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Ubuntu / Debian Linux: Install and Setup TFTPD Server

Author: Vivek Gite • Last updated: July 19, 2013 • 16 comments

How do I install and configure TFTP server under Debian or Ubuntu Linux server to configure networking equipment such as remote booting of diskless devices or remote loading of Unix like operating systems via PXE boot?

Tutorial details	
Difficulty level	Intermediate
Root privileges	Yes
Requirements	Debian/Ubuntu tftpd-hpa
Est. reading time	5 minutes

tftpd is a server for the Trivial File Transfer Protocol. The TFTP protocol is extensively used to support remote booting of diskless devices or loading operating systems. Debian or Ubuntu can use any one of the following tftpd server:

- `atftpd` – Advanced TFTP server.
- `tftpd` – Trivial file transfer protocol server.
- `tftpd-hpa` – HPA's tftp server.
- `dnsmasq` – Lightweight DNS, TFTP and DHCP server.

In this tutorial, I am going to install and configure tftpd-hpa.

> **Warning**: TFTP server / protocol provides little security. Make sure a TFTP server is placed behind a firewall system.

tftpd-hpa TFTP server installation

Type the following apt-get command as root user:

```
$ sudo apt-get install tftpd-hpa
```

OR

```
# apt-get install tftpd-hpa
```

You will be promoted as follows (make sure you set the directory name to `/srv/tftp`):

Fig.01: Installing and Setting TFTPD Server In Ubuntu / Debian System

Sample outputs:

```
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following NEW packages will be installed:
  tftpd-hpa
0 upgraded, 1 newly installed, 0 to remove and 15 not upgraded.
Need to get 0 B/49.1 kB of archives.
After this operation, 201 kB of additional disk space will be use
Preconfiguring packages ...
Selecting previously deselected package tftpd-hpa.
(Reading database ... 281779 files and directories currently inst
Unpacking tftpd-hpa (from .../tftpd-hpa_5.0-18_amd64.deb) ...
Processing triggers for man-db ...
Setting up tftpd-hpa (5.0-18) ...
Starting HPA's tftpd: in.tftpd.
```

Configuration

Edit /etc/default/tftpd-hpa, run:

```
# vi /etc/default/tftpd-hpa
```

Sample configuration:

```
TFTP_USERNAME="tftp"
TFTP_DIRECTORY="/srv/tftp"
TFTP_ADDRESS="0.0.0.0:69"
TFTP_OPTIONS="--secure"
```

How do I start / stop / restart tftpd-hpa server?

Type the following commands:

```
service tftpd-hpa status
service tftpd-hpa stop
service tftpd-hpa start
service tftpd-hpa restart
service tftpd-hpa force-reload
```

Sample outputs:

Fig.02: Starting / Stopping / Restarting the tftpd server commands

Next, you need to place all boot files in /srv/tftp directory. You can create a
directory structure as follows for various operating systems and third party
firmwares:

```
# cd /srv/tftp
# mkdir {openbsd,freebsd,netbsd}
# mkdir -p linux/{debian,ubuntu,rhel,centos,fedora,suse}
# mkdir -p firmwares/
{linksys,cisco,soekris,pata,sata,ipmi,nic}
# ls -l
# ls -l linux/
# ls -l firmwares/
```

How do I test my tftpd server?

You need to install tftp client called tftp. It is the user interface to the Internet TFTP (Trivial File Transfer Protocol), which allows users to transfer files to and from a remote machine. The remote host may be specified on the command line, in which case tftp uses host as the default host.

Install trivial file transfer protocol client (tftp)

Type the following command:

```
$ sudo apt-get install tftp
```

OR

```
# apt-get install tftp
```

Sample outputs:

```
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following NEW packages will be installed:
  tftp
0 upgraded, 1 newly installed, 0 to remove and 15 not upgraded.
Need to get 18.9 kB of archives.
After this operation, 53.2 kB of additional disk space will be us
Get:1 http://debian.osuosl.org/debian/ squeeze/main tftp amd64 0.
Fetched 18.9 kB in 1s (10.5 kB/s)
Selecting previously deselected package tftp.
(Reading database ... 281794 files and directories currently inst
Unpacking tftp (from .../tftp_0.17-18_amd64.deb) ...
Processing triggers for man-db ...
Setting up tftp (0.17-18) ...
```

Test the tftpd server

In this example, I am putting pxeboot file (second-stage PXE bootstrap for network installs) from OpenBSD.org in /srv/tftp/openbsd/ directory to retrieve with a client, for testing purpose:

```
# cd /srv/tftp/openbsd/
# wget http://ftp.openbsd.org/pub/OpenBSD/5.2/i386/pxeboot
```

