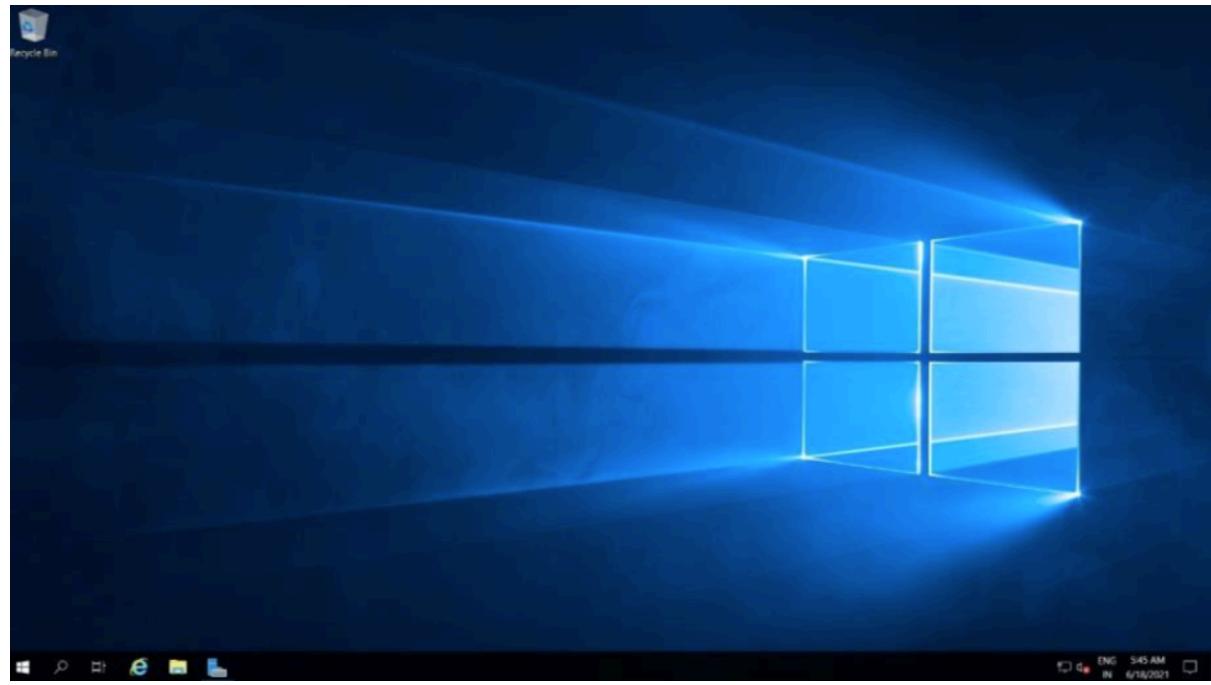


EXP13. DEMONSTRATE INFRASTRUCTURE AS A SERVICE (IAAS) BY CREATING A VIRTUAL MACHINE USING A PUBLIC CLOUD SERVICE PROVIDER (AZURE), CONFIGURE WITH REQUIRED MEMORY AND CPU.

The screenshot shows the Microsoft Azure portal interface. At the top, there's a search bar with the placeholder "Search resources, services, and docs (G+/" and a user profile icon. Below the header, the URL "Home > CreateVm-MicrosoftWindowsServer.WindowsServer-201-20210721104828 >" is visible. The main content area is titled "Record-virtual" and "Virtual machine". On the left, there's a sidebar with "Overview" selected, followed by "Activity log", "Access control (IAM)", "Tags", "Diagnose and solve problems", "Settings", "Networking", "Connect", "Windows Admin Center (preview)", "Disks", "Size", "Security", "Advisor recommendations", and "Extensions". The main pane is divided into sections: "Essentials" (Resource group, Status, Location, Subscription, Tags) and "Properties" (Virtual machine details like Computer name, Operating system, Publisher, Offer, Plan, VM generation, Agent status) and "Networking" (Public IP address, Private IP address, Virtual network/subnet, DNS name). The URL "https://portal.azure.com/#" is at the bottom of the browser window.



