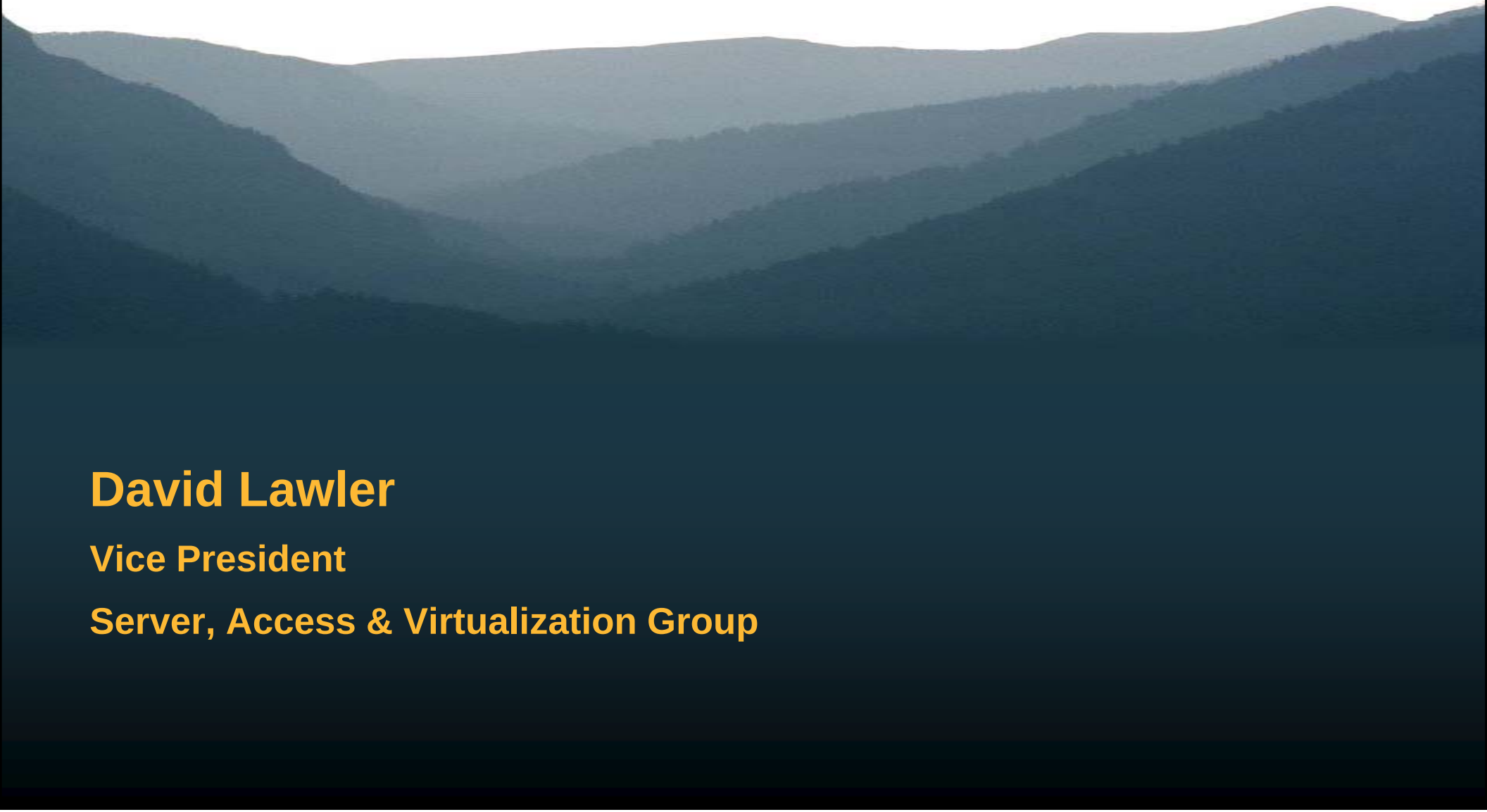
Data Center & Cloud Computing



David Lawler

Vice President

Server, Access & Virtualization Group

We Are Facing Unparalleled Growth

- 1.7 billion+ people on the Net today
- 390 gigabytes of data created every second
- 60-90% new data growth
- 140M new handsets/yr
- 450M Skype
- 500M facebook users

