

A photograph of a vast sky filled with large, white, fluffy cumulus clouds against a clear blue background. The clouds are layered, with some appearing closer and more detailed than others.

# Cloud Computing & HPC

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# Sun's Vision



**THE NETWORK  
is the  
Computer**

Focusing on Network Transparent Computing Since 1984

# Cloud Computing's Defining Concepts



**Virtualization  
+  
Multi-tenancy**



**Real-time,  
user-controlled  
provisioning  
+  
Pay-per-use**

**Proven technology for data center efficiency  
with new model for delivery and end-user costs**

# Cloud Computing Layers

## Software as a Service (SaaS)

Applications offered on-demand over the network (salesforce.com)

## Platform as a Service (PaaS)

Developer platform with built-in services (Google App Engine, Microsoft Azure Platform)

## Infrastructure as a Service (IaaS)

Basic storage and compute capabilities offered as a service (Amazon Web Services, Microsoft's Cloud Infrastructure Services, Mosso)

# Cloud Computing Business Models

## Public



You don't know who else is on the same server, network or disk that you are

## Private



You own the server, network and disk, and decide who gets to run on it with you

## Hybrid



You own some parts and are sharing some parts, though in a controlled way

# Cloud Computing Application Domains

HPC

Medical

Intelligence

Finance

Analytics

Web

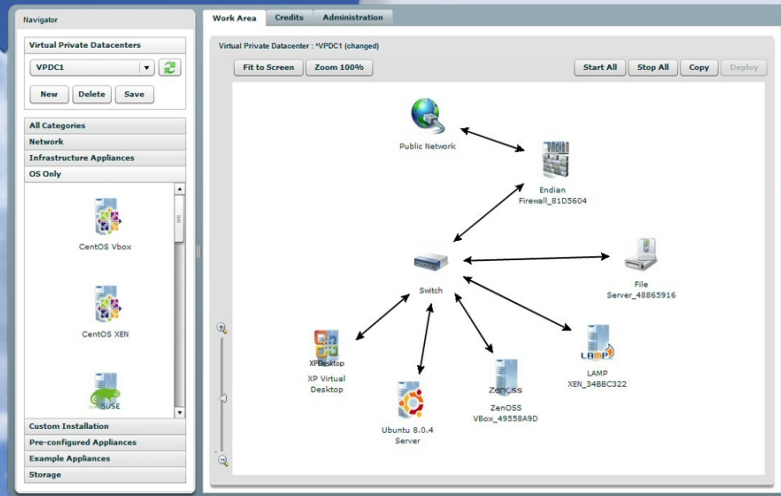
Domains Drive Differences  
in Hardware and Software Architecture

