File Transfer with SSH

To complete the lab experiment reports, the student is first required to upload the report templates from the course website to his OIT UNIX account home area. From there he has to download the files necessary for his lab report to his desktop, modify them and finally transfer them back to into the appropriate directory in his UNIX account.

1). Installation of SSH (Secure Shell):

For Windows operating systems, SSH can be downloaded to your computer via the course websites. Follow the link at "Technical Help", or download from <u>here</u>. Next double-click the file to start the installation process. The setup will install two new icons on your desktop, one for the SSH Secure Shell Client (Terminal), and one for the SSH Secure File Transfer Client (FTP).

2). Transferring files using SSH:

Double-click the SSH Secure File Transfer Client icon on your desktop window. This will start the SSH GUI (see Figure 1).

📁 - defaultsftp -	SSH Secure Fi	ile Tra	nsfer						
Eile Edit <u>V</u> iew (Operation <u>W</u> indo	ow <u>H</u> e	lp						
📗 🗾 Quick Connect	📄 Profiles 📗		J 📕 🖻	R 🖉 🖉	1	11		<u>a</u> <u>a</u> <u>a</u> -	8-8- 8-8-
🛛 🔁 🖆 🕋 🗢 🗌	📸 🗙 📔		▼ Add	8	1	ař X		ŀ	Add
Local Name	4	Size	Туре 🔥	Remote Nar	ne			Size	э Туре
My Documents			System 🗧						
😼 My Computer			System 💻						
🧐 My Network Places			System						
🥑 Recycle Bin			System						
🥶 Internet Explorer			System						
🙆 Microsoft Outlook			System						
🔁 Adobe Acrobat 6.0 P	vrofessi	1,740	Shortcu						
🚰 Adobe Studio		176	Interne						
🚴 AOL Instant Messen(ger	626	Shortcu						
🛄 Conquests		1,887	Shortcu						
强 Creative PlayCenter		1,820	Shortcu						
🙉 IBM PC Camera		680	Shorter	<					>
Transfer Queue)									
🔺 Source File 🛛 🤉	Source Directory	De	stination Dire	ctory	Size Sta	atus	9	peed	Time
<									>
Not connected - press E	inter or Space to								

Figure 1. SSH Secure File Transfer GUI

Next click on "Quick Connect" in the third menu bar from above. A new window comes up in which you have to enter the host machine you want to connect to, as well as you username for your OIT Unix account (Figure 2). The username/password combination should be the same as your NetID (see your UTK e-mail). If you do not have an OIT Unix account, you need to get one.

Enter the host name of the public OIT Unix server, *unix.cas.utk.edu*, your Net ID and then press "Connect".



Figure 2. Quick Connect

If this is the first time you connect to that machine, you will be ask if you want to save the fingerprint of that new host to the local SSH database (see Figure 3). Press "Yes".



Figure 3. Host Identification

Next the program will ask you for the password (Figure 4). Insert the password that is connected to your OIT Unix account.

🛍 unix.cas.utk.e	du - default - SSH	l Secure File T	ransfer			. 🗆 🗙
<u> </u>	Operation <u>W</u> indow	Help				
📗 🛃 Quick Connect	🧰 Profiles 📗 🔛	🔎 🎉 🖻	e 🛎 🛍 «	1 I 🖗		- 8-8-
8 🖄 🛍 🗢	📑 🗙 🛛	▼ Add	B & m	2 8 X		- Add
Local Name	7 5	5ize Type 📩	Remote Name		Sia	ze Type
My Documents		System				
😼 My Computer		System 💻				
SMy Network Places		System				
🥑 Recycle Bin		System				
🦲 Internet Explorer		System				
🕒 Microsoft Outlook		System				
Adobe Acrobat 6.0	Enter Password					
🚰 Adobe Studio				-		
🔏 AOL Instant Messe		ecced to		OK		
Conquests	Password:	****		Canaal		
强 Creative PlayCenti						
Se IBM PC Camera			1	100	1	3
<u> </u>			<u> </u>	100		<u> </u>
Transfer Queue						
/ Source File	Source Directory	Destination Direc	tory Size	Status	Speed	Time
<						>
Connecting to unix.cas	s.utk.edu				1	

Figure 4. Password window

To save time in the future you can now save all the login information in a so-called profile (Figure 5). This window will only stay open for several seconds. Enter the name you want to give the profile, e.g. OIT Unix, then press the "Add In Profiles" button. From now on, instead of using the "Quick Connect", just go to the "Profiles" button, and choose the profile you saved earlier. It automatically inserts all the required connection information and will only ask you for the password.

