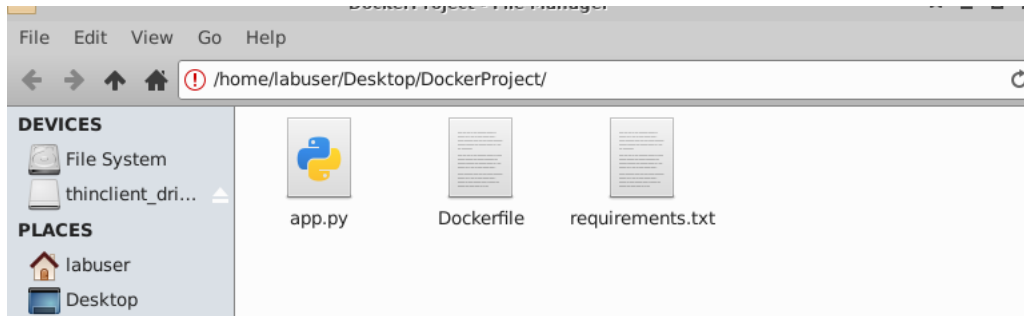


Custom Learnings

Day 21

Docker

Creating 3 files for building docker image:



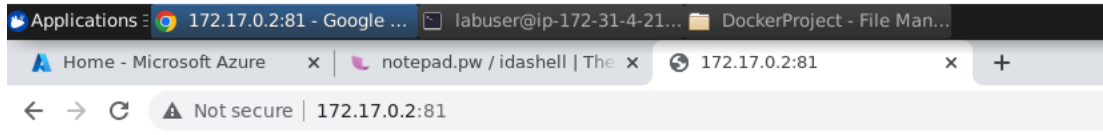
Installing Docker and building docker image:

```
labuser@ip-172-31-4-214:~/Desktop/DockerProject$ sudo systemctl start docker
labuser@ip-172-31-4-214:~/Desktop/DockerProject$ sudo docker ps
Got permission denied while trying to connect to the Docker daemon socket at unix:///var/run/docker.sock: Get http://localhost:2375/v1.24/containers/json: dial unix /var/run/docker.sock: connect: permission denied
CONTAINER ID   IMAGE     COMMAND   CREATED   STATUS    PORTS   NAMES
labuser@ip-172-31-4-214:~/Desktop/DockerProject$ ls
Desktop  Documents  Downloads  Music  Pictures  Public  Templates  Videos  kubectll  kubectll.sha256  minikube-linux-amd64  snap  thinclient_drives
labuser@ip-172-31-4-214:~/Desktop/DockerProject$ ls
DockerProject  README  chrome-cdpbfelflklonephppleindpcgoen-Default.desktop  chrome-mbfhflccpgibbdfhoodckagpcncl-Default.desktop  code.desktop  google-chrome.desktop  intellij-idea-community_intellij-idea-community.desktop
labuser@ip-172-31-4-214:~/Desktop/DockerProject$ ls
Dockerfile  app.py  requirements.txt
labuser@ip-172-31-4-214:~/Desktop/DockerProject$ sudo docker build -t my-first-python-app .
Sending build context to Docker daemon  4.096kB
Step 1/7 : FROM python:3.8-slim-buster
3.8-slim-buster: Pulling from library/python
8b91b88d5577: Pull complete
824416e23423: Pull complete
8f77578c122: Pull complete
c8fea27109a8: Pull complete
276dfc5deff: Pull complete
Digest: sha256:8799b0564103a9f36cfba8e1c562e11a9d6f2e3bb214e2adc23982b36a04511
Status: Downloaded newer image for python:3.8-slim-buster
--> add6962740a
Step 2/7 : WORKDIR /app
--> Running in fbe13686c49b
Removing intermediate container fbe13686c49b
--> 93f15da5d50f
Step 3/7 : COPY . /app
--> 03a471dbc3b
Step 4/7 : RUN pip install -r requirements.txt
--> Running in 73ee7daed22
Collecting Flask==2.0.1
  Downloading Flask-2.0.1-py3-none-any.whl (94 kB)
    94.8/94.8 kB 6.8 MB/s eta 0:00:00
Collecting Werkzeug==2.0
  Downloading werkzeug-2.3.7-py3-none-any.whl (242 kB)
    242.2/242.2 kB 20.8 MB/s eta 0:00:00
Collecting Jinja2==3.0
  Downloading Jinja2-3.1.2-py3-none-any.whl (133 kB)
    133.1/133.1 kB 9.4 MB/s eta 0:00:00
Collecting itsdangerous==2.0
  Downloading itsdangerous-2.1.2-py3-none-any.whl (15 kB)
Collecting click==7.1.2
  Downloading click-8.1.7-py3-none-any.whl (97 kB)
    97.9/97.9 kB 13.9 MB/s eta 0:00:00
Collecting MarkupSafe==2.0
  Downloading MarkupSafe-2.1.3-cp38-cp38-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (25 kB)
Installing collected packages: MarkupSafe, itsdangerous, click, Werkzeug, Jinja2, Flask
Successfully installed Flask-2.0.1 Jinja2-3.1.2 MarkupSafe-2.1.3 Werkzeug-2.3.7 click-8.1.7 itsdangerous-2.1.2
WARNING: Running pip as the 'root' user can result in broken permissions and conflicting behaviour with the system package manager. It is recommended to use a virtual environment instead: https://pip.pypa.io/warnings/venv

[notice] A new release of pip is available: 23.0.1 -> 23.2.1
[notice] To update, run: pip install --upgrade pip
Removing intermediate container 73ee7daed22
--> 4fa88c5f643
```

