Install and Configure Ipython Notebook with Apache Spark in HDP

Required Components

- HDP 2.5 (containing Apache Spark) on Hortonworks sandbox
  - Go to http://hortonworks.com/downloads/ and download for Virtualbox
  - Install HDP in Virtualbox
- Python 2.7X

Configure the Dependencies

At Centos prompt, **type** the following commands:

- yum install nano centos-release-SCL zlib-devel
- yum install bzip2-devel openssl-devel ncurses-devel
- yum install sqlite-devel readline-devel tk-devel
- yum install gdbm-devel db4-devel libpcap-devel xz-devel
- yum install libpng-devel libjpg-devel atlas-devel

Install the “Development tools” Dependency for Python 2.7

Ipython requires Python 2.7 or higher (the version came with the HDP installation is Python 2.6.

Execute:

```
yum groupinstall "Development tools"
```

Install Python 2.7

- Run the following command to get Python 2.7:

  yum install python27

  (if it does not work, first run **yum install centos-release-scl**)
- Get the Python Anaconda distribution to upgrade Python to current version and to obtain the most useful Python packages for scientific computation.

  - yum install wget
  - wget https://repo.continuum.io/archive/Anaconda2-4.3.1-Linux-x86_64.sh
  - bash Anaconda2-4.3.1-Linux-x86_64.sh

    (accept the license and type 'yes')

Install or Upgrade Python Analytics Packages

By installing the latest version of Anaconda, you should have all the following Python packages for data science: numpy, scipy, matplotlib, pandas, scikit-learn, tornado, pyzmq, pygments, jsonschema and jinja2. Use pip to check installation or to upgrade them if already installed:

```
pip install numpy scipy pandas matplotlib scikit-learn
pip install tornado pyzmq pygments  jsonschema
pip install jinja2 --upgrade
pip install matplotlib --upgrade
pip install scikit-learn --upgrade
pip install numpy --upgrade
...
```

Install and Configure IPython Notebook

- Run the following command to install ipython notebook if not already installed:

  pip install "ipython[notebook]”

- Configure a Pyhton interpreter built with Apache Spark by creating an Ipython profile for pyspark:

  ipython profile create pyspark

- Generate a Jupyter configuration file:

  jupyter notebook --generate-config

(You should see the following output:
Writing default config to:
/root/.jupyter/jupyter_notebook_config.py)

Create a Shell Script to Start IPython

In a text editor (vi), in the home directory (~) create a shell script called start_ipython_notebook.sh.

```
#!/bin/bash
source /opt/rh/python27/enable
IPYTHON_OPTS="notebook --port 8889
--notebook-dir='/usr/hdp/2.5.0.0-1245/spark/'
--ip='*' --no-browser" pyspark
```

Make the above shell script executable:

