



INVESTOR MEETING 2014

Diane Bryant

Senior Vice President & General Manager
Data Center Group

Key Messages

Big industry trends fuel data center growth

Investing to win across workloads & segments

Revenue CAGR at 15% through 2018*

Capitalizing on Industry Trends

Move to Digital Service Economy



Billions
of connected
DEVICES



New
SERVICES



Build out of the
CLOUD

Jevons Paradox

Increase in
technology
efficiency

Increases
rate of
consumption



Leads to
new usages

Resulting in Four
Data Center
Growth Drivers

Cloud

NFV / SDN

HPC

Big Data

2013

... and Drive Unprecedented Economic Results
China's "Singles' Day" (11/11) = 3X US Cyber Monday Sales



\$5.7 BILLION IN SALES
&
188M TRANSACTIONS
in One Day

Source: Alibaba, November 2013

* Other names and brands may be claimed as the property of others.

2014

China's Singles' Day 2014 11/11



63%
INCREASE
VS. 2013

\$9.3 BILLION IN SALES

&

85%
INCREASE
VS. 2013

278M TRANSACTIONS

in One Day

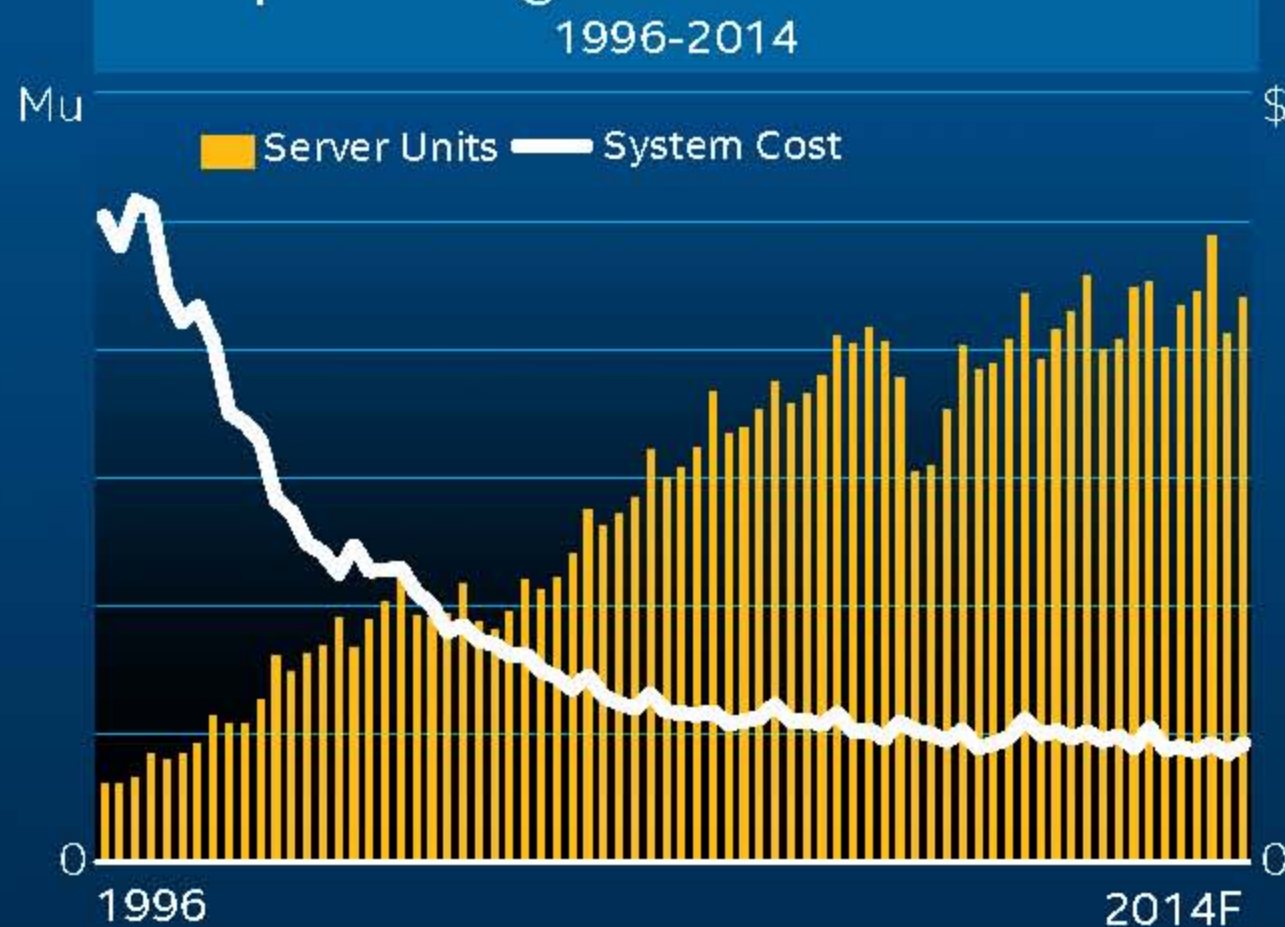
43% of transactions from mobile devices

Source: Alibaba, November 2014

* Other names and brands may be claimed as the property of others.

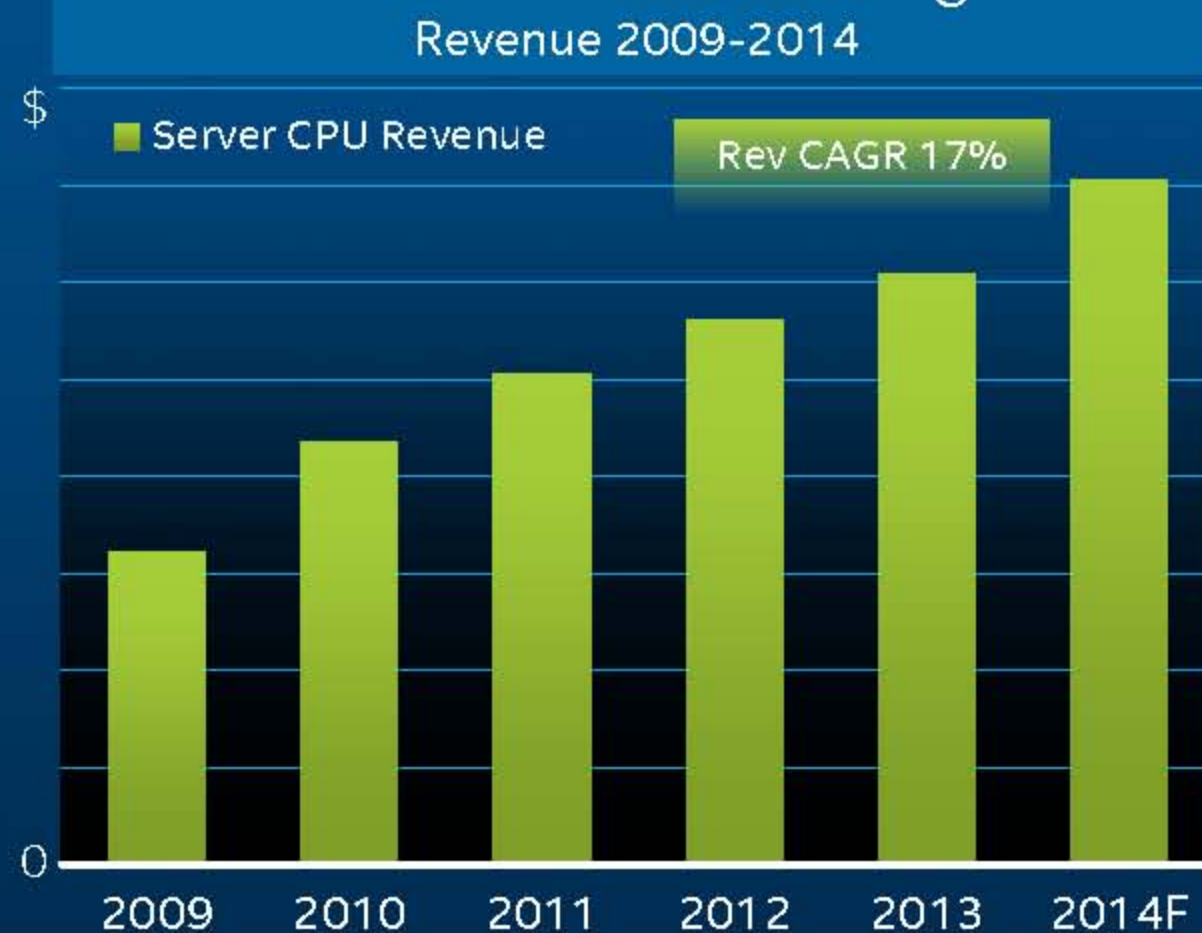
Jevons Paradox

Impact of high volume x86 servers 1996-2014



SHV servers delivered **80%** system cost savings over RISC & drove **625%** increase in volume

