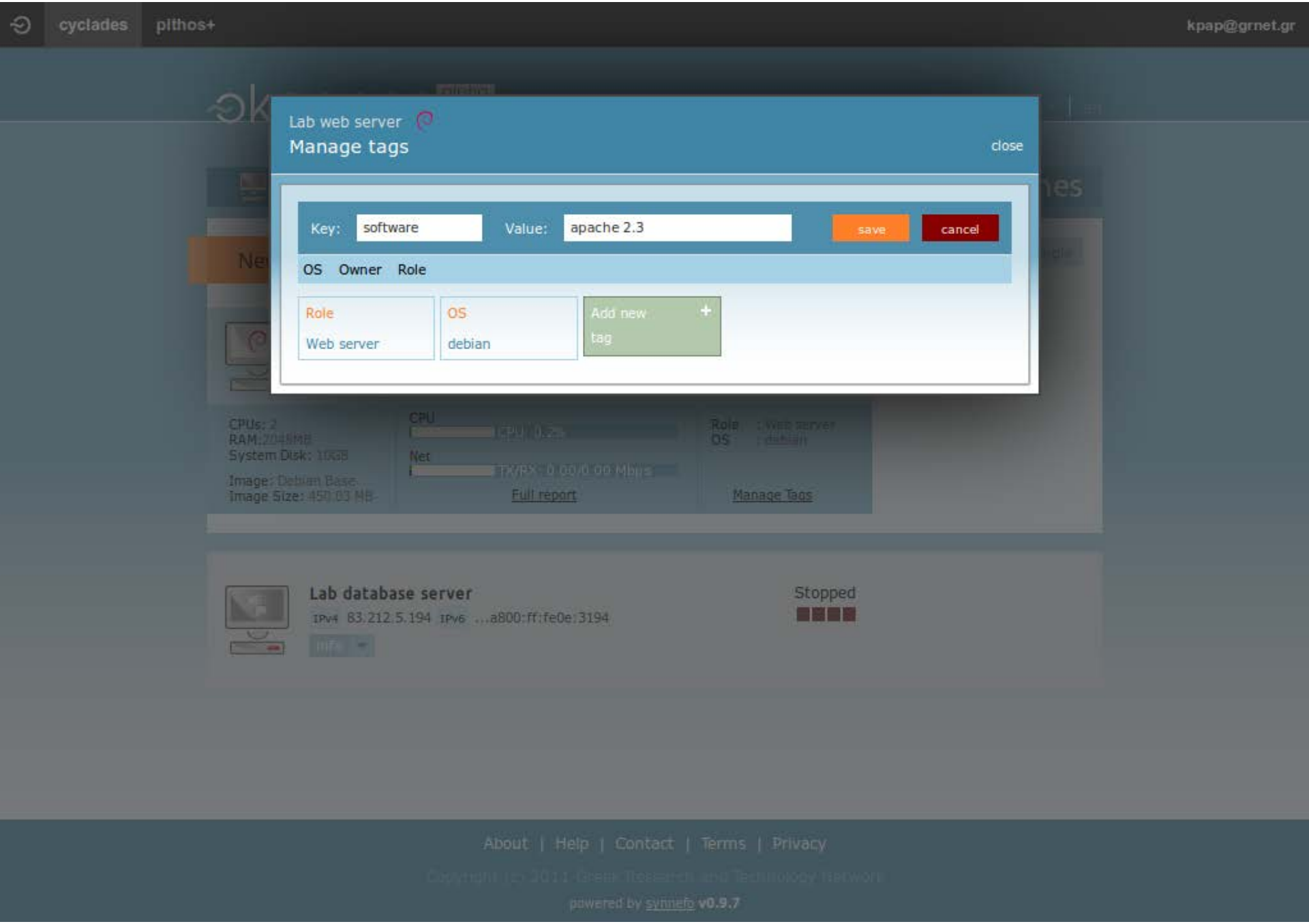
Lab web server

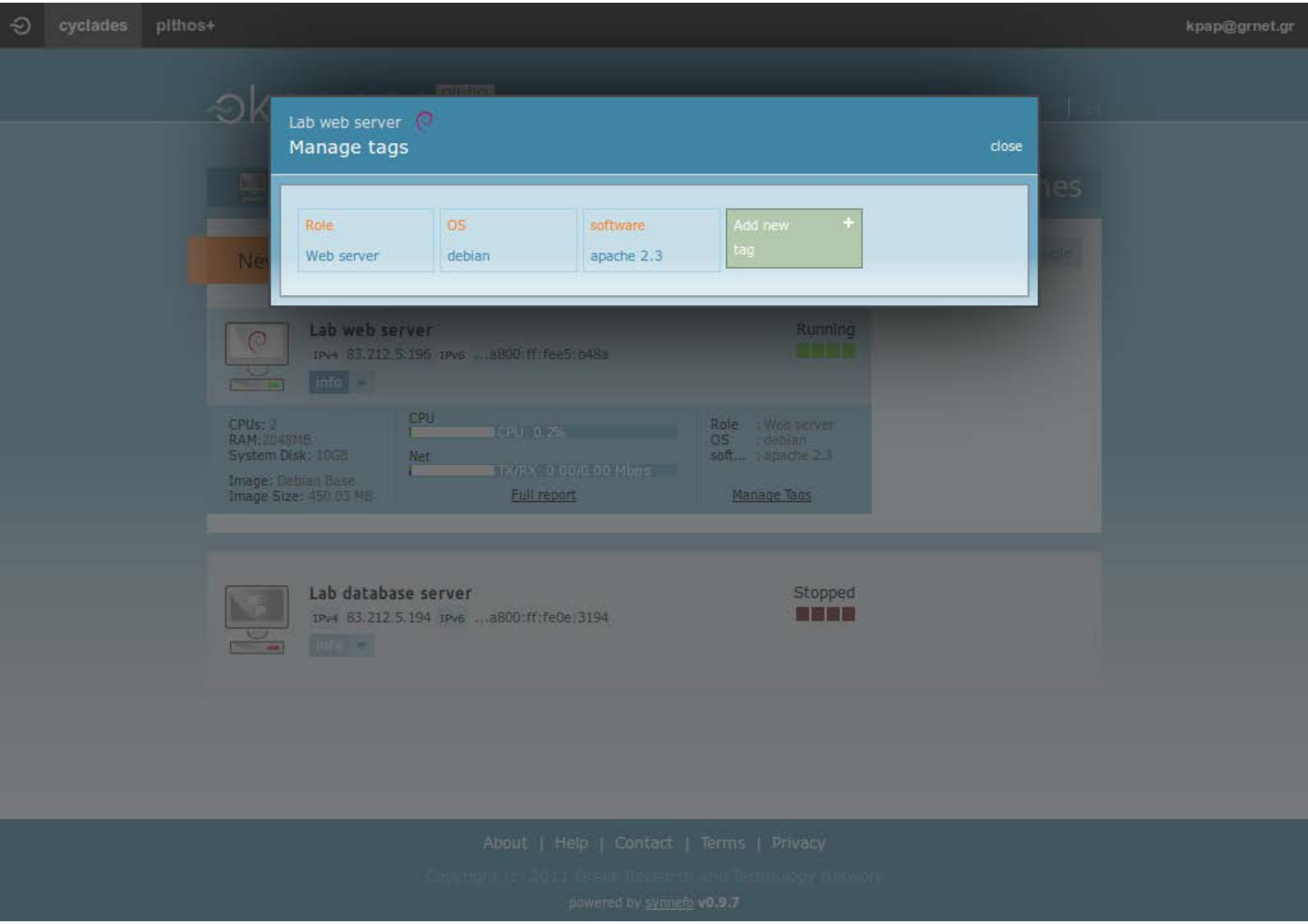
CPU Utilization

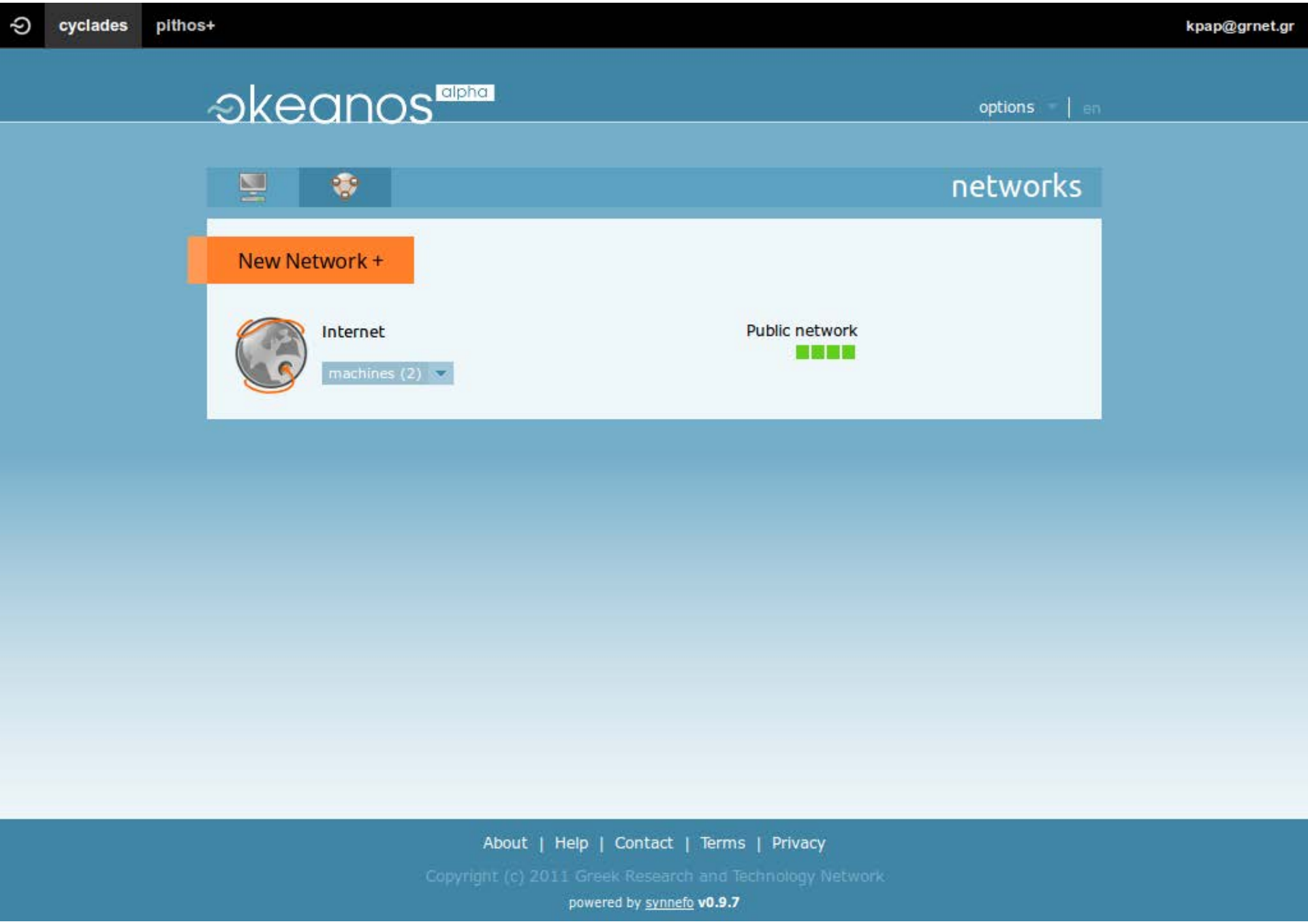


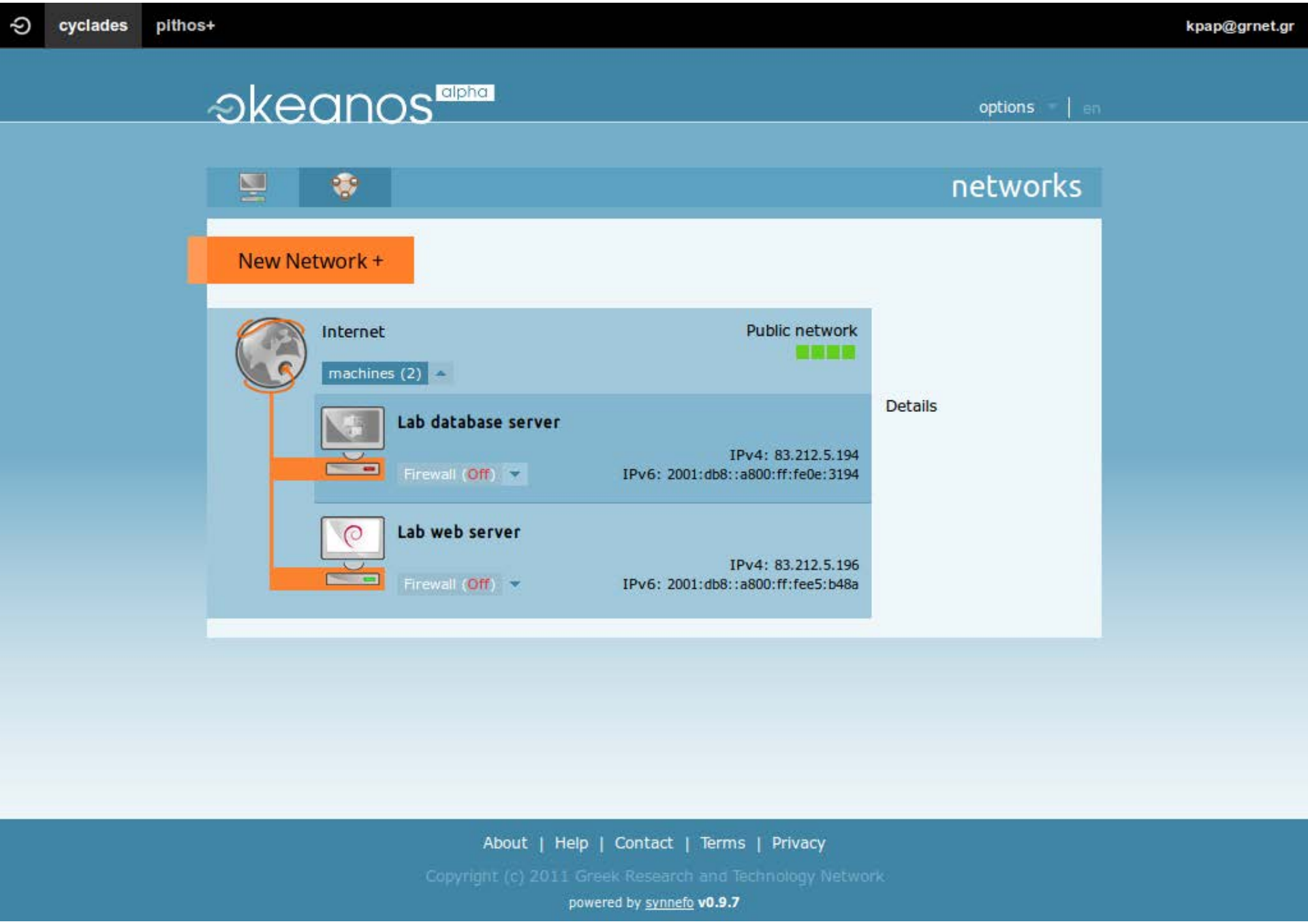

cyclades
pithos+
kpap@grnet.gr
Lab web server
Manage tags
close
Role
Web server
OS
debian
Add new tag
+
Lab web server
IPv4 83.212.5.196 IPv6 ...a800:ff:fee5:b48a
Running
info
CPUs: 2
RAM: 2048MB
System Disk: 10GB
Image: Debian Base
Image Size: 450.03 MB
CPU
CPU: 0.2%
Net
TX/RX: 0.00/0.00 Mbps
Full report
Role : Web server
OS : debian
Manage Tags
Lab database server
IPv4 83.212.5.194 IPv6 ...a800:ff:fe0e:3194
Stopped
info
About | Help | Contact | Terms | Privacy
Copyright (c) 2011 Greek Research and Technology Network
powered by synnefo v0.9.7


cyclades
pithos+
kpap@grnet.gr
Lab web server
Manage tags
close
Key:
Value:
save
cancel
OS
Owner
Role
Role
Web server
OS
debian
Add new tag
+
CPUs: 2
RAM: 2048MB
System Disk: 10GB
Image: Debian Base
Image Size: 450.03 MB
CPU
Net
Full report
Role : Web server
OS : debian
Manage Tags
Lab database server
IPv4 83.212.5.194 IPv6 ...a800:ff:fe0e:3194
Stopped
About | Help | Contact | Terms | Privacy
powered by synnefo v0.9.7

