

NTP / SSH

NTP

NTP

Chrony NTP
[1] Chrony

```
[root@dlp ~]# dnf -y install chrony
[root@dlp ~]# vi /etc/chrony.conf
# line 3: change servers to synchronize (replace to your own timezone NTP server)
# need NTP server itself to sync time with other NTP server
#pool 2.centos.pool.ntp.org iburst
pool ntp.nict.jp iburst
# line 27: add network range to allow to receive time synchronization requests from NTP
Clients
# specify your local network and so on
# if not specified, only localhost is allowed
allow 10.0.0.0/24
[root@dlp ~]# systemctl enable --now chronyd
```

[2] Firewalld NTP NTP [123/UDP]

```
[root@dlp ~]# firewall-cmd --add-service=ntp
success
[root@dlp ~]# firewall-cmd --runtime-to-permanent
success
```

[3]

```
[root@dlp ~]# chronyc sources
MS Name/IP address              Stratum Poll Reach LastRx Last sample
=====
```

^+ ntp-a3.nict.go.jp	1	6	17	3	+171us[+843us]	+/-	8339us
^* ntp-a2.nict.go.jp	1	6	17	4	+304us[+976us]	+/-	8983us
^+ ntp-b3.nict.go.jp	1	6	17	4	-2654us[-1982us]	+/-	11ms
^- ntp-b2.nict.go.jp	1	6	17	3	-1036us[-1036us]	+/-	9465us

NTP

[1]

NTP

[allow ***]

```
[root@node01 ~]# dnf -y install chrony
[root@node01 ~]# vi /etc/chrony.conf
# line 3: change to your own NTP server or others in your timezone
#pool 2.centos.pool.ntp.org iburst
pool dlp.srv.world iburst
[root@node01 ~]# systemctl enable --now chronyd
# verify status
[root@node01 ~]# chronyc sources
MS Name/IP address          Stratum Poll Reach LastRx Last sample
=====
^* dlp.srv.world             2      6   17   11    +19us[ +8744ns] +/-    29ms
```

[2] NTPStat

```
root@node01 ~]# dnf -y install ntpstat
[root@node01 ~]# ntpstat
synchronised to NTP server (10.0.0.30) at stratum 3
    time correct to within 29 ms
    polling server every 64 s
```

SSH

OpenSSH

SSH

[1] Minimal Install Fedora OpenSSH

```
root@dlp ~]# systemctl status sshd
```

```
* sshd.service - OpenSSH server daemon
   Loaded: loaded (/usr/lib/systemd/system/sshd.service; enabled; vendor pres>
   Active: active (running) since Thu 2021-11-04 09:40:43 JST; 3h 38min ago
     Docs: man:sshd(8)
           man:sshd_config(5)
  Main PID: 770 (sshd)
    Tasks: 1 (limit: 4649)
   Memory: 2.5M
      CPU: 12ms
   CGroup: /system.slice/sshd.service
           +-+ 770 "sshd: /usr/sbin/sshd -D [listener] 0 of 10-100 startups"

.....
.....
```

[2] Firewalld SSH SSH [22/TCP]

```
[root@dlp ~]# firewall-cmd --add-service=ssh
success
[root@dlp ~]# firewall-cmd --runtime-to-permanent
success
```

SSH Fedora

Fedora SSH

[3] SSH

```
[root@client ~]# dnf -y install openssh-clients
```

[4] SSH

```
# ssh [username@(hostname or IP address)]
[root@client ~]# ssh fedora@dlp.srv.world
The authenticity of host 'dlp.srv.world (10.0.0.30)' can't be established.
ED25519 key fingerprint is SHA256:gM9dNgDXW8/3Zv6bw1xD3nY1ffRrMZ6ZWZxYpmMn3PQ.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added 'dlp.srv.world' (ED25519) to the list of known hosts.
fedora@dlp.srv.world's password:
Web console: https://dlp.srv.world:9090/ or https://10.0.0.30:9090/
```

```
[fedora@dlp ~]$ # logged
```

[5] SSH

```
# for example, run [cat /etc/passwd]
[fedora@client ~]$ ssh fedora@dlp.srv.world "cat /etc/passwd"
fedora@dlp.srv.world's password:
root:x:0:0:root:/root:/bin/bash
bin:x:1:1:bin:/bin:/sbin/nologin
daemon:x:2:2:daemon:/sbin:/sbin/nologin
.....
.....
tcpdump:x:72:72:/:/sbin/nologin
fedora:x:1000:1000:~/home/fedora:/bin/bash
clevis:x:990:988:Clevis Decryption Framework unprivileged
user:/var/cache/clevis:/usr/sbin/nologin
```

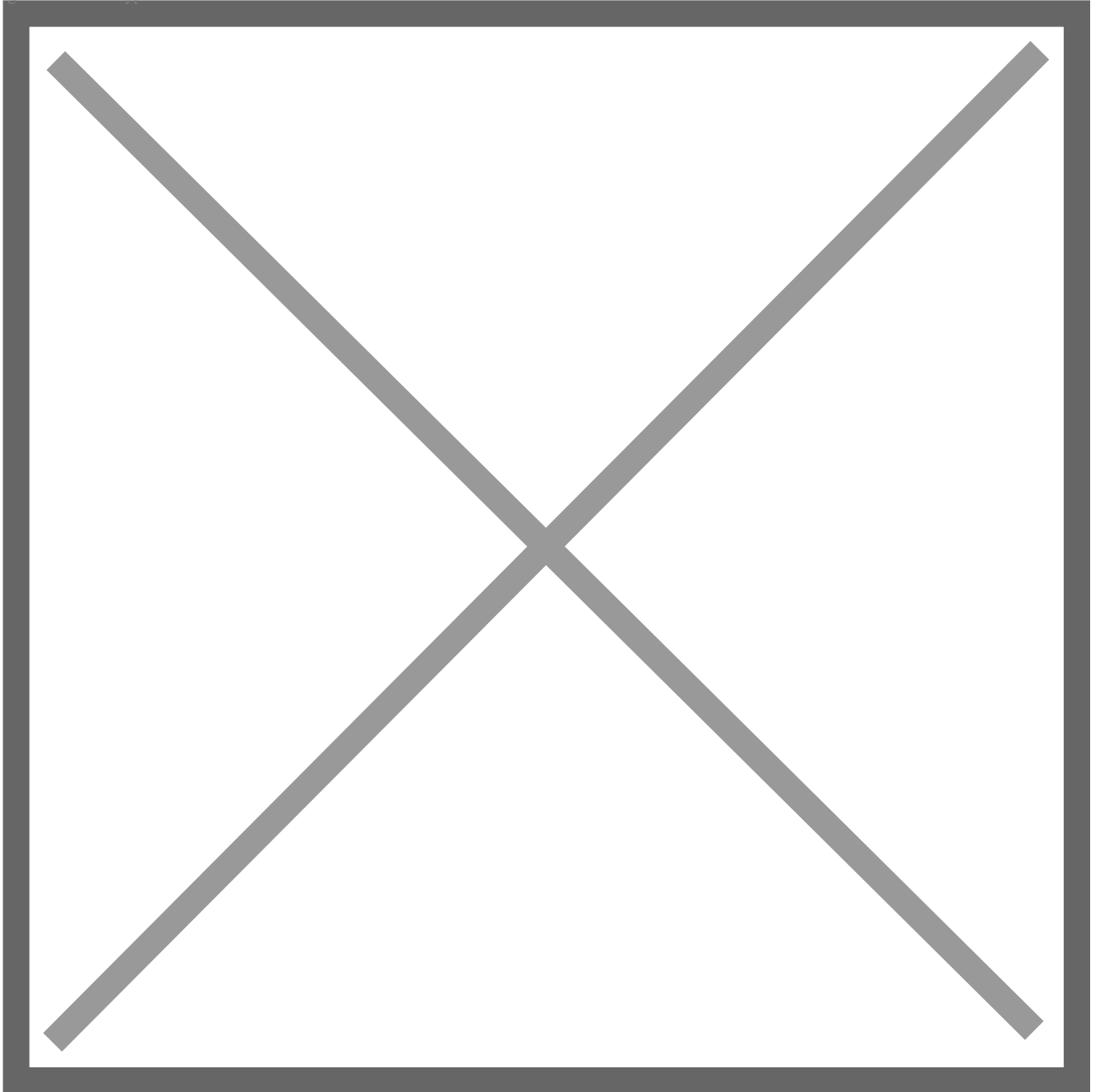
SSH Windows #1

Windows SSH Windows 11

[6] Windows SSH
Putty (www.chiark.greenend.org.uk/~sgtatham/putty/)

