Re-architecting the Datacenter: Introducing the New Intel® Xeon® Processor E5 Family

Diane Bryant
Senior Vice President & General Manager
Datacenter & Connected Systems Group
IT: Period of Transformation

*up to ‘90s*
Computer-Centric

*’00s*
Network-Centric

*Today*
Human-Centric

**Focused on**
- **Productivity** through automation
- **Cost Reduction** through connectivity
- **Rapid Service Delivery** through cloud & devices
Today’s Infrastructure is Strained

**Server**
Average utilization <50% despite virtualization

**Storage**
40% data growth CAGR, 90% unstructured

**Network**
2-3 weeks to provision new services
66% CAGR in mobile data traffic

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1: Source: Intel IT internal estimate
4: IDC Server Virtualization and The Cloud 2012
Software Defined Infrastructure

*From Static to Dynamic, Manual to Automated*

Server

Storage

Network

All Built on a Common, Scalable, Efficient Architecture
Introducing Next Generation

Intel® Xeon® Processor

E5 v2 Family

At the heart of the agile, efficient data center
Intel® Xeon® E5 2600 v2 Product Family

Up to 50% more performance¹
Up to 12 cores and 30 MB last level cache
Up to 45% energy efficiency gain²
22nm process technology

Advanced security features
Intel® Data Protection Technology

¹ SPECvirt_sc2013*: E5-2690 platform, 256GB, score: 624.9@37VMs, baseline source. IBM* System x3650 M4, E5-2697 v2, 512GB, score 947.9@53 VMs.
² SPECpower_ssj2008*: E5-2660 platform, 16GB, score 5,544, baseline source. Fujitsu* PRIMERGY RX300 S8, E5-2660 v2, 48GB, score 8,097.

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Leadership Across Workloads

#1 DATABASE
TPC-E *

#1 ENTERPRISE COMPUTING
SPECint_rate_base2006*

#1 Web
SPECjbb2013*

#1 TECHNICAL COMPUTING
SPECfp_rate_base2006*

#1 VIRTUALIZATION
SPECVirt_sc2013*

#1 ENERGY EFFICIENCY
SPECpower_ssj2008*

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Server Transformation:

91% of the Performance at
4% the Power and 2% the Cost

64 socket Fujitsu SPARC
Enterprise M9000*

40,000W²
~$1M³

2008

Two systems with Intel® Xeon®
Processor E5 2697 v2

1,500W²
~$20K³

2013


2. Power figures based on listed specifications of M900 system per Fujitsu and a representative Xeon based platform from Dell the R720.

3. SPARC M9000 data per IDC worldwide Quarterly Server Tracker - 2012 Q3 and Xeon E5 based system based on Intel internal estimate of expected OEM system price.

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IBM x86 systems solutions

Robust solutions that drive business results

- View overview video (00:04:51)

Whether your business requires a “quick start” solution or you do your own integration, IBM x86 systems provide highly reliable and flexible platforms that can scale quickly, easily and inexpensively, so you can stretch your IT budget and confidently execute your business objectives – even as conditions change.

SmartCloud Desktop Infrastructure
Run your office anywhere with robust virtual desktop solutions built on IBM System x servers.
- View video (00:03:31)

Big data and analytics solutions
Achieve more accurate insights with Apache Hadoop running on IBM System x servers.
- View video (00:05:09)

Featured solution topics

- Desktop virtualization
  Deploy flexible virtual desktops with greater choice and control.
- Business analytics
  Deliver business insights with speed and flexibility.
- For SAP environments
  Empower your employees and organizations.
- Cloud computing
  Transform your business with innovation.
- Data management
  Manage data reliably and economically.
- Technical computing and HPC
  Harness extreme performance without the extreme cost.

