

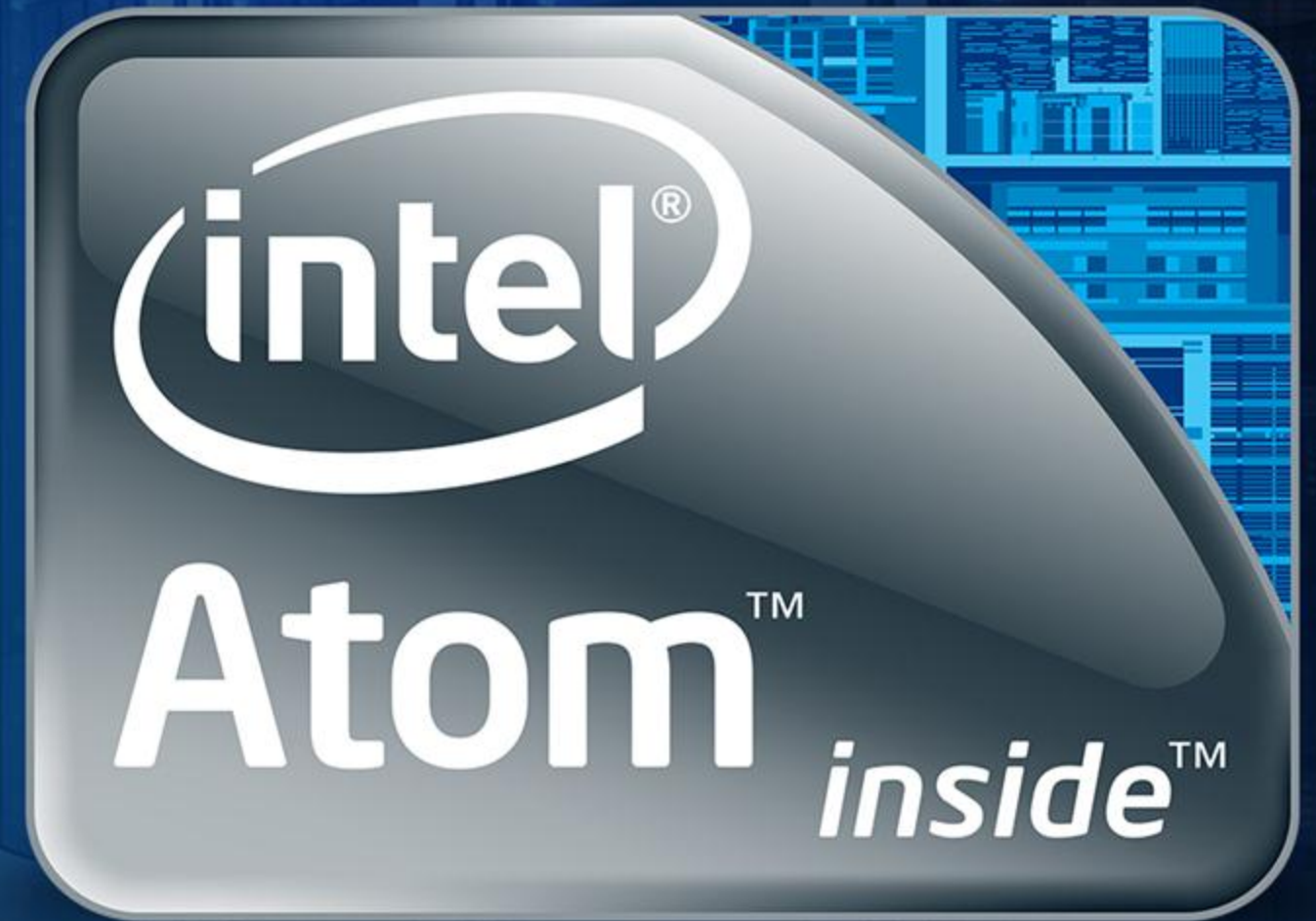
*Introducing the First  
Datacenter Atom™ SOC*

**Diane Bryant**

Intel® Vice President, General Manager,  
Datacenter & Connected Systems Group, Intel

**Jason Waxman**

General Manager, Cloud Platform Group, Intel  
December 11, 2012



# Today's News

Intel delivers world's first 6W, 64 bit SoC for datacenters

>20 Intel® Atom™ design wins  
*Microserver, storage and comms*

New Atom SoC extends Intel's breadth of application optimized  
datacenter products



# TCO a Universal Focus... Metric Varies by Segment

## Enterprise IT



### KEY METRICS:

Utilization, reliability & OpEx per app

## Technical Computing



### KEY METRICS:

FLOPS per dollar,  
FLOPS per Watt

## Cloud SPs



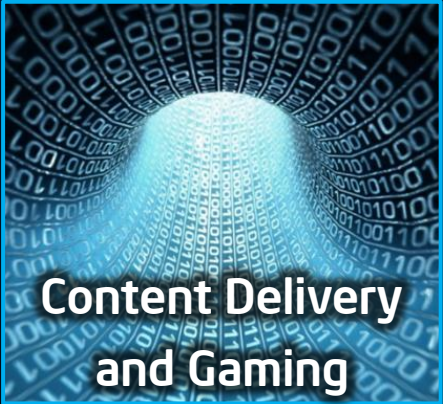
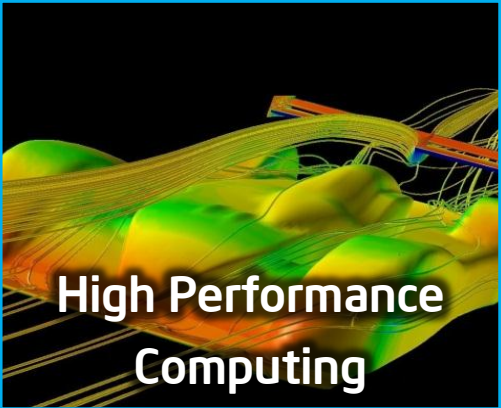
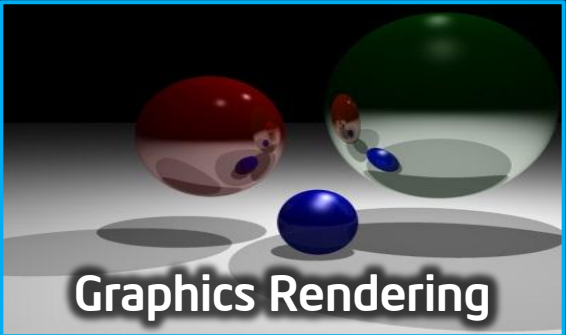
### KEY METRICS:

Perf per CapEx, Perf per Watt, consistency

# Workload Spectrum

CPU Intensive

Memory Intensive



I/O Intensive

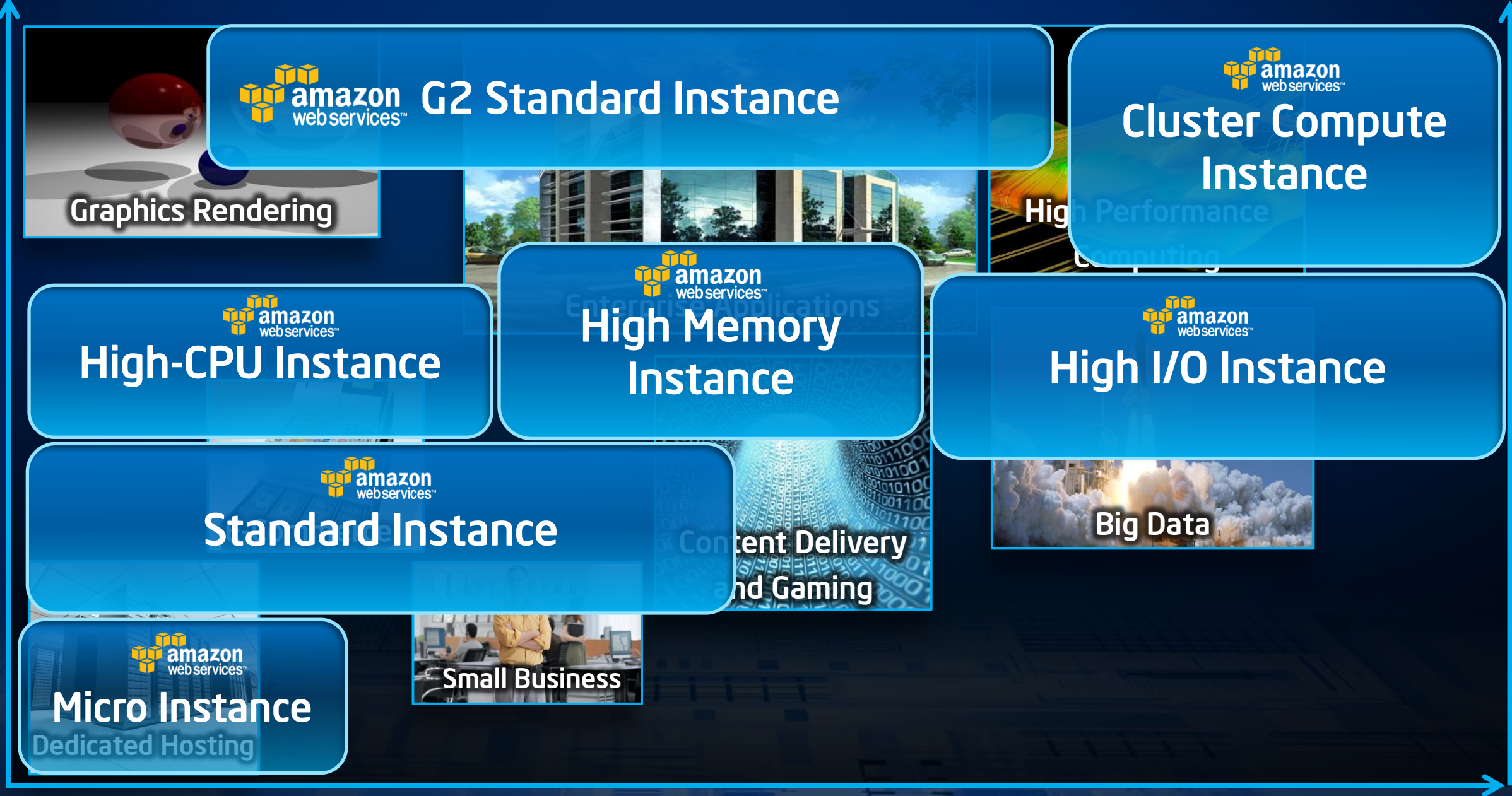
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# Workload Spectrum