Putty	[Host name]	IP	[Open]
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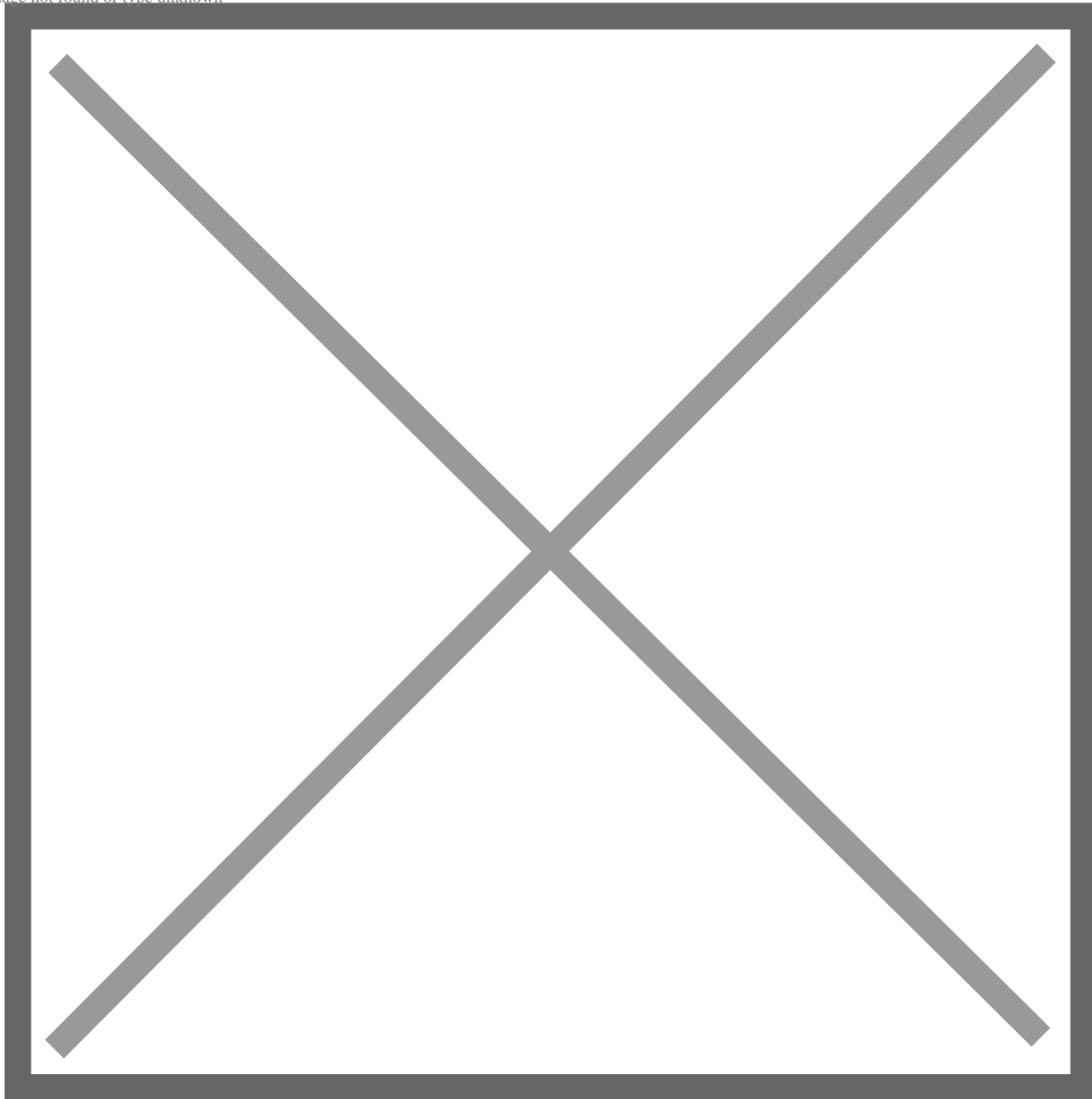
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[7]

Fedora

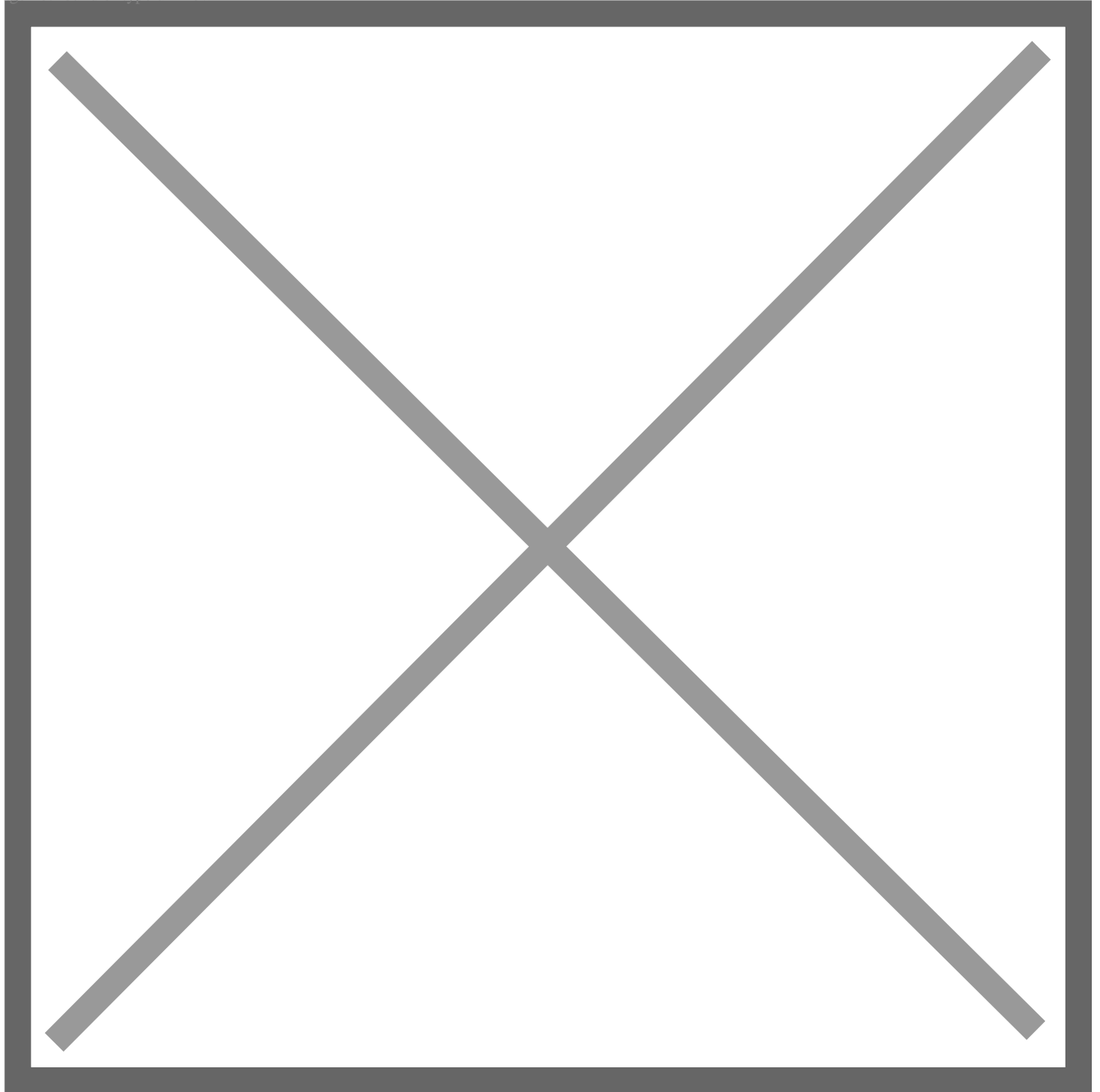
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SSH Windows #2

