



OPENNEBULA ENHANCEMENTS

Virtual Distributed Ethernet

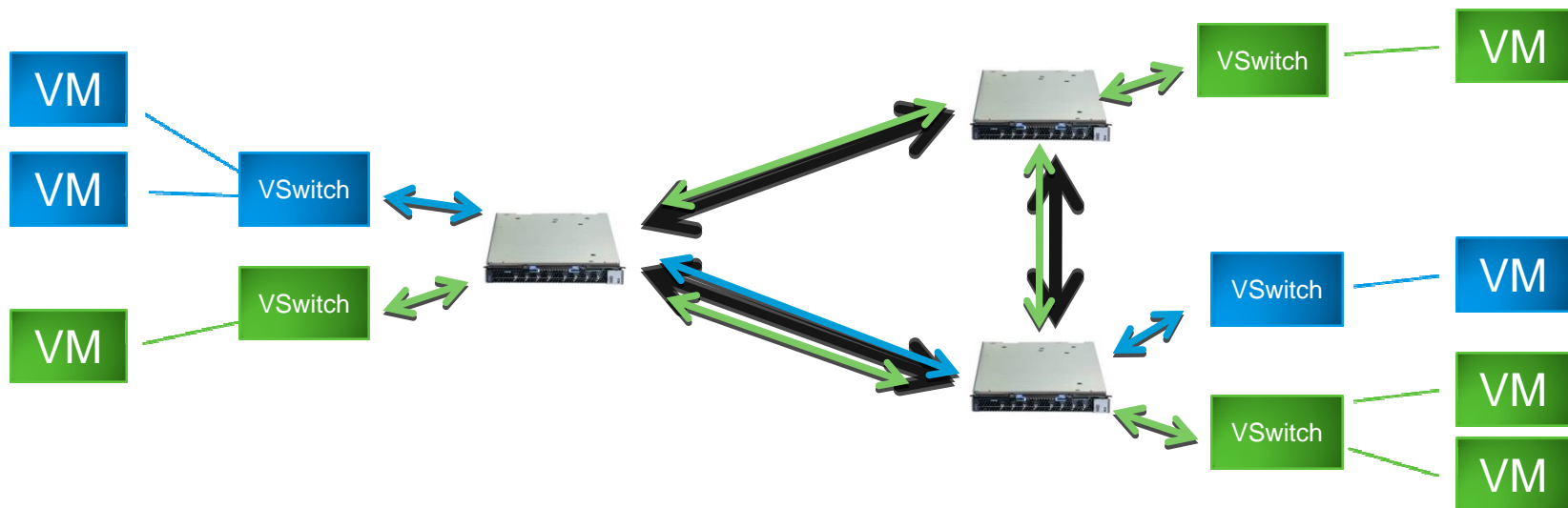
QCow image format

Web Interface prototype

1

VIRTUAL DISTRIBUTED ETHERNET - BASICS

- Provides virtual Ethernet network for VMs
- Virtual networks are separated
- They can span over Internet



VDE – WHY?

- Issues with standard OpenNebula approach
 - Packet sniffing – possible security problem
 - Lack of traffic control – users can use whole bandwidth
- VDE – independent virtual Ethernet for each logical network
 - Connection based – no sniffing
 - Traffic control – we can apply limits for users
 - Possible client-side direct connection to virtual network



VDE COMPONENTS

- Virtual switch - vde_switch
 - Same functionality as physical switch (VLANs, STP)
- Virtual cables connecting switches
 - Programs for transferring data (i.e. ssh)
- Plugs – to connect switches/VMs with cables
- Basic router – slirpvde
 - Connects with physical network, provides DHCP
- Additional features
 - Encrypted cables, filters



VDE APPLICATION IN ONE

- All VDE components supervised by Cluster Manager
- Network architecture on demand
- Virtual networks covering part of **physical network** for performance
- Possibility of client-side software to connect directly with user's machines



QCOW IMAGE FORMAT

- Problems with raw images
 - Occupy more space than necessary – „holes”
 - Long time needed to transfer them to node
 - Lot of storage place used for only slightly different versions of image
- QCow as solution
 - Image space growing with usage
 - Copy-on-write images, snapshot images
 - Support for encryption and compression



QCOW APPLICATION

○ Basic application

- Images growing with usage
- Smaller file size – more space for users' images
- Almost no change to ONE