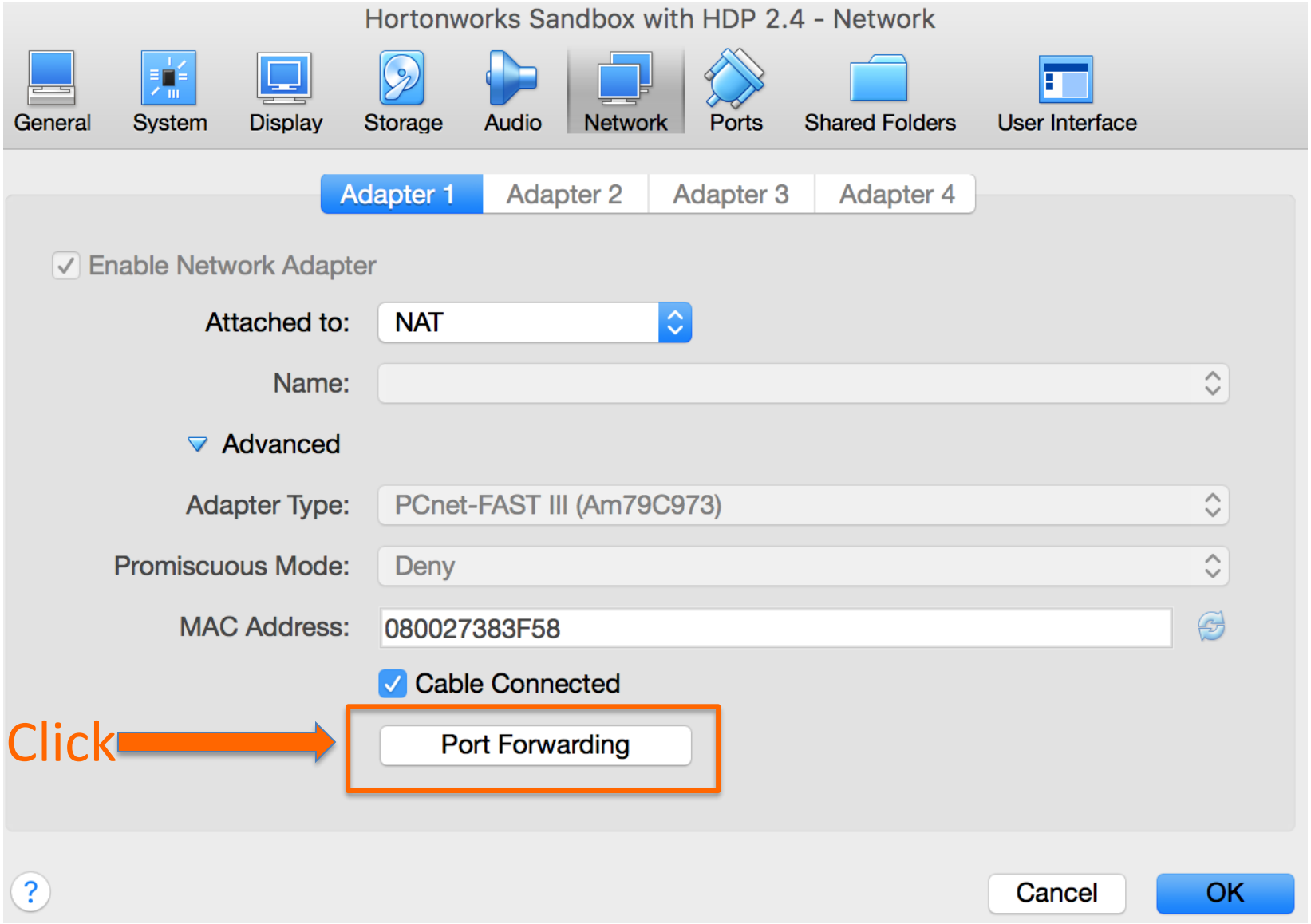
```
chmod +x start_ipython_notebook.sh
```

