

From Virtualization To Cloud: The Evolution of Enterprise IT in Five Simple Steps

James Urquhart

Market Strategist, Cloud Computing and Data Center Virtualization
Data Center Solutions, Cisco Systems, Inc.

Author, CNET Blog Network | The Wisdom of Clouds
<http://news.cnet.com/the-wisdom-of-clouds>



The Enterprise Evolution from Virtualization to Cloud Computing

Consolidation

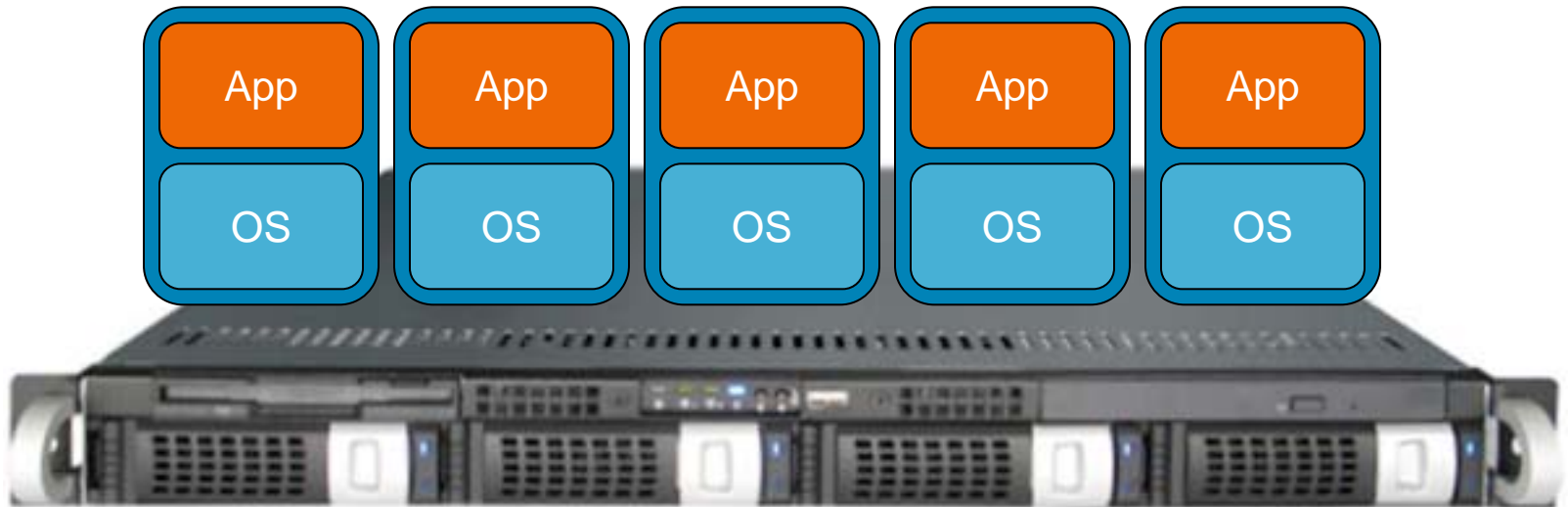
Abstraction

Automation

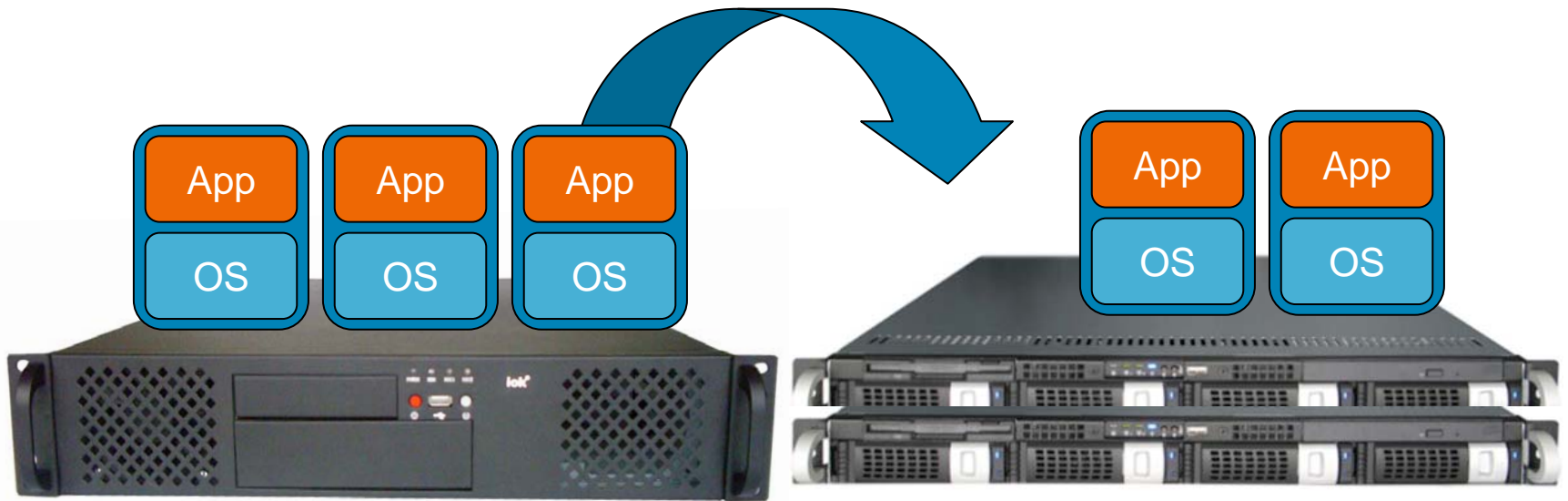
Utility

Market

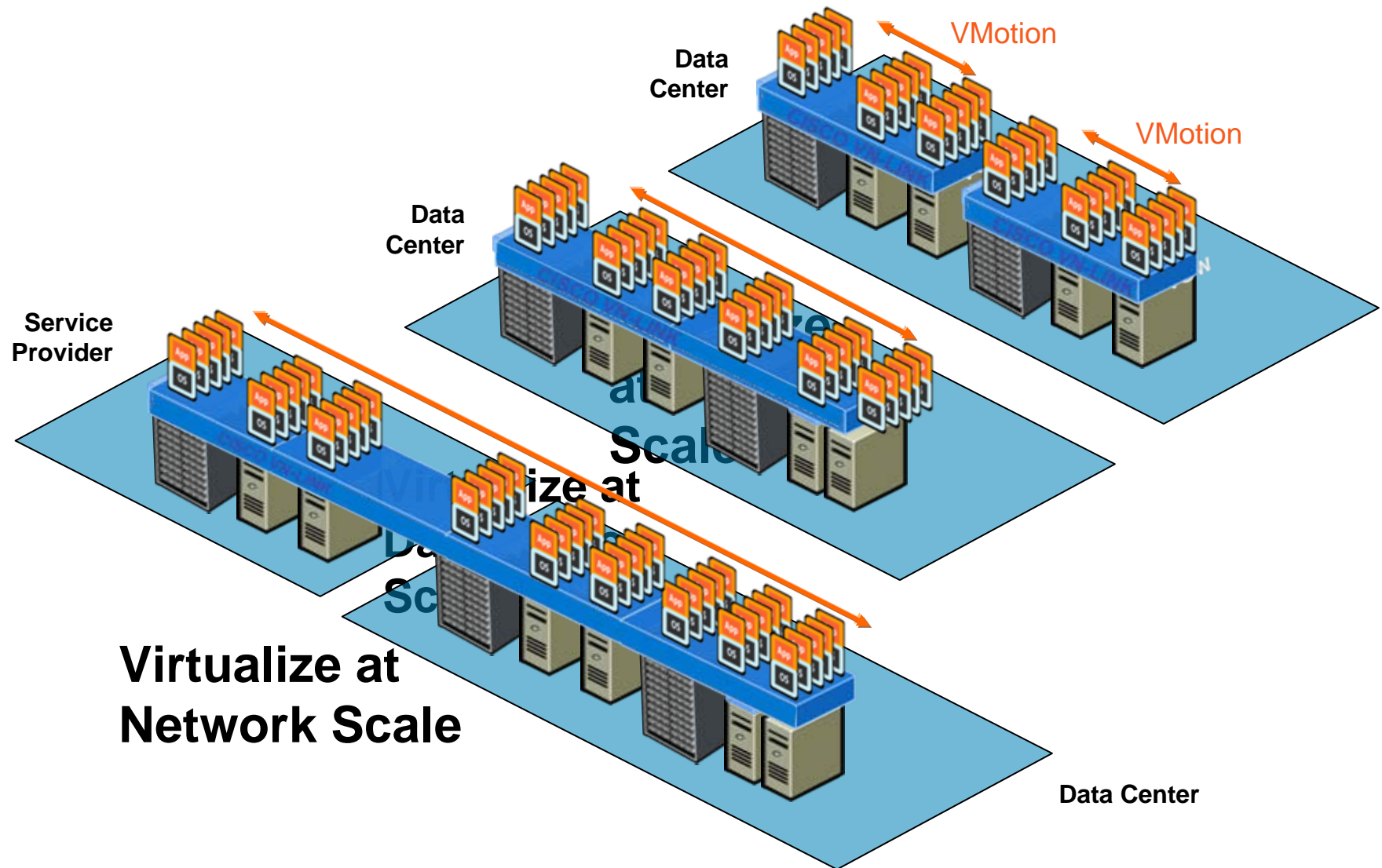
Consolidation → Abstraction → Automation → Utility → Market



