Collaboration Backups with Cygwin + OpenSSH on Windows

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Summary

Cisco officially supports the Cygwin + OpenSSH solution on Windows computers as the backup solution for its collaboration products. This is a free option, and with how quickly it sets up, you really cannot beat it.

Presently this guide only works for local accounts defined on the SFTP server. Domain account support is pending further testing and validation, but is possible to do.

Information Gathering

Spend a few minutes to gathering the following information which you will need during the setup and testing. Some example values have been supplied.

| Кеу | Value | Notes |
|--------------------------------------|------------------------|----------------------------|
| SFTP Server Cygwin Install Directory | C:\cygwin | Use this default directory |
| SFTP Server Cygwin Package Directory | C:\cygwin\packages | |
| SFTP Server Operating System | Windows Server 2008 R2 | |
| SFTP Server Hostname | SFTPSERVER01 | |
| SFTP Server IP Address | 10.10.10.10 | |
| SFTP Server Backup Folder Location | D:\backups | Mind the storage space! |

| SFTP User Username | cisco | |
|----------------------------------|------------|----------------|
| SFTP User Password | Cisco123 | |
| SFTP System User SSHD Username | sshd | System account |
| SFTP System User SSHD Password | Cisco123 | |
| SFTP System User CYGWIN Username | cyg_server | System account |
| SFTP System User CYGWIN Password | Cisco123 | |
| Frequency of Backups | Daily | Per product |
| Number of Backups to Store | 3 | Per product |
| Backup CDR? | No | CUCM Only |
| Back Greetings, Names, Messages? | Yes | CUC Only |

Obtain Software

The only software you need to download is the server software, which is Cygwin. However, to test the SFTP solution from a client machine, you will also want to download an SFTP client.

Server Software

Download the Windows 32/64-bit binary file from:

http://www.cygwin.com/

The file is called setup-x86.exe for 32-bit systems and setup-x86_64.exe for 64-bit systems.

This file goes anywhere on your SFTP server. The desktop or downloads folders are both good choices.

Client Software (For Testing)

Download the Windows 32-bit binary file from:

http://www.chiark.greenend.org.uk/~sgtatham/putty/download.html

The file is called psftp.exe.

This file goes anywhere on your client computer. The desktop or downloads folders are both good choices.

SFTP Server Installation

1. Run the setup file by double clicking it.

둘 setup-x86.exe

2. Click Next to begin setup.



3. Select 'Install from Internet' and click Next.

| E Cygwin Setup - Choose Installation Type | |
|--|--------|
| Choose A Download Source Choose whether to install or download from the internet, or install from files in a local directory. | E |
| Install from Internet (downloaded files will be kept for future re-use) Download Without Installing | |
| Install from Local Directory | |
| < <u>B</u> ack <u>N</u> ext > | Cancel |

4. Enter your SFTP Server Cygwin Install Directory, Select All Users, Click Next

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

5. Enter your SFTP Server Cygwin Packages Directory, Click Next

| E 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:\cygwin\packages | B <u>r</u> owse |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| < <u>B</u> ack <u>N</u> ext > | Cancel |

6. Select Yes to have the Packages directory created.



7. Select 'Direct Connection' and click Next.

| E Cygwin Setup - Select Connection Type | -OX |
|--|--------|
| Select Your Internet Connection Setup needs to know how you want it to connect to the internet. Choose the appropriate settings below. | E |
| Direct Connection Use Internet Explorer Proxy Settings Use HTTP/FTP Proxy: Proxy Host Port 80 | |
| < <u>B</u> ack <u>N</u> ext > | Cancel |

