Datacenter IaaS workshop 2014

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New!

- Workshop summary

Organisers

This workshop is organised as part of the GEANT3plus project. The responsible GEANT3plus task team is "Campus Best Practices" (NA3/T2).

This event contact email address is: **funet-events (at) csc.fi**

Venue and date

The workshop takes place at the September 11-12 2014, Helsinki Finland.

- Event hotel HUONE, (Länsisatamankatu 16, 00180 Helsinki)
  - Instructions (pdf) to find venue
  - See the map
- More practical information can be found end of this page

Welcome letter

Requirements of IT services are growing. Costs drive to seeking more efficient solutions taking into account the availability requirements. Is your datacenter full, old and energy consuming? Is building new space the only option or could infra as a service be a better solution?

A wide range of cloud services is available. What kind of technology is behind these solutions? What is required to build own cloud? Is it worthwhile to build your own cloud or is joint procurement a better choice? What if the services are outsourced, how to ensure high quality of services? How can energy efficiency be ensured when capacity is obtained as a service? This workshop tries to find answers to the above questions.

The participants are challenged to ask questions from the speakers and discuss with each other to find out the critical areas of datacenter IaaS procurement. If such areas exist.

The workshop is open to anyone and will be held on 11-12.9.2014 in Helsinki, Finland.

The intended target audience is the network engineers working with deployment of IT services on campuses and NREN staff involved in datacenter and campus deployments.

The program of the workshop consists of the following themes:

- Green datacenter technologies

- Cloud service provisioning
- Joint procurement, costs and agreements
- Security and standards
- Network

Welcome to the workshop!

On behalf of the program committee,

Janne Oksanen

chair

Call for Presentations

The GN3plus Datacenter IaaS workshop 2014 organizers ask the community to contribute to the event by presenting their results, experiences and success stories on the deployment and usage of datacenter and cloud solutions. The workshop is arranged in Helsinki between September 11th and 12th, 2014.

Submission guidelines

The author contact details and short abstract are asked to be submitted electronically to the reviewers by June 30th, 2014 23:00 EET at the latest. The authors of the selected papers are contacted for arranging the practicalities.

For more information, please, contact the reviewers.

The submission e-mail address is: **funet-events (at) csc.fi**

Important dates
- Call for presentation is opened: June 2nd, 2014 - Submission deadline: July 25th, 2014 - Approval: July 30th, 2014 - Presentation date: September 12th, 2014

Postcard

You can send/print the event postcards. Just print file in 2-sided and you will get both english and finnish versions.

Registration page

Registration is closed. You can participate to the event by following webcast.

Here you can find registered participants.

Feedback page (survey is now closed)

You can give your feedback here. Feedback survey is open 12.-30.9.2014.

Programme

Here is an agenda in PDF.

Webcasting

The Thursday and Friday program is webcasted.

Instruction: Click on the link (below) and you can log on your own ACP user name and password, if you have them. If you do not have ACP user name and password, click on “Enter as a Guest”, type your name and organzation/country code. If the system wants to install itself, click OK. This should happen at the first time only.

Webcasting recording for day 1

Webcasting recording for day 2

Day 1	**"0x0D, Destination unreachable"**	
09:00 EET	Reception opens	
10:00-10:15	Opening	Jari Miettinen /FUNET
SESSION I	**Theme: Green datacenter technologies**	chair: Juha Hopia /FUNET
10:15-10:35	Modular DC solutions: CSC Kajaani datacenter Somewhere in 2009 CSC started to investigate new location for the datacenter which could host next supercomputers. And after 3 years we had one of the most eco efficient DC in the world hosting computing services for the Finnish academia, research institutes and EU projects. Past couple of years we have had production ongoing have shown our selections and design principles were right ones. Very reliable and extremely low PUE in a same DC package, that is CSC Kajaani datacenter. Slides	Jukka-Pekka Partanen /CSC
10:35-11:05	Do-it-yourself traditional DC If creating a Datacenter from scratch is not an easy task, re-organizing an existing computer room into a decent DC can be quite of a headache. This talk will do a survey of several techniques and existing products from vendors that will allow you to transform your old-fashioned computer room into a (almost :-)) brand new datacenter. The talk will cover : - airflow control : how can you create hot and cold aisles at low cost ? - cooling technologies : are you ready for free-cooling ? - How can you monitor best ? - can you improve your PUE ? For each of these items, we will give cost estimates and achievement difficulty level. Slides	Romaric David /University of Strasbourg
11:05-11:25	Do-it-yourself datacenter - case Tampere University of Technology Slides	Tuure Vartiainen /Tampere University of Technology
11:25-12:35	*Lunch break*	
SESSION II	**Theme: Cloud service provisioning**	chair: Jovana Palibrk /AMRES