[8] Windows 11 OpenSSH Windows
Putty 3rd SSH PowerShell [ssh]
OpenSSH [4] [5]

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OpenSSH : SSH (Fedora)

SSH

[1] SCP (Secure Copy)

```
# command ⇒ scp [Option] Source Target
# copy the [test.txt] on localhost to remote host [node01.srv.world]
[fedora@dlp ~]$ scp ./test.txt fedora@node01.srv.world: ~/
fedora@node01.srv.world's password:      # password of the user
```

```

test.txt                                100%   10    0.0KB/s   00:00

# copy the [/home/fedora/test.txt] on remote host [node01.srv.world] to the localhost
[redhat@dlp ~]$ scp fedora@node01.srv.world:/home/fedora/test.txt ./test.txt
fedora@node01.srv.world's password:
test.txt                                100%   10    0.0KB/s   00:00

```

[2] SFTP SSH SFTP
 [/etc/ssh/sshd_config] [Subsystem sftp /usr/libexec/openssh/sftp-server]

```

# sftp [Option] [user@host]
[redhat@dlp ~]$ sftp fedora@node01.srv.world
fedora@node01.srv.world's password:      # password of the user
Connected to node01.srv.world.
sftp>

# show current directory on remote host
sftp> pwd
Remote working directory: /home/fedora

# show current directory on localhost
sftp> !pwd
/home/redhat

# show files in current directory on remote host
sftp> ls -l
drwxrwxr-x    2 fedora    fedora                7 Nov 04 21:33 public_html
-rw-rw-r--    1 fedora    fedora                10 Nov 04 22:53 test.txt

# show files in current directory on localhost
sftp> !ls -l
total 4
-rw-rw-r--    1 redhat    redhat                10 Nov 04 21:53 test.txt

# change directory
sftp> cd public_html
sftp> pwd
Remote working directory: /home/fedora/public_html

# upload a file to remote host

```



```

sftp> put test.txt redhat.txt
Uploading test.txt to /home/fedora/redhat.txt
test.txt                                100%  10    0.0KB/s   00:00

sftp> ls -l
drwxrwxr-x    2 fedora    fedora          6 Nov 04 21:33 public_html
-rw-rw-r--    1 fedora    fedora          10 Nov 04 21:39 redhat.txt
-rw-rw-r--    1 fedora    fedora          10 Nov 04 22:53 test.txt

# upload some files to remote host
sftp> put *.txt
Uploading test.txt to /home/fedora/test.txt
test.txt                                100%  10    0.0KB/s   00:00
Uploading test2.txt to /home/fedora/test2.txt
test2.txt                                100%   0    0.0KB/s   00:00

sftp> ls -l
drwxrwxr-x    2 fedora    fedora          6 Nov 04 21:33 public_html
-rw-rw-r--    1 fedora    fedora          10 Nov 04 21:39 redhat.txt
-rw-rw-r--    1 fedora    fedora          10 Nov 04 21:45 test.txt
-rw-rw-r--    1 fedora    fedora          10 Nov 04 21:46 test2.txt

# download a file from remote host
sftp> get test.txt
Fetching /home/fedora/test.txt to test.txt
/home/fedora/test.txt                  100%  10    0.0KB/s   00:00

# download some files from remote host
sftp> get *.txt
Fetching /home/fedora/fedora.txt to fedora.txt
/home/fedora/fedora.txt                100%  10    0.0KB/s   00:00
Fetching /home/fedora/test.txt to test.txt
/home/fedora/test.txt                  100%  10    0.0KB/s   00:00
Fetching /home/fedora/test2.txt to test2.txt
/home/fedora/test2.txt                 100%  10    0.0KB/s   00:00

# create a directory on remote host
sftp> mkdir testdir
sftp> ls -l
drwxrwxr-x    2 fedora    fedora          6 Nov 04 21:33 public_html
-rw-rw-r--    1 fedora    fedora          10 Nov 04 21:39 redhat.txt

```

```

-rw-rw-r-- 1 fedora fedora 10 Nov 04 21:45 test.txt
-rw-rw-r-- 1 fedora fedora 10 Nov 04 21:46 test2.txt
drwxrwxr-x 2 fedora fedora 6 Nov 04 21:53 testdir

# delete a directory on remote host
sftp> rmdir testdir
rmdir ok, `testdir' removed
sftp> ls -l
drwxrwxr-x 2 fedora fedora 6 Nov 04 21:33 public_html
-rw-rw-r-- 1 fedora fedora 10 Nov 04 21:39 redhat.txt
-rw-rw-r-- 1 fedora fedora 10 Nov 04 21:45 test.txt
-rw-rw-r-- 1 fedora fedora 10 Nov 04 21:46 test2.txt

# delete a file on remote host
sftp> rm test2.txt
Removing /home/fedora/test2.txt
sftp> ls -l
drwxrwxr-x 2 fedora fedora 6 Nov 04 21:33 public_html
-rw-rw-r-- 1 fedora fedora 10 Nov 04 21:39 redhat.txt
-rw-rw-r-- 1 fedora fedora 10 Nov 04 Nov 04 21:45 test.txt

# execute commands with ![command]
sftp> !cat /etc/passwd
root:x:0:0:root:/root:/bin/bash
bin:x:1:1:bin:/bin:/sbin/nologin
.....
.....
redhat:x:1001:1001::/home/redhat:/bin/bash

# exit
sftp> quit
221 Goodbye.

```

OpenSSH : SSH (Windows)

