Dynamic Virtual Client
From the Cloud to the Classroom

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Emerging Compute Laboratory

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edIT Chicago, IL October 2009

Pain Points

IT and Industry Response

- Data Security

- Maintenance/Repair

- Budget/Cost Control

- License Management

- Innovation

- Agility – Mobile and @Home

- Power

- Etc….

Drive for Centralized Control via…

New Software and Data Delivery Models

+

Improved Client Management and Security Capabilities

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A Common Goal

M.O.R.E.

*Manage Once,
Run Everywhere*

M.E.R.E.

*Manage Everywhere,
Run Everywhere*

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Thin

Rich

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What Makes Sense to Centralize?

Administration ☑

Critical Data ☑

Compute & Graphics **?**

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Technology Options

Multiple options to deliver centralized control of the desktop, applications, & data. Distinction is how much is local to client vs. remote
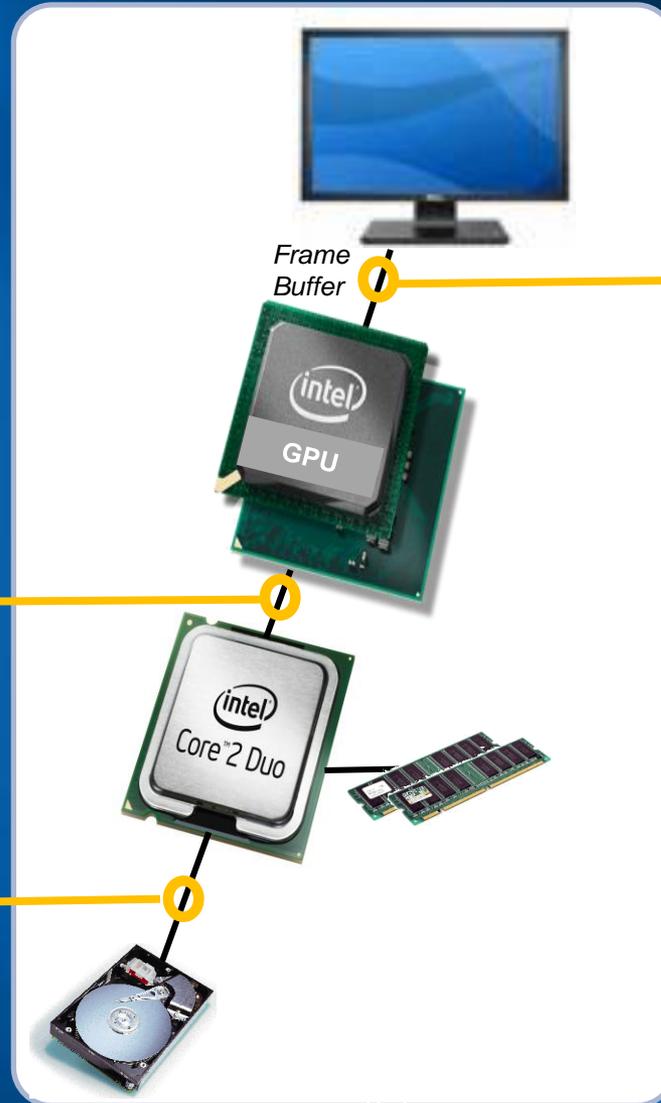
Client Hosted Virtual Container

Running Virtual PC Image(s) locally on a client

Virtual Hosted Desktop (VDI)

Server hosts multiple desktops that are accessed remotely

On-Demand OS Desktop Streaming

Client boots from networked storage

Frame Buffer

GPU

Dedicated Remote Desktop (Blade PC)

