**CS551: Advanced Software Engineering**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | | **Amazon AWS** | **Google AppEngine** | **Microsoft Azure** | **IBM Smart Business Dev** |
| **Focus** | | Iaas | Paas | Paas | Iaas+Paas |
| **Infrastructure & Virtualization Architecture** | | OS level running on Xen hypervisor | Application container | Hyper-V | Hypervisors |
| **Platforms** | | Linux, Oracle ,Mason,  Servlets, Perl, C++,Windows,  Jboss | Windows, Mac OS X, Linux, PHP | Windows server 2008, Windows server 2003, Ubuntu, Mac, Linux | Windows Server, Linux, Red Hat |
| **Persistent Storage** | | Amazon Elastic Block Store (Amazon EBS)  Amazon Simple Storage Service (Amazon S3) | Gdisk bulk storage | Standard Application storage | Bulk Storage |
| **Monitoring** | | Yes(not free)  Amazon Cloud watch ($3.50 per instance per month, provided at 1-minute frequency) | No | Yes(free) | Yes(not free) |
| **Load Balancing** | | Elastic load balancing with extra charges  ($0.025 per Elastic Load Balancer-hour) | Yes (free) Automatic scaling and load balancing. | Yes (free), current implementation uses round robin | Yes |
| **Message Queues** | | Simple Queue Service (SQS)  Simple Message Service(SMS) | Push Queues,  Asynchronous Task Queues | available | JMS queues |
| **Development tools** | | [Amazon EC2 AMI Tools](http://aws.amazon.com/developertools/368)  [Elastic Load Balancing API Tools](http://aws.amazon.com/developertools/2536)  [Amazon CloudWatch Command Line Tool](http://aws.amazon.com/developertools/2534)  [Amazon EC2 API Tools](http://aws.amazon.com/developertools/351)  [AWS CloudFormation Command Line Tools](http://aws.amazon.com/developertools/2555753788650372) | AppStats,  Datastore SQLite Stub,  Local Unit Testing, Zipserve | Microsoft .Net services, Microsoft SQL server services, Microsoft dynamics CRM services | IBM Rational tools,  Java plugin for Eclipse |
| **Integration with other tools** | | Yes | Yes | Yes | yes |
| **Web APIs** | | Yes | No | Yes | Yes |
| **Programming Framework** | | Java, JavaScript, PHP,  Python, Ruby ,Windows, .net | Python,  Java | .Net, Java, Node.js, PHP, Python, Ruby, Perl | Java, Node, Ruby |
| **Pricing** | **Machine CPU** | $ 0.113 per hour | $ 0.05 per hour | $ 0.02 per hour | - |
| **Storage** | $0.085 /GB/month | $0.18 / GB / month | - | $ 0.19 GB/month |
| **I/O** | - | $0.12 / GB | - | - |
| **Bandwidth** | $3.1/hour | $0.39/GB | - | - |