

## Repositories:

- Micro-services application: [https://github.com/binh0001/sd0772\\_msa](https://github.com/binh0001/sd0772_msa)
- Architecture as code: [https://github.com/binh0001/sd0772\\_azure\\_infrastructure](https://github.com/binh0001/sd0772_azure_infrastructure)

```
C:\Users\HP840\Desktop\DevopsTraining\sd0772_azure_infrastructure>az login
Select the account you want to log in with. For more information on login with Azure CLI, see https://go.microsoft.com/fwlink/?linkid=2271136

Retrieving tenets and subscriptions for the selection...

[Tenant and subscription selection]

No. Subscription name Subscription ID Tenant
-----
[1] * Azure subscription 1 7acbc135-0905-4851-a66f-ab0531532b60 Default Directory

The default is marked with an *; the default tenant is 'Default Directory' and subscription is 'Azure subscription 1' (7acbc135-0905-4851-a66f-ab0531532b60).
Select a subscription and tenant (Type a number or Enter for no changes): 1

Tenant: Default Directory
Subscription: Azure subscription 1 (7acbc135-0905-4851-a66f-ab0531532b60)

[Announcements]
With the new Azure CLI login experience, you can select the subscription you want to use more easily. Learn more about it and its configuration at https://go.microsoft.com/fwlink/?linkid=2271236
If you encounter any problem, please open an issue at https://aka.ms/azclibug

[Warning] The login output has been updated. Please be aware that it no longer displays the full list of available subscriptions by default.
```

```
C:\Users\HP840\Desktop\DevopsTraining\sd0772_azure_infrastructure>terraform init
Initializing the backend...
Initializing modules...
Initializing provider plugins...
- Reusing previous version of hashicorp/azurerm from the dependency lock file
- Reusing previous version of hashicorp/random from the dependency lock file
- Reusing previous version of hashicorp/kubernetes from the dependency lock file
- Reusing previous version of azure/azapi from the dependency lock file
- Using previously-installed hashicorp/kubernetes v2.32.0
- Using previously-installed azure/azapi v1.15.0
- Using previously-installed hashicorp/azurerm v3.93.0
- Using previously-installed hashicorp/random v3.6.2

Terraform has been successfully initialized!

You may now begin working with Terraform. Try running "terraform plan" to see
any changes that are required for your infrastructure. All Terraform commands
should now work.

If you ever set or change modules or backend configuration for Terraform,
rerun this command to reinitialize your working directory. If you forget, other
commands will detect it and remind you to do so if necessary.
```

```
C:\Users\HP840\Desktop\DevopsTraining\sd0772_azure_infrastructure>terraform validate
Success! The configuration is valid.
```

```
C:\Users\HP840\Desktop\DevopsTraining\sd0772_azure_infrastructure>terraform plan
```

terraform used the selected providers to generate the following execution plan. Resource actions are indicated with the following symbols:

- + create

terraform will perform the following actions:

```
# azapi_resource.ssh_public_key will be created
+ resource "azapi_resource" "ssh_public_key" {
  + body          = jsonencode({})
  + id            = (known after apply)
  + ignore_casing = false
  + ignore_missing_property = true
  + location      = "eastus"
  + name          = (known after apply)
  + output        = (known after apply)
  + parent_id     = (known after apply)
  + removing_special_chars = false
  + schema_validation_enabled = true
  + tags          = {
    + "Project" = "bnt2408practicaldevops"
  }
  + type          = "Microsoft.Compute/sshPublicKeys@2022-11-01"
}

# azapi_resource_action.ssh_public_key_gen will be created
+ resource "azapi_resource_action" "ssh_public_key_gen" {
  + action      = "generateKeyPair"
  + id          = (known after apply)
  + method      = "POST"
  + output      = (known after apply)
  + resource_id = (known after apply)
  + response_export_values = [
    + "publicKey",
    + "privateKey",
  ]
  + type          = "Microsoft.Compute/sshPublicKeys@2022-11-01"
  + when          = "apply"
}

# azure_rm_container_registry.acr will be created
+ resource "azure_rm_container_registry" "acr" {
  + admin_enabled      = true
  + admin_password     = (sensitive value)
  + admin_username     = (known after apply)
  + encryption         = (known after apply)
  + export_policy_enabled = true
  + id                 = (known after apply)
}
```

```
zurnm_kubernetes_cluster.aks_cluster: Still creating... [40s elapsed]
zurnm_network_interface.terraform_nic: Creation complete after 15s [id=/subscriptions/7acbc135-0905-4851-a66f-ab0531532b60/resourceGroups/bnt2408practicaldevops/providers/Microsoft.Network
zurnm_network_interface_security_group_association.terraform_network_interface: Creating...
zurnm_linux_virtual_machine.terraform_vm: Creating...
zurnm_network_interface_security_group_association.terraform_network_interface: Creation complete after 4s [id=/subscriptions/7acbc135-0905-4851-a66f-ab0531532b60/resourceGroups/bnt2408pr
Interfaces/bnt2408-NIC/subscriptions/7acbc135-0905-4851-a66f-ab0531532b60/resourceGroups/bnt2408practicaldevops/providers/Microsoft.Network/networkSecurityGroups/bnt2408-network-security-
zurnm_kubernetes_cluster.aks_cluster: Still creating... [50s elapsed]
zurnm_linux_virtual_machine.terraform_vm: Still creating... [10s elapsed]
zurnm_kubernetes_cluster.aks_cluster: Still creating... [1m0s elapsed]
zurnm_linux_virtual_machine.terraform_vm: Still creating... [20s elapsed]
zurnm_kubernetes_cluster.aks_cluster: Still creating... [1m10s elapsed]
zurnm_linux_virtual_machine.terraform_vm: Still creating... [30s elapsed]
zurnm_kubernetes_cluster.aks_cluster: Still creating... [1m20s elapsed]
zurnm_linux_virtual_machine.terraform_vm: Still creating... [40s elapsed]
zurnm_kubernetes_cluster.aks_cluster: Still creating... [1m30s elapsed]
zurnm_linux_virtual_machine.terraform_vm: Still creating... [50s elapsed]
zurnm_linux_virtual_machine.terraform_vm: Creation complete after 54s [id=/subscriptions/7acbc135-0905-4851-a66f-ab0531532b60/resourceGroups/bnt2408practicaldevops/providers/Microsoft.Com
zurnm_kubernetes_cluster.aks_cluster: Still creating... [1m40s elapsed]
zurnm_kubernetes_cluster.aks_cluster: Still creating... [1m50s elapsed]
zurnm_kubernetes_cluster.aks_cluster: Still creating... [2m0s elapsed]
zurnm_kubernetes_cluster.aks_cluster: Still creating... [2m10s elapsed]
zurnm_kubernetes_cluster.aks_cluster: Still creating... [2m20s elapsed]
zurnm_kubernetes_cluster.aks_cluster: Still creating... [2m30s elapsed]
zurnm_kubernetes_cluster.aks_cluster: Still creating... [2m40s elapsed]
zurnm_kubernetes_cluster.aks_cluster: Still creating... [2m50s elapsed]
zurnm_kubernetes_cluster.aks_cluster: Still creating... [3m0s elapsed]
zurnm_kubernetes_cluster.aks_cluster: Still creating... [3m10s elapsed]
zurnm_kubernetes_cluster.aks_cluster: Still creating... [3m20s elapsed]
zurnm_kubernetes_cluster.aks_cluster: Still creating... [3m30s elapsed]
zurnm_kubernetes_cluster.aks_cluster: Still creating... [3m40s elapsed]
zurnm_kubernetes_cluster.aks_cluster: Still creating... [3m50s elapsed]
zurnm_kubernetes_cluster.aks_cluster: Creation complete after 3m51s [id=/subscriptions/7acbc135-0905-4851-a66f-ab0531532b60/resourceGroups/bnt2408practicaldevops/providers/Microsoft.Conta
zurnm_role_assignment.acrpull: Creating...
ubernetes_namespace.aks_namespace: Creation complete after 2s [id=bnt2408]
zurnm_role_assignment.acrpull: Still creating... [10s elapsed]
zurnm_role_assignment.acrpull: Still creating... [20s elapsed]
zurnm_role_assignment.acrpull: Creation complete after 26s [id=/subscriptions/7acbc135-0905-4851-a66f-ab0531532b60/resourceGroups/bnt2408practicaldevops/providers/Microsoft.ContainerRegis
horization/roleAssignments/063ad45f-84bd-2807-4a99-45abde20b89a]

opply complete! Resources: 18 added, 0 changed, 0 destroyed.

Outputs:

key_data = "ssh-rsa AAAAB3NzaC1yc2EAAAADAQABAAQGBQC8cP5MunizbMdk5yUik3mv2bn5GqEVGT/Vqj/08XCzKdRwFu1SA1Pn0pbXat3z5BdGSGuURdIH8GpBzn7U1/a9IxxgaqFFD2wyInW4z8X/ZhzCsMEzVPuUd8E6vneNdQdTqHg1OJZF
44NMMc3btpx69wopCQneXPXPKR3JW1M9UXU316MMORh0GLC29Uv0/Q90EUmRAqX00rF+1Q0wJ8A9VotDa82COHYXELDdzpgOHkKwMDNDf297C2g4unxyDIAw1KqVXR6UhzFej3FpCLW4Kpa08McexRYeZgxSHfawMqy86yV6xLVBci91+y4AXfMqTuxD
Q8XC3qIAfsv4InQ531Uu+Ew8J7mVGHPRr0hRnFG4sczMytc0zg7A3HDGQMs26+qYTp2Rku/Pb7MvIDCuWCNI0+ generated-by-azure"
public_ip_address = "40.88.15.90"
resource_group_name = "bnt2408practicaldevops"
```

