

Small Project 3

Membangun Infrastruktur
Berbasis Container Orchestration

by Faisal



Background

Overview of the project

Sebuah prusahaan startup bernama Macross, perusahaan tersebut akan memigrasikan layanan yang mereka miliki menjadi container base dengan mengintegrasikan ke layanan AWS. Tadinya mereka memiliki 2 server yaitu staging dan production dengan tiga aplikasi yaitu sosial media website company, dan blog documentation berbasis wordpress. Mereka berencana memindahkan semua service ke kubernetes.



Requirement of the Project

KOPS dan Kubectl

Tools yang digunakan untuk melakukan managemen kluster kubernetes

MACROSS IT SERVICE

EC2

Sebagai instance/VM node master dan worker kluster

S3

Menggunakan service S3 sebagai data konfigurasi cluster dan lainnya

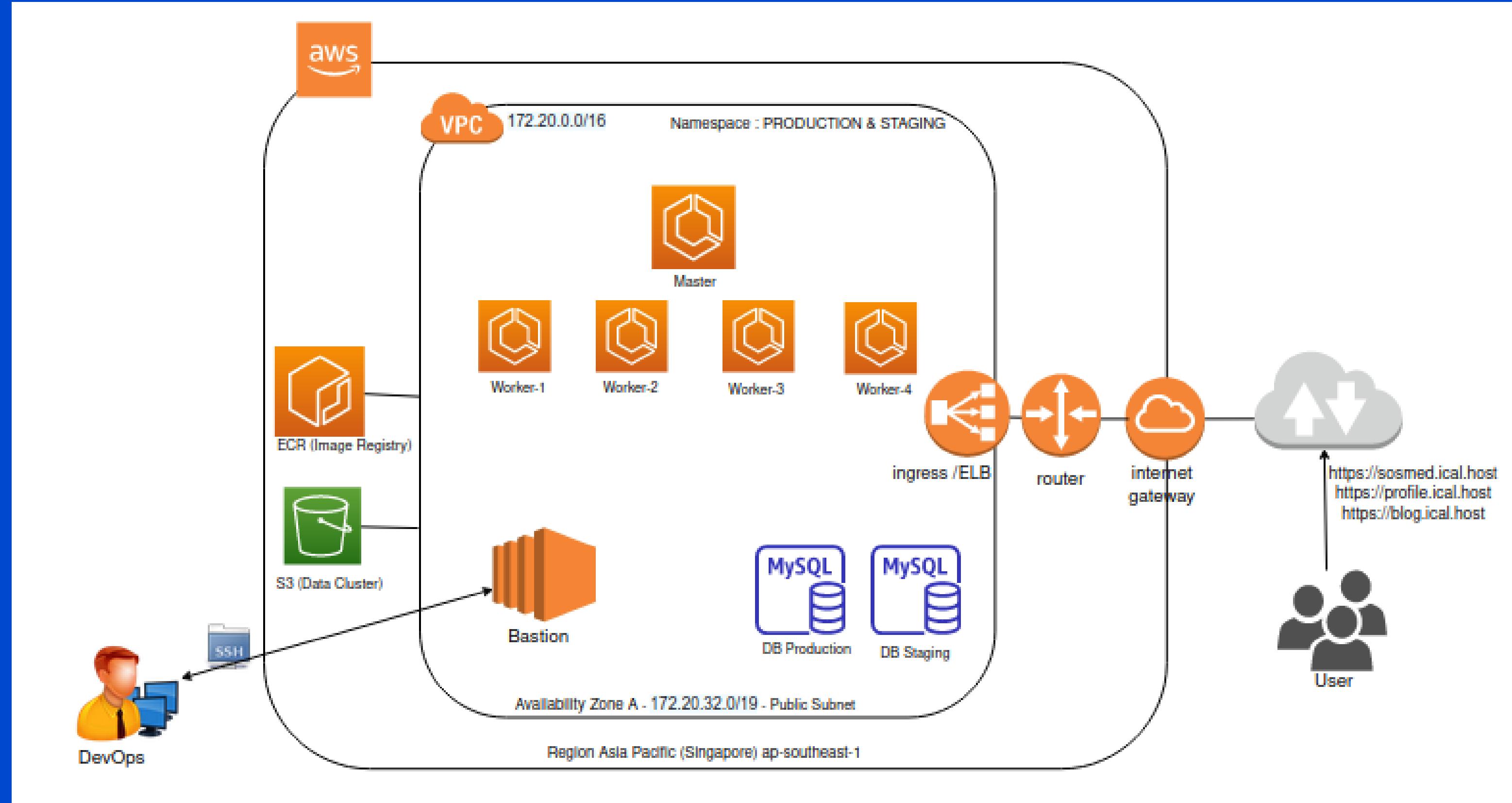
RDS

Menentukan service database yang akan digunakan untuk, seperti MySQL,

ECR

Sebagai repository penyimpanan image aplikasi

Infrastructur Topology



Budgeting

Services	Type / Specification	Estimate (per month)	Count	Total (USD)
EC2 (Node Worker)	t2.micro, Memory 1GB , 1 vCPUs EBS SSD 20GB Operating System Linux	4,155	4	16,62
EC2 (Node Master)	t2.medium, Memory 4GB , 2 vCPUs 1 EBS SSD 20GB Operating System Linux	88,62	1	88,62
S3	S3 Standard 10GB, with calculate data transfer 100GB	17,53	1	17,53
RDS For MySQL	db.t3.micro, Memory 1GB, vCPUs2	19,105	2	38,21
Elastic Load Balancer	Process Data (20GB)	20,65	1	20,65
Elastic Container Registry	Outbound & Inbound: Internet (20GB)	5,07	3	15,21
Data Transfer	Outbound & Inbound: Internet (20GB)	18,21	1	18,21
Route 53	Hosted Zone 1	1,1	1	1,1
(Normal Condition)	SUBTOTAL (per month)			216,15
	TOTAL (per 3 months)			648,45
(High Traffic Condition)	SUBTOTAL (per month)		x 3	648,45
	TOTAL (per 3 months)			1945,35