Move to virtualization fuels growth Revenue 2009-2014



5X improvement in server utilization results in **17%** revenue CAGR

Next efficiency transformation
Cloud Architecture & NFV / SDN

Data Center Transformation

Enterprise IT

In 2014, **12%** of Enterprise IT deploying private cloud

UBS
NFV/SDN connecting a Hadoop cluster for banking operations

Cloud Service Provider

Tencent
Deployed NFV / SDN for Cloud network

AWS
Deployed 729 TFLOP HPC cluster, 71K cores in 60 min

Telco Service Provider

China Telecom + VMware
Delivering hybrid cloud, IaaS

China Mobile
Big Data solution for billing inquiry service

Technical Computing

Paypal
Semantic analysis using HPC for detecting anomalous transactions

Growth Drivers Underlie All Segments

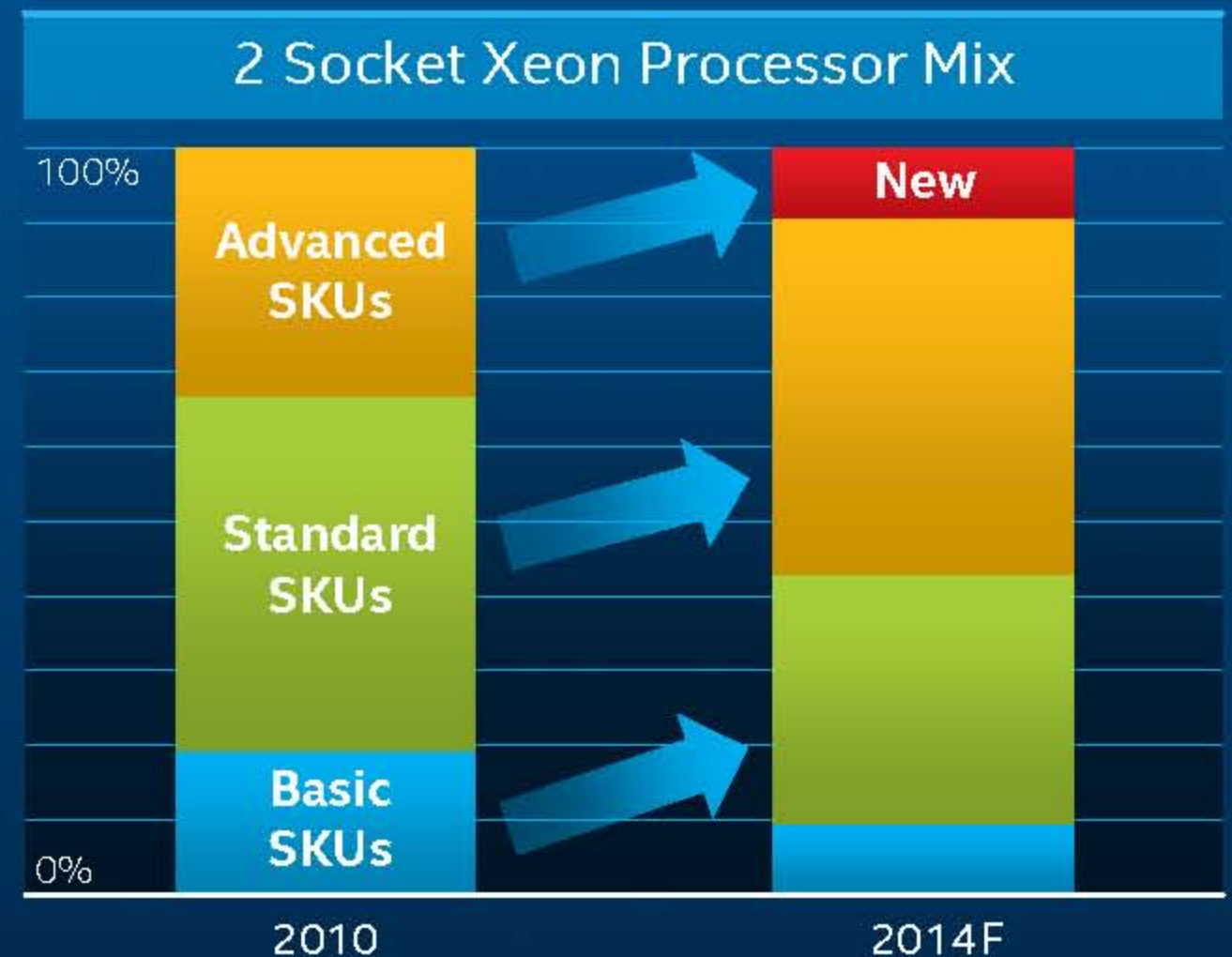
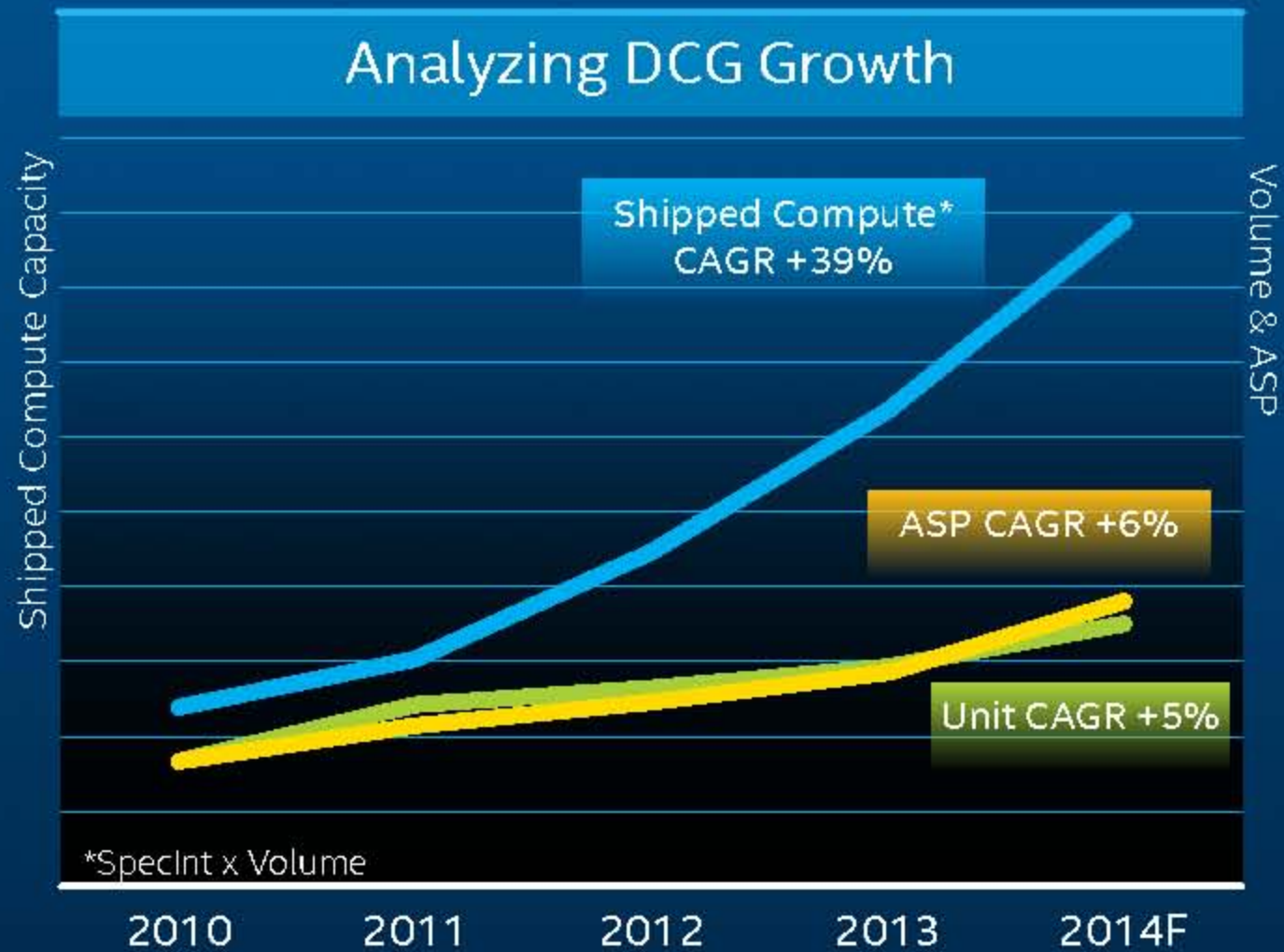
Cloud

