



CLOUD
TRANSFORMS IT

BIG DATA
TRANSFORMS BUSINESS

Pat Gelsinger

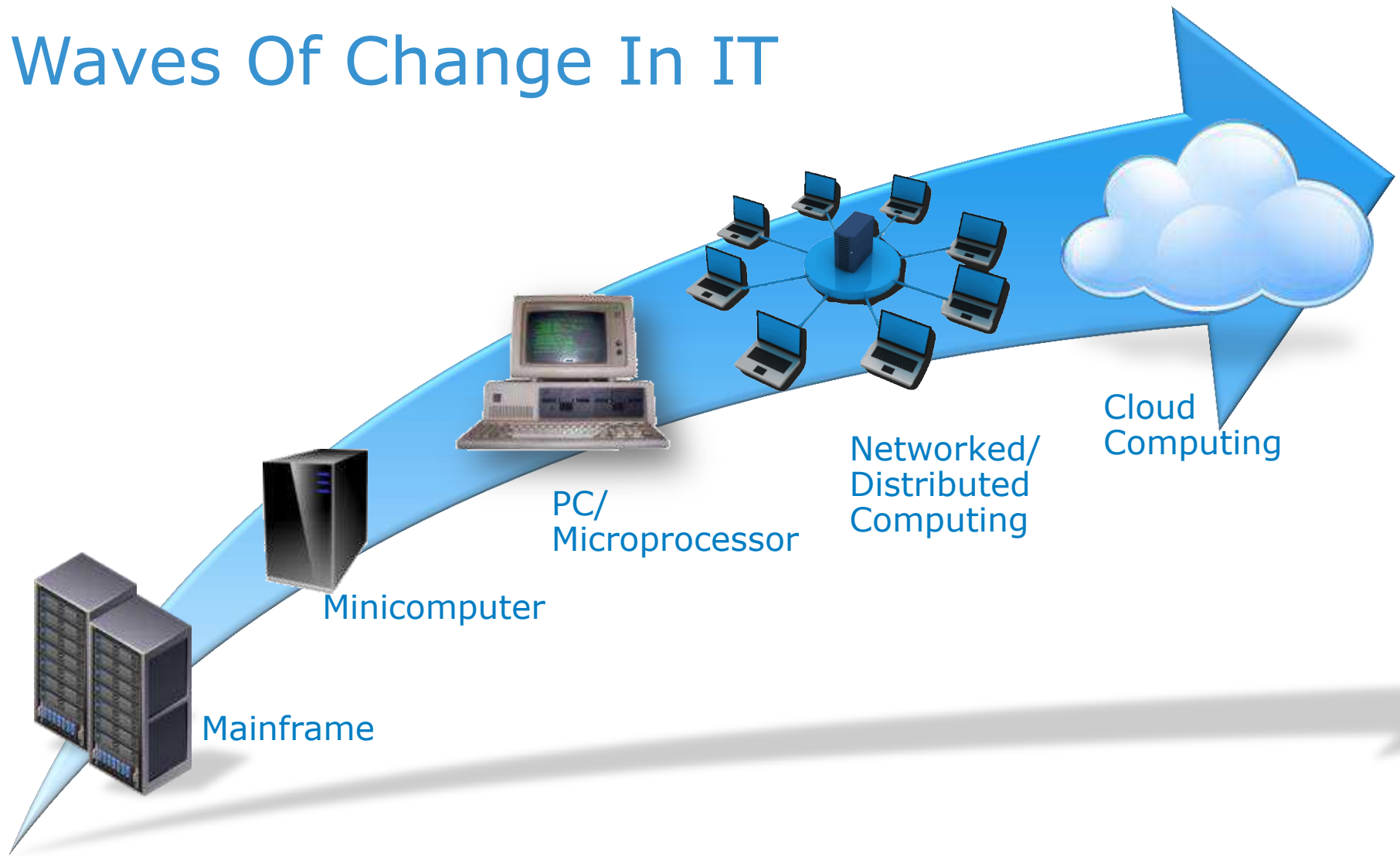
President & COO

Information Infrastructure Products

EMC Corporation

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Waves Of Change In IT



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Phases Of IT Maturity



Packaged Applications
Flat IT Tax, Project-centric
Dedicated Vertical Stacks

Reactive

Respond To Business Request



Service Catalog
Cost & Use Metrics
Dynamic Resource Pools

Proactive

Increase IT Agility

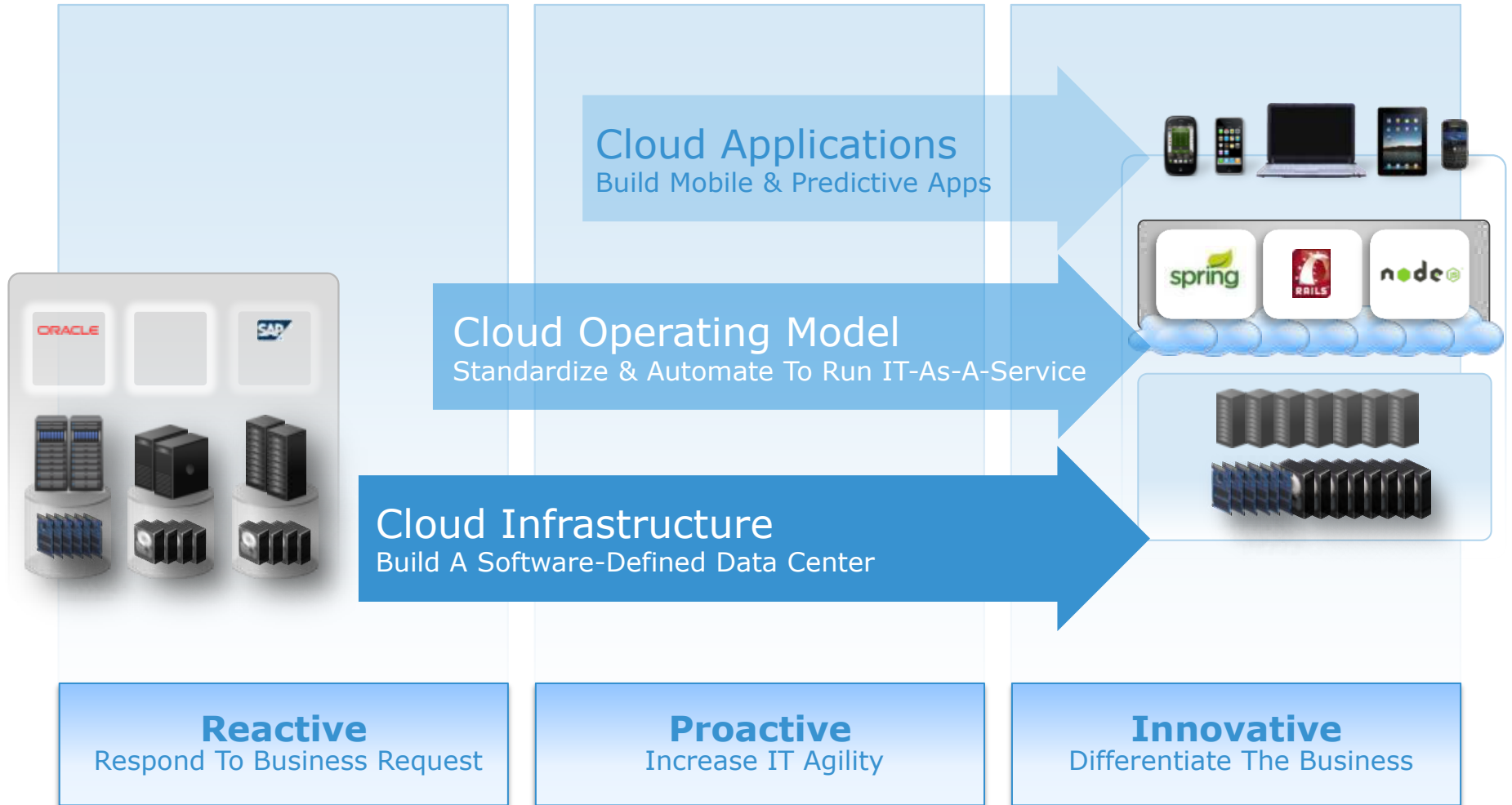


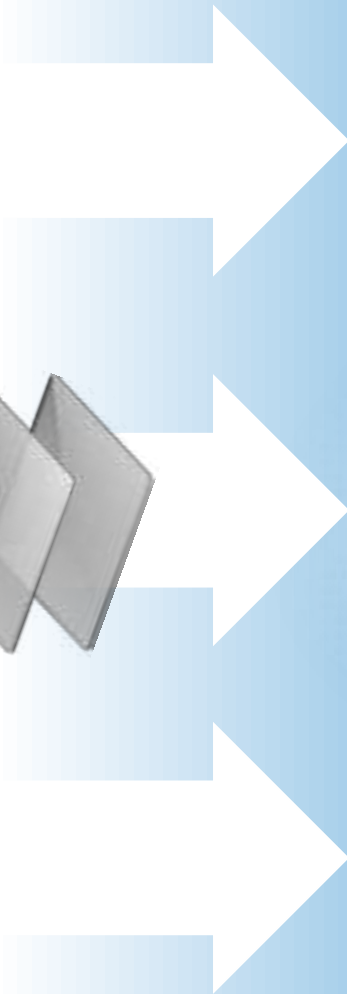
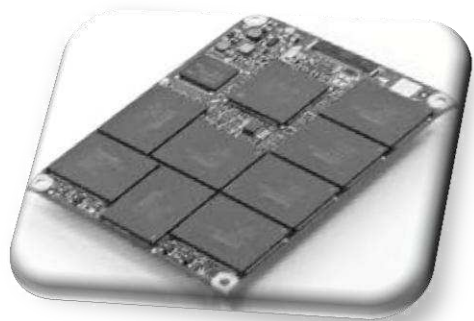
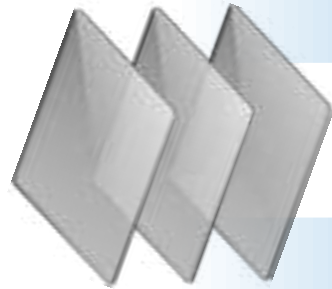
New Business Applications
Pay-For-Use
Automated Infrastructure