CPU Intensive

Memory Intensive



I/O Intensive

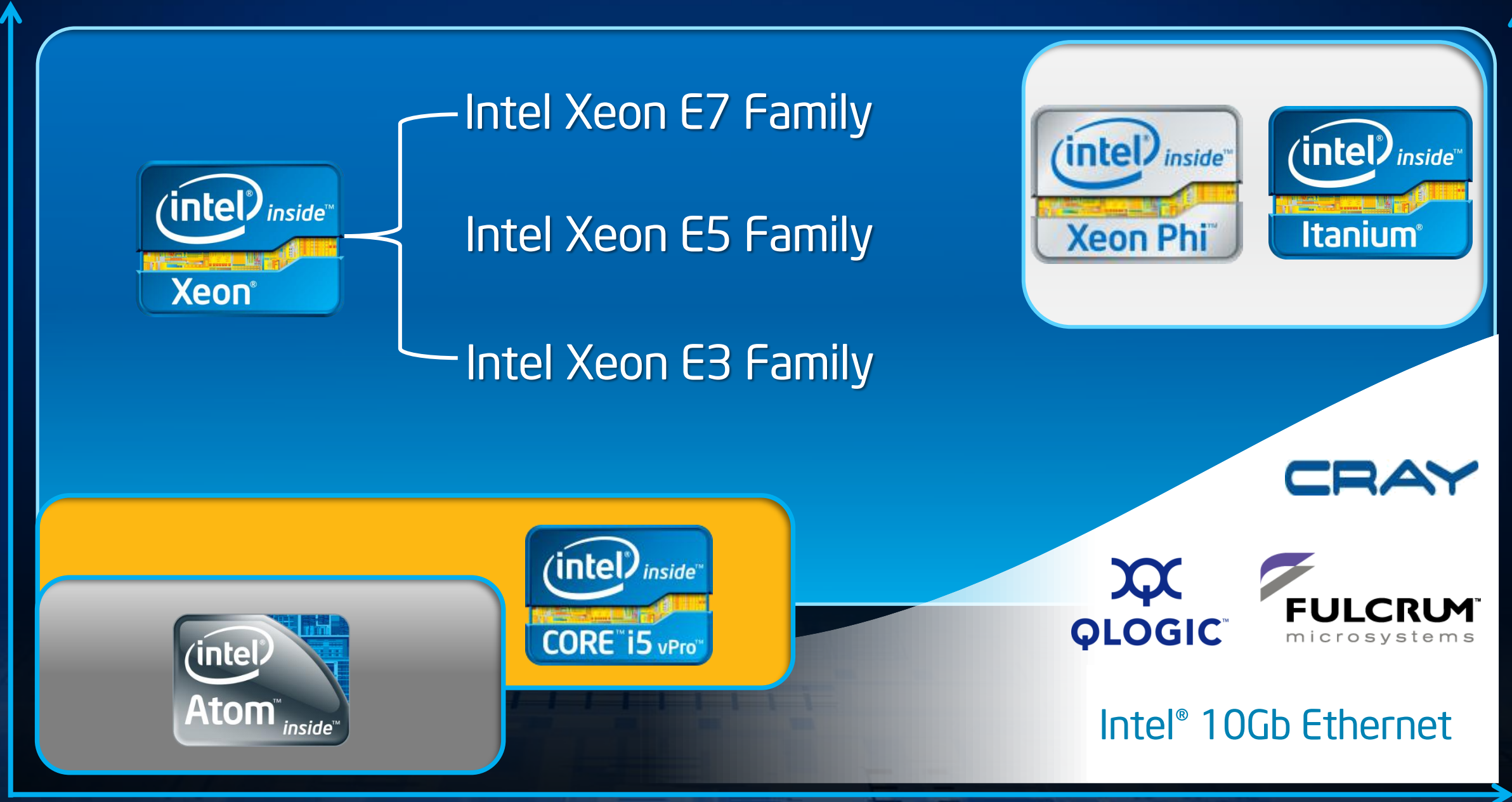
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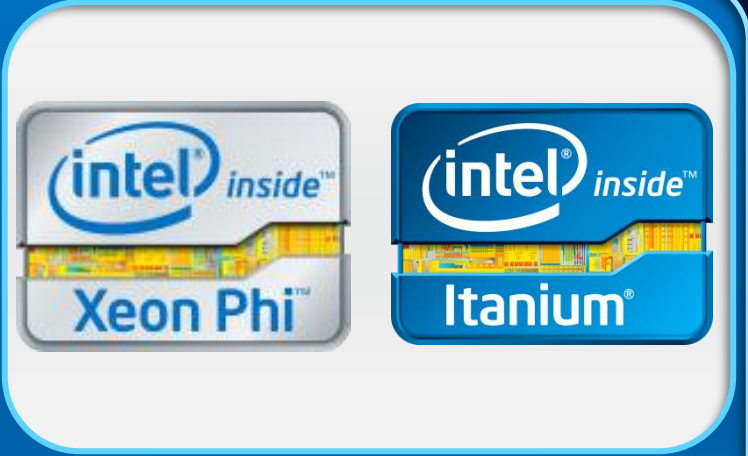
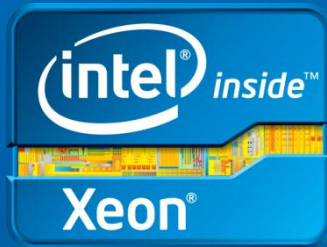
# Diverse Infrastructure

