CLOUD COMPUTING METHODOLOGIES

LAB ASSESSMENT-5

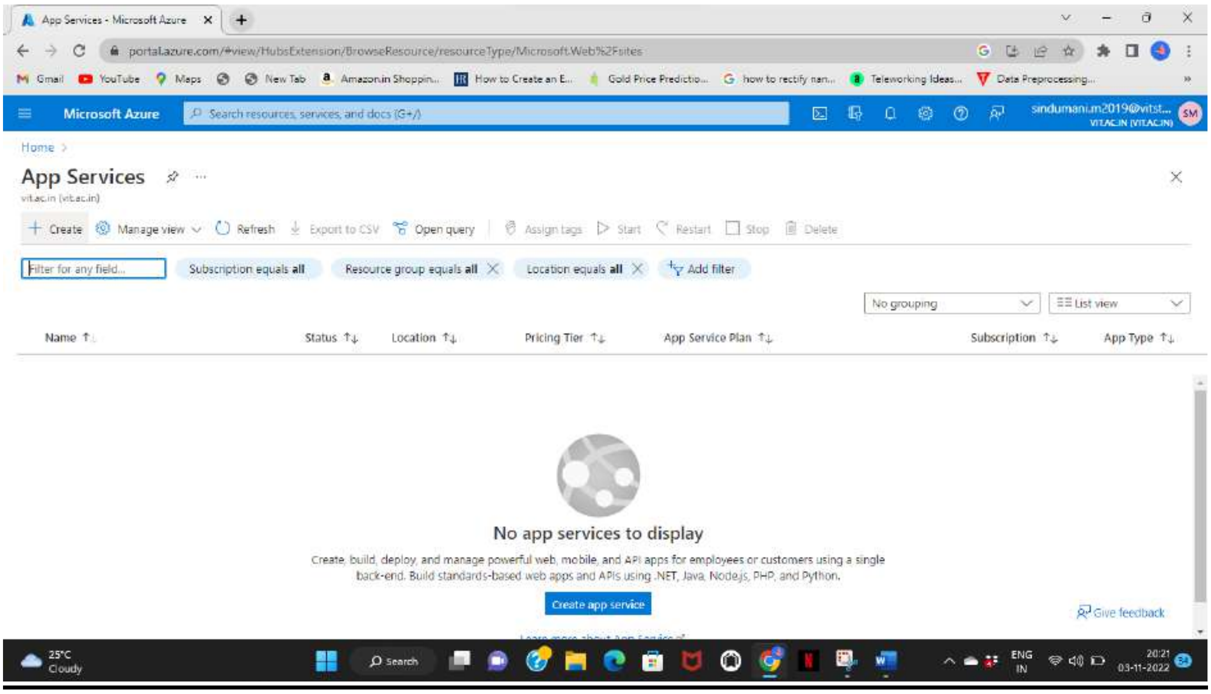
NAME:SINDUMANI.M

REGNO:19MIC0002

SLOT:L9+L10

1.DEPLOYMENT OF A BASIC WEBAPP AND ADD ADDITIONAL FUNCTIONALITY

STEP 1:TO CREATE AN APP SERVICE



portal.azure.com/#view/HubsExtension/BrowseResource/resourceType/Microsoft.Web%2Fsites

App Services
vit.ac.in (vit.ac.in)

Filter for any field... | Subscription equals **all** | Resource group equals **all** | Location equals **all**

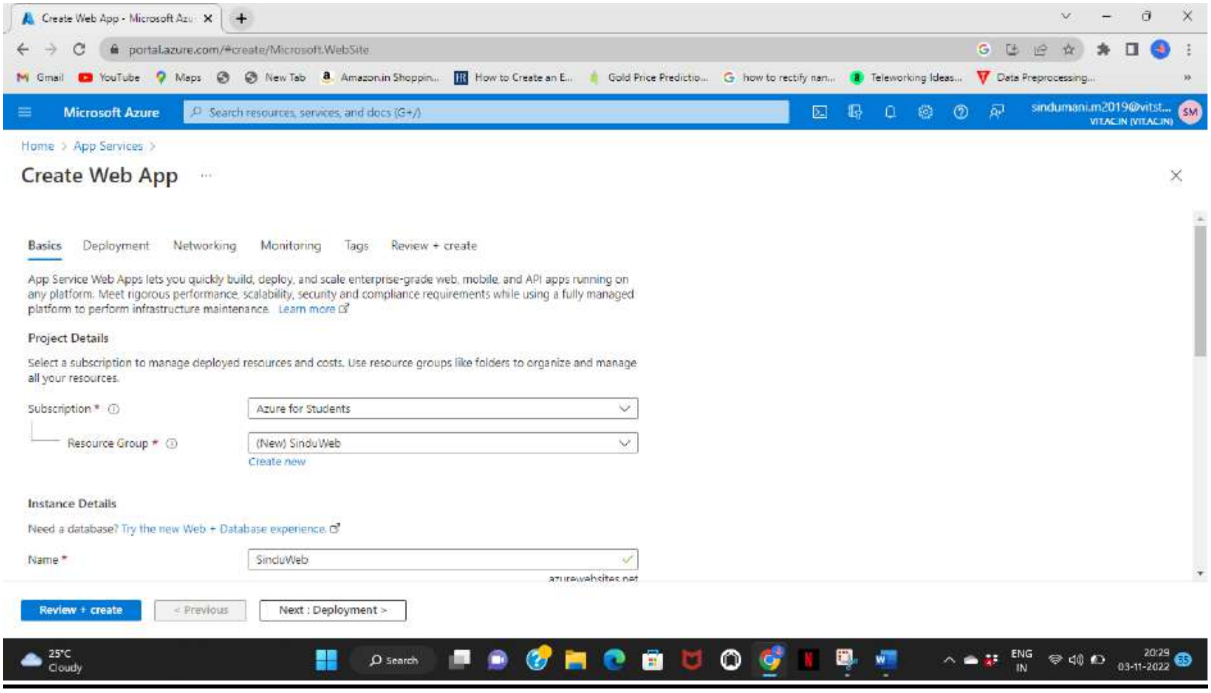
No grouping | List view

Name	Status	Location	Pricing Tier	App Service Plan	Subscription	App Type

No app services to display

Create, build, deploy, and manage powerful web, mobile, and API apps for employees or customers using a single back-end. Build standards-based web apps and APIs using .NET, Java, Node.js, PHP, and Python.

STEP 2:GIVING THE DETAILS FOR CREATING WEB AP


Create Web App - Microsoft Azu
portal.azure.com/#create/Microsoft.WebSite
Microsoft Azure
Search resources, services, and docs (G+/)
sindumani.m2019@vitst...
VITAC.IN (VITAC.IN)

Home > App Services >

Create Web App

Basics Deployment Networking Monitoring Tags Review + create

App Service Web Apps lets you quickly build, deploy, and scale enterprise-grade web, mobile, and API apps running on any platform. Meet rigorous performance, scalability, security and compliance requirements while using a fully managed platform to perform infrastructure maintenance. Learn more

Project Details

Select a 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) SinduWeb
Create new

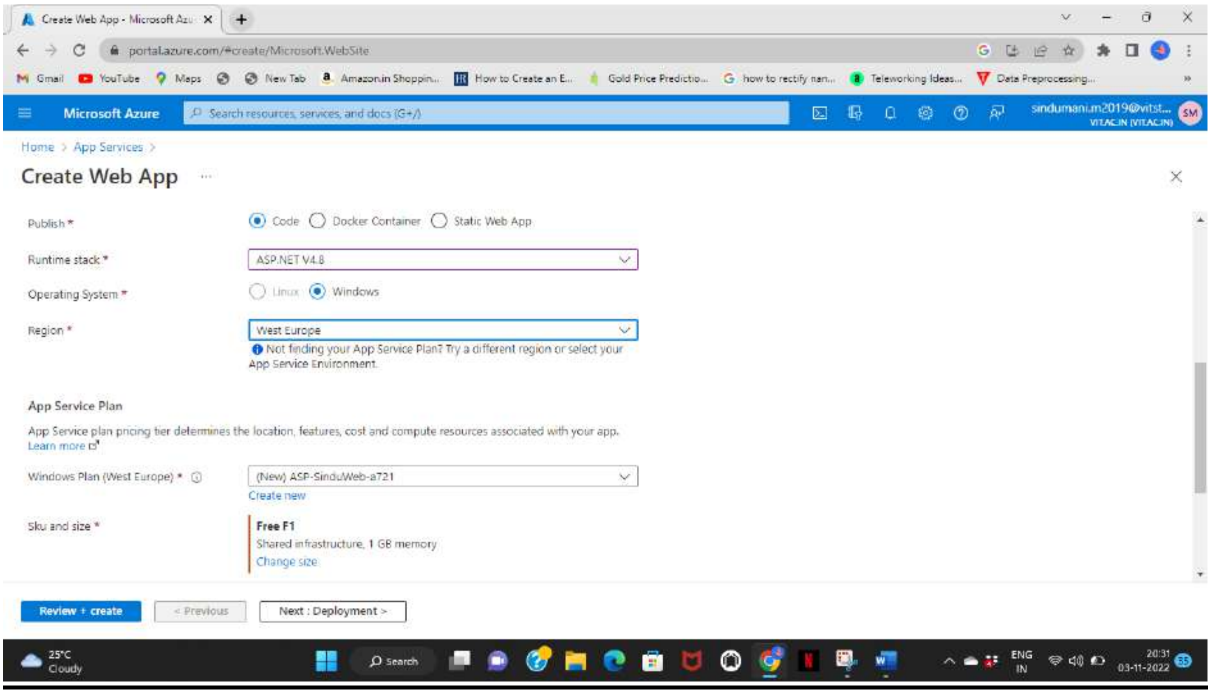
Instance Details

Need a database? Try the new Web + Database experience.

Name * : SinduWeb
.azurewebsites.net

Review + create | < Previous | Next : Deployment >

25°C
Cloudy
Search
ENG
IN
20:29
03-11-2022


Create Web App - Microsoft Azu
portal.azure.com/#create/Microsoft.WebSite
Microsoft Azure
Search resources, services, and docs (G+/)
sindumani.m2019@vitst...
VITAC.IN (VITAC.IN)

Home > App Services >

Create Web App

Publish * : ● Code ○ Docker Container ○ Static Web App

Runtime stack * : ASP.NET V4.8

Operating System * : ○ Linux ● Windows

Region * : West Europe
Not finding your App Service Plan? Try a different region or select your App Service Environment.

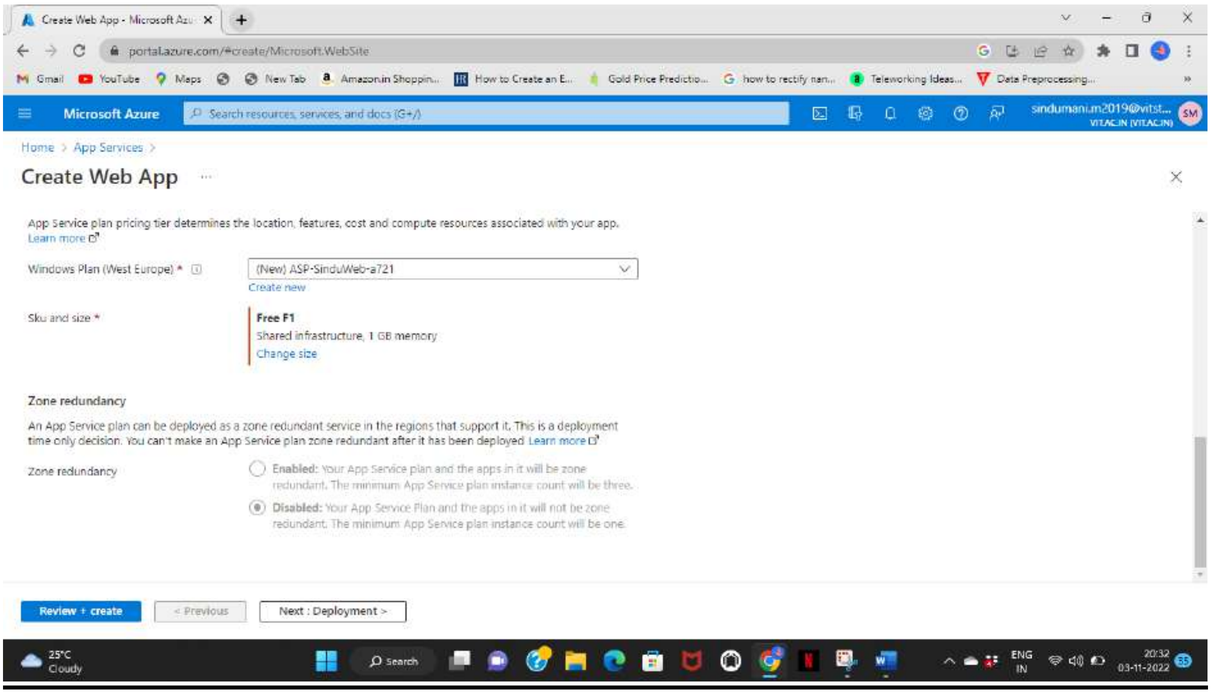
App Service Plan

App Service plan pricing tier determines the location, features, cost and compute resources associated with your app. Learn more

Windows Plan (West Europe) * : (New) ASP-SinduWeb-a721
Create new

Sku and size * : Free F1
Shared infrastructure, 1 GB memory
Change size

Review + create | < Previous | Next : Deployment >



Create Web App

App Service plan pricing tier determines the location, features, cost and compute resources associated with your app. Learn more

Windows Plan (West Europe) * (New) ASP-SinduWeb-a721
Create new

Sku and size * **Free F1**
Shared infrastructure, 1 GB memory
Change size

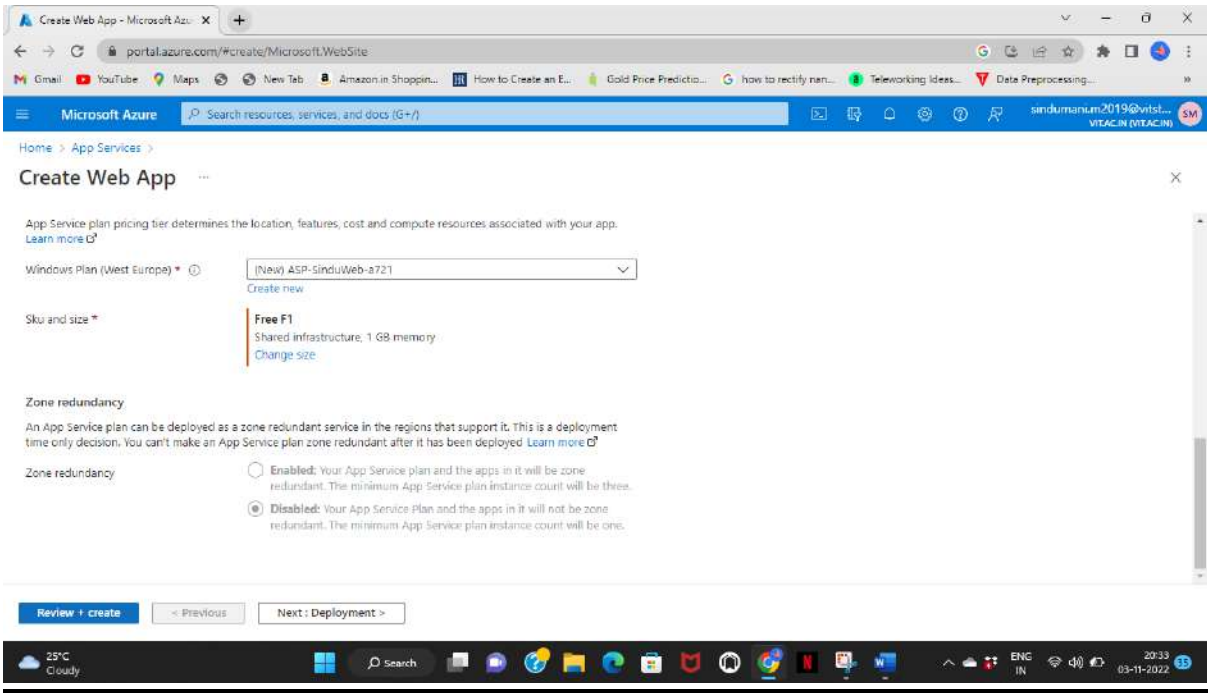
Zone redundancy

An App Service plan can be deployed as a zone redundant service in the regions that support it. This is a deployment time only decision. You can't make an App Service plan zone redundant after it has been deployed Learn more

Zone redundancy
○ **Enabled:** Your App Service plan and the apps in it will be zone redundant. The minimum App Service plan instance count will be three.
● **Disabled:** Your App Service Plan and the apps in it will not be zone redundant. The minimum App Service plan instance count will be one.

Review + create | < Previous | Next : Deployment >

STEP 3:CLICKING REVIEW+CREATE FOR CREATING THE WEBAPP



Create Web App - Microsoft Azu
portal.azure.com/#create/Microsoft.WebSite
Microsoft Azure
Search resources, services, and docs (G+/)
sindumani.m2019@vitst...
Home > App Services >
25°C
Cloudy
20:33
03-11-2022

Create Web App

App Service plan pricing tier determines the location, features, cost and compute resources associated with your app. Learn more

Windows Plan (West Europe) * (New) ASP-SinduWeb-a721
Create new

Sku and size * **Free F1**
Shared infrastructure, 1 GB memory
Change size

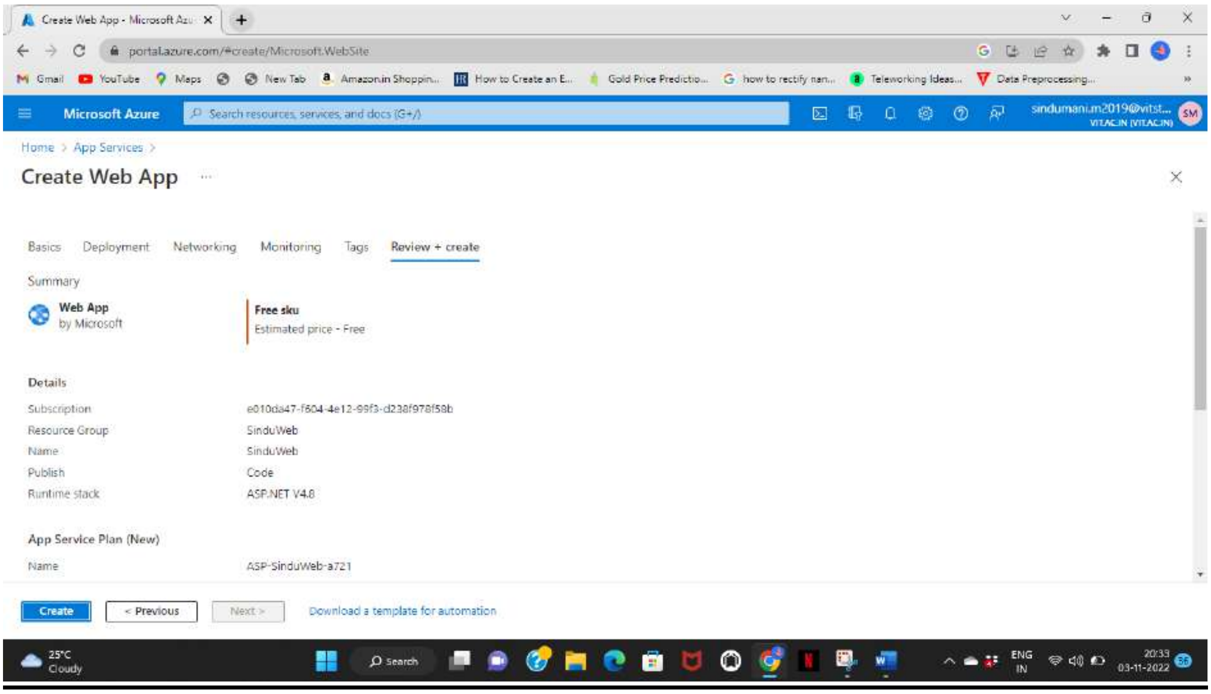
Zone redundancy

An App Service plan can be deployed as a zone redundant service in the regions that support it. This is a deployment time only decision. You can't make an App Service plan zone redundant after it has been deployed Learn more

Zone redundancy
○ **Enabled:** Your App Service plan and the apps in it will be zone redundant. The minimum App Service plan instance count will be three.
● **Disabled:** Your App Service Plan and the apps in it will not be zone redundant. The minimum App Service plan instance count will be one.

Review + create | < Previous | Next : Deployment >

STEP 4:CLICKING CREATE TO DEPLOY



Home > App Services >

Create Web App

Basics | Deployment | Networking | Monitoring | Tags | Review + create

Summary

Web App
by Microsoft

Free sku
Estimated price - Free

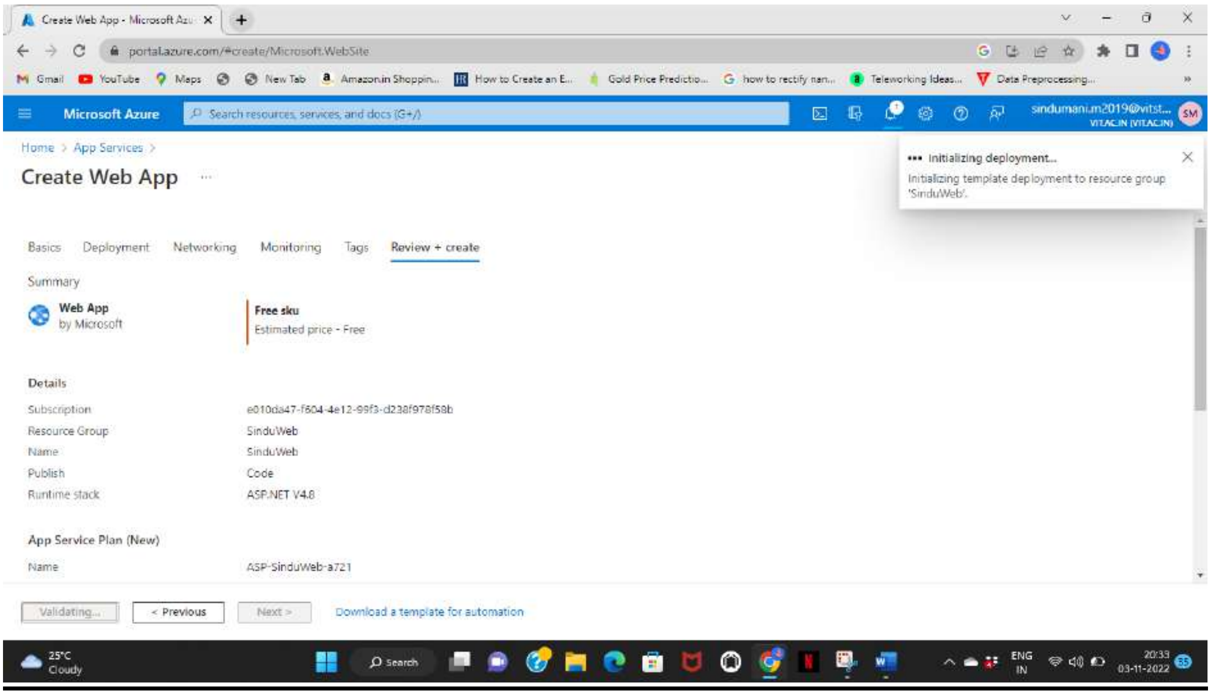
Details

Subscription	e010da47-f604-4e12-99f3-d238f978f58b
Resource Group	SinduWeb
Name	SinduWeb
Publish	Code
Runtime stack	ASP.NET V4.8

App Service Plan (New)

Name	ASP-SinduWeb-a721

STEP 5:DEPLOYMENT IS INITIALIZED



Home > App Services >

Create Web App

••• Initializing deployment...
Initializing template deployment to resource group 'SinduWeb'.

Basics | Deployment | Networking | Monitoring | Tags | Review + create

Summary

Web App
by Microsoft

Free sku
Estimated price - Free

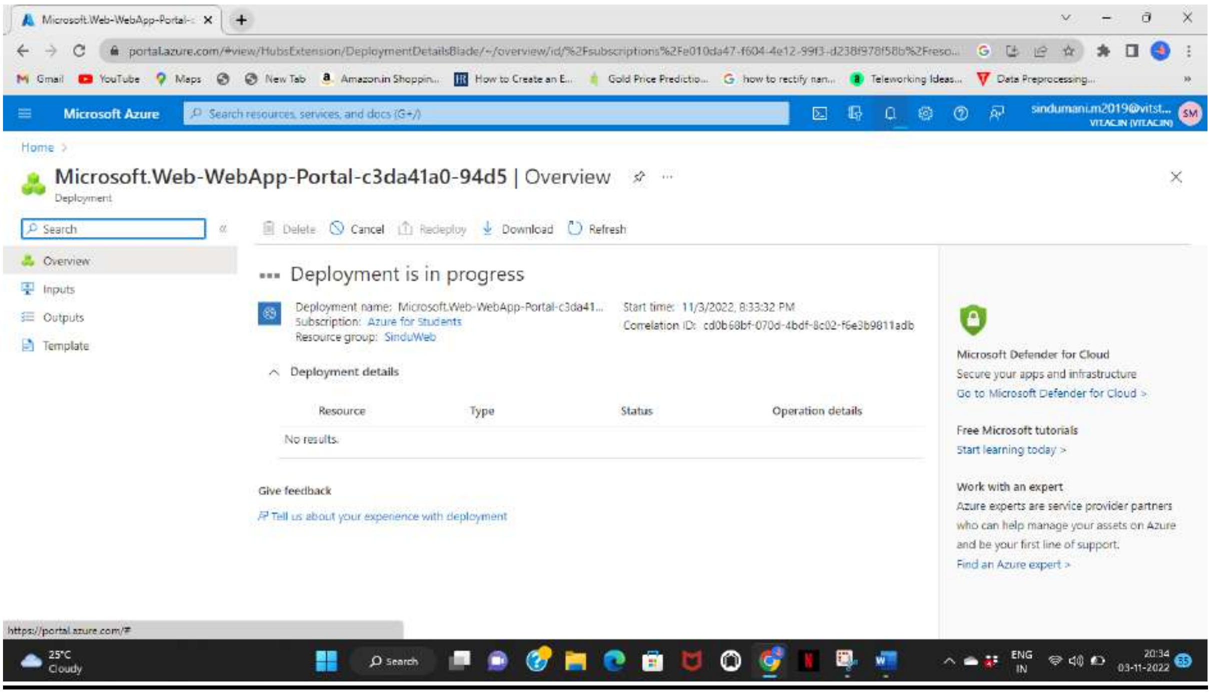
Details

Subscription	e010da47-f604-4e12-99f3-d238f978f58b
Resource Group	SinduWeb
Name	SinduWeb
Publish	Code
Runtime stack	ASP.NET V4.8

App Service Plan (New)

Name	ASP-SinduWeb-a721

STEP 6:DEPLOYMENT IS IN PROGRESS



Microsoft.Web-WebApp-Portal-c3da41a0-94d5 | Overview

Deployment

Deployment is in progress

Deployment name: Microsoft.Web-WebApp-Portal-c3da41...

Subscription: Azure for Students

Resource group: SinduWeb

Start time: 11/3/2022, 8:33:32 PM

Correlation ID: cd0b68bf-070d-4bdf-8c02-f6e3b9811adb

Deployment details

Resource	Type	Status	Operation details
No results.			

Give feedback

Tell us about your experience with deployment

Microsoft Defender for Cloud

Secure your apps and infrastructure

Go to Microsoft Defender for Cloud >

Free Microsoft tutorials

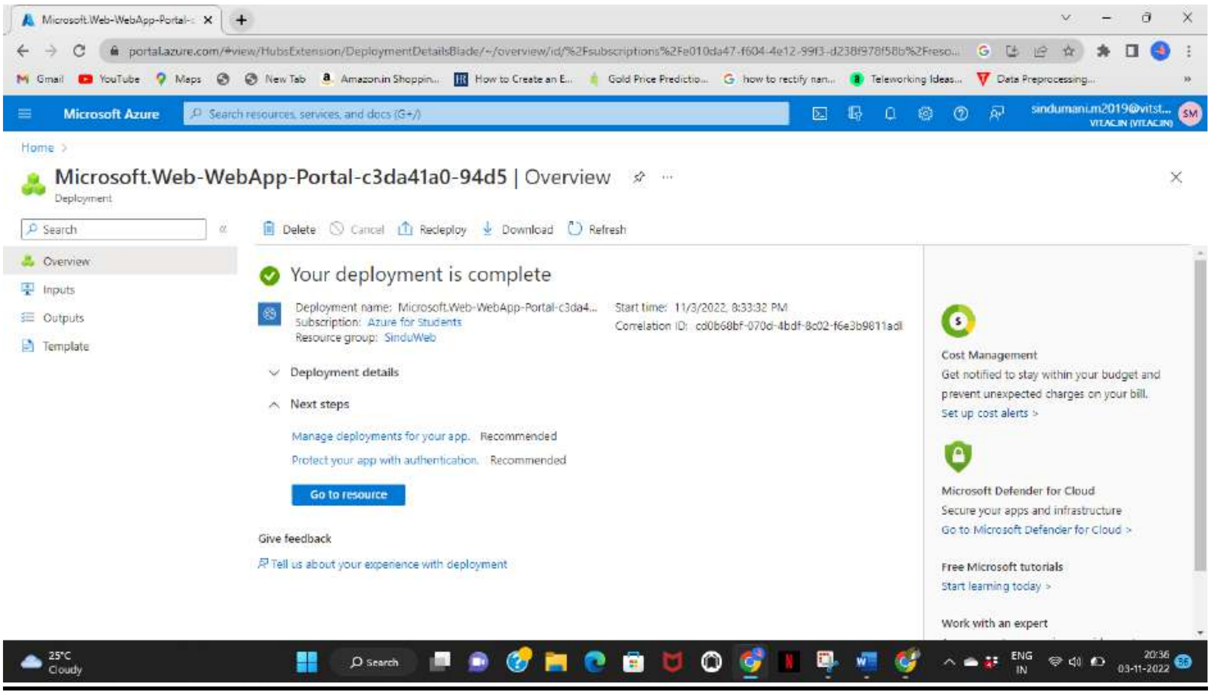
Start learning today >

Work with an expert

Azure experts are service provider partners who can help manage your assets on Azure and be your first line of support.

Find an Azure expert >

STEP 7:DEPLOYMEMT IS COMPLETED



Microsoft.Web-WebApp-Portal-c3da41a0-94d5 | Overview

Deployment

Your deployment is complete

Deployment name: Microsoft.Web-WebApp-Portal-c3da4...

Subscription: Azure for Students

Resource group: SinduWeb

Start time: 11/3/2022, 8:33:32 PM

Correlation ID: cd0b68bf-070d-4bdf-8c02-f6e3b9811adl

Deployment details

Next steps

Manage deployments for your app. Recommended

Protect your app with authentication. Recommended

Go to resource

Give feedback

Tell us about your experience with deployment

Cost Management

Get notified to stay within your budget and prevent unexpected charges on your bill.

Set up cost alerts >

Microsoft Defender for Cloud

Secure your apps and infrastructure

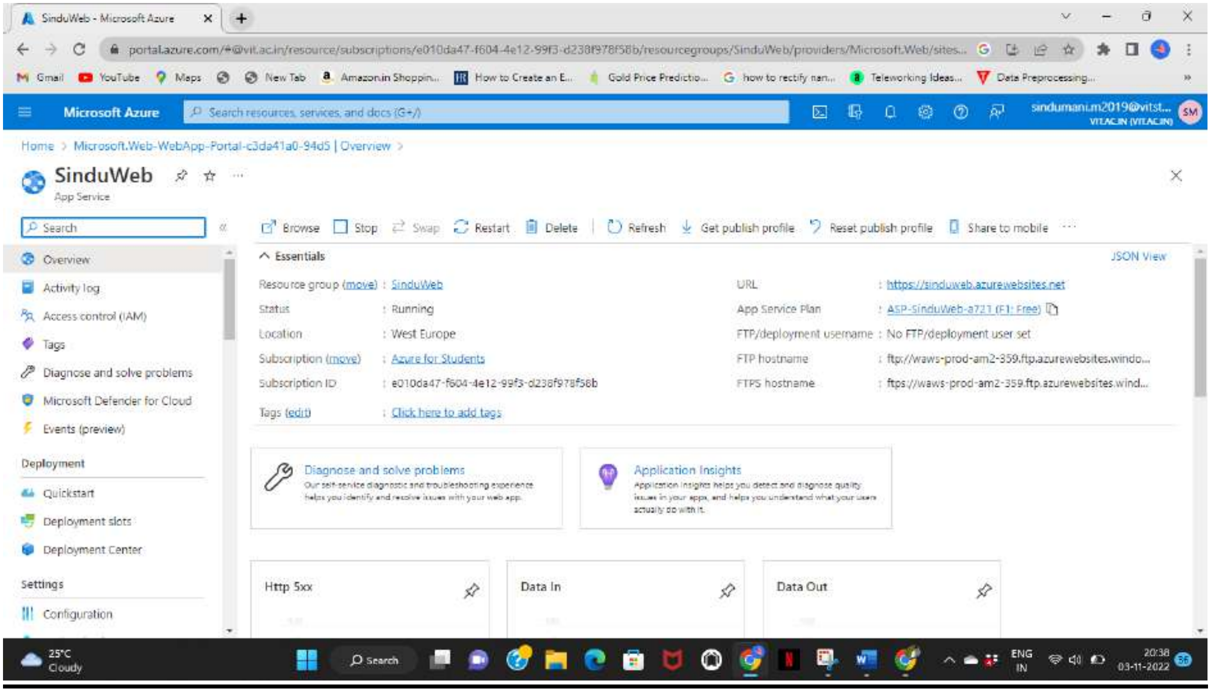
Go to Microsoft Defender for Cloud >

Free Microsoft tutorials

Start learning today >

Work with an expert

STEP 8:OVERVIEW OF THE WEBAPP CREATED



portal.azure.com/#@vit.ac.in/resource/subscriptions/e010da47-f604-4e12-99f3-d238f978f58b/resourcegroups/SinduWeb/providers/Microsoft.Web/sites...