Windows SSH

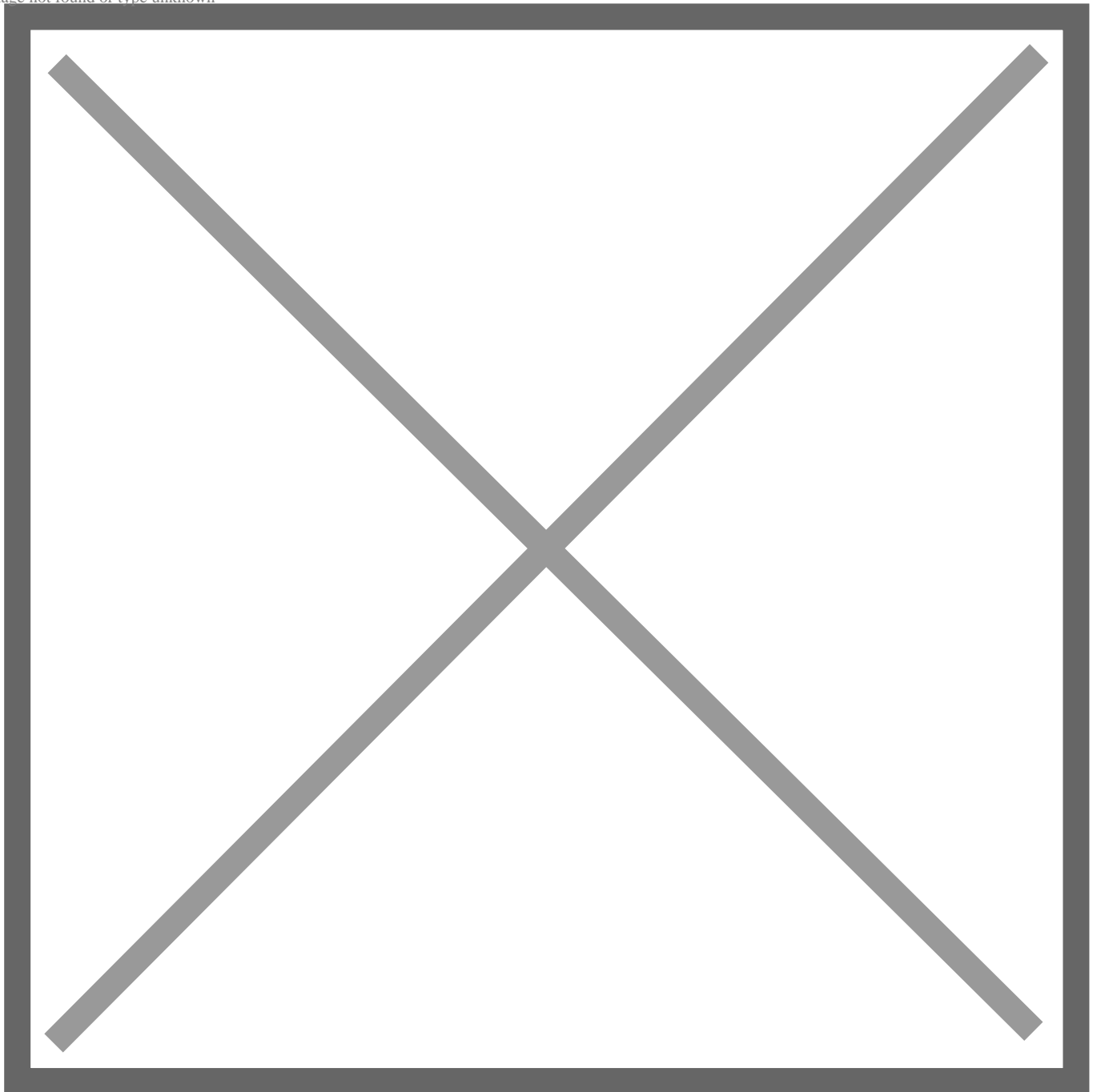
WinSCP (winscp.net/eng/download.php)

Windows 11 OpenSSH Windows

[\[scp\]](#) [\[sftp\]](#)

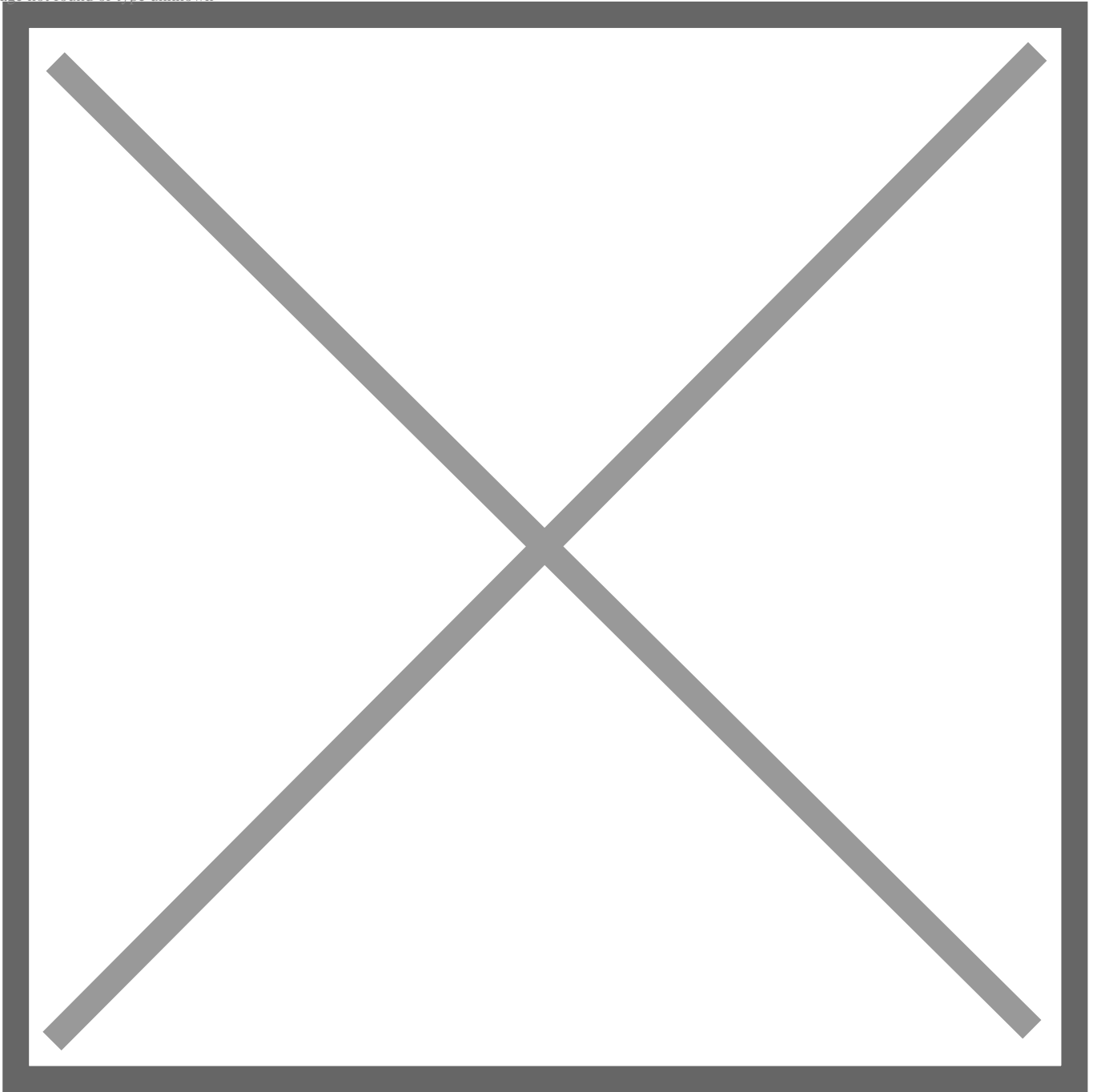
[1] WinSCP

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[2] WinSCP SSH

Image not found or type unknown



OpenSSH SSH

SSH

[1] SSH

```
# create key-pair
[fedora@dlp ~]$ ssh-keygen -t ecdsa
Generating public/private ecdsa key pair.
Enter file in which to save the key (/home/fedora/.ssh/id_ecdsa): # Enter or input changes if
```

```

you want
Created directory '/home/fedora/.ssh'.
Enter passphrase (empty for no passphrase): # set passphrase (if set no passphrase, Enter
with empty)
Enter same passphrase again:
Your identification has been saved in /home/fedora/.ssh/id_ecdsa
Your public key has been saved in /home/fedora/.ssh/id_ecdsa.pub
The key fingerprint is:
SHA256: eZV3AxI39NqZglzADa/51KFMR3wyvbMlBhkQrZTymNI fedora@dlp.srv.world
The key's randomart image is:
.....
.....

[ fedora@dlp ~]$ ll ~/.ssh
total 8
-rw-----. 1 fedora fedora 557 Nov  4 14:54 id_ecdsa
-rw-r--r--. 1 fedora fedora 182 Nov  4 14:54 id_ecdsa.pub

[ fedora@dlp ~]$ mv ~/.ssh/id_ecdsa.pub ~/.ssh/authorized_keys