NFV / SDN

HPC

Big Data

Compute Capacity Drives Purchase Decision



Increased capacity per system drives up processor mix
70% of volume moves up over 4 years

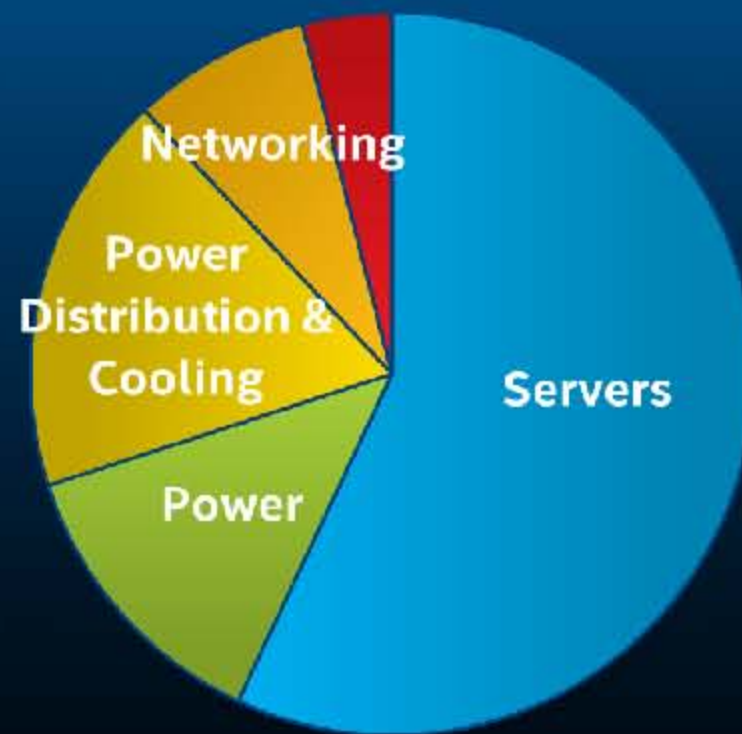
Compute Capacity Drives End-user Value

Enterprise IT TCO

| Cost / Bandwidth | Server A | Server B |
|-------------------|--------------------------|-------------------------|
| CPU | Haswell, 10 cores | Haswell, 6 cores |
| RAM | 256GB | 256GB |
| Avg. System Cost | \$10,519 | \$7,519 |
| # of Servers | 10 | 19 |
| 4-year TCO | \$543,932 | \$977,672 |