Run the docker image:

```
labuser@ip-172-31-4-214:~/Desktop/DockerProject$
labuser@ip-172-31-4-214:~/Desktop/DockerProject$ sudo docker run my-first-python-app
* Serving Flask app 'app' (lazy loading)
* Environment: production
  WARNING: This is a development server. Do not use it in a production deployment.
  Use a production WSGI server instead.
* Debug mode: off
WARNING: This is a development server. Do not use it in a production deployment. Use a production WSGI server instead.
* Running on all addresses (0.0.0.0)
* Running on http://127.0.0.1:81
* Running on http://172.17.0.2:81
Press CTRL+C to quit
172.17.0.1 - - [28/Sep/2023 05:38:32] "GET / HTTP/1.1" 200 -
172.17.0.1 - - [28/Sep/2023 05:38:32] "GET /favicon.ico HTTP/1.1" 404 -
```



Web App with Python Flask!

Initializing Azure CLI:

```
labuser@ip-172-31-4-214:~/Desktop/DockerProject$ cd
labuser@ip-172-31-4-214:~$ curl -sL https://aka.ms/InstallAzureCLIDeb | sudo bash
Hit:2 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu focal InRelease
Get:3 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu focal-updates InRelease [114 kB]
Get:4 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu focal-backports InRelease [108 kB]
Hit:5 http://packages.microsoft.com/repos/code stable InRelease
Hit:6 https://deb.nodesource.com/node_16.x focal InRelease
Ign:1 https://pkg.jenkins.io/debian-stable binary/ InRelease
Get:7 https://pkg.jenkins.io/debian-stable binary/ Release [2044 B]
Get:8 https://pkg.jenkins.io/debian-stable binary/ Release.gpg [833 B]
Get:9 http://security.ubuntu.com/ubuntu focal-security InRelease [114 kB]
Hit:10 https://dl.google.com/linux/chrome/deb stable InRelease
Hit:11 http://apt.postgresql.org/pub/repos/apt focal-pgdg InRelease
Hit:12 http://ppa.launchpad.net/ansible/ansible/ubuntu focal InRelease
Get:13 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu focal-updates/main amd64 Packages [2852 kB]
Get:14 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu focal-updates/main amd64 DEP-11 Metadata [275 kB]
Get:15 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu focal-updates/restricted amd64 Packages [2328 kB]
Get:16 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu focal-updates/universe amd64 Packages [1117 kB]
Get:17 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu focal-updates/universe amd64 DEP-11 Metadata [414 kB]
Get:18 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu focal-updates/multiverse amd64 Packages [25.8 kB]
Get:19 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu focal-updates/multiverse amd64 DEP-11 Metadata [944 B]
Get:20 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu focal-backports/main amd64 DEP-11 Metadata [7996 B]
Get:21 http://ap-south-1.ec2.archive.ubuntu.com/ubuntu focal-backports/universe amd64 DEP-11 Metadata [30.5 kB]
Err:8 https://pkg.jenkins.io/debian-stable binary/ Release.gpg
The following signatures couldn't be verified because the public key is not available: NO_PUBKEY 5BA31D57EF5975CA
```

Logging into Azure Account through CLI:

```
labuser@ip-172-31-4-214:~$ az login
A web browser has been opened at https://login.microsoftonline.com/organizations/oauth2/v2.0/authorize. Please continue the login in
e web browser. If no web browser is available or if the web browser fails to open, use device code flow with 'az login --use-device-co
a'.
Opening in existing browser session.
libva error: vaGetDriverNameByIndex() failed with unknown libva error, driver_name = (null)
[
  {
    "cloudName": "AzureCloud",
    "homeTenantId": "dce87315-8ffa-4a01-ab40-0de5a7214b2f",
    "id": "7179ale4-9824-4360-9eda-2930d7e2dc08",
    "isDefault": true,
    "managedByTenants": [],
    "name": "npunext-1680261698581",
    "state": "Enabled",
    "tenantId": "dce87315-8ffa-4a01-ab40-0de5a7214b2f",
    "user": {
      "name": "Shellunext_1693422208756@npunext.onmicrosoft.com",
      "type": "user"
    }
  }
]
```