```

[2]

```

[ fedora@node01 ~]$ mkdir ~/.ssh
[ fedora@node01 ~]$ chmod 700 ~/.ssh
# transfer the private key to the local ssh directory
[ fedora@node01 ~]$ scp fedora@dlp.srv.world:/home/fedora/.ssh/id_ecdsa ~/.ssh/
fedora@dlp.srv.world's password:
id_ecdsa                                100% 2655      2.2MB/s   00:00

[ fedora@node01 ~]$ ssh fedora@dlp.srv.world
Enter passphrase for key '/home/fedora/.ssh/id_ecdsa': # passphrase if you set
Last login: Thu Apr 28 19:49:52 2021
[ fedora@dlp ~]$ # logged

```

[3] [PasswordAuthentication no]

```

[root@dlp ~]# vi /etc/ssh/sshd_config
# line 65 : uncomment and change to [no]
PasswordAuthentication no
[root@dlp ~]# systemctl restart sshd

```

Windows #1 SSH

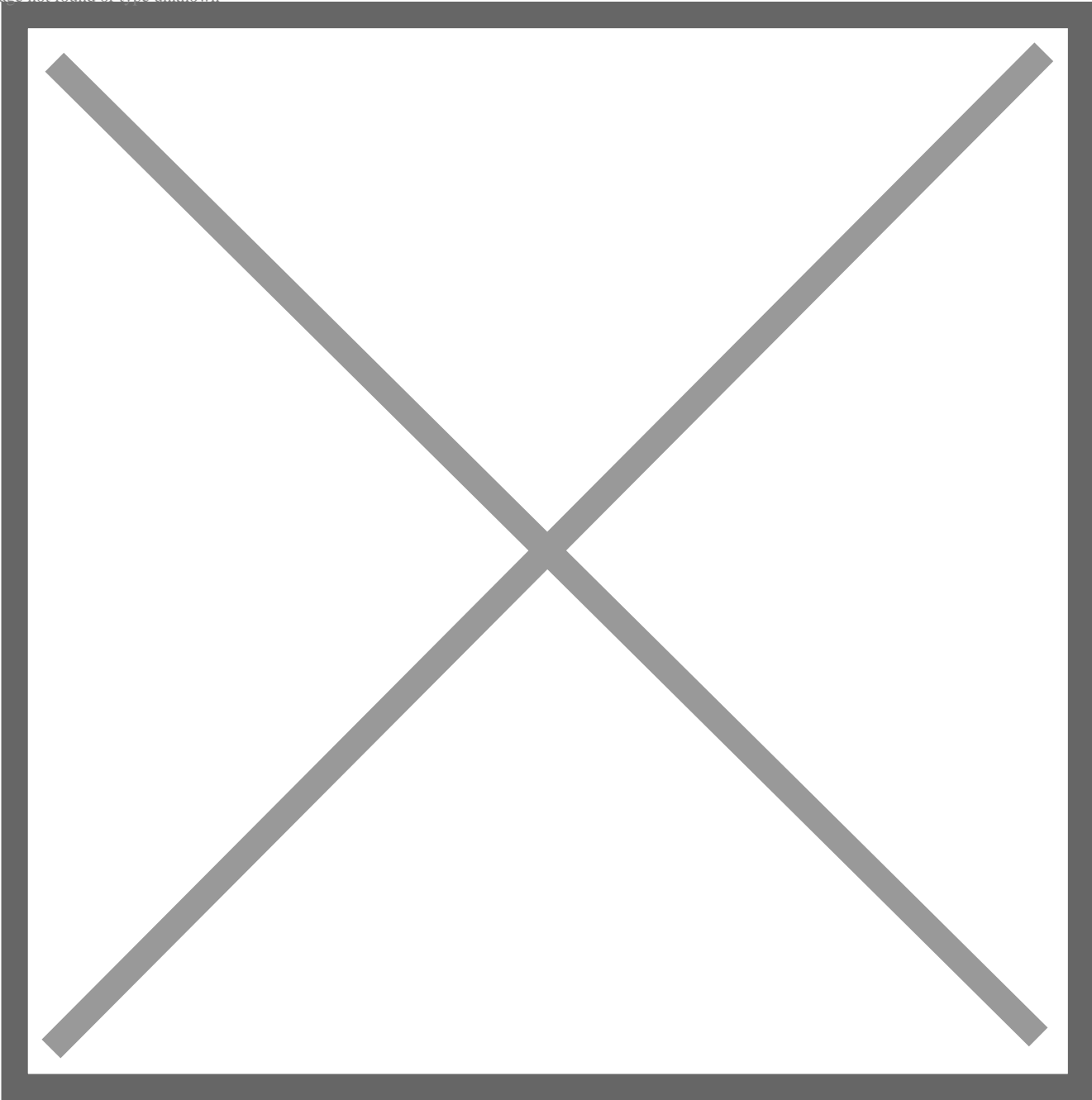
Windows SSH

Putty

Windows

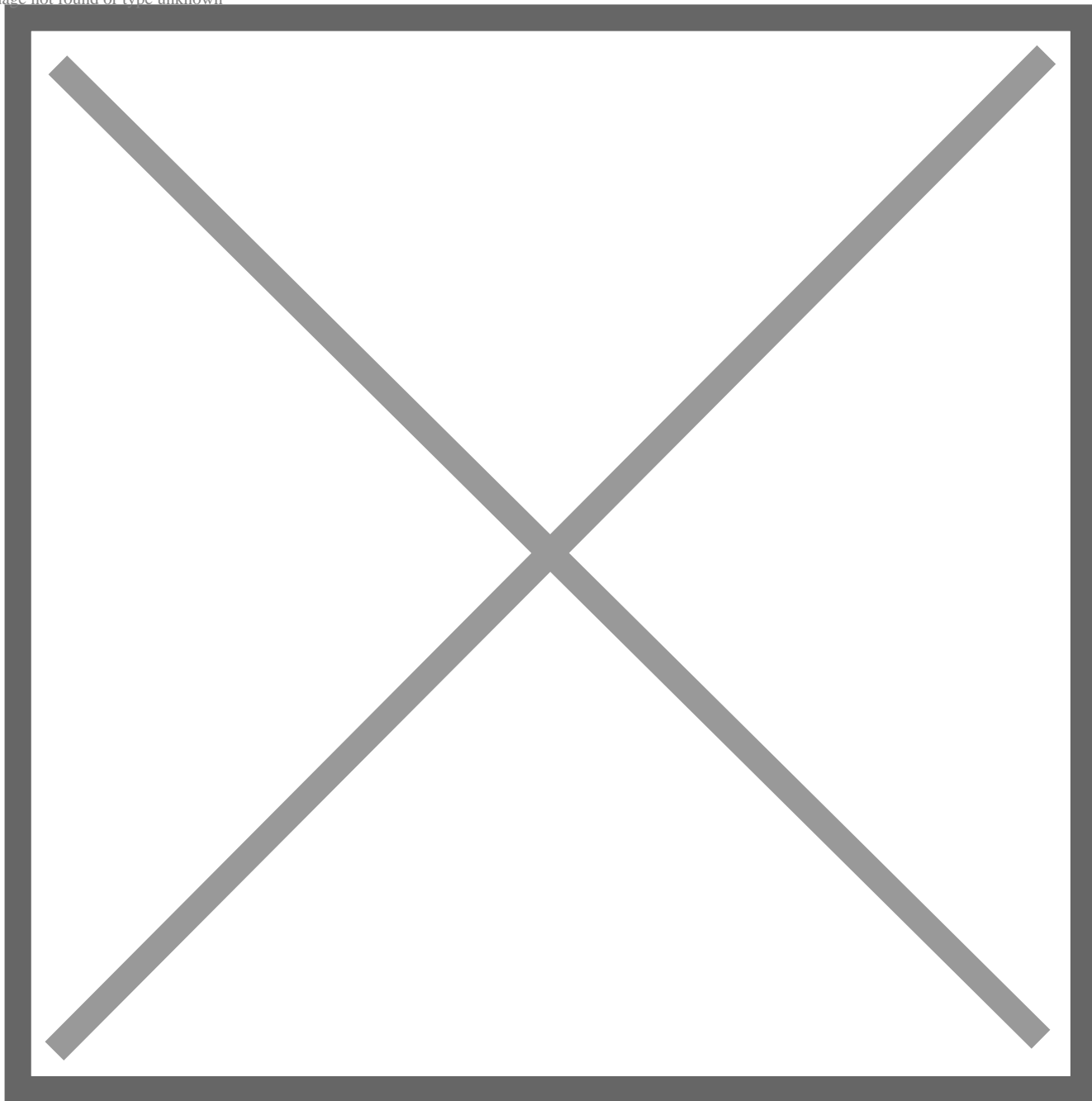
[4] [Putty] [Puttygen.exe] [Putty.exe]
www.chiark.greenend.org.uk/~sgtatham/putty/
[Puttygen.exe] [Load]

