


Group member

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Launch a new EC2  
Ubuntu Server  
16.04 LTS (HVM),  
SSD Volume Type -  
ami-cd0f5cb6 (free  
tier) inside LabVpc,  
PublicSubnet1, with auto  
assigned public IP  
enabled

 **Ubuntu Server 20.04 LTS (HVM), SSD Volume Type** - ami-083654bd07b5da81d (64-bit x86) / ami-04fe9398b2a27a600 (64-bit Arm)

Free tier eligible

Root device type: ebs    Virtualization type: hvm    ENA Enabled: Yes

Select

☒ 64-bit (x86)  
☐ 64-bit (Arm)

### Step 2: Choose an Instance Type

Amazon EC2 provides a wide selection of instance types optimized to fit different use cases. Instances are virtual servers that can run applications. They have varying combinations of CPU, memory, storage, and networking capacity, and give you the flexibility to choose the appropriate mix of resources for your applications. [Learn more](#) about instance types and how they can meet your computing needs.

Filter by: 

All instance families

Current generation

[Show/Hide Columns](#)

Currently selected: t2.micro (- ECUs, 1 vCPUs, 2.5 GHz, -, 1 GiB memory, EBS only)

	Family	Type	vCPUs	Memory (GiB)	Instance Storage (GB)	EBS-Optimized Available	Network Performance	IPv6 Support
<input type="checkbox"/>	t2	t2.nano	1	0.5	EBS only	-	Low to Moderate	Yes
<input checked="" type="checkbox"/>	t2	t2.micro <small>Free tier eligible</small>	1	1	EBS only	-	Low to Moderate	Yes

[1. Choose AMI](#) [2. Choose Instance Type](#) [3. Configure Instance](#) [4. Add Storage](#) [5. Add Tags](#) [6. Configure Security Group](#) [7. Review](#)

### Step 3: Configure Instance Details

Configure the instance to suit your requirements. You can launch multiple instances from the same AMI, request Spot instances to take advantage of the lower pricing, assign an access management role to the instance, and more.

Number of instances


1

[Launch into Auto Scaling Group](#)


Purchasing option

☐ Request Spot instances

Network

vpc-0ef32a7643d19a4bd | Db-assignment  [Create new VPC](#)

Subnet

subnet-05953df443cb2f3af | Pub1 | us-east-1a  [Create new subnet](#)

