OpenNebula.org

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Experiences from the OpenNebula Community to Develop Your Organization's Cloud

Where to Start, What to Do & What to Avoid

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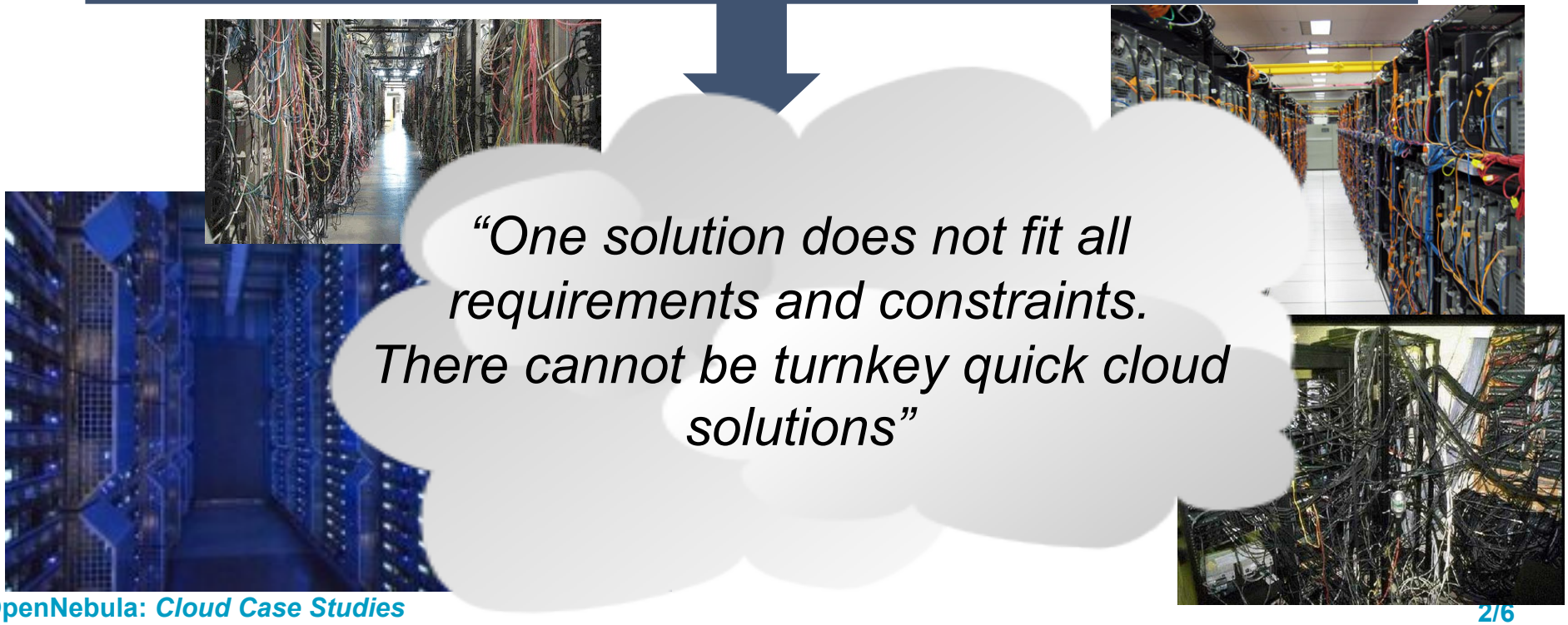
1. Does One Cloud Fit All?

- Cloud Computing is an **evolution of existing data centers**
- One solution can not fit all data-center and user requirements and constraints

Constraints from Existing Infrastructure and Processes

Requirements from Usage and Deployment Scenarios



1. Does One Cloud Fit All?

Component	Design Parameters	Requirements of Use Cases and Constraints from Infrastructure
Physical Machines	• Memory and CPU per server • Number and scalability of servers • Hardware virtualization support	• Memory/CPU requirements of service instances • Elasticity of services
Physical Network	• Latency/bandwidth per network • Number and scalability of networks	• Level of coupling between service instances
Physical Storage	• Size, scalability, latency and throughout • Organization: DAS/SAN/NAS	• Live migration • Scalability of the cluster • Performance
Clusters	• Number of clusters	• Workloads with different execution profiles • Scalability in one cluster
Virtual Machine Manager	• Hypervisors	• Overhead in service instances • Licensing
Interfaces	• Administration interface • Cloud interface	• Required functionality • Compatibility with existing interfaces
Scheduler	• Allocation Policies • Quota management	• Energy efficiency, load balancing, affinity-aware, capacity reservation, live migration…
Cloud bursting	• Hybrid • Federation	• Fluctuating demands • Security constraints • Level of coupling between service instances