Consolidation → Abstraction → Automation → Utility → Market

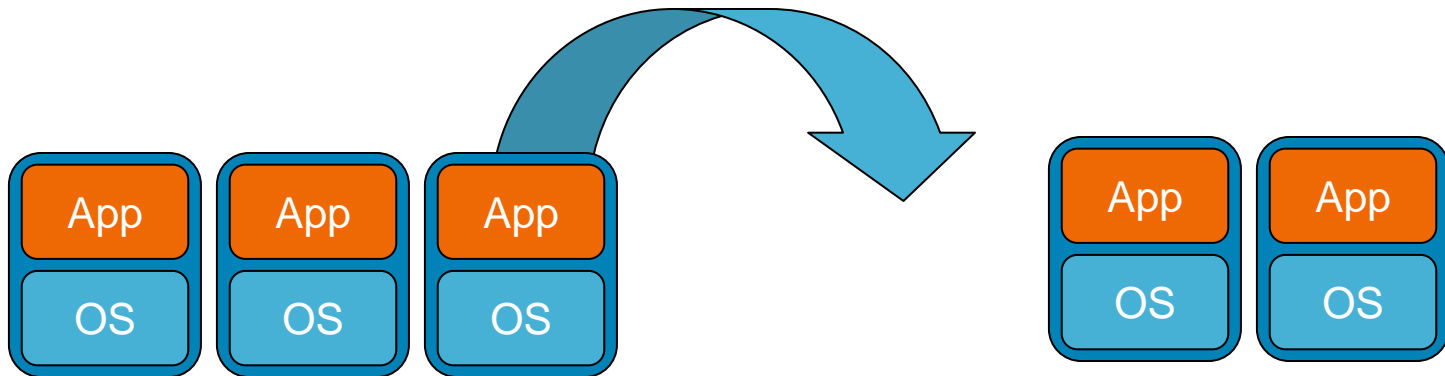


Consolidation → Abstraction → Automation → Utility → Market



Consolidation → Abstraction → Automation → Utility → Market

Orchestration System

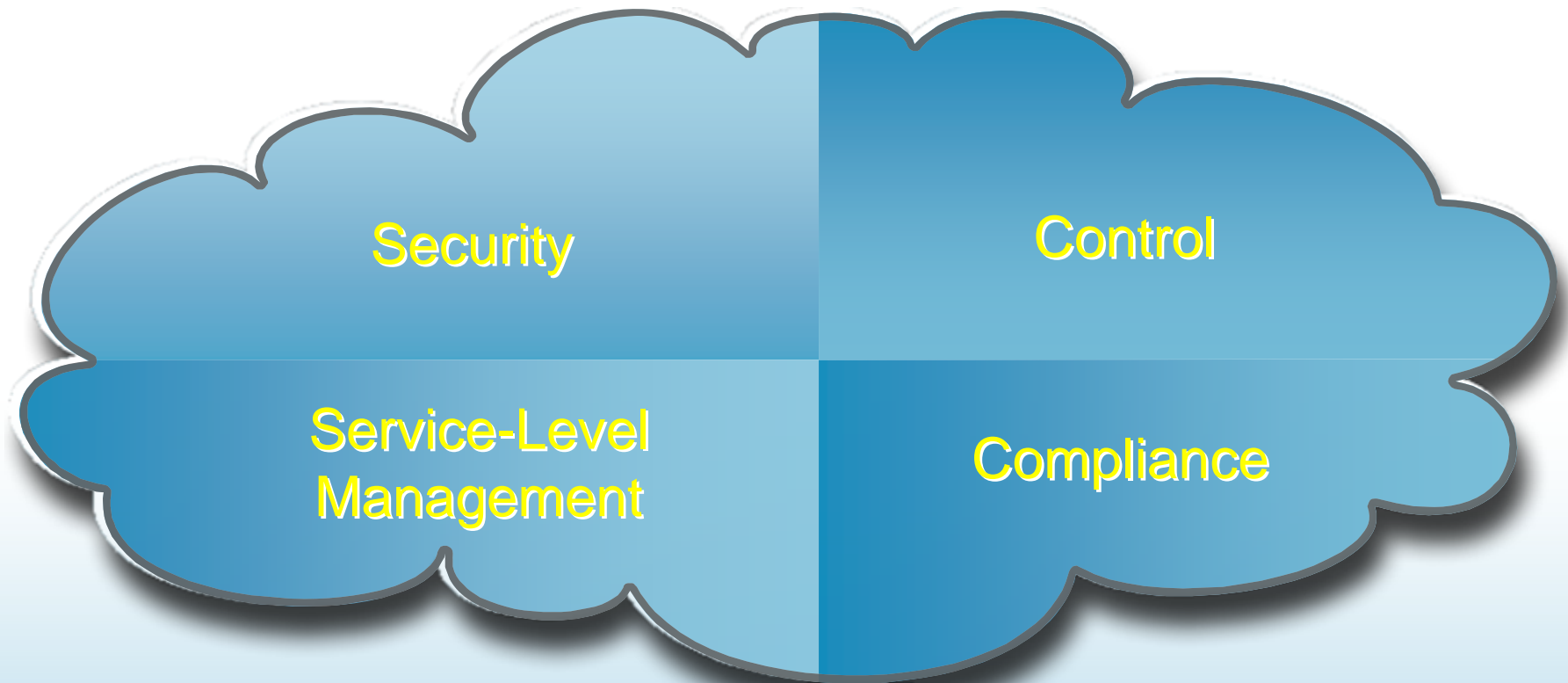


Dynamic Infrastructure



The Foundation of Next Generation IT: Trust

Before the Economics of Virtualization or Cloud Computing Can Be Considered, the Enterprise Requires a Trusted Service Infrastructure