The network of everything

Cloud Computing

Flexible

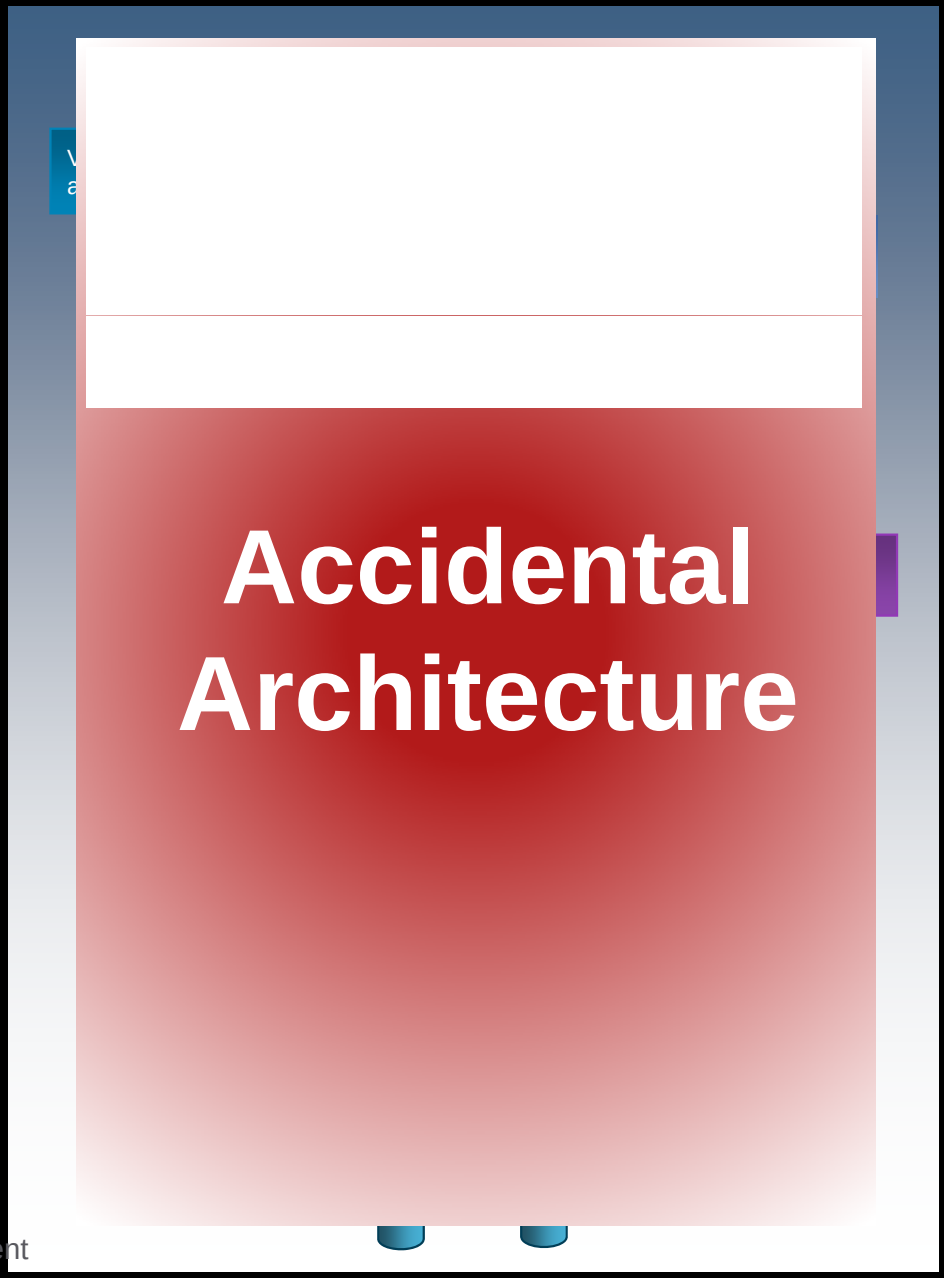
Dynamic

On Demand

Efficient

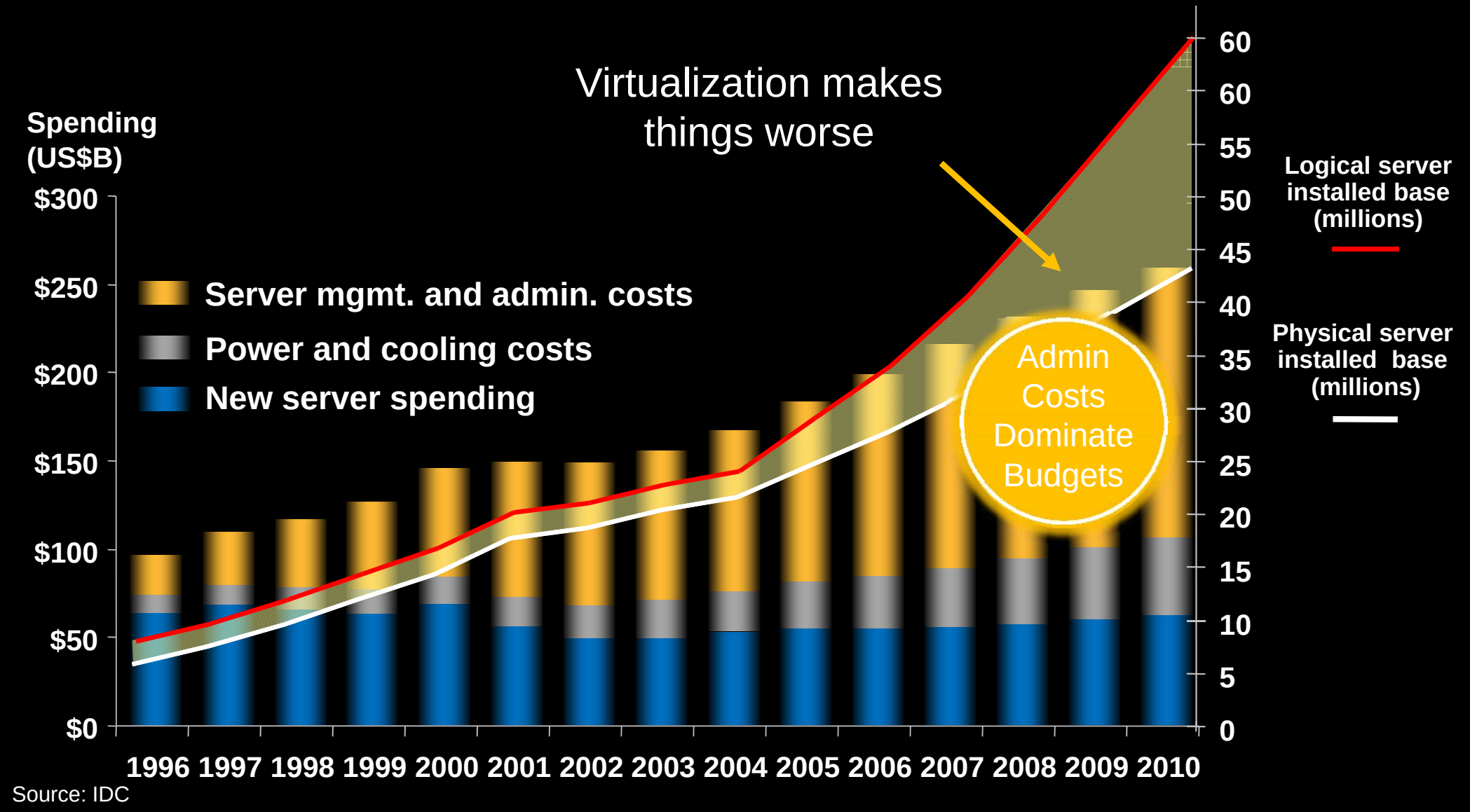
Legacy Systems Approach

- "Simplify" by
  - adding software layers
  - providing professional services
- Layering software on hardware only increases overall system complexity
  - Complexity increases exponentially with the number of independent variables
  - Everything has to tested with everything
