Agenda

• Key Market Trends
• How to improve data center effectiveness
• Intel roadmap to success
• Summary
Key Market Trends

Demands are exceeding traditional IT capabilities

More users, devices, data, storage, traffic ...

More Users

More Devices

More Data

Changing Role of IT

Help Lead the Business

Support the Business

Growing Capability Gap

What’s Needed

gap

What’s possible with traditional IT architecture capabilities

Maint. Costs Inhibit Innovation

Innovation (and new capabilities)

Maintenance

80/20 Split of the Typical IT Budget
In year 2016...

3.4B Internet users

5B Personal devices

14B Intelligent systems

6X Growth in Cloud traffic

All supported by the world’s datacenters

Source: Cisco VNI, GCL, Intel
WHY NOW?

AFFORDABILITY

AVERAGE SERVER COST
2002 - 2012

40%

STORAGE COST / GB
2002 - 2012

90%

INDUSTRY INVESTMENT

$17 Billion
By 2015
(IDC)

$20 Billion
$15
$10
$5

2010 2011 2012 2013 2014 2015

Source: Intel, IDC WW Big Data Forecast, 2012
Evolution of Data Center

Discrete Data Center

Konzolidace
Oddělené sítě
Proprietární řešení

Virtualized Data Center

Flexibilní Management
10G Unifikovaná síť
Výkon, Bezpečnost, TCO

Cloud Data Center

Efektivní a Bezpečné
Méně konfigurací, kabelů, serverů
Otevřená Architektura
Iluze nekonečných zdrojů
Snadnější integrace serverů

Procesory Intel Xeon® E5 naplňují potřeby budoucích privátních cloudů díky novým integrovaným funkcím a vlastnostem
Intel in the Data Center

Balance and Scale Required
*Bigger data centers require ease of scale and balance designs*

Common underlying architecture and ecosystem
Simplifies scaling (design, build, and maintain) and balancing system elements for overall optimal results
Server Modernization – TCO Reduction

Refresh and Save

• Software license and operating costs are often significantly higher than the server acquisition cost

• Power management and increased efficiency is estimated to reduce power ~90% to deliver the same level of performance

• Significant performance gains maximize output per software license – possibly saving over $25k over a system’s life

Reduce Total Cost of Ownership by an estimated 66%\(^1\)

Go to [www.intel.com/go/xeonestimator](http://www.intel.com/go/xeonestimator) to learn more

CPU choice can dramatically affect software costs

TCO savings of 66% based on Intel estimates using Intel® Xeon® Processor-based Server Refresh Savings Estimator by refreshing quantity 100 2S Intel® Xeon® X5365 based servers with quantity 16 2S Intel® Xeon® E5-2690 based servers in a physical-to-physical consolidation that provides equivalent total server performance. The 4-year TCO savings based on: One time server acquisition cost of $129,968 (16 servers at $8123 each) plus installation cost of $21,800 ($1362 per server). Removing 84 servers from the data center provides network and server maintenance savings of $53,040 ($157 per server/year), utility savings of $177,540 ($528 per server/year) and OS license savings of $436,464 ($1299 per server/year).
Simplify with Intel® 10GbE

The #1 selling Ethernet adapter

Simplify²

10X 1GbE Server Connections → 2X 10GbE Server Connections

Fibre Channel Over Ethernet

Up to 20%
Lower Total Infrastructure costs³

Unify

Unify your storage and data networks

Better Together

Intel® Xeon® E5 2600 brings up to 3x more I/O bandwidth vs. prior gen.⁵

Unleash the full I/O capabilities of Xeon® E5 with Intel® 10GbE

Estimate your Intel® 10GbE ROI

Intel(R) 10GbE ROI calculator

1. Intel® 82599 10 Gigabit Controller and Intel® Ethernet X520 Server Adapter; Intel® 10GbE Adapter: #1 MSS per Dell’Oro Group Q3’12 Ethernet Report
3. Intel IT Proof of Concept with 10GbE and FCoE. See back up foil “IT Savings with Unified Network” for more details.
4. Storage Magazine Survey published Dec 11 Link to Storage Magazine article
5. Max. I/O R/W bandwidth Intel® Xeon® E5-2680 vs. Intel® Xeon® X5670. See backup slide “Xeon® Processor Performance Leadership Claims” for details
Non Volatile Memory

Changing The Game In Datacenter Storage

- 4X More IOPs vs HDD
- 90% Lower Power Consumption
- Ideal For Accelerating Throughput-bound Applications

Source: SNIA, 2011
Intel® Solid-State Drive DC S3700 Series
Consistently Amazing

Fast and Consistent Performance

Deliver data at a breakneck pace, with consistently low latencies and tight IOPS distribution.

