Cloud 2015

Raejeanne Skillern

Director, Cloud Computing

Data Center Group

intel

By 2015…

More Users

>1 Billion More
Netizen's

More Devices

15 Billion
Connected Devices

More Data

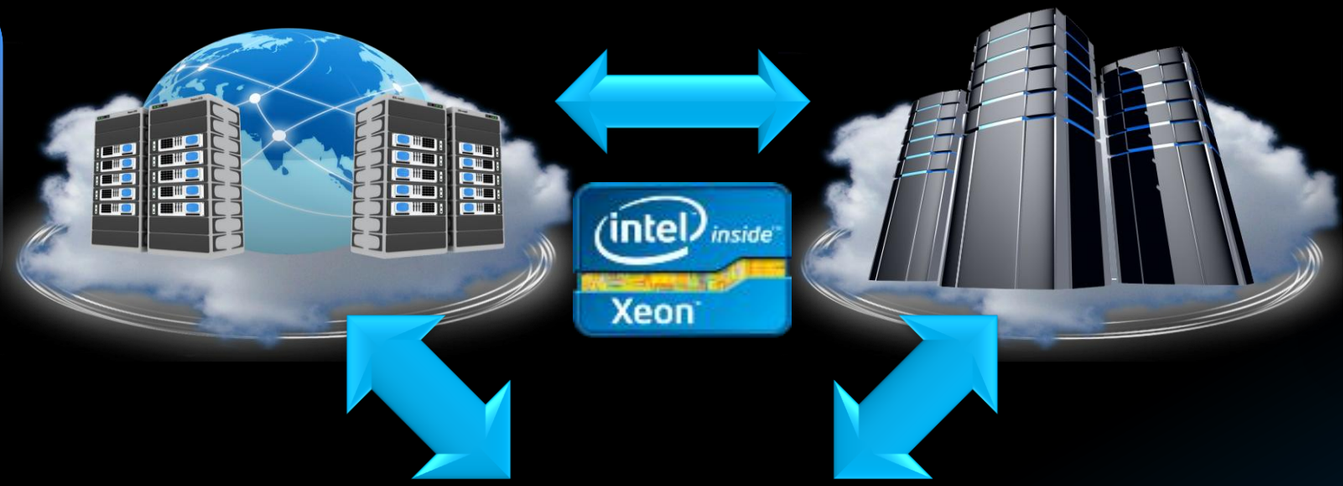
>1,000 Exabytes
Internet Traffic

1. IDC "Server Workloads Forecast" 2009. 2.IDC "The Internet Reaches Late Adolescence" Dec 2009, extrapolation by Intel for 2015 2.ECG "Worldwide Device Estimates Year 2020 - Intel One Smart Network Work" forecast 3. Source: http://www.cisco.com/assets/cdc_content_elements/networking_solutions/service_provider/visual_networking_ip_traffic_chart.html extrapolated to 2015

intel

Cloud 2015 Vision

Federated
Share data securely across public and private clouds



Automated
IT can focus more on innovation and less on management

Client Aware
Optimizing services based on device capability

intel inside CORE i5

intel Atom inside

Desktops | Laptops | Netbooks | Personal Devices | Smartphones | Smart TVs | Embedded

intel

Are We Ready? …

Security

IDC
Analyze the Future

70% of Respondents Saying Security is Top Concern In Moving to Public Cloud[1]

Efficiency

Today's Technology Would Require Building 45 New Coal Power Plants to Support 2015 IT Infrastructure2

Manageability

BAIN & COMPANY

IT will spend ~$2T on deployment and operations thru 2015 unless smarter infrastructure radically simplifies management of virtualized environments.