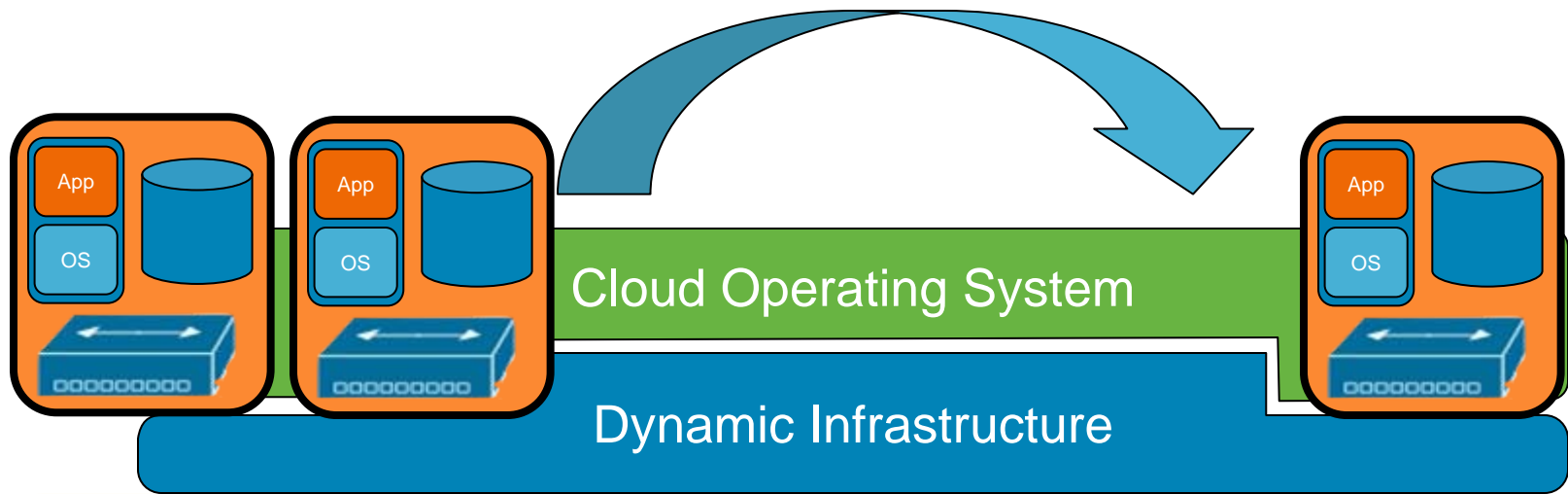


Consolidation → Abstraction → Automation → Utility → Market

Private Cloud

A networked system of IT infrastructure managed with cloud computing qualities, such as self-service, pay-as-you-go charge-back, on-demand provisioning and the appearance of infinite scalability, defined and controlled by the enterprise.

Consolidation → Abstraction → Automation → **Utility** → Market



Consolidation → Abstraction → Automation → Utility → Market

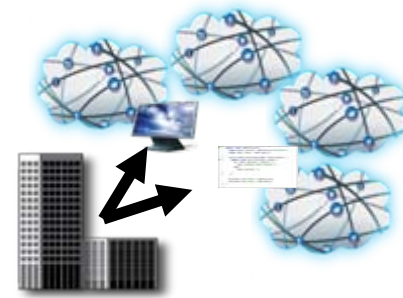
Internal Cloud vs. External Cloud



≠



Private Cloud vs. Public Cloud

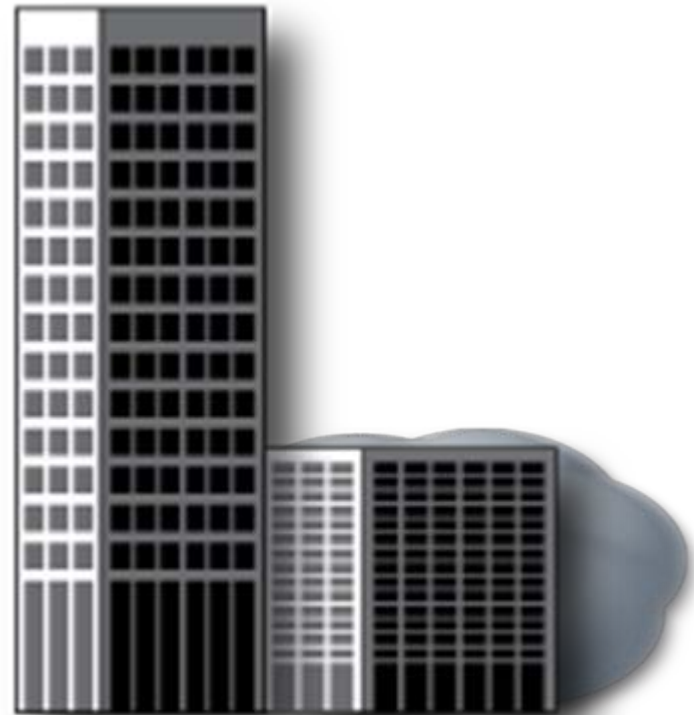


Private Cloud – Early Stage Pilots

Clouds developed around a few non-critical applications.

For example:

- Self-service virtualized development and testing labs
- Grids for:
 - Academic research
 - Experimental models
 - Data mining
- Intranet application environments with widely varying loads



Private Cloud – Scale/Expand to Production

Success with pilot private clouds leads to expansion of private clouds:

- Resource pools are expanded
- New classes of application architectures are utilized:
 - MapReduce applications (like Monte Carlo simulations or protein folding)
 - “Shared memory” web sites and applications

