Spark Data Processing

Window + r then paste below command

wsl.exe -d Ubuntu

curl -LO "https://dl.k8s.io/release/$(curl -L -s https://dl.k8s.io/release/stable.txt)/bin/linux/amd64/kubectl"

chmod +x kubectl

Let’s take a simple real word scenario where we can use pyspark

You're about to build a **local Kafka + Python producer + PySpark streaming consumer** setup — a powerful pattern for real-time data pipelines.

**🧩 What You’ll Build**

[Python Kafka Producer] --> [Kafka Topic] --> [PySpark Structured Streaming Consumer]

**✅ STEP 1: Setup Local Kafka**

**🛠️ If you don’t have Kafka locally yet:**

1. Install Kafka via Docker (easy way):

docker run -d --name zookeeper -p 2181:2181 zookeeper:3.6

docker run -d --name kafka -p 9092:9092 \

-e KAFKA\_ZOOKEEPER\_CONNECT=zookeeper:2181 \

-e KAFKA\_ADVERTISED\_LISTENERS=PLAINTEXT://localhost:9092 \

-e KAFKA\_LISTENER\_SECURITY\_PROTOCOL\_MAP=PLAINTEXT:PLAINTEXT \

--network host \

confluentinc/cp-kafka:7.4.0

1. Create Kafka topic (optional):

docker exec -it kafka kafka-topics --create --topic employee-topic \

--bootstrap-server localhost:9092 --partitions 1 --replication-factor 1

**✅ STEP 2: Python Kafka Producer (with employee object loop)**

# producer.py

import json

import time

from kafka import KafkaProducer

producer = KafkaProducer(

bootstrap\_servers='localhost:9092',

value\_serializer=lambda v: json.dumps(v).encode('utf-8')

)

# Simulate employee data

employees = [

{"id": 1, "name": "Alice", "email": "alice@example.com"},

{"id": 2, "name": "Bob", "email": "bob@example.com"},

{"id": 3, "name": "Charlie", "email": "charlie@example.com"}

]

while True:

for emp in employees:

producer.send("employee-topic", emp)

print(f"Produced: {emp}")

time.sleep(2) # simulate delay

producer.flush()

Requires:

bash

pip install kafka-python

**✅ STEP 3: PySpark Kafka Consumer (Structured Streaming)**

# pyspark\_consumer.py

from pyspark.sql import SparkSession

from pyspark.sql.functions import from\_json, col

from pyspark.sql.types import StructType, StringType, IntegerType

# Define schema for employee

schema = StructType() \

.add("id", IntegerType()) \

.add("name", StringType()) \

.add("email", StringType())

spark = SparkSession.builder \

.appName("KafkaEmployeeConsumer") \

.master("local[\*]") \

.getOrCreate()

df\_raw = spark.readStream \

.format("kafka") \

.option("kafka.bootstrap.servers", "localhost:9092") \

.option("subscribe", "employee-topic") \

.option("startingOffsets", "earliest") \

.load()

# Extract and parse the value

df = df\_raw.selectExpr("CAST(value AS STRING)") \

.select(from\_json(col("value"), schema).alias("employee")) \

.select("employee.\*")

# Output to console

query = df.writeStream \

.outputMode("append") \

.format("console") \

.option("truncate", "false") \

.start()

query.awaitTermination()

Run with:

bash

spark-submit pyspark\_consumer.py

**✅ STEP 4: Run the Whole Pipeline**

1. Start Kafka (via Docker or locally)
2. Start the **PySpark consumer** (spark-submit pyspark\_consumer.py)
3. Run the **producer** (python producer.py)

You’ll see the employee data printed in the PySpark console as it's consumed.

**❗ Gotchas & Tips**

* Make sure ports 2181 (Zookeeper) and 9092 (Kafka) are open.
* Use "startingOffsets": "latest" after initial development, so you don’t reprocess old messages.
* Ensure both producer and Spark consumer use the same Kafka topic (employee-topic).
* If Spark hangs: check Docker network and firewall/antivirus on port 9092.

Would you like:

* To write to a file/database from Spark after consuming?
* To add checkpointing for fault tolerance?
* To switch to Kafka on Windows/Ubuntu instead of Docker?

**Creating a PySpark DataFrame**

**PySpark** helps in processing large datasets using its DataFrame structure. In this article, we will see different methods to create a [PySpark](https://www.geeksforgeeks.org/introduction-pyspark-distributed-computing-apache-spark/) DataFrame. It starts with initialization of SparkSession which serves as the entry point for all PySpark applications which is shown below:

*from pyspark.sql import SparkSession  
spark = SparkSession.builder.getOrCreate()*

Lets see an example of creating DataFrame from a List of Rows. Here we can create a DataFrame from a list of rows where each row is represented as a Row object. This method is useful for small datasets that can fit into memory.

* **spark = SparkSession.builder.getOrCreate()**: Initializes a SparkSession which is the entry point for working with PySpark or retrieves an existing session if one is already created.
* **df = spark.createDataFrame([…])**: Creates a PySpark DataFrame using a list of Row objects where each row contains values for the columns a, b, c, d and e.

**from** **datetime** **import** datetime, date

**import** **pandas** **as** **pd**

**from** **pyspark.sql** **import** Row

**from** **pyspark.sql** **import** SparkSession

spark = SparkSession.builder.getOrCreate()

df = spark.createDataFrame([

Row(a=1, b=4., c='GFG1', d=date(2000, 8, 1),

e=datetime(2000, 8, 1, 12, 0)),

Row(a=2, b=8., c='GFG2', d=date(2000, 6, 2),

e=datetime(2000, 6, 2, 12, 0)),

Row(a=4, b=5., c='GFG3', d=date(2000, 5, 3),

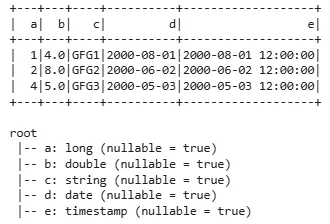
e=datetime(2000, 5, 3, 12, 0))

])

df.show()

df.printSchema()

**Output:**



*Basic example using List of rows*

**Syntax**

*pyspark.sql.SparkSession.createDataFrame(data, schema=None, samplingRatio=None, verifySchema=True)*

**Parameters:**

* **data**: Data we want to load into the DataFrame.
* **schema**: A string or list specifying column names and data types. It is optional.
* **samplingRatio**: Ratio of rows used for analysing schema. Default is None.
* **verifySchema**: Ensures data types of each row match the schema. Default is True.

**Returns:**Dataframe

**Different Methods to Create a PySpark DataFrame**

**1. Create PySpark DataFrame with an Explicit Schema**

Here we can specify the schema explicitly to define the structure of DataFrame which is useful when we want more control over data types.

* **df = spark.createDataFrame([…], schema=’a long, b double, c string, d date, e timestamp’)**: Creates a PySpark DataFrame using a list of tuples and an explicit schema that defines the column names and data types.

**from** **datetime** **import** datetime, date

**import** **pandas** **as** **pd**

**from** **pyspark.sql** **import** Row

**from** **pyspark.sql** **import** SparkSession

spark = SparkSession.builder.getOrCreate()

df = spark.createDataFrame([

(1, 4., 'GFG1', date(2000, 8, 1),

datetime(2000, 8, 1, 12, 0)),

(2, 8., 'GFG2', date(2000, 6, 2),

datetime(2000, 6, 2, 12, 0)),

(3, 5., 'GFG3', date(2000, 5, 3),

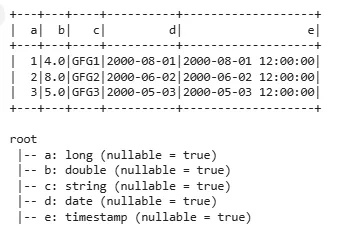
datetime(2000, 5, 3, 12, 0))

], schema='a long, b double, c string, d date, e timestamp')

df.show()

df.printSchema()

**Output:**



*Explicit Schema*

**2. Create DataFrame from a Pandas DataFrame**

We can convert a Pandas DataFrame into a PySpark DataFrame for large-scale data processing.

