CS15-319 / 15-619
Cloud Computing

Recitation 6
October 1st and 4th, 2013
Announcements

• Encounter a general bug:
  – Post on Piazza
• Encounter a grading bug:
  – Post Privately on Piazza
• Don’t ask if my answer is correct
• Don’t post code on Piazza
• Search before posting
• Post feedback on OLI
Project 2

• Introduction and APIs
  – Single Instance Benchmarks

• Updated: Elastic Load Balancing (Updated)
  – Elastic Load Balancer
  – Static Load Benchmarking

• AutoScaling on Amazon
  – Auto Scaling
Available Modules

• UNIT 3: Virtualizing Resources for the Cloud
  – Module 6: Introduction and Motivation
  – Module 7: Virtualization
  – Module 8: Resource Virtualization - CPU
  – Module 9: Resource Virtualization - Memory
  – Module 10: Resource Virtualization – I/O
  – Module 11: Case Study
  – Quiz 3: Virtualizing Resources for the Cloud
Piazza Questions

• Script/Program must be under the same folder as the benchmark folder

• When trying to run the apache benchmark, please make sure that you are not including the HTTP in front of DNS
  – apr_sockaddr_info_get() for http:: Unknown error 14642 (14642)

• Manual grading the Static Load Benchmarking Checkpoint Question #3
  – Due to EC2 variations
Elasticity

- Vertical Scaling

Launchpad

Benchmark Script

Small

Medium

Large

X REQUESTS

Y REQUESTS

Z REQUESTS
Elasticity

- Horizontal Scaling

Elastic Load Balancer

Web Server Pool

- Instance: 1
- Instance: 2
- Instance: 3
- Instance: 4
Elasticity

- Amazon’s Auto Scaling Service
Amazon’s CloudWatch Alarm

- Monitors CloudWatch metrics for triggers and invokes a defined action
Amazon’s SNS

- SNS (Simple Notification Service)
  - Messaging Service

![Diagram showing SNS Topic with connections to Publisher and subscribers]

- E-Mail Subscriber
- SMS Subscriber
- Other Subscriber
Your Task

• Build Infrastructure to Test Benchmark Requests

- Launchpad
- Siege Benchmark Script
- ELB
- Web Server Pool
- CloudWatch Alarm
- Auto Scaling Service
- Amazon’s SNS
Resources

- Amazon’s Auto Scaling Service
  - http://aws.amazon.com/autoscaling/
- Amazon’s CloudWatch Alarm
- Amazon’s SNS (Simple Notification Service)
  - http://aws.amazon.com/sns/
Upcoming Deadlines

• Project 2:

<table>
<thead>
<tr>
<th>AutoScaling on Amazon</th>
<th>Checkpoint</th>
<th>Available 9/30/13 12:01 AM Due 10/6/13 11:59 PM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Auto Scaling</td>
<td></td>
<td></td>
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</table>

• Unit 3:

UNIT 3: Virtualizing Resources for the Cloud

<table>
<thead>
<tr>
<th>Module 6: Introduction and Motivation</th>
<th>Gradebook</th>
<th>Learning Dashboard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Module 7: Virtualization</td>
<td>Gradebook</td>
<td>Learning Dashboard</td>
</tr>
<tr>
<td>Module 8: Resource Virtualization - CPU</td>
<td>Gradebook</td>
<td>Learning Dashboard</td>
</tr>
</tbody>
</table>
Demo Outline

• 1. Create Auto Scaling Group using CLI
  – Install Auto Scaling CLI
  – Create Auto Scaling Launch Configuration
  – Create Auto Scaling Group
  – Create Auto Scaling Policy
  – Configure SNS
  – Delete Auto Scaling Group

• 2. Create Auto Scaling Group using Java API
Install Auto Scaling CLI

• Set JAVA_HOME variable
• Set AWS_AUTO_SCALING_HOME & PATH variable
• Set AWS_CREDENTIAL_FILE variable
• Verify
  – as-cmd
Create Auto Scaling Launch Configuration

• as-create-launch-config
  
  LaunchConfigurationName --image-id value --instance-type value

• http://docs.aws.amazon.com/AutoScaling/latest/GettingStartedGuide/CreateASGroup.html#create-auto-scaling-group
Create Auto Scaling Group

- `as-create-auto-scaling-group
  AutoScalingGroupName --availability-zones value[,value...] -- launch-configuration value -- max-size value --min-size value`
- `as-describe-auto-scaling-groups
  [AutoScalingGroupName]`
- `http://docs.aws.amazon.com/AutoScaling/latest/GettingStartedGuide/CreateASGroup.html#create-auto-scaling-group`
Create Auto Scaling Policy

• as-put-scaling-policy PolicyName --type value --auto-scaling-group value --adjustment value

• http://docs.aws.amazon.com/AutoScaling/latest/DeveloperGuide/as-scale-based-on-demand.html
Configure SNS

• Create a SNS topic
• Subscribe to topic with email
• `as-put-notification-configuration AutoScalingGroupName --notification-types value --topic-arn topic-ARN`
Delete Auto Scaling Group

• Terminate all instances
  – as-update-auto-scaling-group AutoScalingGroupName

• Delete Auto Scaling Group
  – as-delete-auto-scaling-group AutoScalingGroupName

• Delete Auto Scaling Launch Configuration
  – as-delete-launch-config LaunchConfigurationName

• http://docs.aws.amazon.com/AutoScaling/latest/GettingStartedGuide/DeleteASGroup.html
Create Auto Scaling Group using Java API

• Useful packages
  – com.amazonaws.services.autoscaling
  – com.amazonaws.services.autoscaling.model

• http://aws.amazon.com/articles/3586?_encoding=UTF8&_jiveRedirect=1