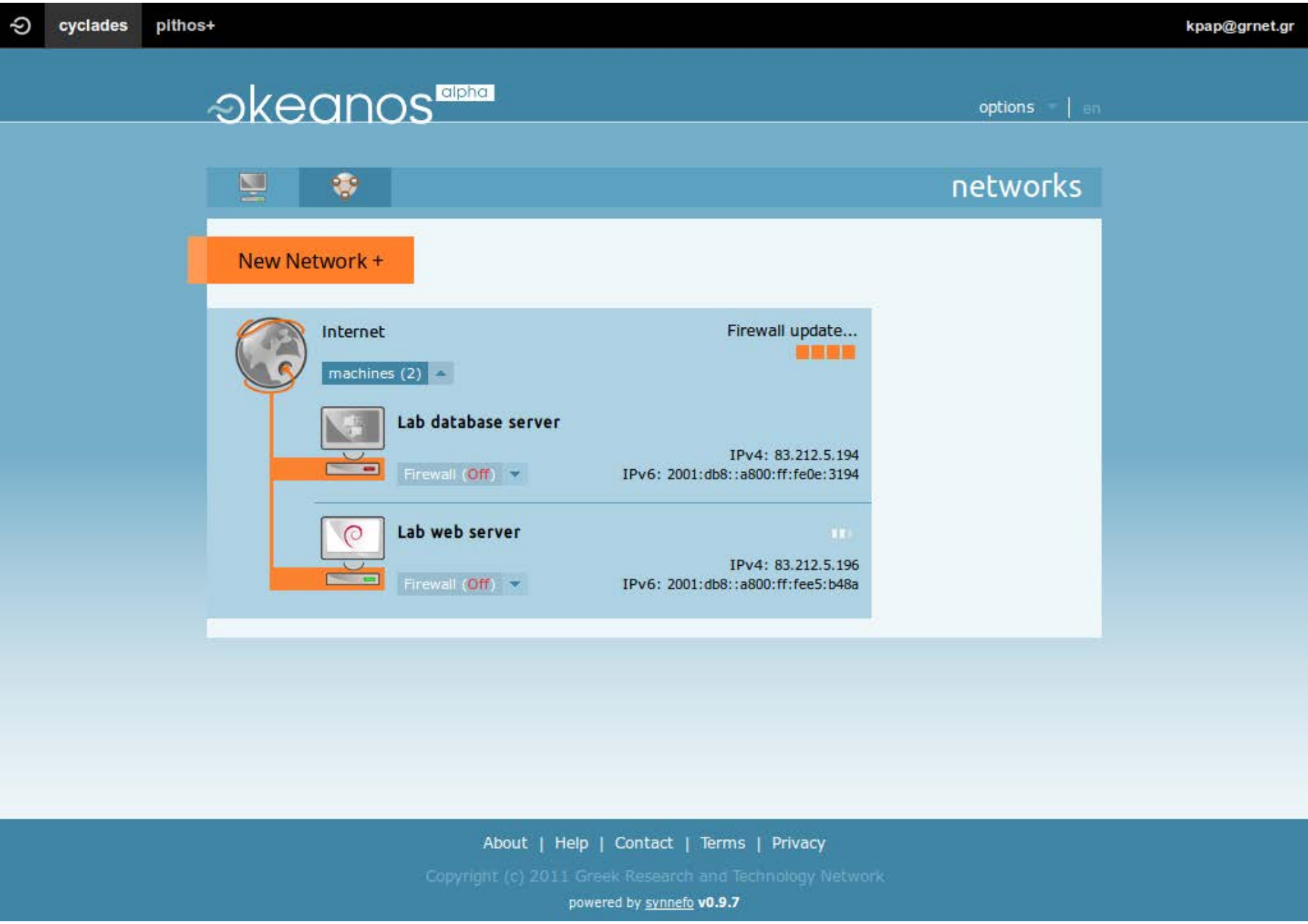

cyclades
pithos+
kpap@grnet.gr
Lab web server
Manage tags
close
Key:
software
Value:
apache 2.3
save
cancel
OS
Owner
Role
Role
Web server
OS
debian
Add new tag
+
CPUs: 2
RAM: 2048MB
System Disk: 10GB
Image: Debian Base
Image Size: 450.03 MB
CPU
Net
Full report
Role : Web server
OS : debian
Manage Tags
Lab database server
IPv4 83.212.5.194 IPv6 ...a800:ff:fe0e:3194
Stopped
About | Help | Contact | Terms | Privacy
powered by synnefo v0.9.7

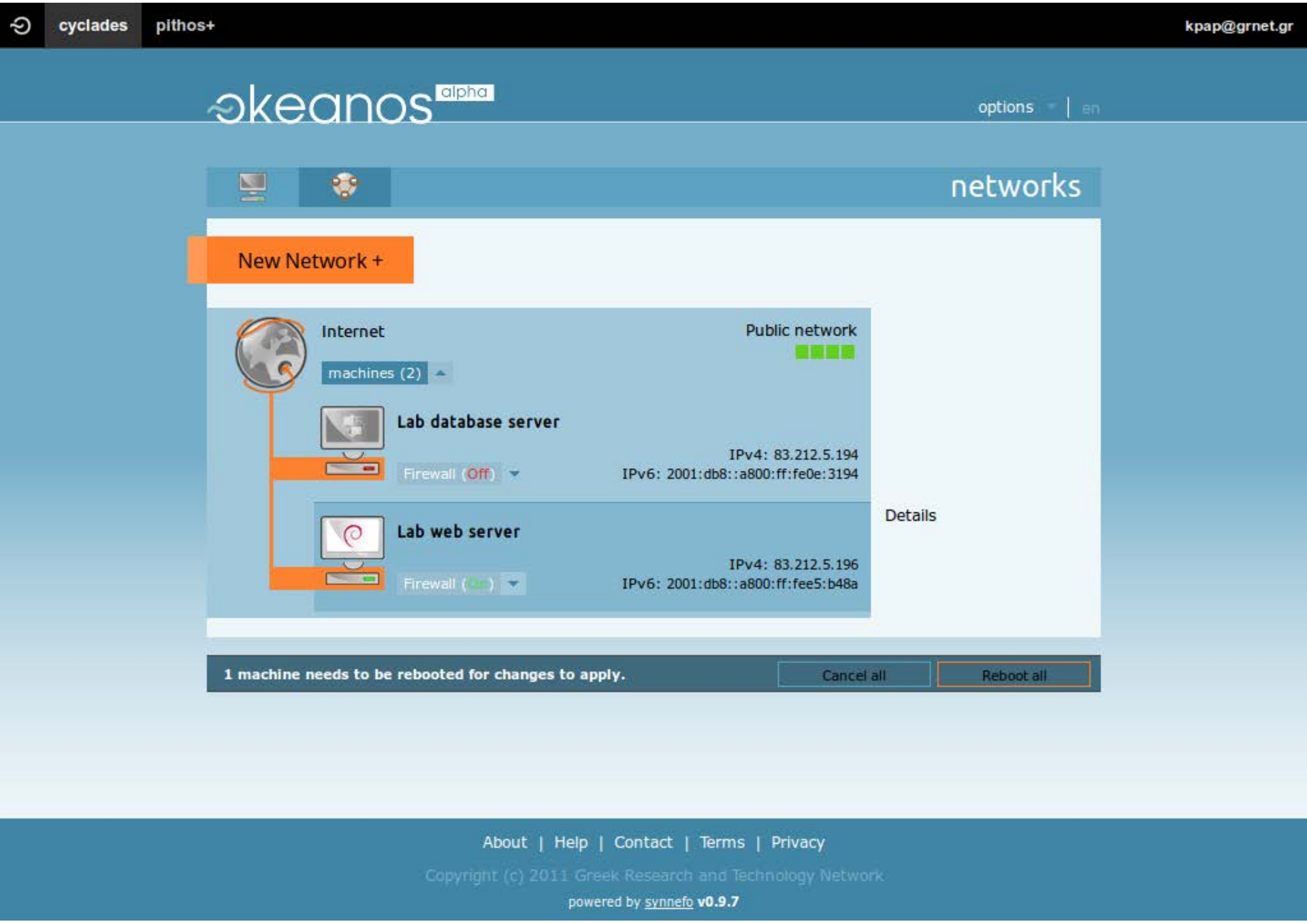

cyclades
pithos+
kpap@grnet.gr
Lab web server
Manage tags
close
Role
Web server
OS
debian
software
apache 2.3
Add new tag
+
Lab web server
IPv4 83.212.5.196 IPv6 ...a800:ff:fee5:b48a
Running
info
CPUs: 2
RAM: 2048MB
System Disk: 10GB
Image: Debian Base
Image Size: 450.03 MB
CPU
CPU: 0.2%
Net
TX/RX: 0.00/0.00 Mbps
Full report
Role : Web server
OS : debian
soft... : apache 2.3
Manage Tags
Lab database server
IPv4 83.212.5.194 IPv6 ...a800:ff:fe0e:3194
Stopped
info
About | Help | Contact | Terms | Privacy
powered by synnefo v0.9.7

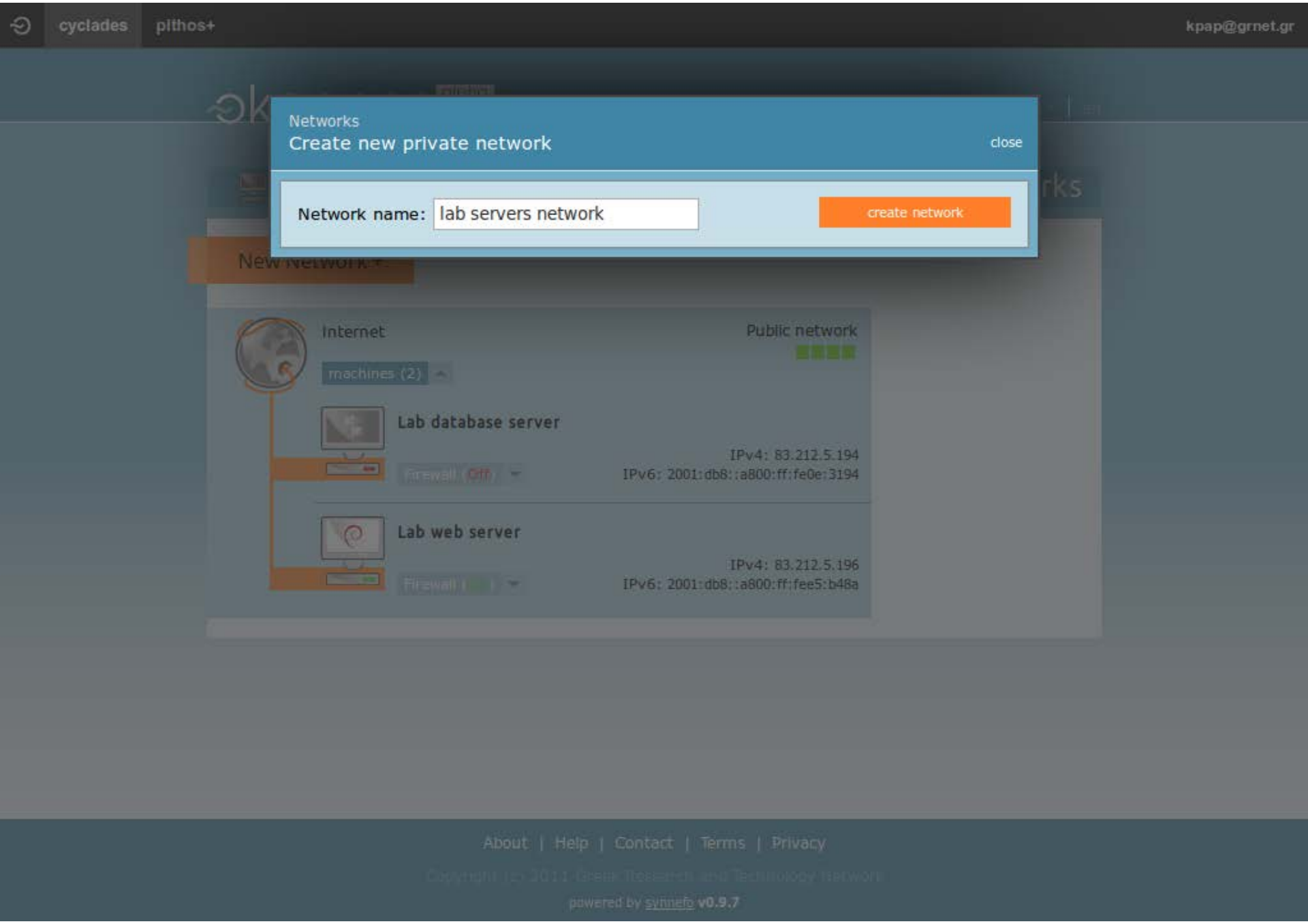

cyclades
pithos+
kpap@grnet.gr
okeanos alpha
options | en
networks
New Network +
Internet
machines (2)
Public network
About | Help | Contact | Terms | Privacy
Copyright (c) 2011 Greek Research and Technology Network
powered by synnefo v0.9.7

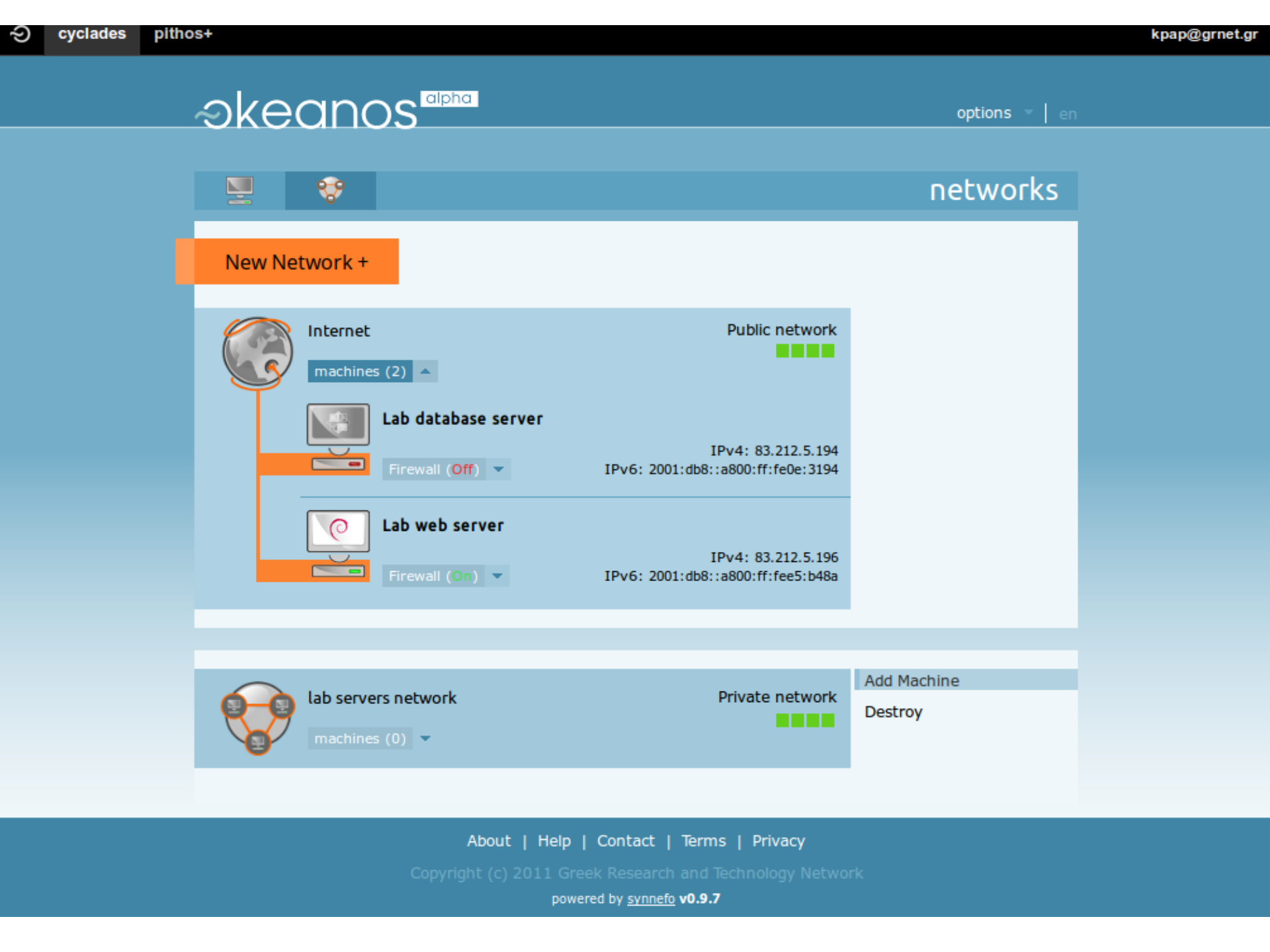

cyclades
pithos+
kpap@grnet.gr
okeanos alpha
options | en
networks
New Network +
Internet
Public network
machines (2)
Details
Lab database server
IPv4: 83.212.5.194
IPv6: 2001:db8::a800:ff:fe0e:3194
Firewall (Off)
Lab web server
IPv4: 83.212.5.196
IPv6: 2001:db8::a800:ff:fee5:b48a
Firewall (Off)
About | Help | Contact | Terms | Privacy
Copyright (c) 2011 Greek Research and Technology Network
powered by synnefo v0.9.7

