Analysis of cloud computing application in scientific centre

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As cloud computing continues to experience more widespread adoption and executives who have adopted the technology have become more comfortable and are now looking for new methods of optimizing the solutions, organizations in some of the most highly regulated sectors have been slower to adopt the technology, and might be putting themselves at a competitive disadvantage.

Seemingly it is due to complexity of cloud technologies itself, including variety of different products, jointed together. Joining of these products gives synergy effect and lets obtain also complex, but very tunable and scalable system. Cloud computing include different services: identity service, image service, messaging service, compute service, block storage service, network service.

Lets discuss these services concerning application in scientific centrum. Scientific centrum has specific requirements: organization of network services for scientific network (routing, proxy for access to different resources, library services, file storage, site hosting), administration of cluster. Consider cloud technologies for that sake on the example of OpenStack --- opensource platform. Cloud technologies gives opportunity to launch many different instances as virtual machines (VM). The principal question is question of network topology of VMs. Sole VM is connected to network via physical network of host. It is attained using network bridge. In cloud computing VMs are connected in subnets, it is implemented using different services --- quantum and Open vSwitch. Open vSwitch implements bridges, quantum implements virtual routing and network management. VMs are connected to global network via number of bridges and virtual router. It has detrimental influence on network connectivity. So network services should be located on usual hosts as native or VM, but not in the cloud. VMs in cloud could be used for educational purposes, e.g. for students. Also they could be used for scalable calculations.

Scalability of cloud computing has detrimental effect on network connectivity. Unfortunately, they should be used only if scalability of resources in time is the main factor.

Literature.

1. Web-resource http://openstack.org

2. Web-resource http://www.alcf.anl.gov/magellan

3. Web-resource http://aws.amazon.com/ec2/