Port Forwarding

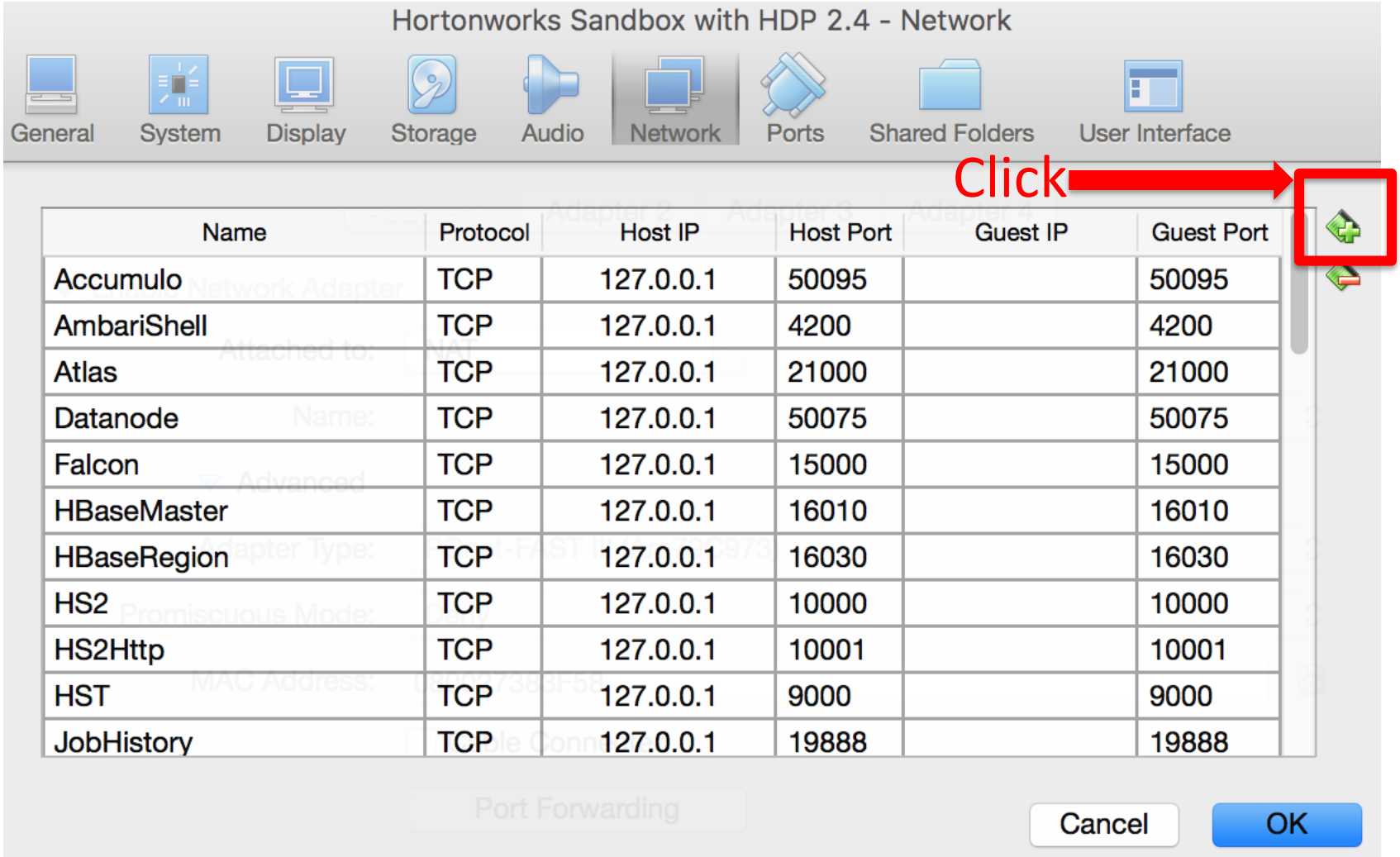
In order for IPython notebook to be accessible from a browser on your host machine, if not already completed, you must forward the port 8889 from the virtual machine to the host machine:

- Open the VirtualBox
- Click the **Setting** button
- Select the **Network** tab

