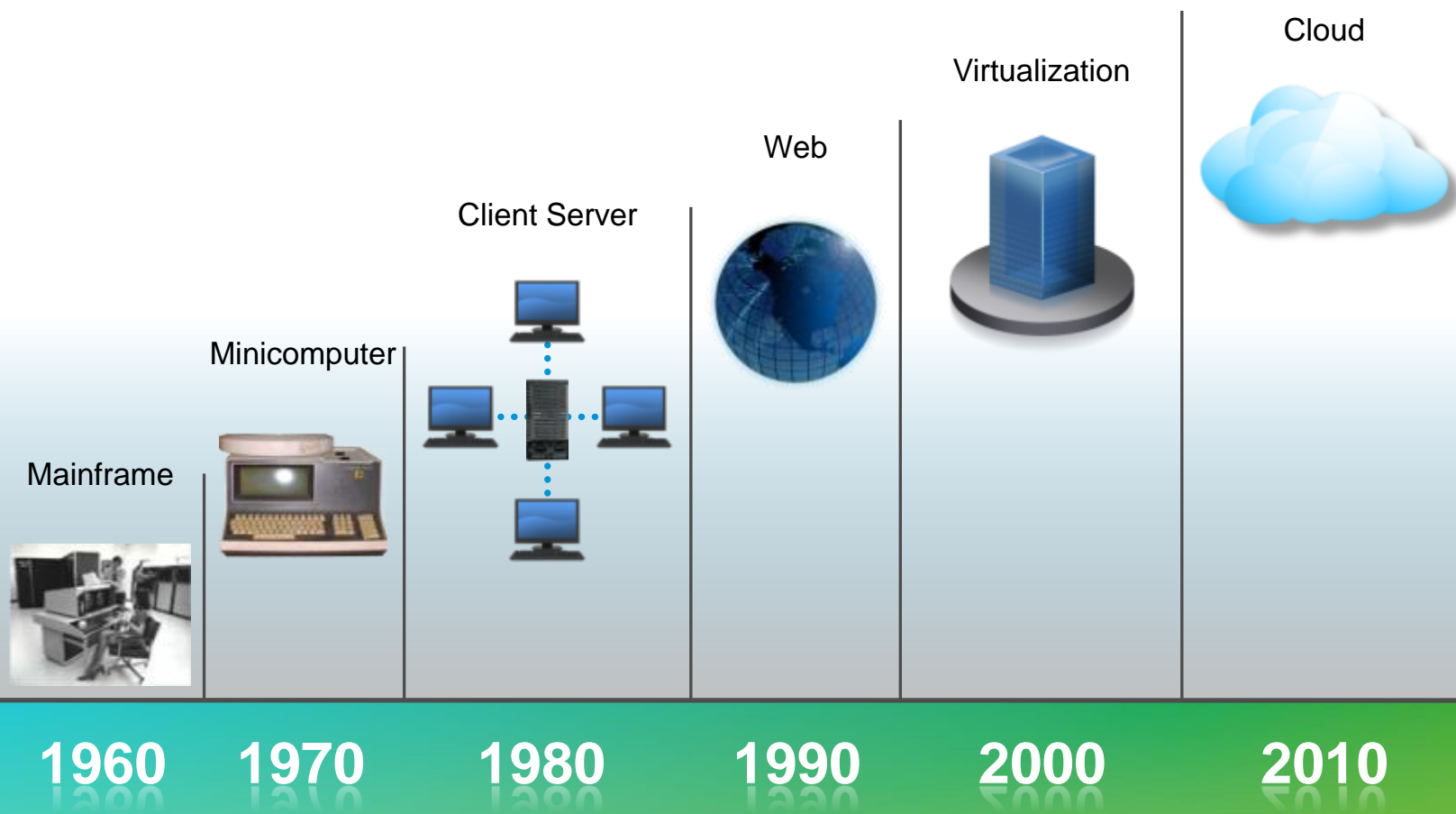# Where Clouds Live

Mitesh Patel

DC Senior Systems Engineering Manager
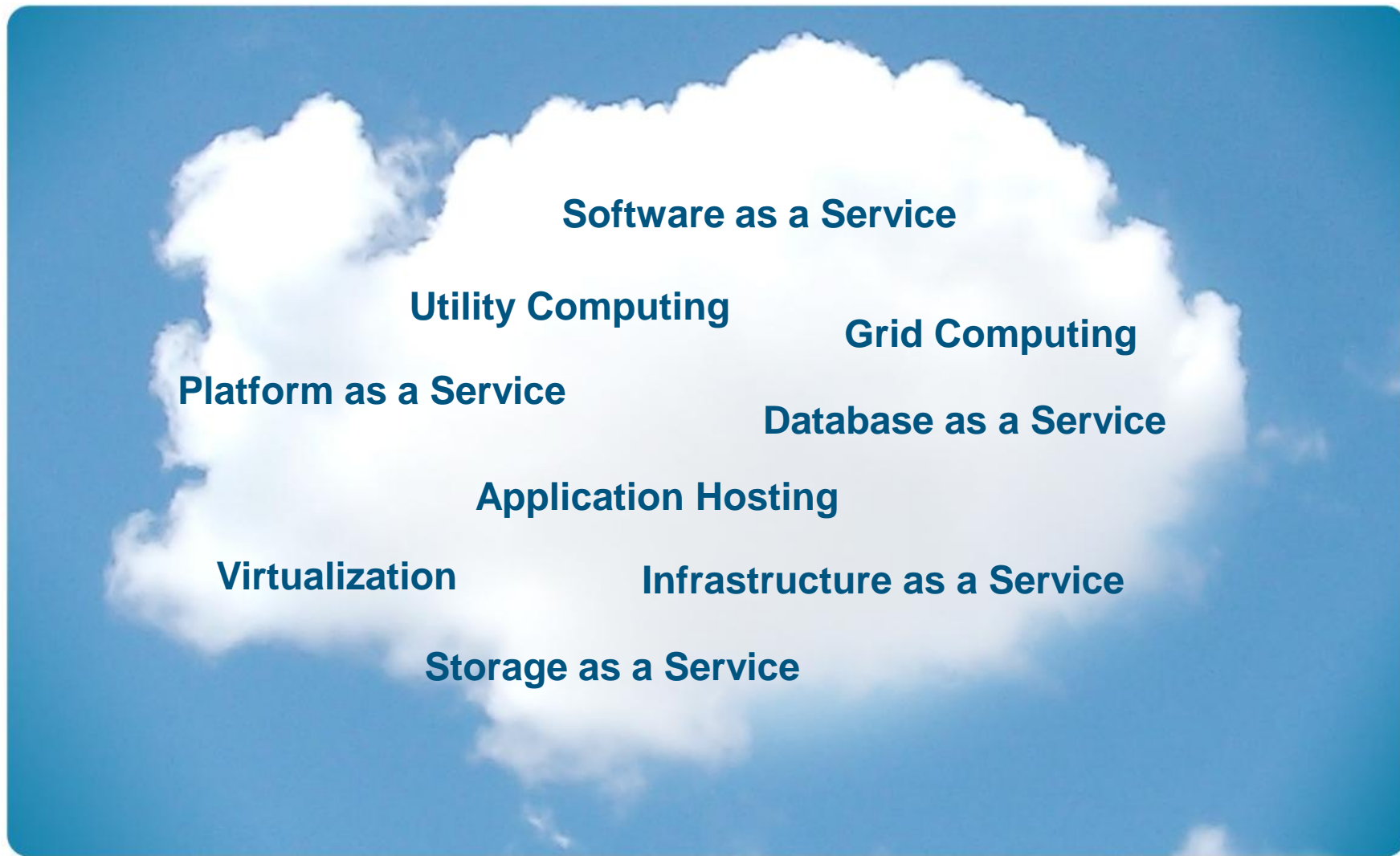
Emerging Markets

Agenda

- Cloud Overview and Definition

- Cloud Drivers

- Why Cisco?

