Cloud Computing
Prospects & Challenges

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25 YEARS 1985 - 2010
SPACE HELLAS
More than Technology

OUTLINE

- Cloud Definition and Classification
- Deployment Types, Roles, and Capabilities
- Economic Benefits
- Technology Enablers
- Challenges
- Trends
- Roadmap
- Opportunities

WHAT IS A CLOUD ?

"A cloud is a platform or infrastructure that enables execution of code (services, applications, …) in a managed, automated and elastic fashion, delivered using Internet technologies"

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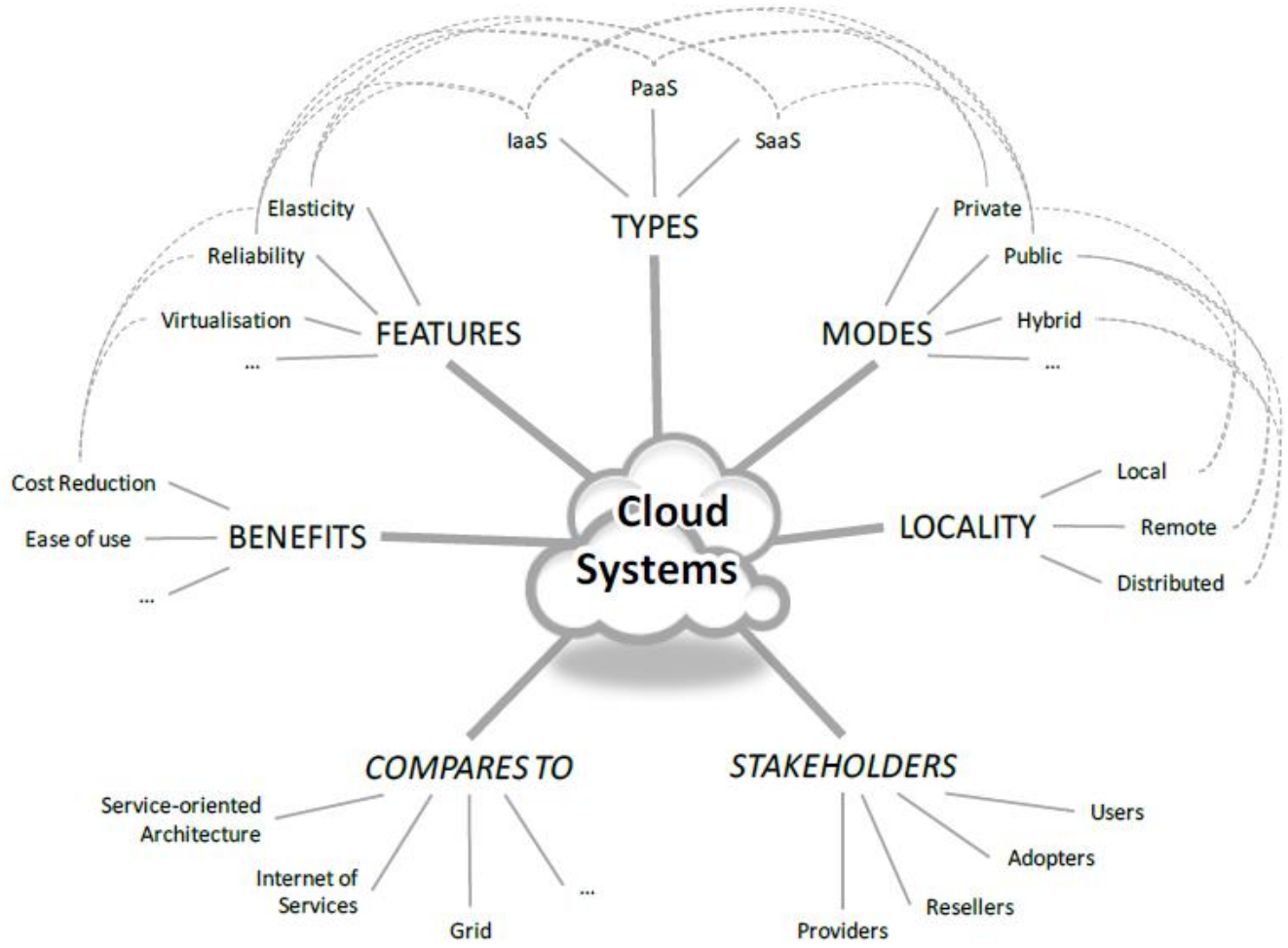
WHAT IS A CLOUD ?



