Opportunities in Cloud Computing
Discussion at ISTC Summit

Jason Waxman
General Manager, Cloud Infrastructure Group
Intel Corporation
Twitter: @jpwaxman

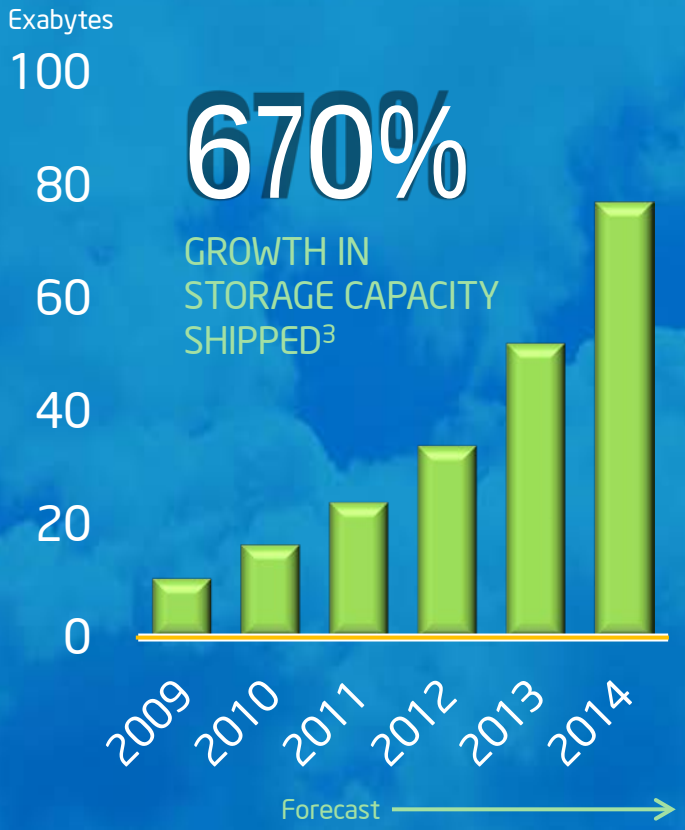
http://www.istc-cc.cmu.edu/

Cloud Computing Driven by:

More users, more devices, more data, more storage, more traffic…

55%

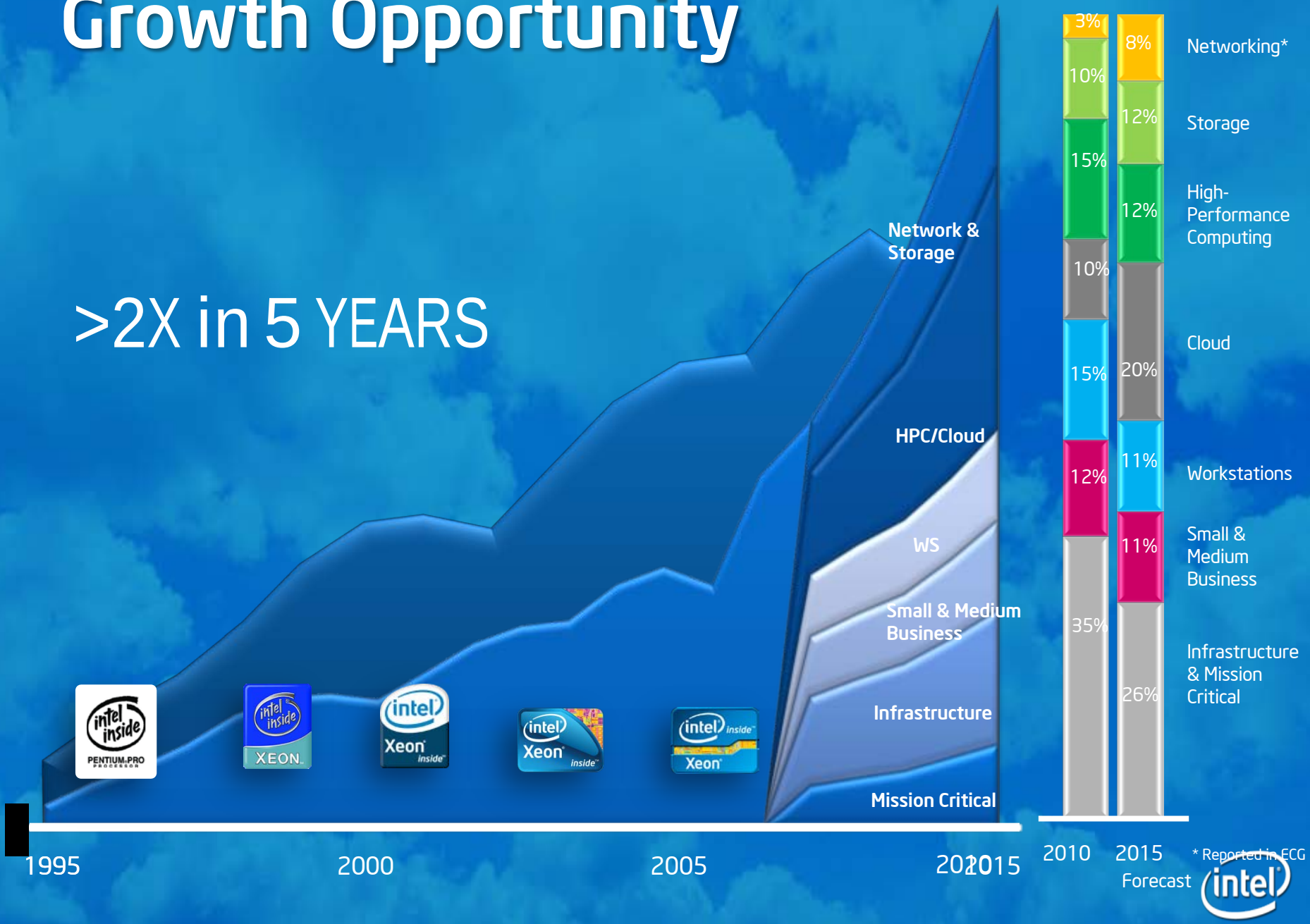
Growth in Unstructured data (e-mail, video, images, social media etc.)



