

CLOUD COMPUTING
Lab 1
Introduction to Cloud Computing



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Lab Summary:

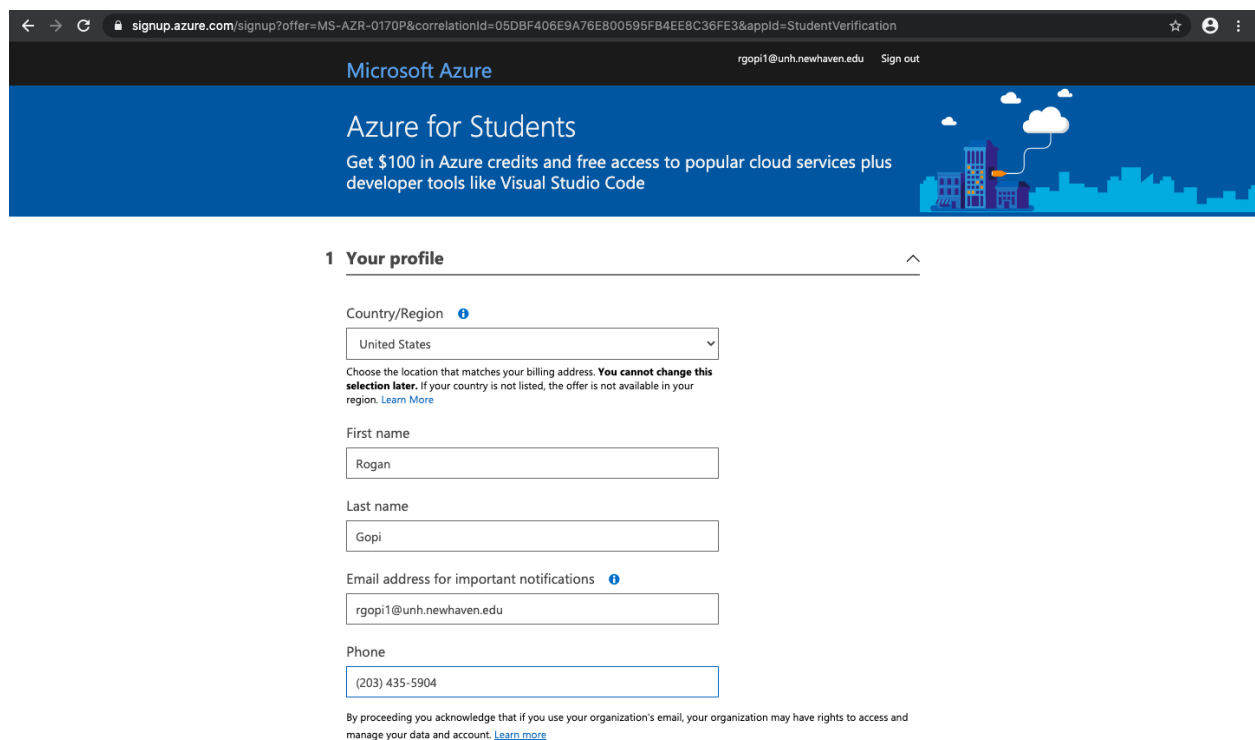
The main goal of the cloud computing lab is to experience the services provided by the cloud providers. In order to perform this lab, we chose the Microsoft Azure as our service provider as we have some basic knowledge to play around web services provided by the Amazon. Initially, as per the lab instruction, a new account was created in the Microsoft Azure with one of our member's university ID (student account), Which directed us to the dashboard of Azure as the registration was completed.

Secondly, the task was to create a new virtual machine inside the Azure and how to interact with the resources provided such as storage, computing power, network and so on. Once the VM is created successfully, it should be configured such that you can login remotely from any computer with the perfect credentials.

Finally, a web application (web page) was created and deployed with lot of complicated steps to get familiar with the services provided by Azure and steps was explained clearly in the creation of web application [fig: screenshot]

Creation of Microsoft Azure:

A new account was created in the Microsoft Azure with student account (without validation of credit card). The student account lets the students to create their own account without credit card and \$100 credit was given to have interaction with the services.