Provisioning Cluster

initializing variable

```
export bucket_name=macross-prod  
export KOPS_CLUSTER_NAME=macross.ical.host  
export KOPS_STATE_STORE=s3://${bucket_name}
```

create cluster

```
kops create cluster --zones=ap-southeast-1a --node-count=4 --master-count=1 --node-size=t2.micro  
--master-size=t2.medium --name=${KOPS_CLUSTER_NAME} --ssh-public-key=~/.ssh/id_rsa.pub  
  
kops update cluster --name ${KOPS_CLUSTER_NAME} --yes --admin  
  
kops validate cluster  
  
kops delete cluster --name ${KOPS_CLUSTER_NAME} --yes
```

result

```
root@bastion:~# kubectl get nodes;  
NAME STATUS ROLES AGE VERSION  
ip-172-20-38-184.ap-southeast-1.compute.internal Ready node 4h10m v1.19.7  
ip-172-20-48-205.ap-southeast-1.compute.internal Ready node 4h8m v1.19.7  
ip-172-20-56-205.ap-southeast-1.compute.internal Ready node 4h7m v1.19.7  
ip-172-20-56-80.ap-southeast-1.compute.internal Ready master 4h18m v1.19.7  
ip-172-20-61-244.ap-southeast-1.compute.internal Ready node 4h10m v1.19.7
```



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Images Repositories

Push commands for macross-sosmed

Started with Amazon ECR.

Use the following steps to authenticate and push an image to your repository. For additional registry authentication methods, including the Amazon ECR credential helper, see [Registry Authentication](#).

1. Retrieve an authentication token and authenticate your Docker client to your registry.

Use the AWS CLI:

```
aws ecr get-login-password --region ap-southeast-1 | docker login --username AWS --password-stdin
```

Note: If you receive an error using the AWS CLI, make sure that you have the latest version of the AWS CLI and Docker installed.

2. Build your Docker image using the following command. For information on building a Docker file from scratch see the instructions [here](#). You can skip this step if your image is already built:

```
docker build -t macross-sosmed .
```

3. After the build completes, tag your image so you can push the image to this repository:

```
docker tag macross-sosmed:latest 768876311475.dkr.ecr.ap-southeast-1.amazonaws.com/macross-sosmed:latest
```

4. Run the following command to push this image to your newly created AWS repository:

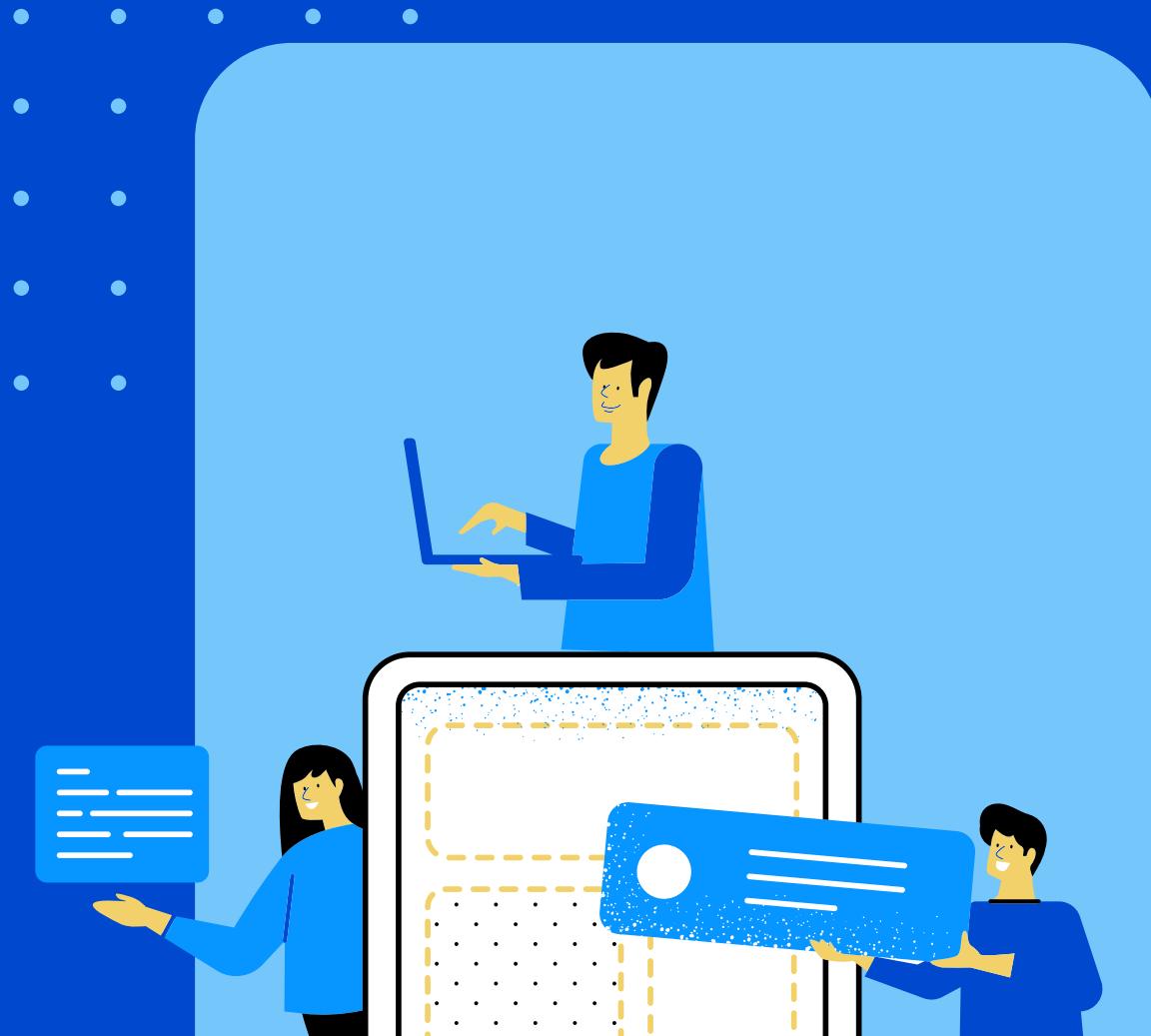
```
docker push 768876311475.dkr.ecr.ap-southeast-1.amazonaws.com/macross-sosmed:latest
```