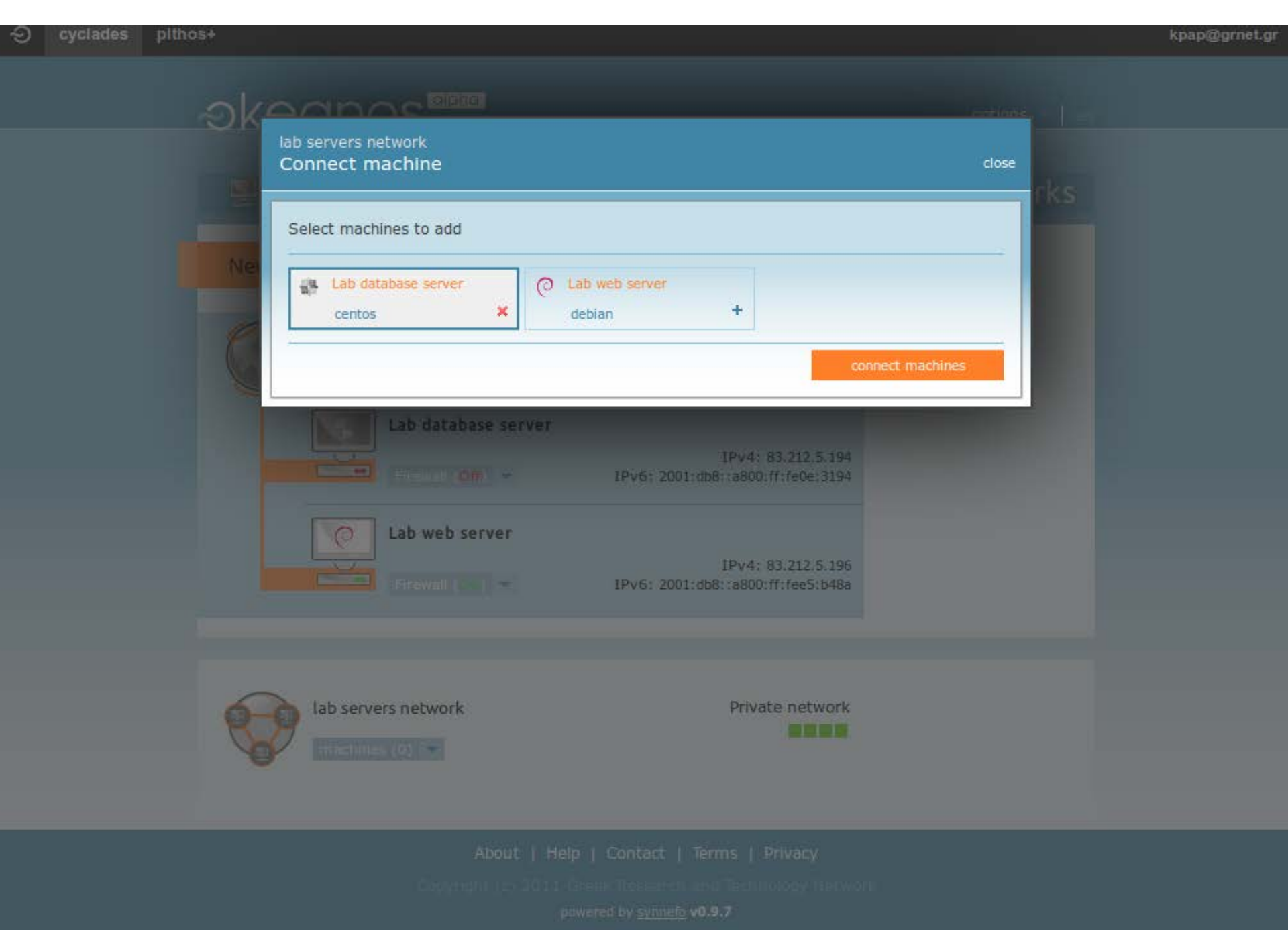

cyclades
pithos+
kpap@grnet.gr
okeanos alpha
options | en
networks
New Network +
Internet
Public network
machines (2)
Lab database server
IPv4: 83.212.5.194
IPv6: 2001:db8::a800:ff:fe0e:3194
Firewall (Off)
Lab web server
IPv4: 83.212.5.196
IPv6: 2001:db8::a800:ff:fee5:b48a
Firewall (Off)
Unprotected mode (Firewall off)
Fully protected mode (Firewall on)
Basically protected mode (Firewall on)
Apply
About | Help | Contact | Terms | Privacy
Copyright (c) 2011 Greek Research and Technology Network
powered by synnefo v0.9.7

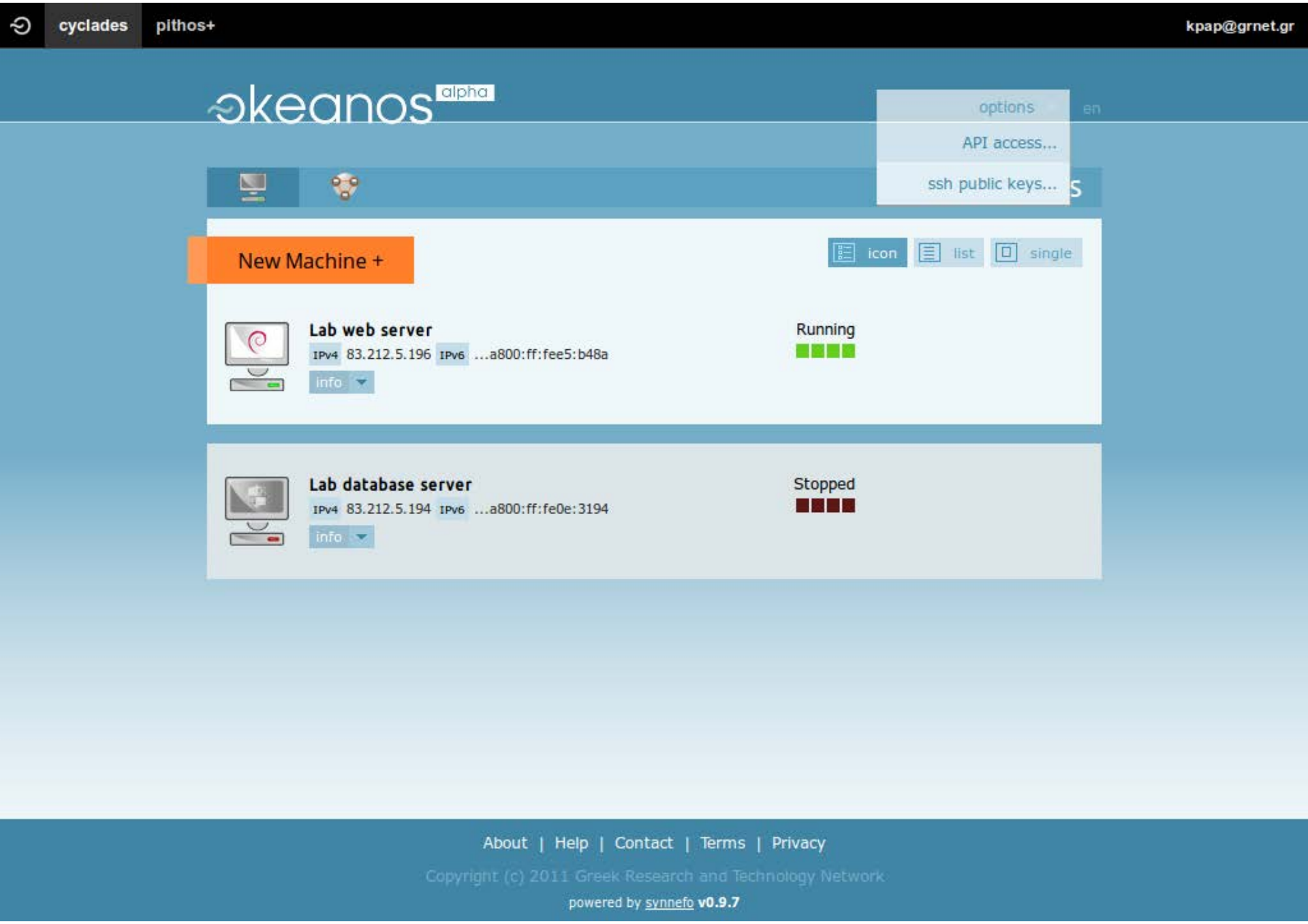

cyclades
pithos+
kpap@grnet.gr
okeanos alpha
options | en
networks
New Network +
Internet
Firewall update...
machines (2)
Lab database server
IPv4: 83.212.5.194
IPv6: 2001:db8::a800:ff:fe0e:3194
Firewall (Off)
Lab web server
IPv4: 83.212.5.196
IPv6: 2001:db8::a800:ff:fee5:b48a
Firewall (Off)
About | Help | Contact | Terms | Privacy
Copyright (c) 2011 Greek Research and Technology Network
powered by synnefo v0.9.7

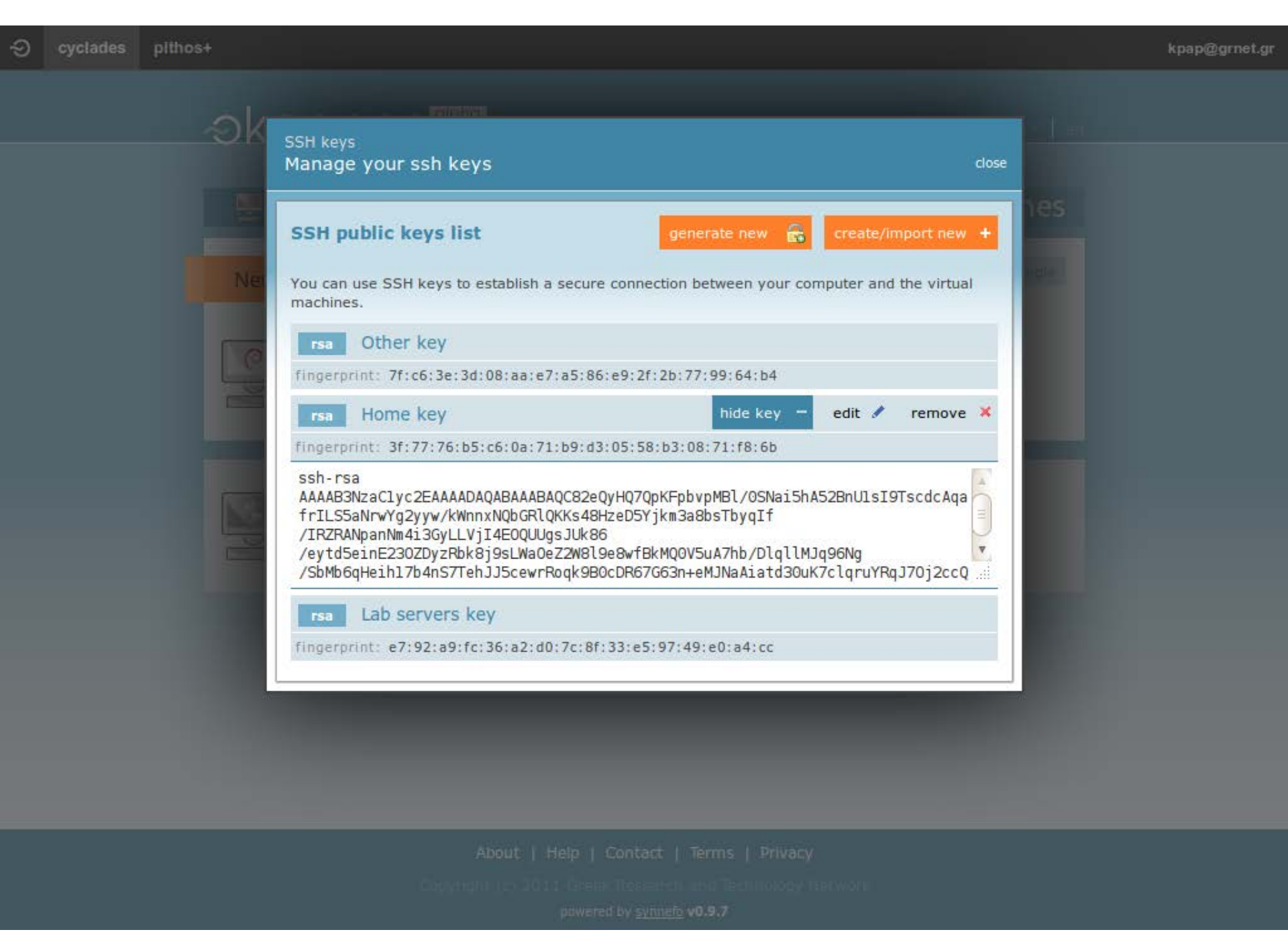

cyclades
pithos+
kpap@grnet.gr
okeanos alpha
options | en
networks
New Network +
Internet
Public network
machines (2)
Lab database server
IPv4: 83.212.5.194
Firewall (Off)
IPv6: 2001:db8::a800:ff:fe0e:3194
Lab web server
Details
IPv4: 83.212.5.196
Firewall (On)
IPv6: 2001:db8::a800:ff:fee5:b48a
1 machine needs to be rebooted for changes to apply.
Cancel all
Reboot all
About | Help | Contact | Terms | Privacy
Copyright (c) 2011 Greek Research and Technology Network
powered by synnefo v0.9.7

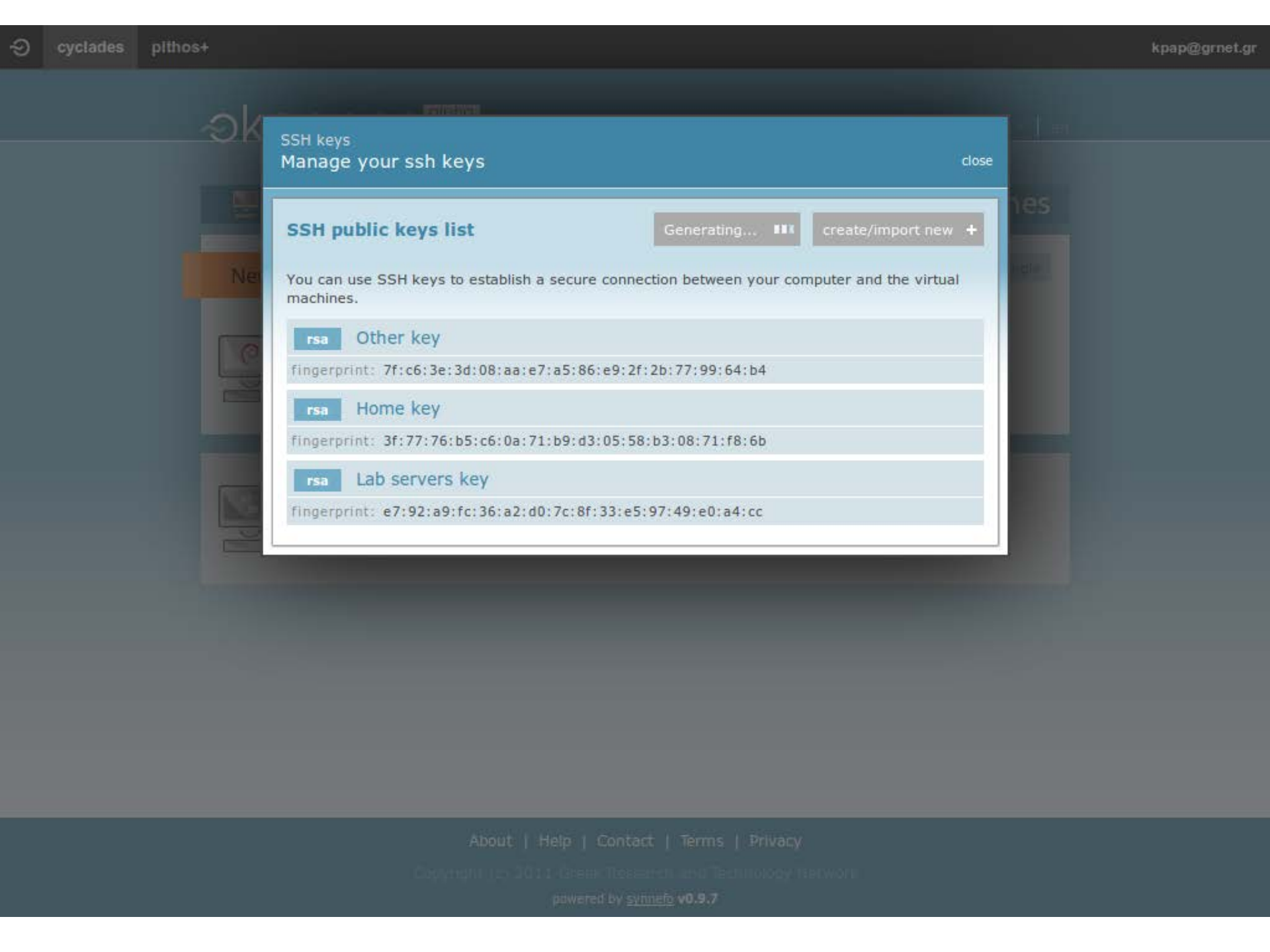

cyclades
pithos+
kpap@grnet.gr
Networks
Create new private network
close
Network name:
lab servers network
create network
Internet
Public network
machines (2)
Lab database server
IPv4: 83.212.5.194
IPv6: 2001:db8::a800:ff:fe0e:3194
Lab web server
IPv4: 83.212.5.196
IPv6: 2001:db8::a800:ff:fee5:b48a
About | Help | Contact | Terms | Privacy
powered by synnefo v0.9.7

