Cloud Computing

Winter Term 2020/2021

Tutorial Session 1

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Distributed and Operating Systems (DOS)

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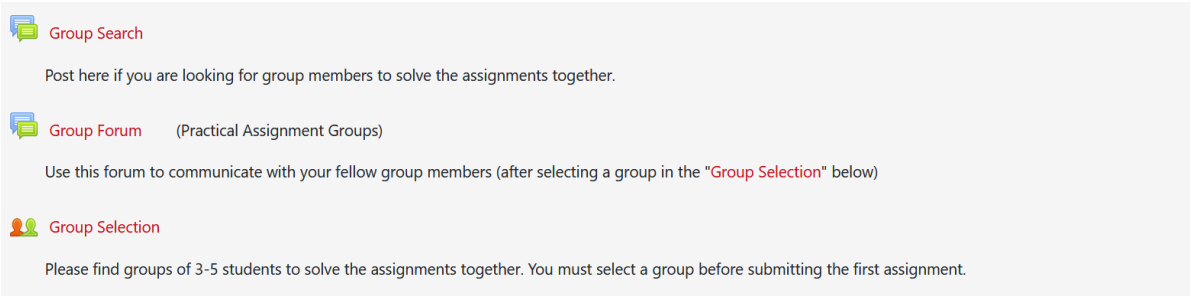
Organization

- Five tutorial sessions (every second Monday 12 – 2 pm, Zoom):
  - 09.11.
  - 23.11.
  - 07.12.
  - 04.01.
  - 18.01.
- Each session introduces one assignment
- Each assignment is due 2 weeks later (skipping Christmas)
- Written Exam:
  - Around February 2021
- Exam counts 50% of the final grade, other 50% can be obtained in assignments

Organization

- Assignments are solved in teams of 3-5 students
- Register on ISIS, get in touch through your “Group Forum”
  - If you don’t have a group, write in the “Group Search” forum



- **Important: QISPOS Registration**
  - Email us (or Jana Bechstein jana.bechstein@tu-berlin.de) if there are problems
  - Required to submit assignments and write the exam!

Practical Assignments

- Topics covered
  - Usage of Infrastructure-as-a-service clouds (dashboard and CLI API)
  - Benchmarking the performance of different platforms
  - Benchmarking the cloud API
  - DevOps tasks for cloud services
  - Infrastructure-as-code orchestration
  - Container virtualization (Docker)
  - Container-based orchestration (Kubernetes)
- Sources of Information:
  - Assignment sheet
  - Online documentation
  - Online forums (https://stackoverflow.com/)
  - ISIS forum: ask your fellow students!