- Cisco's Cloud Strategy

- Q&A

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

Mainframe — 1960
Minicomputer — 1970
Client Server — 1980
Web — 1990
Virtualization — 2000
Cloud — 2010

Cloud covers a lot of territory

Software as a Service

Utility Computing

Grid Computing

Platform as a Service

Database as a Service

Application Hosting

Virtualization

Infrastructure as a Service

Storage as a Service

Cloud Defined

Cloud is a data center that delivers services over the internet, or intranet using dynamically scaled shared resources

Key Services include:

Software as a Service (SaaS)

Platform as a Service (PaaS)

Infrastructure as a Service (IaaS)

How Cloud differs from traditional enterprise data centers per IDC :

Management
{
Shared, standard service

Solution-packaged

Self-service

Elastic scaling

Use-based pricing
}

Accessible via the Internet

Standard UI technologies

Published service interface/API
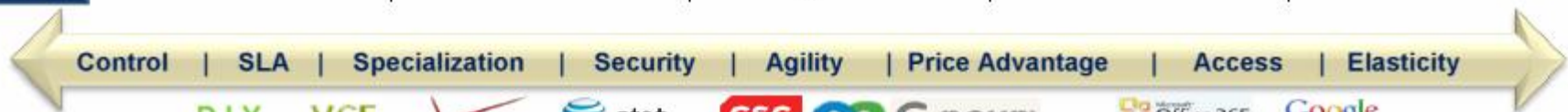
5 Key Cloud Deployment & Delivery Models

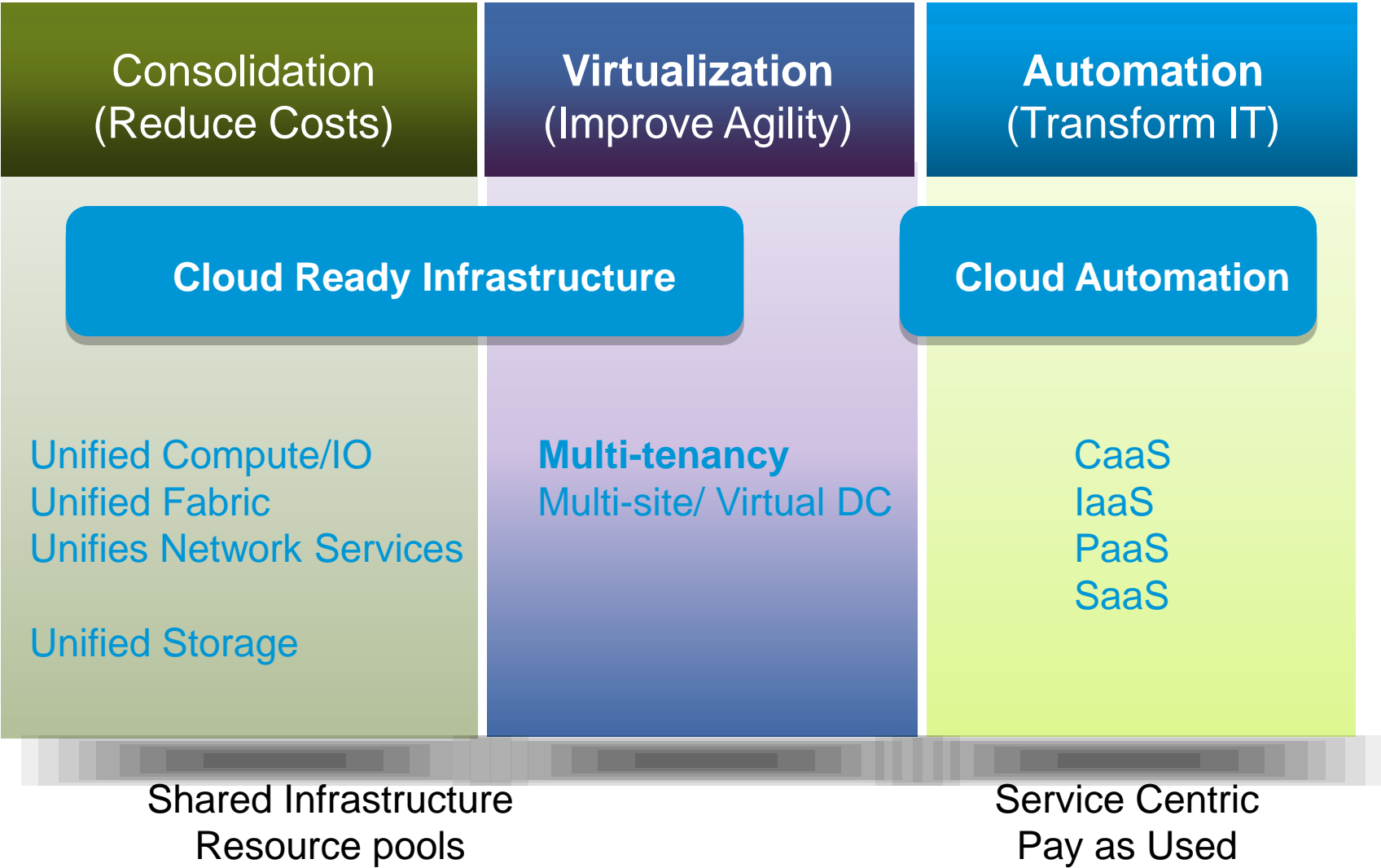|	Enterprise Private Cloud	Hosted Private Cloud	Hybrid Cloud	Shared Public Cloud	Public Cloud
Composition	Customer-based data center — Private Cloud	Operator-based data center — Hosted Private Cloud — Cloud IaaS provider (AT&T, AWS, Google) or CoLo Operator (e.g. BT, Rackspace)	Customer-based data center — Private + Public Cloud — Mixture of private dedicated resources + public cloud services	Customer A / Customer B / Customer C — Public Cloud	User A User B User C — Public Cloud
Operator	Internal IT Dept	Vendor	Enterprise + Vendor	Vendor	Vendor
Ownership	Typically customer	Typically vendor	Enterprise + Vendor	Vendor	Vendor
User	Single enterprise and/or extended enterprise	Single enterprise and/or extended enterprise	Single enterprise and/or extended enterprise	Multiple organizations	Multiple Users & SMBs
Resource dedication/ Isolation	Single enterprise/ extended enterprise (dedicated)	Single enterprise/ extended enterprise (dedicated)	Virtual and physical (non-cloud) resources and applications	Multiple unrelated enterprises (shared)	Multiple unrelated enterprises (shared)

Control | SLA | Specialization | Security | Agility | Price Advantage | Access | Elasticity