🚰 unix.cas.utk.edu - d	efault - SSH S	ecure File T	ransfer		_	
<u>File E</u> dit <u>V</u> iew Operat	ion <u>W</u> indow <u>H</u>	elp				
🛛 👔 Quick Connect 🛛 📄 Pr	ofiles	S 🗾 🖻 I	8 🛎 🎦 «	🗞 J û		
🔁 🙆 📾 🗢 📑	×	Add	B & B (2 😽 🗙	/mgrubert 👻	Add
Local Name	/ Size	Type Add P	rofile			
My Documents		Syst Unix			Add to Profiles	r I
😼 My Computer		System	John	-	-	1 oract
😒 My Network Places		System	🚞 mail			Folder
🥑 Recycle Bin		System	🚞 nsmail			Folder
Internet Explorer		System	🚞 public_html			Folder
🙆 Microsoft Outlook		System	🔟 dead.letter		457	LETTER I
🔀 Adobe Acrobat 6.0 Profess	i 1,740	Shortcu	🔟 simp		0	File
🕼 Adobe Studio	176	Interne				
AOL Instant Messenger	626	Shortcu				
Conquests	1,887	Shortcu				
强 Creative PlayCenter	1,820	Shortcu				
IBM PC Camera	680	Shorta 🎽	/			-
<u> </u>			<u> </u>	100		<u> </u>
Transfer Queue)						
/ Source File Source	Directory D	estination Direc	tory Size	Status	Speed	Time
2						151
		1111				
Connected to unix.cas.utk.edu	u - /u06/m SSH2 -	aes128-cbc - hi	mac-md5 - none	7 items (457	B)	

Figure 5. Add Profile

Files on the computer have certain permissions. Those limit or grant access to certain features of the file, e.g. how you can read them, change them, etc.

It is important that the report files you transfer stay world-readable, otherwise you will be the only one who can read them and the instructor will not be able to grade your work.

On the top menu bar, click on "Edit", then "Settings". Scroll down until you find "File Transfer" (see Figure 6). Click on the "Advanced" selection and make sure that in the paragraph labeled "Upload" the checkbox before "Preserve original destination permissions" has a marker. Then press "OK".

Keyboard 🔼	Advanced		
- Tunneling			
⊟- File Transfer — Remote Favorites	Configure advanced file transfer se	ettings.	
🖃 Global Settings 📃			
🚊 Appearance	Preserve original file time		
- Font	Upload		
- Colors	Preserve original destination	nermissions	
- Messages	I Teserve originar destination	r permissions	
User Authentication	Default file permissions:	644	
- Keys	Default directory parairright	755	
Certificates	Default directory permissions:	1.00	
SSH Accession			
⊡- PKCS #11	File transfer send window		
- Configuration	Number of buffers:	10	-
Server Authentication		1.000	
- Host Keys	Buffer size:	32	KBytes
- LA Certificates		·	
LDAP Servers			
	Upload after modifying remote file	38	
Advanced	C Yes When editing a ren	note file, a temp	orary copy is
Mode	C No automatically down	nloaded.	
Local Favorites	Choose if the modil	hed hie should b	e uploaded to the
Firewall	 Ask server alter editing. 		
Disting			
- Printing			

Figure 6. Settings for File Permissions

Now you see the GUI for the file transfer client (Figure 7). It consists of two windows, the one on the left, which shows the directory structure on your home machine (the machine you are sitting in front of), and the one on the right, which shows the directory structure of your host machine (the one you logged in remotely at OIT, e.g. Unix.