12:35-13:05	Strategic approach to cloud computing deployment The presentation will demonstrate a survey of cloud services adoption in European NRENs, obtained through the questionnaire circulated among 23 NRENs. Based on these results, the presentation will cover a strategic approach to deployment of cloud computing and services which is driven by a business cases for the users community. A set of information and different aspects need to be analyzed to setup strategic objectives which are desirable, feasible and achievable, and therefor which are worth investing in. Slides	Slavko Gajin /University of Belgrade
13.05-13.35	Providing IaaS to Greek Academic Users GRNET currently runs more than 11.000 VMs in two flavors of IaaS services. In this presentation we're going to show how we build and provision these IaaS/cloud services. Our solutions have to cater to different needs, from students to labs and from university NOCs to scientists that need computing resources. We're going to present the open source tools, both 3rd-party and in-house developed, that we use everyday in order to deploy, automate and monitor our services. Slides	George Kargiotakis /GRNET
13.35-14:05	Provisioning Cloud Services to Academic Users in the Czech Republic	Filip Hubik /Masaryk University in Brno

Introduction

CESNET, an association of legal entities established by universities and the Academy of Sciences of the Czech Republic, is responsible for operation and development of the National Research and Education Network (NREN), National Grid Infrastructure (NGI) and active research in the field of advanced network technologies and applications.

As a provider of scientific computing services for the Czech academic community and a facilitator of international connections to European Grid Infrastructure (EGI), CESNET has considerable experience with virtualization-based solutions such as virtualization as a tool for operation flexibility, on-demand virtual cluster services for scientific computing or HPC cloud.

The national Center CERIT-SC (CERIT Scientific Cloud) offers storage and computing resources and related services, including support for their experimental use. The Center also participates in research and development related to flexible e-Infrastructures and it also collaborates in research activities of its partners.

The CERIT-SC Center was created through a transformation of the Supercomputing Center Brno (SCB), a part of the Institute of Computer Science (ICS) at Masaryk University (MU).

Scientific cloud for academic community

As a part of a joint effort, CESNET and CERIT-SC provide an IaaS cloud service for academic use. This venture was motivated by the need to react to requirements from user communities with an increased flexibility. In most cases, it allows for provisioning of highly specialised worker nodes for scientific computing applications, and acts as a new interface to existing NGI resources. Therefore an evaluation in terms of cost is not the primary goal, cost cutting is not the reason for deploying a cloud in this environment. The primary focus is the support of new and more diverse user communities.

The scientific cloud infrastructure provides users with two essential services. The Infrastructure as a Service (IaaS) cloud for launching virtual machines and The Storage as a Service (STaaS) cloud for file-based storage and file sharing.

IaaS

The IaaS cloud infrastructure at CESNET/CERIT-SC is based on OpenNebula an open source cloud

management framework, which has been extended and integrated with various pre-existing NGI services such as:

* Accounting (MetaAcct)

* Monitoring (PBSMon, Nagios monitoring probes for OpenNebula)

* User management (The Perun management system)

* Authentication and authorization (Kerberos and X.509)

In general, it is used to run on-demand nodes with user-supplied images as well as worker nodes for the national grid environment.