CPU Intensive

Memory Intensive



Intel Xeon E7 Family  
Intel Xeon E5 Family  
Intel Xeon E3 Family



Intel® 10Gb Ethernet

I/O Intensive



# Intel® Atom™ for the Datacenter

*Right sized processing for specific workloads and deployment models*

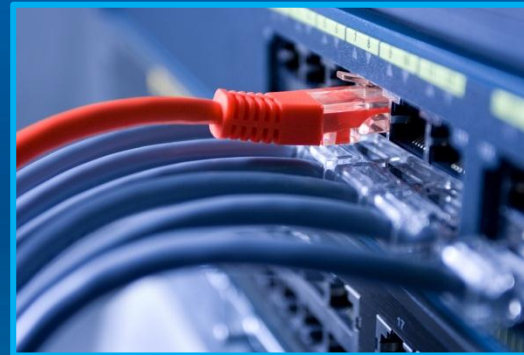
## Microservers



### EXAMPLE:

Dedicated web hosting

## Communications



### EXAMPLE:

Basic L2 Switching

## Storage



### EXAMPLE:

Low end storage

> 20 Design Wins



Quanta  
Optimize Your Datacenter



inspur 浪潮



SUPERMICRO®

wiwynn



ACCUSYS  
The RAID Architects



**GIGaDom**  
As Energy Cost Spiral, Intel Launches  
Low Power Chips, Microservers  
Sept. 22, 2009

# Intel In Microservers

2009

**INITIAL  
CONCEPT**



2010

**GEN 1**  
2 Commercial  
Systems



2011

**GEN 2**  
5 Commercial  
Systems



**GEN 1**  
3 Commercial  
Systems



2012

**GEN 3**  
6 Commercial  
Systems



Announcing  
**TODAY**



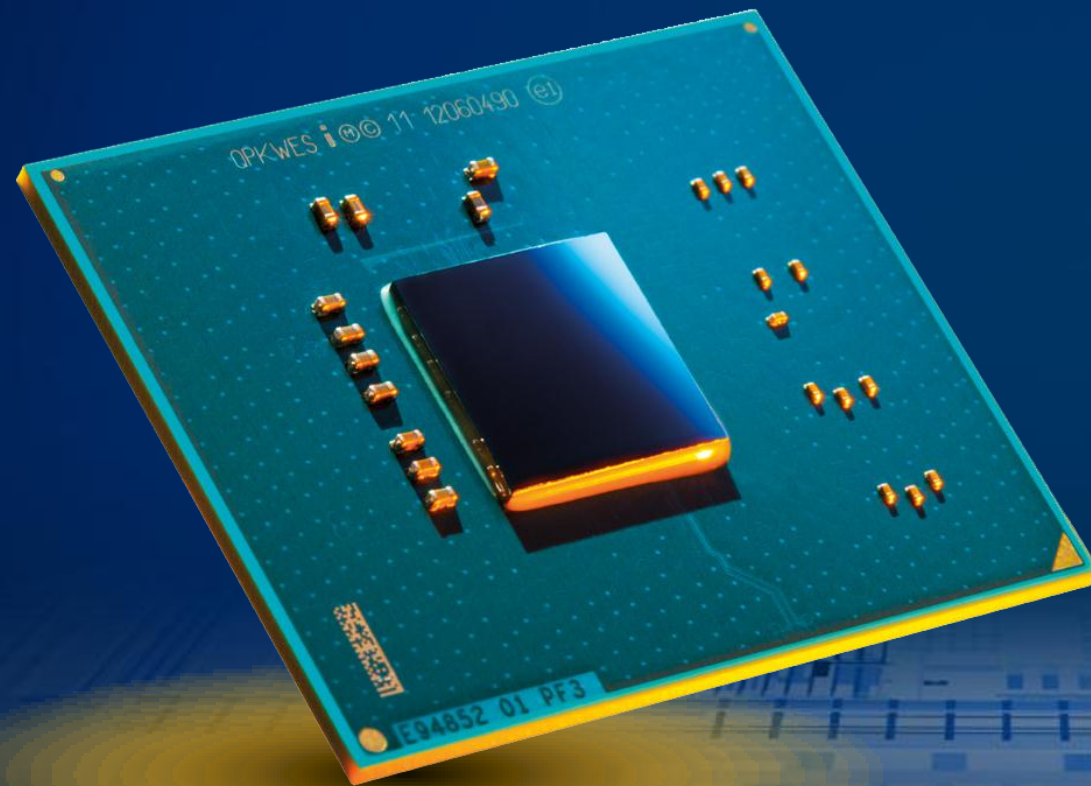


# Intel® Atom™ Processor S1200

*“World’s First 64 bit, 6 Watt Datacenter Class SoC”*

**SHIPPING NOW!**

Intel® Atom™ Processor S1200



## Low Power

- 6 Watt TDP
- 2 cores with Intel® Hyper Threading Technology

## Datacenter Class

- 64 bit
- ECC Memory
- Intel® Virtualization Technology

## High Density

- 1000+ nodes per rack

## IA Software Compatibility

- Leverages Existing SW Ecosystem

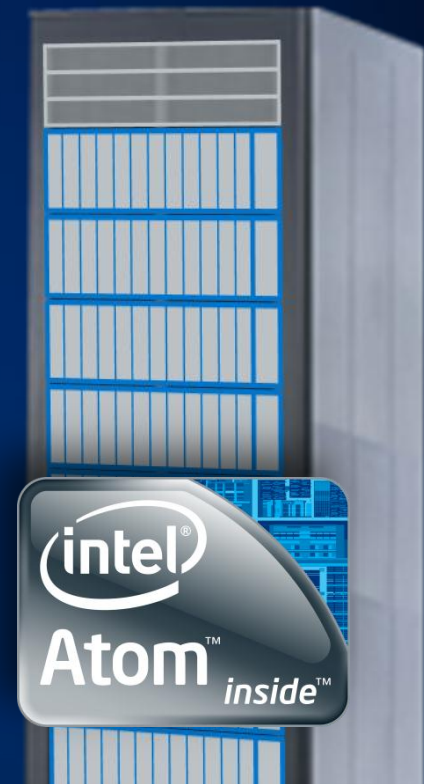
# Example: Two Types of Web Serving Needs

*Comparing a high throughput web tier to a dedicated web hoster*



**Maximum Web Transactions**

**Maximum Web Servers**



**UP TO 2X MORE  
Web Trans/Min/Rack**

**UP TO 5X MORE  
Dedicated Nodes/Rack**

Est. Intel CPU Revenue  
\$32.9K

Est. Intel CPU Revenue  
\$35.8K



• Software and workloads used in performance tests may have been optimized for performance only on Intel microprocessors. Performance tests, such as SYSmark and MobileMark, are measured using specific computer systems, components, software, operations and functions. Any change to any of those factors may cause the results to vary. You should consult other information and performance tests to assist you in fully evaluating your contemplated purchases, including the performance of that product when combined with other products. Configurations: Intel Internal measurements and estimates April 2012, All comparisons assume 42U 5kW rack. See backup for configuration details. For more information go to <http://www.intel.com/performance>. 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. Refer to slide speaker notes for more details.

# The next disruptive wave of computing

Paul Santeler

VP of Hyperscale Business Unit,  
Industry Standard Servers



# HP revolutionizing scale-out data centers

First Moonshot production system, 'Gemini', featuring Intel® Atom™ processor

- Low power and ultra high density
- Rich, Datacenter-class features:
  - 64-bit support
  - Virtualization technology
  - ECC (error correcting code) memory
- Broad software ecosystem and consistent management
- Shipping customer evaluation units today

