Install Secure Shell Server (sshd) on Windows using Cygwin

In this tutorial you will learn to install a Secure Shell Server (also known as sshd or Secure Shell Daemon) on a Windows system using the openssh package and the Cygwin utilities. You will learn how to use the secure shell client to connect to a system running sshd and start a shell. If you were unaware, the shell is the equivalant of the Windows command prompt (cmd.exe). This shell is what you will be interacting with on the system running sshd.

SSH is a suite of client/server based tools used for encrypted communication between two systems. There are several tools included in the suite of SSH tools. The two we are going to use in this tutorial are the following:

- 1. sshd The secure shell server software.
- 2. ssh The secure shell client software, used to connect to the server.

Why would you want to do this? These tools were built as a secure replacement for telnet. If you still use telnet, then you need to switch to SSH now! Telnet sends information across the network in plain text, including your username and password! Anyone able to sniff your network traffic can see this information and then log in as you.

If you aren't familiar with Cygwin, it is an awesome suite of tools that make many Linux utilities available in the Windows environment. This will allow you to run a BASH shell in your Windows environment! If you aren't familiar with Linux, Cygwin is one way to get started learning some of the basic tools provided with Linux. At some point I'll write a post about why these tools are so awesome and why everyone stuck developing on a Windows system should install them.

A quick word about security after you install sshd. When you connect to the system running sshd, you will have to supply a username and password (until you learn how to configure keys: next article). The username and password that you will supply needs to correspond with a Windows user account on the system running sshd. That said, make sure every user account on the sshd system has a strong password(passphrase is better).

When you install sshd, you are making port 22 available for connections by anyone, unless you lock it down through a firewall of some sort(which you should). I will repeat myself, make sure every user account on the system has a strong password! Port 22 is the standard SSH port number. There are botnets running on the internet that

may find your machine with port 22 open. The bots will assume sshd is running on port 22, so don't be suprised if you look at logs and see failed login attempts with simple username/password combinations of root/blank, Administrator/blank, etc... The login attempts are nothing to be alarmed about if you have strong passwords. root is the unix equivalent of the Windows Administrator account.

Installing Cygwin and openssh applications

1. First we need to download setup.exe from the Cygwin website.



- 2. Run the setup.exe which you just downloaded.
- 3. Select next.

E Cygwin Setup	
	Cygwin Net Release Setup Program
	This setup program is used for the initial installation of the Cygwin environment as well as all subsequent updates. Make sure to remember where you saved it.
	The pages that follow will guide you through the installation. Please note that Cygwin consists of a large number of packages spanning a wide variety of purposes. We only install a base set of packages by default. You can always run this program at any time in the future to add, remove, or upgrade packages as necessary.
	Setup.exe version 2.774
	Copyright 2000-2012
	http://www.cygwin.com/
	< Back Next > Cancel

4. Select 'Install from Internet'

wnload Source
ether to install or download from the internet, or install from files in ctory.
 Install from Internet (downloaded files will be kept for future re-use) Download Without Installing
Install from Local Directory

Select the root directory of the installation and who is allowed to use it.
 a. (c:\cygwin and 'All Users' should be fine)

E Cygwin Setup - Choose Installation Directory
Select Root Install Directory Select the directory where you want to install Cygwin. Also choose a few installation parameters.
Root Directory
C:\cygwin Browse
Install For
<u>A</u> II Users (RECOMMENDED)
Cygwin will be available to all users of the system.
⊚ Just <u>M</u> e
Cygwin will still be available to all users, but Desktop Icons, Cygwin Menu Entries, and important Installer information are only available to the current user. Only select this if you lack Administrator privileges or if you have specific needs.
< <u>B</u> ack Next > Cancel

6. Select the 'Local Package Directory'. This location will be used to store downloaded information during the installation process.