1. 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. IDC
4. Source: http://www.cisco.com/assets/cdc_content_elements/networking_solutions/service_provider/visual_networking_ip_traffic_chart.html, http://www.cisco.com/en/US/solutions/collateral/ns341/ns525/ns537/ns705/ns827/white_paper_c11-481360_ns827_Networking_Solutions_White_Paper.html extrapolated to 2015

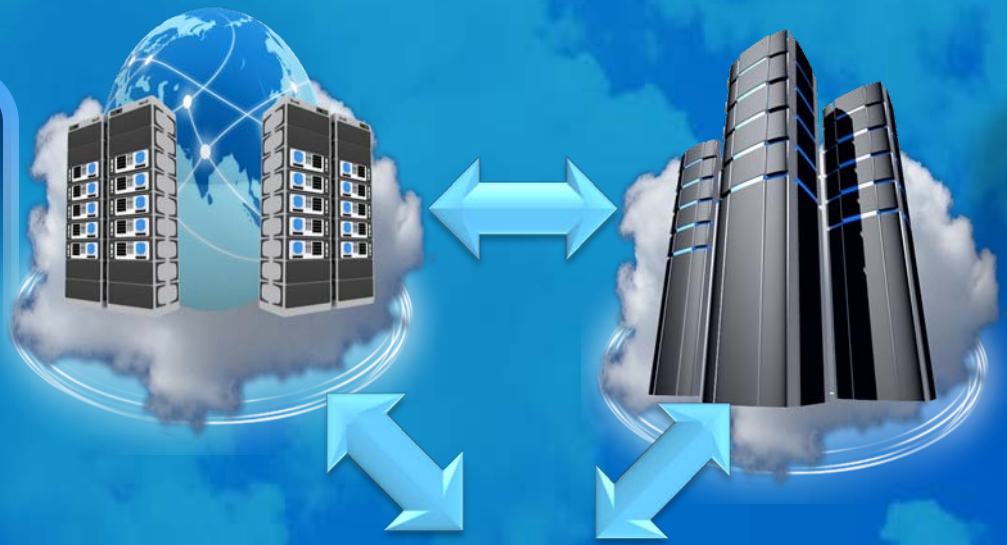