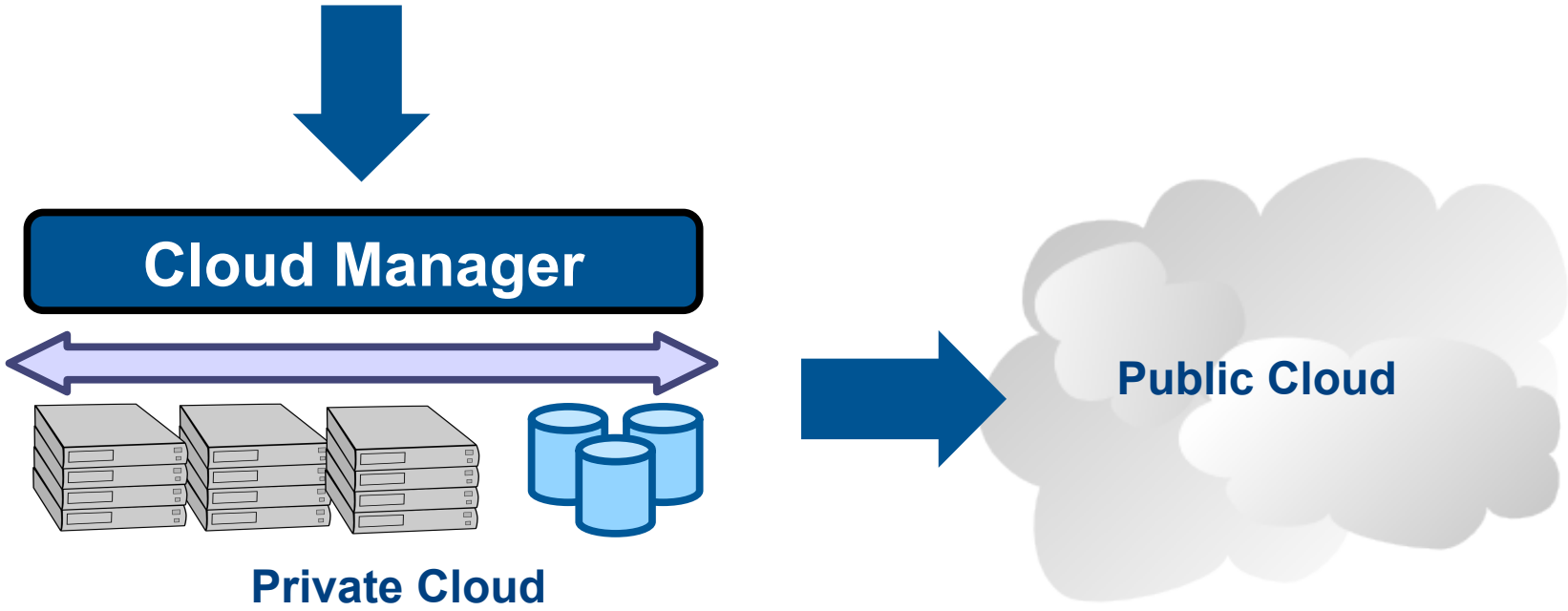
2. What is the Role for Public Cloud?

Private Cloud Computing

- Simplify internal operations
- Dynamic allocation of resources
- Higher utilization & operational savings
- Security concerns, **A "Public Cloud behind the firewall"**
- **Build your own public cloud**

Hybrid Cloud Computing

- Supplement the capacity of the Private Cloud
- **Utility Computing dream made a reality!**



3. Implementation Tips

Openness

- Open architectures
- Open interfaces
- Open code

Control and Security

- Policy enforcement
- Acconting/Autorization/Authentication

Automation
Multi-tenancy
Elasticity
Scalability

Standardization

- Use standards
- Implement standards

Interoperabilty/Portability

- It can be installed in any hardware and software
- Provide with choice across most popular cloud interfaces, hypervisors and public clouds

4. What Comes after Cloud?

More Cloud Computing… this is only the beginning

- Cloud computing is starting to become a reality
- Most of deployments are pilot projects

IT Resources will be the Next Utility

- **Future enterprise datacenters will look like private Clouds** supporting a flexible and agile execution of virtualized services, and combining local with public Cloud-based infrastructure to enable highly scalable hosting environments
- **Growing number of domain specific and regional Cloud providers implementing a utility computing business model** by offering pay per use resources on-demand
- **Public Clouds will be supported by a network of geographically distributed datacenters** for high availability, end-user service proximity, legal and policy issues…
- **Public Clouds will be interconnected to meet fluctuating demands**