Cloud computing

Relevance to companies?

Cloud Computing will be of particular relevance to the following types of firms:
- Cash-lean firms
- Firms not already heavily invested in previously installed systems/software
- Firms facing heavy IT costs

This obviously includes start-ups, among other firms

The “Cloud”

What is cloud computing?
- Getting your firm’s software and possibly hardware needs as well served over a network
- Cloud computing is already a $40,000,000,000 market

Two general types of cloud computing:
1. Software as a Service (SaaS)
2. Utility computing

Software as a Service (SaaS)

“SaaS” denotes software that is made available by a third party online.
- E.g., Google Docs
- Benefits of SaaS?
  - Let’s see Salesforce.com (video link)

Utility Computing

- “Utility computing” is the strategy of replacing computing hardware that it might otherwise run on-site with a service provided by a third party online.
- Hardware cloud vendors:
  - IBM: Cloud Labs.
  - Amazon: Elastic Computing Cloud (EC2).
  - Microsoft: Azure.
- Customer examples: Elizabeth Arden, NASDAQ, NY Times

Benefits of utility computing

- Gartner estimates that at a typical corporation, 80% of tech spending is for data center maintenance
- Provides firms with scalable resources
  - a way to handle unexpected spikes in web traffic by customers (or other server demands)
Risks of SaaS / Utility Computing

- As a prospective corporate customer of "cloud computing" services, what would worry you?

- ...think about this quote from CEO of Zuora (business billing/payment solutions)
  - “We have no servers, we run the entire business in the cloud.”

Pricing models for cloud computing services

- Three options in use
  - Subscriptions
  - “Pay for view”
  - Charge for add-on features

- The later two are often based on “microtransactions”
  - Charge customers in very small increments
  - Example: Electronics Arts (gaming) has had success in Asia with this approach. Their “free” FIFA soccer game earned double the profits as the original (not free) FIFA game.

Impact on the IT industry

- Large IT firms’ investments in large server farms are up
  - Oregon is a major player in the server farm space. Why?

- Huge resources in Oregon
  - Amazon: Boardman, OR
  - Google: The Dalles, OR (30 acre site)

- Google is said to have ~1,400,000 servers across its approximately three dozen data centers

Data Centers and Virtualization

- “Virtual Machine” (VM) software allows multiple operating systems to run at the same time on the same hardware
  - E.g., running multiple copies of windows on one computer, or a couple copies of Windows and one copy of Apple OS-X
  - No longer need to have both dedicated Windows and OS-X hardware boxes
  - 1 box serving more needs implies higher % utilization of hardware

- Virtualization allows data centers to better leverage their powerful hardware boxes
  - If a hardware box isn’t running at 100% capacity with one “computer” (i.e., OS) running on it, then add another parallel OS, and another, and another...
  - VM technology lets data centers run at ~80% utilization, compared to the traditional 15-20%. 