The screenshot shows the Microsoft Azure sign-up page for students. The browser address bar displays the URL: `signup.azure.com/signup?offer=MS-AZR-0170P&correlationId=05DBF406E9A76E800595FB4EE8C36FE3&applId=StudentVerification`. The page header includes the Microsoft Azure logo and the user's email address, `rgopi1@unh.newhaven.edu`, with a "Sign out" link. The main banner features the text "Azure for Students" and "Get \$100 in Azure credits and free access to popular cloud services plus developer tools like Visual Studio Code". Below the banner, the "1 Your profile" section is visible, containing the following fields:

- Country/Region:** A dropdown menu showing "United States". Below it, a note states: "Choose the location that matches your billing address. **You cannot change this selection later.** If your country is not listed, the offer is not available in your region. [Learn More](#)".
- First name:** A text input field containing "Rogan".
- Last name:** A text input field containing "Gopi".
- Email address for important notifications:** A text input field containing `rgopi1@unh.newhaven.edu`.
- Phone:** A text input field containing `(203) 435-5904`.

At the bottom of the form, a disclaimer reads: "By proceeding you acknowledge that if you use your organization's email, your organization may have rights to access and manage your data and account. [Learn more](#)".

Fig: 1 Creation of Microsoft Azure Account

Once the account was created successfully, the dashboard of Azure was displayed with lot of services provided by them.

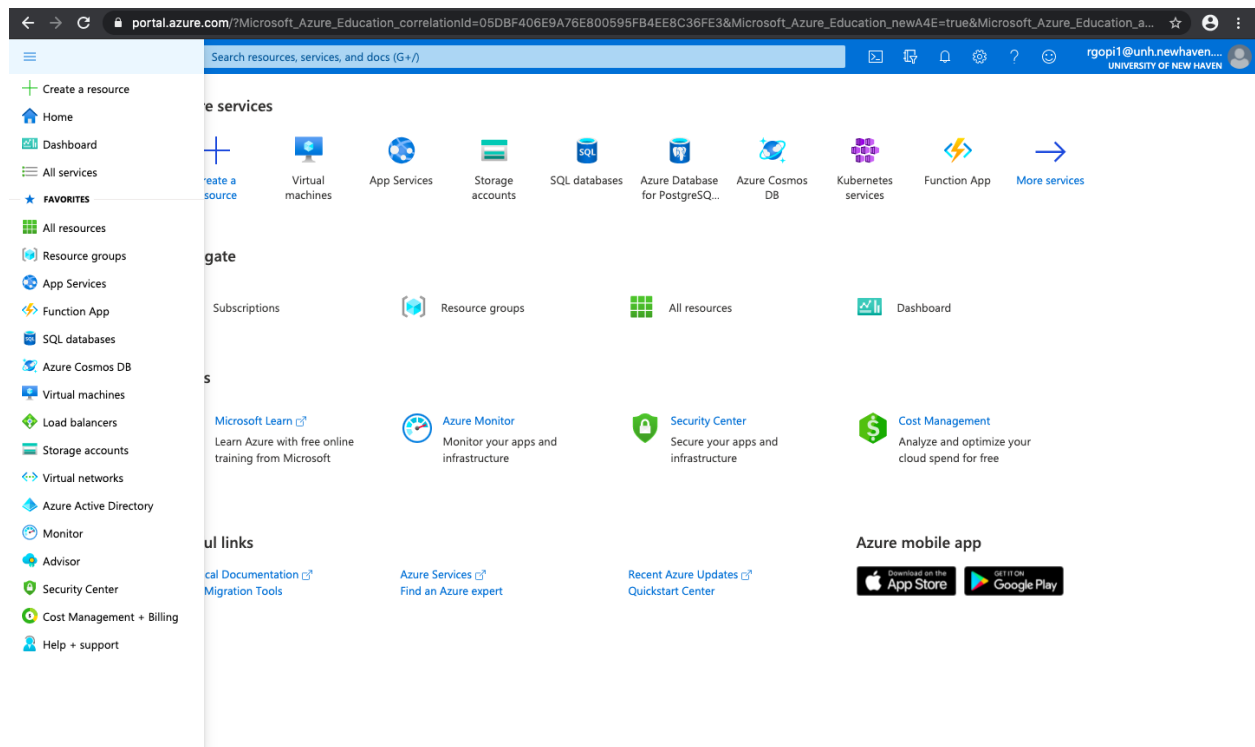


Fig: 1.1 Dashboard of Azure

Creating Virtual Machine on Azure:

A Virtual Machine was created with student subscription account with the pre-built or inbuilt ISO of the particular Operating System, storage, network interface, authentication to login with azure and enabled ports to login with SSH. The complete details of the VM will be in the following screenshots.

Microsoft Azure Search resources, services, and docs (G+/I) rgopi1@unh.newhaven... UNIVERSITY OF NEW HAVEN

Home > Virtual machines >

Create a virtual machine

⚠ Changing Basic options may reset selections you have made. Review all options prior to creating the virtual machine.

Basics Disks Networking Management Advanced Tags Review + create

Create a virtual machine that runs Linux or Windows. Select an image from Azure marketplace or use your own customized image. Complete the Basics tab then Review + create to provision a virtual machine with default parameters or review each tab for full customization. [Learn more](#)

Project details

Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription * ⓘ Azure for Students

Resource group * ⓘ (New) Lab1_group
[Create new](#)

Instance details

Virtual machine name * ⓘ Lab1 ✓

Region * ⓘ (US) East US

Availability options ⓘ No infrastructure redundancy required

Image * ⓘ Ubuntu Server 18.04 LTS - Gen1
[Browse all public and private images](#)

Azure Spot instance ⓘ ☐ Yes ☒ No

Fig: 2. Creating VM on Azure

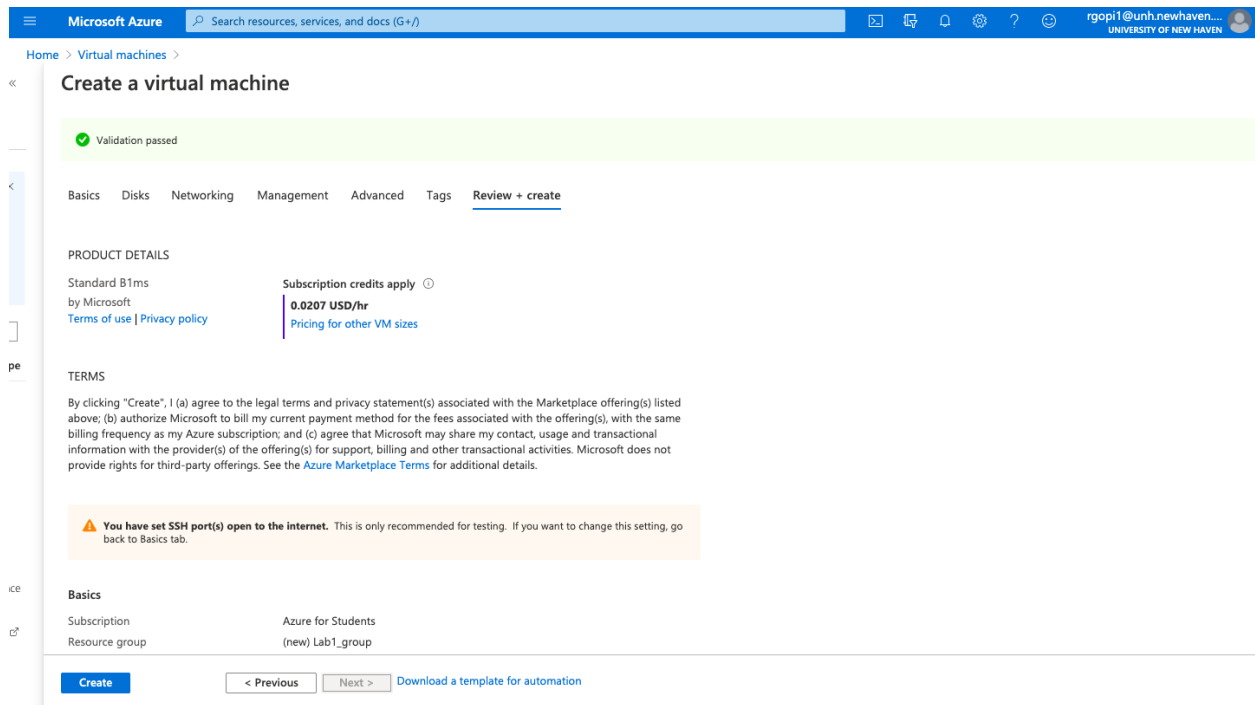


Fig. 2.1 Details of VM.

Logging into VM using SSH:

```
[rogang@ROGANS-MacBook-Air ~ % ssh Lab1@52.150.11.10
The authenticity of host '52.150.11.10 (52.150.11.10)' can't be established.
ECDSA key fingerprint is SHA256:7ypzXSP1UKKSE6cn6YbAlj0BDbZZPvjkbSEMFQkVNHw.
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '52.150.11.10' (ECDSA) to the list of known hosts.
Lab1@52.150.11.10's password:
Welcome to Ubuntu 18.04.5 LTS (GNU/Linux 5.4.0-1025-azure x86_64)

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

System information as of Thu Sep 17 23:54:37 UTC 2020

System load:  0.32           Processes:    118
Usage of /:   4.4% of 28.9GB  Users logged in:  0
Memory usage: 14%           IP address for eth0: 10.0.0.4
Swap usage:   0%

0 packages can be updated.
0 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.

Lab1@Lab1:~$
```

Fig.2.2 Logging using SSH

Creation of Web Application:

The web application was created on the web application by selecting the specific zone.

