



# Installing and using the Cisco AnyConnect client with Debian and Ubuntu for UCI VPN

by Jeff Stern

(Note: There is also an [alternative method](#) of installing UCI VPN support without using the Cisco client, but using the built-in Debian/Ubuntu openconnect and openvpn drivers, should you find the below method does not work for you, or if you prefer to use open-source non-proprietary software.)

## Introduction

OIT has a good general [VPN-Linux page](#) with instructions on setting up the Cisco AnyConnect VPN client software for Linux, but I got tripped up in a couple of places and thought I'd pass on some heads-ups for other Debian and Ubuntu users.

I originally wrote this "How-To" for Ubuntu v10, and have updated it through v17.04. It should work for most or all Debian-derived distributions through 9.0 ("Stretch").

Please do [write me](#) to let me know how it went for you, and/or with any suggestions. I'd love to hear that it helped someone and/or any improvements that could be added.

[Thanks](#) to several for the help getting here.

## Summary

In the instructions below, I'll walk you through installing the Cisco VPN client on a Debian or Ubuntu system. When you're done, you'll have two commands available at the command-prompt, which you can run to connect to the campus VPN: 'vpn' (text mode) and 'vpnuui' (graphical/windowing).

I used to also include instructions for getting VPN support to show up in the NetworkManager icon/applet in the system tray, for those who used a Gnome based desktop. I no longer do this, as it is too complicated these days to keep up with documenting the various desktop environments, and the changes (and unreliability) of NetworkManager. And it's not really necessary anyway. If you get it going for yourself, though, Kudos to You! :-)

## Installing the Cisco AnyConnect client

1. First, make sure you have the necessary Debian/Ubuntu support packages installed:

```
$ sudo apt-get update
$ sudo apt-get install lib32z1 lib32ncurses5
```

2. Go to the [UCI OIT Cisco Anyconnect/Linux instruction page](#).

3. Download the 32 or 64 bit client as a .gz file.

- o If you are unsure whether you should use the 32 or 64 bit client: Most people are on 64-bit machines now. But if you are unsure, just run the uname command like this:

```
$ uname -a
Linux sporkula 3.19.0-31-lowlatency #36-Ubuntu SMP PREEMPT Wed Oct 7 15:44:16 UTC 2015 x86_64 x86_64 x86_64 GNU/Linux
$_
```

As you can see from the above example, my machine has a 64-bit Intel (x86\_64) based processor. If you see a '386' somewhere, then you are on a 32-bit machine.