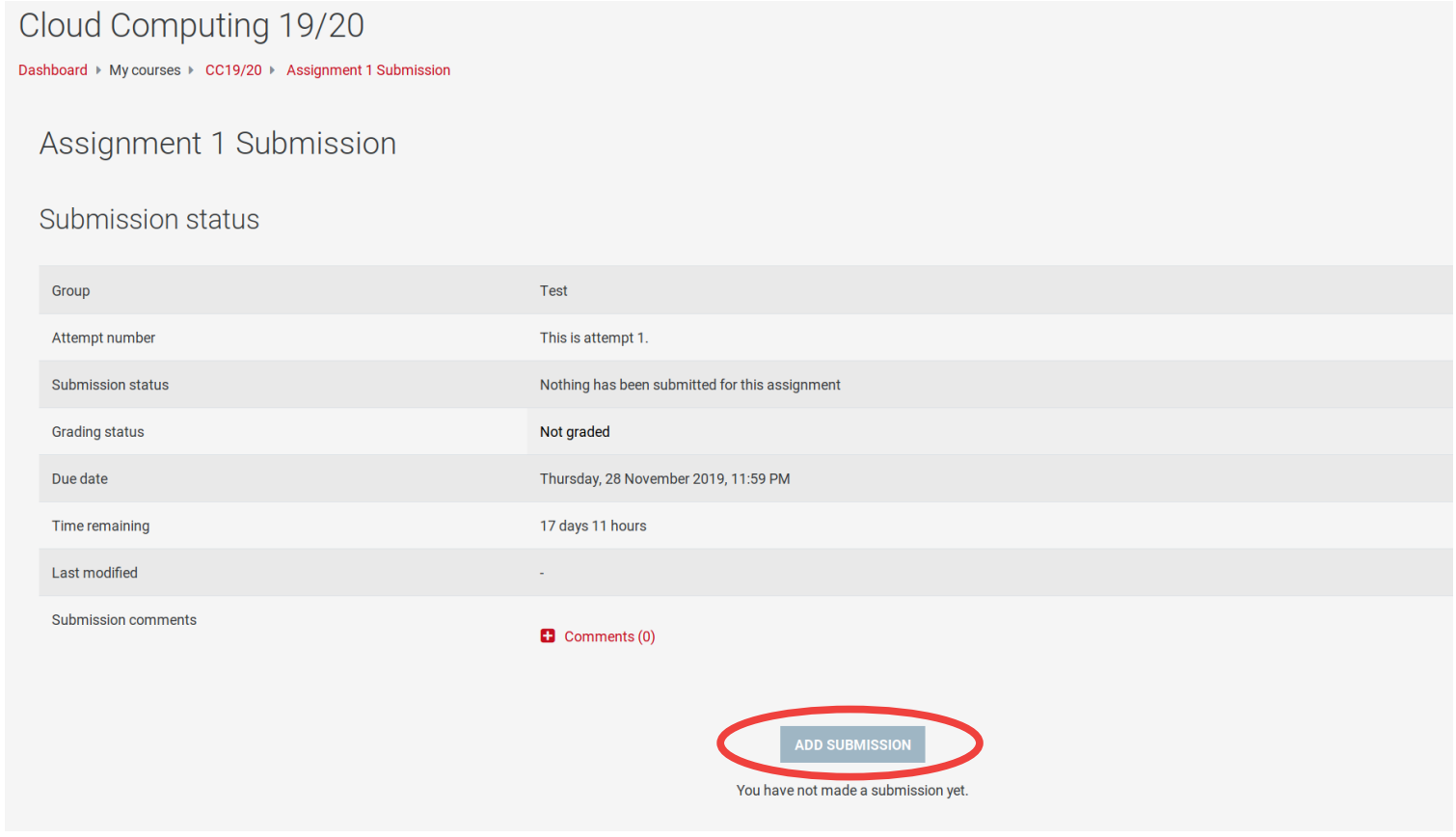
Practical Assignment 1

- Due: 22.11.2020
- Summary:
  - Create accounts on Amazon AWS and Google Cloud Platform
  - Apply for Amazon AWS Educate and receive a coupon for Google Cloud credits (link on assignment sheet)
  - Create and prepare VMs in both platforms
  - Write performance benchmarks (CPU, disk, memory benchmarks)
  - Benchmark the 2 platforms regularly and collect the results
  - Plot the results with a script provided by us
  - Answer questions related to your measurements