TERMINOLOGY

- Types of Clouds (based on Functionality Provisioning)
  - Infrastructure, Platform, Software-Application
- Deployment Types (based on Cloud Usage)
  - Private, Public, Hybrid, Community, Special Purpose
- Cloud Environment Roles
  - Providers, Resellers, Adopters, Consumers, Tool Providers

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TYPES OF CLOUDS

- Infrastructure as a Service (IaaS)
  - Data and Storage Clouds
  - Compute Clouds
- Platform as a Service (PaaS)
  - A development and deployment platform delivered as a service to developers over the Web
  - Consists of infrastructure software that includes database, middleware, development tools and APIs
- Software as a Service (SaaS)
  - Based on Infrastructure or Platform Clouds
  - Offer specific Business Functions and Business Processes to multiple tenants

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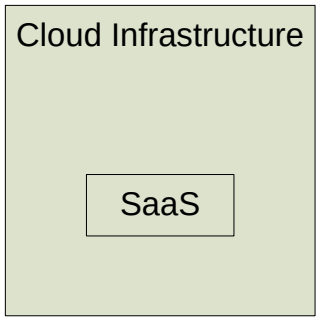
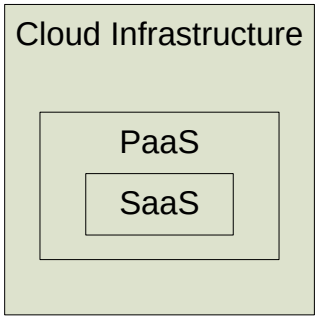
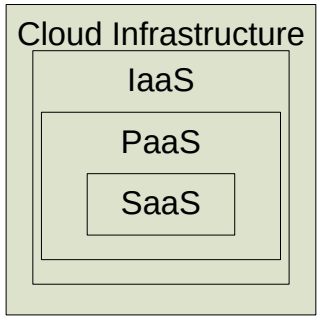
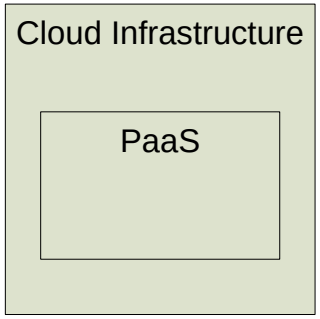
TYPES OF CLOUDS

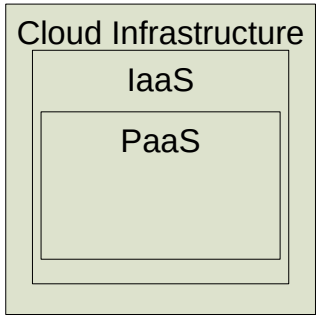




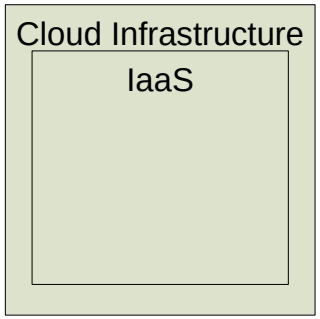


Software as a Service (SaaS) Architectures





Platform as a Service (PaaS) Architectures



Infrastructure as a Service (IaaS) Architectures

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DEPLOYMENT TYPES (CLOUD USAGE)

- Private Clouds
  - Usually owned by an Enterprise
  - Functionality not exposed to the Customer
- Public Clouds
  - Enterprises use Cloud functionality from others
  - Offer services to users outside of the Enterprise
- Hybrid Clouds
  - Mix of Private and Public Clouds
  - Partial Resource Outsourcing for Cost Reduction
  - Control over Sensitive Data & Code
- Community Clouds
  - Aggregation of Public Clouds or Resource Infrastructures
- Special Purpose Clouds