Cygwin Setup - Select Local Package Directory	
Select Local Package Directory Select a directory where you want Setup to store the installation files it downloads. The directory will be created if it does not already exist.	E
Local Package Directory C:\Users\lars\Downloads	Browse
< <u>B</u> ack	Next > Cancel

7. Select your internet connect type. (If you don't use a proxy, select 'Direct Conection').

Cygwin Setup - Select Connection Type
Select Your Internet Connection Setup needs to know how you want it to connect to the internet. Choose the appropriate settings below.
Direct Connection Use Internet Explorer Proxy Settings Use UTTR (FTR R
© Use HTTP/FTP <u>P</u> roxy: Proxy <u>H</u> ost Port_ 80
< <u>B</u> ack <u>N</u> ext > Cancel

8. Choose a download site. Just pick one.

E Cygwi	in Setup - Choose Download Site(s)	
	se A Download Site noose a site from this list, or add your own sites to t	he list
	Available Download Sites:	
	http://cygwin.mirrorcatalogs.com http://www.netgull.com ftp://cygwin.mirrors.pair.com http://cygwin.mirrors.pair.com http://cygwin.parentingamerica.com http://servingzone.com http://servingzone.com http://wirror.symnds.com ftp://mirrors.xmission.com ftp://mirrors.xmission.com ftp://ftp.gtlib.gatech.edu http://tug.mtu.edu	
User	r URL:	Add
		< <u>B</u> ack Next > Cancel

- 9. Select the openssh package for installation.
 - a. In the search field, enter in 'ssh'. The installer will automatically search for matches.
 - b. Expand the 'Net' menu
 - c. Click (only once!) on the word 'Skip' in the openssh package row. This will cycle it to the next option, which displays the current version. At the time

of writing (5/13/2013) that version is 6.2p1-2

d. Note that this is only installing the openssh binary package. It is not setting up the Secure Shell Server for you. That comes later.

<u>S</u> earch ssh		Clear				<u>K</u> eep
Category	Current	New	В	S Size)	Package
🗆 All 🚯 De						
	g 😯 Default					
	Default					
🗆 Net 🕄	🕈 Default					
		Skip	ηία	n/a		autossh: Automatically restart SSH sessions and tunnels
		Skip	ηία	ηία		libssh2: SSH2 protocol library (sources)
		Skip	ηία	ηία		libssh2-devel: SSH2 protocol library (development)
		🚯 Skip	ηία	nja		libssh2_1: SSH2 protocol library (runtime)
		€ 6.2p1-2	\boxtimes		899k	openssh: The OpenSSH server and client programs
•						•

10. The installer will show you a list of openssh dependencies (things it uses). Select next.

🗲 Cygwin Set	up - Resolving Dependencies	_ D _ X
	Dependencies owing packages are required to satisfy dependencies.	E
cygrunsrv	r (1.40-2) NT/W2K service initiator Required by: openssh	*
libedit0	(20120311-1) The NetBSD Editline library (runtime) Required by: openssh	
libkafs0	(1.5.2-4) Kerberos 5 implementation (AFS library) Required by: openssh	
libwrap0	(7.6-21) Host-based access restrictions on tcp services (runtime) Required by: openssh	Ŧ
		- F
Select rec	quired packages (RECOMMENDED)	
	< <u>B</u> ack <u>N</u> ext >	Cancel

11. Let the installer do it's thing... Some people have experienced half hour long installs. If you do, try selecting a different download site.

	E 31% - Cygwin Setup
	Progress This page displays the progress of the download or installation.
	Downloading libfpx1-1.3.1.2-1.tar.bz2 from http://mirror.symnds.com/software Connecting Package: Total: Disk:
12 Cvowi	<u> </u>
	Cygwin Setup - Installation Status and Create Icons
	Create Icons Tell setup if you want it to create a few icons for convenient access to the Cygwin environment.
	Create icon on <u>D</u> esktop
	Installation Status Installation Complete

Setting up Secure Shell Server (sshd)

- 1. Start a Cygwin Terminal as an Administrator. You must run the terminal with administrative access to set up sshd. To start a cygwin terminal with administrative access:
 - a. Find the Cygwin Terminal icon in the start menu.
 - b. Right click the 'Cygwin Terminal' icon and select 'Run as Administrator'.