🚰 1:unix.cas.utk.edu - d	efault - SSH Secure F	le Transfer	
Eile Edit View Operation	<u>W</u> indow <u>H</u> elp		
📗 🗾 Quick Connect 🛛 📄 Profile	es 📗 🖬 📕 🏂 🗎	a 💼 🛛 🙇 🖉 🖓 📔) î 🔚 🍳 🗄 📰 d
🛛 🔁 🖄 🛍 🌣 🛛 💣 🗙	C:\ 💽 Add	8 🖄 🔁 🗢	📸 🗙 🛛 6/mgrubert 💌 🛛 Add
Local Name 🗸 🗸	Size Type 🧹	Remote Name	🛆 Size Type
🛅 452w	File Fold	🗀 public_html	Folder
	File Fold		
CD-Copy/S	File Fold		
Config.Msi	File Fold		
d7dafed9b926f5c64eb	File Fold		
Dissertation	File Fold		
Documents	File Fold		
Documents and Settings	File Fold		
Download	File Fold		
Employment	File Fold		
🗖 gs	File Fold		
Homework	File Fold	<	>
Transfer J. Oursen J.			
Transfer Queue	De la		
A Source File Source Dir	ectory Destination D	rectory Size Stat	us Speed lime
Connected to unix.cas.utk.edu - /	/u06/mgi SSH2 - aes128-cb	: - hmac-md5 - none 1 ite	ems (0 Bytes)

Figure 7. File Transfer Client

You will see a *public_html* folder in the right window. This is where all you publicly accessible files are stored, like websites and such. Click on the folder.

Next you have to download the Lab report templates from the course website, or directly from <u>here</u>, to your desktop. Extract the compressed file. Depending on the program or web browser you use, the file content might be extracted in a sub-folder. Figure 8 shows the desired directory structure for your OIT Unix account. If the extraction of the file was successful, you should see a folder labeled 452w on your desktop. You can double-click on the folder to make sure that the directory structure is the same as in Figure 8.



Figure 8. Lab report directory structure

Now drag the folder 452w over to the right window of your SSH GUI. This will upload the 452w folder under the *public_html* directory on your OIT Unix account (see Figure 9), hence makes it accessible for everybody to see as a webpage.

📁 1:unix.cas.utk.edu -	- default -	SSH Secure File	Transfe	r			
∏ <u>F</u> ile <u>E</u> dit ⊻iew Operat	tion <u>W</u> indow	Help					
📗 🛃 Quick Connect 🛛 📄 Pr	rofiles 📗 🔚	🔳 🎜 🖺 (a 🔊 i	<u>i</u> %	J û 🛛	<u><u> </u></u>	🗄 🏢 d
🛛 🔁 🖆 🔛 🖆 🔛	× [c:/	▼ Add	8 🖓	🔁 🗭	🛪 🗙	/public_html	▼ Add
Local Name	Δ	Size Type 🔥	Remote N	lame	Δ.	Siz	е Туре
🛅 452w		File Fold	🚞 452w				Folder
🚞 ATI		File Fold					
🛅 CD-Copy		File Fold					
🛅 Config.Msi		File Fold					
a7dafed9b926f5c64eb		File Fold					
Dissertation		File Fold					
Documents		File Fold					
Documents and Settings		File Fold					
Download		File Fold					
Employment		File Fold					
न्द्रि 💭		File Fold					
Homework		File Fold	<				>
						,	
Transfer Queue		1					
△ Source File Source	Directory	Destination Dire	tory	Size Sta	atus	Speed	Time
Connected to unix.cas.utk.edu	u - /u06/mai S	:5H2 - aes128-cbc -	hmac-md5	- none 1 i	tems (0 Bytes	;)	2

Figure 8. 452w lab reports installed in *public_html* area

After the file transfer is complete, click on the 452w folder in the right window of you SSH GUI. You should now see the different Lab folders, as well as an *index.html* file. This file is what you see when you go to the Student Labs link at the course website and click on a student name. It contains all the links to your different lab reports. Let's look what's in a Lab folder. If you click for example Lab 4, you can see a folder labeled *Figures* and several *.htm* files (see Figure 9). Those *.htm* files contain each a webpage for your lab report. The information you find in those pages is as following:

- obj.htm Objective
- prb.htm
 Problem Statement
- disc.htm Discussion/Results
- conc.htm Conclusion

For Lab 1 you will need to update the Objective (*obj.htm*) and the Problem Statement (*prb.htm*), for all the other labs you will need to update the Discussion/Results section (*disc.htm*) and the Conclusion (*conc.htm*).

