Infrastructure as a Service Cloud

A SERVICE MODEL BASED VARIANT
Infrastructure as a Service (IaaS)

- Provides fundamental computing resources
  - Processing
  - Storage
  - Networks
  - Etc.
- User can deploy and run arbitrary software
  - E.g. operating systems and applications
- No control of underlying hardware
  - Can allow limited control of networking components
  - Full control of OS
- Typically, enabled via virtualization technologies
  - VM is a common deployment unit
  - E.g. AWS EC2
IaaS Architecture

Front-End Node
- IaaS Services
- VM Image Repository

Cloud Client
- HTTP/S

Cluster Node
- IaaS Control Agent
- VMM (XeN, KVM etc.)

VMs
- DHCP Server

SSH
IaaS Cloud Characteristics

• Provides bare-bones computing infrastructure
  – Storage, compute networking etc., often via a VM
• Cloud user responsible for installing/managing all software on VM
• Allows resource utilization monitoring and reacting to events
  – Responsibility again lies with the user application
• Limited control on networking components, e.g. host firewalls
• By far the most flexible cloud variant
  – User can configure/control the VM and software stack
  – This also means more effort from the cloud user
Vendor Example | Amazon Web Services

• A leading public IaaS cloud provider
• Offers wide variety of services
  – Compute (EC2)
  – Storage (S3)
  – Databases (RDS, SimpleDB etc.)
  – DNS system (Route 53)
• Easy to sign-up for an account
  – Requires account verification (usually via phone)
Amazon Web Services (AWS)

Select hosting region

Click here to start VM creation wizard
Select Machine Image

- LAMP Web Starter (AMI Id: ami-2cb05345)
  Fedora Core 8, 32-bit architecture, PHP 5.2, Apache 2.2, and MySQL 5

- Basic Fedora Core 8 (AMI Id: ami-84db39ed)
  Minimal Fedora Core 8, 32-bit architecture, and Amazon EC2 AMI Tools.

- Basic 64-bit Fedora Core 8 (AMI Id: ami-86db39ef)
  Fedora Core 8, 64-bit architecture, and Amazon EC2 AMI tools.

- Getting Started on Microsoft Windows Server 2008 (AMI Id: ami-c5e400ac)
  Microsoft Windows Server 2008 R1 SP2 Datacenter edition, 32-bit architecture, Microsoft SQL Server 2008 Express, Internet Information Services 7, ASP.NET 3.5.

- Basic Microsoft Windows Server 2008 (AMI Id: ami-c3e40daa)
  Microsoft Windows 2008 R1 SP2 Datacenter edition and 32-bit architecture.

- Basic 64-bit Microsoft Windows Server 2008 (AMI Id: ami-d9e40db0)
  Microsoft Windows 2008 R1 SP2 Datacenter edition and 64-bit architecture.
Select Machine Type

Pick the resources you need for VM.
Cost varies with instance type *:
Small (Default): $0.080/Hour
Medium: $0.160/Hour
Large: $0.320/Hour
Extra Large: $0.640/Hour

* Costs shown for Linux instances as on 25-Oct-2012
Configure Network Access

To allow us to SSH into this VM
We Have Our Machine Running!

Our instance

DNS name
SSH Into Our VM

My Debian desktop in Kanpur

In the Amazon datacenter in US West zone!
## Real-time Billing Details

### AWS Service Charges

**Amazon Elastic Compute Cloud**
- **$92.72**
- **Download Usage Report**

**US West (Oregon) Region**

**Amazon EC2 running Linux/UNIX**
- $0.160 per Medium Instance (m1.medium) instance-hour (or partial hour) 575 Hrs 92.00

**Amazon EC2 EBS**
- $0.10 per GB-month of provisioned storage 6.161 GB-Mo 0.62
- $0.10 per 1 million I/O requests 1,006,423 IOs 0.10

**AWS Data Transfer (excluding Amazon CloudFront)**
- $0.00

**VAT to be collected**
- $0.00

† Usage and recurring charges for this statement period will be charged on your next billing date, November 1, 2012. Estimated charges shown are subject to significant change and should be regarded as approximate only. For more details, please refer to the AWS Statement Terms of Service at http://aws.amazon.com/terms/statements. Charges are not fully finalized and may be subject to additional fees and adjustments.
Summary

• Provides basic computing resources as a service
  – Compute, storage, networking etc.
  – Typically as a VM running a vanilla OS
• Consumer responsible for installing/managing the OS and any S/W he/she installs on top of it
• Providers provide some add-on services
  – Auto-scaling rules
  – Load-balancing and replication etc.
Homework

• Most IaaS cloud service such as AWS or Google Compute offer reasonable quota for free. You should try to register for one of those IaaS services and try launching VMs there. You can try installing and running your personal website from there by installing a web server on the VM that you launch. Observe how long it takes from registering to creating the VM to finally logging into the VM.
THANK YOU