



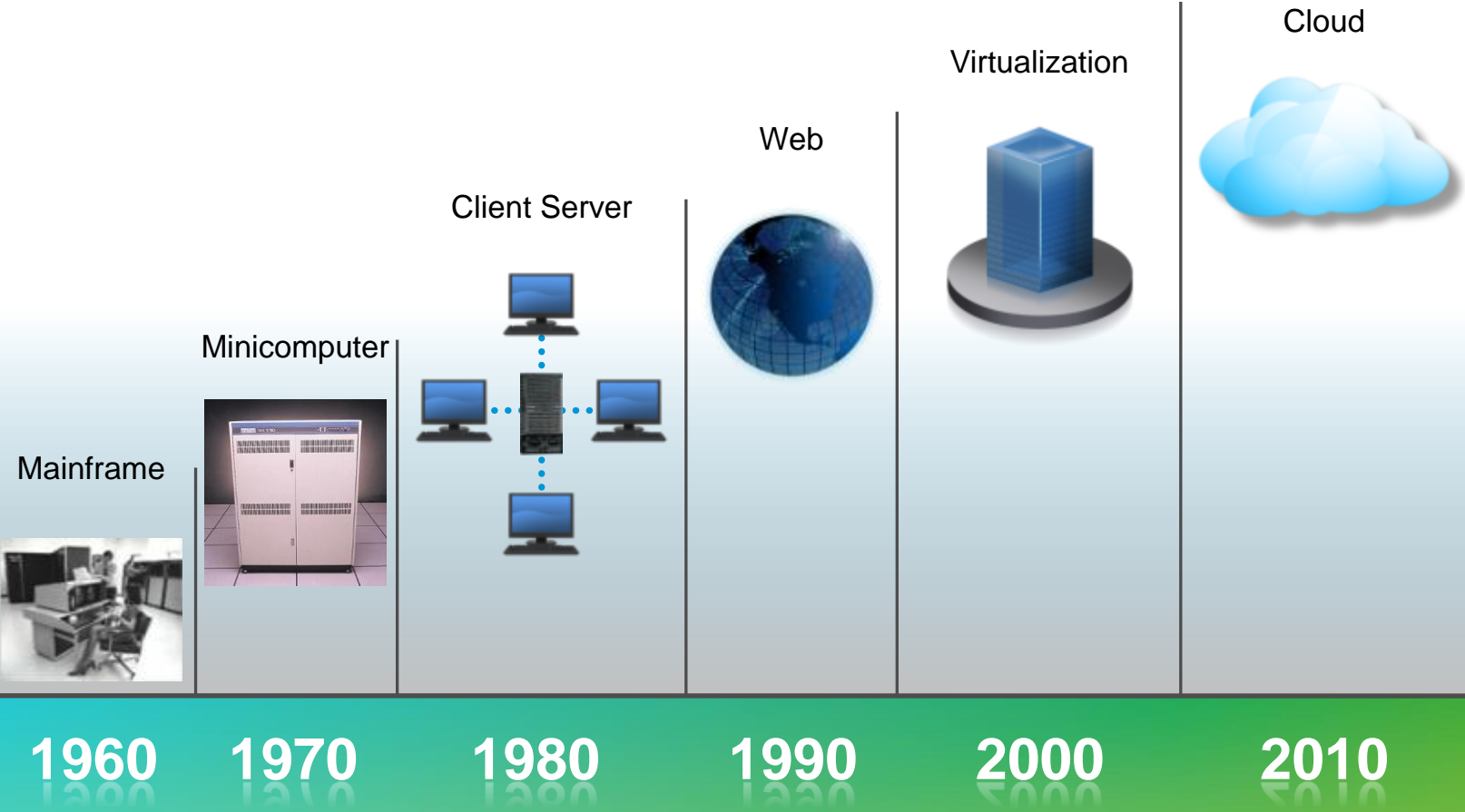
# Cisco Expo 2011

## The Journey to the Cloud

Axel Clauberg, SE Director  
Solutions & Architectures,  
CTO, Emerging Markets



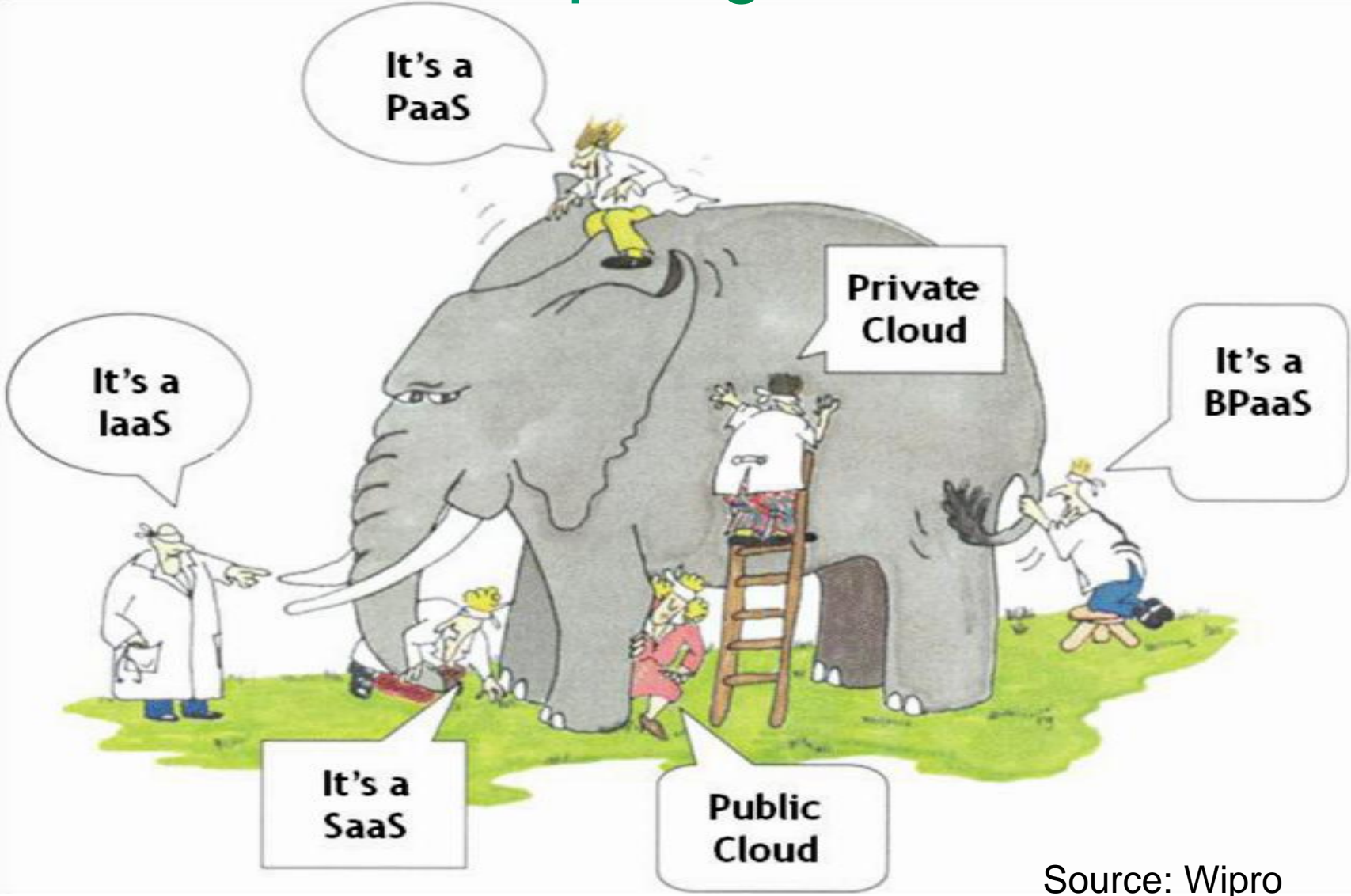
# Cloud Computing Is the Next Big Step in the Evolution of Computing and the Internet.



