

Ubuntu Server 18.04-LTS Virtual Machine

The intent of this README is to guide you in a deployment a **Ubuntu Server 18.04-LTS Standard-D2s-v3** (Two VCPUs and 8 GIB RAM).

It's good to bear in mind that there are different ways to deploy resources in Azure, here a few options if you want to dig on the Azure Universe. You can run this template either using [PowerShell](#), [Azure CLI](#), [Azure Portal](#) or your favorite SDK.

The Template

Don't let the size of the template scares you. The structure is very intuitive and once that you get the gist of it, you gonna see how easier your life will be regarding creating resources on Azure.

The only two parameters that we need to inform are **adminUsername** and **adminPassword**.

Don't worry about changing anything on the file, either on the portal or using Azure CLI, you gonna be asked to insert this information, but bear in mind that there is some requirement for those two parameters:

- *adminUsername*: Usernames can be a maximum of 20 characters in length and cannot end in a period (".").

The following usernames are not allowed:

administrator	admin	user	user1
test	user2	test1	user3
admin1	1	123	a
actuser	adm	admin2	aspnet
backup	console	david	guest
john	owner	root	server
sql	support	support_388945a0	sys
test2	test3	user4	user5

- *adminPassword* There are varying password length requirements, depending on the tool you are using:

Portal - between 12 - 72 characters

PowerShell - between 8 - 123 characters

CLI - between 12 - 123

- Have lower characters
- Have upper characters
- Have a digit
- Have a special character (Regex match [W_])

. The following passwords are not allowed:

```
abc@123 iloveyou! P@$w0rd P@ssw0rd P@ssword123 Pa$$word pass@word1 Password!  
Password1 Password22
```

Keeping that in mind, let's rock with the Deployment.

Deployment

There are a few ways to deploy this template. You can use [PowerShell](#), [Azure CLI](#), [Azure Portal](#) or your favorite SDK.

For this task, we gonna deploy using Visual Code and the portal and a little surprise for you at the end. :D

For Azure CLI I choose to use the Visual Code with Azure CLI extensions, if you like, you can find more information [here](#). But bare in mind that you don't need to use the Visual Code, you can stick with the old good always present **Command Line** on Windows or any **bash terminal**.

Using Azure CLI with Visual Code

type on the terminal windows: **az login**

The image shows a Visual Studio Code editor window with a file named `azuredeploy.json` open. The file contains Bicep code for deploying a virtual machine. The code is as follows:

```
119     },
120   },
121   {
122     "name": "[variables('virtualMachineName')]",
123     "type": "Microsoft.Compute/virtualMachines",
124     "apiVersion": "2019-03-01",
125     "location": "[variables('location')]",
126     "dependsOn": [
127       "[resourceId('Microsoft.Network/networkInterfaces/', variables('nicName'))]"
128     ],
129     "properties": {
130       "hardwareProfile": {
131         "vmSize": "[variables('virtualMachineSize')]"
132       },
133       "storageProfile": {
134         "osDisk": {
135           "createOption": "fromImage",
136           "managedDisk": {
137             "storageAccountType": "[variables('osDiskType')]"
138           }
139         },
140         "imageReference": {
141           "publisher": "MicrosoftVisualStudio",
142           "offer": "VisualStudio",
143           "sku": "VS-2017-Comm-Win10-N",
144         }
145       }
146     }
147   }
148 }
```

Below the code editor, the `TERMINAL` tab is active, showing a bash shell. The user has run the command `az login`, which has been highlighted with a red box. The terminal output is as follows:

```
Osiris-2:101-vm-windows-visualstudio2019 krisnatagoras$ az login
Note, we have launched a browser for you to login. For old experience with device code, use "az login --use-device-code"
You have logged in. Now let us find all the subscriptions to which you have access...
{
  "cloudName": "AzureCloud",
  "id": "[REDACTED]",
  "isDefault": false,
  "name": "Free Trial",
  "state": "Enabled",
  "tenantId": "4[REDACTED]",
  "user": {
    "name": "krisnatagoras@[REDACTED]",
    "type": "user"
  }
}
```

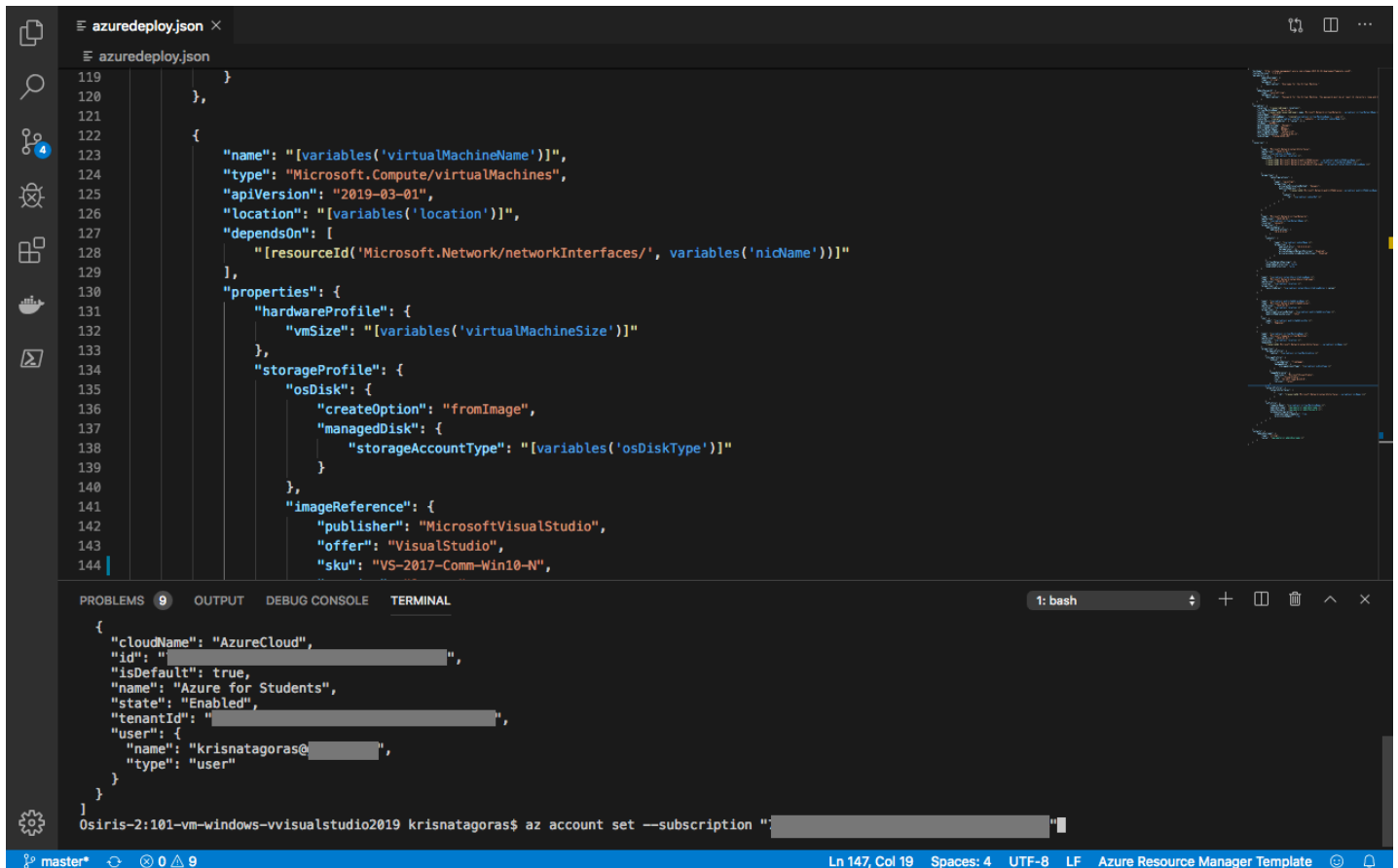
The status bar at the bottom of the editor shows the file is named `master*`, the cursor is at `Ln 147, Col 19`, and the file encoding is `UTF-8`. The file is identified as an `Azure Resource Manager Template`.