PC is relocated to the data center and accessed via a display/input device
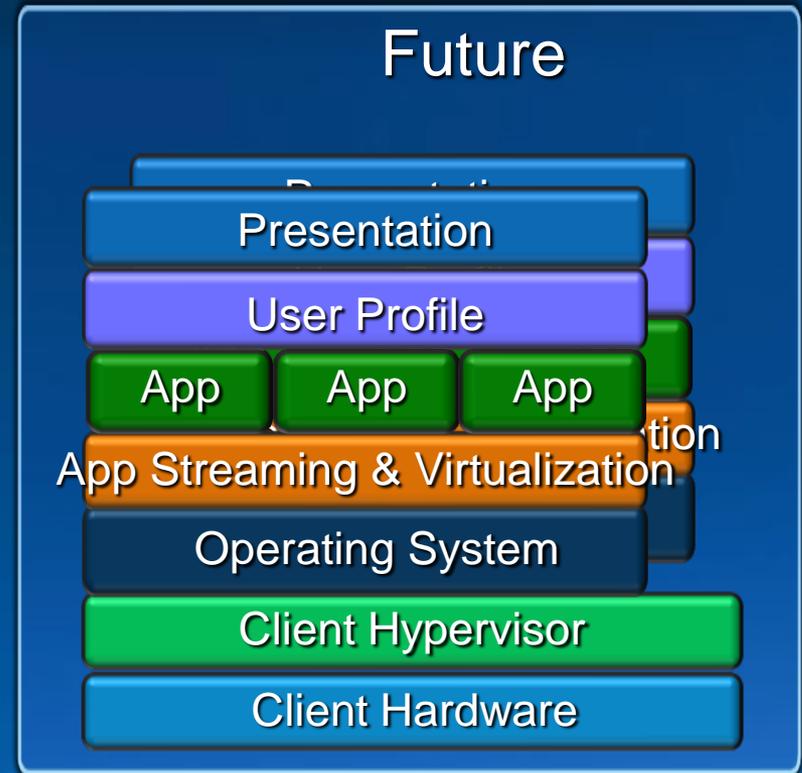
Application Virtualization & Streaming

Apps are encapsulated and distributed to clients such that the OS is not altered

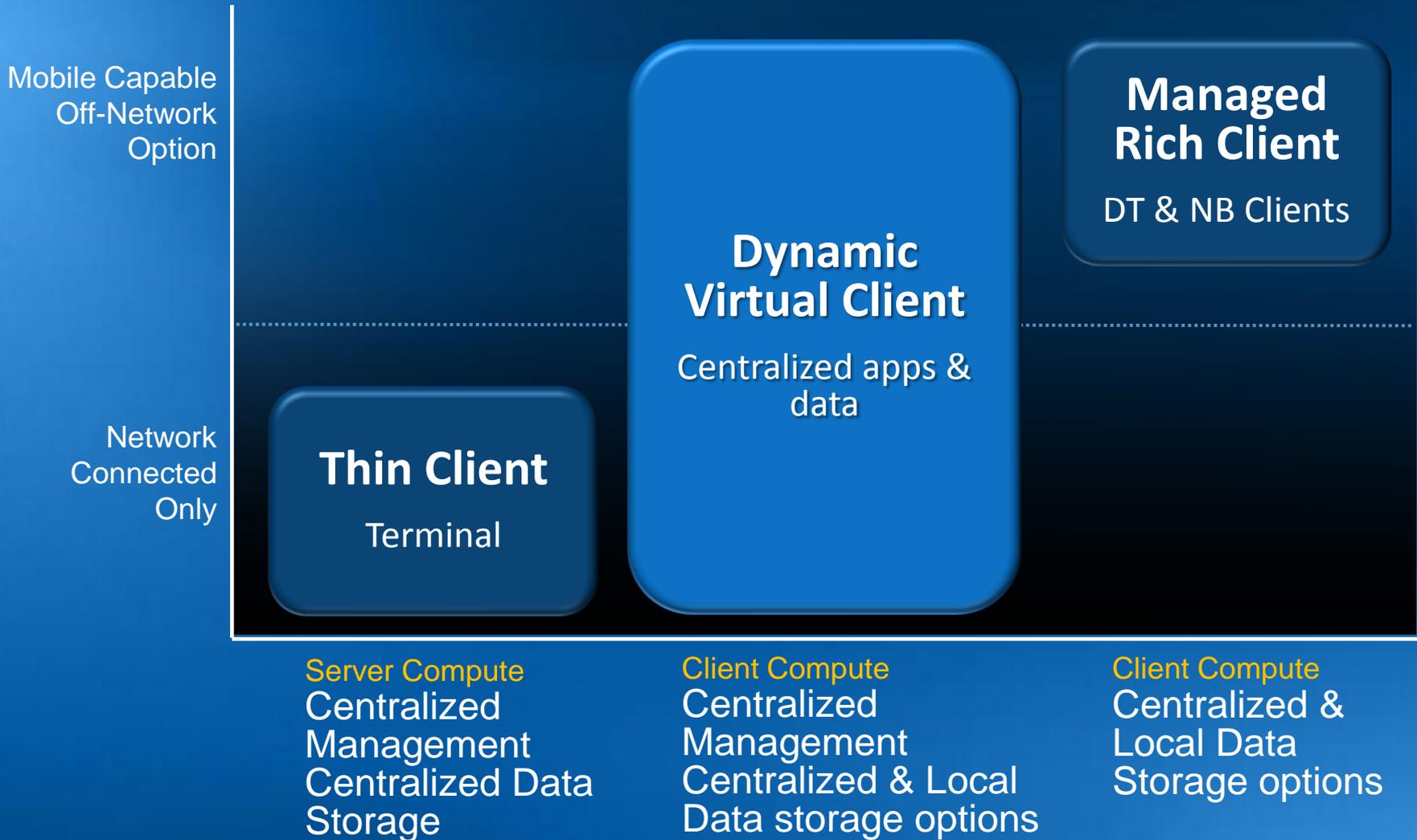(intel)