- Legacy mentality =
  - Difficult to scale & change
  - High OpEx , High CapEx
- Result:
  - Complex infrastructure stacks
  - Fragile Data Center environments
  - Increasing management costs



Impact on the Data Center

Operations & Maintenance Now ~80% of IT Budgets and Growing



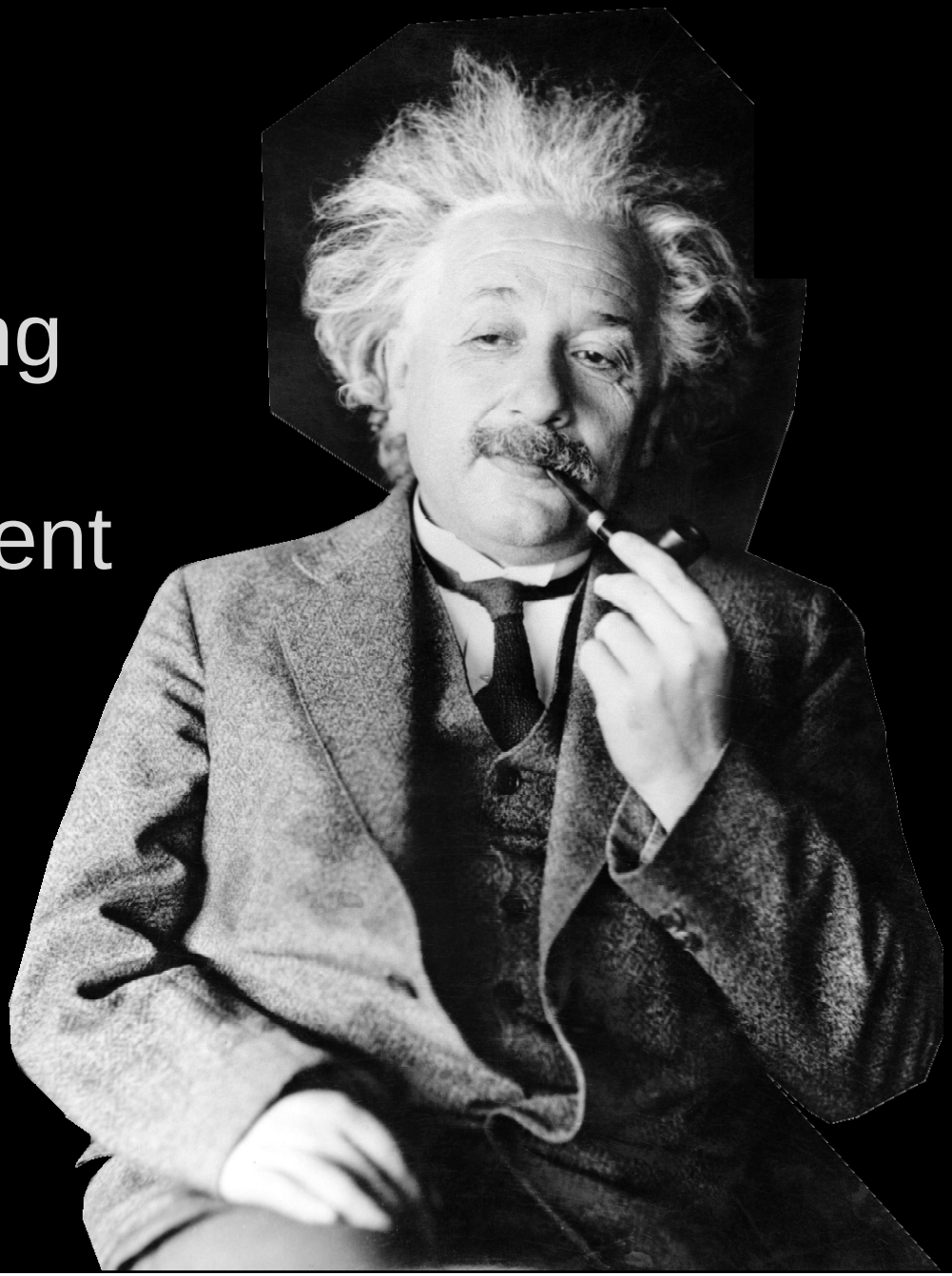
Source: IDC

Where Does This Lead Us

Insanity:

Doing the same thing over and over again and expecting different results.