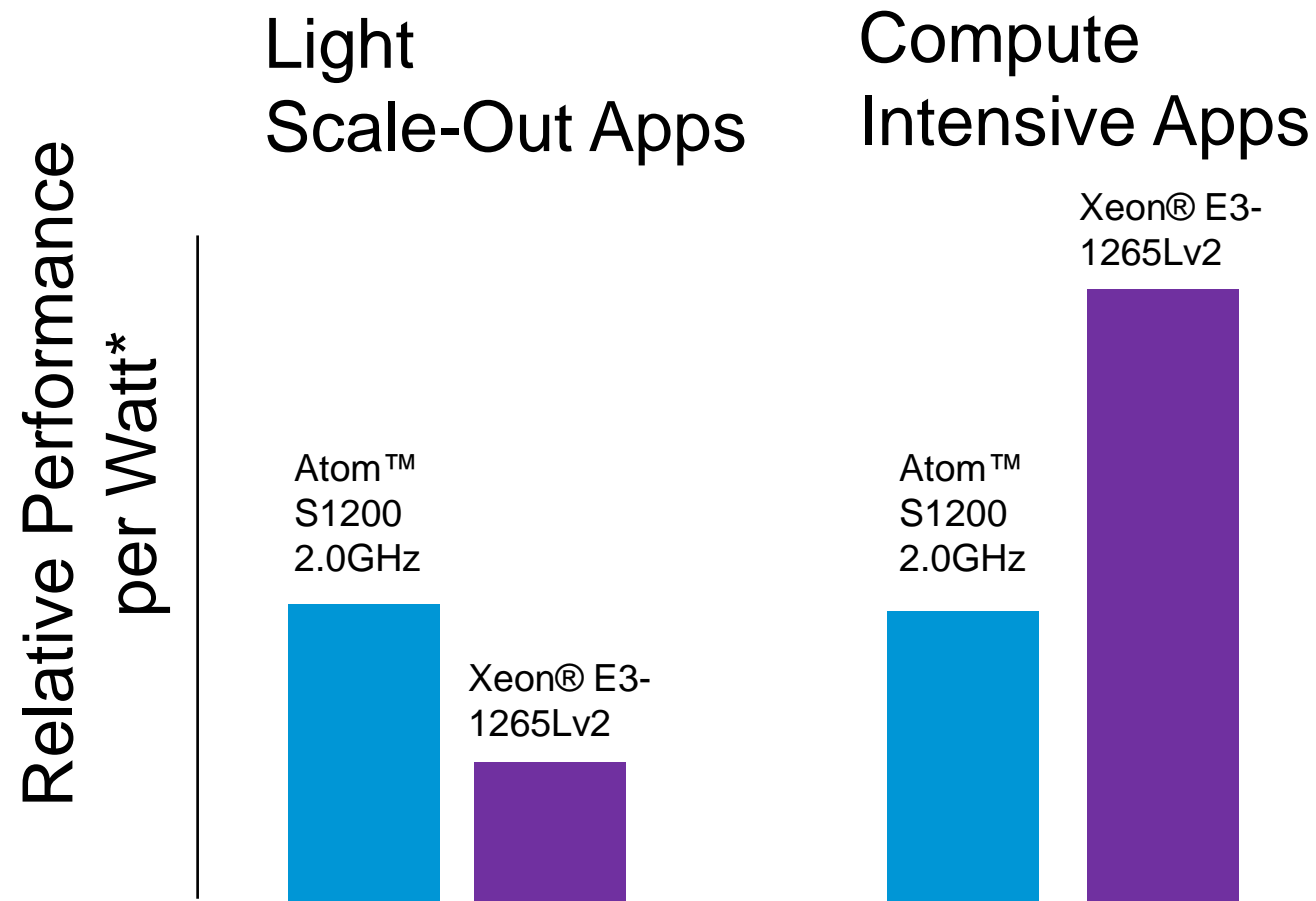


**HP & Intel: Proven industry leadership and partnership**



# Maximize efficiency for scale-out applications

Extreme-low-energy Intel® Atom™ processors significantly improve power efficiencies



\* Based on HP internal testing

## Most suitable for light Scale-Out applications

- Simple content delivery
- Large distributed memory caching
- Big-data simple search systems
- MapReduce applications





“LeaseWeb continuously innovates its product portfolio and services. That’s why we tested an **HP Gemini beta system with the Intel® Atom™ S1200 product family**, and compared it with our Dedicated Server products. We are intrigued with the balance between power, performance and 64-bit software ecosystem support. Based on what we have seen so far, **HP appears to have developed a highly efficient solution that is ideal for light scale-out workloads.**”

Marc Burkels

Manager Dedicated Servers and Colocation





# HP Project Moonshot

Changing the game with extreme low-energy computing

## Let our innovations power yours - enabling world's most efficient Datacenter

- Industry's first **comprehensive program** to unlock savings of **extreme low energy servers**
- From ten's of servers per rack sharing nothing to **thousands per rack sharing everything**
- **Radical savings** at scale for select workloads and applications

# Atom Leverages Existing Software Ecosystem

**15M**  
Developers Building  
IA SOFTWARE

**18,000**  
Members of the  
Intel Software  
Partners Program



"Long-standing optimization on Intel Xeon processors extends today to the Intel Atom S1200 processor. **With a single code base, Intel and Red Hat deliver the binary compatibility needed to run the most complex customer applications unchanged.**"

*- Jim Totton, VP & GM, Platform Business Unit, Red Hat*

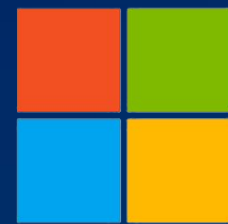


"Software compatibility between Intel® Atom™ S1200 Processor and Intel® Xeon processors provides customers with a seamless growth path. **Writing and running a single code base across the broad range of Intel's x86 platforms sidesteps costly Software overhauls and delivers huge value for us and our customers"**