You gonna be redirected to the Azure Portal where you can use your credentials to login in.

After login, you gonna have your credentials.

In order to set the right subscription, you can use the following command:

az account set --subscription "< your subscription id >"



The image shows a VS Code editor with a file named `azuredeploy.json` open. The file contains a JSON configuration for an Azure Virtual Machine. The configuration includes a `name` variable, `type` (`Microsoft.Compute/virtualMachines`), `apiVersion` (`2019-03-01`), and `location` variable. It also specifies `dependsOn` for a network interface and `properties` for the VM, including `hardwareProfile` (with `vmSize` variable), `storageProfile` (with `osDisk` and `imageReference`), and `imageReference` (with `publisher`, `offer`, and `sku`).

Below the editor, the `TERMINAL` tab is active, showing a `bash` prompt. The terminal output displays the `az account set` command being executed, with the `subscription` parameter highlighted. The command is: `az account set --subscription "`

Resource Group

After you logged in, we gonna need to create a Resource Group for our deployment. If you haven't yet created a Resource Group, we gonna do that now! But what is a Resource Group, one might ask. Bare with me! A Resource Group is a container that holds related resources for an Azure solution. The resource group includes those resources that you want to manage as a group. Simply saying, it's like a folder that contains files. Simple as that ;-)

To create a Resource Group, you need a name and the location for your Resource Group.

For a list of locations, type: **az account list-locations**

To create the Resource group, just type the command:

az group create --name simpleLinuxVM-RG --location < yourlocation >

The screenshot shows a VS Code editor with two tabs: `azuredeploy.json` and `azuredeploy.parameters.json`. The `azuredeploy.json` file contains a JSON template for an Azure Resource Group deployment. The template includes parameters for `adminUsername` and `adminPassword`, and variables for `location`, `networkInterfaceName`, `networkSecurityGroupName`, `virtualMachineName`, `virtualNetworkName`, `publicIpAddressName`, `subnetName`, `subnetRef`, `nsgId`, `vnetId`, `osDiskType`, and `virtualMachineSize`. The `resources` section is partially visible at the bottom of the file.

The terminal window at the bottom shows the command `az group create --name simpleLinuxVM-RG --location "uksouth"` being executed. The output shows the successful creation of the resource group `simpleLinuxVM-RG` in the `uksouth` location. The command prompt is `Osiris-2:simpleLinux-VM krisnatagoras$`.

```
2 "$schema": "http://schema.management.azure.com/schemas/2015-01-01/deploymentTemplate.json#",
3 "contentVersion": "1.0.0.0",
4 "parameters": {
5   "adminUsername": {
6     "type": "string"
7   },
8   "adminPassword": {
9     "type": "secureString"
10  }
11 },
12 "variables": {
13   "location": "[resourceGroup().location]",
14   "networkInterfaceName": "myNetInt",
15   "networkSecurityGroupName": "mySecGroup",
16   "virtualMachineName": "my-ubuntu-vm",
17   "virtualNetworkName": "MyVNet",
18   "publicIpAddressName": "myPublicIP",
19   "subnetName": "mySubnet",
20   "subnetRef": "[concat(variables('vnetId'), '/subnets/', variables('subnetName'))]",
21   "nsgId": "[resourceId(resourceGroup().name, 'Microsoft.Network/networkSecurityGroups', variables('networkSecurityGroupName'))]",
22   "vnetId": "[resourceId(resourceGroup().name, 'Microsoft.Network/virtualNetworks', variables('virtualNetworkName'))]",
23   "osDiskType": "Premium_LRS",
24   "virtualMachineSize": "Standard_D2s_v3"
25 },
26 ],
27 "resources": [
```

