# 4. Instalación de YARN en modo pseudo-distribuido

## 4.1. Configuración

Editar con permisos de administrador el archivo "~/.profile" para configurar las variables locales y actualizar la variable PATH

```
$ sudo gedit ~/.profile
```

Modificar la variable PATH para incluir las rutas por defecto y otras variables de configuración. **IMPORTANTE: Utilizar la ruta de vuestra instalación, en este ejemplo el usuario se llama hadoop y la carpeta donde está la aplicación también se llama hadoop**

```
PATH="/home/hadoop/hadoop/hadoop-3.3.4-aarch64/hadoop-3.3.4/bin:$PATH"

PATH="/home/hadoop/hadoop/hadoop-3.3.4-aarch64/hadoop-3.3.4/sbin:$PATH"

export HADOOP_HOME=/home/hadoop/hadoop/hadoop-3.3.1-aarch64/hadoop-3.3.4

export HADOOP_MAPRED_HOME=$HADOOP_HOME

export HADOOP_COMMON_HOME=$HADOOP_HOME local

export HADOOP_HDFS_HOME=$HADOOP_HOME

export YARN_HOME=$HADOOP_HOME
```

```
23
24 # set PATH so it includes user's private bin if it exists
25 if [ -d "$HOME/.local/bin" ] ; then
26     PATH="$HOME/.local/bin:$PATH"
27 fi
28
29 #Modificamos PATH para incluir las rutas de Haddop
30 PATH="/home/hadoop/hadoop/hadoop-3.3.1-aarch64/hadoop-3.3.1/bin:$PATH"
31 PATH="/home/hadoop/hadoop/hadoop-3.3.1-aarch64/hadoop-3.3.1/sbin:$PATH"
32
33 #Definimos variables adicionales
34 export HADOOP_HOME="/home/hadoop/hadoop/hadoop-3.3.1-aarch64/hadoop-3.3.1"
35 export HADOOP_MAPRED_HOME=$HADOOP_HOME
36 export HADOOP_COMMON_HOME=$HADOOP_HOME
37 export HADOOP_HDFS_HOME=$HADOOP_HOME
38 export YARN_HOME=$HADOOP_HOME
39
40
```

Nota el carácter ~ desde el editor podemos escribirlo con "ALT+SHIFT+U" muestra una u continuar tecleando el código de ~ en hexadecimal "7e" y pulsar la barra espaciadora.

Guardar los cambios y reiniciar sesión (también con gnome-session-quit)

Verificar que se han cargado correctamente las variables por ejemplo con

```
$ hadoop versión
```

```
hadoop@hadoop2:~$ hadoop version
Hadoop 3.3.1
Source code repository https://github.com/apache/hadoop.git -r a3b9c37a397ad4188
041dd80621bdeefc46885f2
Compiled by ubuntu on 2021-06-15T10:51Z
Compiled with protoc 3.7.1
From source with checksum 88a4ddb2299aca054416d6b7f81ca55
This command was run using /home/hadoop/hadoop/hadoop-3.3.1-aarch64/hadoop-3.3.1
/share/hadoop/common/hadoop-common-3.3.1.jar
hadoop@hadoop2:~$
```

## 4.2. Configuración de archivos de registro

Modificar etc/hadoop/mapred-site.xml

1.  Obtener la ruta de las librerías de hadoop con el comando

```
$hadoop classpath
```

```
hadoop@hadoop2:~$ hadoop classpath
/home/hadoop/hadoop/hadoop-3.3.1-aarch64/hadoop-3.3.1/etc/hadoop:/home/hadoop/hadoop/hadoop-3.3.1-aarch64/hadoop-3.3.1/sha
re/hadoop/common/lib/*:/home/hadoop/hadoop/hadoop-3.3.1-aarch64/hadoop-3.3.1/share/hadoop/common/*:/home/hadoop/hadoop/had
oop-3.3.1-aarch64/hadoop-3.3.1/share/hadoop/hdfs:/home/hadoop/hadoop/hadoop-3.3.1-aarch64/hadoop-3.3.1/share/hadoop/hdfs/l
ib/*:/home/hadoop/hadoop/hadoop-3.3.1-aarch64/hadoop-3.3.1/share/hadoop/hdfs/*:/home/hadoop/hadoop/hadoop-3.3.1-aarch64/ha
doop-3.3.1/share/hadoop/mapreduce/*:/home/hadoop/hadoop/hadoop-3.3.1-aarch64/hadoop-3.3.1/share/hadoop/yarn:/home/hadoop/h
adoop/hadoop-3.3.1-aarch64/hadoop-3.3.1/share/hadoop/yarn/lib/*:/home/hadoop/hadoop/hadoop-3.3.1-aarch64/hadoop-3.3.1/shar
e/hadoop/yarn/*
```