* **pandas\_df = pd.DataFrame({…})**: Creates a Pandas DataFrame pandas\_df with columns a, b, c, d, and e using sample data.
* **df = spark.createDataFrame(pandas\_df):** Converts Pandas DataFrame pandas\_df into a PySpark DataFrame df.

**from** **datetime** **import** datetime, date

**import** **pandas** **as** **pd**

**from** **pyspark.sql** **import** Row

**from** **pyspark.sql** **import** SparkSession

spark = SparkSession.builder.getOrCreate()

pandas\_df = pd.DataFrame({

'a': [1, 2, 3],

'b': [4., 8., 5.],

'c': ['GFG1', 'GFG2', 'GFG3'],

'd': [date(2000, 8, 1), date(2000, 6, 2),

date(2000, 5, 3)],

'e': [datetime(2000, 8, 1, 12, 0),

datetime(2000, 6, 2, 12, 0),

datetime(2000, 5, 3, 12, 0)]

})

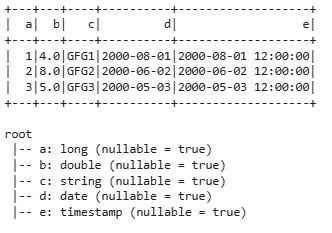
df = spark.createDataFrame(pandas\_df)

df

df.show()

df.printSchema()

**Output:**



*Using Pandas DataFrame*

**3. Create DataFrame from an RDD**

We can convert an existing RDD (Resilient Distributed Dataset) into a DataFrame for structured data processing.

* **rdd = spark.sparkContext.parallelize([ … ]):** Creates an RDD from a list of tuples where each tuple represents a row of data.
* **df = spark.createDataFrame(rdd, schema=[‘a’, ‘b’, ‘c’, ‘d’, ‘e’])**: Converts RDD into a PySpark DataFrame and assigns column names (a, b, c, d, e) to DataFrame.

**from** **datetime** **import** datetime, date

**import** **pandas** **as** **pd**

**from** **pyspark.sql** **import** Row

**from** **pyspark.sql** **import** SparkSession

spark = SparkSession.builder.getOrCreate()

rdd = spark.sparkContext.parallelize([

(1, 4., 'GFG1', date(2000, 8, 1), datetime(2000, 8, 1, 12, 0)),

(2, 8., 'GFG2', date(2000, 6, 2), datetime(2000, 6, 2, 12, 0)),

(3, 5., 'GFG3', date(2000, 5, 3), datetime(2000, 5, 3, 12, 0))

])

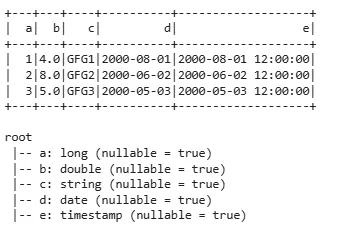
df = spark.createDataFrame(rdd, schema=['a', 'b', 'c', 'd', 'e'])

df

df.show()

df.printSchema()

**Output:**



*Using RDD*

**4. Create DataFrame from a CSV File**

PySpark can easily load data from a CSV file into a DataFrame. Here we are using random dataset for its implementation. Download the dataset from [train\_dataset](https://media.geeksforgeeks.org/wp-content/cdn-uploads/20210512205547/train_dataset-1.csv).

* **df = spark.createDataFrame(pd.read\_csv(‘/content/train\_dataset-1.csv’)):** Reads a CSV file using Pandas **read\_csv()**function and then converts resulting Pandas DataFrame into PySpark DataFrame.

**from** **datetime** **import** datetime, date

**import** **pandas** **as** **pd**

**from** **pyspark.sql** **import** Row

**from** **pyspark.sql** **import** SparkSession

spark = SparkSession.builder.getOrCreate()

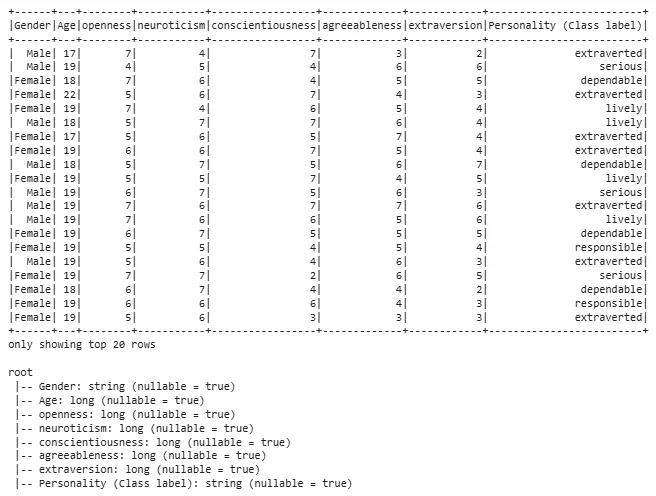
df = spark.createDataFrame(pd.read\_csv('/content/train\_dataset-1.csv'))

df

df.show()

df.printSchema()

**Output:**



*Using a CSV File*

**5. Create PySpark DataFrame from Text file**

If our data is stored in a plain text file we can load each line as a row using the **read.text()** method. Here we are using a random .txt file which can be downloaded from [here](https://media.geeksforgeeks.org/wp-content/uploads/20250503172613340152/text_file.zip).

* **df = spark.createDataFrame(pd.read\_csv(‘/content/text\_file.txt’, delimiter=”\t”)):** Reads text file using **pandas.read\_csv()**to load it into Pandas DataFrame.

**from** **datetime** **import** datetime, date

**import** **pandas** **as** **pd**

**from** **pyspark.sql** **import** Row

**from** **pyspark.sql** **import** SparkSession

spark = SparkSession.builder.getOrCreate()

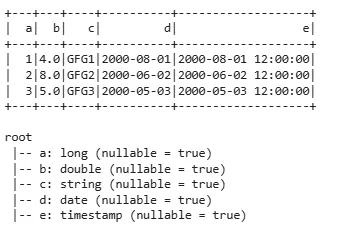
df = spark.createDataFrame(pd.read\_csv('/content/text\_file.txt', delimiter="**\t**"))

df

df.show()

df.printSchema()

**Output:**



*Using aext file*

**6. Create DataFrame from JSON**

JSON is a common format used for structured data. We can use **read.json()** to load data from JSON files directly into a PySpark DataFrame. The file we are using can be downloaded from [here](https://media.geeksforgeeks.org/wp-content/uploads/20250503172936988905/json_data.zip).

* **df = spark.createDataFrame(pd.read\_json(‘/content/json\_data.json’)):** Reads a JSON file using **pandas.read\_json()**to load it into a Pandas DataFrame.

**from** **datetime** **import** datetime, date

**import** **pandas** **as** **pd**

**from** **pyspark.sql** **import** Row

**from** **pyspark.sql** **import** SparkSession

spark = SparkSession.builder.getOrCreate()

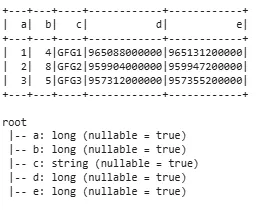
df = spark.createDataFrame(pd.read\_json('/content/json\_data.json'))

df

df.show()

df.printSchema()

**Output:**



*Using a JSON file*

PySpark’s process large-scale datasets using DataFrames and its integration with Spark’s distributed computing framework makes it important for data science work.