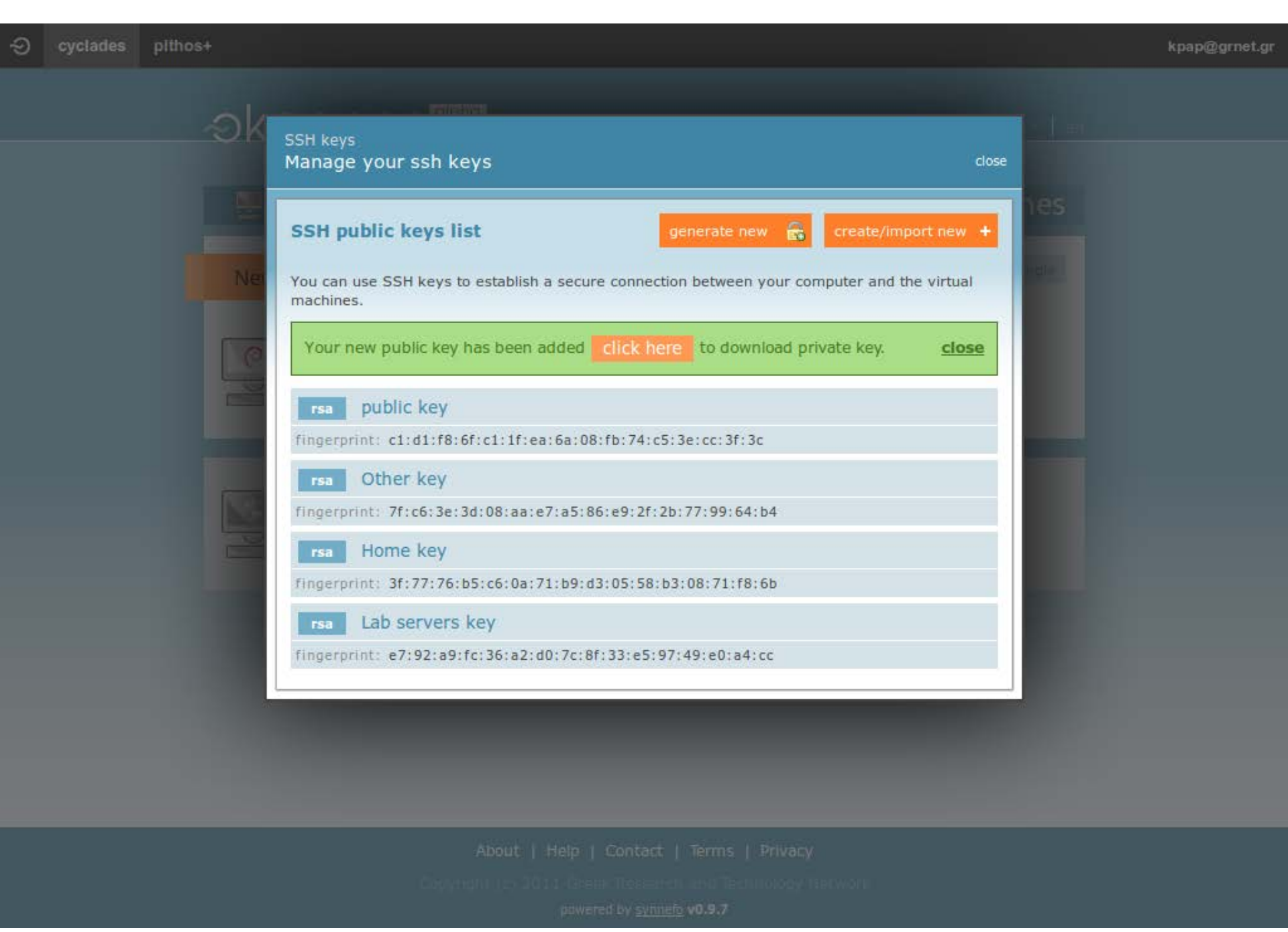

cyclades
pithos+
kpap@grnet.gr
okeanos alpha
options
en
networks
New Network +
Internet
Public network
machines (2)
Lab database server
IPv4: 83.212.5.194
IPv6: 2001:db8::a800:ff:fe0e:3194
Firewall (Off)
Lab web server
IPv4: 83.212.5.196
IPv6: 2001:db8::a800:ff:fee5:b48a
Firewall (On)
lab servers network
Private network
machines (0)
Add Machine
Destroy
About | Help | Contact | Terms | Privacy
Copyright (c) 2011 Greek Research and Technology Network
powered by synnefo v0.9.7

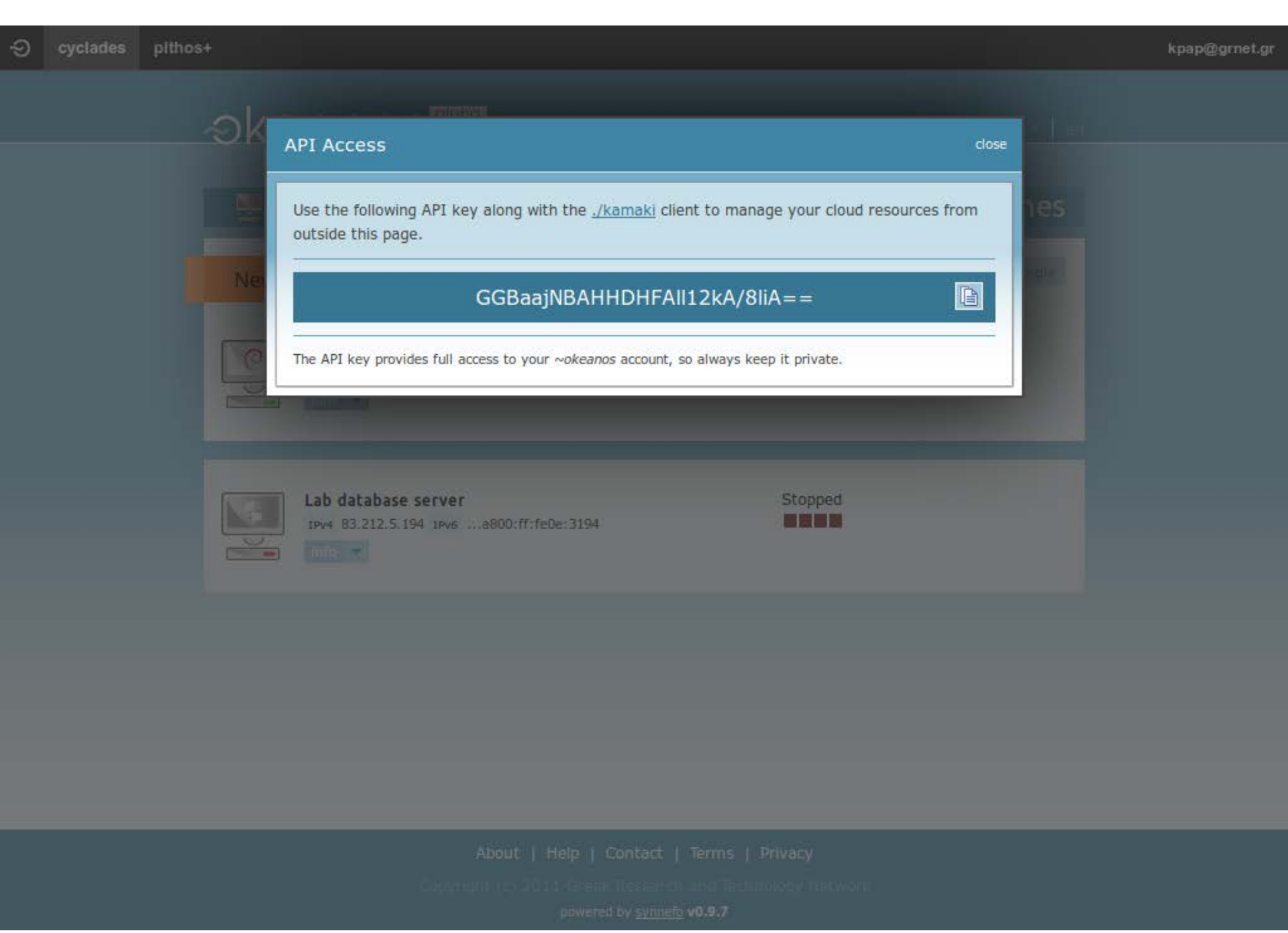

cyclades
pithos+
kpap@grnet.gr
lab servers network
Connect machine
close
Select machines to add
Lab database server
centos
Lab web server
debian
connect machines
Lab database server
IPv4: 83.212.5.194
IPv6: 2001:db8::a800:ff:fe0e:3194
Lab web server
IPv4: 83.212.5.196
IPv6: 2001:db8::a800:ff:fee5:b48a
lab servers network
Private network
About | Help | Contact | Terms | Privacy
powered by synnefo v0.9.7

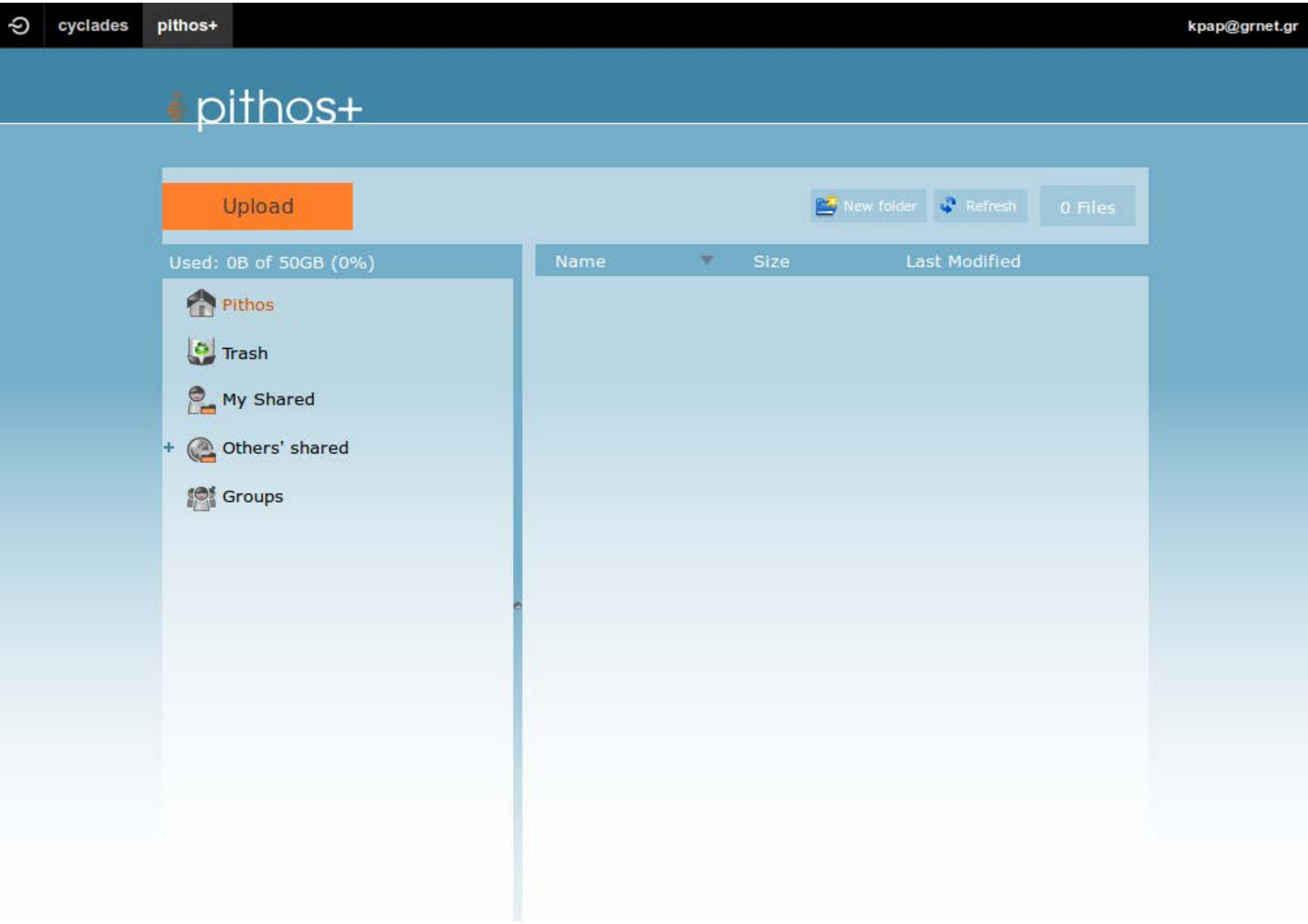

cyclades
pithos+
kpap@grnet.gr
okeanos alpha
options
en
API access...
ssh public keys...
New Machine +
icon
list
single
Lab web server
IPv4 83.212.5.196 IPv6 ...a800:ff:fee5:b48a
info
Running
Lab database server
IPv4 83.212.5.194 IPv6 ...a800:ff:fe0e:3194
info
Stopped
About | Help | Contact | Terms | Privacy
Copyright (c) 2011 Greek Research and Technology Network
powered by synnefo v0.9.7