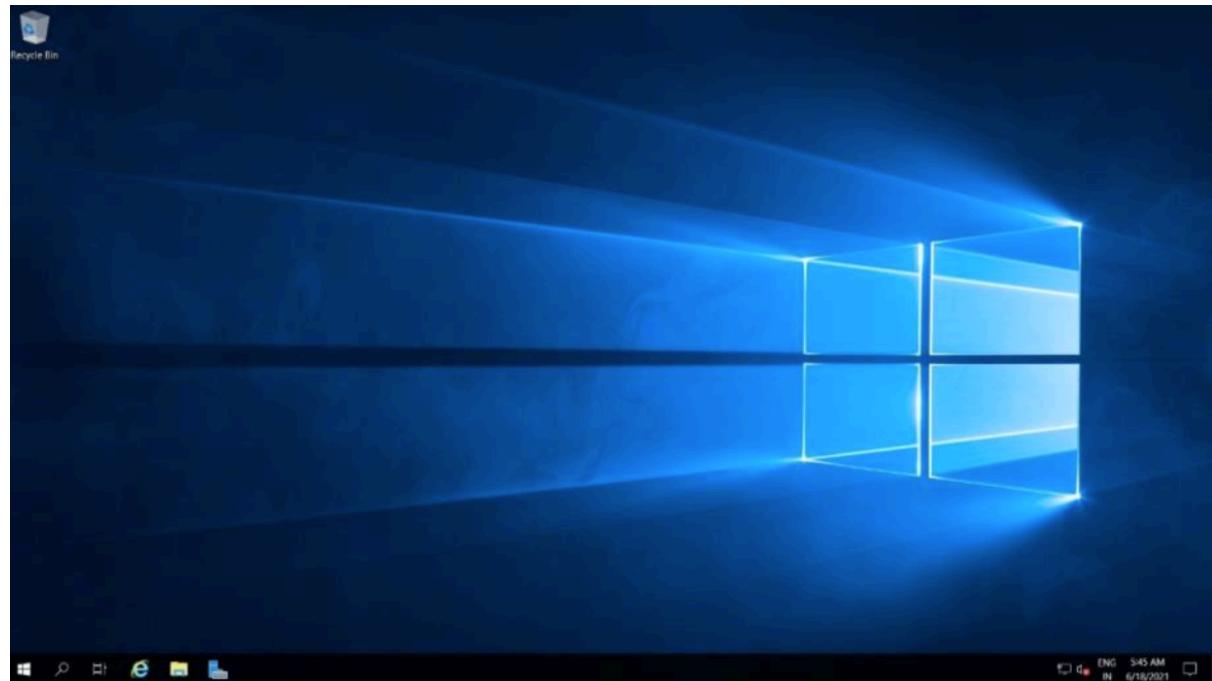
EXP 14 .DEMONSTRATE INFRASTRUCTURE AS A SERVICE(IAAS) BY CREATING AVIRTUAL MACHINE USING A PUBLIC CLOUD SERVICE PROVIDER(AZURE/GCP/AWS) CONFIGURE WITH MINIMUM CPU, RAM ANDSTORAGE AND LAUNCH THE VM IMAGE.

The screenshot shows the Microsoft Azure portal interface for managing a virtual machine. The main title bar says "Microsoft Azure" and "Search resources, services, and docs (G+ /)". The left sidebar lists "Record-virtual" under "Virtual machine". The main content area shows the "Essentials" tab with details about the VM:

| Resource group (change) : Record | | Operating system : Windows (Windows Server 2019 Datacenter) | |
|----------------------------------|--|---|--|
| Status | : Running | Size | : Standard DS1 v2 (1 vcpus, 3.5 GB memory) |
| Location | : East US | Public IP address | : 23.96.9.147 |
| Subscription (change) | : Azure for Students | Virtual network/subnet | : Record-vnet/default |
| Subscription ID | : db4eee0b-1e34-4be0-9c9c-65cc8d398405 | DNS name | : Not configured |
| Tags (change) | : Click here to add tags | | |

Below the Essentials tab, there are tabs for Properties, Monitoring, Capabilities (8), Recommendations, and Tutorials. The Properties tab is selected, showing the "Virtual machine" section with the following details:

| Virtual machine | | Networking | |
|------------------|--|---------------------------|---------------------|
| Computer name | Record-virtual | Public IP address | 23.96.9.147 |
| Operating system | Windows (Windows Server 2019 Datacenter) | Public IP address (IPv6) | - |
| Publisher | MicrosoftWindowsServer | Private IP address | 10.0.0.4 |
| Offer | WindowsServer | Private IP address (IPv6) | - |
| Plan | 2019-Datacenter | Virtual network/subnet | Record-vnet/default |
| VM generation | V1 | DNS name | Configure |
| Agent status | Ready | | |