Image not found or type unknown



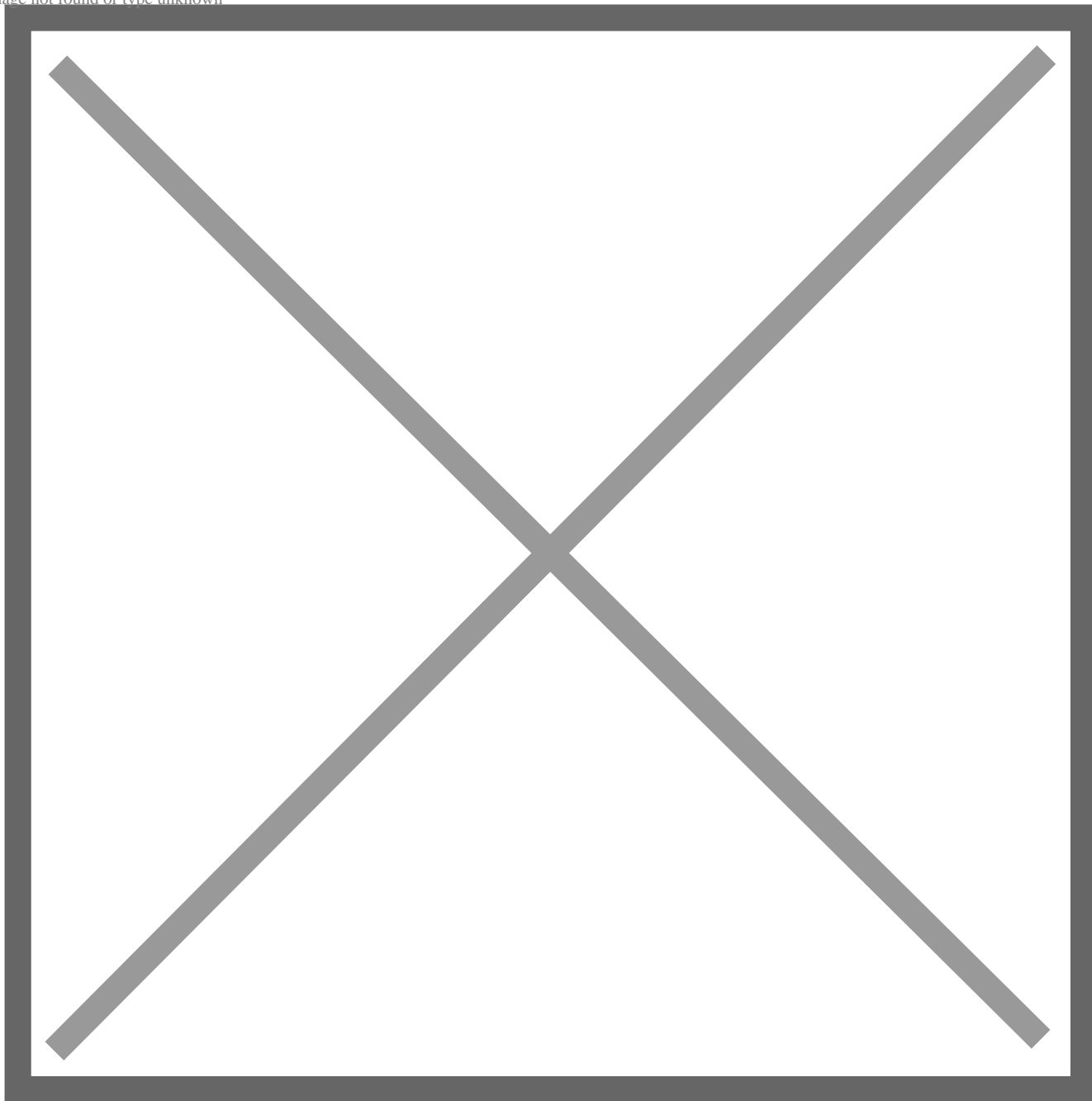
[5] SSH

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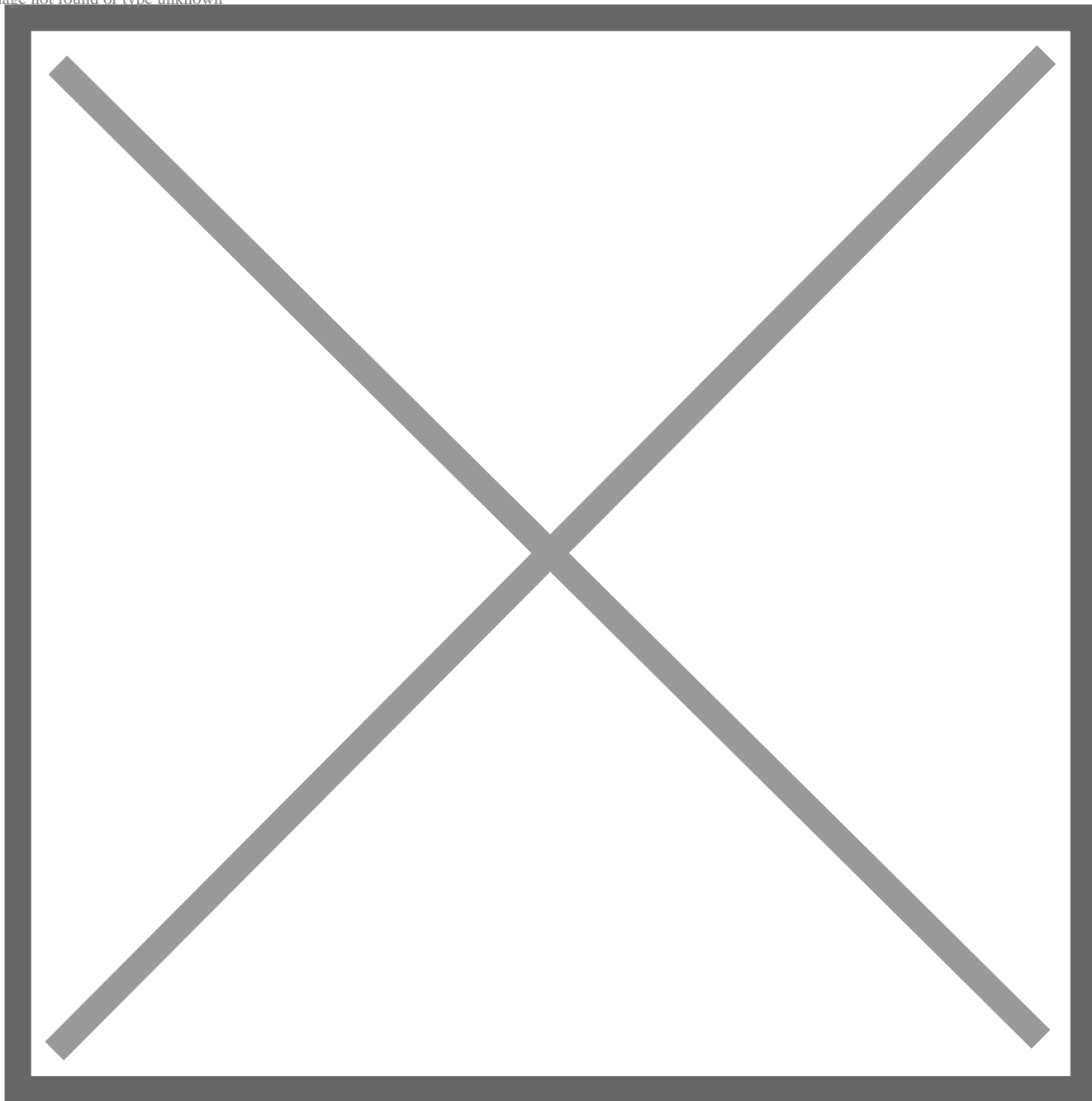
[6] []