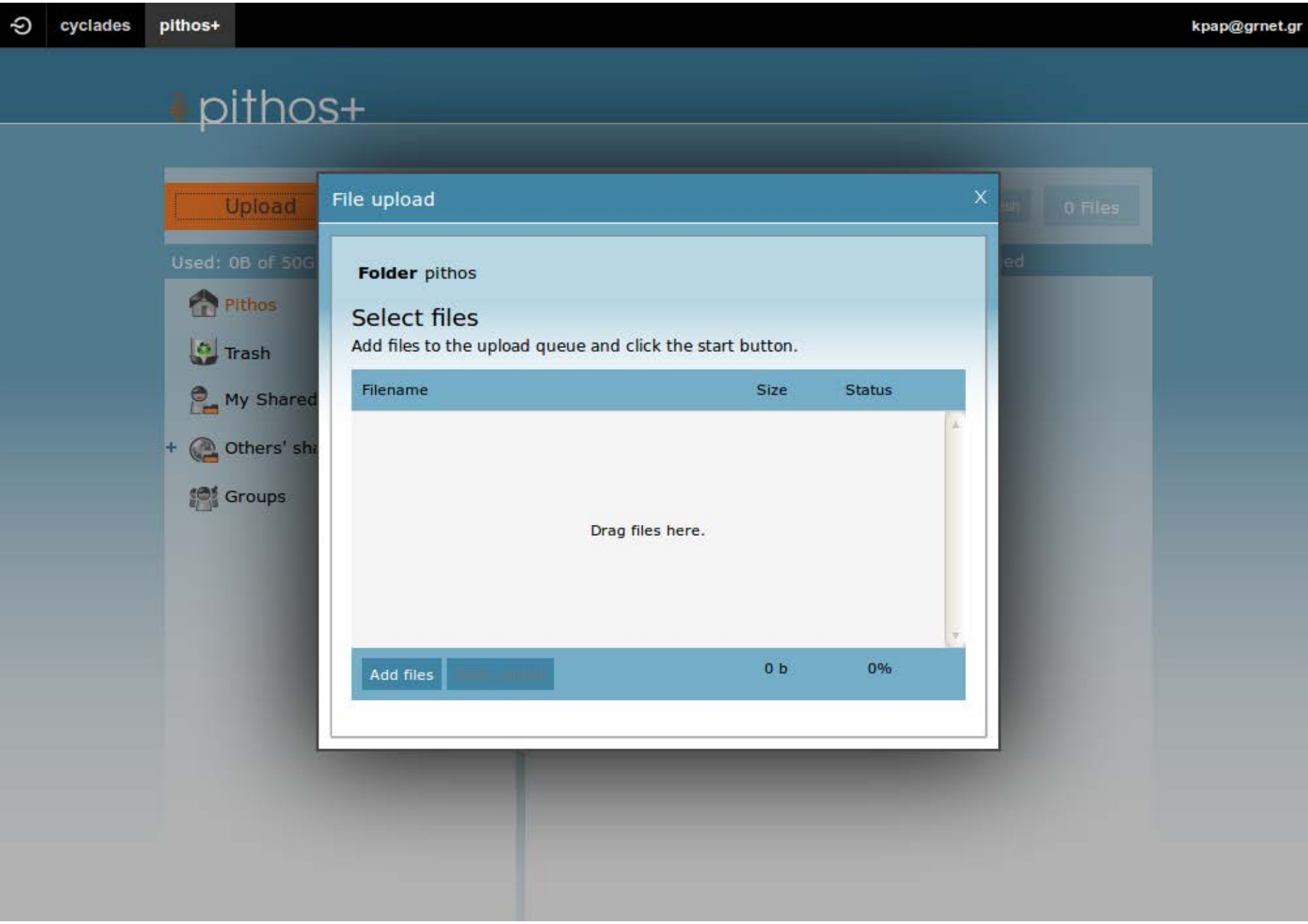

cyclades
pithos+
kpap@grnet.gr
SSH keys
Manage your ssh keys
close
SSH public keys list
generate new
create/import new +
You can use SSH keys to establish a secure connection between your computer and the virtual machines.
rsa
Other key
fingerprint: 7f:c6:3e:3d:08:aa:e7:a5:86:e9:2f:2b:77:99:64:b4
rsa
Home key
hide key
edit
remove
fingerprint: 3f:77:76:b5:c6:0a:71:b9:d3:05:58:b3:08:71:f8:6b
ssh-rsa
AAAAB3NzaC1yc2EAAAADAQABAAABAQC82eQyHQ7QpKFpbvpMBl/0SNai5hA52BnU1sI9TscdcAqa
frILS5aNrwYg2yyw/kWnnxNQbGRlQKKs48HzeD5Yjkm3a8bsTbyqIf
/IRZRANpanNm4i3GyLLVjI4E0QUUgsJUk86
/eytd5einE23OZDyzRbk8j9sLWaOeZ2W8l9e8wfBkMQ0V5uA7hb/DlqllMJq96Ng
/SbMb6qHeih17b4nS7TehJJ5cewrRoqk9B0cDR67G63n+eMJNaAiatd30uK7clqruYRqJ7Oj2ccQ
rsa
Lab servers key
fingerprint: e7:92:a9:fc:36:a2:d0:7c:8f:33:e5:97:49:e0:a4:cc
About | Help | Contact | Terms | Privacy
powered by synnefo v0.9.7

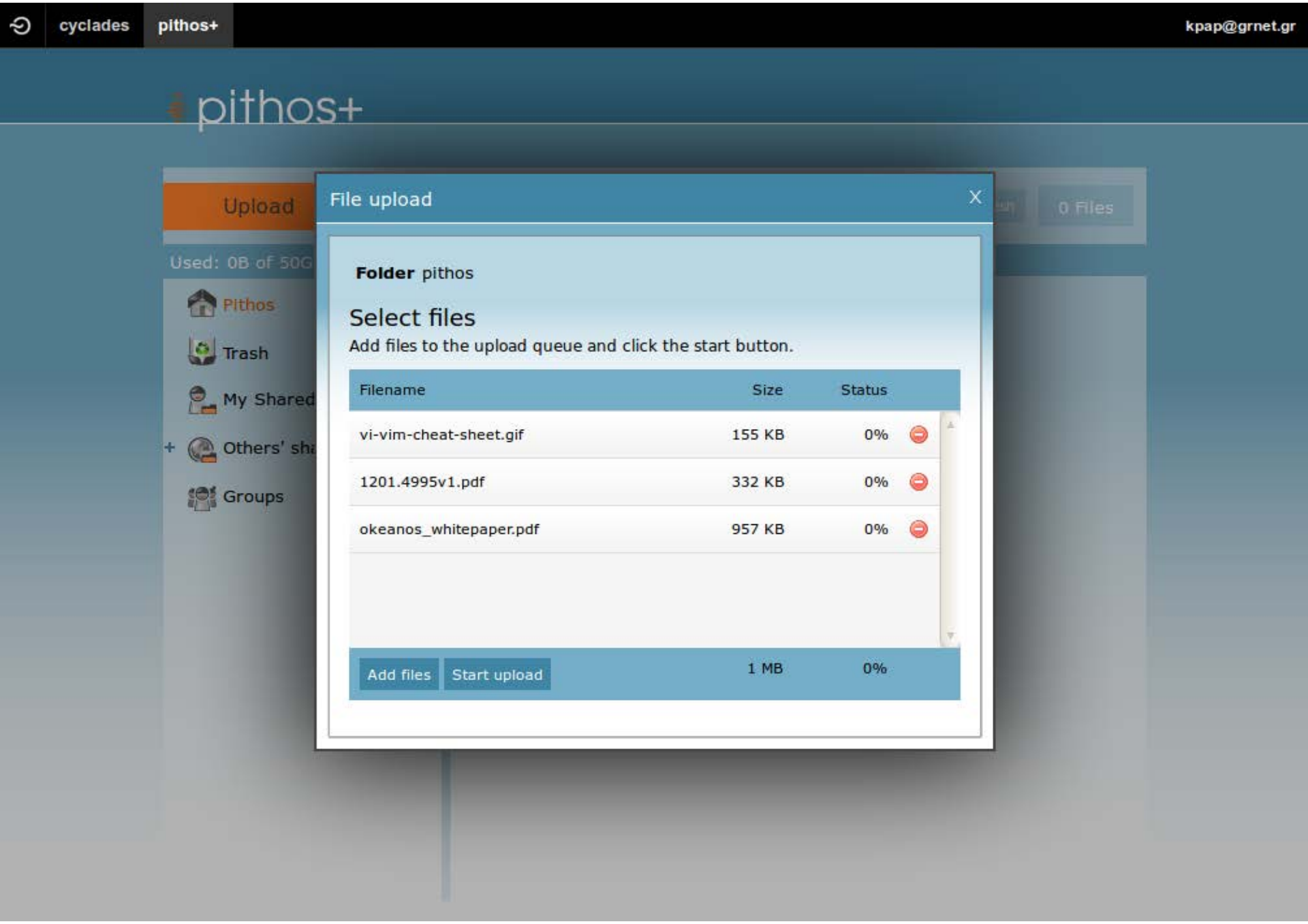

cyclades
pithos+
kpap@grnet.gr
SSH keys
Manage your ssh keys
close
SSH public keys list
Generating...
create/import new +
You can use SSH keys to establish a secure connection between your computer and the virtual machines.
rsa
Other key
fingerprint: 7f:c6:3e:3d:08:aa:e7:a5:86:e9:2f:2b:77:99:64:b4
rsa
Home key
fingerprint: 3f:77:76:b5:c6:0a:71:b9:d3:05:58:b3:08:71:f8:6b
rsa
Lab servers key
fingerprint: e7:92:a9:fc:36:a2:d0:7c:8f:33:e5:97:49:e0:a4:cc
About | Help | Contact | Terms | Privacy
powered by synnefo v0.9.7

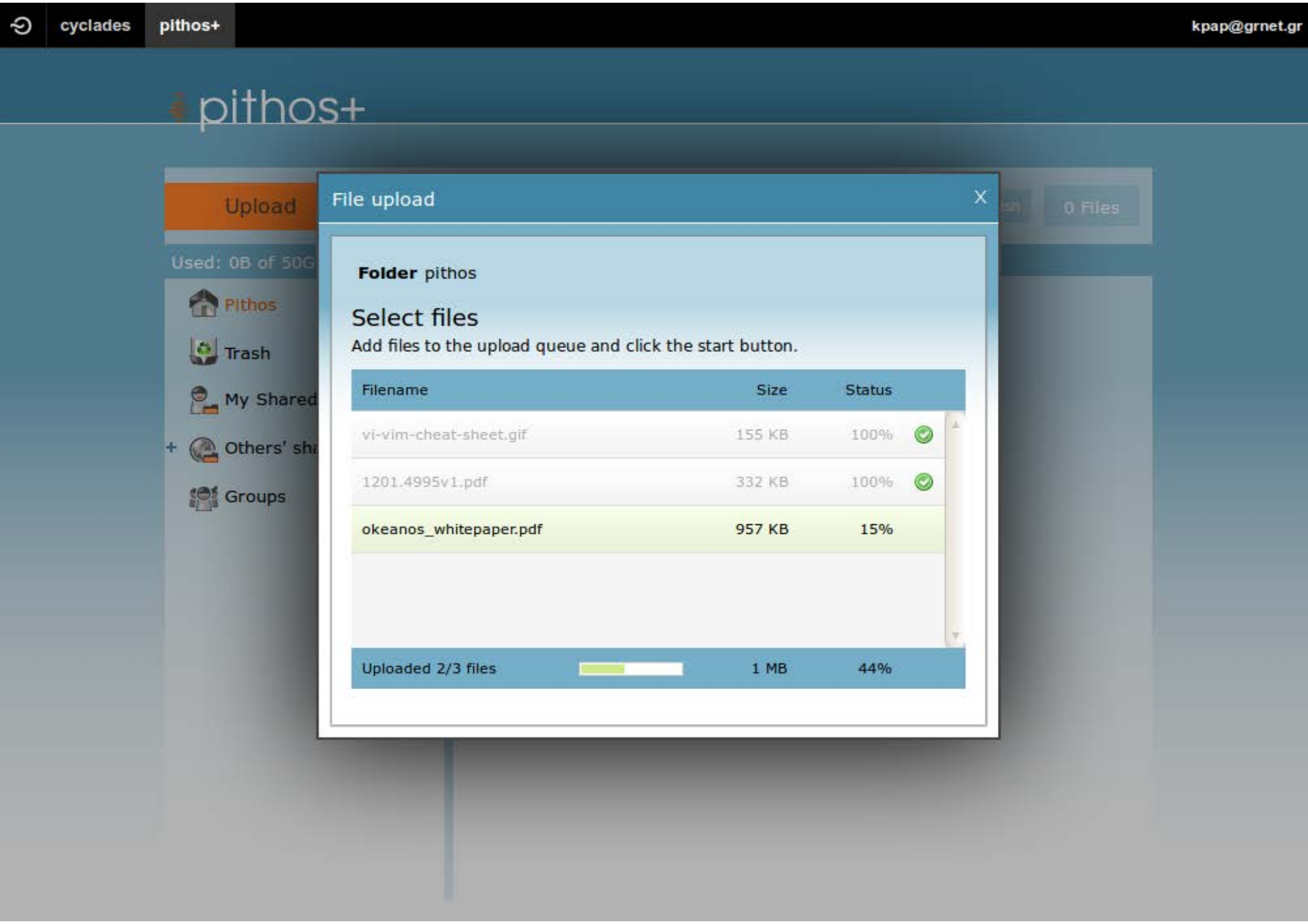

cyclades
pithos+
kpap@grnet.gr
SSH keys
Manage your ssh keys
close
SSH public keys list
generate new
create/import new +
You can use SSH keys to establish a secure connection between your computer and the virtual machines.
Your new public key has been added click here to download private key.
close
rsa public key
fingerprint: c1:d1:f8:6f:c1:1f:ea:6a:08:fb:74:c5:3e:cc:3f:3c
rsa Other key
fingerprint: 7f:c6:3e:3d:08:aa:e7:a5:86:e9:2f:2b:77:99:64:b4
rsa Home key
fingerprint: 3f:77:76:b5:c6:0a:71:b9:d3:05:58:b3:08:71:f8:6b
rsa Lab servers key
fingerprint: e7:92:a9:fc:36:a2:d0:7c:8f:33:e5:97:49:e0:a4:cc
About | Help | Contact | Terms | Privacy
powered by synnefo v0.9.7

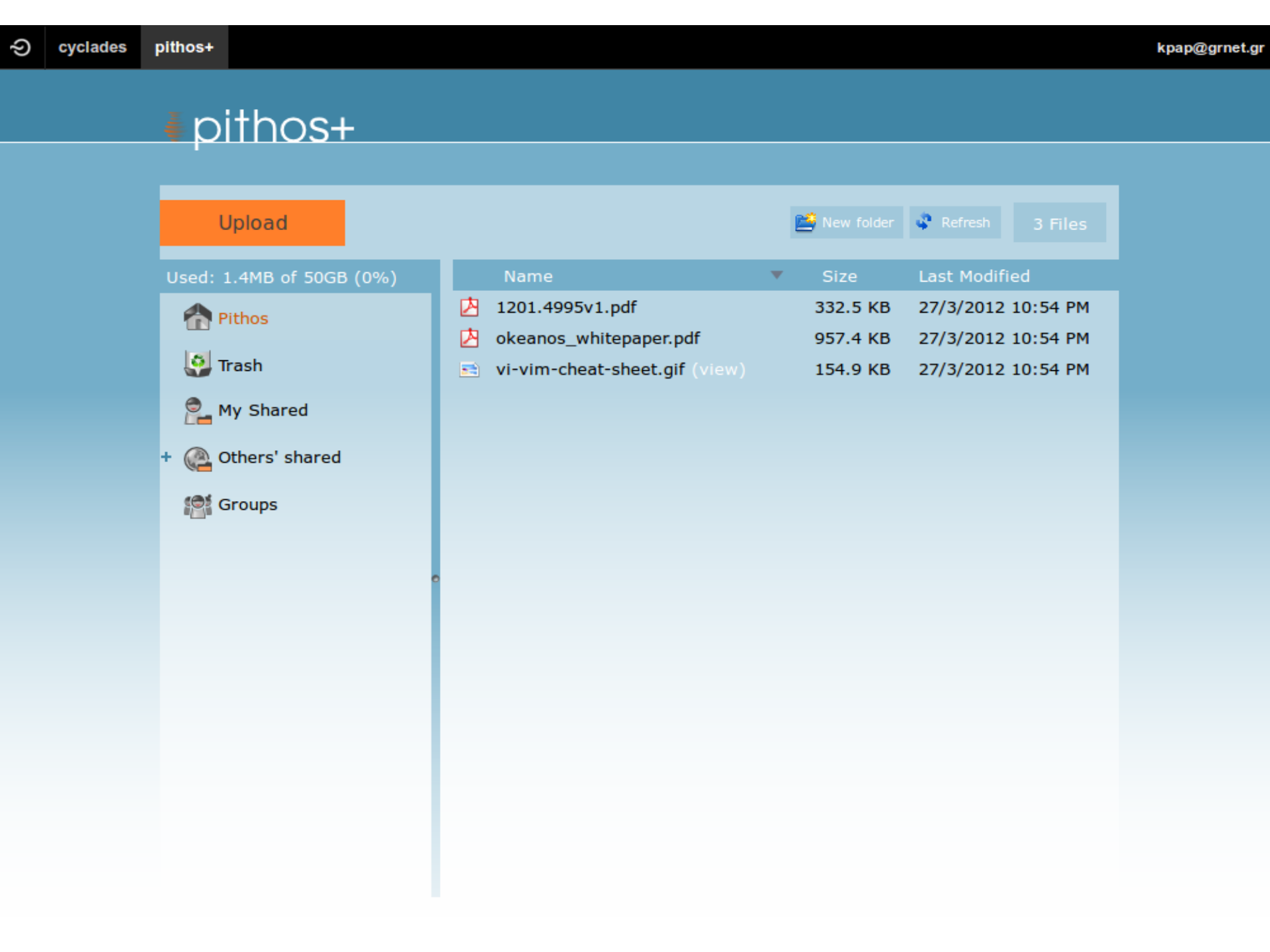

cyclades
pithos+
kpap@grnet.gr
API Access
close
Use the following API key along with the ./kamaki client to manage your cloud resources from outside this page.
GGBaajNBAHHDHFAII12kA/8liA==
The API key provides full access to your ~okeanos account, so always keep it private.
Lab database server
IPv4 83.212.5.194 IPv6 ...a800:ff:fe0e:3194
Stopped
About | Help | Contact | Terms | Privacy
powered by synnefo v0.9.7