Amazon ECR

Repositories

Registries

Public gallery



ECR > Repositories

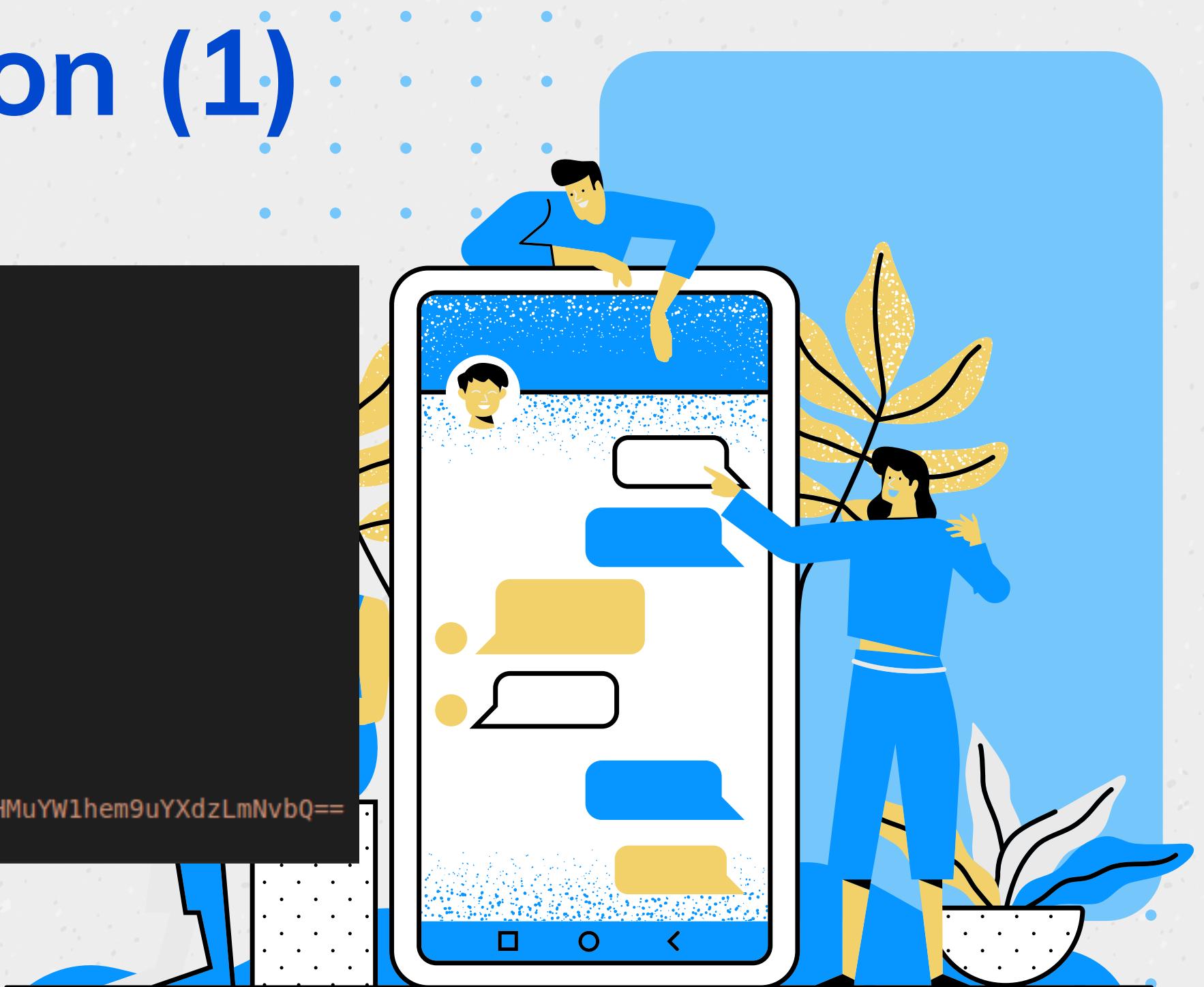
Private Public

Private repositories (3)

