15-319 / 15-619 Cloud Computing

Course Overview 3

September 13, 2022

Agenda

- Piazza Best Practices
- Last Week Reflection
- This Week Overview
- Deadlines!

Piazza
Articulate your technical questions

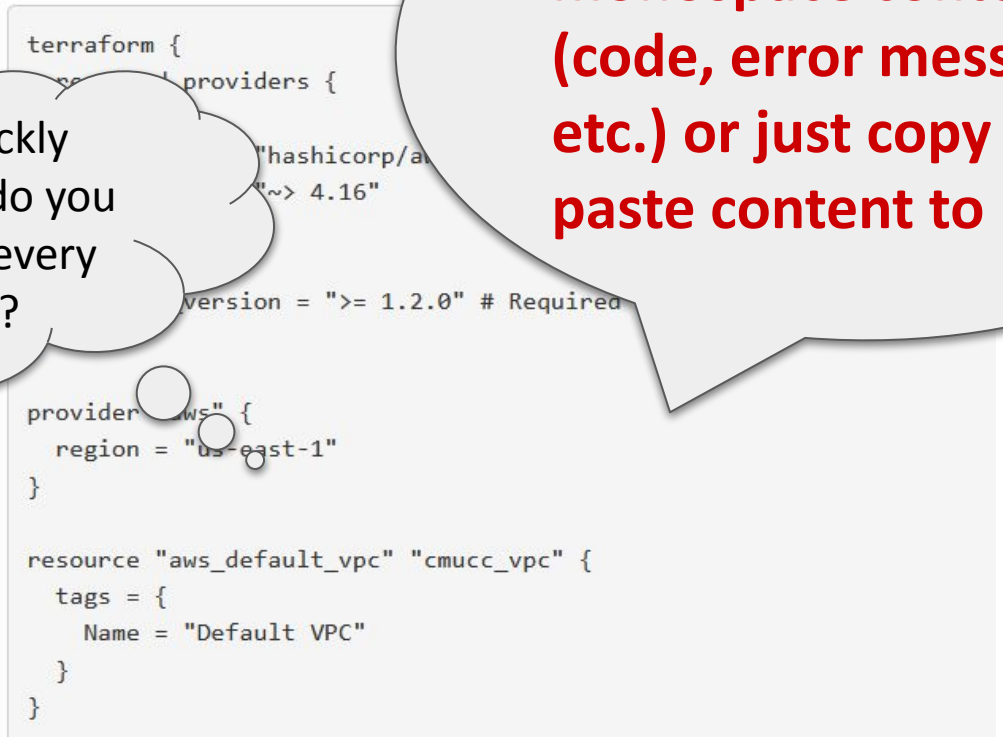
- There are common patterns to communicate effectively in a technical setting.
- We aim to build your technical skills and your communication skills.
- Please check out the “How To Ask Good Technical Questions” primer.

Piazza - Provide the full context

- Put a relevant post title
- Which project/task/section are you working on?
- What is the submission ID/Andrew ID?
- If relevant, please provide the information of the cloud account and resources.
- How to reproduce?
- Expected Behavior v.s. Actual Behavior
- Environment summary
- What you have tried?

No screenshots for text information!

Sharing code, commands, error messages, et… nshots does not necessarily save your time. At t… e difficult for others to work with



Can you quickly copy this? Or do you have to type every character?

Please use backticks for monospace content (code, error messages, etc.) or just copy and paste content to Piazza

Last Week

Conceptual content

- Module 1: Cloud Computing Overview
- Module 2: Economics, Benefits, Risks, Challenges and Solutions
- Quiz 1

Project 1

- Task 1: Horizontal Scaling
- Task 2: Auto Scaling
- Task 3: Auto Scaling with Terraform

This Week

Conceptual content

- Module 3: Data Center Trends
- Module 4: Data Center Components
- Quiz 2

Project 1 (continued)

