Agenda

- Cloud Computing Defined
- Data Center Innovations
- Online Applications
- Cloud Platform
Six Areas of Enterprise Investment

- Low-Cost Computing
- Corporate Environmental Sustainability
- Consumerization of IT
- Business Intelligence
- Innovation for Growth
- Cloud Computing

*Investing U.S.$9.5 billion in R&D in FY10*
Transformational Era

Mainframe

PC

Client Server

Web Services

Cloud
The Cloud Computing Taxonomy

- **Software as a Service**
  - Finished Application e.g. Salesforce.com

- **Platform as a Service**
  - Application Code
    - Publish your app to the cloud

- **Infrastructure as a Service**
  - Virtual Machine
    - Some might also consider hosting
Where Do Applications Live?

- Application runs on-premises
  - Bring my own machines, connectivity, software, etc.
  - Complete control and responsibility
  - Upfront capital costs for the infrastructure

- Application runs at a hoster
  - Rent machines, connectivity, software
  - Less control, but fewer responsibilities
  - Lower capital costs, but pay for fixed capacity, even if idle

- Application runs using cloud platform
  - Shared, multi-tenant environment
  - Offers pool of computing resources, abstracted from infrastructure
  - Pay as you go

CHOICE
Where Do Applications Live?

Build versus Buy

Application runs on-premises

“Packaged” Application
An application that I buy “off the shelf” and run myself

“Home Built” Application
An application that I develop and run myself

Application runs at a hoster

Hosted “Packaged”
An application that I buy “off the shelf” and then run at a hoster

Hosted “Home Built”
An application that I develop myself, but run at a hoster

Application runs using cloud platform

“Software as a Service”
A hosted application that I buy from a vendor

Cloud Platform
An application that I develop myself, that I run in the cloud
Power of Choice
Software + Services

Interoperable by Design
Seamless User Experience

ON-PREMISES

Deployment Choice

CLOUD SERVICES

WEB

PC

PHONE
Microsoft Complete Cloud Platform

Live Services
- Windows Live
- Office Live

MS Online Services
- Exchange Online
- SharePoint Online
- Office Communications Online
- Dynamics CRM Online

Azure™ Services Platform
- Live Services
- .NET Services
- SQL Services
- SharePoint Services
- Dynamics CRM Services

Windows® Azure

Global Foundation Services
- Infrastructure Services
- Security
- Global Delivery
- Environment
An Overview of Business Productivity Online Suite
Integrated Capabilities

Communicate and collaborate seamlessly across applications and devices

- Instant Messaging
- E-mail
- Web Conferencing
- Document Sharing
- Calendaring
- Work Flow
- Mobility
- Offline Access
- Presence
- Archiving

Microsoft Office Communications Online
Microsoft Exchange Online
Microsoft SharePoint Online
Microsoft Office Live Live Meeting
Feature Overview

Larger mailboxes - up to 25GB Mailbox
Outlook and Web Access
Anti-Virus/Anti-Spam
Shared Calendars, Contacts & Tasks
Active Sync Mobile Devices
Blackberry Device Support*
Compliance Archiving*

Collaboration
Portal
Enterprise Content Management
Search
Business Process Forms
Business Intelligence
Platform & Extensibility

Web Conferencing
Small group collaboration to large events
Desktop sharing, chat, question manager
Training support and virtual breakout rooms
VOIP or PSTN voice support
Live 360 degree panoramic video

Instant Messaging and Presence
Group IM
Address Book Search
Distribution List Expansion
File Transfer
1:1 Audio and Video
Right Features for Right Users

Deskless Worker is a low cost offering to users that do not have messaging and collaboration capabilities today.

**Exchange Online Deskless Worker**
- 500 MB mailbox
- Outlook Web Access Light only
- Messaging, calendar, contacts
- Anti-Virus / Anti-Spam
- Optional archiving and mail encryption
- No Mobile Access

**SharePoint Online Deskless Worker**
- Read-Only Access to calendars, contacts, portal sites only
- Read-write access to Wikis, Blogs and Forms
- Set-mail alerts
- Search capabilities
- No Mobile Access
Microsoft Online Today

Business Productivity Online Suite Reference Customers

More than 1.5M seats!
Data Center Innovations
Microsoft’s Data Center Evolution

- Data Center Collocation
  - Generation 1
- Quincy and San Antonio
  - Generation 2
- Chicago and Dublin
  - Generation 3
- Future
  - Generation 4
    - Modular Data Center

Deployment Scale Unit

- Server
  - Capacity

Rack
- Density
- And Sustainability

Containers
- Scalability

Lowest Work per Watt

IT PAC
- Pre-Assembled Components
  - Right Time to Market, Lower TCO
  - Scalable Data Centers
Generation 4 Data Center

An Overview of the Windows Azure Platform
The Windows Azure Platform

- Applications
- Windows Azure
- .NET Services
- SQL Azure
- Live Services

Windows Server
Windows Vista/XP
Windows Mobile
Others

Source: Chappell & Associates
Windows Azure
An illustration

Source: Chappell & Associates
Windows Azure Compute Service
A closer look

Fabric
Compute
Storage
Application

Web Role
IIS
ASP.NET, WCF, etc.
Agent

Worker Role
main()
{ ... }
Agent

Load Balancer
HTTP

Source: Chappell & Associates
Windows Azure Storage Service
A closer look

HTTP

Blobs
Tables
Queues

Source: Chappell & Associates
.NET Services
Infrastructure in the cloud

- Access Control
- Service Bus
- SQL Azure
- Live Services
- Windows Azure
- Applications

Source: Chappell & Associates
SQL Azure
Formerly known as SQL Services

Source: Chappell & Associates
Windows Azure and Its Competitors
Amazon Web Services (AWS)

- AWS Elastic Compute Cloud (EC2) provides virtual machines running Linux or Windows.
Google AppEngine

- AppEngine runs Python and Java applications

Source: Chappell & Associates
Force.com and Windows Azure

Salesforce.com’s Force.com focuses on data-driven enterprise applications.

**Force.com**
- Enterprise Application
- Force.com Runtime
- Force.com Database

**Windows Azure**
- Web Role
- Worker Role
- Windows Server 2008
- Windows Azure Storage
- Windows Azure Fabric
- SQL Azure Database

Source: Chappell & Associates
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What do Enterprise customers say?

- We need lower cost solutions
- Some workers need more and some need less
- We need to scale up or down quickly
- How do make sure it’s secure and redundant?
- How do you manage identity and access?
- SLA’s are critical
- Can I work offline?
- It has to work with my other systems
- Is good enough really good enough?