

Virtualisation & Cloud Computing at RAL

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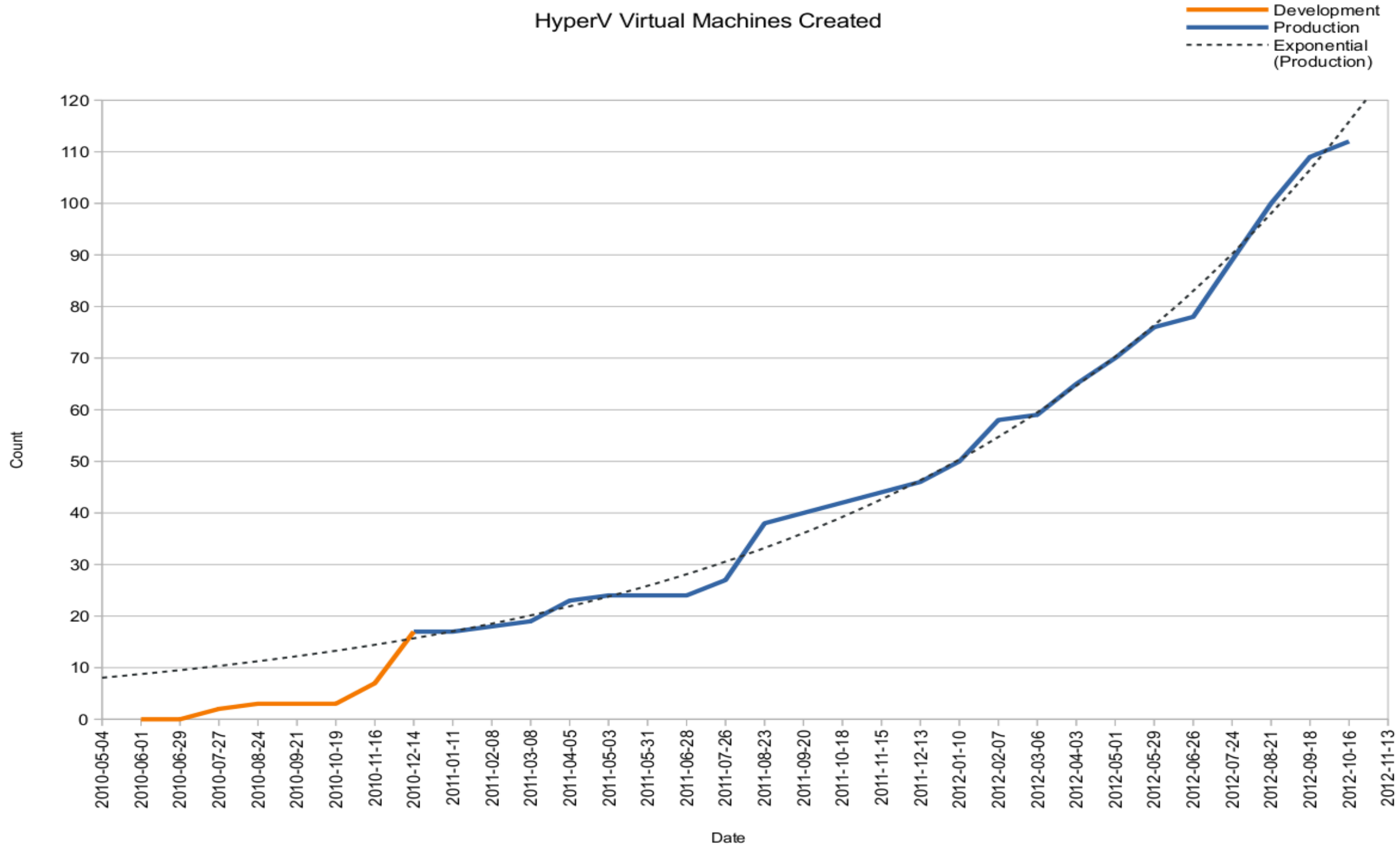
- RAL Tier 1 Services Virtualisation
- eScience (SCD) StratusLab Cloud platform
- EGI Federated Cloud participation
- Contrail
- JASMIN/CEMS