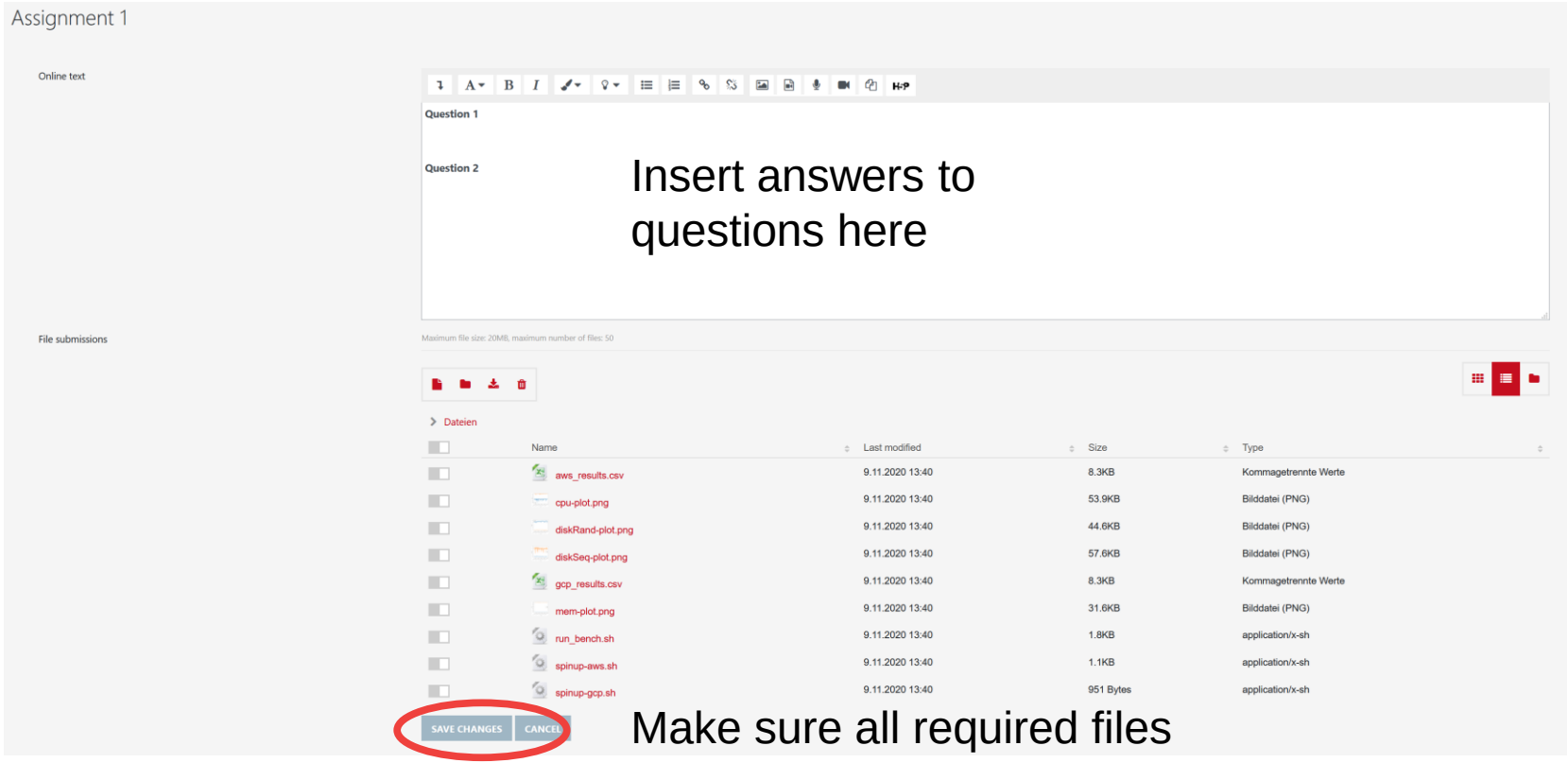
Assignment Submission: ISIS

- Submit all required files on ISIS
- Resubmissions are possible: only the last submission will be counted
- Submission will be partially validated automatically:
  - Use exactly the correct file names
  - Submit exactly the 9 required files described in the assignment
  - Use the text field to enter your answers to the final questions

Assignment Submission: ISIS



Assignment Submission: ISIS



Amazon AWS Educate Starter

- You receive a small number of credits to use EC2 virtual machines
  - Limited feature set, but enough to solve assignments
- Alternative: full Amazon AWS Educate account
  - You receive 100$ AWS credits for FULL AWS usage
  - More than enough to solve all assignments
  - Requires credit card!
  - It will not be charged if you follow our instructions. You are responsible!
  - **Most important thing: always shut down your VMs when you are done!**
- You can share an Amazon AWS account using IAM
  - https://aws.amazon.com/iam/

Google Cloud: Education Grants

- 50$ coupons received for education purpose
- Follow the instructions on the assignment sheet to receive the credits
- Most newly created accounts receive additional credits valid for one year
- Google Cloud might ask for a credit card, but it will not be charged

Amazon AWS & Google Cloud

- Pay-as-you-go model:
  - Pay by the hour, megabyte, request, …
  - Permanent use can be expensive, but many possibilities without much configuration
- Administration possible via:
  - Browser (Management console)
  - Command Line
    - Based on REST API
    - Required to solve the project assignments
  - REST API

