LS Lab Assignment:
Amazon EC2*

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Abstract

This lab will introduce you to the Amazon Cloud and EC2 in particular. You will learn about the billing model, authentication, VM instantiation, and load balancing.

NOTE Using cloud services costs money. You're kindly asked to use small AMIs and to make sure that you terminate running VM instances once you are done with the lab.

1 Access

Log on to Amazon Web Services using the credentials you've received via email. The login URL is `https://uva-sne-lia.signin.aws.amazon.com/console`

Once logged in, take a look at the services provided by AWS. Feel free to explore!

1. Create a keypair and download the *pem* file to a directory. Make sure you **chmod** it to 400. You will use the keypair to connect to your instances.

2 Adding Instances

Make sure you are working in the EU-West (Ireland) region.

Questions

2. What is the difference between EBS and instance-store for VMs?

3. Launch two (micro)instances of an Ubuntu 14.04 LAMP server (bitnami-lampstack-7.0.14-1-linux-ubuntu-14.04.3-x86_64-hvm-ebs in Community AMIs) (**ami-f1a78c82**). For now, use Security Group **os3-allow**.

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*Based on an earlier document by N.D. Jebessa. Version November 9, 2017.

4. Use **ssh** to connect to both instances and change the web page to display the following, where # is a unique single digit id number for each instance.

This page is served by instance number #.

5. Test each web server instance using the DNS reference provided by Amazon.

6. Measure the HTTP response time for each instance.

3   Load Balancing

Create a load balancer containing both LAMP servers.

7. Test the load balancing server using the DNS reference provided by Amazon.

8. Which server is responding? And when?

9. Measure the HTTP response time via the load balancer.

Now generate a continuous load (of work) on the most responsive of the instances.

10. How does this influence the load balancer?

11. Measure the HTTP response time both on the load balancer as well as on the separate web servers.

12. Draw a conclusion from the results.

13. What mechanism does the load balancer use to decide whether a server is overloaded?

Now add a Microsoft Windows Server 2016 Base instance (**ami-b7e93bce**), and set up an IIS web server to serve the same page as the Ubuntu servers (you can change the #, for instance)

Make sure Windows instance is in same availability zone (1a/b/c) and/or EC2 domain (Classic vs. "Current Generation") as the LAMP instances!

14. What are the advantages/disadvantages of a mixed setup?

15. Re-test the load balancing server using the DNS reference provided by Amazon.

16. Which server is responding? And when?

17. Measure the HTTP response time via the load balancer.

4   Security

18. Create a Security Group for your web servers with reasonable inbound traffic rules. For example, you might want to limit certain traffic to sources from the OS3 network only. Explain your reasons.

5 Termination

Now terminate all your instances and especially **your load balancer**, they are really expensive.

For the Amazon Cloud:

19. How much money did it cost? Make a detailed bill based on your estimated usage.

20. Give an estimate of the costs if the services are used for a year.

6 Virtual Data Center

A sysadmin argues that he can move ALL the storage, network, server (web, application, database), and security services of her company to the Amazon cloud.

21. Do you think this is feasible with the current AWS services?

22. Briefly explain how you would use each AWS service to implement the sysadmin's plan.