8. Select any download site from the list and click Next.

| E Cygwin Setup - | Choose Download Site(s) | | | |
|-------------------------------|--|----------------|----------------|--------|
| Choose A Dow Choose a site | nload Site e from this list, or add your own sites to t | he list | | E |
| | Available Download Sites: | | | |
| | http://mirrors-usa.go-parts.com http://cygwin.mirrors.hoobly.com http://cygwin.mirrors.hoobly.com http://cygwin.mirrors.pair.com http://cygwin.mirrors.pair.com http://cygwin.mirrors.pair.com http://cygwin.parentingamerica.com http://cygwin.skazkaforyou.com http://cygwin.skazkaforyou.com http://mirrors.symnds.com ftp://mirrors.xmission.com http://mirrors.xmission.com ftp://ftp.gtlib.gatech.edu http://www.gtlib.gatech.edu | | | |
| User URL: | | | Add | j j |
| | | | | |
| | | < <u>B</u> ack | <u>N</u> ext > | Cancel |

9. Enter 'OpenSSH' into the search field, expand 'Net', and click on Skip one time.

| Þ | Cygwin Setu | p - Select P | ackages | | | | | _ 🗆 🗙 |
|---|--------------------------|------------------------------|---------------|----------------|----------------|----------------|------------|-----------|
| | Select Pack Select pa | ages ckages to ins | tall | | | | | E |
| | Search open | issh | <u>C</u> lear | ○ <u>К</u> еер | ⊙ <u>C</u> urr | ⊖ E <u>x</u> p | ⊻iew | Category |
| | Category | New | | B | S Size | , | Package | <u> </u> |
| | 🗆 All 🚯 De | fault | | | | | | |
| | 🗄 Debug | 🚯 Default | | | | | | |
| | 🗆 Net 😯 | Default | | | | | | |
| | | 🚯 Skip | | ηία | ηία | 723k | openssh: 1 | The OpenS |
| | | | | | | | | T |
| | I | | | | | | | |
| | ✓ <u>H</u> ide obso | lete package | S | | | | | |
| | | | | | < <u>B</u> ack | <u>N</u> | ext > | Cancel |

10. Confirm that the package will be installed by verifying a version number and the 'X' in the Binary column, then click Next.

| Þ | Cygwin Setu | ıp - Select P | ackages | | | | | | <u>_ </u> |
|---|---------------------------------|---------------------------------|---------------|---|--------------|----------------|----------------|----------|--|
| | Select Pacl Select pa | k ages Ickages to ins | tall | | | | | | E |
| | Search oper | issh | <u>C</u> lear | 0 | <u>K</u> eep | ⊙ <u>C</u> urr | О Е <u>х</u> р | ⊻iew | Category |
| | Category | New | | | B | S Size | e | Package | A |
| | 🗆 All 🚯 De | fault | | | | | | | |
| | 🗄 Debug | 🚯 Default | | | | | | | |
| | 🗆 Net 🕄 | Default | | | | | | | |
| | | 🚯 6.6.1p1-1 | 1 | | \boxtimes | | 723k | openssh: | The OpenS |
| | ' | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | - |
| | • | | | | | | | | • |
| | <mark>⊯ <u>H</u>ide obso</mark> | lete package | s | | | | | | |
| - | | | | | | < <u>B</u> ack | 1 | lext > | Cancel |

11. Select 'Select required packages (RECOMMENDED)' and click Next

| Cygwin S | etup - Resolving Dependencies | × |
|---------------------------|---|---|
| Resolvin The fo | ng Dependencies ollowing packages are required to satisfy dependencies. | _ |
| bzip2 | (1.0.6-2) A high-quality block-sorting file compressor (utilities) Required by: man, tar | |
| ca-certif | ficates (1.97-1) CA root certificates Required by: libopenssI100 | |
| crypt ∢ | (1.2-1) Encryption/Decryption utility and library Required by: openssh, libkrb5_26, libroken18 ▼ | |
| ✓ Select | required packages (RECOMMENDED) | |
| | < <u>B</u> ack <u>N</u> ext > Cancel | |

12. Wait while packages are downloaded and installed.

| 🖻 20% - Cygwin Setup | |
|---|-----------------|
| Progress This page displays the progress of the download or installation. | |
| Downloading | |
| coreutils-8.15-1.tar.bz2 from http://mirrors-usa.go-parts. | .com/cy |
| 82 % (3047k/3681k) 1878.8 kB/s | |
| Package: | |
| Total: | |
| Disk: | |
| | |
| | |
| | |
| < <u>B</u> ac | k Next > Cancel |

13. Click Finish.

| 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 | | | |
| Add icon to <u>S</u> tart Menu | | | |
| Installation Status | | | |
| Installation Complete | | | |
| | Conset | | |
| < <u>B</u> ack [inish] | Lancel | | |

14. Right click the Cygwin icon on your desktop and select 'Run As Administrator'.



15. In the Cygwin terminal, enter the command: **ssh-host-config**, and follow the prompts as in the example below. Leave this window open, we'll come back to it.