Refer link for PySpark Documentation for more function on Spark SQL, Spark Dataframe:

<https://spark.apache.org/docs/2.2.1/sql-programming-guide.html>

Practice applying all those function on different dataset

**Step-by-Step: Install Ubuntu on WSL**

**1. 💻 Open PowerShell as Administrator, then run:**

powershell

wsl --install -d Ubuntu

This will:

* Download and install the latest Ubuntu for WSL2
* Set it as your default distro

C:\Users\DELL> wsl --list –verbose

NAME STATE VERSION

Ubuntu Running 2

Perfect! Your **WSL2 environment with Ubuntu** is set up and running properly:

Now let’s proceed to the next steps to **set up Spark on Kubernetes** via WSL.

**✅ Step-by-Step: Set Up Spark + Kubernetes in WSL2**

We’ll install:

1. kubectl – Kubernetes CLI
2. minikube – Local Kubernetes cluster
3. Docker – Required by Minikube to run containers

**🧩 Step 1: Install kubectl inside WSL (Ubuntu)**

Open your **WSL Ubuntu terminal** (wsl.exe -d Ubuntu or via Start Menu) and run:

bash

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curl -LO "https://dl.k8s.io/release/$(curl -L -s https://dl.k8s.io/release/stable.txt)/bin/linux/amd64/kubectl"

chmod +x kubectl

sudo mv kubectl /usr/local/bin/

kubectl version --client

**🧩 Step 2: Install minikube inside WSL**

bash

curl -LO https://storage.googleapis.com/minikube/releases/latest/minikube-linux-amd64

sudo install minikube-linux-amd64 /usr/local/bin/minikube

minikube version

**🧩 Step 3: Install Docker (for running containers in Minikube)**

bash

sudo apt install -y docker.io

sudo usermod -aG docker $USER

Then **restart your WSL shell**:

bash

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exit

Then open WSL again and confirm Docker works:

bash

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docker --version

**🏁 Step 4: Start Minikube with Docker driver**

Back in WSL Ubuntu:

bash

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minikube start --driver=docker

Once started, confirm:

bash

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kubectl get nodes

Once you're done with these steps, we’ll proceed to:

✅ Deploying Spark on Kubernetes  
✅ Connecting Spark consumer to Kafka  
✅ Load balancing and scaling Spark workers

Let me know when ready or if you hit any issue in any step!

**Step-by-Step: Run Spark on Minikube with Kafka Integration**

**🔁 Prerequisites Recap**

Make sure the following are installed on Windows:

* ✅ Docker Desktop with WSL2 backend
* ✅ Minikube
* ✅ kubectl
* ✅ WSL2 + Ubuntu (you already have this)

Now let’s start.

**🚀 STEP 1: Start Minikube with Docker Driver**

Run this in **PowerShell** (as admin) or your **WSL Ubuntu terminal**:

bash

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minikube start --driver=docker

This will:

* Start a Kubernetes cluster inside Docker
* Work perfectly with your current setup

**🔥 STEP 2: Deploy Spark on Kubernetes**

**Option 1: Quickstart with Helm (Recommended)**

First, install [Helm](https://helm.sh/) if not already:

bash

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sudo apt update

sudo apt install -y helm

Then add the Spark Helm chart:

bash

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helm repo add bitnami https://charts.bitnami.com/bitnami

helm repo update

Now install Spark:

bash

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helm install spark-cluster bitnami/spark

This will install:

* 1 Spark master pod
* 3 Spark worker pods (default)

Verify it:

bash

kubectl get pods

**🧠 STEP 3: Access Spark Master UI (optional)**

Expose Spark Master as a service:

bash

minikube service spark-cluster-spark-master

This opens the Spark master UI in your browser (useful for monitoring jobs).

**3. Check Nodes**

Maybe your minikube cluster has no resources:

bash

kubectl get nodes

kubectl describe node <node-name>

**Most Common Fix: Not Enough Resources**

Spark pods can be **heavy**, and minikube might not have enough CPU/RAM allocated.

**✅ Fix: Start Minikube with More Resources**

Stop and restart minikube with extra CPU/memory:

bash

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minikube stop

minikube delete

minikube start --cpus=4 --memory=8192 --driver=docker

This gives 4 CPUs and 8GB RAM to the cluster.

You can also check what your current config is using:

bash

minikube config view

You can simply forward to a **higher, non-privileged port** like this:

bash

kubectl port-forward --namespace default svc/spark-cluster-master-svc 8080:80

Then access the Spark Master UI in your browser:

cpp

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http://127.0.0.1:8080

**🧪 STEP 4: Submit Spark Job (example)**

Now, let's say you want to run a Spark job that consumes Kafka data. You’ll need:

* Your spark\_kafka\_consumer.py or JAR ready (copy into pod or use a volume)
* Submit your Spark job like this:

bash

kubectl exec -it POD\_NAME -- spark-submit \

--master spark://spark-cluster-spark-master:7077 \

--packages org.apache.spark:spark-sql-kafka-0-10\_2.12:3.3.0 \

/path/to/your\_script.py

You can also create a Kubernetes Job YAML to do this.

**🔄 Next Steps**

* ✔ If you already have Kafka running in Docker or Minikube, we can expose it to Spark.
* 💡 I can help you:
  + Create Spark job for Kafka stream (Python or Scala)
  + Deploy Kafka on Minikube
  + Create a deployment YAML for your Spark consumer

Would you like to proceed with:

1. Deploying **Kafka in Minikube**
2. Submitting your **Kafka Spark consumer job**
3. Deploying your **own Spark Docker image**?

Let me know, and I’ll tailor the next steps.

**Recommended for Production**

You saw this warning:

WARNING: There are "resources" sections in the chart not set...

In production, you should define CPU and memory limits:

yaml

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master:

resources:

limits:

cpu: 1

memory: 2Gi

requests:

cpu: 0.5

memory: 1Gi

worker:

resources:

limits:

cpu: 2

memory: 4Gi

requests:

cpu: 1

memory: 2Gi

Then install using:

bash

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helm upgrade --install spark-cluster bitnami/spark -f values.yaml

**Submitting Your Own App**

If you have your own Spark app:

* Package it into a .jar
* Mount it or copy it into the worker/master container
* Submit using spark-submit from inside the pod or via a mounted script

⚠️ **If you run spark-submit from outside the cluster**, use the **NodePort** or **LoadBalancer** IP/port to access the Spark Master.

Example:

bash

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spark-submit \

--master spark://<NODE-IP>:<NODEPORT> \

--class your.main.Class \

your-app.jar args...

**You can verify that each one is working by running:**

**helm version**

kubectl version --client

minikube version

**Step 1: Confirm You Have a Linux Distro Installed for WSL**

Run this in PowerShell:

powershell

wsl --list --verbose

**Example Output:**

pgsql

NAME STATE VERSION

\* Ubuntu Running 2

If nothing is listed or says "Stopped" / "1", continue:

* If **nothing is listed**, install Ubuntu:

powershell

wsl --install -d Ubuntu

* If **version is 1**, convert it to WSL 2:

powershell

wsl --set-version <distro-name> 2

**Step-by-Step: Set Up Spark + Kubernetes in WSL2**

We’ll install:

1. kubectl – Kubernetes CLI
2. minikube – Local Kubernetes cluster
3. Docker – Required by Minikube to run containers

