

# Hosting Docker on EduCloud

This is a guide to hosting your Docker-containerized web application through EduCloud.

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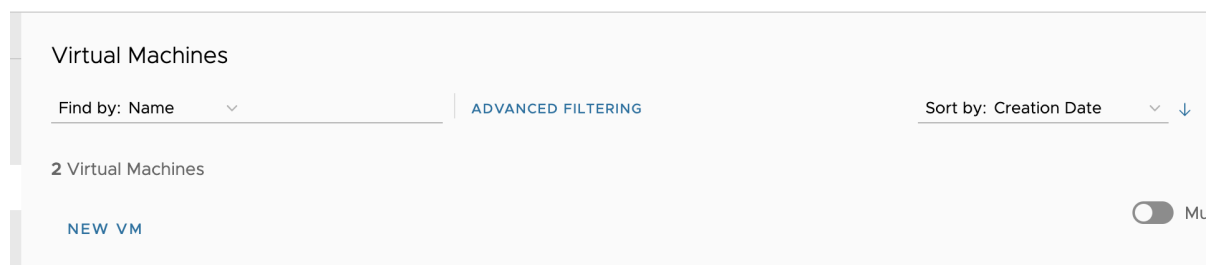
## Hosting Docker applications on EduCloud

### Before we begin:

- This document assumes you have a prebuilt Dockerfile ready to be deployed. This guide will not go into setting up a Docker or Docker Compose file.
- You should already have already reached out to your Administrators to obtain access to EduCloud
- This current method only allows the application you plan to host to be accessible only through the UBC network. A VPN to UBC is needed if the end-user is not on Campus. Further assistance can be made with UBC-LT to assist in changing permissions to enable further accessibility outside of UBC.

### Setting up your VM:

1. Create a new virtual machine.



2. When creating a new virtual machine (abbreviated as VM), name the VM such that it reflects the application you are launching. It is recommended to use Ubuntu 18.04 LTS as the OS of

the VM however this may change depending on your needs. Linux-based OS is preferred over Windows-based OS due to some incompatibility issues with Docker

- a. The compute name is the name of the VM computer itself. This is the name other systems will see within the networking context.
- b. Description is the description of the virtual machine. I would recommend something along the lines of "VM for hosting <your project name here>"

New VM

Name \*

Input is required

Computer Name \*

Description

Type

☐ New

☒ From Template

Power on

☒

Templates

	Name	vApp Name	Catalog	OS	Compute
<input type="radio"/>	Ubuntu 18	Image - Ubuntu 18.04 LTS	EduAdmin-V...	Ubuntu Linux (64-bit)	CPU 1 Memory 1 GB
<input type="radio"/>	Red Hat Enterprise Linux 8	Image - Red Hat Enterprise Linux...	EduAdmin-V...	Red Hat Enterprise Linux 7 (64-bit)	CPU 1

CANCEL

OK

## New VM

**Name \***

**Computer Name \***

**Description**

**Type** ☐ New ☒ From Template

**Power on** ☒

### Templates

	Name	vApp Name	Catalog	OS	Compute	
<input checked="" type="radio"/>	Ubuntu 18	Image - Ubuntu 18.04 LTS	EduAdmin-V...	Ubuntu Linux (64-bit)	CPU	1
					Memory	1 GB
<input type="radio"/>	Red Hat Enterprise Linux 8	Image - Red Hat Enterprise Linux...	EduAdmin-V...	Red Hat Enterprise Linux 7 (64-bit)	CPU	1
					Memory	1 GB
<input type="radio"/>	Red Hat Enterprise Linux 7	Image - Red Hat Enterprise Linux...	EduAdmin-V...	Red Hat Enterprise Linux 7 (64-bit)	CPU	1
					Memory	1 GB
<input type="radio"/>	Microsoft Windows Server 2019	Windows Server 2019 Standard	EduAdmin-V...	Microsoft Windows Server 2016 (64-b...	CPU	1
					Memory	2 GB

CANCEL

OK

3. Scrolling down, adjust your virtual Compute properties according to your needs. This will vary depending on your usage. The official guide to Docker recommends 8gb of memory to run however from our testing, lower memory may seems functional.