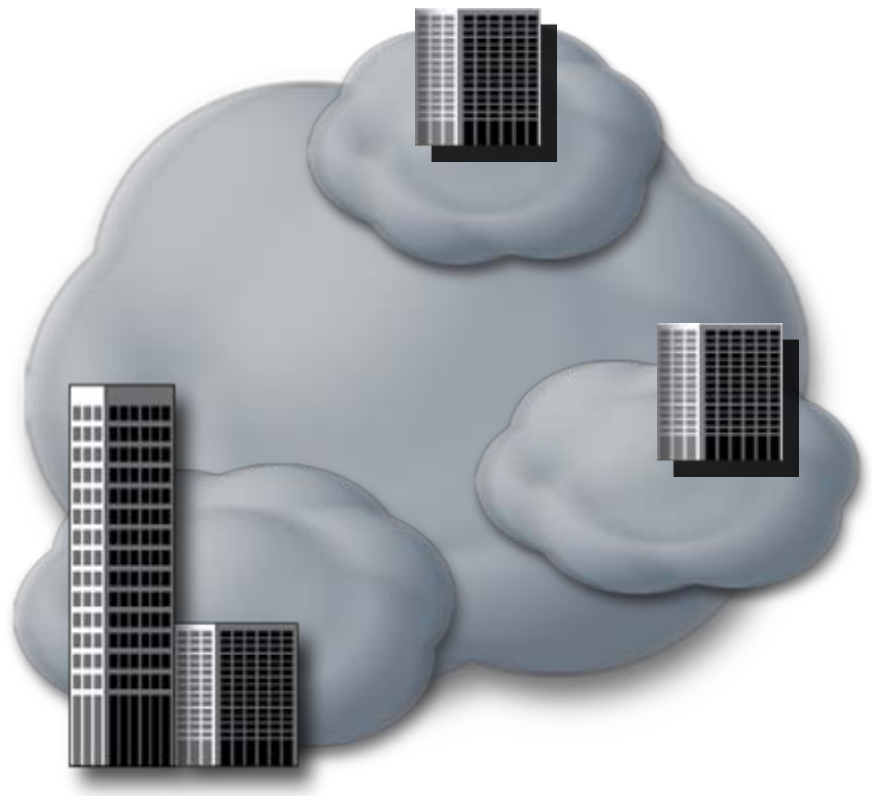


Federation

Organizations with multiple private clouds will gain a benefit from federating those clouds.

Federation allows private clouds to:

- Strengthen the illusion of infinite available capacity through resource sharing
- Leverage peer clouds for:
 - Disaster recover
 - Global distribution