Repository name	URI	Created at	Tag immutability	Scan on push	Encryption type
macross-blog	768876311475.dkr.ecr.ap-southeast-1.amazonaws.com/macross-blog	Feb 21, 2021 02:58:08 AM	Disabled	Disabled	AES-256
macross-sosmed	768876311475.dkr.ecr.ap-southeast-1.amazonaws.com/macross-sosmed	Feb 20, 2021 11:52:56 PM	Disabled	Disabled	AES-256
macross-webprofile	768876311475.dkr.ecr.ap-southeast-1.amazonaws.com/macross-webprofile	Feb 20, 2021 07:30:56 PM	Disabled	Disabled	AES-256

Deployment Application (1)

```
sosmed > ! namespace-secret-sosmed.yml > ...
1  apiVersion: v1
2  kind: Namespace
3  metadata:
4    name: sosmed
5  ---
6  apiVersion: v1
7  kind: Secret
8  metadata:
9    name: secretsosmed
10   namespace: sosmed
11   type: Opaque
12   data:
13     DB_USER: YWRtaW4=
14     DB_PASS: YWRtaW4xMjM0NQ==
15     DB_HOST: bWFjcm9zcylzdGFnaW5nLmMzMnJ4emRlazdtZy5hcC1zb3V0aGVhc3QtMS5yZHMuYW1hem9uYXdzLmNvbQ==
16     DB_NAME: ZGJzb3NtZWQ=
```

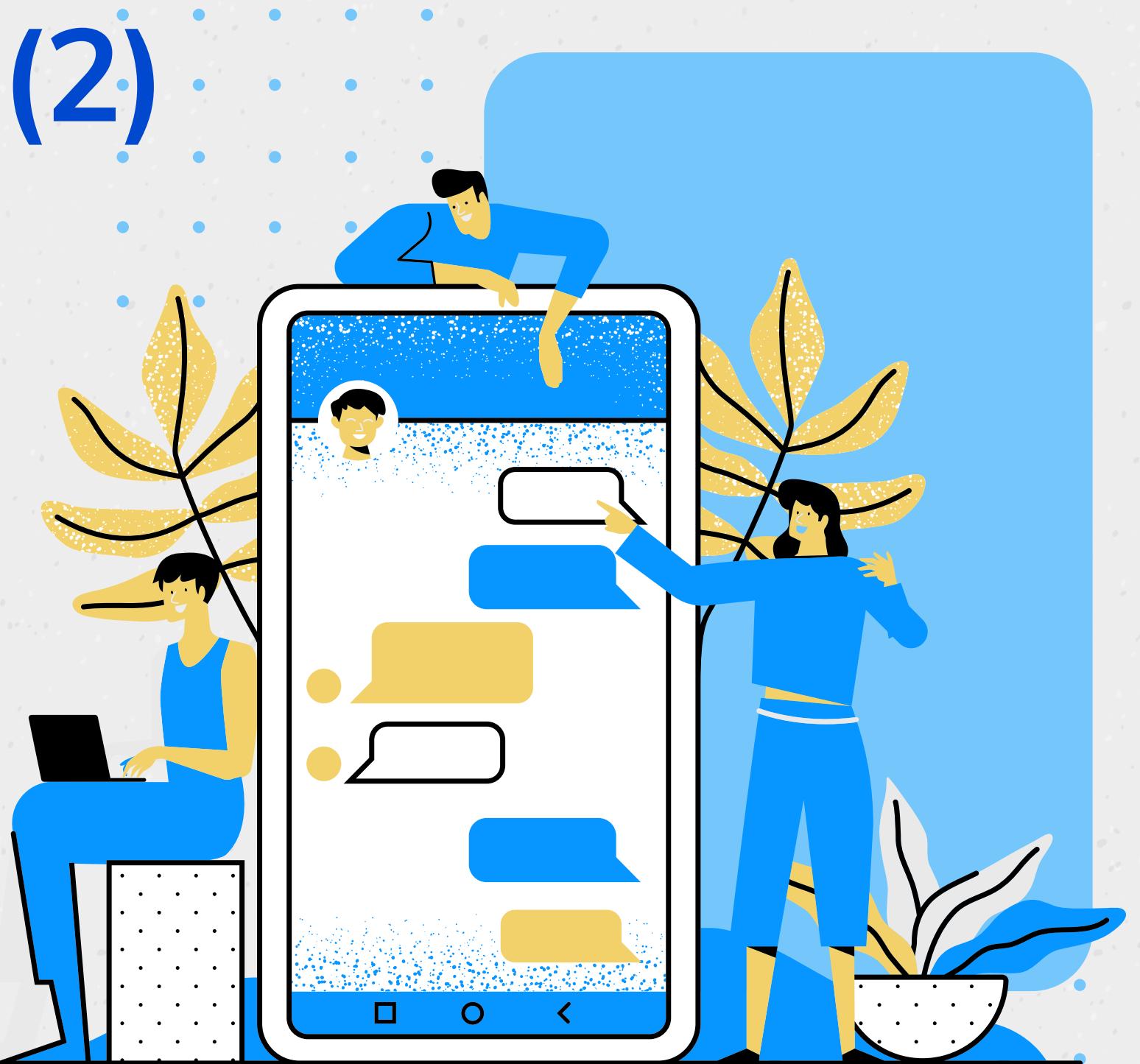


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Deployment Application (2)

```
sosmed > ! cert-issuer-sosmed.yaml > apiVersion
1   apiVersion: cert-manager.io/v1alpha2
2   kind: ClusterIssuer
3   metadata:
4     name: letsencrypt-sosmed
5     namespace: cert-manager
6   spec:
7     acme:
8       # The ACME server URL
9       server: https://acme-v02.api.letsencrypt.org/directory
10      # Email address used for ACME registration
11      email: uangkoin.100@gmail.com
12      # Name of a secret used to store the ACME account private key
13      privateKeySecretRef:
14        name: letsencrypt-sosmed
15      # Enable the HTTP-01 challenge provider
16      solvers:
17        - http01:
18          ingress:
19            class: nginx
```