- 75K Random Read IOPS\(^1\)
- Latencies: Typical 50µs; Max <500µs\(^2\)

Stress-Free Protection

Protect your data center applications with multiple secure checkpoints that provide protection against data loss and corruption.

- Full data path and non-data path protection

High-Endurance Technology

Meet your most demanding needs with marathon-like write endurance of 10 drive writes per day over five years

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\(^1\) 4K Random Reads
\(^2\) As measured by Intel:100GB 4K Random Writes QD=1 at 99.9 % of the time across 100% span of the drive

Configuration: Intel DH67CFB3; CPU i5 Sandy Bridge i5-2400S LGA1155 2.5GHz 6MB 65W 4 cores CM8062300835404; Heatsink: HS - DHA-B LGA1156 73W Intel E41997-002 and E97379-001; Memory: 2GB 1333 Unbuf non-ECC DDR3; 250GB HDD 2.5in SATA 7200RPM Seagate ST9250410AS Momentus 3Gb/s; Mini-ITX Slim Flex w/PS Black Sentey 2421; Ulink Power Hub; SATA Data and Power Combo 24 in. Orange EndPCNoise Sata fp7lp4
Big Data – A Foundation For Delivering Big Value

Unleash the power of platform

TeraSort for 1TB sort: **>4 hour process time**

Nearly 50x increase in your ability to discover insights

**Intel® Xeon® 5600**
**HDD**
**1GbE**

**Upgrade processor**

~50% reduction

**Upgrade to SSD**

~80% reduction

**Upgrade to 10GbE**

~50% reduction

**Hadoop processing time:** **<10 minutes**

with complete Intel-based solution

**Intel distribution**

~40% reduction

Upgrade

*Other brands and names are the property of their respective owners*

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.

Source: Intel Internal testing

For more information go to: [intel.com/performance](http://intel.com/performance)
Enterprise Data Center Modernization

**Balance and scale considerations for today and tomorrow**

### Server
- Performance & efficiency optimized
- Intel® Xeon® processor E3 platforms
- Intel® Xeon® processor E5 platforms
- Intel® Xeon® processor E7 platforms
- Intel® Atom™ (Server class)
- Intel® Xeon® Phi™

### Storage
- Scalable converged storage servers
- SSDs for low latency and high bandwidth needs
- Intel® Xeon® -based intelligent t storage
- Intel® SSD 910 series
- Intel® SSD S3700 series
- Intel® SSD 710 series
- Intel® Cache Acceleration Software

### Network
- Programmable network equipment, open interfaces
- Unified networking
- Intel® Ethernet Controllers
- Intel® Ethernet Adapters
- Intel® Ethernet Switch Silicon
- Intel® True Scale Fabric

### Security
- Automated controls, data protection, multi-tenant Data Center
- Hardware-based data and multi-tenant workload integrity
- Intel® Trusted Execution Technology
- Intel® Virtualization Tech; Intel® AES-NI
- Intel® Expressway Appliances
- McAfee ePO™; McAfee MOVE-AV™
- McAfee NS Series Appliances
- McAfee Cloud Identity Manager™
- McAfee Application & Change Control

### Orchestration
- Automated density/efficiency
- DC efficiency and density tuning via deep power and resource usage instrumentation
- Intel® Node Manager
- Intel® Datacenter Manager

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**2013**

- Increasing application performance, reliability, scale, serviceability
- Enhancing large scale distributed storage and analytics
- Programmable switch & management APIs
Secure Your Infrastructure at the Hardware Level