Evolution of Client Computing Stack

Old

Presentation

App | App | App

Operating System With User Profile

Client Hardware

Engineered as an IMAGE
Delivered as an INSTALLATION
Managed at the END-POINT

Future

Presentation

User Profile

App | App | App

App Streaming & Virtualization
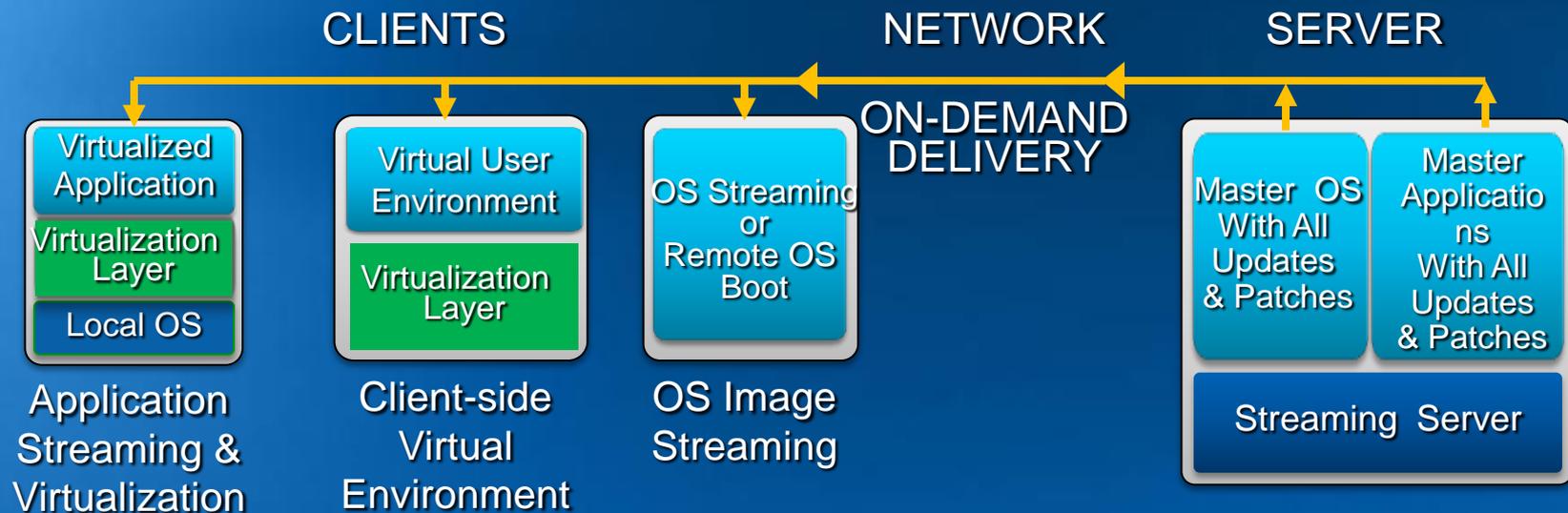
Operating System

Client Hypervisor

Client Hardware

Engineered as VIRTUALIZED LAYERS
Delivered ON-DEMAND
Managed in the BACK OFFICE

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Emerging : Intel Dynamic Virtual Client