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CLOUD ENVIRONMENT ROLES

- Providers
- Resellers or Aggregators
- Adopters or (Software / Services) Vendors
- Consumers or Users
- Tool Providers

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SPECIFIC CAPABILITIES of CLOUDS

- Elasticity
  - Horizontal and Vertical Scalability
  - Rapid Up- and Down- Scaling
  - Dynamic Integration of Physical Resources
- Reliability
- Quality of Service
- Agility and adaptability
  - On-time reaction to changing numbers and size of requests
- Availability

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ECONOMIC BENEFITS

Cost reduction

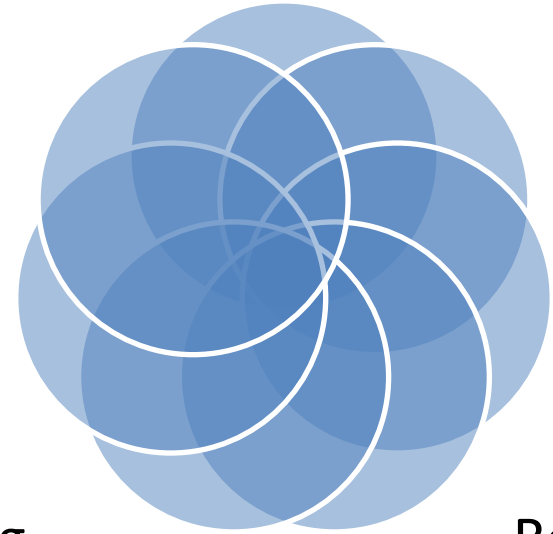
Pay per use

Improved time to market

Return on investment (ROI)

Turning CAPEX into OPEX

“Going Green”



TECHNOLOGY ENABLERS

- Virtualization
  - Evolution to Fabrics of Computing
- Multi-tenancy
  - One application instance may be serving hundreds of companies
- Security, Privacy and Compliance
- Data Management
- APIs and / or Programming Enhancements
- Metering
- Tools

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CHALLENGES

- Manageability and Automation
  - Optimal resource usage
  - Self-healing, Self-configuration, Self-optimization, Self-protection
- Data Management
- Immaturity of Technology Enablers
- Privacy & Security
- Federation & Interoperability
- Virtualization, Elasticity and Adaptability
- APIs, Programming Models & Resource Control
- Legislation, Government & Policies
- Economic Concerns