Business Transformation
.. Organization, ROI, Technology

Business Value

IT Initiatives

Data Center/Cloud

Virtualization

Consolidation

Application Integration

Compliance

Cloud Services

New Service Creation and New Business Models

Cost Reduction and Revenue Generation

Governance and Risk Management

Data Center Transformation

Source: IT initiatives from Goldman Sachs CIO Study
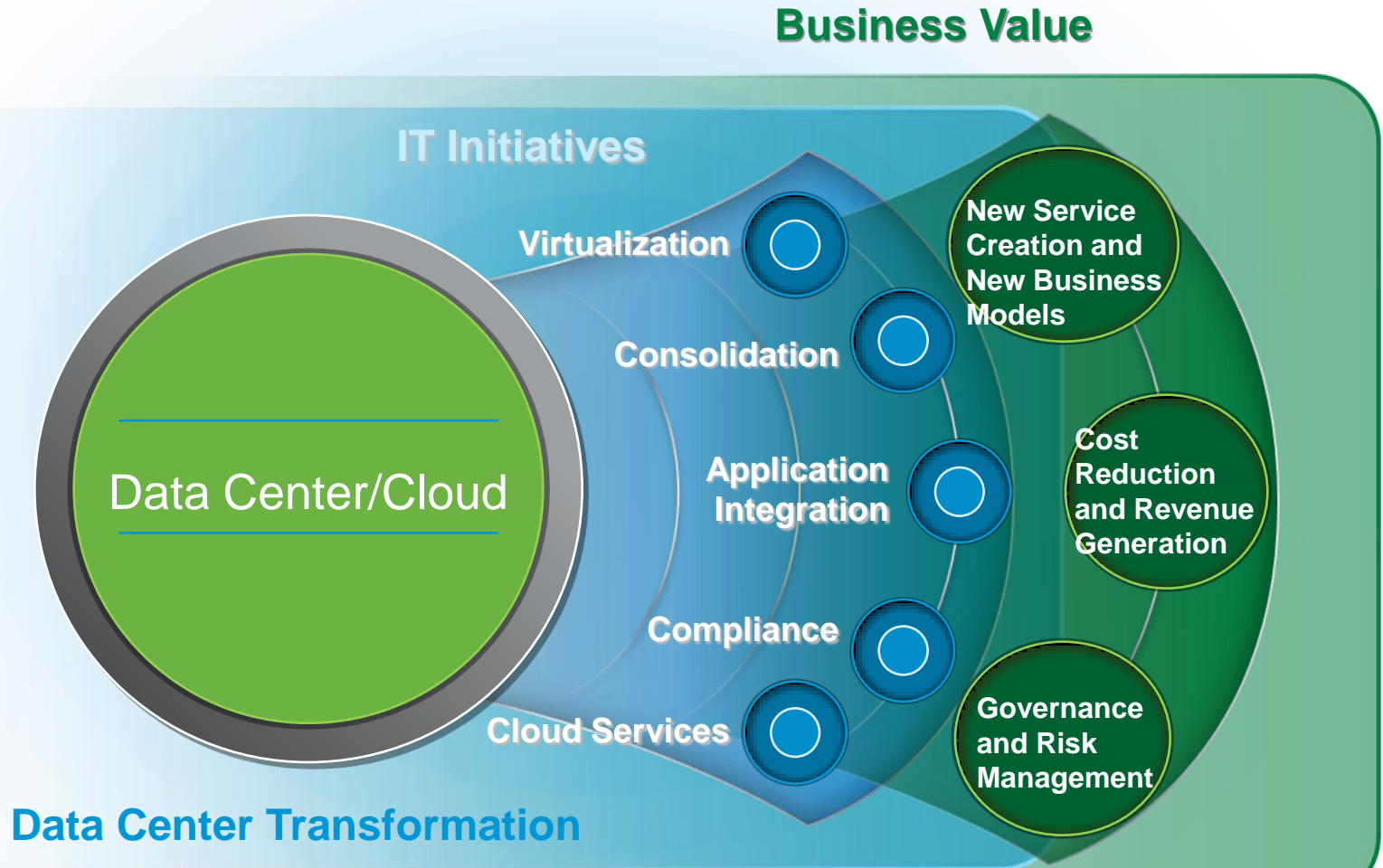
Transition Steps to Cloud Consumption Model

Consolidation (Reduce Costs)	Virtualization (Improve Agility)	Automation (Transform IT)
Cloud Ready Infrastructure		**Cloud Automation**
Unified Compute/IO Unified Fabric Unifies Network Services Unified Storage	**Multi-tenancy** Multi-site/ Virtual DC	CaaS IaaS PaaS SaaS

Shared Infrastructure
Resource pools

Service Centric
Pay as Used

Drivers for Cloud
Business Drivers

1.Reduce Hardware Costs
- When utilizing services from a provider or even internal virtualization – lower devise, maintenance, technical support costs
- Pay for what is needed vs what is potentially needed

2.Replace Capex with Predictable Opex
- More predicable vs Capex
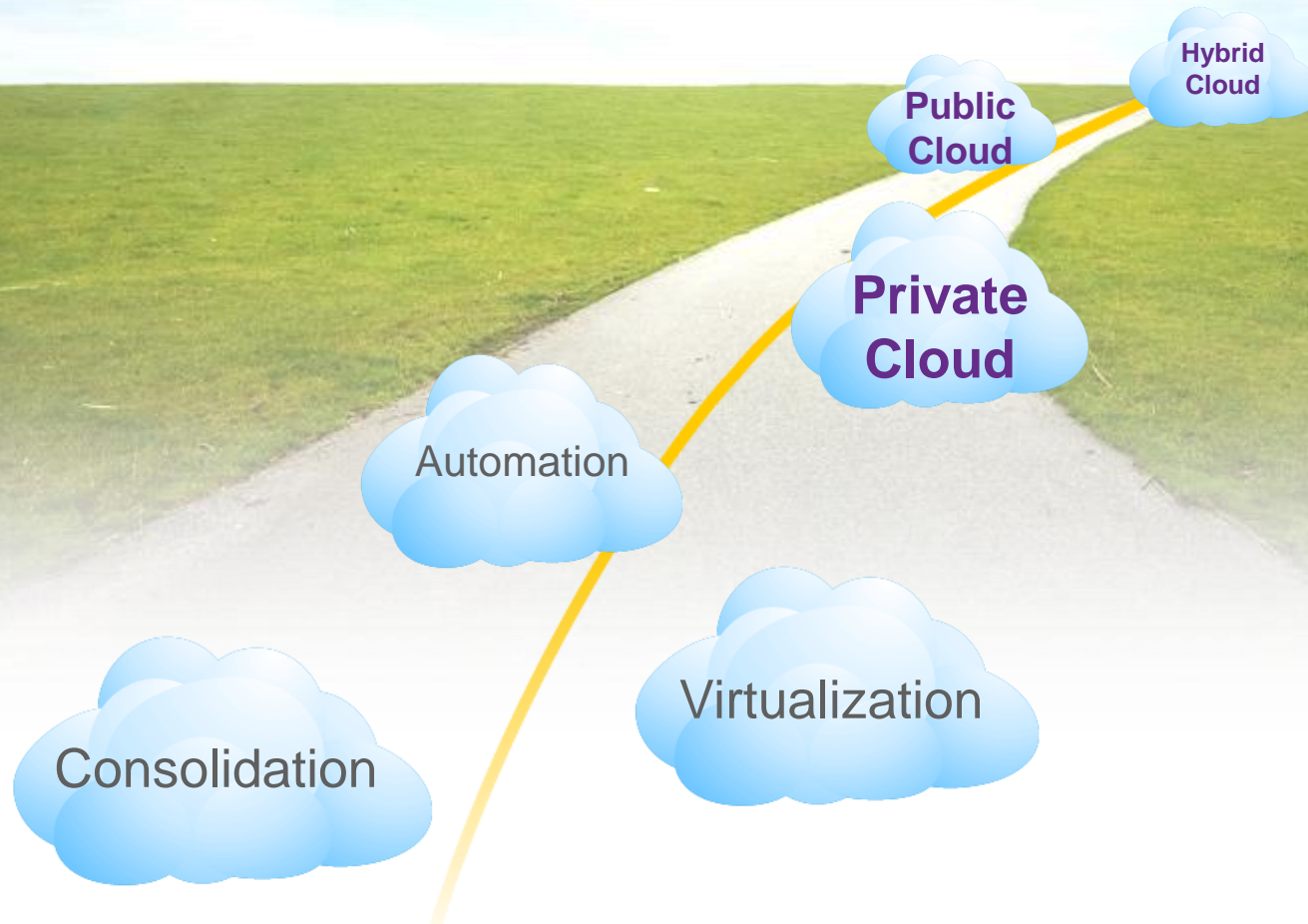- Predicable cost vs ongoing investment