Services Virtualisation

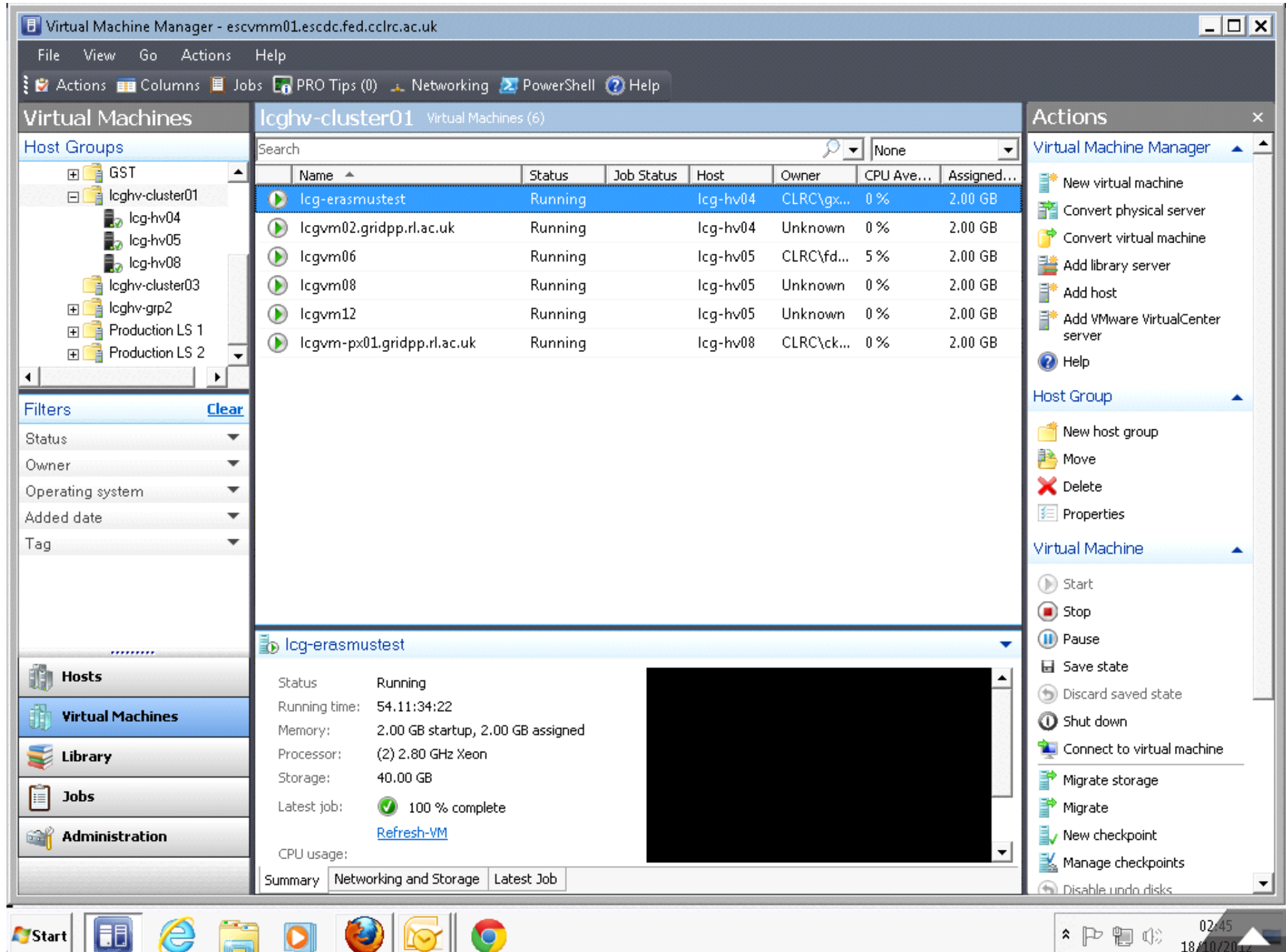
- Hyper-V Hypervisors & System Center Virtual Machine Manager
 - It works. Really pretty well. But it is Windows (continues to be unfamiliar territory)
 - Likely to migrate to open source solution (ovirt/RHEV)
- Aim is most services running on resilient virtualisation platform with iSCSI shared storage
 - Unless there is a definite contra-indication (performance)
 - Currently all using local storage - in practice fine for most things
- Working
 - Both for production & test systems
- ~200 VMs and growing fast

Services Virtualisation

HyperV Virtual Machines Created



Services Virtualisation



Virtual Machine Manager - escvmm01.escdc.fed.cclrc.ac.uk

File View Go Actions Help

Actions Columns Jobs PRO Tips (0) Networking PowerShell Help

Virtual Machines

Host Groups

- GST
 - lghv-cluster01
 - lcg-hv04
 - lcg-hv05
 - lcg-hv08
 - lghv-cluster03
 - lghv-grp2
 - Production LS 1
 - Production LS 2

Filters [Clear](#)

- Status
- Owner
- Operating system
- Added date
- Tag

Hosts

Virtual Machines

Library

Jobs

Administration

lghv-cluster01 Virtual Machines (6)