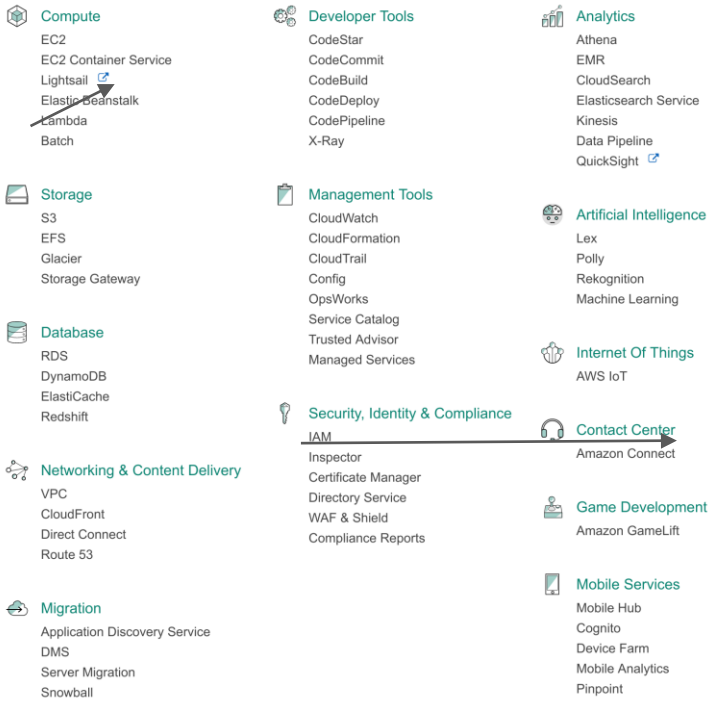
Amazon AWS

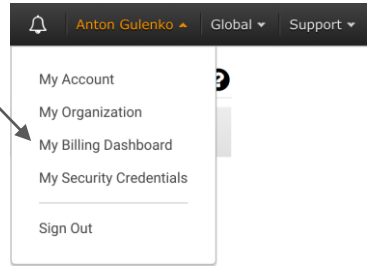
- >40 services, list growing...