Microsoft Azure

Upgrade

Search resources, services, and docs (G+)

Copilot

nguyenthaibinh261022...  
DEFAULT DIRECTORY (INGUENT...

Home >

All resources ✎ ... ✕

Default Directory (nguyenthaibinh261022@gmail.onmicrosoft.com)

Create

Manage view

Refresh

Export to CSV

Open query

Assign tags

Delete

Filter for any field...

Subscription equals all

Resource group equals all ✕

Type equals all ✕

Location equals all ✕

Add filter

0 Unsecure resources

0 Recommendations

19 Changed resources

No grouping

List view

Name	Type	Resource group	Location	Subscription
bnt2408-NIC	Network Interface	bnt2408practicaldevops	East US	Azure subscription 1
bnt2408-OsDisk	Disk	BNT2408PRACTICALDEVOPS	East US	Azure subscription 1
bnt2408-public-IP	Public IP address	bnt2408practicaldevops	East US	Azure subscription 1
bnt2408-VM	Virtual machine	bnt2408practicaldevops	East US	Azure subscription 1
bnt2408-vnet	Virtual network	bnt2408practicaldevops	East US	Azure subscription 1
bnt2408acr	Container registry	bnt2408practicaldevops	East US	Azure subscription 1
bnt2408storageaccount	Storage account	bnt2408practicaldevops	East US	Azure subscription 1
kubernetes	Load balancer	MC_bnt2408practicaldevops_bnt2408-...	East US	Azure subscription 1
NetworkWatcher_eastus	Network Watcher	NetworkWatcherRG	East US	Azure subscription 1
sshtouchedredfish	SSH key	bnt2408practicaldevops	East US	Azure subscription 1

< Previous

Page 1 of 1

Next >

Showing 1 to 19 of 19 records.

Give feedback



# bnt2408-VM

Virtual machine



Connect



Start



Restart



Stop



Hibernate



Capture



Overview



Activity log



Access control (IAM)



Tags



Diagnose and solve problems



Connect



Networking



Settings



Disks



Extensions + applications



Operating system



Configuration



Advisor recommendations



Properties



Locks



Advisor (1 of 1): Enable Trusted Launch foundational excellence, and modern security

## ^ Essentials

Resource group ([move](#))

[bnt2408practicaldevops](#)

Status

Running

Location

East US

Subscription ([move](#))

[Azure subscription 1](#)

Subscription ID

7acbc135-0905-4851-a66f-ab0531532b60

Tags ([edit](#))

Project : bnt2408practicaldevops

Properties

Monitoring

Capabilities (7)

Recommendations (1)

All resources

Default Directory (nguyenthaibinh261022@gmail.on...

Create

Manage view

...

Filter for any field...

Name ↑

bnt2408-aks-agentpool

bnt2408-network-security-group

bnt2408-NIK

Page 1 of 1

bnt2408-VM | Connect

Virtual machine

Search

adminuser

Port (change)  
22 [Check access](#)

Just-in-time policy  
Unsupported by plan

Recommended

SSH using Azure CLI

Local machine

Azure portal

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Connect

Connect

SSH using Azure CLI

Connect from the Azure portal

1 Configure prerequisites for SSH using Azure CLI

Azure needs to configure some features in order to

Prerequisites configured

System assigned managed identity

Microsoft Entra ID SSH Login Extension

Close

Troubleshooting

Switch to PowerShell

Restart

Manage files

New session

Editor

Web preview

Settings

Help

18 updates can be applied immediately.

12 of these updates are standard security updates.