EXP15.CREATE A SIMPLE WEB SITE USING ANY PUBLIC CLOUD SERVICE PROVIDER (AZURE/GCP/AWS) AND CHECK THE PUBLIC ACCESSIBILITY OFTHE STORED FILE TO DEMONSTRATE STORAGE AS A SERVICE

Microsoft Azure Search resources, services, and docs (G+)

Home > Microsoft.Web-WebApp-Portal-1b6a401b-9ae6 >

Record-app

App Service

Search (Ctrl+ /)

Browse Stop Swap Restart Delete Refresh Get publish profile Reset publish profile Share to mobile ...

Overview Essentials JSON View

Resource group (change) : Record URL : https://record-app.azurewebsites.net

Status : Running App Service Plan : ASP-Record-92e3 (B1: 1)

Location : Australia Central FTP/deployment username : No FTP/deployment user set

Subscription (change) : Azure for Students FTP hostname : ftp://waws-prod-cbr20-003.ftp.azurewebsites.wind...

Subscription ID : db4eee0b-1e34-4be0-9c9c-65cc8d398405 FTSP hostname : https://waws-prod-cbr20-003.ftp.azurewebsites.win...

Tags (change) : Click here to add tags

Diagnose and solve problems Application Insights

Our self-service diagnostic and troubleshooting experience helps you identify and resolve issues with your web app. Application insights helps you detect and diagnose quality issues in your apps, and helps you understand what your users actually do with it.

App Service Advisor

App Service Advisor provides insights for improving app experience on the App Service platform. Recommendations are sorted by freshness, priority and impact to your app.

Activity log Access control (IAM) Tags Diagnose and solve problems Security Events (preview)

Quickstart Deployment slots Deployment Center

Configuration Authentication

https://portal.azure.com/

https://record-app.azurewebsites.net

Microsoft Azure

Hey, Node developers!

Your app service is up and running.
Time to take the next step and deploy your code.

Have your code ready?
Use deployment center to get code published from your client or setup continuous deployment.

Don't have your code yet?
Follow our quickstart guide and you'll have a full app ready in 5 minutes or less.

Deployment Center Quickstart



EXP 16.DEMONSTRATE INFRASTRUCTURE AS A SERVICE(IAAS) BY CREATING AVIRTUAL MACHINE USING A PUBLIC CLOUD SERVICE PROVIDER(AZURE/GCP/AWS) CONFIGURE WITH MINIMUM CPU, RAM ANDSTORAGE AND LAUNCH THE VM IMAGE.

The screenshot shows the Microsoft Azure portal interface. At the top, there's a search bar and a user profile. Below it, the URL is [https://portal.azure.com/#](#). The main content area displays the properties of a virtual machine named "Record-virtual".

Essentials

| | | | |
|---------------------------|--------------------------------------|--------------------------|---|
| Resource group (change) : | Record | Operating system : | Windows (Windows Server 2019 Datacenter) |
| Status : | Running | Size : | Standard DS1 v2 (1 vcpus, 3.5 GiB memory) |
| Location : | East US | Public IP address : | 23.96.9.147 |
| Subscription (change) : | Azure for Students | Virtual network/subnet : | Record-vnet/default |
| Subscription ID : | db4eee0b-1e34-4be0-9c9c-65cc8d398405 | DNS name : | Not configured |
| Tags (change) : | Click here to add tags | | |