**🧩 Step 1: Install kubectl inside WSL (Ubuntu)**

Open your **WSL Ubuntu terminal** (wsl.exe -d Ubuntu or via Start Menu) and run:

bash

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curl -LO "https://dl.k8s.io/release/$(curl -L -s https://dl.k8s.io/release/stable.txt)/bin/linux/amd64/kubectl"

chmod +x kubectl

sudo mv kubectl /usr/local/bin/

kubectl version --client

**🧩 Step 2: Install minikube inside WSL**

bash

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curl -LO https://storage.googleapis.com/minikube/releases/latest/minikube-linux-amd64

sudo install minikube-linux-amd64 /usr/local/bin/minikube

minikube version

**Step-by-step: Install Docker in WSL (Ubuntu)**

**🔄 1. Update and Install Required Prerequisites**

bash

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sudo apt update

sudo apt install -y ca-certificates curl gnupg lsb-release

**🐳 2. Add Docker’s Official GPG Key**

bash

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sudo mkdir -p /etc/apt/keyrings

curl -fsSL https://download.docker.com/linux/ubuntu/gpg | \

sudo gpg --dearmor -o /etc/apt/keyrings/docker.gpg

**📦 3. Set Up Docker Repository**

bash

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echo \

"deb [arch=$(dpkg --print-architecture) \

signed-by=/etc/apt/keyrings/docker.gpg] \

https://download.docker.com/linux/ubuntu \

$(lsb\_release -cs) stable" | \

sudo tee /etc/apt/sources.list.d/docker.list > /dev/null

**🔄 4. Update Package List Again**

bash

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sudo apt update

**📥 5. Install Docker Engine (CE)**

bash

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sudo apt install -y docker-ce docker-ce-cli containerd.io docker-buildx-plugin docker-compose-plugin

**✅ 6. Verify Docker Installation**

bash

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docker --version

**👤 7. Add Your User to the docker Group**

bash

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sudo usermod -aG docker $USER

Then **restart the shell** or run:

bash

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newgrp docker

To run a command as administrator (user "root"), use "sudo <command>".

See "man sudo\_root" for details.

rajeev@DESKTOP-JDQBCCU:/mnt/c/Users/DELL$ curl -LO "https://dl.k8s.io/release/$(curl -L -s https://dl.k8s.io/release/stable.txt)/bin/linux/amd64/kubectl"

chmod +x kubectl

% Total % Received % Xferd Average Speed Time Time Time Current

Dload Upload Total Spent Left Speed

100 138 100 138 0 0 428 0 --:--:-- --:--:-- --:--:-- 428

100 57.3M 100 57.3M 0 0 4817k 0 0:00:12 0:00:12 --:--:-- 4796k

chmod: changing permissions of 'kubectl': Operation not permitted

rajeev@DESKTOP-JDQBCCU:/mnt/c/Users/DELL$ sudo mv kubectl /usr/local/bin/

[sudo] password for rajeev:

rajeev@DESKTOP-JDQBCCU:/mnt/c/Users/DELL$ kubectl version --client

Client Version: v1.33.2

Kustomize Version: v5.6.0

rajeev@DESKTOP-JDQBCCU:/mnt/c/Users/DELL$ curl -LO https://storage.googleapis.com/minikube/releases/latest/minikube-linux-amd64

% Total % Received % Xferd Average Speed Time Time Time Current

Dload Upload Total Spent Left Speed

100 126M 100 126M 0 0 4432k 0 0:00:29 0:00:29 --:--:-- 4843k

rajeev@DESKTOP-JDQBCCU:/mnt/c/Users/DELL$ sudo install minikube-linux-amd64 /usr/local/bin/minikube

rajeev@DESKTOP-JDQBCCU:/mnt/c/Users/DELL$ minikube version

minikube version: v1.36.0

commit: f8f52f5de11fc6ad8244afac475e1d0f96841df1-dirty

rajeev@DESKTOP-JDQBCCU:/mnt/c/Users/DELL$ sudo apt install -y docker.io

Reading package lists... Done

Building dependency tree... Done

Reading state information... Done

Package docker.io is not available, but is referred to by another package.

This may mean that the package is missing, has been obsoleted, or

is only available from another source

E: Package 'docker.io' has no installation candidate

rajeev@DESKTOP-JDQBCCU:/mnt/c/Users/DELL$ sudo apt update

sudo apt install -y ca-certificates curl gnupg lsb-release

Get:1 http://security.ubuntu.com/ubuntu noble-security InRelease [126 kB]

Hit:2 http://archive.ubuntu.com/ubuntu noble InRelease

Get:3 http://archive.ubuntu.com/ubuntu noble-updates InRelease [126 kB]

Get:4 http://security.ubuntu.com/ubuntu noble-security/main amd64 Packages [920 kB]

Get:5 http://archive.ubuntu.com/ubuntu noble-backports InRelease [126 kB]

Get:6 http://archive.ubuntu.com/ubuntu noble/universe amd64 Packages [15.0 MB]

Get:7 http://security.ubuntu.com/ubuntu noble-security/main Translation-en [169 kB]

Get:8 http://security.ubuntu.com/ubuntu noble-security/main amd64 Components [21.5 kB]

Get:9 http://security.ubuntu.com/ubuntu noble-security/main amd64 c-n-f Metadata [7068 B]

Get:10 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Packages [860 kB]

Get:11 http://security.ubuntu.com/ubuntu noble-security/universe Translation-en [188 kB]

Get:12 http://security.ubuntu.com/ubuntu noble-security/universe amd64 Components [52.2 kB]

Get:13 http://security.ubuntu.com/ubuntu noble-security/universe amd64 c-n-f Metadata [17.0 kB]

Get:14 http://security.ubuntu.com/ubuntu noble-security/restricted amd64 Packages [1235 kB]

Get:15 http://security.ubuntu.com/ubuntu noble-security/restricted Translation-en [263 kB]

Get:16 http://security.ubuntu.com/ubuntu noble-security/restricted amd64 Components [212 B]

Get:17 http://security.ubuntu.com/ubuntu noble-security/restricted amd64 c-n-f Metadata [468 B]

Get:18 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 Packages [17.7 kB]

Get:19 http://security.ubuntu.com/ubuntu noble-security/multiverse Translation-en [3792 B]

Get:20 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 Components [208 B]

Get:21 http://security.ubuntu.com/ubuntu noble-security/multiverse amd64 c-n-f Metadata [380 B]

Get:22 http://archive.ubuntu.com/ubuntu noble/universe Translation-en [5982 kB]

Get:23 http://archive.ubuntu.com/ubuntu noble/universe amd64 Components [3871 kB]

Get:24 http://archive.ubuntu.com/ubuntu noble/universe amd64 c-n-f Metadata [301 kB]

Get:25 http://archive.ubuntu.com/ubuntu noble/multiverse amd64 Packages [269 kB]

Get:26 http://archive.ubuntu.com/ubuntu noble/multiverse Translation-en [118 kB]

Get:27 http://archive.ubuntu.com/ubuntu noble/multiverse amd64 Components [35.0 kB]

Get:28 http://archive.ubuntu.com/ubuntu noble/multiverse amd64 c-n-f Metadata [8328 B]

Get:29 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 Packages [1168 kB]

Get:30 http://archive.ubuntu.com/ubuntu noble-updates/main Translation-en [246 kB]

Get:31 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 Components [162 kB]

Get:32 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 c-n-f Metadata [13.5 kB]

Get:33 http://archive.ubuntu.com/ubuntu noble-updates/universe amd64 Packages [1092 kB]

Get:34 http://archive.ubuntu.com/ubuntu noble-updates/universe Translation-en [278 kB]

Get:35 http://archive.ubuntu.com/ubuntu noble-updates/universe amd64 Components [376 kB]

Get:36 http://archive.ubuntu.com/ubuntu noble-updates/universe amd64 c-n-f Metadata [26.0 kB]

Get:37 http://archive.ubuntu.com/ubuntu noble-updates/restricted amd64 Packages [1274 kB]

Get:38 http://archive.ubuntu.com/ubuntu noble-updates/restricted Translation-en [271 kB]

Get:39 http://archive.ubuntu.com/ubuntu noble-updates/restricted amd64 Components [212 B]

Get:40 http://archive.ubuntu.com/ubuntu noble-updates/restricted amd64 c-n-f Metadata [492 B]

Get:41 http://archive.ubuntu.com/ubuntu noble-updates/multiverse amd64 Packages [22.1 kB]

Get:42 http://archive.ubuntu.com/ubuntu noble-updates/multiverse Translation-en [4972 B]

Get:43 http://archive.ubuntu.com/ubuntu noble-updates/multiverse amd64 Components [940 B]