Home > Microsoft.Web-WebApp-Portal-c3da41a0-94d5 | Overview >

SinduWeb
App Service

Essentials

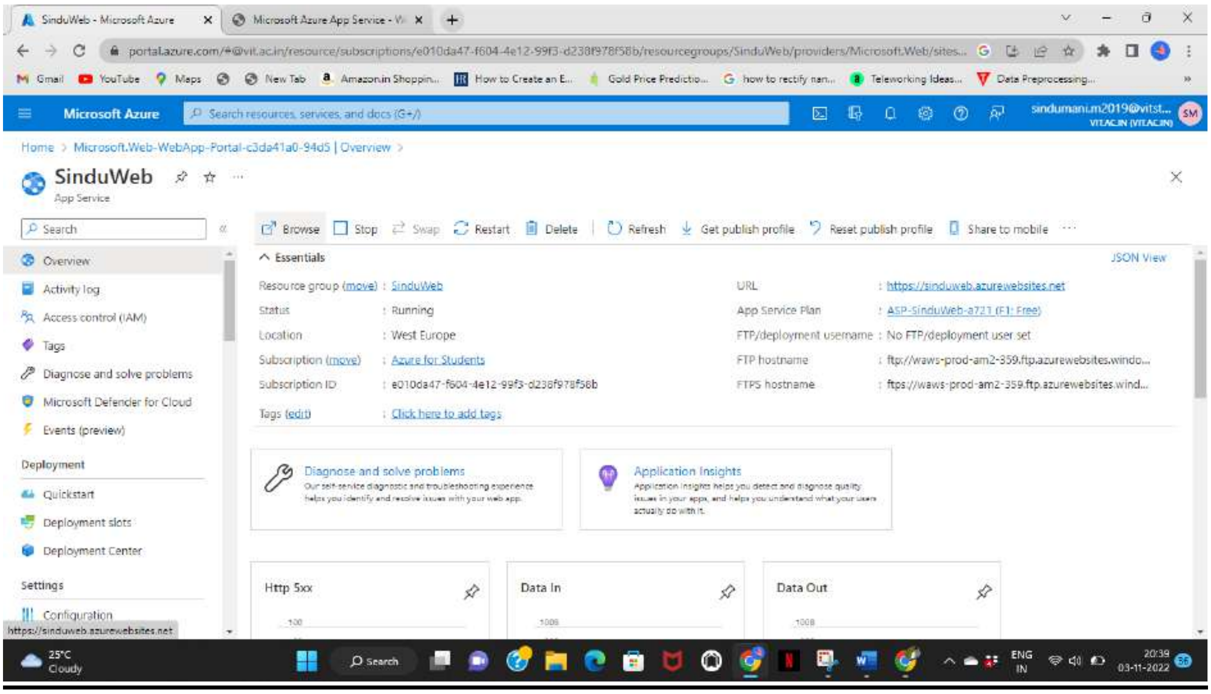
Resource group (move) : SinduWeb
Status : Running
Location : West Europe
Subscription (move) : Azure for Students
Subscription ID : e010da47-f604-4e12-99f3-d238f978f58b
Tags (edit) : Click here to add tags

URL : https://sinduweb.azurewebsites.net
App Service Plan : ASP-SinduWeb-a721 (F1: Free)
FTP/deployment username : No FTP/deployment user set
FTP hostname : ftp://waws-prod-am2-359.ftp.azurewebsites.windo...
FTPS hostname : ftps://waws-prod-am2-359.ftp.azurewebsites.wind...

Diagnose and solve problems
Our self-service diagnostic and troubleshooting experience helps you identify and resolve issues with your web app.

Application Insights
Application Insights helps you detect and diagnose quality issues in your apps, and helps you understand what your users actually do with it.

STEP 9:COPYING THE URL FROM WEBAPP



portal.azure.com/#@vit.ac.in/resource/subscriptions/e010da47-f604-4e12-99f3-d238f978f58b/resourcegroups/SinduWeb/providers/Microsoft.Web/sites...

Home > Microsoft.Web-WebApp-Portal-c3da41a0-94d5 | Overview >

SinduWeb
App Service

Essentials

Resource group (move) : SinduWeb
Status : Running
Location : West Europe
Subscription (move) : Azure for Students
Subscription ID : e010da47-f604-4e12-99f3-d238f978f58b
Tags (edit) : Click here to add tags

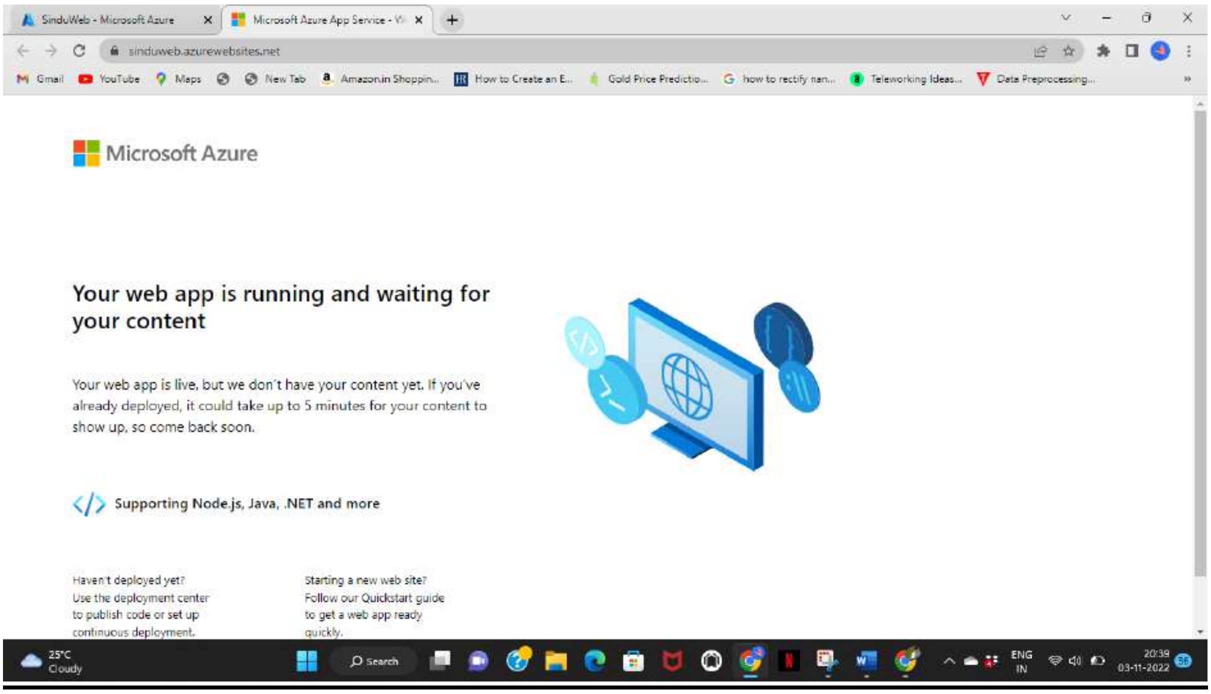
URL : https://sinduweb.azurewebsites.net
App Service Plan : ASP-SinduWeb-a721 (F1: Free)
FTP/deployment username : No FTP/deployment user set
FTP hostname : ftp://waws-prod-am2-359.ftp.azurewebsites.windo...
FTPS hostname : ftps://waws-prod-am2-359.ftp.azurewebsites.wind...

Diagnose and solve problems
Our self-service diagnostic and troubleshooting experience helps you identify and resolve issues with your web app.

Application Insights
Application Insights helps you detect and diagnose quality issues in your apps, and helps you understand what your users actually do with it.

https://sinduweb.azurewebsites.net

STEP 10:PASTING THE LINK IN URL



Your web app is running and waiting for your content

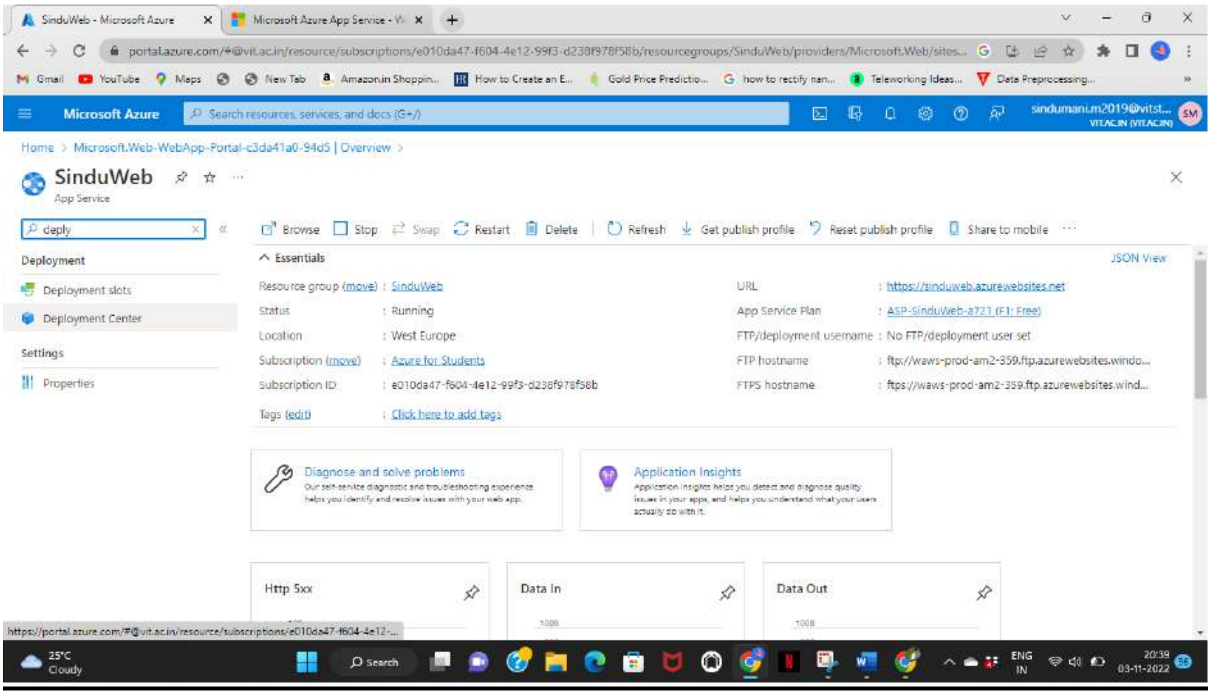
Your web app is live, but we don't have your content yet. If you've already deployed, it could take up to 5 minutes for your content to show up, so come back soon.

Supporting Node.js, Java, .NET and more

Haven't deployed yet?
Use the deployment center to publish code or set up continuous deployment.

Starting a new web site?
Follow our Quickstart guide to get a web app ready quickly.

STEP 11:SEARCHING FOR DEPLOYMENT CENTER

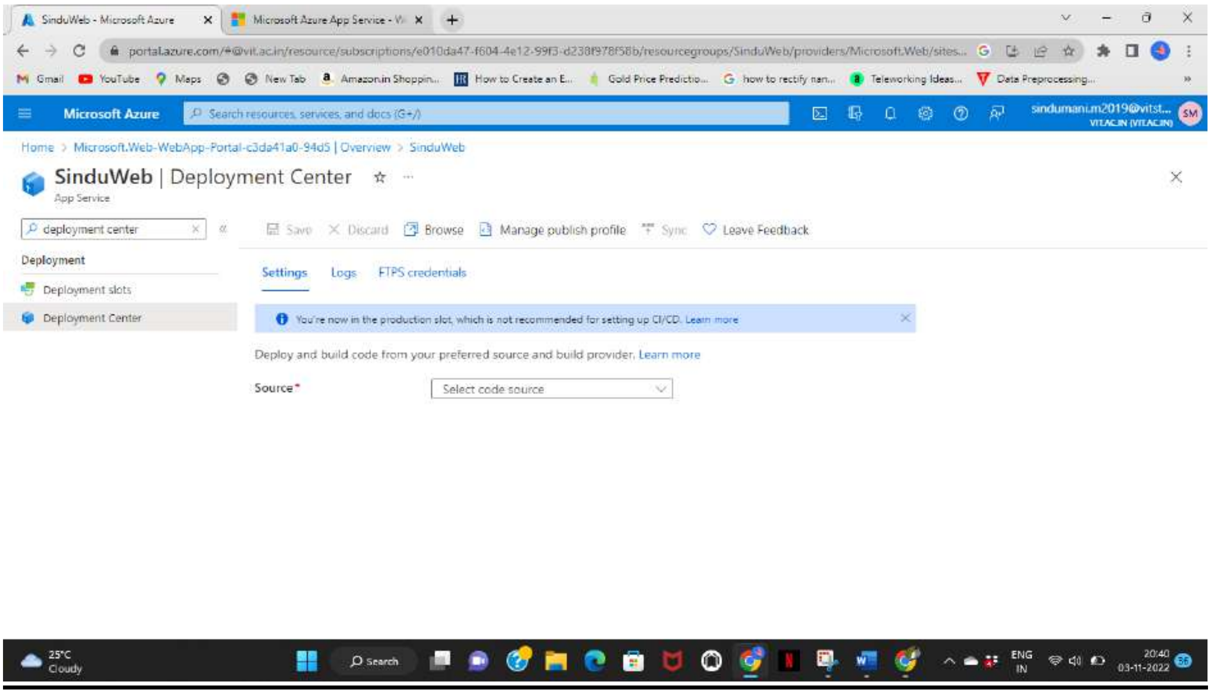


Resource group (move)	: SinduWeb	URL	: https://sinduweb.azurewebsites.net
Status	: Running	App Service Plan	: ASP-SinduWeb-a721 (F1: Free)
Location	: West Europe	FTP/deployment username	: No FTP/deployment user set
Subscription (move)	: Azure for Students	FTP hostname	: ftp://waws-prod-am2-359.ftp.azurewebsites.windo...
Subscription ID	: e010da47-f604-4e12-99f3-d238f978f58b	FTPS hostname	: ftps://waws-prod-am2-359.ftp.azurewebsites.wind...
Tags (edit)	: Click here to add tags		

Diagnose and solve problems
Our self-service diagnostic and troubleshooting experience helps you identify and resolve issues with your web app.

Application Insights
Application Insights helps you detect and diagnose quality issues in your apps, and helps you understand what your users actually do with it.

STEP 12:SELECTING THE SOURCE

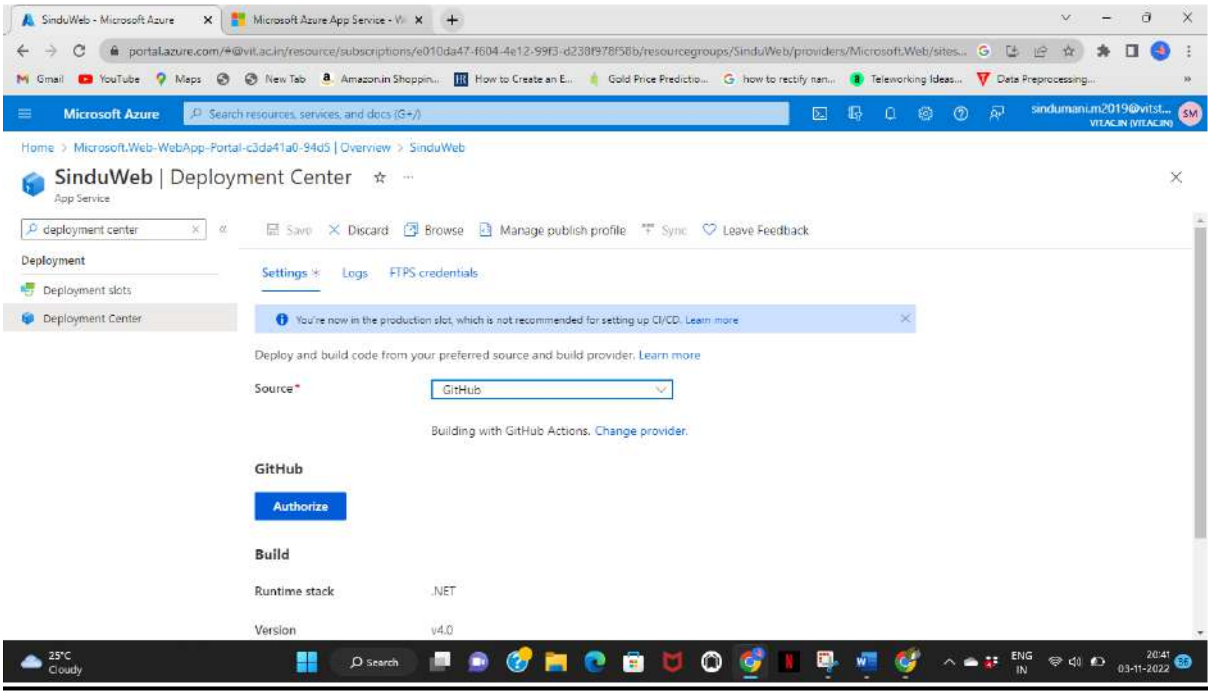


You're now in the production slot, which is not recommended for setting up CI/CD. Learn more

Deploy and build code from your preferred source and build provider. Learn more

Source* Select code source

STEP 13:CHOOSING GITHUB FROM THE AVAILABLE SOURCES



You're now in the production slot, which is not recommended for setting up CI/CD. Learn more

Deploy and build code from your preferred source and build provider. Learn more

Source* GitHub

Building with GitHub Actions. Change provider.

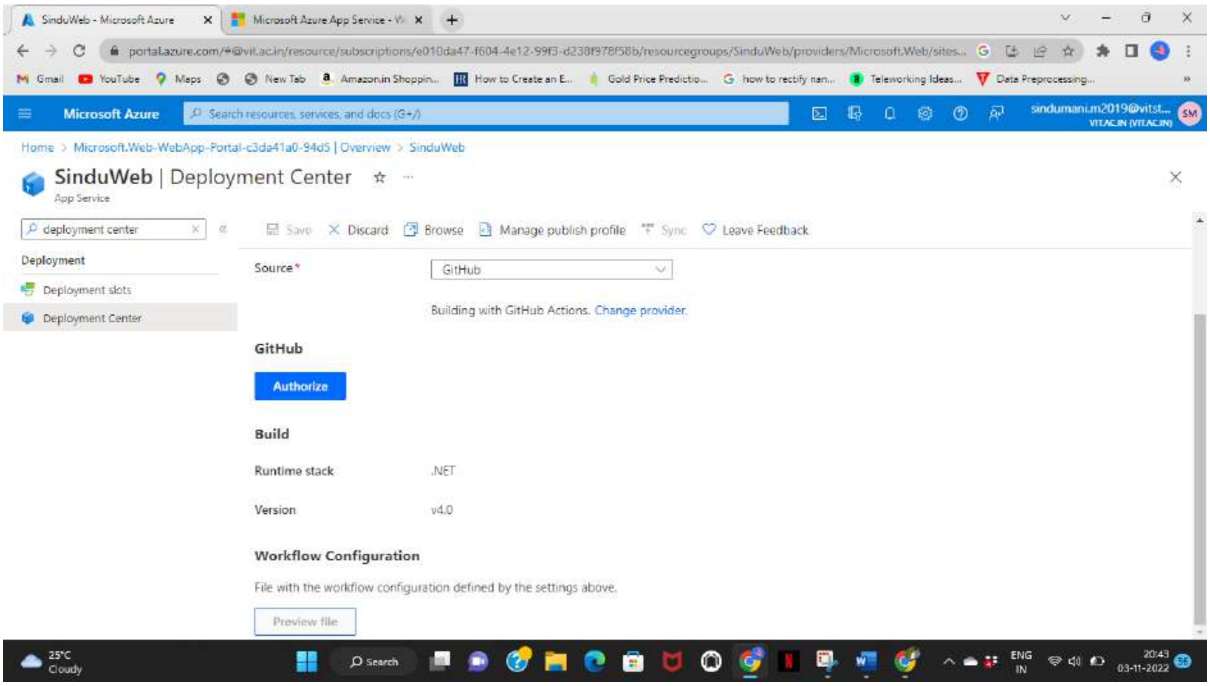
GitHub

Build

Runtime stack .NET

Version v4.0

STEP 14:CLCIKING AUTHORIZE TO LINK OUR GITHUB ACCOUNT


SinduWeb - Microsoft Azure
Microsoft Azure App Service - W
portal.azure.com/#@vit.ac.in/resource/subscriptions/e010da47-f604-4e12-99f3-d238f978f58b/resourcegroups/SinduWeb/providers/Microsoft.Web/sites...
Microsoft Azure
Search resources, services, and docs (G+/)
sindumani.m2019@vitst... VITAC.IN (VITAC.IN)
Home > Microsoft.Web-WebApp-Portal-c3da41a0-94d5 | Overview > SinduWeb
SinduWeb | Deployment Center
App Service
deployment center
Save
Discard
Browse
Manage publish profile
Sync
Leave Feedback
Deployment
Deployment slots
Deployment Center
Authorize
Preview file

Source* GitHub

Building with GitHub Actions. Change provider.

GitHub

Build

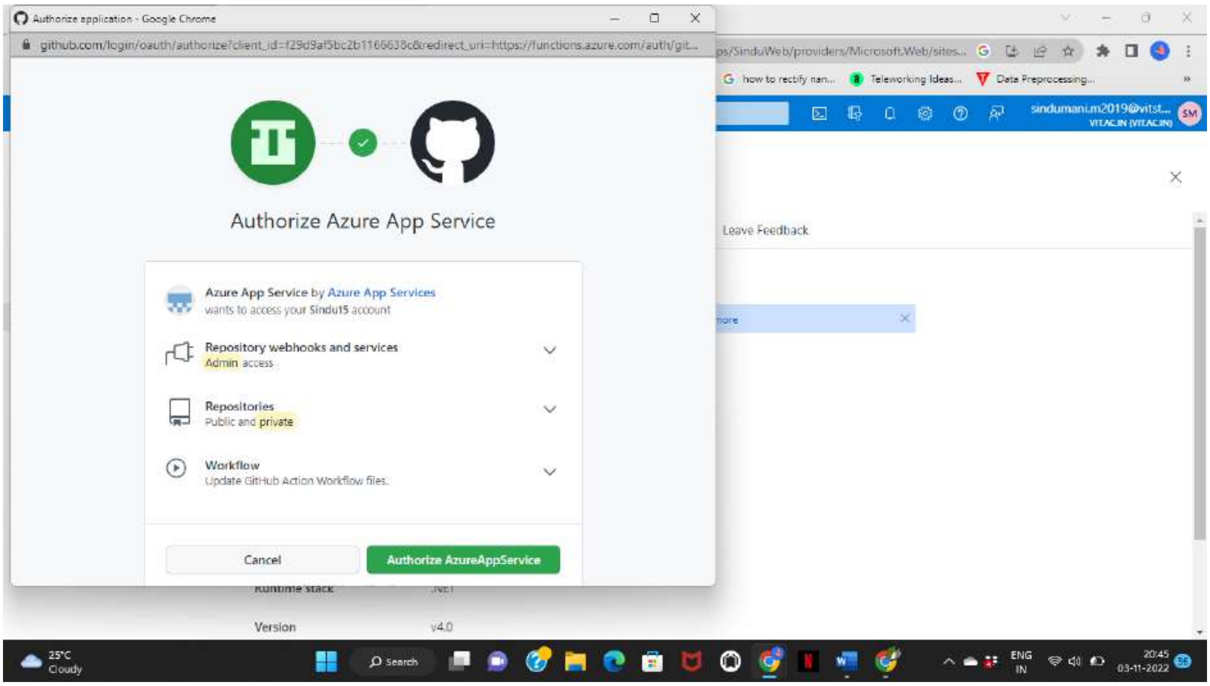
Runtime stack .NET

Version v4.0

Workflow Configuration

File with the workflow configuration defined by the settings above.

STEP 15:CHOOSING AZURE APP SERVICE AT THE FIRST DIALOGUE BOX


Authorize application - Google Chrome
github.com/login/oauth/authorize?client_id=f29d9af5bc2b1166638c&redirect_uri=https://functions.azure.com/auth/git...
Leave Feedback
Cancel
Authorize AzureAppService

Authorize Azure App Service

Azure App Service by Azure App Services
wants to access your Sindu15 account

Repository webhooks and services
Admin access

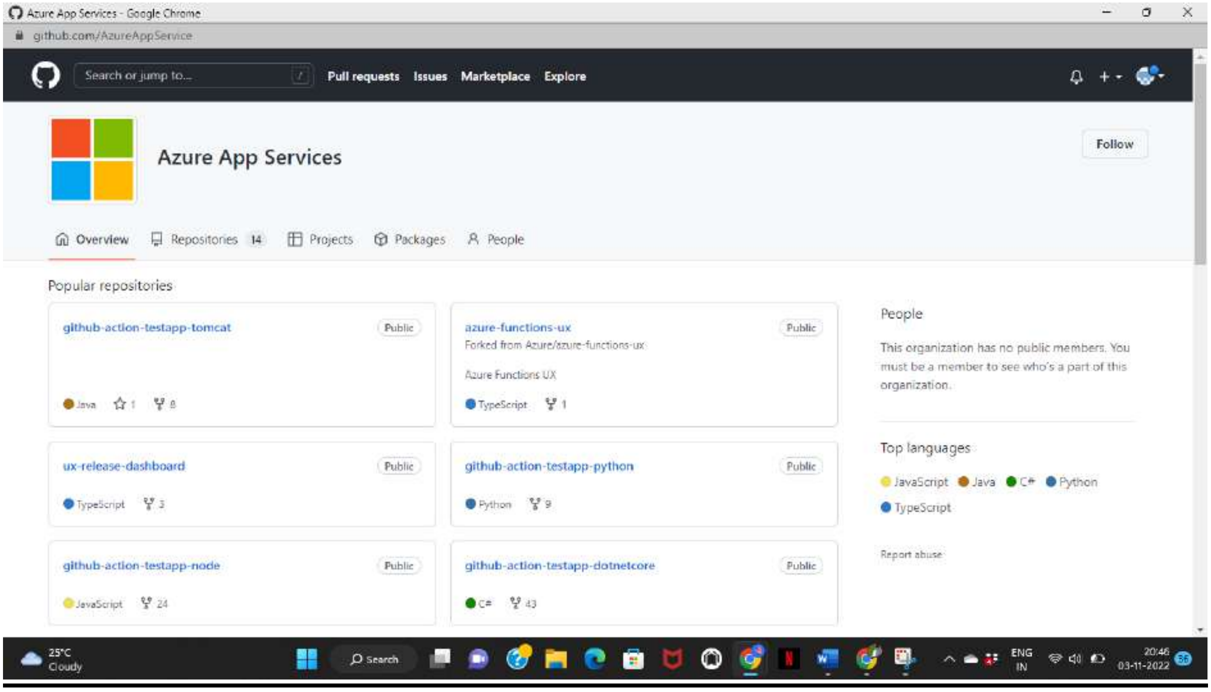
Repositories
Public and private

Workflow
Update GitHub Action Workflow files.

Runtime stack .NET

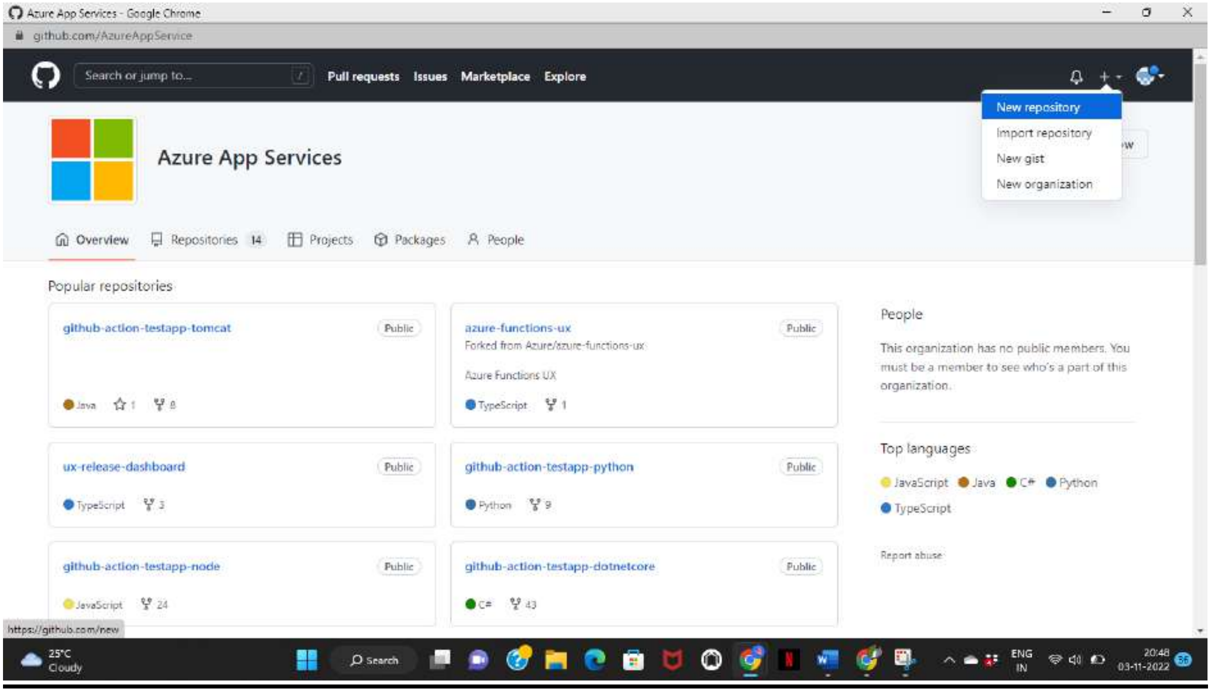
Version v4.0

STEP 16:THE GITHUB IS OPENED UNDER AZURE APP SERVICES



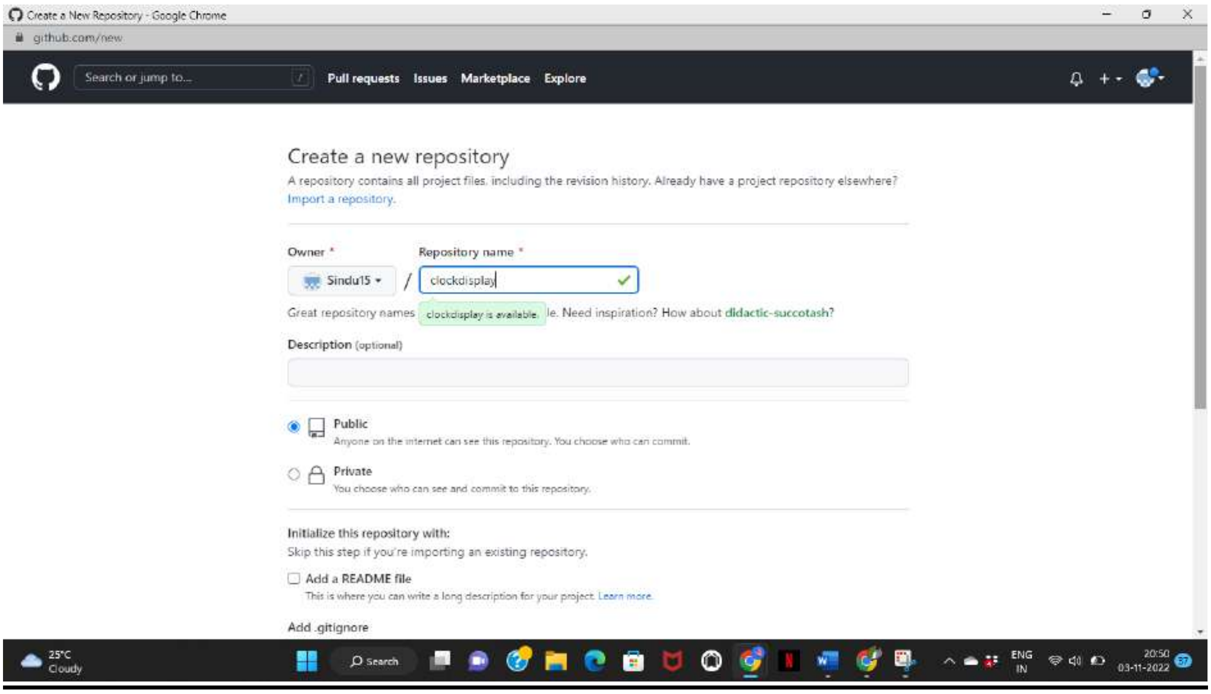
This organization has no public members. You must be a member to see who's a part of this organization.