SKU selection provides
Up to 44% TCO savings over 4 years

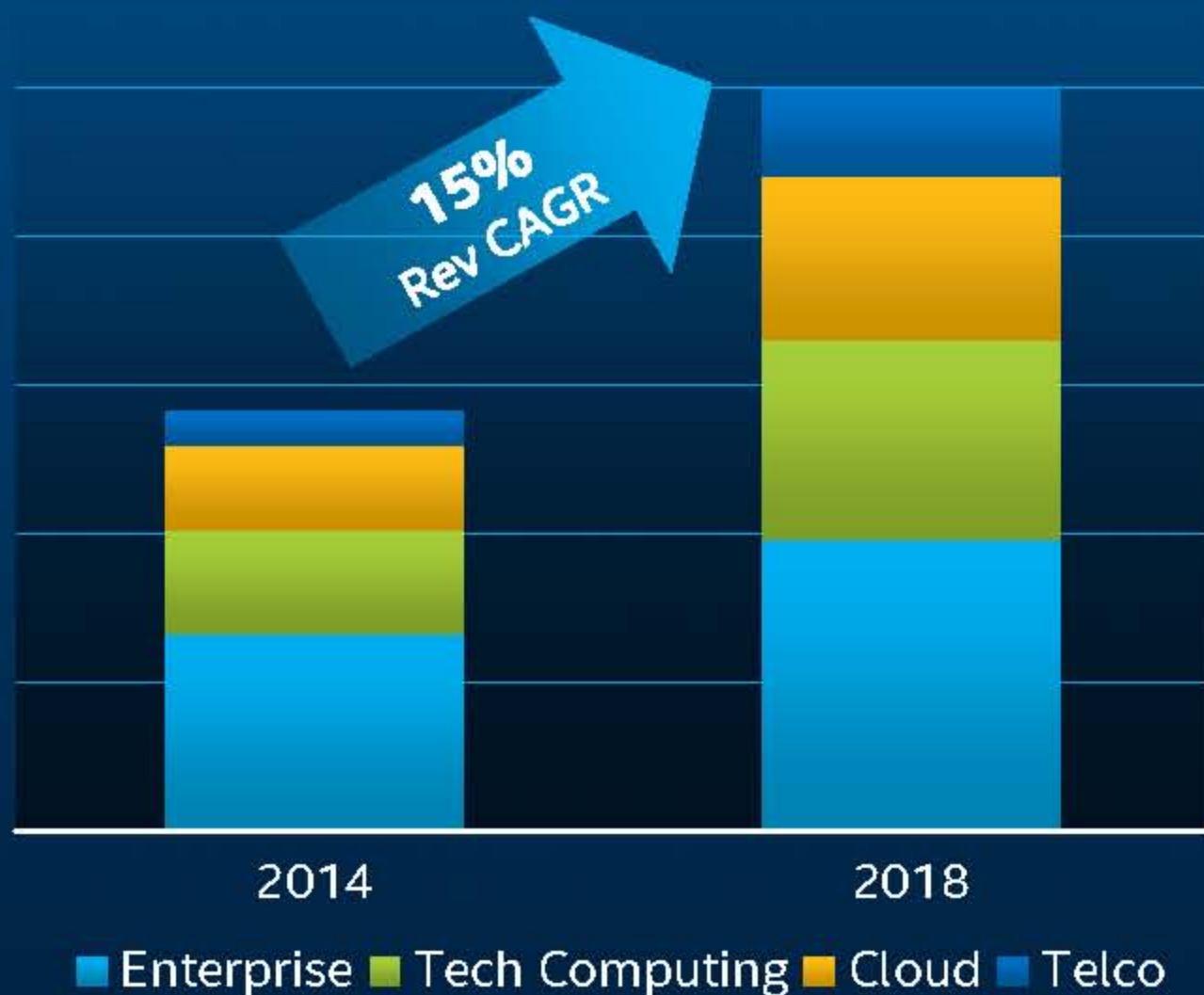
Amazon's TCO Analysis



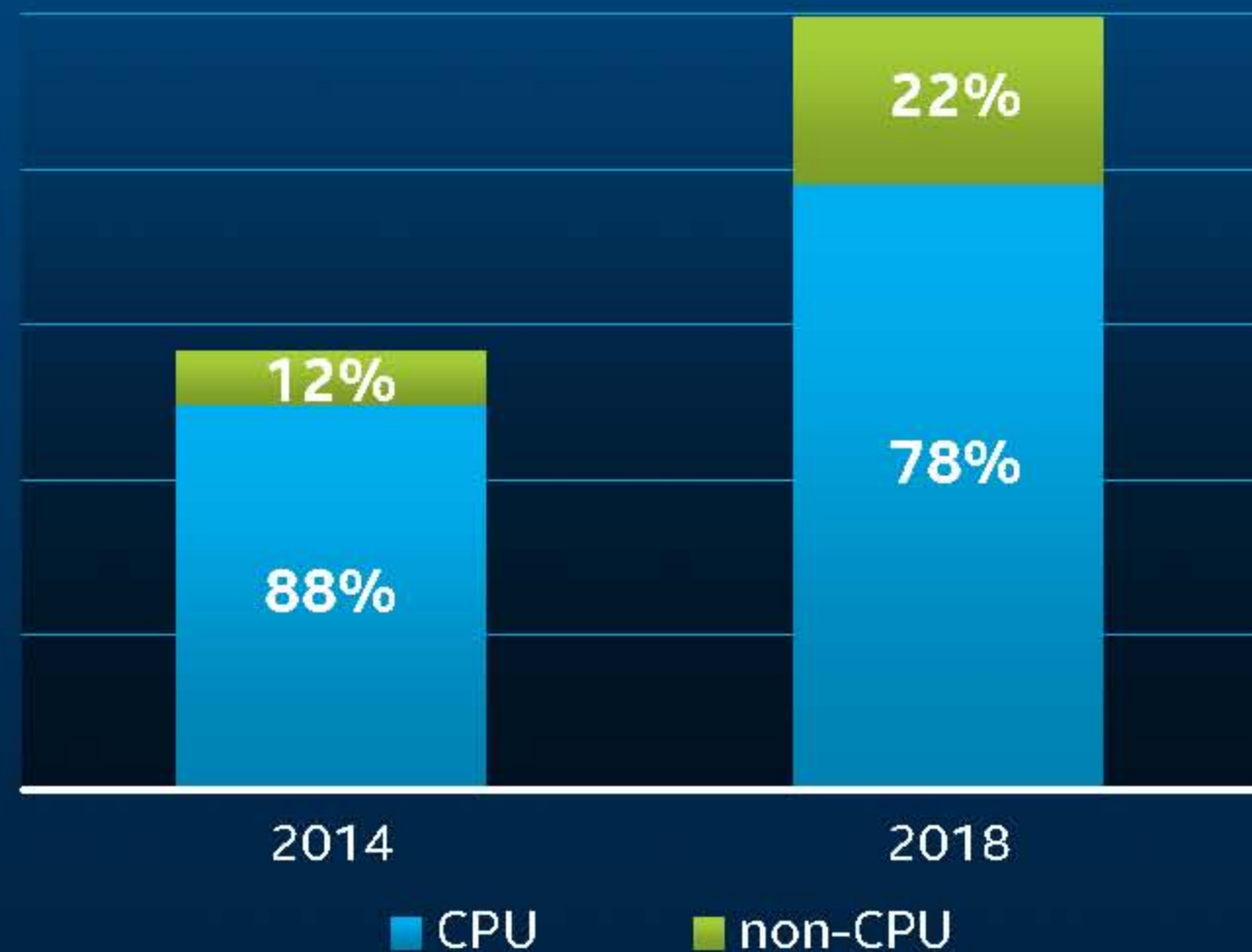
Customized SKU provides
Up to 14% more performance for 2-4%
incremental TCO