# Cloud covers a lot of territory

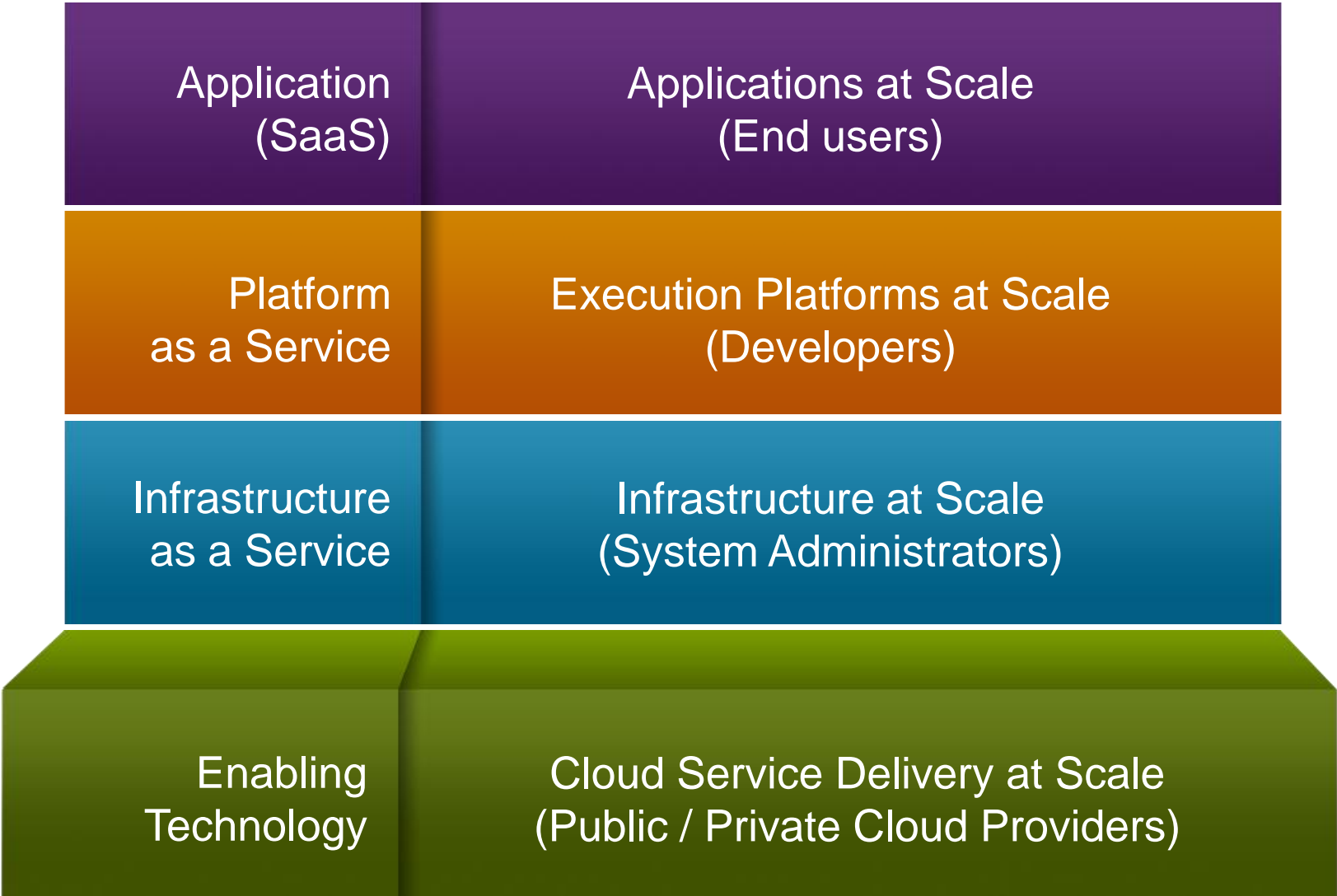


# What Is Cloud Computing?



Source: Wipro

# Cloud Delivery Models



# Cloud Deployment Models

Public Cloud	Cloud infrastructure made available to the general public.
Private Cloud	Cloud infrastructure operated solely for an organization.
Hybrid Cloud	Cloud infrastructure composed of two or more clouds that interoperate or federate through technology
Community Cloud	Cloud infrastructure shared by several organizations and supporting a specific community

...and one other

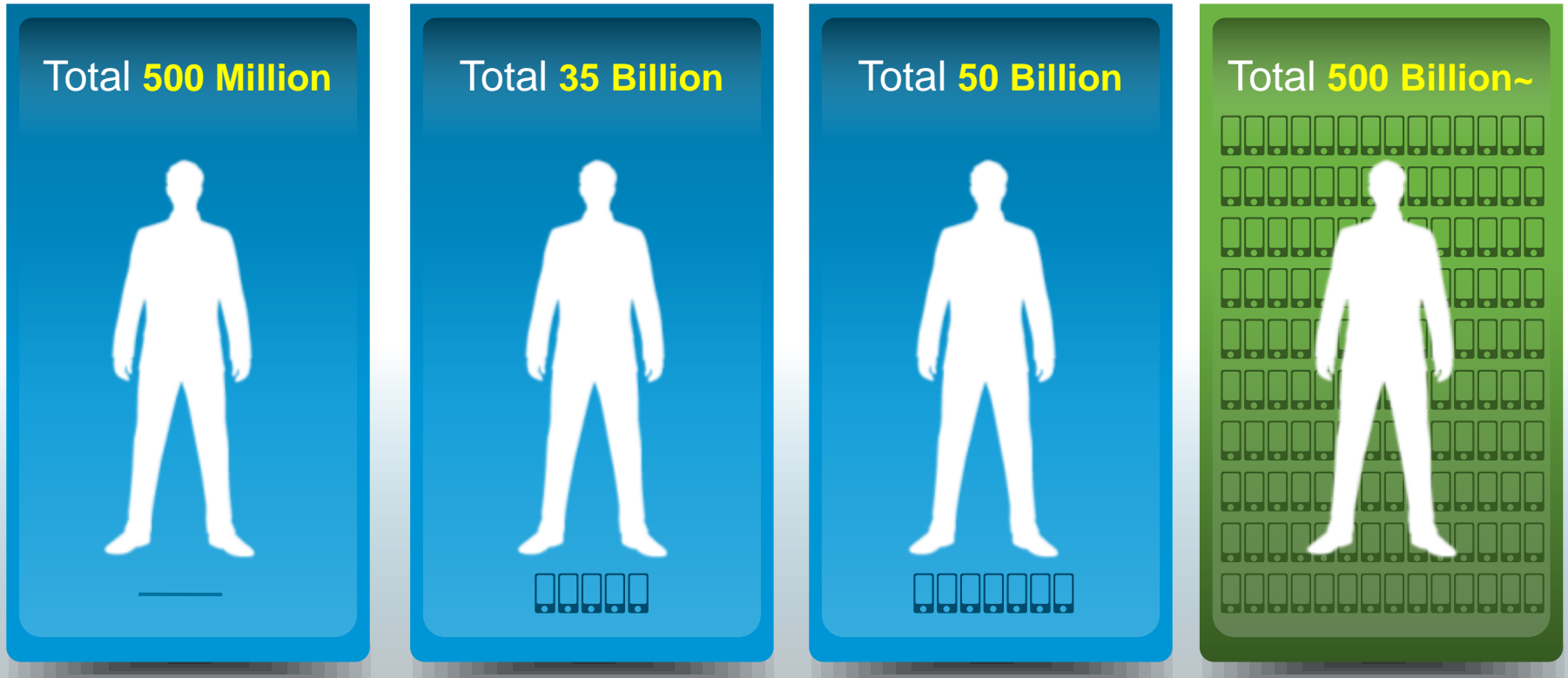
Virtual Private Cloud	Cloud services that simulate the private cloud experience in public cloud infrastructure
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# Age of “Warehouse Scale” Machines



Google's data center on the Columbia river, Oregon

# Growth of Connected Devices



1/10<sup>th</sup> of a Device per  
Person on Earth  
**2007**

5 Devices per  
Person on Earth  
**2010**

7 Devices per  
Person on Earth  
**2013**

70~ Devices per  
Person on Earth  
**2020**

Source: Forrester Research, Cisco IBSG



# An Even Larger Cloud Is on the Horizon



Reference: J. Rabaey, "A Brand New Wireless Day," Keynote Presentation, ASPDAC Jan. 2008