Lock-In

the 451 group

August 2010

"We have seen lock-in return as a top concern … routinely seeking alternatives to proprietary virtualization and cloud computing technology "

Infrastructure Must Evolve to Address IT Challenges

1. IDC Market Analysis, January 2010.
2. Source information in backup

intel

Vision To Action

IT & Service Providers

Define and Prioritize IT Requirements

Products & Technologies

Take Advantage of New Capabilities In Intel Platforms

Intel® Cloud Builders

Utilize Proven Reference Solutions to Ease your Deployments

Catalyst for Change

OPEN DATA CENTER ALLIANCE

Open & Interoperable Solutions Essential

intel

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

OPEN DATA CENTER ALLIANCE

DELIVERING CUSTOMER REQUIREMENTS FOR THE CLOUD

Curt Aubley
VP & CTO Cyber Security & NexGen Innovation
Lockheed Martin Information Systems & Global Services
President, Open Data Center Alliance

OPEN DATA CENTER ALLIANCE

>280 GLOBAL IT LEADERS

Steering Committee

BMW, Capgemini, China Life, China Unicom, Deutsche Bank, Walt Disney Corp., JPMorgan Chase & Co., Lockheed Martin, Marriott, nab, terremark, UBS

Contributing Members

AT&T, Atos Origin, AXA, Baidu, Banco Azteca, Leumi, Banorte, BBVA, BSE, CERN, Sinopec, Chunghwa Telecom, CLALIT, T-Mobile, DHL, Dimension Data, HCA, ING, kt, Locaweb, Motorola Mobility, Nokia, OCLC, sanofi aventis, Savvis, SNDA, Tencent, sify, swisscom, switch, Telecom Italia, TravelSky, verizon, vivo

Adopter Members

AAA Carolinas, Abiquo, Academic, ADP, AIMS Data Centre SDN BHD, align, Alliant, allied digital, amdocs, American Family Insurance, Arsys, AwareSerché, BearingIrel and Ltd, Beijing China Power Information Technology Co., Ltd., BesTV 百视通, C1000, C4 Advanced Solutions, Capitoline LLP, CEMEX, Ceske Radiokomunikace, 中信银行, China Telecom Corporatio, Cloud4com, CloudEx, Cloud Soft, ComputeNext, MPS, corelink, CoreSite, CtrlS, eBay, eCareme Technologies, edgecast, entel, ePLDT, expedient, FINNET, FLAGSHIP, ForLinux, Getronics NL BV, GlobalOne, Gravitant, SMS, 国泰君安证券, HARRELL & WIDENER, Himes Associates Ltd, HyTrust, InterHost, INTESA SANPAOLO, iWeb, KBC ICT Services, KL, kraft foods, KULACOM, LEON, LG U+, locuz, logica, MCH, McKESSON, MEEZA, microACCESS, NEC, NetEase, netmagic, Nordea, Network Services, online RESOURCES, Pfizer, Phillips Technology Solutions, Posteitaliane, PRAKAT, puppet labs, PURDUE, RENAULT, REPSOL, saba, SIS, SecureKeys, Selectel, SIAT, SITA, SK telecom, Solid Pass, StarHub, State Farm Insurance, TCC Technology, TE connectivity, telx, TestPros, The Clearing House, StorageIO, Tissat, Tropitone, True Internet Data Center true, Uber Technologies, UniCredit, unis 清华紫光, virtustream, POLITIE, VYATTA, Walmart, WilTel, workface

OPEN DATA CENTER ALLIANCE

Intel serves as Technical Advisor to the Alliance

VISION FOR THE OPEN DATA CENTER ALLIANCE

ACCELERATE

$50B

OF CLOUD SERVICES[1]

SAVING

$25B

IN TOTAL ANNUAL IT SPEND WITHIN 5 YEARS[2]

secure federation …automation …common management and policy … transparency

OPEN DATA CENTER ALLIANCE

1: Source: Projections based on IDC Cloud Services Forecast, May 2010. Assumes a 25% acceleration in cloud services from IDC estimate between 2010 and 2015
2: Source: Estimated 15% reduction in operational costs based on Bain's $142B annual spending estimates.

ALLIANCE: AMAZING PROGRESS IN 7 MONTHS

October 2010	Today
1st user-driven organization for cloud requirements established	Release of the 1st user-driven requirements for the cloud
70 IT leaders joined by technical advisor Intel	4X members representing >$100B annual IT spend
Formation of 5 technical working groups	New technical collaborations: 4 organizations & 4 initial solutions providers