Data Center Growth Forecast

Data Center Revenue Forecast



Data Center Portfolio Diversifying



Four Growth Drivers

New
Architectures

CLOUD

NFV / SDN

New
Usages

HPC

BIG DATA

Jevons Paradox: Cloud Architecture

Increased efficiency through the Cloud

Revenue Acceleration: Easier to create new apps and services

OpEx Efficiency: Automation of the data center

CapEx Efficiency: Maximize use of system resources

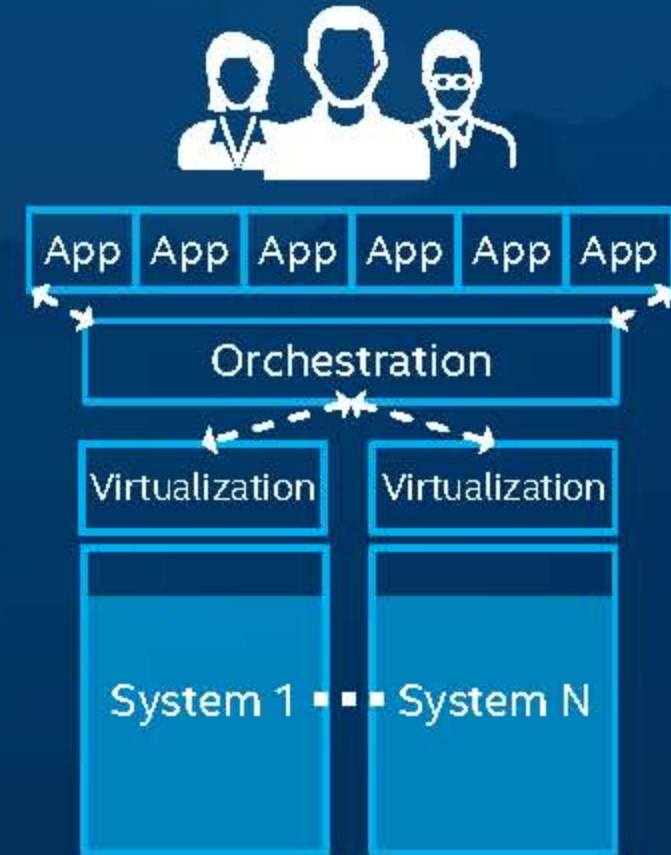


Traditional



Virtualized

1. Shared resources



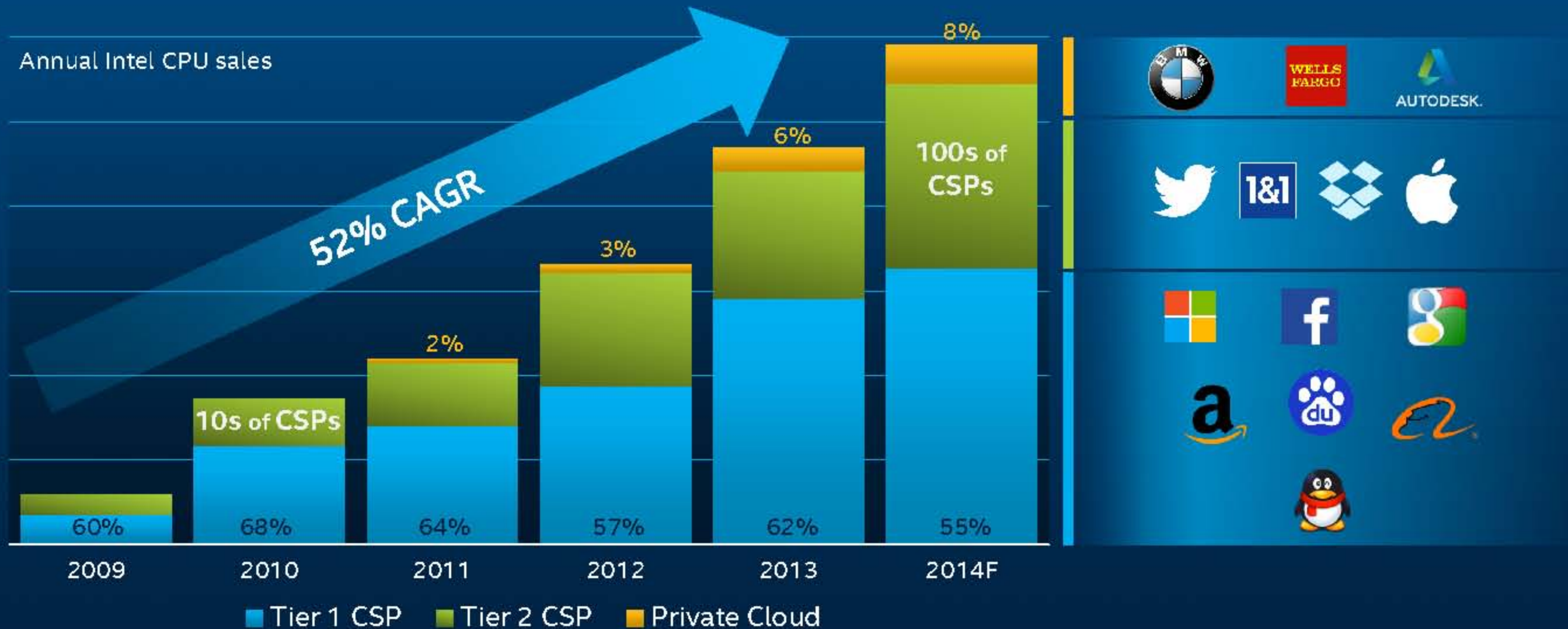
Cloud

1. Self-service
2. Automation
3. Multi-tenant
4. Measured services

■ = Resource Utilization

Cloud Computing Growth

Connected Devices + Apps + New Services + New Service Providers



Public Cloud SPs: Exposing Intel Value

IBM Soft Layer

Security

Overview Security Software Threats SSL Certificate Compliance Intel TXT

Intel® Trusted Execution Technology

Making cloud safer, one Trusted Computing Pool at a time.

Add Intel® Trusted Execution Technology (Intel® TXT) to enhance your security portfolio. SoftLayer is the first cloud company to offer the solution as an additional method to secure your infrastructure.

As the cloud industry evolves, security has become a top priority. SoftLayer is the first cloud company to offer the solution as an additional method to secure your infrastructure.

Stay Online

Intel® Trusted Execution Technology (Intel® TXT) is a hardware-based security technology that can help protect your data and applications from unauthorized access.

AWS EC2



45 Cloud Service Providers
branding Intel Inside cloud services

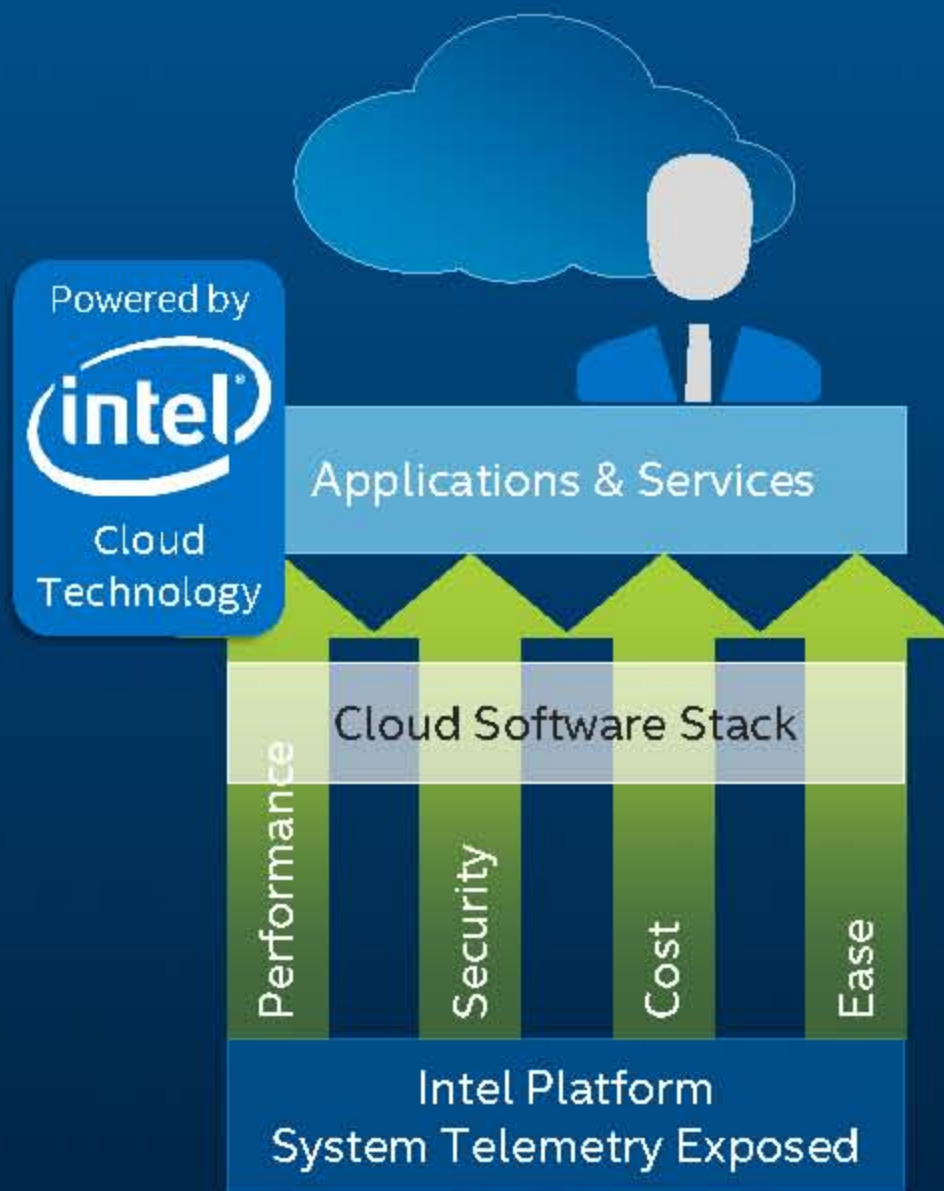
Instance Types Matrix

| Instance Type | vCPU | Memory (GiB) | Storage (GB) | Networking Performance | Physical Processor | Clock Speed (GHz) | Intel® AES-NI | Intel® AVX† | Intel® Turbo | EBS-OP | Enhanced Networking |
|---------------|------|--------------|--------------|------------------------|--------------------|-------------------|---------------|-------------|--------------|--------|---------------------|
| t2.micro | 1 | 1 | EBS Only | Low to Moderate | Intel Xeon family | 2.5 | Yes | Yes | Yes | - | - |

