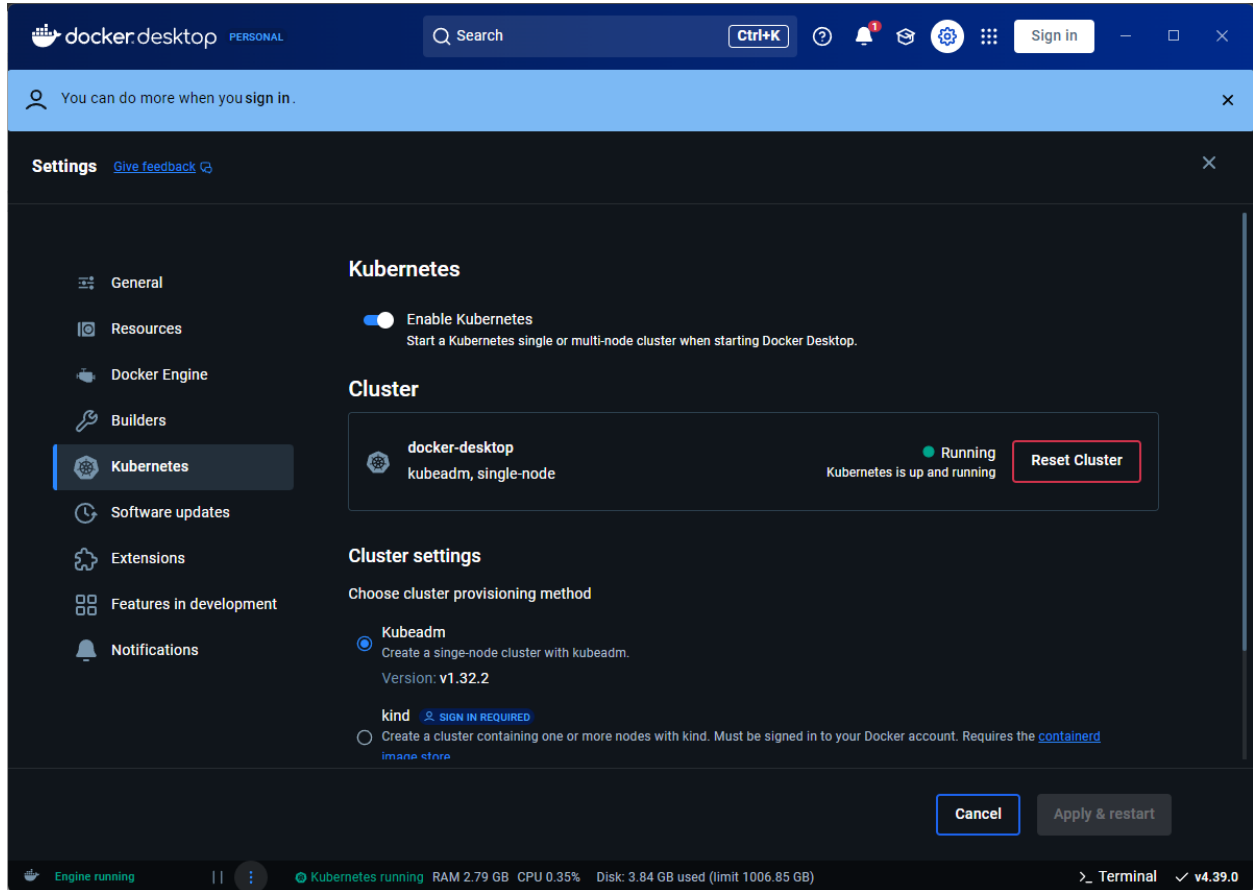


Exercise: การใช้งาน Kubernetes เบื้องต้น

ภาพหน้าจอที่แสดงว่า Kubernetes กำลังทำงานอยู่



ภาพหน้าจอนที่แสดงผลการรันคำสั่ง “minikube start”

```
Windows PowerShell
Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindows

PS C:\Users\LAB203_xx> kubectl config current-context
docker-desktop
PS C:\Users\LAB203_xx> minikube start
minikube v1.35.0 on Microsoft Windows 11 Education 10.0.22631.4391 Build 22631.4391
✨ Using the docker driver based on existing profile
👉 Starting "minikube" primary control-plane node in "minikube" cluster
🔄 Pulling base image v0.0.46 ...
🔧 docker "minikube" container is missing, will recreate.
🔥 Creating docker container (CPUs=2, Memory=4000MB) ...
❗ Failing to connect to https://registry.k8s.io/ from inside the minikube container
💡 To pull new external images, you may need to configure a proxy: https://minikube.sigs.k8s.io/docs/reference/networking/proxy/
🔄 Preparing Kubernetes v1.32.0 on Docker 27.4.1 ...
  ▪ Generating certificates and keys ...
  ▪ Booting up control plane ...
  ▪ Configuring RBAC rules ...
🔗 Configuring bridge CNI (Container Networking Interface) ...
🔍 Verifying Kubernetes components...
  ▪ Using image gcr.io/k8s-minikube/storage-provisioner:v5
  ▪ Using image docker.io/kubernetesui/dashboard:v2.7.0
  ▪ Using image docker.io/kubernetesui/metrics-scraper:v1.0.8
💡 Some dashboard features require the metrics-server addon. To enable all features please run:

    minikube addons enable metrics-server

🌟 Enabled addons: storage-provisioner, default-storageclass, dashboard
🏁 Done! kubectl is now configured to use "minikube" cluster and "default" namespace by default
PS C:\Users\LAB203_xx> |
```

ภาพหน้าจอที่แสดง Minikube Dashboard

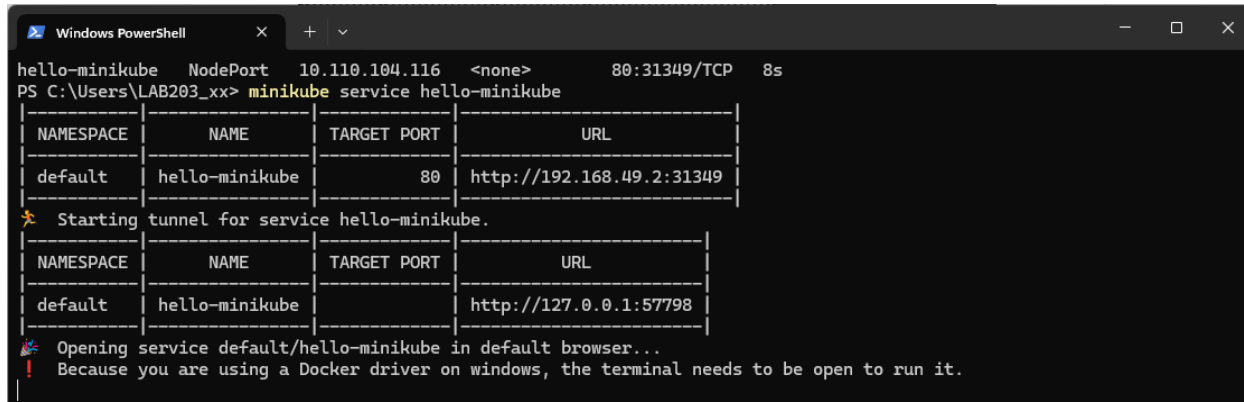
