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Section:

BCS-7A

Subject:

Cloud Computing

- **minikube start**

- This command is used to start a local Kubernetes cluster

```
|└o minikube start
  🎉 minikube v1.28.0 on Darwin 13.1 (arm64)
  ✨ Using the docker driver based on existing profile
  👍 Starting control plane node minikube in cluster minikube
  ⏺ Pulling base image ...
    > gcr.io/k8s-minikube/kicbase: 0 B [=====] ?% ? p/s 20s
  🚀 docker "minikube" container is missing, will recreate.
  🔥 Creating docker container (CPUs=2, Memory=6100MB) ...
  🛡️ Preparing Kubernetes v1.25.3 on Docker 20.10.20 ...
  🔍 Verifying Kubernetes components...
    ■ Using image gcr.io/k8s-minikube/storage-provisioner:v5
  ⭐ Enabled addons: storage-provisioner, default-storageclass
  🎉 Done! kubectl is now configured to use "minikube" cluster and "default" namespace by default
```

- **docker images**

- This command is used to list all the images that are available on the local system

```
|└→ docker images
REPOSITORY          TAG      IMAGE ID   CREATED        SIZE
tayyub-php-apache-environment latest   84e0fad47c4b  About an hour ago  443MB
mysql              latest   7b6f3978ca29  2 weeks ago   550MB
gcr.io/k8s-minikube/kicbase   v0.0.36  c87ac1e75807  2 months ago  1.02GB
phpmyadmin/phpmyadmin   latest   4a4023c7e22a  7 months ago  510MB
```

- **docker-compose ps**

- This command in Docker is used to list all the running containers for a particular Docker Compose application

```
|└[$] < docker-compose ps
      NAME            COMMAND           SERVICE          STATUS
      PORTS
db           "docker-entrypoint.s..." db             running
            33060/tcp, 0.0.0.0:8001->3306/tcp
php-apache   "docker-php-entrypoi..." php-apache-environment  running
            0.0.0.0:8000->80/tcp
tayyub-phpmyadmin-1 "/docker-entrypoint...." phpmyadmin       running
            0.0.0.0:8080->80/tcp
```

- **minikube image ls --format table**

- This command in the Minikube tool is used to list all the images that are available in the local Minikube environment

Image	Tag	Image ID	Size
registry.k8s.io/etcdb	3.5.4-0	8e041a3b0ba8b	179MB
registry.k8s.io/coredns/coredns	v1.9.3	b19406328e70d	47.7MB
k8s.gcr.io/pause	3.6	7d46a07936af9	484kB
registry.k8s.io/kube-apiserver	v1.25.3	12dd70322f973	123MB
registry.k8s.io/kube-scheduler	v1.25.3	13b15fc3e0938	49.3MB
registry.k8s.io/kube-controller-manager	v1.25.3	cf6c9e4e18a33	113MB
registry.k8s.io/pause	3.8	4e42fb3c9d90e	514kB
registry.k8s.io/kube-proxy	v1.25.3	bcc74496abfdb	58MB
gcr.io/k8s-minikube/storage-provisioner	v5	ba04bb24b9575	29MB

- **minikube docker-env**

- This command in the Minikube tool is used to output the necessary environment variables that you can use to connect your local Docker client to the Minikube Docker daemon.
- It's just for confirmation that minikube is working

```
[└[$] < minikube docker-env
export DOCKER_TLS_VERIFY="1"
export DOCKER_HOST="tcp://127.0.0.1:54033"
export DOCKER_CERT_PATH="/Users/ahmad/.minikube/certs"
export MINIKUBE_ACTIVE_DOCKERD="minikube"

# To point your shell to minikube's docker-daemon, run:
# eval $(minikube -p minikube docker-env)
[─[ahmad@Afzals-Air] - [~/Desktop/tayyub] - [Tue Dec 27, 10:20]
[└[$] < eval $(minikube -p minikube docker-env)
[─[ahmad@Afzals-Air] - [~/Desktop/tayyub] - [Tue Dec 27 10:20]
```

- **kubectl run first-container --image=Tayyub-php-apache-environment --image-pull-policy=Never --restart=Never**

- kubectl run is a command in the Kubernetes command-line tool that creates and runs a new deployment in the Kubernetes cluster
 1. The **first-container** argument specifies the name of the deployment to create
 2. The **--image** flag specifies the name of the Docker image to use for the deployment
 3. The **--image-pull-policy** flag specifies whether to pull the image from a registry if it is not present in the local image cache
 4. The **--restart** flag specifies the restart policy for the deployment

```
[└[$] < kubectl run first-container --image=tayyub-php-apache-environment --image-pull-policy=Never --restart=Never
pod/first-container created
```