Growth Opportunity

>2X in 5 YEARS



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

Desktops Laptops Netbooks Personal Devices Smartphones Smart TVs Embedded

From Vision to Action

User Requirements

Define and Prioritize IT Requirements

Products & Technologies

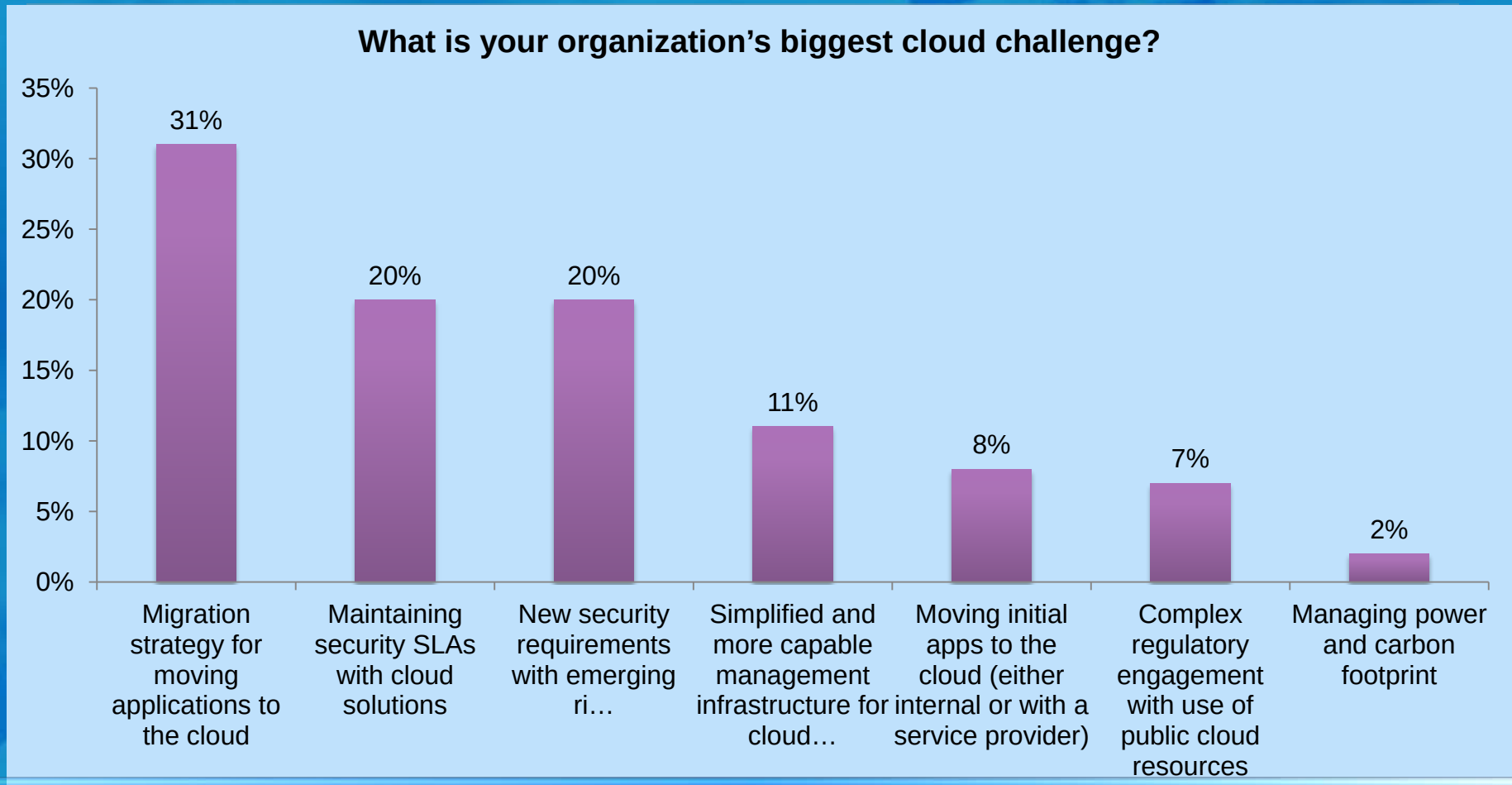
Take Advantage of New Capabilities In Intel Platforms