Creating the resource group and azure container registry:

```
labuser@ip-172-31-4-214:~$ az group create --name RG_IDA_SHELL --location eastus
{
  "id": "/subscriptions/7179a1e4-9824-4360-9eda-2930d7e2dc08/resourceGroups/RG_IDA_SHELL",
  "location": "eastus",
  "managedBy": null,
  "name": "RG_IDA_SHELL",
  "properties": {
    "provisioningState": "Succeeded"
  },
  "tags": null,
  "type": "Microsoft.Resources/resourceGroups"
}
labuser@ip-172-31-4-214:~$ az acr create --name idashellacr03 --resource-group RG_IDA_SHELL --location eastus --sku Standard
Resource provider 'Microsoft.ContainerRegistry' used by this operation is not registered. We are registering for you.
Registration succeeded.
{
  "adminUserEnabled": false,
  "anonymousPullEnabled": false,
  "creationDate": "2023-09-28T06:07:32.026543+00:00",
  "dataEndpointEnabled": false,
  "dataEndpointHostNames": [],
```

Logging into the azure acr:

```
labuser@ip-172-31-4-214:~/Desktop/DockerProject$ sudo docker login idashellacr03.azurecr.io
Username: idashellacr03
Password:
WARNING! Your password will be stored unencrypted in /root/.docker/config.json.
Configure a credential helper to remove this warning. See
https://docs.docker.com/engine/reference/commandline/login/#credentials-store

Login Succeeded
```

Tagging and pushing to the acr repository:

```
labuser@ip-172-31-4-214:~/Desktop/DockerProject$ sudo docker tag my-first-python-app idashellacr03.azurecr.io/my-first-python-app:v1
labuser@ip-172-31-4-214:~/Desktop/DockerProject$ sudo docker push idashellacr03.azurecr.io/my-first-python-app:v1
The push refers to repository [idashellacr03.azurecr.io/my-first-python-app]
f937a0ea8640: Pushed
e02caf25ee01: Pushed
f78dc48200c8: Pushed
e6c5004ee77f: Pushed
997b8e79e84f: Pushed
3054512b6f71: Pushed
ae2d55769c5e: Pushed
e2ef8a51359d: Pushed
v1: digest: sha256:7195a20a551476cee8e86ac47f8a3284cab0b66016302d9664f3906a8b0a119c size: 1995
labuser@ip-172-31-4-214:~/Desktop/DockerProject$ █
```

Microsoft Azure | Search resources, services, and docs (G+)

Home > Resource groups > RG_IDA_SHELL > idashellacr03 | Repositories > my-first-python-app >

my-first-python-app

Repository

Refresh

JSON View

Repository: my-first-python-app
Last updated date: 9/28/2023, 6:35 AM UTC
Tag count: 1
Manifest count: 1

Search to filter tags...

Tags	Digest
v1	sha256:7195a20a551476cee8e86ac478a3284cab0b66016302d9664f3906a8b0a119c

my-first-python-app:v1

sha256:7195a20a551476cee8e86ac478a3284cab0b66016302d9664f3906a8b0a119c

Essentials

Repository: my-first-python-app
Tag: v1
Tag creation date: 9/28/2023, 6:35 AM UTC
Tag last updated date: 9/28/2023, 6:35 AM UTC

Digest: sha256:7195a20a551476cee8e86ac478a3284cab0b66016302d9664f3906a8b0a119c
Manifest creation date: 9/28/2023, 6:35 AM UTC
Platform: linux / amd64
Media type: application/vnd.docker.distribution.manifest.v2+json

Manifest Referers

Docker pull command: `docker pull idashellacr03.azurecr.io/my-first-python-app:v1`