Mobile Capable
Off-Network
Option

Network
Connected
Only

**Managed
Rich Client**

DT & NB Clients

**Dynamic
Virtual Client**

Centralized apps &
data

Thin Client

Terminal

Server Compute
Centralized
Management
Centralized Data
Storage

Client Compute
Centralized
Management
Centralized & Local
Data storage options

Client Compute
Centralized &
Local Data
Storage options

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Dynamic Virtual Client Options

CLIENTS   NETWORK   SERVER

ON-DEMAND
DELIVERY

Virtualized Application	Virtual User Environment	OS Streaming or Remote OS Boot	Master OS With All Updates & Patches	Master Applications With All Updates & Patches
Virtualization Layer	Virtualization Layer		Streaming Server	
Local OS				

Application Streaming & Virtualization

Client-side Virtual Environment

OS Image Streaming

Client-side Compute ● *Centralized Management* ● *Data Security via Policy*
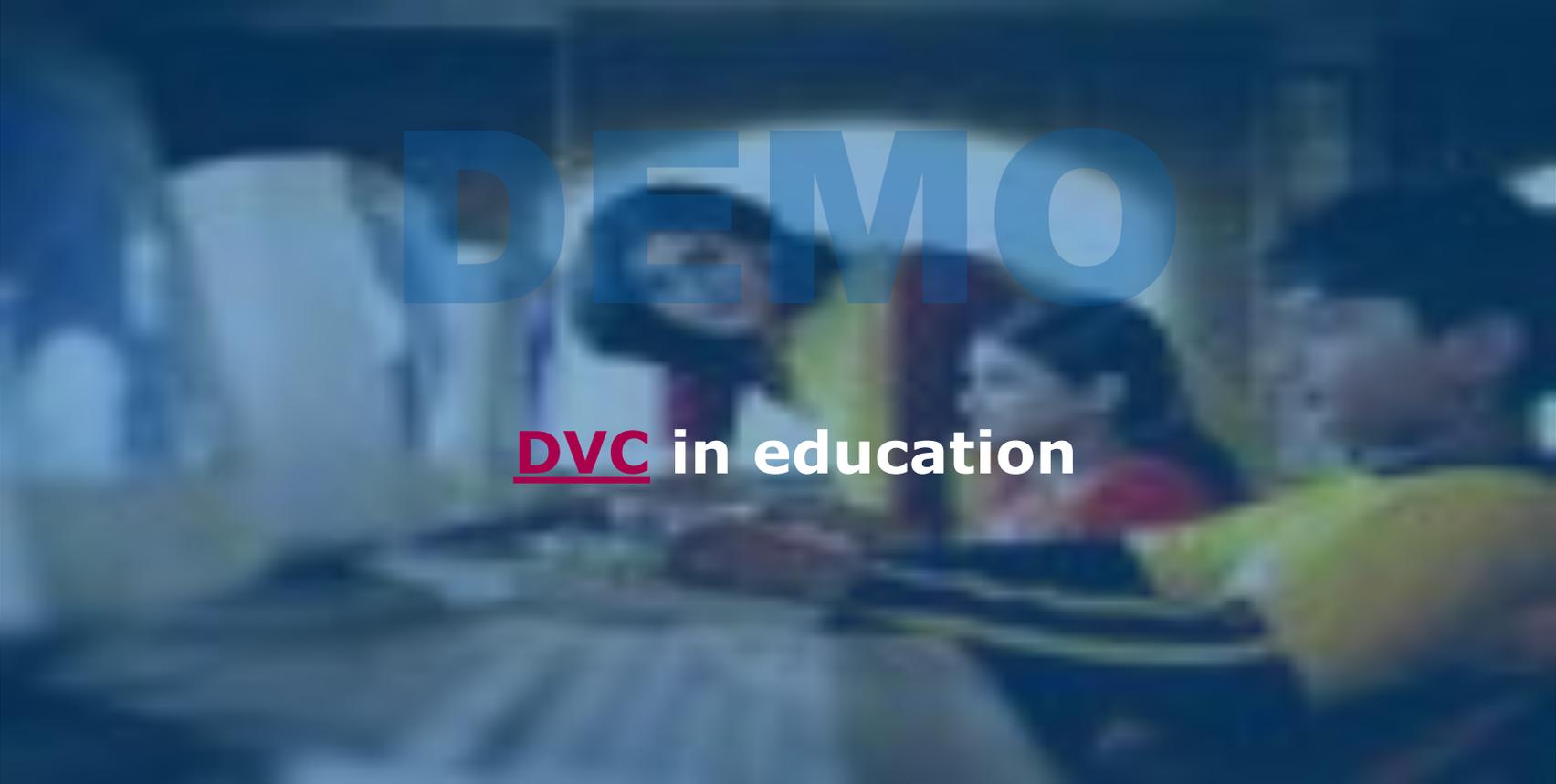
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DEMO