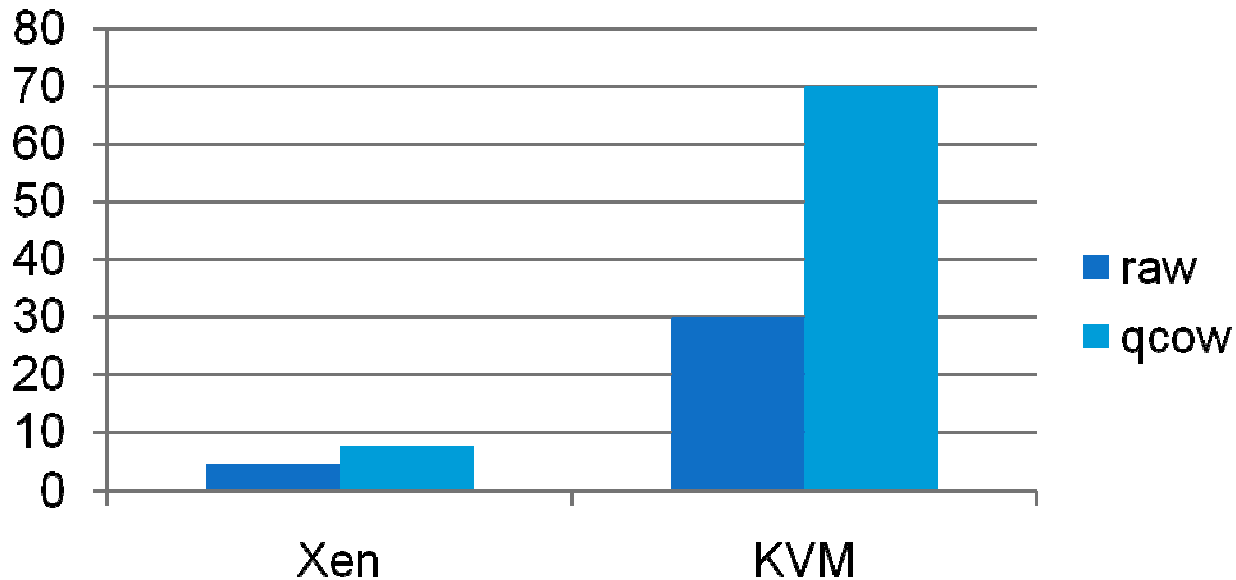
○ Copy-on-write images

- Keeping common image base on nodes – quick startup
- Would require small changes in ONE

