Setting Up Spark, PySpark and Notebook

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Setting up your workstation

Session Outline

We'll

- Set up your system
- Run "Hello World"

Setting up

Your System

- Ubuntu 16.04LTS
- 64-bit
- Python3 (Anaconda)

What we'll set-up

- Spark2.0
- findspark

Hello World

We'll

- Start a local Spark server
- Use pyspark to run a program
- Understand the Spark MasterWebUI

Setting Up

Install Spark

We'll use Spark 2.0.0, prebuilt for Hadoop 2.7 or later

Download link

- http://d3kbcqa49mib13.cloudfront.net/spark-2.0.0-bin-hadoop2.7.tgz

Spark Download Page

- http://spark.apache.org/downloads.html

PySpark

How to talk to PySpark from Jupyter Notebooks

- PySpark isn't on sys.path by default
  - This means the Python kernel in Jupyter Notebook doesn't know where to look for PySpark
- You can address this by either
  - symlinking pyspark into your site-packages, or
  - adding pyspark to sys.path at runtime
    - by passing the path diretly
    - by looking at a running instance
- *findspark* adds pyspark to sys.path at runtime

PySpark

How to talk to PySpark from Jupyter Notebooks

findspark homepage

- https://github.com/minrk/findspark

Install

pip install findspark

Hello World

Install Spark

Just extract the files and folders from the compressed file and you are done.

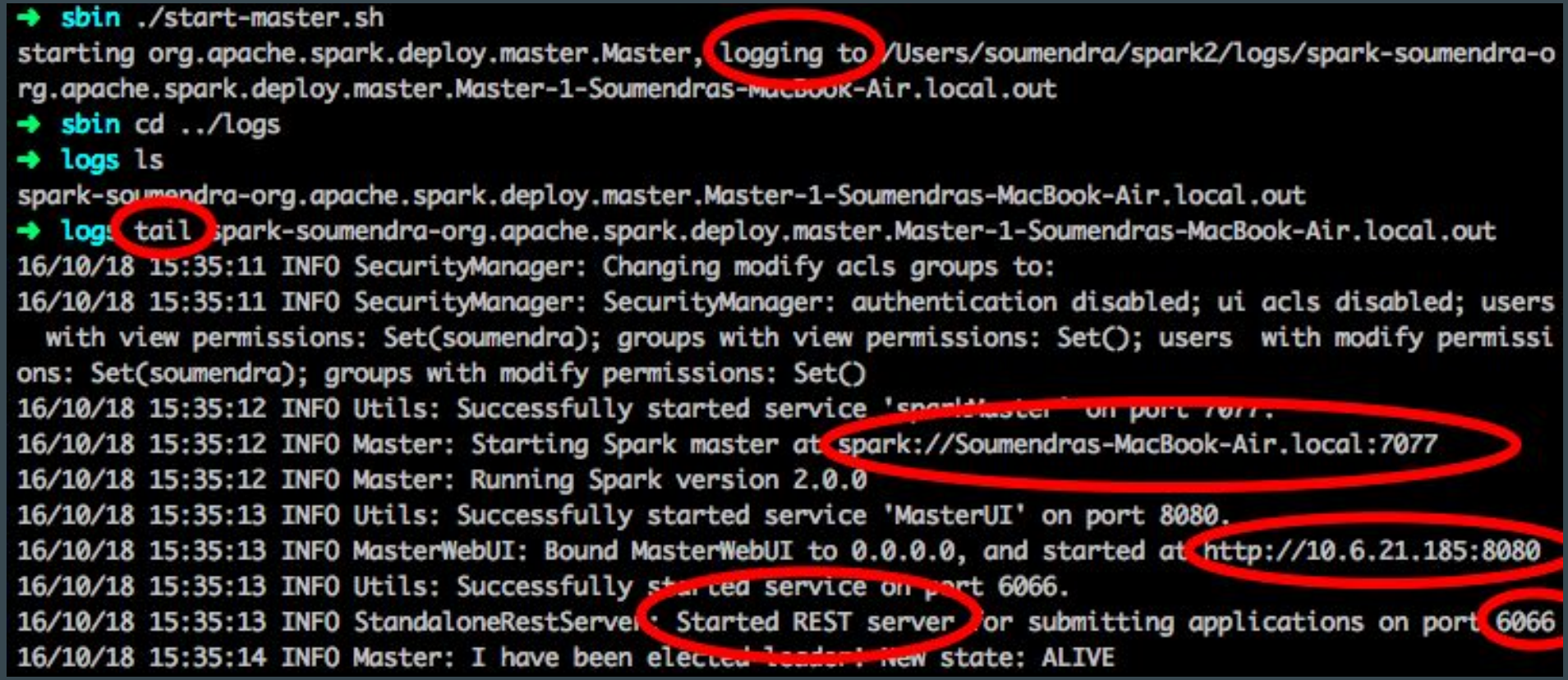
If you've used the link in the last slide to download Spark, then