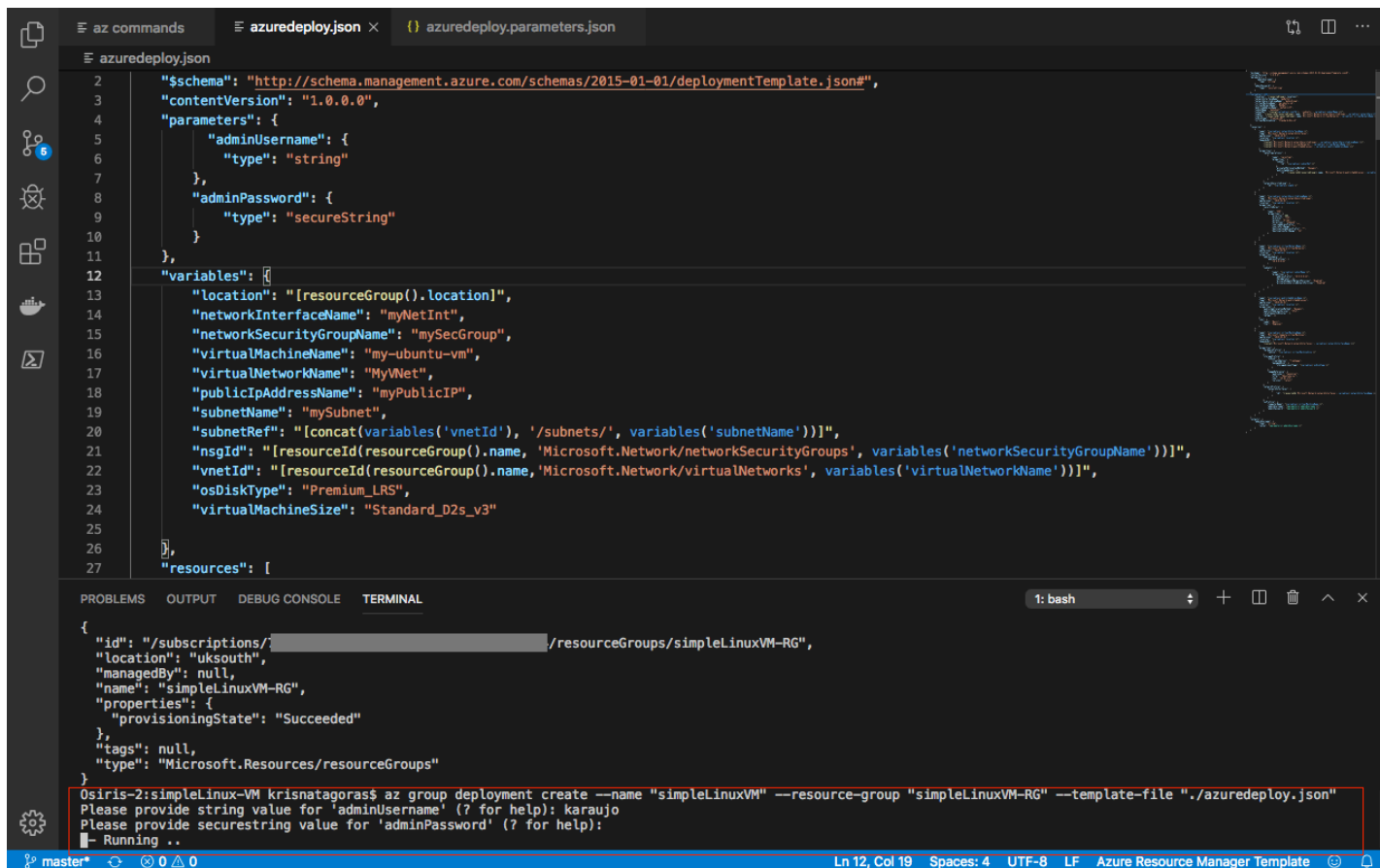
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL 1: bash

```
Osiris-2:simpleLinux-VM krisnatagoras$ az group create --name simpleLinuxVM-RG --location "uksouth"
{
  "id": "/subscriptions/.../resourceGroups/simpleLinuxVM-RG",
  "location": "uksouth",
  "managedBy": null,
  "name": "simpleLinuxVM-RG",
  "properties": {
    "provisioningState": "Succeeded"
  },
  "tags": null,
  "type": "Microsoft.Resources/resourceGroups"
}
Osiris-2:simpleLinux-VM krisnatagoras$ az group deployment create --name "simpleLinuxVM" --resource-group "simpleLinuxVM-RG" --template-file "./azuredeploy.json"
```

Ln 12, Col 19 Spaces: 4 UTF-8 LF Azure Resource Manager Template

Super simple, right? Now that we have our **Resource Group** created, let's deploy our Virtual Machine.

az group deployment create --name "name of your deployment" --resource-group "simpleLinuxVM-RG" --template-file "./azuredeploy.json"



```
az commands
azuredeploy.json
azuredeploy.parameters.json

azuredeploy.json
2  "$schema": "http://schema.management.azure.com/schemas/2015-01-01/deploymentTemplate.json#",
3  "contentVersion": "1.0.0.0",
4  "parameters": {
5    "adminUsername": {
6      "type": "string"
7    },
8    "adminPassword": {
9      "type": "secureString"
10   }
11 },
12 "variables": {
13   "location": "[resourceGroup().location]",
14   "networkInterfaceName": "myNetInt",
15   "networkSecurityGroupName": "mySecGroup",
16   "virtualMachineName": "my-ubuntu-vm",
17   "virtualNetworkName": "MyVNet",
18   "publicIpAddressName": "myPublicIP",
19   "subnetName": "mySubnet",
20   "subnetRef": "[concat(variables('vnetId'), '/subnets/', variables('subnetName'))]",
21   "nsgId": "[resourceId(resourceGroup().name, 'Microsoft.Network/networkSecurityGroups', variables('networkSecurityGroupName'))]",
22   "vnetId": "[resourceId(resourceGroup().name, 'Microsoft.Network/virtualNetworks', variables('virtualNetworkName'))]",
23   "osDiskType": "Premium_LRS",
24   "virtualMachineSize": "Standard_D2s_v3"
25 },
26 "resources": [
27
```

```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL
1: bash

{
  "id": "/subscriptions/[REDACTED]/resourceGroups/simpleLinuxVM-RG",
  "location": "uksouth",
  "managedBy": null,
  "name": "simpleLinuxVM-RG",
  "properties": {
    "provisioningState": "Succeeded"
  },
  "tags": null,
  "type": "Microsoft.Resources/resourceGroups"
}

Osiris-2:simpleLinux-VM krisnatagoras$ az group deployment create --name "simpleLinuxVM" --resource-group "simpleLinuxVM-RG" --template-file "./azuredeploy.json"
Please provide string value for 'adminUsername' (? for help): karaujo
Please provide securestring value for 'adminPassword' (? for help):
Running ..
```

As you can see, it's running. Go grab a cup of coffee, have some fresh air and I'm sure that before you come back you gonna have your Ubuntu Server Virtual Machine ready.