Virtual Machines

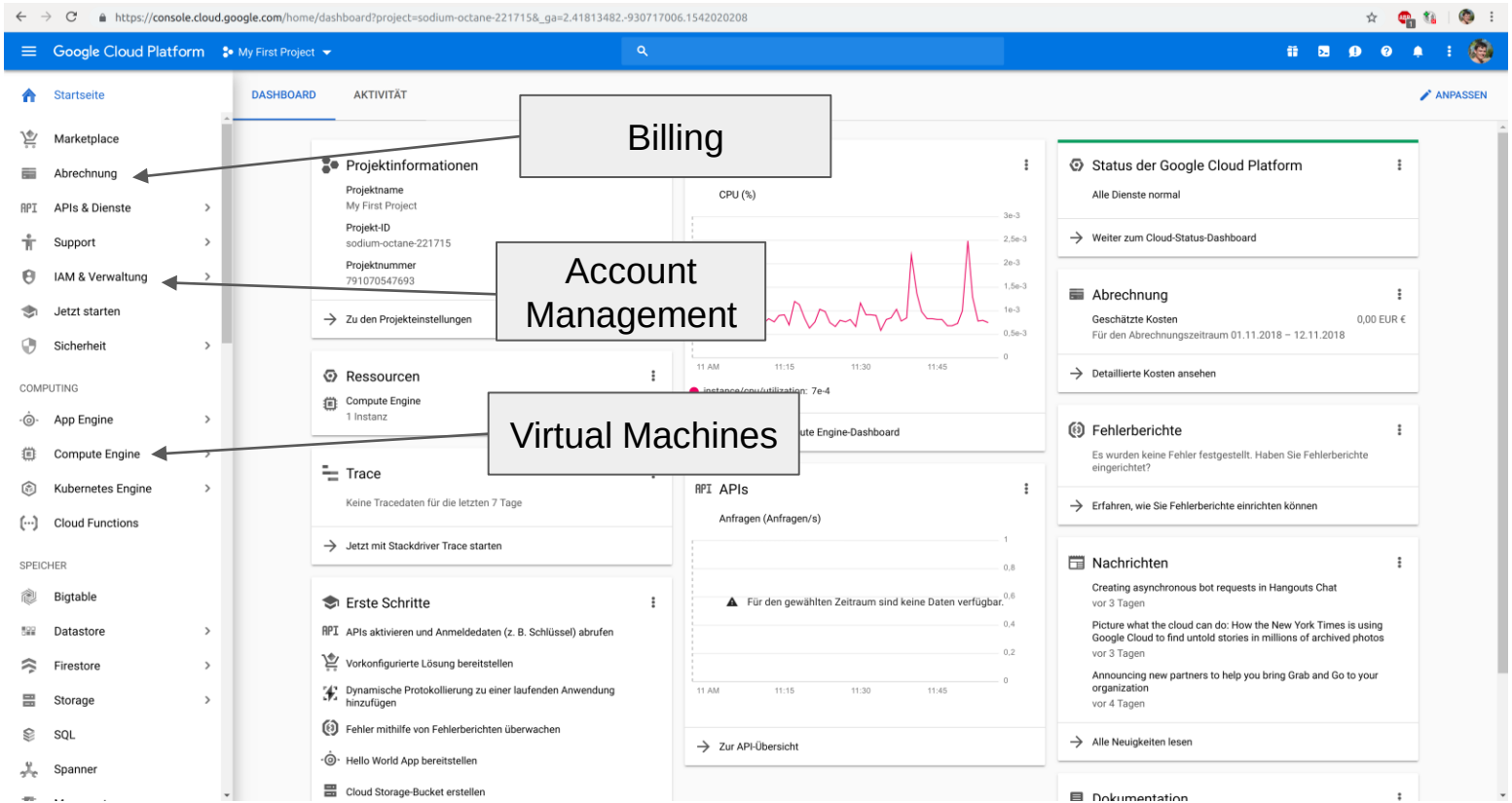
Account Management

Billing

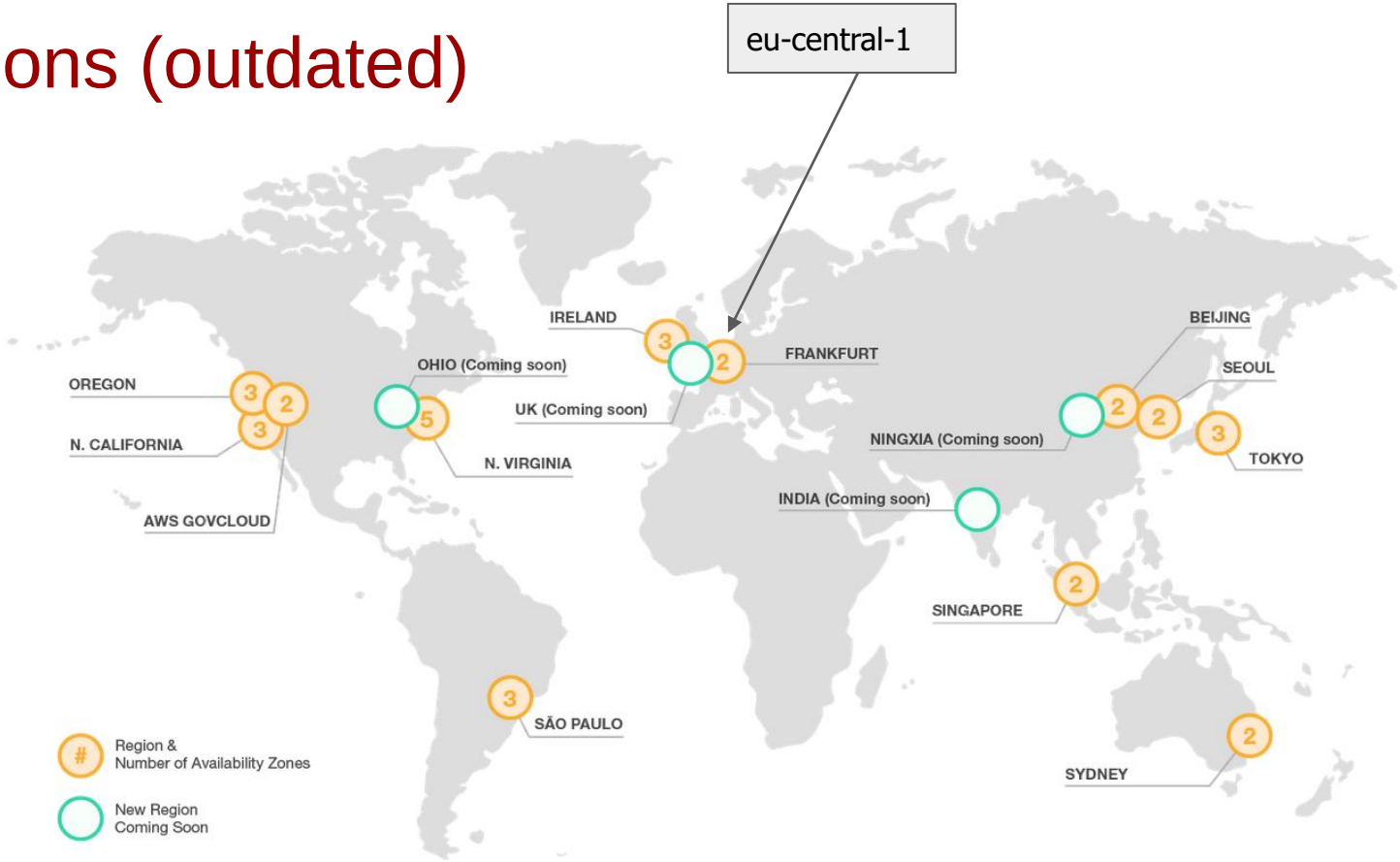




Google Cloud



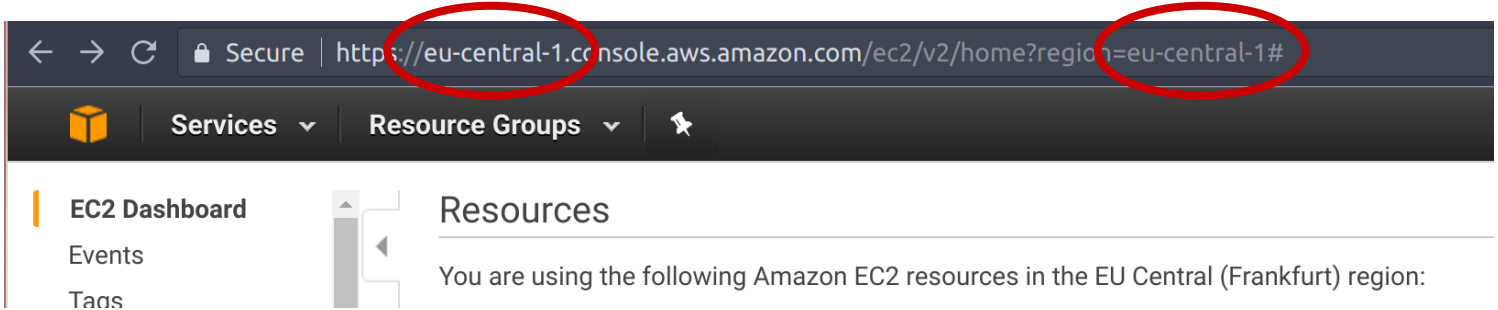
Regions (outdated)



Source: https://awsinsider.net/articles/2016/01/07/aws-launches-region-in-korea.aspx

Amazon AWS Regions

- Make sure you are in the correct region in the Dashboard



Command Line Tools

- You will have to set up an environment for connecting to the Cloud APIs
  - AWS: http://docs.aws.amazon.com/cli/latest/userguide/installing.html
  - Gcloud: https://cloud.google.com/sdk/docs
- Work on Linux!
- Read the docs
- Use the command line tools to create all resources described in the assignment

Last Reminder

Always remember to shut down your unused VMs!