OPEN DATA CENTER ALLIANCE

OPEN DATA CENTER USAGE MODEL OVERVIEW

SECURE FEDERATION	AUTOMATION	COMMON MGMT AND POLICY	TRANSPARENCY
Provider Assurance Industry standard provider security tiers: bronze-platinum **Compliance Monitoring** Transparent oversight of provider security	**VM Interoperability** Standard, interoperable VM deployment & management **IO Control** Extend QoS guarantees from system to network	**Regulatory Framework** Guide industry in requirements & compliance management best practices	**Service Catalog** Compare service features & price across providers **Standard Unit of Measurement** Standardized cloud perf comparison **Carbon Footprint** Cloud services become “CO2 aware”

OPEN DATA CENTER ALLIANCE

LOOKING FORWARD

Today:
Usage Model
Release

6 months:
Initial Industry
Roadmap Integration

18 months:
Initial Deployments

OPEN
DATA
CENTER
ALLIANCE

DRIVING ADOPTION WITH INDUSTRY

Specifications
& Standards

Requirements
& Usage Models

Cloud Solution
Delivery

OPEN
DATA
CENTER
ALLIANCE

Responding to Alliance Usage Models

IT & Service Providers

Define and Prioritize IT Requirements

Products & Technologies

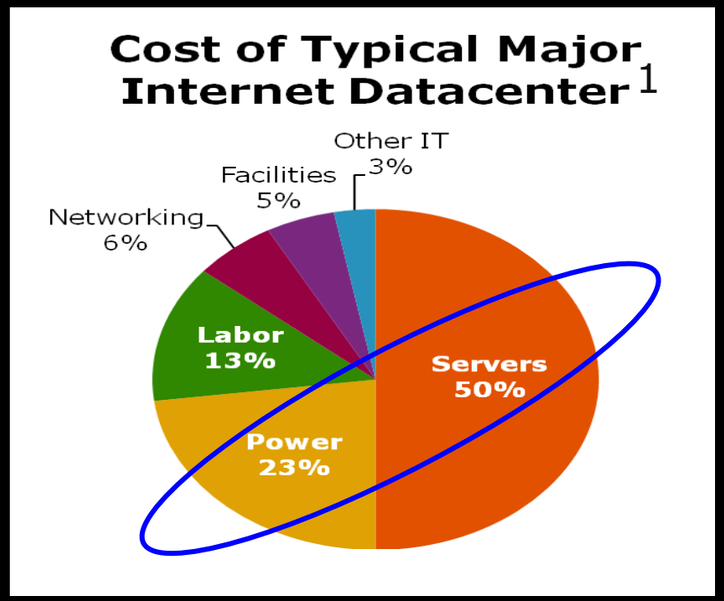
Take Advantage of New Capabilities In Intel Platforms

Intel® Cloud Builders

Utilize Proven Reference Solutions to Ease your Deployments

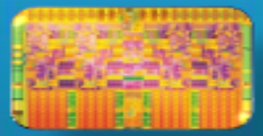
Intel: History of Driving Cloud Innovation & Optimization

Intel can address ~75% of TCO…



…via optimized platforms & technologies

Optimized Silicon



Optimized Technologies

Scalable Software

Optimized Systems & Datacenters

Baidu 百度

Up to 40W/node power savings using Intel® Node Manager[2]

Facebook*

60% power reduction per user - Intel Xeon processor 5600 series[3]

terremark

Higher density and up to 30% performance increase[4]

1 Source: Intel internal analysis, 2008 of 3 yr TCO

2 Source: http://software.intel.com/en-us/articles/intel-cloud-builders-success-stories

3 Source: For more details on the benchmark results: http://gigaom.com/2009/12/16/facebook-dyno

4 source: http://www.intel.com/references/Cloud/cloud.htm

Intel® Cloud Builders

Build A Cloud:

- Fujitsu Primergy with VMware vCloud
- HP ProLiant SL* & Enomaly Elastic Computing Platform
- Huawei SingleCLOUD*
- IBM* CloudBurst
- Inspur* IaaS
- Joyent SmartDataCenter
- Microsoft System Center VM Manager Self-Service Portal 2.0*
- Neusoft Aclome* Cloud
- Nimbula* Cloud Operating System & Nimbula Director*
- Novell* Cloud Manager
- Oracle* Optimized Solution for Enterprise Cloud
- Parallels* Elastic IT Solution Developer Cloud
- Powerleader Power Rack Server* with Microsoft*
- Red Hat* Cloud Foundations
- Ubuntu Enterprise Cloud
- Univa UD*

Enhance A Cloud:

- Balanced Compute Model with NetSuite & Gproxy Design
- Cisco* Virtualized Multi-Tenant Data Center
- Cloud Gateway Security on Intel Platforms
- Cloud On-Boarding with Citrix OpenCloud*
- Dell & VMware* Policy Based Power Management
- EMC* Atmos* Scale-out Storage Usage Models
- Enhanced Cloud Security with HyTrust and VMware
- NetApp* Unified Storage and Networking
- Parallels* Trusted Compute Pools for Cloud Computing
- VMware Enhanced Server Platform Security

Proven, Open, Interoperable Solutions Optimized For IA Capabilities

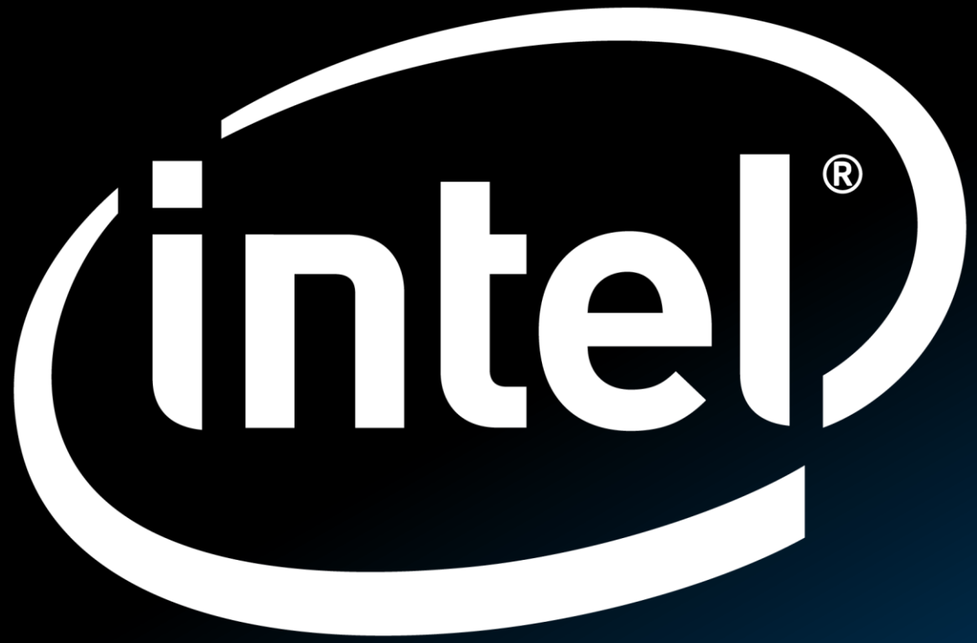
www.intel.com/cloudbuilders

Solutions Available Today To Make It Easier To Build And Optimize Cloud Infrastructure

Summary

- Cloud 2015: Federated, Automated, Client Aware
- Open Data Center Alliance:

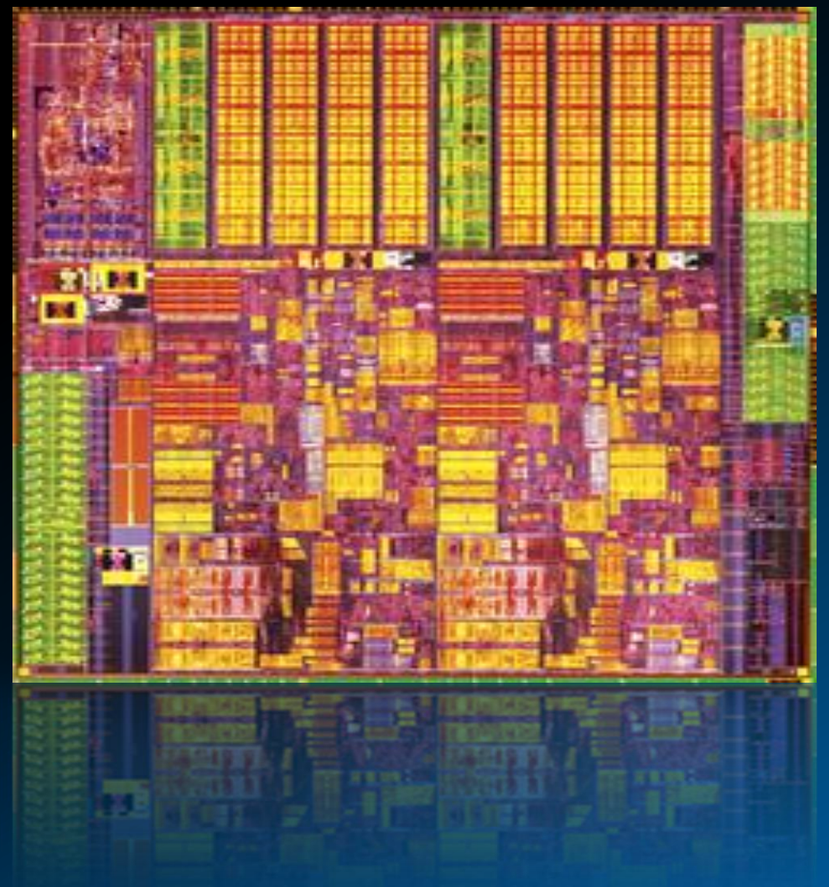
  First customer requirements for cloud
  4X Membership Growth
  4 Industry Collaborations
  4 New Solutions Provider Members