The screenshot displays the Minikube Dashboard web interface in a browser. The URL bar shows the dashboard's endpoint. The left sidebar contains navigation links for various Kubernetes resources. The main content area shows the 'Namespaces' page, which lists the following namespaces:

Name	Labels	Phase	Created
kubernetes-dashboard	addonmanager.kubernetes.io/mode: Reconcile kubernetes.io/metadata.name: kubernetes-dashboard	Active	14 minutes ago
default	kubernetes.io/minikube-addons: dashboard kubernetes.io/metadata.name: default	Active	14 minutes ago
kube-node-lease	kubernetes.io/metadata.name: kube-node-lease	Active	14 minutes ago
kube-public	kubernetes.io/metadata.name: kube-public	Active	14 minutes ago
kube-system	kubernetes.io/metadata.name: kube-system	Active	14 minutes ago

Overlaid on the bottom right is a Windows PowerShell terminal window with the following output:

```
minikube addons enable metrics-server
* Enabled addons: storage-provisioner, default-storageclass, dashboard
Done! kubectrl is now configured to use "minikube" cluster and "default" namespace by default
PS C:\Users\LAB283_xx> kubectrl get nodes
NAME          STATUS    ROLES    AGE   VERSION
minikube      Ready     control-plane  13m   v1.32.0
PS C:\Users\LAB283_xx> kubectrl get pods
No resources found in default namespace.
PS C:\Users\LAB283_xx> minikube dashboard
* Verifying dashboard health ...
* Launching proxy ...
* Verifying proxy health ...
* Opening http://127.0.0.1:57705/api/v1/namespaces/kubernetes-dashboard/services/http:kubernetes-dashboard:/proxy/ in your default browser...
```

ภาพหน้าจอที่แสดงผลการรันคำสั่ง “minikube service hello-minikube”



```
hello-minikube NodePort 10.110.104.116 <none> 80:31349/TCP 8s
PS C:\Users\LAB203_xx> minikube service hello-minikube
```

NAMESPACE	NAME	TARGET PORT	URL
default	hello-minikube	80	http://192.168.49.2:31349

🔥 Starting tunnel for service hello-minikube.

