

ULI101: INTRODUCTION TO UNIX / LINUX AND THE INTERNET

WEEK 6:

TRANSFERRING FILES BETWEEN COMPUTERS

ISSUING REMOTE COMPUTER COMMANDS ON LOCAL COMPUTERS

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LESSON I TOPICS

Transferring Files Between Computers:

SSH Suite of Utilities:

- Purpose / Using the `scp` utility / Using the `sftp` utility
- Issuing commands on remote computers from local computers (`ssh [Linux Command(s)]`)
- Demonstration

Mail Utility:

- Purpose / Using the `mail` utility
- Sending Messages / File Attachments
- Demonstration

Perform Week 6 Tutorial (Due first Friday AFTER reading week)

- Investigations 1, 2 & 3
- Review Questions (Questions 1 – 12)

Perform BONUS Week 7 Tutorial (Due near the end of this semester)

- Investigations 1 & 2

TRANSFERRING FILES BETWEEN UNIX / LINUX SERVERS

It is important to learn how to transfer files from your Matrix account to other computers.

Reasons for Transferring Files from Matrix:

- **Backup** your work in case of **accidental deletion**
- **Save space** on your Matrix account

You will learn different methods to securely **transfer** files between your Matrix Linux account and other computers.



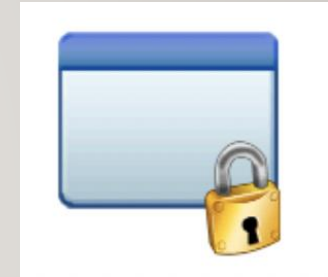
TRANSFERRING FILES BETWEEN UNIX / LINUX SERVERS

The **ssh** Linux command is a **suite** (collection) of **utilities** to allow the user to **securely connect** among Unix / Linux servers, as well as **securely copy** and **transfer** files among Unix/Linux servers.

There are two additional utilities in addition to the **ssh** utility to allow secure transfer of files between computers:

- **scp** (secure copy)
- **sftp** (secure file transmission protocol)

SSH / SCP / SFTP



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Secure Copy (scp)

Usage:

```
scp local.file user@host:destination-pathname
```

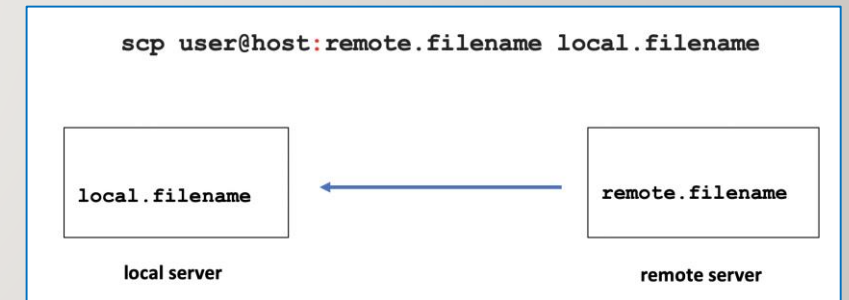
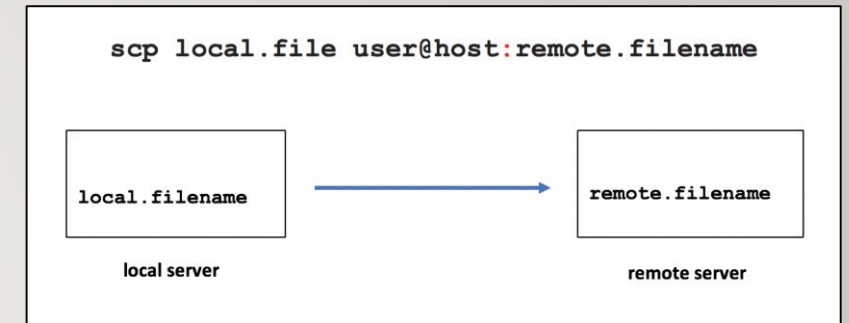
```
scp local.file user@host:
```

```
scp user@host:file-pathname local-pathname
```

The usage for the **scp** command is like the **cp** command with the addition of host names.