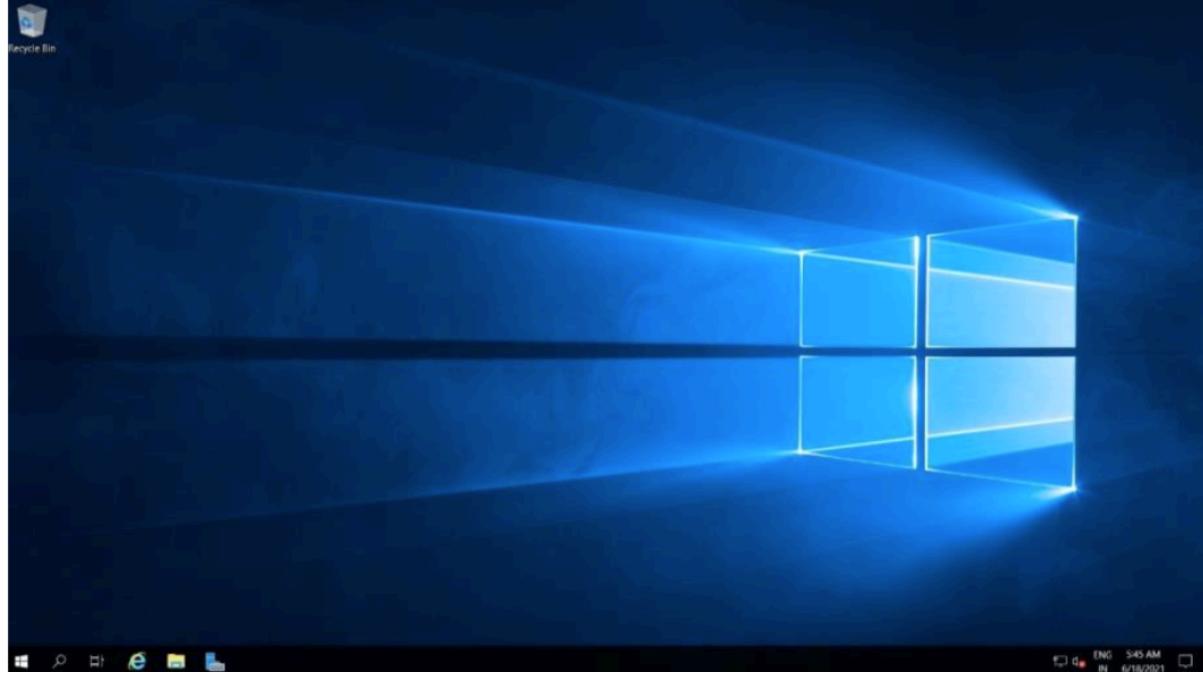
Properties **Monitoring** **Capabilities (8)** **Recommendations** **Tutorials**

Virtual machine

| | |
|------------------|--|
| Computer name | Record-virtual |
| Operating system | Windows (Windows Server 2019 Datacenter) |
| Publisher | MicrosoftWindowsServer |
| Offer | WindowsServer |
| Plan | 2019-Datacenter |
| VM generation | V1 |
| Agent status | Ready |

Networking

| | |
|---------------------------|---------------------|
| Public IP address | 23.96.9.147 |
| Public IP address (IPv6) | - |
| Private IP address | 10.0.0.4 |
| Private IP address (IPv6) | - |
| Virtual network/subnet | Record-vnet/default |
| DNS name | Configure |



EXP17.CREATE A STORAGE SERVICE USING ANY PUBLIC CLOUD SERVICE PROVIDER (AZURE/GCP/AWS) AND CHECK THE PUBLIC ACCESSIBILITY OFTHE STORED FILE TO DEMONSTRATE STORAGE AS A SERVICE.

Screenshot of Microsoft Azure Storage Explorer (preview) showing the contents of a Blob Container named '\$web'. The container contains 11 items, all of which are Active and have a Last Modified date of 7/21/2021, 1:30:35 PM. The items include various files such as 'about.jpg', 'hero-bg.png', 'index.html', 'logo.png', 'README.md', 'script.js', 'style.css', 'values-1.png', 'values-2.png', and 'values-3.png'.

| Name | Access Tier | Last Modified | Blob Type | Content Type | Size | Status | RI |
|--------------|----------------|-----------------------|------------|--------------------------|----------|--------|----|
| about.jpg | Hot (inferred) | 7/21/2021, 1:30:36 PM | Block Blob | image/jpeg | 188.6 KB | Active | |
| hero-bg.png | Hot (inferred) | 7/21/2021, 1:30:35 PM | Block Blob | image/png | 7.1 KB | Active | |
| hero-img.png | Hot (inferred) | 7/21/2021, 1:30:35 PM | Block Blob | image/png | 22.1 KB | Active | |
| index.html | Hot (inferred) | 7/21/2021, 1:30:34 PM | Block Blob | text/html | 9.6 KB | Active | |
| logo.png | Hot (inferred) | 7/21/2021, 1:30:34 PM | Block Blob | image/png | 1.0 KB | Active | |
| README.md | Hot (inferred) | 7/21/2021, 1:30:34 PM | Block Blob | application/octet-stream | 14 B | Active | |
| script.js | Hot (inferred) | 7/21/2021, 1:30:34 PM | Block Blob | text/javascript | 447 B | Active | |
| style.css | Hot (inferred) | 7/21/2021, 1:30:34 PM | Block Blob | text/css | 3.8 KB | Active | |
| values-1.png | Hot (inferred) | 7/21/2021, 1:30:35 PM | Block Blob | image/png | 20.3 KB | Active | |
| values-2.png | Hot (inferred) | 7/21/2021, 1:30:35 PM | Block Blob | image/png | 22.2 KB | Active | |
| values-3.png | Hot (inferred) | 7/21/2021, 1:30:35 PM | Block Blob | image/png | 19.6 KB | Active | |