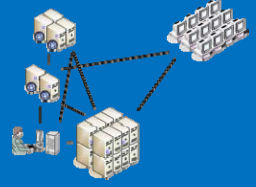
Albert Einstein



Past Data Center Inflection Points

Thinking Different Followed by Cost Savings

First Inflection Point



Distributed Computing

Mainframe

Second Inflection Point

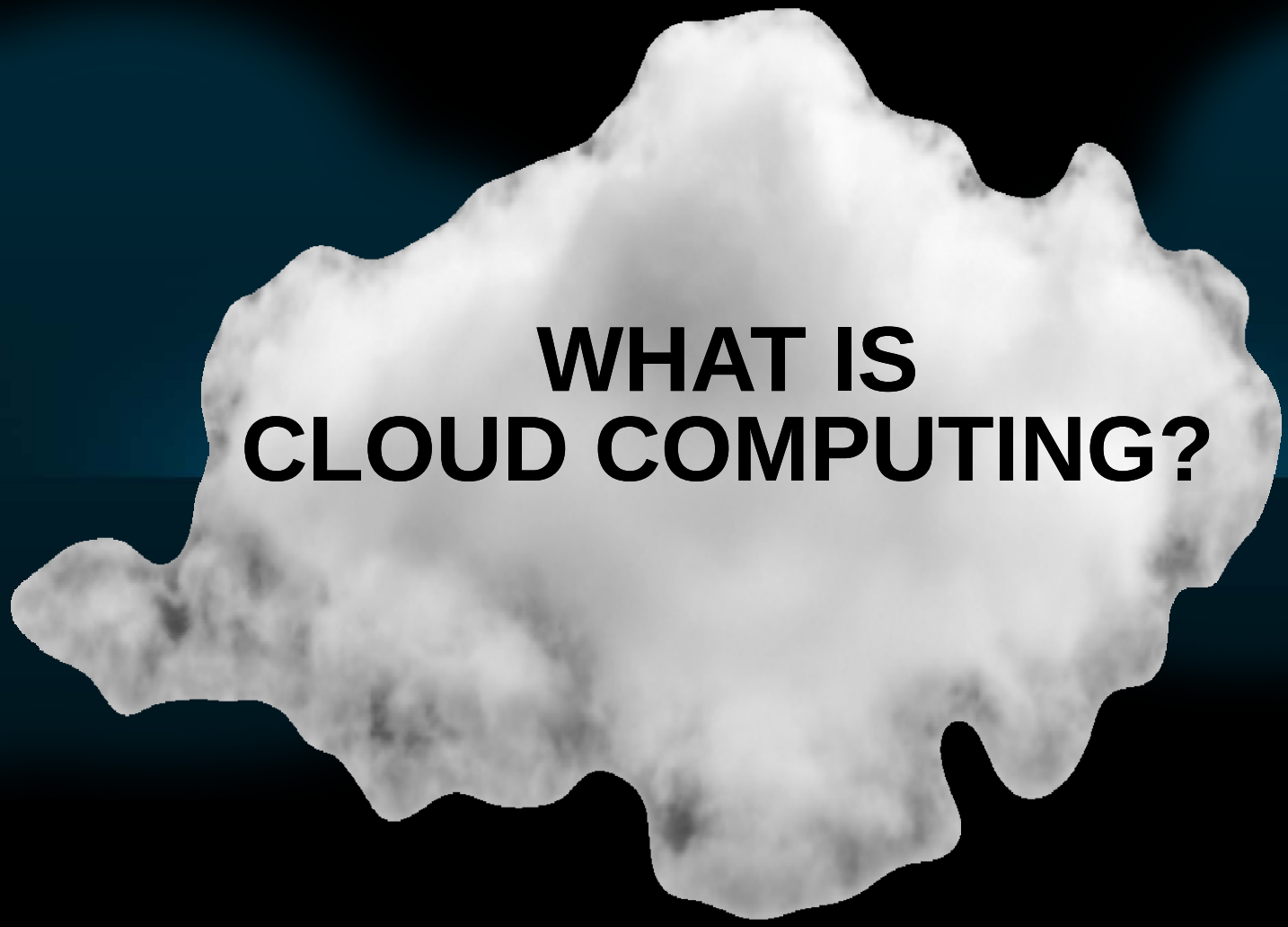
1960 1970 1980 1990 2000 2010


Inflection Point:
Cloud Computing

Inflection Point: A Definition

An event that changes the way we think and act.

- Andy Grove, Founder of Intel.