249 IP Addresses available

Auto-assign Public IP

Enable

<p>As advanced Details, select user data as text and provide the following script</p> <pre>#!/bin/bash sudo apt-get update -y sudo apt-get install pdsh -y sudo apt install openjdk-8-jdk headless -y</pre>	<div><div>▼ Advanced Details</div><div><div>Enclave ⓘ</div><div><input type="checkbox"/> Enable</div></div><div><div>Metadata accessible ⓘ</div><div>Enabled</div></div><div><div>Metadata version ⓘ</div><div>V1 and V2 (token optional)</div></div><div><div>Metadata token response hop limit ⓘ</div><div>1</div></div><div><div>User data ⓘ</div><div><div><input checked="" type="radio"/> As text</div><div><input type="radio"/> As file</div><div><input type="checkbox"/> Input is already base64 encoded</div></div><div><pre>#!/bin/bash sudo apt-get update -y sudo apt-get install pdsh -y sudo apt install openjdk-8-jdk headless -y</pre></div></div></div>										
<p>Create a new security group called hadoop that would accept all traffic, from all protocols, all port range, from anywhere</p>	<div><div>Step 6: Configure Security Group</div><div>A security group is a set of firewall rules that control the traffic for your instance. On this page, you can add rules to allow specific traffic to reach your instance. For example, if you want to set up a web server and allow Internet traffic to reach your instance, add rules that allow unrestricted access to the HTTP and HTTPS ports. You can create a new security group or select from an existing one below. <a href="#">Learn more</a> about Amazon EC2 security groups.</div><div><div>Assign a security group:</div><div><div><input checked="" type="radio"/> Create a new security group</div><div><input type="radio"/> Select an existing security group</div></div><div><div>Security group name:</div><div>hadoop</div></div><div><div>Description:</div><div>launch-wizard-1 created 2021-11-12T23:21:40.482-05:00</div></div></div><table><thead><tr><th>Type ⓘ</th><th>Protocol ⓘ</th><th>Port Range ⓘ</th><th>Source ⓘ</th><th>Description ⓘ</th></tr></thead><tbody><tr><td>All traffic</td><td>All</td><td>0 - 65535</td><td>Anywhere 0.0.0.0/0, ::/0</td><td>e.g. SSH for Admin Desktop</td></tr></tbody></table></div>	Type ⓘ	Protocol ⓘ	Port Range ⓘ	Source ⓘ	Description ⓘ	All traffic	All	0 - 65535	Anywhere 0.0.0.0/0, ::/0	e.g. SSH for Admin Desktop
Type ⓘ	Protocol ⓘ	Port Range ⓘ	Source ⓘ	Description ⓘ							
All traffic	All	0 - 65535	Anywhere 0.0.0.0/0, ::/0	e.g. SSH for Admin Desktop							
<p>Login in the ec2 using putty (Windows) or ssh (Lunix)</p>	<div>Welcome to Ubuntu 20.04.3 LTS (GNU/Linux 5.11.0-1020-aws x86_64)</div> <div><div>* Documentation:</div><div>https://help.ubuntu.com</div></div> <div><div>* Management:</div><div>https://landscape.canonical.com</div></div> <div><div>* Support:</div><div>https://ubuntu.com/advantage</div></div> <div>System information as of Sat Nov 13 04:55:17 UTC 2021</div>										
<p>Update ~/.bashrc with the java home</p>	<pre>ubuntu@ip-30-0-0-111:~\$ echo "JAVA_HOME=/usr/lib/jvm/java-8-openjdk-amd64" &gt;&gt; ~/.bashrc ubuntu@ip-30-0-0-111:~\$ source ~/.bashrc</pre>										
<p>Download Hadoop</p>	<pre>ubuntu@ip-30-0-0-111:~\$ wget https://dlcdn.apache.org/hadoop/common/current/hadoop-3.3.1.tar.gz --2021-11-13 05:16:21-- https://dlcdn.apache.org/hadoop/common/current/hadoop-3.3.1.tar.gz Resolving dlcdn.apache.org (dlcdn.apache.org)... 151.101.2.132, 2a04:4e42::644 Connecting to dlcdn.apache.org (dlcdn.apache.org) 151.101.2.132 :443... connected. HTTP request sent, awaiting response... 200 OK Length: 605187279 (577M) [application/x-gzip] Saving to: 'hadoop-3.3.1.tar.gz'  hadoop-3.3.1.tar.gz  100%[=====&gt;] 577.15M  59.5MB/s   in 6.6s  2021-11-13 05:16:27 (87.9 MB/s) - 'hadoop-3.3.1.tar.gz' saved [605187279/605187279]</pre>										

Uncompress hadoop	<pre>[ubuntu@ip-30-0-0-111:~]\$ tar -xvf hadoop-3.3.1.tar.gz hadoop-3.3.1/ hadoop-3.3.1/licenses-binary/ hadoop-3.3.1/licenses-binary/LICENSE-hsql.txt hadoop-3.3.1/licenses-binary/LICENSE-zstd-jni.txt hadoop-3.3.1/licenses-binary/LICENSE-paranamer.txt</pre>
run ifconfig and make note of the ip address provided by ifconfig. Note if you stop and restart your EC2 instance again, this number will change and you will have to reconfigure /etc/hosts, /etc/hostname, and rsa	<pre>[ubuntu@ip-30-0-0-111:~]\$ ifconfig eth0: flags=4163&lt;UP,BROADCAST,RUNNING,MULTICAST&gt; mtu 9001     inet 30.0.0.111 netmask 255.255.255.0 broadcast 30.0.0.255     inet6 fe80::8b0:29ff:fe05:ecaf prefixlen 64 scopeid 0x20&lt;link&gt;     ether 0a:b0:29:05:ec:af txqueuelen 1000 (Ethernet)     RX packets 462160 bytes 682076186 (682.0 MB)     RX errors 0 dropped 0 overruns 0 frame 0     TX packets 79270 bytes 11367712 (11.3 MB)     TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0  lo: flags=73&lt;UP,LOOPBACK,RUNNING&gt; mtu 65536     inet 127.0.0.1 netmask 255.0.0.0     inet6 ::1 prefixlen 128 scopeid 0x10&lt;host&gt;     loop txqueuelen 1000 (Local Loopback)     RX packets 150 bytes 14246 (14.2 KB)     RX errors 0 dropped 0 overruns 0 frame 0     TX packets 150 bytes 14246 (14.2 KB)     TX errors 0 dropped 0 overruns 0 carrier 0 collisions 0</pre>

