**1. Network: VPC, subnets, routes, NAT**

**1.1. Create VPC**

- VPC – Your VPCs – Create VPC

Name: Forum-Service

Ipv4 CIDR: 10.0.0.0/16

other – default

Create VPC

Action – Edit VPC settings

Enable DNS resolution, Enable DNS hostnames

Save

**1.2. Create Subnets**

Public

- Subnets – Create Subnet

Subnet name: PublicForumSubnet1, Availibility Zone: us-east1-a, CIDR: 10.0.1.0/24

- Subnets – Create Subnet

Subnet name: PublicForumSubnet2, Availibility Zone: us-east1-b, CIDR: 10.0.2.0/24

Private

- Subnets – Create Subnet

Subnet name: PrivateForumSubnet1, Availibility Zone: us-east1-a, CIDR: 10.0.3.0/24

- Subnets – Create Subnet

Subnet name: PrivateForumSubnet2, Availibility Zone: us-east1-b, CIDR: 10.0.4.0/24

**1.3. Create Internet Gateway**

- VPC – Internet gateway – Create Internet gateway

Name: Forum-IGW – Create

Action – Attach to VPC: Forum-VPC

**1.4. Create Route Table**

Public Route Table:

- Create Route Table: Public-Forum-RT, VPC: Forum-VPC – Create

- Routes – Edit Routes – Add route – 0.0.0.0/0 – Internet Gateway – Forum-IGW – Save changes

- Actions Edit subnet association – Associate: PublicForumSubnet1, PublicForumSubnet2

Private Route Table:

- Create Route Table: Private-Forum-RT, VPC: Forum-VPC – Create

- Actions Edit subnet association – Associate: PrivateForumSubnet1, PrivateForumSubnet2

... see below

**1.5. Create NAT Gateway**

- Elastic Ips – Allocate Elastic IP address – us-east-1 – allocate

- NAT Gateways – Create NAT Gateway – Subnet: PublicForumSubnet1, Elastic IP: see above – Create NAT Gateway

- Route Tables – Private-Forum-RT – Edit Routes – Add route – 0.0.0.0/0 – NAT Gateway

**2. Cloud Map**

**2.1. Create Cloud Map**

Cloud Map – Create namespace

Name: forum.local

check API calls and DNS queries in VPC, VPC: Forum-VPC, TTL: 60

Create

**3. Security Groups**

**EC2 – Security Groups**

**3.1. frontend-alb-sg**

choice Forum-VPC

Inbound: Type HTTP – Port 80 – source: 0.0.0.0/0

Outbound: All traffic

**3.2. frontend-tasks-sg**

choice Forum-VPC

Inbound: Type HTTP – Port 80 – source: frontend-alb-sg

Outbound: All traffic

**3.3. backend-tasks-sg**

choice Forum-VPC

Inbound: Type HTTP – Port 8080 – source: frontend-tasks-sg

Outbound: All traffic

**4. Systems Manager**

**4.1. Parameter Store**

Systems Manager – Parameter Store – Create Parameter

Name: /backend/forum/MONGODB\_USER

Type: SecureString

**5. Task Definition**

**5.1. backend-task**

ECS – Task Definitions – Create new task definition

Launch type: Fargate

OS: Linux

Network mode: awsvpc

CPU: 1vCPU

Memory: 2Gb

Port: 8080

Container name: backend, Image: ECR forum image url

Environment variables: valueFrom: Systems Manager Parameter Store arn

**5.2. frontends-task**

ECS – Task Definitions – Create new task definition

Launch type: Fargate

OS: Linux

Network mode: awsvpc

CPU: 1vCPU

Memory: 2Gb

Container name: frontend, Image: ECR forum image url

**6. Application Load Balancer**

**6.1. EC2 – Load Balancers – Create**

Application Load Balancer – Create

Load balancer name: frontend-alb

Scheme: Internet-facing

VPC: Forum-VPC

Availibility Zones and subnets – us-east1-1a – PublicForumSubnet1

- us-east1-1b – PublicForumSubnet2

Security Groups: frontend-alb-sg

Listeners and routing: HTTP:80

Select target group: frontend-tg

Create

Target Group – Create

Choose a target type: IP addresses

Target group name: frontend-tg

Protocol, Port: HTTP:80

**7. ECS Cluster**

**7.1. Create Cluster**

ECS – Clusters – Create cluster

Cluster name: Forum-Cluster

Choose checkbox: AWS Fargate

Create

**8. ECS Services**

**8.1. Create backend-service**

IAM – Roles – ecsTaskExecutionRole

Add permissions: [AmazonSSMReadOnlyAccess](https://us-east-1.console.aws.amazon.com/iam/home?region=us-east-1" \l "/policies/details/arn%3Aaws%3Aiam%3A%3Aaws%3Apolicy%2FAmazonSSMReadOnlyAccess)

ECS – Clusters – Forum-Cluster – Services - Create

Task definition family: backend-task

Task definition revision: Latest

Service name: backend-service

Launch type: Fargate

Desired task: 1 (recomended min 2)

Networking

VPC: Forum-VPC

Subnets: ForumPrivateSubnet1, ForumPrivateSubnet2

Security group: backend-tasks-sg

Public IP: Turned off

Service discovery

Choose checkbox: Use service discovery

Select an existing namespace: forum.local

Create a new service discovery service – Service discovery name: backend

Create

**8.2. Create frontend-service**

ECS – Clusters – Forum-Cluster – Services - Create

Task definition family: frontend-task

Task definition revision: Latest

Service name: frontend-service

Launch type: Fargate

Desired task: 1 (recomended min 2)

Networking

VPC: Forum-VPC

Subnets: ForumPublicSubnet1, ForumPublicSubnet2

Security group: frontend-tasks-sg

Public IP: Turned on

Load Balancing

Choose checkbox: Use load balancing

Load balancer type: Application Load Balancer

Container: frontend 80:80

Application load balancer: frontend-alb

Listener – Use an existing listener: HTTP:80

Target group – Use an existing target group: frontend-tg

Create

[http://frontend-alb-716282465.us-east-1.elb.amazonaws.com](http://frontend-alb-716282465.us-east-1.elb.amazonaws.com/)

**9. Auto Scaling**

**9.1. Backend Auto Scaling**

ECS – Clusters – Forum-Cluster – backend-service – Service auto scaling

Set the number of tasks - Use service auto scaling to adjust your service's desired task count

Min: 2 Max: 4 – Save

Scaling policy – Create scaling policy

Choose Target Tracking

Policy name: Target Tracking

Metric type: ECSServiceAverageCPUUtilization – 75%

create