HPCC - Hrothgar
Getting Started User Guide – Matlab

Texas Tech University

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User Guide

Running Matlab jobs on Hrothgar

1. About Matlab campus license

Since September 1, 2011, TTU obtained campus license of Matlab. This license includes the most recent version (R2013b) of the Matlab software and the top 50 toolboxes. This version of Matlab is installed on Hrothgar, and available to all TTU faculty, staff and students. However, under the license agreement, each user is allowed to run two Matlab sessions simultaneously. This limitation is enforced on Hrothgar. Matlab jobs must be submitted to "matlab" queue. Running Matlab in "normal" or "serial" queue, and running other jobs in "matlab" queue is not allowed.

The following instructions focus on the usage under the campus license. For users who wish to use department or group owned Matlab licenses on Hrothgar, please contact HPCC for assistance.

2. Setting the environment variables

Environment variables on Hrothgar are managed by Softenv. For more information about Softenv, please refer to the user guide "User's Environment" at HPCC user guides page http://www.hpcc.ttu.edu/php/NewUser.php.

For infrequent Matlab uses, users can set up Matlab environment variables by command:

soft   add +matlab

This command sets up the environment variables for the current session. It expires when the user logs out. Frequent users may prefer to set up the environment variables permanently, and it can be done through the following commands:

echo +matlab >> $HOME/.soft

resoft

Type the command "which matlab" to verify that matlab command can be found and is the correct version

which matlab

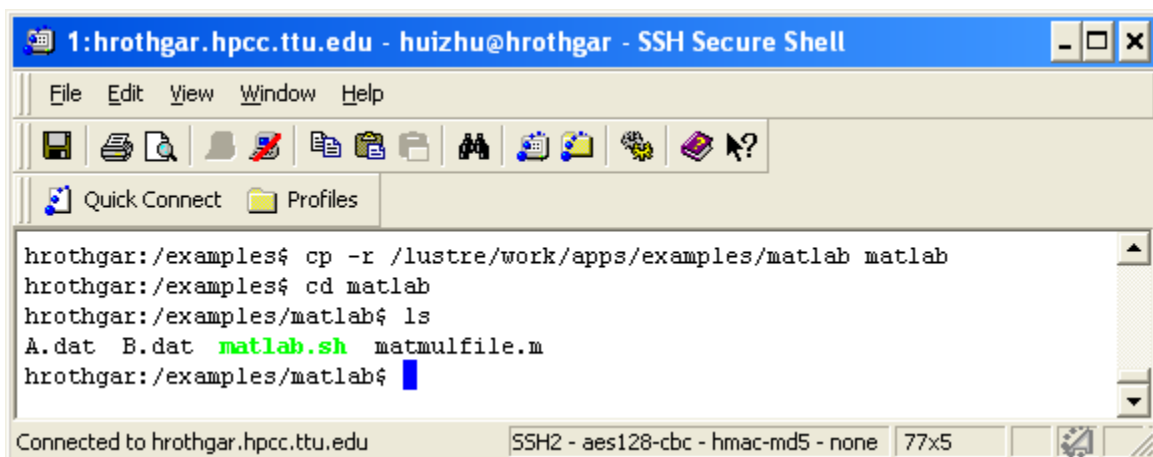It should return: /lustre/work/apps/MATLAB/R2013b/bin/matlab.

3. Job Submission

3.1 Non-interactive jobs

When a user needs to execute an m file, and there is no interaction between the user and the program, it is suggested to submit a non-interactive job. Typically it is also without a graphical interface for better computation performance. Following is a simple Matlab job submission example that would request 1 core and execute an m file.

3.1.1. Step 1 – copy examples as test programs

cp –r /lustre/work/apps/examples/matlab matlab

This command will copy the matlab test directory to the user's current directory. The directory contains four files, matlab.sh, matmulfile.m, A.dat and B.dat: matlab.sh is a job submission script, and matmulfile.m is an m file that multiples the matrices in data files A.dat and B.dat.

```
1:hrothgar.hpcc.ttu.edu - huizhu@hrothgar - SSH Secure Shell

File   Edit   View   Window   Help

Quick Connect      Profiles

hrothgar:/examples$ cp -r /lustre/work/apps/examples/matlab matlab
hrothgar:/examples$ cd matlab
hrothgar:/examples/matlab$ ls
A.dat  B.dat  matlab.sh  matmulfile.m
hrothgar:/examples/matlab$

Connected to hrothgar.hpcc.ttu.edu     SSH2 - aes128-cbc - hmac-md5 - none   77x5
```

The file matlab.sh looks like the below. The lines starting with "#$" are Sun Grid Engine settings. In this case, the job's name is "matlab-test" (#$ -N matlab-test), it is submitted to "matlab" queue (#$ -q matlab), and it requests to use one core (#$ -pe fill 1). The command line "matlab –nodisplay –nojvm –r matmulfile > matlab.out" tells the system to execute "matmulfile" in matlab, without display and java virtual machine, and write the output to file matlab.out.

```
#!/bin/sh
#$ -V
#$ -cwd
#$ -S /bin/bash
#$ -N matlab-test
#$ -o $JOB_NAME.o$JOB_ID
#$ -e $JOB_NAME.e$JOB_ID
#$ -q matlab
#$ -pe fill 1
#$ -P hrothgar
matlab -nodisplay -nojvm -r matmulfile > matlab.out
```

Users may copy this script to the directory with ".m" files and other input files, and modify the command line "matlab –nodisplay –nojvm –r matmulfile > matlab.out", replace "matmulfile" with the file name of the ".m" file (without the .m extension)with. For more information about Matlab command line options, please refer to Matlab user guide.