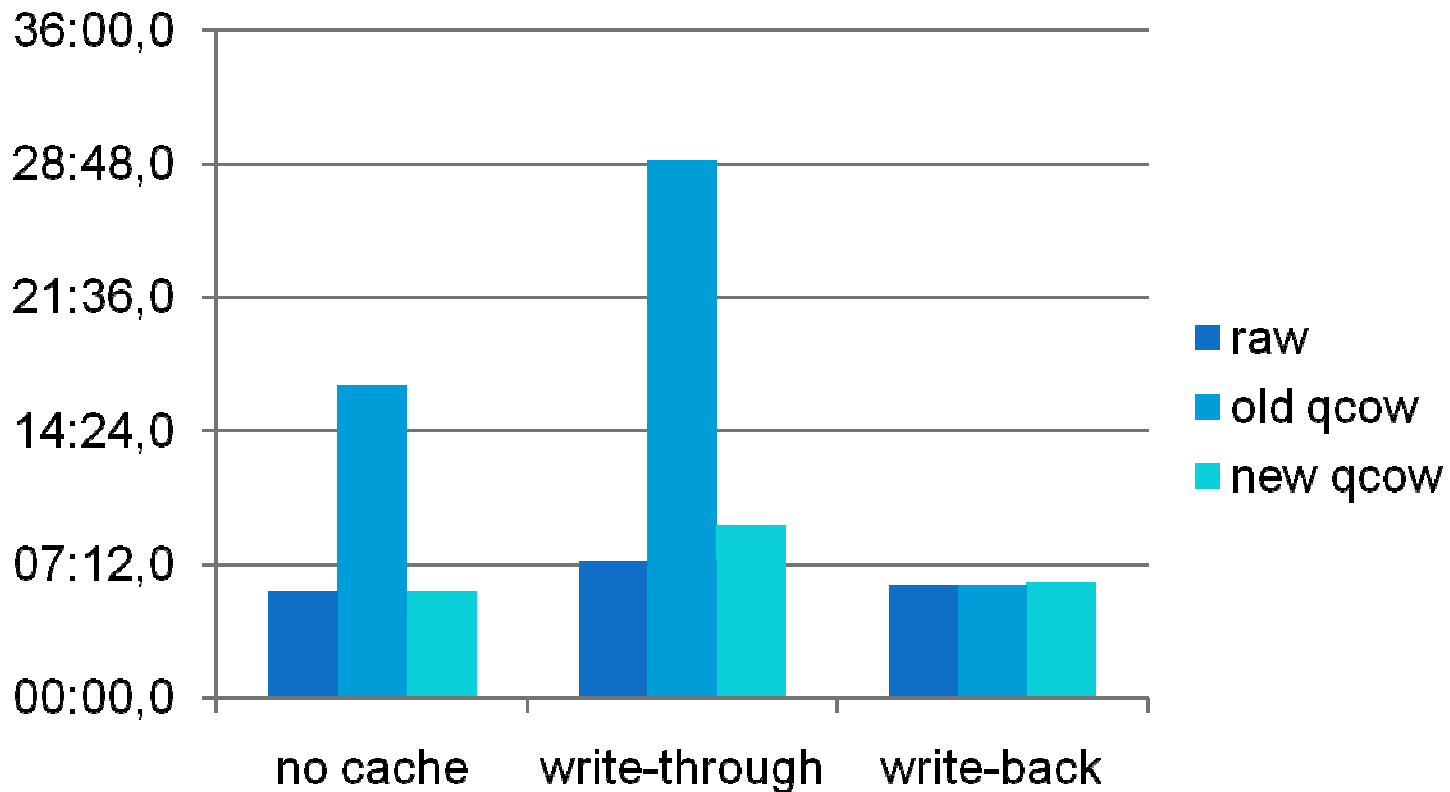


QCOW PERFORMANCE - GROWTH

- Tested on Windows 7 installation (min) - lots of copy/extract operations, constant image growth



QCOW PERFORMANCE – USAGE TEST



WEB INTERFACE PROTOTYPE - REASONS

- Functionalities limited/not provided by ONE
 - Easy machine deployment - premade configurations
 - Integration with networking solution
 - Automatic clustering with job scheduling
 - Image repository with group image sharing
 - Time accounting and restrictions
 - Limiting access to ONE capabilities



CURRENT FEATURES

VM creation/management, external IP assignment

Przeglądanie maszyn

Szczegóły wybranej maszyny

Nazwa: my_machine Nr klastra: ---
Data utworzenia: 2010-06-17 14:30:59 Obraz: Ubuntu_slurm
Data uruchomienia: 2010-06-17 14:32:00 Kernel: 2.6.27.21-0.1-xen
Data zatrzymania: 0000-00-00 00:00:00
Sieć: Podsiec_5 Adres IP: 10.7.5.5
Liczba rdzeni: 1 Ilość RAM: 1000

Operacje na maszynie

WYŁĄCZ **ZAPISZ I WYŁĄCZ**

Lista maszyn

NASTĘPNE >>

Obraz	Sieć	Adres IP	Identyfikator	Stan	Stan 2	Id klastra	Zew. IP
Ubuntu_slurm	Podsiec_5	10.7.5.5	833	active	running	---	192.245.169.64 ✗
Ubuntu_slurm	Podsiec_5	10.7.5.11	825	done	---	---	PRZYDZIEL

Tworzenie maszyny wirtualnej

Szczegóły maszyny

Nazwa:

Obraz:

Kernel:

Klasa:

Sieć:

UTWÓRZ



CURRENT FEATURES

Easy clustering using SLURM as scheduler software

Tworzenie wirtualnego klastra

Parametry klastra

Nazwa:

Liczba węzłów (2-20):

Dedykowany "zarządca":

Obraz:

Kernel:

Klasa:

Sieć:

UTWÓRZ

Przeglądanie klas

Lista klastrów

Id klastra	Nazwa klastra	Liczba węzłów	Dedykowany "zarządca"
53	asd	0 / 3	Tak
52	ggg	0 / 3	Nie