And there we go, our deploy is Succeeded:

```
az commands  azuredeploy.json x  azuredeploy.parameters.json

azuredeploy.json
2  "$schema": "http://schema.management.azure.com/schemas/2015-01-01/deploymentTemplate.json#",
3  "contentVersion": "1.0.0.0",
4  "parameters": {
5    "adminUsername": {
6      "type": "string"
7    },
8    "adminPassword": {
9      "type": "secureString"
10   }
11 },
12 "variables": {
13   "location": "[resourceGroup().location]",
14   "networkInterfaceName": "myNetInt",
15   "networkSecurityGroupName": "mySecGroup",
16   "virtualMachineName": "my-ubuntu-vm",
17   "virtualNetworkName": "MyVNet",
18   "publicIpAddressName": "myPublicIP",
19   "subnetName": "mySubnet",
20   "subnetRef": "[concat(variables('vnetId'), '/subnets/', variables('subnetName'))]",
21   "nsgId": "[resourceId(resourceGroup().name, 'Microsoft.Network/networkSecurityGroups', variables('networkSecurityGroupName'))]",
22   "vnetId": "[resourceId(resourceGroup().name, 'Microsoft.Network/virtualNetworks', variables('virtualNetworkName'))]",
23   "osDiskType": "Premium_LRS",
24   "virtualMachineSize": "Standard_D2s_v3"
25 },
26 ],
27 "resources": [
28   {
29     "resourceType": "virtualMachines"
30   },
31   {
32     "provisioningState": "Succeeded",
33     "template": null,
34     "templateHash": "12673323086516715193",
35     "templateLink": null,
36     "timestamp": "2019-10-24T11:24:51.564602+00:00"
37   },
38   {
39     "resourceGroup": "simpleLinuxVM-RG",
40     "type": "Microsoft.Resources/deployments"
41   }
42 ]

PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL
1: bash
"resourceType": "virtualMachines"
}
},
},
"provisioningState": "Succeeded",
"template": null,
"templateHash": "12673323086516715193",
"templateLink": null,
"timestamp": "2019-10-24T11:24:51.564602+00:00"
},
"resourceGroup": "simpleLinuxVM-RG",
"type": "Microsoft.Resources/deployments"
}
}
Osiris-2:simpleLinux-VM krisnatagoras$
```

Let's go and check the resource at the Azure Portal: Go the Resource Group, find the Resource group you've created. And there it's your brand new **Virtual Machine**:

Microsoft Azure

Search resources, services, and docs (G+I)

Jobs Utilidades Idiomas Teaching Traductor Writing Books Tools Mais visitados Tech iCloud Photos ElastaCloud Diffchecker - Online...

Create a resource

Home

Dashboard

All services

FAVORITES

All resources

Templates

Resource groups

Resource Explorer

App registrations

Roles

Subscriptions

Azure Active Directory

Quickstart Center

App Services

Function App

SQL databases

Azure Cosmos DB

Virtual machines

Load balancers

Home > Resource groups > simpleLinuxVM-RG

simpleLinuxVM-RG

Resource group

Search (Cmd+I)

Overview

Activity log

Access control (IAM)

Tags

Events

Settings

Quickstart

Deployments

Policies

Properties

Locks

Export template

Cost Management

Cost analysis

Cost alerts

Budgets

Advisor recommendations

+ Add Edit columns Delete resource group Refresh Move Export to CSV More

Subscription (change)

Azure for Students

Subscription ID

Tags (change)

Click here to add tags

Filter by name...

Type == all

Location == all

Add filter

No grouping

Showing 1 to 6 of 6 records. Show hidden types

Name	Type	Location
my-ubuntu-vm	Virtual machine	UK South
my-ubuntu-vm_disk1_41683901e1e54a1db037a8fbaf8...	Disk	UK South
myNetInt	Network interface	UK South
myPublicIP	Public IP address	UK South
mySecGroup	Network security group	UK South
MyVNet	Virtual network	UK South

< Previous Page 1 of 1 Next >

Note that beyond your Virtual Machine there are also all the resources that the VM needs in order to run:

