15-319 / 15-619 Cloud Computing

Course Overview 3

September 14, 2021

Agenda

- Piazza
- Reflection from last week
- Project Reflection Activity
- OLI content
- Deadlines

Piazza - Articulate technical questions

- There are common patterns to communicate effectively in a technical setting.
- Our course not only aims at building your technical skills, but also training your communication skills.
- We created a template for you to structure your questions.

Piazza - Provide the full context

- Which project module are you working on?
- Which task/section are you working on?
- If relevant, please provide the information of the cloud account and resources.
- Example error message in the plain text format (if you are reporting programmatic issues) or screenshot (if you are reporting UI/UX issues)
  - Please provide example error messages **in the plain text format**, **NEVER** share code/text as screenshots which are not parsable!
  - Use screenshots (only) for UI/UX issues
- How to reproduce?
- Expected behavior v.s. actual behavior
- Environment summary
- What you have tried?

Plain text over screenshots on Piazza

Sharing code, commands, error messages, etc. as screenshots does not necessarily save your time. At the same time, screenshots are much more difficult for others to work with. People have to type the information character by character.

```
$ mkdir aws_intro && cd aws_intro

$ wget https://clouddeveloper.blob.core.windows.net/aws-apis/aws-apis-vm-java.tgz -O aws-apis-vm-jav
a.tgz

$ tar -xvzf aws-apis-vm-java.tgz

$ export KEY_NAME='<your_key_pair>'
$ export SECURITY_GROUP_NAME='<your_security_group_name>'

$ mvn compile && mvn exec:java -Dexec.mainClass="edu.cmu.cs.cloud.samples.aws.LaunchEC2Instance"
 ...
[INFO] --- exec-maven-plugin:1.6.0:java (default-cli) @ aws-apis-samples ---
Launched instance with Instance Id: [i-0b8c7ed1909c63a90]!
[INFO] ------------------------------------------------------------------------
[INFO] BUILD SUCCESS
[INFO] ------------------------------------------------------------------------
...
```

Reflection from last week

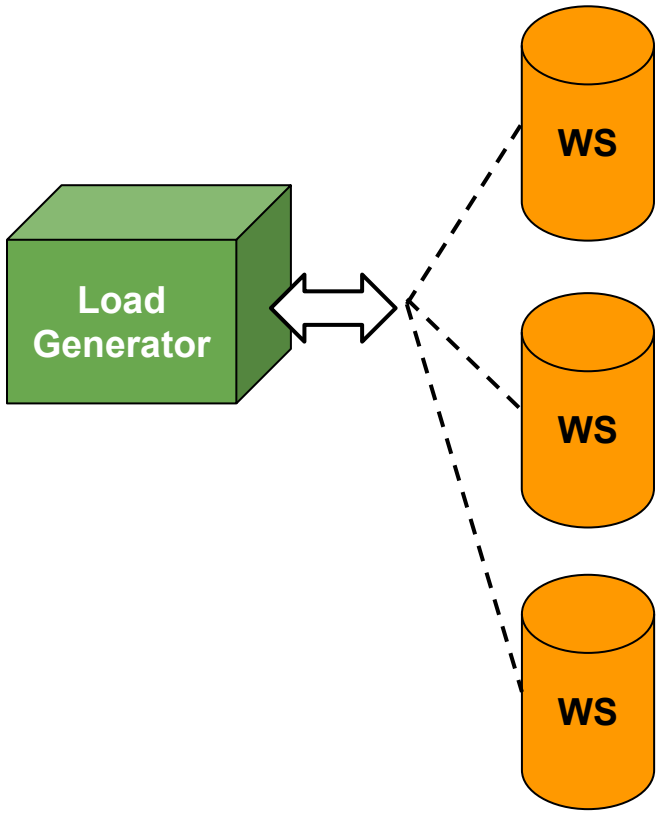
- Conceptual content on OLI
  - Modules 1, 2
  - Quiz 1
- Project 1
  - Task 1
    - AWS Horizontal Scaling
  - Task 2
    - AWS Auto Scaling
  - Task 3
    - AWS Auto Scaling with Terraform

Activities to complete this week

- Conceptual content on OLI
  - Modules 3, 4
  - Quiz 2
- Project 1 (cont.)
- Project 2 primers
  - Intro to Containers and Docker
  - Kubernetes and Container Orchestration