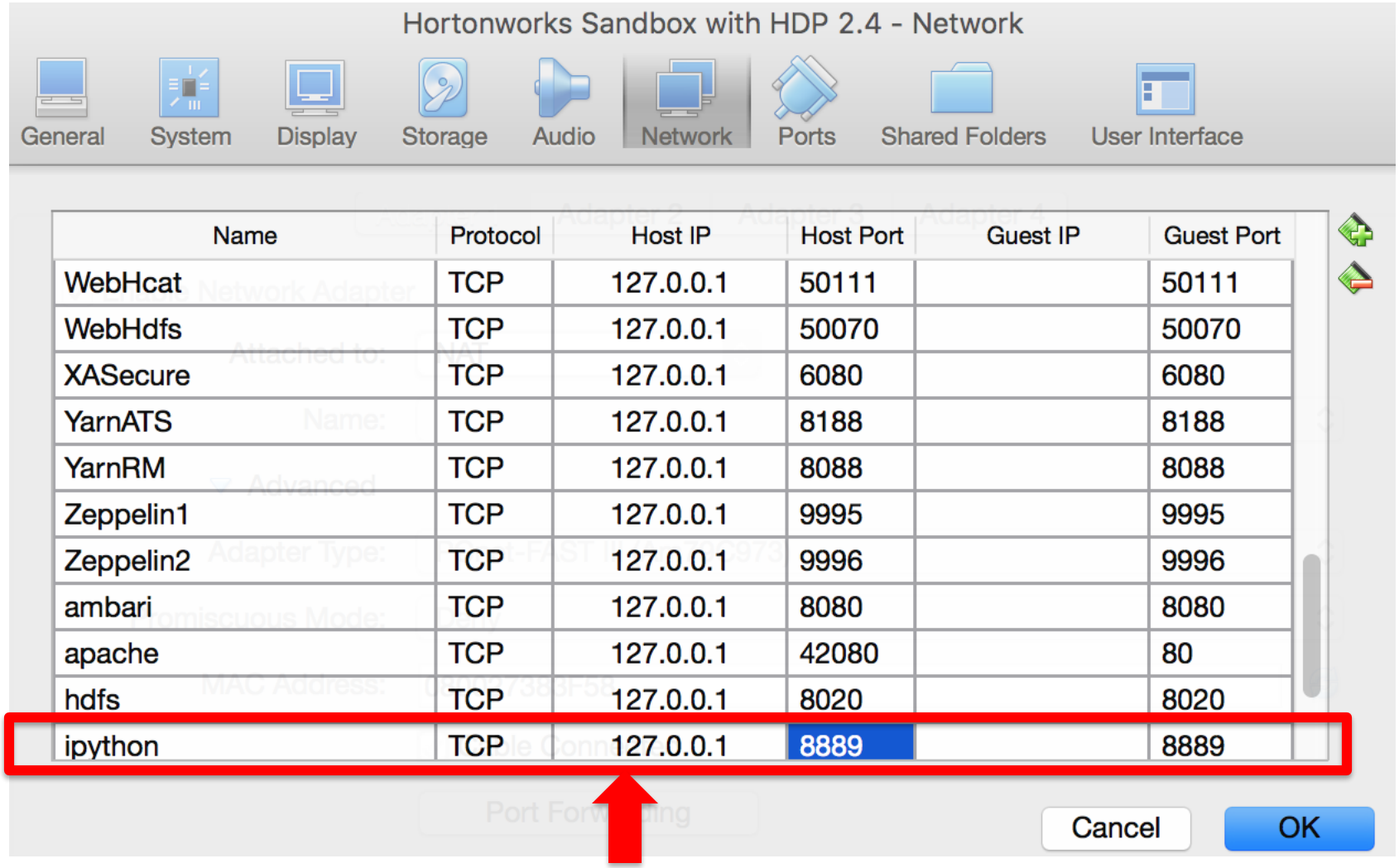
Port Forwarding (cont'd)



Port Forwarding (cont'd)



Port Forwarding (cont'd)



Add a new port (ipython) as indicated and then click OK

Running IPython Notebook

- Execute the shell script from CentOS (home director ~) :

