

Remote Matlab Submission

This page documents the process for configuring remote submission of Matlab jobs from the client desktop. Note that this requires a fair amount of work up front.

Important notes



Warning

These notes are important

- You **must** allow Matlab to listen on a TCP port. In Windows XP, a popup will appear shortly after starting Matlab to allow this. If you do not allow this, the Matlab Pool will not function.
- Your computer **must not** be behind NAT or a firewall that otherwise interferes with or blocks traffic from Ithaca to your machine. If the workers cannot connect to the Matlab instance listening on your machine, the Matlab Pool will not function.
 - If you are on the VT campus, your computer **must** have a wired Ethernet connection. All wireless connections now use 172.x.x.x addresses which the compute nodes cannot connect to.
- If your machine has multiple network interfaces OR has a host name that does not resolve in DNS, you will need to issue this command before running ANY parallel command:

```
pctconfig hostname ip-address
```

where ip-address is the ip address of the interface that will be involved with the connection with Ithaca. This should be an address in the range 198.82.x.x or 128.173.x.x.

- This procedure requires Administrator rights or at least the ability to do the following:
 - Alter the system PATH variable
 - Alter files in the Matlab installation directory

Windows

Download and install PuTTY

1. Download PuTTY from <http://www.chiark.greenend.org.uk/~sgtatham/putty/download.html>
 - I recommend the Windows installer because it'll make your life easier
2. Install PuTTY by running the installer or copying the program files to somewhere useful. Note the following instructions assume you used the Windows installer package

Set the system path to include PuTTY binaries

1. Open System Properties
 - Right-click My Computer and select Properties, or
 - Open Control panel, select Classic View, and open System
2. Navigate to the Advanced tab
3. Click the Environment Variables button
4. Scroll down to the Path variable in the System variables list
5. Select it and click Edit
6. Add ";C:\Program Files\PuTTY" (without the quote) to the end of the Variable value
7. Click OK to close the Edit System Variable window
8. Click OK to close the Environment Variables window

Generate your SSH key pair

1. Open PuTTYgen by selecting Start > All Programs > PuTTYgen
2. Click the Generate key and move the mouse over the window for a while
3. Once the key is generated, click the Save public key button
4. Save the key somewhere useful like My Documents\yourpid.pub
5. Click the Save private key button
6. Click Yes to save the key without a passphrase
7. Save the key somewhere useful like My Documents\yourpid.ppk

8. Close the Key Generator utility

Configure PuTTY for passwordless login

1. Open PuTTY by selecting Start > All Programs > PuTTY
2. Enter the host name 'ithaca.arc.vt.edu' (without the quotes)
3. Select Connection > Data from the left pane
4. Enter your PID as your auto-login username
5. Select Connection > SSH > Auth from the left pane
6. Select your private key file by clicking Browse... in the Authentication parameters pane
7. Select the key you created and saved in the previous section and click Open
8. Select Session from the left pane again
9. Enter the host name 'ithaca.arc.vt.edu' in the Save Sessions text box
10. Click Save

Configure your Ithaca account for passwordless login

1. Open a command prompt
 - Select Start > All Programs > Accessories > Command Prompt, or
 - Select Start > Run, type cmd, and click Run
2. Copy your key to ithaca (use your Virginia Tech PID password to log in since your key won't work yet)
 - a. Use the pscp command to copy the public key file to your home directory on ithaca. This example assumes you saved your public key in your My Documents folder with the name yourpid.pub. Note the colon at the end of the pscp command. That is intentional.

```
Microsoft Windows XP [Version 5.1.2600]
(C) Copyright 1985-2001 Microsoft Corp.

C:\Documents and Settings\Administrator>cd "My Documents"

C:\Documents and Settings\Administrator\My Documents>pscp yourpid.pub
yourpid@ithaca.arc.vt.edu:
The server's host key is not cached in the registry. You have no guarantee that the
server is the computer you think it is.
The server's rsa2 key fingerprint is: ssh-rsa 1024
e7:2c:00:32:1e:5c:76:03:ba:58:43:d6:02:7a:60:b6
If you trust this host, enter "y" to add the key to PuTTY's cache and carry on
connecting.
If you want to carry on connecting just once, without adding the key to the cache, enter
"n".
If you do not trust this host, press Return to abandon the connection.
Store key in cache? (y/n) y
Server refused our key
Using keyboard-interactive authentication.
Password:
yourpid.pub          | 0 kB | 0.3 kB/s | ETA: 00:00:00 | 100%

C:\Documents and Settings\Administrator\My Documents>
```

3. Close the command prompt window
4. Log on to ithaca using PuTTY (this should still be open from the steps in the previous section)
 - a. Click the Open button
 - b. Enter your PID at the login as: prompt
 - c. Enter your PID password at the Password: prompt
 - d. Copy your public key to your authorized keys file

```
mkdir -p ~/.ssh
ssh-keygen -i -f yourpid.pub >> ~/.ssh/authorized_keys
```

- e. Close the SSH session by typing exit
5. Test passwordless login
 - a. Open PuTTY by selecting Start > All Programs > PuTTY
 - b. Double-click 'ithaca.arc.vt.edu' in the Saved Sessions list
 6. You should be logged in without being prompted for a password. If not, please contact an administrator.