DVC in education

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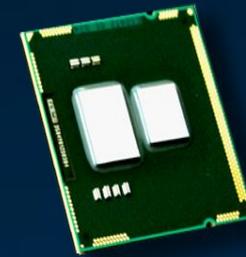# The Best PCs for Education
Best PCs for Dynamic Virtual Client

Today

2010

45 nm

45/32 nm

Unified Desktop and Mobile Platform

Intel® Virtualization Technology

Intel® Trusted Execution Technology

Intel® Active Management Technology

Next Generation Embedded IT

Virtualization, Security, Manageability, and Energy Efficient Performance
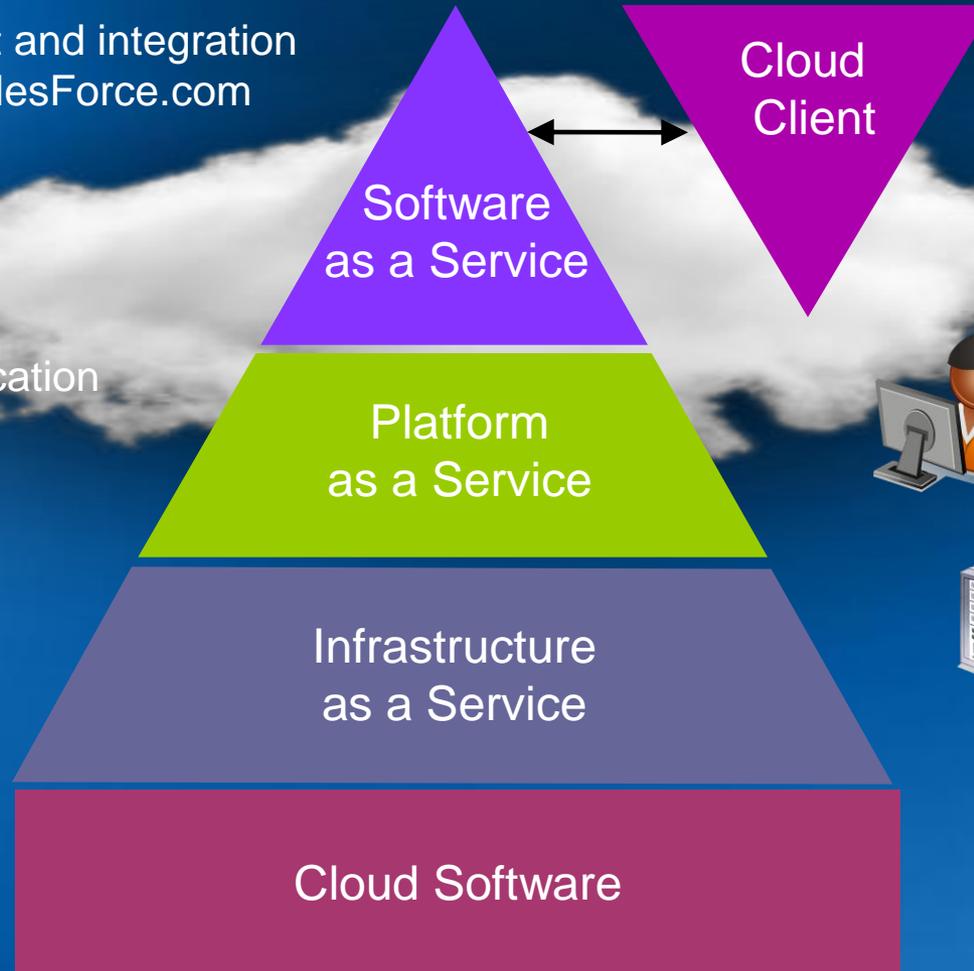
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What is Cloud Computing?

