### Browse web securely through SSH Tunnel:

If you require a secure connection to UMass online resources (such as access to academic journals, gradebooks, etc) while off-campus or on an insecure network, you can set up your computer to act as a SOCKS proxy in order to access the internet as if you were coming from our department's ssh server. All traffic passed between your local computer and ssh is encrypted, allowing you to browse the web securely.

## **Mac Instructions:**

Set up the SSH tunnel:

- 1. Open a Terminal (Applications  $\rightarrow$  Utilities  $\rightarrow$  Terminal)
- 2. Type the following command, replacing "username" with your math department username, then hit Enter.

```
ssh -v -D 8080 -f -C -q -N username@ssh.math.umass.edu
```

\* Note: the number following the "-D" option is the port number we want to use for our tunnel. You can use any number between 1025-65536

- 3. Type your password when prompted. Note that the terminal does not display any characters as you type the password this is normal and your keystrokes are still being recorded by the terminal.
- 4. The tunnel is now running in the background! Next we will configure a proxy to use it.

### Configure Computer as SOCKS Proxy:

- There are two options for setting up the proxy: system-wide, and application-specific. **The Firefox browser** allows you to configure just Firefox as a proxy, allowing you to leave your system settings untouched:

- 1. Open Firefox. Type "about:preferences" into the search bar and hit Enter
- 2. Search the settings for "Network Settings". Click the button that says "Settings..."



3. Under "Configure Proxy Access to the Internet", select the button for "Manual proxy configuration". Enter "127.0.0.1" as the "SOCKS Host", select "SOCKS v5", and Port "8080" (or whichever port you specified in your ssh command). Click "OK" to confirm the changes.

	Connection Settings			×
Configure Proxy No proxy Auto-detect p Use system p Manual proxy	y Access to the Internet proxy settings for this network proxy settings			
HTTP Proxy	Use this proxy server for all protocols	Port	0	
SSL Proxy		Port	0	
FTP Proxy		Port	0	
SOCKS Host	127.0.0.1	Port	8080	
Automatic pro	SOCKS v4 O SOCKS v5		Peload	
			Reloau	
Help		Cancel	OK	

4. Google "my ip" and confirm that your public IP address matches that of our ssh server (128.119.47.109)

Alternatively, if you would like to use Chrome or Safari to browse the web, you will need to change your **system-wide settings**:

- 1. Open Network settings in System Preferences (Apple logo in the top left corner → System Preferences → Network)
- 2. From the sidebar on the left, select the connection you want to use (Wi-Fi, Ethernet, etc). Then click "Advanced..." in the bottom left corner.
- 3. Select "Proxies" from the menu of the new window. Then check the button next to "SOCKS proxy". For the SOCKS Proxy Server, enter the localhost IP address ("127.0.0.1") and the port number you specified when setting up the SSH tunnel ("8080" in the above example). Click "OK". Then back in the Network window, click "Apply"

Wi-Fi       TCP/IP       DNS       WINS       802.1X       Proxies       Hardware         Select a protocol to configure:       SOCKS Proxy Server         Auto Proxy Discovery       127.0.0.1       : 8080         Automatic Proxy Configuration       Proxy server requires password       Username:								
Wi-Fi     TCP/IP     DNS     WINS     802.1X     Proxies     Hardware       Select a protocol to configure:     SOCKS Proxy Server     127.0.0.1     : 8080       Auto Proxy Discovery     127.0.0.1     : 8080       Automatic Proxy Configuration     Proxy server requires password       Web Proxy (HTTP)     Username:								
Select a protocol to configure:     SOCKS Proxy Server       Auto Proxy Discovery     127.0.0.1       Automatic Proxy Configuration     Proxy server requires password       Web Proxy (HTTP)     Username:								
Auto Proxy Discovery       127.0.0.1       : 8080         Automatic Proxy Configuration       Proxy server requires password       : 9080         Web Proxy (HTTP)       Username:       : 9080								
Automatic Proxy Configuration     Proxy server requires password       Web Proxy (HTTP)     Secure Web Proxy (HTTPS)								
Secure Web Proxy (HTTPS) Username:								
SOCKS Proxy Password:								
Streaming Proxy (RTSP) Gopher Proxy								
Exclude simple hostnames								
Bypass proxy settings for these Hosts & Domains:								
Use Passive FTP Mode (PASV)								
? Cancel OK								

Confirm the setup:

1. Open your web browser and google "my ip". You should see that google now sees your public IP address as "128.119.47.109"

Shut Down Tunnel:

1. **If using Firefox**: Follow the setup instructions to navigate back to the proxy settings window in Firefox. Switch the option for "Configure Proxy Access to the Internet" back to "Use system proxy settings". Click "OK"

**If using system-wide** proxy: Follow the setup instructions to navigate back to the proxy settings in System Preferences, and un-check the box next to "SOCKS Proxy". Click "OK", then "Apply"

2. Open a terminal and search for the PID number of the ssh connection, using the following command:

ps -ef | grep ssh

In the output, you should see a line such as

501 66007 1 0 3:33PM ?? 0:00.29 ssh -v -D 8080 -f -C -q -N user@ssh.math.umass.edu

The second number in this output (66007 in this example) is the PID number.

3. To shut down the tunnel, enter the following command into Terminal, replacing "66007" with the PID number you found in the previous step:

kill 66007

4. Confirm SSH tunnel no longer open:

ps -ef | grep ssh

You should no longer see the ssh command in the output

# **Windows Instructions:**

To open the SSH tunnel on Windows, you will need the Firefox browser as well as either PuTTY (<u>https://www.putty.org/</u>) or the Windows Subsystem for Linux (<u>https://docs.microsoft.com/en-us/windows/wsl/install-win10</u>) installed on your machine.