# We Are Rapidly Approaching...

**1 Trillion**  
Connected Devices

**1 Million**  
Applications

**1 Zettabyte**  
1B Terabytes of Content





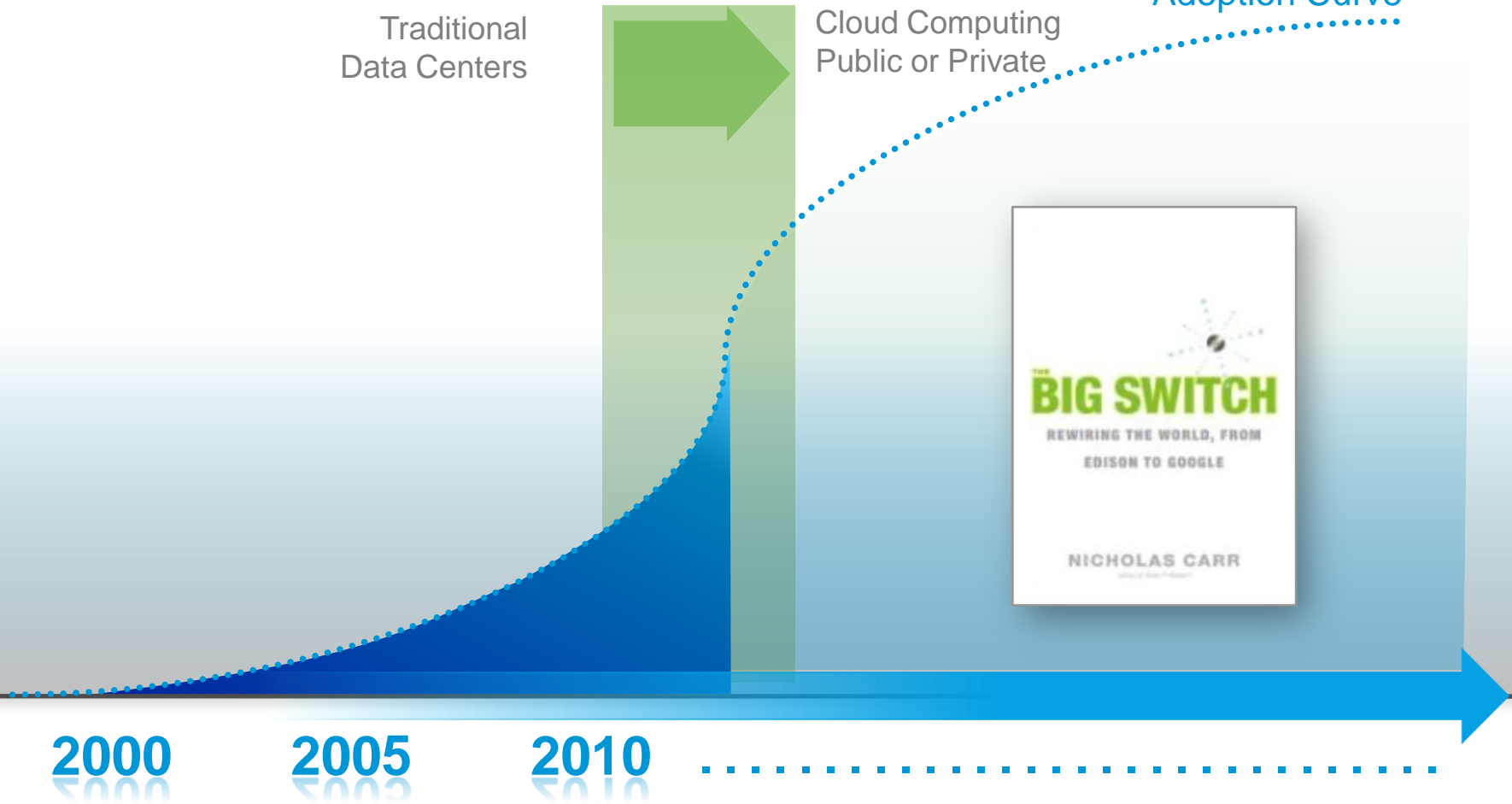
# Cloud Computing Arriving Just in Time

# We Are at the Very Beginning of a Major Shift

Traditional Data Centers

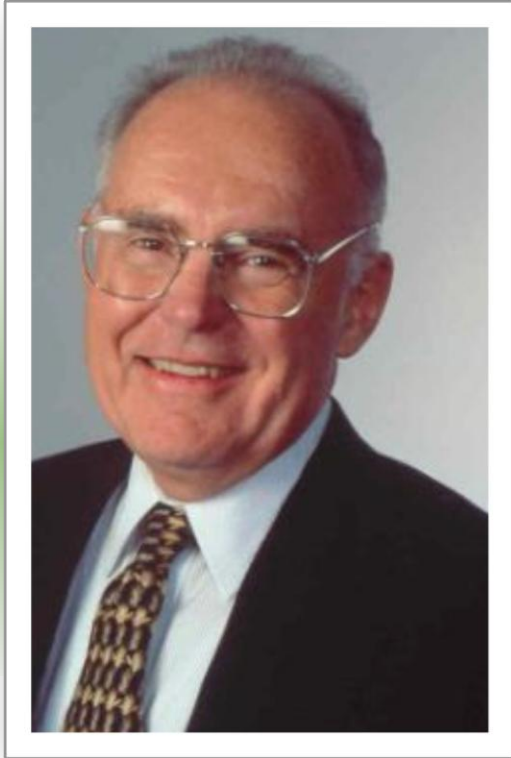
Cloud Computing  
Public or Private

Adoption Curve

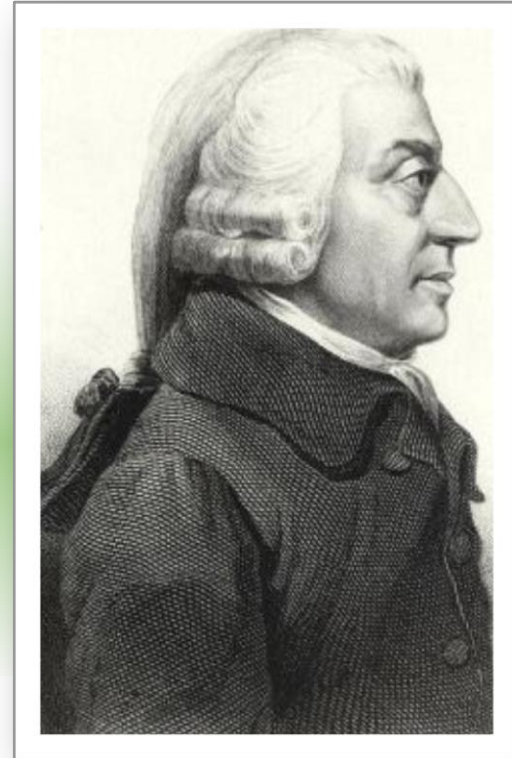


Prediction is very difficult, especially if it's about the future.  
Niels Bohr

# Driven by: Technology + Economics



○ — Gordon Moore —



— Adam Smith — ○

# Cisco's Cloud Strategy

## Essential Infrastructure for Building Clouds



For customers to build and operate public or private clouds

## Solutions for Deploying Cloud Services



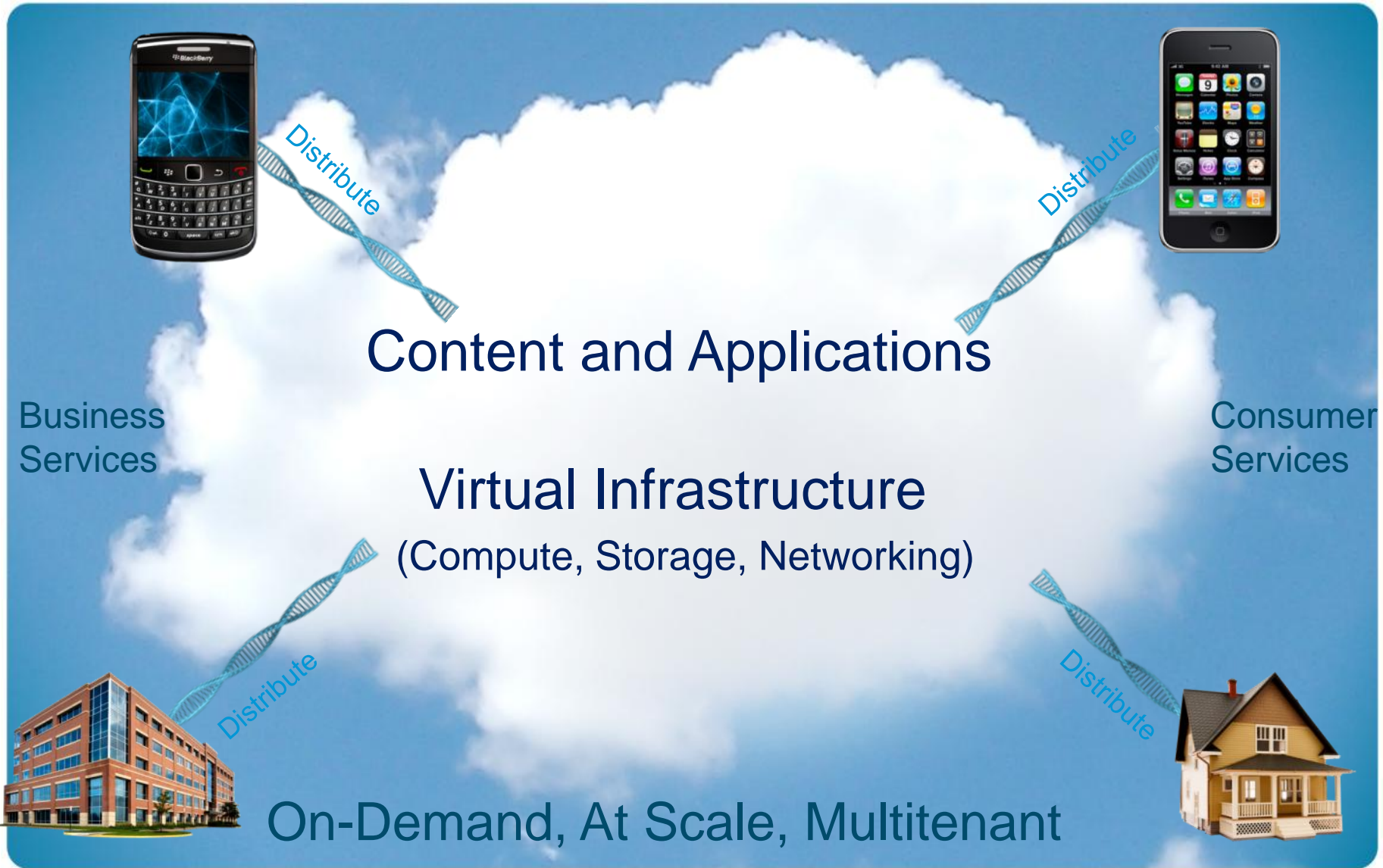
For customers to deploy fully-tested, best-of-breed cloud services