In my case, the ip address is 172.31.35.158 (notice that is this aws private IP address, which is ok)	30.0.0.111
Update /etc/hosts using this IP address and the <u>EC2 instance Public DNS (IPv4)</u> . To do so, you can use sudo nano /etc/hosts  <u>Make sure you delete the entry to 127.0.0.0 localhost</u>	 <pre>key — ubuntu@ec2-107-22-68-220: ~/hadoop-3.3.1/etc — ssh — 126x28 GNU nano 4.8                                     host 30.0.0.111 ec2-107-22-68-220.compute-1.amazonaws.com # The folloeing lines are sedirable for IPv6 capable hosts ::1 ip6-localhost ip6-loopback fe00::0 ip6-localnet ff00::0 ip6-mcastprefix ff02::1 ip6-allnodes ff02::2 ip6-allrouters ff02::3 ip6-allhosts</pre>

<p>Update hostname with the EC2 instance Public DNS (IPv4). In my case, my EC2 DNS is 'ec2-34-228-184-174.compute-1.amazonaws.com', therefore to do so I used <code>sudo hostnamectl set-hostname 'ec2-34-228-184-174.compute-1.amazonaws.com'</code></p>	<pre>[ubuntu@ec2-54-226-110-108:~/hadoop-3.3.1/etc\$ sudo hostnamectl set-hostname ec2-107-22-68-220.compute-1.amazonaws.com [ubuntu@ec2-54-226-110-108:~/hadoop-3.3.1/etc\$ hostname ec2-107-22-68-220.compute-1.amazonaws.com</pre>
<p>Create a ssh key</p>	<pre>[ubuntu@ec2-54-226-110-108:~/hadoop-3.3.1/etc\$ ssh-keygen -t rsa -P '' -f ~/.ssh/id_rsa Generating public/private rsa key pair. /home/ubuntu/.ssh/id_rsa already exists. Overwrite (y/n)? y Your identification has been saved in /home/ubuntu/.ssh/id_rsa Your public key has been saved in /home/ubuntu/.ssh/id_rsa.pub The key fingerprint is: [REDACTED] ubuntu@ec2-107-22-68-220.compute-1.amazonaws.com The key's randomart image is: [REDACTED] +-----+ [ubuntu@ec2-54-226-110-108:~/hadoop-3.3.1/etc\$ cat ~/.ssh/id_rsa.pub &gt;&gt; ~/.ssh/authorized_keys</pre>

<p>Test ssh. If you are not able to ssh to localhost, you did something wrong. First time, ubuntu will ask you confirm: type Y</p>	<pre>[ubuntu@ec2-54-226-110-108:~/hadoop-3.3.1/etc\$ ssh localhost Welcome to Ubuntu 20.04.3 LTS (GNU/Linux 5.11.0-1021-aws x86_64)   * Documentation:  https://help.ubuntu.com  * Management:    https://landscape.canonical.com  * Support:       https://ubuntu.com/advantage  System information as of Sun Nov 14 05:41:07 UTC 2021  System load:  0.0          Processes:           106 Usage of /:   50.4% of 7.69GB Users logged in:      1 Memory usage: 22%         IPv4 address for eth0: 30.0.0.111 Swap usage:   0%   * Ubuntu Pro delivers the most comprehensive open source security and   compliance features.  https://ubuntu.com/aws/pro  11 updates can be applied immediately. To see these additional updates run: apt list --upgradable  Last login: Sun Nov 14 05:26:27 2021 from 72.196.199.101 [ubuntu@ec2-107-22-68-220:~\$ ls</pre>
<p>If you successfully have been ssh to localhost, reboot the ec2 instance using AWS console and login again using putty</p>	