Manifest

```
{
  "schemaVersion": 2,
  "mediaType": "application/vnd.docker.distribution.manifest.v2+json",
  "config": {
    "mediaType": "application/vnd.docker.container.image.v1+json",
    "size": 9138,
    "digest": "sha256:50e8d51e48f1a1e0f94ba5830c6e43540eade9f23134582b1901fae9c8049"
  },
  "layers": [
    {
      "mediaType": "application/vnd.docker.image.rootfs.diff.tar.gzip",
      "size": 27138458,
      "digest": "sha256:8081b880597765d8c882668755a3f6dc4337b0ce3a17e4057139efc96473"
    },
    {
      "mediaType": "application/vnd.docker.image.rootfs.diff.tar.gzip",
      "size": 2781345,
      "digest": "sha256:824486234237981c9c5d4f410fe9b295a3c35a671e528808f0808e257ec4c"
    },
    {
      "mediaType": "application/vnd.docker.image.rootfs.diff.tar.gzip",
      "size": 12809905,
      "digest": "sha256:8f777578c172d81807783dc226654011fff6066097943f6c4697cf8aac35"
    },
    {
      "mediaType": "application/vnd.docker.image.rootfs.diff.tar.gzip",
      "size": 244,
      "digest": "sha256:c8f627189a8b113605a7973c0b243889fa7162ebc173a5988dc0b6ec93c9"
    }
  ]
}
```

Creation of Kubernetes Cluster:

Microsoft Azure | Search resources, services, and docs (G+)

Home > microsoft.aks-20230928082949 | Overview >

idashellkc03

Kubernetes service

Search

Create Connect Start Stop Delete Refresh Open in mobile Give feedback

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Microsoft Defender for Cloud

Kubernetes resources

Namespaces

Workloads

Services and ingresses

Storage

Configuration

Custom resources

Run command

Settings

Node pools

Cluster configuration

Networking

Extensions + applications

Backup (preview)

Open Service Mesh

GitOps

Automated deployments (preview)

Essentials

Resource group: RG_IDA_SHELL

Status: Succeeded (Running)

Location: East US

Subscription: resource-1680261698581

Subscription ID: 7179a1e4-9824-4360-9eda-2930d7e2dc08

Tags: Add tags

Kubernetes version: 1.26.6

API server address: idashellkc03-dns-jko8fk32.hcp.eastus.azurek8s.io

Network type (plugin): Azure CNI

Node pools: 2 node pools

Get started Properties Monitoring Capabilities (4) Recommendations Tutorials

Kubernetes services

Encryption type: Encryption at-rest with a platform-managed key

Virtual node pools: Not enabled

Node pools

Node pools: 2 node pools

Kubernetes versions: 1.26.6

Node sizes: Standard_DS2_v2

Configuration

Kubernetes version: 1.26.6

Auto Upgrade Type: Patch

Authentication and Authorization: Local accounts with Kubernetes RBAC

Local accounts: Enabled

Extensions + applications

No extensions installed

Networking

API server address: idashellkc03-dns-jko8fk32.hcp.eastus.azurek8s.io

Network type (plugin): Azure CNI

Pod CIDR: -

Service CIDR: 10.0.0.0/16

DNS service IP: 10.0.0.10

Docker bridge CIDR: -

Network Policy: Calico

Load balancer: Standard

HTTP application routing: Not enabled

Private cluster: Not enabled

Authorized IP ranges: Not enabled

Application Gateway ingress controller: Not enabled

Integrations

Container insights: Enabled

Workspace resource ID: DefaultWorkspace-7179a1e4-9824-4360-9eda-2930d7e2dc08-EUS

```
labuser@ip-172-31-4-214:~/Desktop/DockerProject/Kubernetes$ az aks update -n idashellkc03 -g RG_IDA_SHELL --attach-acr idashellacr03
AAD role propagation done[#####] 100.000AAD role propagation done[#####] 100.00000%{
  "aadProfile": null,
  "addonProfiles": {
    "azureKeyvaultSecretsProvider": {
      "config": null,
      "enabled": false,
      "identity": null
    }
  }
}
```

```

labuser@ip-172-31-4-214:~/Desktop/DockerProject/Kubernetes$ kubectl apply -f deployment.yaml
deployment.apps/my-first-python-app created
labuser@ip-172-31-4-214:~/Desktop/DockerProject/Kubernetes$ kubectl apply -f service.yaml
service/my-first-python-app configured
labuser@ip-172-31-4-214:~/Desktop/DockerProject/Kubernetes$ kubectl get pods
NAME                                READY   STATUS    RESTARTS   AGE
my-app-f966d9c8d-6zgjm              1/1     Running   0           49m
my-app-f966d9c8d-nz48v              1/1     Running   0           49m
my-first-python-app-7cbf5c4874-ljgkj 1/1     Running   0           42s
my-first-python-app-7cbf5c4874-xlv8f 1/1     Running   0           41s
labuser@ip-172-31-4-214:~/Desktop/DockerProject/Kubernetes$ kubectl get svc
NAME                TYPE          CLUSTER-IP      EXTERNAL-IP      PORT(S)          AGE
kubernetes          ClusterIP     10.0.0.1         <none>            443/TCP          83m
my-first-python-app LoadBalancer  10.0.162.251     20.241.145.238   80:30861/TCP     49m

```