## Innovation to Accelerate Use of Clouds

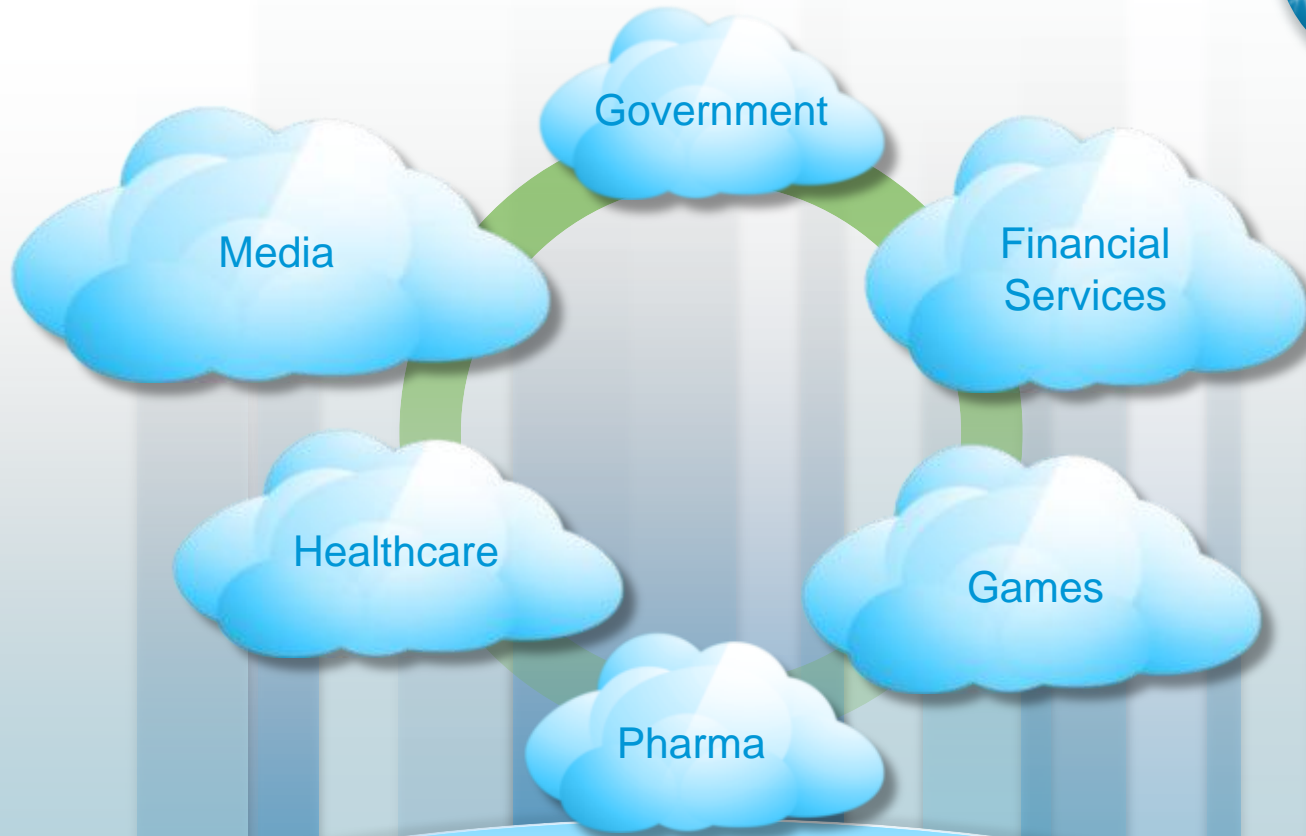


For users to access and collaborate using secure cloud services

# Everything as a service in the cloud



# A World of Many Clouds



Public **Seamlessly Connected  
Securely Accessed** Private

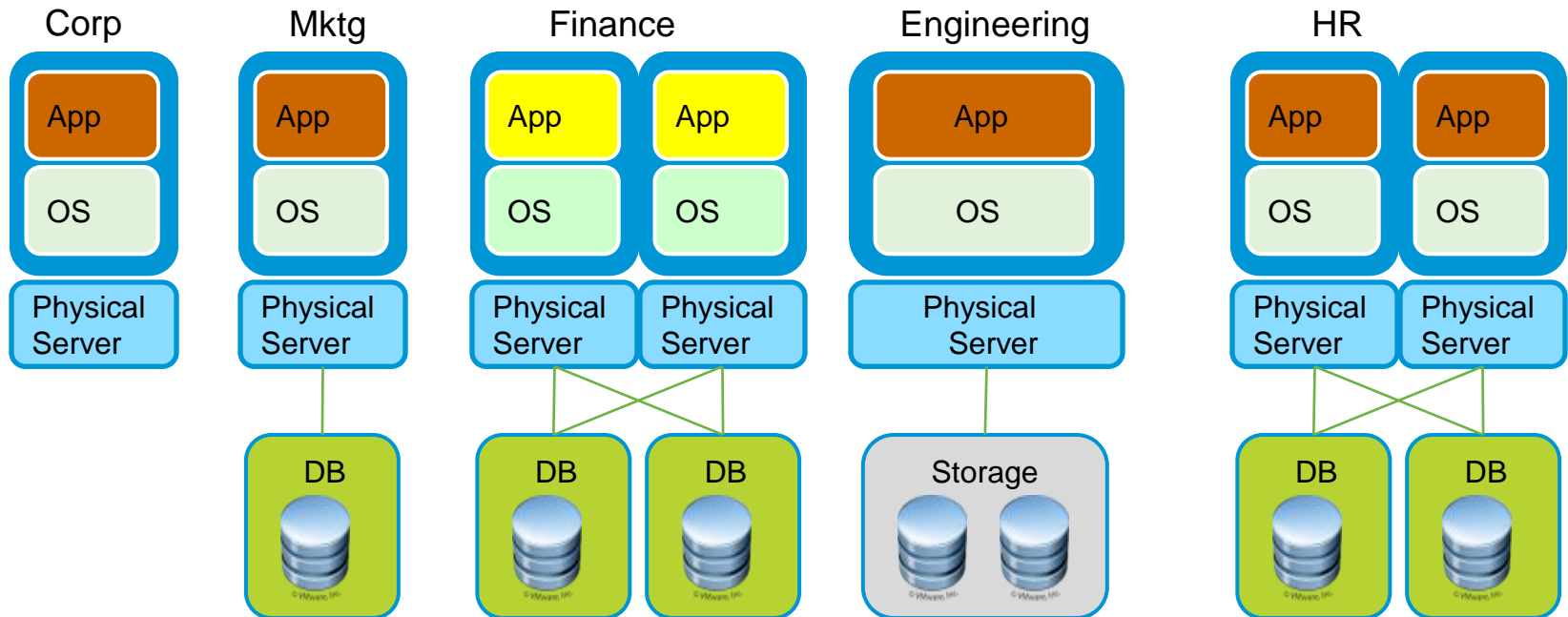


# Why is the enterprise interested?

- Cloud computing is an operational model that arose out of the world of web applications needing massive, horizontal scale
- It's already taking off in new web-based companies where the economics favor a pay-as-you go financial model
- The economics of this has caught the attention of mainstream businesses
- Service providers are beginning to acknowledge the requirements for enterprise-class cloud computing
- In the meantime, can the cloud-computing model work in an on-premise, "private cloud"?

# Traditional Data Center Approach

## Complexity Grows With Number of Apps



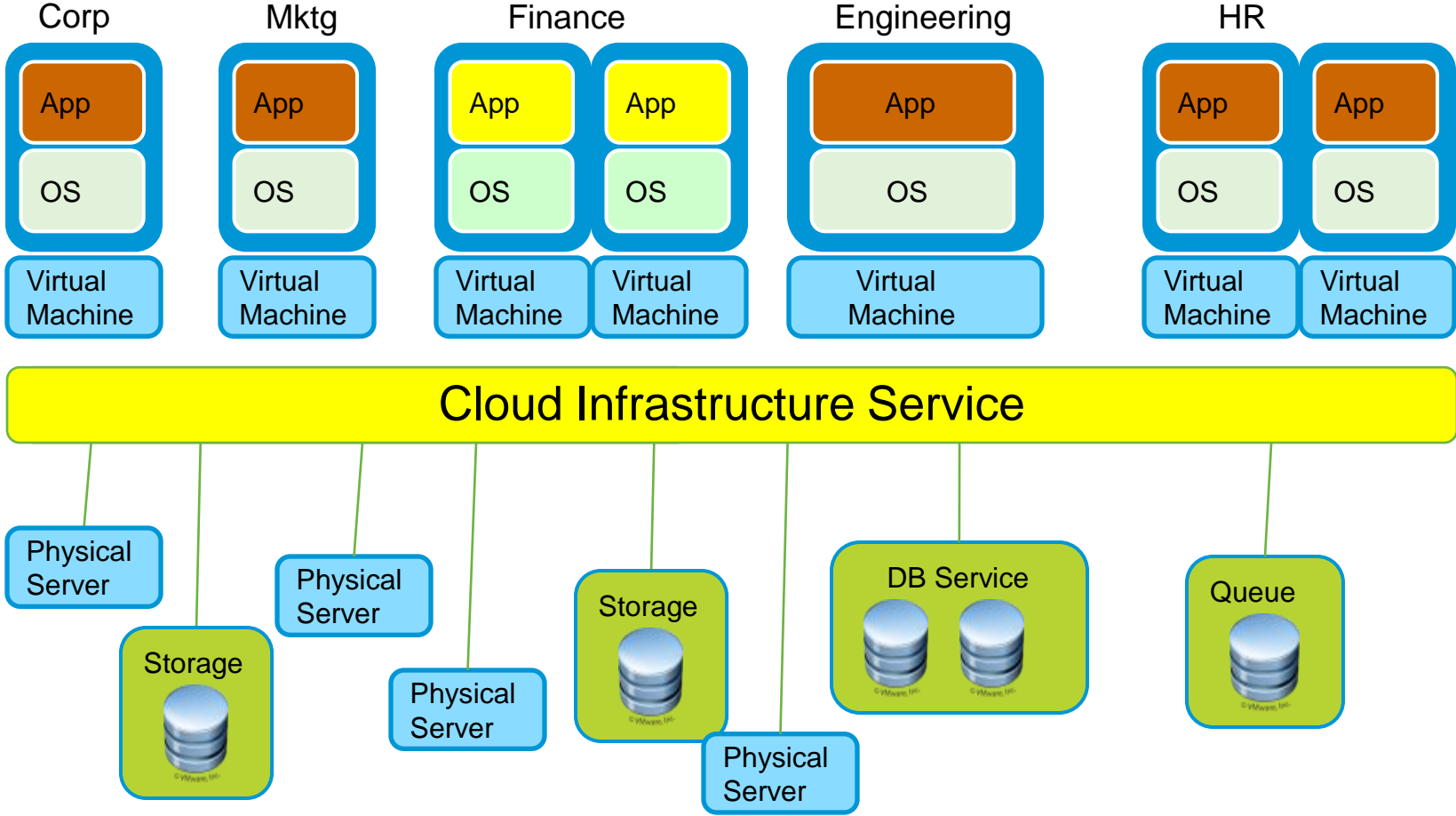
Poor Utilization



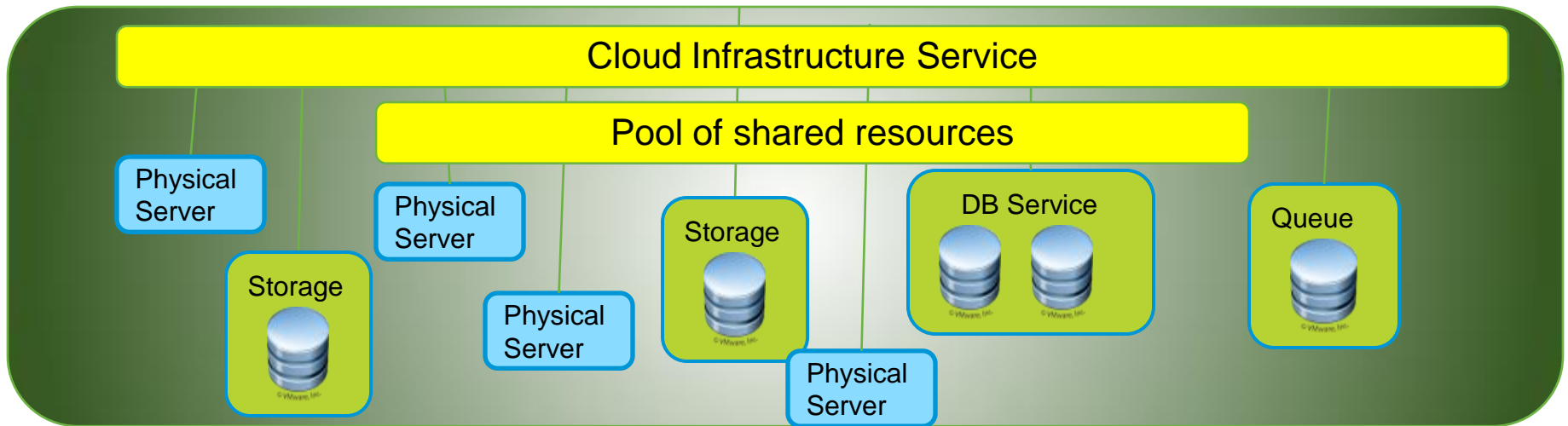
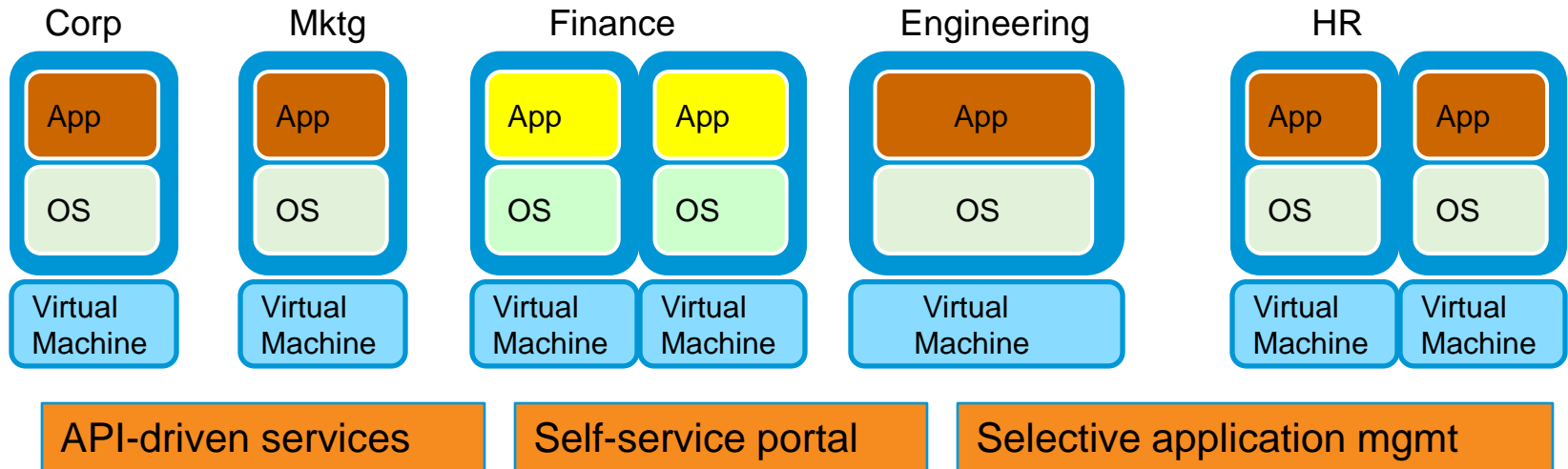
Inflexible Infrastructure