STEP 17:CREATING A NEW REPOSITORY



This organization has no public members. You must be a member to see who's a part of this organization.

STEP 18:NAMING THE REPOSITORY



Create a new repository

A repository contains all project files, including the revision history. Already have a project repository elsewhere? Import a repository.

Owner * Sindu15 / Repository name * clockdisplay ✓

Great repository names clockdisplay is available. le. Need inspiration? How about didactic-succotash?

Description (optional)

● Public
Anyone on the internet can see this repository. You choose who can commit.

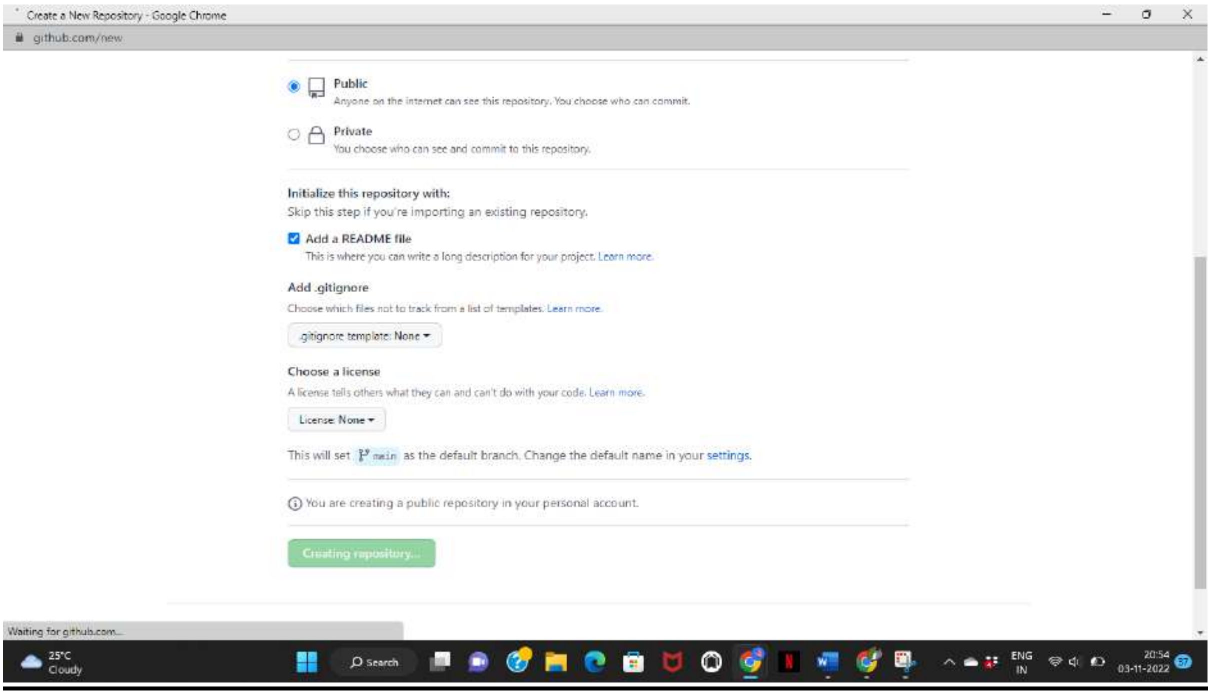
○ Private
You choose who can see and commit to this repository.

Initialize this repository with:
Skip this step if you're importing an existing repository.

□ Add a README file
This is where you can write a long description for your project. Learn more.

Add .gitignore

STEP 19:CREATING REPOSITORY


Create a New Repository - Google Chrome
github.com/new
Waiting for github.com...
25°C
Cloudy
Search
ENG
IN
20:54
03-11-2022

● Public
Anyone on the internet can see this repository. You choose who can commit.

○ Private
You choose who can see and commit to this repository.

Initialize this repository with:
Skip this step if you're importing an existing repository.

☑ Add a README file
This is where you can write a long description for your project. Learn more.

Add .gitignore
Choose which files not to track from a list of templates. Learn more.
.gitignore template: None

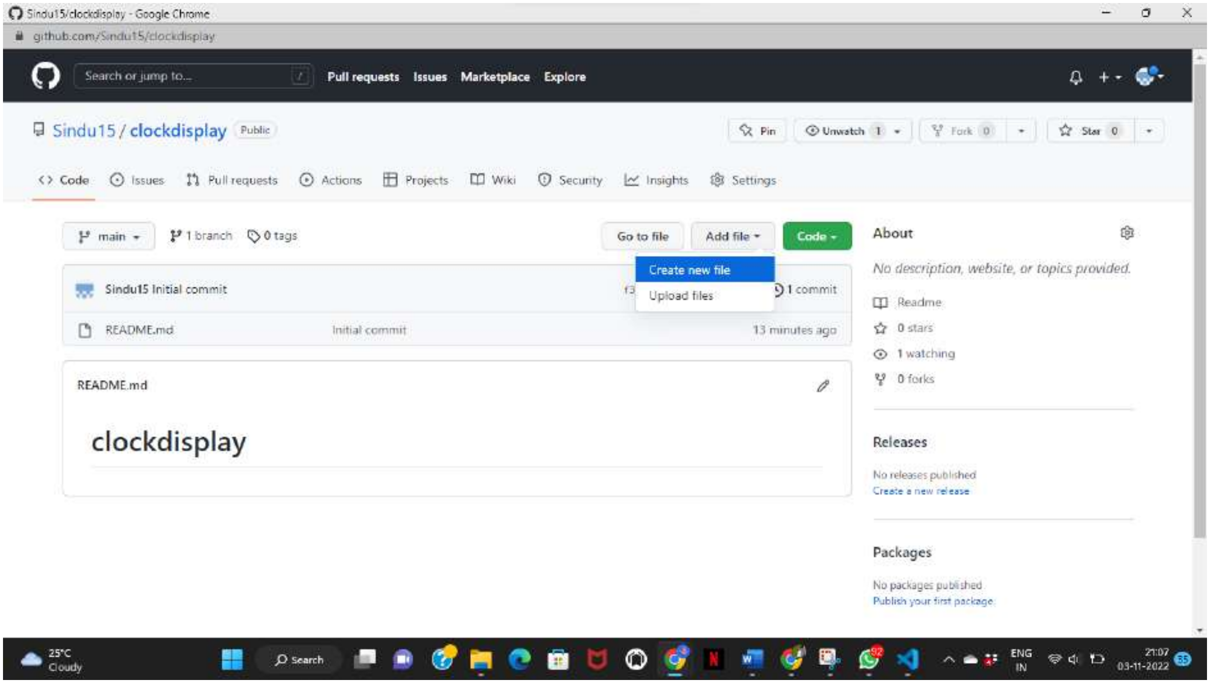
Choose a license
A license tells others what they can and can't do with your code. Learn more.
License: None

This will set main as the default branch. Change the default name in your settings.

ⓘ You are creating a public repository in your personal account.

Creating repository...

STEP 20:CLICKING ADD FILES TO UPLOAD FILES

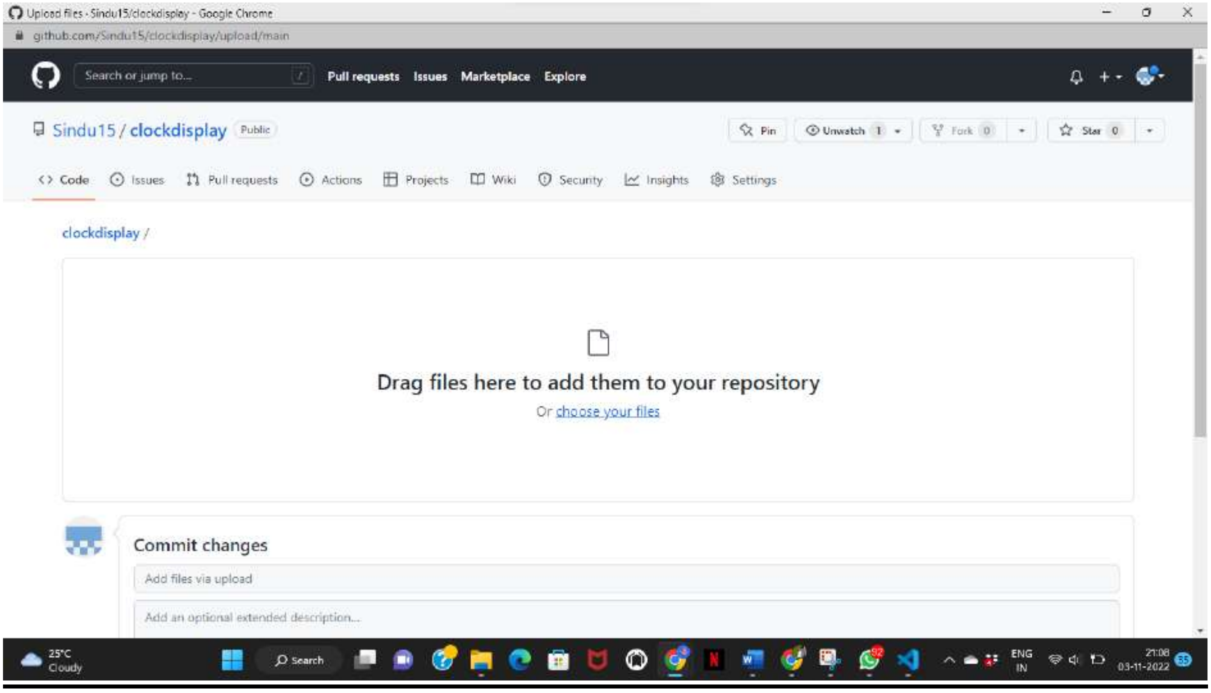


No description, website, or topics provided.

No releases published

No packages published

STEP 21:CHOOSING OUR FILES



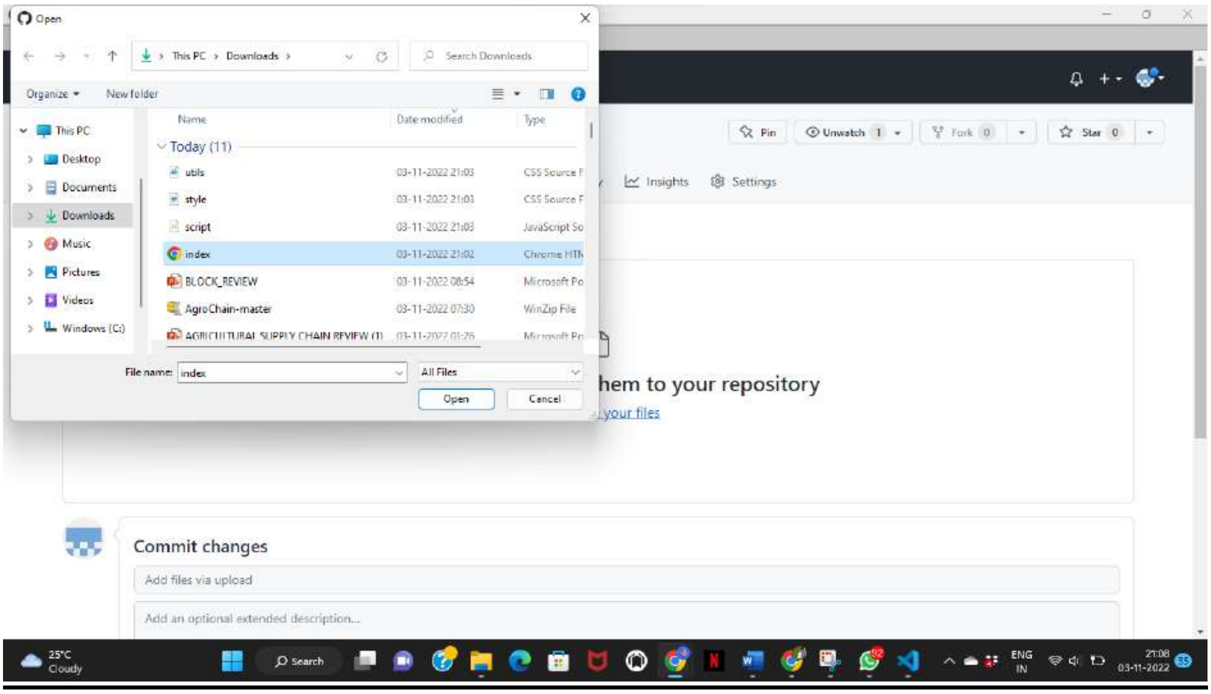
Drag files here to add them to your repository

Or choose your files

Add files via upload

Add an optional extended description...

STEP 22:OPENING index.html which is the mainfile



Today (11)

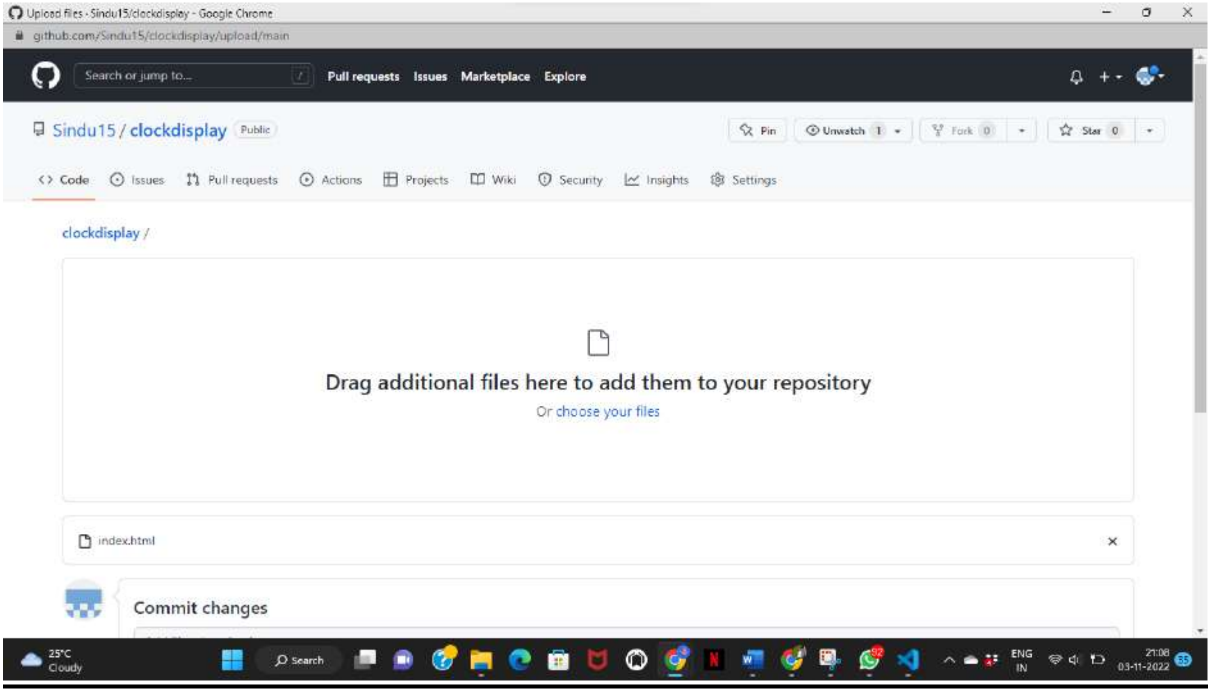
Name	Date modified	Type
utils	03-11-2022 21:03	CSS Source F
style	03-11-2022 21:03	CSS Source F
script	03-11-2022 21:03	JavaScript So
index	03-11-2022 21:02	Chrome HTM
BLOCK_REVIEW	03-11-2022 08:54	Microsoft Po
AgroChain-master	03-11-2022 07:30	WinZip File
AGRICULTURAL SUPPLY CHAIN REVIEW (1)	03-11-2022 01:26	Microsoft Po

File name: index
All Files

hem to your repository
your files

Commit changes
Add files via upload
Add an optional extended description...

STEP 23:CHOOSING index.html



clockdisplay /

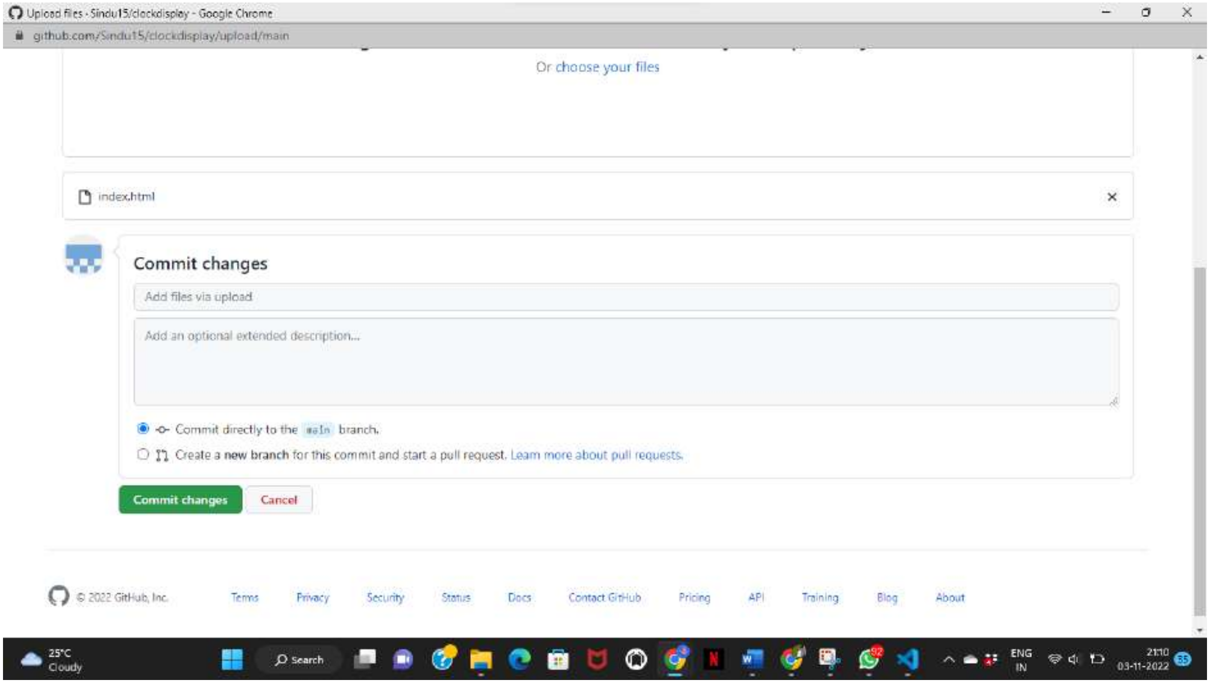
Drag additional files here to add them to your repository

Or choose your files

index.html

Commit changes

STEP 24:CLICKING COMMIT CHANGES TO UPLOAD THE FILE



Upload files · Sindu15/clockdisplay - Google Chrome

github.com/Sindu15/clockdisplay/upload/main

Or choose your files

index.html

Commit changes

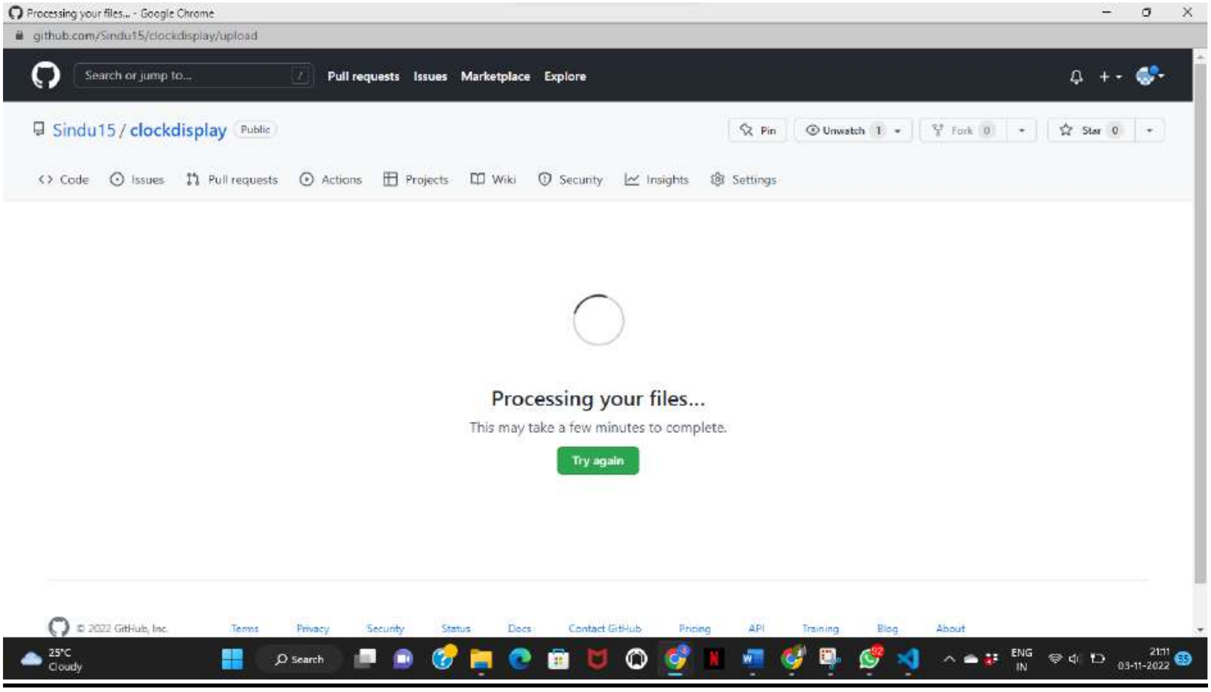
Add files via upload

Add an optional extended description...

● Commit directly to the main branch.

○ Create a new branch for this commit and start a pull request. Learn more about pull requests.

STEP 25:THE FILE IS PROCESSED



Processing your files... - Google Chrome

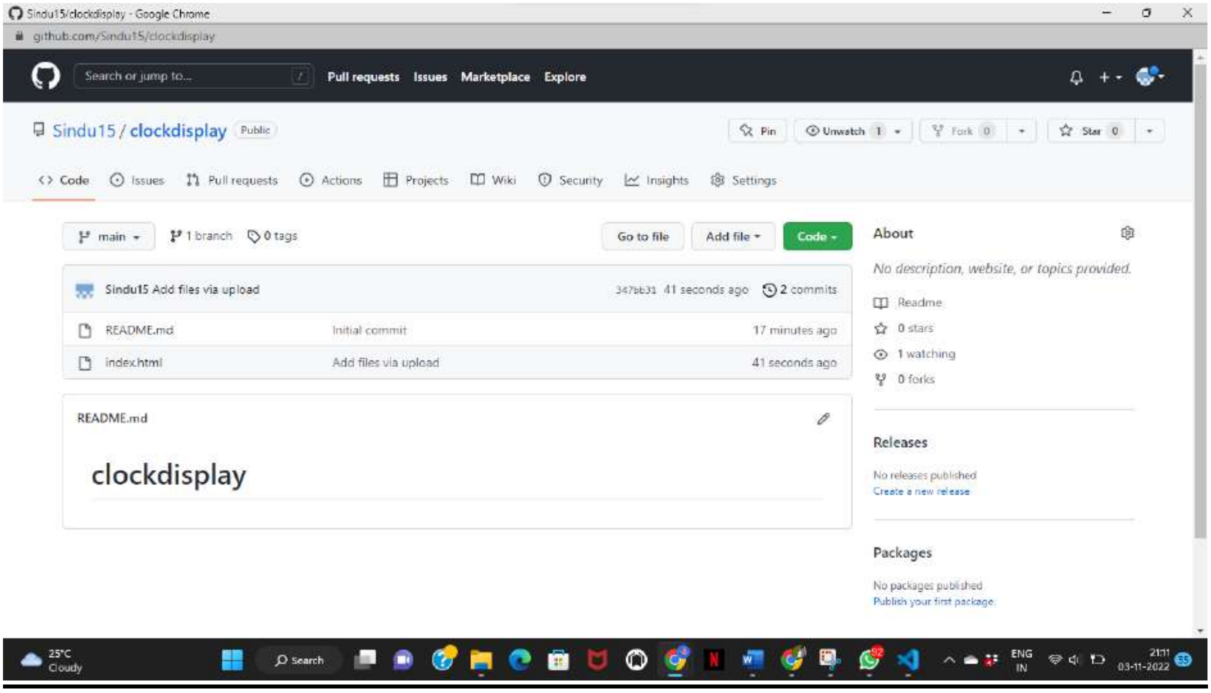
github.com/Sindu15/clockdisplay/upload

Sindu15 / clockdisplay Public

Processing your files...

This may take a few minutes to complete.

STEP 26:THE FILE IS UPLOADED



Sindu15/clockdisplay - Google Chrome

github.com/Sindu15/clockdisplay

Sindu15 / clockdisplay Public

main · 1 branch · 0 tags

Sindu15 Add files via upload · 347bb31 41 seconds ago · 2 commits

README.md	Initial commit	17 minutes ago
index.html	Add files via upload	41 seconds ago

README.md

clockdisplay

About

No description, website, or topics provided.

Readme · 0 stars · 1 watching · 0 forks

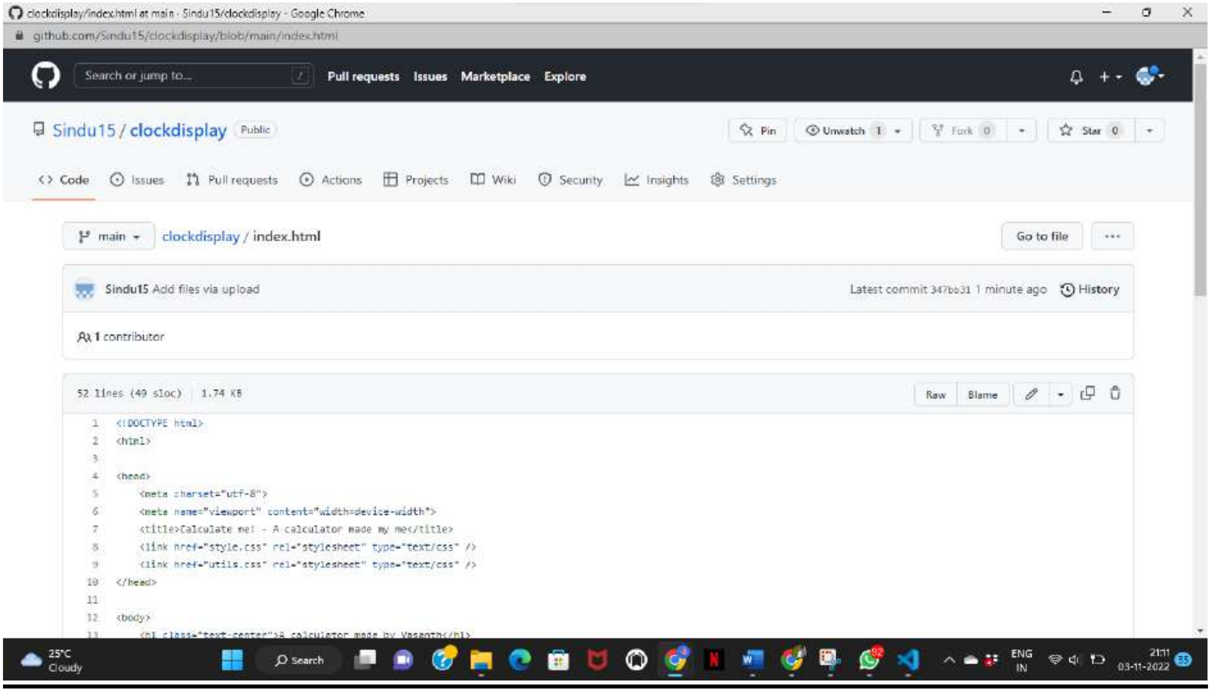
Releases

No releases published
Create a new release

Packages

No packages published
Publish your first package

STEP 27:THE FILE(index.html)IS VIEWED



clockdisplay/index.html at main · Sindu15/clockdisplay - Google Chrome

github.com/Sindu15/clockdisplay/blob/main/index.html

Sindu15 / clockdisplay Public

main · clockdisplay / index.html

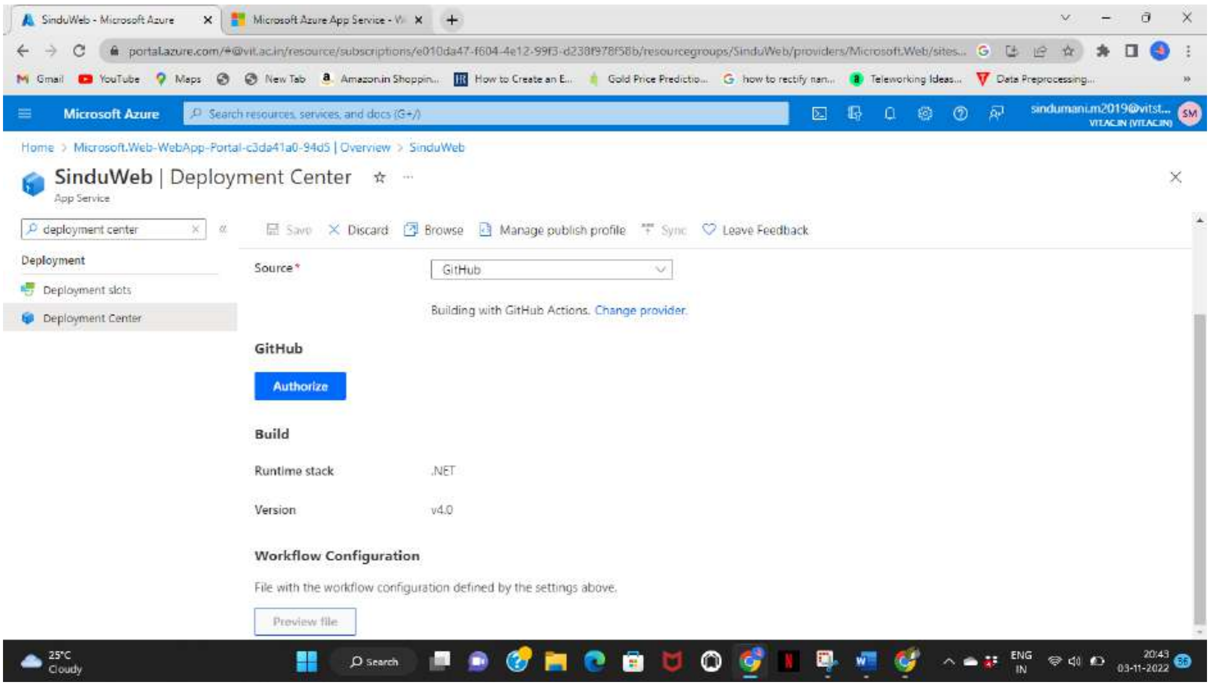
Sindu15 Add files via upload · Latest commit 347bb31 1 minute ago · History

1 contributor

52 lines (49 sloc) | 1.74 KB

```
<!DOCTYPE html>
<html>

<head>
    <meta charset="utf-8">
    <meta name="viewport" content="width=device-width">
    <title>Calculate me! - A calculator made my me</title>
    <link href="style.css" rel="stylesheet" type="text/css" />
    <link href="utils.css" rel="stylesheet" type="text/css" />
</head>

<body>
    <h1 class="text-center">A calculator made by Vasanth</h1>
```

STEP 28:CLICKING AUTHORIZE TO LINK THE ACCOUNT



Source* GitHub

Building with GitHub Actions. Change provider.