The most common **mistake** that students make is forgetting to add the **colon** character ":" after the remote hostname.

The username in the command can be **omitted** if the username is the same on both servers. Multiple file and **recursive** directory copy (i.e. option **-R**) is supported.



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Instructor Demonstration

Your instructor will now demonstrate using the **scp** command.



TRANSFERRING FILES BETWEEN UNIX / LINUX SERVERS

Secure File Transmission Protocol (sftp)

sftp is a utility to connect to a shell that allows a user to **issue ftp commands** to access and transfer files between servers.

FTP is an acronym for **File Transfer Protocol** that provides a set of **rules** on how to convert data that is transferred between computer servers (both identical and different operating systems).



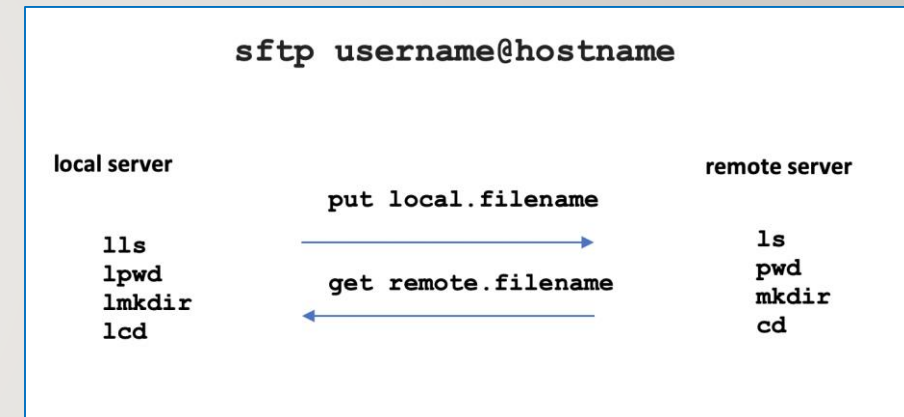
TRANSFERRING FILES BETWEEN UNIX / LINUX SERVERS

Secure File Transmission Protocol (sftp)

When you login via the sftp command, the **sftp command prompt** appears. This prompt acts like the Bash shell prompt, but with a limited number of commands.

The table below displays common **FTP commands** for transferring files between servers.

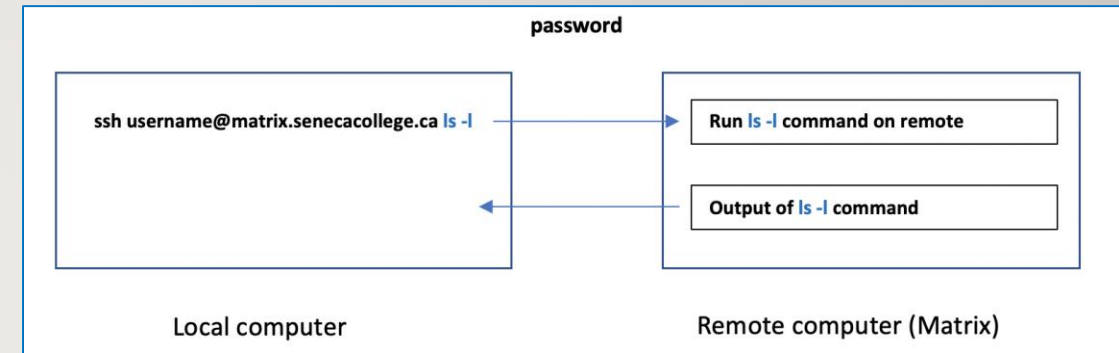
Operation	Local Server	Remote Server
Display current working directory	<code>lpwd</code>	<code>pwd</code>
Display directory contents	<code>lls</code>	<code>ls</code>
Create Directory	<code>lmkdir</code>	<code>mkdir</code>
Change directory location	<code>lcd</code>	<code>cd</code>
Upload file to remote server	<code>put</code>	
Download file to local server	<code>get</code>	