⊵~ _ 🗆 🗙 ٠ \$ ssh-host-config *** Info: Creating default /etc/ssh_config file *** Info: Creating default /etc/sshd_config file *** Info: Privilege separation is set to yes by default since OpenSSH 3.3. *** Info: However, this requires a non-privileged account called 'sshd'. *** Info: For more info on privilege separation read /usr/share/doc/openssh/READ ME.privsep. *** Query: Should privilege separation be used? (yes/no) yes *** Query: Should privilege separation be used? (yes/no) yes *** Info: Note that creating a new user requires that the current account have *** Info: Administrator privileges. Should this script attempt to create a *** Query: new local account 'sshd'? (yes/no) yes *** Info: Updating /etc/sshd_config file *** Query: Do you want to install sshd as a service? *** Query: (Say "no" if it is already installed as a service) (yes/no) yes *** Query: Enter the value of CYGWIN for the daemon: [] *** Info: On Windows Server 2003, Windows Vista, and above, the *** Info: SYSTEM account cannot setuid to other users -- a capability *** Info: sshd requires. You need to have or to create a privileged *** Info: account. This script will help you do so. *** Info: You appear to be running Windows XP 64bit, Windows 2003 Server, *** Info: or later. On these systems, it's not possible to use the LocalSystem *** Info: account for services that can change the user id without an *** Info: explicit password (such as passwordless logins [e.g. public key *** Info: authentication] via sshd). *** Info: If you want to enable that functionality, it's required to create *** Info: a new account with special privileges (unless a similar account *** Info: already exists). This account is then used to run these special *** Info: servers. *** Info: Note that creating a new user requires that the current account *** Info: have Administrator privileges itself. *** Info: No privileged account could be found. *** Info: This script plans to use 'cyg_server'.
*** Info: 'cyg_server' will only be used by registered services.
*** Query: Do you want to use a different name? (yes/no) no
*** Query: Create new privileged user account 'cyg_server'? (yes/no) yes
*** Info: Please enter a password for new user cyg_server. Please be sure
*** Info: that this password matches the password rules given on your system.
*** Query: Please enter the password:
*** Query: Reenter: *** Info: User 'cyg_server' has been created with password 'Cisco123'. *** Info: If you change the password, please remember also to change the *** Info: password for the installed services which use (or will soon use) *** Info: the 'cyg_server' account. *** Info: Also keep in mind that the user 'cyg_server' needs read permissions *** Info: on all users' relevant files for the services running as 'cyg_server' *** Info: In particular, for the sshd server all users' .ssh/authorized_keys *** Info: files must have appropriate permissions to allow public key *** Info: authentication. (Re-)running ssh-user-config for each user will set *** Info: these permissions correctly. [Similar restrictions apply, for *** Info: instance, for .rhosts files if the rshd server is running, etc]. *** Info: The sshd service has been installed under the 'cyg_server' *** Info: account. To start the service now, call `net start sshd' or *** Info: `cygrunsrv -S sshd'. Otherwise, it will start automatically *** Info: after the next reboot. *** Info: Host configuration finished. Have fun! EUser@IE9Win7 🛹

SFTP Server Configuration

Now you will create your backup folder, user account and then set its home directory to the backup folder directory.