Sample outputs:

```
--2012-12-01 17:17:09--  http://ftp.openbsd.org/pub/OpenBSD/5.2/i386/pxel
Resolving ftp.openbsd.org... 129.128.5.191
Connecting to ftp.openbsd.org|129.128.5.191|:80... connected.
HTTP request sent, awaiting response... 200 OK
Length: 53920 (53K) [text/plain]
Saving to: `pxeboot'

100%[=======================================>] 53,920       53.0K/s   in 1.0s

2012-12-01 17:17:10 (53.0 KB/s) - `pxeboot' saved [53920/53920]
```

I am also downloading bsd.rd file. It is a compressed RAMDISK kernel; the embedded filesystem contains the installation tools:

```
# wget http://ftp.openbsd.org/pub/OpenBSD/5.2/i386/bsd.rd
```

Sample outputs:

```
--2012-12-01 17:17:25--  http://ftp.openbsd.org/pub/OpenBSD/5.2/i

Resolving ftp.openbsd.org... 129.128.5.191

Connecting to ftp.openbsd.org|129.128.5.191|:80... connected.

HTTP request sent, awaiting response... 200 OK

Length: 6422208 (6.1M)

Saving to: `bsd.rd'

17% [=====>                                  ] 11,42,782   20.3K/s
```

Finally, verify that both files are downloaded and installed correctly at the /srv/tftp/openbsd/ location:

```
# ls -l /srv/tftp/openbsd/
```

Sample outputs:

```
total 6344
-rw-r--r-- 1 root root 6422208 Dec  1 17:20 bsd.rd
-rw-r--r-- 1 root root   53920 Aug  1 22:02 pxeboot
```

Type the following command from the remote client:

```
$ tftp tftp-server-ip-here
$ tftp 192.168.1.5
```

Sample outputs (type the commands highlighted in green color at `tftp>` prompt):

```
tftp> status
Connected to 192.168.1.5.
```

```
Mode: netascii Verbose: off Tracing: off

Rexmt-interval: 5 seconds, Max-timeout: 25 seconds

tftp> get openbsd/pxeboot

Received 54234 bytes in 0.0 seconds

tftp> get openbsd/bsd.rd

Received 6465608 bytes in 0.5 seconds

tftp> quit
```

Firewall configuration

Add firewall rules to your firewall script to open required ports:

```
## make sure you load the following modules first ##
modprobe ip_conntrack_tftp
modprobe  ip_conntrack_ftp

## firewall rules to open tcp/udp tftpd port 69  for 192.168.1.0/24 ##
/sbin/input -A INPUT -s 192.168.1.0/24 -m tcp -p tcp --dport 69 -j ACC
/sbin/input -A INPUT -s 192.168.1.0/24 -m tcp -p udp  --dport 69 -j AC
```

Did it worked?

Now, you have DHCP and TFTP services available. Reboot the test system. Turn on PXE network boot in BIOS. Save and reboot the system. You will see information about he BIOS. Press [Enter] (or special key) to start pxe booting. A sample session:

Fig.03: Installing OpenBSD by booting the server via PXE

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System Management	reboot • shutdown
Terminal/ssh	sshpass • tty
Text processing	cut • rev
Text Editor	6 Text editors • Save and exit vim
User Environment	exit • who
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Jeremy • Apr 5, 2013 @ 17:33

During and after the apt-get install, I never received the Package Configuration screen as you have shown here in the tutorial. How do I go about setting up the /srv/tftp directory after it has been installed or do I need to remove tftp and try again?

Jeremy

↩ ∞

Happy1789 • Apr 5, 2013 @ 20:55

Hi,

Thanks for your post.
To avoid issues with the get/put action, I would recommend to add
–create

in the configuration of /etc/default/tftpd-hpa:

vi /etc/default/tftpd-hpa
[…]
TFTP_OPTIONS="–secure –create"

[…]

↵   ∞

visitor • Jun 17, 2015 @ 9:38

Thanks! And great comments!

–create option is very important if you want devices to write to tftp server as well.

↵   ∞

Dave • Apr 12, 2013 @ 13:39

Jeremy, I started to install tftpd last night and noticed the same thing. However, while I haven't done it yet, I think you just need to continue with his instructions and execute 'vi /etc/default/tftpd-hpa' and set the directory there.