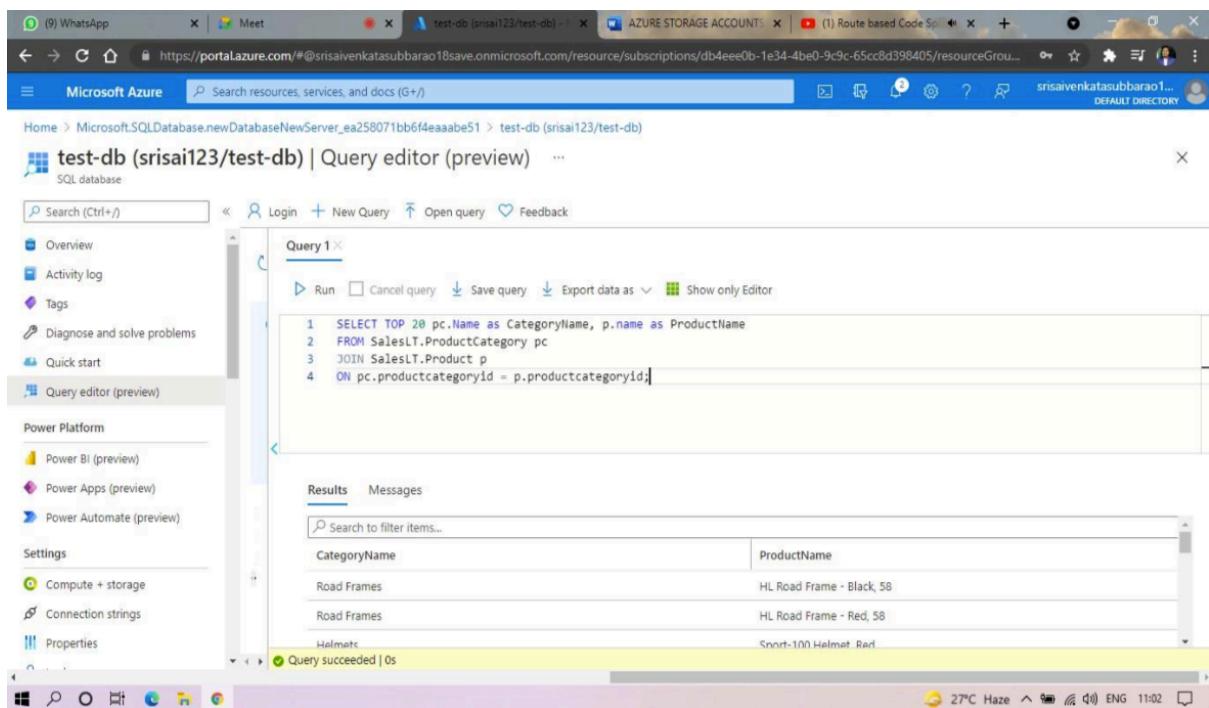
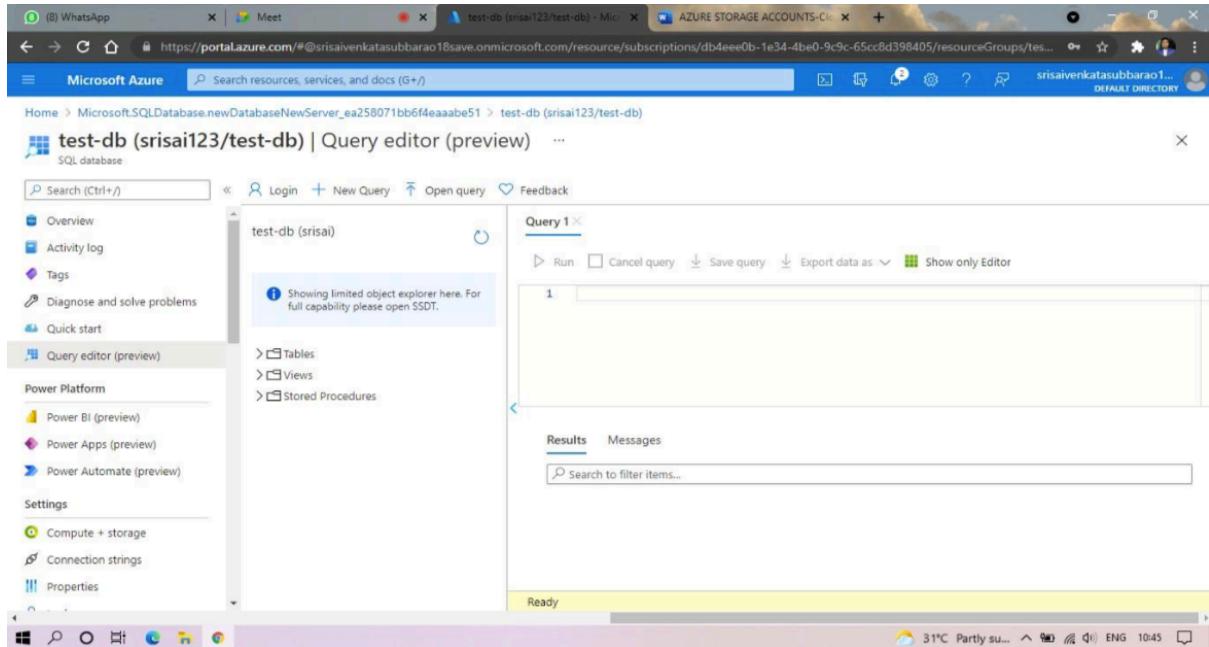
Screenshot of a web browser displaying a website at <https://recordstoragesubbarao.z13.web.core.windows.net>. The website features a large graphic of three people working on a large laptop screen, surrounded by server racks. The text on the page reads:

We offer modern solutions for growing your business

We are team of talented designers making websites with Bootstrap

[Get Started](#)

EXP18.CREATE A SQL STORAGE SERVICE AND PERFORM A BASIC QUERY USING ANY PUBLIC CLOUD SERVICE PROVIDER (AZURE/GCP/AWS) TO DEMONSTRATE DATABASE AS A SERVICE



EXP. 19: PERFORM THE BASIC CONFIGURATION SETUP FOR INSTALLING HADOOP 2.X LIKE CREATING THE HDUSER AND SSH LOCALHOST

```
udhay@ubuntu:~$ su hduser
Password:
hduser@ubuntu:/home/udhay$ ssh-keygen -t rsa -P ""
Generating public/private rsa key pair.
Enter file in which to save the key (/home/hduser/.ssh/id_rsa):
/home/hduser/.ssh/id_rsa already exists.
Overwrite (y/n)? y
Your identification has been saved in /home/hduser/.ssh/id_rsa.
Your public key has been saved in /home/hduser/.ssh/id_rsa.pub.
The key fingerprint is:
09:0f:15:f2:b2:b7:5e:11:1a:6c:d3:2f:c3:09:02:15 hduser@ubuntu
The key's randomart image is:
+---[RSA 2048]---+
|   ..E.o.      |
| . = .          |
| = B o          |
| O B +          |
| . S * .        |
| . . +          |
| . .           |
| . .           |
| . .           |
+-----+
hduser@ubuntu:~$ cat $HOME/.ssh/id_rsa.pub >> $HOME/.ssh/authorized_keys
hduser@ubuntu:/home/udhay$ ssh localhost
Welcome to Ubuntu 15.04 (GNU/Linux 3.19.0-84-generic x86_64)

 * Documentation: https://help.ubuntu.com/

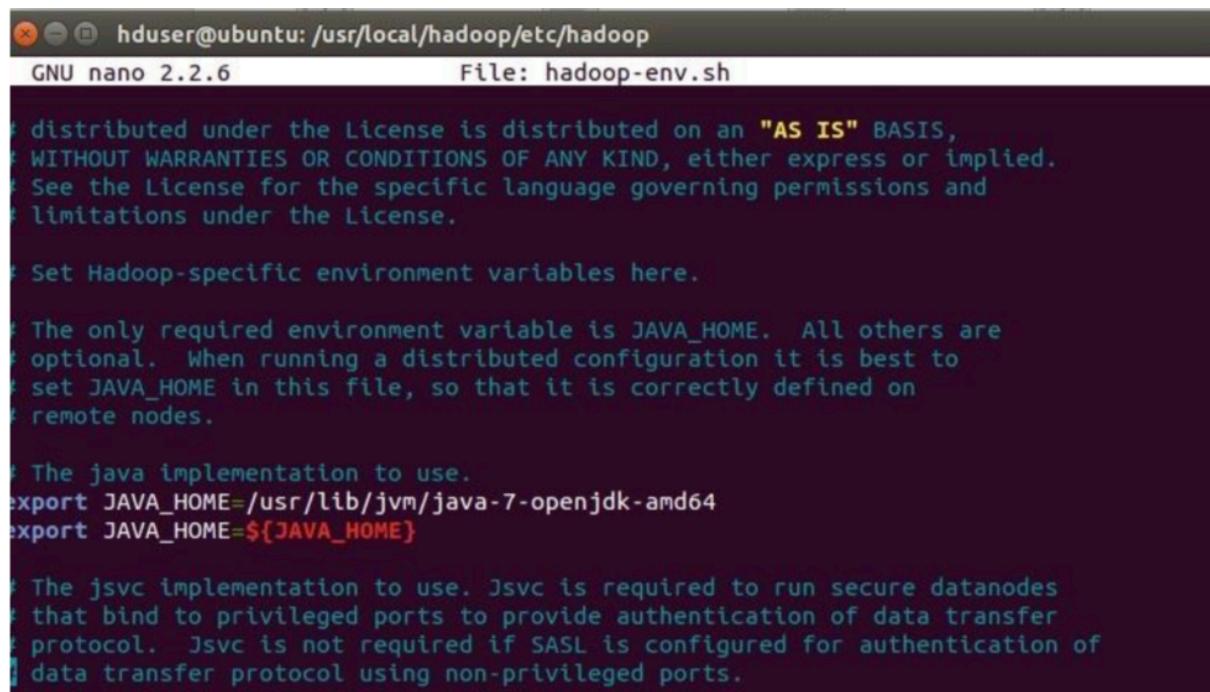
Last login: Thu Jul 15 22:00:14 2021 from localhost
hduser@ubuntu:~$
```