# Sun Constellation System Architecture



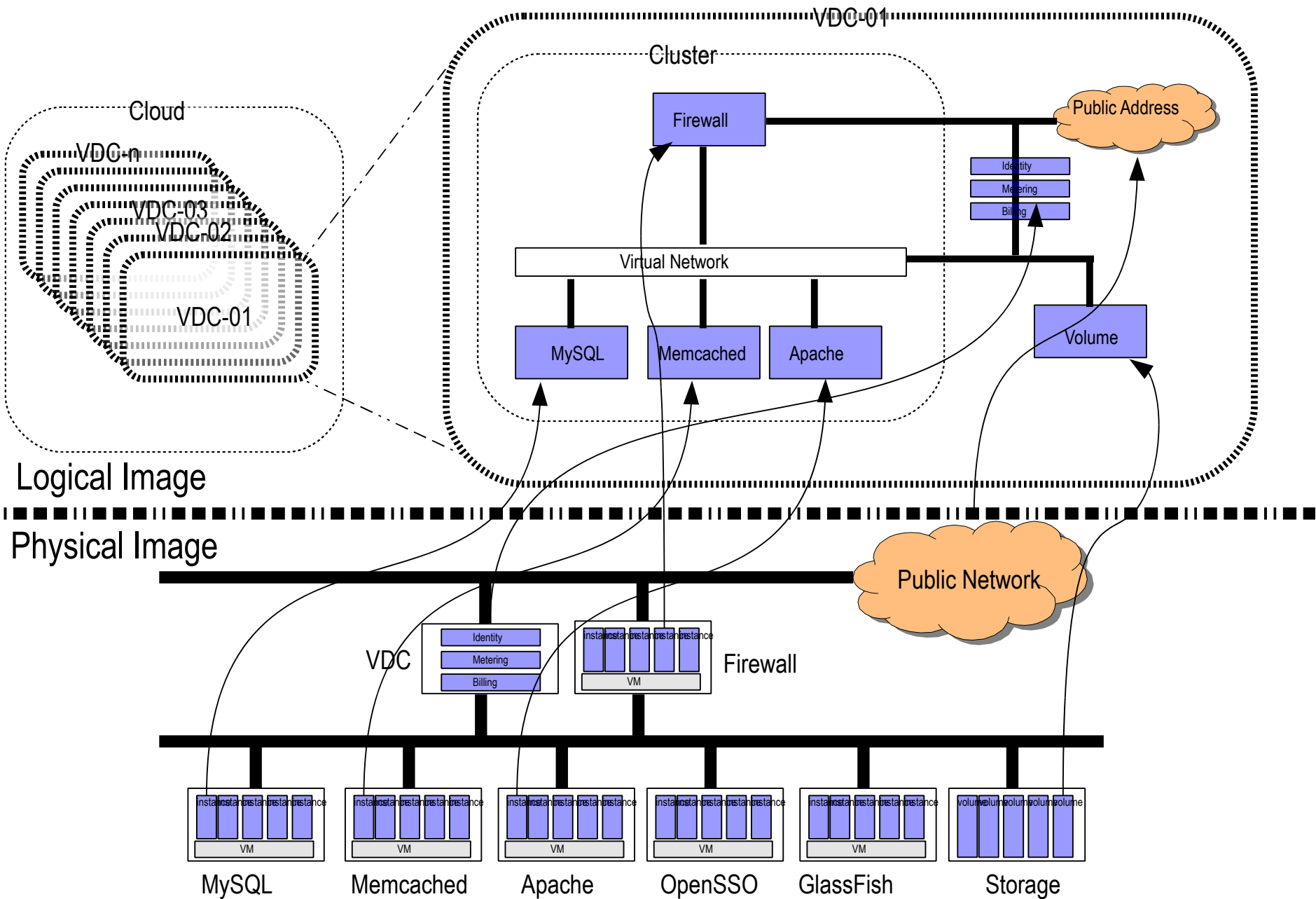
# Sun Public Cloud Storage Service

## Q-Layer : Virtual DataCenter Model (VDC)



- Design application from pre-built components using drag-and-drop
- Deploy to cloud
- Monitor, manage and reconfigure
- Compatibility with programmatic APIs
- Encapsulate system architecture of an application
- Ability to model, save and deploy entire system

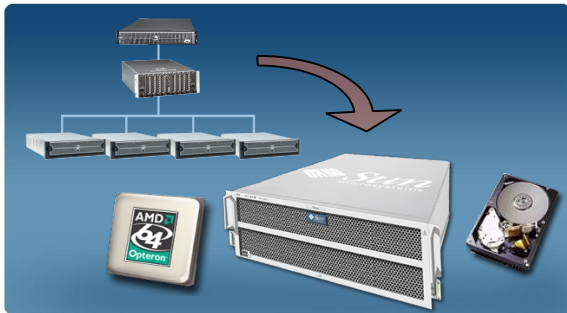




# Sun Private Cloud Storage

## Storage as a Services

Useful for Data Intensive Computing ?



### General Purpose Storage Servers

- Combine server with disk & networking
- Specialized software enables general purpose systems designs to provide high performance data services

### Sun's Open Storage Platform direction

Sun Fire 4540

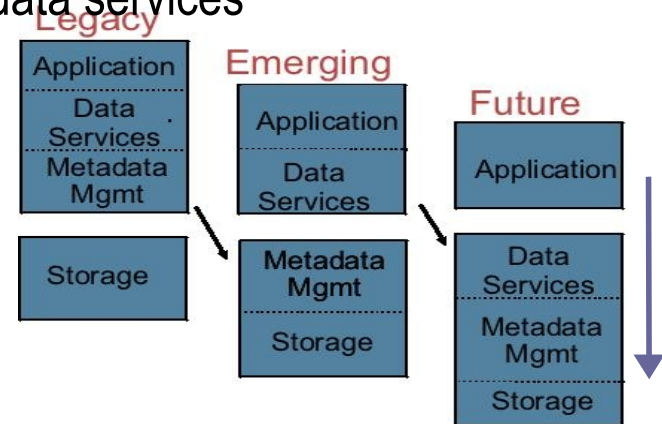
2 quad-core Opteron, 64GB, 48 hot-plug, SATA II drives, 48TB in 4 RU



Sun Storage 7000 Unified Storage System

Hybrid Ready Architecture

High Performance Analytics



Data functionality moves to the infrastructure



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