**New VM**

Microsoft Windows 10 Enterprise   Windows 10 Enterprise   EduAdmin-V...   Microsoft Windows 10 (64-bit)

Memory 1 GB

CPU 1

Memory 2 GB

**Storage**

Storage Policy Van Standard (\$\$) PG02 (VDC Default)

**Compute**

Virtual CPUs 1

Cores per socket 1

Number of sockets 1

Memory 1 GB

**NICs**

Primary NIC	NIC	Connected	Network Adapter Type	Network	IP Mode	IP Address	External IP Address	MAC Address
+	0	<input checked="" type="checkbox"/>	VM	No	No		-	00:50:56:0

Custom Properties

CANCEL OK

4. within the NICs settings, we will configure the network such that the virtual machine can talk to the web. Choose a network with inbound connections (in our case IT-FRONT02-p02), and set your IP Mode to **Static - IP Pool**. This will autogenerate an available IP address once we click **OK** in the bottom right corner of the popout window. The autogenerated IP will also act as your external IP address.

- Note: **DO NOT** choose your own IP address unless you have the permissions to see other IP addresses being used in your network. This will cause severe issues within the network you are under and may cause external systems to crash.

**NICs**

Primary NIC	NIC	Connected	Network Adapter Type	Network	IP Mode	IP Address	External IP Address	MAC Address
+	0	<input checked="" type="checkbox"/>	VM	No	No		-	00:50:56:0

None  
CSSERVERS-p02  
IT-Back-p02  
IT-Dev102-p02  
**IT-FRONT02-p02**  
MGRP-ACCOUNTING-p02  
SCLS-FUSIONSVRs-p02  
VCONF-UDC-p02  
VCS-CONTROL-p02

## NICS

Primary NIC	NIC	Connected	Network Adapter Type	Network	IP Mode	IP Address	External IP Address	MAC Address	
	0	<input checked="" type="checkbox"/>	VM	IT-f	<div> <input checked="" type="radio"/> None             <input type="radio"/> DHCP             <input checked="" type="radio"/> Static - IP Pool             <input type="radio"/> Static - Manual         </div>	-	-	00:50:56:0	

## Custom Properties

- Click **OK** in the bottom right corner of the popout window to initialize your VM.

## New VM

Please wait

**Name \*** testVM

**Computer Name \*** testVM

**Description** This is a test VM for documentation purposes

**Type** ☐ New ☒ From Template

**Power on** ☒

### Templates

	Name	vApp Name	Catalog	OS	Compute
<input type="radio"/>	Ubuntu 18	Image - Ubuntu 18.04 LTS	EduAdmin-V...	Ubuntu Linux (64-bit)	CPU 1 Memory 1 GB
<input type="radio"/>	Red Hat Enterprise Linux 8	Image - Red Hat Enterprise Linux...	EduAdmin-V...	Red Hat Enterprise Linux 7 (64-bit)	CPU 1 Memory 1 GB
<input type="radio"/>	Red Hat Enterprise Linux 7	Image - Red Hat Enterprise Linux...	EduAdmin-V...	Red Hat Enterprise Linux 7 (64-bit)	CPU 1 Memory 1 GB
<input type="radio"/>	Microsoft Windows Server 2019	Windows Server 2019 Standard	EduAdmin-V...	Microsoft Windows Server 2016 (64-b...	CPU 1

CANCEL

OK

Virtual Machines

Find by: Name ▼ [ADVANCED FILTERING](#)

2 Virtual Machines

[NEW VM](#)