Get:44 http://archive.ubuntu.com/ubuntu noble-updates/multiverse amd64 c-n-f Metadata [592 B]

Get:45 http://archive.ubuntu.com/ubuntu noble-backports/main amd64 Packages [39.2 kB]

Get:46 http://archive.ubuntu.com/ubuntu noble-backports/main Translation-en [8676 B]

Get:47 http://archive.ubuntu.com/ubuntu noble-backports/main amd64 Components [7084 B]

Get:48 http://archive.ubuntu.com/ubuntu noble-backports/main amd64 c-n-f Metadata [272 B]

Get:49 http://archive.ubuntu.com/ubuntu noble-backports/universe amd64 Packages [27.1 kB]

Get:50 http://archive.ubuntu.com/ubuntu noble-backports/universe Translation-en [16.5 kB]

Get:51 http://archive.ubuntu.com/ubuntu noble-backports/universe amd64 Components [16.4 kB]

Get:52 http://archive.ubuntu.com/ubuntu noble-backports/universe amd64 c-n-f Metadata [1304 B]

Get:53 http://archive.ubuntu.com/ubuntu noble-backports/restricted amd64 Components [216 B]

Get:54 http://archive.ubuntu.com/ubuntu noble-backports/restricted amd64 c-n-f Metadata [116 B]

Get:55 http://archive.ubuntu.com/ubuntu noble-backports/multiverse amd64 Components [212 B]

Get:56 http://archive.ubuntu.com/ubuntu noble-backports/multiverse amd64 c-n-f Metadata [116 B]

Fetched 34.8 MB in 10s (3402 kB/s)

Reading package lists... Done

Building dependency tree... Done

Reading state information... Done

118 packages can be upgraded. Run 'apt list --upgradable' to see them.

Reading package lists... Done

Building dependency tree... Done

Reading state information... Done

ca-certificates is already the newest version (20240203).

ca-certificates set to manually installed.

curl is already the newest version (8.5.0-2ubuntu10.6).

curl set to manually installed.

lsb-release is already the newest version (12.0-2).

lsb-release set to manually installed.

The following additional packages will be installed:

dirmngr gnupg-l10n gnupg-utils gpg gpg-agent gpg-wks-client gpgconf gpgsm gpgv keyboxd

Suggested packages:

pinentry-gnome3 tor parcimonie xloadimage gpg-wks-server scdaemon

The following packages will be upgraded:

dirmngr gnupg gnupg-l10n gnupg-utils gpg gpg-agent gpg-wks-client gpgconf gpgsm gpgv keyboxd

11 upgraded, 0 newly installed, 0 to remove and 107 not upgraded.

Need to get 2291 kB of archives.

After this operation, 0 B of additional disk space will be used.

Get:1 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 gpg-wks-client amd64 2.4.4-2ubuntu17.2 [70.9 kB]

Get:2 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 dirmngr amd64 2.4.4-2ubuntu17.2 [323 kB]

Get:3 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 gnupg-utils amd64 2.4.4-2ubuntu17.2 [109 kB]

Get:4 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 gpgsm amd64 2.4.4-2ubuntu17.2 [232 kB]

Get:5 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 gpg-agent amd64 2.4.4-2ubuntu17.2 [227 kB]

Get:6 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 gpg amd64 2.4.4-2ubuntu17.2 [565 kB]

Get:7 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 gpgconf amd64 2.4.4-2ubuntu17.2 [103 kB]

Get:8 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 gnupg all 2.4.4-2ubuntu17.2 [359 kB]

Get:9 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 keyboxd amd64 2.4.4-2ubuntu17.2 [78.3 kB]

Get:10 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 gpgv amd64 2.4.4-2ubuntu17.2 [158 kB]

Get:11 http://archive.ubuntu.com/ubuntu noble-updates/main amd64 gnupg-l10n all 2.4.4-2ubuntu17.2 [66.1 kB]

Fetched 2291 kB in 3s (663 kB/s)

(Reading database ... 40768 files and directories currently installed.)

Preparing to unpack .../0-gpg-wks-client\_2.4.4-2ubuntu17.2\_amd64.deb ...

Unpacking gpg-wks-client (2.4.4-2ubuntu17.2) over (2.4.4-2ubuntu17) ...

Preparing to unpack .../1-dirmngr\_2.4.4-2ubuntu17.2\_amd64.deb ...

Unpacking dirmngr (2.4.4-2ubuntu17.2) over (2.4.4-2ubuntu17) ...

Preparing to unpack .../2-gnupg-utils\_2.4.4-2ubuntu17.2\_amd64.deb ...

Unpacking gnupg-utils (2.4.4-2ubuntu17.2) over (2.4.4-2ubuntu17) ...

Preparing to unpack .../3-gpgsm\_2.4.4-2ubuntu17.2\_amd64.deb ...

Unpacking gpgsm (2.4.4-2ubuntu17.2) over (2.4.4-2ubuntu17) ...

Preparing to unpack .../4-gpg-agent\_2.4.4-2ubuntu17.2\_amd64.deb ...

Unpacking gpg-agent (2.4.4-2ubuntu17.2) over (2.4.4-2ubuntu17) ...

Preparing to unpack .../5-gpg\_2.4.4-2ubuntu17.2\_amd64.deb ...

Unpacking gpg (2.4.4-2ubuntu17.2) over (2.4.4-2ubuntu17) ...

Preparing to unpack .../6-gpgconf\_2.4.4-2ubuntu17.2\_amd64.deb ...

Unpacking gpgconf (2.4.4-2ubuntu17.2) over (2.4.4-2ubuntu17) ...

Preparing to unpack .../7-gnupg\_2.4.4-2ubuntu17.2\_all.deb ...

Unpacking gnupg (2.4.4-2ubuntu17.2) over (2.4.4-2ubuntu17) ...

Preparing to unpack .../8-keyboxd\_2.4.4-2ubuntu17.2\_amd64.deb ...

Unpacking keyboxd (2.4.4-2ubuntu17.2) over (2.4.4-2ubuntu17) ...

Preparing to unpack .../9-gpgv\_2.4.4-2ubuntu17.2\_amd64.deb ...

Unpacking gpgv (2.4.4-2ubuntu17.2) over (2.4.4-2ubuntu17) ...

Setting up gpgv (2.4.4-2ubuntu17.2) ...

(Reading database ... 40768 files and directories currently installed.)

Preparing to unpack .../gnupg-l10n\_2.4.4-2ubuntu17.2\_all.deb ...

Unpacking gnupg-l10n (2.4.4-2ubuntu17.2) over (2.4.4-2ubuntu17) ...

Setting up gnupg-l10n (2.4.4-2ubuntu17.2) ...

Setting up gpgconf (2.4.4-2ubuntu17.2) ...

Setting up gpg (2.4.4-2ubuntu17.2) ...

Setting up gnupg-utils (2.4.4-2ubuntu17.2) ...

Setting up gpg-agent (2.4.4-2ubuntu17.2) ...

Setting up gpgsm (2.4.4-2ubuntu17.2) ...

Setting up dirmngr (2.4.4-2ubuntu17.2) ...

Setting up keyboxd (2.4.4-2ubuntu17.2) ...

Setting up gnupg (2.4.4-2ubuntu17.2) ...

Setting up gpg-wks-client (2.4.4-2ubuntu17.2) ...

Processing triggers for install-info (7.1-3build2) ...

