SETUP Spark Cluster

# 1. Installing environments

## 1.1 Installing Java 11

Spark uses JDK 11, installs Java 11 packages and sets environment variables

Open the "edit environment variable" tool

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## 1.2 Installing Python

Download python from <https://www.python.org/downloads/> website and install them. Then open "edit environment variable" tool and declare environment variable

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# 2. Installing Spark

## 2.1 Download Spark

Download spark at the following address <https://www.apache.org/dyn/closer.lua/spark/spark-3.5.3/spark-3.5.3-bin-hadoop3.tgz>

After downloading, we unzip the folder

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## 2.2 Setup Spark in Window

Next we need to open the "edit environment variable " tool and declare environment variables for spark



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# 3. Testing spark

Use the command cd %SPARK\_HOME% to move to the Spark directory and type the command "Spark-Shell"

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# 4. Setup Spark Cluster

## 4.1 Connecting to a common network (master and workers)

A screen shot of a phone

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Master's ip address

A screen shot of a computer

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Slave's ip address

A screen shot of a black screen

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## 4.2 Renaming the hosts

Rename the host file of the master and slave machines for easy management (perform on master and workers)

Run command prompt as admin

A screenshot of a computer command prompt

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To easily manage slave machine addresses by name instead of numbers. Type the command “notepad C:\Windows\System32\drivers\etc\hosts” to name each ip

A screenshot of a computer program

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A screenshot of a computer screen

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This will help us manage the machine easily when pinging or checking. Instead of pinging the machine address directly, we only need to ping the machine name.

## 4.3 Turning off the firewall

Turn off the firewall of the master and slave machines (master and workers)

Open “Control Panel”

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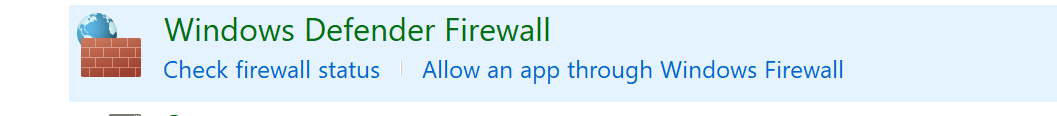
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Click “System and Security”

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Click “Windows Defender Firewall”



Click “Turn Windows Defender Firewall on or off”

A screenshot of a computer

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Turn off and click ok

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## 4.4 Check connection

Use the ngocphung-master machine to ping the ngocphung-slave machine

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Use the ngocphung-slave machine to ping the ngocphung-master machine

A computer screen shot of a program

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## 4.5 Setup Environment

### 4.5.1 spark-defaults.conf (In Master and Slave)

Create file spark-defaults.conf in %SPARK\_HOME%\conf

|  |
| --- |
| spark.master spark://192.168.1.131:7077  spark.eventLog.enabled true  spark.eventLog.dir file:///c:/tmp/spark-events  spark.history.fs.logDirectory file:///c:/tmp/spark-events  spark.serializer org.apache.spark.serializer.KryoSerializer |

### 4.5.2 spark-env.cmd (In Master)

Create file spark-env.cmd in %SPARK\_HOME%\conf

|  |
| --- |
| set JAVA\_HOME=W:\Java\jdk-1.8  set SPARK\_HOME=C:\Spark\spark-3.5.3-bin-hadoop3  set HADOOP\_HOME=C:\Hadoop\hadoop-3.3.6  set SPARK\_MASTER\_HOST=192.168.1.131  set SPARK\_WORKER\_CORES=8  set SPARK\_LOCAL\_IP=192.168.1.131  set PATH=%JAVA\_HOME%\bin;%SCALA\_HOME%\bin;%SPARK\_HOME%\bin;%HADOOP\_HOME%\bin;%PATH%  set PYSPARK\_PYTHON=C:\Python\python.exe  set PYSPARK\_PYTHON=C:\Python\python.exe  set PYSPARK\_DRIVER\_PYTHON=C:\Python\python.exe |

### 4.5.3 spark-env.cmd (In Slave)

Create file spark-env.cmd in %SPARK\_HOME%\conf

|  |
| --- |
| set JAVA\_HOME=C:\Java-1.8\jdk-1.8  set SPARK\_HOME=C:\Spark\spark-3.5.3-bin-hadoop3  set HADOOP\_HOME=C:\Hadoop\hadoop-3.3.6  set SPARK\_MASTER\_HOST=192.168.1.131 set SPARK\_WORKER\_CORES=8  set SPARK\_LOCAL\_IP=192.168.1.120  set PATH=%JAVA\_HOME%\bin;%SCALA\_HOME%\bin;%SPARK\_HOME%\bin;%HADOOP\_HOME%\bin;%PATH%  set PYSPARK\_PYTHON=C:\Users\LG\AppData\Local\Programs\Python\Python311\python.exe  set PYSPARK\_PYTHON=C:\Users\LG\AppData\Local\Programs\Python\Python311\python.exe  set PYSPARK\_DRIVER\_PYTHON=C:\Users\LG\AppData\Local\Programs\Python\Python311\python.exe |

### 4.5.4 Worker (In Master)

Create file Master in %SPARK\_HOME%\conf

|  |
| --- |
| 192.168.1.131 ngocphung-master  192.168.1.120 tientran-slave  192.168.1.23 phuthanh-slave  192.168.1.172 vanhao-slave |

### 4.5.5 Worker (In Slave)

Create file Worker in %SPARK\_HOME%\conf

|  |
| --- |
| 192.168.1.172 vanhao-slave |

## 4.5 Deploy on the master machine (execute on the master machine)

Navigate to Spark\_Home using the following command “cd %SPARK\_HOME%\bin”

Start the master machine using the following command “spark-class2.cmd org.apache.spark.deploy.master.Master”

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## 4.6 Deploy on the slave machine (execute on the slave machine)

Navigate to Spark\_Home using the following command “cd %SPARK\_HOME%\bin”

Start the master machine using the following command “spark-class2.cmd org.apache.spark.deploy.worker.Worker spark://192.168.1.129:7077”

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## 4.7 Checking on master

We can see in the worker section that the name of a machine matches the IP address of the slave machine.

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