Source code, content and integration
Eg: Google Apps, SalesForce.com

Client runtime
Eg: AIR, Flex, Flash;
Google Chrome,
Microsoft Silverlight

Cloud Client

Software as a Service

Place to run an application
Eg: Microsoft Azure,
Force.com

Platform as a Service

Developer

Computing Service
Eg: Amazon EC2,
Enomaly

Infrastructure as a Service

Administrator

Core SW Tech
Eg: Xen, vSphere

Cloud Software

Infastructure

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Does The Client Device Matter Here?

App Launch Time*

Device	Time (sec)
Wyse Thin Client	84
Atom™ Netbook	42
Dual Core® vPro™ Notebook	32
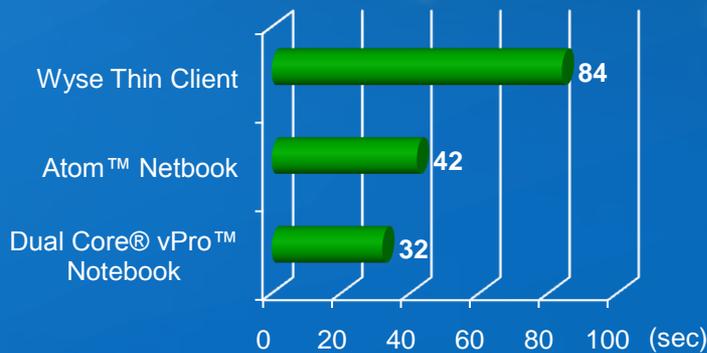
Source: Intel, 2009

App Execution Time*

(%CPU) vs (sec)

Intel® Dual Core ® vPro™ Notebook

Intel® Atom™ Netbook

Wyse ® R-Series Thin Client

Source: Intel, 2009
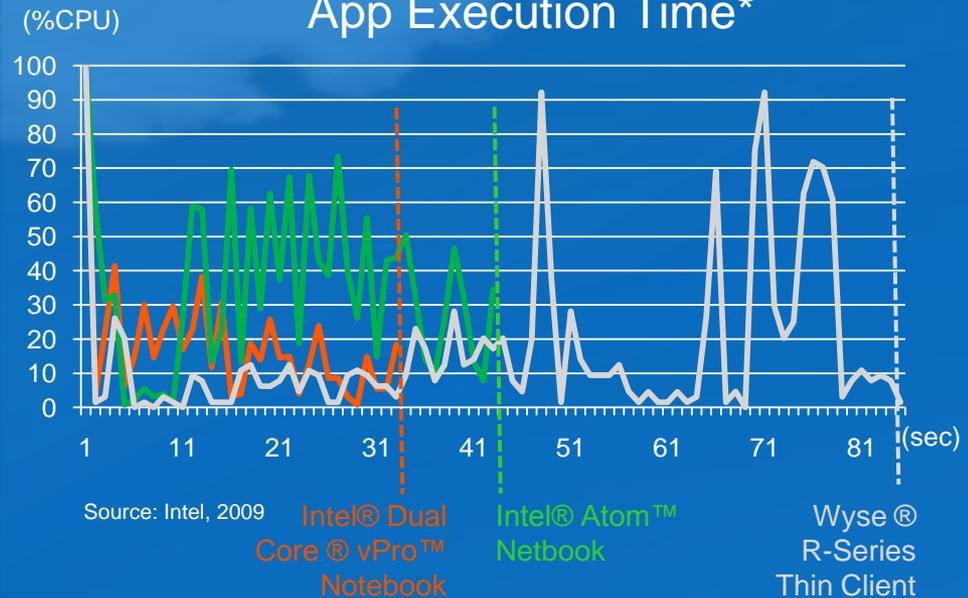
* Test of salesbuilder.com cloud application. Results subject to change.

Future – the Client Aware Cloud

Private Cloud

Virtual User
- Data
- Apps
- Profile

Public Cloud

Location aware
Connectivity aware
Form factor aware

Notebook   **Desktop**   **Smartphone**   **NetTop**   **Netbook**   **Home PC**

Secure and Manageable from Class Room to Home

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Summary

DVC offers no compromise approach to cost-effectiveness, improved productivity, and reduced complexity

Intel vPRO™ technology enhancements offer delivery, manageability, and security

Delivering a balance of

- Best Student Experience

- Data Security, Manageability

- Total-Cost-of-Ownership

A balance between IT and Student needs

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