Intel® Technologies for server security

Isolate
Intel® VT & Intel® TXT

Protects VM isolation and provides a more secure platform launch

Enforce
Intel® TXT

Establishes “trusted” status foundation to control migration based on security policy

Encrypt
Intel® AES-NI

Delivers built-in encryption acceleration for better data protection

www.intel.com/txt
Control One of your Biggest Operating Expenses

Power Management at the Server, Rack and Datacenter Level

Greater Workload Consolidation

Intel® Node Manager

Intel® Data Center Manager

Operational Costs of a Typical Large IPDC

<table>
<thead>
<tr>
<th>Component</th>
<th>Cost Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Servers (HW and SW)</td>
<td>50%</td>
</tr>
<tr>
<td>Labor</td>
<td>13%</td>
</tr>
<tr>
<td>Networking</td>
<td>6%</td>
</tr>
<tr>
<td>Facilities</td>
<td>5%</td>
</tr>
<tr>
<td>Other IT</td>
<td>3%</td>
</tr>
<tr>
<td>Power</td>
<td>23%</td>
</tr>
</tbody>
</table>

Lower TCO

Manage Server Power

Manage Datacenter Power

1. up to 30% power reduction at similar performance
2. up to 40% more servers and performance per rack
3. up to 66% TCO reduction

Intel® Xeon® Processor v2
Product Families
<table>
<thead>
<tr>
<th>Product Line Descriptions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Intel® Itanium® processor 9500 product family</strong></td>
</tr>
<tr>
<td>Targeted at large-scale databases, data warehouses, ERP, data analytics, and SMP deployments. Delivers uncompromised scalable performance and world-class RAS for the most demanding workloads, and provides uninterrupted real-time business processing and decision support.</td>
</tr>
<tr>
<td><strong>Intel® Xeon Phi™ product family</strong></td>
</tr>
<tr>
<td>Advanced performance for highly parallel workloads for breakthrough innovation and discovery. Based on Intel® MIC Architecture; Works synergistically with Intel® Xeon® processors. Increased developer productivity via programming models &amp; tools common with Intel® Xeon® processors.</td>
</tr>
<tr>
<td><strong>Intel® Xeon® processor E7 family</strong></td>
</tr>
<tr>
<td>Scalable (up to 256-way), reliable, powerful multi-core servers offering industry-leading performance, expanded memory &amp; I/O capacity, and advanced reliability ideal for the most demanding enterprise and mission critical workloads, large scale virtualization and large-node HPC applications.</td>
</tr>
<tr>
<td><strong>Intel® Xeon® processor E5 family</strong></td>
</tr>
<tr>
<td>Versatile (up to 4-way) servers for all your infrastructure, high-density, workstation and HPC applications with features that enable optimal performance and power efficiency for the data center.</td>
</tr>
<tr>
<td><strong>Intel® Xeon® processor E3 family</strong></td>
</tr>
<tr>
<td>Economical (1-way) dependable general purpose servers well-suited for small businesses and education with features that optimize performance, uptime, and security.</td>
</tr>
<tr>
<td><strong>Intel® Atom™ processor S1200 product family</strong></td>
</tr>
<tr>
<td>Designed for micro servers which have unique density, performance, and cost per rack requirements. Well-suited to highly parallel workloads including lightweight web tier, low-end dedicated web hosting, and basic content delivery.</td>
</tr>
</tbody>
</table>

* Other names and brands may be claimed as the property of others.
2013: Key changes

Q2
Xeon E3 v3
(Haswell)
Up to 40%
Graphics Perf

Q3
Xeon E5 v2
(IVB-EP)
Up To 40% Perf

Q4
Xeon E7 v2
(IVB-EX)
Up to 100% Perf
3X Memory
Advanced RAS

Q4
Atom Server
(Avoton)
Up to 4X Perf
8 cores, 2.5 GbE

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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.
Source: Best available submissions and publications as of 6 March 2012. Please see slide speaker notes for source details.

For more information go to http://www.intel.com/content/www/us/en/benchmarks/server/xeon-e5-2600-summary.html

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Děkuji za pozornost