  ./start_ipython_notebook.sh

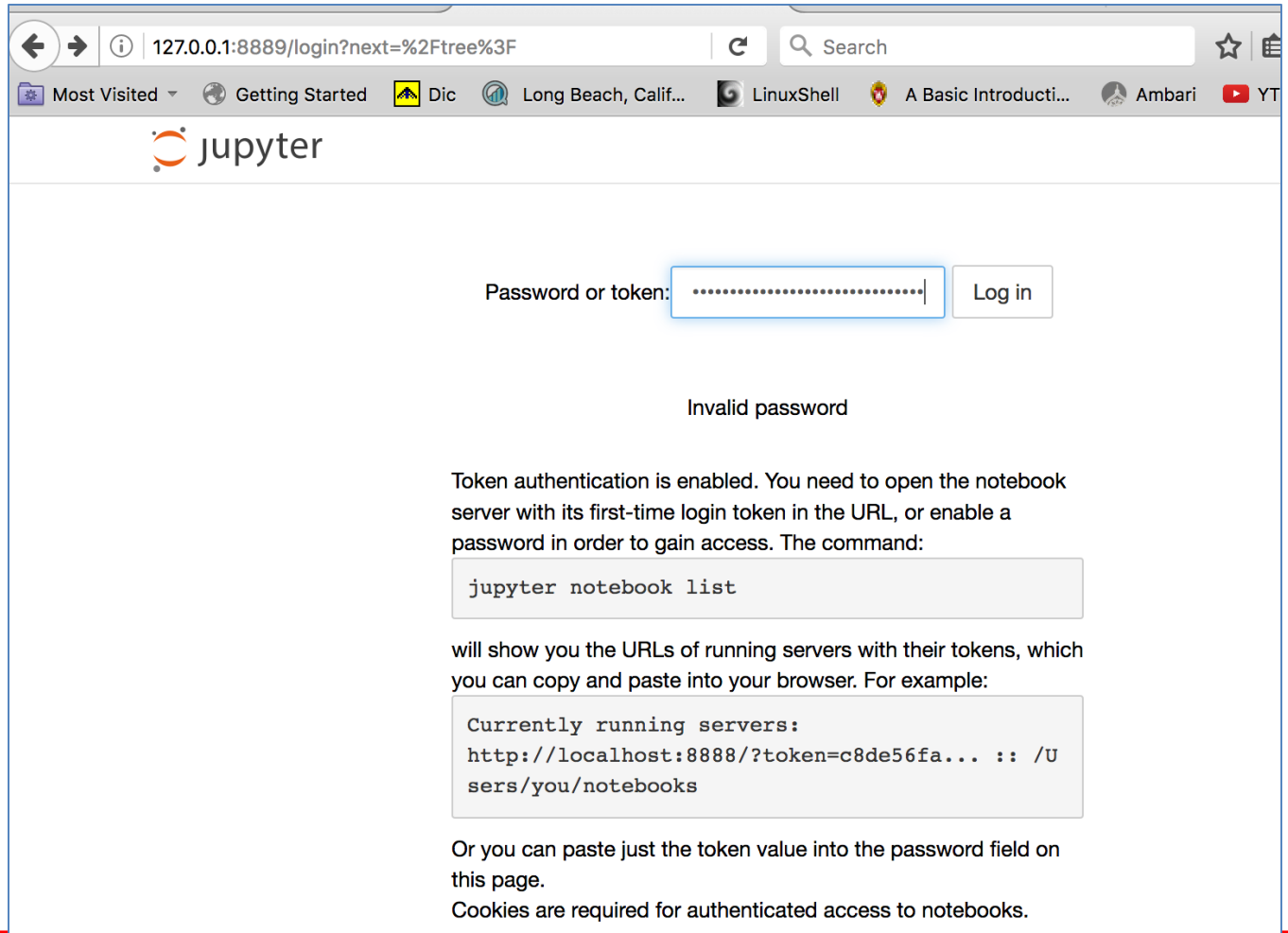
  Copy the URL created by the script or record the token for login in next step.