*- Ashok Joshi, Sr. Director Oracle NoSQL Database*







Microsoft

# Jeffrey Snover

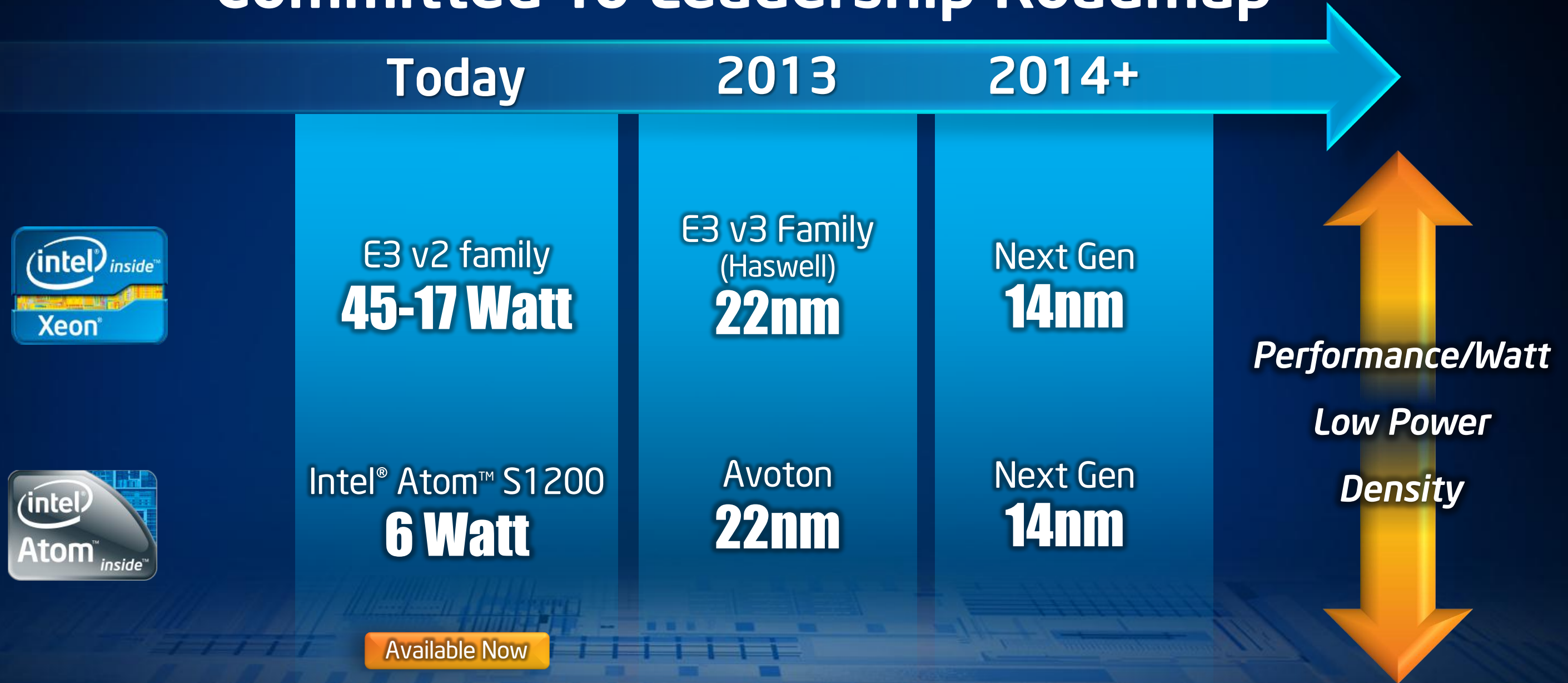
Distinguished Engineer  
Windows Server Lead Architect