3.Flexibility / Reduce technology risk
- Competitive advantage - react to change and market conditions
- Determine the need before buying for the need (ex. SaaS, dev/test)
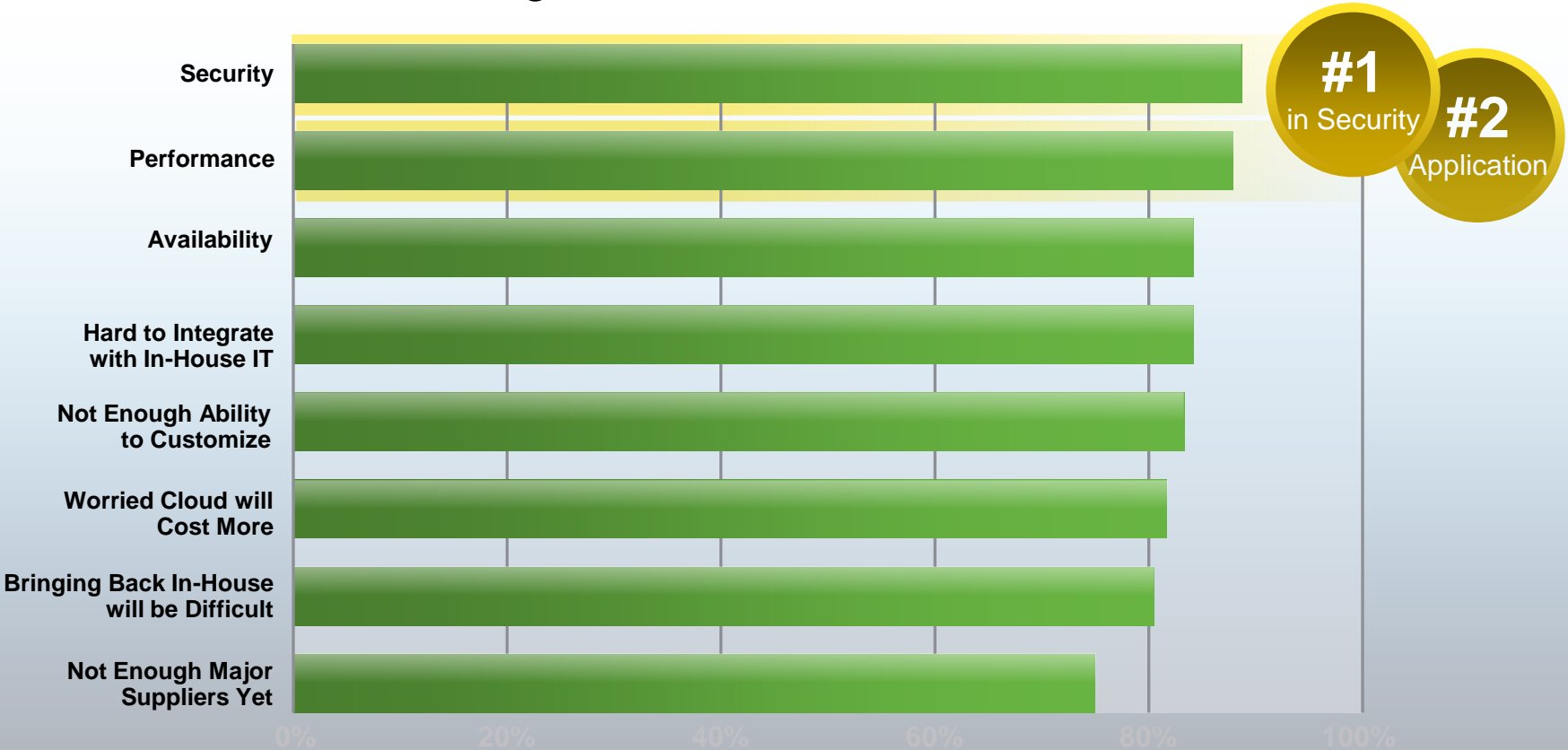
4.Increased productivity
- Employee access anytime, anywhere, any device

The Journey to the Cloud

Cloud Adoption Inhibitors

Rate the Challenges/Issues of the "Cloud:/ON-Demand Model
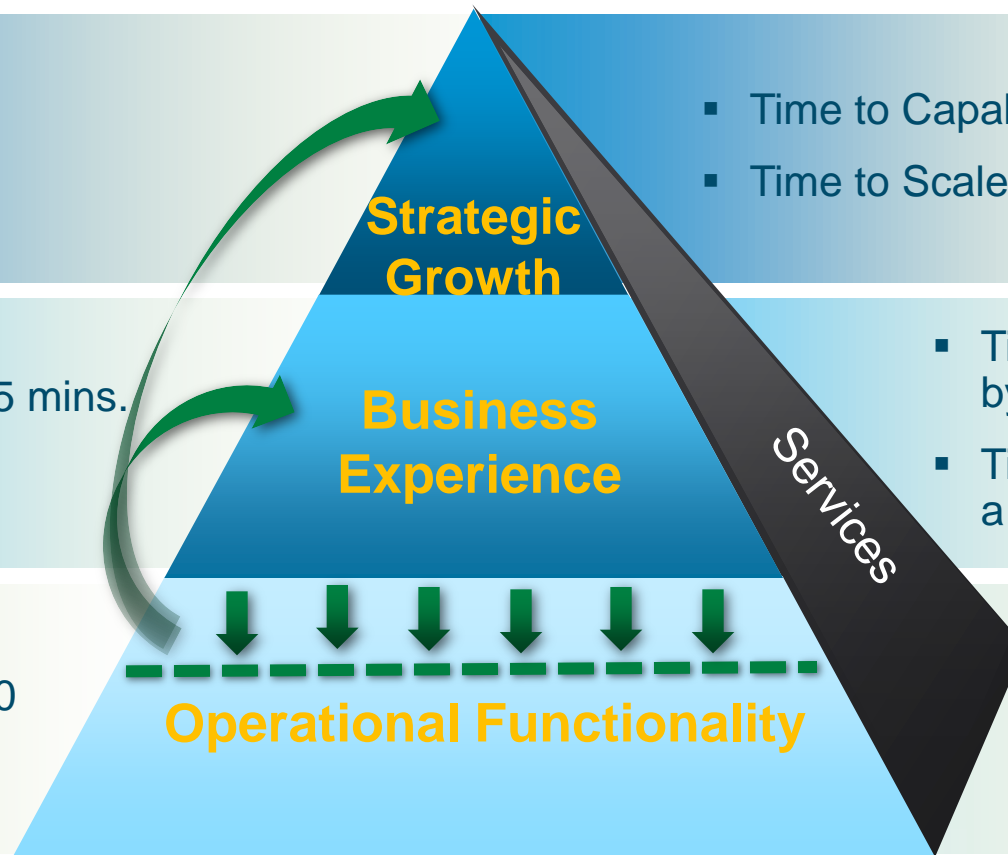

Source: IDC

IT Value of Virtualization and Cloud
Lowers average TCO from $3,700-$1,200 per qtr.

IT Effectiveness

Business Results
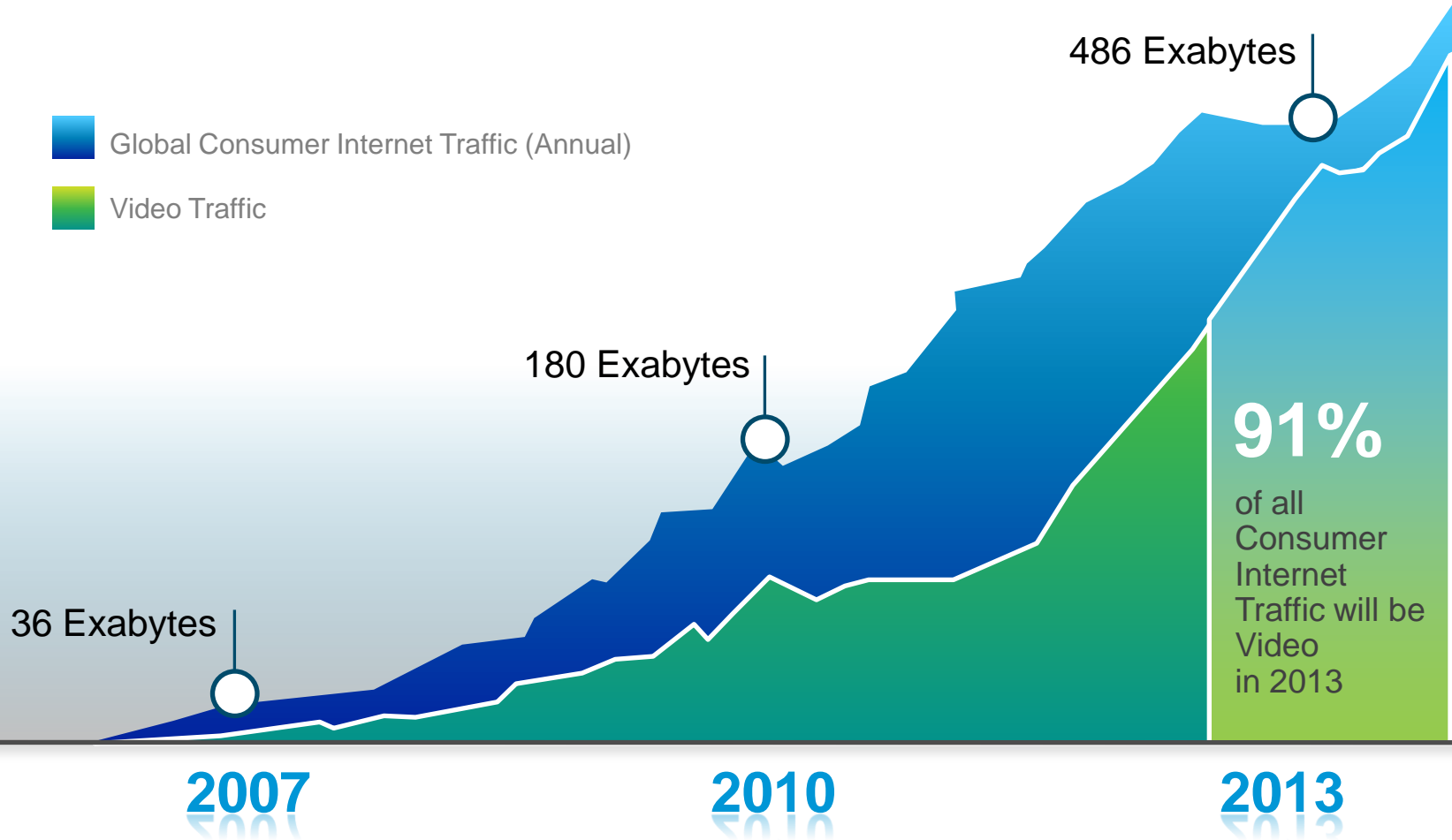
- Drives…
Innovation
Time to market