Processing triggers for man-db (2.12.0-4build2) ...

rajeev@DESKTOP-JDQBCCU:/mnt/c/Users/DELL$ sudo mkdir -p /etc/apt/keyrings

curl -fsSL https://download.docker.com/linux/ubuntu/gpg | \

sudo gpg --dearmor -o /etc/apt/keyrings/docker.gpg

rajeev@DESKTOP-JDQBCCU:/mnt/c/Users/DELL$ echo \

"deb [arch=$(dpkg --print-architecture) \

signed-by=/etc/apt/keyrings/docker.gpg] \

https://download.docker.com/linux/ubuntu \

$(lsb\_release -cs) stable" | \

sudo tee /etc/apt/sources.list.d/docker.list > /dev/null

rajeev@DESKTOP-JDQBCCU:/mnt/c/Users/DELL$ sudo apt update

Get:1 https://download.docker.com/linux/ubuntu noble InRelease [48.8 kB]

Get:2 https://download.docker.com/linux/ubuntu noble/stable amd64 Packages [26.9 kB]

Hit:3 http://archive.ubuntu.com/ubuntu noble InRelease

Hit:4 http://security.ubuntu.com/ubuntu noble-security InRelease

Hit:5 http://archive.ubuntu.com/ubuntu noble-updates InRelease

Hit:6 http://archive.ubuntu.com/ubuntu noble-backports InRelease

Fetched 75.7 kB in 1s (58.2 kB/s)

Reading package lists... Done

Building dependency tree... Done

Reading state information... Done

107 packages can be upgraded. Run 'apt list --upgradable' to see them.

rajeev@DESKTOP-JDQBCCU:/mnt/c/Users/DELL$ sudo apt install -y docker-ce docker-ce-cli containerd.io docker-buildx-plugin docker-compose-plugin

Reading package lists... Done

Building dependency tree... Done

Reading state information... Done

The following additional packages will be installed:

docker-ce-rootless-extras iptables libip4tc2 libip6tc2 libltdl7 libnetfilter-conntrack3 libnfnetlink0 libnftables1

libnftnl11 libslirp0 nftables pigz slirp4netns

Suggested packages:

cgroupfs-mount | cgroup-lite docker-model-plugin firewalld

The following NEW packages will be installed:

containerd.io docker-buildx-plugin docker-ce docker-ce-cli docker-ce-rootless-extras docker-compose-plugin iptables

libip4tc2 libip6tc2 libltdl7 libnetfilter-conntrack3 libnfnetlink0 libnftables1 libnftnl11 libslirp0 nftables pigz

slirp4netns

0 upgraded, 18 newly installed, 0 to remove and 107 not upgraded.

Need to get 104 MB of archives.

After this operation, 434 MB of additional disk space will be used.

Get:1 https://download.docker.com/linux/ubuntu noble/stable amd64 containerd.io amd64 1.7.27-1 [30.5 MB]

Get:2 http://archive.ubuntu.com/ubuntu noble/main amd64 libip4tc2 amd64 1.8.10-3ubuntu2 [23.3 kB]

Get:3 http://archive.ubuntu.com/ubuntu noble/main amd64 libip6tc2 amd64 1.8.10-3ubuntu2 [23.7 kB]

Get:4 http://archive.ubuntu.com/ubuntu noble/main amd64 libnfnetlink0 amd64 1.0.2-2build1 [14.8 kB]

Get:5 http://archive.ubuntu.com/ubuntu noble/main amd64 libnetfilter-conntrack3 amd64 1.0.9-6build1 [45.2 kB]

Get:6 http://archive.ubuntu.com/ubuntu noble/main amd64 libnftnl11 amd64 1.2.6-2build1 [66.0 kB]

Get:7 http://archive.ubuntu.com/ubuntu noble/main amd64 iptables amd64 1.8.10-3ubuntu2 [381 kB]

Get:8 https://download.docker.com/linux/ubuntu noble/stable amd64 docker-ce-cli amd64 5:28.3.0-1~ubuntu.24.04~noble [16.5 MB]

Get:9 http://archive.ubuntu.com/ubuntu noble/universe amd64 pigz amd64 2.8-1 [65.6 kB]

Get:10 http://archive.ubuntu.com/ubuntu noble/main amd64 libnftables1 amd64 1.0.9-1build1 [358 kB]

Get:11 http://archive.ubuntu.com/ubuntu noble/main amd64 nftables amd64 1.0.9-1build1 [69.8 kB]

Get:12 http://archive.ubuntu.com/ubuntu noble/main amd64 libltdl7 amd64 2.4.7-7build1 [40.3 kB]

Get:13 http://archive.ubuntu.com/ubuntu noble/main amd64 libslirp0 amd64 4.7.0-1ubuntu3 [63.8 kB]

Get:14 http://archive.ubuntu.com/ubuntu noble/universe amd64 slirp4netns amd64 1.2.1-1build2 [34.9 kB]

Get:15 https://download.docker.com/linux/ubuntu noble/stable amd64 docker-ce amd64 5:28.3.0-1~ubuntu.24.04~noble [19.7 MB]

Get:16 https://download.docker.com/linux/ubuntu noble/stable amd64 docker-buildx-plugin amd64 0.25.0-1~ubuntu.24.04~noble [15.6 MB]

Get:17 https://download.docker.com/linux/ubuntu noble/stable amd64 docker-ce-rootless-extras amd64 5:28.3.0-1~ubuntu.24.04~noble [6480 kB]

Get:18 https://download.docker.com/linux/ubuntu noble/stable amd64 docker-compose-plugin amd64 2.37.3-1~ubuntu.24.04~noble [14.2 MB]

Fetched 104 MB in 20s (5170 kB/s)

Selecting previously unselected package containerd.io.

(Reading database ... 40768 files and directories currently installed.)

Preparing to unpack .../00-containerd.io\_1.7.27-1\_amd64.deb ...

Unpacking containerd.io (1.7.27-1) ...

Selecting previously unselected package docker-ce-cli.

Preparing to unpack .../01-docker-ce-cli\_5%3a28.3.0-1~ubuntu.24.04~noble\_amd64.deb ...

Unpacking docker-ce-cli (5:28.3.0-1~ubuntu.24.04~noble) ...

Selecting previously unselected package libip4tc2:amd64.

Preparing to unpack .../02-libip4tc2\_1.8.10-3ubuntu2\_amd64.deb ...

Unpacking libip4tc2:amd64 (1.8.10-3ubuntu2) ...

Selecting previously unselected package libip6tc2:amd64.

Preparing to unpack .../03-libip6tc2\_1.8.10-3ubuntu2\_amd64.deb ...

Unpacking libip6tc2:amd64 (1.8.10-3ubuntu2) ...

Selecting previously unselected package libnfnetlink0:amd64.

Preparing to unpack .../04-libnfnetlink0\_1.0.2-2build1\_amd64.deb ...

Unpacking libnfnetlink0:amd64 (1.0.2-2build1) ...

Selecting previously unselected package libnetfilter-conntrack3:amd64.

Preparing to unpack .../05-libnetfilter-conntrack3\_1.0.9-6build1\_amd64.deb ...

Unpacking libnetfilter-conntrack3:amd64 (1.0.9-6build1) ...

Selecting previously unselected package libnftnl11:amd64.

Preparing to unpack .../06-libnftnl11\_1.2.6-2build1\_amd64.deb ...

Unpacking libnftnl11:amd64 (1.2.6-2build1) ...

Selecting previously unselected package iptables.

Preparing to unpack .../07-iptables\_1.8.10-3ubuntu2\_amd64.deb ...

Unpacking iptables (1.8.10-3ubuntu2) ...

Selecting previously unselected package docker-ce.

Preparing to unpack .../08-docker-ce\_5%3a28.3.0-1~ubuntu.24.04~noble\_amd64.deb ...

Unpacking docker-ce (5:28.3.0-1~ubuntu.24.04~noble) ...

Selecting previously unselected package pigz.

Preparing to unpack .../09-pigz\_2.8-1\_amd64.deb ...

Unpacking pigz (2.8-1) ...

Selecting previously unselected package libnftables1:amd64.

Preparing to unpack .../10-libnftables1\_1.0.9-1build1\_amd64.deb ...

Unpacking libnftables1:amd64 (1.0.9-1build1) ...

Selecting previously unselected package nftables.

