

Apini User Manual

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Connect to Apini Cluster

To connect to the server, we use the [ssh](#) command shown below.

```
$ ssh <encs_username>@apini.encs.concordia.ca
```

Enter your ENCS password when prompted.

When you first sign in successfully, your account will be created and the server will run through some steps to prepare your account to be able to run processes on multiple nodes.

```
Verifying <encs_username> has completed startup profile  
configuration...  
Configuration not found. Starting initiation script...  
Generating Key  
Disabling Host Key Checking  
Appending Key to your ~/.ssh/authorized_keys File  
Initiation script complete.
```

After the startup configuration has been completed for your account, the message will change to show that you have completed this step.

```
Verifying <encs_username> has completed startup profile  
configuration...  
Configuration Verified
```

Once your account has been created and initialized, you can go about adding your files to the server from your local machine in the following step.

Transfer files from Local to Apini Cluster

To transfer files, we use the [scp](#) command shown below.

```
$ scp <filename> <encs_username>@apini.encs.concordia.ca:/<remote_path>
```

Example:

```
$ scp HelloWorld.c q_werty@apini.encs.concordia.ca:/home/q_werty
```

Note that if you aren't currently located in the same directory on your local machine as the files you wanted to transfer, the scp command will be unable to find them. In this case, you should provide the full path to the file.

```
$ scp <path/to/filename>  
<encs_username>@apini.encs.concordia.ca:/<remote_path>
```

Example:

```
$ scp C:/Users/qwerty/Documents/HelloWorld.c  
q_werty@apini.encs.concordia.ca:/home/q_werty
```

Transfer files from Apini Cluster to Local

We will use the same [scp](#) command to perform the transfer. This time however, we will put the remote host path first and the local path second.

```
$ scp <encs_username>@apini.encs.concordia.ca:/<remote_filename> <local_path>
```

Example:

```
$ scp q_werty@apini.encs.concordia.ca:/home/q_werty/HelloWorld.o  
C:/Users/qwerty/Desktop/HelloWorld.c
```

Compile your C/C++ Program on the Apini Cluster

Once your files are on the Apini server, you can ssh to it and compile them using the [mpicc/mpicxx](#) command.

For C:

```
$ mpicc <filename.c> -o <program_name.o>
```

For C++:

```
$ mpicxx <filename.cpp> -o <program_name.o>
```

Example:

```
$ mpicc HelloWorld.c -o HelloWorld.o
```

Run your C/C++ Program on the Apini Cluster

Once you have compiled your files, you can run them using the [mpirun](#) command. It is important to note the number of processes you want to run, as well as which hosts you would like to run them on. A hostfile has been provided for you which contains all of the available nodes. To use it, use the --hostfile flag and provide the path to the hostfile.

```
$ mpirun -np <num_of_processes> --hostfile  
/media/pkg/apini-scripts/apini_hostfile <program_name>
```

Example:

```
$ mpirun -np 3 --hostfile /media/pkg/apini-scripts/apini_hostfile  
HelloWorld.o
```

Appendix: Some helpful Linux commands

To create or edit a file on the remote cluster, use the vim editor.

```
$ vim <filename>
```

Enable typing - i

Save & Exit - Esc followed by :x

Quit without saving - Esc followed by :q

To navigate your directories on the remote cluster, you can use the following commands.

Change directory: cd <directoryPath>

Go one directory up: cd ..

Previous directory: cd -

Print current/working directory: pwd

List contents of directory: ls

Clear terminal: clear

Create new directory: mkdir <directoryName>

Delete directory: rmdir <directoryName>

Delete file: rm <fileName/directoryName>

Stop & Terminate Command: ctrl + C

Pause Command: ctrl+ Z

Beginning of line: ctrl + A

End of line: ctrl + E