1. Use Windows Explorer to create your backup folder.



2. Use Start > Run and enter compmgmt.msc to launch the Computer Management console.

| 📨 Run | | × | | |
|---------------|--|---|--|--|
| | Type the name of a program, folder, document, or Internet resource, and Windows will open it for you. | | | |
| <u>O</u> pen: | compmgmt.msc 💌 | | | |
| | 😌 This task will be created with administrative privileges. | | | |
| | | | | |
| | UK Cancel <u>B</u> rowse | | | |

3. Expand System Tools > Local Users and Groups and Right click on Users, selecting New User...



4. Fill in the appropriate fields using the below illustration as a guide, then click Create followed by Close. Close the Computer Management window, we're done with it.

| New User | | ? × |
|--------------------------|-----------------------------|-----|
| <u>U</u> ser name: | cisco | |
| <u>F</u> ull name: | cisco | |
| Description: | cisco | |
| | | |
| <u>H</u> assword: | | |
| <u>C</u> onfirm passwore | d: ••••••• | _ |
| 🔲 User <u>m</u> ust ch | ange password at next logon | |
| ✓ User cannot | change password | |
| Pass <u>w</u> ord ne | ver expires | |
| 🔲 Account is di | sa <u>b</u> led | |
| | | |
| | | |
| <u>H</u> elp | Cr <u>e</u> ate Cl <u>o</u> | se |

5. Back in the Cygwin terminal window, enter the following command: **mkgroup** --local > /etc/group



6. Now enter the command: mkpasswd -1 > /etc/passwd



- 7. You can now close the terminal window.
- 8. Open the following file in notepad: C:\cygwin\etc\passwd, and locate your SFTP user's home directory.



9. Modify the **/home/cisco** path to your SFTP Server Backup Directory path, using the special Cygwin syntax. Save and close the file.



10. Open the following file in notepad: C:\cygwin\etc\sshd_config, and paste the below two lines at the end of the file. Save and close the file.

```
Ciphers 3des-cbc,aes128-cbc,aes192-cbc,aes256-cbc,aes128-
ctr,aes192-ctr,aes256-ctr,aes128-gcm@openssh.com,aes256-
gcm@openssh.com,arcfour,arcfour128,arcfour256,blowfish-
cbc,cast128-cbc,chacha20-poly1305@openssh.com,aes128-ctr,aes192-
ctr,aes256-ctr,aes128-gcm@openssh.com,aes256-
gcm@openssh.com,chacha20-poly1305@openssh.com
```

```
KexAlgorithms curve25519-sha256@libssh.org,diffie-hellman-group1-
sha1,diffie-hellman-group14-sha1,diffie-hellman-group-exchange-
sha1,diffie-hellman-group-exchange-sha256,ecdh-sha2-
nistp256,ecdh-sha2-nistp384,ecdh-sha2-nistp521,curve25519-
sha256@libssh.org,ecdh-sha2-nistp256,ecdh-sha2-nistp384,ecdh-
sha2-nistp521,diffie-hellman-group-exchange-sha256,diffie-
```

hellman-group14-sha1

11. Reboot the SFTP server and the sshd process should start automatically. Verify by opening a command prompt window and enter: **netstat** -a -n | find "0.0.0.0:22 "



Simple Validation

Now that you have your SFTP server setup and running automatically upon reboot, let's see if we can actually transfer files back and forth and delete from the remote machine.

1. On your client machine where you have psftp.exe saved, right click on its parent folder and select 'Open Command Window Here'



2. Enter the command: **psftp cisco@10.10.10.10**, substituting your actual values for username and IP Address, enter 'y' to accept the key, and then supply the password for your user account. Note the working directory is the same as your backup path.

| psftp_cisco@10.90.90.137 | | × |
|--|---------------------------------------|---|
| <pre>#psftp cisco@10.90.90.137 WARNING - POTENTIAL SECURITY BREACH! The server's host key does not match the one PuTTY has cached in the registry. This means that either the server administrator has changed the host key, or you have actually connected to another computer pretending to be the server. The new rsa2 key fingerprint is: ssh-rsa 2048 80:1a:99:25:48:66:f7:49:d0:31:33:5d:47:94 If you were expecting this change and trust the new ke enter "y" to update PuTTY's cache and continue connect If you want to carry on connecting but without updating the cache, enter "n". If you want to abandon the connection completely, pres Return to cancel. Pressing Return is the ONLY guarante safe choice. Update cached key? (y/n, Return cancels connection) y Using username "cisco". cisco@10.90.90.137's password: Remote working directory is /cygdrive/c/backups psftp></pre> | e:c6:1b y, ing. g s ed | ~ |

3. Copy a file over to the server by entering the command: **put psftp.exe**

NOTE: I am copying the psftp.exe file by choice, you can copy any file you want.