2.  Copiar el resultado
3.  Modificar etc/hadoop/mapred-site.xml indicando en el valor de la propiedad

```
<configuration>

        <property>

                <name>mapreduce.framework.name</name>

                <value>yarn</value>

        </property>



        <property>

                <name>mapreduce.application.classpath</name>

                <value>**Pegar aquí el resultado del comando anterior ***  </value>

        </property>

</configuration>
```

```
  yarn-site.xml                    ×              *mapred-site.xml                              ×

 2 <?xml-stylesheet type="text/xsl" href="configuration.xsl"?>
 3 <!--
 4   Licensed under the Apache License, Version 2.0 (the "License");
 5   you may not use this file except in compliance with the License.
 6   You may obtain a copy of the License at
 7
 8     http://www.apache.org/licenses/LICENSE-2.0
 9
10   Unless required by applicable law or agreed to in writing, software
11   distributed under the License is distributed on an "AS IS" BASIS,
12   WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
13   See the License for the specific language governing permissions and
14   limitations under the License. See accompanying LICENSE file.
15 -->
16
17 <!-- Put site-specific property overrides in this file. -->
18
19 <configuration>
20       <property>
21             <name>mapreduce.framework.name</name>
22             <value>yarn</value>
23       </property>
24       <property>
25             <name>mapreduce.application.classpath</name>
26             <value>/home/hadoop/hadoop/hadoop-3.3.1-aarch64/hadoop-3.3.1/etc/hadoop:/home/hadoop/hadoop/hadoop-3.3.1-aarch64/
   hadoop-3.3.1/share/hadoop/common/lib/*:/home/hadoop/hadoop/hadoop-3.3.1-aarch64/hadoop-3.3.1/share/hadoop/common/*:/home/hadoop/-
   hadoop/hadoop-3.3.1-aarch64/hadoop-3.3.1/share/hadoop/hdfs:/home/hadoop/hadoop/hadoop-3.3.1-aarch64/hadoop-3.3.1/share/hadoop/-
   hdfs/lib/*:/home/hadoop/hadoop/hadoop-3.3.1-aarch64/hadoop-3.3.1/share/hadoop/hdfs/*:/home/hadoop/hadoop/hadoop-3.3.1-aarch64/-
   hadoop-3.3.1/share/hadoop/mapreduce/*:/home/hadoop/hadoop/hadoop-3.3.1-aarch64/hadoop-3.3.1/share/hadoop/yarn:/home/hadoop/-
   hadoop/hadoop-3.3.1-aarch64/hadoop-3.3.1/share/hadoop/yarn/lib/*:/home/hadoop/hadoop/hadoop-3.3.1-aarch64/hadoop-3.3.1/share/-
   hadoop/yarn/*</value>
27       </property>
28        |
29
30 </configuration>
```

Modificar el archivo etc/hadoop/yarn-site.xml:

```
<configuration>

    <property>

        <name>yarn.nodemanager.aux-services</name>

        <value>mapreduce_shuffle</value>

    </property>

    <property>

        <name>yarn.nodemanager.env-whitelist</name>

        <value>JAVA_HOME,HADOOP_COMMON_HOME,HADOOP_HDFS_HOME,HADOOP_CONF_
DIR,CLASSPATH_PREPEND_DISTCACHE,HADOOP_YARN_HOME,HADOOP_HOME,PATH,LANG,TZ,HA
DOOP_MAPRED_HOME</value>

    </property>

</configuration>
```

```
     mapred-site.xml                    ×              *yarn-site.xml              ×
 1 <?xml version="1.0"?>
 2 <!--
 3   Licensed under the Apache License, Version 2.0 (the "License");
 4   you may not use this file except in compliance with the License.
 5   You may obtain a copy of the License at
 6
 7     http://www.apache.org/licenses/LICENSE-2.0
 8
 9   Unless required by applicable law or agreed to in writing, software
10   distributed under the License is distributed on an "AS IS" BASIS,
11   WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.
12   See the License for the specific language governing permissions and
13   limitations under the License. See accompanying LICENSE file.
14 -->
15 <configuration>
16 <!-- Site specific YARN configuration properties -->
17      <property>
18              <name>yarn.nodemanager.aux-services</name>
19              <value>mapreduce_shuffle</value>
20      </property>
21      <property>
22              <name>yarn.nodemanager.env-whitelist</name>
23              <value>JAVA_HOME,HADOOP_COMMON_HOME, HADOOP_HDFS_HOME, HADOOP_CONF_DIR,
   CLASSPATH_PREPEND_DISTCACHE,HADOOP_YARN_HOME, HADOOP_HOME, PATH, LANG,TZ,HADOOP_MAPRED_HOME</value>
24      </property>
25 </configuration>
```

## 4.3. _Iniciamos el servicio YARN de NodeManager

Conectar con ssh a localhost

```
$ sbin/start-yarn.sh
```



```
hadoop@hadoop2:~/hadoop/hadoop-3.3.1-aarch64/hadoop-3.3.1$ sbin/start-yarn.sh
Starting resourcemanager
Starting nodemanagers
```

Acceder a la interfaz web de Yar

Resource Manager → http://localhost:8088



## 4.4. Detener el servicio de YARN

```
$ sbin/stop-yarn.sh
```

## 4.5. Prueba de ejecución con YARN

Ejecutar el ejemplo de cálculo de PI con YARN

```
yarn jar $YARN_HOME/share/hadoop/mapreduce/hadoop-mapreduce-examples-
3.3.4.jar pi 16 100000
```

Consultar logs de ejecución desde la consola localhost:8088



En la Ventana de terminal podemos ver el proceso

Resultado final

```
                    WRONG_REDUCE=0
        File Input Format Counters
                Bytes Read=1888
        File Output Format Counters
                Bytes Written=97
Job Finished in 45.183 seconds
Estimated value of Pi is 3.14157500000000000000
hadoop@hadoop2:~$
```

NOTA: Para practicar, ejecutar el ejemplo 3.7 con yarn en vez de hadoop

## 4.6. Proceso completo

1.  Iniciar servicio dfs → start-dfs.sh
2.  Verificar que tanto el namenode como el datanode está activo → localhost:9870.
    2.1.  Si no está levantado el datanode.
        2.1.1.Parar servicio namenode y datanode        stop-dfs.sh
        2.1.2.Borrar carpeta (recorder que la ruta puede variar con vuestro usuario de Ubuntu)
            → tmp/hadoop-hadoop/dfs
        2.1.3.Formatear en nodo → hdfs namenode -format
        2.1.4.Iniciar el servicio de datanode y namenode → start-dfs.sh
3.  Iniciar Yarn → start-yarn.sh
4.  Verificar que el servicio está activo → localhost/8088
5.  Ejecutar comando mapred