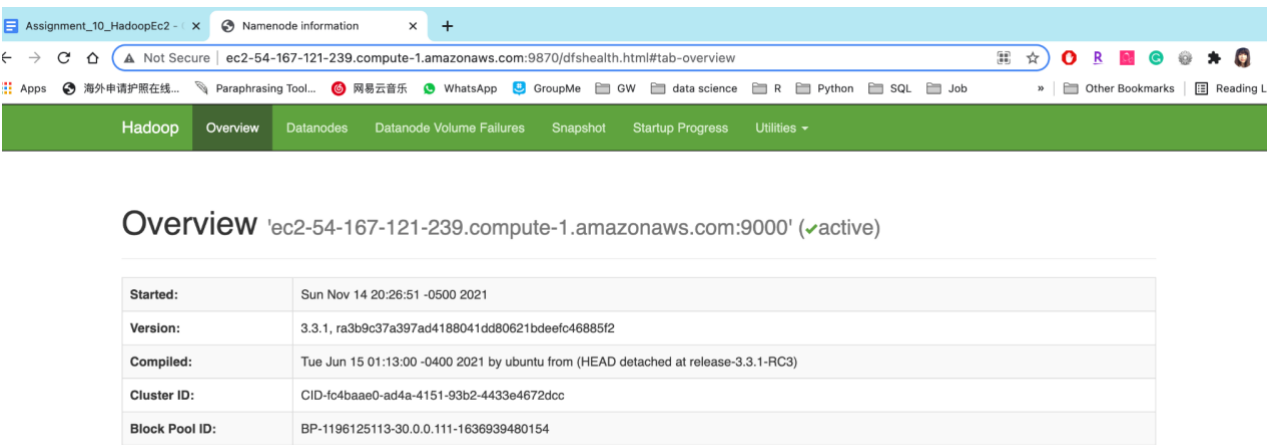
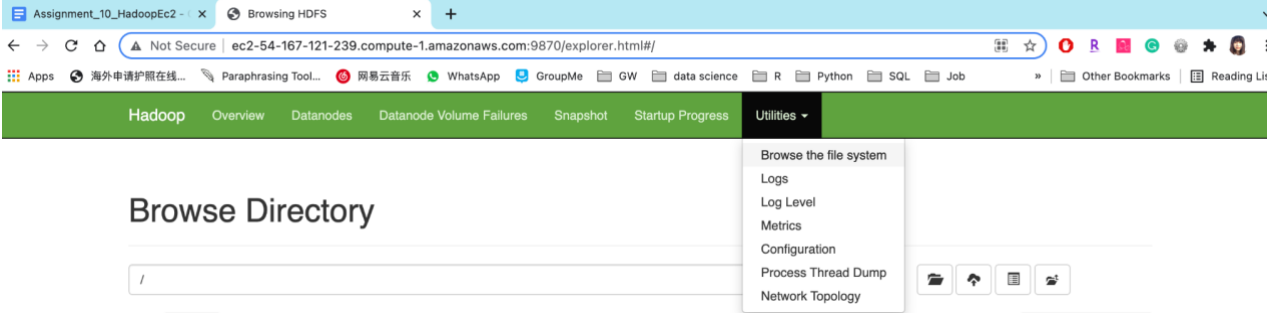
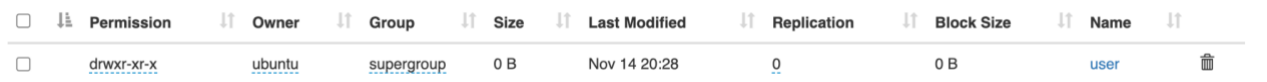
<p>Update Hadoop env with JAVA_HOME. To do so: cd hadoop-2.7.4 nano etc/hadoop/hadoop env.sh</p>	<pre>GNU nano 4.8                                hadoop-env.sh ### # Generic settings for HADOOP ###  # Technically, the only required environment variable is JAVA_HOME. # All others are optional.  However, the defaults are probably not # preferred.  Many sites configure these options outside of Hadoop, # such as in /etc/profile.d  # The java implementation to use.  By default, this environment # variable is REQUIRED on ALL platforms except OS X! export JAVA_HOME=/usr/lib/jvm/java-8-openjdk-amd64</pre>
<p>Test your configuration by using the stand-alone Hadoop installation</p>	<pre>[ubuntu@ec2-107-22-68-220:~\$ cd hadoop-3.3.1 [ubuntu@ec2-107-22-68-220:~/hadoop-3.3.1\$ ls LICENSE-binary  NOTICE-binary  README.txt  etc          include  lib      licenses-binary  sbin  unput LICENSE.txt     NOTICE.txt    bin         hadoop-env.sh  input   libexec  pp              share [ubuntu@ec2-107-22-68-220:~/hadoop-3.3.1\$ cp etc/hadoop/*.xml input [ubuntu@ec2-107-22-68-220:~/hadoop-3.3.1\$ bin/hadoop jar share/hadoop/mapreduce/hadoop-mapreduce-examples-3.3.1.jar grep input output 'dfs[a-z.]+' 2021-11-14 05:57:29,800 INFO impl.MetricsConfig: Loaded properties from hadoop-metrics2.properties 2021-11-14 05:57:30,029 INFO impl.MetricsSystemImpl: Scheduled Metric snapshot period at 10 second(s). [ubuntu@ec2-107-22-68-220:~/hadoop-3.3.1\$ cat output/* cd hadoop-2.7.4</pre>