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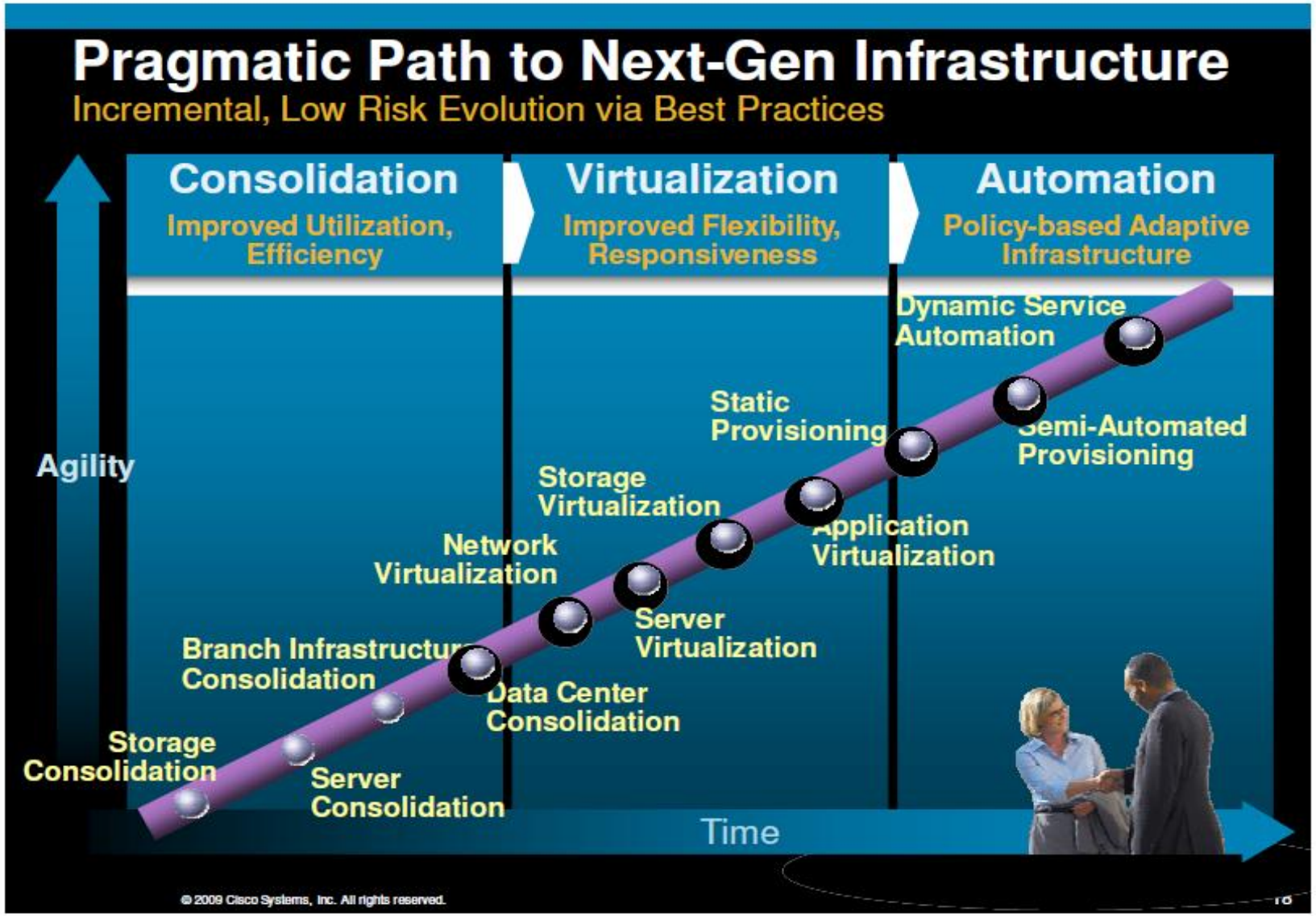
EVOLUTION


Pragmatic Path to Next-Gen Infrastructure
Incremental, Low Risk Evolution via Best Practices
Consolidation
Improved Utilization, Efficiency
Virtualization
Improved Flexibility, Responsiveness
Automation
Policy-based Adaptive Infrastructure
Agility
Storage Consolidation
Server Consolidation
Branch Infrastructure Consolidation
Data Center Consolidation
Network Virtualization
Storage Virtualization
Server Virtualization
Application Virtualization
Static Provisioning
Semi-Automated Provisioning
Dynamic Service Automation
Time
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EXPECTED TRENDS

- Not everything can be moved to cloud
- Private clouds are the first to come with hybrid to follow
- Public clouds will mature gradually
- New applications must & will appear based on SoA
- Infrastructure will evolve to a more abstract paradigm
- X86 Architecture seems to prevail

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ROADMAP to CLOUD

- IT Modernization through Virtualization
- Analysis of services, SLAs, costs, future needs
- Development of a Cloud Strategy to services that fit
- Private cloud Implementation
- Identification of new opportunities that cloud computing offers