Windows Server 2012



# Committed To Leadership Roadmap



**facebook**<sup>®</sup>

**Frank Frankovsky**

Vice President, Hardware Design and Supply Chain



1 billion users

140+ billion friend connections

220+ billion photos

300+ million photos added per day

4.5 billion likes, posts, comments, and  
photos added per day

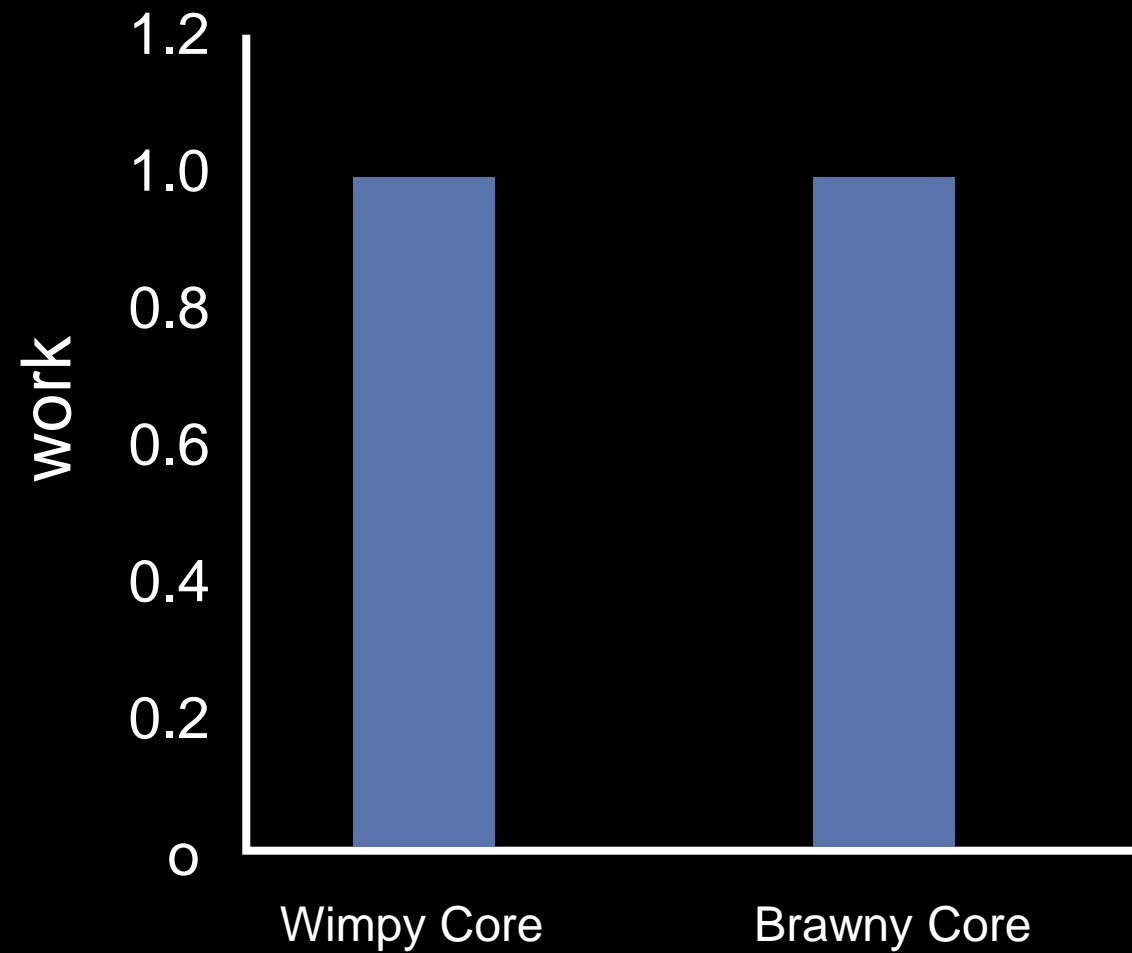


17 billion check-ins

Yep, that's a lot of compute power

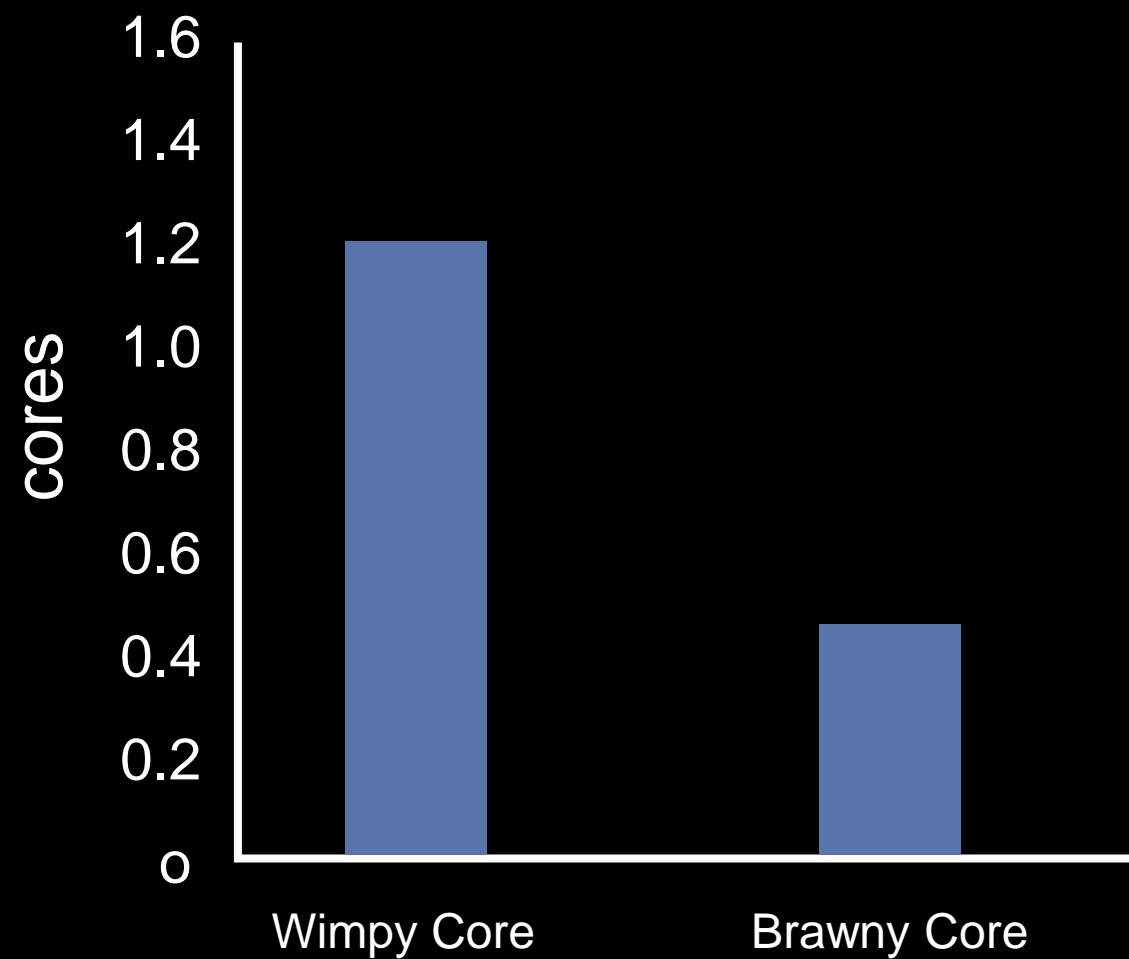
# Computing Power

work – normalized

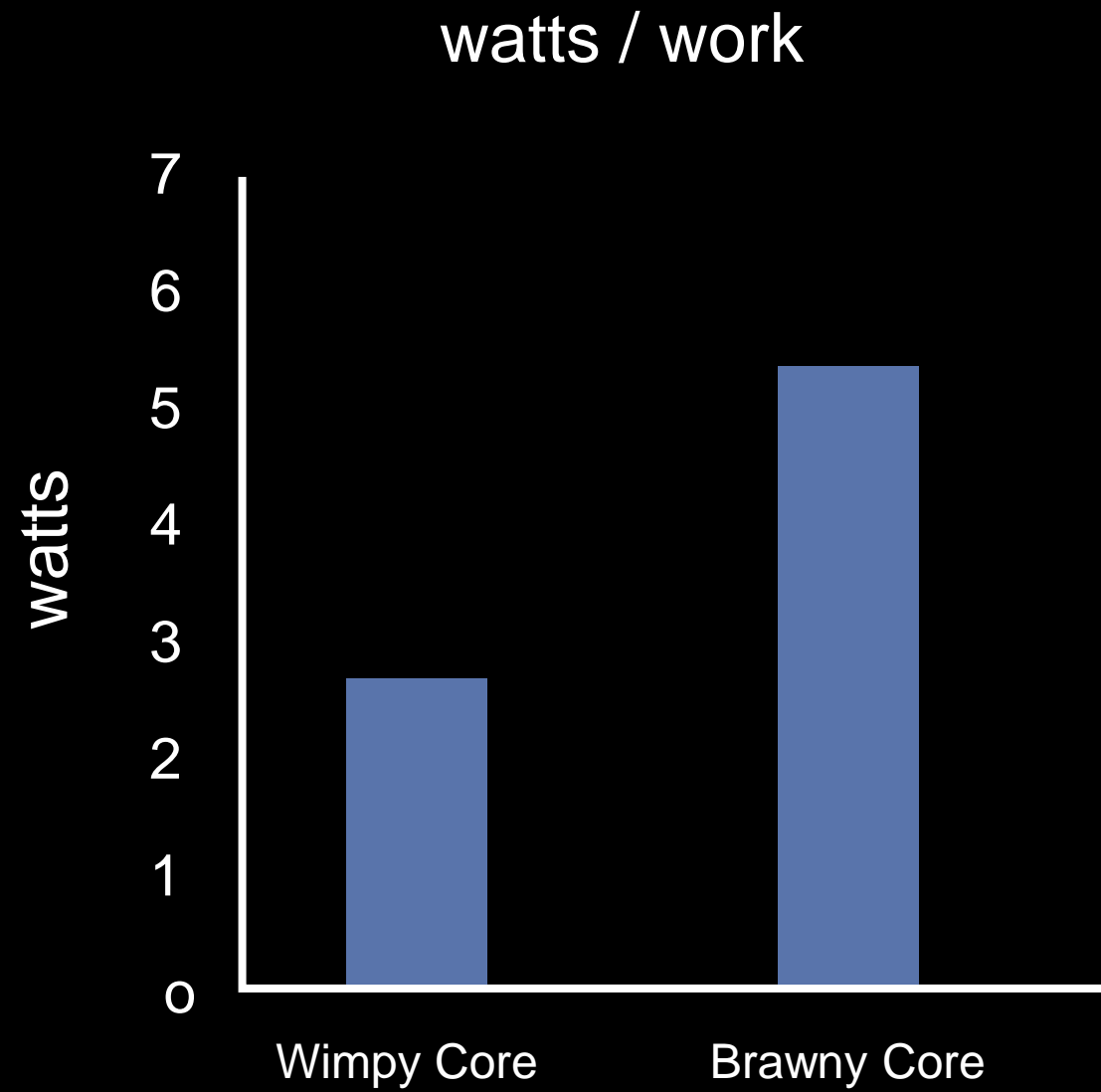


# Cores Required

cores / work



# Watts Required



Facing unprecedented scale requirements

Excited about the potential of SOCs

It's all about useful work per watt per dollar!

**facebook**

# Summary

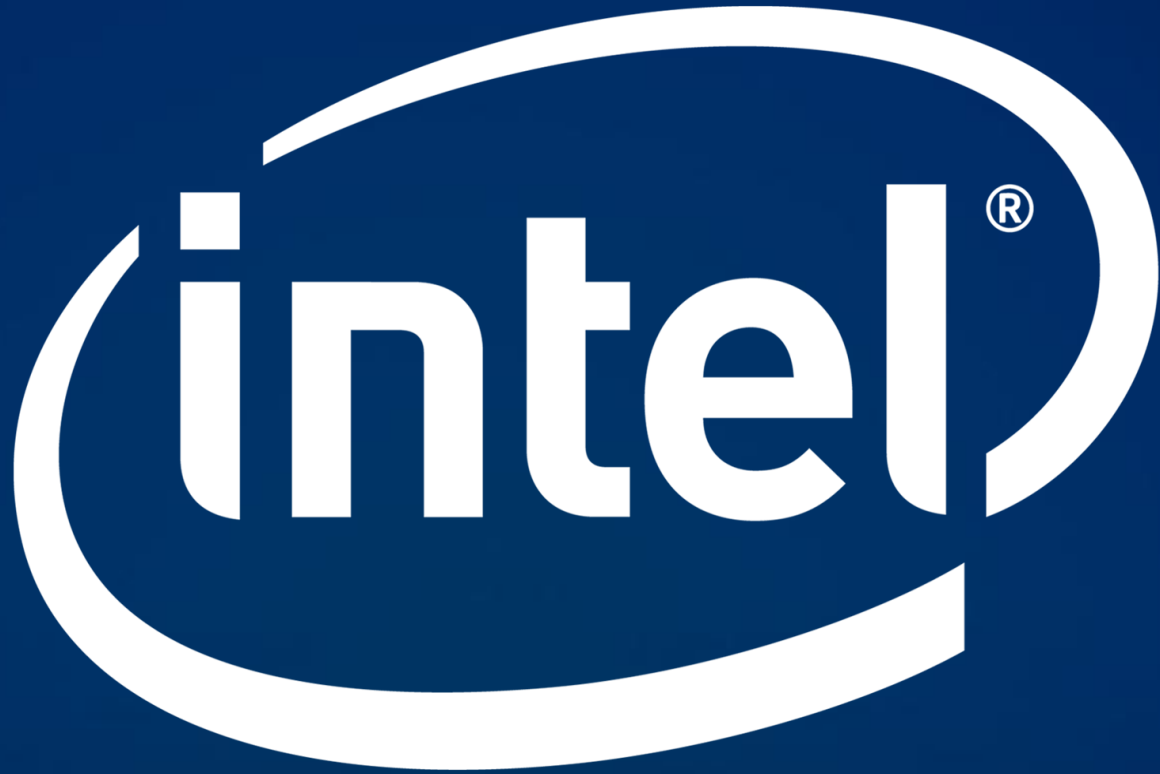
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*Microserver, storage and comms*

New Atom SoC extends Intel's breadth of application optimized  
datacenter products







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Hyper-Threading Technology requires a computer system with a processor supporting HT Technology and an HT Technology-enabled chipset, BIOS and operating system. Performance will vary depending on the specific hardware

and software you use. For more information including details on which processors support HT Technology, see [here](#)

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BIOS, authenticated Code Modules and an Intel TXT-compatible measured launched environment (MLE). The MLE could consist of a virtual machine monitor, an OS or an application. In addition, Intel TXT requires the system to

contain a TPM v1.2, as defined by the Trusted Computing Group and specific software for some uses. For more information, see [here](#)