- 2. The Cygwin installer put a script on your system that performs the sshd set up for you. The script exists here: /usr/bin/ssh-host-config
 - a. At the prompt, enter in 'ssh-host-config' (without the single quotes, and press enter)



- 3. You will now either see a warning about not having administrative privileges because you didn't run the terminal as an Administrator, or the script will start generating keys and begin asking you questions. If you see warnings about privileges then you need to close the terminal and run it again with administrative privileges (see above).
- Here are the answers you will be asked by the script, along with the response you should supply in **bold**Query: Should privilege separation be used? (yes/no) yes

Query: new local account 'sshd'? (yes/no) yes

Query: Do you want to install sshd as a server?

Query: (Say "no" if it is already install as a service) (yes/no) **yes**

Query: Enter the value of CYGWIN for the daemon: [] (DON'T ENTER ANYTHING, PRESS ENTER)

Query: Do you want to use a different name? (yes/no) **no**

Query: Create new privileged user account 'cyg_server'? (yes/no) **yes**

Query: Please enter the password: ENTER YOUR PASSWORD HERE

Query: Reenter: **RE-ENTER YOUR PASSWORD**

5. Now you should have a Windows service installed named 'CYGWIN sshd',

which is run as the user 'cyg_server'. If you look at the service, you can see it is running the executable 'c:\cygwin\bin\cygrunsrv.exe'. There will be a new Windows account 'Privileged Server'. That's it. That is all there is to getting the Secure Shell Server installed! You can always go back and re-run the script if you need to.

Starting and stopping the sshd server

- 1. Starting the server
 - a. At the command prompt enter 'net start sshd'
 - b. You should see the following output: The CYGWIN sshd service is starting.

The CYGWIN sshd service was started successfully.

- 2. Stopping the server
 - a. At the command prompt enter 'net stop sshd'
 - b. You should see the following output: The CYGWIN sshd service is stopping.

The CYGWIN sshd service was stopped successfully.

Testing your sshd installation

To connect to an sshd server you can type in the command 'ssh username@ipaddress' where username is the windows username and ipaddress is in dotted-decimal notation.

- 1. Now we will test our sshd installation.
- 2. Start a cygwin terminal on the system that sshd is installed on.
- 3. Enter the following at the command prompt 'ssh username@127.0.0.1' where username is the Windows account username you want to connect as on the system running sshd.
- 4. You will be presented some information and asked: Are you sure you want to continue connecting (yes/no)?
 - a. enter yes
- 5. Enter the pasword for your Windows account.
- 6. If your connection was successful you should see something similar to this:

<pre>\ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \</pre>		x
-	<pre>\$ ssh lars@127.0.0.1 The authenticity of host '127.0.0.1 (127.0.0.1)' can't be established. ECDSA key fingerprint is 7e:d7:79:e6:39:f7:6e:59:6b:3a:c6:b8:74:85:0c:4f. Are you sure you want to continue connecting (yes/no)? yes Warning: Permanently added '127.0.0.1' (ECDSA) to the list of known hosts. lars@127.0.0.1's password: Last login: Thu May 16 22:08:23 2013 from 127.0.0.1</pre>	*

Now what?

- 1. Type 'help' at the command line to see what is offered in the BASH shell.
- 2. Learn about the BASH shell: https://www.google.com/search? q=learn+the+bash+shell
- 3. Next time, we will talk about hardening / configuring the sshd installation. When the article is complete, it will be linked to here.

Firewalls

As with all networking software, you need a good understanding of TCP/IP to get everything running properly. If you are only expecting ssh connections from specific systems, you should try to limit incoming connection to those IPs or an IP range. I'm not going to go into detail about configuring your firewall. However, here are the two important pieces of information for setting up the firewall for sshd.

- 1. sshd default port: 22
- 2. sshd application will appear to run from the executable c:\cygwin\bin\cygrunsrv.exe

Logs

sshd will write to the windows logs. The souce of the log entry will be from 'sshd'.

Troubleshooting

You may see a connection attempt fail and present a similar error message:

ssh: connect to host 127.0.0.1 port 22: Connection refused

This can happen for at the very least, one of the two following reasons:

- 1. sshd is not running. In which case you can start the service by entering 'net start sshd'
- 2. The firewall on the sshd system may be blocking port 22 from your IP address.

More information

- 1. Cygwin docs: http://cygwin.com/cygwin-ug-net.html
- 2. OpenSSH: http://www.openssh.org/