To see these additional updates run: apt list --upgradable

Enable ESM Apps to receive additional future security updates.

See <https://ubuntu.com/esm> or run: sudo pro status

Last login: Thu Aug 22 08:57:39 2024 from 4.224.112.6

To run a command as administrator (user "root"), use "sudo <command>".

See "man sudo\_root" for details.

nguyenthaibinh261022@gmail.com@hostname:~\$

```
.\Users\HP840\Desktop\DevopsTraining\sd0772_msa\src>docker build ./backend -t backend
[+] Building 88.5s (11/11) FINISHED
=> [internal] load build definition from Dockerfile
=> => transferring dockerfile: 632B
=> [internal] load metadata for docker.io/library/node:lts-buster-slim
=> [internal] load .dockerignore
=> => transferring context: 54B
=> [1/6] FROM docker.io/library/node:lts-buster-slim@sha256:b5c14e85662c43b8c86a3a88259a34f0071474ad0a029ecb4ec39bbea588b030
=> => resolve docker.io/library/node:lts-buster-slim@sha256:b5c14e85662c43b8c86a3a88259a34f0071474ad0a029ecb4ec39bbea588b030
=> => sha256:b5c14e85662c43b8c86a3a88259a34f0071474ad0a029ecb4ec39bbea588b030 2.64kB / 2.64kB
=> => sha256:d2c1a7c2c34c323c91eb403dc5307aa5bf7c8fd85a8c1b65409757ad1175026b 1.92kB / 1.92kB
=> => sha256:cbbef3e9fc4833b5f05a0e274a1f87a078fb3458010b4e8edddf3678a80db9e5 6.88kB / 6.88kB
=> => sha256:b338562f40a7fb7360dfae935da6d7e40d2545db18bc461d9d70ec1b2b657f33 27.34MB / 27.34MB
=> => sha256:83e7bfbf444cbbba7a4525fb9f89eed0fec15f0fee7634be90e605e976e0a2b62 4.08kB / 4.08kB
=> => sha256:91fb5bf3bf5644e732816abba38fa882f8f219b0e5e94721769d22be091d346e 40.56MB / 40.56MB
=> => sha256:92fb55bbf58f7d8f1e314d1d57935fe02bc2793dbea1584620ba06774751336b 1.71MB / 1.71MB
=> => sha256:cfc35741f7c213ed8d4fe84fc24fa7276066a6cbb24bc2483349ebc0c4532d41 453B / 453B
=> => extracting sha256:b338562f40a7fb7360dfae935da6d7e40d2545db18bc461d9d70ec1b2b657f33
=> => extracting sha256:83e7bfbf444cbbba7a4525fb9f89eed0fec15f0fee7634be90e605e976e0a2b62
=> => extracting sha256:91fb5bf3bf5644e732816abba38fa882f8f219b0e5e94721769d22be091d346e
=> => extracting sha256:92fb55bbf58f7d8f1e314d1d57935fe02bc2793dbea1584620ba06774751336b
=> => extracting sha256:cfc35741f7c213ed8d4fe84fc24fa7276066a6cbb24bc2483349ebc0c4532d41
=> [internal] load build context
=> => transferring context: 76.75kB
=> [2/6] WORKDIR /usr/src/app
=> [3/6] COPY package.json /usr/src/app/package.json
=> [4/6] COPY package-lock.json /usr/src/app/package-lock.json
=> [5/6] RUN npm ci
=> [6/6] COPY . /usr/src/app
=> exporting to image
=> => exporting layers
=> => writing image sha256:653a781996d1980be9cea8c26a3176fce78d4d448089ca9f0ebcdc7f45010ac2
=> => naming to docker.io/library/backend

View build details: docker-desktop://dashboard/build/desktop-linux/desktop-linux/9h0mctp0yjt8tkud21by9e1ebk

What's next:
View a summary of image vulnerabilities and recommendations → docker scout quickview
```

```
View a summary of image vulnerabilities and recommendations → docker scout quickview

:\Users\HP840\Desktop\DevopsTraining\s0772_msa\src>docker build ./frontend -t frontend
+ Building 444.5s (11/11) FINISHED
=> [internal] load build definition from Dockerfile
=> => transferring dockerfile: 976B
=> [internal] load metadata for docker.io/library/node:lts-buster
=> [internal] load .dockerignore
=> => transferring context: 69B
=> [1/6] FROM docker.io/library/node:lts-buster@sha256:479103df06b40b90f189461b6f824a62906683e26a32c77d7c3e2d855a0e3e9f
=> => resolve docker.io/library/node:lts-buster@sha256:479103df06b40b90f189461b6f824a62906683e26a32c77d7c3e2d855a0e3e9f
=> => sha256:479103df06b40b90f189461b6f824a62906683e26a32c77d7c3e2d855a0e3e9f 2.62kB / 2.62kB
=> => sha256:32ab8bed435ee0e35413bb45d14dae2283dc0841644d881be35089debd8cc3 17.59MB / 17.59MB
=> => sha256:2a567eb2264b60aa779a5bc8f8f4dc7a6d3e1e01d8f5d1bcd039ed444d91a408 51.90MB / 51.90MB