Set up SSH Tunnel using PuTTY:

- 1. Open PuTTY
- 2. From the sidebar, select "Session". Enter <u>username@ssh.math.umass.edu</u> for the Host Name (replacing "username" with your department username) and 22 for the port:

🕵 PuTTY Configuration			? ×	
Category:				
Session /		Basic options for your PuTTY sess	ion	
Logging		Specify the destination you want to connect	to	
		Host Name (or IP address) F	ort	
Bell		usemame@ssh.math.umass.edu	22	
Features		Connection type:		
🖻 Window		○ Raw ○ Telnet ○ Rlogin ● SSH	Serial	
Appearance		Load, save or delete a stored session		
Translation		Saved Sessions		
H- Selection				
Colours		Default Settings	Land	
- Connection			Load	
···· Data			Save	
Proxy			2.1.1	
Telnet			Delete	
Riogin				
E- SSH Kov				
Kex		Close window on exit:		
Cipher		○ Always ○ Never ● Only on clean exit		
. Auth	¥			
About	Help	Open	Cancel	

 From the sidebar, select "Tunnels" (located under Connection → SSH → Tunnels). Enter any number between 1025-65536 as the source port. In this example we use 8080. Select the buttons for "Dynamic" and "Auto", then click "Add".

🕵 PuTTY Configuration	1	? ×
Category:		
Features     Window     Appearance     Behaviour     Translation     Selection     Colours	Options controlling SSH Port forwarding Decal ports accept connection Remote ports do the same (SS Forwarded ports:	oort forwarding is from other hosts GH-2 only) Remove
<ul> <li>Connection</li> <li>Data</li> <li>Proxy</li> <li>Telnet</li> <li>Rlogin</li> <li>SSH</li> <li>Kex</li> <li>Host koun</li> </ul>	Add new forwarded port: Source port 8080 Destination	Add
Host keys     Cipher     Cipher     TTY     X11     Tunnels     Bugs     More bugs	Auto O IPv4	O IPv6
About H	elp Open	Cancel

- 4. You should now see "D8080" (or whichever port number you specified in the previous step) in the list of Forwarded ports. Click "Open" and a terminal should appear with a prompt for your department password. Note that the terminal does not display any characters as you type the password this is normal and your keystrokes are still being recorded by the terminal.
- 5. You can now minimize the terminal window and proceed to the next step configuring Firefox as a SOCKS proxy. Do NOT close the window → this will shut down the connection.

Set up SSH tunnel using the Linux Subsystem:

- 1. Open your linux subsystem terminal
- 2. Type the following command, replacing "username" with your math department username, then hit Enter.

ssh -v -D 8080 -f -C -q -N username@ssh.math.umass.edu

\* Note: the number following the "-D" option is the port number we want to use for our tunnel. You can use any number between 1025-65536

- 3. Type your password when prompted. Note that the terminal does not display any characters as you type the password this is normal and your keystrokes are still being recorded by the terminal.
- 4. The tunnel is now running in the background! Next we will configure a proxy to use it.

Configure Firefox as a SOCKS Proxy:

1. Open Firefox. Type "about:preferences" into the search bar and hit Enter

2. Search the settings for "Network Settings". Click the button that says "Settings..."



Under "Configure Proxy Access to the Internet", select the button for "Manual proxy configuration". Enter "127.0.0.1" as the "SOCKS Host", select "SOCKS v5", and Port "8080" (or whichever port you specified in your ssh command). Click "OK" to confirm the changes.

Connection Settings			×
Configure Proxy Access to the Internet <ul> <li>No proxy</li> <li>Auto-detect proxy settings for this network</li> <li>Use system proxy settings</li> <li>Manual proxy configuration</li> </ul>			
HTTP Proxy	Port	0	
Use this proxy server for all protocols			
SSL Proxy	Port	0	
FTP Proxy	Port	0	
SOCKS Host 127.0.0.1	Port	8080	
SOCKS v4  SOCKS v5			
Automatic proxy configuration URL			
	R	eload	
Help	Cancel	ОК	

4. Google "my ip" and confirm that your public IP address matches that of our ssh server (128.119.47.109)

### Shut down SSH tunnel using PuTTy:

- 1. Follow the same instructions as during setup to navigate back to the proxy settings window in Firefox. Switch the option for "Configure Proxy Access to the Internet" back to "Use system proxy settings". Click "OK"
- 2. Exit out of the PuTTy application. This will automatically close the connection.

Shut down SSH tunnel using the Linux Subsystem:

- 1. Follow the same instructions as during setup to navigate back to the proxy settings window in Firefox. Switch the option for "Configure Proxy Access to the Internet" back to "Use system proxy settings". Click "OK"
- 2. Open a terminal and search for the PID number of the ssh connection, using the following command:

ps -ef | grep ssh

In the output, you should see a line such as

```
user 66007 1 0 3:33PM ?? 0:00.29 ssh -v -D 8080 -f -C -q -N user@ssh.math.umass.edu
```

The second entry in this output (66007 in this example) is the PID number.

3. To shut down the tunnel, enter the following command into Terminal, replacing "66007" with the PID number you found in the previous step:

kill 66007

4. Confirm SSH tunnel no longer open:

ps -ef | grep ssh

You should no longer see the ssh command in the output

## **Linux Instructions:**

Follow the instructions for a Windows machine using a Windows Linux Subsystem, but use the native Linux terminal.