VERIFYING COPIED / TRANSFERRED FILES

Running Remote Matrix Commands on your Local Computer

You can use the **ssh** command to issue Unix/Linux commands on a **remote** server without logging into a remote session.



```
ssh username@matrix.senecacollege.ca ls -l
```

You will be prompted for your Matrix account password, then the contents of your home directory in your remote Matrix account will be displayed, although you will **remain** on your local computer.

```
ssh username@matrix.senecacollege.ca ls -l other.txt
#####
#
# Welcome to Matrix
#
# You are accessing a private utility and information that is strictly
# confidential on a server owned by Seneca College and maintained by
# Information Technology Services
#
# All connection attempts are logged and strictly monitored.
# All unauthorized connection attempts will be fully investigated
# and dealt with appropriately.
#
# All activities on this system are governed by
# Seneca Information Technology Acceptable Use Policy
# For complete ITAU policy visit http://www.senecacollege.ca/policies/itau.html
#
#####
Starting September 1, 2020, Login to VPN will be required to SSH to matrix.

Students: studentvpn.senecacollege.ca
Faculty: senecavpn.senecacollege.ca

Instruction on using VPN: https://inside.senecacollege.ca/its/services/vpn/"

username@matrix.senecacollege.ca's password:
-rw-r--r-- 1 username users 22 Jan 27 10:55 other.txt
```

TRANSFERRING FILES BETWEEN UNIX / LINUX SERVERS

Instructor Demonstration

Your instructor will now demonstrate using the **ssh** command to issue commands on your remote Matrix server to verify files have been properly copied / transferred files between computers..

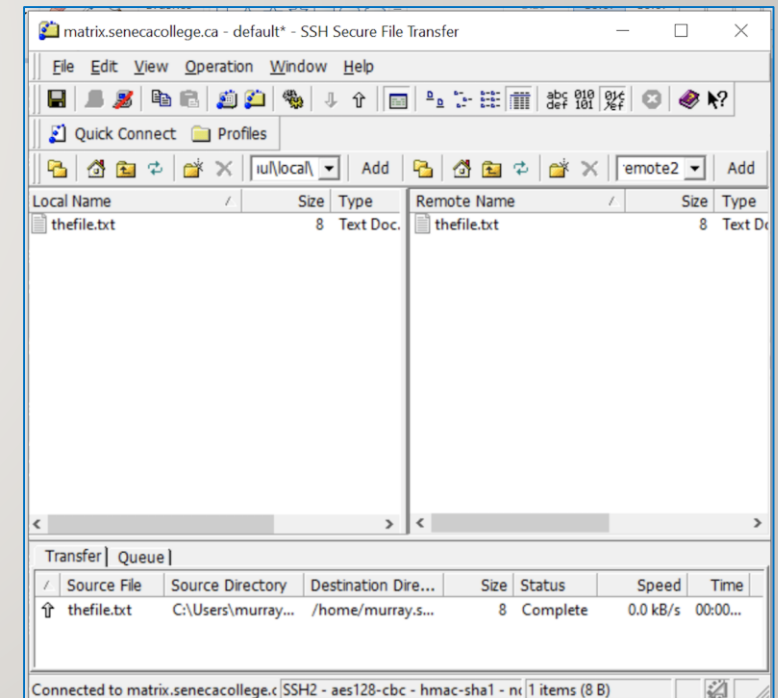


TRANSFERRING FILES BETWEEN UNIX / LINUX SERVERS

Graphical SFTP Application

Although it is important to learn how to use command-line sftp and is considered coverage for *quizzes*, *midterm* and *final exams*, there are **graphical sftp** applications to make it more "user-friendly".

If your computer is using the **MS Windows OS** and you installed the graphical Secure Shell application in **TUTORIAL I INVESTIGATION I**, then you can run a graphical application from your computer desktop.