=> => sha256:210343259138ad1b7bad23cd3be6aa1126f764f887c639749411387c9321c2d5 2.50kB / 2.50kB
=> => sha256:e789c1e41c485bf1ebec54eee06e33c1480fbfb4cfa6c354489e248d35c12fbf 6.59kB / 6.59kB
=> => sha256:3892befd2c3f36ceb247ba7d906de12601d69b806597a65c4c837cf3d93df119 50.66MB / 50.66MB
=> => sha256:9be81a73cfb7b45f4634965206adaa318a889f15cff6ced0ffd70f7c2d851fe4 191.96MB / 191.96MB
=> => extracting sha256:3892befd2c3f36ceb247ba7d906de12601d69b806597a65c4c837cf3d93df119
=> => sha256:a508c11d72bec9ab7ecb8e2f18f9399603b028f6eb8da53a4411c5f9a15dd921 4.09kB / 4.09kB
=> => sha256:3bcf1cf7cb91fe6b1eb2a4113148f94e21b4e399fba8fc08cdee7a0c5104a1 48.02MB / 48.02MB
=> => extracting sha256:32ab8bed435ee0e35413bb45d14dae2283dc0841644d881be35089debd8cc3
=> => sha256:e20b342eff9190e35ab3c6a9e05cac912ebd6848d3fa4caaa1dc31f28acd6f9 1.25MB / 1.25MB
=> => extracting sha256:2a567eb2264b60aa779a5bc8f8f4dc7a6d3e1e01d8f5d1bcd039ed444d91a408
=> => sha256:ab80d1950cdb44d12f0729d9d9d3f624dd1d347ca142b323742a79ce2e32d8f1 452B / 452B
=> => extracting sha256:9be81a73cfb7b45f4634965206adaa318a889f15cff6ced0ffd70f7c2d851fe4
=> => extracting sha256:a508c11d72bec9ab7ecb8e2f18f9399603b028f6eb8da53a4411c5f9a15dd921
=> => extracting sha256:3bcf1cf7cb91fe6b1eb2a4113148f94e21b4e399fba8fc08cdee7a0c5104a1
=> => extracting sha256:e20b342eff9190e35ab3c6a9e05cac912ebd6848d3fa4caaa1dc31f28acd6f9
=> => extracting sha256:ab80d1950cdb44d12f0729d9d9d3f624dd1d347ca142b323742a79ce2e32d8f1
=> [internal] load build context
=> => transferring context: 571.07kB
=> [2/6] WORKDIR /usr/src/app
=> [3/6] COPY package.json /usr/src/app
=> [4/6] COPY package-lock.json /usr/src/app
=> [5/6] RUN npm ci
=> [6/6] COPY . /usr/src/app
=> exporting to image
=> => exporting layers
=> => writing image sha256:0fef9362390fe9cd8187744d8050c741d5f750f1b69bf32e55dc8ac2ade0b8
=> => naming to docker.io/library/frontend

View build details: docker-desktop://dashboard/build/desktop-linux/desktop-linux/gw1tvsg28rz2e5ahnqv9mfyip
```

```
C:\Users\HP840\Desktop\DevopsTraining\s0772_msa\src>docker tag frontend bnt2408acr.azurecr.io/frontend:latest

C:\Users\HP840\Desktop\DevopsTraining\s0772_msa\src>docker tag backend bnt2408acr.azurecr.io/backend:latest

C:\Users\HP840\Desktop\DevopsTraining\s0772_msa\src>docker image ls
REPOSITORY          TAG          IMAGE ID      CREATED      SIZE
bnt2408acr.azurecr.io/frontend    latest       0fef9362390  7 minutes ago  1.31GB
frontend              latest       0fef9362390  7 minutes ago  1.31GB
bnt2408acr.azurecr.io/backend     latest       653a781996d1 15 minutes ago  248MB
backend                latest       653a781996d1 15 minutes ago  248MB
```

```
C:\Users\HP840\Desktop\DevopsTraining\sd0772_msa\src>docker push bnt2408acr.azurecr.io/frontend
Using default tag: latest
The push refers to repository [bnt2408acr.azurecr.io/frontend]
877c6c1448ac: Pushed
41b2d851ea53: Pushed
18e7cfade032: Pushed
9986aac46a19: Pushed
3d5867a69e1b: Pushed
659e539388fc: Pushed
13dbcad4a1a6: Pushed
bb779e5cd086: Pushed
a7fcbdac839: Pushed
ecff6742845c: Pushed
ee7e2e7202d1: Pushed
55d1b3b58b6c: Pushed
19b1230ac19d: Pushed
latest: digest: sha256:71f62c3a8aa0444a1c6b1d6473da5e11bf77eff35344c6cb6bdb32da98a2e693 size: 3051

C:\Users\HP840\Desktop\DevopsTraining\sd0772_msa\src>docker push bnt2408acr.azurecr.io/backend
Using default tag: latest
The push refers to repository [bnt2408acr.azurecr.io/backend]
ccb6b0a78627: Pushed
21d8a366ad1a: Pushed
6a58461af614: Pushed
d6af6c896b31: Pushed
d152613d0505: Pushed
32099f9871f1: Pushed
969e32e610dc: Pushed
6fc3f74b8750: Pushed
9fba20807f73: Pushed
8a84050e401d: Pushed
latest: digest: sha256:11f6694275492358609154828cedbd245f2768edcecf4778c2e25ee9b9a3ff1c size: 2411
```