69%

'09-'14
Revenue
CAGR

10%
increase in
MSS to
94%
'09-'14



Four Growth Drivers

New
Architectures

CLOUD

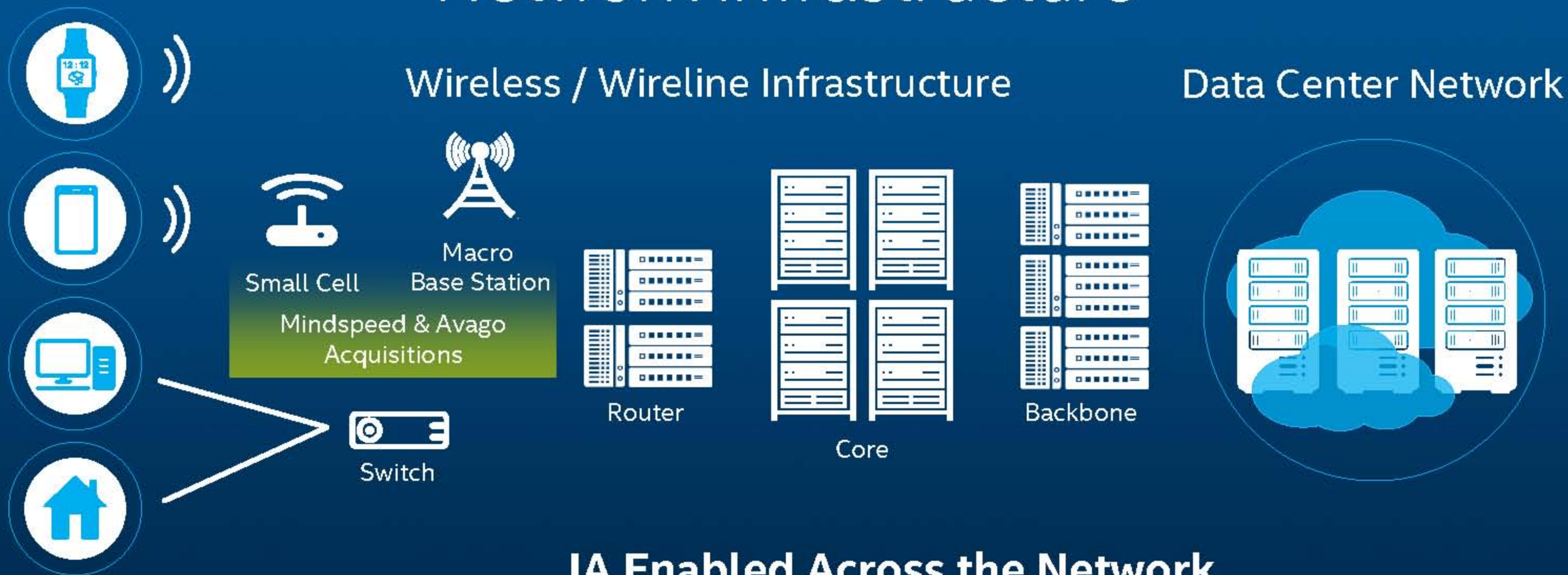
NFV / SDN

New
Usages

HPC

BIG DATA

Network Infrastructure



IA Enabled Across the Network

STEP 1: Consolidate workloads on Intel Architecture

STEP 2: Virtualize & automate the network (NFV / SDN)

NFV / SDN Growth

Accelerated network transformation

2011

NFV Research Results



2012

9 Use Case Definitions



2013

Proof-of-Concepts



2014

Pilots + 1st Commercial Deployments



Alcatel-Lucent brings IP routing to cloud with most complete portfolio of virtualized IP Edge router functions

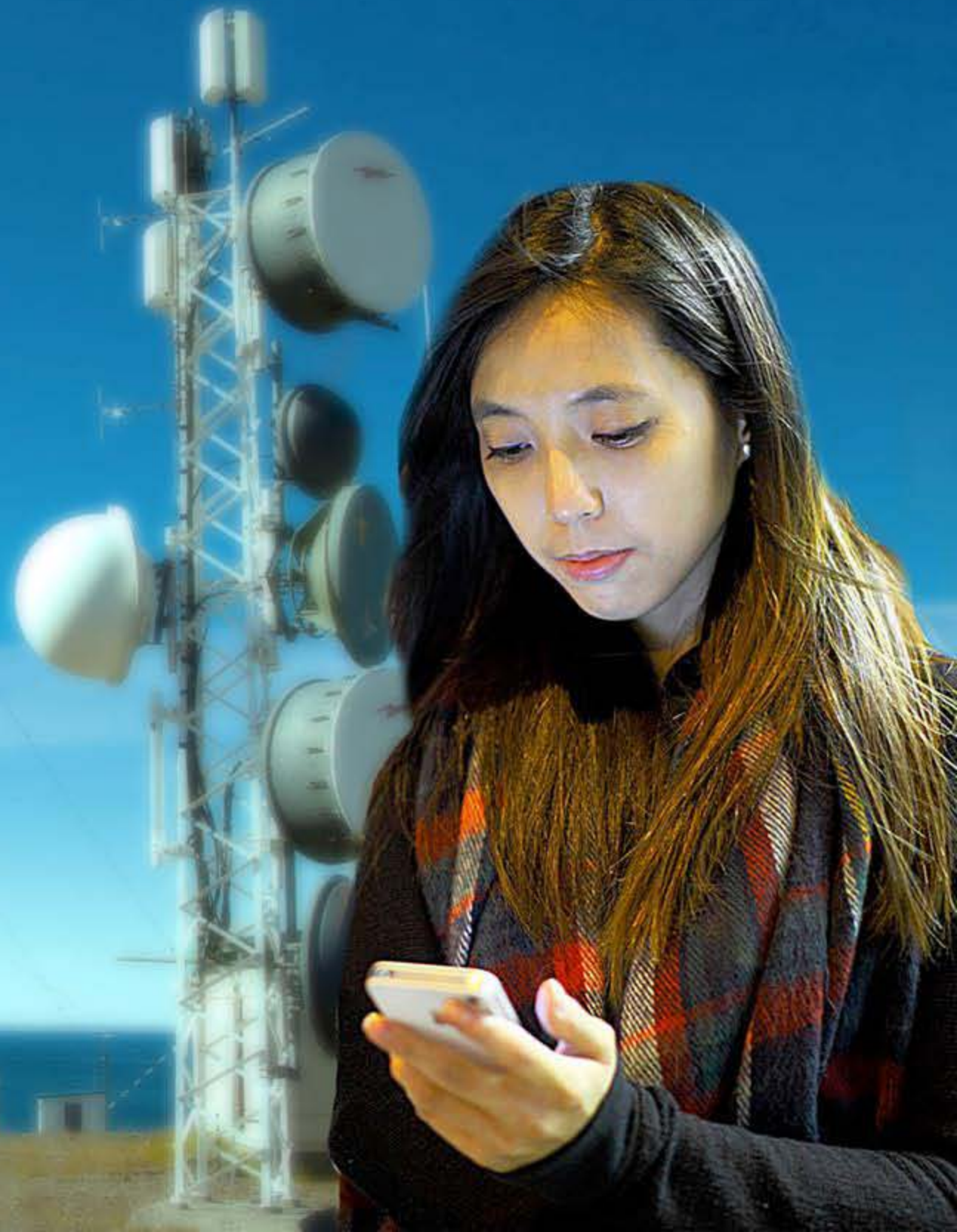
"...demonstrating 320G half duplex, or greater than 2x better than competitor offers, for a virtualized Provider Edge routing application in a single x86 server. "

- November 12, 2013



at&t

Telefonica



Maximizing Intel Opportunity & Return



2014
First \$1B+ Year

NFV / SDN Ecosystem Growth

Intel® Network Builders Program Growing the ecosystem to accelerate NFV and SDN solutions



>100 members enabling IA-based open standards solutions for Networking

Four Growth Drivers

New
Architectures

CLOUD

NFV / SDN

New
Usages

HPC

BIG DATA

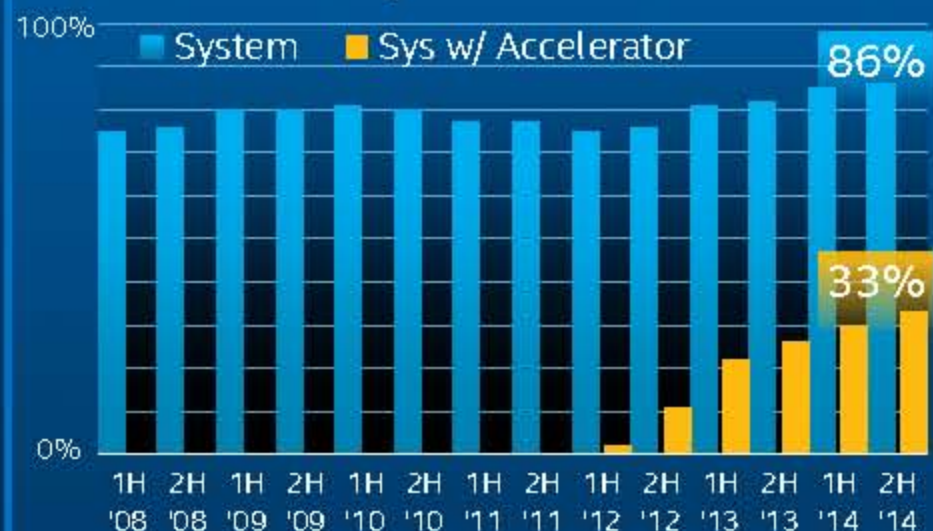
High Performance Computing Growth

Government & Research

\$174M
"Trinity"



