NWEN_243 Project 1

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3. Testing Server and Client locally

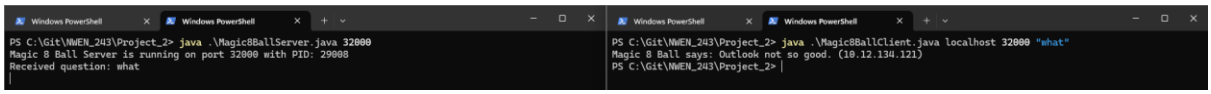

Figure 1: 1.jpg

7. Testing of Server and client on AWS Instances

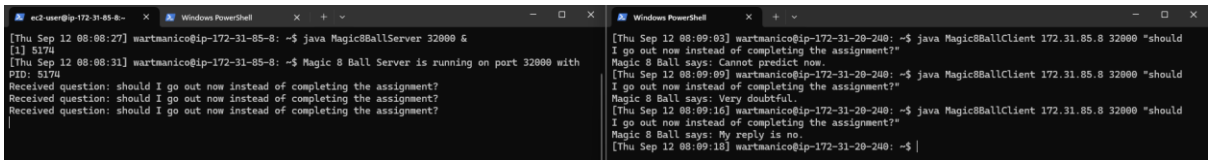

Figure 2: 2.jpg

8.2 Crontab setup

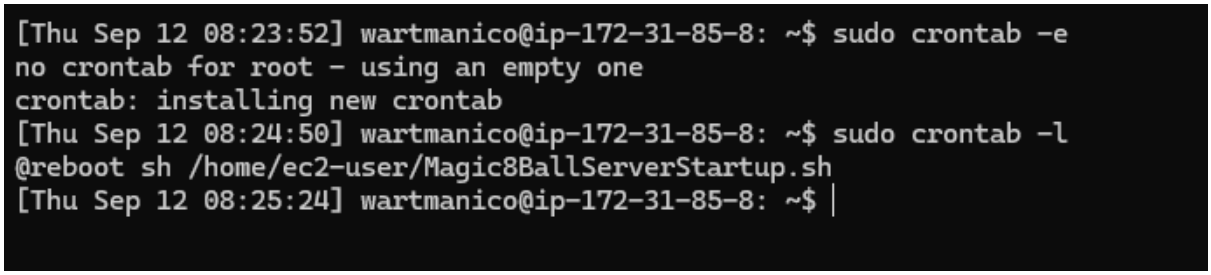

Figure 3: 3.jpg

Test after reboot:

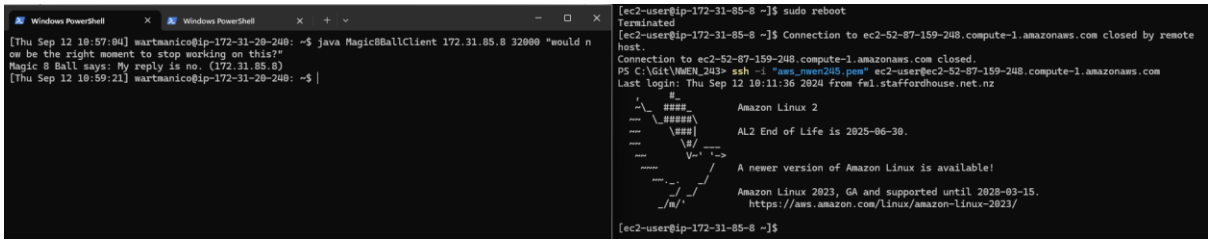

Figure 4: 4.jpg

8.4 Creating and running the Image

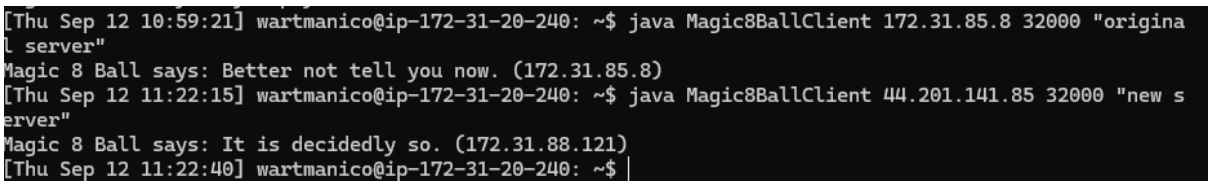

Figure 5: 5.jpg

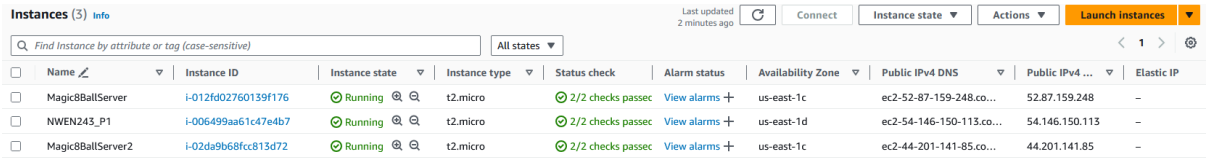

Figure 6: 6.jpg

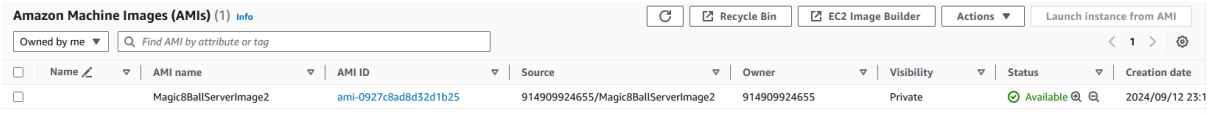

Figure 7: 7.jpg

Part II

Launch Templates

```
[Thu Sep 12 11:54:02] wartmanico@ip-172-31-20-240: ~$ java Magic8BallClient 54.198.72.249 32000 "Launc
h Template Instance 1"
Magic 8 Ball says: Cannot predict now. (192.168.1.108)
[Thu Sep 12 11:54:10] wartmanico@ip-172-31-20-240: ~$ java Magic8BallClient 44.223.1.25 32000 "Lanuch
Template Instance 2"
Magic 8 Ball says: Very doubtful. (192.168.0.127)
```

```
PS C:\Git\NWEN_243> ssh -i "aws_nwen245.pem" ec2-user@44.223.1.25
The authenticity of host '44.223.1.25 (44.223.1.25)' can't be established.
ED25519 key fingerprint is SHA256:fT7Jvx3lHp1CClZpnTAcR3/f9715LAU9U6M2kQhyxAI.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '44.223.1.25' (ED25519) to the list of known hosts.
Last login: Thu Sep 12 10:59:13 2024 from fw1.staffordhouse.net.nz
   ,     #_
   ~\_  ####_        Amazon Linux 2
  ~~  \_#####\
  ~~     \###|       AL2 End of Life is 2025-06-30.
  ~~       \#/ ___
   ~~       V~' '->
    ~~~         /    A newer version of Amazon Linux is available!
      ~~._.   _/
         _/ _/       Amazon Linux 2023, GA and supported until 2028-03-15.
       _/m/'           https://aws.amazon.com/linux/amazon-linux-2023/

[ec2-user@ip-192-168-0-127 ~]$ exit
logout
Connection to 44.223.1.25 closed.
PS C:\Git\NWEN_243> ssh -i "aws_nwen245.pem" ec2-user@54.198.72.249
The authenticity of host '54.198.72.249 (54.198.72.249)' can't be established.
ED25519 key fingerprint is SHA256:HSWO+4PNow/Z7Wbo3ejRb/45nYzH8ekb5jf5dCtl9kE.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '54.198.72.249' (ED25519) to the list of known hosts.
Last login: Thu Sep 12 10:59:13 2024 from fw1.staffordhouse.net.nz
   ,     #_
   ~\_  ####_        Amazon Linux 2
  ~~  \_#####\
  ~~     \###|       AL2 End of Life is 2025-06-30.
  ~~       \#/ ___
   ~~       V~' '->
    ~~~         /    A newer version of Amazon Linux is available!
      ~~._.   _/
         _/ _/       Amazon Linux 2023, GA and supported until 2028-03-15.
       _/m/'           https://aws.amazon.com/linux/amazon-linux-2023/

[ec2-user@ip-192-168-1-108 ~]$ exit
logout
Connection to 54.198.72.249 closed.
PS C:\Git\NWEN_243>
```

