01 HDFS Practice Environment -KirkYagami👨‍💻🕵️

What is a Hadoop Cluster?

A Hadoop cluster is a collection of computers, known as nodes, that are networked together to perform parallel computations on big data sets. The Name node is the master node of the Hadoop Distributed File System (HDFS). It maintains the meta data of the files in the RAM for quick access. An actual Hadoop Cluster setup involves extensive resources which are not within the scope of this lab. In this lab, you will use dockerized hadoop to create a Hadoop Cluster which will have:

1. Namenode
2. Datanode
3. Node Manager
4. Resource manager
5. Hadoop history server
6. git clone
   Execute the commands as it as.

```
git clone https://github.com/KirkYagami/docker_hadoop.git
cd docker_hadoop
```

```
docker-compose up -d
```

> *Compose is a tool for defining and running multi-container Docker applications. It uses the YAML file to configure the services and enables us to create and start all the services from just one configuration file.*

```
   # 3192219afd04 Pull complete
   # aa53513fe997 Pull complete
   # b0d764123f3e Pull complete
   # b04394ddb35d Pull complete
[+] Running 9/9
 # Network ooxwv-docker_hadoop_default                Created
 # Volume "ooxwv-docker_hadoop_hadoop_historyserver"  Created
 # Volume "ooxwv-docker_hadoop_hadoop_namenode"       Created
 # Volume "ooxwv-docker_hadoop_hadoop_datanode"       Created
 # Container nodemanager                              Started
 # Container datanode                                 Started
 # Container historyserver                            Started
 # Container namenode                                 Started
 # Container resourcemanager                          Started
```

To Run HDFS Commands

Start your docker engine and check whether the docker-hadoop container is running or not.
Run the namenode as a mounted drive on bash.

```
docker exec -it namenode /bin/bash
```