Top 500 MSS



62%
Top 500
FLOP CAGR

71%
Intel Top 500
FLOP CAGR

Commercial

Move from Physical to Digital



2003-2013

70% to 92%
Xeon
MSS

11%
Xeon
Unit CAGR

New Usages

Big Data

PayPal

Real-time
analytics



Children's Mercy
KANSAS CITY

Genomic
sequencing

Cloud

% of HPC spend in Public Cloud

TODAY



BY 2017



HPC: Maximizing Intel Value

Maximize Si Opportunity



- #1 supercomputer runs on Xeon Phi
- 2nd gen design wins > 1st gen sales to date
- >50 system providers committed

Expand System Capability



- TrueScale Infiniband growth 50% YoY
- Design wins for Omni Path integrated fabric
- HPC software stack investment

Advance the Parallel Ecosystem



- 41 Intel Parallel Computing Centers
- 14 countries
- 70+ apps

Four Growth Drivers

New
Architectures

CLOUD

NFV / SDN

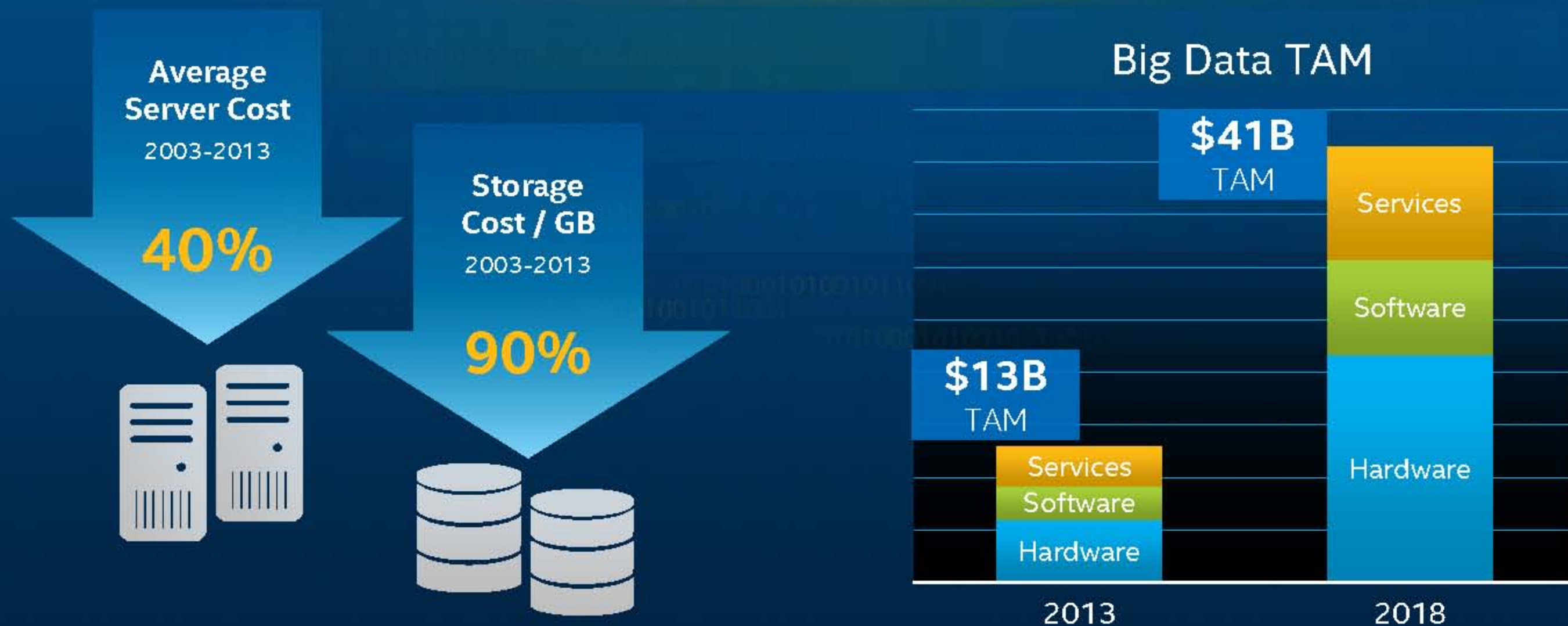
New
Usages

HPC

BIG DATA

Jevons Paradox: Big Data Growth

New discoveries drive massive amounts of compute & storage



Big Data: Maximizing Intel Value

Accelerate implementation of Big Data solutions
through optimized platform & tangible proof points

cloudera[®]



Hadoop
Distribution



THE MICHAEL J. FOX FOUNDATION
FOR PARKINSON'S RESEARCH



KNIGHT
CANCER INSTITUTE
Oregon Health & Science University

A-wear

Wearables-to-Analytics
Developer Platform

- Addressing a \$41B TAM by 2018
- Dramatic server growth YoY
- Hadoop optimized for IA
- Industry enabling with PaaS
- Builds upon full Intel portfolio:
Xeon, Xeon Phi, fabrics, flash, FPGA



BIG DATA

analytics

 **BASIS**
An Intel Company

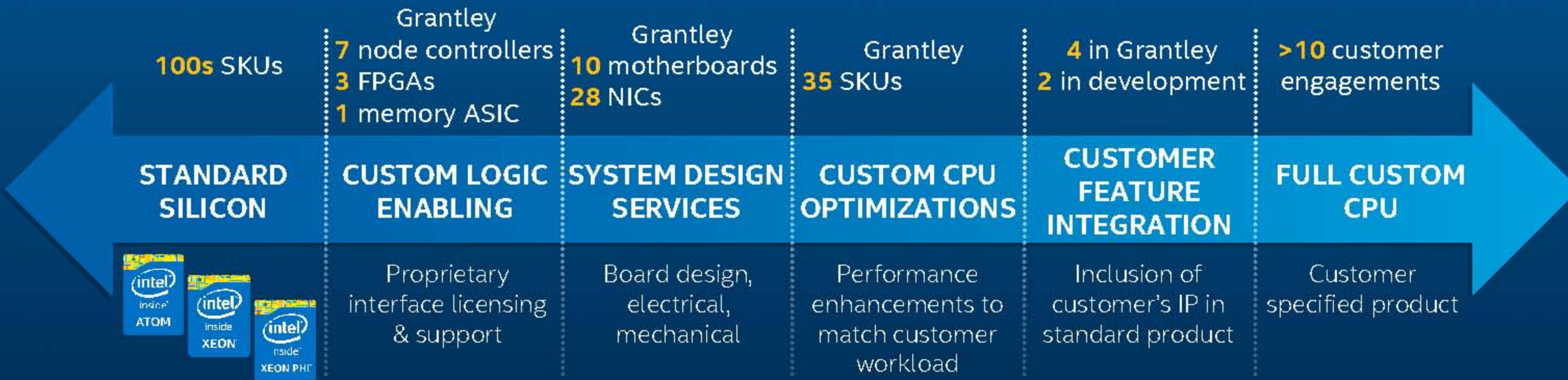
Products and Technologies

Processors: Standard to Custom

Silicon Photonics

Rack Scale Architecture

Standard to Custom Roadmap



In the past 4 months, custom CPUs launched



Silicon Photonics

Shipping Now



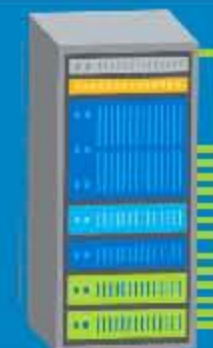
Data Centers
Fiber Optic Replacement

2015



HPC
Copper Replacement

2015



Rack Scale Architecture
Copper Replacement

Disruptive Cost Structure

| Cost / Bandwidth Density | 100G | 400G | 1TB |
|--------------------------|------|------|------|
| Intel Silicon Photonics | x | y | z |
| Other Silicon Photonics | ~2x | ~3y | ~4z |
| Discrete Fiber | ~3x | ~6y | ~10z |