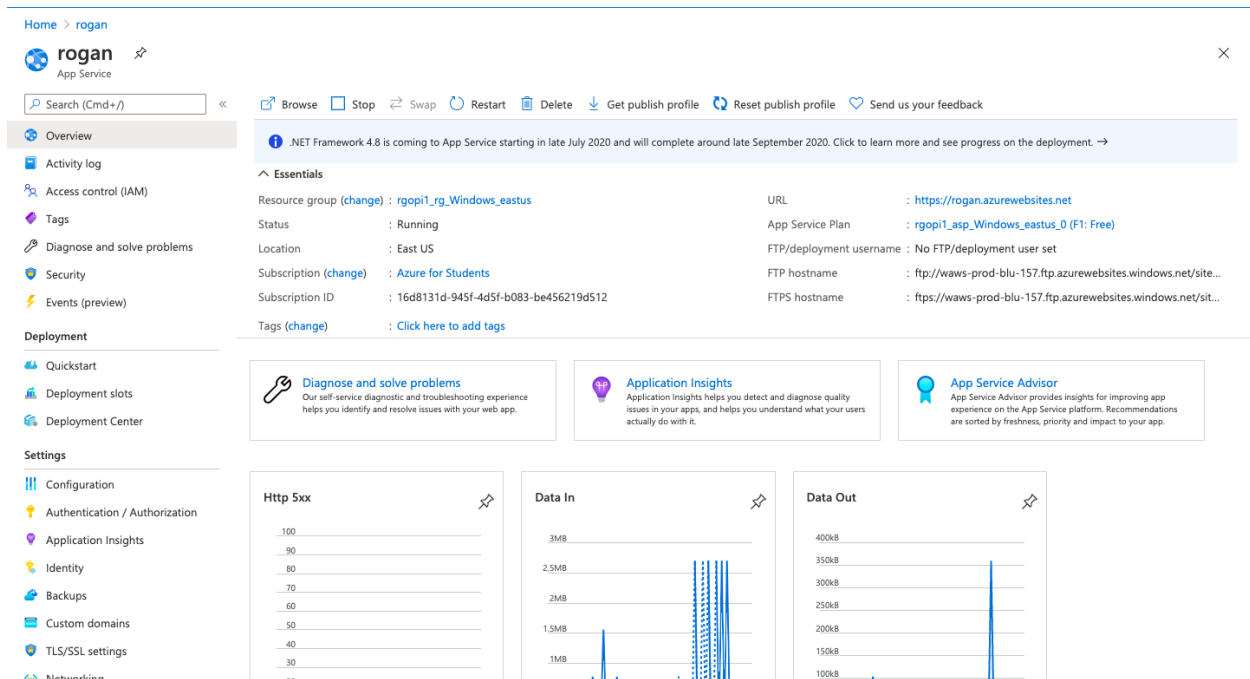


Fig: 3. Web application

Later, we decided to launch the static web application by using the shell available in the Azure. To perform such a web page we first created the git hub repository named HTML, added the required html files and cloned into Azure terminal and deployed it which successfully launched the static website.

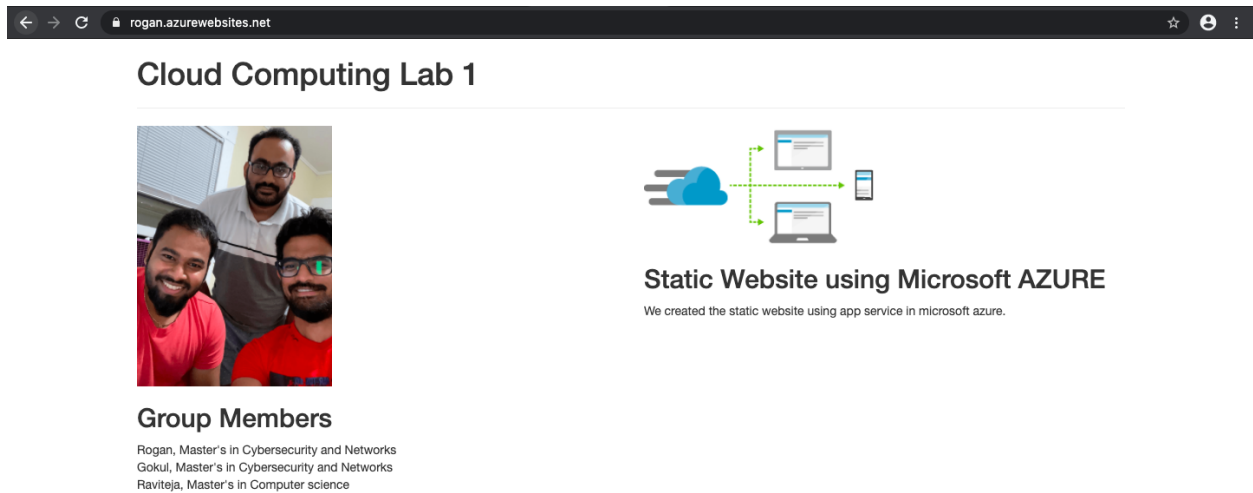


Fig:3.1 Launching of static website.

Problems and Solution:

1. The SSH let us only to view the command line whereas not the graphical representation of OS so we tried installing VNC and then we noted the local host which it was tunneling through and configure that port in the Azure to make sure it works good and finally, it allowed us to view the VNC graphical representation of OS.


```
Lab1@Lab1:~$ vncserver

You will require a password to access your desktops.

Password:
Warning: password truncated to the length of 8.
Verify:
Would you like to enter a view-only password (y/n)? y
Password:
Warning: password truncated to the length of 8.
Verify:
xauth: file /home/Lab1/.Xauthority does not exist

New 'X' desktop is Lab1:1

Creating default startup script /home/Lab1/.vnc/xstartup
Starting applications specified in /home/Lab1/.vnc/xstartup
Log file is /home/Lab1/.vnc/Lab1:1.log

Lab1@Lab1:~$ nc localhost 5901
RFB 003.008

```

Fig:4. Finding the local host RFB to configure in Azure.

Last but not least, as an enhancement, we tried writing or uploading the report in the static web page itself and as the result, you are viewing the enhanced version of what we did.