GitHub

Build

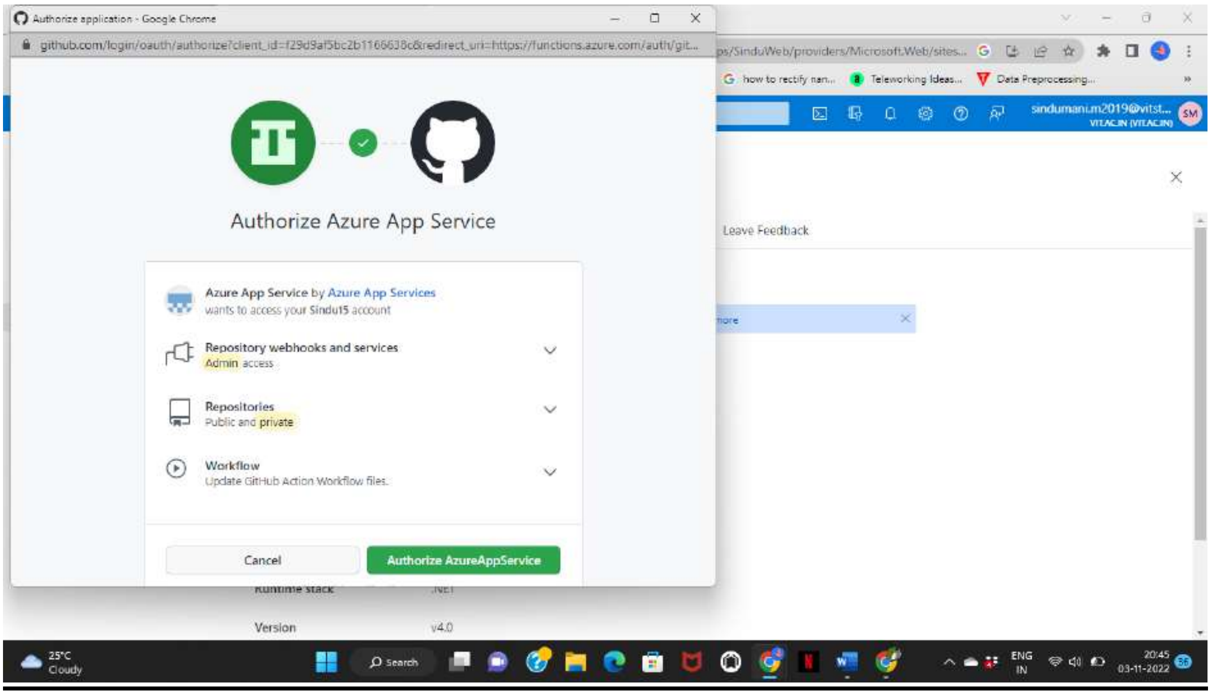
Runtime stack .NET

Version v4.0

Workflow Configuration

File with the workflow configuration defined by the settings above.

STEP 29:CLICKING AUTHORIZE AZUREAPPSERVICE TO LINK OUR ACCOUNT FINALLY



Authorize application - Google Chrome
github.com/login/oauth/authorize?client_id=f29d9af5bc2b1166638c&redirect_uri=https://functions.azure.com/auth/git...
Leave Feedback
Cancel
Authorize AzureAppService
sindumani.m2019@vitst...
VITAC.IN (VITAC.IN)
25°C
Cloudy
Search
ENG
IN
20:45
03-11-2022

Authorize Azure App Service

Azure App Service by Azure App Services
wants to access your Sindu15 account

Repository webhooks and services
Admin access

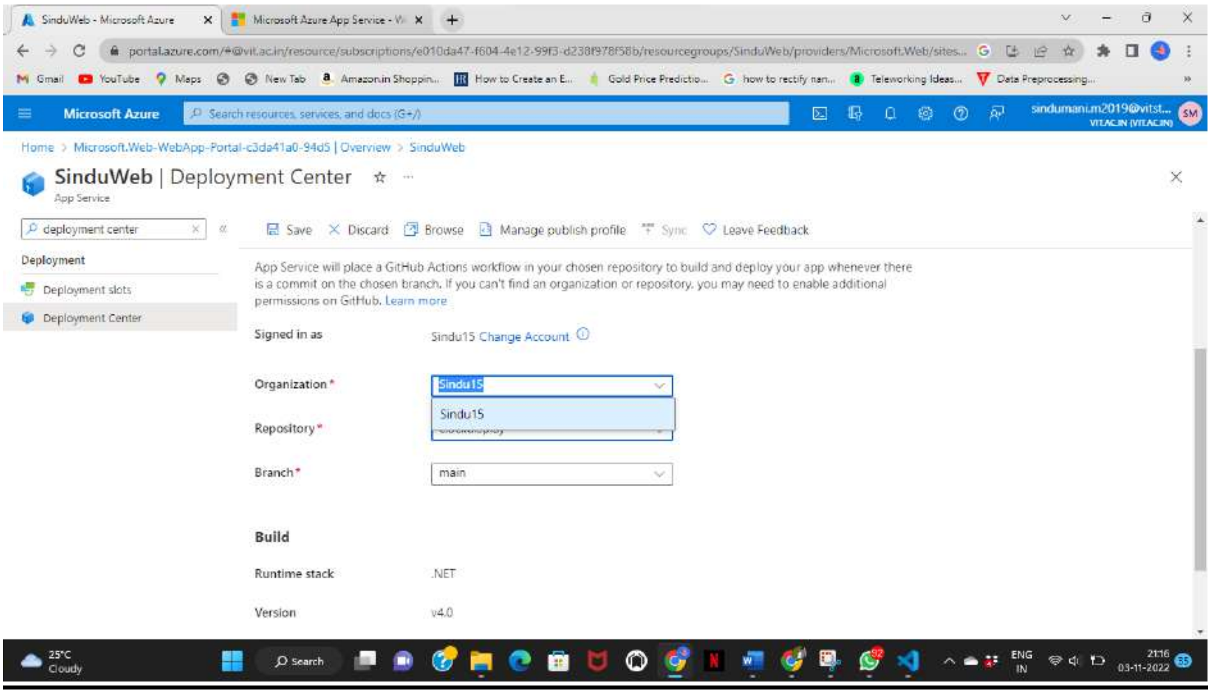
Repositories
Public and private

Workflow
Update GitHub Action Workflow files.

Runtime stack .NET

Version v4.0

STEP 30:SELECTING THE ORGANIZATION



App Service will place a GitHub Actions workflow in your chosen repository to build and deploy your app whenever there is a commit on the chosen branch. If you can't find an organization or repository, you may need to enable additional permissions on GitHub. Learn more

Signed in as: Sindu15 Change Account

Organization *: Sindu15 (dropdown: Sindu15)

Repository *: clockdisplay

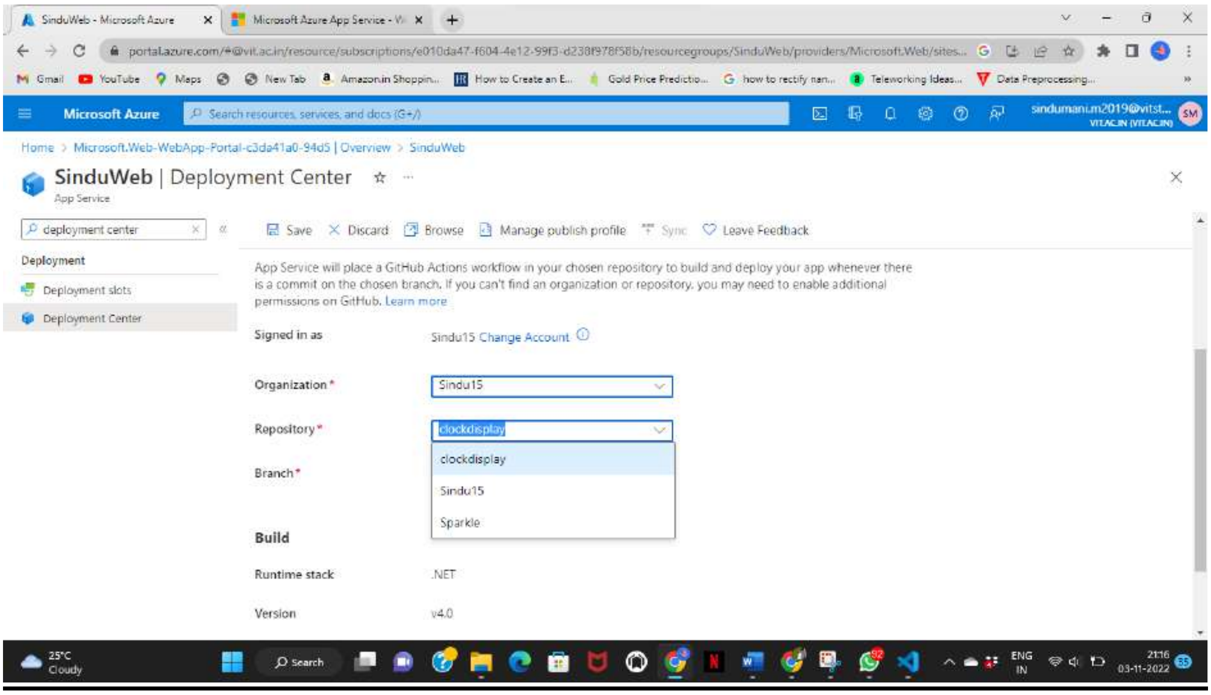
Branch *: main

Build

Runtime stack: .NET

Version: v4.0

STEP 31:SELECTING THE REPOSITORY



App Service will place a GitHub Actions workflow in your chosen repository to build and deploy your app whenever there is a commit on the chosen branch. If you can't find an organization or repository, you may need to enable additional permissions on GitHub. Learn more

Signed in as: Sindu15 Change Account

Organization *: Sindu15

Repository *: clockdisplay (dropdown: clockdisplay, Sindu15, Sparkle)

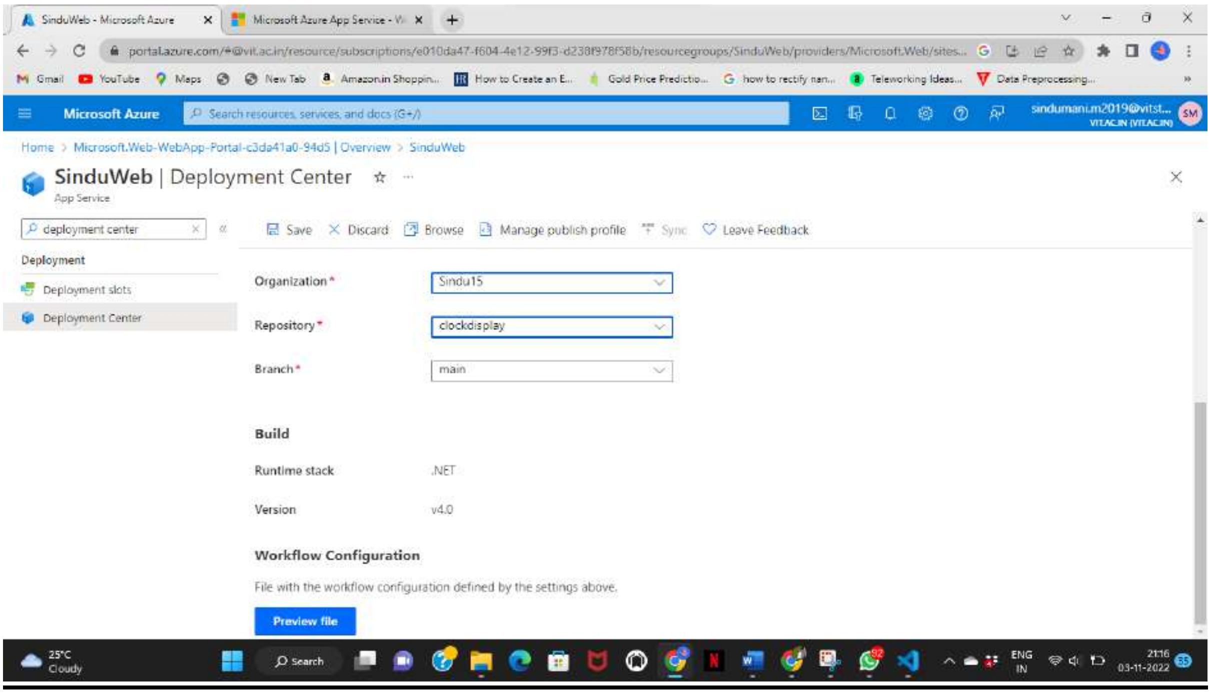
Branch *

Build

Runtime stack: .NET

Version: v4.0

STEP 32:CHOOSING BRANCH AND PREVIEWING FILE


SinduWeb - Microsoft Azure
Microsoft Azure App Service - W
portal.azure.com/#@vit.ac.in/resource/subscriptions/e010da47-f604-4e12-99f3-d238f978f58b/resourcegroups/SinduWeb/providers/Microsoft.Web/sites...
Microsoft Azure
Search resources, services, and docs (G+/)
sindumani.m2019@vitst...
VITAC.IN (VITAC.IN)
Home > Microsoft.Web-WebApp-Portal-c3da41a0-94d5 | Overview > SinduWeb
SinduWeb | Deployment Center
App Service
deployment center
Deployment
Deployment slots
Deployment Center
Save
Discard
Browse
Manage publish profile
Sync
Leave Feedback
25°C
Cloudy
Search
ENG
IN
21:16
03-11-2022

Organization* Sindu15

Repository* clockdisplay

Branch* main

Build

Runtime stack .NET

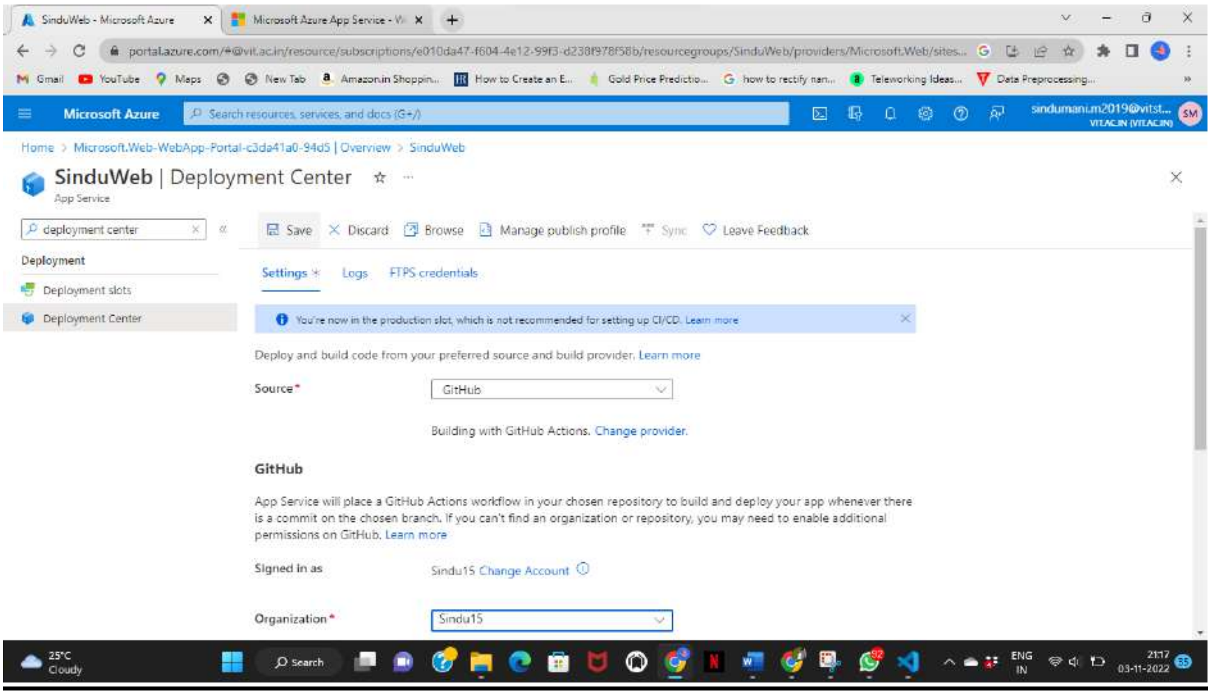
Version v4.0

Workflow Configuration

File with the workflow configuration defined by the settings above.

Preview file

STEP 33:SAVING THE DEPLOYMENT CENTER


SinduWeb - Microsoft Azure
Microsoft Azure App Service - W
portal.azure.com/#@vit.ac.in/resource/subscriptions/e010da47-f604-4e12-99f3-d238f978f58b/resourcegroups/SinduWeb/providers/Microsoft.Web/sites...
Microsoft Azure
Search resources, services, and docs (G+/)
sindumani.m2019@vitst...
VITAC.IN (VITAC.IN)
Home > Microsoft.Web-WebApp-Portal-c3da41a0-94d5 | Overview > SinduWeb
SinduWeb | Deployment Center
App Service
deployment center
Deployment
Deployment slots
Deployment Center
Save
Discard
Browse
Manage publish profile
Sync
Leave Feedback
Settings
Logs
FTPS credentials
25°C
Cloudy
Search
ENG
IN
21:17
03-11-2022

You're now in the production slot, which is not recommended for setting up CI/CD. Learn more

Deploy and build code from your preferred source and build provider. Learn more

Source* GitHub

Building with GitHub Actions. Change provider.

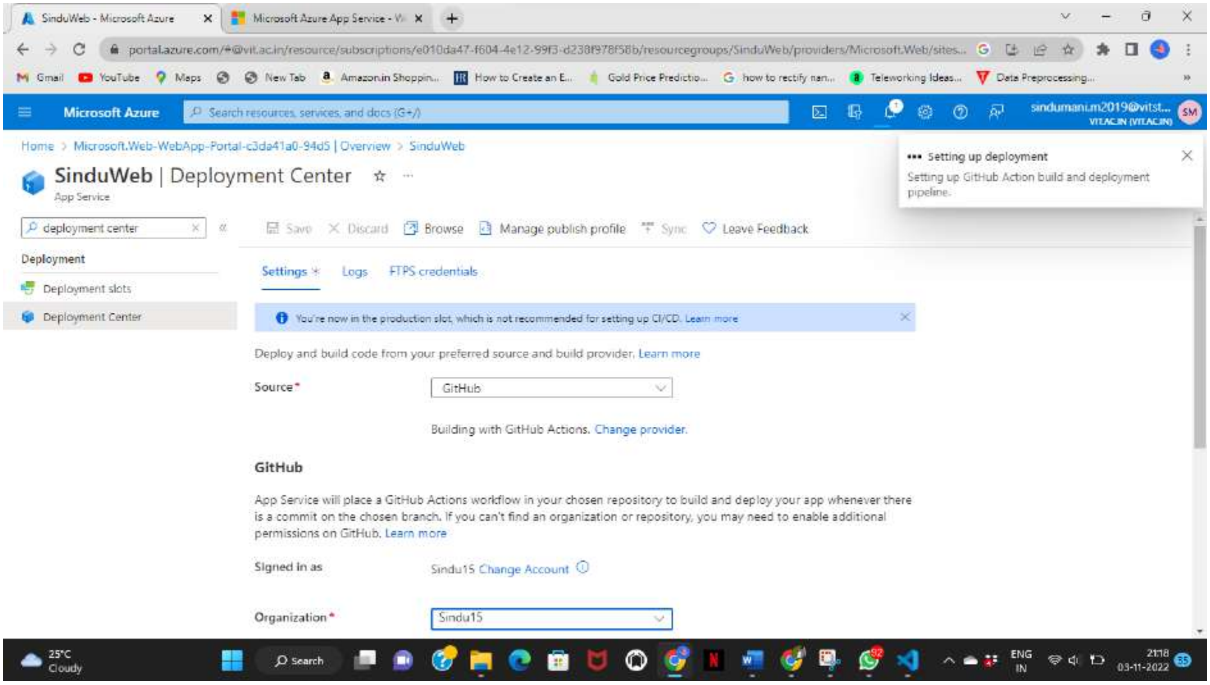
GitHub

App Service will place a GitHub Actions workflow in your chosen repository to build and deploy your app whenever there is a commit on the chosen branch. If you can't find an organization or repository, you may need to enable additional permissions on GitHub. Learn more

Signed in as Sindu15 Change Account

Organization* Sindu15

STEP 34:DEPLOYMENT IS INITIALIZED



Home > Microsoft.Web-WebApp-Portal-c3da41a0-94d5 | Overview > SinduWeb

SinduWeb | Deployment Center

App Service

••• Setting up deployment

Setting up GitHub Action build and deployment pipeline.

You're now in the production slot, which is not recommended for setting up CI/CD. Learn more

Deploy and build code from your preferred source and build provider. Learn more

Source* GitHub

Building with GitHub Actions. Change provider.

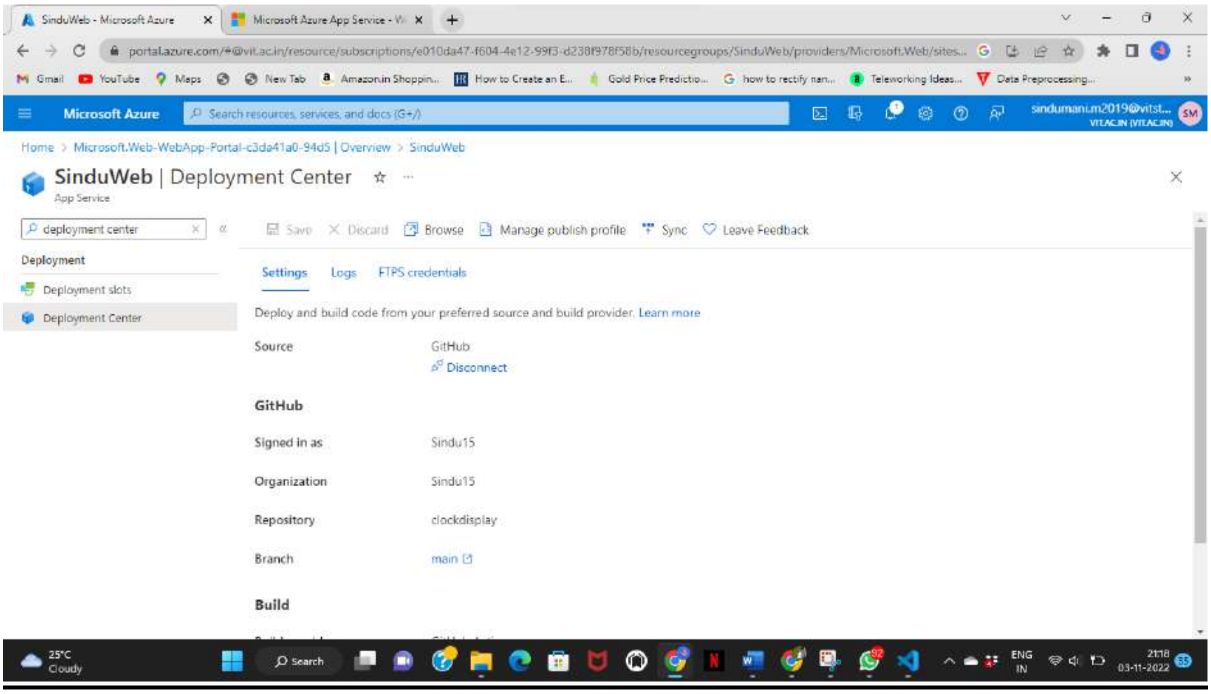
GitHub

App Service will place a GitHub Actions workflow in your chosen repository to build and deploy your app whenever there is a commit on the chosen branch. If you can't find an organization or repository, you may need to enable additional permissions on GitHub. Learn more

Signed in as Sindu15 Change Account

Organization* Sindu15

STEP 35:DEPLOYMENT IS COMPLETED



Home > Microsoft.Web-WebApp-Portal-c3da41a0-94d5 | Overview > SinduWeb

SinduWeb | Deployment Center

App Service

Deploy and build code from your preferred source and build provider. Learn more

Source GitHub

Disconnect

GitHub

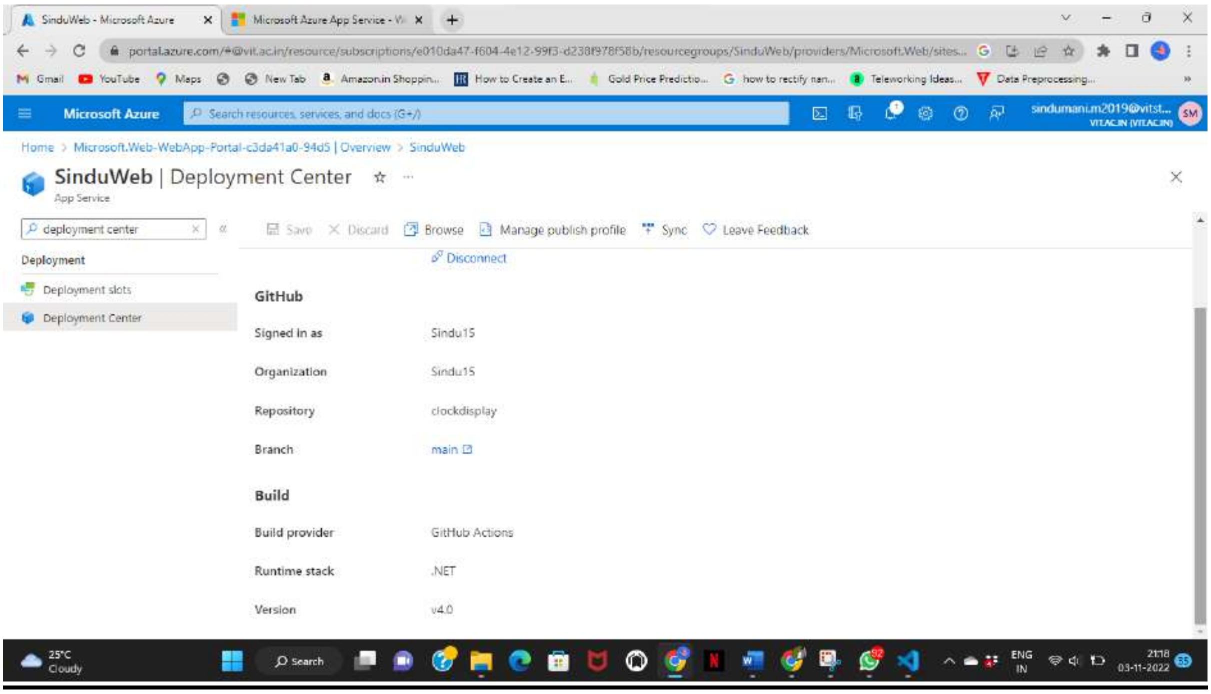
Signed in as Sindu15

Organization Sindu15

Repository clockdisplay

Branch main

Build

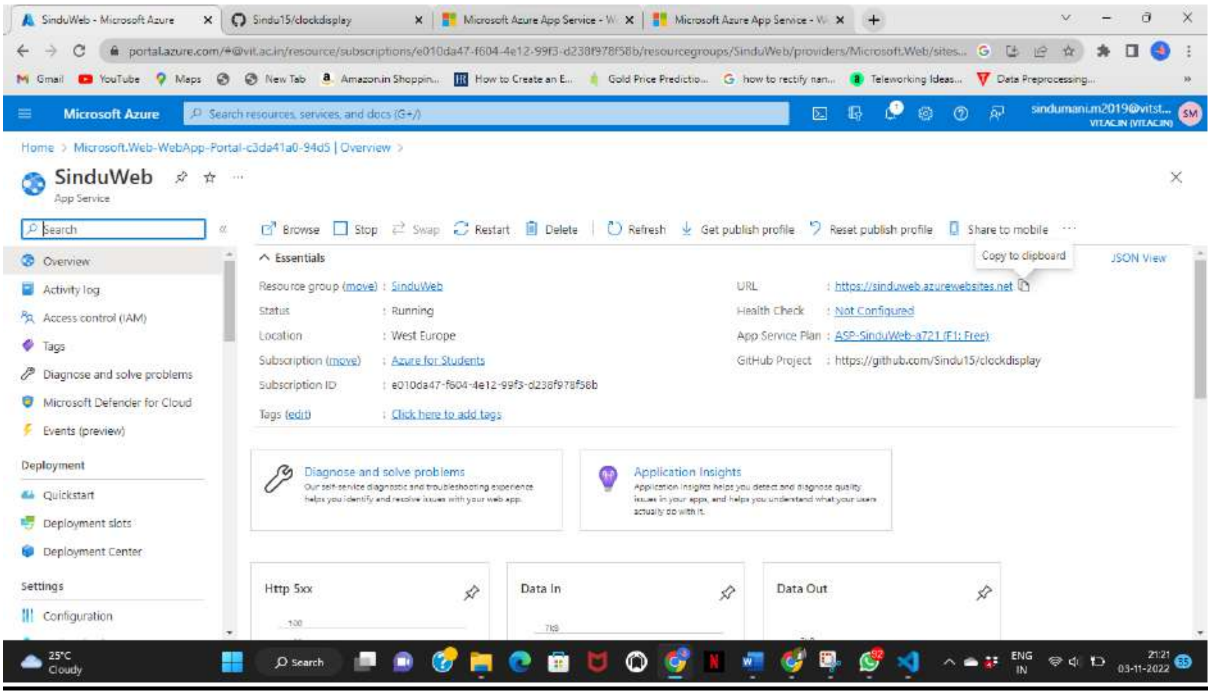


SinduWeb | Deployment Center

App Service

GitHub	
Signed in as	Sindu15
Organization	Sindu15
Repository	clockdisplay
Branch	main
Build	
Build provider	GitHub Actions
Runtime stack	.NET
Version	v4.0

STEP 36:COPYING THE LINK FROM APP SERVICE



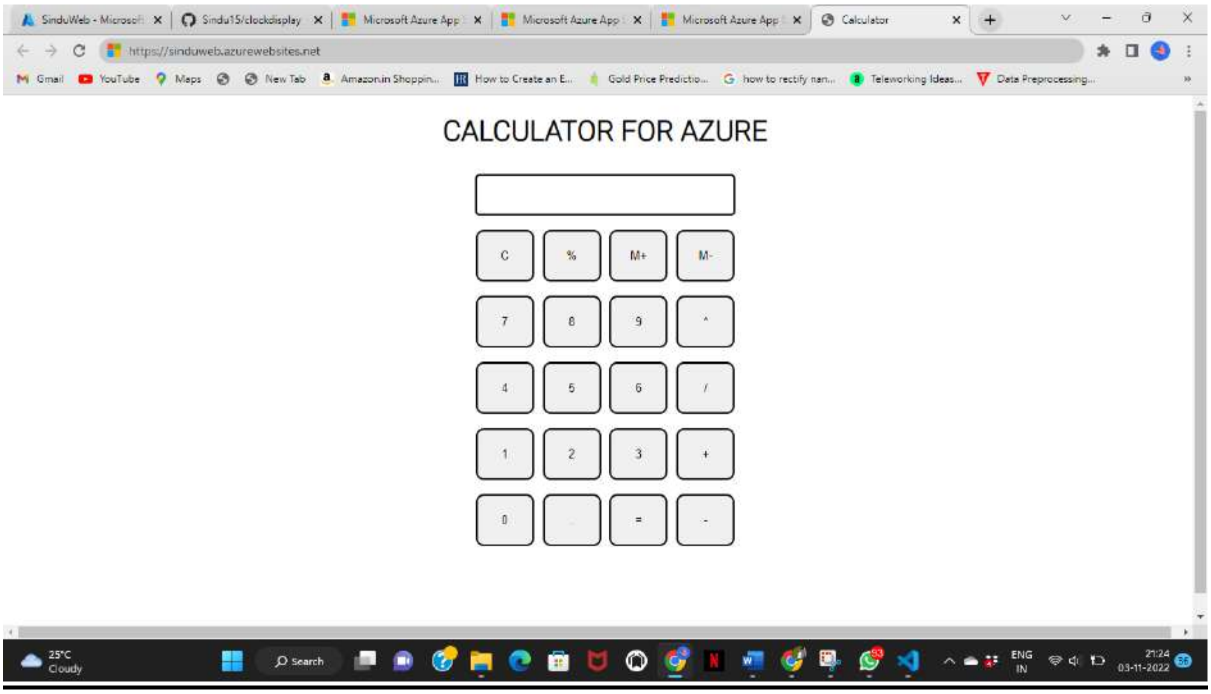
SinduWeb

App Service

Essentials

Resource group (move)	SinduWeb	URL	https://sinduweb.azurewebsites.net
Status	Running	Health Check	Not Configured
Location	West Europe	App Service Plan	ASP-SinduWeb-a721 (F1: Free)
Subscription (move)	Azure for Students	GitHub Project	https://github.com/Sindu15/clockdisplay
Subscription ID	e010da47-f604-4e12-99f3-d238f978f58b		
Tags (edit)	Click here to add tags		

STEP 37:PASTING THE URL AND DEPLOYING THE FILE FROM GITHUB



2.CASE STUDY ON HADOOP AS A SERVICE

ABSTRACT

Using straightforward programming concepts, the Apache Hadoop software library provides a framework for the distributed processing of massive data volumes across computer clusters. From a single server to thousands of devices, each providing local computing and storage, it is intended to scale up. The library itself is designed to identify and handle problems at the application layer rather than relying on hardware to provide high availability. As a result, a highly-available service is delivered on top of a cluster of computers, each of which may be prone to failures. In this post, we will examine each HDFS component in detail and learn how it operates internally. HDFS has a master/slave architecture. **HDFS and MapReduce are the two main components of the Hadoop framework**. A single NameNode, a master server that oversees the file system namespace and controls client access to files, makes up an HDFS cluster. Additionally, there are a number of DataNodes that manage storage related to the nodes that they run on, often one per node in the cluster. User data may be saved in files thanks to HDFS, which offers a namespace for the file system. A file is internally divided into one or more blocks, which are then stored in a collection of **DataNodes.** File system namespace activities like **opening, shutting, and renaming files** and directories are carried out by the **NameNode**. Additionally, it chooses how blocks are mapped to DataNodes. **Serving read and write requests from the file system's customers is the responsibility of the DataNodes**. Upon receiving a command from the NameNode, the DataNodes also carry out block creation, deletion, and replication.