Innovative

Differentiate The Business

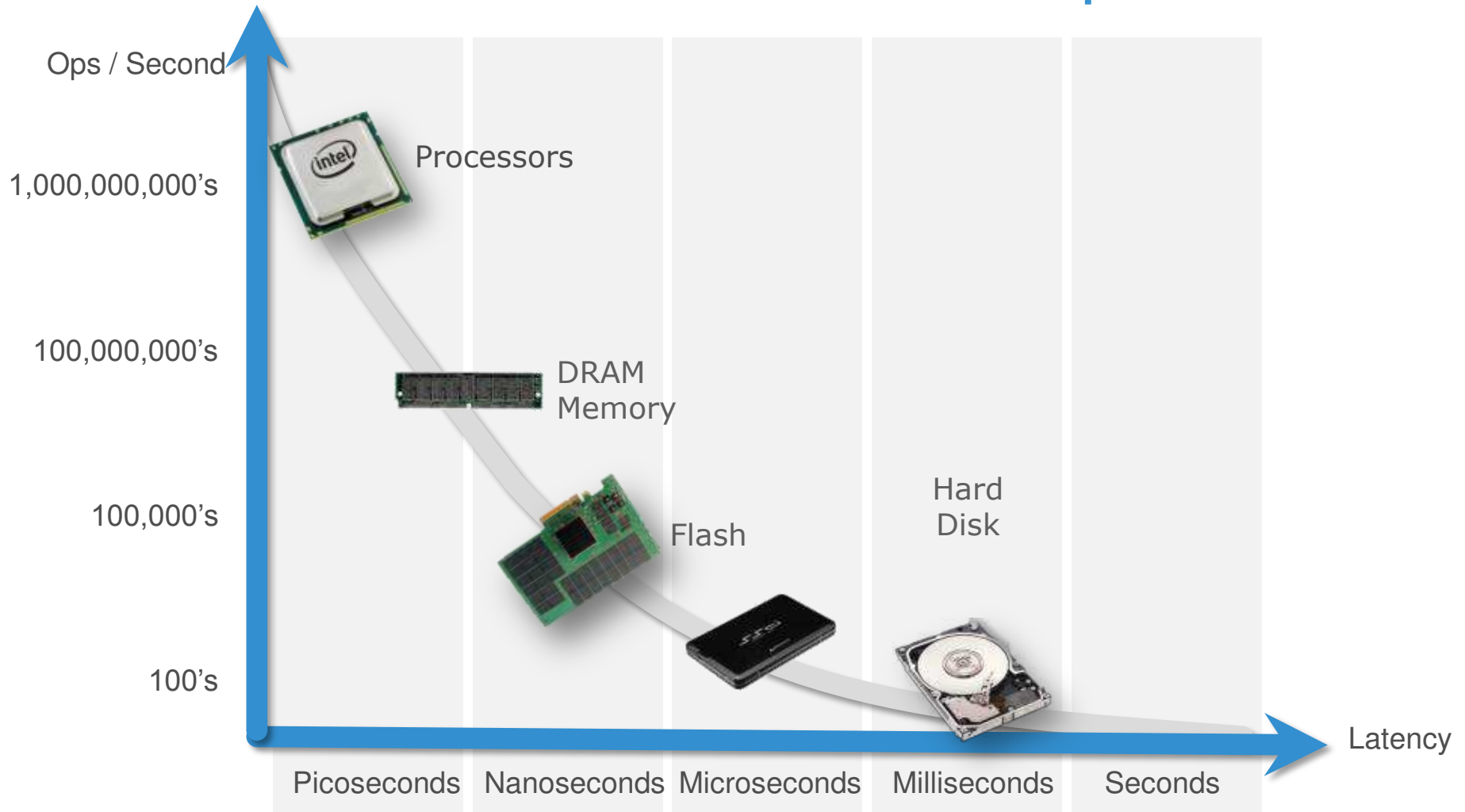
Steps Of IT Transformation





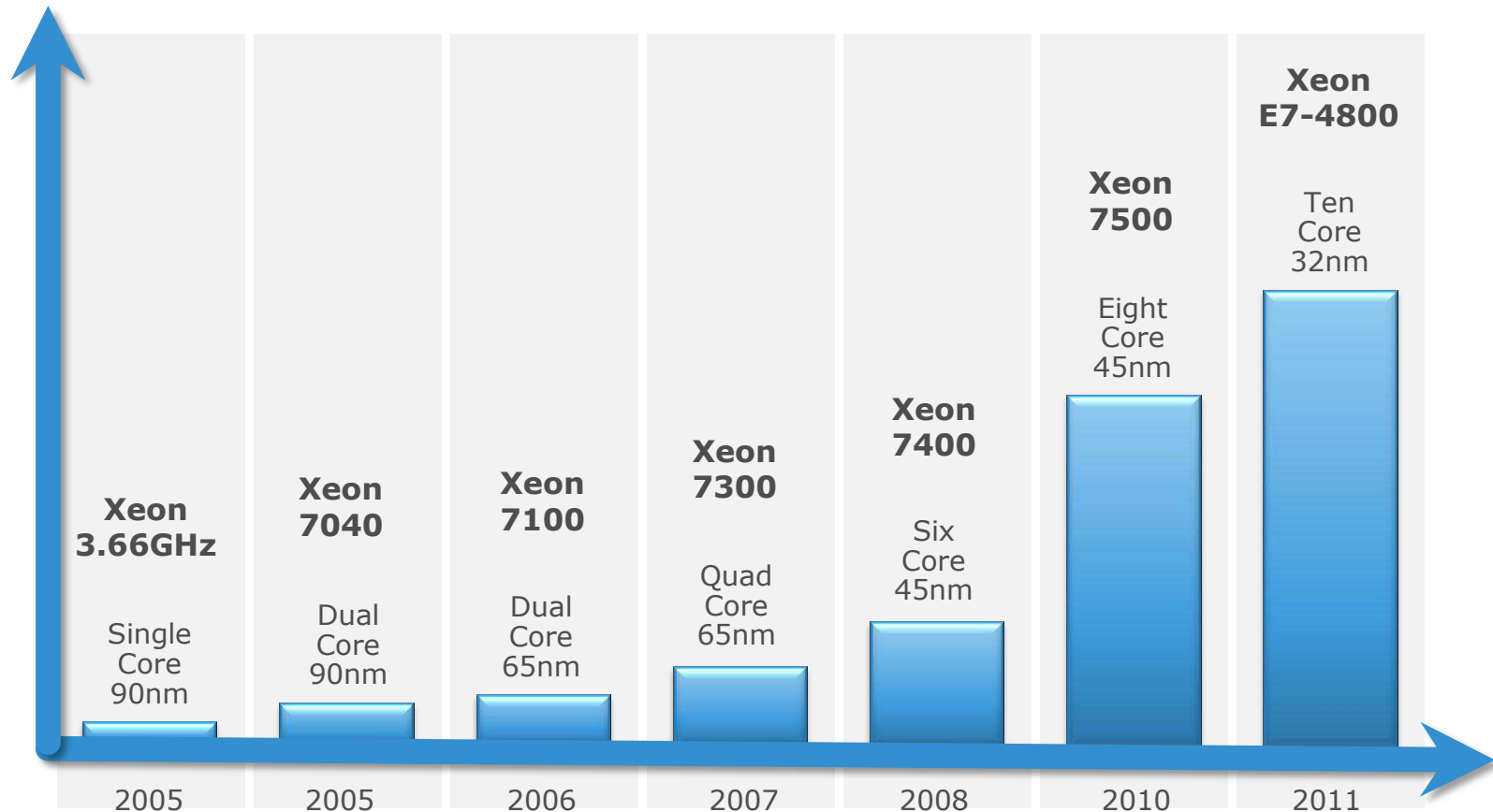
Cloud.

Flash Fills The Performance Gap



Dramatic Performance Growth For x86

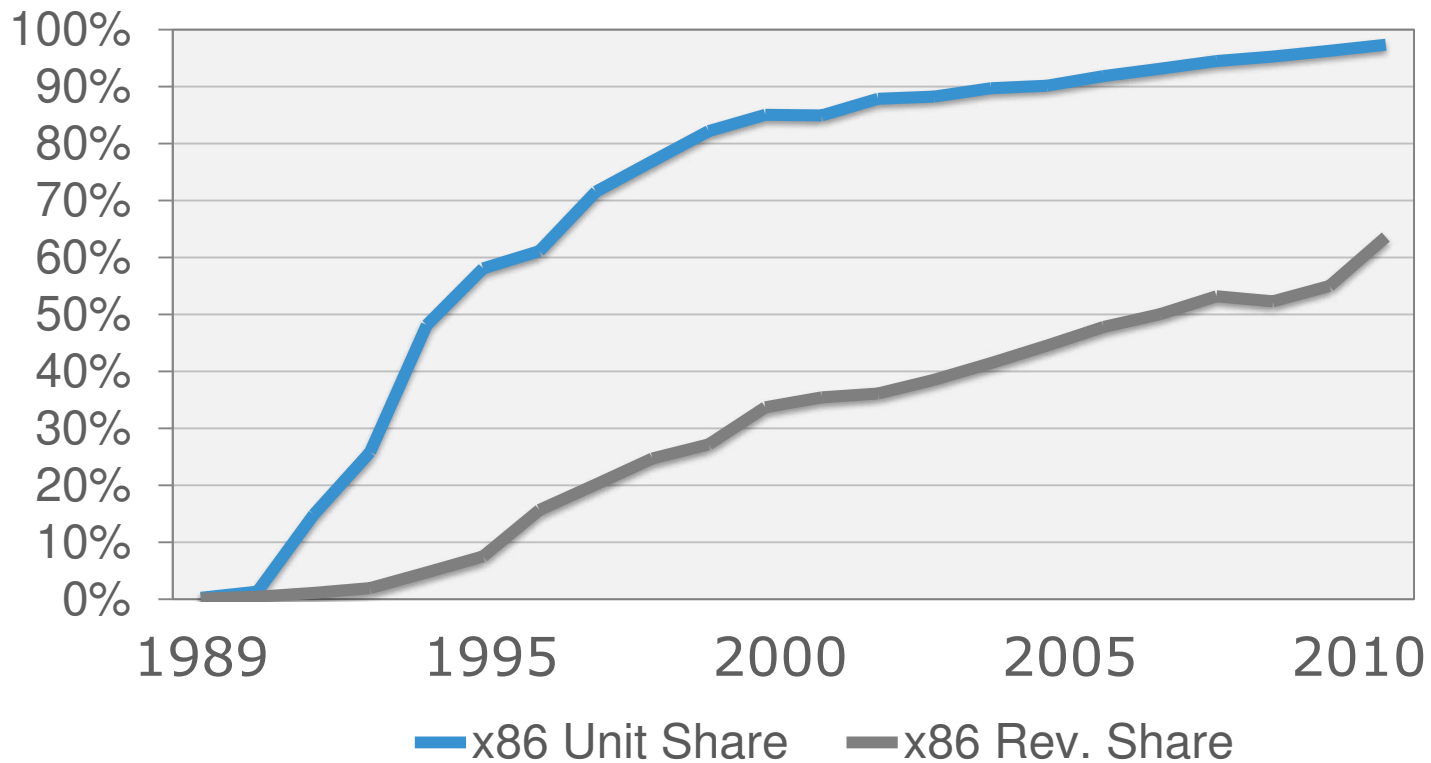
2000% Performance Increase Since 2005



Source: Intel internal OLTP database workload performance estimates as of 15 April 2011. Results have been estimated based on internal Intel analysis and are provided for informational purposes only. Any difference in system hardware or software design or configuration may affect actual performance.