**testVM**

Unresolved

VM Console

Lease	Never Marks as expired ⓘ
Created On	-
Owner	nkod
vApp	-
OS	-

CPU

Storage

Memory

Network

-

33 GB ⓘ

0 MB

ⓘ

[BADGES](#)

[ACTIONS ▼](#)
[DETAILS](#)

**3dmetabolism-wikibase**

Powered on

VM Console

Lease	Never Suspends ⓘ
Created On	08/06/2021, 11:37:13 AM
Owner	nkod
vApp	-
OS	Ubuntu Linux (64-bit)

CPU

Storage

Memory

Network

1

166 GB ⓘ

8 GB

ⓘ

[BADGES](#)

[ACTIONS ▼](#)
[DETAILS](#)

**MGRP\_Quoting**

Powered off

VM Console

Lease	Never Suspends ⓘ
Created On	08/28/2018, 12:09:31 AM
Owner	system
vApp	MGRP_Quoting
OS	Microsoft Windows Server 20...

CPU

Storage

Memory

Network

5

7.91 TB ⓘ

8 GB

ⓘ

[BADGES](#)

[ACTIONS ▼](#)
[DETAILS](#)

- You should now see your VM as one of the square cards. Before accessing the virtual machine, we must override the current password associated to the image. Click your VM name (the blue text, in our case, it is testVM) to enter its settings. The following window should appear.

testVM

POWER ON POWER OFF LAUNCH WEB CONSOLE LAUNCH REMOTE CONSOLE ALL ACTIONS

testVM  
Powered on

General

Hardware  
Removable Media  
Hard Disks  
Compute  
NICs

Guest OS  
Customization  
Guest Properties  
Sharing  
Metadata

Monitor  
Tasks  
Events

EDIT

Name	testVM
State	Powered on
Computer Name	testVM
Description	This is a test VM for documentation purposes
Operating System	Ubuntu Linux (64-bit)
Boot Delay	0
Storage Policy	Van Standard (\$\$) PG02
Virtual Data Center	ubc-itav-prod
Owner	nkod
VMware Tools	11269
Virtual Hardware Version	Hardware Version 13
Enter BIOS Setup	Disabled

7. Turn off the virtual machine by clicking **POWER OFF** beside the name of your virtual machine

testVM

POWER ON POWER OFF LAUNCH WEB CONSOLE LAUNCH REMOTE CONSOLE ALL ACTIONS

testVM  
Powered off

General

Hardware  
Removable Media  
Hard Disks  
Compute  
NICs

Guest OS  
Customization  
Guest Properties  
Sharing  
Metadata

Monitor  
Tasks  
Events

EDIT

Name	testVM
State	Powered off
Computer Name	testVM
Description	This is a test VM for documentation purposes
Operating System	Ubuntu Linux (64-bit)
Boot Delay	0
Storage Policy	Van Standard (\$\$) PG02
Virtual Data Center	ubc-itav-prod
Owner	nkod
VMware Tools	11269
Virtual Hardware Version	Hardware Version 13
Enter BIOS Setup	Disabled

8. On the left-hand side, click **Guest OS Customization**. Then, proceed to click the **EDIT** button just above the

All Virtual Machines > testVM

**testVM**  
Powered off

POWER ON POWER OFF LAUNCH WEB CONSOLE LAUNCH REMOTE CONSOLE ALL ACTIONS ▾

General

Hardware

Removable Media

Hard Disks

Compute

NICs

**Guest OS**

**Customization**

Guest Properties

Sharing

Metadata

Monitor

Tasks

Events

[EDIT](#)

General

Enable guest customization	Enabled
Change SID	Disabled

Password Reset

Allow local administrator password	Enabled
Require Administrator to change password on first login	Disabled
Auto generate password	Enabled
Number of times to log on automatically	0

Join Domain

Enable this VM to join a domain	Disabled
Override organization's domain	Enabled

Script

Script file	-
-------------	---

9. Once clicked, proceed to deselect **Auto generate password** and then write your own password under the **Specify password** section. Click **SAVE** when done



**Edit Guest Properties**

General

☒ **Enable guest customization**

The computer name and network settings configured for this VM are applied to its Guest OS when the VM is powered on. The following settings are only applied the 1st time the VM is powered on or if "Power on and Force Recustomization" is performed: Change SiD, Password Reset, Join Domain and Customization Script. Guest customization should not be enabled if the VM uses Guest Properties for customization.