HDFS ANALYSIS

Here is the dependency graph of the hdfs project following the analysis of **Hadoop with JArchitect**. Hdfs leverages a variety of third-party libraries, including **guava, jetty, jackson, and others**, to complete its task. More information regarding the burden of using each library is provided by the DSM (Design Structure Matrix). Most of the libraries used by HDFS are rt, hadoop-common, and protobuf. When using external libraries, it's best to see if we can quickly replace a third party library with another one without having an adverse effect on the entire programme. There are numerous factors that can lead us to do so. The other library might:

- Have more features

- More performent
- More Secure

We have taken **jetty library** as an example and see which hdfs methods use it directly. m.IsUsing ("jetty-6.1.26") && m.ParentProject.Name=="hadoop-hdfs-0.23.6" from m in Methods choose new'm, m.NbBCInstructions'Only a small number of methods directly use the Jetty library, and switching to another one is relatively simple. In general, it's highly interesting to limit the use of an external library to just a few classes when you can, since this makes it easier to maintain and develop the project. The main **HDFS components** are as follows:

I-DATA NODE

STARTUP

Let's perform a search before all hdfs jar entry points from m in Methods where m.Name to find out how to start a data node. There are several entries in HDFS, including **DFSAdmin, DfSsc, Balancer, and HDFSConcat.** Contains("main(String[])") && m.IsStatic select new m, m.NbBCInstructions Here is what happens when the DataNode class's main method is called, which is the entry point for the data node. When the node is launched in a non-secure cluster, this parameter is null; however, when it is started in a secure environment, the param is assigned with the secure resources. The main method then calls securemain after passing it the securityresources parameter. Two attributes may be found in the SecureResources class:

1. **streamingSocket**: secure port for data streaming to datanode.
2. **listner**: a secure listener for the web server.

And here are the methods invoked from DataNode.StartDataNode.This method initialize IPCServer,DataXceiver which is the thread for processing incoming/outgoing data stream, create data node metrics instance.

HOW DATA IS MANAGED?

The DataNode class has a data attribute with the **FSDatasetinterface** data data type. The interface for the underlying storage that houses the blocks for a data node is called FSDatasetinterface. Let's look up the Hadoop implementations that are available. where t is taken from Types. **Hadoop offers FSDataset, which handles a collection of data blocks and stores them on dirs.** Implement("org.apache.hadoop.hdfs.server.datanode.FSDatasetInterface") choose new t, t.NbBCInstructions. Interfaces enforce low coupling and make the design very flexible; however, if the implementation is used instead of the interface, we lose this advantage. To see if interfaceDataSet is used anywhere to represent the data, let's search for all methods using FSDataSet. Only FSDataSet inner classes use it directly, and for all other places, we need to use the implementation. from m in Methods where m.IsUsing **(“org.apache.hadoop.hdfs.server.datanode.FSDataset”)** select new {m, m.NbBCInstructions}Only FSDataSet inner classes use it directly, and for all the other places the **interfaceDataSet** is used instead, what makes the possibility to change the dataset kind very easy. from m in Methods let depth0 = m.DepthOfCreateA(“org.apache.hadoop.hdfs.server.datanode.FSDataset”) where depth0 == 1 select new {m, depth0}The factory pattern is used to create the instance; the problem is if this factory create the implementation directly inside getFactory method, we have to change the Hadoop code to give it our custom DataSet manager.Methods are used by the getFactory method. Where m.IsUsedBy("org.apache.hadoop.hdfs.server.datanode.FSDatasetInterface$Factory.getFactory(Configuration)") is taken from m in Methods. choose new'm, m.NbBCInstructions'.The good news is that since the factory uses configuration to obtain class implementation, we may search for any classes that can be provided by configuration in addition to receiving our custom DataSet through configuration. from m in Methods where m.IsUsing (“org.apache.hadoop.conf.Configuration.getClass(String,Class,Class)”) select new {m, m.NbBCInstructions}**Many classes could be injected inside the Hadoop framework without changing its source code, what makes it very flexible.**

NAMENODE

All HDFS metadata is arbitrated and stored on the **NameNode**. The NameNode never receives any user data because of the way the system is set up. When the name node is launched, the following methods are called. The following is an quick overview of the fsnamesystem and the RPC Server after they have been constructed and loaded:

NAMENODERPSERVER

All **RPC requests** sent to the **NameNode** are handled by **NameNodeRpcServer**. As an illustration, when a data node is launched, it must register itself with the NameNode. The rpc server receives this request and forwards it to the fsnamesystem, which then directs it to the dataNodeManager. from m where m.IsUsed By is true

("org.apache.hadoop.hdfs.server.namenode.NameNodeRpcServer.blockReceiv

d(DatanodeRegistration,String,Block[],String[])") Each rectangle in the graph corresponds to the number of bytes of code instructions, and we can see that BlockManager.addBlock performs the majority of the work. select new m, m.NbBCInstructions Ha ddop is intriguing in that each class has a specific role to play and that all requests are routed to the appropriate manager.

FS NAME SYSTEM

Traditional hirarchical file organisation is **supported** by **HDFS**. Directories can be made by a user or an application, and files can be stored there. Similar to the majority of other current file systems, the file system namespace structure allows for the creation and removal of files as well as the movement of files between directories and file renaming. Here is a dependency graph for creating a symbolic connection as an illustration.

HDFS CLIENT

Basic file operations can be carried out using a Hadoop Filesystem connection and DFSClient. While interacting with a NameNode daemon, it does so using the ClientProtocol, and when reading/writing block data, it connects directly to DataNodes.

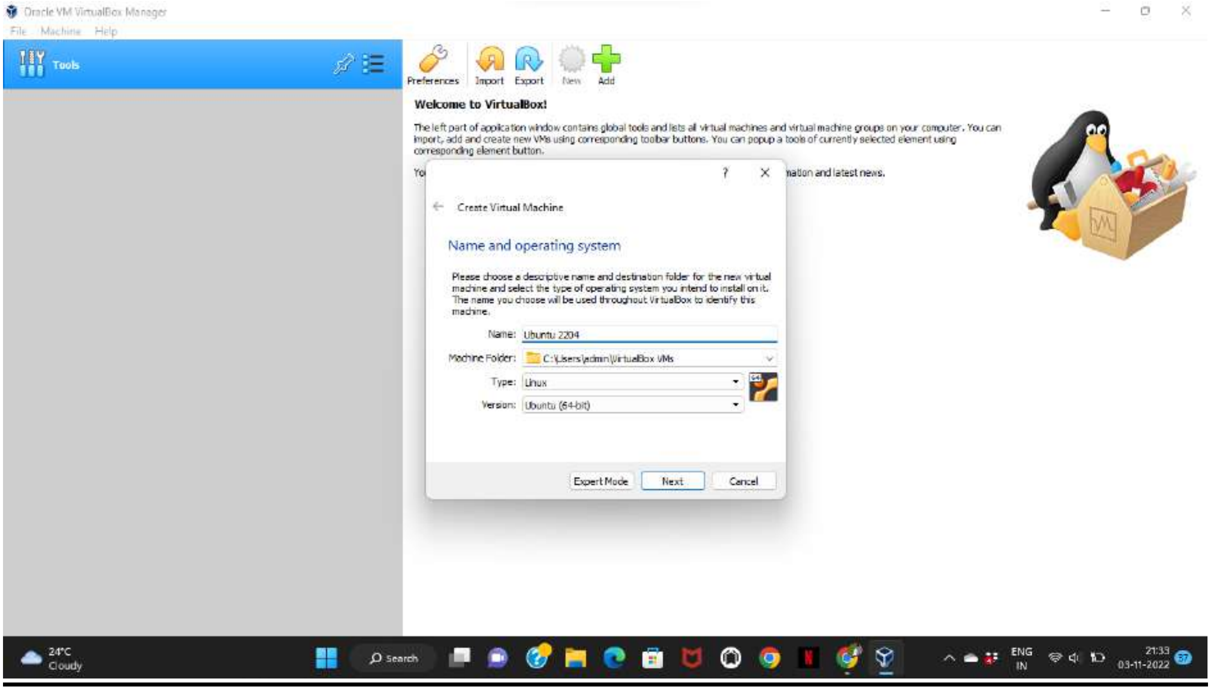
Users of Hadoop DFS need **acquire** a copy of **DistributedFileSystem**, which employs DFSClient to manage filesystem operations. The dependency diagram for creating a directory request shows how DistributedFileSystem serves as a facade and directs requests to the DFSClient class.

CONCLUSION

Although using frameworks as a user is quite intriguing, digging deeper into the framework could provide us with more information that would help us better grasp it and more easily adapt it to our needs. **Many businesses use the powerful Hadoop framework**, and the majority of them need to customise it. Fortunately, **Hadoop is quite adaptable**, allowing us to **change the behaviour without changing the source code.**

3.OPENSSTACK INSTALLATION USING DEVSTACK IN VIRTUAL BOX AND UBUNTU

STEP 1:INSTALLING UBUNTU IN VIRTUAL MACHINE



Welcome to VirtualBox!

The left part of application window contains global tools and lists all virtual machines and virtual machine groups on your computer. You can import, add and create new VMs using corresponding toolbar buttons. You can popup a tools of currently selected element using corresponding element button.

Create Virtual Machine

Name and operating system

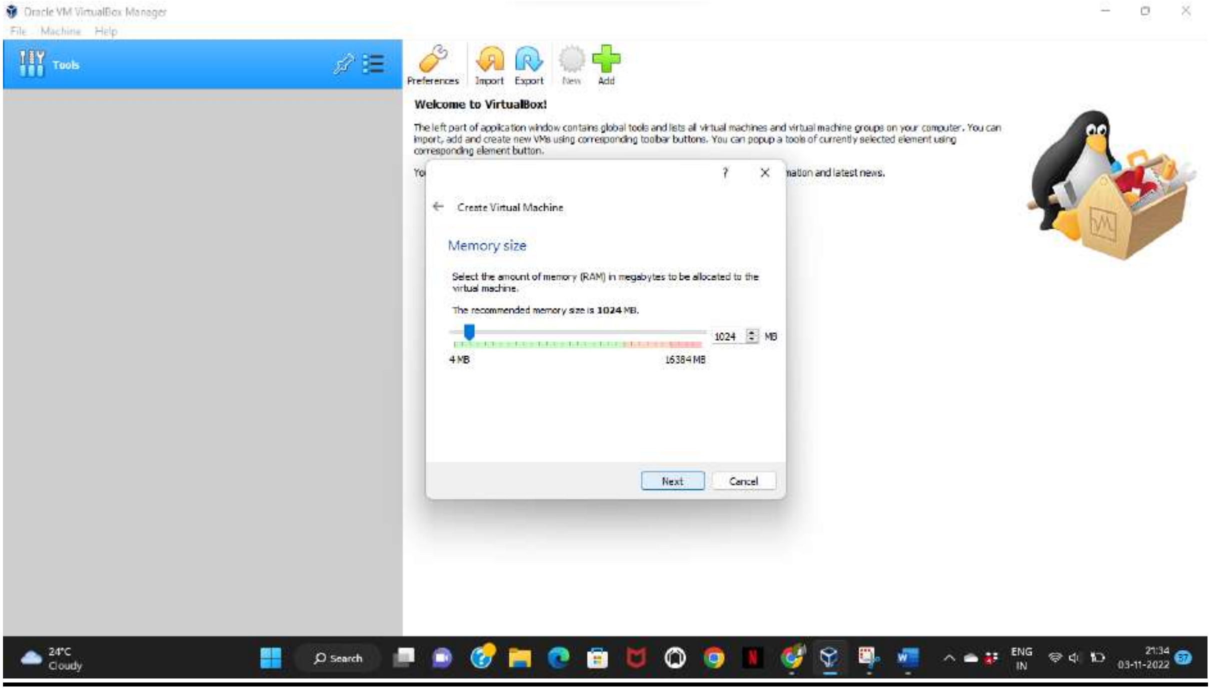
Please choose a descriptive name and destination folder for the new virtual machine and select the type of operating system you intend to install on it. The name you choose will be used throughout VirtualBox to identify this machine.

Name: Ubuntu 2204

Machine Folder: C:\Users\admin\VirtualBox VMs

Type: Linux

Version: Ubuntu (64-bit)



Welcome to VirtualBox!

The left part of application window contains global tools and lists all virtual machines and virtual machine groups on your computer. You can import, add and create new VMs using corresponding toolbar buttons. You can popup a tools of currently selected element using corresponding element button.

Create Virtual Machine

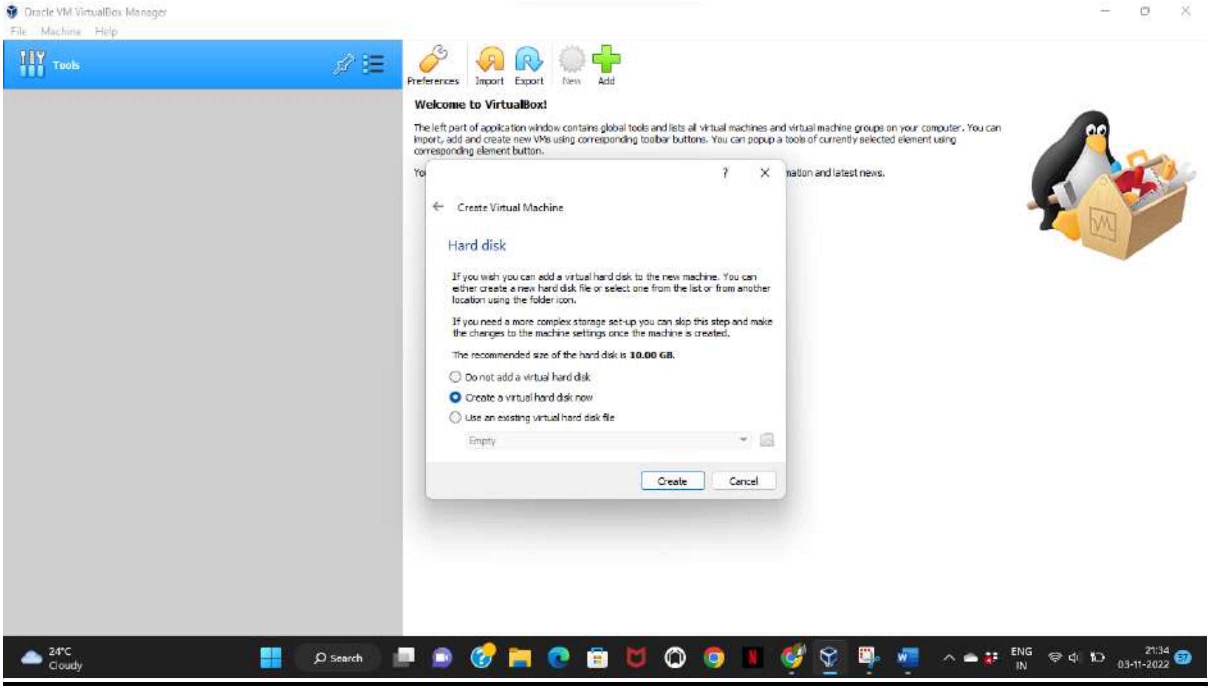
Memory size

Select the amount of memory (RAM) in megabytes to be allocated to the virtual machine.

The recommended memory size is **1024** MB.

1024 MB

4 MB 16384 MB



Welcome to VirtualBox!

The left part of application window contains global tools and lists all virtual machines and virtual machine groups on your computer. You can import, add and create new VMs using corresponding toolbar buttons. You can popup a tools of currently selected element using corresponding element button.

Yo ... mation and latest news.

Create Virtual Machine

Hard disk

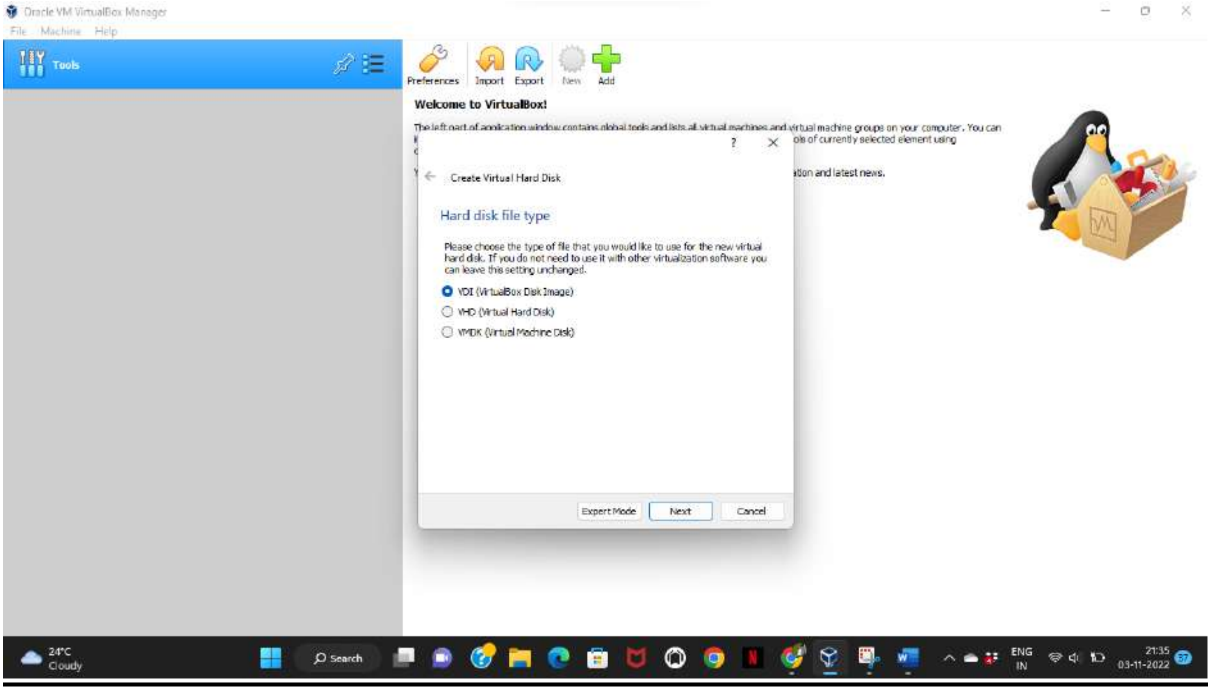
If you wish you can add a virtual hard disk to the new machine. You can either create a new hard disk file or select one from the list or from another location using the folder icon.

If you need a more complex storage set-up you can skip this step and make the changes to the machine settings once the machine is created.

The recommended size of the hard disk is **10.00 GB.**

○ Do not add a virtual hard disk
● Create a virtual hard disk now
○ Use an existing virtual hard disk file

Empty



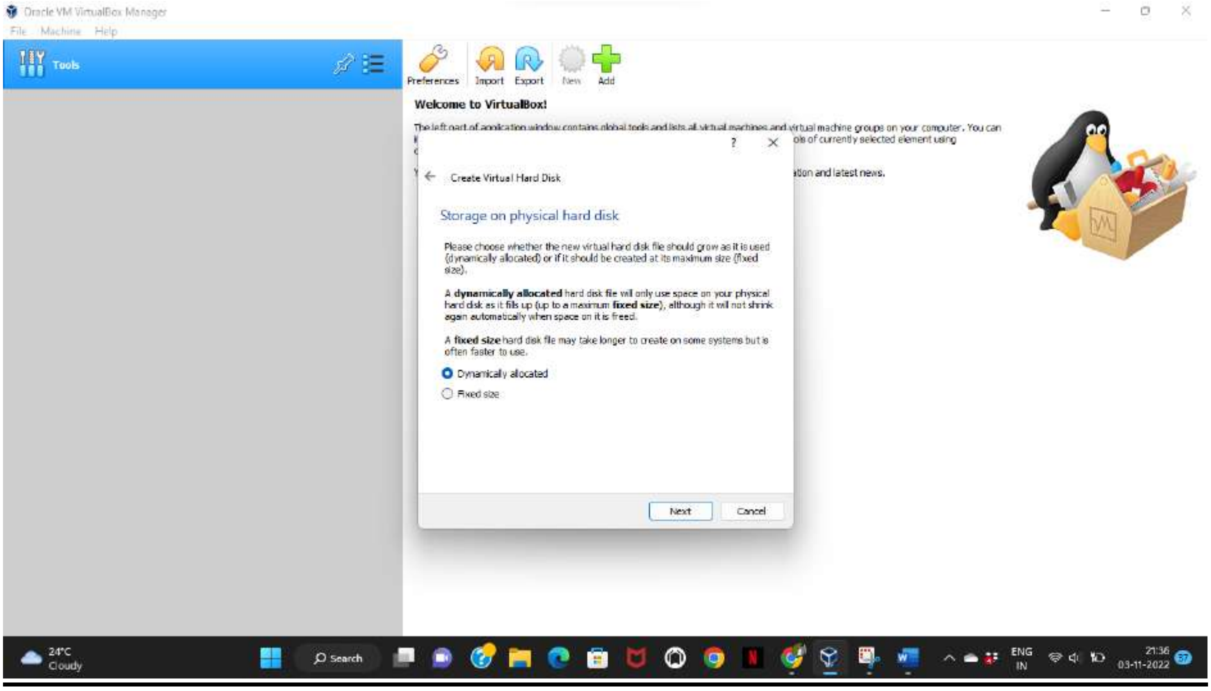
Welcome to VirtualBox!

Create Virtual Hard Disk

Hard disk file type

Please choose the type of file that you would like to use for the new virtual hard disk. If you do not need to use it with other virtualization software you can leave this setting unchanged.

● VDI (VirtualBox Disk Image)
○ VHD (Virtual Hard Disk)
○ VMDK (Virtual Machine Disk)



Welcome to VirtualBox!

Create Virtual Hard Disk

Storage on physical hard disk

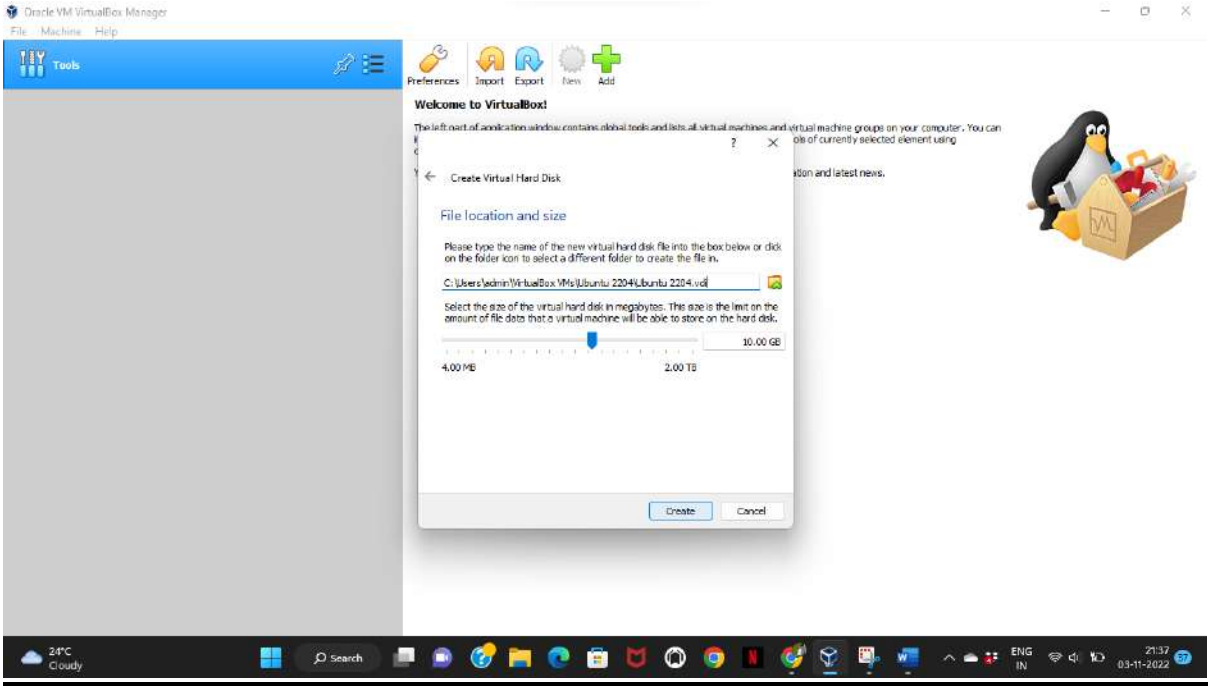
Please choose whether the new virtual hard disk file should grow as it is used (dynamically allocated) or if it should be created at its maximum size (fixed size).

A **dynamically allocated** hard disk file will only use space on your physical hard disk as it fills up (up to a maximum **fixed size**), although it will not shrink again automatically when space on it is freed.

A **fixed size** hard disk file may take longer to create on some systems but is often faster to use.

● Dynamically allocated

○ Fixed size



Welcome to VirtualBox!

Create Virtual Hard Disk

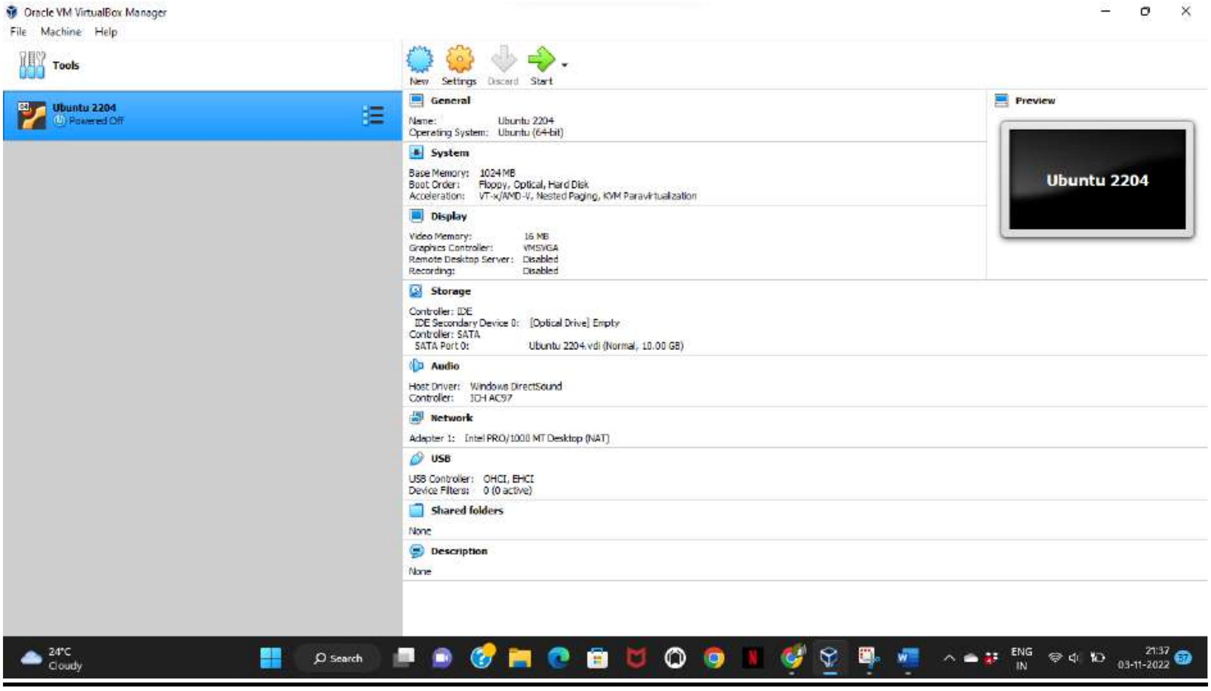
File location and size

Please type the name of the new virtual hard disk file into the box below or click on the folder icon to select a different folder to create the file in.

C:\Users\admin\VirtualBox VMs\Ubuntu 2204\Ubuntu 2204.vdi

Select the size of the virtual hard disk in megabytes. This size is the limit on the amount of file data that a virtual machine will be able to store on the hard disk.