The screenshot shows a Mozilla Firefox browser window with the title "About the Cluster - Mozilla Firefox". The address bar displays "localhost:8088/cluster/cluster". The main content area is titled "About the Cluster" and features a large "hadoop" logo. On the left, there is a sidebar with a tree view under "Cluster" containing items like "About Nodes", "Node Labels", "Applications", and "Scheduler". The "Scheduler" section is expanded, showing metrics for "NEW", "NEW_SAVING", "SUBMITTED", "ACCEPTED", "RUNNING", "FINISHED", "FAILED", and "KILLED". Below this is a "Tools" section. The main content area displays "Cluster Metrics" and "Scheduler Metrics" tables. Under "Cluster Metrics", the table has columns: Apps Submitted, Apps Pending, Apps Running, Apps Completed, Containers, Memory Used, Memory Total, Memory Reserved, Vcores Used, Vcores Total, Vcores Reserved, Active Nodes, and ID. All values are zero except for Active Nodes (1). Under "Scheduler Metrics", it shows the Scheduler Type as "Capacity Scheduler" and the Scheduling Resource Type as "[MEMORY]". At the bottom, detailed cluster information is listed:

| | |
|--|--|
| Cluster ID: | 1626414170591 |
| ResourceManager state: | STARTED |
| ResourceManager HA state: | active |
| ResourceManager HA zookeeper connection state: | ResourceManager HA is not enabled. |
| ResourceManager RMStateStore: | org.apache.hadoop.yarn.server.resourcemanager.recovery.NullRMStateStore |
| ResourceManager started on: | Thu Jul 15 22:42:50 -0700 2021 |
| ResourceManager version: | 2.7.2 from b165c4fe8a74265c792ce23f546c64604acf0e41 by Jenkins source checksum 2016-01-26T00:16Z |
| Hadoop version: | 2.7.2 from b165c4fe8a74265c792ce23f546c64604acf0e41 by jenkins source checksum 2016-01-26T00:08Z |