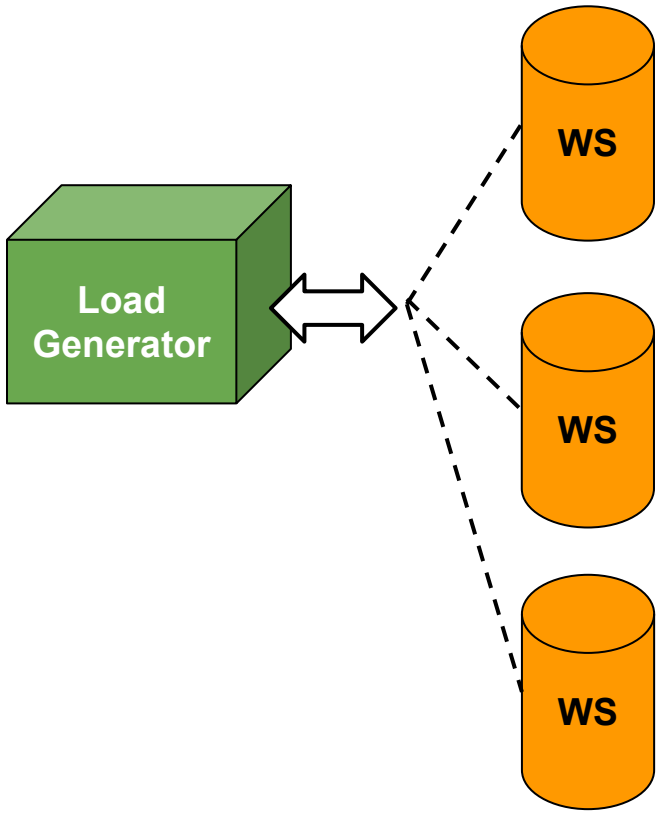
- Task 1: Horizontal Scaling
- Task 2: Auto Scaling
- Task 3: Auto Scaling with Terraform

Project 2 Primers

- Introduction to Containers and Docker
- Container Orchestration and Kubernetes

Project 1 Hands-on Tasks

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



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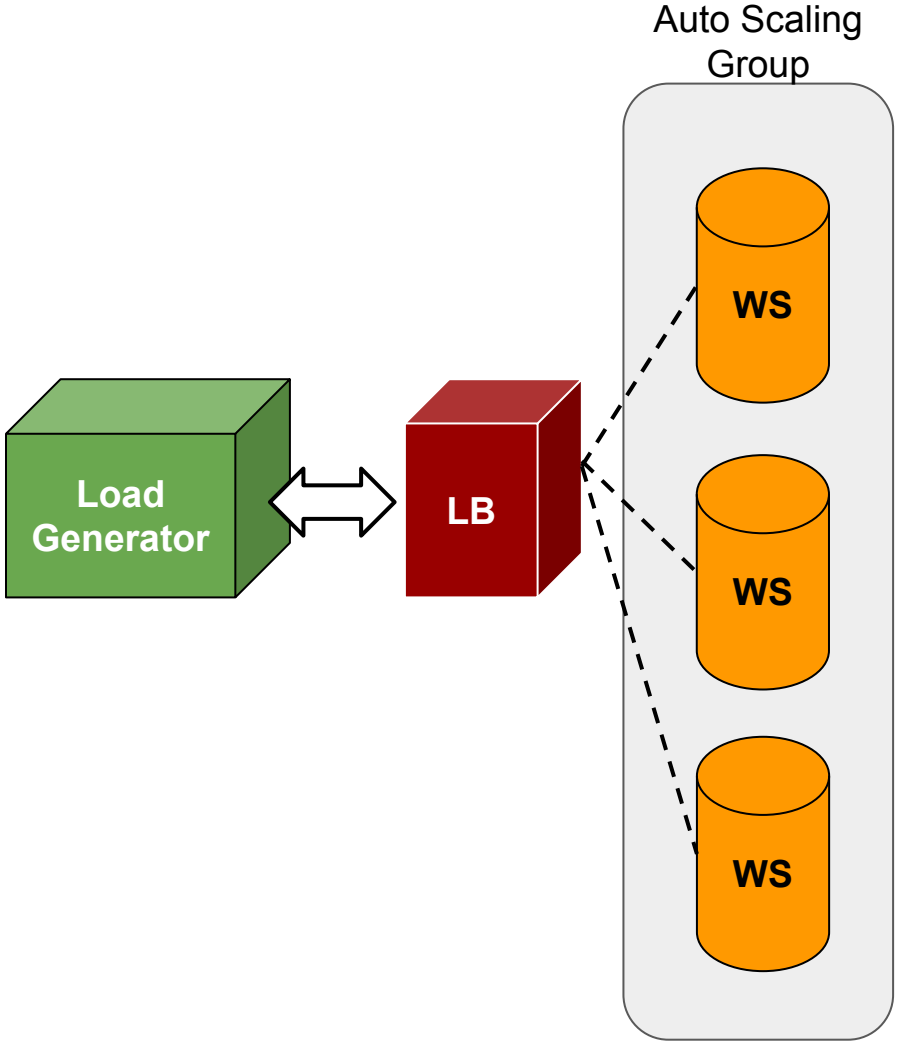