The original equipment manufacturer must provide TPM functionality, which requires a TPM-supported BIOS. TPM functionality must be initialized and may not be available in all countries.

Roadmap not reflective of exact launch granularity and timing - please refer to ILU guidance

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Intel® AES-NI requires a computer system with an AES-NI enabled processor, as well as non-Intel software to execute the instructions in the correct sequence. AES-NI is available on select Intel® processors. For availability, consult

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Relative performance is calculated by assigning a baseline value of 1.0 to one benchmark result, and then 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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# Legal Information: Performance & Density Configuration

<u>Metric</u>	<u>E3-1265Lv2</u>	<u>Atom S1260</u>	<u>Difference</u>
SPECWeb/node	15,303	1,522	E3-1265Lv2 estimated node performance is 10X higher vs. Atom S1260
SPECWeb/rack	1,713,986	852,320	E3-1265Lv2 estimated rack performance is 2X higher vs. Atom S1260 rack
Nodes	112 (space limited)	560	Atom S1260 density is estimated 5X higher per rack
Power/node	60W	20W	Intel estimates based on CPU TDP, chipset (for E), memory, network interface, HDD and amortized power for fans and PSU

## E3-1265Lv2 uSvr:

Dell\* C5220\* blade with Dell Viking Chassis

112 nodes per rack (14 chassis/rack \* 8 blades/chassis) with 16GB DDR3, 2x10GbE, 2x480GB SSD per node.

## Atom S1260 uSvr:

Assumed 560 nodes per rack (well within 15kW envelope) with 8GB DDR3, 2x1GbE, 2x150GB SSD per node.