10.00 GB



Oracle VM VirtualBox Manager

File Machine Help

Tools

Ubuntu 2204
Powered Off

General

Name: Ubuntu 2204
Operating System: Ubuntu (64-bit)

System

Base Memory: 1024 MB
Boot Order: Floppy, Optical, Hard Disk
Acceleration: VT-x/AMD-V, Nested Paging, KVM Paravirtualization

Display

Video Memory: 16 MB
Graphics Controller: VMSVGA
Remote Desktop Server: Disabled
Recording: Disabled

Storage

Controller: IDE
IDE Secondary Device 0: [Optical Drive] Empty
Controller: SATA
SATA Port 0: Ubuntu 2204.vdi (Normal, 10.00 GB)

Audio

Host Driver: Windows DirectSound
Controller: ICH AC97

Network

Adapter 1: Intel PRO/1000 MT Desktop (NAT)

USB

USB Controller: OHCI, EHCI
Device Filters: 0 (0 active)

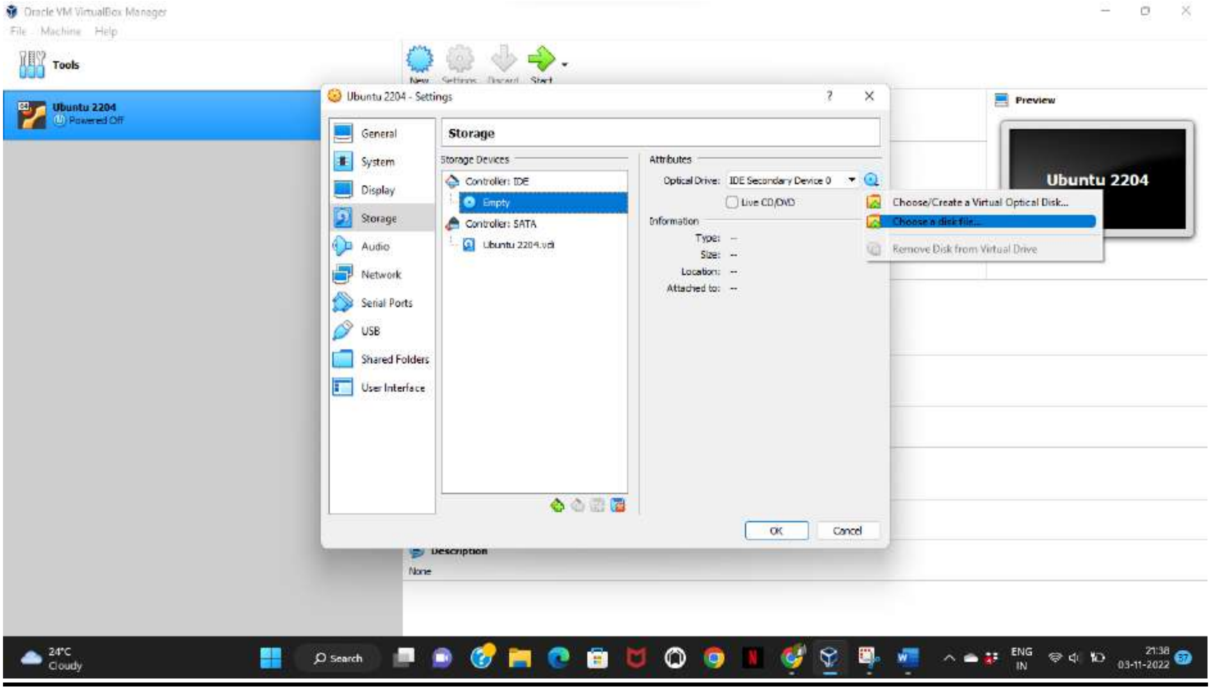
Shared folders

None

Description

None

STEP 2:CHOOSING THE DISK FILE



Ubuntu 2204 - Settings

Storage

Storage Devices

Controller: IDE
Empty
Controller: SATA
Ubuntu 2204.vdi

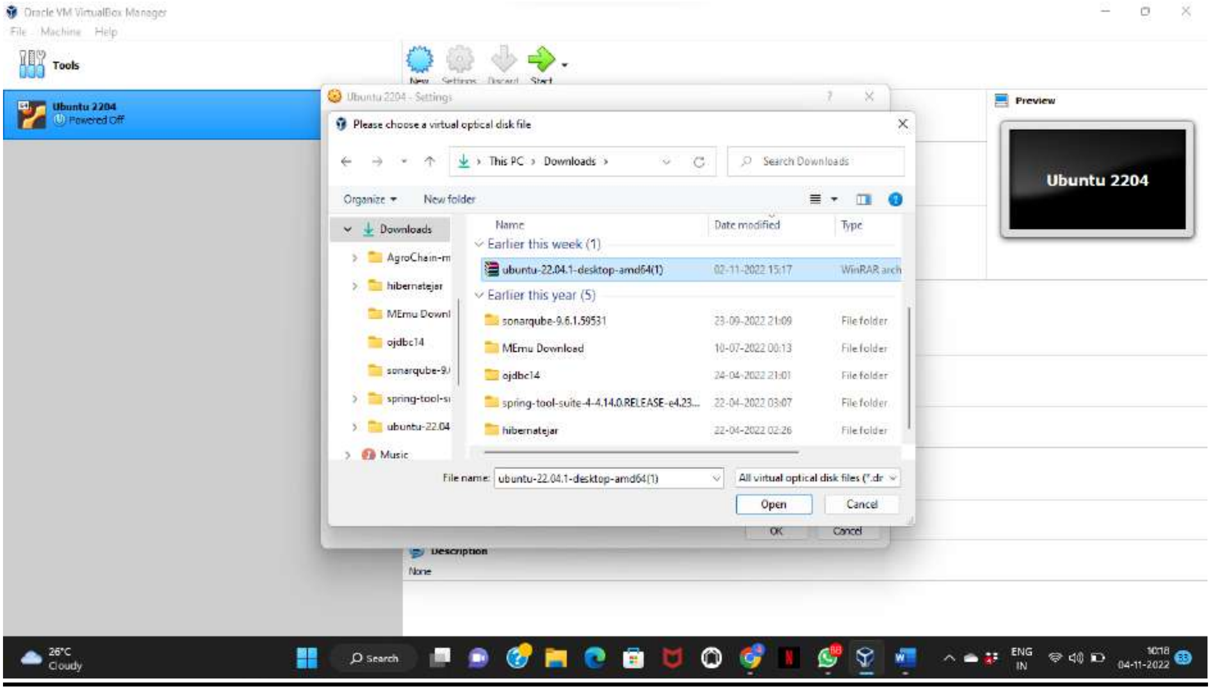
Attributes

Optical Drive: IDE Secondary Device 0

□ Live CD/DVD

Information

Type: --
Size: --
Location: --
Attached to: --



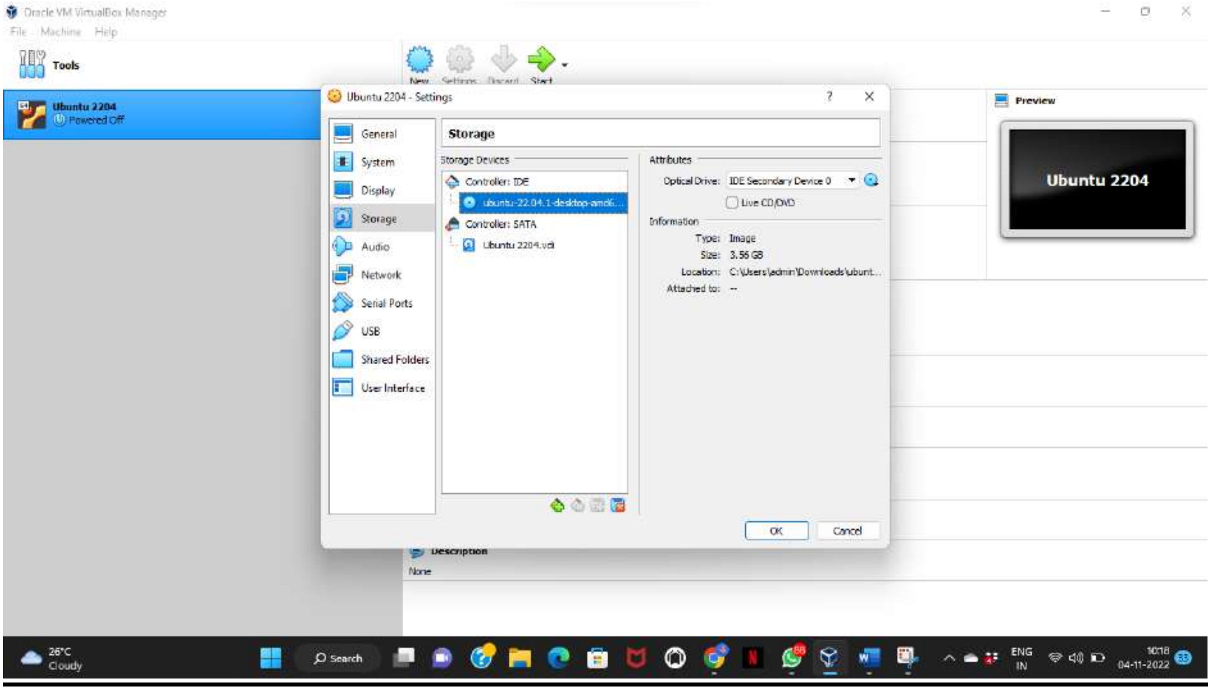
Please choose a virtual optical disk file

Name	Date modified	Type
Earlier this week (1)		
ubuntu-22.04.1-desktop-amd64(1)	02-11-2022 15:17	WinRAR arch
Earlier this year (5)		
sonarqube-9.6.1.59531	23-09-2022 21:09	File folder
MEmu Download	10-07-2022 00:13	File folder
ojdbc14	24-04-2022 21:01	File folder
spring-tool-suite-4-4.14.0.RELEASE-e4.23...	22-04-2022 03:07	File folder
hibernatejar	22-04-2022 02:26	File folder

File name: ubuntu-22.04.1-desktop-amd64(1)

All virtual optical disk files (*.dr

Open Cancel



Storage

Storage Devices
- Controller: IDE
  - ubuntu-22.04.1-desktop-amd6...
- Controller: SATA
  - Ubuntu 2204.vdi

Attributes

Optical Drive: IDE Secondary Device 0

□ Live CD/DVD

Information

Type: Image

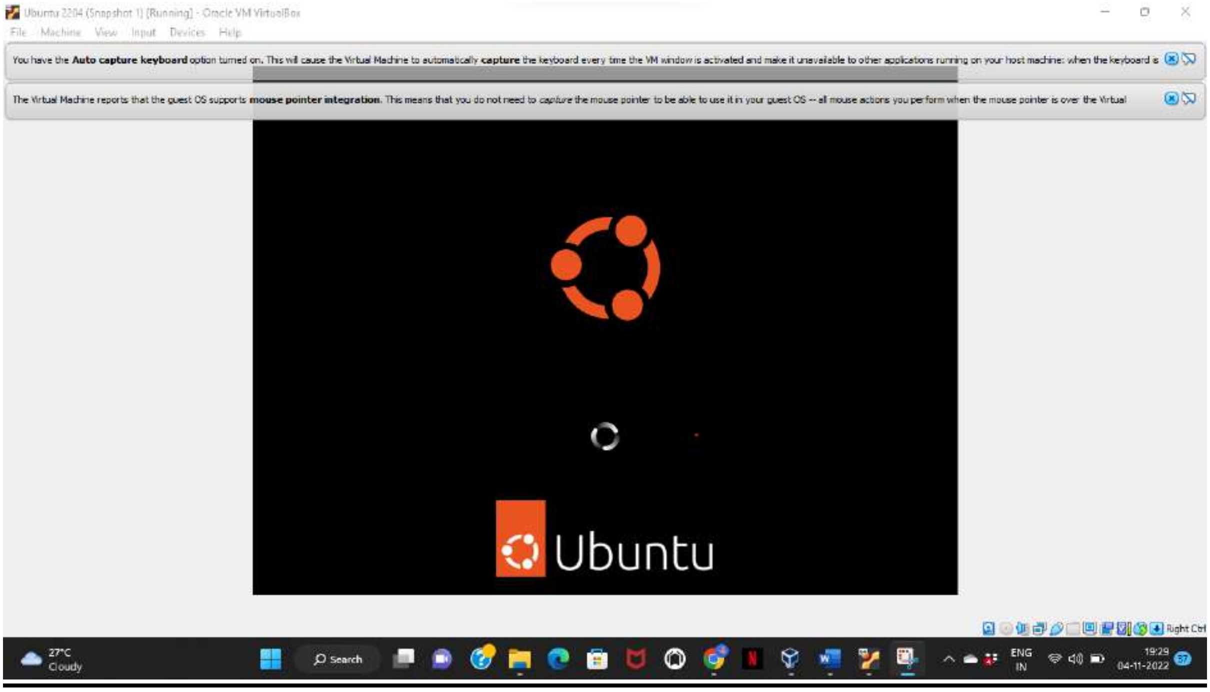
Size: 3.56 GB

Location: C:\Users\admin\Downloads\ubunt...

Attached to: --

OK Cancel

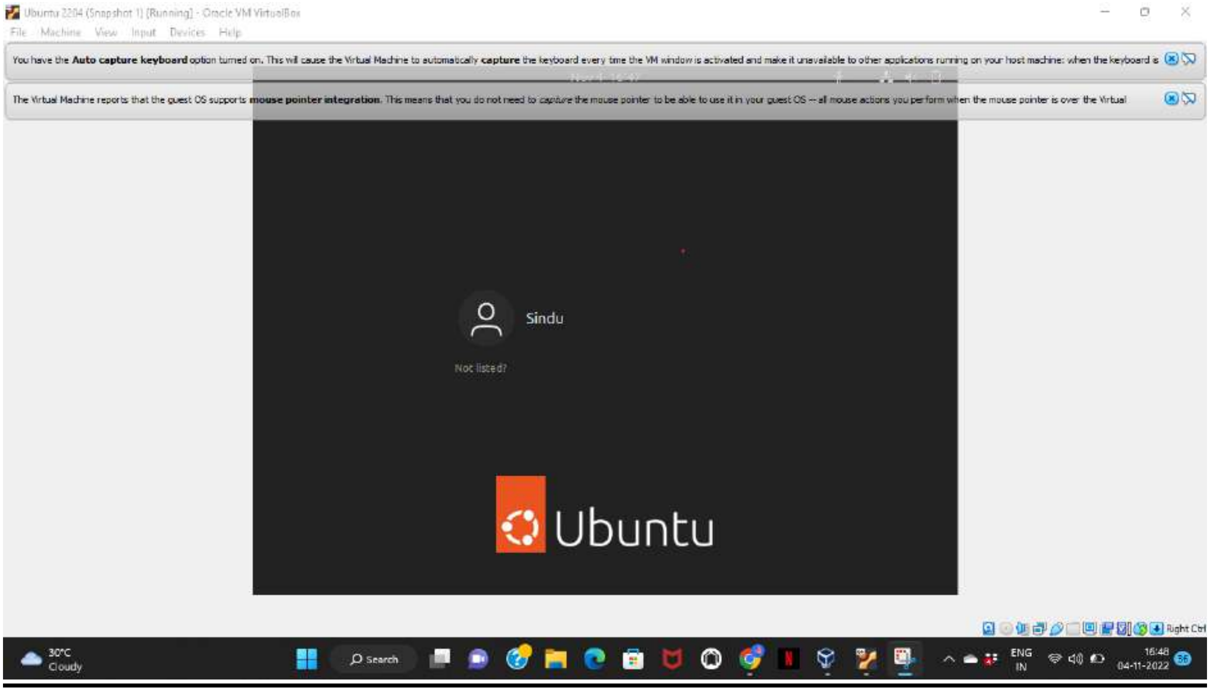
STEP 4:INSTALLING UBUNTU AND STARTING



You have the **Auto capture keyboard** option turned on. This will cause the Virtual Machine to automatically **capture** the keyboard every time the VM window is activated and make it unavailable to other applications running on your host machine: when the keyboard is

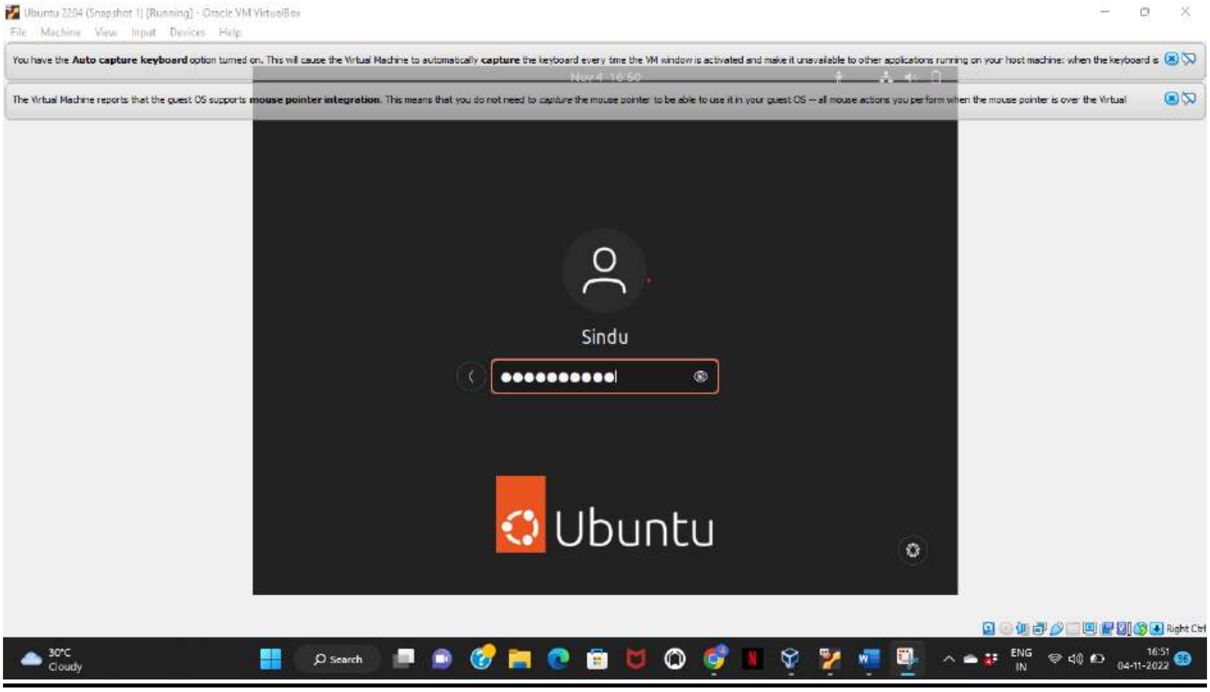
The Virtual Machine reports that the guest OS supports **mouse pointer integration.** This means that you do not need to capture the mouse pointer to be able to use it in your guest OS -- all mouse actions you perform when the mouse pointer is over the Virtual

STEP 5:LOGGING IN INTO UBUNTU



You have the **Auto capture keyboard** option turned on. This will cause the Virtual Machine to automatically **capture** the keyboard every time the VM window is activated and make it unavailable to other applications running on your host machine: when the keyboard is

The Virtual Machine reports that the guest OS supports **mouse pointer integration.** This means that you do not need to capture the mouse pointer to be able to use it in your guest OS -- all mouse actions you perform when the mouse pointer is over the Virtual

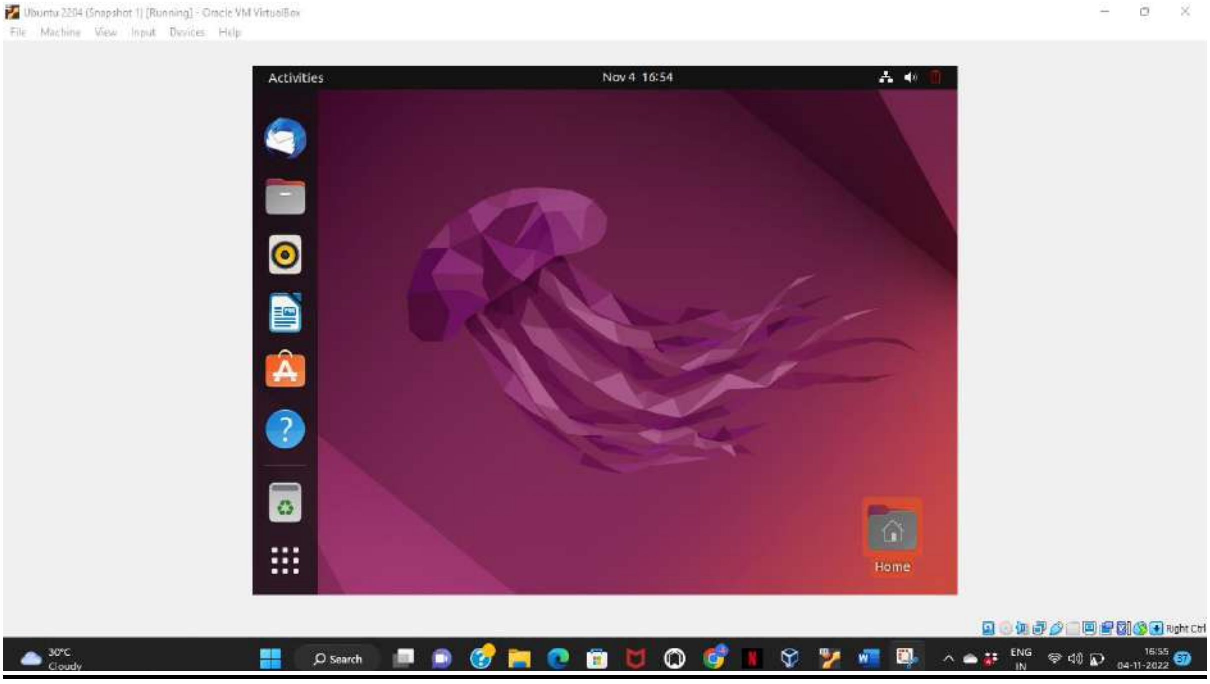


Ubuntu 2204 (Snapshot 1) [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help

You have the **Auto capture keyboard** option turned on. This will cause the Virtual Machine to automatically **capture** the keyboard every time the VM window is activated and make it unavailable to other applications running on your host machine: when the keyboard is

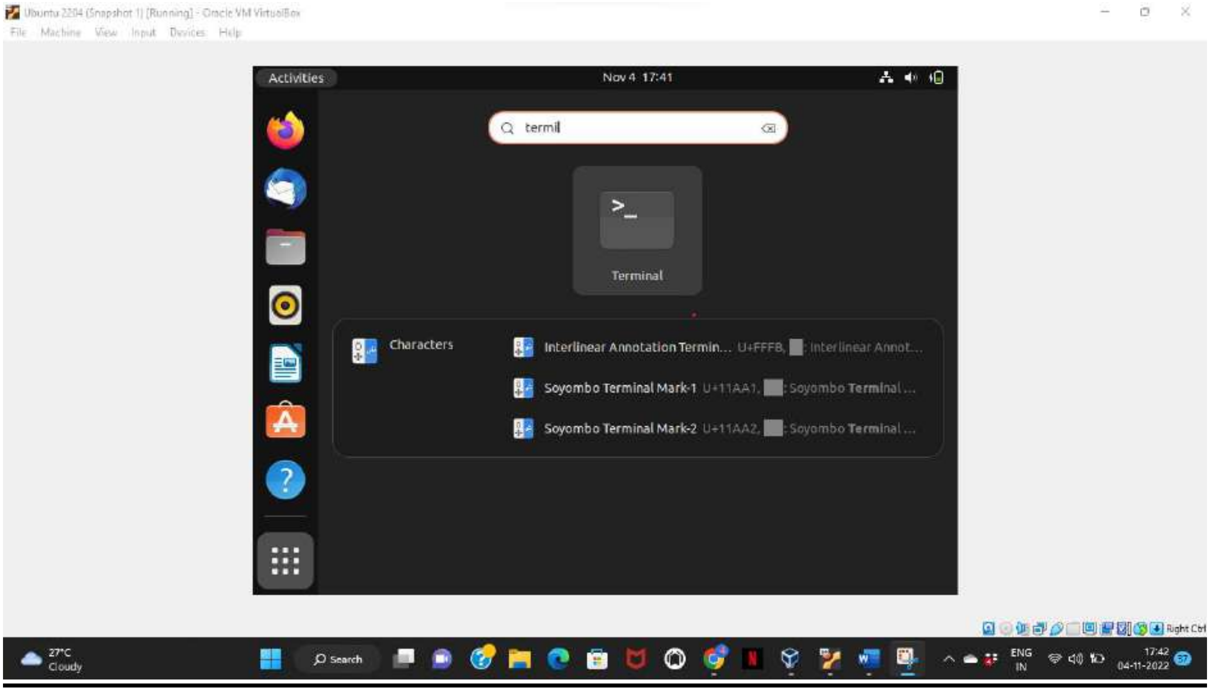
The Virtual Machine reports that the guest OS supports **mouse pointer integration**. This means that you do not need to *capture* the mouse pointer to be able to use it in your guest OS -- all mouse actions you perform when the mouse pointer is over the Virtual

STEP 6:SUCCESSFULLY LOGGED IN

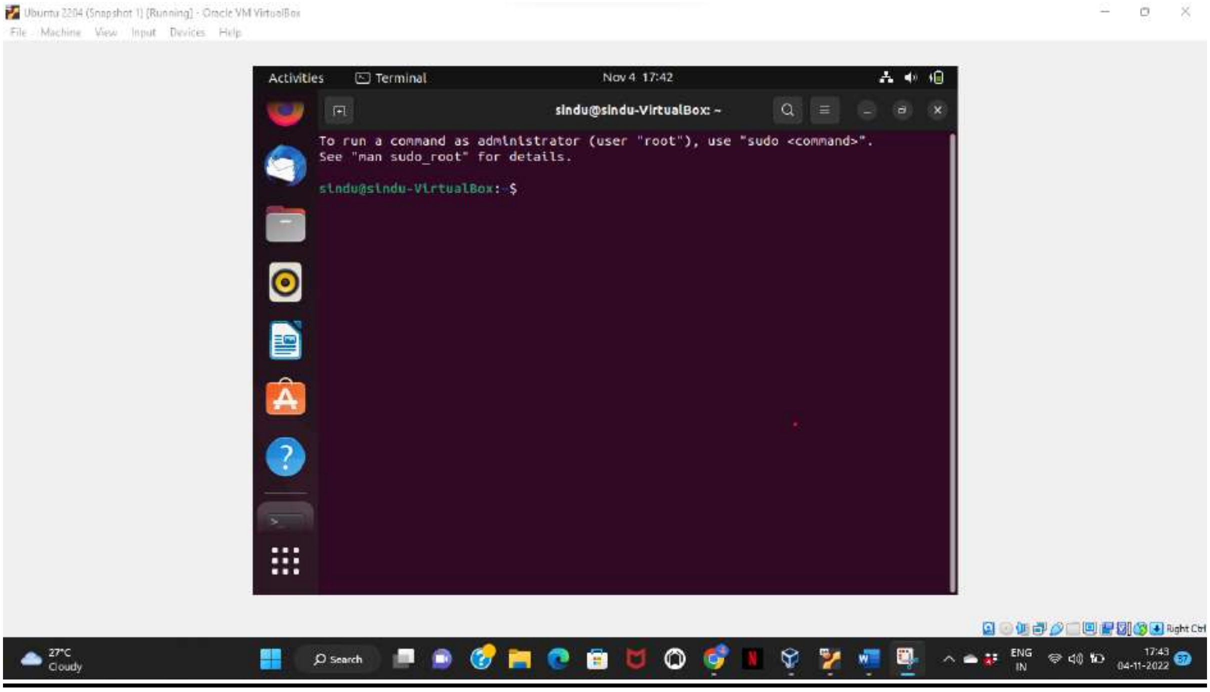


Ubuntu 2204 (Snapshot 1) [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Activities
Nov 4 16:54
Home
Right Ctrl
30°C
Cloudy
Search
ENG
IN
16:55
04-11-2022

STEP 7:OPENING TERMINAL

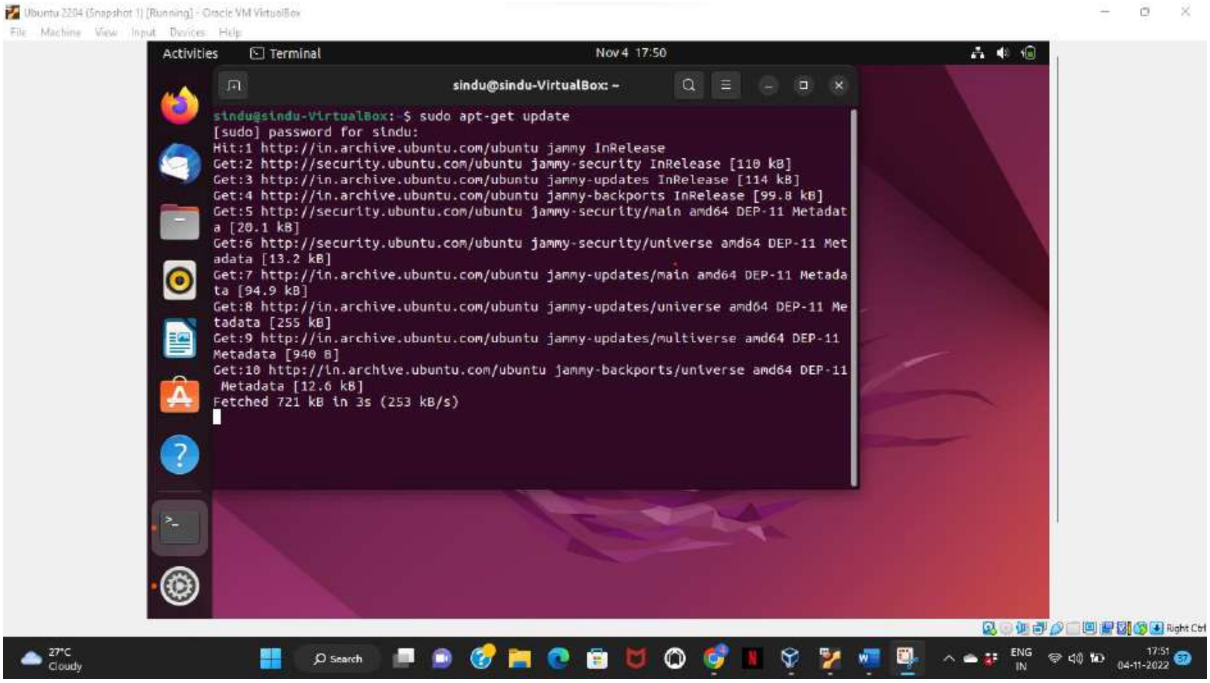

Ubuntu 22.04 (Snapshot 1) [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Activities
Nov 4 17:41
termil
Terminal
Characters
Interlinear Annotation Termin... U+FFFB, : Interlinear Annot...
Soyombo Terminal Mark-1 U+11AA1, : Soyombo Terminal...
Soyombo Terminal Mark-2 U+11AA2, : Soyombo Terminal...
Right Ctrl
27°C
Cloudy
Search
ENG
IN
17:42
04-11-2022

STEP 8:TERMINAL IS OPENED


Ubuntu 22.04 (Snapshot 1) [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Activities
Terminal
Nov 4 17:42
sindu@sindu-VirtualBox: ~
Right Ctrl
27°C
Cloudy
Search
ENG
IN
17:43
04-11-2022

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

sindu@sindu-VirtualBox:~$
```

STEP 9:UPDATING THE SYSTEM USING COMMAND:sudo apt-get update

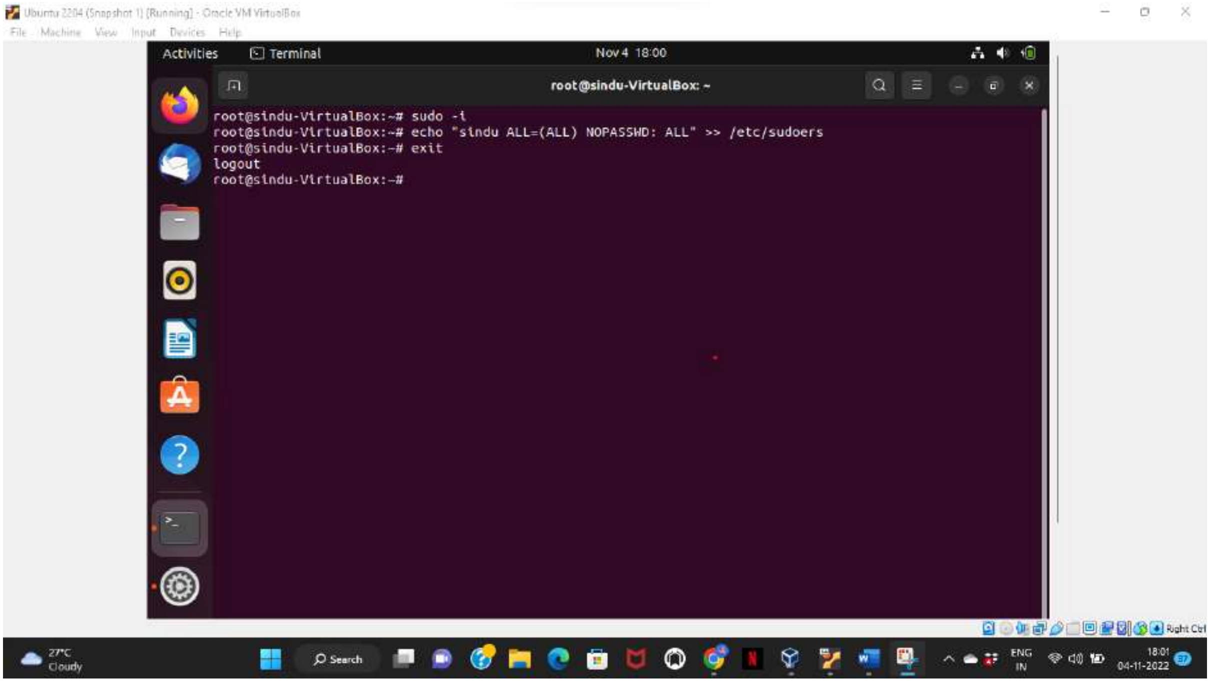

Ubuntu 2204 (Snapshot 1) [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Activities
Terminal
Nov 4 17:50
sindu@sindu-VirtualBox: ~
27°C
Cloudy
Search
ENG
IN
17:51
04-11-2022
Right Ctrl