Preparing to unpack .../11-nftables\_1.0.9-1build1\_amd64.deb ...

Unpacking nftables (1.0.9-1build1) ...

Selecting previously unselected package docker-buildx-plugin.

Preparing to unpack .../12-docker-buildx-plugin\_0.25.0-1~ubuntu.24.04~noble\_amd64.deb ...

Unpacking docker-buildx-plugin (0.25.0-1~ubuntu.24.04~noble) ...

Selecting previously unselected package docker-ce-rootless-extras.

Preparing to unpack .../13-docker-ce-rootless-extras\_5%3a28.3.0-1~ubuntu.24.04~noble\_amd64.deb ...

Unpacking docker-ce-rootless-extras (5:28.3.0-1~ubuntu.24.04~noble) ...

Selecting previously unselected package docker-compose-plugin.

Preparing to unpack .../14-docker-compose-plugin\_2.37.3-1~ubuntu.24.04~noble\_amd64.deb ...

Unpacking docker-compose-plugin (2.37.3-1~ubuntu.24.04~noble) ...

Selecting previously unselected package libltdl7:amd64.

Preparing to unpack .../15-libltdl7\_2.4.7-7build1\_amd64.deb ...

Unpacking libltdl7:amd64 (2.4.7-7build1) ...

Selecting previously unselected package libslirp0:amd64.

Preparing to unpack .../16-libslirp0\_4.7.0-1ubuntu3\_amd64.deb ...

Unpacking libslirp0:amd64 (4.7.0-1ubuntu3) ...

Selecting previously unselected package slirp4netns.

Preparing to unpack .../17-slirp4netns\_1.2.1-1build2\_amd64.deb ...

Unpacking slirp4netns (1.2.1-1build2) ...

Setting up libip4tc2:amd64 (1.8.10-3ubuntu2) ...

Setting up libip6tc2:amd64 (1.8.10-3ubuntu2) ...

Setting up libnftnl11:amd64 (1.2.6-2build1) ...

Setting up docker-buildx-plugin (0.25.0-1~ubuntu.24.04~noble) ...

Setting up containerd.io (1.7.27-1) ...

Created symlink /etc/systemd/system/multi-user.target.wants/containerd.service → /usr/lib/systemd/system/containerd.service.

Setting up docker-compose-plugin (2.37.3-1~ubuntu.24.04~noble) ...

Setting up libltdl7:amd64 (2.4.7-7build1) ...

Setting up docker-ce-cli (5:28.3.0-1~ubuntu.24.04~noble) ...

Setting up libslirp0:amd64 (4.7.0-1ubuntu3) ...

Setting up pigz (2.8-1) ...

Setting up libnfnetlink0:amd64 (1.0.2-2build1) ...

Setting up docker-ce-rootless-extras (5:28.3.0-1~ubuntu.24.04~noble) ...

Setting up libnftables1:amd64 (1.0.9-1build1) ...

Setting up nftables (1.0.9-1build1) ...

Setting up slirp4netns (1.2.1-1build2) ...

Setting up libnetfilter-conntrack3:amd64 (1.0.9-6build1) ...

Setting up iptables (1.8.10-3ubuntu2) ...

update-alternatives: using /usr/sbin/iptables-legacy to provide /usr/sbin/iptables (iptables) in auto mode

update-alternatives: using /usr/sbin/ip6tables-legacy to provide /usr/sbin/ip6tables (ip6tables) in auto mode

update-alternatives: using /usr/sbin/iptables-nft to provide /usr/sbin/iptables (iptables) in auto mode

update-alternatives: using /usr/sbin/ip6tables-nft to provide /usr/sbin/ip6tables (ip6tables) in auto mode

update-alternatives: using /usr/sbin/arptables-nft to provide /usr/sbin/arptables (arptables) in auto mode

update-alternatives: using /usr/sbin/ebtables-nft to provide /usr/sbin/ebtables (ebtables) in auto mode

Setting up docker-ce (5:28.3.0-1~ubuntu.24.04~noble) ...

Created symlink /etc/systemd/system/multi-user.target.wants/docker.service → /usr/lib/systemd/system/docker.service.

Created symlink /etc/systemd/system/sockets.target.wants/docker.socket → /usr/lib/systemd/system/docker.socket.

Processing triggers for man-db (2.12.0-4build2) ...

Processing triggers for libc-bin (2.39-0ubuntu8.4) ...

rajeev@DESKTOP-JDQBCCU:/mnt/c/Users/DELL$ docker --version

Docker version 28.3.0, build 38b7060

rajeev@DESKTOP-JDQBCCU:/mnt/c/Users/DELL$ sudo usermod -aG docker $USER

rajeev@DESKTOP-JDQBCCU:/mnt/c/Users/DELL$ newgrp docker

rajeev@DESKTOP-JDQBCCU:/mnt/c/Users/DELL$ minikube start --driver=docker

😄 minikube v1.36.0 on Ubuntu 24.04 (kvm/amd64)

✨ Using the docker driver based on user configuration

📌 Using Docker driver with root privileges

👍 Starting "minikube" primary control-plane node in "minikube" cluster

🚜 Pulling base image v0.0.47 ...

💾 Downloading Kubernetes v1.33.1 preload ...

> preloaded-images-k8s-v18-v1...: 347.04 MiB / 347.04 MiB 100.00% 4.07 Mi

> gcr.io/k8s-minikube/kicbase...: 502.26 MiB / 502.26 MiB 100.00% 2.77 Mi

🔥 Creating docker container (CPUs=2, Memory=2200MB) ...

🐳 Preparing Kubernetes v1.33.1 on Docker 28.1.1 ...

▪ Generating certificates and keys ...

▪ Booting up control plane ...

▪ Configuring RBAC rules ...

🔗 Configuring bridge CNI (Container Networking Interface) ...

🔎 Verifying Kubernetes components...

▪ Using image gcr.io/k8s-minikube/storage-provisioner:v5

🌟 Enabled addons: storage-provisioner, default-storageclass

🏄 Done! kubectl is now configured to use "minikube" cluster and "default" namespace by default

rajeev@DESKTOP-JDQBCCU:/mnt/c/Users/DELL$ sudo apt update

sudo apt install -y helm

Hit:1 https://download.docker.com/linux/ubuntu noble InRelease

Hit:2 http://security.ubuntu.com/ubuntu noble-security InRelease

Hit:3 http://archive.ubuntu.com/ubuntu noble InRelease

Get:4 http://archive.ubuntu.com/ubuntu noble-updates InRelease [126 kB]

Hit:5 http://archive.ubuntu.com/ubuntu noble-backports InRelease

Fetched 126 kB in 3s (48.8 kB/s)

Reading package lists... Done

Building dependency tree... Done

Reading state information... Done

107 packages can be upgraded. Run 'apt list --upgradable' to see them.

Reading package lists... Done

Building dependency tree... Done

Reading state information... Done

No apt package "helm", but there is a snap with that name.

Try "snap install helm"

E: Unable to locate package helm

rajeev@DESKTOP-JDQBCCU:/mnt/c/Users/DELL$ curl https://raw.githubusercontent.com/helm/helm/main/scripts/get-helm-3 | bash

% Total % Received % Xferd Average Speed Time Time Time Current

Dload Upload Total Spent Left Speed

100 11913 100 11913 0 0 29065 0 --:--:-- --:--:-- --:--:-- 29056

Downloading https://get.helm.sh/helm-v3.18.3-linux-amd64.tar.gz

Verifying checksum... Done.

Preparing to install helm into /usr/local/bin

helm installed into /usr/local/bin/helm

rajeev@DESKTOP-JDQBCCU:/mnt/c/Users/DELL$ sudo apt install -y helm

Reading package lists... Done

Building dependency tree... Done

Reading state information... Done

No apt package "helm", but there is a snap with that name.