Virtual Network Interface

Public IP Address

Storage Account

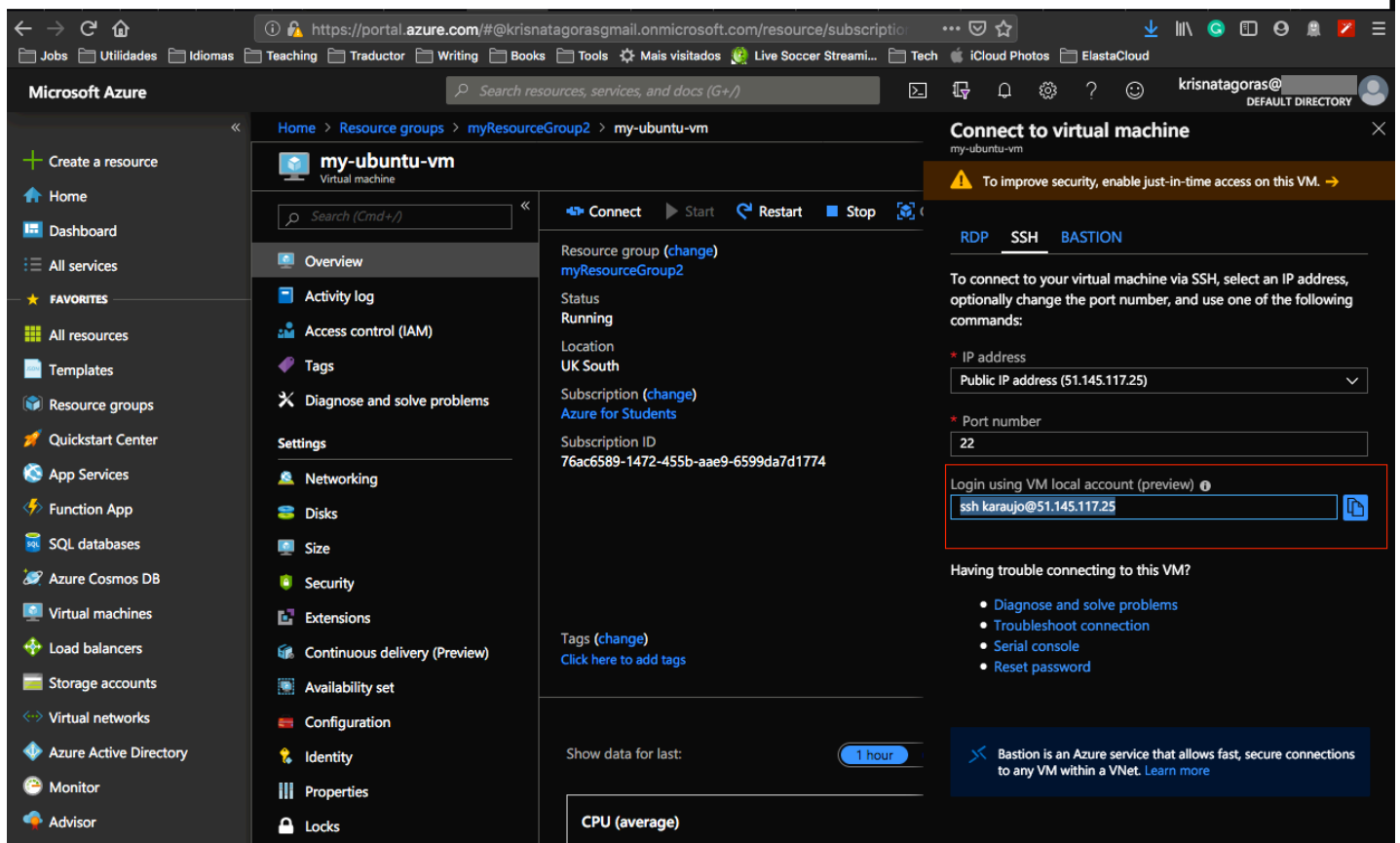
Virtual Network

Disks

Compare these resources with your ARM Template is a good exercise to have a better understanding.

Open your Virtual Machine and then click on the button **connect**.

There you gonna see the ssh command to connect to your Virtual Machine. Copy the command and open your terminal.

The screenshot shows the Microsoft Azure portal interface. The top navigation bar includes the user's profile 'krisnatagoras@' and a search bar. The left sidebar contains various navigation options like 'Create a resource', 'Home', 'Dashboard', and 'All services'. The main content area is titled 'my-ubuntu-vm' and shows the VM's status as 'Running'. On the right, the 'Connect to virtual machine' panel is open, displaying options for RDP, SSH, and Bastion. The SSH section shows the command 'ssh karaujo@51.145.117.25' which is highlighted with a red box. Below this, there are links for 'Having trouble connecting to this VM?' and a note about Bastion.

Paste the command and press **Enter**.

Insert the password you've created.

And Voilà, there you have a brandy new Windows Virtual Machine with Visual Studio.


```
Terminal Shell Edit View Window Help
krisnatagoras — karaujo@my-ubuntu-vm: ~ — ssh karaujo@51.145.117.25 — 181x50

Last login: Tue Oct 15 14:48:26 on ttys000
0siris-2:~ krisnatagoras$ ssh karaujo@51.145.117.25
The authenticity of host '51.145.117.25 (51.145.117.25)' can't be established.
ECDSA key fingerprint is SHA256:5S3/4RaIQe/hrIp70c06jK9tCPYJqIaGE3WnprrgGT1.
Are you sure you want to continue connecting (yes/no)? yes
Warning: Permanently added '51.145.117.25' (ECDSA) to the list of known hosts.
karaujo@51.145.117.25's password:
Welcome to Ubuntu 18.04.3 LTS (GNU/Linux 5.0.0-1018-azure x86_64)

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

System information as of Tue Oct 15 15:29:53 UTC 2019

System load:  0.03               Processes:    116
Usage of /:   4.2% of 28.90GB    Users logged in:  0
Memory usage: 4%                IP address for eth0: 10.0.0.4
Swap usage:   0%

7 packages can be updated.
7 updates are security updates.

The programs included with the Ubuntu system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Ubuntu comes with ABSOLUTELY NO WARRANTY, to the extent permitted by
applicable law.

To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

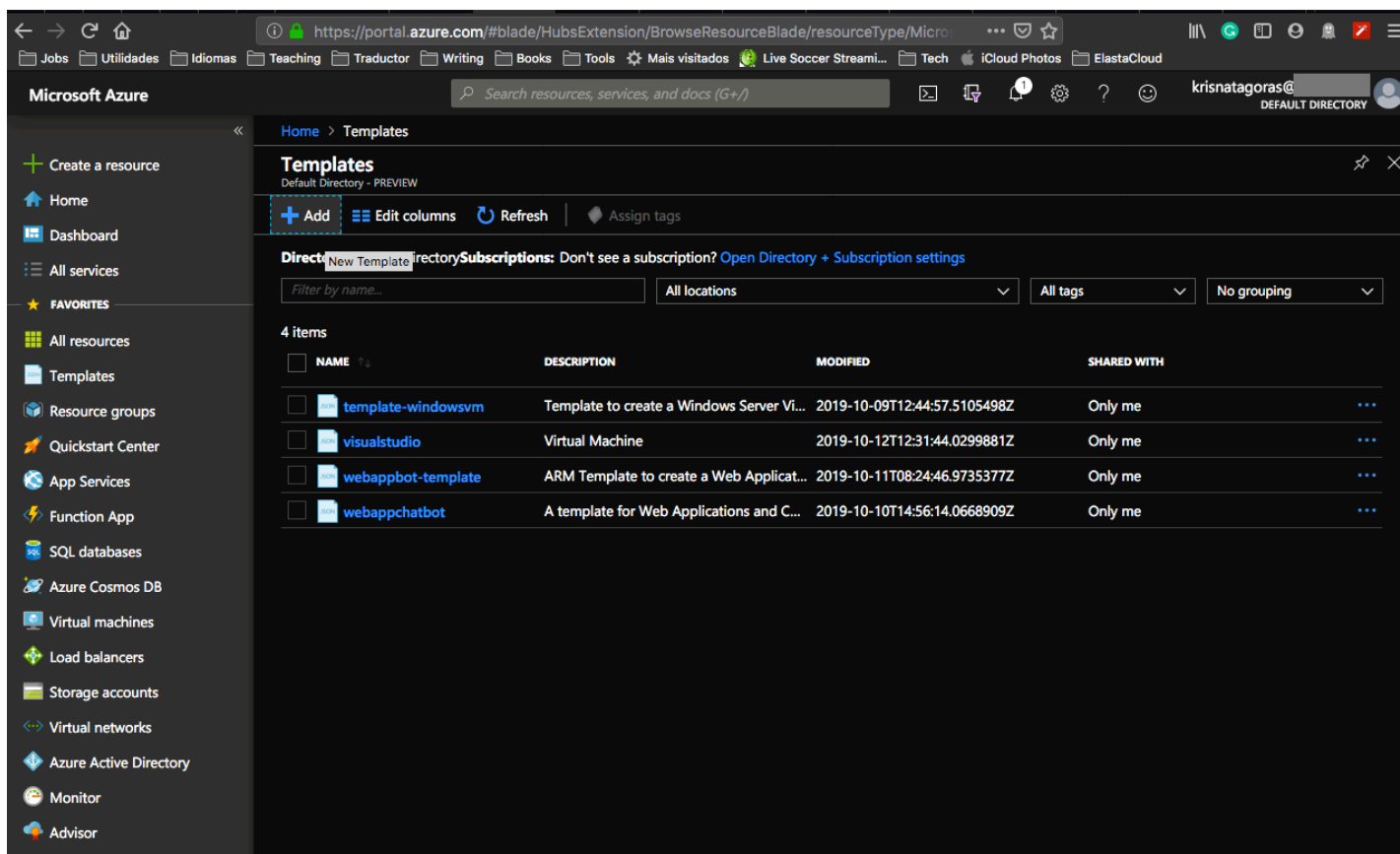
karaujo@my-ubuntu-vm:~$
```