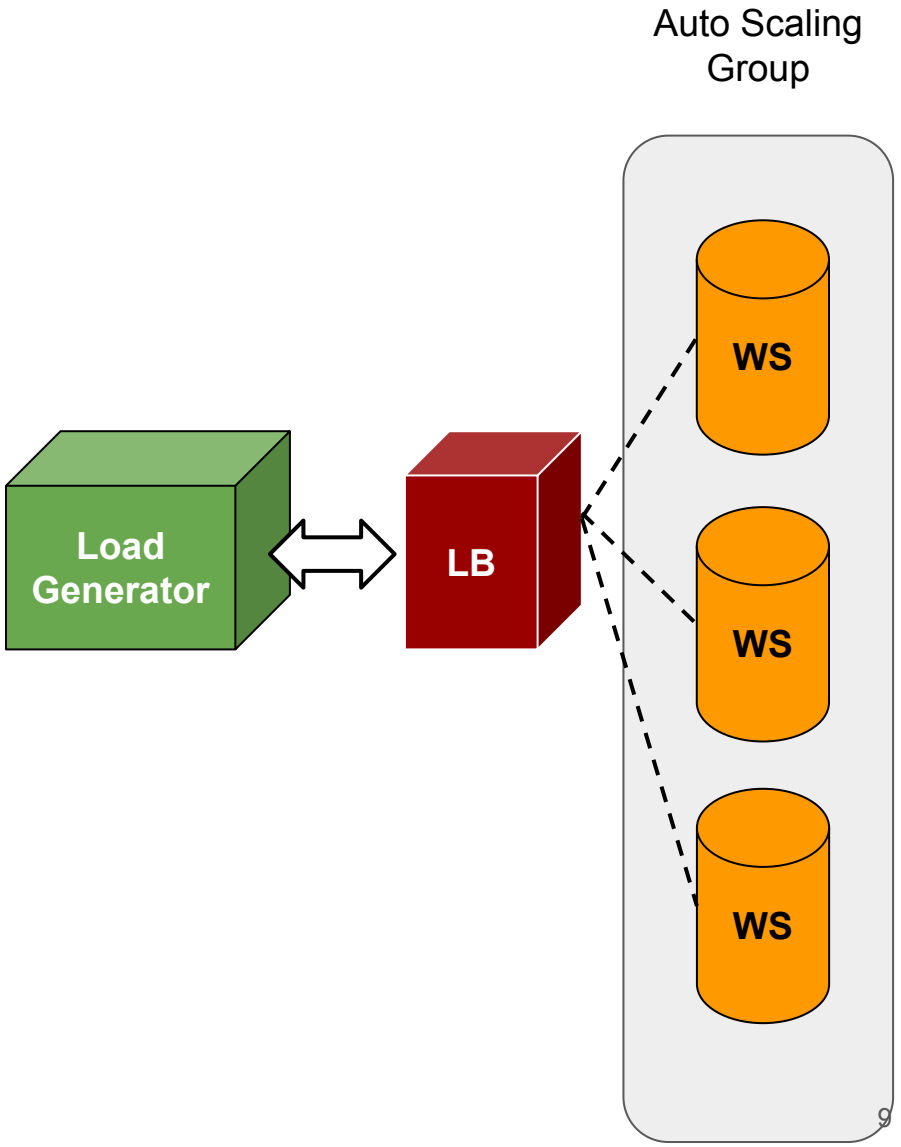
Project 1 Hands-on Tasks

- **Task 1**
  - **AWS Horizontal Scaling**
- **Task 2**
  - **AWS Auto Scaling**
- **Task 3**
  - **AWS Auto Scaling with Terraform**



Project 1 Hands-on Tasks

- Task 1
  - AWS Horizontal Scaling
- **Task 2**
  - **AWS Auto Scaling**
- Task 3
  - AWS Auto Scaling with Terraform