Dominant Market Share For x86

x86 As A Percent Of Worldwide Server Shipments

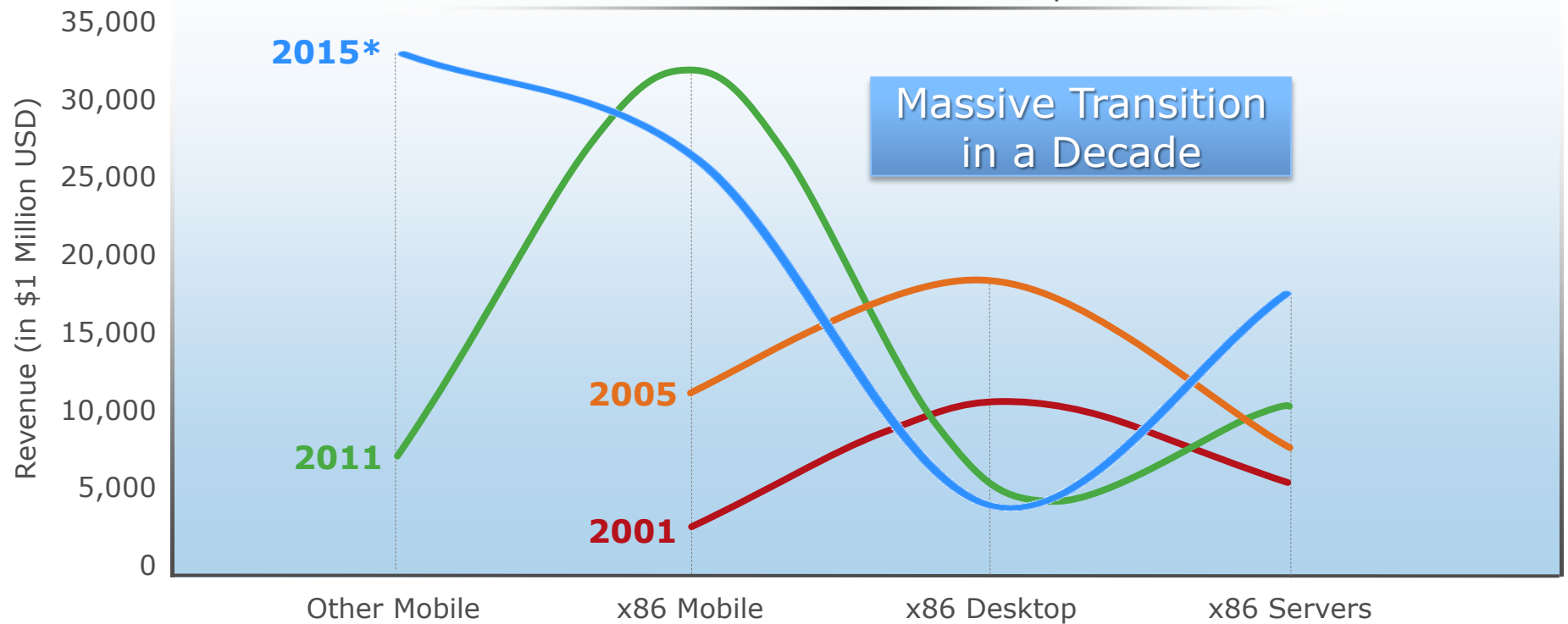


Source: IDC

Waves of Change



Net Revenue From CPUs & Chipsets+



+ Data from Intel 2011, 2005, 2001 Annual Reports, [http:// www.isuppli.com](http://www.isuppli.com), [http:// www2.uta.edu/marketing](http://www2.uta.edu/marketing)

Future Si Design - Mobile

More than Power, Performance, Cost and Footprint

- Embed HW in SoC for:
 - Virtualization
 - Graphics: Remote desktop / graphics-rich remote UI
 - Security: e-Currency, DRM, Anti-Virus
 - Encryption: Fast, secure end-point communication
- Standard HW interface for generic OS / SW management



Cloud.

Future Si Design- Server

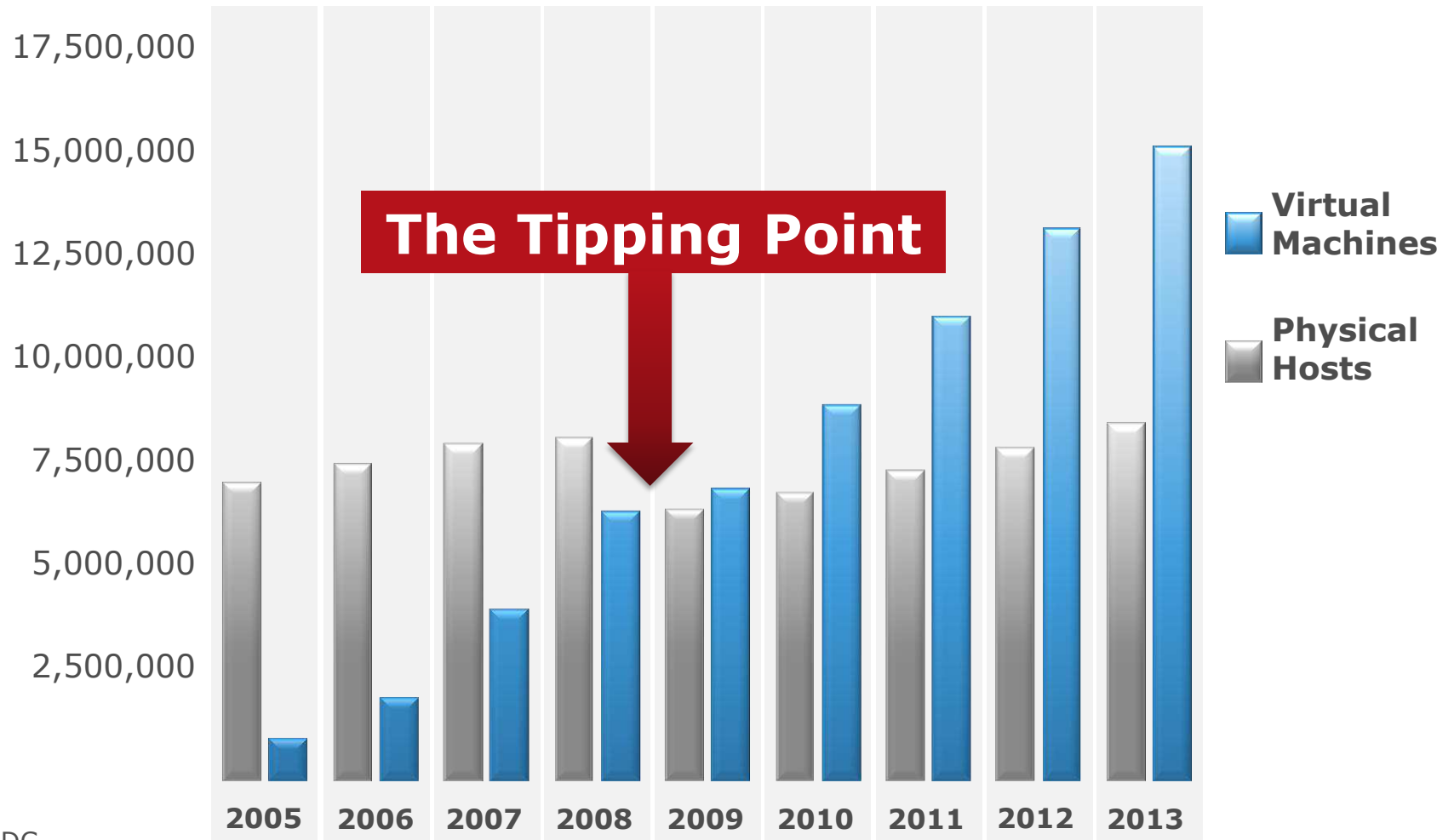
More than Power, Performance, Cost and Footprint