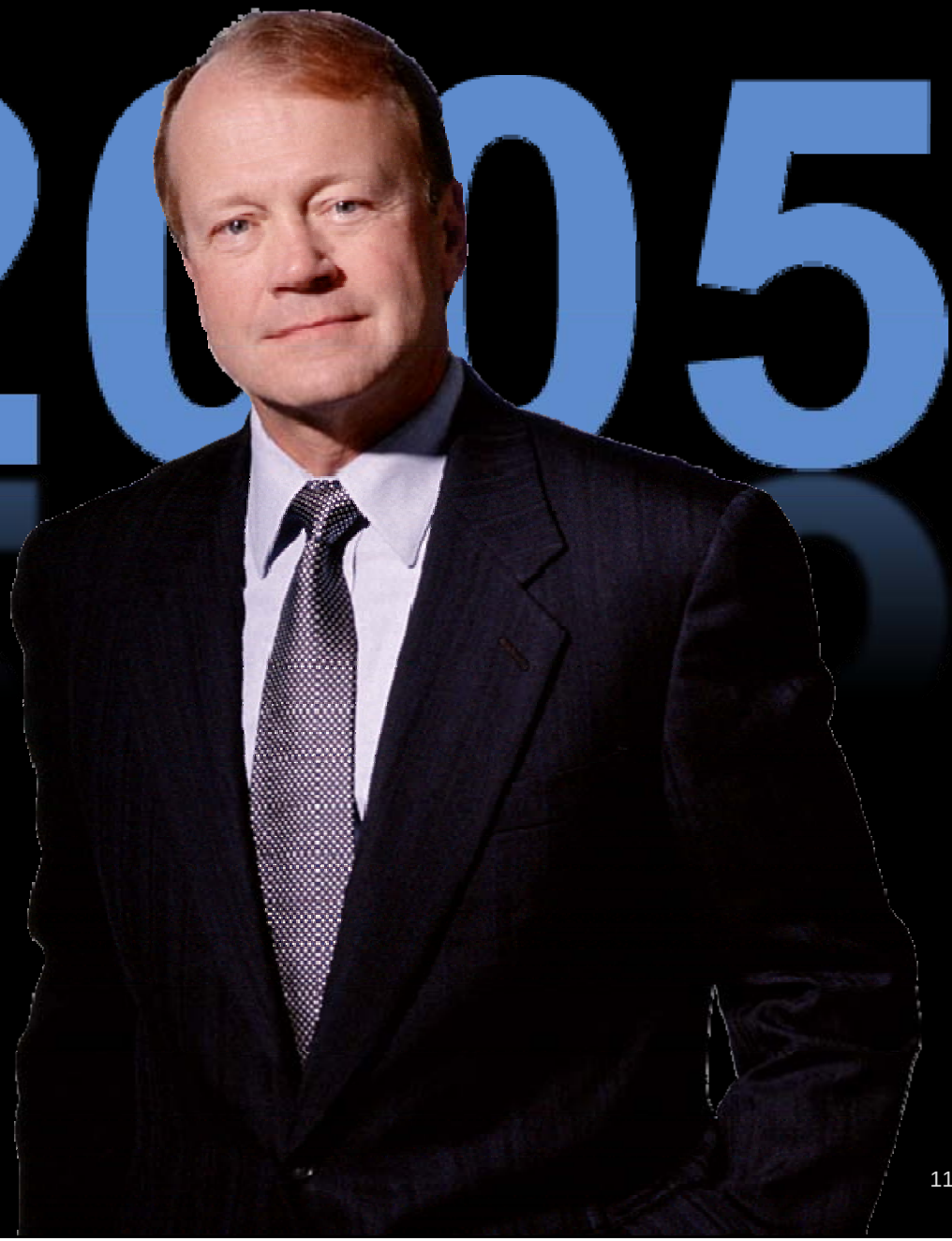
WHAT IS CLOUD COMPUTING?

IT delivered as a service over the network

IT resources and services that are abstracted from the underlying infrastructure and provided on-demand and at scale in a multi-tenant environment

Cisco Strategic Planning

- John Chambers and the Cisco executive team saw 3 trends on the horizon that would change the Data Center
  - Virtualization
  - X86 Evolution
  - 10Gb Ethernet



Virtualization

More Than Just Software

- Virtualization is not new
  - It's just mainstream now
- Changing the Data Center
  - Applications now move around in the network
  - Driving different system requirements
- Integral piece of IT infrastructure
  - 18.2% of all servers shipped in 2009 were virtualized*
  - Virtualization is a top priority for x86 servers*

* IDC Report, April 2010

X86 Evolution

More than Just Transistors

- Moore's Law wins
  - Transistors density doubles every ~2 years
- More transistors = more capable X86
  - Greater scale
  - Better Optimization
  - Higher RAS
- Migration to x86
  - WW shipment of x86 servers up 25.3% in Q1 2010*
  - Shipment of RISC/Itanium down 23.7% in Q1 2010*