The screenshot shows the Microsoft Azure portal interface. On the left, the 'All resources' list includes 'bnt2408acr'. The main panel displays the 'bnt2408acr | Repositories' page. A search bar is at the top. Below it, a table lists the repositories:

Repositories	Cache Rule
backend	None
frontend	None

```
C:\Users\HP840\Desktop\DevopsTraining\sd0772_msa\src>az account set --subscription 7acbc135-0905-4851-a66f-ab0531532b60

C:\Users\HP840\Desktop\DevopsTraining\sd0772_msa\src>az aks get-credentials --resource-group bnt2408practicaldevops --name bnt2408-aks --overwrite-existing
Merged "bnt2408-aks" as current context in C:\Users\HP840\.kube\config
```

```
C:\Users\HP840\Desktop\DevopsTraining\sd0772_msa\src>kubect1 config view --minify | findstr namespace
namespace: bnt2408
```

```
C:\Users\HP840\Desktop\DevopsTraining\s0772_msa\k8s\az>kubectl apply -f mongodb.yaml
storageclass.storage.k8s.io/mongo-sc created
service/mongo created
configmap/mongo-config created
secret/mongo-secrets created
statefulset.apps/mongo created
```

```
C:\Users\HP840\Desktop\DevopsTraining\s0772_msa\k8s\az>kubectl apply -f backend.yaml
service/backend created
deployment.apps/backend created
```

```
C:\Users\HP840\Desktop\DevopsTraining\s0772_msa\k8s\az>kubectl apply -f frontend.yaml
service/frontend created
deployment.apps/frontend created
```

```
C:\Users\HP840\Desktop\DevopsTraining\s0772_msa\k8s\az>kubectl get pod
NAME                                READY   STATUS             RESTARTS   AGE
backend-84c98fb647-542dc            0/1     CrashLoopBackOff   4 (13s ago) 2m8s
frontend-9c58f764c-lv86r           0/1     CrashLoopBackOff   3 (42s ago) 110s
mongo-0                             1/1     Running            0           23m
```

```
C:\Users\HP840\Desktop\DevopsTraining\s0772_msa\src\backend>docker buildx build --platform linux/arm64 -t bnt2408acr.azurecr.io/backend:latest --push .
[+] Building 224.2s (13/13) FINISHED
=> [internal] load build definition from Dockerfile
=> => transferring dockerfile: 632B
=> [internal] load metadata for docker.io/library/node:lts-buster-slim
=> [internal] load .dockerignore
=> => transferring context: 54B
=> [1/6] FROM docker.io/library/node:lts-buster-slim@sha256:b5c14e85662c43b8c86a3a88259a34f0071474ad0a029ecb4ec39bbea588b030
=> => resolve docker.io/library/node:lts-buster-slim@sha256:b5c14e85662c43b8c86a3a88259a34f0071474ad0a029ecb4ec39bbea588b030
=> => sha256:e8f57c65f72e23fe82c5beb87b309cad1d747627779f49773bf6a628a66d8129 451B / 451B
=> => sha256:5be12037d52a69c60cb728bd91559ff93bde6bc528071cf49660c5323518f06f 1.71MB / 1.71MB
=> => sha256:1c9af253592a7c9d3fdad7005592b62e8ec2bf81180b76be7ea63a8a5093c606 40.53MB / 40.53MB
=> => sha256:7abf9f73c7747bb840a8edcd895830e53f09498136de3015568a9cd9f5ab10ed 26.11MB / 26.11MB
=> => sha256:1315af9be5adb3f6947aaec3808ccc417f714db527ff88eb653f477d97f8ea4e 4.08kB / 4.08kB
=> => extracting sha256:7abf9f73c7747bb840a8edcd895830e53f09498136de3015568a9cd9f5ab10ed
=> => extracting sha256:1315af9be5adb3f6947aaec3808ccc417f714db527ff88eb653f477d97f8ea4e
=> => extracting sha256:1c9af253592a7c9d3fdad7005592b62e8ec2bf81180b76be7ea63a8a5093c606
=> => extracting sha256:5be12037d52a69c60cb728bd91559ff93bde6bc528071cf49660c5323518f06f
=> => extracting sha256:e8f57c65f72e23fe82c5beb87b309cad1d747627779f49773bf6a628a66d8129
=> [internal] load build context
=> => transferring context: 76.75kB
=> [2/6] WORKDIR /usr/src/app
=> [3/6] COPY package.json /usr/src/app/package.json
=> [4/6] COPY package-lock.json /usr/src/app/package-lock.json
=> [5/6] RUN npm ci
=> [6/6] COPY . /usr/src/app
=> exporting to image
=> => exporting layers
=> => exporting manifest sha256:f2f187e543c6bb069e577c7ea7a8de4ef78f87fb0271d85b247c7b9ff932f3e8
=> => exporting config sha256:f7e02e567ffad08c4033092c1353ae864d639bd640a8478cd09d76747e31157
=> => exporting attestation manifest sha256:2cb0b8bb4a235d3b537c516100bd191181e9aad107e6b0c17c6d75a4d9b2295f
=> => exporting manifest list sha256:2816765d402307e306ef1eabb7598352291aa8a7663b92d86a8a85c97303bbaa
=> => pushing layers
=> => pushing manifest for bnt2408acr.azurecr.io/backend:latest@sha256:2816765d402307e306ef1eabb7598352291aa8a7663b92d86a8a85c97303bbaa
=> [auth] backend:pull,push token for bnt2408acr.azurecr.io
=> [auth] backend:pull,push token for bnt2408acr.azurecr.io
```

View build details: [docker-desktop://dashboard/build/vigilant\\_jones/vigilant\\_jones0/qlnu45ujd49akdac5gbxp9anh](https://dashboard/build/vigilant_jones/vigilant_jones0/qlnu45ujd49akdac5gbxp9anh)



```
.\Users\HP840\Desktop\DevopsTraining\sd0772_msa\src\frontend>docker buildx build --platform linux/arm64 -t bnt2408acr.azurecr.io/frontend:latest --push .
+ Building 1192.1s (15/15) FINISHED
=> [internal] load build definition from Dockerfile
=> => transferring dockerfile: 976B
=> [internal] load metadata for docker.io/library/node:lts-buster
=> [internal] load .dockerignore
=> => transferring context: 69B
=> [1/6] FROM docker.io/library/node:lts-buster@sha256:479103df06b40b90f189461b6f824a62906683e26a32c77d7c3e2d855a0e3e9f
=> => resolve docker.io/library/node:lts-buster@sha256:479103df06b40b90f189461b6f824a62906683e26a32c77d7c3e2d855a0e3e9f
=> => sha256:49eef3a28212c7e95ec372477a0d3fdac7d343a520372ea89a14980a321b34eb 449B / 449B
=> => sha256:d8d515582f8d1f8363aecb5d01667cfb0e2f15a9bc9198e13e3fe7d4b088ee5e 1.25MB / 1.25MB
=> => sha256:602a4a774ad27c93ec6f4270f4a2ed9822a8ba61fc45b32ee67a6ba22314d654 47.99MB / 47.99MB
=> => sha256:fcf7eb78bb8fca175a04b947ff4c30e0fbcc7799eb9fc8d525f750264ec130cd 4.10kB / 4.10kB
=> => sha256:d462078a4e654dfe4d03086b828f77c76e47c0d5d14062aab137912bd0047683 183.53MB / 183.53MB
=> => sha256:2afdcf6433347dce5a44ff0bc3de90b44a9fa538fa39a22d9b21f9ee5365d4 52.23MB / 52.23MB
=> => sha256:e0606e294c7cef3c3fc7bdc4e83c5d17bd0ef8ae487db37628efb49fb6a03ed2 17.46MB / 17.46MB
=> => sha256:6fd6935d93f420effd7ed408f8df1ad31990dc3cf356be01e2e5ed55ee6ee084 49.45MB / 49.45MB
=> => extracting sha256:6fd6935d93f420effd7ed408f8df1ad31990dc3cf356be01e2e5ed55ee6ee084
=> => extracting sha256:e0606e294c7cef3c3fc7bdc4e83c5d17bd0ef8ae487db37628efb49fb6a03ed2
=> => extracting sha256:2afdcf6433347dce5a44ff0bc3de90b44a9fa538fa39a22d9b21f9ee5365d4
=> => extracting sha256:d462078a4e654dfe4d03086b828f77c76e47c0d5d14062aab137912bd0047683
=> => extracting sha256:fcf7eb78bb8fca175a04b947ff4c30e0fbcc7799eb9fc8d525f750264ec130cd
=> => extracting sha256:602a4a774ad27c93ec6f4270f4a2ed9822a8ba61fc45b32ee67a6ba22314d654
=> => extracting sha256:d8d515582f8d1f8363aecb5d01667cfb0e2f15a9bc9198e13e3fe7d4b088ee5e
=> => extracting sha256:49eef3a28212c7e95ec372477a0d3fdac7d343a520372ea89a14980a321b34eb
=> [internal] load build context
=> => transferring context: 571.07kB
=> [2/6] WORKDIR /usr/src/app
=> [3/6] COPY package.json /usr/src/app
=> [4/6] COPY package-lock.json /usr/src/app
=> [5/6] RUN npm ci
=> [6/6] COPY . /usr/src/app
=> exporting to image
=> => exporting layers
=> => exporting manifest sha256:aa9797fe11b8d5c5c58454d92067f2df91468e443de5264f46a5d061b83bb430
=> => exporting config sha256:d3d00412c7713bde20add1aaaab0669b0f9d7397e9907465dd3654b02881b0fe
=> => exporting attestation manifest sha256:372094a698a7c5124baf6e1b2efda5733224985f49b85bdf398866fb9fc2c98
=> => exporting manifest list sha256:8b83683f26c99f0235b6e721b6c75245116ddc3c95378b2dc9f810b2fedb4a8e
=> => pushing layers
=> => pushing manifest for bnt2408acr.azurecr.io/frontend:latest@sha256:8b83683f26c99f0235b6e721b6c75245116ddc3c95378b2dc9f810b2fedb4a8e
=> [auth] frontend:pull,push token for bnt2408acr.azurecr.io
=> [auth] frontend:pull,push token for bnt2408acr.azurecr.io
=> [auth] frontend:pull,push token for bnt2408acr.azurecr.io
=> [auth] frontend:pull,push token for bnt2408acr.azurecr.io
```