Roland Hagan
Vice President
IBM System x Marketing

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Introducing IBM NeXtScale

A superior architecture for scale-out computing

- Architected for now and the future
- Better density and flexibility
- Compatible with standard racks
- Optimized for Top of Rack Switching
- Software Defined Networking (SDN) ready
- Designed for performance
- Intel® Xeon® processor E5-2600 v2 product family
- Extremely powerful roadmap
IBM Strategy delivers a leadership systems portfolio

High-end systems
4 socket+ enterprise-class x86 performance, resiliency and security
IBM eX5 Systems

Blades/Integrated systems
Integration across IBM assets in systems and SW for maximum client optimization and value
IBM PureSystems
IBM Flex System
IBM BladeCenter

Volume systems
Broad portfolio to meet a wide range of client needs from infrastructure to technical computing
IBM System x Rack & Tower

Dense systems
Optimize space-constrained data centers with extreme performance and energy efficiency
IBM iDataPlex
IBM NeXtScale
IBM NeXtScale Roadmap

**Announce:** TODAY  
**Shipping:** October 2013

- 6U Dense Chassis
- 1U tall 1/2 Wide Compute
- Departmental HPC and Cloud Computing Solution

**Announce:** TODAY  
**Shipping:** November 2013

- Storage Native Expansion (Storage NEX)
  - 1U (2U tall 1/2 Wide)
  - Up to 32TB total capacity

**Announce:** Early 2014  
**Shipping:** Early 2014

- PCI Native Expansion (PCI NEX)
  - 1U (2U tall 1/2 Wide)
  - Xeon Phi or GPU Support

**A Lot More Coming!**

- More Storage
- More IO Options
- Next Gen Processors
- MicroServers

*The Chassis will support mix-match nodes*
New Innovation on Intel® Xeon® Processor: Servers and Workstations

**Mac Pro:**
Up to 2.5x performance vs prior generation and unrivaled IO expandability

**Milkyway-2:**
#1 supercomputer on Top 500 list with density innovations

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Storage Transformation: 
Manage Data Growth with Xeon®

Xeon Enabling In-line Deduplication

Up to 2.2x Hashing Algorithm Performance
Up to 3.5x I/O bandwidth Improvement

1 Average copies of enterprise data
2: Source: Internal measurements on 2S E5-2680 v2 2.70GHz/1600MHz 64GB DRAM) and Intel® Server Board S5520HC (2S EP X5680 (Westmere) 3.33GHz/1600MHz 48GB DRAM). Based on sha1 multi-buffer hash function from v2.7 of the Intel® ISA-L library and use of 25% of available cores on each system.
3: Internal measurements using 2S Xeon® E5-2600 based platform vs. 2S Xeon® X5600 based platform with 4x8 PCIe lanes per platform, 50/50 read/write traffic.
New Innovation on Intel Xeon Processor: Storage Enhanced Data Reliability

VRTX:
Integrated IT solution designed specifically for office environments

“The Intel Xeon processor E5 v2 family provides a great hardware base for Dell’s high performance, innovative solutions like our PowerEdge VRTX and intelligent tiered Compellent storage solutions.”

Forrest Norrod
VP and General Manager, Server Solutions

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Growth of Software Defined Infrastructure

82% of global telco providers to evaluate SDN/NFV in 2013¹

Driven by new services, network optimizations and simplified provisioning

¹ Source: Infonetics research SDN and NFV Strategies: Global Service Provider Survey July 8, 2013
Announcing the Intel® Network Builders Program

Intel® Infrastructure Builders

Intel® Cloud Builders

Intel® Network Builders

Accelerate Software Defined Infrastructure Solutions

- Software Defined Networking (SDN)
- Network Function Virtualization (NFV)

Learn more at networkbuilders.intel.com

Come see 20 Demos at the IDF Intel SDI Technology Community

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Bringing Moore’s Law to Networks

- Intel Internal measurement of 2S Intel® Xeon® processor E5645 (2x6C Westmere-EP) 2.40 GHz vs 2S Intel® Xeon® E5-2658v2 (2x10C Ivy bridge-EP) 2.4 GHz 22 x 10GbE PCIe Gen2.