As a leader of the virtual machine management activity in the context of the EGI Federated Cloud, we are focusing on standardization and interoperability while providing several components used in various places of the federated cloud ecosystem. Most notably, the rOCCI framework implementing the Open Cloud Computing Interface (OCCI) in Ruby and providing both client-side and server-side ready-to-use products.

STaaS

CESNET has its own storage service providing storage and archiving capacity for grid and cloud users alike via standardized protocols such as FTP or NFS. One of several ways to use this large storage capacity is the OwnCloud-based STaaS generally available for end users.

Outcome

The aforementioned services create a solid foundation for a scientific HPC cloud which has proven to be an efficient tool for supporting new and existing user communities with a considerable increase in flexibility. Similar trends are also emerging in the European e-Infrastructure as demonstrated by the EGI Federated Cloud effort and its recent move to production. As a result of the participation in multiple international cloud-oriented projects and internal efforts, we can share our technical expertise on a plethora of subjects including but not limited to interoperability, infrastructure design and management, user management and AAI.

	Slides	
14:05-14:40	*Coffee break*	
SESSION III	**Theme: Joint Procurement, costs and agreements**	chair: Jari Miettinen /FUNET
14.40-15:00	Cost of outsourced datacenter services Experiences of broad scale outsourcing of datacenter services in a Finnish UAS Decision to outsource is always a strategic initiative and needs to be made by the highest management. Before making the decision to outsource there are few questions that needs to be considered and answered: What is the core business of the organization, does the present service support the core business in a strategic level or is it more a supportive service, do we have enough skills and employees to effectively produce service by ourselves, would it make economically sense to outsource, etc. Conditions for a successful outsourcing are manifold. Main thing is to know what you are outsourcing before you do as well as what is the total cost of ownership - including training and life cycle costs. To find out total costs of an in-house service can be tricky but the better you succeed in this “spy” task the better informed decision you are able to make. In addition to salary and social security costs there are bunch of other “hidden” costs that needs to take into account. Without them in-house production may feel too cheap and you miss the realistic comparison. There are also other things than money that needs to take into account. You need to figure out what are indirect effects of outsourcing for the organization. What changes are needed if there will be another party to deliver part of the process? How information will flow from one party to the other and back? Will there be lack of confidence between different parties? Will there be temporary or even permanent drop in service level for your customers etc. In Laurea UAS we did not go through outsourcing in traditionally sense BUT rather a partial in-sourcing! When Laurea was founded in the late -90’s whole IT-function was outsourced. During the years uncertainty towards an outsourced IT function started to raise and made the management to think whether outsourced IT was too inflexible and expensive. Requirements of teaching had changed and multinational service provider was not able to bend to these requirements. During the spring 2004 decision was made to perform a partial in-housing which led to a so called hybrid-model where there is a place for in-house and outsourced services. How we have organized our IT is quite different from most of the higher education institutes in Finland. Come and hear how IT is organized in Laurea University of Applied Sciences, what led to this model, what are the benefits of our current model of operation, what could have been done differently and how we have organized cooperation with our vendors. Slides	Kimmo Pettinen /Laurea Univ of Applied Sciences