- Design for the Software-Defined Data Center & Big Data
 - Server NICs integrate VXLAN VTEP
 - HW accelerates remote graphics-rich desktops and connection protocols
 - Programmable HW to classify and inspect network packets
 - Large on-chip, high-speed memory (SRAM, PCM, Flash)

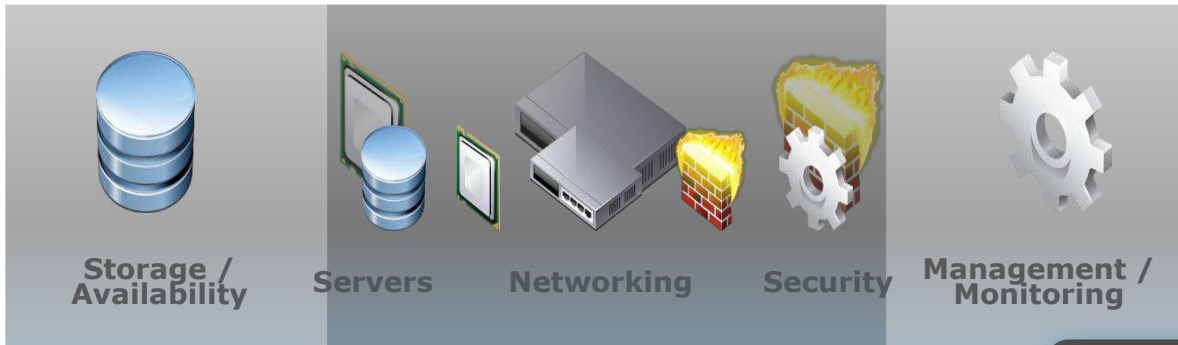


Cloud.

2009: More Apps On Virtual Infrastructure



Source: IDC



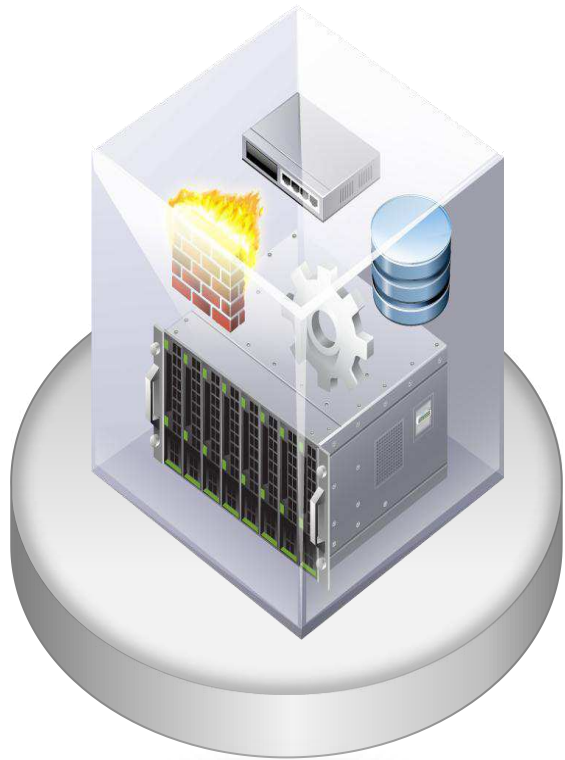
2008



2012



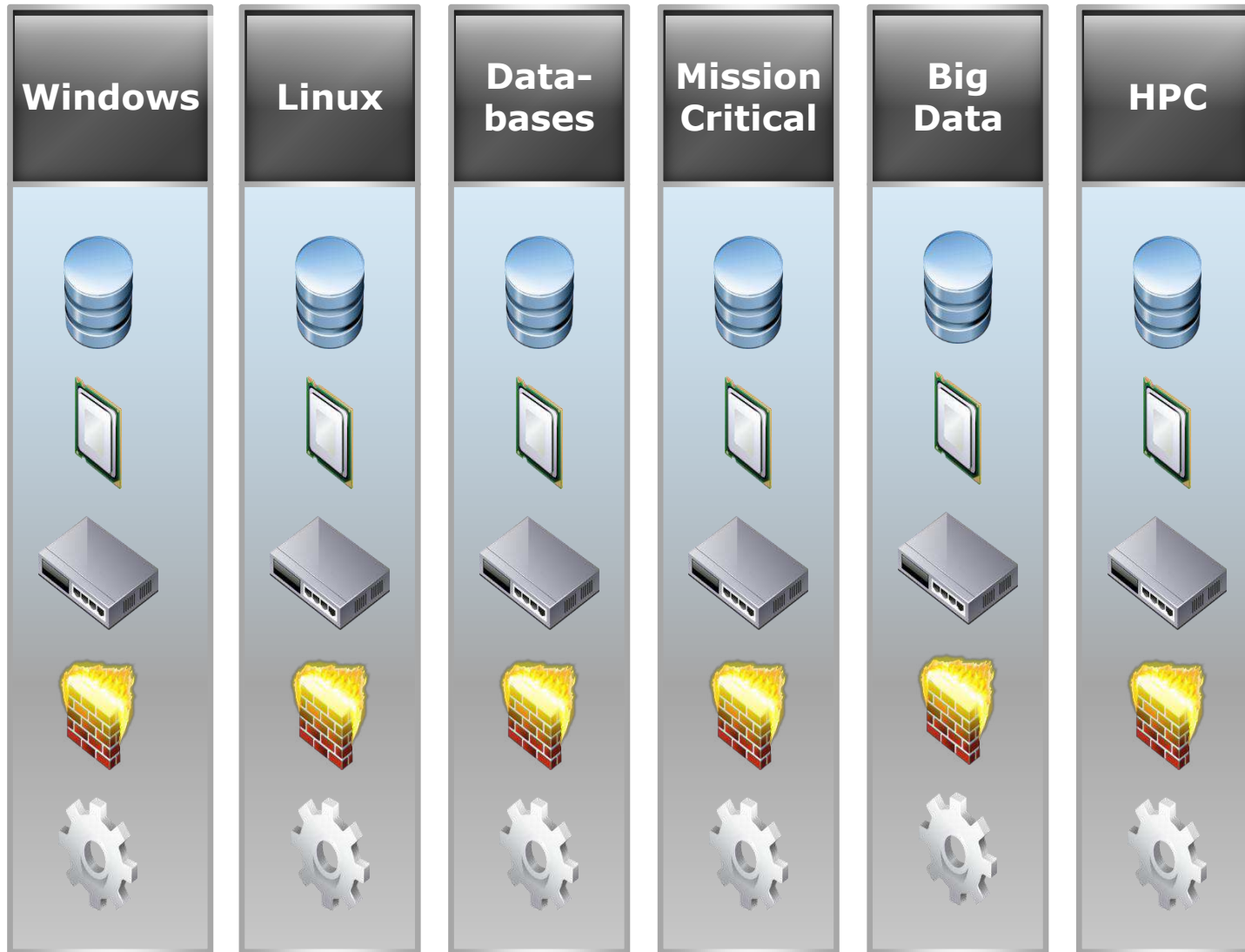
FUTURE



SOFTWARE-DEFINED DATACENTER

All infrastructure is virtualized and delivered as a service, and the control of this datacenter is entirely automated by software.