Consolidation → Abstraction → Automation → Utility → Market

Virtual Private Cloud

A service offering that allows enterprises to extend their private clouds to include infrastructure services provided by the service provider.

Virtual Private Clouds – Single Cloud Service Provider

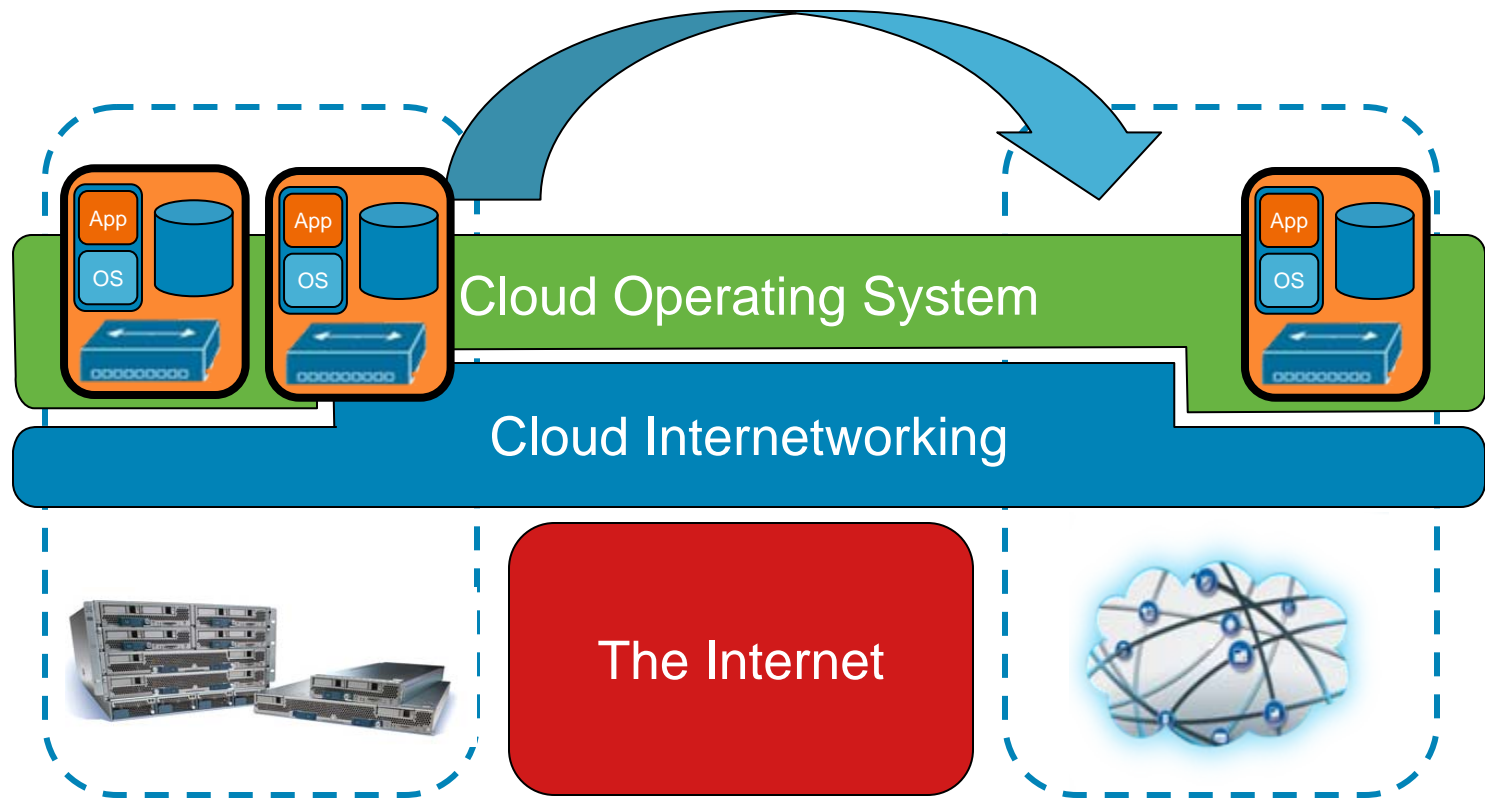
Commercial cloud vendors offer virtual private cloud services