intel

22nm Silicon Technology Breakthrough Benefits Broad Range of Intel Architecture Devices

New 22nm 3-D transistors deliver unprecedented performance improvement and power reduction for Intel's product portfolio

- This benefits smallest handhelds to powerful cloud-based servers
- 37% performance increase at low voltage vs. 32nm planar transistors*
- Consumes only half the power at the same performance level as 2-D transistors on 32nm planar chips*

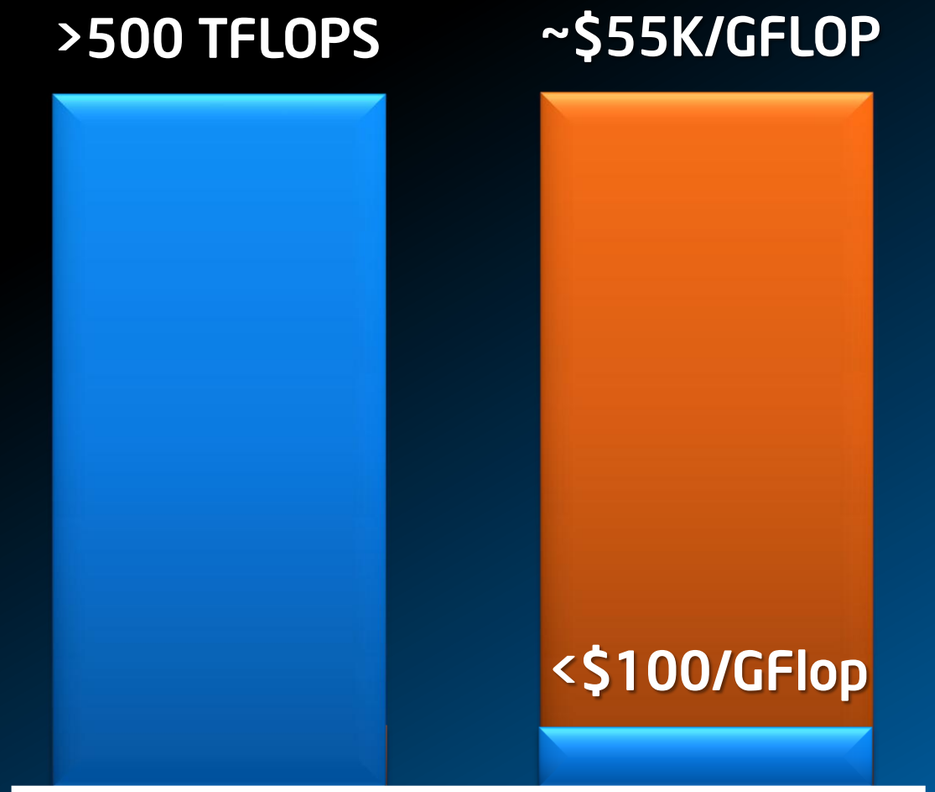


* Based on Intel Internal Data

We've Helped Transform Industries

Annual Server Unit Shipments

Supercomputing in 2000



The Compute Model Evolution