15:00-15:20	How to calculate cost effiency of energy May I propose a little bit different approach of the subject? Because the purpose of our work is DataCenter (DC) – IaaS – Green IT. So, my presentation will not give you a formula to calculate the cost efficiency of energy in a DC, but in a more global approach, I propose to look at where are the problems, what kind of "solutions" we can expect; and what we can do. **Energy:** Energy is clearly **the** challenge of the 21th century. Two centuries of "industrial revolution", something like 1850 to 2050 will have use a very large amount of fossil combustibles, 100 000 000 years of production ! We have no choice we must develop renewable sources of energy at a very large scale. **DCs :** DCs are the "back office" of the internet. Users (most of) see the internet through their smartphone or tablet. Just a very few users know that a single "clic" cost a large amount of energy, very bigger than their personal (terminal) usage. The talk will provide some significant numbers; example : global (world wide) electricity consumption of network enabled devices in 2013 = 616 TWh; global electricity consumption in France in 2013 = 547 TWh !!! **GreenIT** Green … nothing is green or virtual in the ICT world. Just a few countries such as Iceland can provide renewable energy at human scale, but what about building servers and so on and recycling ? **OK, what can we do ?** Ideas to act in the better possible way. Slides	Robert Ferret /RENATER
15:20-15.40	Finnish "energy efficiency tool" *(this presentation was calcelled)*	Petri Hyyppä /Proceed Consulting Ltd
15:40-16:00	Legislation and agreements - Funet Boksi use case In this presentation Pekka Palin of CSC tells about the co-operation with Box.com, the legal challenges, the pricing logic, the negotiations between Box and the Nordunet-consortium, and user feedback. CSC – IT Center for Science Ltd is administered by the Ministry of Education, Science and Culture. CSC is a non-profit company providing IT support and resources for academia, research institutes and companies: modeling, computing and information services. CSC provides Finland's widest selection of scientific software and databases and Finland's most powerful supercomputing environment that researchers can use via the Funet network. Slides	Pekka Palin /CSC
16.00-16:15	Ending of first day	Janne Oksanen /FUNET

Social event (September 11th)

- **Datacenter visit**
  - Event starts at 17:00
  - There will be bus transportation Venue - DC - Helsinki center - Venue
- **Dinner**
  - Event starts at 20:00
  - Radisson Blu Plaza (kabinet Takkahuone), Mikonkatu 23, 00100 Helsinki
  - See the map

Day 2	**"0x0D, Destination unreachable"**	
9:30 EET	*Reception opens*	
9:45-9:45	Opening	Janne Oksanen /FUNET
SESSION IV	**Theme: Security**	chair: Janne Oksanen /FUNET
09:45-10:15	Safe file storage and databases Increasingly, data is stored in seemingly private containments in public locations. This poses challenges due to the differences between perceived and actual safety of the data. Safety here refers to security, privacy, reliability and availability. The talk will present two software prototypes for file storage and simple relational databases which can be used in multi-user environments to offer non-expert users a safe environment for their data across multiple locations. Slides	Josef Spillner /Technical Univ of Dresden
10:15-10.45	SURFdrive: an Owncloud sync & share service discription -- Simple and secure data sharing Although many commercial personal storage services are free, no one knows exactly where the data is stored, or what it is subsequently used for. There is a secure alternative for users in the Dutch higher education and research community. SURFdrive offers staff, researchers and students an easy way to share and synchronise files within a secure community cloud with ample storage capacity. Privacy and security In order to offer users a secure and reliable service, all SURFdrive information security protocols meet high standards. The Legal Framework for Cloud Services in Higher Education serves as a guideline for all service-related agreements. SURFdrive complies with all Dutch and European privacy legislation. For example, SURFdrive's conditions of use ensure safe usage, whereby users retain ownership of their own data. All data is securely stored within the Netherlands. Furthermore, SURF does not share information with third parties. This presentation is about the legal policy's and technical choices in order to offer a secure sync & share service that is based on Owncloud. Slides	Rogier Spoor /SURFnet