Project 1 Hands-on Tasks

- Task 1
  - AWS Horizontal Scaling
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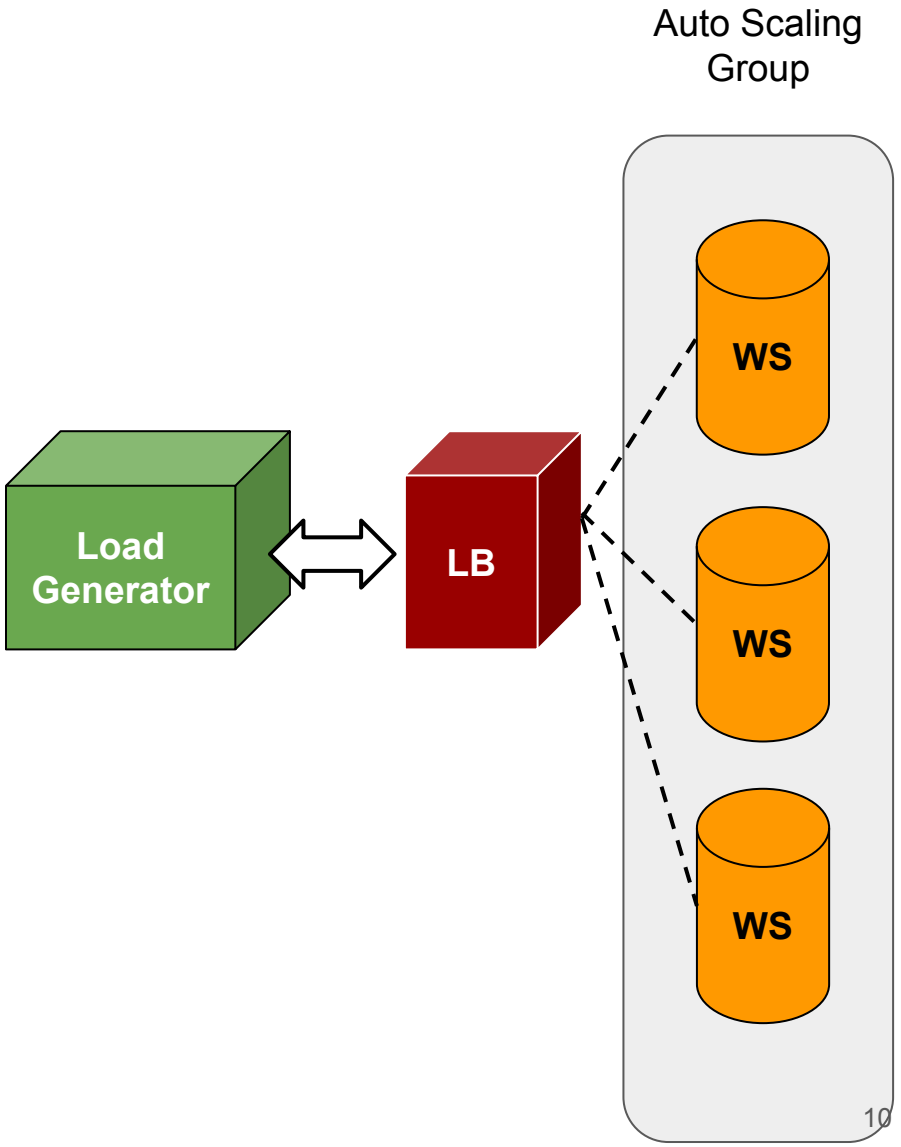
  - AWS Auto Scaling
- Task 3
  - AWS Auto Scaling with Terraform



Project 1 Pitfalls

- Did not authenticate on the load generator with submission username and password before starting a test
- Did not wait for the test to complete on the load generator before the program finishes

Project 1 Workflow

- Launch EC2 instance with the VM Image provided by us
  - The Terraform template to provision EC2 in provided in Project 0
- Complete the Horizontal Scaling Task
- Complete the Autoscaling Task
  - Submit the patterns.pdf file
- Complete the Autoscaling with Terraform Task
- Submit your code for grading
  - Complete the references file for citation
  - Execute submitter to submit your code
- Finish Project Reflection (graded) before the deadline
- Finish Project Discussion (graded) within 7 days **after** the project deadline
  - Reply and provide feedback to 3 reflection posts

Guideline for Project Reflection

- Describe your approach in solving each task in this project
  - Please share your
    - approach, challenges faced, how you overcame issues, and lessons learned
    - If you came up with a novel solution!
- However, please:
  - Do not share your code or pseudocode
  - Do not share details about your solution

Module 3: Data Center Trends

- Definition & Origins
  - Infrastructure dedicated to housing computer and networking equipment, including power, cooling, and networking
- Growth
  - Size (No. of racks and cabinets)
  - Density
- Efficiency
  - Servers
  - Server Components
  - Power
  - Cooling

Facebook data center

Module 4: Data Center Components

- IT Equipment
  - Servers : rack-mounted
    - Motherboard
    - Expansion cards
  - Types of Storage
    - Direct attached storage (DAS)
    - Storage area network (SAN)
    - Network attached storage (NAS)
  - Networking
    - Ethernet, protocols, etc.
- Facilities
  - Server room
  - Power (distribution)
  - Cooling

Reminder: Deadlines

- Sep 17 at 23:59 ET
  - Quiz 2
- Sep 19 at 23:59 ET
  - Project 1 (including Project Reflection)
- Sep 26 at 23:59 ET
  - Project 1 Project Discussion