# Cloud-based IT Delivery Model

Applications Run on Virtualized Infrastructure

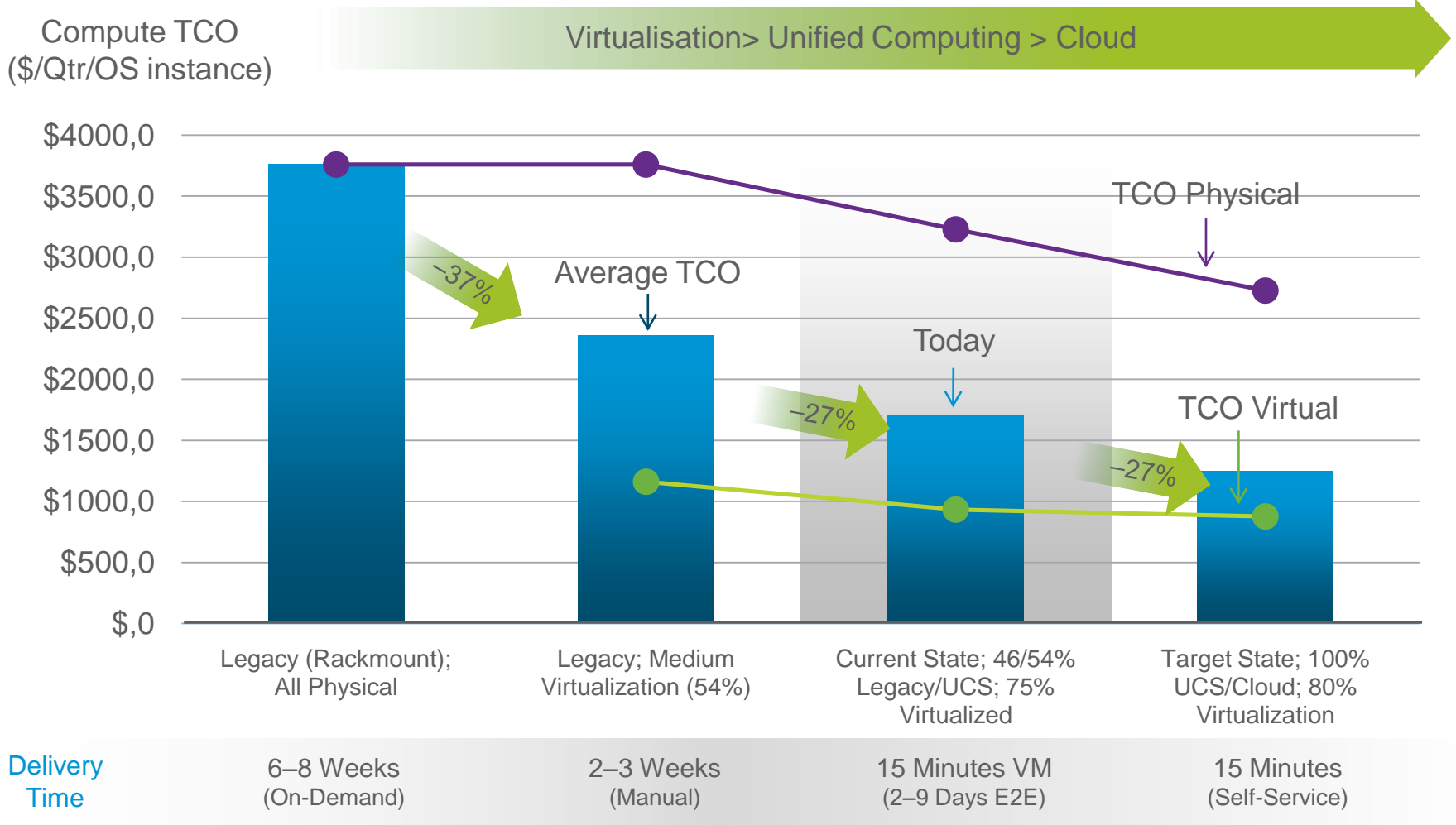


# Infrastructure Becomes Scalable & Efficient



# Cisco Private Cloud Brings Agility & Cost Benefits

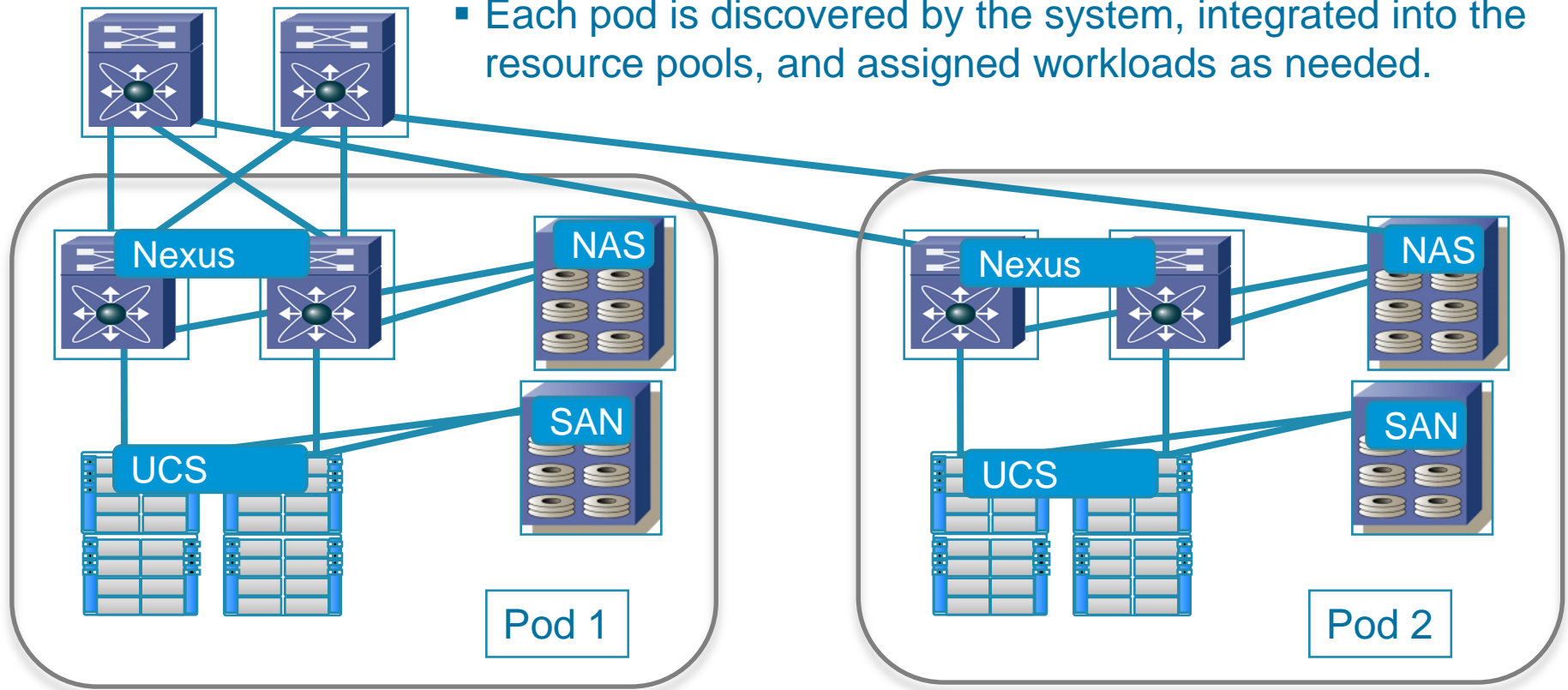
## TCO and Provisioning Times



Updated Q2FY11.

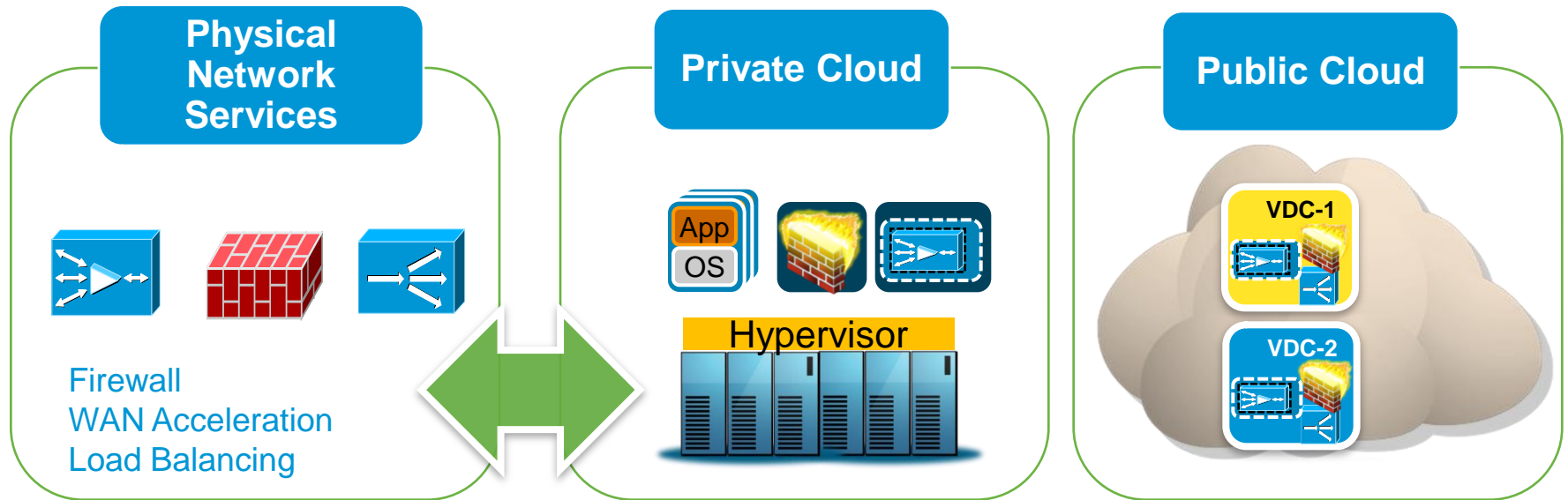
# Add Capacity via Pre-defined Building Blocks

- Network, Compute and Storage Resources Pre-Integrated into “pods”
- System adds capacity by adding pods
- Each pod is discovered by the system, integrated into the resource pools, and assigned workloads as needed.