Image not found or type unknown



[7] Putty [Connection] - [SSH] - [Auth] [Private key file]

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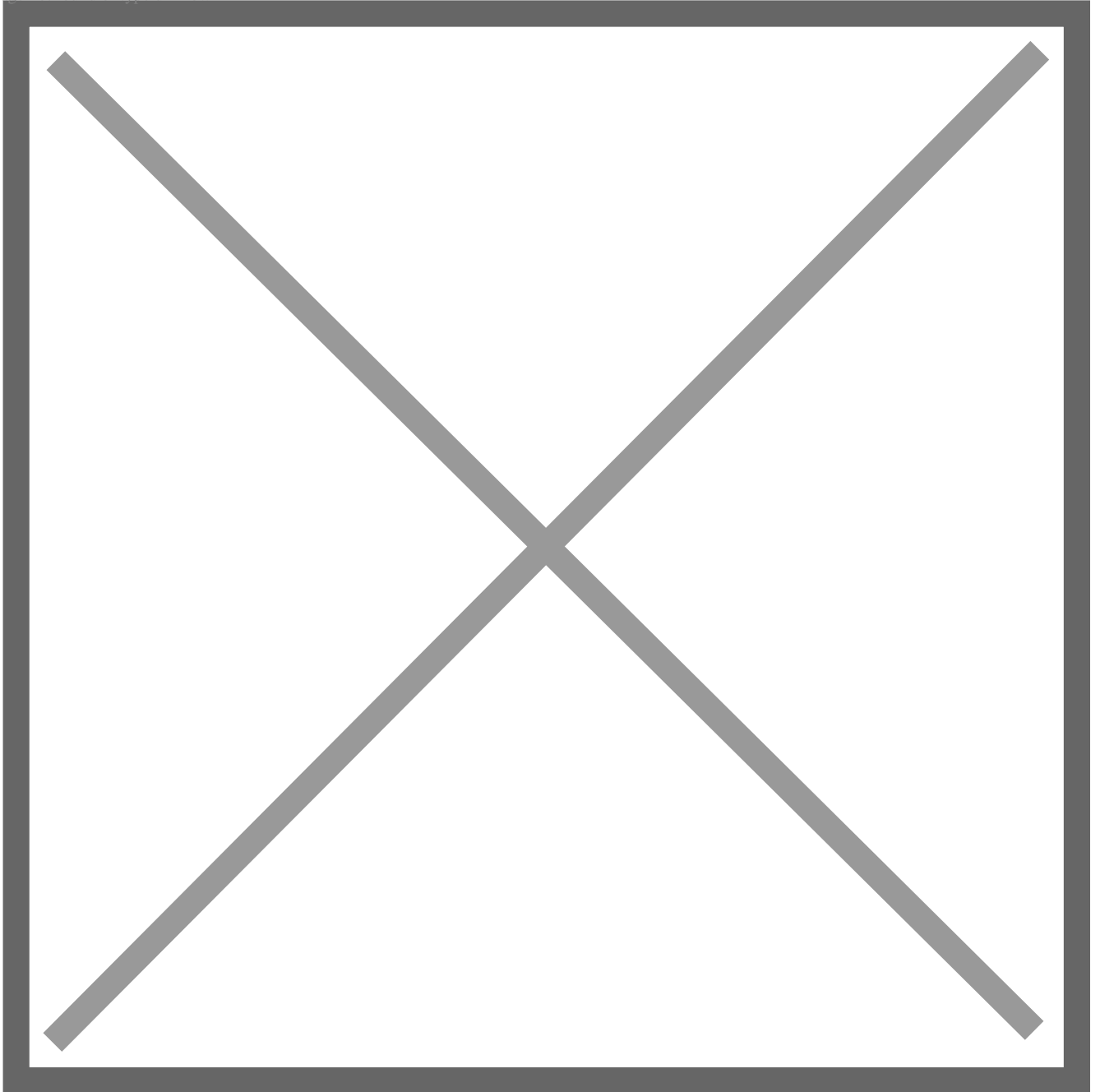


[8]

[Session]