Password Reset

☒ **Allow local administrator password**

☐ **Require Administrator to change password on first login**

☐ **Auto generate password**

Specify password

Number of times to log on automatically

Value of 0 will disable automatic log on as administrator.

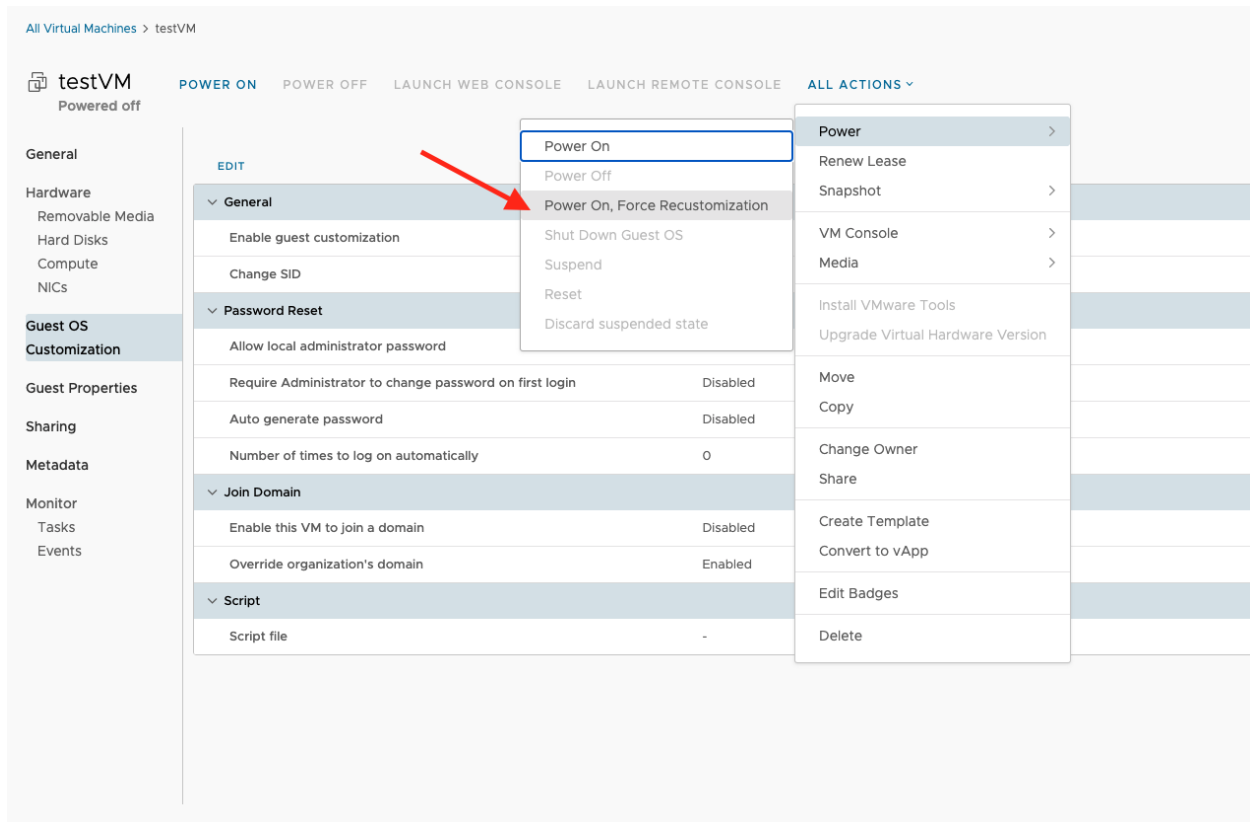
Script

Script file

UPLOAD

DISCARD SAVE

10. We will now proceed to access the virtual machine. To force the password change, select the dropdown window, **ALL ACTIONS** → **POWER** → **Power On, Force Recustomization**. This will turn on your machine.