10:45-11:05	elfCLOUD - Credibly secure cloud storage elfCLOUD is a Finland based secure cloud platform. The platform combines the privacy of private clouds with cost-efficiency and ease of maintenance of the public clouds. The entire architecture has been designed from the ground up with primary focus on information security and end-user privacy. Content is always encrypted locally on the users' device before transmitting to the cloud. The content keys are never sent to or stored on the elfCLOUD servers in usable format. Secure cloud assisted key sharing within and across organizations is supported and facilitated in a user-friendly manner. The elfCLOUD platform provides open APIs and open-source client libraries as well as a set of readily available client applications for day-to-day file management, sharing, folder synchronization and backups. Slides	Tuomas Tonteri /elfCLOUD
11:05-11:25	Sync&share / Cloud service in education and research Slides	Christian Sprajc /Powerfolder
11:25-12:30	*Lunch break*	
SESSION V	**Theme: Network**	chair: Milos Kukoleca /AMRES
12:30-13:00	Services and DC infrastructure of VSB-Technical university VSB-Technical University of Ostrava has its own datacenter which runs on some modern technologies - converged 10GE, smart disc storages, virtualisation. The first part of presentation describes technical infrastructure of datacenter - networking, servers, storages and virtualisation. The DC's services are offered mainly to university users. Other institutions (universities, high schools, etc.) can connect their networks to datacenter and run their own servers or virtual machines in our datacenter. The second part of presentation describes offered services, network connections between datacenter and institution's network, practical experiences and future plans. Slides	Martin Pustka /VSB-TU Ostrava
13:00-13:30	Hardware acceleration for high-density datacenter monitoring Use of hardware acceleration for high-density network traffic monitoring will be presented during the talk with a special focus on efficiency, footprint reduction and acceleration of open source network monitoring tools. All these concepts provide significant cost reduction compared to commercial solution while they can be easily combined and integrated. Slides	Denis Matousek /Invea
13:30-13:45	Multi-domain connectivity services Slides	Jani Myyry /FUNET
13:45-14:15	*Coffee break*	
SESSION VI	**Theme: Lightning talks**	chair: Tomi Salmi /FUNET
14:15-14:30	AMRES Virtualization Solution Virtualization offers higher infrastructure utilization, faster service provisioning and significantly reduces the data center footprint. A couple of years ago, Academic Network of Republic of Serbia (AMRES) acknowledged these benefits and started a project which aims to virtualize server infrastructure in AMRES datacenter. Due to lack of funds AMRES was forced to turn to some low-cost solutions (open source virtualization platforms) such as Citrix XenServer and Proxmox. In this session we will present the AMRES virtualization environment and share some of the experience we gathered during these years. Slides	Milos Kukoleca /AMRES

14:30-14:45	Self service for virtual Machines Uninett has developed an in-house self service solution for consumption of IT resources. The talk will present the project and the experiences. Slides	Sigmund Augdal /UNINETT
14:45-15:00	Pouta Cloud service With the expanding field of computational science comes more heterogenous user and software communities. Serving this wider field challanges traditional High Performance Computing (HPC) centers. CSC has launced the Pouta HPC cloud service to serve the needs of this new wave of customers. Pouta has the flexibility of IaaS combined with the perfomance of HPC clusters, provided by a converged cluster and cloud platform. Slides	Kalle Happonen /CSC
15:00-15:15	Case IDA - storage service for Finnish HE institutions and Academy of Finland projects Slides	Jorma Paananen /CSC
15:15-15:30	EUDAT - Standardized storage services for European research communities Slides	Ari Lukkarinen /CSC
15:30-15:45	Feedback	Kaisa Haapala /FUNET
15:45-16:00	Ending of the workshop Slides	Jari Miettinen /FUNET

Workshop summary

Check out some notes from the workshop DC-IaaS-workshop-memo.pdf

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Practical information

- **Moving around Helsinki**: There's an extensive public transport system in the greater Helsinki area. Taxis and Airport Taxi services are also available. It takes about 45 minutes to reach Helsinki center from the Airport using public transport. Taxi service halves the time. The rush hours (7:00-9:00, 15:00-17:00) usually double the driving time. Taxi from Airport to Helsinki center costs around 40-50e.
  - Helsinki Airport bus and taxi service information
  - Helsinki Region Transport Journey Planner, timetables, routes etc
  - Airport taxi services
  - Helsinki metro and tram routes.
- **Networking**: eduroam and guest network at the workshop
- **Climate**: average climate information
- **Hotels**: Nearest hotels of the venue are
  - Holiday Inn
  - Radisson Blu Seaside

    You can find more hotels by using e.g. hotels.com or booking.com services.

NOTE: There is special prices for participant to Holiday Inn. Special prices are valid till 27.6.2014, but if there are rooms available after that day, prices should be valid still. Hotel offer is here.

NOTE2: There are lots of other events in Helsinki area at same time. Please reserve your room as early as possible.