view build details: docker-desktop://dashboard/build/vigilant\_jones/vigilant\_jones0/wjmbck2p8p5t0ir5lnc4u343d

```
C:\Users\HP840\Desktop\DevopsTraining\sd0772_msa\src\frontend>kubectl get pod
NAME                                READY   STATUS    RESTARTS   AGE
backend-84c98fb647-542dc            1/1     Running   8 (21m ago)    32m
frontend-9c58f764c-lv86r            1/1     Running   11 (5m37s ago) 32m
mongo-0                             1/1     Running   0              54m
```

```
C:\Users\HP840\Desktop\DevopsTraining\sd0772_msa\src\frontend>
```

localhost:3000

Install

## Todos for Webhook testing

Add Todo

No Todos to display

nguyenthaibinh261022 / bnt2408practicdevops / Settings / Service connections

### Project Settings

bnt2408practicdevops

- General
  - Overview
  - Teams
  - Permissions
  - Notifications
  - Service hooks
  - Dashboards
- Boards
  - Project configuration
  - Team configuration
  - GitHub connections
- Pipelines
  - Agent pools
  - Parallel jobs
  - Settings
  - Test management
  - Service connections**
  - XAML build services
- Repos
  - Repositories
- Artifacts

#### bnt2408ServiceConnection


Overview Usage history Approvals and checks

Convert your service connections to workload identity federation for improved security and simplified maintenance. [Learn more](#)


[Convert](#)

#### Details

Service connection type

 **Azure Resource Manager**  
using service principal authentication  
Manage service connection roles  
[Manage Service Principal](#)

Creator

 **nguyenthaibinh261022**  
nguyenthaibinh261022@gmail.com

Projects

Azure DevOps nguyenthaibinh261022 / bnt2408 practical devops / Pipelines

**bnt2408 practical devo...** + You selected a public repository, but this is not a public project. Go to [project settings](#) to change the visibility of the project. [Learn more](#)

Overview Boards Repos Pipelines Pipelines Environments Library Test Plans Artifacts Project settings

Connect Select Configure **Review**

New pipeline

## Review your pipeline YAML

[Variables](#) [Run](#)

binh0001/sd0772\_msa / azure-pipelines.yml

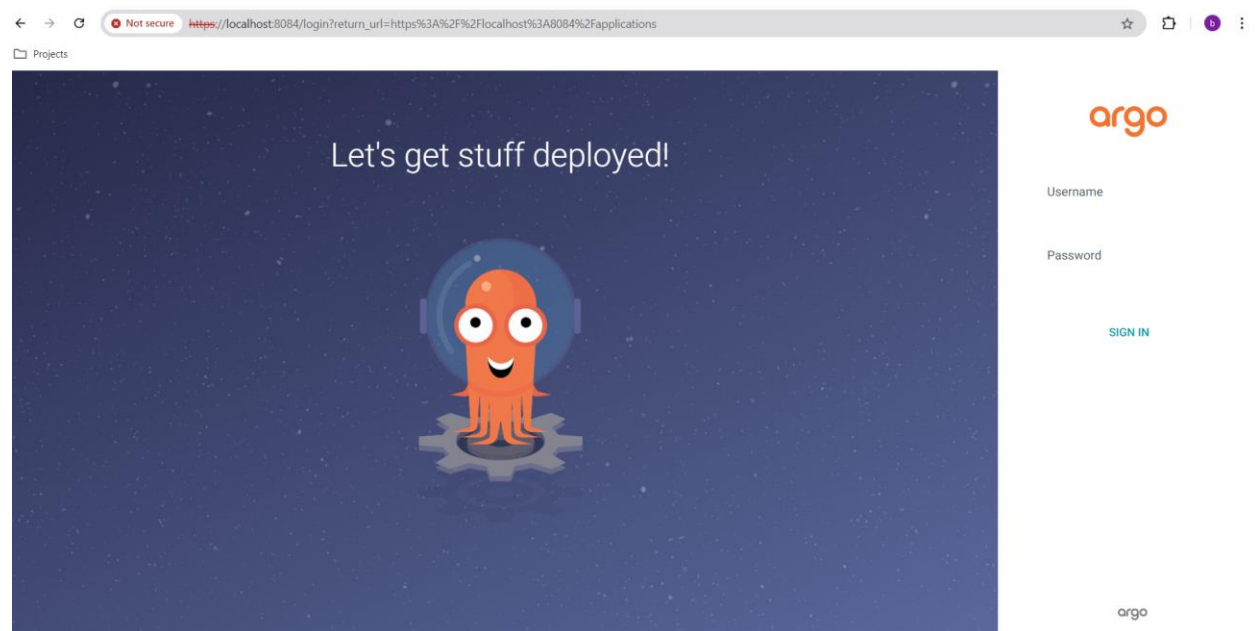
Show assistant

```
1 trigger:
2   branches:
3     include:
4       - main
5
6 variables:
7   group: "sd0772-msa-var"
8
9 # Pool build
10 pool:
11   vmImage: "ubuntu-latest"
12
13 stages:
14   stage: Build
15   jobs:
16     job: Docker_Build_and_Push_Image
17     steps:
18       Settings
19       task: AzureCLI@2
```

```
C:\Users\HP840\Desktop\DevopsTraining\sd1121_msa\k8s\az>kubectl apply -n argocd -f https://raw.githubusercontent.com/argoproj/argo-cd/stable/manifests/install.yaml
customresourcedefinition.apiextensions.k8s.io/applications.argoproj.io created
customresourcedefinition.apiextensions.k8s.io/applicationsets.argoproj.io created
customresourcedefinition.apiextensions.k8s.io/appprojects.argoproj.io created
serviceaccount/argocd-application-controller created
serviceaccount/argocd-applicationset-controller created
serviceaccount/argocd-dex-server created
serviceaccount/argocd-notifications-controller created
serviceaccount/argocd-redis created
serviceaccount/argocd-repo-server created
serviceaccount/argocd-server created
role.rbac.authorization.k8s.io/argocd-application-controller created
role.rbac.authorization.k8s.io/argocd-applicationset-controller created
role.rbac.authorization.k8s.io/argocd-dex-server created
role.rbac.authorization.k8s.io/argocd-notifications-controller created
role.rbac.authorization.k8s.io/argocd-redis created
role.rbac.authorization.k8s.io/argocd-server created
clusterrole.rbac.authorization.k8s.io/argocd-application-controller created
clusterrole.rbac.authorization.k8s.io/argocd-applicationset-controller created
clusterrole.rbac.authorization.k8s.io/argocd-server created
rolebinding.rbac.authorization.k8s.io/argocd-application-controller created
rolebinding.rbac.authorization.k8s.io/argocd-applicationset-controller created
rolebinding.rbac.authorization.k8s.io/argocd-dex-server created
rolebinding.rbac.authorization.k8s.io/argocd-notifications-controller created
rolebinding.rbac.authorization.k8s.io/argocd-redis created
rolebinding.rbac.authorization.k8s.io/argocd-server created
clusterrolebinding.rbac.authorization.k8s.io/argocd-application-controller created
clusterrolebinding.rbac.authorization.k8s.io/argocd-applicationset-controller created
clusterrolebinding.rbac.authorization.k8s.io/argocd-server created
configmap/argocd-cm created
configmap/argocd-cmd-params-cm created
configmap/argocd-gpg-keys-cm created
configmap/argocd-notifications-cm created
configmap/argocd-rbac-cm created
configmap/argocd-ssh-known-hosts-cm created
configmap/argocd-tls-certs-cm created
secret/argocd-notifications-secret created
secret/argocd-secret created
service/argocd-applicationset-controller created
service/argocd-dex-server created
service/argocd-metrics created
```

```
Error from server (NotFound): namespaces "j" not found
```

```
C:\Users\HP840\Desktop\DevopsTraining\sd1121_msa\k8s\az>kubectl port-forward svc/argocd-server -n argocd 8084:443
Forwarding from 127.0.0.1:8084 -> 8080
Forwarding from [::1]:8084 -> 8080
```