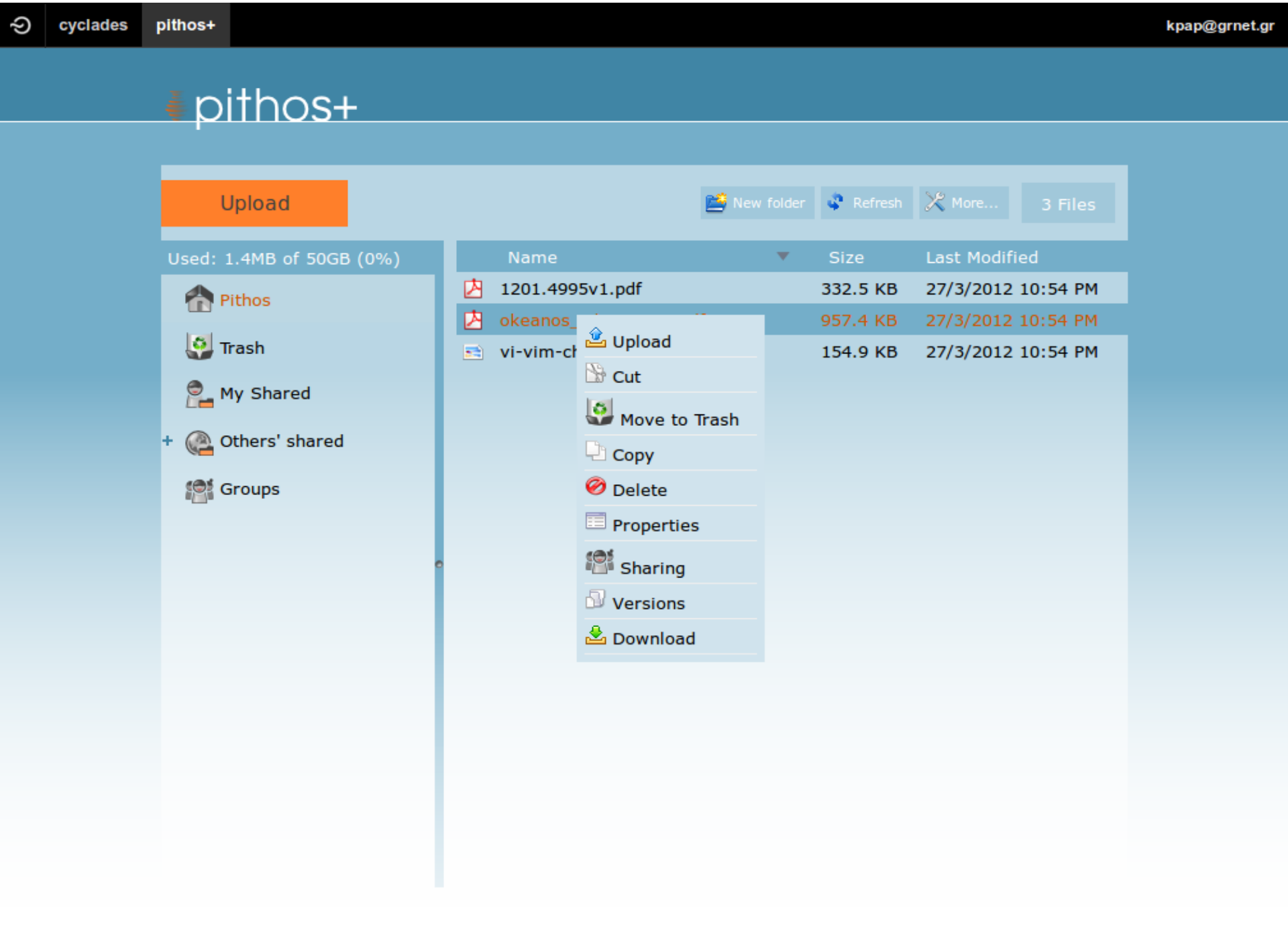

cyclades
pithos+
kpap@grnet.gr
pithos+
Upload
New folder
Refresh
0 Files
Used: 0B of 50GB (0%)
Pithos
Trash
My Shared
Others' shared
Groups
Name
Size
Last Modified

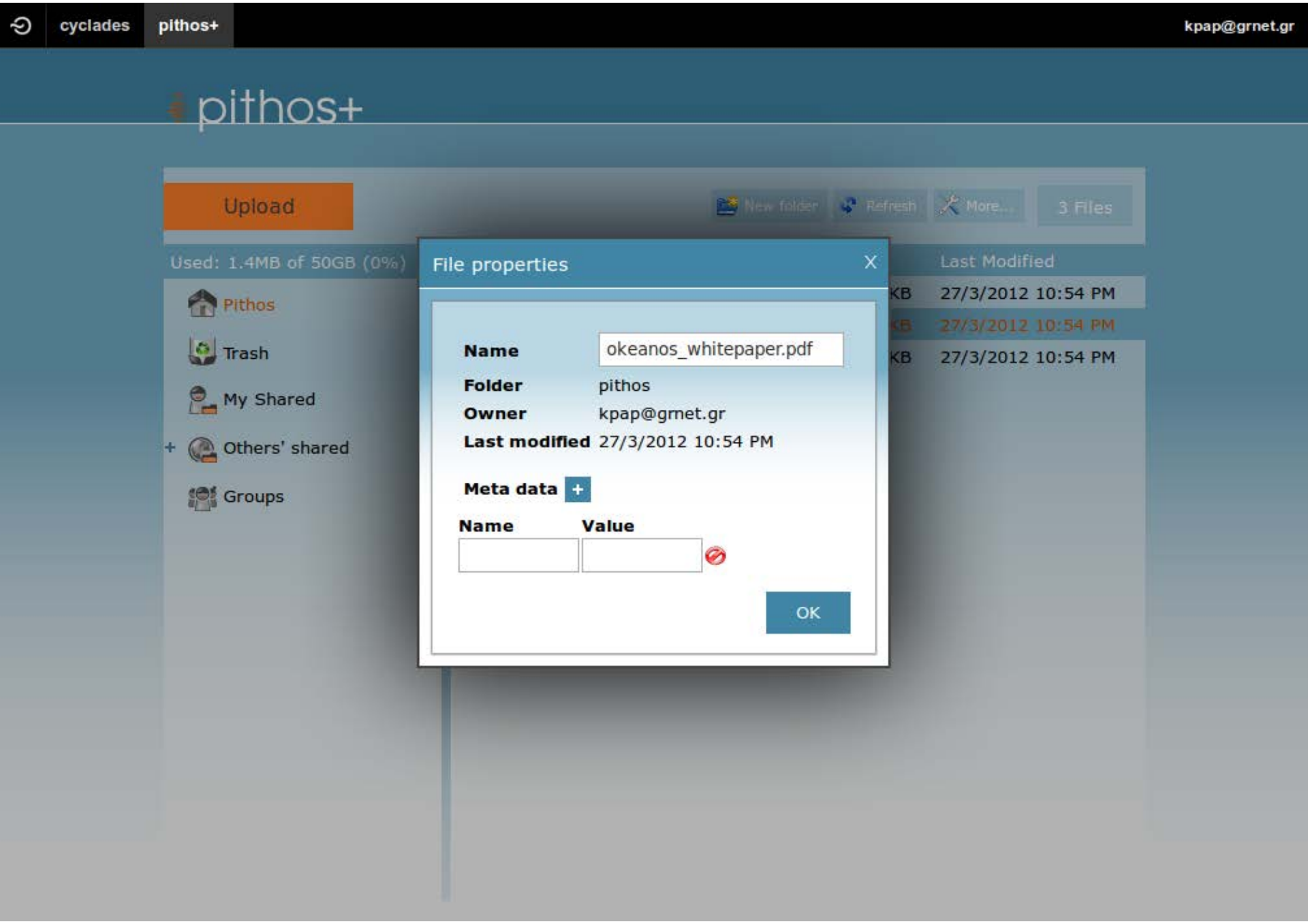

cyclades
pithos+
kpap@grnet.gr
pithos+
Upload
0 Files
Used: 0B of 50G
Pithos
Trash
My Shared
Others' sha
Groups
File upload
X
Folder pithos
Select files
Add files to the upload queue and click the start button.
Filename
Size
Status
Drag files here.
Add files
0 b
0%

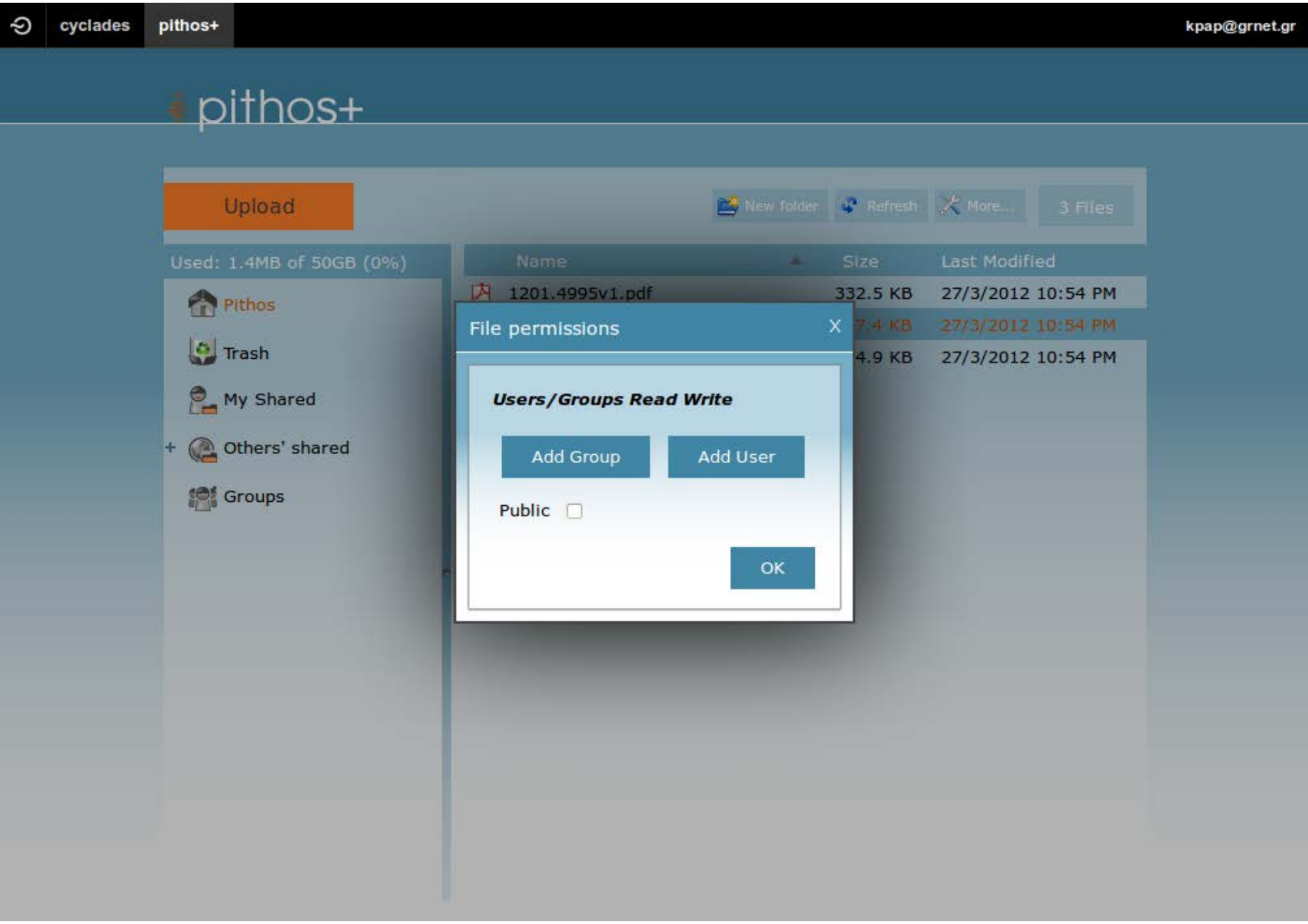

cyclades
pithos+
kpap@grnet.gr
pithos+
Upload
0 Files
Used: 0B of 50G
Pithos
Trash
My Shared
Others' sha
Groups
File upload
X
Folder pithos
Select files
Add files to the upload queue and click the start button.
Filename
Size
Status
vi-vim-cheat-sheet.gif
155 KB
0%
1201.4995v1.pdf
332 KB
0%
okeanos_whitepaper.pdf
957 KB
0%
Add files
Start upload
1 MB
0%

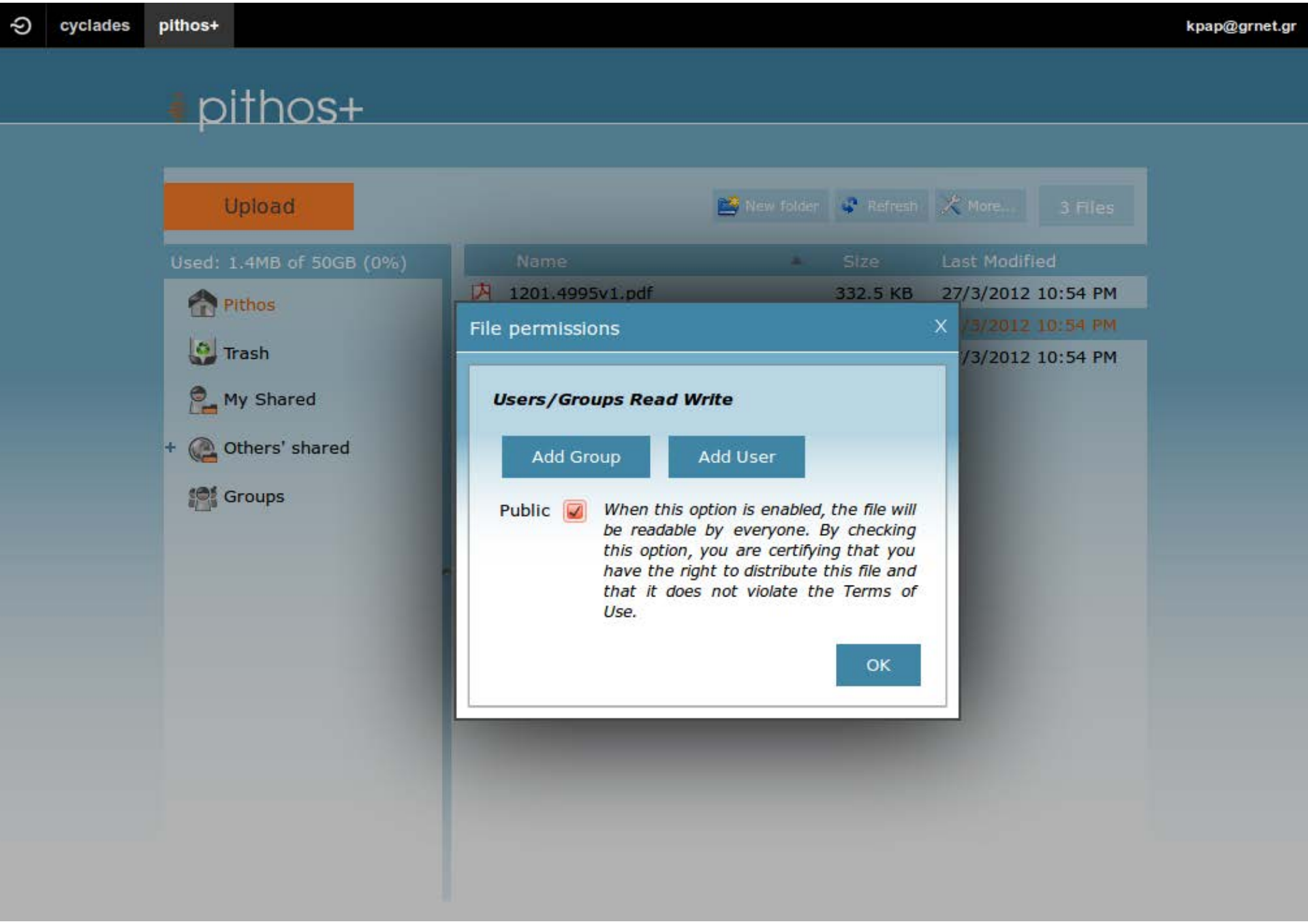

cyclades
pithos+
kpap@grnet.gr
pithos+
Upload
Used: 0B of 50G
Pithos
Trash
My Shared
Others' sha
Groups
0 Files
File upload
X
Folder pithos
Select files
Add files to the upload queue and click the start button.
Filename
Size
Status
vi-vim-cheat-sheet.gif
155 KB
100%
1201.4995v1.pdf
332 KB
100%
okeanos_whitepaper.pdf
957 KB
15%
Uploaded 2/3 files
1 MB
44%