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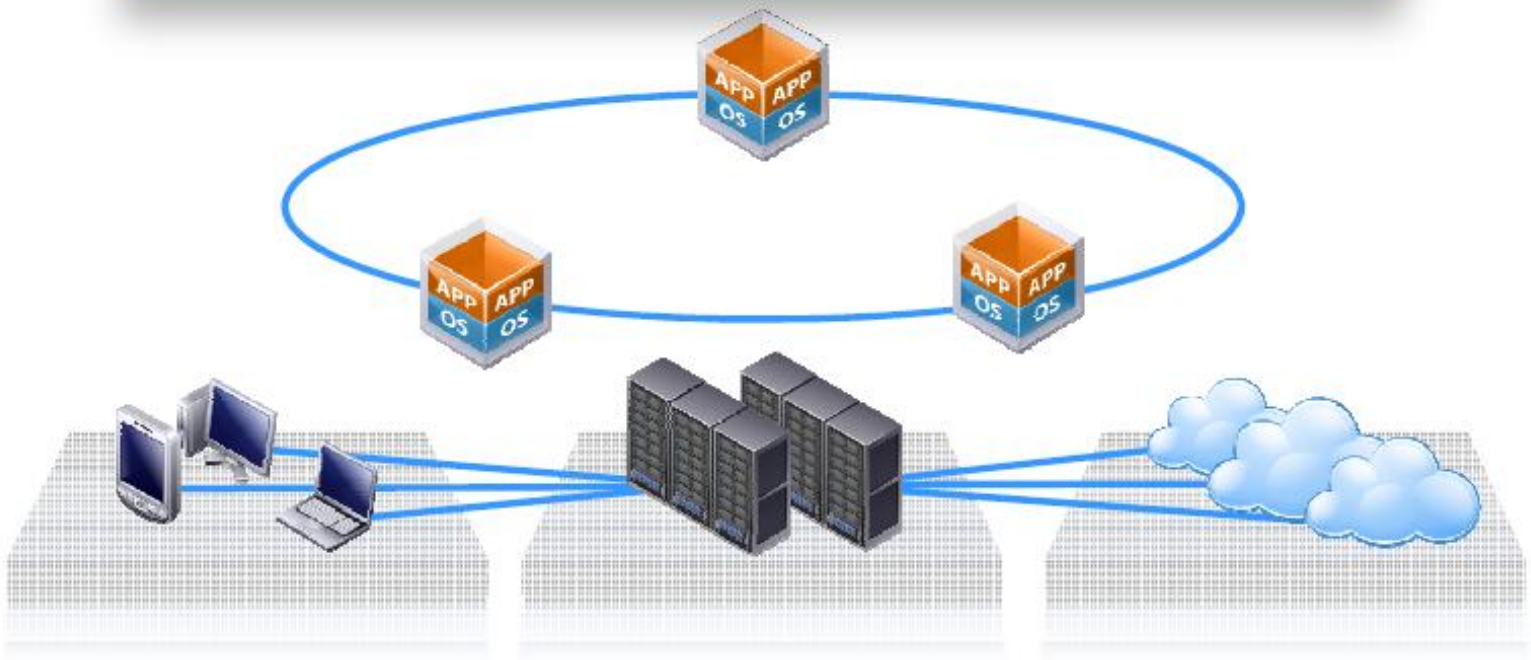
VIRTUALIZATION ADOPTION OPPORTUNITIES

Virtualizing all IT assets – from the desktop through the datacenter to the cloud – using a common virtualization platform, to create a dynamic, flexible infrastructure for the business