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Xeon® E5 v2
Intel® Data Plane Development Kit
~250 Mpps¹

Xeon® 5600
Intel® Data Plane Development Kit
~54 Mpps¹

¹ - Intel Internal measurement of 2S Intel® Xeon® processor E5645 (2x6C Westmere-EP) 2.40 GHz vs 2S Intel® Xeon® E5-2658v2 (2x10C Ivy bridge-EP) 2.4 GHz 22 x 10GbE PCIe Gen2.
Werner Schaefer
Vice President Market and Business Development, HP Servers
HP NFV – SDN Capability Stack

Application
Application

Resource Management & Orchestration

Telco applications (HP/ISV/Partners)
Spectrum program

Standards-based application integration APIs

Hypervisors
Controllers

HP OpenFlow Controller

Compute & Storage

Networking

Compute & Storage

HP CloudSystem
HP Moonshot Hardware
NEBS Compliant HP ProLiant Gen8 Servers
HP Storage (3PAR/P2000)
HP Networking (FlexNetwork range of networking)
Dynamic WAN Bandwidth Provisioning
Delivering New Revenue Opportunities for Service Provider Cloud Data Centers

- Automated provisioning
- On-demand scalability
- Disaster avoidance

Booth # 850
Simulated virtual network with IA managing Open vSwitch

Measures packet throughput between 2-8 VM tenants + Virtual Appliance

Compares Intel® DPDK optimized and non-optimized workloads

Leverages performance and memory improvements with Intel® Xeon® E5-2600 v2 Product Family

Intel® Open Network Platform Reference Design with HP Servers and Networking

HP ProLiant DL380p Gen8 server
HP Demonstrating the Intel ONP Reference Design in the HP Booth

HP ProLiant DL380p Gen8 Server

virtual switching

~10x
Throughput Performance over stock OPEN vSwitch Performance

Booth # 831
New Innovation on Intel Xeon Processor: Network

Gateway GPRS Support Node:
Improved network efficiency and capacity; 3X performance vs prior architecture

FlexiBTS Server:
Enhancing intelligence at the edge with 3X performance vs prior gen

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Unlocking New Services

Growth in Cloud Services

~$200B
CLOUD SERVICE REVENUE
IN 2016

Source: Gartner Worldwide IT Spending Forecast, 2Q12 Update
Running your website on AWS

Deliver your website with highly scalable, flexible, and low-cost solutions from AWS.

Get started today with AWS »

Ariel Kelman
Head of WW Marketing
Amazon Web Services

Get Started for Free » Launch virtual machines and apps in minutes.

FREE TIER

*Other brands and names are the property of their respective owners.
How Enterprises Use AWS

1. Augment On-Premises resources with cloud capacity
2. Migrate existing apps & data to the cloud
3. Build new apps, sites, services & lines of businesses
AWS Global Infrastructure

9 Regions
26 Availability Zones
Continuous Expansion
Trusted by Enterprises Around the World
Infrastructure as a Service Magic Quadrant

2011 - 2013
Hybrid IT Architectures are Becoming More and More Popular

- On-Premises Resources
- Integration
- Cloud Resources

Corporate Data Centers
Use Cloud to Make On-Premises Apps Better

- Export operational data to AWS for analytics processing
- Automated backup to S3 with Oracle RMAN
- 50% cost reduction with 2x faster queries using Amazon Redshift
Migrate Existing Apps to the Cloud

1/3 of servers migrated to AWS

Saved £1.5 Million

Migrated 500 web properties in 5 months

New product web sites live in 2 days vs. 2 weeks

Migrated clinical trials simulations platform

Simulations in 1.2hrs vs. 60hrs 64% reduction in costs
- Technology Collaboration
- Marketing Collaboration

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First cloud provider to Adopt Intel Xeon Processor E5 Family For Cluster Compute
What’s Next?

Bringing Intel Xeon Processor E5 v2 Family instances to our customers later this year
Next Generation
Intel® Xeon® Processor
E5 v2 Family

World record setting
performance and efficiency

Transforming server, storage,
and network

Enabling rapid service delivery
to improve user experiences
intel® Look Inside.™
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Relative performance for each benchmark is calculated by taking the actual benchmark result for the first platform tested and assigning it a value of 1.0 as a baseline. Relative performance for the remaining platforms tested was calculated by dividing the actual benchmark result for the baseline platform into each of the specific benchmark results of each of the other platforms and assigning them a relative performance number that correlates with the performance improvements reported.

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Intel® Enhanced Intel SpeedStep® Technology: See the Processor Spec Finder at http://ark.intel.com/ or contact your Intel representative for more information.

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