

MECA PROJECT TRAINING SEMINAR FOR SYSTEM ADMINISTRATORS

MINUTES

Politecnico di Torino, October 6 - 8 2016

Participants

1. Rossen Radonov, TUS Sofia, Bulgaria
2. Martin Klossek, eWORKS, Germany
3. Massimo Ruo Roch, Politecnico di Torino, Italy
4. Risto Chavdarov, UKIM, Macedonia
5. Gabriel Popescu, Giga Electronic Int., Romania
6. Peter Martinek, BME, Hungary
7. Rainer Mihai, Giga Electronic Int., Romania
8. Dragan Stankovski, ATRONIKA, Macedonia

DAY 1: OCTOBER 6TH

Géczy Attila: Configuration of the Cloud system at BME

Presentation of the configuration Case study: CloudStack Architecture

Set up VM with working tools + training course documentation as presentation of VM capability

Set up VM template for Cloudstack

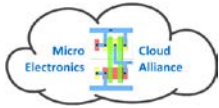
Template based VM generation in the system

- Management server(s)
- Infrastructure hierarchy
- Storage types

Analysis of problems encountered and suggestions for new tests

Resources

- Heavy resources are needed for VMs
- Allocated resources are enough for electronics CAD applications



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- Resources are also enough for course documentation playback (PDF, Video, etc...)

Licensing

- Licensing is possible via the VM, meaning licensed software is able to draw the license allowances from the central servers
- However it is questionable to set up licensed software if it is not present at all partners

Suggestions

- Practical demonstrations, courses, training and practice tools: suggested freeware, open source softwares besides available documentations and other media.
- In the suggested topics (electronics technology, circuit design, etc.) freeware alternatives are available to conduct a professional training session.
- Software, which are legally available for all partners, could also be implemented to the system.

DAY 2: OCTOBER 7TH

Martin Klossek: Configuration of the Cloud system at eWorks

Martin Klossek describes the results of the configuration of the system at eWorks.

PoliTo and eWorks prepared shared installation:

- 1 Basic zone in PoliTO

- 1 Basic zone in eWorks

- Redundant management server (1 per site)

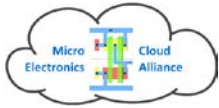
- Redundant database: Master in PoliTO, Backup in eWorks

Encrypt the management traffic between the different zones / data centers

Domain feature in CloudStack: Hierarchical user levels through domains, e. g. for departments inside of institutions. "Projects" in CloudStack are for grouping people

Use subdomains of meca-project.eu for the project, e. g. server1.polito.meca-project.eu or machine4.bme.meca-project.eu

All trainees participate in the case study on problems encountered in Cloudstack installation, and suggested solutions:



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- Even slight mismatch in OS and software version can lead to problems. Recommendation is to strictly adhere to documentation requirements.
- Sometimes template creation is very slow. BME reports ~1 hour. Bottlenecks must be identified in network paths and in I/O performance.
- Security groups function is not clear. Specifically, it's not clear that default security group has a 'block all' rule. A better description of institution and top-of-rack firewalls role must be defined, too, and given to implementers.

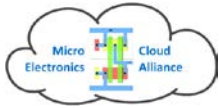
Discussion and analysis of tests in Germany and Hungary

- PfSense system is not reliable when run in a VM guest, due to known (now) kernel bugs.
- Possible solutions are:
 - Installation of PfSense on a bare metal firewall.
 - Installation of a Linux firewall supporting OpenVPN.
 - pfSense VM for firewalling + Linux VM as OpenVPN server/client.
 - Different cloud architecture, with reduced performances and features, but easier to deploy: each institution has a single 'region' of the overall cloud.

Practical assignments: NFS server: firewall configuration for the specific OS at each institution

Massimo Ruo Roch: Summary of problems encountered in site-to-site cloud integration, and suggested solutions

- Heavy resources are needed for VMs
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- PfSense system is not reliable when run in a VM guest, due to known (now) kernel bugs.



DAY 3: OCTOBER 8TH

Workshop: 'Test and production environment requirements'

Discussion and planning the test and production environment requirements:

ACTIONS:

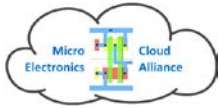
- VPN setup between institutions
- Mysql data replication, possibly in a master/master configuration.
- Performance assessment, to detail hardware and software architecture costs, related to number of students/VMs/courses.
- Definition of test and production environment requirements.
- Cloudstack region evaluation.
- Possible test of an existing PaaS solution (Cloudify).
- Creation of examples of network topologies for different needs, i.e. classroom course server to access CAD tools, Moodle instance, etc.
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Training seminar: 'VPN setup between institutions'

- NFS server: firewall configuration must be adapted to NFS software used. Specifically, if local firewall is enabled, then static ports must be assigned to NFS services. Standard configuration uses portmap service at a static port, and mountd/lockd/statd at dynamic ones. This situation is not supported, and changes must be applied to /etc/sysconfig/nfs file.
- NFS server: performance of Microsoft Windows virtualized guests is very poor in accessing the disk. No definitive solution is up to know available. A possible one is the usage of paravirtualized (virtio) drivers in Windows guest.

Recommendation: Firewall in front of CloudStack to avoid conflicts with the other organizations/departments

- Free firewall: pfSense (low system requirements, e. g. 512 MB RAM), can be installed as virtual appliance or one can buy a physical appliance. Server Load Balancing is possible. IPsec and OpenVPN is built-in
- If possible the management server and the NFS should be on separate servers.



Summary and conclusions

Summary of problems encountered in Cloudstack installation, and suggested solutions

The following problems has been identified during installation of Cloudstack 4.8 in partner's premises:

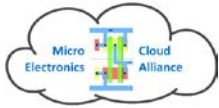
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Summary of problems encountered in site-to-site cloud integration, and suggested solutions

- PfSense system is not reliable when run in a VM guest, due to known (now) kernel bugs.
- Possible solutions are:
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Future steps:

- VPN setup between institutions
- Mysql data replication, possibly in a master/master configuration.



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- Performance assessment, to detail hardware and software architecture costs, related to number of students/VMs/courses.
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- Possible test of an existing PaaS solution (Cloudify).
- Creation of examples of network topologies for different needs, i.e. classroom course server to access CAD tools, Moodle instance, etc.

NEXT Training for implementation of mClouds: TU-Berlin, Germany, 16-17 March 2017.