11. Once on, select the **LAUNCH WEB CONSOLE** button shown in the screenshot below. A popup window will appear.
  - a. NOTE: if you close the popout window and plan to use the web console again, refresh your page as there is a bug that prevents a page to open the web console twice without refreshing.

testVM

Powered on

POWER ON

POWER OFF

LAUNCH WEB CONSOLE

LAUNCH REMOTE CONSOLE

ALL ACTIONS ▾

General

Hardware

Removable Media

Hard Disks

Compute

NICs

Guest OS

Customization

Guest Properties

Sharing

Metadata

Monitor

Tasks

Events

EDIT

General

Enable guest customization

Enabled

Change SID

Disabled

Password Reset

Allow local administrator password

Enabled

Require Administrator to change password on first login

Disabled

Auto generate password

Disabled

Number of times to log on automatically

0

Join Domain

Enable this VM to join a domain

Disabled

Override organization's domain

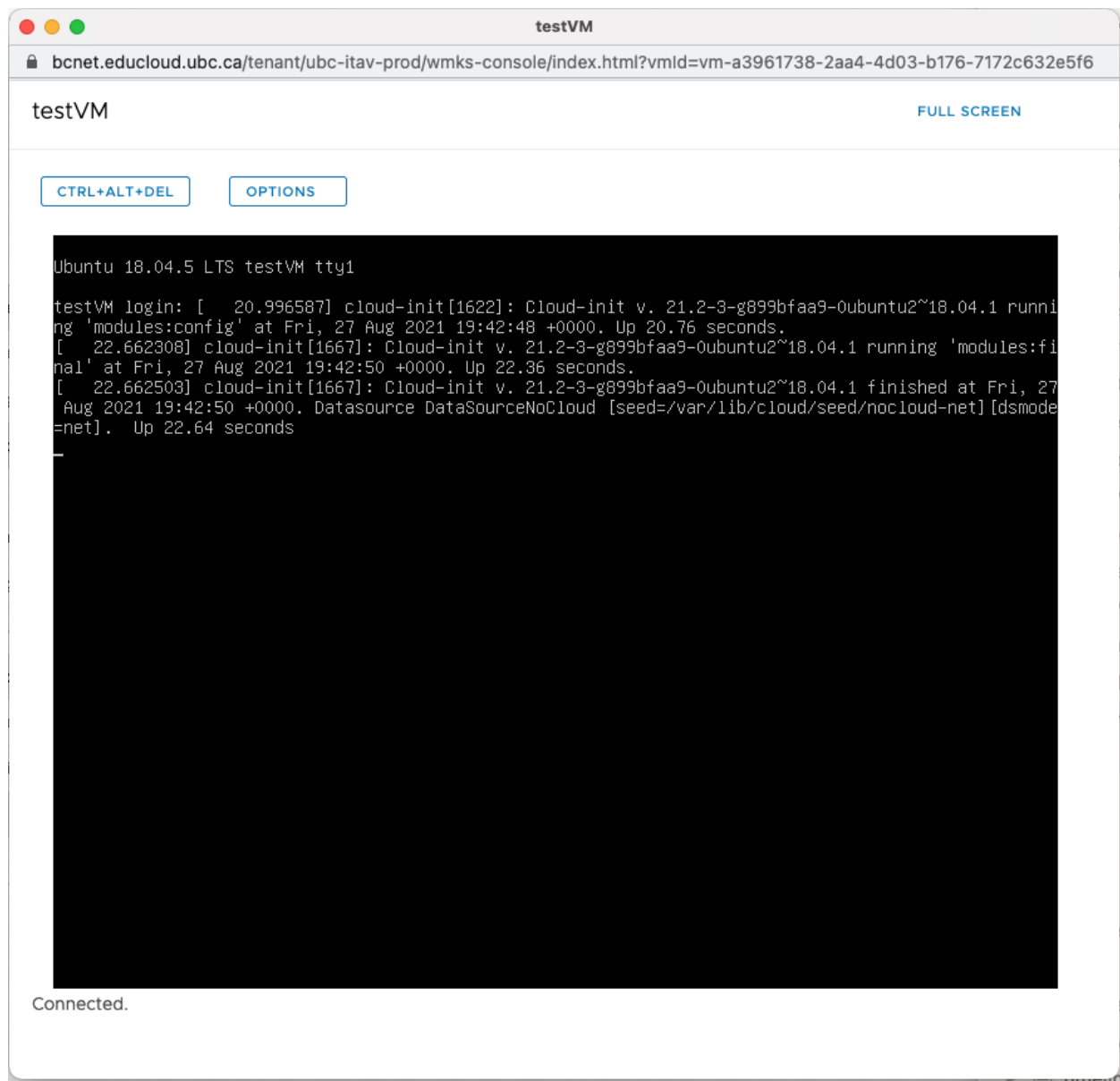
Enabled

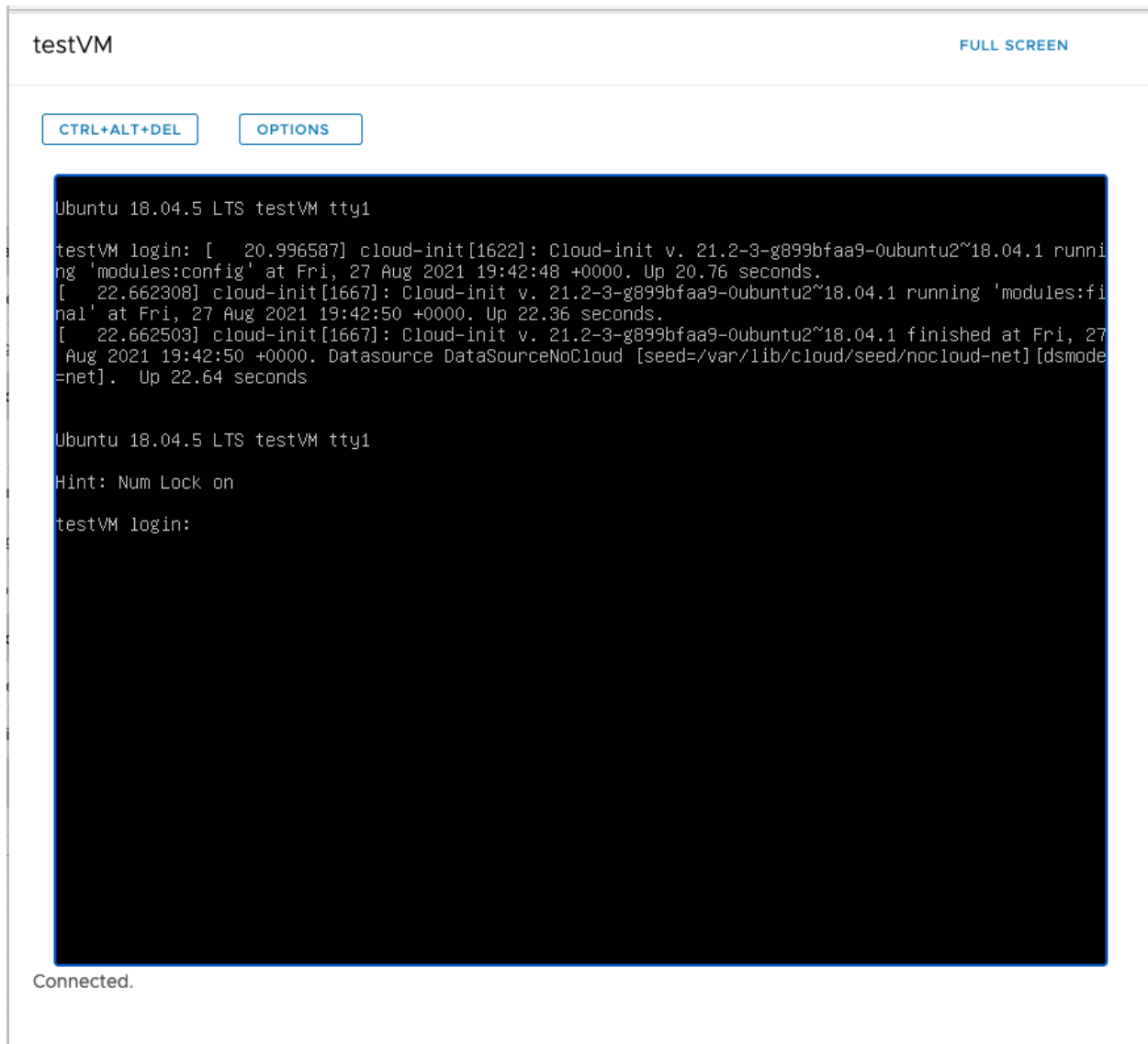
Script

Script file

-

- You are now within the screen of your virtual machine. When prompt with the window below, press **Enter** on your keyboard to switch to the login page (shown in the second screenshot below).