Gordon Moore

*Gartner Study, June 2010

Ethernet Evolution

More Than Just Bandwidth

Technology innovation leads to **More Bandwidth**

10MbE 100MbE 1GbE 10GbE 40GbE and 100GbE

More Bandwidth leads to **New Capabilities** in the Fabric

Shared Switched VLANs QoS L3 Switching PoE Security L4-7 Svcs

- L2 Congestion Management
- Lossless Ethernet
- Multipathing
- FCoE
- ++

New Capabilities drive **Standards Evolution**

802.1d 802.3 802.1Q 802.1P 802.11 802.3af ANSI T11, 802.1Qaz 802.1au… IEEE HSSG

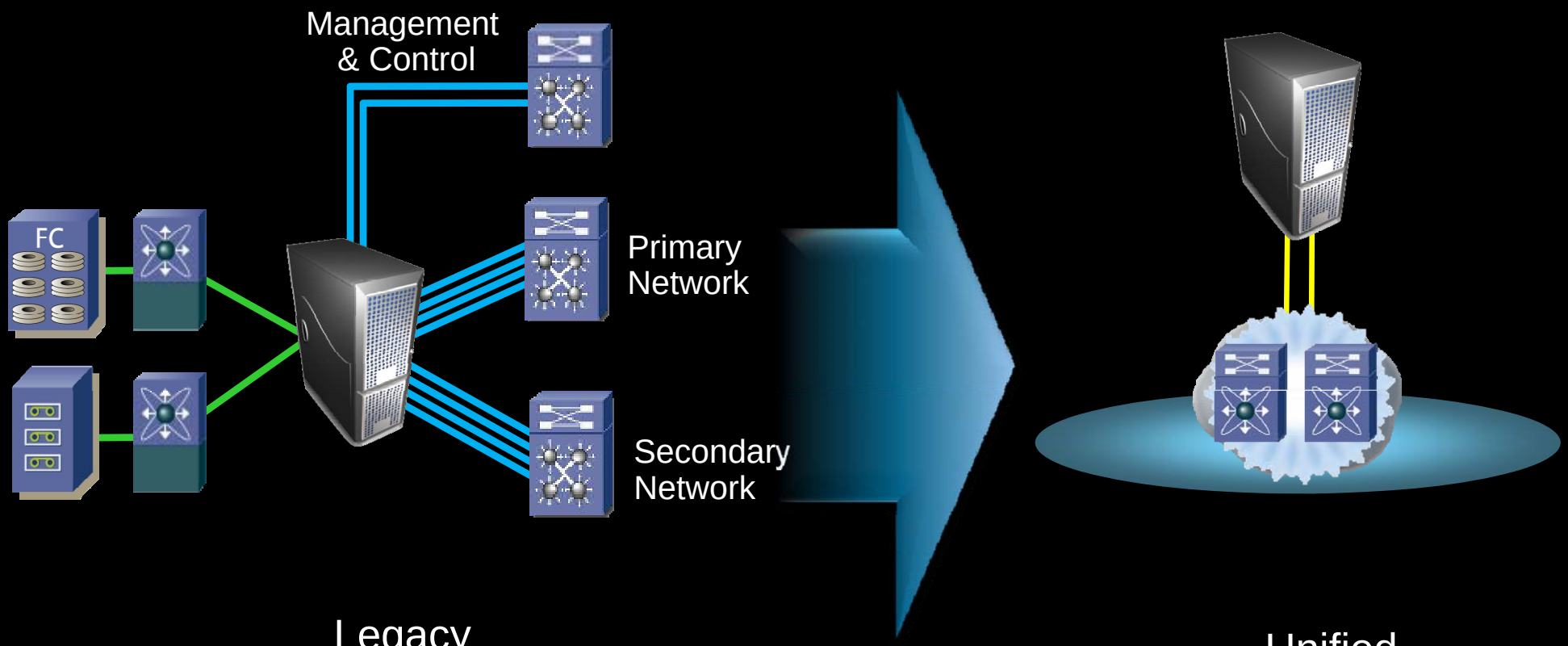
1994 1999 2004 2009+

The Next Data Center Inflection Point

- Virtualization: Application Mobility
- X86 Evolution: Common Compute Architecture
- 10Gb Ethernet: Common Fabric

Simplify the Data Center: Unified Fabric

Wire Once and Walk Away



Legacy

Server = Application

- Inefficient
- Complex
- High Cost
- Fragile

Unified

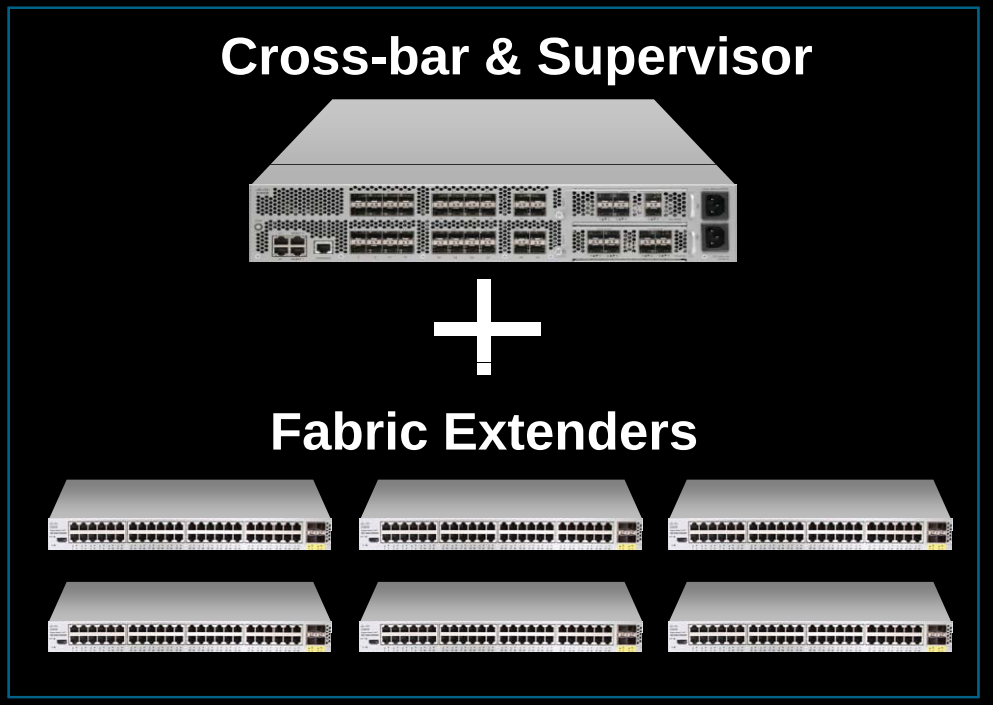
Server = Resource

- Efficient
- Simple
- Lower cost
- Agile

Simplify the Data Center: Unified Fabric

Decouple Scale & Complexity: Lower Costs

=



Modular Switch

Fixed backplane

Distributed Modular Chassis

10Gb Ethernet for the Backplane

FEX-Link Technology: Available in UCS and the Nexus 5000 + Nexus 2000

Technology Evolution: Early 1990's

Simplify The Data Center

Disk Drive

Storage Array

- System Administrators used to manage each disk drive
- The Storage Array fundamentally changed the focus
- How many disk drives do you have in your Data Center?