<u>Eile E</u> dit <u>V</u> iew	Operation Windo	w <u>H</u> elp				
📗 🛃 Quick Connect	Profiles	2 S 🎉 P a	R 🖄 🍅	🎭 🕹 û		e 📰 a
8 2 2	📑 🗙 🕅 \452	_Labs\ 💌 Add	8 3 6	s 🕫 🖄 🗸	/452w/Lab4 _	Add
Local Name	1	Size Type	Remote Nam	ne	/ Size	Туре
			Figures			Folder
			Conc.htm		468	HTML Do.
			disc.htm		479	HTML Do.
			home4.ht	tm	676	HTML Do.
			elleft.htm		3,108	HTML Do.
			el obj.htm		2,838	HTML Do.
			e prb.htm		42,001	HTML Do.
<i>I</i> ∕ ₂						
<		>	<			>
Transfer Queue)						
/ Source File	Source Directory	Destination Dir	ectory :	Size Status	Speed	Time
						24

Figure 9. Lab 4 files

Also in Figure 9 you can see that each of the directory windows in the SSH GUI has a menu bar above them, which are identically and allow the user to change directories, create new folders, refresh the window, etc.

To transfer files you choose the destination folder in the left window, e.g. My Documents, or just create a new folder on your C: Drive, e.g. 452w_Labs. Then you drag the files you want to copy from the host machine to your local machine by holding the left mouse button over the file in the right window and moving it over to the left window. Alternatively you can just double-click the file in the right window.

Figure 10 shows the GUI after the files conc.htm and disc.htm have been successfully transferred to your local machine.

📁 1 : unix. cas. utk	c.edu - default - SS	iH Secure File	Transfer				
<u> </u>	Operation <u>W</u> indow	Help					
👔 Quick Connect	📄 Profiles 🛛 🔛	🎩 🏂 🖪 I	2 🙆 🖉	<u> </u>) J J	<u> </u>	i 📰 al
🔁 🖄 🖻 🌩	🔺 🗙 🕅 \452_Lat	os\ ▼ Add	8	<u>e</u> 7	* 🖆 🗙	/452w/Lab4 🗖	Add
Local Name	A Si	ze Type	Remote N	ame		∆ Size	Туре
Econc	4	90 HTML Do	Eigures	5			Folder
😂 disc	50	01 HTML Do	Conc.hl	tm		468	HTML Do.
			disc.hti	m		479	HTML Do.
2			le home4	.htm		676	HTML Do.
n			el left.htr	n		3,108	HIML Do.
			CODJ.NCN	n ~		2,838	HTML Do.
			Top btr	11 70		42,001	HTML DO.
<	II)	>	<				>
Transfer Queue)							
🔺 Source File	Source Directory	Destination Direc	tory	Size	Status	Speed	Time
🕂 conc.htm	/u06/mgrubert/pu	C:\Internet-Cou	rs	468	Complete	0.4 kB/s 0	0:0
↓ disc.htm	/u06/mgrubert/pu	C:\Internet-Cou	rs	479	Complete	0.9 kB/s 0	0:0
Connected to unix.cas	.utk.edu - /u06/mgi SSH	12 - aes128-cbc -	hmac-md5 -	none	2 selected (9	47 B)	

Figure 10. Successful transferred

3) Updating the files

Now you need to update the files you just transferred. To change the content in an *.htm* file, you can use Microsoft FrontPage, Microsoft Word or Dreamweaver. Most Windows computers have at least Microsoft Word.

Start the software and then open the files you transferred earlier. Write your lab reports and include pictures, tables and formulas, depending on the results. Note that if you include pictures or equations, there is a possibility that those are not being saved in the *.htm* file itself, but within a subfolder, e.g. *disc_files*. It is important that you copy this subfolder as well when you upload the corrected files to you OIT UNIX account. If you rename the folder, or move the files into a different folder, the pictures and equations will not show up in your uploaded report, since the computer will not be able to find the files in the specified locations.

When you are done with your work, click the "Refresh" button (green arrows) above the left window in your SSH GUI, then drag the updated files from the left over to the right window (host machine).

It is advisable to check your results afterwards by going to the Student Labs on the course website. Don't forget to send e-mail to Dr. Baker (<u>ajbaker@utk.edu</u>) to inform him that your lab report has been posted.