The Data Center

Unleash the Demand
The Digital Service Economy

DEVICES

DATA CENTER

SERVICES

... and so on

* Other names and brands may be claimed as the property of others.
The Digital Service Economy... and so on

DEVICES

SERVICES

DATA CENTER

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The Digital Service Economy

... and so on
In the Future ...

...The Data Center

...systems will be workload optimized

...infrastructure will be software defined

...analytics will be pervasive
In the Future
Systems will be
Workload Optimized
Broad Range of Compute, Storage, and Network Workloads

- I/O INTENSIVE
  - OLTP
  - Cold Storage
  - Dedicated Hosting

- MEMORY INTENSIVE
  - Enterprise Resource Planning
  - Dynamic Modeling
  - Memory Caching
  - E-Commerce
  - Genomics
  - OLTP
  - Static Web

- CPU INTENSIVE
  - Cloud I/O
  - OS
  - Graphics Rendering
  - Application Development
  - Gov't R&D

- V/O INTENSIVE
  - Collaboration Tools
  - Cloud Storage
  - Security
  - Application Development
  - Gamma
Intel Architecture: >100 Data Center Processors
Common Architecture for Full Range of Workloads
MEMORY INTENSIVE

I/O INTENSIVE

Intel Architecture:
>100 Data Center Processors

Common Architecture for Full Range of Workloads
Karl Triebes
Executive Vice President of Product Development
and Chief Technical Officer
F5 Networks

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Karl Triebes
Executive Vice President of Product Development and Chief Technical Officer
F5 Networks
The Industry's 64-bit Data Center SoC

2012
- Intel® Atom™ Processor S1200

2013
- Intel® Atom™ Processor C2000

Production Systems
- Network: 54%
- Storage: 24%
- Microserver: 17%
Intel's 3rd Generation Data Center System on a Chip

Intel® Xeon® D

Xeon performance in an energy efficient and dense SoC

Sampling Now!
Patty Kummrow
Intel Corporation
Director of Atom Server SoC Development
### Options for Workload Acceleration

<table>
<thead>
<tr>
<th>Compute</th>
<th>Storage</th>
<th>Network</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ex: FPGA</td>
<td>Ex: QuickAssist Technology</td>
<td>Ex: Customer IP</td>
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<td>Ex: AES-NI</td>
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<th>Software</th>
<th>In-Package Accelerator</th>
<th>SoC</th>
<th>Instruction Set Architecture</th>
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</tbody>
</table>
In the Future Infrastructure will be Software Defined
The Storage Challenge

1. Low Utilization
2. Rapid Data Growth
3. Siloed Capacity

42% CAGR through 2020 per IDC

1 Intel IT estimate
Intel Investing in Software Defined Storage

Intel Storage Acceleration Libraries (ISA-L)

Open Source Code Contributions

Prototype SDS Controller

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Software Defined Storage

Opportunity

Dynamic, policy driven management of storage resources

Software Defined Storage Controller

Abstraction  Aggregation  Provisioning  Orchestration
NFV / SDN Network Transformation

October 2011

2012

2013

2014

NFV Research Results
ISG Defines 9 Use Cases
From POCs to Pilots
1st Commercial Deployments

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Logical pools of disaggregated resources

Standard method of exposing HW to SW

Composable based on app requirements
Rack Scale Architecture

Pooled Compute
Pooled Network
Pooled Storage

Learn more: Customer system demonstration at IDF showcase
Silicon Photonics – Optical Innovations

Copper Cables
3M max @ 100Gbps
Low cost
High reliability

Silicon Photonics
>300M @ 100Gbps
Learn more: Customer system demonstration at IDF showcase
Andy Bechtolsheim
Arista Networks
Founder, Chief Development Officer and Chairman

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Andy Bechtolsheim
Arista Networks
Founder, Chief Development Officer
and Chairman
In the Future
Analytics will be
Pervasive
Improving Products
Reducing Costs
Discovering Treatments
Improving Cities
Big Data Analytics Platform Requirements

Big Data Platform

Requirements
- Predictive, In-memory, Streaming, Graph

Services Delivery
- App A
- App B
- App C
- App D

Analytics Tools

Resource Pool

Storage

Network

Server

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Cloudera Distribution for Hadoop 5.2
Optimized for Intel® Architecture

- Performance Optimizations
- Enhanced Security
- Accelerating Adoption of Hadoop
Data Analytics Solutions

Your Opportunity to Transform Industries


$1B $2B $3B

A-wear Wearables-to-Analytics Developer Program
In the Future ...
...analytics will be pervasive
...infrastructure will be software defined
...systems will be workload optimized
Attend Technical Sessions:

>40 Datacenter Technical Sessions, Panels and Poster Chats at IDF
11 am Today Room 3016
Das Kamhout: Technology Insight: Can the Data Center Think for Itself? From Abacus to Autonomics

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Datacenter Meet Up Zone
Intel Fellows Live
Intel Chip Chat Live
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