- Enables…
Agility: 60+days to 15 mins.
Productivity

- Improves…
Cost: $3700 to $1200
SLA : Tiered offering
Built in resiliency

Strategic Growth

Business Experience

Services

Operational Functionality

- Time to Capability

- Time to Scale

- Time/Cost Saved by Re-Use

- Time to Provision a Service

- Cost/Use of service

- Tiered SLA

Video Will Dominate the Information Flow

Global Consumer Internet Traffic (Annual)

Video Traffic

486 Exabytes

180 Exabytes

36 Exabytes

91% of all Consumer Internet Traffic will be Video in 2013

2007 **2010** **2013**

Source: Cisco Visual Networking Index

An Even Larger Cloud Is on the Horizon

Data Centers

Mobile Devices

Sensors

Data Center

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

Why Cisco?

Business Value	Technical Differentiation
Improve Business Agility	Virtualization
Extend Business Asset Life	Unified Fabric
Maximize IT Investments	Processing Power
Ensure Compliance	Memory Density
Accelerate Team Performance	

Ethernet Market is in Transition - Again

TDM Telephony to VoIP

100 Mg to 1GbE – Fixed vs Modular

Land Lines to Cellular

Wired LAN to Wireless

Ma Bell Telephony to Cable VoIP

1G to 10G

This Transition will change the Core, Aggregation and Access Infrastructures.

What is Driving 10GE Growth in the Data Center?

	Access Evolution	• **Server Virtualization** • **Multi-Core Chips** • **10GbE NICs**
	Core & Aggregation Bandwidth	• **1 GbE Saturation** • **10 GbE Uplinks – Blades, ToR** • **Inter-Switch Bandwidth – MCEC/vPC**
	Unified Fabric and I/O Interfaces	• **I/O Virtualization** • **I/O & Cable Consolidation** • **Unified Fabric DCE/FCoE**

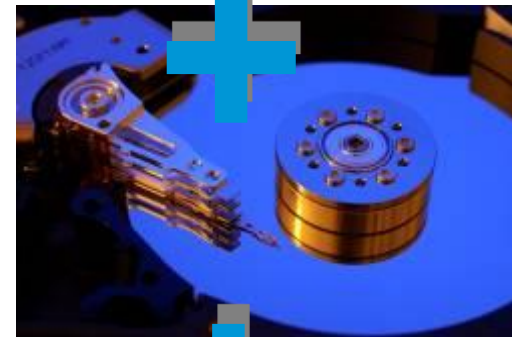# Degrees of Virtualization

Server Virtualization
Consolidation of *physical* servers to reduce management, power and cooling, etc

Storage Virtualization
Consolidation of physical storage assets to logical storage assets
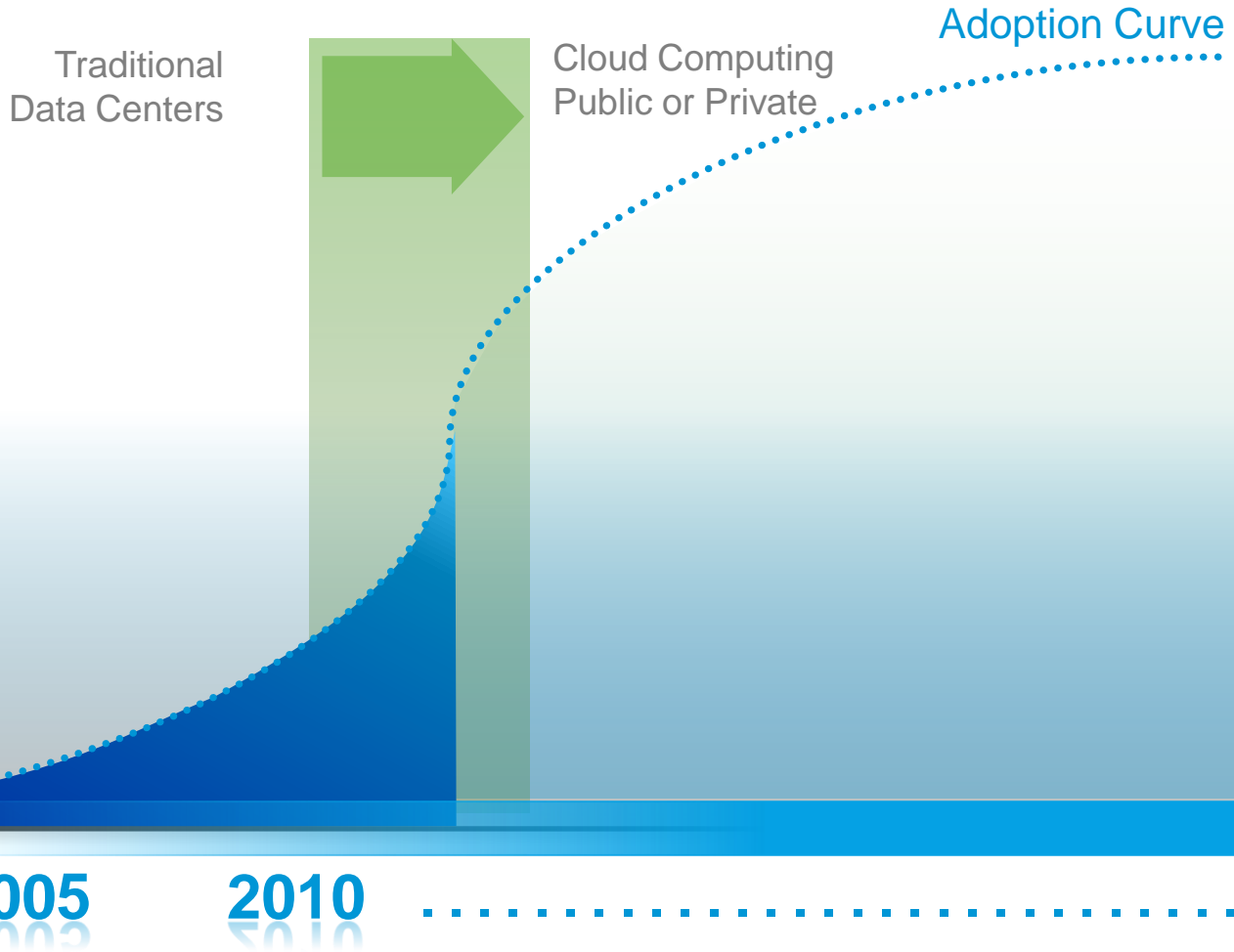
Network Virtualization
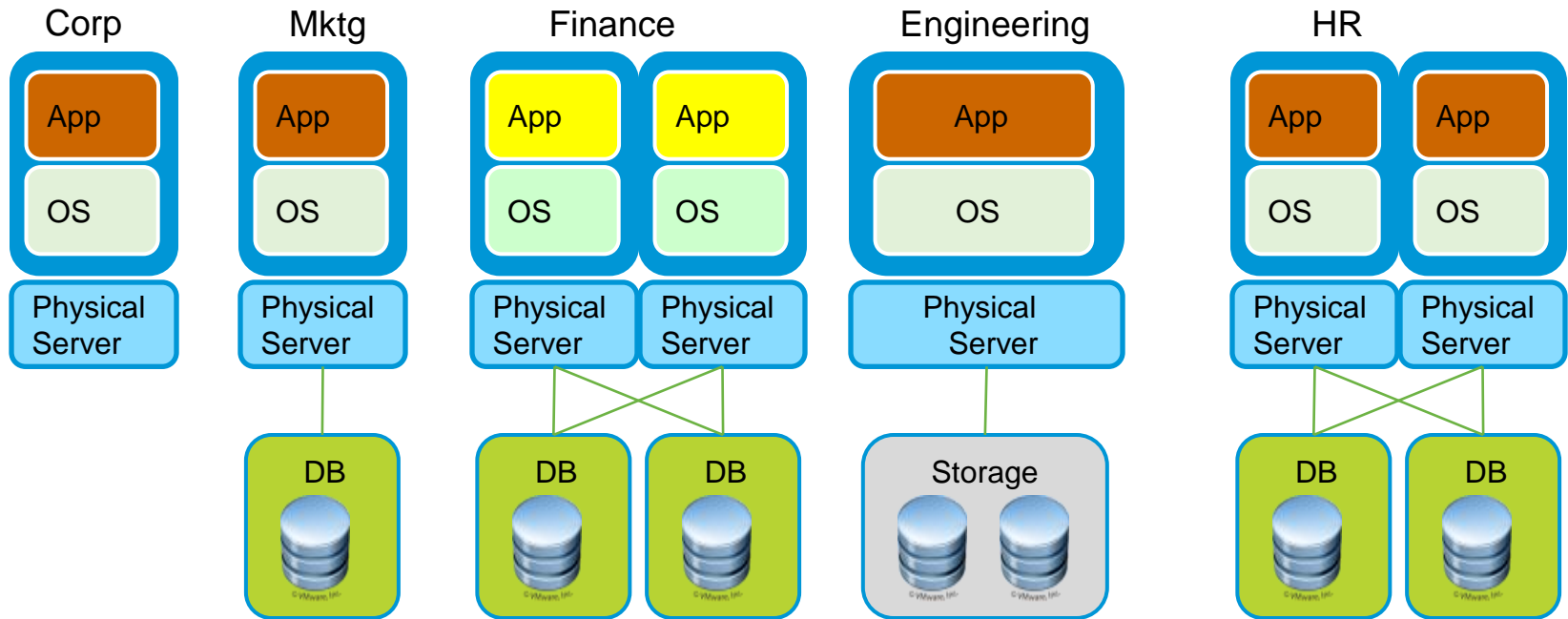Creating pools of network ports that are isolated, but which reside on the same physical infrastructure