Search None

Name	Status	Job Status	Host	Owner	CPU Ave...	Assigned...
lcg-erasmustest	Running		lcg-hv04	CLRC\gx...	0 %	2.00 GB
lcgvm02.gridpp.rl.ac.uk	Running		lcg-hv04	Unknown	0 %	2.00 GB
lcgvm06	Running		lcg-hv05	CLRC\fd...	5 %	2.00 GB
lcgvm08	Running		lcg-hv05	Unknown	0 %	2.00 GB
lcgvm12	Running		lcg-hv05	Unknown	0 %	2.00 GB
lcgvm-px01.gridpp.rl.ac.uk	Running		lcg-hv08	CLRC\ck...	0 %	2.00 GB

Actions

Virtual Machine Manager

- New virtual machine
- Convert physical server
- Convert virtual machine
- Add library server
- Add host
- Add VMware VirtualCenter server
- Help

Host Group

- New host group
- Move
- Delete
- Properties

Virtual Machine

- Start
- Stop
- Pause
- Save state
- Discard saved state
- Shut down
- Connect to virtual machine
- Migrate storage
- Migrate
- New checkpoint
- Manage checkpoints
- Disable undo disks

lcg-erasmustest

Status: Running

Running time: 54.11:34:22

Memory: 2.00 GB startup, 2.00 GB assigned

Processor: (2) 2.80 GHz Xeon

Storage: 40.00 GB

Latest job: 100 % complete

[Refresh-VM](#)

CPU usage:

Summary Networking and Storage Latest Job

Windows Taskbar: Start, Internet Explorer, File Explorer, Media Center, Firefox, Mail, Chrome

System Tray: 02:45, 18/10/2012

- Some teething troubles/issues
 - Devices/Drivers old, poorly supported in Linux
 - Packaging issues for paravirtualised drivers. In SL6 having to keep old kernel for now
 - Does require an amount of Windows administrative expertise - we are Linux admins - and some of us plain don't really like Windows
- Management very easy (mostly)

SratusLab Cloud Platform

- STFC Scientific Computing Cloud platform - led by Tier 1
 - Infrastructure as a Service cloud
 - Using StratusLab – integrating cloud & grid - Very much a prototype so far
 - Several dozen VMs there as well - Very good for ‘just trying things’
- Several use cases:
 - Internal (Tier1 & SCT) development & testbeds
 - At present trust users as regular sysadmins
 - Scientific computing resource for other departments in STFC
 - Virtualised layer in batch farm - Experiments are investigating clouds - We need to be building up experience
 - EGI Federated cloud

SratusLab Cloud Platform

- First phase demonstrated it can work
 - Deployed using Quattor - SratusLab provided templates
 - Small numbers of uses for dev systems
- Second phase
 - Upgraded SratusLab version
 - Developed 'Virtualised Headnodes' for SCT SCARF HPC cluster
- Third Phase - starting now
 - Upgrade SratusLab again - now being deployed with Aquilon
 - Deploy persistent storage

EGI Federated Cloud

- Main objective of third phase of SCD Cloud
- Active participation in EGI Federated Cloud
- StratusLab stills requires an rOCCI plugin
 - RAL will work on this

- EU FP7 Project
 - 3 Years, 10 Partners, 16 Workpackages
- Federated Clouds
 - Infrastructure as a Service (IaaS)
 - Services for federating IaaS Clouds
 - Platform as a Service (PaaS) on top of federated Clouds.
- STFC Scientific Computing contribution
 - identity management
 - quality of service
 - security
- Not much interaction with EGI Federated Cloud - until now.

Sub-projects and Workpackages

1 Project management

SP5. Use cases and exploitation

12 Applications and Use Cases

13 Testbeds

14 Communication and Dissemination

15 Demonstrators

16 Exploitation and technology transfer

SP4. System Engineering

10 System Architecture

11 Integration, testing and release management

SP3. Platform as a Service

8 High level services

9 Runtime environments

SP1. Cloud federation management

2 IaaS federation

3 Service level agreements

SP2. Virtual Infrastructure layer

4 Virtual Infrastructure Network (VIN)

5 Computational Resource Management for Virtual Cluster Platforms (VCP)

6 Global Autonomous File System (GAFS)

7 Security in Virtual Infrastructures

The JASMIN super-data-cluster

- UK and European climate and earth system modelling community.
- Climate and Environmental Monitoring from Space (CEMS)
- Facilitating further comparison and evaluation of models with data.
- Virtualised compute nodes (VMWare)

4.6 PB Storage Panasas at STFC

- Fast Parallel IO to Compute servers (370 Cores)

Now installed

More details tomorrow

- A wide range of activities
- Some overlap - in technology and uses
- Hyper-V Platform has transformed provisioning in Tier 1
- We don't really know where it will all lead - entire infrastructure will likely end up more dynamically provisioned