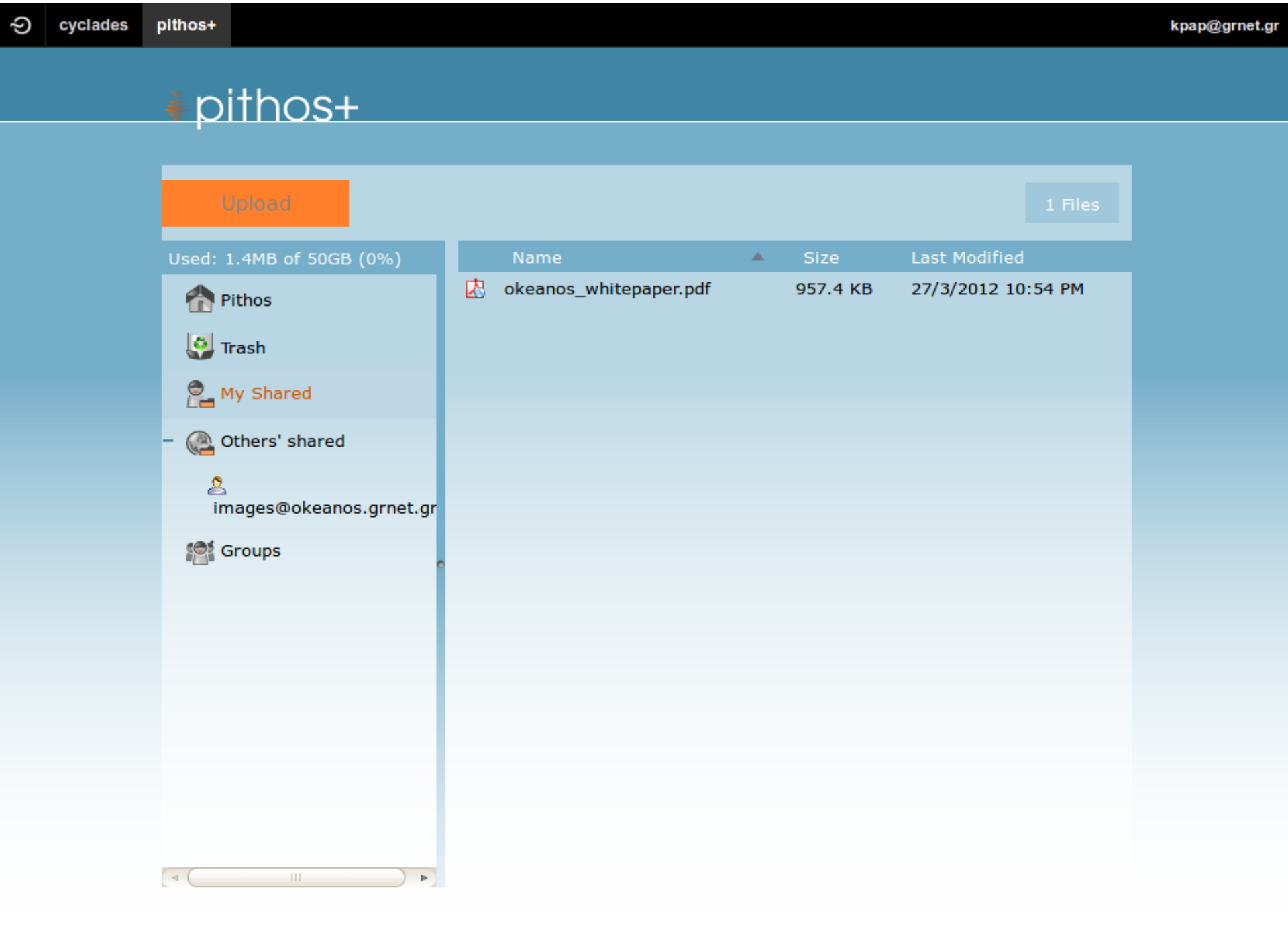

cyclades
pithos+
kpap@grnet.gr
pithos+
Upload
New folder
Refresh
3 Files
Used: 1.4MB of 50GB (0%)
Pithos
Trash
My Shared
Others' shared
Groups
Name
Size
Last Modified
1201.4995v1.pdf
332.5 KB
27/3/2012 10:54 PM
okeanos_whitepaper.pdf
957.4 KB
27/3/2012 10:54 PM
vi-vim-cheat-sheet.gif (view)
154.9 KB
27/3/2012 10:54 PM

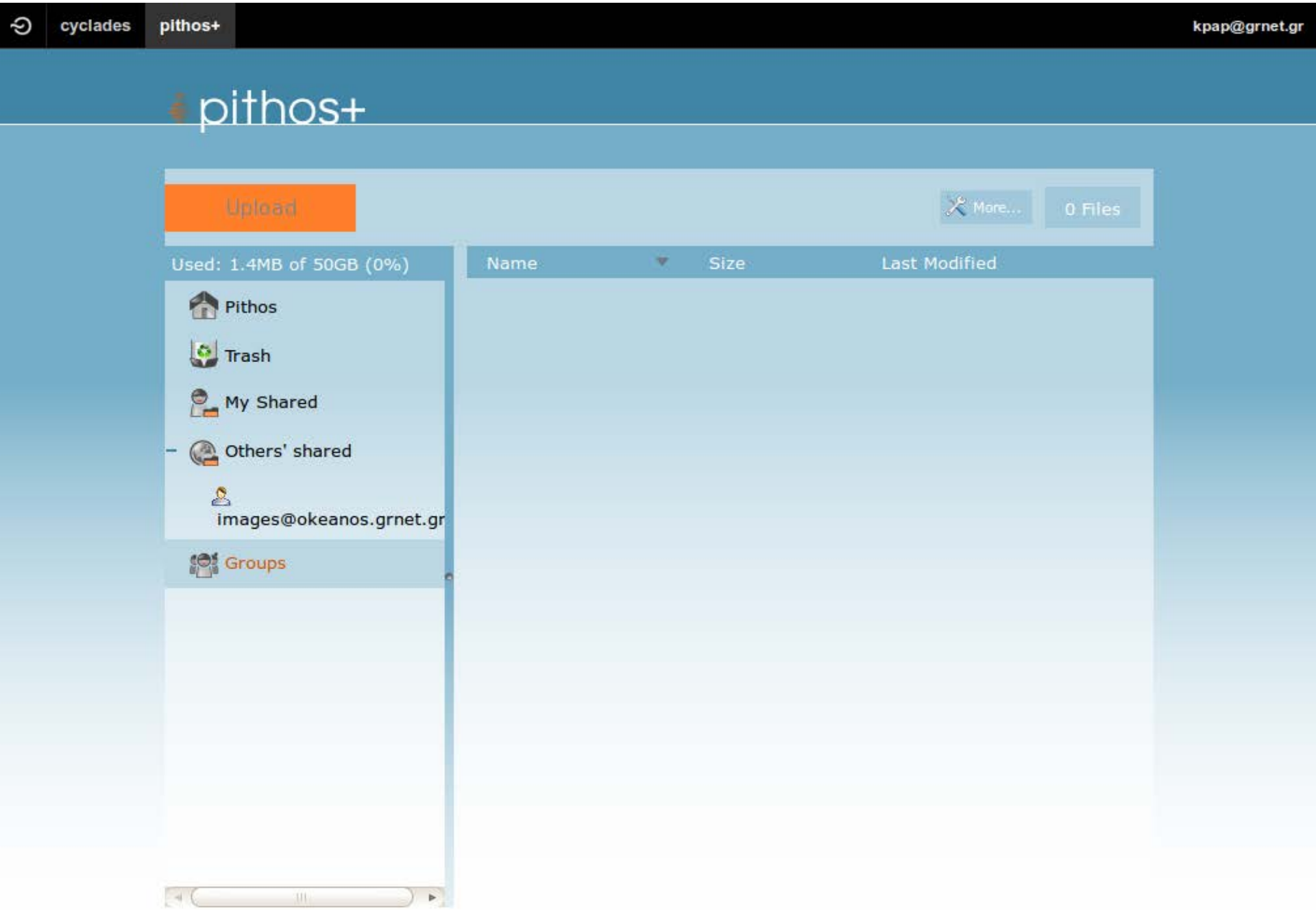

cyclades
pithos+
kpap@grnet.gr
pithos+
Upload
New folder
Refresh
More...
3 Files
Used: 1.4MB of 50GB (0%)
Pithos
Trash
My Shared
Others' shared
Groups
Name
Size
Last Modified
1201.4995v1.pdf
332.5 KB
27/3/2012 10:54 PM
okeanos_
957.4 KB
27/3/2012 10:54 PM
vi-vim-cl
154.9 KB
27/3/2012 10:54 PM
Upload
Cut
Move to Trash
Copy
Delete
Properties
Sharing
Versions
Download

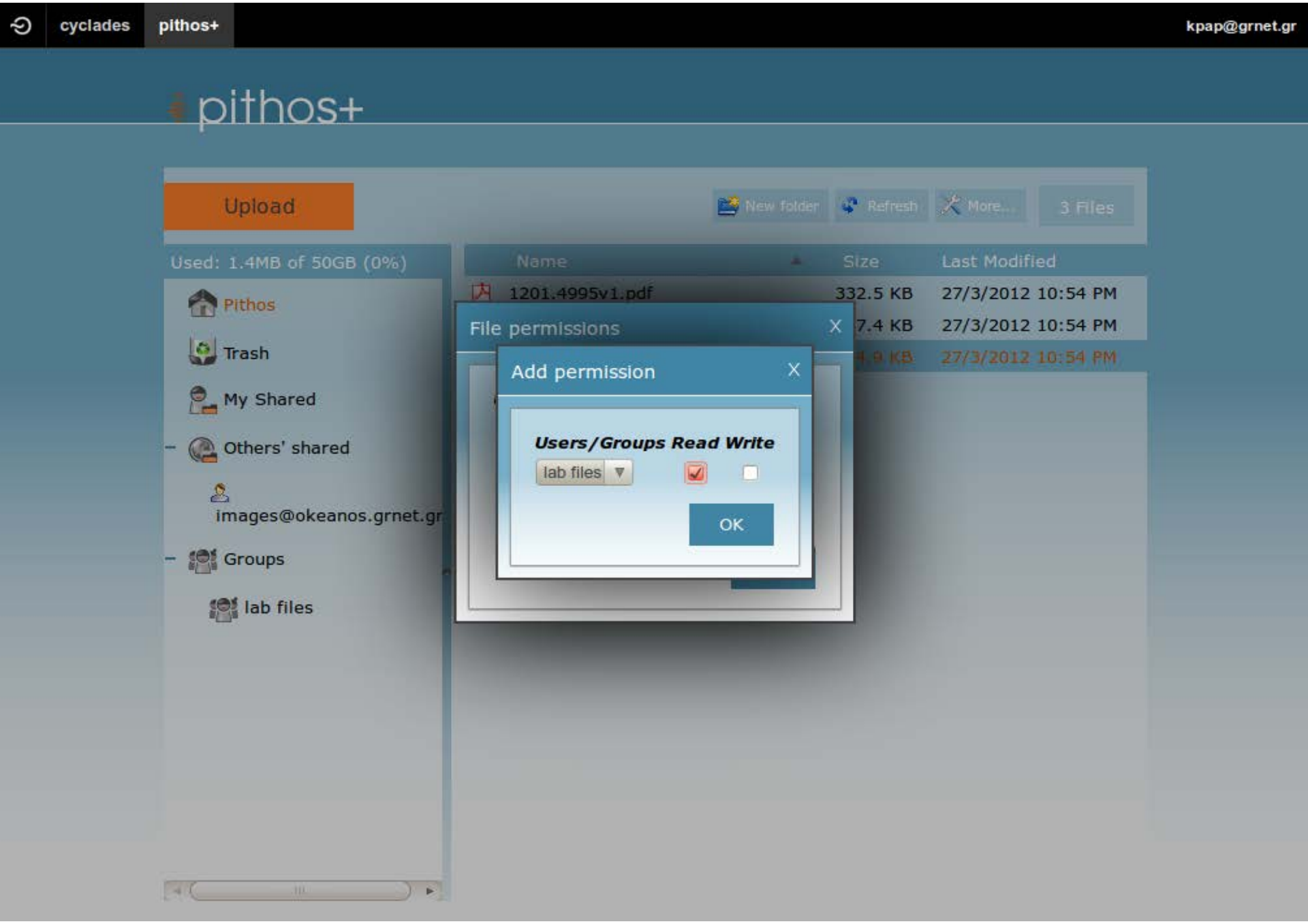

cyclades
pithos+
kpap@grnet.gr
pithos+
Upload
New folder
Refresh
More...
3 Files
Used: 1.4MB of 50GB (0%)
Pithos
Trash
My Shared
Others' shared
Groups
Last Modified
27/3/2012 10:54 PM
27/3/2012 10:54 PM
27/3/2012 10:54 PM
File properties
X
Name
okeanos_whitepaper.pdf
Folder
pithos
Owner
kpap@grnet.gr
Last modified
27/3/2012 10:54 PM
Meta data
+
Name
Value
OK

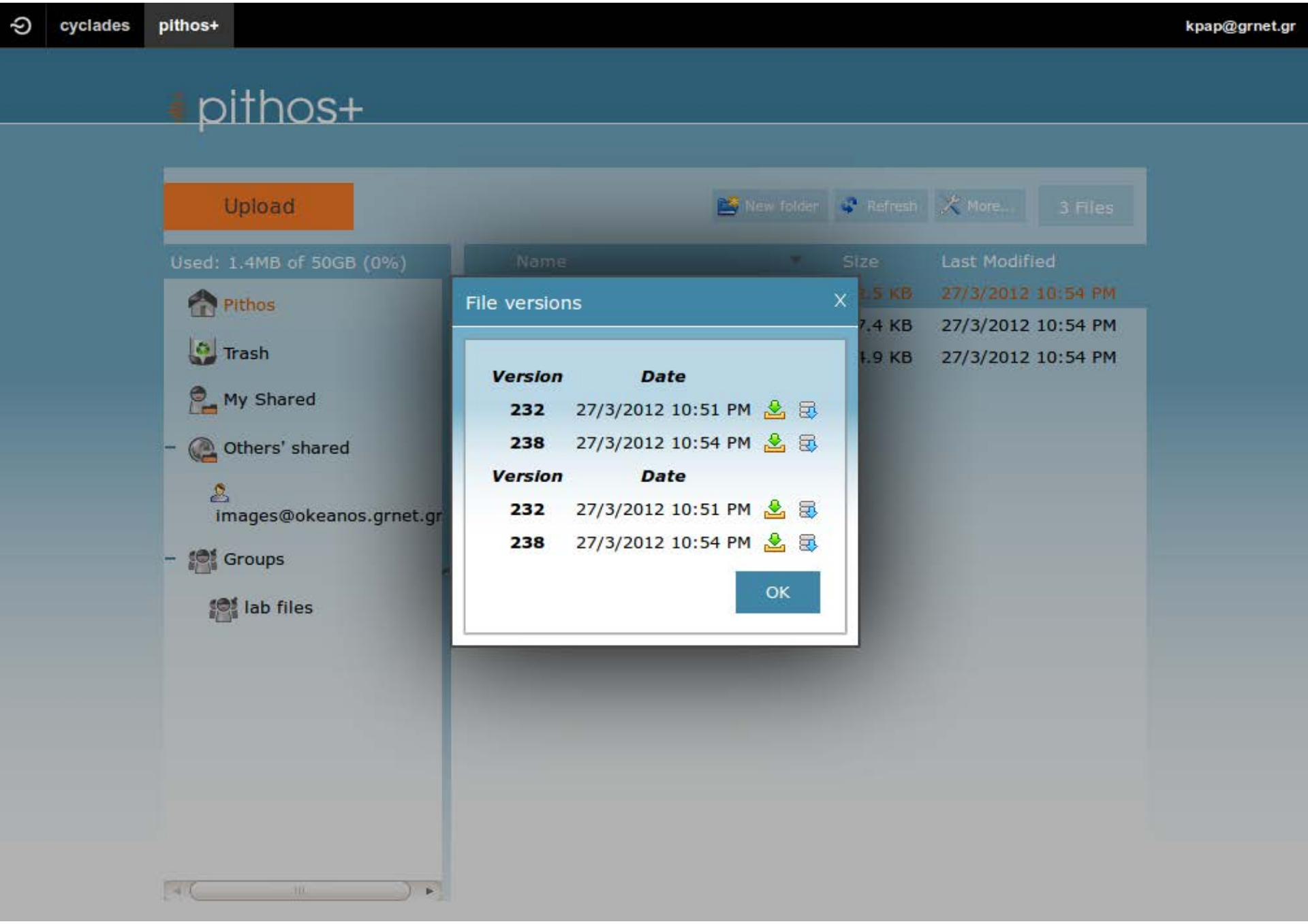

cyclades
pithos+
kpap@grnet.gr
pithos+
Upload
New folder
Refresh
More...
3 Files
Used: 1.4MB of 50GB (0%)
Pithos
Trash
My Shared
Others' shared
Groups
Name
Size
Last Modified
1201.4995v1.pdf
332.5 KB
27/3/2012 10:54 PM
27/3/2012 10:54 PM
27/3/2012 10:54 PM
File permissions
X
Users/Groups Read Write
Add Group
Add User
Public
OK