Virtual Data Center Infrastructure

We Are at the Very Beginning of a Major Shift

Traditional Data Centers

Cloud Computing Public or Private

Adoption Curve

2000   2005   2010

Traditional Data Center Approach
Complexity Grows With Number of Apps

Corp

| App |
| OS |
| Physical Server |

Mktg

| App |
| OS |
| Physical Server |

DB

Finance

App	App
OS	OS
Physical Server	Physical Server

DB | DB

Engineering

| App |
| OS |
| Physical Server |

Storage

HR

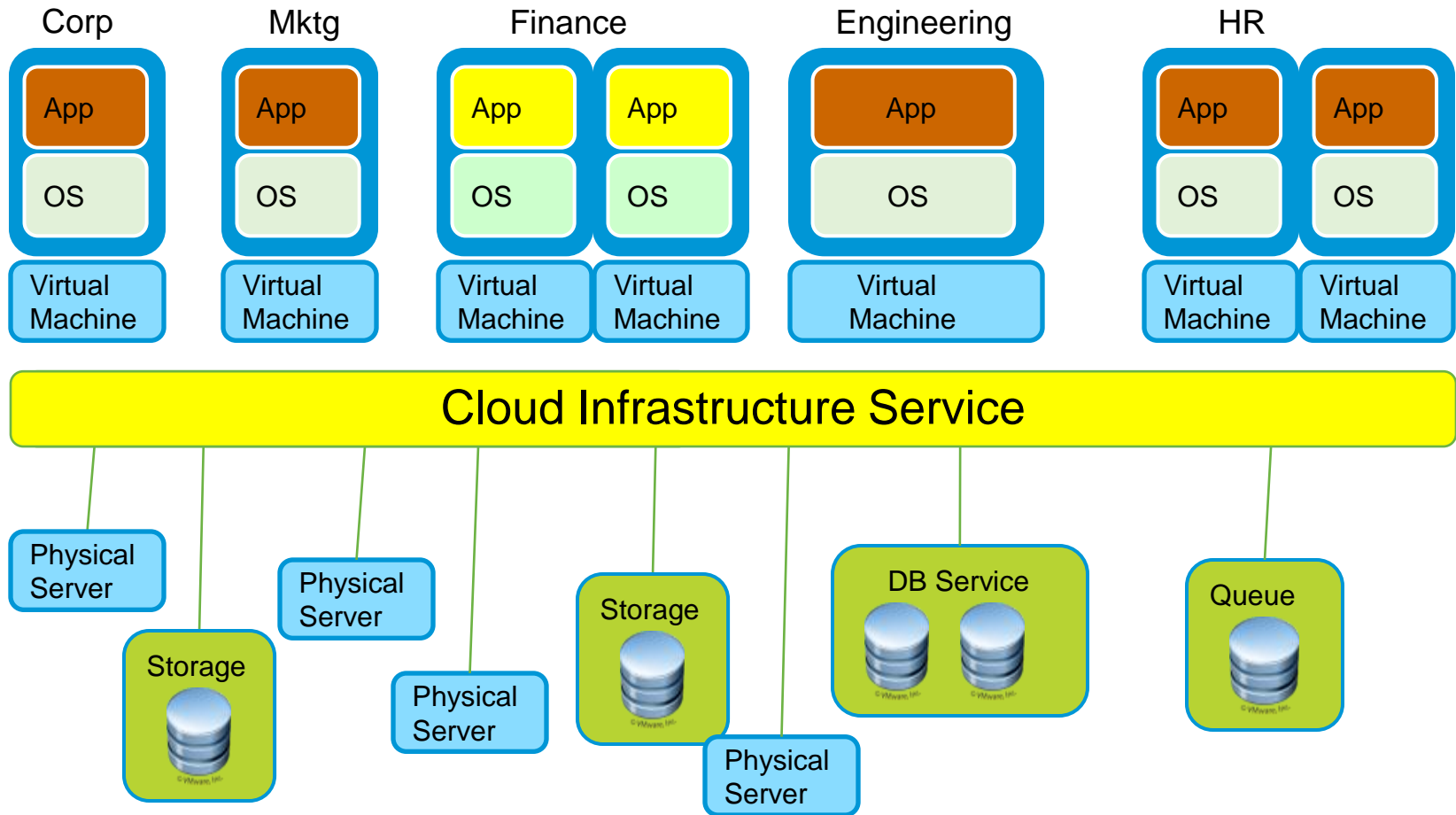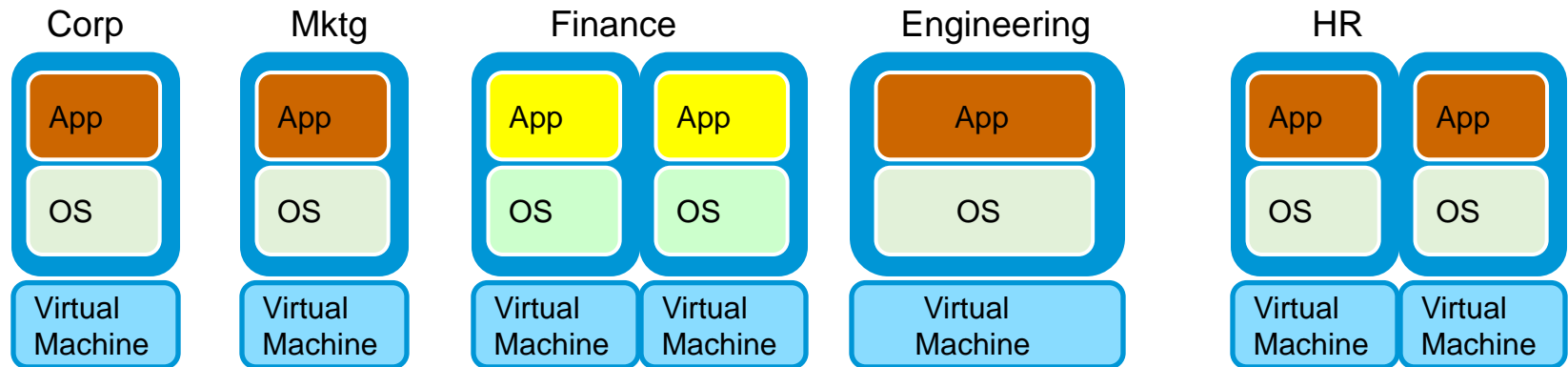| App | App |
| OS | OS |
| Physical Server | Physical Server |

