Building a Private Cloud for Umeå University

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What is a private cloud?
The cloud definition

- On-demand self-service
- Broad network access
- Resource pooling
- Rapid elasticity
- Measured service

As defined by the US National Institute of Standards and Technology
Why build a private cloud?
Primary drive factors

- Automation = Fewer administrative tasks
- Faster delivery time = More productivity
- A self service portal for X as a service
- On premise = More control
- A service catalog
- Better governance
- Better use of the infrastructure
Reducing administrative overhead

Administration
70%

Licenses 5%

Hardware 25%

Total VM Cost
Designing the private cloud
Requirements for a private cloud

• A self-service portal
• Monitoring tools
• Automation tools
• Cost efficient, scalable, reliable virtualization infrastructure
A self-service portal

- **vCloud Director**
  - Don’t use, use vCloud Automation Center says VMware since 2013.

- **vCloud Automation Center**
  - Can connect to public clouds
  - Included with our vCloud licenses

- **OpenStack requires more work to implement**
Monitoring tools

• VMware Operations Manager
  - Included in the vCloud licenses.
  - Oversized and undersized VM:s reports
  - Capacity planning
  - Monitors health status
  - Can automate deployment based on load

• Ms System Center Operations Manager
  - Using Veeam Management pack
Automation tools

- VMware vCenter Orchestrator
  - For advanced deployments

- Microsoft Orchestrator
  - To manage roles, group memberships in Active Directory etc.

- Bash/Perl/Python scripts
  - for Linux deployment and auto-configuration
Cost efficient, scalable, reliable hypervisor

• VMware vSphere hypervisor
  – Perpetual license model
  – Scale up host model to keep licence costs down
  – High availability and DRS
  – Stretched cluster spanning over two sites
Cost efficient, scalable, reliable network

• Cisco Nexus 1000V
  - Software defined networking
  - Fits into our existing Cisco network infrastructure
Cost efficient, scalable, reliable storage

- DataCore SANsymphony-V
  - Software defined storage
  - X86 hardware
  - Multi-tier storage with auto tiering
  - Synchronous replication of data between sites
  - Converged network infrastructure
  - Perpetual license model and/or subscription
Cost efficient, scalable, reliable disaster recovery/backup

- Veeam Backup & Replication
  - Provide Basic backup for all VM:s
  - Used as disaster recover in case of SAN failure.
A software defined datacenter
Automating the deployment

- Identify VM types define services
- Document the tasks needed to create a VM
- Write scripts to automate sub-tasks
- Run the scripts manually for a while
- Automate the process and make it available for order in the self-service portal
Where do we go from here?

• Our self-service portal is in final testing stages.

• Hybrid cloud
• Community cloud
• Platform as a service, PaaS
• Desktop as a service, DaaS
• X as a service
Thank you

Questions?