4. Validate that the file does in fact exist on the SFTP server.



5. Delete the file on the server by entering the command: del psftp.exe



6. Validate that the file no longer exists on the SFTP server.

| 📕 🔹 Computer 👻 Local Disk (C:) 👻 backups | | | |
|--|-------------------------------|--|--|
| · Include in libra | ary 🔻 Share with 👻 New folder | | |
| tes | Name * | | |
| <top< td=""><td></td></top<> | | | |
| Inloads | | | |
| ent Places | | | |

7. Disconnect from the server by entering the command: bye

Configure Backup Device in Disaster Recovery

Before you begin the configuration within Disaster Recovery, you'll want to create a folder for each product inside of your backup folder. In the below example, I have create a folder for each of: CUCM, CUC, CER, CIMP, and UCCX.



Next, log into Disaster Recovery on each of your products to perform the following tasks.

1. Select Backup > Backup Device > Add New

| Backup 🔻 | Restore | • | Help 🔻 | |
|------------------|---------|-----|-----------|---|
| Backup Device |) | ist | | |
| Schedu | uler | S | elect All | E |

| Backup 🔻 Restore 👻 Help 👻 |
|---------------------------|
| Backup Device List |
| Add New Select All |
| Add New |

2. Enter a device name of your choosing, the IP Address of your SFTP server, the path for this product, the username/password to access SFTP, and the number of backups to keep. Click Save.

| Backup Device | |
|---|---|
| Save Back | |
| _ Status | |
| ③ Status:Ready | |
| Backup device name | |
| Backup device name* | CygwinOpenSSH |
| Select Destination* | |
| Tape Device Device Name | Not Selected v Tape drive is not supported on a virtual machine |
| Network Directory | [] |
| Host name/IP address | 10.90.90.137 |
| Path name | UCCX |
| User name | cisco |
| Password | ••••• |
| Number of backups to store on Network Directory | 3 🗸 |

The system will actually attempt a login, putting a file on the remote server, and then deleting it.

| 👞 Administrator: C:\Windows\system32\cmd.exe | | | |
|---|---------------|--|--|
| C:\backups\UCCX>dir Volume in drive C has no label. Volume Serial Number is E0CE-337D | | | |
| Directory of C:\backups\UCCX | | | |
| 05/14/2014 03:48 PM <dir> . 05/14/2014 03:48 PM <dir></dir></dir> | | | |
| 05/14/2014 03:48 PM 0 dUmmI_I 1 File(s) 0 bytes 2 Dir(s) 120.532.217.856 bytes |)rf ; free | | |

If it can do that, then the Save will work. If not, it will fail. This is a very good validation test for connectivity, as it tests: Network connectivity, SSH Protocol, Ciphers, KeyExchange, and File permissions.



3. Select Backup > Scheduler and then click Add

| Bac | :kup 🔻 | Restore | • | Help | Ŧ |
|---------------|------------------|---------|-------|---------|----|
| | Backup Device | 0 | | | |
| | Sched | uler | et De | fault | |
| | | | | | |
| Bac | :kup 🔻 | Restore | • | Help | Ŧ |
| Schedule List | | | | | |
| 4 | Add 1 | lew | Se | elect A | 11 |

4. Enter a scheduler name, such as Daily, select the backup device you just defined in the previous step, then select the components you want to backup, followed by setting a time of day to run the backups (consider staggering each product), and finally set the frequency of the schedule. Click Save.

No screenshot as each product page is slightly different.

Stopping and Starting the SSHd Service

To stop or start the sshd service use the following commands in a Cygwin terminal window.

• Stop

```
cygrunsrv --stop sshd
```

• Start

cygrunsrv --start sshd