← → ↺

Not secure https://localhost:8084/settings/projects/devops-cd

☆ 📄 👤 ⋮

Projects

argo  
v2.12.1+26b2039

←

Applications

Settings

User Info

Documentation

Settings / Projects / devops-cd

PROJECTS

+ ADD ROLE

+ ADD SYNC WINDOW

DELETE

Log out

SUMMARY

ROLES

WINDOWS

EVENTS

Project has no source repositories

SCOPED REPOSITORIES ⓘ  
Project has no source repositories

DESTINATIONS ⓘ

SERVE

CANCEL

Server	Name	Namespace
*	*	*

×

ADD DESTINATION

☐ REPLACE ⚠

☐ RETRY

## SOURCE

Repository URL

https://github.com/binh0001/sd0772\_msa.git

Revision

main

Path

./k8s/az

https://github.com/binh0001/sd0772\_msa.git

GIT ▼

Revision

main

Branches ▼

Path

./k8s/az

DESTINATION

Cluster URL

https://kubernetes.default.svc


URL ▼

```
C:\Windows\System32>kubect1 get namespaces
NAME                STATUS    AGE
argocd              Active    11h
bnt2408             Active    19h
default             Active    19h
gatekeeper-system   Active    19h
kube-node-lease     Active    19h
kube-public         Active    19h
kube-system         Active    19h

C:\Windows\System32>
```

← → ↺ Not secure https://localhost:8084/applications?showFavorites=false&proj=&sync=&autoSync=&health=&namespace=&cluster=&labels=&appNameSpace=argocd

Projects

  
v2.12.1+26b2039

Applications

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★ Favorites Only

SYNC STATUS

Unknown 0

Synced 0

OutOfSync 1

HEALTH STATUS

Unknown 0

Progressing 0

Suspended 0

Healthy 0

Applications

+ NEW APP

SYNC APPS

REFRESH APPS

Search applications...

Sort: name ▼ It

devops-cd

Project: devops-cd

Labels:

Status: Missing OutOfSync

Repository: https://github.com/binh0001/sd0772\_m...

Target R...: main

Path: ./k8s/az

Destinati...: in-cluster

Namesp...: app-argocd

Created ...: 08/23/2024 00:06:41 (a few seconds a...


SYNC

REFRESH

DELETE

← → ↺ Not secure https://localhost:8084/applications/argocd/devops-cd/view=tree&operation=false&resource=

Projects

  
v2.12.1+26b2039

Applications

Settings

User Info

Documentation

NAME

NAME

KINDS

KINDS

SYNC STATUS

Synced 9

OutOfSync 0

HEALTH STATUS

Healthy 14

Progressing 0

Degraded 0

Suspended 0

Missing 0

Unknown 0

Applications / devops-cd

DETAILS

DIFF

SYNC

SYNC STATUS

HISTORY AND ROLLBACK

DELETE

REFRESH

APP HEALTH @

Healthy

SYNC STATUS @

Synced to main (3ee7aab)

Auto sync is not enabled.

Author: binh0001 <steven.lee1003@gmail.com>

Comment: update new domain

LAST SYNC @

Sync OK to 3ee7aab

Succeeded a minute ago (Fri Aug 23 2024 10:42:34 GMT+0700)

Author: binh0001 <steven.lee1003@gmail.com>

Comment: update new domain

devops-cd

backend

frontend

mongo

backend

frontend

backend-84c98fb647

backend-7b8df94c8

frontend-9c58f764c

frontend-754df96f6

backend-bn4k9

frontend-m8qj

mongo-huhzf

backend-84c98fb647-542dc

frontend-9c58f764c-lv66r

```
C:\Windows\System32>kubectl get all
```

NAME	READY	STATUS	RESTARTS	AGE
pod/backend-84c98fb647-542dc	1/1	Running	8 (17h ago)	17h
pod/frontend-9c58f764c-1v86r	1/1	Running	11 (16h ago)	17h
pod/mongo-0	1/1	Running	0	17h

NAME	TYPE	CLUSTER-IP	EXTERNAL-IP	PORT(S)	AGE
service/backend	ClusterIP	10.0.177.55	<none>	3000/TCP	17h
service/frontend	ClusterIP	10.0.143.187	<none>	3000/TCP	17h
service/mongo	ClusterIP	10.0.213.77	<none>	27017/TCP	17h