# Networking Services for the Cloud

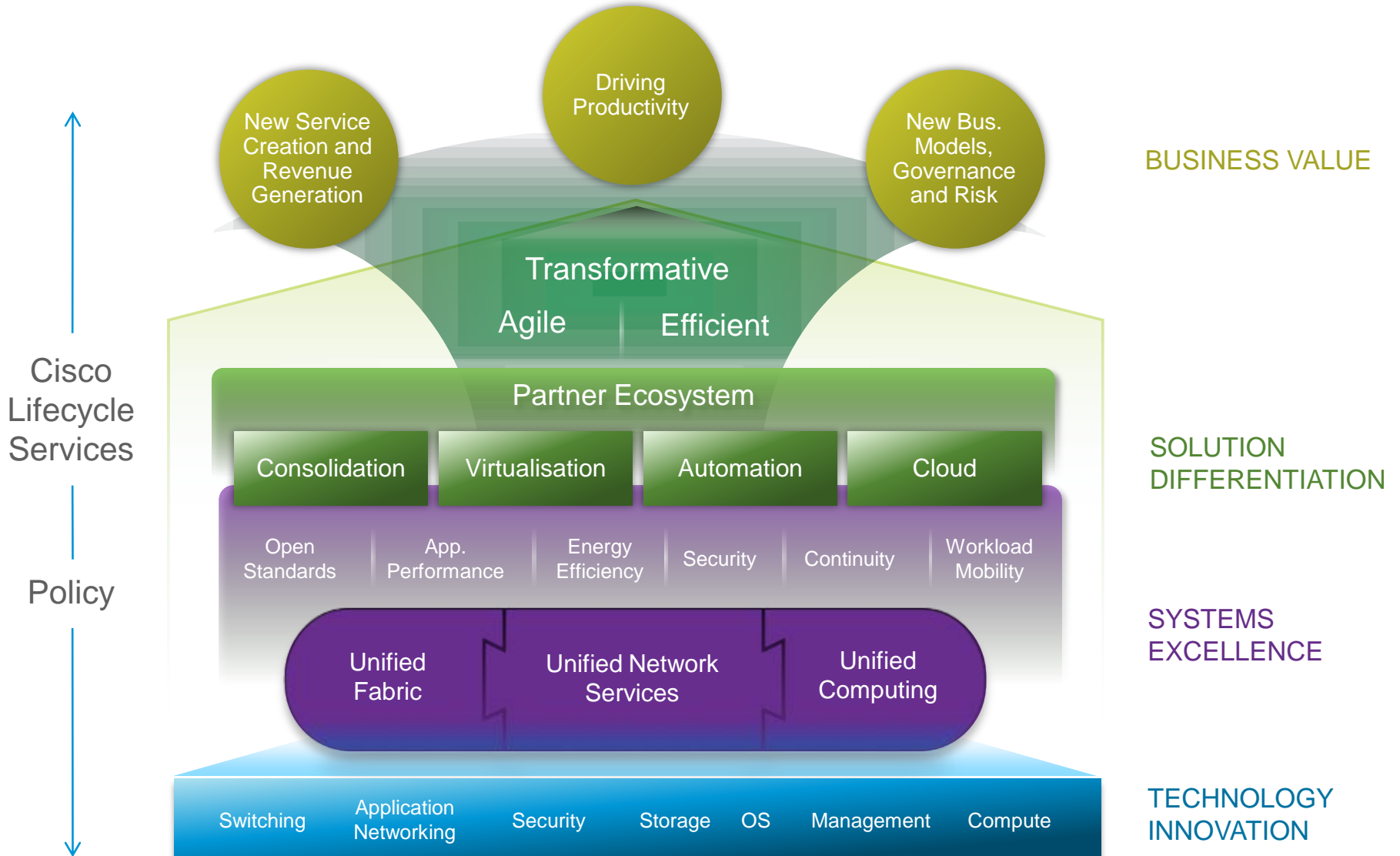
... Network Management of VMs, Virtual Network Services, Security, & Intelligent Routing



- Virtual appliance form factor
- Elastic Instantiation/Provisioning
- Service transparent to VM mobility
- Integrated policy-based management
- Intelligent traffic steering with vPath

- Virtual Security Gateway
- Virtual WAN App Acceleration
- Virtual Management Center
- Nexus 1000v

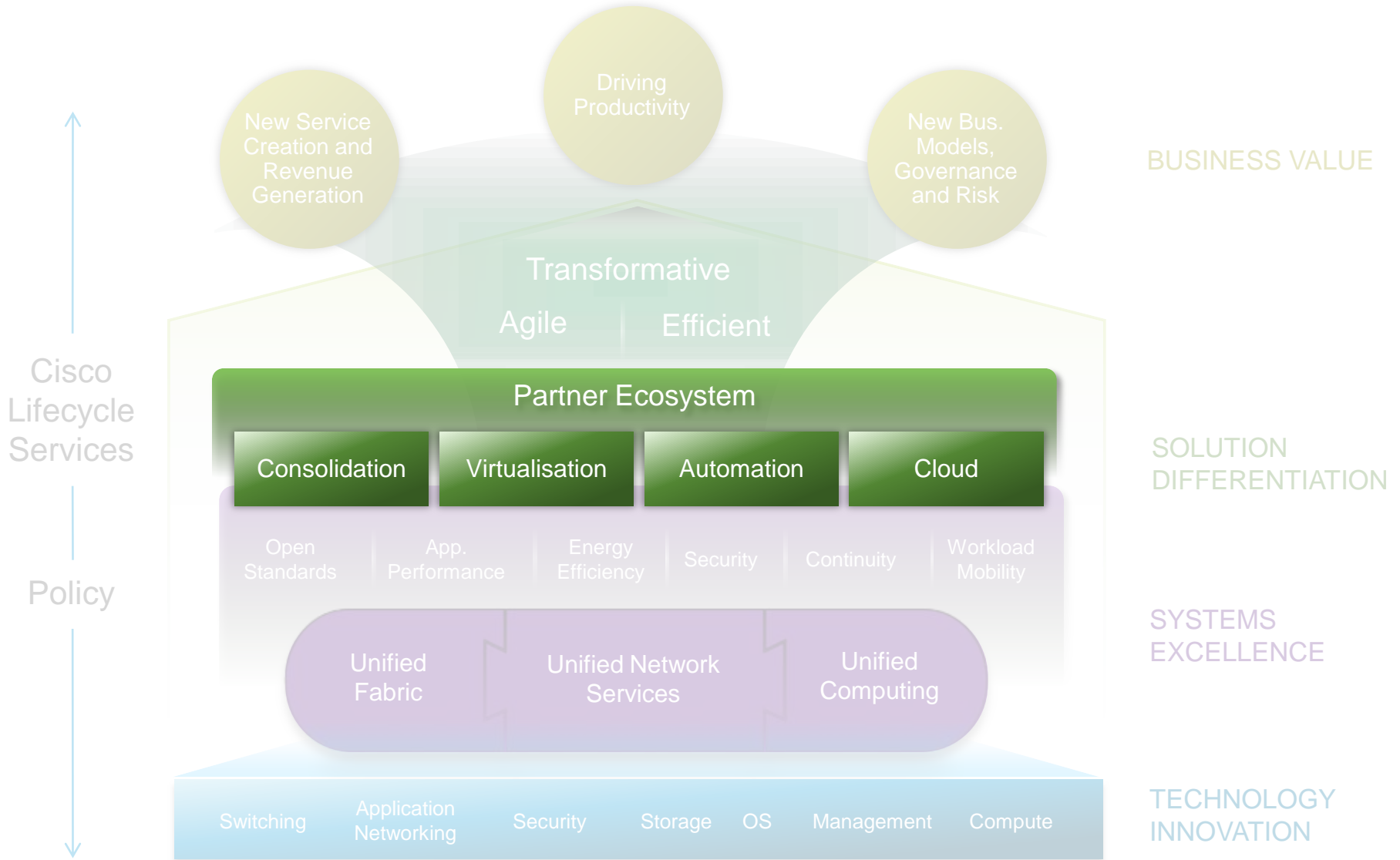
# Data Centre Business Advantage Architectural Framework