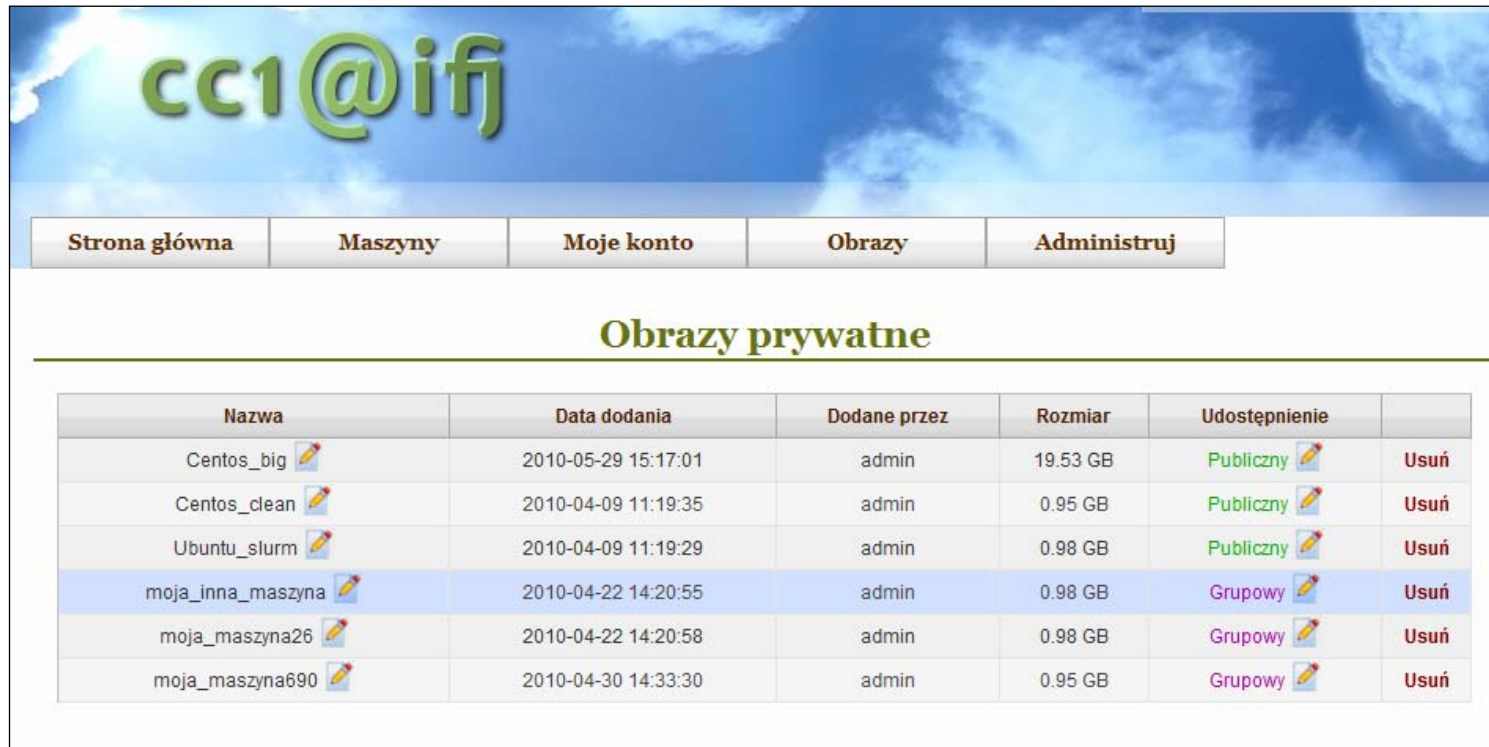
Id węzła	Nazwa węzła
809	ggg0
810	ggg1
811	ggg2













WYŁĄCZ KLASTER



CURRENT FEATURES

Image repository with group images



Nazwa	Data dodania	Dodane przez	Rozmiar	Udostępnienie	
Centos_big 	2010-05-29 15:17:01	admin	19.53 GB	Publiczny 	Usuń
Centos_clean 	2010-04-09 11:19:35	admin	0.95 GB	Publiczny 	Usuń
Ubuntu_slurm 	2010-04-09 11:19:29	admin	0.98 GB	Publiczny 	Usuń
moja_inna_maszyzna 	2010-04-22 14:20:55	admin	0.98 GB	Grupowy 	Usuń
moja_maszyzna26 	2010-04-22 14:20:58	admin	0.98 GB	Grupowy 	Usuń
moja_maszyzna690 	2010-04-30 14:33:30	admin	0.95 GB	Grupowy 	Usuń



CURRENT FEATURES

Account management and basic statistics

Statystyki

Liczba działających maszyn: 1

Liczba maszyn ogółem: 342

Rdzeniosekundy (zamknięte): 8265526 (95 d 15 h 58 m 46 s)

Rdzeniosekundy (wszystkie): 8266167 (95 d 16 h 9 m 27 s)

Stan na: 2010-06-17 14:42:41

Dane osobowe

Imię: Administrator

Nazwisko: Chmurka

Email: admin@nephele.cloud.ifj.edu.pl

Należysz do grup: ★ admin

xyzq_grup



FUTURE PLANS

- Additional features for web interface
 - Storage management
 - Virtual network management
 - Additional job scheduling software (i. e. Torque)
- Development of Web Interface final version
- Application of VDE technology for automated use
- Application of QCow images for ONE with Xen