Instance Test with Load balancer

```
PS C:\Git\NWEN_243\Project_2> java .\Magic8BallClient.java 54.80.122.38 32000 "Test 1"
Magic 8 Ball says: Outlook good. (192.168.1.89)
PS C:\Git\NWEN_243\Project_2> java .\Magic8BallClient.java 54.235.3.26 32000 "Test 2"
Magic 8 Ball says: It is certain. (192.168.0.208)
PS C:\Git\NWEN_243\Project_2> cd ..
PS C:\Git\NWEN_243> ssh -i "aws_nwen245.pem" ec2-user@54.80.122.38
The authenticity of host '54.80.122.38 (54.80.122.38)' can't be established.
ED25519 key fingerprint is SHA256:pKS2Sres8sejKiIJ/8WaNkj5/NNPV97BQkoqoVROBaA.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '54.80.122.38' (ED25519) to the list of known hosts.
Last login: Thu Sep 12 10:59:13 2024 from fw1.staffordhouse.net.nz
   ,     #_
   ~\_  ####_        Amazon Linux 2
  ~~  \_#####\
  ~~     \###|       AL2 End of Life is 2025-06-30.
  ~~       \#/ ___
   ~~       V~' '->
    ~~~         /    A newer version of Amazon Linux is available!
      ~~._.   _/
         _/ _/       Amazon Linux 2023, GA and supported until 2028-03-15.
       _/m/'           https://aws.amazon.com/linux/amazon-linux-2023/

[ec2-user@ip-192-168-1-89 ~]$ exit
logout
Connection to 54.80.122.38 closed.
PS C:\Git\NWEN_243> ssh -i "aws_nwen245.pem" ec2-user@54.235.3.26
The authenticity of host '54.235.3.26 (54.235.3.26)' can't be established.
ED25519 key fingerprint is SHA256:TZjYeHdTwT73Sccg6+HJFrcI7HziXpRVcgblO5DhJUc.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '54.235.3.26' (ED25519) to the list of known hosts.
Last login: Thu Sep 12 10:59:13 2024 from fw1.staffordhouse.net.nz
   ,     #_
   ~\_  ####_        Amazon Linux 2
  ~~  \_#####\
  ~~     \###|       AL2 End of Life is 2025-06-30.
  ~~       \#/ ___
   ~~       V~' '->
    ~~~         /    A newer version of Amazon Linux is available!
      ~~._.   _/
         _/ _/       Amazon Linux 2023, GA and supported until 2028-03-15.
       _/m/'           https://aws.amazon.com/linux/amazon-linux-2023/

[ec2-user@ip-192-168-0-208 ~]$ exit
logout
Connection to 54.235.3.26 closed.
PS C:\Git\NWEN_243>
```

7. Question 1

New instances are created until the desired minimum is met again (in my case this is 2 instances:

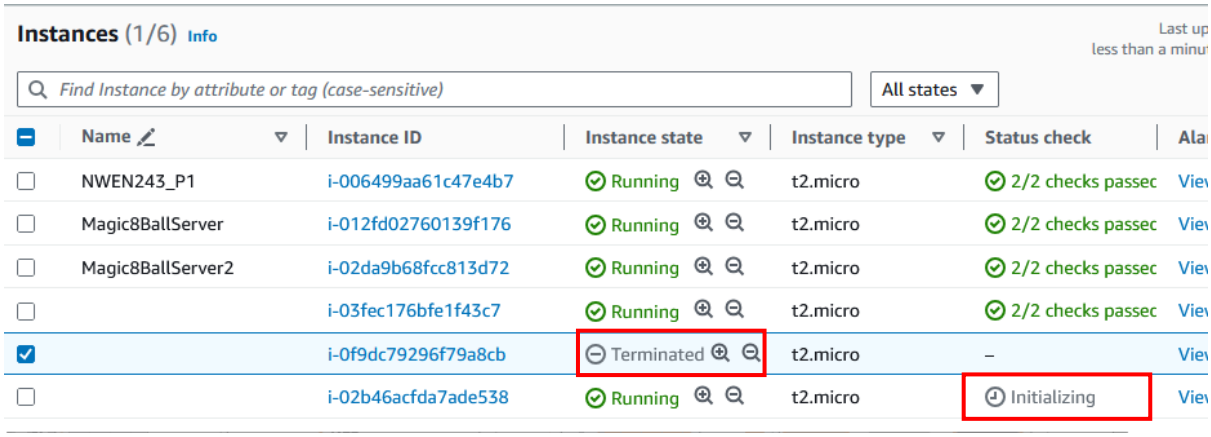

Figure 8: Instance termination

As can be seen in Figure 8, I have terminated an automatically created Instance and instead of it another Instance has been created automatically by the autoscaler.