Technology Evolution: Today

Simplify The Data Center

Server

Unified Computing System

- System Administrators have to manage each server
- Unified Computing changes the focus
- You shouldn’t care how many servers you have

Cisco Unified Computing System

- A Platform for Tomorrow's Data Center. And Today's.
  - Run any application: virtualized or non-virtualized
  - Integrate with existing networks, storage, and management infrastructure
  - Run side by side with legacy infrastructure
  - Self integrating: Deploy rapidly & increase productivity

Cisco Unified Computing System

A single system

- Compute: Industry standard x86
- Network: Unified fabric
- Virtualization: Control, scale, performance
- Storage Access: Wire once for SAN, NAS, iSCSI

Embedded management

- Increase scalability without added complexity
- Dynamic resource provisioning
- Ability to integrate with broad partner ecosystem

Highly efficient

- Fewer servers, switches, adapters, cables
- Lower power and cooling requirements
- Fewer people to deploy and manage

The Datacenter Today

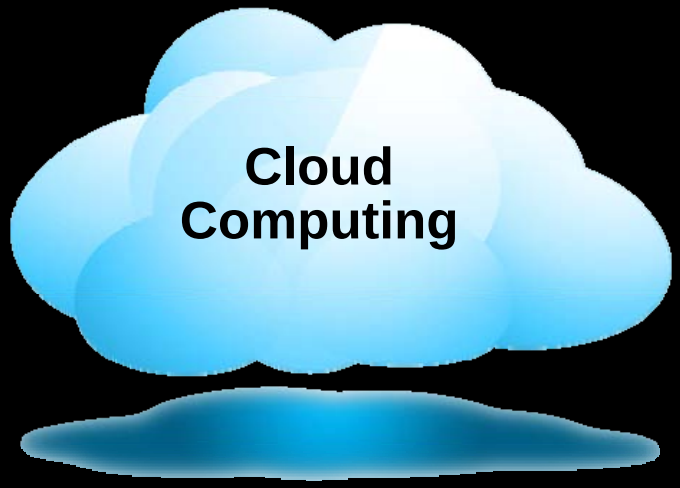
Trusted

Control

Reliable

Secure

Cloud Computing?



Trusted

Control

Reliable

Secure

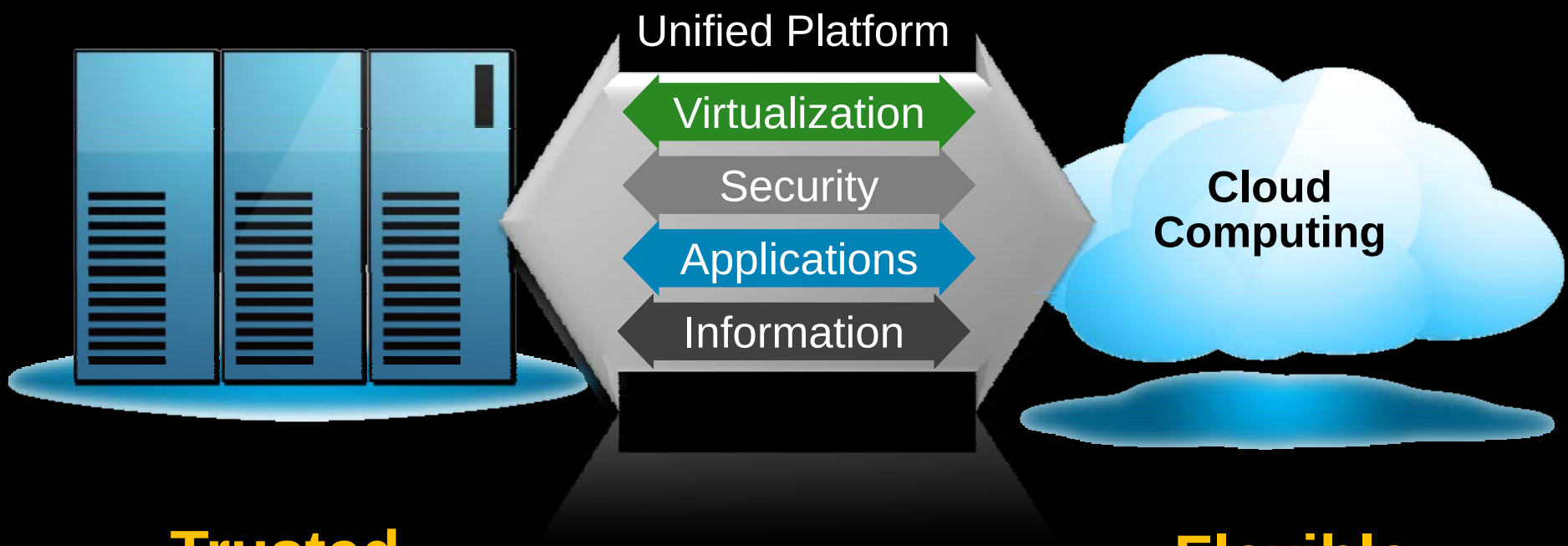
Flexible

Dynamic

On-demand

Efficient

The Goal:



Trusted

Control

Reliable

Secure

Flexible

Dynamic

On-demand

Efficient

Cisco UCS After 1 Year

1700+

UCS CUSTOMERS

#3

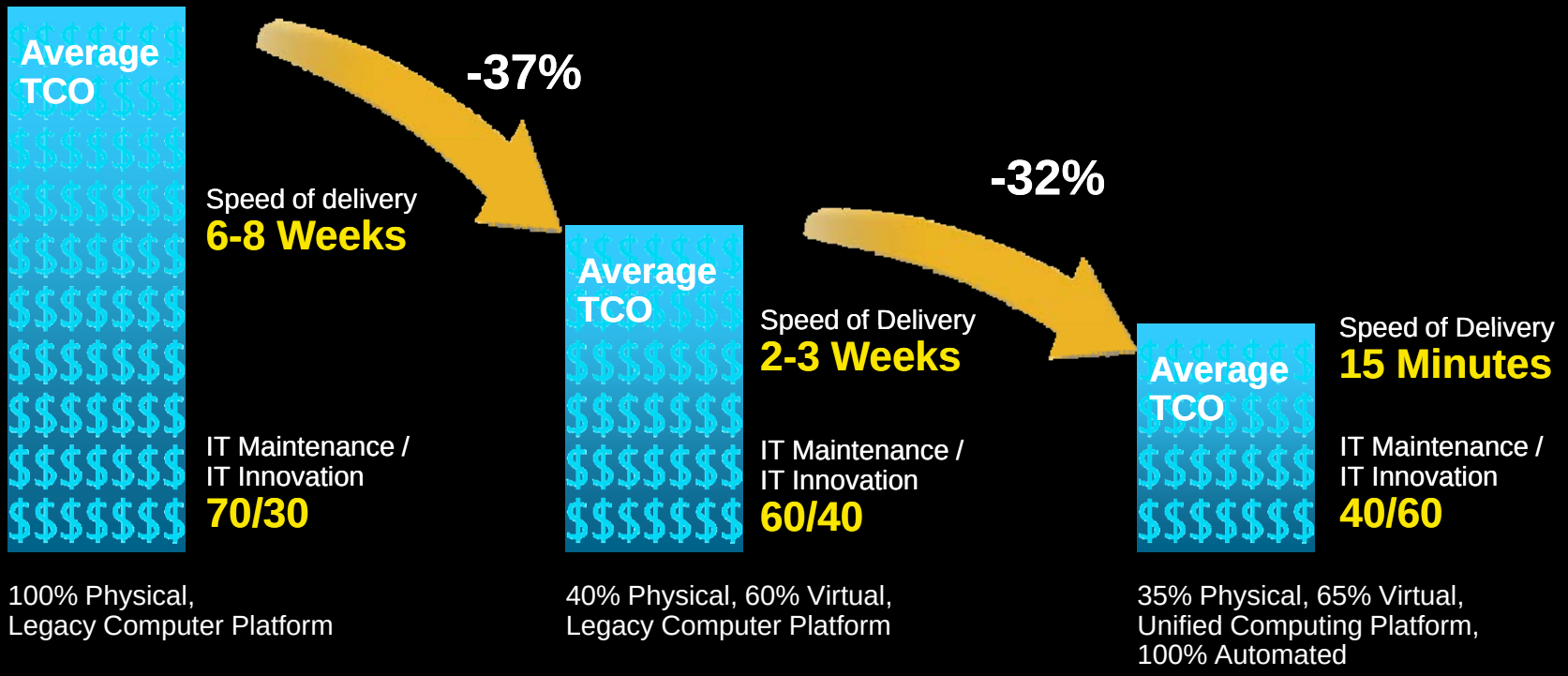
US Blade Vendor

11

WORLD RECORDS
Industry Benchmarks

	Blade Form Factor	Rack Mount Form Factor
	Intel Nehalem EX Processor Family	
4S Servers	B440 M1	C460 M1
2S Servers High Memory Small form factor	B230 M1 NEW	
	Intel Westmere EP Processor Family	
Extended Memory 2S Servers	B250 M2	C250 M2
2-Socket Servers	B200 M2	C210 M2 C200 M2

Cisco-on-Cisco Results: ROI Achieved by Cisco IT



Virtualization → **Unified Computing and Automation**

Cisco's Track Record

25 Years of Anticipating and Driving Industry Change

Major IT Transitions Lead by Cisco Innovation

Market Area	Technological Innovations
Enterprise Networks	SNA networking over IP and Ethernet Switching transformed Enterprise networking
Carrier Networks	Tag Switching was the basis of MPLS, the foundation of today's Service Provider networks
Business Telephony	IP telephony technology revolutionized legacy PBX market by converging telephony with IP networks.
Unified Fabric	Unified Fabrics allow integration and simplification of disparate LAN and SAN switching domains
Unified Computing	Unified Computing combines compute, network, and storage systems to further optimize data center architectures

In Each Case Legacy Vendors Attacked the New Approach

In Each Case Cisco Defined the Next-Generation Architecture

Join Us as We Change the Data Center

- What is happening in the data center today is a once in a decade opportunity
- Cisco is innovating to simplify the Data Center so you can scale to tomorrows needs
- Learn about Cisco's
  - Unified Computing System
  - Unified Network Services
  - Unified Fabric