Intel® Cloud Builders

Utilize Proven Reference Solutions to Ease Your Deployments

Cloud Customer Challenges Today

Open Data Center Alliance Member Survey



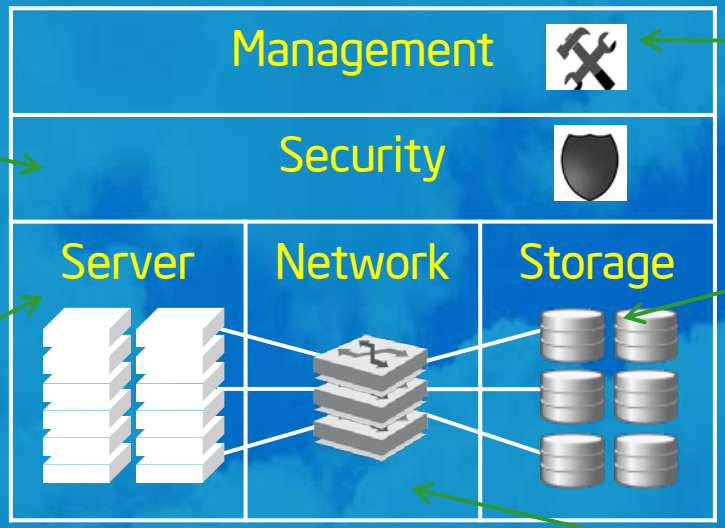
Security is a critical cloud concern

Convergence & Flexibility in Cloud Infrastructure

1. programmable platforms for compute, network & storage
2. most secure, efficient and simple to deploy
3. common interfaces to manage

Multi-Tenant Security
- Execution integrity
- VM data privacy
- Secure DC federation

Cloud Server
- Secure
- Efficient
- Automated



Group Level Mgt.
- Simple node control
- QoS enforced
- Consistent API

Scalable Cloud Storage
- Low-latency scale-out
- Accelerated by NVM tiers

Network Platform
- Std. high-volume hardware
- Programmable OS
- Open Mgt. APIs

Optimized Data Center
- High efficiency, High Temp, Low PUE
- Management integration with facility

System Fabric
- Connects servers + storage
- Cost-effective bandwidth, low-latency
- Shared I/O and NVM

Opportunity to enable greater platform programmability

Application Optimized Servers

Mainstream

Search workloads

Caching tiers

Data tiers

Highly Parallel

Visualization

Real-time Analytics

Video processing

Light Weight

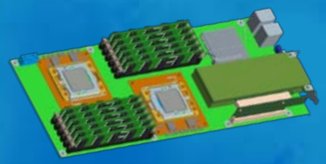
Web access tier

Web hosting

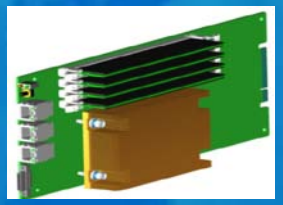
Spread Core Form-Factor

4S Mid-range

Half-width Board Form-Factor



Microserver



Need scheduling approach for managing heterogeneous environment

Client Aware Cloud

Service optimized based on context, content and capability

Compute
Graphics
Media
Connectivity
Security
Location

CAPABILITIES

CONTENT

HD or SD
Flash or HTML5
Compressed or uncompressed
Secure Content & Commerce

Implications for both cloud service and client / device design

Client Aware Cloud Services

Example: Lenovo Secure Cloud Access

Intel® Identification Protection Technology

Enhanced Authentication

Aware of Device Capabilities

Optimized Service Delivery

stoneware, inc.

Public Cloud

Private Cloud

Hybrid Cloud

Opportunities include simplified service development, increasing security and optimized execution

intel

Cloud 2015: 15 Billion Connected Devices

HEALTHCARE

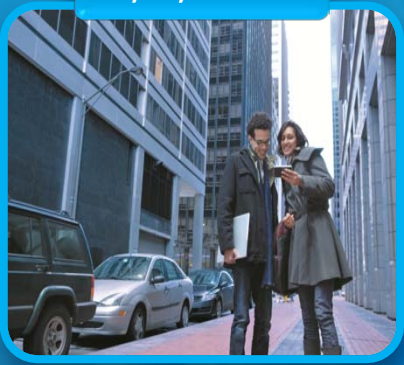
MANUFACTURING

TRANSPORTATION

ENERGY

RETAIL

PC, CE, PHONES



COMMUNICATIONS

intel

Intelligent Connected Systems

Opportunity for analytics and big data beyond client-devices

Great Cloud Opportunity

1. Platform “Convergence” & programmability
2. Rising importance of security
3. Holistic approach to workload optimization
4. Easier approach to developing x-device services
5. Big Data beyond consumer devices


intel®