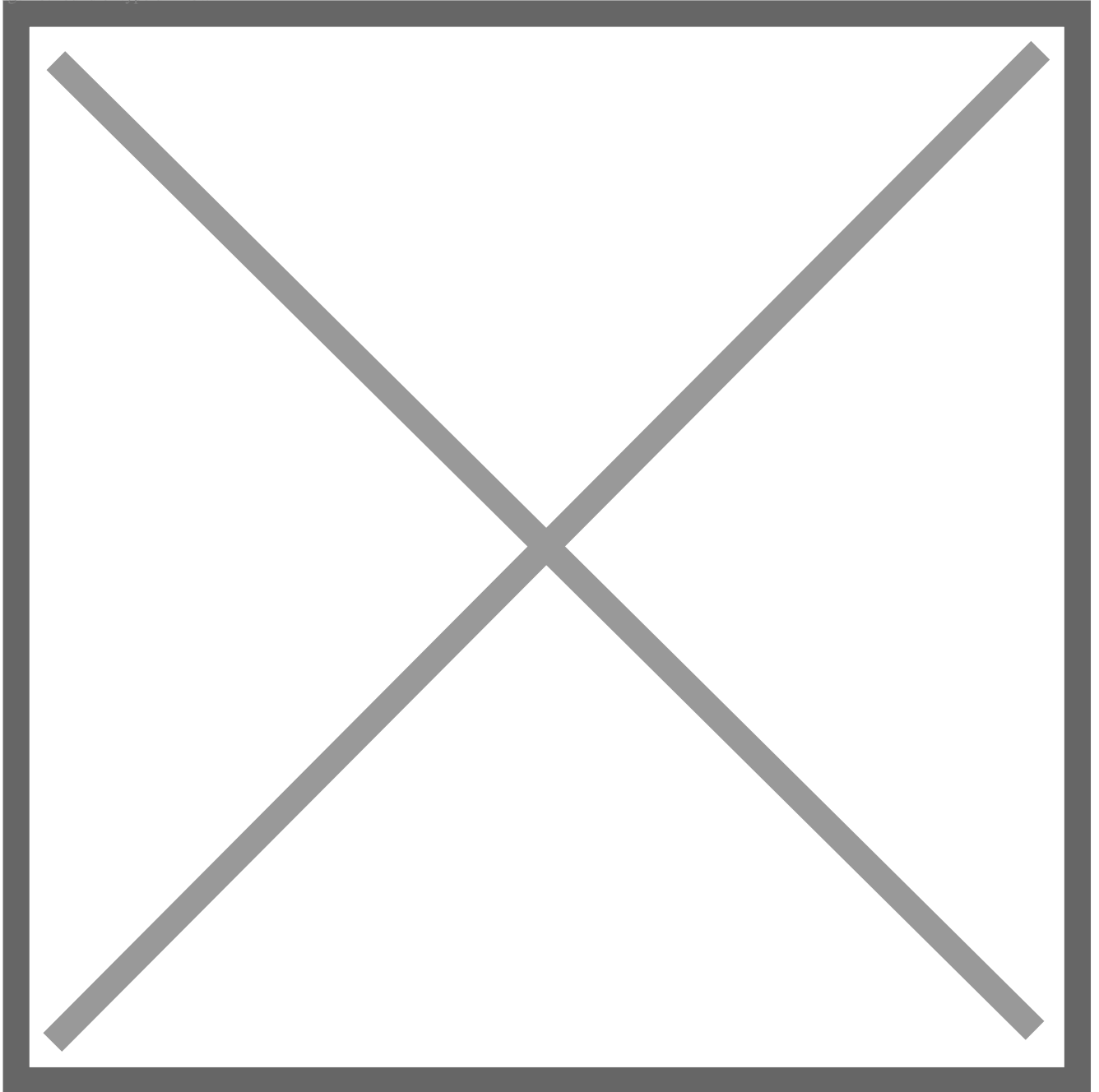
SSH

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[9] SSH

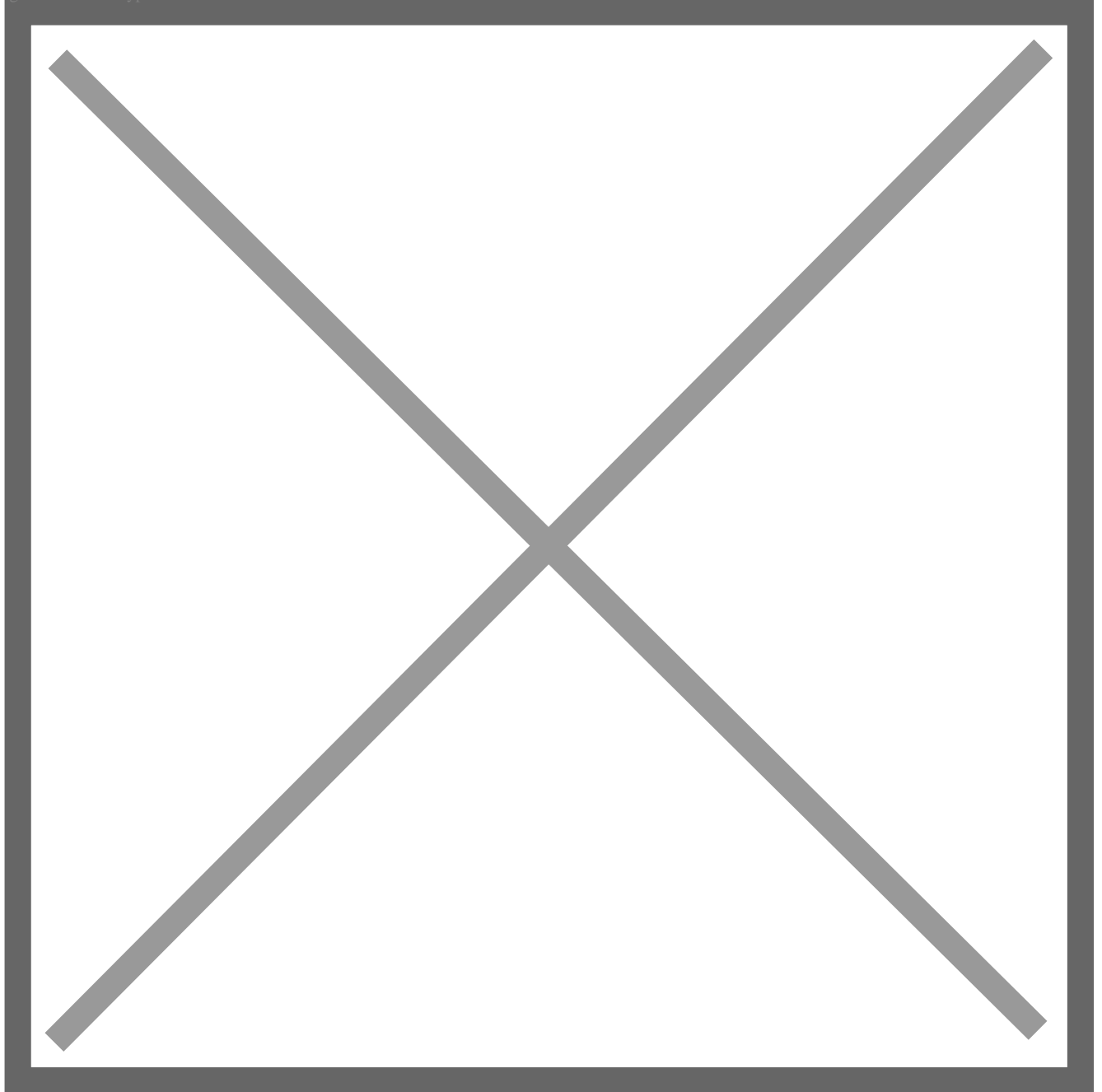
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Windows #2 SSH

[10] Windows 11 OpenSSH Windows
 Putty 3rd SSH
 Windows 10 [(logon user home).ssh]

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OpenSSH SFTP + Chroot

SFTP + Chroot

SFTP

chroot

[1] [/home] Chroot

```
# create a group for SFTP only
[root@dlp ~]# groupadd sftp_users
# for example, set [fedora] user as SFTP only user
```

```
[root@dlp ~]# usermod -aG sftp_users fedora
[root@dlp ~]# vi /etc/ssh/sshd_config
# line 123 : comment out and add a line
#Subsystem      sftp    /usr/libexec/openssh/sftp-server
Subsystem        sftp    internal-sftp

# add to the end
Match Group sftp_users
    X11Forwarding no
    AllowTcpForwarding no
    ChrootDirectory /home
    ForceCommand internal-sftp
[root@dlp ~]# systemctl restart sshd
```

[2] SFTP

```
[fedora@node01 ~]$ ssh dlp.srv.world
fedora@dlp.srv.world's password:
This service allows sftp connections only.
Connection to dlp.srv.world closed.    # denied normally
[fedora@node01 ~]$ sftp dlp.srv.world
fedora@dlp.srv.world's password:
Connected to dlp.srv.world.
sftp> ls -l
drwx-----  3 1000    1000          95 Nov  4 05:54 fedora
drwx-----  2 1001    1001          83 Nov  3 23:43 redhat
sftp> pwd
Remote working directory: /
sftp> exit
```

OpenSSH SSH

SSH-Agent SSH

[1] SSH-Agent

```
# run SSH-Agent
[fedora@node01 ~]$ eval $(ssh-agent)
Agent pid 1389
# add passphrase
```

```
[fedora@node01 ~]$ ssh-add
Enter passphrase for /home/fedora/.ssh/id_ecdsa:
Identity added: /home/fedora/.ssh/id_ecdsa (fedora@dlp.srv.world)
# confirm
[fedora@node01 ~]$ ssh-add -l
256 SHA256: eZV3AxI39NqZglzADa/51KFMR3wyvbMLBhkQrZTymNI fedora@dlp.srv.world (ECDSA)
# verify to connect without inputting passphrase
[fedora@node01 ~]$ ssh dlp.srv.world hostname
dlp.srv.world
# stop SSH-Agent
# if not execute it, SSH-Agent process remains even if you logout System, be careful
[fedora@node01 ~]$ eval $(ssh-agent -k)
Agent pid 1389 killed
```

Revision #5

Created 2 March 2022 20:51:18 by

Updated 9 July 2022 19:08:53 by