DB | DB

Poor Utilization

Inflexible Infrastructure

Cloud-based IT Delivery Model
Applications Run on Virtualized Infrastructure

Infrastructure Becomes Scalable & Efficient

Corp	Mktg	Finance		Engineering	HR	
App	App	App	App	App	App	App
OS	OS	OS	OS	OS	OS	OS
Virtual Machine	Virtual Machine	Virtual Machine	Virtual Machine	Virtual Machine	Virtual Machine	Virtual Machine

API-driven services   **Self-service portal**   **Selective application mgmt**

Cloud Infrastructure Service

Pool of shared resources

Physical Server

Physical Server

Physical Server

Storage

Storage

DB Service

Queue

Physical Server
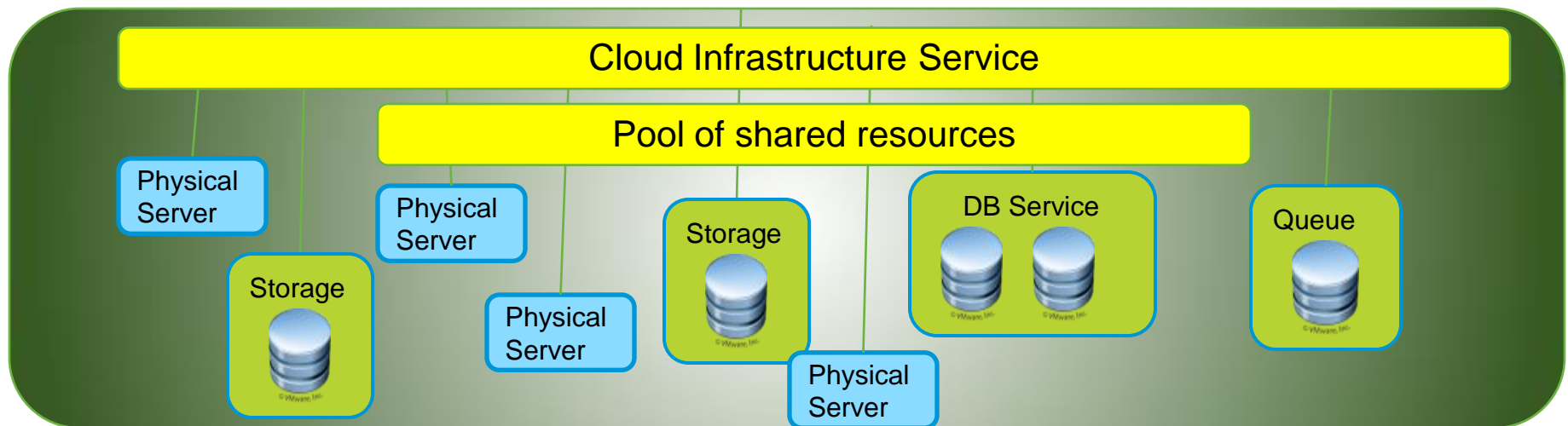
Add Capacity via Pre-defined Building Blocks

- 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.

Nexus

NAS

SAN

UCS

Pod 1

Nexus

NAS

SAN

UCS

Pod 2
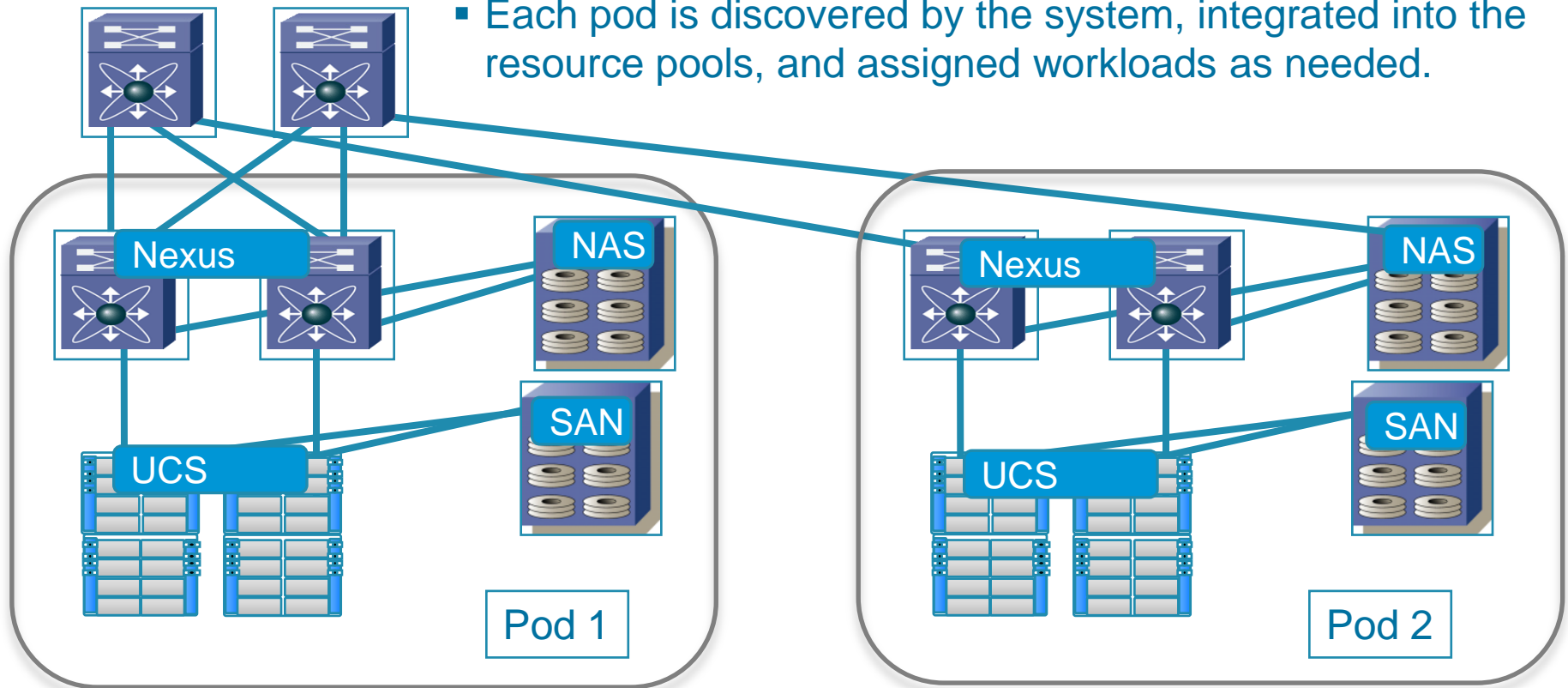
Cisco Cloud Data Center Components

Business Application Solutions

vmware CITRIX
EMC² where information lives
NetApp
Virtual Desktop Infrastructure (VDI)

Cisco VXI

ORACLE SAP
Microsoft
Tier-1 Business Applications

Cloud Management

CISCO
bmcsoftware
ca
Microsoft
vmware
IBM

Integrated Computing Stacks

Vblock

FlexPod

Unified Data Center Networking

Cisco Borderless Networks

Unified Fabric

Unified Computing

Unified Delivery Services

Cisco's Cloud Strategy
Addressing Our Customers' Business Challenges

Deliver products, solutions & services to organizations to build secure Clouds

Enable Service Providers to deliver secure Cloud solutions & services to their customers

