13519165
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Source Code

https://github.com/kadeksuryam/AWS-Nginx-ECS-Cluster

Architecture
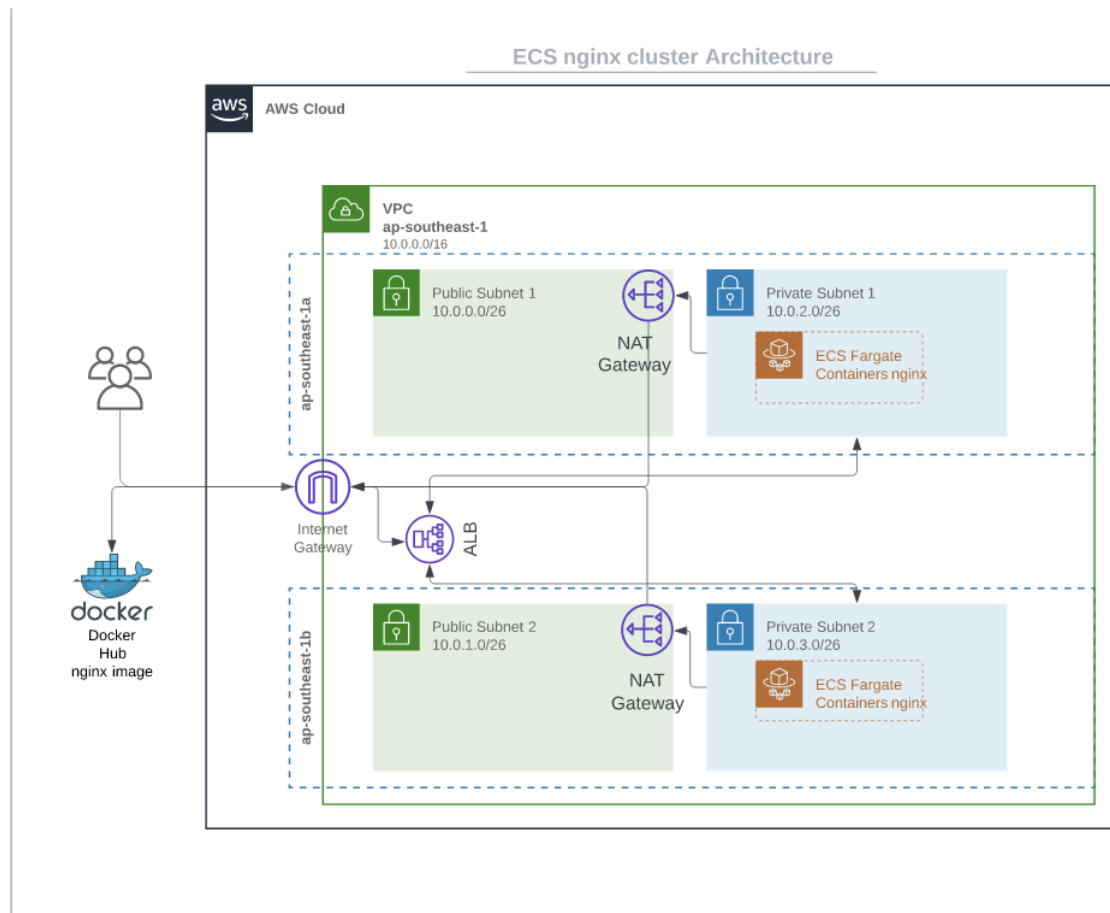
How I Implement The Assignment

- First I read the documentation about ECS Cluster at
  https://docs.aws.amazon.com/AmazonECS/latest/developerguide/clusters.html
- Then, I tried to find terraform resources related to ECS cluster at
  https://registry.terraform.io/providers/hashicorp/aws/latest/docs/resources/ecs_account_setting_default
- Finally, I implement all the required AWS components. For me, the simplest to
  implement was AWS networking, then ECS related stuff.

Difficulties encountered

The difficulties mainly come when I integrate ECS components with the networking components. Turns out I missed a couple configuration in networking components, initially ECS cannot pull nginx images from Docker Hub, after I fixed NAT and Subnet configurations, the service successfully pulled the image.

How to test the cluster is working

By doing HTTP Request to load balancer hostname:

Example Request:

Request
curl http://tf-lb-2022120805381485630000005-1397205297.ap-southeast-1.elb.amazonaws.com/Provisioning nginx ECS Cluster - Report 13519165 (1)
Response
<!DOCTYPE html> <html> <head> <title>Welcome to nginx!</title> <style> html { color-scheme: light dark; } body { width: 35em; margin: 0 auto; font-family: Tahoma, Verdana, Arial, sans-serif; } </style> </head> <body> Welcome to nginx!   If you see this page, the nginx web server is successfully installed and working. Further configuration is required.   For online documentation and support please refer to nginx.org. Commercial support is available at nginx.com.   Thank you for using nginx. </body> </html>

What I have learned

I learned a lot, especially about AWS Networking stuff such as VPC, Subnet, Load Balancer. I also learned about ECS and how to integrate it with AWS Networking components so ECS Task is able to reach the internet.