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Instructor Demonstration

Your instructor will now demonstrate using the **sftp** command and the Secure Shell graphical SFTP application.



TRANSFERRING FILES BETWEEN UNIX / LINUX SERVERS

UNIX Mail (mail)

The **Matrix** server is also an **email server** that can allow you to **send** emails messages to other email accounts.

NOTE: In order to use the **mail** command on a Linux computer at home, you must first install and run an **email server** and have the appropriate **mail client application** installed.



Linux
Mail Command

TRANSFERRING FILES BETWEEN UNIX / LINUX SERVERS

UNIX Mail (mail)

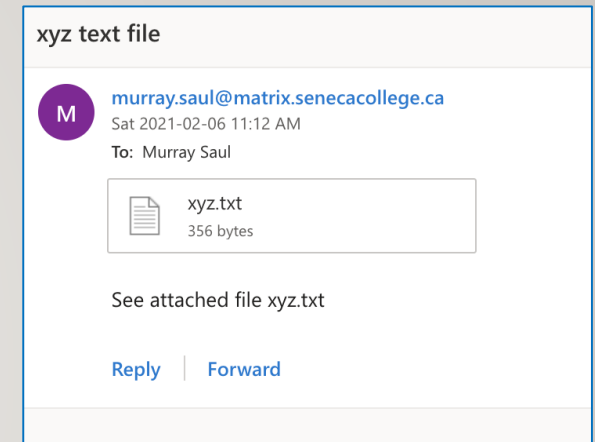
Steps to Send an Email Message:

1. Type: `mail username@hostname` and press **ENTER**
2. Enter **subject line** and press **ENTER**
3. Type the **body of the message** and then when finished, press `ctrl+d` to send message

NOTE: You can use the **mail** command with the **-a** option to specify a file to send as an attachment to your email message.

Example:

```
mail recipient@hostname -a filename
```



```
[ murray.saul ] cat xyz.txt
This is file xyz.txt
[ murray.saul ]
[ murray.saul ] mail -a xyz.txt murray.saul@senecacollege.ca
Subject: xyz text file
See attached file xyz.txt
EOT
[ murray.saul ] █
```


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UNIX Mail (mail)

Alternative Method to Send Email with Attachment

Use the **-s** option in the command to specify the subject line of the command and use **stdin** redirection to send a text file as the body of the message.

NOTE: You would have to use this method since you have used **stdin** redirection to attach the file's so you can't input the subject line from the terminal! You should notice that the contents of the file are displayed in text in the email message as opposed to a file attachment.

Example:

```
mail -s "your subject line" recipient@hostname < filename
```

```
[ murray.saul ]  
[ murray.saul ] cat xyz.txt  
This is file xyz.txt  
[ murray.saul ]  
[ murray.saul ] mail -s "xyz text file" murray.saul@senecacollege.ca < xyz.txt  
[ murray.saul ] █
```

xyz text file



murray.saul@matrix.senecacollege.ca

Sat 2021-02-06 10:38 AM

To: Murray Saul

This is file xyz.txt

[Reply](#)

[Forward](#)

TRANSFERRING FILES BETWEEN UNIX / LINUX SERVERS

Instructor Demonstration

Your instructor will now demonstrate using the **mail** command.



TRANSFERRING FILES BETWEEN UNIX / LINUX SERVERS

Getting Practice

To get practice to help perform assignment #1, perform **Week 6 Tutorial**:

- [INVESTIGATION 1: USING SECURE COPY](#)
- [INVESTIGATION 2: USING SECURE FILE TRANSMISSION CONTROL PROTOCOL](#)
- [INVESTIGATION 3: USING THE MAIL COMMAND TO SEND FILE ATTACHMENTS](#)
- [LINUX PRACTICE QUESTIONS](#) (Questions 1 – 12)
- Perform **BONUS tutorial 7** (due near the end of this semester)