3.1.2. Step 2 – qsub to submit jobs

qsub matlab.sh - To submit your matlab job to Hrothgar.

qstat – To check the status of the job

The following snapshot shows the procedure of submitting a job and checking its status. The first qstat command was executed just after the job was submitted, and it returned the job state as "qw", which means the job is waiting in the queue. The second qstat command was executed about 30 seconds later, and it returned the job state as "r", which means it is running. The last qstat command returned nothing, when the job finishes.

3.2 Interactive jobs

To take advantage of Matlab's graphical interface, one can submit interactive jobs. The following steps submit an interactive job to a node, and the user can invoke matlab's graphical interface on that node.
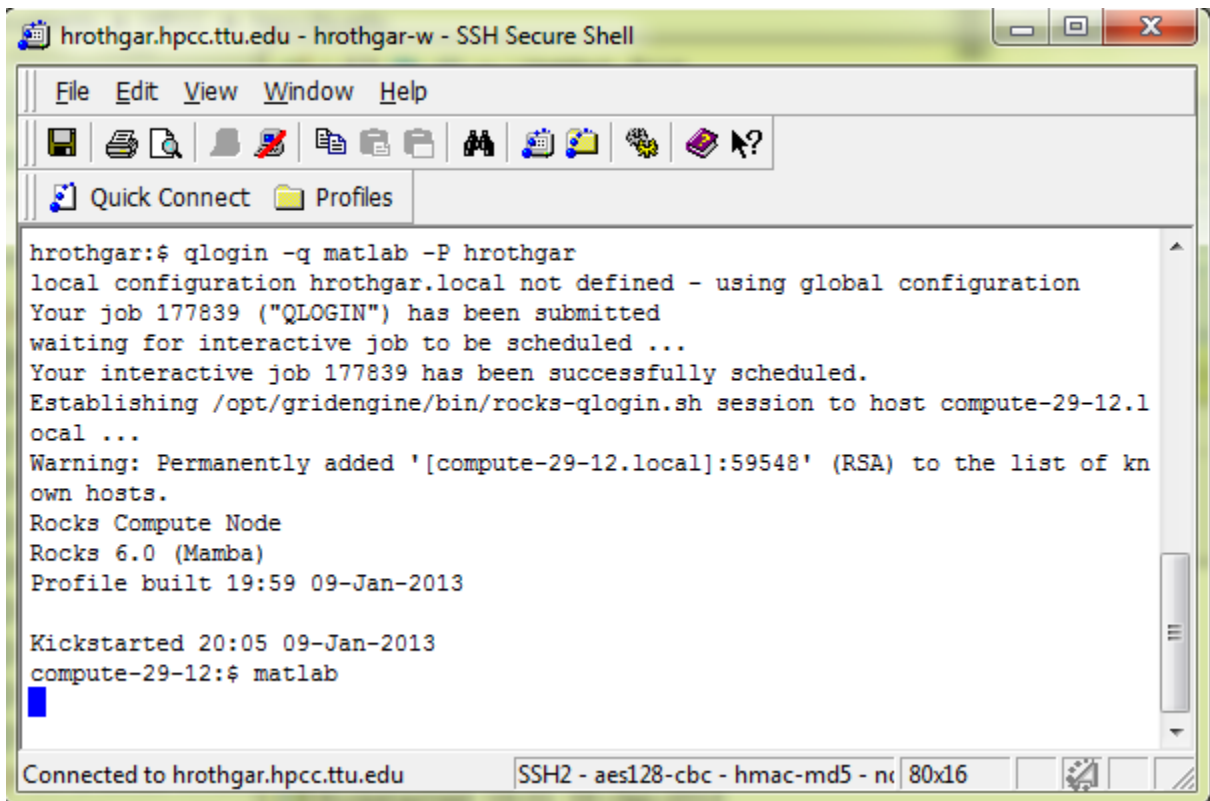
First, set up Xming for X window forwarding. Refer to the user guide "Installing X-Windows server" on the user guides page http://www.hpcc.ttu.edu/php/NewUser.php.

Second, run command qlogin to start an interactive job.

qlogin –q matlab –P hrothgar

Sun Grid Engine will schedule a free node for his job. When the terminal is brought to a specific node, the user can call Matlab application by typing the command *matlab*.

The following snapshot illustrates the procedure of starting the Matlab graphical interface. If all settings are valid, a Matlab desktop will be brought up to the local computer's screen.

Last updated: 09/27/2013

For Additional Assistance Contact: hpccsupport@ttu.edu

For Comments/Suggestions on user guide hpcc@ttu.edu

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