Don't forget to have fun!

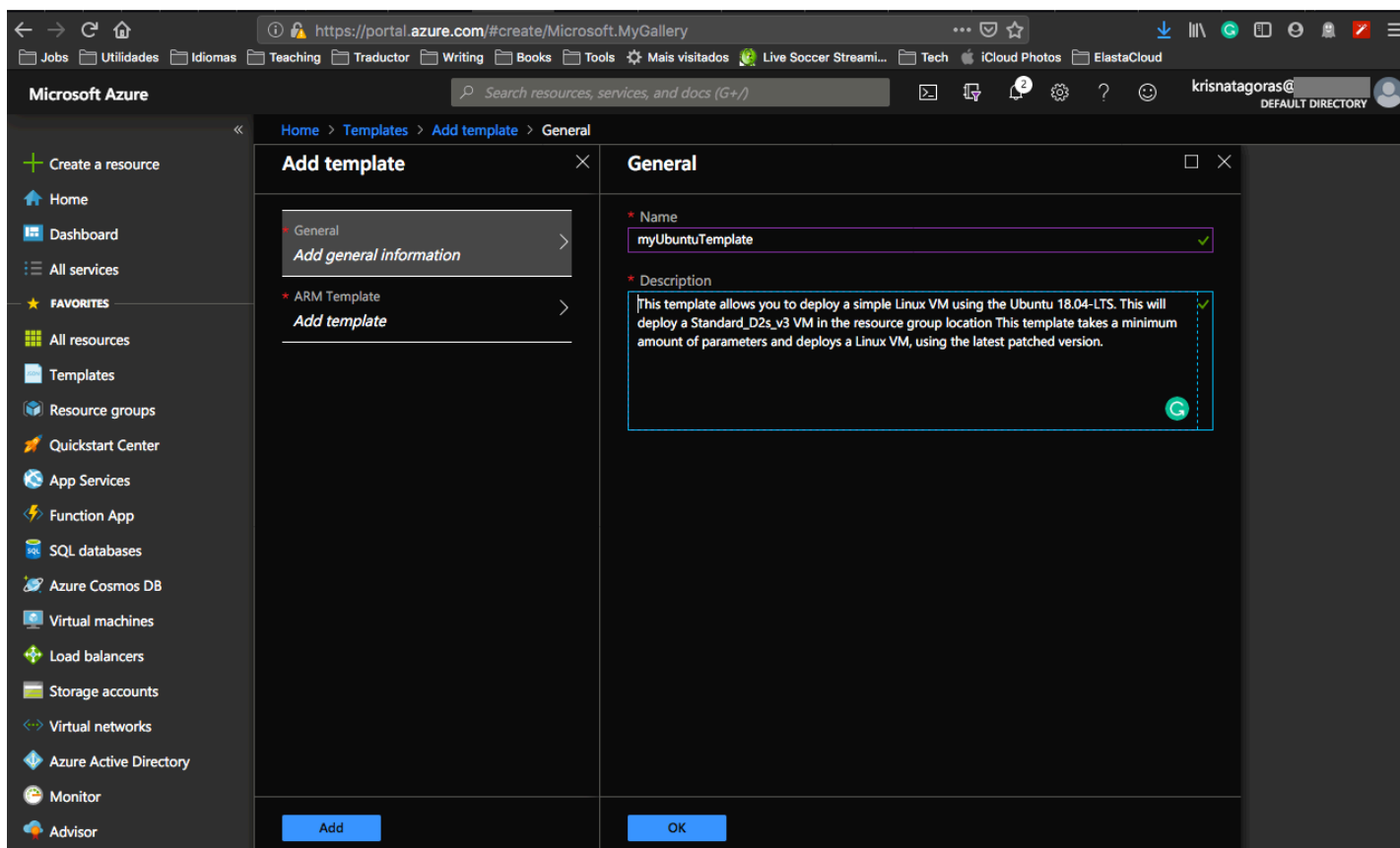
Using the Portal

At the Portal, in All Services look for **Templates**, you can favorite this service.

Click in **Add** to add your template:



On General, type a name and a description for your template, and click on [OK].



On ARM Template, replace the contents of the template with your template, and click on [OK].