	<pre>mkdir input cp etc/hadoop/*.xml input bin/hadoop jar share/hadoop/mapreduce/hadoop-mapreduce-examples-hadoop-2.7.4.jar grep input output 'dfs[a-z.]+' cat output/*</pre>
Check output: more output/part*	<pre>[ubuntu@ec2-107-22-68-220:~/hadoop-3.3.1\$ cat output/* 1      dfsadmin _</pre>
<p><b>Pseudo-Distributed Operation</b></p> <p>Hadoop can also be run on a single-node in a pseudo distributed mode where each Hadoop daemon runs in a separate Java process.</p>	
<p>Change etc/hadoop/core-site.xml by adding the following properties under configuration. Remember to use EC2 instance Public DNS (IPv4) you used previously.</p> <pre>&lt;configuration&gt;  &lt;property&gt; &lt;name&gt;fs.defaultFS&lt;/name&gt;</pre>	<pre>GNU nano 4.8      core-site.xml      Modified &lt;!-- Licensed under the Apache License, Version 2.0 (the "License"); you may not use this file except in compliance with the License. You may obtain a copy of the License at      http://www.apache.org/licenses/LICENSE-2.0  Unless required by applicable law or agreed to in writing, software 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. See accompanying LICENSE file. --&gt;  &lt;!-- Put site-specific property overrides in this file. --&gt;  &lt;configuration&gt; &lt;property&gt; &lt;name&gt;fs.defaultFS&lt;/name&gt; &lt;value&gt;hdfs://ec2-107-22-68-220.compute-1.amazonaws.com:9000&lt;/value&gt; &lt;/property&gt;  &lt;/configuration&gt;</pre>