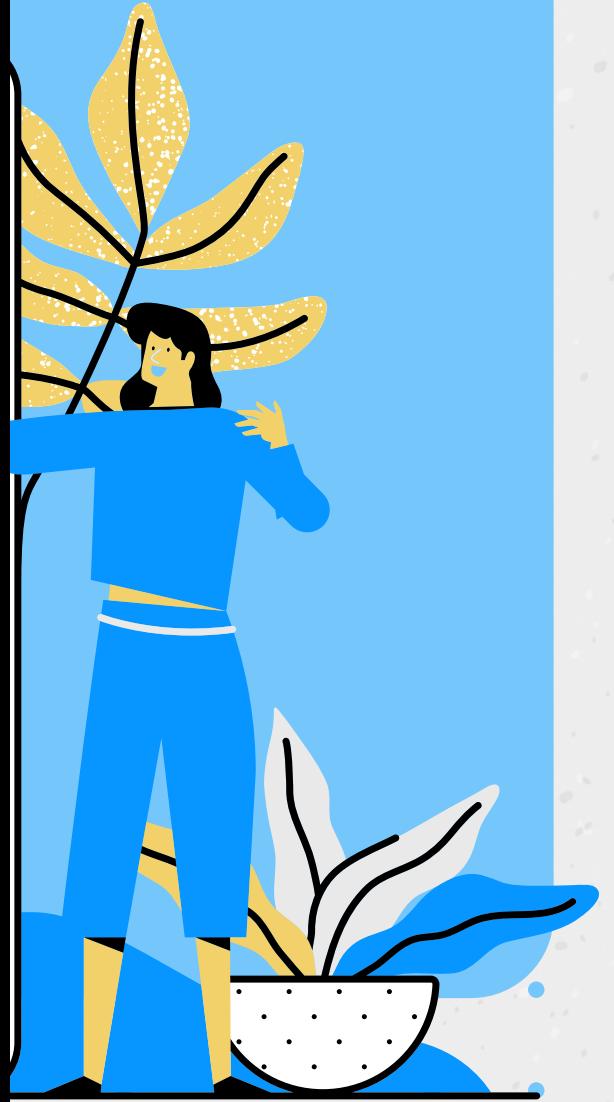
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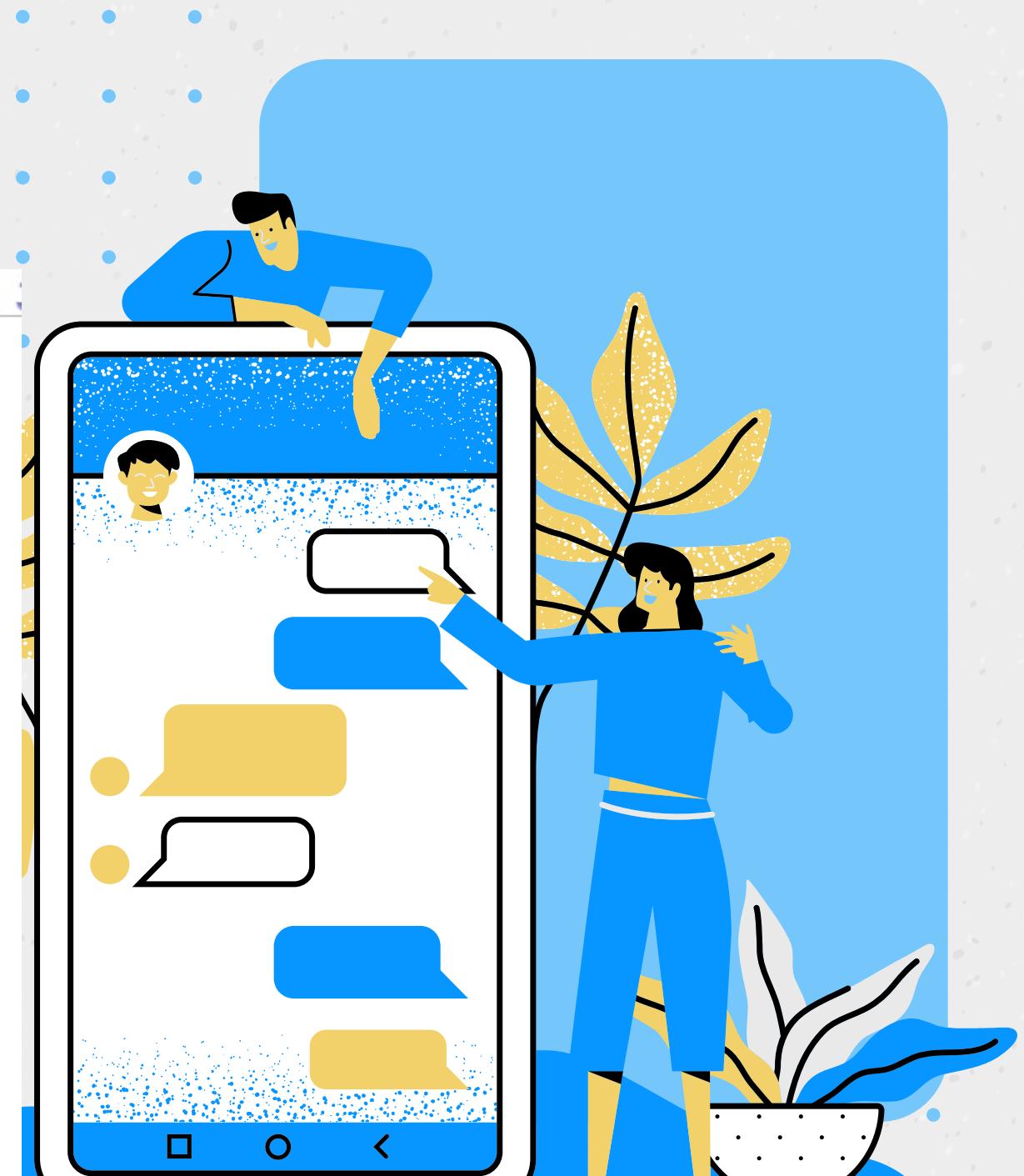
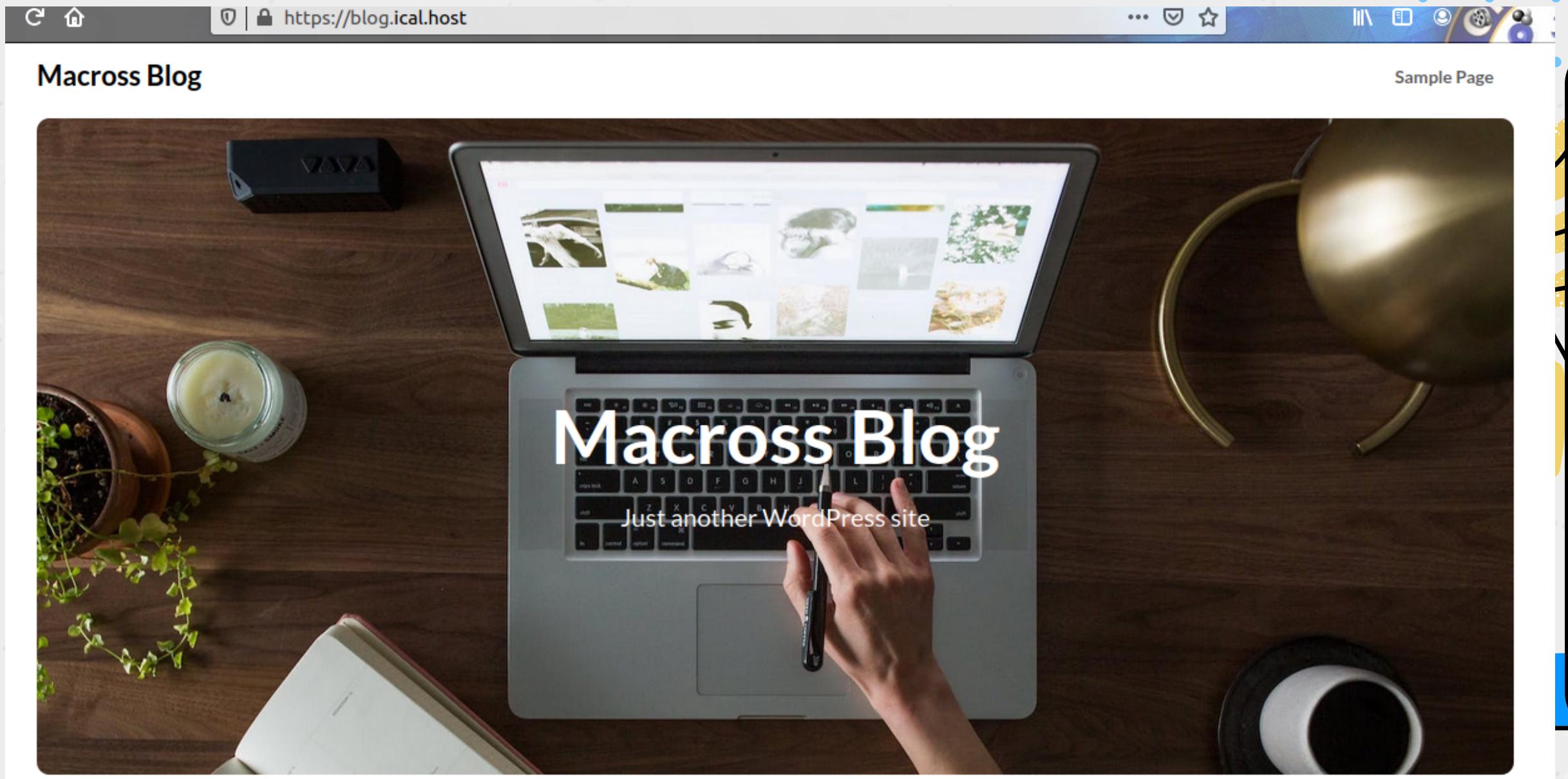
Deployment Application (3)

```
apiVersion: apps/v1
kind: Deployment
metadata:
  name: sosmed-testing
  namespace: testing-sosmed
spec:
  replicas: 1
  selector:
    matchLabels:
      name: sosmed-testing
      metadata: sosmed-testing
  template:
    metadata:
      labels:
        name: sosmed-testing
        metadata: sosmed-testing
    spec:
      containers:
        - name: sosmed-testing
          image: 768876311475.dkr.ecr.ap-southeast-1.amazonaws.com/macross-sosmed:latest
          ports:
            - containerPort: 80
          env:
            - name: DB_USER
              valueFrom:
                secretKeyRef:
                  name: secretsosmed
                  key: DB_USER
            - name: DB_PASS
              valueFrom:
                secretKeyRef:
                  name: secretsosmed
                  key: DB_PASS
            - name: DB_HOST
              valueFrom:
                secretKeyRef:
                  name: secretsosmed
                  key: DB_HOST
            - name: DB_NAME
              valueFrom:
                secretKeyRef:
                  name: secretsosmed
                  key: DB_NAME
```