- The administrative account username is `root`. Type the username and press enter. You are now prompted with your password. Note that the password does not indicate that you are typing, any key you press will be accounted into the password login attempt. Hit `Enter` when you are done. If you are successfully logged in you should see a similar screen to the screenshot below

CTRL+ALT+DEL

OPTIONS

```
Welcome to Ubuntu 18.04.5 LTS (GNU/Linux 4.15.0-154-generic x86_64)

* Documentation:  https://help.ubuntu.com
* Management:    https://landscape.canonical.com
* Support:        https://ubuntu.com/advantage

System information as of Fri Aug 27 20:00:10 UTC 2021

System load:  0.0               Processes:    186
Usage of /home: 0.7% of 4.99GB   Users logged in: 0
Memory usage:  27%              IP address for ens192: 142.103.81.130
Swap usage:    0%

* Super-optimized for small spaces - read how we shrank the memory
  footprint of MicroK8s to make it the smallest full K8s around.

  https://ubuntu.com/blog/microk8s-memory-optimisation

0 updates can be applied immediately.

New release '20.04.3 LTS' available.
Run 'do-release-upgrade' to upgrade to it.

No mail.
root@testVM:~#
```

Connected.

At this point your virtual machine has been configured and is ready for docker installation. Note at this point you will also need to ask your administrator, or contact UBC-LT (with a ticket under the application EduCloud) to edit some settings hidden from you:

1. Request to configure firewall settings for inbound and outbound requests.
2. Request to expose the ports of your application that Docker will use.

## Installing Docker on your Virtual Machine:

This installation process was referenced from a tutorial from [DigitalOcean](#). Installation process can vary however this tutorial worked for our needs.

1. to begin, start by updating `apt-get` . This is done by typing `sudo apt-get update` in your terminal. Hit enter.

testVM

FULL SCREEN

CTRL+ALT+DEL

OPTIONS

```
root@testVM:~# sudo apt-get update
Hit:1 https://mirror.it.ubc.ca/ubuntu bionic InRelease
Get:2 https://mirror.it.ubc.ca/ubuntu bionic-updates InRelease [88.7 kB]
Get:3 https://mirror.it.ubc.ca/ubuntu bionic-backports InRelease [74.6 kB]
Get:4 https://mirror.it.ubc.ca/ubuntu bionic-security InRelease [88.7 kB]
Get:5 https://mirror.it.ubc.ca/ubuntu bionic-updates/main amd64 Packages [2,191 kB]
Get:6 https://mirror.it.ubc.ca/ubuntu bionic-updates/universe amd64 Packages [1,747 kB]
Fetched 4,190 kB in 3s (1,412 kB/s)
Reading package lists... Done
root@testVM:~#
```

Connected.