NAMESPACE	NAME	TARGET PORT	URL
default	hello-minikube		http://127.0.0.1:57798

🌐 Opening service default/hello-minikube in default browser...

! Because you are using a Docker driver on windows, the terminal needs to be open to run it.

ภาพหน้าจอที่แสดงผลการรันคำสั่ง “kubectl get pods”

```
PS C:\Users\LAB203_xx> kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
balanced-565f6795c7-5hxxkg         1/1     Running   0           2m28s
hello-minikube-6f695484-bdvpb8     1/1     Running   0           5m39s
PS C:\Users\LAB203_xx> |
```

ภาพหน้าจอที่แสดงผลการรันคำสั่ง “kubectl get nodes”

```
PS C:\Users\LAB203_xx> kubectl get nodes
NAME          STATUS    ROLES          AGE   VERSION
minikube      Ready     control-plane  22m   v1.32.0
PS C:\Users\LAB203_xx> |
```

ภาพหน้าจอที่แสดงผลการรันคำสั่ง “kubectl get namespaces”

```
PS C:\Users\LAB203_xx> kubectl get namespaces
NAME                STATUS    AGE
default             Active    24m
kube-node-lease     Active    24m
kube-public         Active    24m
kube-system         Active    24m
kubernetes-dashboard Active    23m
PS C:\Users\LAB203_xx> |
```

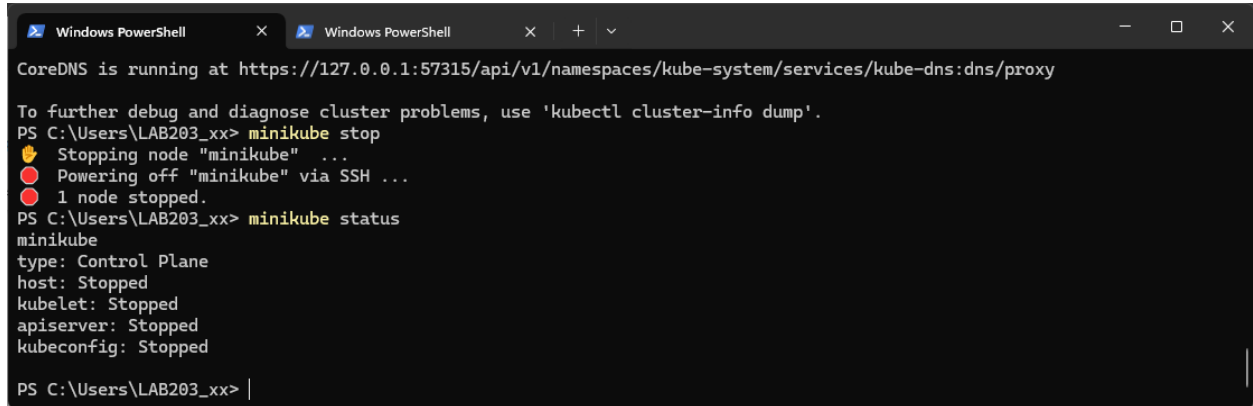
ภาพหน้าจอที่แสดงผลการรันคำสั่ง “kubectl get deployments”

```
PS C:\Users\LAB203_xx> kubectl get deployments
NAME                READY    UP-TO-DATE    AVAILABLE    AGE
balanced            1/1      1              1            7m8s
hello-minikube      1/1      1              1            10m
```

ภาพหน้าจอที่แสดงผลการรันคำสั่ง “kubectl get services”

```
PS C:\Users\LAB203_xx> kubectl get services
NAME                TYPE          CLUSTER-IP      EXTERNAL-IP      PORT(S)          AGE
balanced            LoadBalancer  10.108.73.127   127.0.0.1        80:32306/TCP     7m10s
hello-minikube      NodePort      10.110.104.116  <none>           80:31349/TCP     10m
kubernetes           ClusterIP     10.96.0.1       <none>           443/TCP          26m
```

ภาพหน้าจอนที่แสดงผลการรันคำสั่ง “minikube stop ” และตามด้วยคำสั่ง “minikube status”



```
Windows PowerShell
CoreDNS is running at https://127.0.0.1:57315/api/v1/namespaces/kube-system/services/kube-dns:dns/proxy

To further debug and diagnose cluster problems, use 'kubectl cluster-info dump'.
PS C:\Users\LAB203_xx> minikube stop
👉 Stopping node "minikube" ...
🔴 Powering off "minikube" via SSH ...
🔴 1 node stopped.
PS C:\Users\LAB203_xx> minikube status
minikube
type: Control Plane
host: Stopped
kubelet: Stopped
apiserver: Stopped
kubeconfig: Stopped
PS C:\Users\LAB203_xx> |
```