<pre>&lt;value&gt;hdfs://ec2-34-228-184-174.compute-1.amazonaws.com:9000&lt;/value&gt; &lt;/property&gt;  &lt;/configuration&gt;</pre>	
<p>Change etc/hadoop/hdfs-site.xml by adding the following properties under configuration.</p> <pre>&lt;configuration&gt;  &lt;property&gt; &lt;name&gt;dfs.replication&lt;/name&gt; &lt;value&gt;1&lt;/value&gt; &lt;/property&gt;  &lt;/configuration&gt;</pre>	 <pre>key — ubuntu@ec2-107-22-68-220: ~/hadoop-3.3.1/etc/hadoop — ssh · sudo — 126x28 GNU nano 4.8 hdfs-site.xml Modified &lt;!-- Licensed under the Apache License, Version 2.0 (the "License"); you may not use this file except in compliance with the License. You may obtain a copy of the License at      http://www.apache.org/licenses/LICENSE-2.0  Unless required by applicable law or agreed to in writing, software 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. See accompanying LICENSE file. --&gt;  &lt;!-- Put site-specific property overrides in this file. --&gt;  &lt;configuration&gt; &lt;property&gt; &lt;name&gt;dfs.replication&lt;/name&gt; &lt;value&gt;1&lt;/value&gt; &lt;/property&gt; &lt;/configuration&gt;</pre>
Now let us run a MapReduce job locally	
Format the filesystem:	<pre>\$ bin/hdfs namenode -format [ubuntu@ec2-107-22-68-220:~/hadoop-3.3.1\$ bin/hdfs namenode -format</pre>
Start NameNode daemon and DataNode daemon:	<pre>\$ sbin/start-dfs.sh [ubuntu@ec2-107-22-68-220:~/hadoop-3.3.1\$ sbin/start-dfs.sh</pre>
Make the HDFS directories required to execute MapReduce jobs:	<pre>\$ bin/hdfs dfs -mkdir /user ubuntu@ec2-107-22-68-220:~/hadoop-3.3.1\$ bin/hdfs dfs -mkdir /user \$ bin/hdfs dfs -mkdir /user/ubuntu [ubuntu@ec2-107-22-68-220:~/hadoop-3.3.1\$ bin/hdfs dfs -mkdir /user/ubuntu</pre>
Copy the input files into the distributed filesystem (ignore the WARN exceptions)	<pre>\$ bin/hdfs dfs -mkdir input [ubuntu@ec2-107-22-68-220:~/hadoop-3.3.1\$ bin/hdfs dfs -mkdir input \$ bin/hdfs dfs -put etc/hadoop/*.xml input [ubuntu@ec2-107-22-68-220:~/hadoop-3.3.1\$ bin/hdfs dfs -put etc/hadoop/*.xml input</pre>

Run some of the examples provided:	<pre>\$ bin/hadoop jar share/hadoop/mapreduce/hadoop-mapreduce-examples-3.3.1.jar grep input output 'dfs[a-z.]+' [ubuntu@ec2-107-22-68-220:~/hadoop-3.3.1\$ bin/hadoop jar share/hadoop/mapreduce/hadoop-mapreduce-examples-3.3.1.jar grep input output 'dfs[a-z.]+' </pre>
Examine the output files: Copy the output files from the distributed filesystem to the local filesystem and examine them:	<pre>\$ bin/hdfs dfs -get output output [ubuntu@ec2-107-22-68-220:~/hadoop-3.3.1\$ bin/hdfs dfs -get output output \$ cat output/* [ubuntu@ec2-107-22-68-220:~/hadoop-3.3.1\$ cat output/* cat: output/output: Is a directory 1      dfsadmin </pre>

Open a browser and check results using Hadoop web UI	
Select Utilities/Browse the file system, then click Go!	
Click on user	



Click on ubuntu

Browse Directory

/user

Go!

Show 

25

 entries

Search:

<input type="checkbox"/>	<div><div></div><div></div></div> Permission	<div><div></div><div></div></div> Owner	<div><div></div><div></div></div> Group	<div><div></div><div></div></div> Size	<div><div></div><div></div></div> Last Modified	<div><div></div><div></div></div> Replication	<div><div></div><div></div></div> Block Size	<div><div></div><div></div></div> Name	<div><div></div><div></div></div>
<input type="checkbox"/>	<a href="#">drwxr-xr-x</a>	<a href="#">ubuntu</a>	<a href="#">supergroup</a>	0 B	Nov 14 20:29	<a href="#">0</a>	0 B	<a href="#">ubuntu</a>	<div></div>

Click on output

Browse Directory

/user/ubuntu

Go!

