Tutorial on Linux and SUGAR access

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Resource Summary

edX site : `https://edge.edx.org/courses/RiceX/COMP322/1T2014R`

Piazza site : `https://piazza.com/rice/spring2014/comp322/home`

Java 8 Download : `https://jdk8.java.net/download.html`

IntelliJ IDEA : `http://www.jetbrains.com/idea/download/`

HJ-lib Jar File : `http://www.cs.rice.edu/~vs3/hjlib/habanero-java-lib.jar`

HJ-lib API Documentation : `https://wiki.rice.edu/confluence/display/PARPROG/API+Documentation`

HelloWorld Project : `https://wiki.rice.edu/confluence/display/PARPROG/Download+and+Set+Up`

Sugar Login: ssh *your-netid*@sugar.rice.edu and then login with your password

Linux Tutorial visit `http://www.rcsg.rice.edu/tutorials/`

NOTE: This handout contains important information for the rest of the semester. Be sure to refer to it when doing future labs and homeworks.

1 Linux Filesystem Basics

pwd Show the current directory

mkdir DIRECTORY Create a new directory

cd DIRECTORY Change current directory to DIRECTORY

ls List file information in current directory

emacs FILE Use EMACS text editor to create or edit a FILE

cp SRCFILE DESTFILE Copy SRCFILE to DESTFILE

cp -r SRCDIR DESTDIR Copy SRCDIRECTORY to DESTDIRECTORY

mv SRCFILE DESTDIR Move SRCFILE to DESTDIRECTORY

mv SRCDIR DESTDIR Move SRCDIRECTORY to DESTDIRECTORY

rm FILE Delete the FILE

rm -r DIRECTORY Delete the DIRECTORY

2 Other Useful Bash Commands

CTRL+A Go to beginning of the line

CTRL+E Go to end of the line

CTRL+C End a running program and return to prompt

CTRL+R Search command history

CTRL+D Log out or Exit

ArrowUp and ArrowDown Browse history of commands

Tab Auto complete

3 Read the SUGAR FAQ

Before going any further, it is important that you familiarize yourself with the SUGAR system by reading the FAQ at `http://rcsg.rice.edu/sugar/faq`. In particular, it is important that you read the following links:

- **Getting Started on SUG@R.** Click on this FAQ and scroll down to the section on "Login Nodes" to understand the difference between login nodes and compute nodes. Make special note of the following comment:

  > "Any user running intensive computational tasks directly on the login node risks disciplinary action up to and including the loss of their access privileges."

- **Getting a Compute Node.** To request a dedicated *compute node*, you should use the following command (as usual) from a SUGAR login node:
  qsub -q commons -I -V -l nodes=1:ppn=8,walltime=00:30:00
  When successful, it will give you a command shell on a dedicated 8-core compute node for your use for 30 minutes at a time. Your home directory is the same on both the login and compute nodes. NOTE: If you are unable to get a node with the above command, please try remove the "-q commons" option and try again.

- **How do use DrHJ with SUGAR?** You cannot. However, you can run DrHJ on your local computer, and transfer files to SUGAR when you need to run them there for performance timings.

4 Compiling and Running HJ-Lib programs on SUGAR

On SUGAR, JDK8 is already available at `/users/COMP322/jdk1.8.0` and HJ-Lib is already installed at `/users/COMP322/habanero-java-lib.jar`. Run the following command to setup the JDK8 path.

```
source /users/COMP322/hjLibSetup.txt
```

Check your installation by running the following commands:

```
which java
```

You should see the following: `/users/COMP322/jdk1.8.0/bin/java`

```
java -version
```

You should see the following:

```
java version ‘‘1.8.0’’
Java(TM) SE Runtime Environment (build 1.8.0-b128)
Java HotSpot(TM) 64-Bit Server VM (build 25.0-b69, mixed mode)
```

To download files on SUGAR, you have two options:

1. Download the file using a web browser on any computer, and then transfer (via sftp or scp) the file to your SUGAR account.
2. Use the *wget* command. If you type the command "*wget URL*" in SUGAR, it will retrieve the file from URL into your local directory e.g.,
   wget http://www.cs.rice.edu/~vs3/hjlib/code/course-materials/lab04/Nqueens.java

Whenever possible, we will try to make copies of files locally available on SUGAR in /users/COMP322.

You should run your program on SUGAR, to evaluate the parallelization. As before, you can compile the program as follows:

```
javac -cp /users/COMP322/habanero-java-lib.jar Nqueens.java
```

To run the program using 8 cores, use the following command on a *compute node*:

```
java -cp /users/COMP322/habanero-java-lib.jar:.  -Dhj.numWorkers=8 Nqueens
```