ภาพหน้าจอที่แสดงผลการรันคำสั่ง “kubectl get events”

```
PS C:\Users\LAB203_XX> kubectl get events
LAST SEEN   TYPE      REASON              OBJECT                                          MESSAGE
12m         Normal    Scheduled            pod/balanced-565f6795c7-5hxxkg                pod/balanced-565f6795c7-5hxxkg
12m         Normal    Pulling              pod/balanced-565f6795c7-5hxxkg                Pulling image "docker.io/nginx:latest"
12m         Normal    Pulled              pod/balanced-565f6795c7-5hxxkg                Successfully pulled image "docker.io/nginx:latest" in 2.984s (2.984s including waiting). Image size: 191998640 byt
es.
12m         Normal    Created             pod/balanced-565f6795c7-5hxxkg                Created container: nginx
12m         Normal    Started             pod/balanced-565f6795c7-5hxxkg                Started container nginx
12m         Normal    SuccessfulCreate     replicaset/balanced-565f6795c7-5hxxkg          Created pod: balanced-565f6795c7-5hxxkg
12m         Normal    ScalingReplicaSet    deployment/balanced                           Scaled up replica set balanced-565f6795c7 from 0 to 1
15m         Normal    Scheduled            pod/hello-minikube-6f695484-bdph8             Successfully assigned default/hello-minikube-6f695484-bdph8 to minikube
15m         Normal    Pulling              pod/hello-minikube-6f695484-bdph8             Pulling image "docker.io/nginx:latest"
15m         Normal    Pulled              pod/hello-minikube-6f695484-bdph8             Successfully pulled image "docker.io/nginx:latest" in 9.73s (9.73s including waiting). Image size: 191998640 bytes
.
15m         Normal    Created             pod/hello-minikube-6f695484-bdph8             Created container: nginx
15m         Normal    Started             pod/hello-minikube-6f695484-bdph8             Started container nginx
15m         Normal    SuccessfulCreate     replicaset/hello-minikube-6f695484-bdph8       Created pod: hello-minikube-6f695484-bdph8
15m         Normal    ScalingReplicaSet    deployment/hello-minikube                      Scaled up replica set hello-minikube-6f695484 from 0 to 1
31m         Warning   PossibleMemoryBackedVolumesOnDisk             node/minikube                               The tmpfs noswap option is not supported. Memory-backed volumes (e.g. secrets, emptyDirs, etc.) might be swapped t
o disk and should no longer be considered secure.
31m         Normal    Starting            node/minikube                               Starting kubelet.
31m         Warning   CgroupPV1          node/minikube                               cgroup v1 support is in maintenance mode, please migrate to cgroup v2
31m         Normal    NodeAllocatableEnforced node/minikube                               Updated Node Allocatable limit across pods
31m         Normal    NodeHasSufficientMemory node/minikube                               Node minikube status is now: NodeHasSufficientMemory
31m         Normal    NodeHasNoDiskPressure node/minikube                               Node minikube status is now: NodeHasNoDiskPressure
31m         Normal    NodeHasSufficientPID node/minikube                               Node minikube status is now: NodeHasSufficientPID
31m         Normal    RegisteredNode     node/minikube                               Node minikube event: Registered Node minikube in Controller
31m         Normal    Starting            node/minikube                               Starting kubelet.
8s         Warning   PossibleMemoryBackedVolumesOnDisk             node/minikube                               The tmpfs noswap option is not supported. Memory-backed volumes (e.g. secrets, emptyDirs, etc.) might be swapped t
o disk and should no longer be considered secure.
8s         Normal    Starting            node/minikube                               Starting kubelet.
8s         Warning   CgroupPV1          node/minikube                               cgroup v1 support is in maintenance mode, please migrate to cgroup v2
8s         Normal    NodeHasSufficientMemory node/minikube                               Node minikube status is now: NodeHasSufficientMemory
8s         Normal    NodeHasNoDiskPressure node/minikube                               Node minikube status is now: NodeHasNoDiskPressure
8s         Normal    NodeHasSufficientPID node/minikube                               Node minikube status is now: NodeHasSufficientPID
8s         Normal    NodeAllocatableEnforced node/minikube                               Updated Node Allocatable limit across pods
1s         Normal    RegisteredNode     node/minikube                               Node minikube event: Registered Node minikube in Controller
0s         Normal    Starting            node/minikube                               Starting kubelet.
```