I/O = 30% of System Cost

Remove density constraints

Serviceability & reliability

Lower power

100Gb/s in Rack

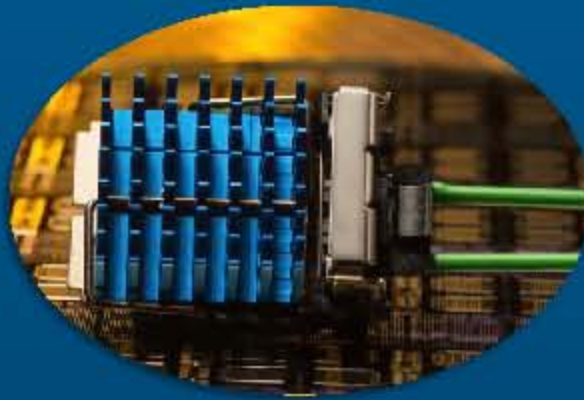
| | |
|-------------------|------------------------------------|
| Copper | 100Gb/s limited to 3m |
| Silicon Photonics | 100 Gb/s reach of up to 2km |

Only fully integrated silicon solution; benefitting from Moore's Law

Silicon Photonics: Moving Data with Lasers

Industry Standard Cabling & Connectors

Intel Silicon Photonics module



Multiple suppliers commercializing MXC standard

Design Wins



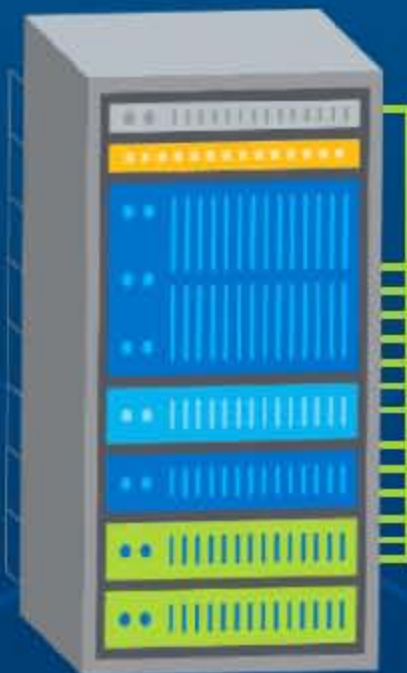
Silicon Photonics Revenue Forecast



Rack Scale Architecture

2015

- With Cloud the rack becomes the unit of compute
- Compose & decompose resources dynamically based on application need



Intel
Ethernet
controller
& switch



Intel
Silicon
Photonics



Intel SSD

Up to 1.5X servers per rack

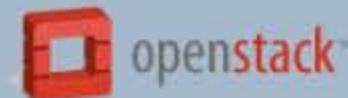
Up to 5X reduction in provisioned power

Up to 3X fewer cables

Customers & Partners



OpenDatacenter



Quanta



Competition

High interest in data center business

~~16~~ 12 **ARM**
vendors

 **OpenPOWER™**

AMD 

Why Intel

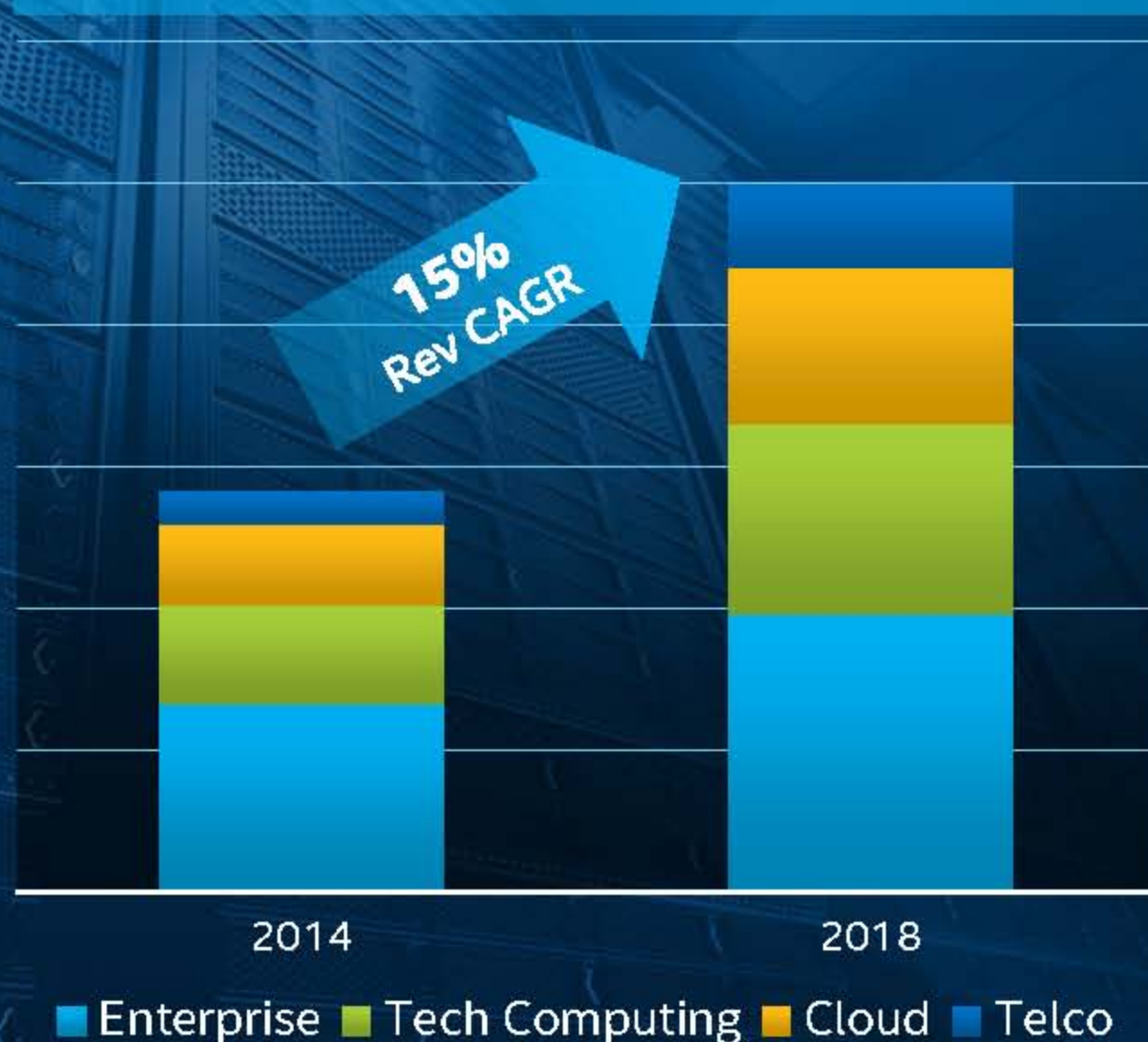
- Leadership roadmap across Server, Storage & Network
- Customization for targeted workloads
- ~\$2B annual R&D investment
- Broadest ecosystem & compatibility
- Best perf / TCO

Any time I work out the cost models, it's not quite there. Intel is also easier to work with on some of the custom work that Amazon requires.

- James Hamilton, vice president
for Amazon Web Services

Data Center Summary

Data Center Revenue Forecast



- Industry trends create continued revenue growth opportunities

| | | | |
|-------|-----------|-----|----------|
| Cloud | NFV / SDN | HPC | Big Data |
|-------|-----------|-----|----------|

- Investing to win across Server, Storage, network
 - Performance and TCO leadership
 - Expanding technology portfolio – fabrics, silicon photonics, customization driving revenue growth
- Revenue CAGR of ~15% through 2018

For More Information

Demos

NFV Service Chaining

Big Data Analytics in Retail

Rack Scale Architecture

Silicon Photonics in HPC

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