Traditional View of the DC Environment



Windows

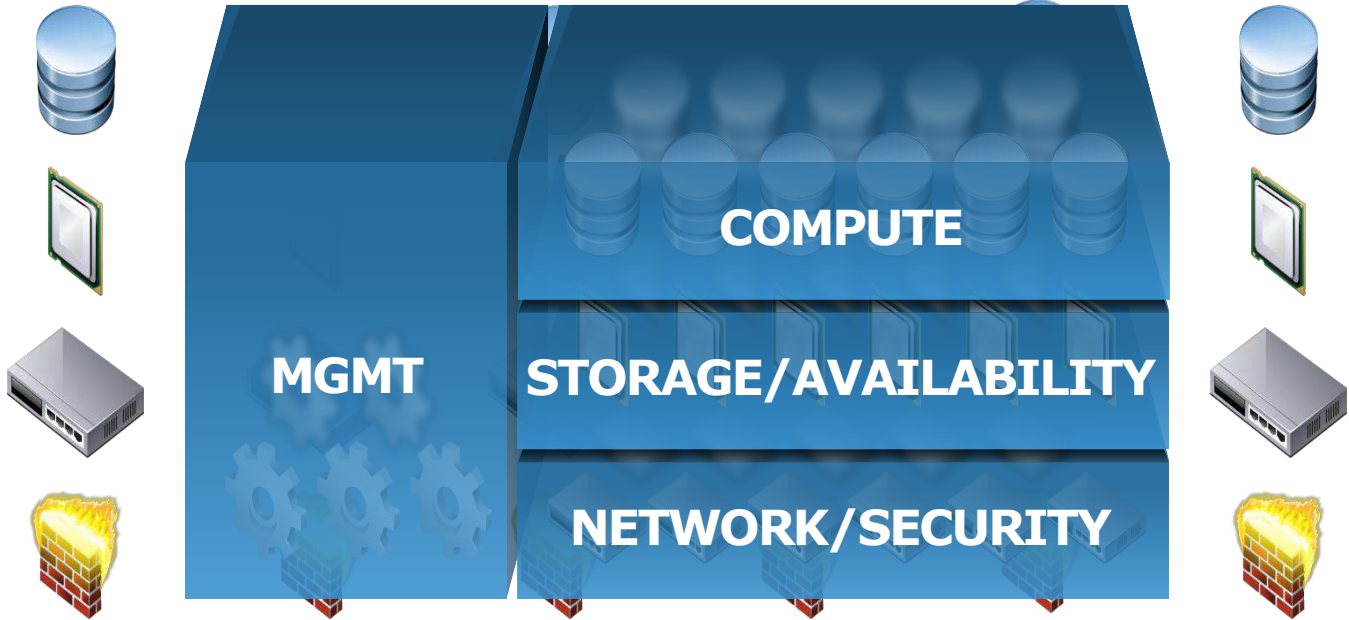
Linux

Data-bases

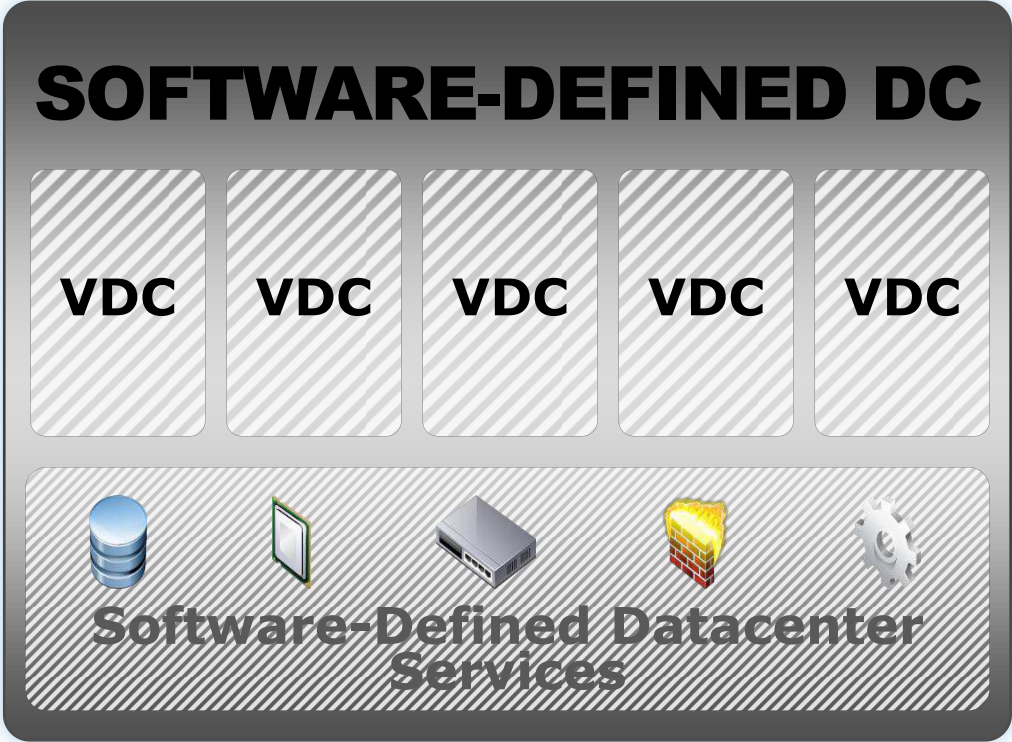
Mission Critical

Big Data

HPC



ABSTRACT. POOL. AUTOMATE.