Configure Matlab support files for remote submission

1. Copy necessary files from the ARC website
2. Go to <http://portal.arc.vt.edu/matlab>
3. Select your operating system from the available directories
4. Select your Matlab version from the available directories
5. Download both files and make a note where you save them (you'll need the .mat file later)
6. Unzip the zip archive and copy the contents to MATLAB_ROOT\toolbox\local
 - a. By default MATLAB_ROOT is C:\Program Files\MATLAB and then the release version (such as R2009b)

Create the appropriate Matlab parallel configuration

1. Open Matlab
2. Select 'Manage Configurations...' from the Parallel menu
3. Select 'Import...' from the File menu
4. Select the .mat file you downloaded in the previous section
5. This should create a new configuration named ithaca_2009b. Edit this configuration by double-clicking it
6. In the ParallelSubmitFcn field, change 'yourpid' to your PID **Do not change anything else in this field**
7. In the SubmitFcn field, change 'yourpid' to your PID. **Do not change anything else in this field**
8. Enter the path to your Matlab work files (where you keep your .m files and other code) in the DataLocation field. By default, this is C:\matlab
9. Click OK
10. Set the configuration to be the default by selecting the Default radio button next to this configuration

Validate the configuration

1. Click Start Validation
2. If validation fails, contact an administrator

OS X

Generate your SSH key pair.

If you already have a passwordless key pair set up, you may skip this step

1. Open Terminal (/Applications/Terminal.app)
2. Run 'ssh-keygen -t rsa'. Unless you have a good reason not to, accept the defaults.

```
yourmachine:~ youl$ ssh-keygen -t rsa
Generating public/private rsa key pair.
Enter file in which to save the key (/Users/you/.ssh/id_rsa):
Enter passphrase (empty for no passphrase):
Enter same passphrase again:
Your identification has been saved in /Users/you/.ssh/id_rsa.
Your public key has been saved in /Users/you/.ssh/id_rsa.
The key fingerprint is:
44:03:e7:fa:04:93:3d:6d:cf:7e:1c:30:26:cd:fb:2d you@yourmachine
The key's randomart image is:
+--[ RSA 2048]-----+
|      .+.      |
|     * o o     |
|    + = + *    |
|   = o = +    |
|  . S   + .   |
|   o   . o o  |
|    .   . E . |
|             . |
|             . |
+-----+

```

Set up passwordless remote access on Ithaca

1. Copy your public key to Ithaca (note the : on the end of the command is required)

```
yourmachine:~ you$ scp ~/.ssh/id_rsa.pub ithaca.arc.vt.edu:
```

2. Copy your public key on Ithaca to the authorized keys file

```
yourmachine:~ you$ ssh ithaca.arc.vt.edu
login01:~ you$ mkdir .ssh
login01:~ you$ cat ~/id_rsa.pub >> ~/.ssh/authorized_keys
login01:~ you$ exit
```

3. Try logging into Ithaca. You should not be prompted for a password. If you are, please contact an administrator.

```
yourmachine:~ you$ ssh ithaca.arc.vt.edu
login01:~ you$ exit
```

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3. Select your operating system from the available directories
4. Select your Matlab version from the available directories
5. Download both files and make a note where you save them (you'll need the .mat file later). These instructions assume you download the files to the Downloads directory under your home directory
6. Unzip and untar the archive and copy the contents to MATLAB_ROOT/toolbox/local
 - a. By default MATLAB_ROOT is /Applications/MATLAB_\$VERSION.app, where \$VERSION is the release version (such as R2009b). These instructions show R2009b

```
yourmachine:~ you$ cd /Applications/MATLAB_R2009b.app/toolbox/local
yourmachine:local you$ tar xvzf ~/Downloads/macosR2009b.tar.gz
```

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8. Enter the path to your Matlab work files (where you keep your .m files and other code) in the DataLocation field. By default, this is /matlab
9. Click OK
10. Set the configuration to be the default by selecting the Default radio button next to this configuration

Validate the configuration

1. Click Start Validation
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