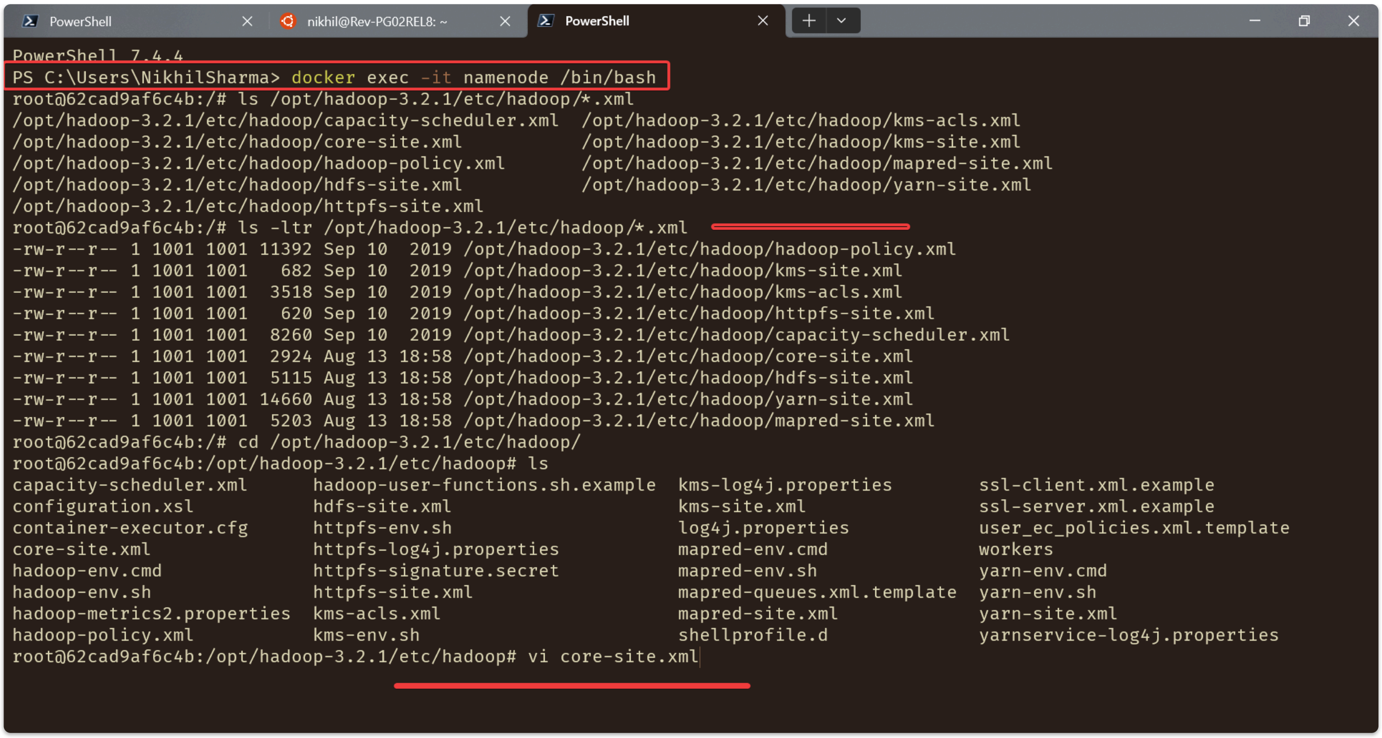
Explore the hadoop environment

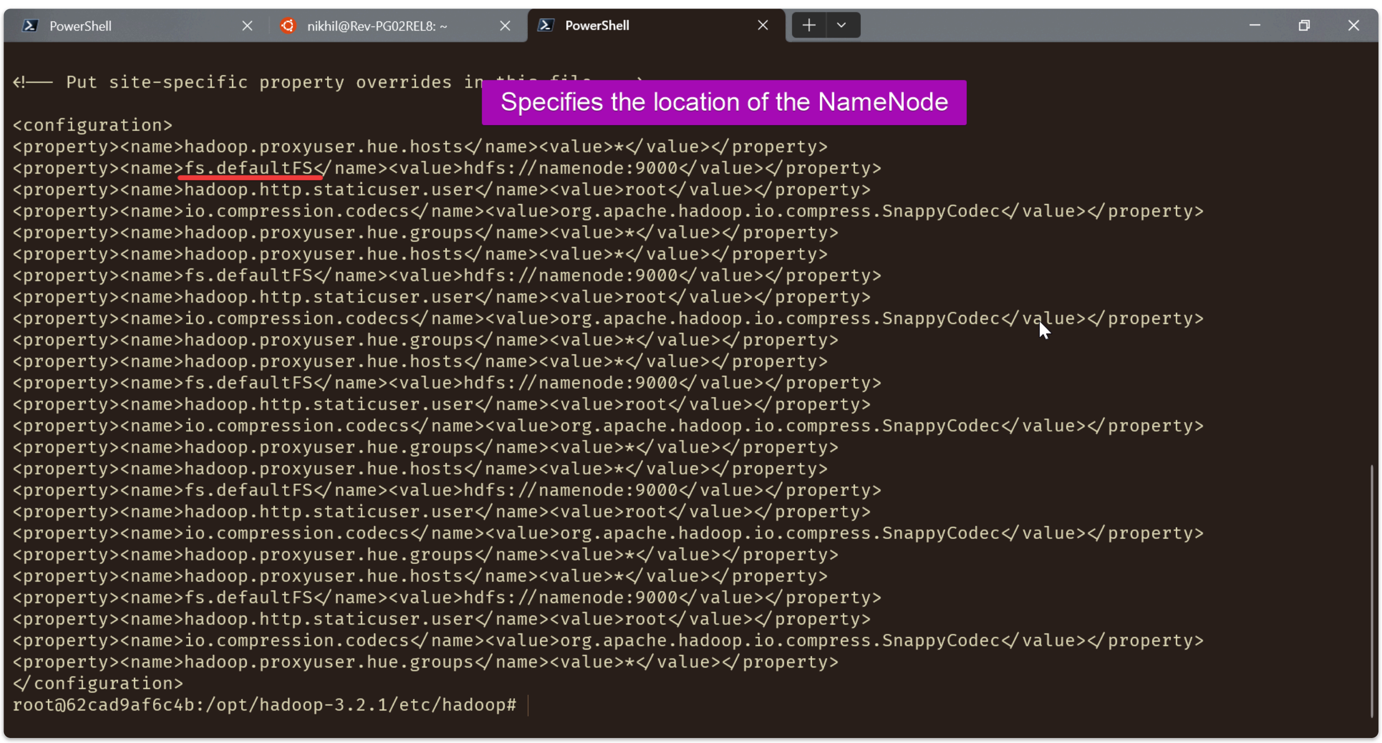
As you have learnt in the videos and reading thus far in the course, a Hadoop environment is configured by editing a set of configuration files:

- **hadoop-env.sh** Serves as a master file to configure YARN, HDFS, MapReduce, and Hadoop-related project settings.
- **core-site.xml** Defines HDFS and Hadoop core properties
- **hdfs-site.xml** Governs the location for storing node metadata, fsimage file and log file.
- **mapred-site-xml** Lists the parameters for MapReduce configuration.
- **yarn-site.xml** Defines settings relevant to YARN. It contains configurations for the Node Manager, Resource Manager, Containers, and Application Master.

For the docker image, these xml files have been configured already. You can see these in the directory **/opt/hadoop-3.2.1/etc/hadoop/** by running

```
ls /opt/hadoop-3.2.1/etc/hadoop/*.xml
ls -ltr /opt/hadoop-3.2.1/etc/hadoop/*.xml
```





1. In the HDFS, create a directory structure named `user/root/input`.

```
hdfs dfs -mkdir -p /user/root/input
```

2. Copy all the hadoop configuration xml files into the input directory.

```
hdfs dfs -put $HADOOP_HOME/etc/hadoop/*.xml /user/root/input
```

3. Create a `data.txt` file in the current directory.

```
curl https://raw.githubusercontent.com/KirkYagami/docker_hadoop/master/SampleMapReduce.txt --output data.txt
```

4. Copy the `data.txt` file into `/user/root`.

```
hdfs dfs -put data.txt /user/root/
```

5. Check if the file has been copied into the HDFS by viewing its content.

```
hdfs dfs -cat /user/root/data.txt
```