- `kubectl run second-container --image=Tayyub-php-apache-envirnment --image-pull-policy=Never --restart=Never`

```
[ahmad@Afzals-Air] - [~/Desktop/tayyub] - [Tue Dec 27, 10:25]
└─[$] ↵ kubectl run second-container --image=tayyub-php-apache-envirnment --image-pull-policy=Never --restart=Never
pod/second-container created
└─[ahmad@Afzals-Air] - [~/Desktop/tayyub] - [Tue Dec 27, 10:25]
└─[$] ↵ kubectl logs second-container
AH00558: apache2: Could not reliably determine the server's fully qualified domain name, using 172.17.0.5. Set the 'ServerName' directive globally to suppress this message
AH00558: apache2: Could not reliably determine the server's fully qualified domain name, using 172.17.0.5. Set the 'ServerName' directive globally to suppress this message
[Tue Dec 27 09:25:42.176254 2022] [mpm_prefork:notice] [pid 1] AH00163: Apache/2.4.54 (Debian) PHP/8.0.26 configured -- resuming normal operations
[Tue Dec 27 09:25:42.176278 2022] [core:notice] [pid 1] AH00094: Command line: 'apache2 -D FOREGROUND'
```

- **Database**

The screenshot shows the phpMyAdmin interface for a MySQL database named 'company1'. The left sidebar lists databases: 'company1', 'information_schema', 'mysql', 'performance_schema', and 'sys'. The 'users' table under 'company1' is selected. The main panel displays the table structure with columns 'name' and 'fav_color'. A SQL query is shown above the table: `SELECT * FROM `users``. The table data is as follows:

name	fav_color
Lil Sneazy	Yellow
Nick Jonas	Brown
Maroon 5	Maroon
Tommy Baker	043A2B
John Doe	Blue

- Output

← → C ⌂ ⓘ localhost:8000

Users

Lil Sneazy

Favorite Color: Yellow



Nick Jonas

Favorite Color: Brown



Maroon 5

Favorite Color: Maroon



Tommy Baker

Favorite Color: 043A2B



- **minikube dashboard**

```
[└─[$] < minikube dashboard
  Enabling dashboard ...
    ■ Using image docker.io/kubernetesui/metrics-scraper:v1.0.8
    ■ Using image docker.io/kubernetesui/dashboard:v2.7.0
  ⚠ Some dashboard features require the metrics-server addon. To enable
  all features please run:

    minikube addons enable metrics-server

  🤔 Verifying dashboard health ...
  🚀 Launching proxy ...
  🤔 Verifying proxy health ...
  🌐 Opening http://127.0.0.1:54274/api/v1/namespaces/kubernetes-dashboard/services/http:kubernetes-dashboard:/proxy/ in your default browser...
```

- **output on Kubernetes GUI**

The screenshot shows the Kubernetes Dashboard interface at `http://127.0.0.1:54274/api/v1/namespaces/kubernetes-dashboard/services/http:kubernetes-dashboard:/proxy/#/workloads?namespace=default`. The top navigation bar includes a back button, forward button, refresh button, and a search bar. The main header is "Workloads". On the left, a sidebar lists various workload types: Cron Jobs, Daemon Sets, Deployments, Jobs, Pods, Replica Sets, Replication Controllers, Stateful Sets, and Services. Under "Services", it lists Ingresses, Ingress Classes, and Services. Under "Config and Storage", it lists Config Maps, Persistent Volume Claims, Secrets, and Storage Classes. The central area displays the "Workload Status" section, which shows a large green circle indicating "Running: 2" pods. Below this is a table titled "Pods" with the following data:

Name	Images	Labels	Node	Status	Restarts	CPU Usage (cores)	Memory Usage (bytes)	Created
second-container	tayyub-php-apache -environment	run: second-contai ner	minikube	Running	0	-	-	2 minutes ago
first-container	tayyub-php-apache -environment	run: first-contai ner	minikube	Running	0	-	-	5 minutes ago

Kubernetes Dashboard - Workloads > Pods > second-container

Metadata

Name	second-container	Namespace	default	Created	Dec 27, 2022	Age	3 minutes ago	UID	142f4bbd-09e5-410d-9259-cc21537819f5
Labels	run: second-container								

Resource information

Node	Status	IP	QoS Class	Restarts	Service Account
minikube	Running	172.17.0.5	BestEffort	0	default

Conditions

Type	Status	Last probe time	Last transition time	Reason	Message
Initialized	True	-	3 minutes ago	-	-
Ready	True	-	3 minutes ago	-	-
ContainersReady	True	-	3 minutes ago	-	-

Kubernetes Dashboard - Workloads > Pods > second-container

Events

second-container.17349c3bc01: Created	Created container second-container	kubelet minikube	spec.containers(second-container)	1	3 minutes ago	3 minutes ago
second-container.17349c3bc28r: Started	Started container second-container	kubelet minikube	spec.containers(second-container)	1	3 minutes ago	3 minutes ago
second-container.17349c3ba0bi: Scheduled	Successfully assigned default/second-container to minikube	-	-	0	3 minutes ago	3 minutes ago

Containers

second-container

Image: tayyub-php-apache-environment

Status

Ready	true	Started At	2022-12-27T09:25:42Z
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Mounts

Name	Read Only	Mount Path	Sub Path	Source Type	Source Name
kube-api-access-xgmv7	true	/var/run/secrets/kubernetes.io/serviceaccount	-	Projected	-