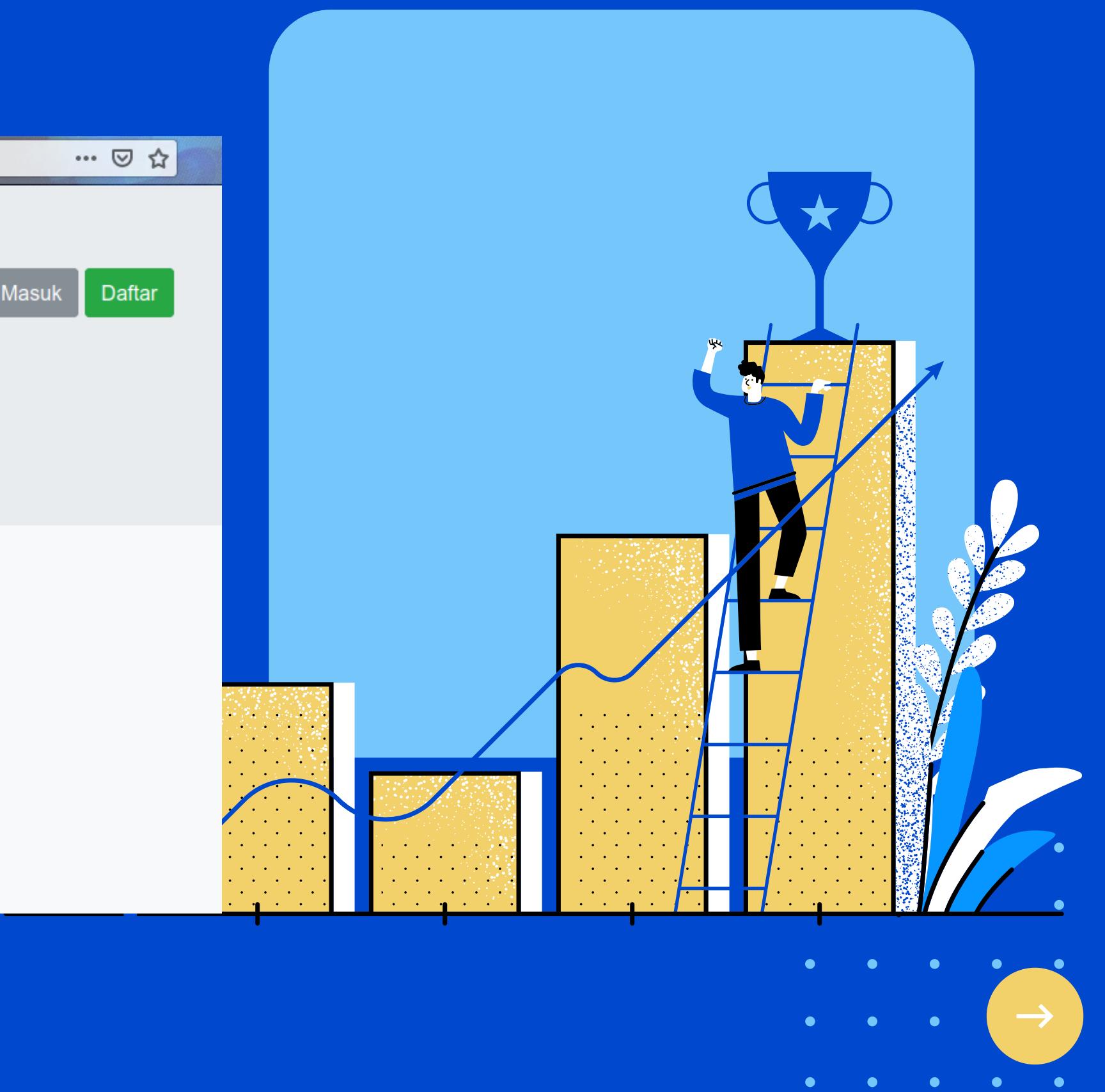
```
apiVersion: v1
kind: Service
metadata:
  name: sosmed-testing
  namespace: testing-sosmed
spec:
  type: LoadBalancer
  ports:
    - port: 80
      nodePort: 30080
  selector:
    name: sosmed-testing
---
apiVersion: networking.k8s.io/v1beta1
kind: Ingress
metadata:
  name: sosmed-tls-ingress
  namespace: testing-sosmed
  annotations:
    kubernetes.io/ingress.class: "nginx"
    cert-manager.io/acme-challenge-type: "http01"
    cert-manager.io/cluster-issuer: "letsencrypt-sosmed-testing"
spec:
  tls:
    - hosts:
        - sosmed-testing.ical.host
      secretName: sosmed-testing-tls
  rules:
    - host: sosmed-testing.ical.host
      http:
        paths:
          - backend:
              serviceName: sosmed-testing
              servicePort: 80
              path: /
```



