



CLOUD COMPUTING CONCEPTS

with Indranil Gupta (Indy)

INTRODUCTION TO CLOUDS

Lecture A

WHY CLOUDS?

THE HYPE!

- Gartner in 2009 – Cloud computing revenue will soar faster than expected and will **exceed \$150 billion** by 2013. It will represent 19% of IT spending by 2015.
- IDC in 2009: “Spending on IT cloud services will triple in the next 5 years, reaching **\$42 billion**.”
- Forrester in 2010 – Cloud computing will go from **\$40.7 billion** in 2010 to **\$241 billion** in 2020.
- Companies and even federal/state governments using cloud computing now: **fedbizopps.gov**

MANY CLOUD PROVIDERS

- AWS: Amazon Web Services
 - EC2: Elastic Compute Cloud
 - S3: Simple Storage Service
 - EBS: Elastic Block Storage
- Microsoft Azure
- Google Compute Engine
- Rightscale, Salesforce, EMC, Gigaspaces, 10gen, Datastax, Oracle, VMWare, Yahoo, Cloudera
- And many, many more!



TWO CATEGORIES OF CLOUDS

- Can be either a (i) public cloud, or (ii) private cloud
- Private clouds are accessible only to company employees
- Public clouds provide service to any paying customer:
 - Amazon S3 (Simple Storage Service): store arbitrary datasets, pay per GB-month stored
 - Amazon EC2 (Elastic Compute Cloud): upload and run arbitrary OS images, pay per CPU hour used
 - Google App Engine/Compute Engine: develop applications within their App Engine framework, upload data that will be imported into their format, and run

CUSTOMERS SAVE TIME AND \$\$\$

- Dave Power, Associate Information Consultant at Eli Lilly and Company: “With AWS, a new server can be up and running in three minutes (it used to take Eli Lilly seven and a half weeks to deploy a server internally) and a 64-node Linux cluster can be online in five minutes (compared with three months internally). ... It’s just shy of instantaneous.”
- Ingo Elfering, Vice President of Information Technology Strategy, GlaxoSmithKline: “With Online Services, we are able to reduce our IT operational costs by roughly 30% of what we’re spending.”
- Jim Swartz, CIO, Sybase: “At Sybase, a private cloud of virtual servers inside its datacenter has saved nearly \$US2 million annually since 2006, because the company can share computing power and storage resources across servers.”
- Hundreds of startups in Silicon Valley can harness large computing resources without buying their own machines.



BUT WHAT EXACTLY IS A CLOUD?

- Next lecture!