BONUS

How do I Implement the autoscaling
- First I create a role with policy for auto scaling service so the service will have authorization to adjust the desired count of ecs tasks
- Then, I setup the policy, in this policy I defined the metrics for ALBRequestCountPerTarget that's 10 request i.e. load balancer requests per target count

How do I test it

I use a tools named Apache Benchmark

```
→  pat git:(master) × ab -n 100000 -c 50 http://ecs-alb-1785620585.ap-southeast-1.elb.amazonaws.com/
This is ApacheBench, Version 2.3 <$Revision: 1879490 $>
Copyright 1996 Adam Twiss, Zeus Technology Ltd, http://www.zeustech.net/
Licensed to The Apache Software Foundation, http://www.apache.org/

Benchmarking ecs-alb-1785620585.ap-southeast-1.elb.amazonaws.com (be patient)
apr_socket_recv: Operation timed out (60)
Total of 2950 requests completed
```

I sent 100k requests with 50 concurrent requests.

After that, you can see the number of ECS tasks has been adjusted to 10. Initially the number of tasks is 1.

Initial state

Get a detailed view of the resources on your cluster.

Cluster ARN	arn:aws:ecs:ap-southeast-1:292739643281:cluster/main
Status	ACTIVE
Registered container instances	0
Pending tasks count	0 Fargate, 0 EC2, 0 External
Running tasks count	10 Fargate, 0 EC2, 0 External
Active service count	1 Fargate, 0 EC2, 0 External
Draining service count	0 Fargate, 0 EC2, 0 External

Services   **Tasks**   ECS Instances   Metrics   Scheduled Tasks   Tags   Capacity Providers

[Run new Task] [Stop] [Stop All] [Actions ▾]   Last updated on December 14, 2022 1:07:29 PM (0m ago)

Desired task status: (Running) Stopped

▼ Filter in this page   Launch type ALL ▾   ‹ 1-1 ›   Page size 50 ▾

	Task	Task definit...	Container i...	Last status...	Desired sta...	Started at ...	Started By ...	Group	Launch typ...	Platform ve...
	5977d51a35...	nginx-servic...	--	RUNNING	RUNNING	2022-12-14 ...	ecs-svc/591...	service:ngin...	FARGATE	1.4.0

After applying benchmark (Wait several minutes for the alarms to be triggered)

Cluster : main

Get a detailed view of the resources on your cluster.

<div align="right">

Update Cluster   Delete Cluster

</div>

Cluster ARN	arn:aws:ecs:ap-southeast-1:292739643281:cluster/main
Status	ACTIVE
Registered container instances	0
Pending tasks count	0 Fargate, 0 EC2, 0 External
Running tasks count	1 Fargate, 0 EC2, 0 External
Active service count	1 Fargate, 0 EC2, 0 External
Draining service count	0 Fargate, 0 EC2, 0 External

Services   **Tasks**   ECS Instances   Metrics   Scheduled Tasks   Tags   Capacity Providers

Run new Task   Stop   Stop All   Actions ▾

Last updated on December 14, 2022 1:20:06 PM (0m ago)

Desired task status: Running   Stopped

▼ Filter in this page   **Launch type** ALL ▾   ‹ **1-10** › Page size 50 ▾

	Task	Task definition	Container instance	Last status	Desired status	Started at	Started By	Group	Launch type	Platform version
☐	0a57142a5f9e4f0ba454…	nginx-service:14	--	RUNNING	RUNNING	2022-12-14 13:19:36 +…	ecs-svc/591399291691…	service:nginx-service	FARGATE	1.4.0
☐	30319dd57a8f43d8899…	nginx-service:14	--	RUNNING	RUNNING	2022-12-14 13:19:36 +…	ecs-svc/591399291691…	service:nginx-service	FARGATE	1.4.0
☐	5570a44e255a4ed3b1f…	nginx-service:14	--	RUNNING	RUNNING	2022-12-14 13:19:35 +…	ecs-svc/591399291691…	service:nginx-service	FARGATE	1.4.0
☐	5977d51a35654fd4938…	nginx-service:14	--	RUNNING	RUNNING	2022-12-14 12:34:46 +…	ecs-svc/591399291691…	service:nginx-service	FARGATE	1.4.0
☐	6383bf31dfd74452ab0…	nginx-service:14	--	RUNNING	RUNNING	2022-12-14 13:19:40 +…	ecs-svc/591399291691…	service:nginx-service	FARGATE	1.4.0
☐	9e20c12b89614b799cb…	nginx-service:14	--	RUNNING	RUNNING	2022-12-14 13:19:37 +…	ecs-svc/591399291691…	service:nginx-service	FARGATE	1.4.0
☐	d65128163b2e474fba8…	nginx-service:14	--	RUNNING	RUNNING	2022-12-14 13:19:37 +…	ecs-svc/591399291691…	service:nginx-service	FARGATE	1.4.0
☐	e4df45ae07eb4dda829f…	nginx-service:14	--	RUNNING	RUNNING	2022-12-14 13:19:37 +…	ecs-svc/591399291691…	service:nginx-service	FARGATE	1.4.0
☐	f3e12d1db3b143a9aa4…	nginx-service:14	--	RUNNING	RUNNING	2022-12-14 13:19:35 +…	ecs-svc/591399291691…	service:nginx-service	FARGATE	1.4.0
☐	f688b22be6bd46c5b12…	nginx-service:14	--	RUNNING	RUNNING	2022-12-14 13:19:36 +…	ecs-svc/591399291691…	service:nginx-service	FARGATE	1.4.0