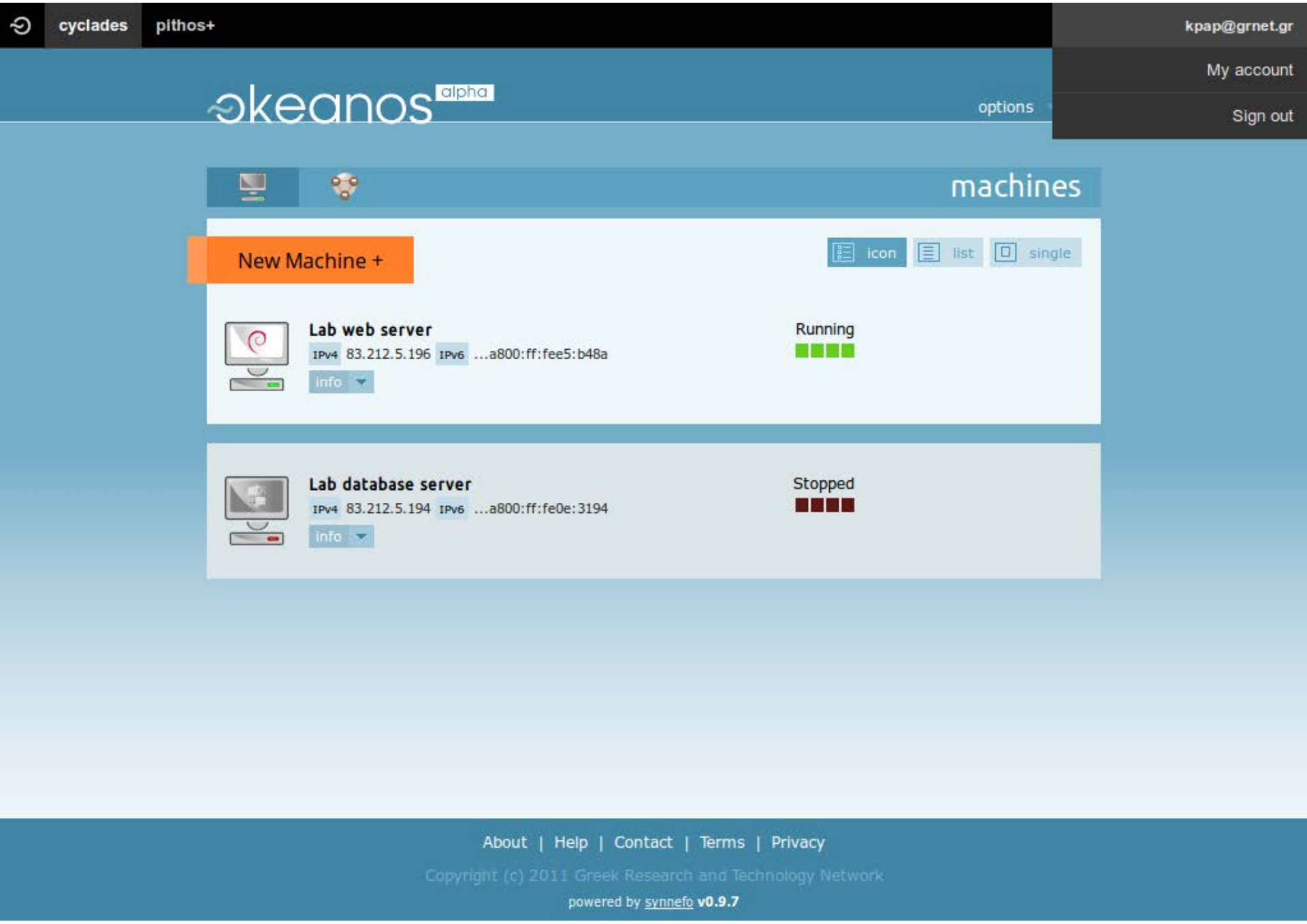

cyclades
pithos+
kpap@grnet.gr
pithos+
Upload
New folder
Refresh
More...
3 Files
Used: 1.4MB of 50GB (0%)
Pithos
Trash
My Shared
Others' shared
Groups
Name
Size
Last Modified
1201.4995v1.pdf
332.5 KB
27/3/2012 10:54 PM
/3/2012 10:54 PM
/3/2012 10:54 PM
File permissions
X
Users/Groups Read Write
Add Group
Add User
Public
When this option is enabled, the file will be readable by everyone. By checking this option, you are certifying that you have the right to distribute this file and that it does not violate the Terms of Use.
OK

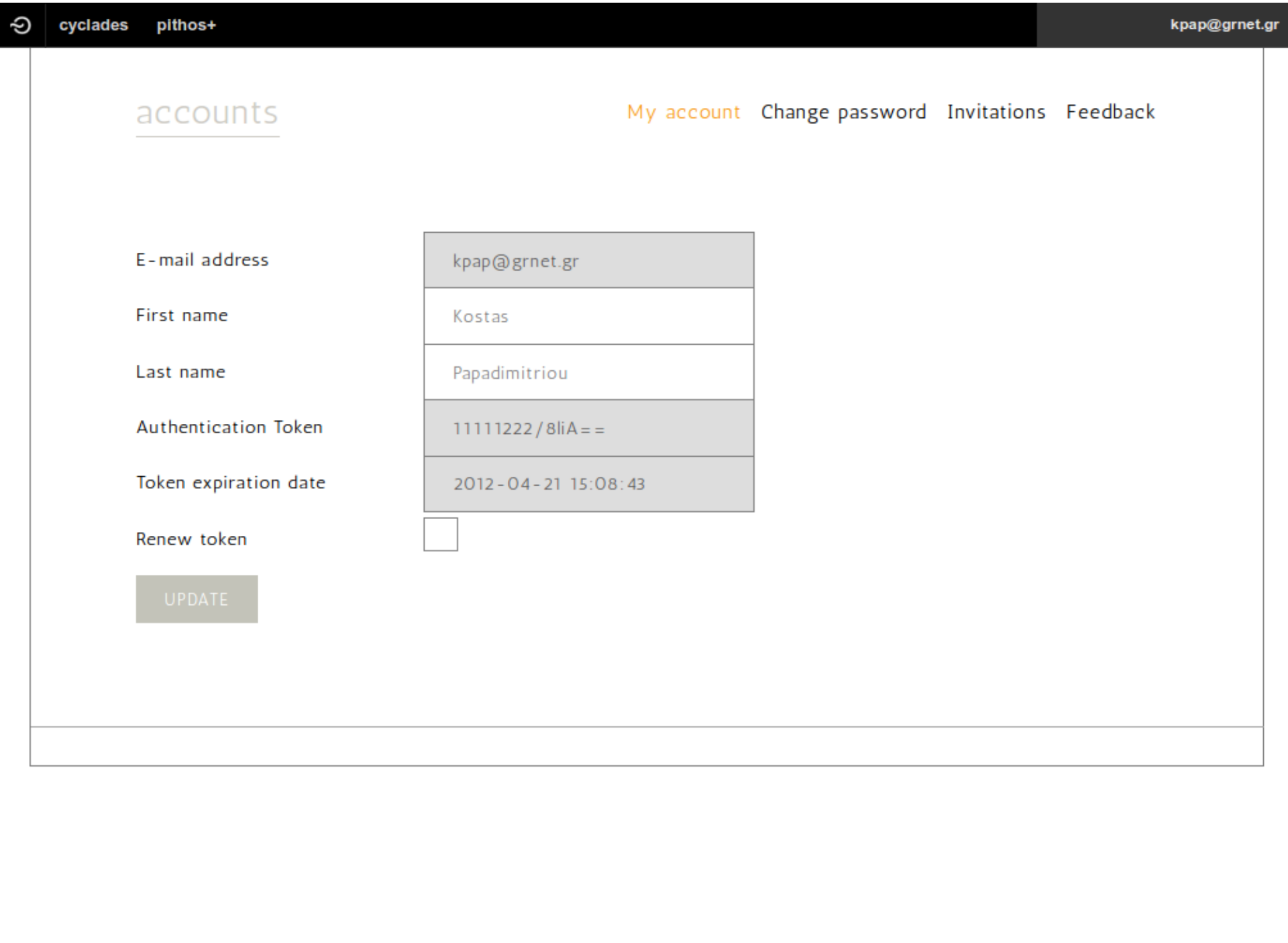

cyclades
pithos+
kpap@grnet.gr
pithos+
Upload
1 Files
Used: 1.4MB of 50GB (0%)
Pithos
Trash
My Shared
Others' shared
images@okeanos.grnet.gr
Groups
Name
Size
Last Modified
okeanos_whitepaper.pdf
957.4 KB
27/3/2012 10:54 PM

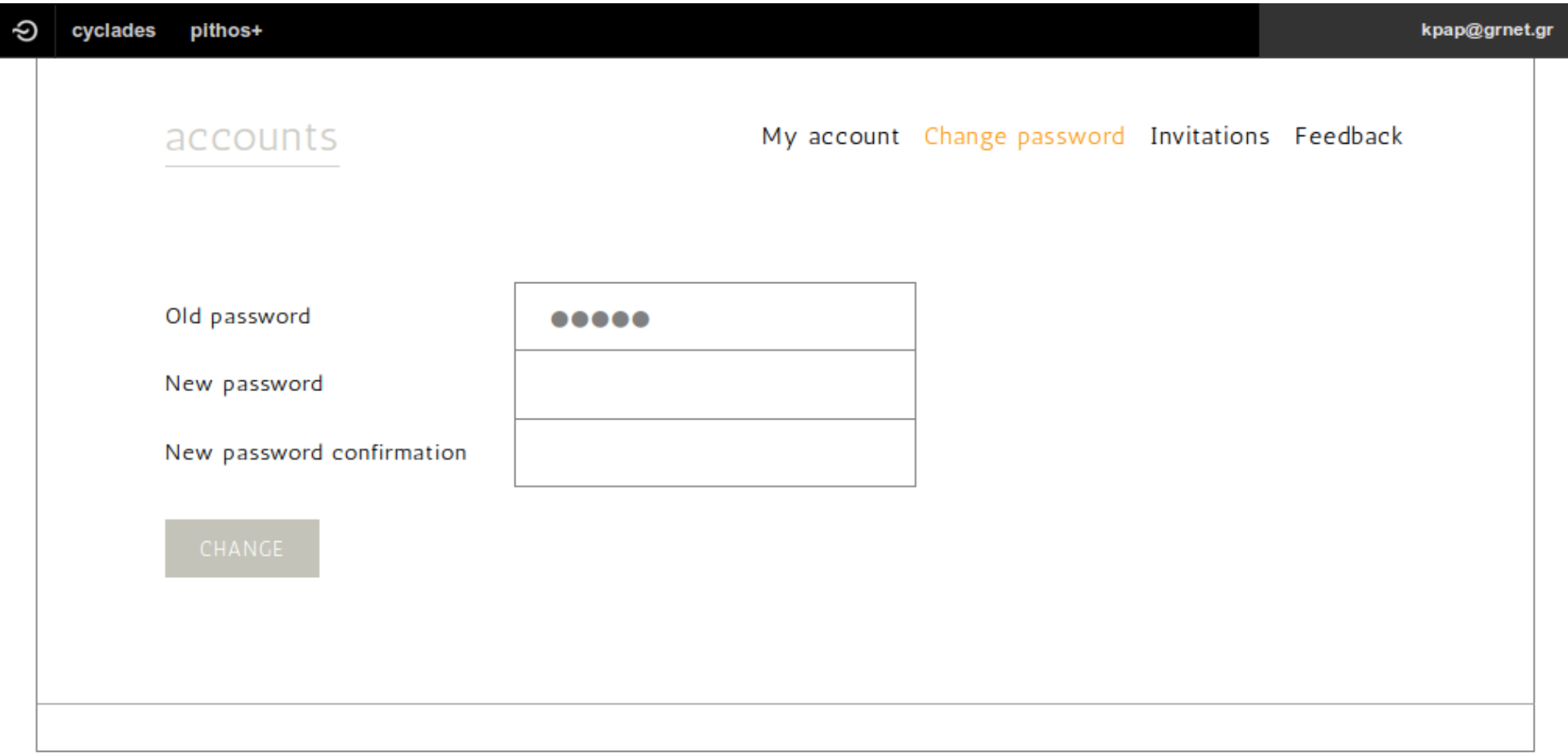

cyclades
pithos+
kpap@grnet.gr
pithos+
Upload
More...
0 Files
Used: 1.4MB of 50GB (0%)
Pithos
Trash
My Shared
Others' shared
images@okeanos.grnet.gr
Groups
Name
Size
Last Modified


cyclades
pithos+
kpap@grnet.gr
pithos+
Upload
New folder
Refresh
More...
3 Files
Used: 1.4MB of 50GB (0%)
Pithos
Trash
My Shared
Others' shared
images@okeanos.grnet.gr
Groups
lab files
Name
Size
Last Modified
1201.4995v1.pdf
332.5 KB
27/3/2012 10:54 PM
7.4 KB
27/3/2012 10:54 PM
27/3/2012 10:54 PM
File permissions
Add permission
Users/Groups Read Write
lab files
OK


cyclades
pithos+
kpap@grnet.gr
pithos+
Upload
New folder
Refresh
More...
3 Files
Used: 1.4MB of 50GB (0%)
Name
Size
Last Modified
Pithos
Trash
My Shared
Others' shared
images@okeanos.grnet.gr
Groups
lab files
27/3/2012 10:54 PM
27/3/2012 10:54 PM
27/3/2012 10:54 PM
File versions
X
Version
Date
232
27/3/2012 10:51 PM
238
27/3/2012 10:54 PM
Version
Date
232
27/3/2012 10:51 PM
238
27/3/2012 10:54 PM
OK


cyclades
pithos+
kpap@grnet.gr
My account
Sign out
okeanos alpha
options
machines
New Machine +
icon
list
single
Lab web server
IPv4 83.212.5.196 IPv6 ...a800:ff:fee5:b48a
info
Running
Lab database server
IPv4 83.212.5.194 IPv6 ...a800:ff:fe0e:3194
info
Stopped
About | Help | Contact | Terms | Privacy
Copyright (c) 2011 Greek Research and Technology Network
powered by synnefo v0.9.7


cyclades
pithos+
kpap@grnet.gr
accounts
My account
Change password
Invitations
Feedback
E-mail address
kpap@grnet.gr
First name
Kostas
Last name
Papadimitriou
Authentication Token
11111222/8liA==
Token expiration date
2012-04-21 15:08:43
Renew token
UPDATE


cyclades
pithos+
kpap@grnet.gr
accounts
My account
Change password
Invitations
Feedback
Old password
New password
New password confirmation
CHANGE

cyclades pithos+ kpap@grnet.gr

accounts

My account Change password Invitations Feedback

Message

SEND

cyclades pithos+ Sign in

accounts

LOGIN

kpap@grnet.gr

●●●●●

SUBMIT

Forgot your password?

new to okeanos ? CREATE ACCOUNT