2. after `apt` has been updated, install additional packages using the following command:

```
sudo apt-get install \
apt-transport-https \
ca-certificates \
curl \
gnupg \
lsb-release
```

```

root@testVM:~# sudo apt install apt-transport-https ca-certificates curl software-properties-common
Reading package lists... Done
Building dependency tree
Reading state information... Done
ca-certificates is already the newest version (20210119~18.04.1).
curl is already the newest version (7.58.0-2ubuntu3.14).
software-properties-common is already the newest version (0.96.24.32.14).
software-properties-common set to manually installed.
apt-transport-https is already the newest version (1.6.14).
0 upgraded, 0 newly installed, 0 to remove and 1 not upgraded.
root@testVM:~#

```

```

root@testVM:~# sudo apt install apt-transport-https ca-certificates curl software-properties-common
Reading package lists... Done
Building dependency tree
Reading state information... Done
ca-certificates is already the newest version (20210119~18.04.1).
curl is already the newest version (7.58.0-2ubuntu3.14).
software-properties-common is already the newest version (0.96.24.32.14).
software-properties-common set to manually installed.
apt-transport-https is already the newest version (1.6.14).
0 upgraded, 0 newly installed, 0 to remove and 1 not upgraded.
root@testVM:~# curl -fsSL https://download.docker.com/linux/ubuntu/gpg | sudo apt-key add -
OK
root@testVM:~# _

```

3. next, we will proceed to install a few packages which will let us use packages over HTTPS:

```
sudo apt install apt-transport-https ca-certificates curl software-properties-common
```

4. We then add the GPG key for the official Docker repository to your system:

```
sudo add-apt-repository "deb [arch=amd64] https://download.docker.com/linux/ubuntu bionic stable"
```

5. update the package database with the Docker packages from the newly added repo:

```
sudo apt update
```

6. make sure you are about to install from the Docker repo instead of the default Ubuntu repo:

```
apt-cache policy docker-ce
```



7. To verify your installation, run the following command:

```
docker version
```

A successful install should produce a similar message within the terminal

```
root@testVM:~# docker version
Client: Docker Engine - Community
 Version:      20.10.8
 API version:  1.41
 Go version:   go1.16.6
 Git commit:   3967b7d
 Built:        Fri Jul 30 19:54:08 2021
 OS/Arch:     linux/amd64
 Context:      default
 Experimental: true

Server: Docker Engine - Community
 Engine:
  Version:      20.10.8
  API version:  1.41 (minimum version 1.12)
  Go version:   go1.16.6
  Git commit:   75249d8
  Built:        Fri Jul 30 19:52:16 2021
  OS/Arch:     linux/amd64
  Experimental: false
 containerd:
  Version:      1.4.9
  GitCommit:    e25210fe30a0a703442421b0f60afac609f950a3
 runc:
  Version:      1.0.1
  GitCommit:    v1.0.1-0-g4144b63
 docker-init:
  Version:      0.19.0
  GitCommit:    de40ad0
root@testVM:~# _
```

8. Additionally for if your application requires Docker Compose, run the following command to install the necessary packages:

```
sudo apt install docker-compose
```

A successful install should produce a similar message within the terminal.

```
root@testVM:~# docker-compose version
docker-compose version 1.17.1, build unknown
docker-py version: 2.5.1
CPython version: 2.7.17
OpenSSL version: OpenSSL 1.1.1 11 Sep 2018
root@testVM:~# _
```

You are now able to run your Docker/Docker-Compose images.