```
sindu@sindu-VirtualBox:~$ sudo apt-get update
[sudo] password for sindu:
Hit:1 http://in.archive.ubuntu.com/ubuntu jammy InRelease
Get:2 http://security.ubuntu.com/ubuntu jammy-security InRelease [110 kB]
Get:3 http://in.archive.ubuntu.com/ubuntu jammy-updates InRelease [114 kB]
Get:4 http://in.archive.ubuntu.com/ubuntu jammy-backports InRelease [99.8 kB]
Get:5 http://security.ubuntu.com/ubuntu jammy-security/main amd64 DEP-11 Metadat
a [20.1 kB]
Get:6 http://security.ubuntu.com/ubuntu jammy-security/universe amd64 DEP-11 Met
adata [13.2 kB]
Get:7 http://in.archive.ubuntu.com/ubuntu jammy-updates/main amd64 DEP-11 Metada
ta [94.9 kB]
Get:8 http://in.archive.ubuntu.com/ubuntu jammy-updates/universe amd64 DEP-11 Me
tadata [255 kB]
Get:9 http://in.archive.ubuntu.com/ubuntu jammy-updates/multiverse amd64 DEP-11
Metadata [940 B]
Get:10 http://in.archive.ubuntu.com/ubuntu jammy-backports/universe amd64 DEP-11
 Metadata [12.6 kB]
Fetched 721 kB in 3s (253 kB/s)
```

STEP 10:ASSIGNED SUDO PRIVILEDGED AND INSTALLED GIT USING THE COMMANDS:

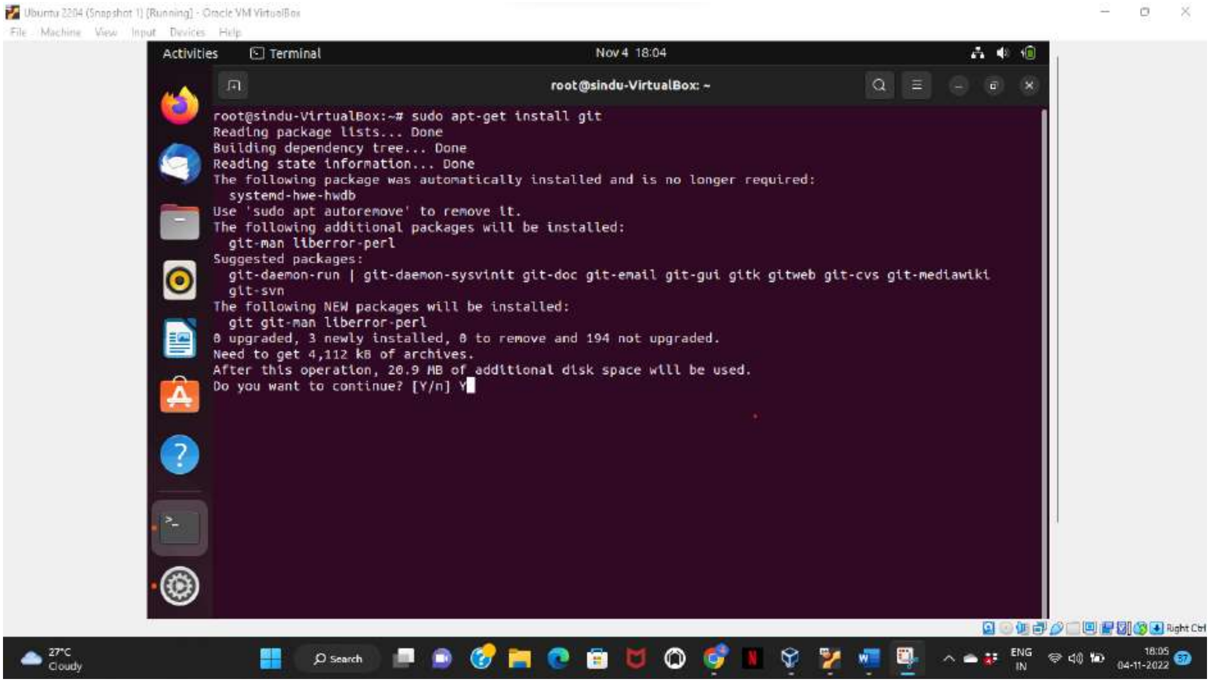
sudo -l

echo ‘sindu ALL=(ALL) NOPASSWD: ALL” >> /etc/sudoers

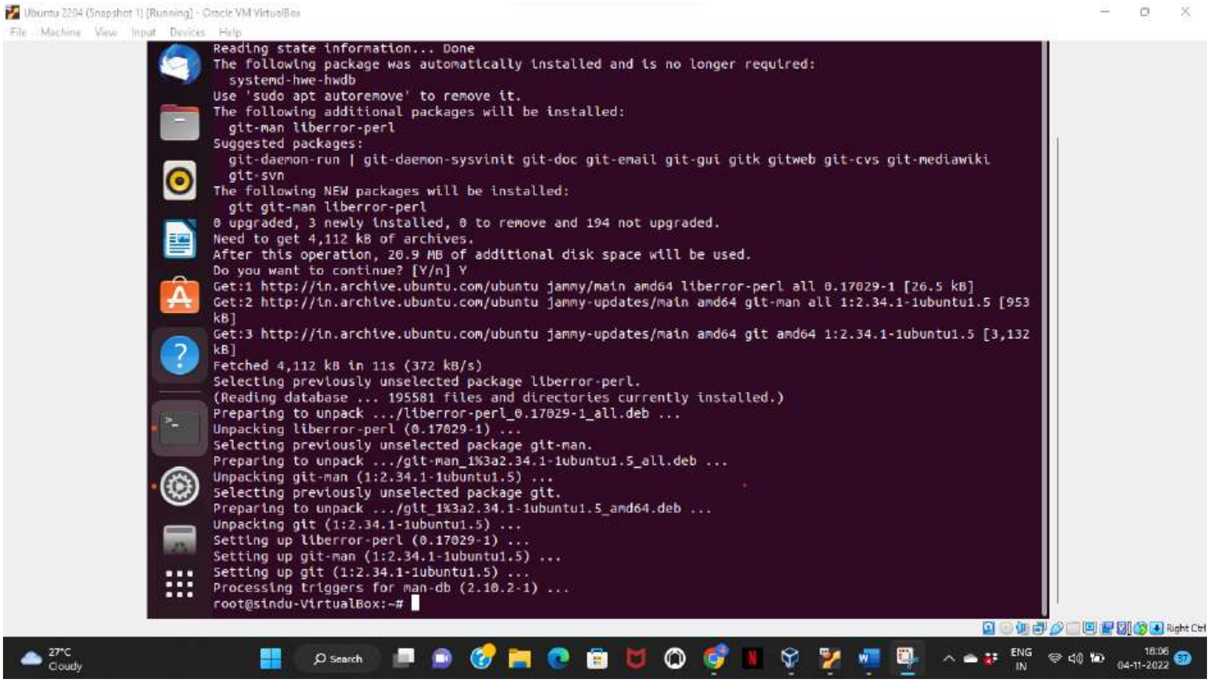


```
root@sindu-VirtualBox:~# sudo -i
root@sindu-VirtualBox:~# echo "sindu ALL=(ALL) NOPASSWD: ALL" >> /etc/sudoers
root@sindu-VirtualBox:~# exit
logout
root@sindu-VirtualBox:~#
```

STEP 11:INSTALLING GIT USING THE COMMAND:sudo apt-get install git

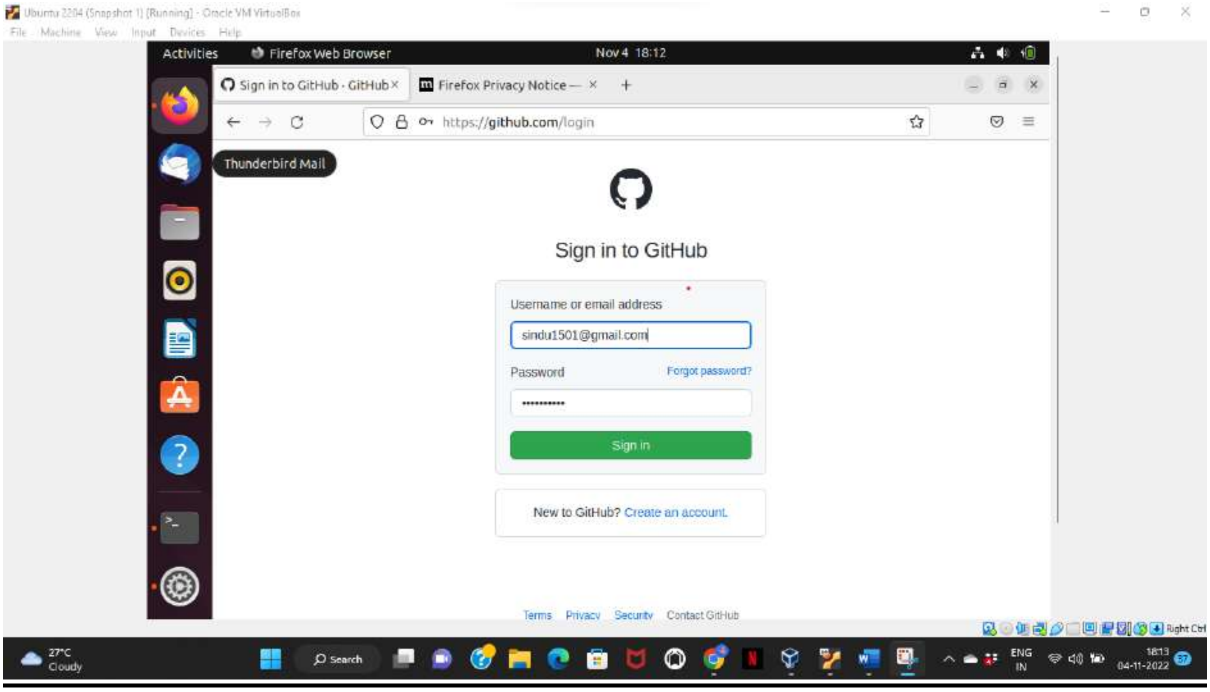


```
root@sindu-VirtualBox:~# sudo apt-get install git
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following package was automatically installed and is no longer required:
  systemd-hwe-hwdb
Use 'sudo apt autoremove' to remove it.
The following additional packages will be installed:
  git-man liberror-perl
Suggested packages:
  git-daemon-run | git-daemon-sysvinit git-doc git-email git-gui gitk gitweb git-cvs git-mediawiki
  git-svn
The following NEW packages will be installed:
  git git-man liberror-perl
0 upgraded, 3 newly installed, 0 to remove and 194 not upgraded.
Need to get 4,112 kB of archives.
After this operation, 20.9 MB of additional disk space will be used.
Do you want to continue? [Y/n] Y
```


Ubuntu 2204 (Snapshot 1) [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
27°C Cloudy
Search
ENG IN
18:06 04-11-2022
Right Ctrl

```
Reading state information... Done
The following package was automatically installed and is no longer required:
  systemd-hwe-hwdb
Use 'sudo apt autoremove' to remove it.
The following additional packages will be installed:
  git-man liberror-perl
Suggested packages:
  git-daemon-run | git-daemon-sysvinit git-doc git-email git-gui gitk gitweb git-cvs git-mediawiki
  git-svn
The following NEW packages will be installed:
  git git-man liberror-perl
0 upgraded, 3 newly installed, 0 to remove and 194 not upgraded.
Need to get 4,112 kB of archives.
After this operation, 20.9 MB of additional disk space will be used.
Do you want to continue? [Y/n] Y
Get:1 http://in.archive.ubuntu.com/ubuntu jammy/main amd64 liberror-perl all 0.17029-1 [26.5 kB]
Get:2 http://in.archive.ubuntu.com/ubuntu jammy-updates/main amd64 git-man all 1:2.34.1-1ubuntu1.5 [953
kB]
Get:3 http://in.archive.ubuntu.com/ubuntu jammy-updates/main amd64 git amd64 1:2.34.1-1ubuntu1.5 [3,132
kB]
Fetched 4,112 kB in 11s (372 kB/s)
Selecting previously unselected package liberror-perl.
(Reading database ... 195581 files and directories currently installed.)
Preparing to unpack .../liberror-perl_0.17029-1_all.deb ...
Unpacking liberror-perl (0.17029-1) ...
Selecting previously unselected package git-man.
Preparing to unpack .../git-man_1%3a2.34.1-1ubuntu1.5_all.deb ...
Unpacking git-man (1:2.34.1-1ubuntu1.5) ...
Selecting previously unselected package git.
Preparing to unpack .../git_1%3a2.34.1-1ubuntu1.5_amd64.deb ...
Unpacking git (1:2.34.1-1ubuntu1.5) ...
Setting up liberror-perl (0.17029-1) ...
Setting up git-man (1:2.34.1-1ubuntu1.5) ...
Setting up git (1:2.34.1-1ubuntu1.5) ...
Processing triggers for man-db (2.10.2-1) ...
root@sindu-VirtualBox:~#
```

STEP 12:SIGNING INTO GITHUB



Sign in to GitHub

Username or email address

sindu1501@gmail.com

Password

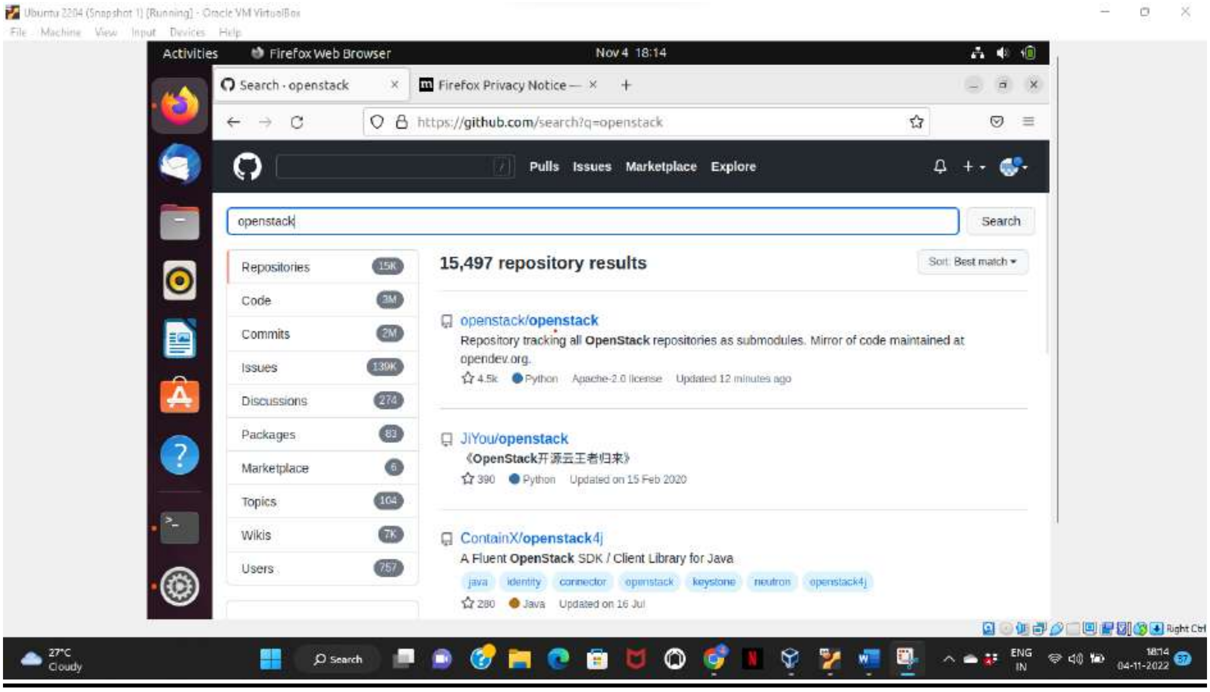
Forgot password?

••••••••••

Sign in

New to GitHub? Create an account.

Ubuntu 2204 (Snapshot 1) [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Activities
Firefox Web Browser
Nov 4 18:12
Sign in to GitHub · GitHub
Firefox Privacy Notice —
https://github.com/login
Thunderbird Mail
Terms Privacy Security Contact GitHub
Right Ctrl
27°C Cloudy
Search
ENG IN
18:13 04-11-2022



openstack

15,497 repository results

Repositories	15K
Code	3M
Commits	2M
Issues	139K
Discussions	274
Packages	83
Marketplace	6
Topics	104
Wikis	7K
Users	757

openstack/openstack

Repository tracking all OpenStack repositories as submodules. Mirror of code maintained at opendev.org.

☆ 4.5k ● Python Apache-2.0 license Updated 12 minutes ago

JiYou/openstack

《OpenStack开源云王者归来》

☆ 390 ● Python Updated on 15 Feb 2020

ContainX/openstack4j

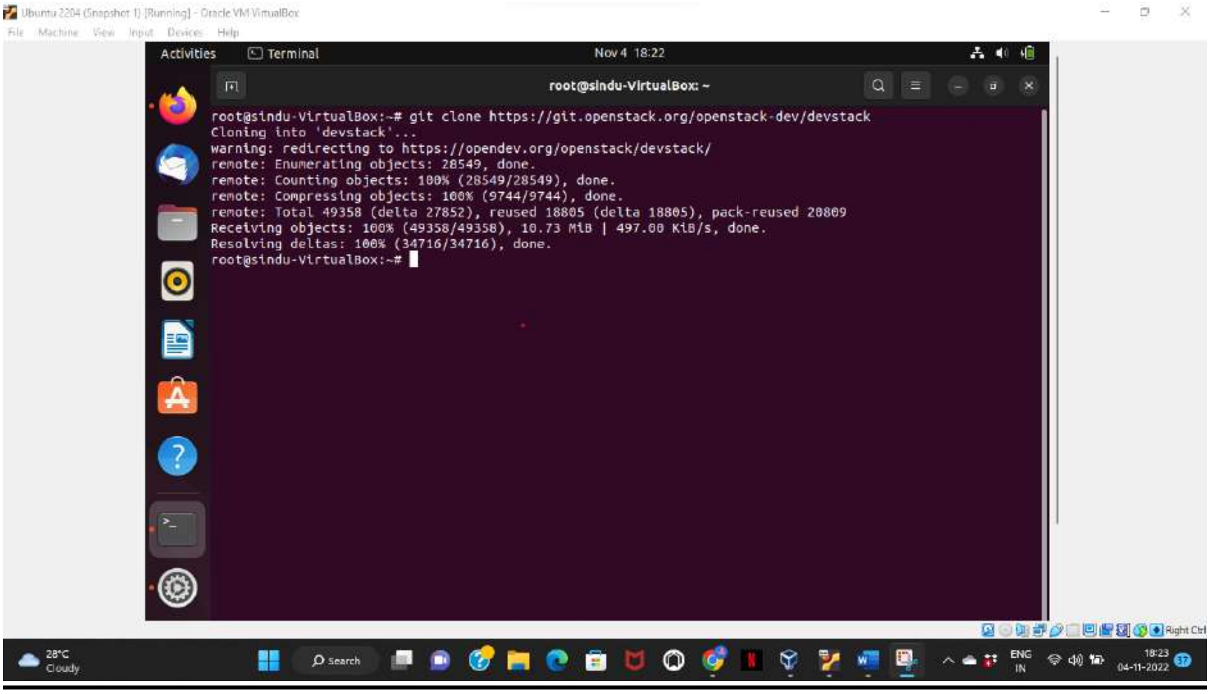
A Fluent OpenStack SDK / Client Library for Java

java identity connector openstack keystone neutron openstack4j

☆ 280 ● Java Updated on 16 Jul

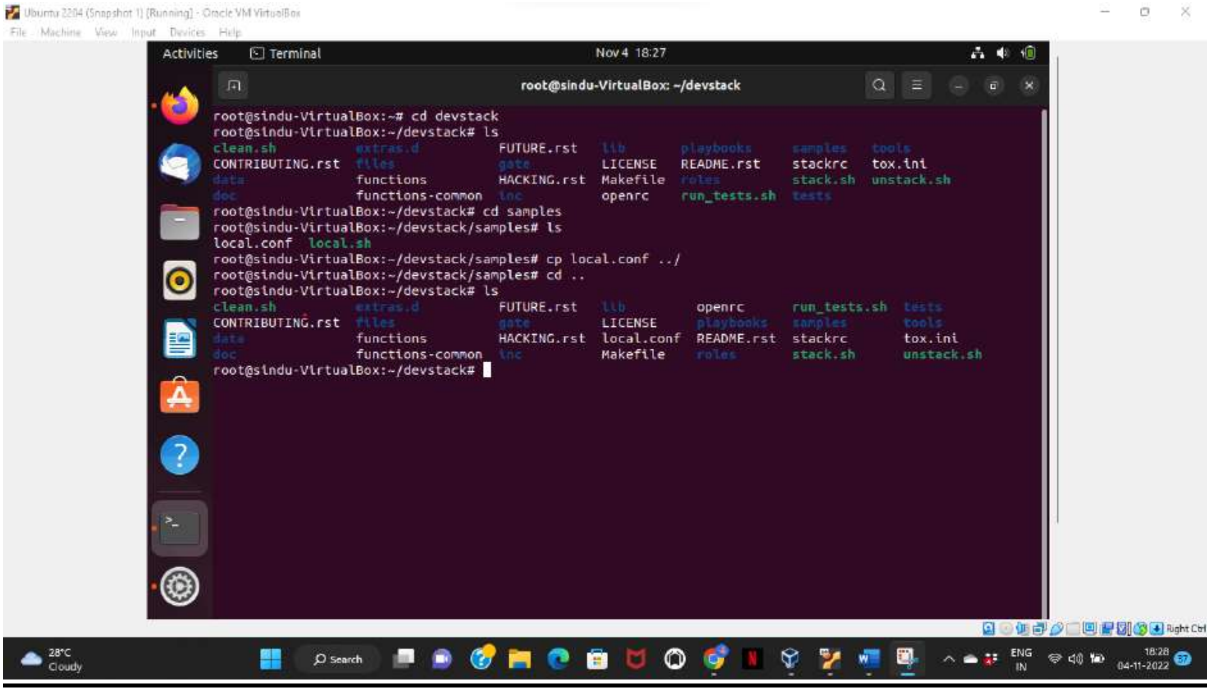
Ubuntu 2204 (Snapshot 1) [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Activities
Firefox Web Browser
Nov 4 18:14
Search · openstack
Firefox Privacy Notice —
https://github.com/search?q=openstack
Pulls Issues Marketplace Explore
Search
Sort: Best match
Right Ctrl
27°C Cloudy
Search
ENG IN
18:14 04-11-2022

STEP 13:CLONING THE OPENSTACK USING THE COMMAND:git clone https://git.openstack.org/openstack-dev/devstack



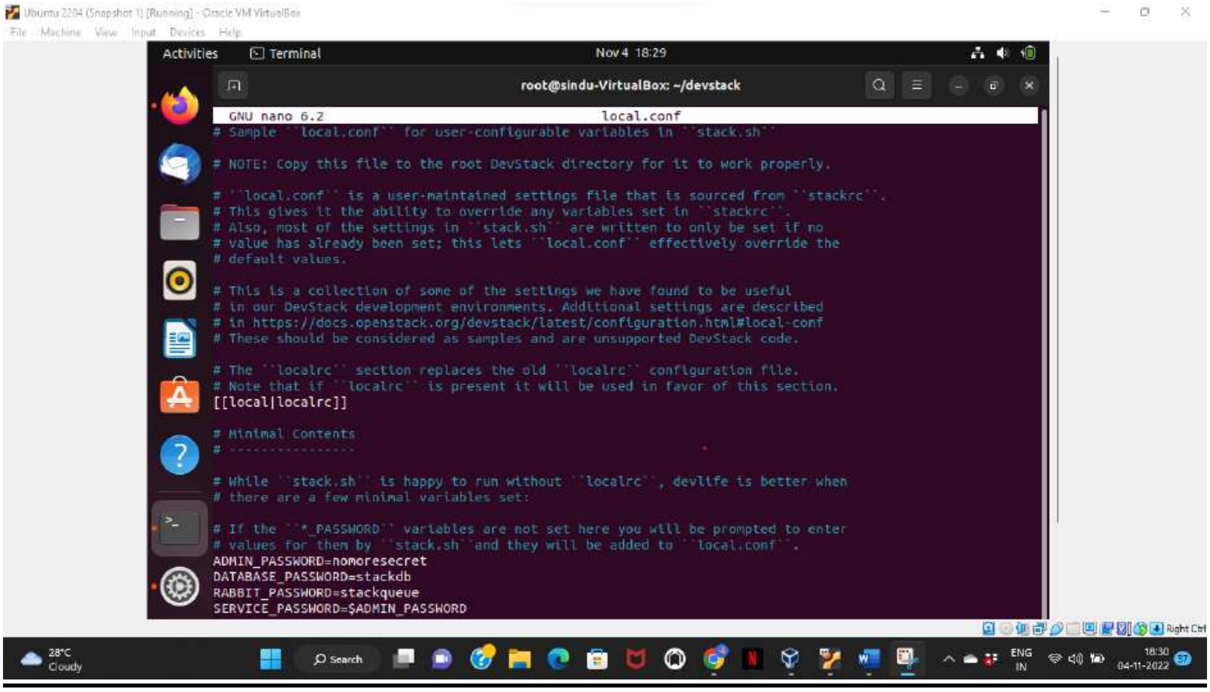
```
root@sindu-VirtualBox:~# git clone https://git.openstack.org/openstack-dev/devstack
Cloning into 'devstack'...
warning: redirecting to https://opendev.org/openstack/devstack/
remote: Enumerating objects: 28549, done.
remote: Counting objects: 100% (28549/28549), done.
remote: Compressing objects: 100% (9744/9744), done.
remote: Total 49358 (delta 27852), reused 18805 (delta 18805), pack-reused 20809
Receiving objects: 100% (49358/49358), 10.73 MiB | 497.00 KiB/s, done.
Resolving deltas: 100% (34716/34716), done.
root@sindu-VirtualBox:~#
```

STEP 14:DEVSTACK CONFIGURATION FILE IS CREATED,LISTED AND DIRECTORY IS CHANGED TO SAMPLES AND LISTED LOCAL.CONF FILE IS CREATED



```
root@sindu-VirtualBox:~# cd devstack
root@sindu-VirtualBox:~/devstack# ls
clean.sh         extras.d          FUTURE.rst  lib       playbooks     samples   tools
CONTRIBUTING.rst files             gate        LICENSE   README.rst    stackrc   tox.ini
data             functions         HACKING.rst Makefile  roles         stack.sh  unstack.sh
doc              functions-common  inc         openrc    run_tests.sh  tests
root@sindu-VirtualBox:~/devstack# cd samples
root@sindu-VirtualBox:~/devstack/samples# ls
local.conf  local.sh
root@sindu-VirtualBox:~/devstack/samples# cp local.conf ../
root@sindu-VirtualBox:~/devstack/samples# cd ..
root@sindu-VirtualBox:~/devstack# ls
clean.sh         extras.d          FUTURE.rst  lib         openrc      run_tests.sh  tests
CONTRIBUTING.rst files             gate        LICENSE     playbooks   samples       tools
data             functions         HACKING.rst local.conf  README.rst  stackrc       tox.ini
doc              functions-common  inc         Makefile    roles       stack.sh      unstack.sh
root@sindu-VirtualBox:~/devstack#
```

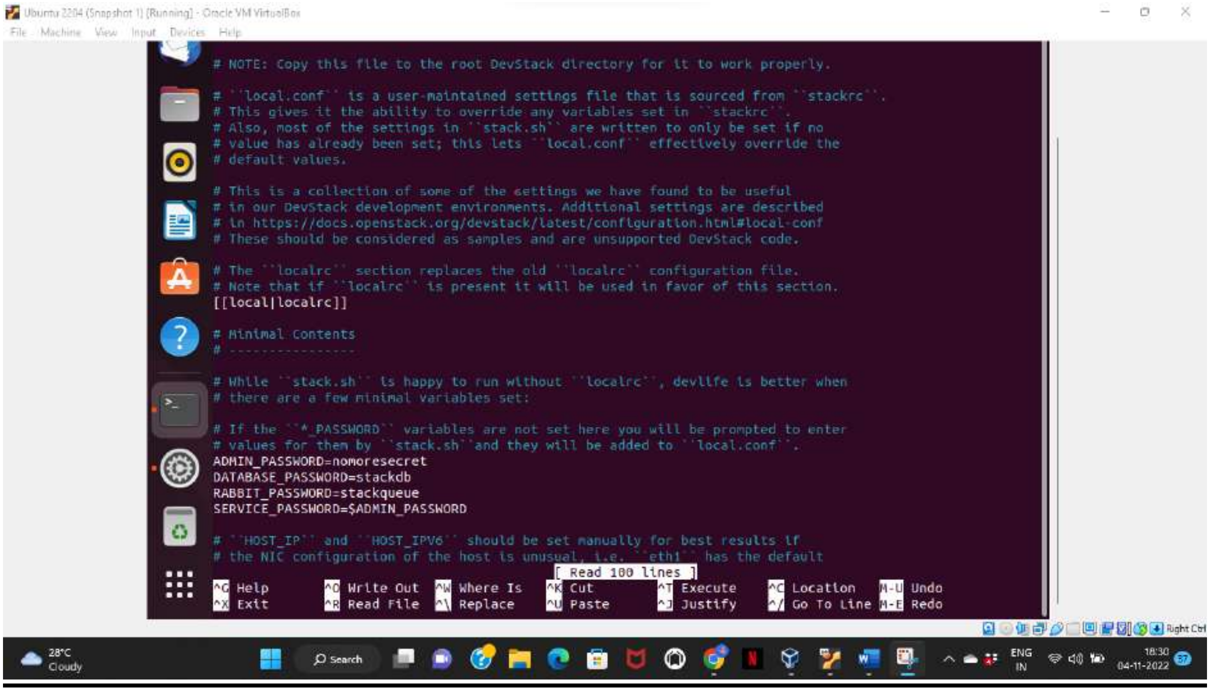
STEP 15:THE LOCAL.CONF FILE IS OPENED



Ubuntu 2204 (Snapshot 1) [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Activities
Terminal
Nov 4 18:29
root@sindu-VirtualBox: ~/devstack
28°C
Cloudy
Search
ENG
IN
18:30
04-11-2022

```
  GNU nano 6.2                                      local.conf
# Sample ``local.conf`` for user-configurable variables in ``stack.sh``

# NOTE: Copy this file to the root DevStack directory for it to work properly.

# ``local.conf`` is a user-maintained settings file that is sourced from ``stackrc``.
# This gives it the ability to override any variables set in ``stackrc``.
# Also, most of the settings in ``stack.sh`` are written to only be set if no
# value has already been set; this lets ``local.conf`` effectively override the
# default values.

# This is a collection of some of the settings we have found to be useful
# in our DevStack development environments. Additional settings are described
# in https://docs.openstack.org/devstack/latest/configuration.html#local-conf
# These should be considered as samples and are unsupported DevStack code.

# The ``localrc`` section replaces the old ``localrc`` configuration file.
# Note that if ``localrc`` is present it will be used in favor of this section.
[[local|localrc]]

# Minimal Contents
# ----------------

# While ``stack.sh`` is happy to run without ``localrc``, devlife is better when
# there are a few minimal variables set:

# If the ``*_PASSWORD`` variables are not set here you will be prompted to enter
# values for them by ``stack.sh``and they will be added to ``local.conf``.
ADMIN_PASSWORD=nomoresecret
DATABASE_PASSWORD=stackdb
RABBIT_PASSWORD=stackqueue
SERVICE_PASSWORD=$ADMIN_PASSWORD
```

STEP 16:LOOKING FOR ADMIN PASSWORD

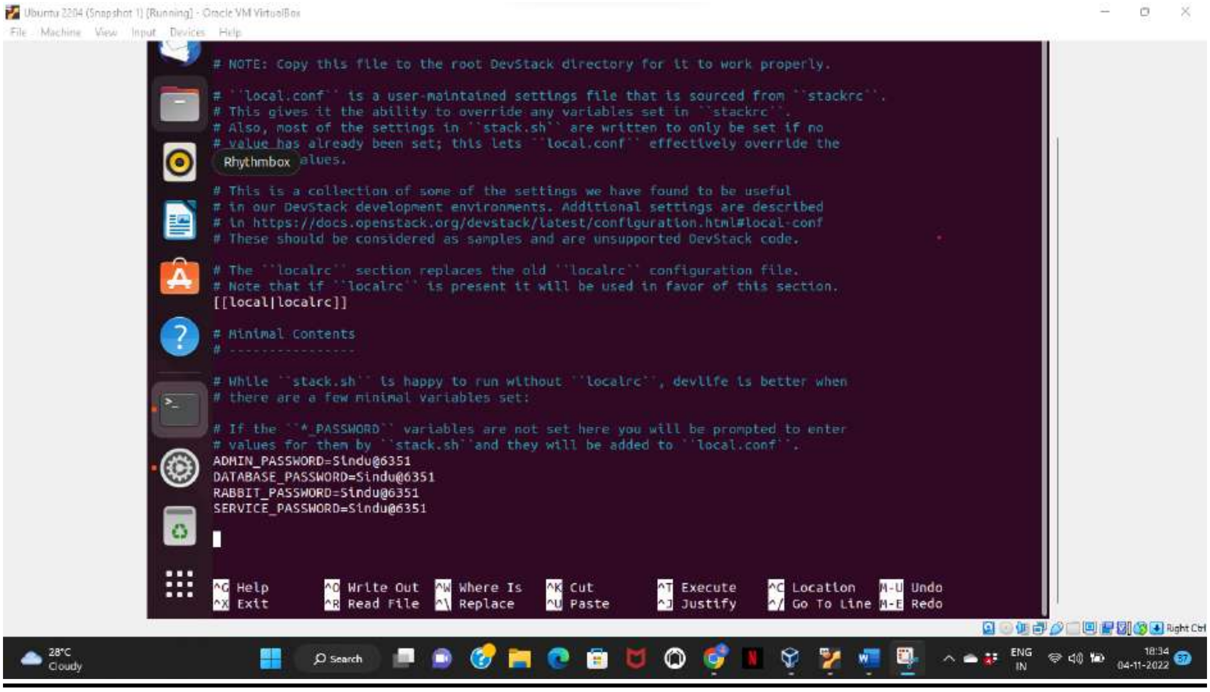


Ubuntu 2204 (Snapshot 1) [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
28°C
Cloudy
Search
ENG
IN
18:30
04-11-2022

```
# NOTE: Copy this file to the root DevStack directory for it to work properly.

# ``local.conf`` is a user-maintained settings file that is sourced from ``stackrc``.
# This gives it the ability to override any variables set in ``stackrc``.
# Also, most of the settings in ``stack.sh`` are written to only be set if no
# value has already been set; this lets ``local.conf`` effectively override the
# default values.