Try "snap install helm"

E: Unable to locate package helm

rajeev@DESKTOP-JDQBCCU:/mnt/c/Users/DELL$ sudo apt update helm

E: The update command takes no arguments

rajeev@DESKTOP-JDQBCCU:/mnt/c/Users/DELL$ sudo apt update -y helm

E: The update command takes no arguments

rajeev@DESKTOP-JDQBCCU:/mnt/c/Users/DELL$ sudo update helm

sudo: update: command not found

rajeev@DESKTOP-JDQBCCU:/mnt/c/Users/DELL$ sudo apt get update helm

E: Invalid operation get

rajeev@DESKTOP-JDQBCCU:/mnt/c/Users/DELL$ sudo apt update helm

E: The update command takes no arguments

rajeev@DESKTOP-JDQBCCU:/mnt/c/Users/DELL$ ls

AndroidStudioProjects SendTo

AppData 'Start Menu'

'Application Data' Templates

Contacts Untitled.ipynb

Cookies Untitled1.ipynb

Documents Untitled2.ipynb

Downloads Untitled3.ipynb

Favorites Videos

Links anaconda3

'Local Settings' anaconda\_projects

Music eclipse

'My Documents' edb\_pgagent\_pg15.exe

NTUSER.DAT erl\_crash.dump

NTUSER.DAT{7df44beb-f72a-11ef-9934-9b66dd43c229}.TM.blf matplotlib.ipynb

NTUSER.DAT{7df44beb-f72a-11ef-9934-9b66dd43c229}.TMContainer00000000000000000001.regtrans-ms minikube-linux-amd64

NTUSER.DAT{7df44beb-f72a-11ef-9934-9b66dd43c229}.TMContainer00000000000000000002.regtrans-ms ntuser.dat.LOG1

NetHood ntuser.dat.LOG2

OneDrive ntuser.ini

Postman numpy.ipynb

PrintHood package-lock.json

Recent pandas.ipynb

'Saved Games' pythonDataScience

Searches scikit\_learn\_data

rajeev@DESKTOP-JDQBCCU:/mnt/c/Users/DELL$ cd user

bash: cd: user: No such file or directory

rajeev@DESKTOP-JDQBCCU:/mnt/c/Users/DELL$ cd ./user

bash: cd: ./user: No such file or directory

rajeev@DESKTOP-JDQBCCU:/mnt/c/Users/DELL$ cd /user

bash: cd: /user: No such file or directory

rajeev@DESKTOP-JDQBCCU:/mnt/c/Users/DELL$ helm install spark-cluster bitnami/spark

NAME: spark-cluster

LAST DEPLOYED: Sun Jun 29 15:01:37 2025

NAMESPACE: default

STATUS: deployed

REVISION: 1

TEST SUITE: None

NOTES:

CHART NAME: spark

CHART VERSION: 10.0.0

APP VERSION: 4.0.0

Did you know there are enterprise versions of the Bitnami catalog? For enhanced secure software supply chain features, unlimited pulls from Docker, LTS support, or application customization, see Bitnami Premium or Tanzu Application Catalog. See https://www.arrow.com/globalecs/na/vendors/bitnami for more information.

\*\* Please be patient while the chart is being deployed \*\*

1. Get the Spark master WebUI URL by running these commands:

kubectl port-forward --namespace default svc/spark-cluster-master-svc 80:80

echo "Visit http://127.0.0.1:80 to use your application"

2. Submit an application to the cluster:

To submit an application to the cluster the spark-submit script must be used. That script can be

obtained at https://github.com/apache/spark/tree/master/bin. Also you can use kubectl run.

export EXAMPLE\_JAR=$(kubectl exec -ti --namespace default spark-cluster-worker-0 -- find examples/jars/ -name 'spark-example\*\.jar' | tr -d '\r')

kubectl exec -ti --namespace default spark-cluster-worker-0 -- spark-submit --master spark://spark-cluster-master-svc:7077 \

--class org.apache.spark.examples.SparkPi \

$EXAMPLE\_JAR 5

\*\* IMPORTANT: When submit an application from outside the cluster service type should be set to the NodePort or LoadBalancer. \*\*

\*\* IMPORTANT: When submit an application the --master parameter should be set to the service IP, if not, the application will not resolve the master. \*\*

WARNING: There are "resources" sections in the chart not set. Using "resourcesPreset" is not recommended for production. For production installations, please set the following values according to your workload needs:

- master.resources

- worker.resources

+info https://kubernetes.io/docs/concepts/configuration/manage-resources-containers/

rajeev@DESKTOP-JDQBCCU:/mnt/c/Users/DELL$ kubectl port-forward --namespace default svc/spark-cluster-master-svc 80:80

error: unable to forward port because pod is not running. Current status=Pending

rajeev@DESKTOP-JDQBCCU:/mnt/c/Users/DELL$ kubectl get pods -n default

NAME READY STATUS RESTARTS AGE

spark-cluster-master-0 1/1 Running 0 5m37s

spark-cluster-worker-0 1/1 Running 0 5m37s

spark-cluster-worker-1 1/1 Running 0 69s

rajeev@DESKTOP-JDQBCCU:/mnt/c/Users/DELL$ kubectl port-forward --namespace default svc/spark-cluster-master-svc 80:80

Unable to listen on port 80: Listeners failed to create with the following errors: [unable to create listener: Error listen tcp4 127.0.0.1:80: bind: permission denied unable to create listener: Error listen tcp6 [::1]:80: bind: permission denied]

error: unable to listen on any of the requested ports: [{80 8080}]

rajeev@DESKTOP-JDQBCCU:/mnt/c/Users/DELL$ kubectl port-forward --namespace default svc/spark-cluster-master-svc 8081:80

Forwarding from 127.0.0.1:8081 -> 8080

Forwarding from [::1]:8081 -> 8080

rajeev@DESKTOP-JDQBCCU:/mnt/c/Users/DELL$ kubectl port-forward --namespace default svc/spark-cluster-master-svc 8080:80

Forwarding from 127.0.0.1:8080 -> 8080

Forwarding from [::1]:8080 -> 8080

Handling connection for 8080

Handling connection for 8080

Handling connection for 8080

Handling connection for 8080

Handling connection for 8080

Handling connection for 8080

^Crajeev@DESKTOP-JDQBCCU:/mnt/c/Users/DELL$

rajeev@DESKTOP-JDQBCCU:/mnt/c/Users/DELL$ cd /usr/local/bin

rajeev@DESKTOP-JDQBCCU:/usr/local/bin$ ls

helm kubectl minikube

rajeev@DESKTOP-JDQBCCU:/usr/local/bin$ cd helm

bash: cd: helm: Not a directory

rajeev@DESKTOP-JDQBCCU:/usr/local/bin$ helm version

kubectl version --client

minikube version

version.BuildInfo{Version:"v3.18.3", GitCommit:"6838ebcf265a3842d1433956e8a622e3290cf324", GitTreeState:"clean", GoVersion:"go1.24.4"}

Client Version: v1.33.2

Kustomize Version: v5.6.0

minikube version: v1.36.0

commit: f8f52f5de11fc6ad8244afac475e1d0f96841df1-dirty

rajeev@DESKTOP-JDQBCCU:/usr/local/bin$ helm version

version.BuildInfo{Version:"v3.18.3", GitCommit:"6838ebcf265a3842d1433956e8a622e3290cf324", GitTreeState:"clean", GoVersion:"go1.24.4"}

rajeev@DESKTOP-JDQBCCU:/usr/local/bin$ helm repo add bitnami https://charts.bitnami.com/bitnami

"bitnami" has been added to your repositories

rajeev@DESKTOP-JDQBCCU:/usr/local/bin$ helm repo update

Hang tight while we grab the latest from your chart repositories...

...Successfully got an update from the "bitnami" chart repository

Update Complete. ⎈Happy Helming!⎈

rajeev@DESKTOP-JDQBCCU:/usr/local/bin$