<https://blog.ical.host>



<https://sosmed.ical.host>



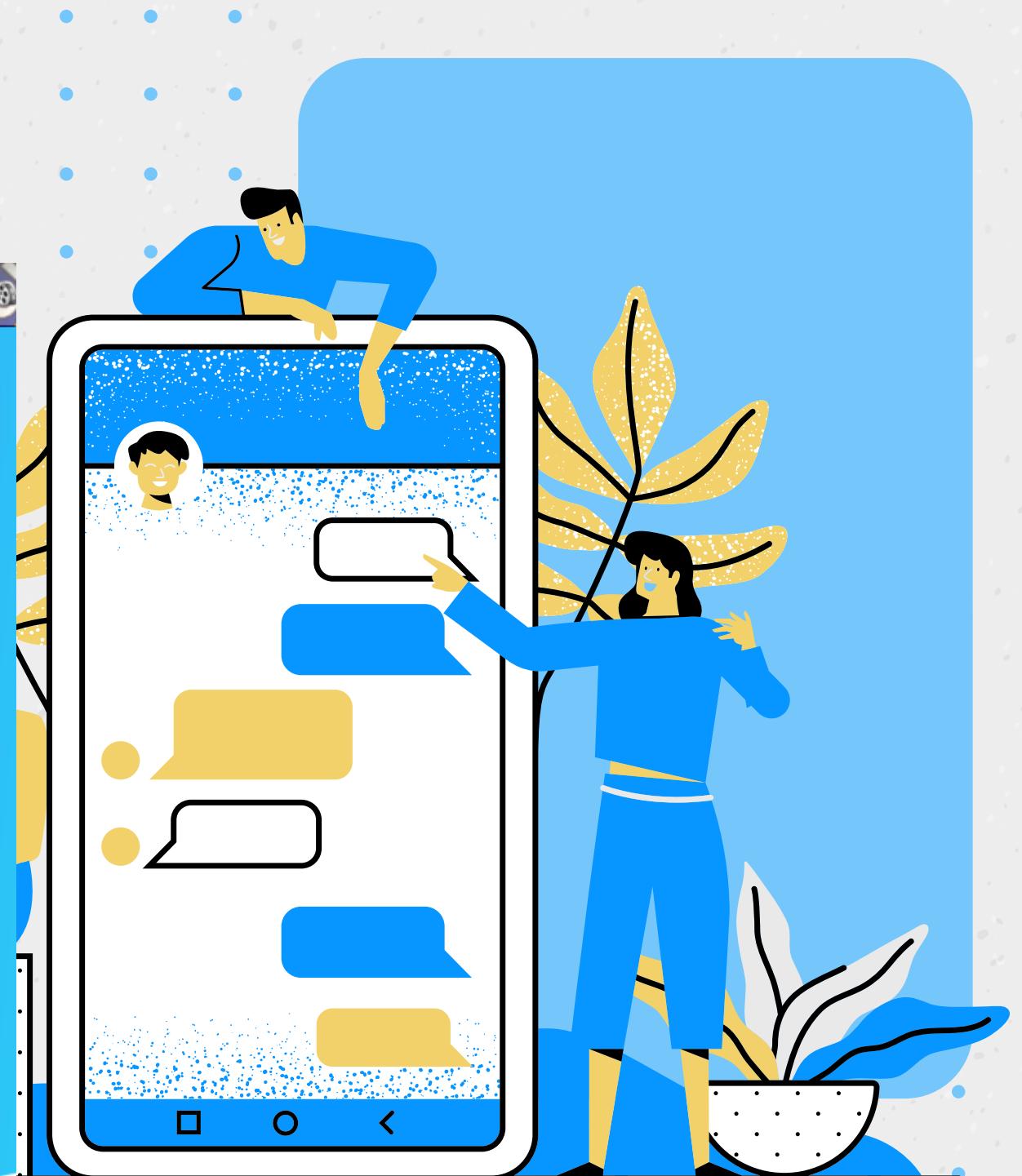
<https://profile.ical.host>

The screenshot shows the homepage of the Macross IT Services website. The header features a logo with a green 'M' icon followed by the word 'Macross'. The navigation menu includes links for Home, About, Services (which is underlined), Showcase, Pricing, Team, Blog, and Contact, along with a 'DOWNLOAD' button. The main section has a large blue background image showing people interacting with large mobile devices displaying websites. Below this, a section titled 'Macross IT Services' describes their services as the best solution for website creation, mentioning professional design, support, and competitive pricing. It highlights features like 3 price plans, custom design, unlimited storage, SSL, SEO optimization, 24/7 support, a money-back guarantee, and documentation. Two call-to-action buttons at the bottom are 'GET STARTED' (green) and 'CONTACT US' (white).

Solusi terbaik untuk Anda yang mencari jasa pembuatan website profesional dengan support terbaik serta pilihan harga termurah. Tersedia berbagai pilihan website dengan 3 pilihan paket harga, bebas menentukan desain, kapasitas penyimpanan unlimited, gratis SSL, termasuk optimasi SEO, support 24 jam, garansi uang kembali dan mendapatkan dokumen panduan penggunaan website Anda.

GET STARTED

CONTACT US



Thank You!

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