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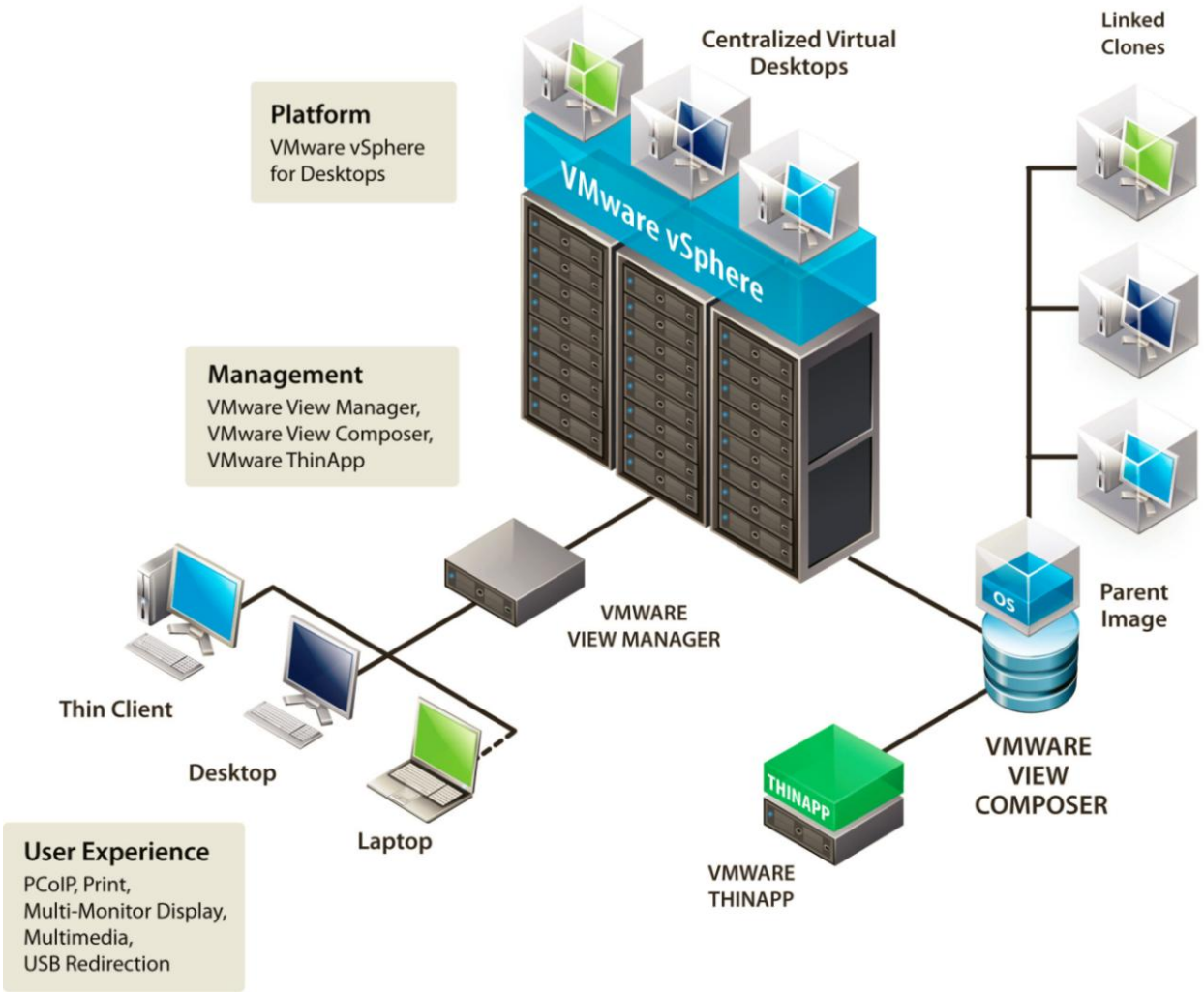
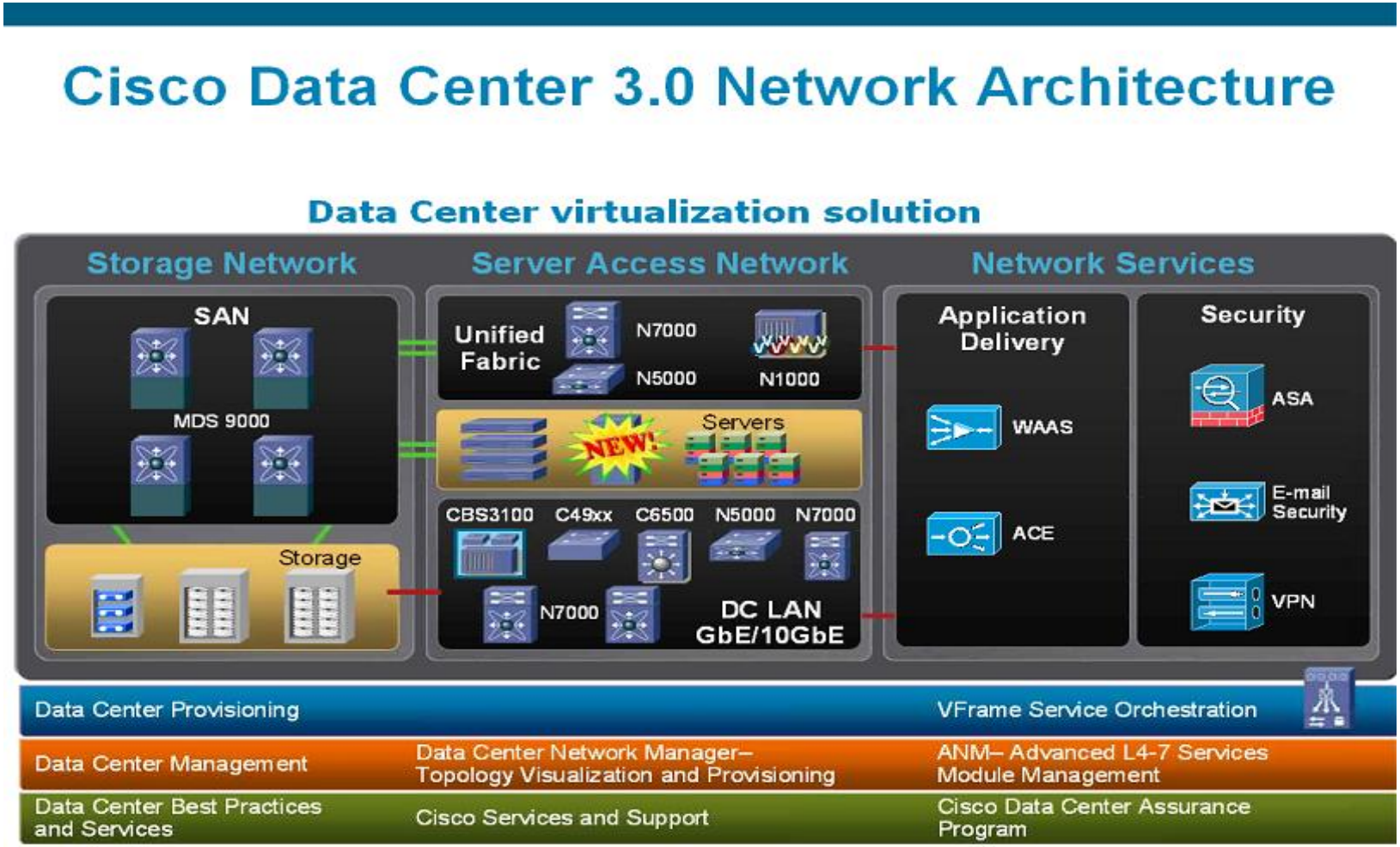
From the CLIENT...



...to FABRICS of COMPUTING



FUTURE OPPORTUNITIES

- GLOBAL CLOUD ECOSYSTEMS
- NEW BUSINESS MODELS AND EXPERT SYSTEMS
- HOLISTIC MANAGEMENT & CONTROL SYSTEMS
- CLOUD SUPPORT TOOLS
- MEDIATION OF SERVICES & APPLICATIONS ON CLOUDS
- GREEN IT
- COMMODITY AND SPECIAL PURPOSE CLOUDS
- OPEN SOURCE CLOUDWARE
- TRANSITION FROM GRID TO CLOUD
- START-UP NETWORKS

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Space Hellas is a **leading System Integrator** in the ICT market servicing a **broad base of loyal customers** for the past **25 years**. Space Hellas implements a wide array of IT solutions and adopts all new IT trends that are able to offer its customers **a strong competitive edge**, backed by a **strong technical team of certified** and **highly skilled personnel**.

Virtualization

- Datacenter
- Desktop

Storage Management

- Consolidation
- Unification
- Tiering

Disaster Recovery

Infrastructure & Application Upgrades

- OS Upgrades
- Application Upgrades

Data Management

- Backup/Restore
- De-duplication
- VTL
- Archiving

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THANK YOU!

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