↵   ∞

Daniel • May 16, 2013 @ 13:07

I tried to install it into Raspberry PI (Debian Wheezy) but an error occurs :

```
[....] Starting HPA's tftpd: in.tftpdinvoke-rc.d: initscript tftp
dpkg: error processing tftpd-hpa (--configure):
 subprocess installed post-installation script returned error exi
Setting up tftp (0.17-18) ...
Errors were encountered while processing:
 tftpd-hpa
E: Sub-process /usr/bin/dpkg returned an error code (1)
 an known bug:

http://bugs.debian.org/cgi-bin/bugreport.cgi?bug=544089

for that you must modify the file /etc/default/tftpd-hpa and chan
TFTP_OPTIONS="--secure --ipv4"

and then run the command : apt-get install -f

and done :
```

```
eading package lists... Done
Building dependency tree
Reading state information... Done
0 upgraded, 0 newly installed, 0 to remove and 8 not upgraded.
1 not fully installed or removed.
After this operation, 0 B of additional disk space will be used.
Setting up tftpd-hpa (5.2-4) ...
tftpd user (tftp) already exists, doing nothing.


tftpd-hpa directory (/srv/tftp) already exists, doing nothing.
[ ok ] Starting HPA's tftpd: in.tftpd.
```

Best Regards,

Daniel

↵   ∞

adrian • May 27, 2013 @ 7:06

when a try to do this

$ tftp 192.168.1.5

tftp> status
Connected to 192.168.1.5.
Mode: netascii Verbose: off Tracing: off
Rexmt-interval: 5 seconds, Max-timeout: 25 seconds
tftp> get openbsd/pxeboot
"show this"

Transfer timed out.

help me please

↵   ∞

Hiero • Jul 19, 2013 @ 13:39

I've got the same, you should put your IP adress in the configuration file (see with ifconfig).

↵   ∞

Cindy • Sep 10, 2013 @ 18:54

Hi Hiero,

Can you specify which configuration file you are referring to? is it the /etc/xinetd.d/tftp file to change? what should it be to add the ip address?

Thanks.

↩ ∞

rduke15 • Jul 16, 2015 @ 15:48

That seems to resolve the "Transfer timed out" in Debian Jessie.

After I edited /etc/default/tftpd-hpa to replace
TFTP_ADDRESS="0.0.0.0:69" with my real IP (leaving the port at 69), it
works.

This looks like a bug in the client or in the server.

↩ ∞

eko indriatmoko • Nov 15, 2013 @ 9:01

Hi

I am new in linux n try to install tftpd-hpa server on my laptop but i got this
massage on terminal :

```
root@echoy:/home/echoy# apt-get install tftpd-hpa
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following NEW packages will be installed:
  tftpd-hpa
0 upgraded, 1 newly installed, 0 to remove and 2 not upgraded.
Need to get 37,5 kB of archives.
After this operation, 145 kB of additional disk space will be use
Get:1 http://id.archive.ubuntu.com/ubuntu/ saucy/main tftpd-hpa i
Fetched 37,5 kB in 1s (31,7 kB/s)
Preconfiguring packages ...
Selecting previously unselected package tftpd-hpa.
(Reading database ... 196155 files and directories currently inst
Unpacking tftpd-hpa (from .../tftpd-hpa_5.2-7ubuntu3_i386.deb) ..
Processing triggers for man-db ...
Processing triggers for ureadahead ...
Setting up tftpd-hpa (5.2-7ubuntu3) ...
tftpd-hpa start/running, process 21463
Processing triggers for ureadahead
```

was my installation fail or what?
i use ubuntu 13.10 saucy

Thanks for the help

↩ ∞

🛡 **nixCraft** • Nov 15, 2013 @ 9:08

It was a success.

↵   ∞

---

eko indriatmoko • Nov 18, 2013 @ 4:42

thanks..

↵   ∞

Root • Dec 8, 2013 @ 11:59

hey guys
i am new here
i have another laptop in that i want to install windows 7
in that laptop dont have disk drive nor support usb
so i want install os with lan
right now i am using ubuntu 13.10
and i have no idea how to do that

so can any one help me out with this

↵   ∞

L-J • Feb 23, 2015 @ 10:35

For R-pi users getting install errors for tftpd-hpa:

Edit the file: `/etc/default/tftpd-hpa`
Add " `--ipv4` " under TFTP_OPTIONS

After that run " `apt-get install -f tftpd-hpa` "

↵   ∞

---

jd • Aug 5, 2016 @ 11:18

you install tftp in next step you want to try if tftp works by downloading
something from http? what?

↵   ∞

---

jd • Aug 5, 2016 @ 11:20

ah, sorry, i see, you prepare the test … sorry sorry …

↵   ∞

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