The screenshot shows the Microsoft Azure portal interface. The left sidebar contains the navigation menu with options like 'Create a resource', 'Home', 'Dashboard', 'All services', and 'FAVORITES'. The 'Add template' option is selected under the 'ARM Template' section. The main area displays the 'Add template' dialog, which includes a preview of the ARM template JSON code. The code defines parameters for admin username and password, and variables for resource IDs and names. The 'OK' button is highlighted at the bottom right.

```
1  {
2    "$schema": "http://schema.management.azure.com/schemas/
3    2015-01-01/deploymentTemplate.json#",
4    "contentVersion": "1.0.0.0",
5    "parameters": {
6      "adminUsername": {
7        "type": "string"
8      },
9      "adminPassword": {
10       "type": "secureString"
11     }
12   },
13   "variables": {
14     "nsgId": "[resourceId(resourceGroup().name,
15       'Microsoft.Network/networkSecurityGroups', variables
16       ('networkSecurityGroupName'))]",
17     "vnetId": "[resourceId(resourceGroup().name,
18       'Microsoft.Network/virtualNetworks', variables
19       ('virtualNetworkName'))]",
20     "subnetRef": "[concat(variables('vnetId'), '/subnets/
21       ', variables('subnetName'))]",
22     "location": "[resourceGroup().location]",
23     "networkInterfaceName": "myNetInt",
24     "networkSecurityGroupName": "[concat(variables
25       ('virtualMachineName'), '-nsg')]",
26     "virtualMachineName": "my-ubuntu-vm",
27     "virtualNetworkName": "MyVNET",
28     "publicIpAddressName": "myPublicIP",
29     "..."
30   }
31 }
```

Click on the refresh button and there is your template:

Microsoft Azure portal showing the **Templates** page. The page displays a list of templates under the heading "5 items". The first template, **myubuntutemplate**, is highlighted with a red box. The table below shows the details of the templates:

NAME	DESCRIPTION	MODIFIED	SHARED WITH
myubuntutemplate	This template allows you to deploy a si...	2019-10-15T15:56:32.2659445Z	Only me
template-windowsvm	Template to create a Windows Server Vi...	2019-10-09T12:44:57.5105498Z	Only me
visualstudio	Virtual Machine	2019-10-12T12:31:44.0299881Z	Only me
webappbot-template	ARM Template to create a Web Applicat...	2019-10-11T08:24:46.9735377Z	Only me
webappchatbot	A template for Web Applications and C...	2019-10-10T14:56:14.0668909Z	Only me

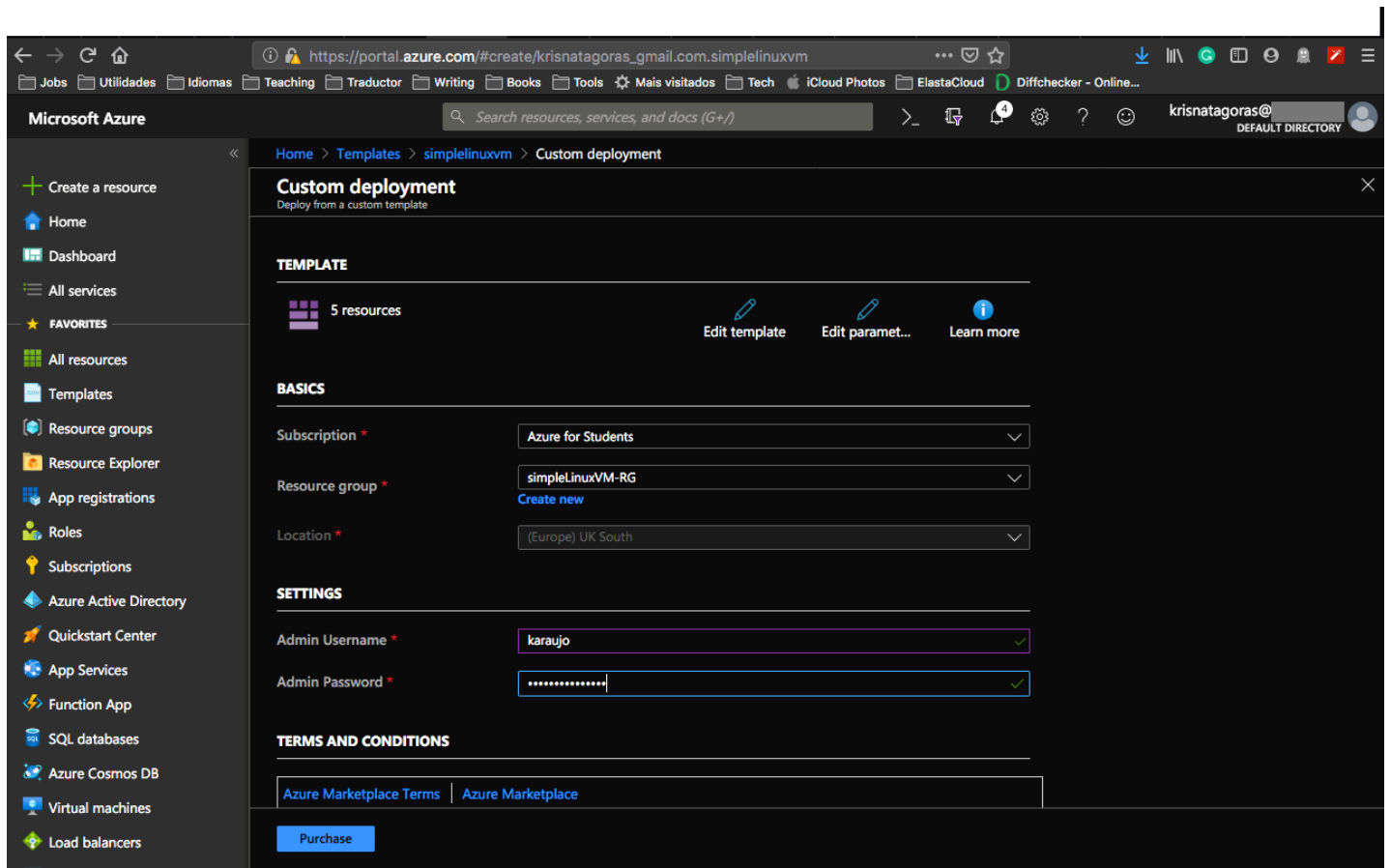
Open the template and click in [Deploy]

Microsoft Azure portal showing the **myubuntutemplate** details page. The **Deploy** button is highlighted with a red box. The page displays the following information:

- myubuntutemplate** (Template - PREVIEW)
- Deploy** button (highlighted)
- Edit** button
- Description**: This template allows you to deploy a simple Linux VM using the Ubuntu 18.04-LTS. This will deploy a Standard_D2s_v3 VM in the resource group location. This template takes a minimum amount of parameters and deploys a Linux VM, using the latest patched version.
- Publisher**: krisnatagoras@gmail.com
- Modified**: 15/10/2019
- [View Template](#) link

On the screen Custom Deployment, check your information and if you don't have the Resource Group you can click and [create new]:

Insert all the information, by now you should be familiar with it, select [I agree] and click on [Purchase].