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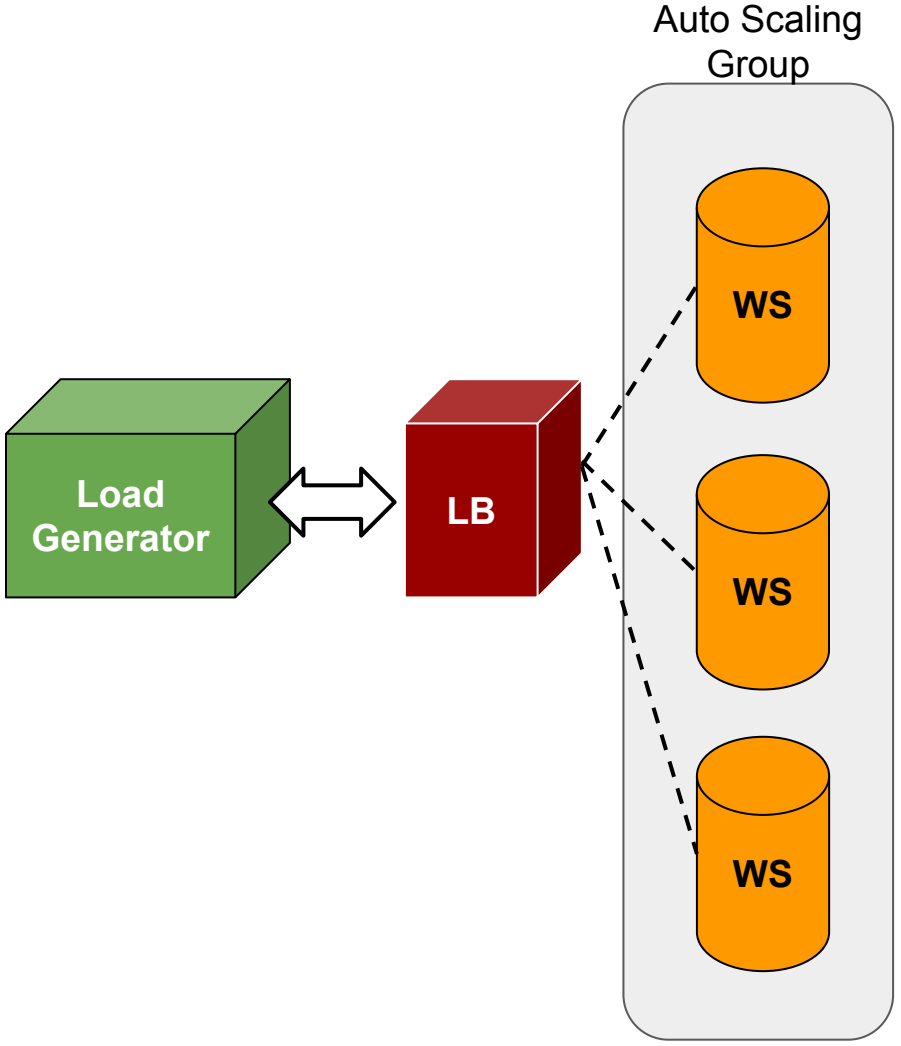


Project 1 Pitfalls

- 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
- Did not terminate all resources after the test is done

Project 1 Deliverables

- Launch EC2 instance with the VM Image we provided
  - Use the Terraform template to provision EC2 instance in P0
- 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 **on the student VM**
- 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

Time to Reflect…

- Describe your approach in solving each task in this project
  - Please share:
    - challenges you faced, your attempts to overcome issues, and lessons learned
    - If you came up with a novel solution!
- However:
  - Do not share your code or pseudocode
  - Do not share your solution detailedly

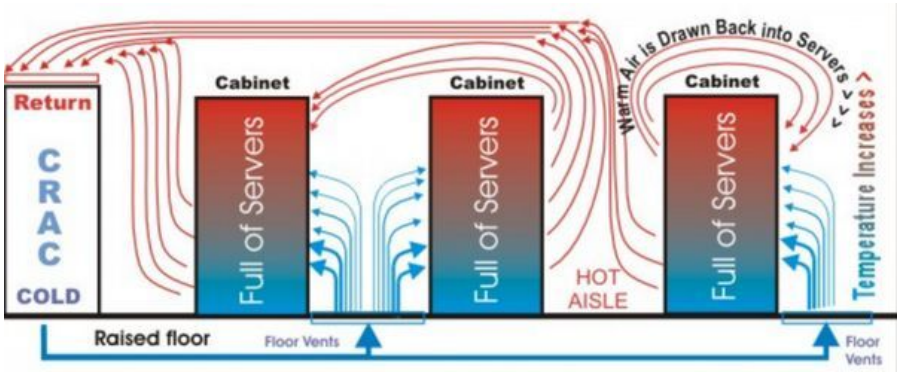
Module 3: Data Center Trends

- 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



A cooling system design in traditional server rooms

Reminder: Deadlines

- **Sep 16** at 23:59 ET
  - Quiz 2
- **Sep 18** at 23:59 ET
  - Project 1 (including Project Reflection)
- **Sep 19** at 00:00 ET
  - Project 2 started!
- **Sep 25** at 23:59 ET
  - Project 1 Project Discussion