Show 

25

 entries

Search:

<input type="checkbox"/>	<div><div></div><div></div></div> Permission	<div><div></div><div></div></div> Owner	<div><div></div><div></div></div> Group	<div><div></div><div></div></div> Size	<div><div></div><div></div></div> Last Modified	<div><div></div><div></div></div> Replication	<div><div></div><div></div></div> Block Size	<div><div></div><div></div></div> Name	<div><div></div><div></div></div>
<input type="checkbox"/>	<a href="#">drwxr-xr-x</a>	<a href="#">ubuntu</a>	<a href="#">supergroup</a>	0 B	Nov 14 20:29	<a href="#">0</a>	0 B	<a href="#">input</a>	<div></div>
<input type="checkbox"/>	<a href="#">drwxr-xr-x</a>	<a href="#">ubuntu</a>	<a href="#">supergroup</a>	0 B	Nov 14 20:29	<a href="#">0</a>	0 B	<a href="#">output</a>	<div></div>

Click on part-r-0000

Download the file and check results

Browse Directory

/user/ubuntu/output

Go!

Show 

25

 entries

Search:

<input type="checkbox"/>	<div><div></div><div></div></div> Permission	<div><div></div><div></div></div> Owner	<div><div></div><div></div></div> Group	<div><div></div><div></div></div> Size	<div><div></div><div></div></div> Last Modified	<div><div></div><div></div></div> Replication	<div><div></div><div></div></div> Block Size	<div><div></div><div></div></div> Name	<div><div></div><div></div></div>
<input type="checkbox"/>	<a href="#">-rw-r--r--</a>	<a href="#">ubuntu</a>	<a href="#">supergroup</a>	0 B	Nov 14 20:29	<a href="#">1</a>	128 MB	<a href="#">_SUCCESS</a>	<div></div>
<input type="checkbox"/>	<a href="#">-rw-r--r--</a>	<a href="#">ubuntu</a>	<a href="#">supergroup</a>	29 B	Nov 14 20:29	<a href="#">1</a>	128 MB	<a href="#">part-r-00000</a>	<div></div>

Wordcount Test

key — ubuntu@ec2-34-234-83-6: ~/hadoop-3.3.1 — ssh • sudo — 148x43

GNU nano 4.8

mapper.py

! /user/bin/python

```
import sys

for line in sys.stdin:
    line = line.strip()
    keys = line.split()
    for key in keys:
        value = 1
        print("%s\t%d"%(key,value))
```

```
key — ubuntu@ec2-34-234-83-6: ~/hadoop-3.3.1 — ssh — sudo — 148x43
GNU nano 4.8 reducer.py
#!/usr/bin/env python
import sys
last_key = None
running_total = 0
for input_line in sys.stdin:
    input_line = input_line.strip()
    this_key,value = input_line.split("\t,1")
    value = int(value)
    if last_key == this_key:
        running_total +=value
    else:
        if last_key:
            print("%s\t%d"%(last_key,running_total))
            running_total = value
            last_key = this_key
        if last_key == this_key:
            print("%s\t%d"%(last_key,running_total))

ubuntu@ec2-34-234-83-6:~/hadoop-3.3.1$ ls
2701-0.txt  LICENSE.txt  NOTICE.txt  bin  hadoop-env.sh  input  libexec  logs  mobydict.txt  pp  sbin  unput
LICENSE-binary  NOTICE-binary  README.txt  etc  include  lib  licenses-binary  mapper.py  output  reducer.py  share

ubuntu@ec2-34-234-83-6:~/hadoop-3.3.1$ bin/hdfs dfs -mkdir wordcount
ubuntu@ec2-34-234-83-6:~/hadoop-3.3.1$ bin/hdfs dfs -put ./mobydict.txt wordcount
ubuntu@ec2-34-234-83-6:~/hadoop-3.3.1$ bin/hadoop jar share/hadoop/tools/lib/hadoop-streaming-3.3.1.jar -mapper "python $PWD/mapper.py" -reducer "python
$PWD/reducer.py" -input "wordcount/mobydict.txt" -output "wordcount/output"
2021-11-15 17:26:26,772 INFO impl.MetricsConfig: Loaded properties from hadoop-metrics2.properties
2021-11-15 17:26:26,966 INFO impl.MetricsSystemImpl: Scheduled Metric snapshot period at 10 second(s).
2021-11-15 17:26:26,966 INFO impl.MetricsSystemImpl: JobTracker metrics system started
```