- go to the folder it has been downloaded in

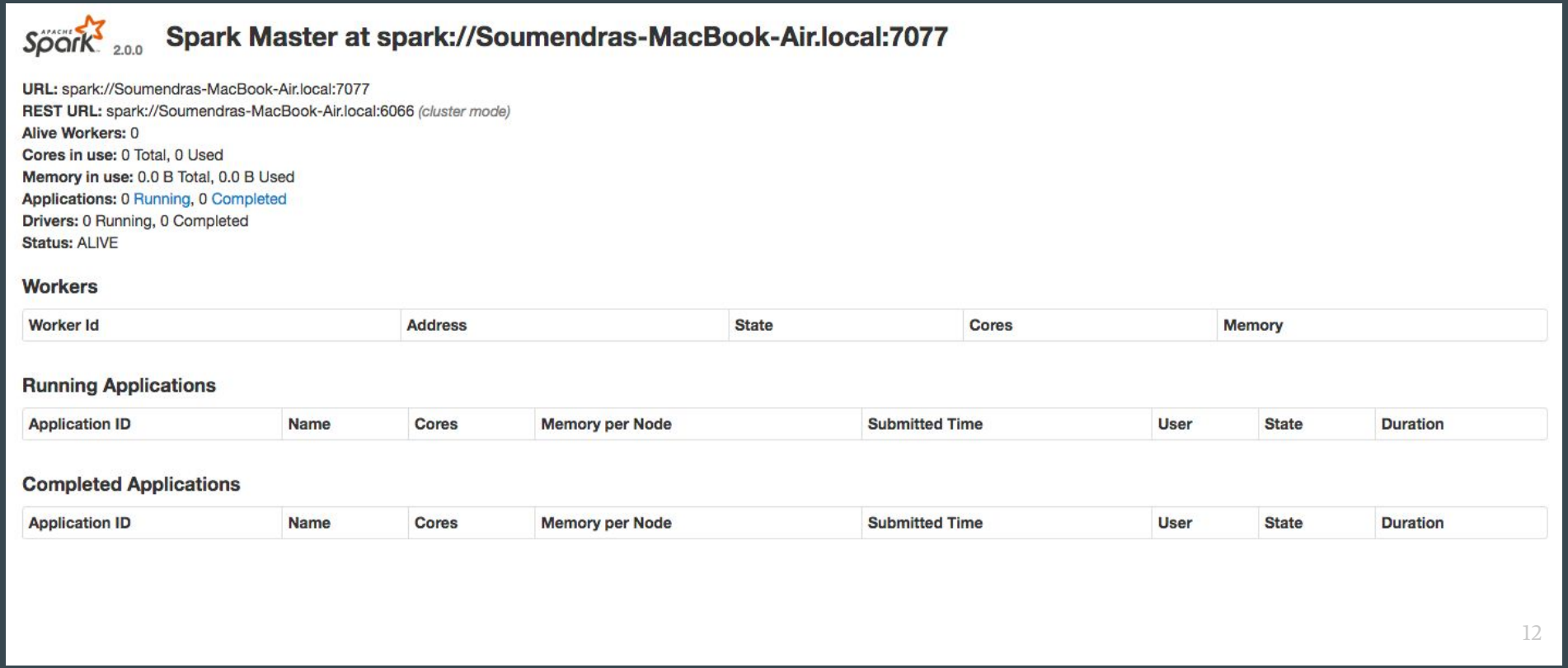
```
> tar xvzf spark-2.0.0-bin-hadoop2.7.tgz
> mv spark-2.0.0-bin-hadoop2.7 spark2
```

- Start a local (master) server

```
> cd spark2/sbin
> ./start-master.sh
```


➜ sbin ./start-master.sh
starting org.apache.spark.deploy.master.Master, logging to /Users/soumendra/spark2/logs/spark-soumendra-o
rg.apache.spark.deploy.master.Master-1-Soumendras-MacBook-Air.local.out
➜ sbin cd ../logs
➜ logs ls
spark-soumendra-org.apache.spark.deploy.master.Master-1-Soumendras-MacBook-Air.local.out
➜ logs tail spark-soumendra-org.apache.spark.deploy.master.Master-1-Soumendras-MacBook-Air.local.out
16/10/18 15:35:11 INFO SecurityManager: Changing modify acls groups to:
16/10/18 15:35:11 INFO SecurityManager: SecurityManager: authentication disabled; ui acls disabled; users
with view permissions: Set(soumendra); groups with view permissions: Set(); users with modify permissi
ons: Set(soumendra); groups with modify permissions: Set()
16/10/18 15:35:12 INFO Utils: Successfully started service
16/10/18 15:35:12 INFO Master: Starting Spark master at spark://Soumendras-MacBook-Air.local:7077
16/10/18 15:35:12 INFO Master: Running Spark version 2.0.0
16/10/18 15:35:13 INFO Utils: Successfully started service 'MasterUI' on port 8080.
16/10/18 15:35:13 INFO MasterWebUI: Bound MasterWebUI to 0.0.0.0, and started at http://10.6.21.185:8080
16/10/18 15:35:13 INFO Utils: Successfully started service on port 6066.
16/10/18 15:35:13 INFO StandaloneRestServer: Started REST server for submitting applications on port 6066
16/10/18 15:35:14 INFO Master: I have been elected leader! New state: ALIVE

localhost:8080



Hello World in Spark (counting words)

```
import findspark

# provide path to your spark directory directly
findspark.init("/home/soumendra/downloads/spark2")

import pyspark
sc = pyspark.SparkContext(appName="helloworld")

# let's test our setup by counting the number of lines in a text file
lines = sc.textFile('/home/soumendra/helloworld')
lines_nonempty = lines.filter( lambda x: len(x) > 0 )
lines_nonempty.count()
```

Hello World in Spark (counting words)

Spark_Activities_01_Basics.ipynb: Activity 1