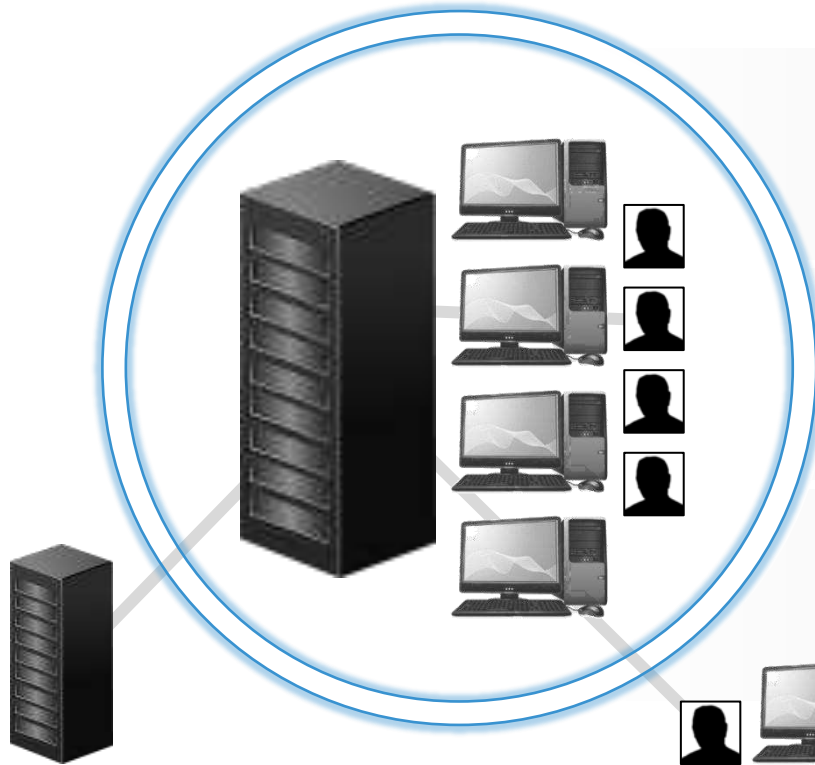




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Old World: Static Security



Static Attacks

Generic, Systems-Based

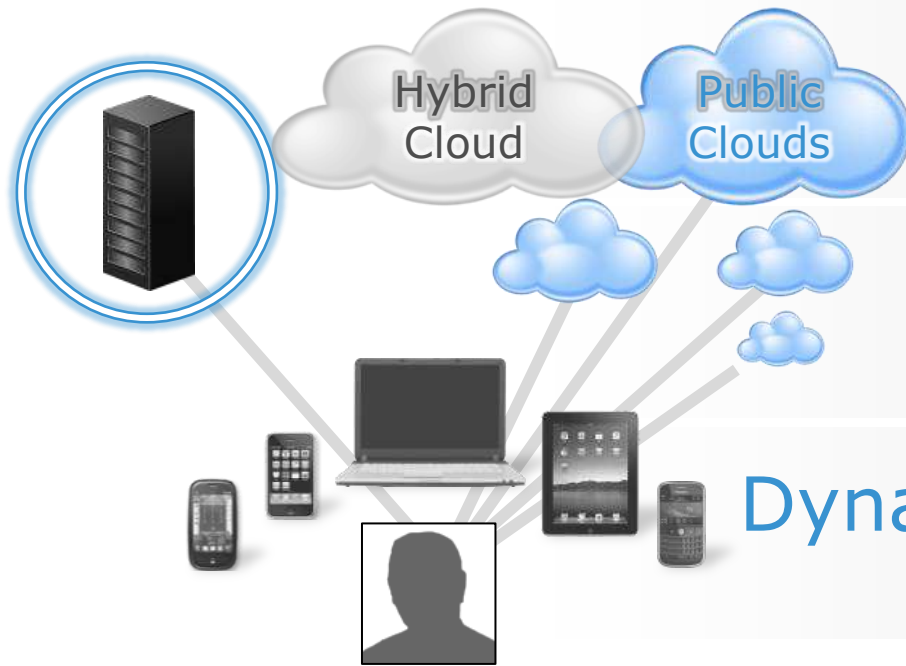
Static Infrastructure

Physical, IT Controlled

Static (Bolt-On) Defenses

Signature-Based, At Perimeter

New World: Dynamic Security



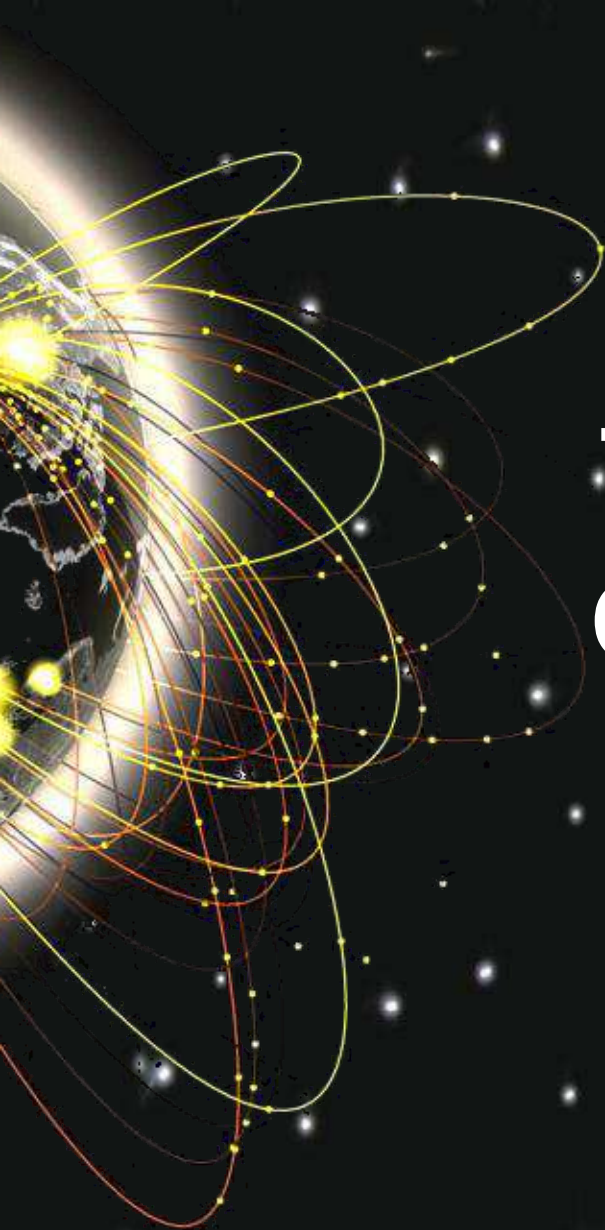
Dynamic Attacks
Targeted, Human-Based

Dynamic Infrastructure
Virtual, User-Centric

Dynamic (Built-In) Defenses
Analytics & Risk-Based



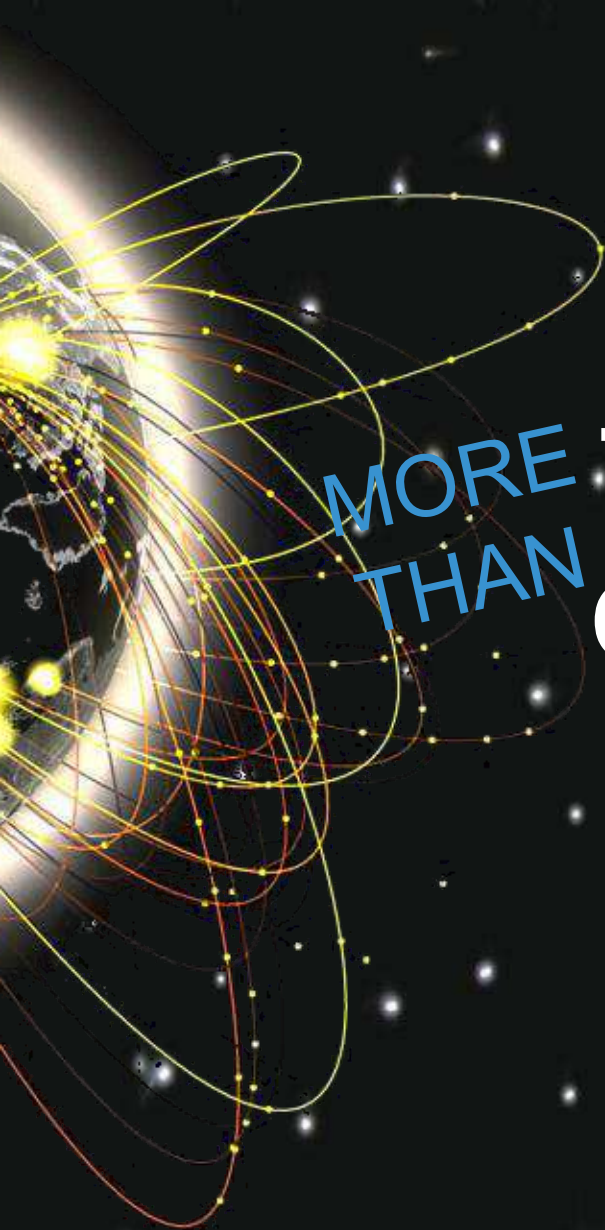
BIG DATA TRANSFORMS BUSINESS



IN 2000 THE WORLD GENERATED
TWO EXABYTES
OF NEW INFORMATION

Sources: "How Much Information?" Peter Lyman and Hal Varian, UC Berkeley, . 2011 IDC Digital Universe Study.