Advance the market for Cloud by driving technology innovation, open standards and **ecosystem development**
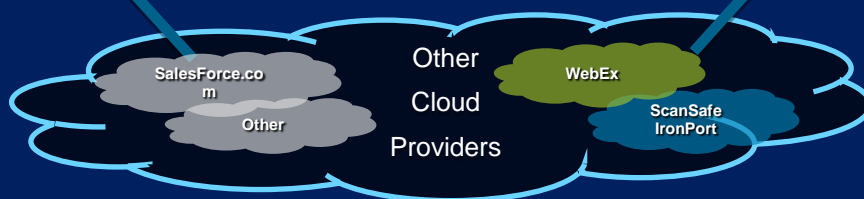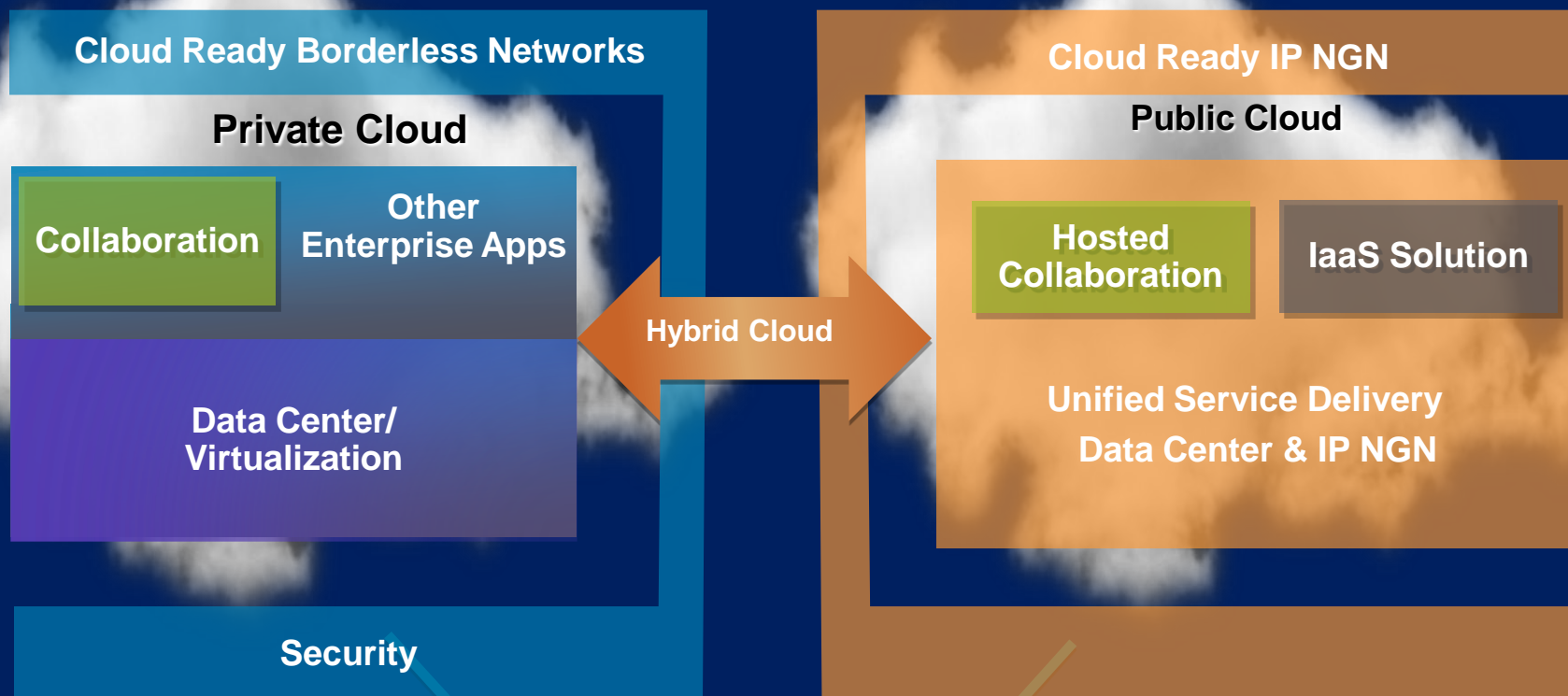
The Journey to Cloud – Cisco Architecture

## Demand Side
Enterprise/Commercial/Government

Supply Side
Service Provider

Cloud Ready Borderless Networks

Private Cloud

Collaboration

Other Enterprise Apps

Data Center/ Virtualization

Hybrid Cloud

Cloud Ready IP NGN

Public Cloud

Hosted Collaboration

IaaS Solution

Unified Service Delivery
Data Center & IP NGN

Security

SalesForce.com

Other

Other Cloud Providers

WebEx

ScanSafe IronPort

Scorecard for Cloud Service Providers

Magic Quadrant for Cloud Infrastructure as a Service and web Hosting, 2010
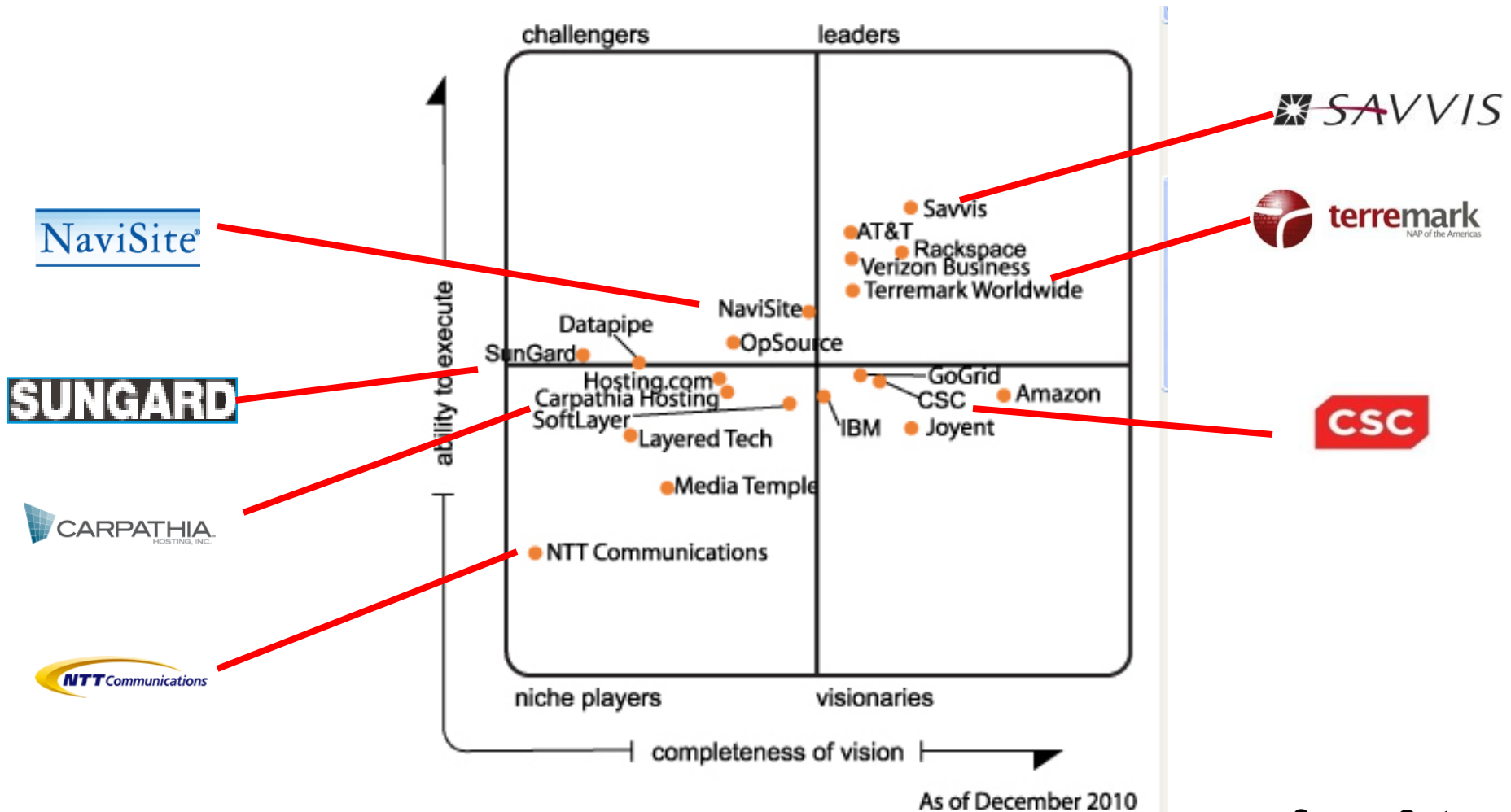
Source: Gartner

WW Cisco Cloud Partners by Geography
Public Posting Only (not all Wins)

Cisco Cloud partners expanding Globally

The Network is the Computer,
once again…

Thank You