NAME	READY	UP-TO-DATE	AVAILABLE	AGE
deployment.apps/backend	1/1	1	1	17h
deployment.apps/frontend	1/1	1	1	17h

NAME	DESIRED	CURRENT	READY	AGE
replicaset.apps/backend-7bd8df94c8	0	0	0	17h
replicaset.apps/backend-84c98fb647	1	1	1	17h
replicaset.apps/frontend-754df96f6	0	0	0	17h
replicaset.apps/frontend-9c58f764c	1	1	1	17h

```
kubernetes-helm package files install completed. Performing other installation steps.
Downloading kubernetes-helm 64 bit
  from 'https://get.helm.sh/helm-v3.15.3-windows-amd64.zip'
Progress: 100% - Completed download of C:\Users\HP840\AppData\Local\Temp\chocolatey\kubernetes-helm\3.15.3\helm-v3.15.3-windows-amd64.zip (16.24 MB).
Download of helm-v3.15.3-windows-amd64.zip (16.24 MB) completed.
Hashes match.
Extracting C:\Users\HP840\AppData\Local\Temp\chocolatey\kubernetes-helm\3.15.3\helm-v3.15.3-windows-amd64.zip to C:\ProgramData\chocolatey\lib\kubernetes-helm\tools...
C:\ProgramData\chocolatey\lib\kubernetes-helm\tools
SHIMGen has successfully created a shim for helm.exe
The install of kubernetes-helm was successful.
  Software installed to 'C:\ProgramData\chocolatey\lib\kubernetes-helm\tools'

Chocolatey installed 1/1 packages.
See the log for details (C:\ProgramData\chocolatey\logs\chocolatey.log).

Did you know the proceeds of Pro (and some proceeds from other
licensed editions) go into bettering the community infrastructure?
Your support ensures an active community, keeps Chocolatey tip-top,
plus it nets you some awesome features!
https://chocolatey.org/compare

C:\Windows\System32>helm repo add prometheus-community https://prometheus-community.github.io/helm-charts
"prometheus-community" has been added to your repositories

C:\Windows\System32>helm repo add grafana https://grafana.github.io/helm-charts
"grafana" has been added to your repositories

C:\Windows\System32>helm repo add grafana https://grafana.github.io/helm-charts
"grafana" already exists with the same configuration, skipping

C:\Windows\System32>helm install prometheus prometheus-community/prometheus
NAME: prometheus
LAST DEPLOYED: Fri Aug 23 10:51:56 2024
NAMESPACE: bnt2408
STATUS: deployed
REVISION: 1
TEST SUITE: None
NOTES:
The Prometheus server can be accessed via port 80 on the following DNS name from within your cluster:
prometheus-server.bnt2408.svc.cluster.local

Get the Prometheus server URL by running these commands in the same shell:
export POD_NAME=$(kubectl get pods --namespace bnt2408 -l "app.kubernetes.io/name=prometheus,app.kubernetes.io/instance=prometheus" -o jsonpath="{.items[0].metadata.name}")
kubectl --namespace bnt2408 port-forward $POD_NAME 9090
```



```
C:\Windows\System32>kubectl get all

NAME                                READY    STATUS              RESTARTS      AGE
pod/backend-84c98fb647-542dc        1/1      Running             8 (17h ago)   17h
pod/frontend-9c58f764c-1v86r        1/1      Running             11 (17h ago)  17h
pod/grafana-cff6c7c8-57h94          0/1      ContainerCreating   0              7s
pod/mongo-0                          1/1      Running             0              17h
pod/prometheus-alertmanager-0        1/1      Running             0              4m53s
pod/prometheus-kube-state-metrics-79c867c577-r87hj  1/1      Running             0              4m53s
pod/prometheus-prometheus-node-exporter-8sr6w    1/1      Running             0              4m53s
pod/prometheus-prometheus-pushgateway-57c548bd6f-2bw6s  1/1      Running             0              4m53s
pod/prometheus-server-65b79f9866-rw8x1  2/2      Running             0              4m53s

NAME                                TYPE          CLUSTER-IP      EXTERNAL-IP      PORT(S)          AGE
service/backend                      ClusterIP      10.0.177.55     <none>            3000/TCP         17h
service/frontend                     ClusterIP      10.0.143.187    <none>            3000/TCP         17h
service/grafana                      ClusterIP      10.0.150.27     <none>            80/TCP           7s
service/mongo                        ClusterIP      10.0.213.77     <none>            27017/TCP        17h
service/prometheus-alertmanager      ClusterIP      10.0.33.236     <none>            9093/TCP         4m54s
service/prometheus-alertmanager-headless ClusterIP      None            <none>            9093/TCP         4m54s
service/prometheus-kube-state-metrics ClusterIP      10.0.98.208     <none>            8080/TCP         4m54s
service/prometheus-prometheus-node-exporter ClusterIP      10.0.69.126     <none>            9100/TCP         4m54s
service/prometheus-prometheus-pushgateway ClusterIP      10.0.162.4      <none>            9091/TCP         4m54s
service/prometheus-server            ClusterIP      10.0.223.61     <none>            80/TCP           4m54s

NAME                                DESIRED      CURRENT    UP-TO-DATE    AVAILABLE    AGE
daemonset.apps/prometheus-prometheus-node-exporter 1            1          1              1            4m54s

NAME                                READY    UP-TO-DATE    AVAILABLE    AGE
deployment.apps/backend              1/1      1              1            17h
deployment.apps/frontend              1/1      1              1            17h
deployment.apps/grafana              0/1      1              0            8s
deployment.apps/prometheus-kube-state-metrics 1/1      1              1            4m54s
deployment.apps/prometheus-prometheus-pushgateway 1/1      1              1            4m54s
deployment.apps/prometheus-server     1/1      1              1            4m54s

NAME                                DESIRED      CURRENT    READY    AGE
replicaset.apps/backend-7bd8df94c8  0            0          0        17h
replicaset.apps/backend-84c98fb647  1            1          1        17h
replicaset.apps/frontend-754df96f6  0            0          0        17h
replicaset.apps/frontend-9c58f764c  1            1          1        17h
replicaset.apps/grafana-cff6c7c8    1            1          0        8s
replicaset.apps/prometheus-kube-state-metrics-79c867c577 1            1          1        4m54s
replicaset.apps/prometheus-prometheus-pushgateway-57c548bd6f 1            1          1        4m54s
replicaset.apps/prometheus-server-65b79f9866 1            1          1        4m54s

NAME                                READY    AGE
statefulset.apps/mongo              1/1      17h
statefulset.apps/prometheus-alertmanager 1/1      4m54s
```