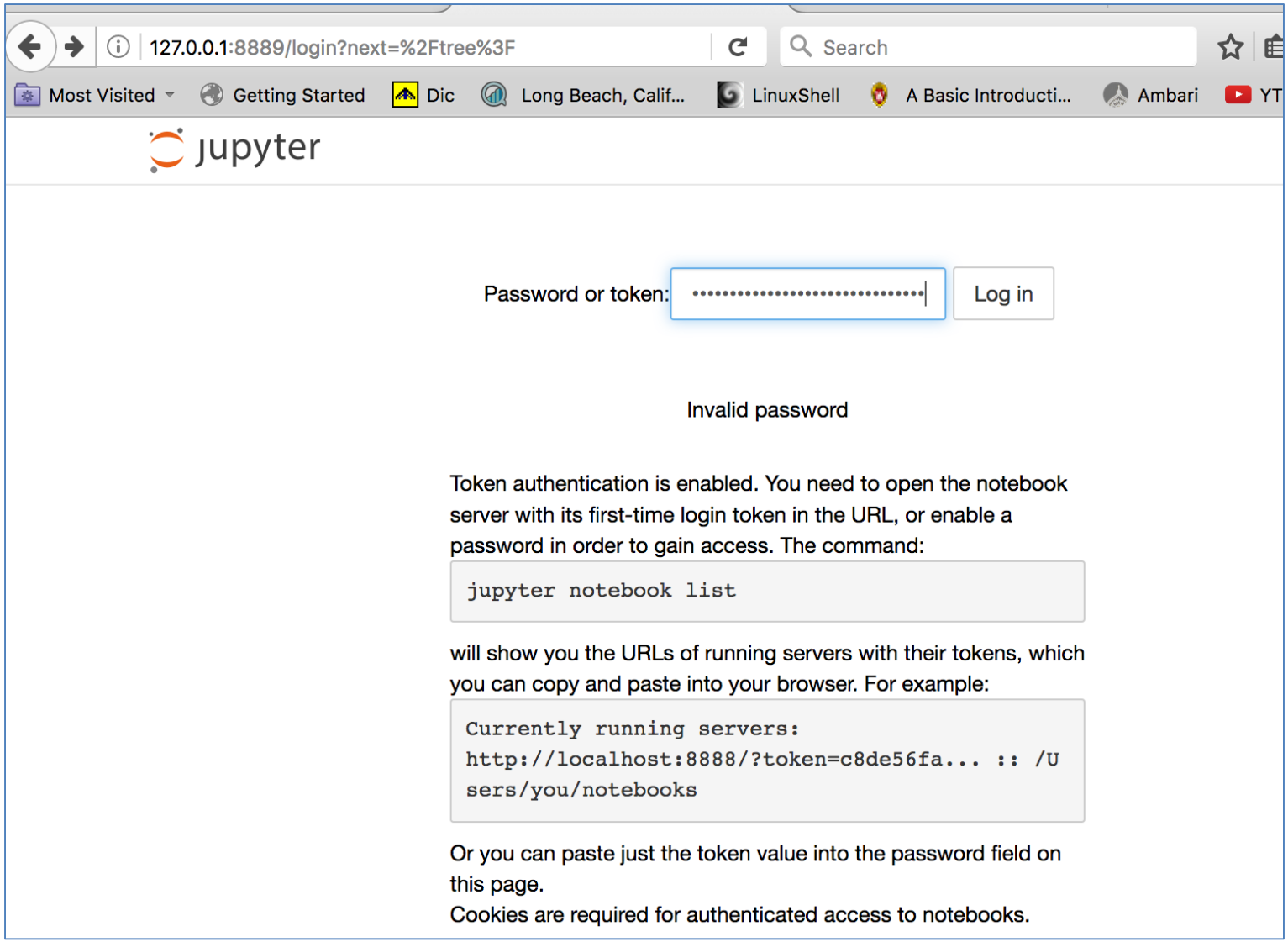
```
[root@sandbox ~]# ./start_ipython_notebook.sh
Multiple versions of Spark are installed but SPARK_MAJOR_VERSION
Spark1 will be picked by default
[TerminalIPythonApp] WARNING | Subcommand `ipython notebook` is d
[TerminalIPythonApp] WARNING | You likely want to use `jupyter no
[W 06:01:57.086 NotebookApp] WARNING: The notebook server is list
recommended.
[I 06:01:57.091 NotebookApp] Serving notebooks from local directo
[I 06:01:57.091 NotebookApp] 0 active kernels
[I 06:01:57.091 NotebookApp] The Jupyter Notebook is running at:
3dfb6bce269232429c857bd64373e133214de
[I 06:01:57.091 NotebookApp] Use Control-C to stop this server an
[C 06:01:57.092 NotebookApp]

    Copy/paste this URL into your browser when you connect for th
    to login with a token:
        http://localhost:8889/?token=b96c93385a63dfb6bce269232429
```

Running IPython Notebook

- Open a browser on your host machine, paste in the URL from last step to enter, or enter http://127.0.0.1:8889 to the URL window and you should see a login window. Enter the token to enter.




127.0.0.1:8889/login?next=%2Ftree%3F
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Token authentication is enabled. You need to open the notebook server with its first-time login token in the URL, or enable a password in order to gain access. The command:
jupyter notebook list
will show you the URLs of running servers with their tokens, which you can copy and paste into your browser. For example:
Currently running servers:
http://localhost:8888/?token=c8de56fa... :: /Users/you/notebooks
Or you can paste just the token value into the password field on this page.
Cookies are required for authenticated access to notebooks.

Jupyter (IPython) Notebook