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2011

MORE
THAN

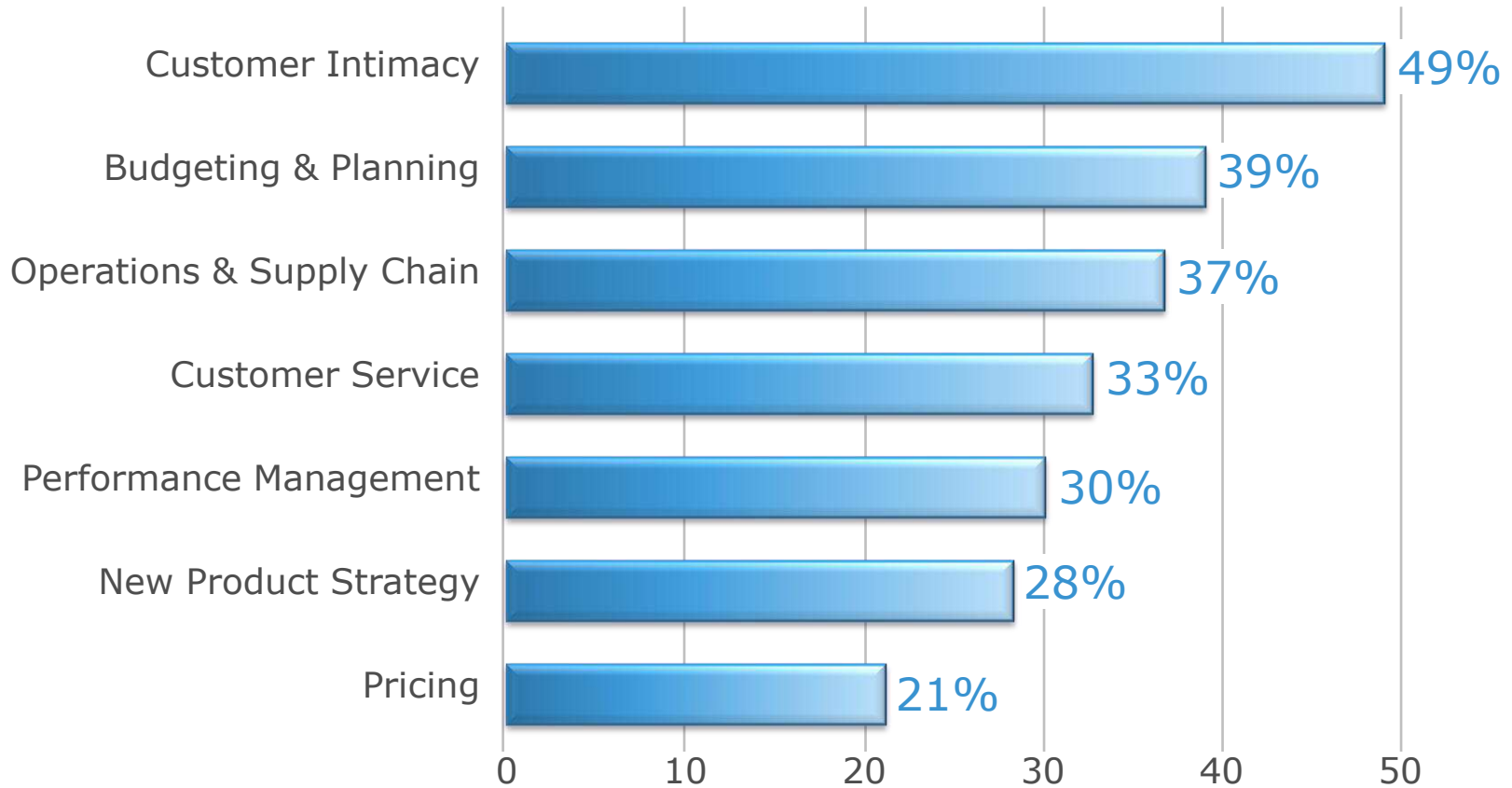
IN ~~2000~~ THE WORLD GENERATED
TWO EXABYTES
OF NEW INFORMATION
EVERY DAY

Sources: "How Much Information?" Peter Lyman and Hal Varian, UC Berkeley, . 2011 IDC Digital Universe Study.

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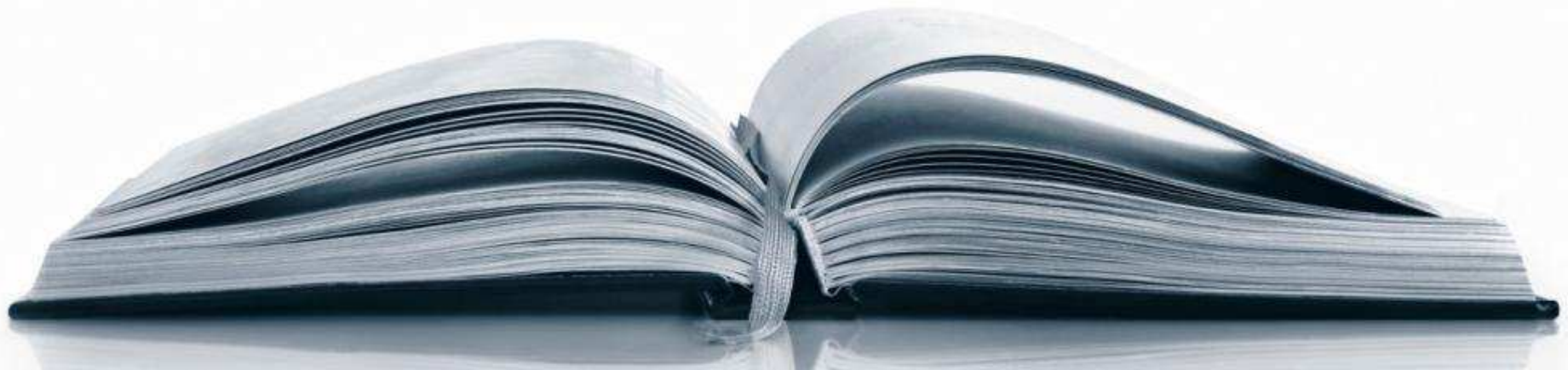
How Companies Are Using Big Data

Functional Areas Where Companies Are Using Big Data



McKinsey Global Survey of 1,469 C-level executive respondents at a range of industries and company sizes, "Minding Your Digital Business," 2012.

big•data \ datasets so large
they break traditional IT
infrastructures.



BI focuses on managing and reporting on **existing data** to **monitor** and **manage** concerns within the enterprise



Data Science applies advanced **analytical** tools and algorithms to generate **predictive insights** and **new** product **innovations** that are a direct result of the data

Who Is The Data Scientist?

Source: EMC Study, "Data Science Revealed: A Data-Driven Glimpse into the Burgeoning New Field," December 5, 2011

Training Tomorrow's Talent

EMC Academic Alliance

Data Science and Big Data Analytics



Introduction to big data and the state of the practice of analytics, including a Data Analytics Lifecycle to address business challenges

[Download Course Outline >>](#)



EMC Data Science
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institutions

ountries

0+ students

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In Summary

- Silicon design remains essential – HW/SW co-design is critical
- The action is in the edges (Mobile & Server)
- Cloud becomes the Software-Defined Datacenter
- Big Data opens up new opportunities for HW design



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