Activate Windows

EXP. 20: INSTALL HADOOP 2.X AND CONFIGURE THE NAME NODE AND DATANODE.



```
hduser@ubuntu: /usr/local/hadoop/etc/hadoop
GNU nano 2.2.6          File: hadoop-env.sh

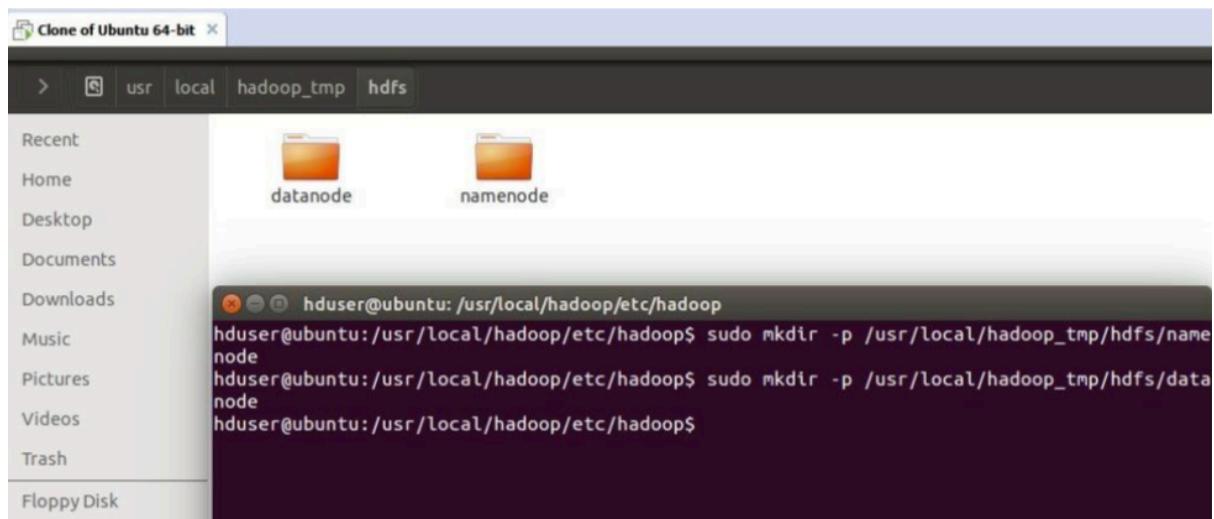
# distributed under the License is distributed on an "AS IS" BASIS,
# WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
# See the License for the specific language governing permissions and
# limitations under the License.

# Set Hadoop-specific environment variables here.

# The only required environment variable is JAVA_HOME. All others are
# optional. When running a distributed configuration it is best to
# set JAVA_HOME in this file, so that it is correctly defined on
# remote nodes.

# The java implementation to use.
export JAVA_HOME=/usr/lib/jvm/java-7-openjdk-amd64
export JAVA_HOME=${JAVA_HOME}

# The jsvc implementation to use. Jsvc is required to run secure datanodes
# that bind to privileged ports to provide authentication of data transfer
# protocol. Jsvc is not required if SASL is configured for authentication of
# data transfer protocol using non-privileged ports.
```



EXP. 15: LAUNCH THE HADOOP 2.X AND PERFORM MAPREDUCE PROGRAMFOR A WORD COUNT PROBLEM

```
hadoop1@ubuntu-1:~/project$ hadoop fs -cat /output/wordcount4/part-r-00000
.          1
a          1
and       1
as         1
count     1
counts    1
file      2
for       1
input     1
is        1
job       1
job.      1
map       1
returns   1
sample    1
takes     1
```

The screenshot shows a Mozilla Firefox browser window titled "Browsing HDFS - Mozilla Firefox". The address bar displays "localhost:50070/explorer.html#/output". The page content is titled "Browse Directory" and shows a table of files in the "/output" directory. The table has columns: Permission, Owner, Group, Size, Last Modified, Replication, Block Size, and Name. There are two entries:

| Permission | Owner | Group | Size | Last Modified | Replication | Block Size | Name |
|------------|--------|------------|------|-----------------------|-------------|------------|------------|
| -rw-r--r-- | hduser | supergroup | 0 B | 8/11/2016, 9:54:38 PM | 1 | 128 MB | _SUCCESS |
| -rw-r--r-- | hduser | supergroup | 44 B | 8/11/2016, 9:54:38 PM | 1 | 128 MB | part-00000 |