And voilà, you have your new VM deployed.

Repeat the connection process that you have done before and enjoy your bash terminal :D .

p.s.: Pretty easy to create resources on Azure, right? But if you are the sort of IT guy that always looks for automating things on the extreme :D Surprise, surprise!. Just click on the button below and it will automatically deploy the VM on your Azure Portal.

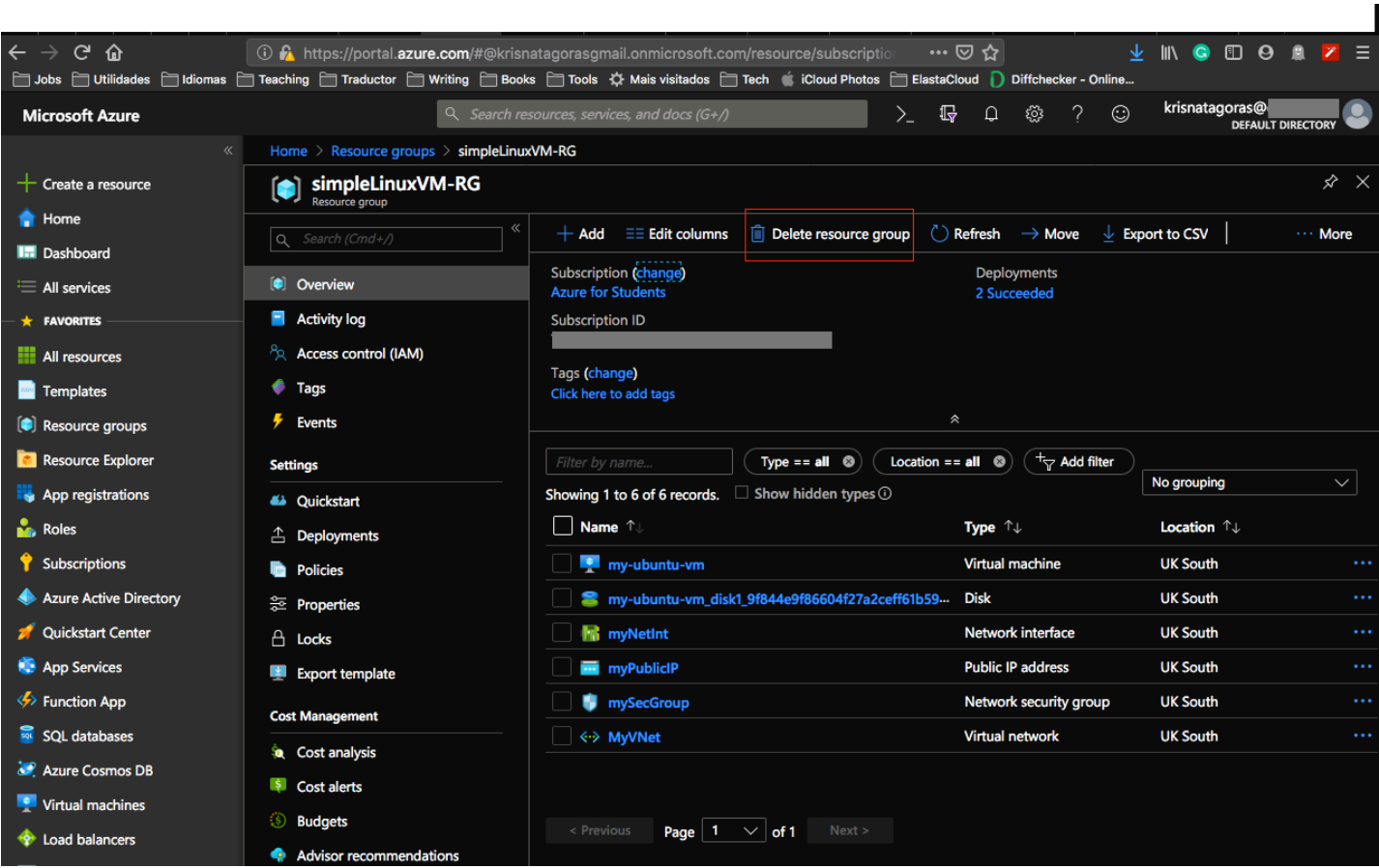


Important disclaimer: Azure charge you for the resources you are using, and you don't want to finish all your credits at once, right? So, for not running out of credit, don't forget to stop the VM at the portal or even delete the Resource Group you create to avoid any unnecessary charges.

How to shutdown your resources:

Using the portal:

On the portal, open your Resource Group, if you will not use the service or VM anymore, you can just click on the [Delete] Button.



You can also just stop the service or Virtual Machine in case you gonna need the resource. Open the resource and click on Stop.

Microsoft Azure portal interface showing the details of a virtual machine named **my-ubuntu-vm** within the **simpleLinuxVM-RG** resource group.

The **Stop** button is highlighted with a red box in the top action bar.

Overview section details:

- Resource group: [simpleLinuxVM-RG](#)
- Status: **Running**
- Location: **UK South**
- Subscription: [Azure for Students](#)
- Subscription ID: [Redacted]

Properties section details:

- Computer name: **my-ubuntu-vm**
- Operating system: **Linux (ubuntu 18.04)**
- Size: **Standard D2s v3 (2 vcpus, 8 GiB memory)**
- Ephemeral OS disk: **N/A**
- Public IP address: **40.120.58.212**
- Private IP address: **10.0.0.4**
- Virtual network/subnet: **MyVNet/mySubnet**
- DNS name: [Configure](#)

Tags: [Click here to add tags](#)

Show data for last: **1 hour** | 6 hours | 12 hours | 1 day | 7 days | 30 days

Summary cards: **CPU (average)** and **Network (total)**

Just refresh your screen and you are good to go.