8. Question 2

Before:

Name	Instance ID	Instance state	Instance type	Status check
NWEN243_P1	i-006499aa61c47e4b7	Running	t2.micro	2/2 checks passec
Magic8BallServer	i-012fd02760139f176	Running	t2.micro	2/2 checks passec
Magic8BallServer2	i-02da9b68fcc813d72	Running	t2.micro	2/2 checks passec
	i-03fec176bfe1f43c7	Running	t2.micro	2/2 checks passec
	i-0f9dc79296f79a8cb	Terminated	t2.micro	–
	i-02b46acfda7ade538	Running	t2.micro	2/2 checks passec

Figure 9: Before adjunsting settings

Adjustment I made:

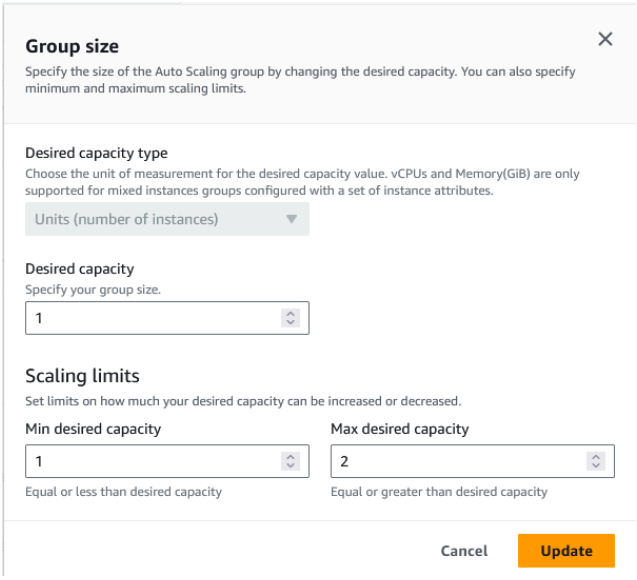

Figure 10: Adjusting of the settings

After:

Name	Instance ID	Instance state	Instance type	Status check
NWEN243_P1	i-006499aa61c47e4b7	Running	t2.micro	2/2 checks passec
Magic8BallServer	i-012fd02760139f176	Running	t2.micro	2/2 checks passec
Magic8BallServer2	i-02da9b68fcc813d72	Running	t2.micro	2/2 checks passec
	i-03fec176bfe1f43c7	Terminated	t2.micro	–
	i-0f9dc79296f79a8cb	Terminated	t2.micro	–
	i-02b46acfda7ade538	Running	t2.micro	2/2 checks passec

Figure 11: after adjusting the settings

9. Monitoring

Target Group:

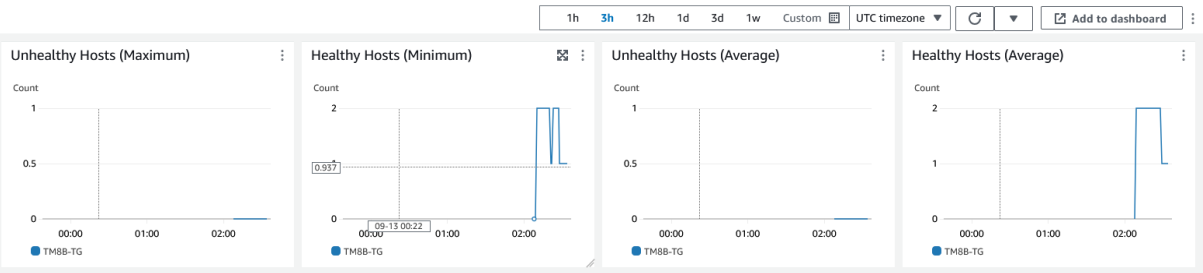

Figure 12: Target Group Monitoring

There are no unhealthy hosts and never have been. This is to be expected, as the complexity of the instances is very minimal and I did not add any additional health checks like Application monitoring or similar.