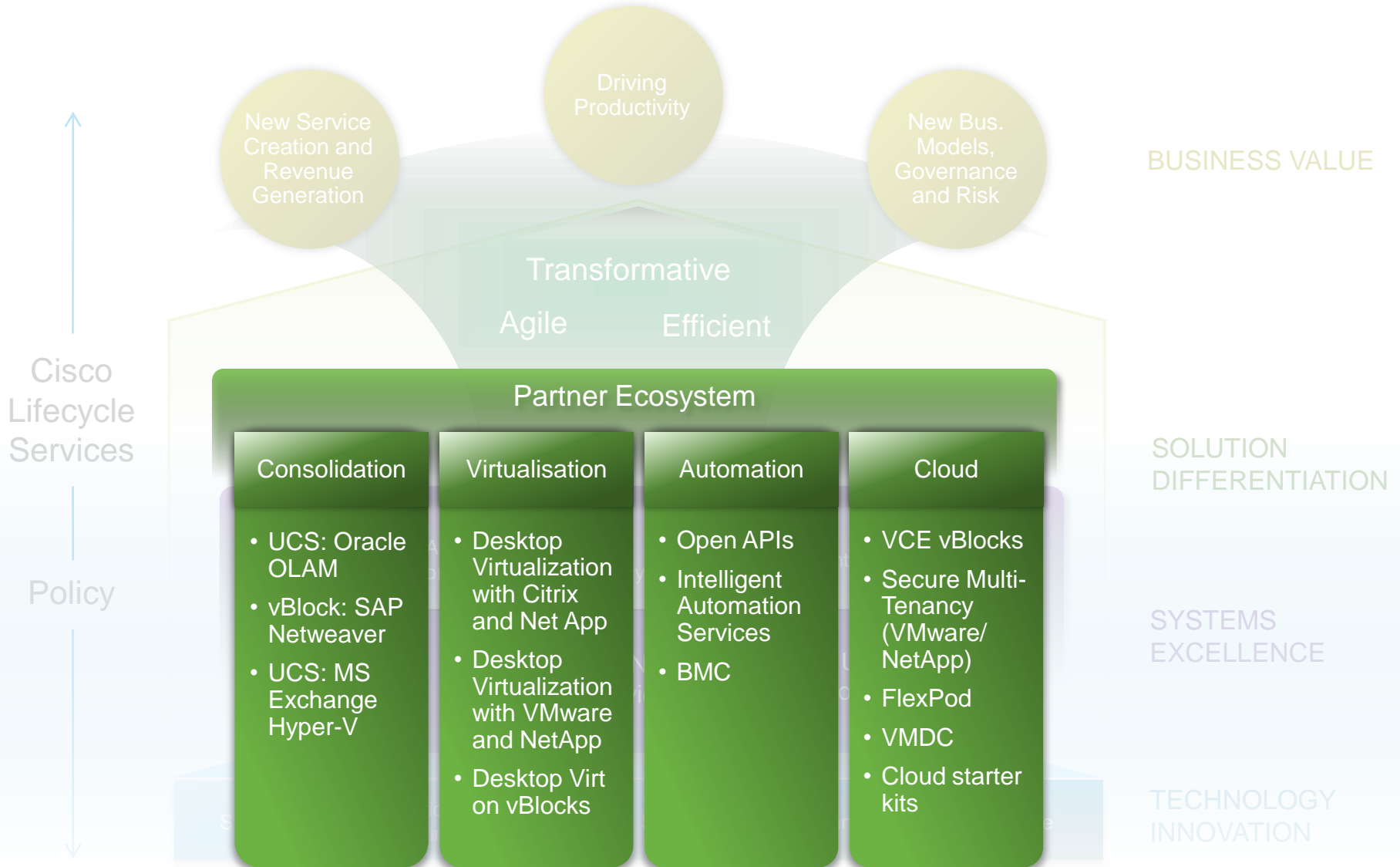
# Data Centre Business Advantage

Whole Offers and Solutions



# Bringing It All Together

## New Solutions and Whole Offers



# Partner Ecosystem

## Integration and Certification Partners

### Database /Middleware

ORACLE<sup>®</sup>  
DATABASE 11<sup>g</sup>

Microsoft<sup>®</sup>  
SQL Server 2008

MySQL<sup>™</sup>

GIGASPACES

Greenplum

### Enterprise Applications

ORACLE<sup>®</sup>  
E-BUSINESS SUITE

SAP

Microsoft<sup>®</sup>  
Exchange

PeopleSoft

SIEBEL

Microsoft<sup>®</sup>  
SharePoint Server 2010

### Operating Systems

Windows Server 2008 R2

redhat

Novell

ORACLE



solaris

### Virtualisation

vmware

Microsoft

CITRIX

redhat

ORACLE

### Storage

EMC<sup>2</sup>

NetApp

HITACHI

3PAR

IBM

### Management

newScale<sup>®</sup>  
The Service Catalog Leader

Microsoft<sup>®</sup>  
symantec

bmcsoftware

EMC<sup>2</sup>  
ca

Compuware  
Zenoss

vmware  
IBM

# Solutions for Cloud

## Business Application Solutions

Hosted Collaboration Solution

vmware<sup>®</sup> CITRIX<sup>®</sup>  
EMC<sup>2</sup> where information lives  
NetApp<sup>®</sup>  
Virtual Desktop Infrastructure (VDI)/  
Cisco VXi

ORACLE<sup>®</sup> SAP<sup>®</sup>  
Microsoft<sup>®</sup>  
Tier-1 Business Applications

## Integrated Computing Stacks

vBlock

FlexPod

Cloud Starter

## Unified Data Centre Networking

Unified Fabric

Unified Network Services

Unified Computing

## Cloud Management



# The Challenge of the Desktop PC

~ 275M PCs in the workplace



Configuration



Installation



Maintenance



Help Desk



User Downtime



Refresh Cycles

## Bank Of America Settles Countrywide Data Theft Case

2010-08-24 - Los Angeles Times

...and roughly 15 million additional Countrywide borrowers and mortgage applicants will be offered credit monitoring, identity theft insurance and reimbursement for losses of up to \$50,000. Norton said she didn't know how many people...  
Via DayLife

## Data Theft Hits 7,000 Cuny Students Weeks Ago

2010-09-07 - New York Daily News

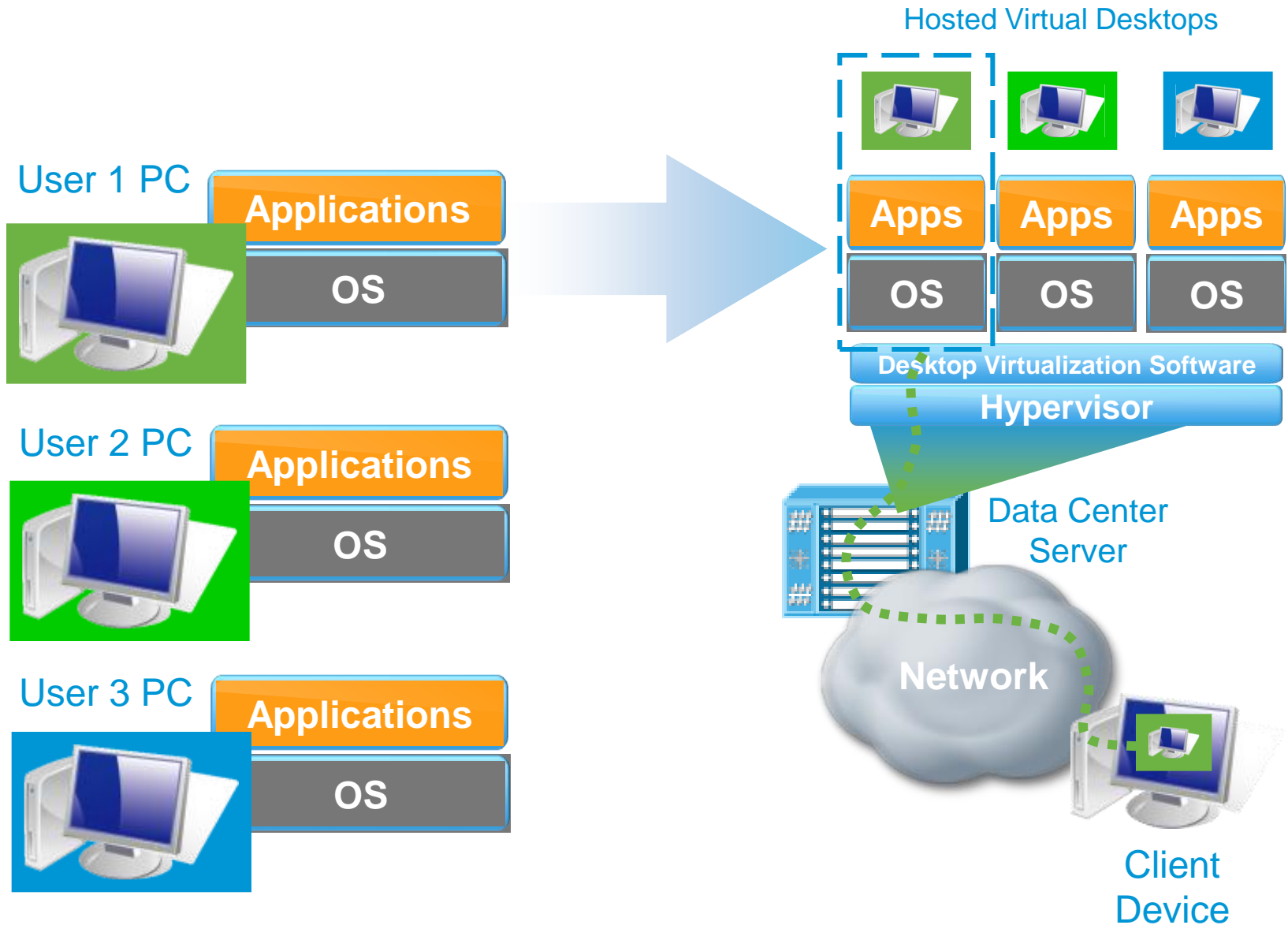
...weeks ago. The desktop computer was password-protected, but students about the possibility of identity theft, "ABC Eyewitness News" reported to New York to sign his \$46 million contract today. On Labor...  
Via DayLife

## Laptop With Social Security Numbers Stolen From U Conn West Hartford

2010-08-19 - West Hartford News

...creditors will know an impostor is not applying for credit; fraud alerts with all three national credit bureaus; and identity theft insurance in the amount of \$25,000 to cover identity restoration costs, lost wages and legal defense fees and expenses. UConn...  
Via DayLife

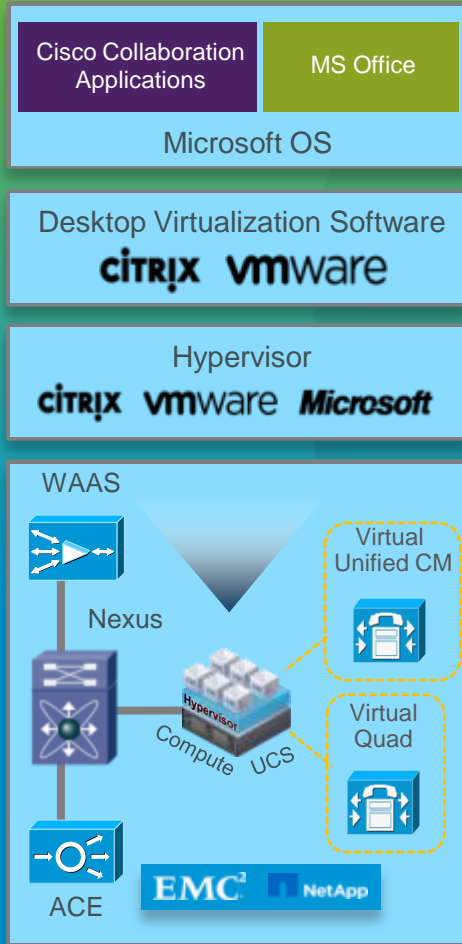
# What Is a Virtual Desktop?