# This is a collection of some of the settings we have found to be useful
# in our DevStack development environments. Additional settings are described
# in https://docs.openstack.org/devstack/latest/configuration.html#local-conf
# These should be considered as samples and are unsupported DevStack code.

# The ``localrc`` section replaces the old ``localrc`` configuration file.
# Note that if ``localrc`` is present it will be used in favor of this section.
[[local|localrc]]

# Minimal Contents
# ----------------

# While ``stack.sh`` is happy to run without ``localrc``, devlife is better when
# there are a few minimal variables set:

# If the ``*_PASSWORD`` variables are not set here you will be prompted to enter
# values for them by ``stack.sh``and they will be added to ``local.conf``.
ADMIN_PASSWORD=nomoresecret
DATABASE_PASSWORD=stackdb
RABBIT_PASSWORD=stackqueue
SERVICE_PASSWORD=$ADMIN_PASSWORD

# ``HOST_IP`` and ``HOST_IPV6`` should be set manually for best results if
# the NIC configuration of the host is unusual, i.e. ``eth1`` has the default
                                       [ Read 100 lines ]
^G Help         ^O Write Out   ^W Where Is    ^K Cut          ^T Execute     ^C Location    M-U Undo
^X Exit         ^R Read File   ^\ Replace     ^U Paste        ^J Justify     ^/ Go To Line  M-E Redo
```

STEP 17:CHANGING THE ADMIN PASSWORD

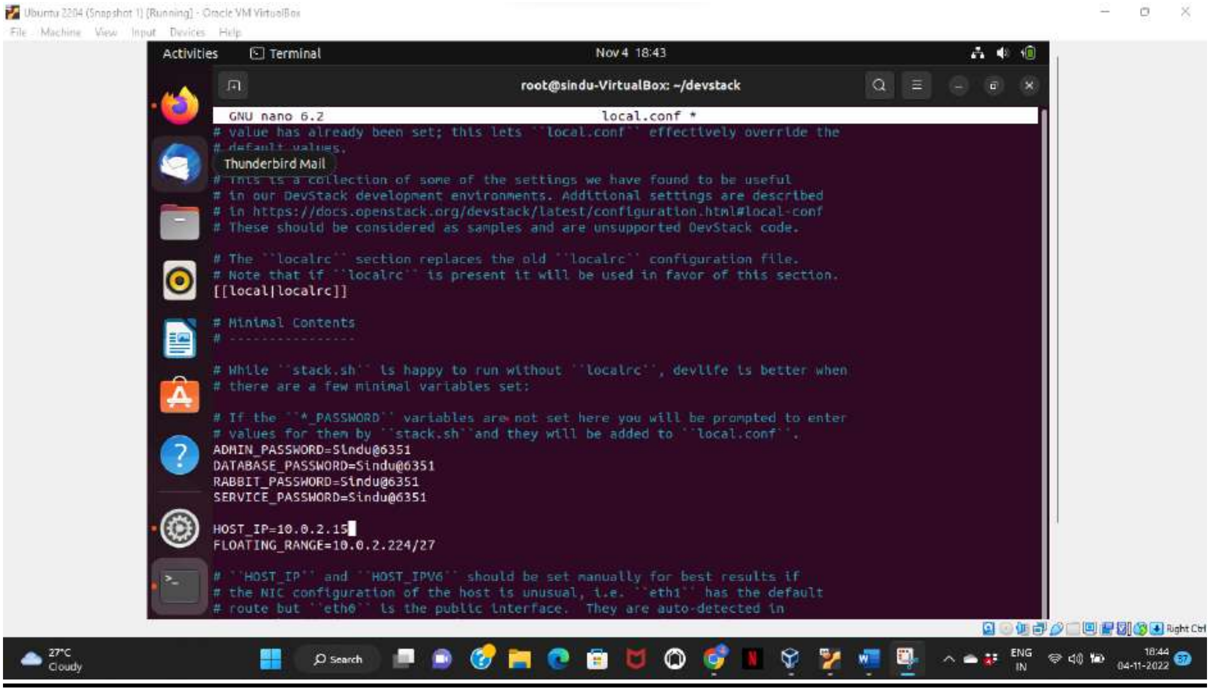
THIS PASSWORD WILL BE USED TO LOG IN TO THE OPEN STACK LOGIN PAGE


Ubuntu 2204 (Snapshot 1) [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Rhythmbox
28°C
Cloudy
Search
ENG
IN
18:34
04-11-2022
Right Ctrl

```
# NOTE: Copy this file to the root DevStack directory for it to work properly.

# ``local.conf`` is a user-maintained settings file that is sourced from ``stackrc``.
# This gives it the ability to override any variables set in ``stackrc``.
# Also, most of the settings in ``stack.sh`` are written to only be set if no
# value has already been set; this lets ``local.conf`` effectively override the
#          alues.

# This is a collection of some of the settings we have found to be useful
# in our DevStack development environments. Additional settings are described
# in https://docs.openstack.org/devstack/latest/configuration.html#local-conf
# These should be considered as samples and are unsupported DevStack code.

# The ``localrc`` section replaces the old ``localrc`` configuration file.
# Note that if ``localrc`` is present it will be used in favor of this section.
[[local|localrc]]

# Minimal Contents
# ----------------

# While ``stack.sh`` is happy to run without ``localrc``, devlife is better when
# there are a few minimal variables set:

# If the ``*_PASSWORD`` variables are not set here you will be prompted to enter
# values for them by ``stack.sh``and they will be added to ``local.conf``.
ADMIN_PASSWORD=Sindu@6351
DATABASE_PASSWORD=Sindu@6351
RABBIT_PASSWORD=Sindu@6351
SERVICE_PASSWORD=Sindu@6351



^G Help       ^O Write Out  ^W Where Is   ^K Cut        ^T Execute    ^C Location   M-U Undo
^X Exit       ^R Read File  ^\ Replace    ^U Paste      ^J Justify    ^/ Go To Line M-E Redo
```

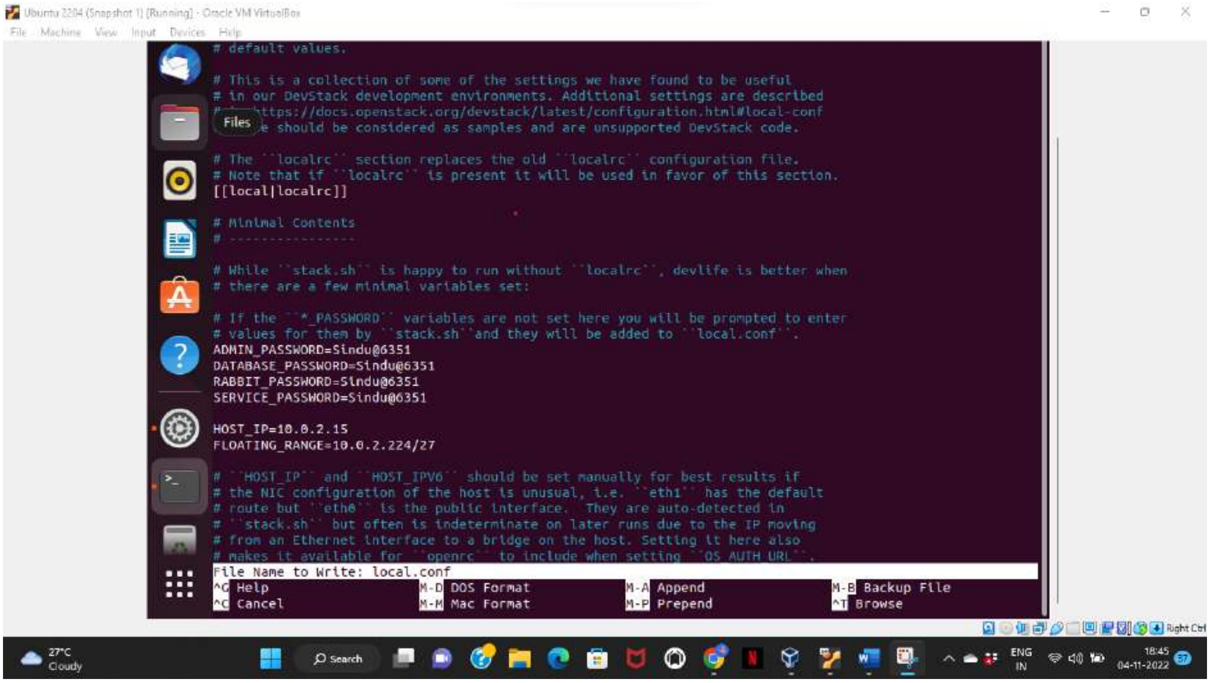
STEP 18:GIVING THE HOST IP(OUR SYSTEM IP) AND FLOATING_RANGE

THE HOST-IP IS MY SYSTEM'S IP ADDRESS THAT IS OBTAINED BY RUNNING ifconfig or ipaddress COMMANDS


Ubuntu 2204 (Snapshot 1) [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Activities
Terminal
Nov 4 18:43
root@sindu-VirtualBox: ~/devstack
Thunderbird Mail
27°C
Cloudy
Search
ENG
IN
18:44
04-11-2022
Right Ctrl

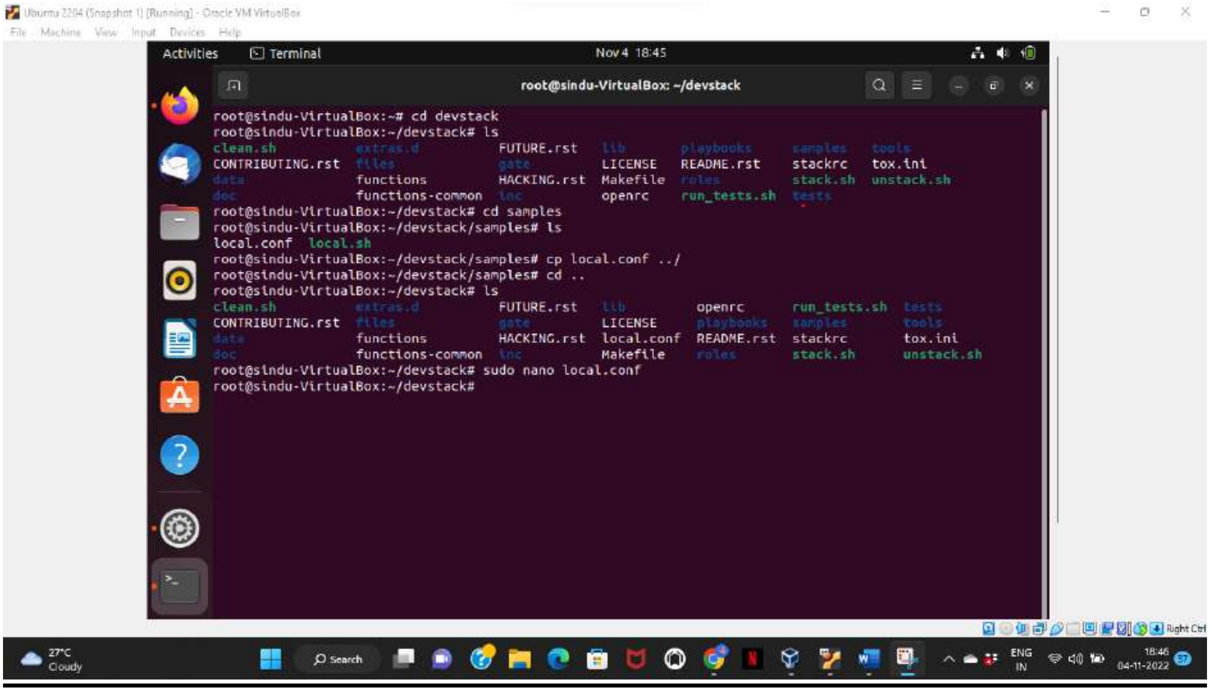
```
  GNU nano 6.2                         local.conf *
# value has already been set; this lets ``local.conf`` effectively override the
# default values.
# This is a collection of some of the settings we have found to be useful
# in our DevStack development environments. Additional settings are described
# in https://docs.openstack.org/devstack/latest/configuration.html#local-conf
# These should be considered as samples and are unsupported DevStack code.

# The ``localrc`` section replaces the old ``localrc`` configuration file.
# Note that if ``localrc`` is present it will be used in favor of this section.
[[local|localrc]]

# Minimal Contents
# ----------------

# While ``stack.sh`` is happy to run without ``localrc``, devlife is better when
# there are a few minimal variables set:

# If the ``*_PASSWORD`` variables are not set here you will be prompted to enter
# values for them by ``stack.sh``and they will be added to ``local.conf``.
ADMIN_PASSWORD=Sindu@6351
DATABASE_PASSWORD=Sindu@6351
RABBIT_PASSWORD=Sindu@6351
SERVICE_PASSWORD=Sindu@6351

HOST_IP=10.0.2.15
FLOATING_RANGE=10.0.2.224/27

# ``HOST_IP`` and ``HOST_IPV6`` should be set manually for best results if
# the NIC configuration of the host is unusual, i.e. ``eth1`` has the default
# route but ``eth0`` is the public interface.  They are auto-detected in
```

STEP 19:SAVE THE CHANGES TO THE LOCAL.CONF FILEUSING THE COMMAND CONTROL+X


Ubuntu 2204 (Snapshot 1) [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Files
Right Ctrl
27°C Cloudy
Search
ENG IN
18:45 04-11-2022

```
# default values.

# This is a collection of some of the settings we have found to be useful
# in our DevStack development environments. Additional settings are described
# in https://docs.openstack.org/devstack/latest/configuration.html#local-conf
# These should be considered as samples and are unsupported DevStack code.

# The ``localrc`` section replaces the old ``localrc`` configuration file.
# Note that if ``localrc`` is present it will be used in favor of this section.
[[local|localrc]]

# Minimal Contents
# ----------------

# While ``stack.sh`` is happy to run without ``localrc``, devlife is better when
# there are a few minimal variables set:

# If the ``*_PASSWORD`` variables are not set here you will be prompted to enter
# values for them by ``stack.sh``and they will be added to ``local.conf``.
ADMIN_PASSWORD=Sindu@6351
DATABASE_PASSWORD=Sindu@6351
RABBIT_PASSWORD=Sindu@6351
SERVICE_PASSWORD=Sindu@6351

HOST_IP=10.0.2.15
FLOATING_RANGE=10.0.2.224/27

# ``HOST_IP`` and ``HOST_IPV6`` should be set manually for best results if
# the NIC configuration of the host is unusual, i.e. ``eth1`` has the default
# route but ``eth0`` is the public interface.  They are auto-detected in
# ``stack.sh`` but often is indeterminate on later runs due to the IP moving
# from an Ethernet interface to a bridge on the host. Setting it here also
# makes it available for ``openrc`` to include when setting ``OS_AUTH_URL``.
File Name to Write: local.conf
^G Help              M-D DOS Format        M-A Append            M-B Backup File
^C Cancel            M-M Mac Format        M-P Prepend           ^T Browse
```

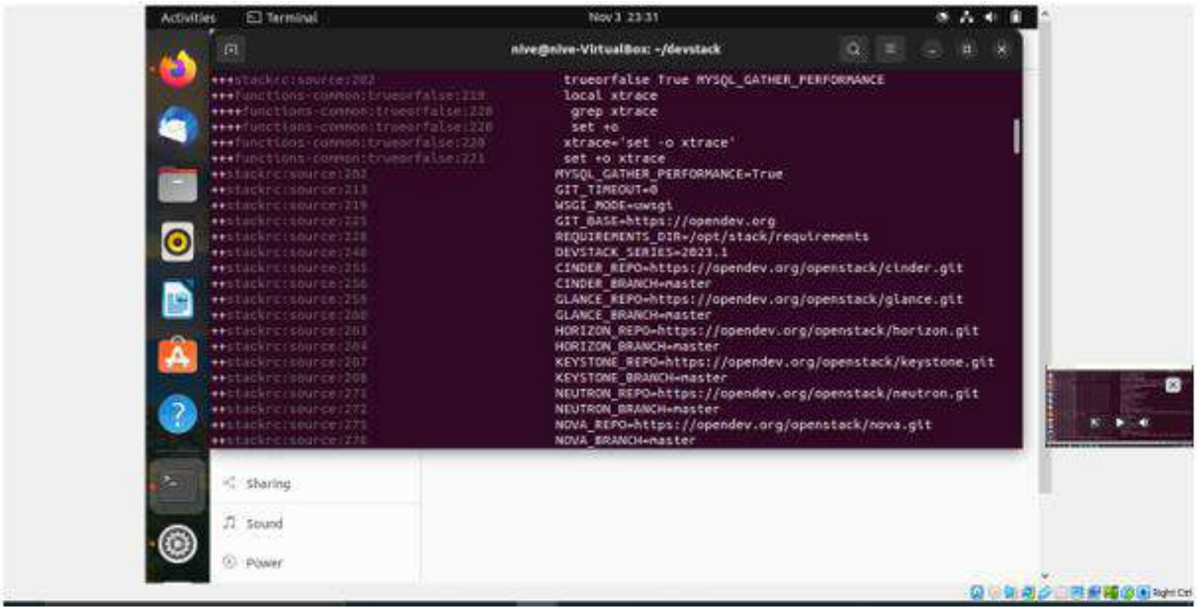
STEP 20:VIEWING THE SAVED FILE


Ubuntu 2204 (Snapshot 1) [Running] - Oracle VM VirtualBox
File Machine View Input Devices Help
Activities
Terminal
Nov 4 18:45
root@sindu-VirtualBox: ~/devstack
Right Ctrl
27°C Cloudy
Search
ENG IN
18:46 04-11-2022

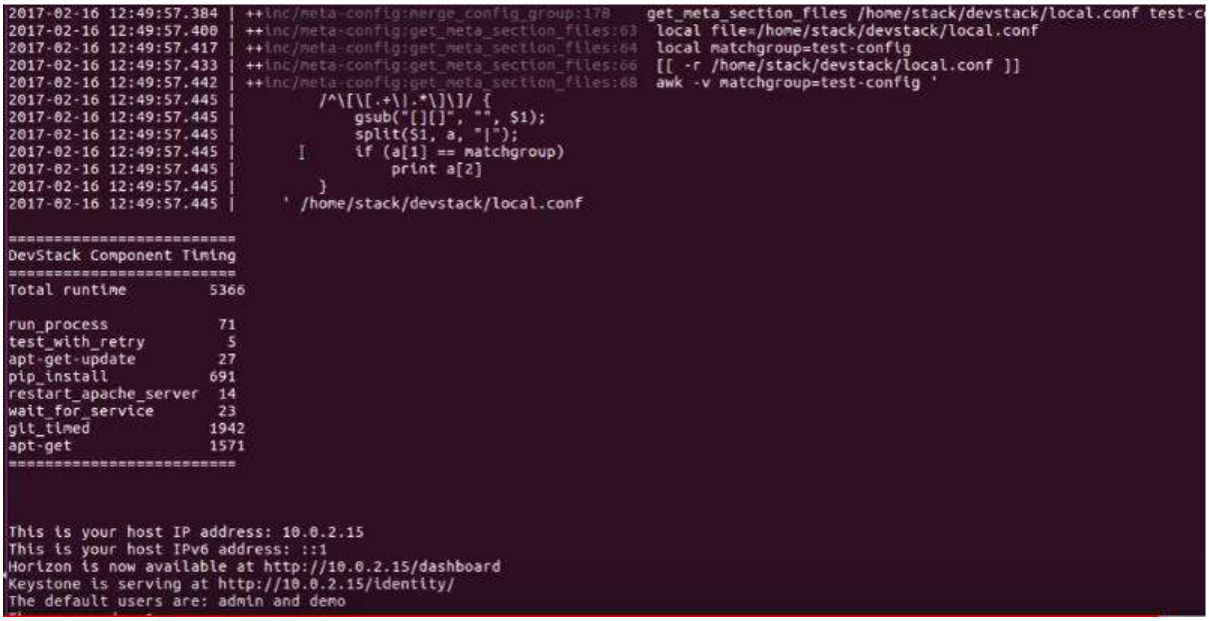
```
root@sindu-VirtualBox:~# cd devstack
root@sindu-VirtualBox:~/devstack# ls
clean.sh          extras.d          FUTURE.rst   lib        playbooks     samples   tools
CONTRIBUTING.rst  files             gate         LICENSE    README.rst    stackrc   tox.ini
data              functions         HACKING.rst  Makefile   roles         stack.sh  unstack.sh
doc               functions-common  inc          openrc     run_tests.sh  tests
root@sindu-VirtualBox:~/devstack# cd samples
root@sindu-VirtualBox:~/devstack/samples# ls
local.conf  local.sh
root@sindu-VirtualBox:~/devstack/samples# cp local.conf ../
root@sindu-VirtualBox:~/devstack/samples# cd ..
root@sindu-VirtualBox:~/devstack# ls
clean.sh          extras.d          FUTURE.rst   lib         openrc      run_tests.sh  tests
CONTRIBUTING.rst  files             gate         LICENSE     playbooks   samples       tools
data              functions         HACKING.rst  local.conf  README.rst  stackrc       tox.ini
doc               functions-common  inc          Makefile    roles       stack.sh      unstack.sh
root@sindu-VirtualBox:~/devstack# sudo nano local.conf
root@sindu-VirtualBox:~/devstack#
```

STEP 21:THE OPENSTACK IS INSTALLED WITH DEVSTACK

TO INSTALLATION OF THE OPENSTACK CAN BE COMMENCED BY USING THE COMMAND /stack.sh

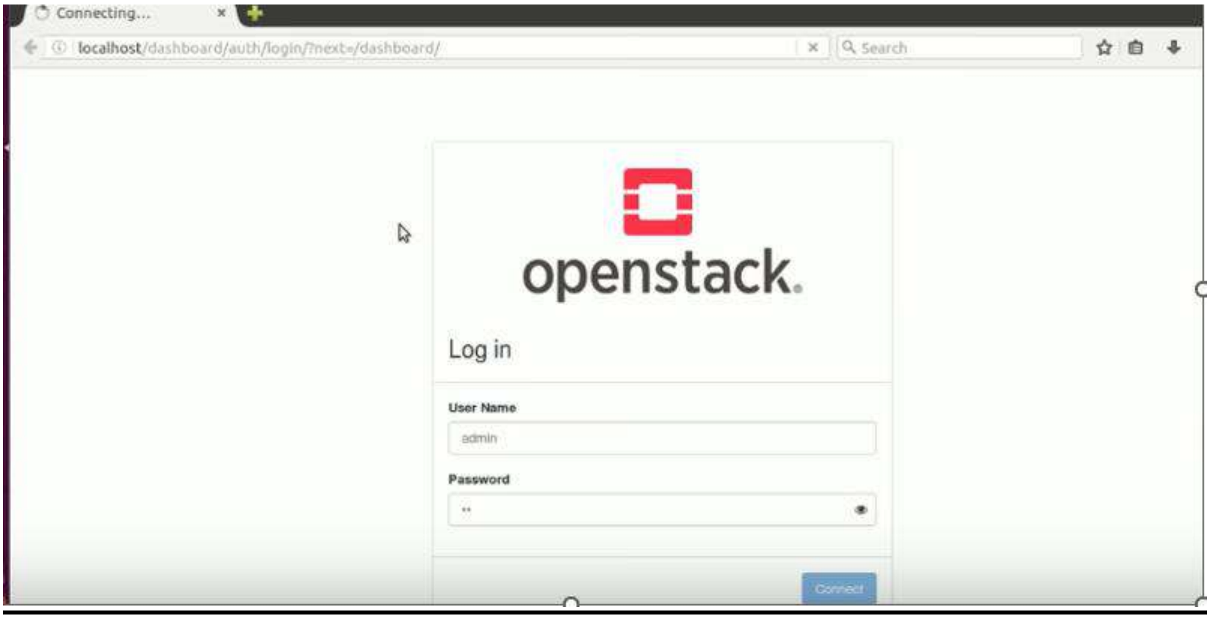


```
+++stackrc:source:202                        trueorfalse True MYSQL_GATHER_PERFORMANCE
+++functions-common:trueorfalse:219           local xtrace
++++functions-common:trueorfalse:220           grep xtrace
++++functions-common:trueorfalse:220           set +o
+++functions-common:trueorfalse:220           xtrace='set -o xtrace'
+++functions-common:trueorfalse:221           set +o xtrace
++stackrc:source:202                         MYSQL_GATHER_PERFORMANCE=True
++stackrc:source:213                         GIT_TIMEOUT=0
++stackrc:source:219                         WSGI_MODE=uwsgi
++stackrc:source:225                         GIT_BASE=https://opendev.org
++stackrc:source:228                         REQUIREMENTS_DIR=/opt/stack/requirements
++stackrc:source:246                         DEVSTACK_SERIES=2023.1
++stackrc:source:255                         CINDER_REPO=https://opendev.org/openstack/cinder.git
++stackrc:source:256                         CINDER_BRANCH=master
++stackrc:source:259                         GLANCE_REPO=https://opendev.org/openstack/glance.git
++stackrc:source:260                         GLANCE_BRANCH=master
++stackrc:source:263                         HORIZON_REPO=https://opendev.org/openstack/horizon.git
++stackrc:source:264                         HORIZON_BRANCH=master
++stackrc:source:267                         KEYSTONE_REPO=https://opendev.org/openstack/keystone.git
++stackrc:source:268                         KEYSTONE_BRANCH=master
++stackrc:source:271                         NEUTRON_REPO=https://opendev.org/openstack/neutron.git
++stackrc:source:272                         NEUTRON_BRANCH=master
++stackrc:source:275                         NOVA_REPO=https://opendev.org/openstack/nova.git
++stackrc:source:276                         NOVA_BRANCH=master
```



```
2017-02-16 12:49:57.384 | ++inc/meta-config:merge_config_group:178    get_meta_section_files /home/stack/devstack/local.conf test-c
2017-02-16 12:49:57.400 | ++inc/meta-config:get_meta_section_files:63  local file=/home/stack/devstack/local.conf
2017-02-16 12:49:57.417 | ++inc/meta-config:get_meta_section_files:64  local matchgroup=test-config
2017-02-16 12:49:57.433 | ++inc/meta-config:get_meta_section_files:66  [[ -r /home/stack/devstack/local.conf ]]
2017-02-16 12:49:57.442 | ++inc/meta-config:get_meta_section_files:68  awk -v matchgroup=test-config '
2017-02-16 12:49:57.445 |         /^\[\[.+\|.*\]\]/ {
2017-02-16 12:49:57.445 |             gsub("[][]", "", $1);
2017-02-16 12:49:57.445 |             split($1, a, "|");
2017-02-16 12:49:57.445 |             if (a[1] == matchgroup)
2017-02-16 12:49:57.445 |                 print a[2]
2017-02-16 12:49:57.445 |         }
2017-02-16 12:49:57.445 |     ' /home/stack/devstack/local.conf

=========================
DevStack Component Timing
=========================
Total runtime         5366

run_process             71
test_with_retry          5
apt-get-update          27
pip_install            691
restart_apache_server   14
wait_for_service        23
git_timed             1942
apt-get               1571
=========================



This is your host IP address: 10.0.2.15
This is your host IPv6 address: ::1
Horizon is now available at http://10.0.2.15/dashboard
Keystone is serving at http://10.0.2.15/identity/
The default users are: admin and demo
```

STEP 22:DEPLOYING IN BROWSER



Connecting...

localhost/dashboard/auth/login/?next=/dashboard/

openstack.

Log in

User Name

admin

Password

••

4.CASE STUDY ON CLOUD TM

AN APPROACH OF FIDELITY TOWARD CLOUD COMPUTING FOR ACHIEVING CLOUD PROABILITY

ABSTRACT

Fidelity's journey toward **cloud native** computing started in 2018 when the cloud platform team started providing Kubernetes as a platform to selected application teams, supported by a variety of managed cloud Kubernetes services. Rajarajan Pudupatti, a cloud platform architect, explains that "we looked at the challenges the applications teams have in general when implementing a brand-new technology." The team worked on developing a platform that also took into account Fidelity-specific criteria, particularly information security and data protection, and relied on an active feedback loop with developer focus groups.

CHALLENGES FACED

Fidelity Investments, one of the biggest financial services firms in the world, provides services to over 35 million investors through more than 76 million accounts. According to Amr Abdelhalem, SVP, Head of Cloud Platforms, the organisation started a digital transformation a few years ago with the goal of "leveraging next generation platforms and technologies to bo ost business value, increase speed to market, and harness the power of innovation."

Fidelity had Kubernetes distributions on-prem and on other cloud providers, which quickly became a problem.

SOLUTION

This initiative includes adopting a **multi-cloud approach**, which required the multi-year migration of thousands of crucial, stringently regulated, low-latency apps. A multi-level platform built on top of Fidelity **Cloud Fabric**, which is based on **CNCF technologies** like Kubernetes, would be the solution.

PROCESS

According to Niraj Amin, Cloud Platform Architect, "It's important to concentrate on developing uniformity across all of the platforms that a business unit may consume with an aim of a consistent developer experience." "Kubernetes is Kubernetes if it is. We therefore try to remove some of the **challenges or distinctions between operating Kubernetes locally versus using a certain cloud provider.**

Pudupatti continues, "Now everything flows through the Kubernetes construct. A specific add-on can be easily implemented in a certain release, and it will affect the hundreds of Kubernetes clusters uniformly. A simple update causes all of the thousands of microservices that are active in a cluster to begin adhering to a specific security process. When they first started, this was one of the key points.

By developing its own operators and automating procedures particular to the financial services sector, Fidelity was able to fulfil some of its most critical regulatory and security requirements. They can actually plug in our own logic because of Kubernetes' extensibility feature, according to Pudupatti. When a problem arises, we can always refer to the Kubernetes design since there is always something we can do to fix it.

For instance, the group created and released KConnect, a CLI that enables users to sign up for the platform, find the **Kubernetes clusters** they have access to across various operating environments, and establish secure connections with them. Another operator was developed to restrict who can create namespaces and to ensure that, once they are formed, they adhere to the predetermined constraints. Amin claims that the entire procedure is automated. "Used to potentially be able to do other things like governance, linking constructs that we've established internally and building on top of that"

As they develop the platform, it is noted that "the very first thing they do is look at the **CNCF tool set** and the projects that are going in. They always considered the path of the community, so even if there is a simple solution,they tookthe stance of not pursuing anything short term because they believe the community is truly moving in a different route for specific reasons.

A multi-level platform built on top of what the team refers to as **Fidelity Cloud Fabric** is the final consequence of all this work. According to Pudupatti, "Fidelity Investments is leveraging a number of CNCF technologies to power our next generation of cloud native platforms." "We rely on **CNI for Networking API, CoreDNS for service discovery**, Fluentd for logging, Helm as a package manager, Kubernetes for container orchestration, and Open Policy Agent for policy administration. etcd serves as the KV store.

Additionally,they are using CNCF sandbox projects like Flux for GitOps and cert-manager for certificate administration.

According to Abdelhalem, "the Fabric itself is a method to build and innovate inside a multi-cloud, hybrid-cloud approach" for the thousands of application teams within Fidelity. "This multi-cloud provider manages our ecosystem itself, all of our application lifecycle management tools, our observability layers, our caching layers, our security and governance levels, and our AI and machine learning layers.

The Fidelity team admits that there is still much to be done in order for the corporation to make the transition to the cloud. According to Amin, some business units **are still in communication with on-premises services, accounts, and other cloud-based services via SaaS solutions**. "Moving everything to the cloud will be difficult, but it is hoped that this platform will make it easier for developers to travel there. **With Kubernetes, they had a platform within their platform that is simple to frequently expand on.**

According to Pudupatti, the advantages have so far been obvious: "The CNCF technological breadth has had a big impact for Fidelity, as we have effortlessly sped application migrations to the cloud." They have reached about 3,000 Kubernetes services on the cloud, nearly 200 Kubernetes clusters, over 1,000 namespaces, and 10,000 containers in a short amount of time.

Given Fidelity's **data centre migrations and eventual shift of many apps to the cloud, portability has also been a huge asset.** "Migrating to a different cloud provider is now possible in a matter of hours, as opposed to the past, when it required months or was occasionally impossible. In the Kubernetes universe, anything we are running locally may theoretically operate on any cloud provider, according to Amin.

Cloud native will have an effect in a broader sense for years to come. The key impetus, according to Pudupatti, is Kubernetes. "**One of the directives that they are getting from our CTO is a very aggressive cloud journey in a few years, and at the same time, prevent vendor lock-in, technology lock-in, and cloud lock-in**. Right now, it is how **cloud portability** is being accomplished.

CONCLUSION

This initiative includes adopting a **multi-cloud approach**, which required the multi-year migration of thousands of crucial, stringently regulated, low-latency apps. A multi-level platform built on top of Fidelity **Cloud Fabric**, which is based on **CNCF technologies** like Kubernetes, would be the solution.