Virtual private clouds allow the customer to:

- Add the vendor's infrastructure to their own private clouds
- Maintain complete control through existing private cloud management tools
- Incorporate billing into private cloud chargeback mechanisms



Consolidation → Abstraction → Automation → **Utility** → Market



Consolidation → Abstraction → Automation → Utility → Market

Open Cloud

Service provider infrastructure that allows federation with similar infrastructure offered by other providers. Enterprises can choose freely among participants, service providers can leverage other providers' infrastructures to handle exceptional loads on their own offerings.

Virtual Private Cloud – Open Cloud Service Providers

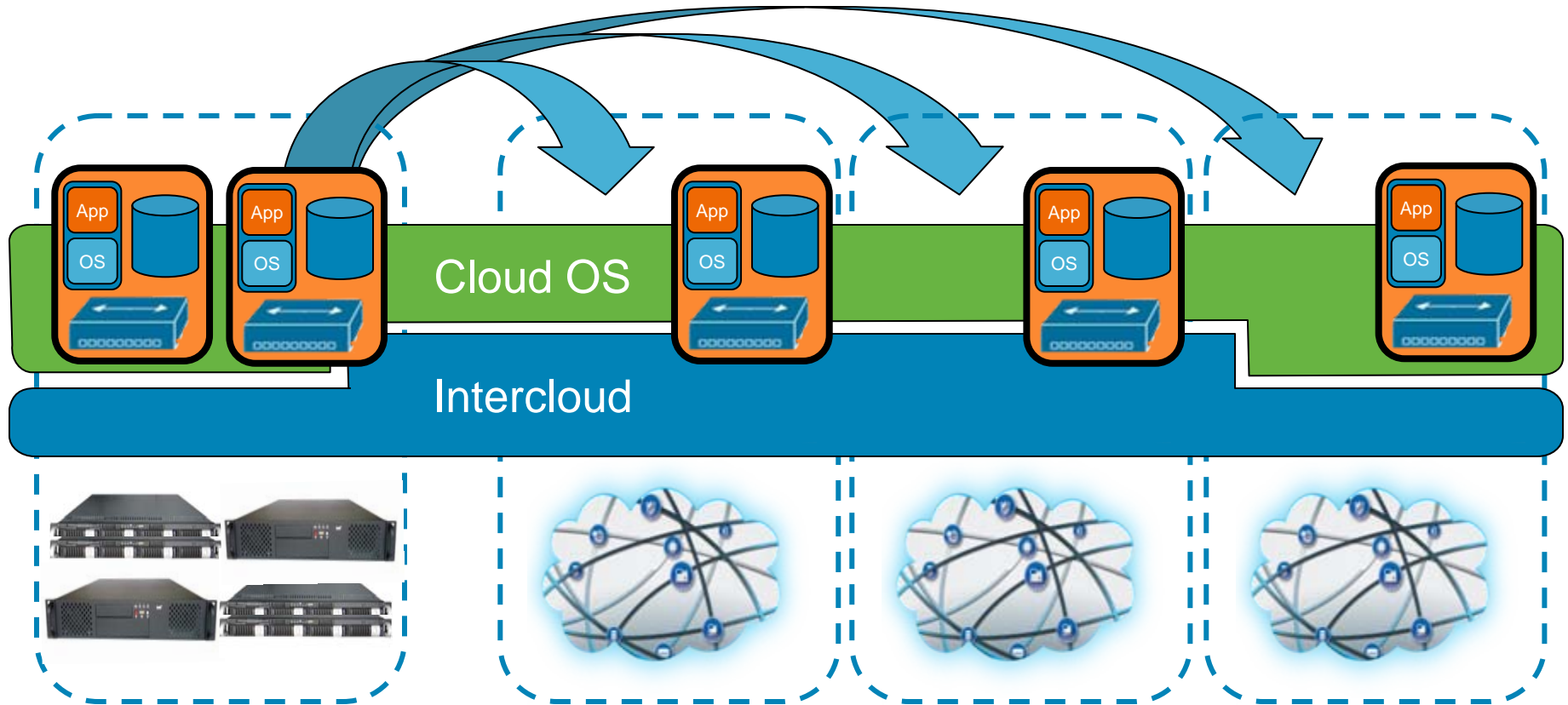
Multiple vendors using standard virtual private cloud platforms form an open cloud market

These open clouds allow:

- Customers to choose from multiple possible vendors based on price, performance and/or services
- Vendors to partner to extend capacity, reliability and services

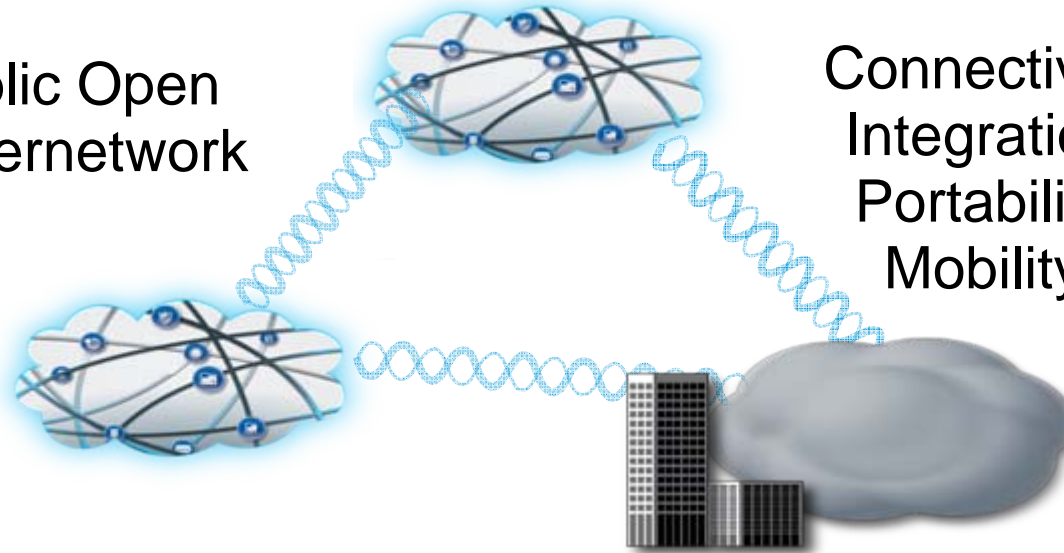


Consolidation → Abstraction → Automation → Utility → Market



The Intercloud

The Public Open
Cloud Internetnetwork



Connectivity
Integration
Portability
Mobility

Based on Open Industry Standards:
Naming/Discovery
Trust
Exchange/Peering