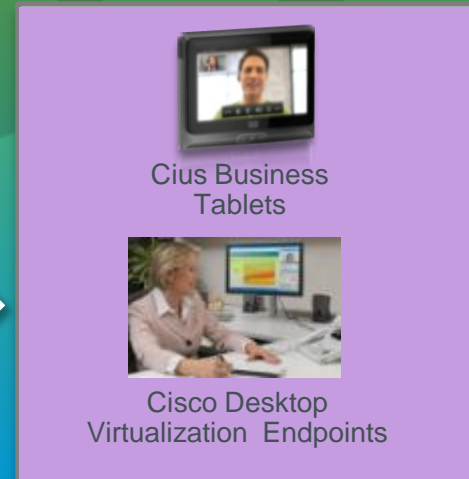
# Network-Wide Virtualization

## VXI End-to-End System Architecture

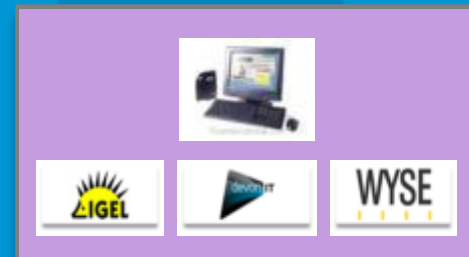
- = Collaboration
- = Borderless Networks
- = Data Center



### Cisco Clients



### Thin Client Ecosystem



End-to-End Security, Management and Automation

# Cisco Solutions for the Cloud

## Cloud-Enabling Solutions

- Unified Computing System
- Unified Service Delivery
- Public and Private Cloud IaaS
- VDI & VXI

## Pervasive Trust and Security Solutions

- ScanSafe, IronPort, AnyConnect
- Security Intelligence Operations
- Physical and Virtual Appliances
- Security In, By and For the Cloud

## Communications and Collaboration Solutions

- Hosted Collaboration Solution
- WebEx
- TelePresence

## Professional Cloud Services

- Cloud Strategy
- Cloud Planning and Design
- Cloud Implementation and Optimization



# Who delivers the Cloud ?

## Enterprise & Public Sector

- Be clear on your core competences, focus & requirements
  - SLAs
  - Security
  - Data Protection
  - Business Needs, Application Skills
- Many large Enterprises decided to build a Private Cloud – move some services out into a Public Cloud
  - Long Term vision: Hybrid
- Many government entities build their Community Cloud or contracted a Service Provider to build it
- Most Services Providers entered the market by building their Private Cloud, in preparation for Virtual Private Cloud/Public Cloud Services

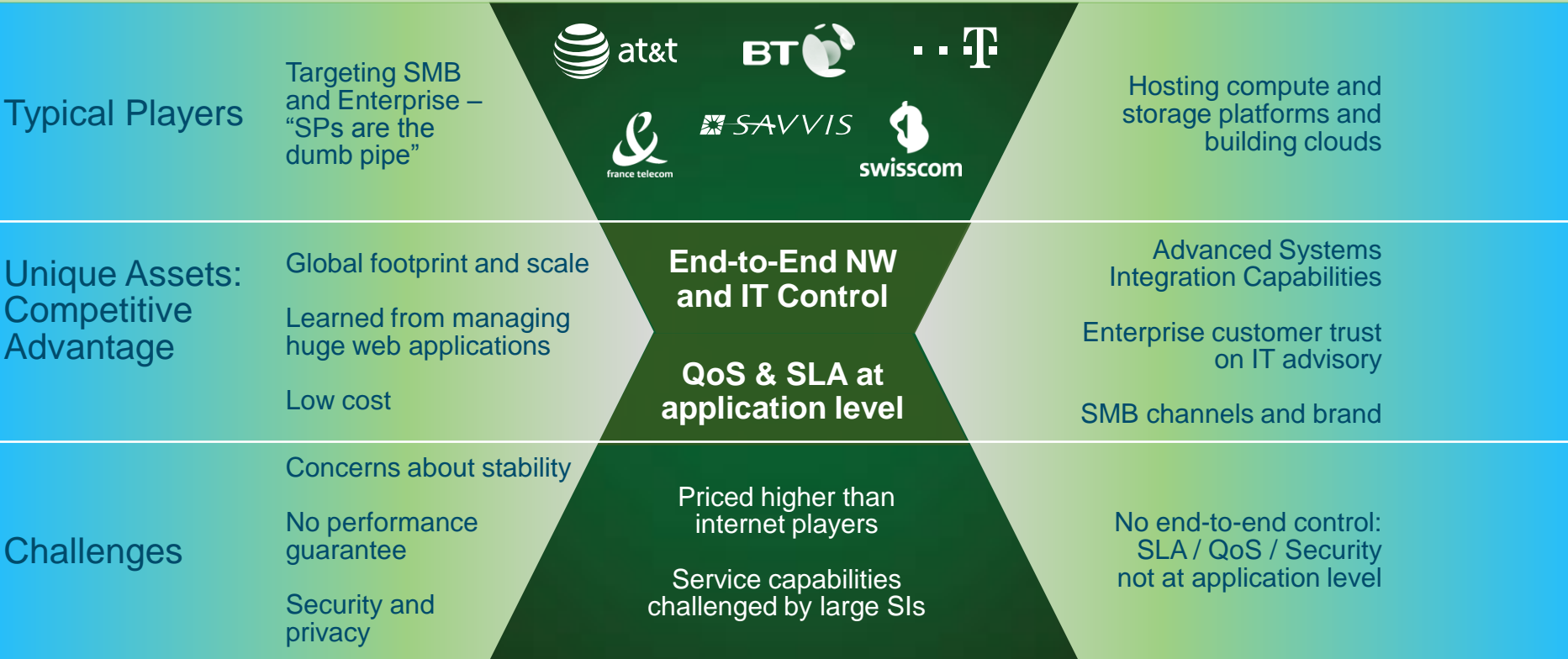
# Who delivers the Cloud ?

## Sustainable Differentiators

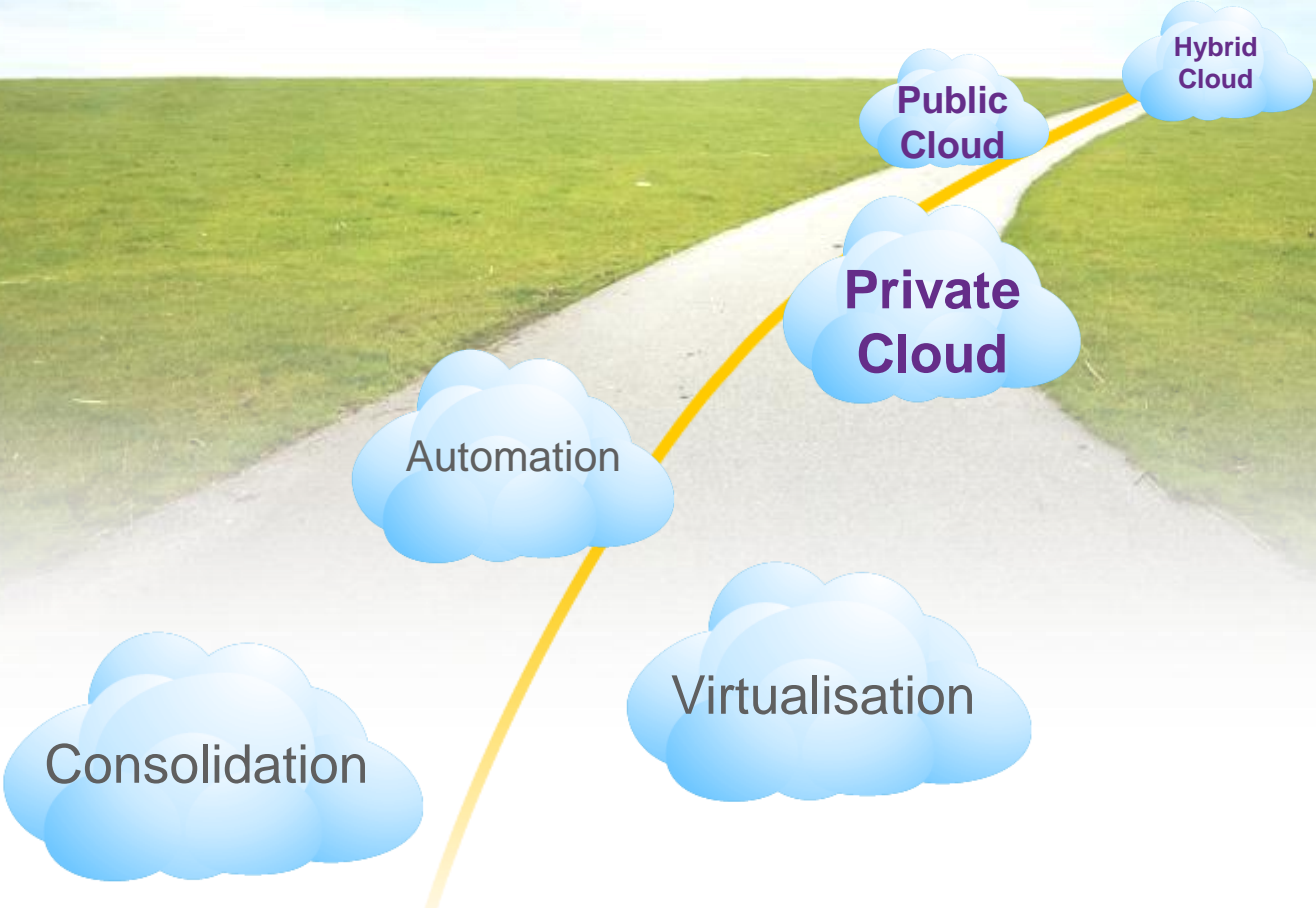
### Internet Companies ("OTT")

### Service Providers

### Systems Integrators and Server Vendors



# Ready for the Cloud?



The Network is the Computer,  
once again...