The most interesting thing here is the “Healthy Hosts (Minimum)” chart. First 2 Instances are created which can be seen by the line rising to 2. After that the line drops to 1. This is where I terminated one of the instances and the line rising back to 2 is where the autoscaling created another instance to match the requirements made in the settings. After that the line drops back to 1 where I adjusted the Autoscaling to 1 Max Host, which lead to the Autoscaler terminating one Instance.

The remaining two plots just display averages of the things just described. This would be interesting in a larger setup where there are tens or hundreds of hosts involved. In this case there isn’t really anything interesting to be said about them.

Load Balancer:

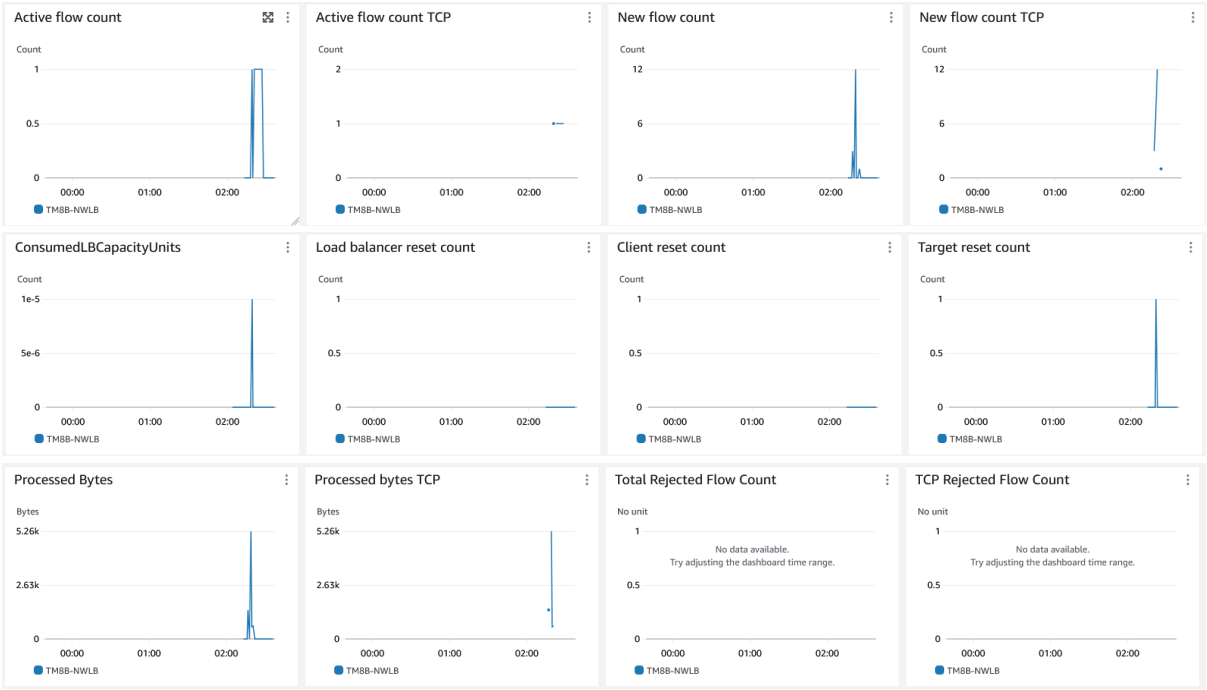

Figure 13: Load Balancer Monitoring

The Load balancer Monitoring is different in a way that it does not list the available hosts, but the traffic that is incoming. The Spikes that can be seen on the charts are my client tests where I executed the TM8B client application on my local machine with the load balancer DNS name as Server. These requests are directed trough the load balancer to an available Instance and this traffic is monitored here.

These charts are especially interesting in analysing times of the day where there is high and low traffic.

10. Question 3

As described above both of these monitorings have different uses although it can be useful to overlay them in larger scaled setups. For example if mor instances are supposed to be launched when there is high traffic both of these monitorings together can give insights in the proper function or in the other case dysfunction of the setup created.

The displayed data is very intuitive to understand with these charts. When there are a lot of requests the TCP monitoring spikes and if hosts are instanciated or terminated this can be seen in the Target Group monitoring.