4. From the command prompt, go to the directory you saved the file to, and unpack it and run, just like the OIT instructions. Note you might have to put in some back-slashes because the download file apparently comes with spaces in the file name these days:

```
~$ cd ~/Downloads
~/Downloads]$ tar -xzf anyconnect-predeploy-linux-64-4.3.05017-k9.tar\ 6.59.23\ AM.gz
anyconnect-4.3.05017/
anyconnect-4.3.05017/vpn/
anyconnect-4.3.05017/vpn/vpn_install.sh
anyconnect-4.3.05017/vpn/vpnagentd
anyconnect-4.3.05017/vpn/vpnagentd_init
anyconnect-4.3.05017/vpn/vpn_uninstall.sh
anyconnect-4.3.05017/vpn/anyconnect_uninstall.sh
anyconnect-4.3.05017/vpn/libacciscssl.so
anyconnect-4.3.05017/vpn/libacciscocrypto.so
anyconnect-4.3.05017/vpn/libaccurl.so.4.3.0
anyconnect-4.3.05017/vpn/vpnui
anyconnect-4.3.05017/vpn/cisco-anyconnect.desktop
anyconnect-4.3.05017/vpn/cisco-anyconnect.menu
anyconnect-4.3.05017/vpn/cisco-anyconnect.directory
anyconnect-4.3.05017/vpn/libvpnagentutilities.so
anyconnect-4.3.05017/vpn/libvpncommon.so
anyconnect-4.3.05017/vpn/libvpncommoncrypt.so
anyconnect-4.3.05017/vpn/libvpnapl.so
anyconnect-4.3.05017/vpn/libvpnipsec.so
anyconnect-4.3.05017/vpn/vpn
anyconnect-4.3.05017/vpn/acinstallhelper
```

```

anyconnect-4.3.05017/vpn/pixmaps/
anyconnect-4.3.05017/vpn/pixmaps/company-logo.png
anyconnect-4.3.05017/vpn/pixmaps/cvc-about.png
anyconnect-4.3.05017/vpn/pixmaps/cvc-configure.png
anyconnect-4.3.05017/vpn/pixmaps/cvc-connect.png
anyconnect-4.3.05017/vpn/pixmaps/cvc-disconnect.png
anyconnect-4.3.05017/vpn/pixmaps/cvc-info.png
anyconnect-4.3.05017/vpn/pixmaps/systray_connected.png
anyconnect-4.3.05017/vpn/pixmaps/systray_disconnecting.png
anyconnect-4.3.05017/vpn/pixmaps/systray_notconnected.png
anyconnect-4.3.05017/vpn/pixmaps/systray_quarantined.png
anyconnect-4.3.05017/vpn/pixmaps/systray_reconnecting.png
anyconnect-4.3.05017/vpn/pixmaps/vpnui48.png
anyconnect-4.3.05017/vpn/pixmaps/downloader-arrow.png
anyconnect-4.3.05017/vpn/manifesttool
anyconnect-4.3.05017/vpn/ACManifestVPN.xml
anyconnect-4.3.05017/vpn/vpndownloader
anyconnect-4.3.05017/vpn/vpndownloader-cli
anyconnect-4.3.05017/vpn/update.txt
anyconnect-4.3.05017/vpn/OpenSource.html
anyconnect-4.3.05017/vpn/AnyConnectProfile.xsd
anyconnect-4.3.05017/vpn/AnyConnectLocalPolicy.xsd
anyconnect-4.3.05017/vpn/libacfeedback.so
anyconnect-4.3.05017/vpn/license.txt
anyconnect-4.3.05017/vpn/VeriSignClass3PublicPrimaryCertificationAuthority-G5.pem
anyconnect-4.3.05017/dart/
anyconnect-4.3.05017/dart/dart_install.sh
anyconnect-4.3.05017/dart/AMPEabler.xml
anyconnect-4.3.05017/dart/AnyConnectConfig.xml
anyconnect-4.3.05017/dart/BaseConfig.xml
anyconnect-4.3.05017/dart/ConfigXMLSchema.xsd
anyconnect-4.3.05017/dart/DARTGUI.glade
anyconnect-4.3.05017/dart/ISEPosture.xml
anyconnect-4.3.05017/dart/NetworkVisibility.xml
anyconnect-4.3.05017/dart/Posture.xml
anyconnect-4.3.05017/dart/RequestXMLSchema.xsd
anyconnect-4.3.05017/dart/Umbrella.xml
anyconnect-4.3.05017/dart/cisco-anyconnect-dart.desktop
anyconnect-4.3.05017/dart/cisco-anyconnect-dart.directory
anyconnect-4.3.05017/dart/cisco-anyconnect-dart.menu
anyconnect-4.3.05017/dart/ciscoLogo.png
anyconnect-4.3.05017/dart/dartCustom.png
anyconnect-4.3.05017/dart/dartTypical.png
anyconnect-4.3.05017/dart/dart_uninstall.sh
anyconnect-4.3.05017/dart/dartcli
anyconnect-4.3.05017/dart/dartcli.symbols
anyconnect-4.3.05017/dart/dartui
anyconnect-4.3.05017/dart/dartui.symbols
anyconnect-4.3.05017/dart/license.txt
anyconnect-4.3.05017/dart/manifesttool
anyconnect-4.3.05017/dart/ACManifestDART.xml
anyconnect-4.3.05017/posture/
anyconnect-4.3.05017/posture/ciscod
anyconnect-4.3.05017/posture/cscan
anyconnect-4.3.05017/posture/ciscod_init
anyconnect-4.3.05017/posture/cstub
anyconnect-4.3.05017/posture/posture_install.sh
anyconnect-4.3.05017/posture/posture_uninstall.sh
anyconnect-4.3.05017/posture/libcsd.so
anyconnect-4.3.05017/posture/libhostscan.so
anyconnect-4.3.05017/posture/libinspector.so
anyconnect-4.3.05017/posture/license.txt
anyconnect-4.3.05017/posture/tables.dat
anyconnect-4.3.05017/posture/ACManifestPOS.xml
anyconnect-4.3.05017/posture/libaccurl.so.4.3.0
anyconnect-4.3.05017/posture/libacciscocrypto.so
anyconnect-4.3.05017/posture/libacciscossl.so
~/Downloads]$ cd anyconnect-4.3.05017
~/Downloads/anyconnect-4.3.05017]$ cd vpn
~/Downloads/anyconnect-4.3.05017/vpn]$ ls -lh
$ total 12M
-rwxr-xr-x 1 jas jas 14K Dec 9 2016 acinstallhelper
-rw-r--r-- 1 jas jas 262 Dec 9 2016 ACManifestVPN.xml
-rw-r--r-- 1 jas jas 6.6K Dec 9 2016 AnyConnectLocalPolicy.xsd
-rw-r--r-- 1 jas jas 83K Dec 9 2016 AnyConnectProfile.xsd
-rwxr-xr-x 1 jas jas 502 Dec 9 2016 anyconnect_uninstall.sh
-rw-r--r-- 1 jas jas 279 Dec 9 2016 cisco-anyconnect.desktop
-rw-r--r-- 1 jas jas 164 Dec 9 2016 cisco-anyconnect.directory
-rw-r--r-- 1 jas jas 603 Dec 9 2016 cisco-anyconnect.menu
-rwxr-xr-x 1 jas jas 2.6M Dec 9 2016 libacciscocrypto.so
-rwxr-xr-x 1 jas jas 436K Dec 9 2016 libacciscossl.so
-rwxr-xr-x 1 jas jas 232K Dec 9 2016 libaccurl.so.4.3.0
-rwxr-xr-x 1 jas jas 168K Dec 9 2016 libacfeedback.so
-rwxr-xr-x 1 jas jas 888K Dec 9 2016 libvpnagentutilities.so
-rwxr-xr-x 1 jas jas 1.6M Dec 9 2016 libvpnapl.so
-rwxr-xr-x 1 jas jas 530K Dec 9 2016 libvpncommoncrypt.so
-rwxr-xr-x 1 jas jas 1.7M Dec 9 2016 libvpncommon.so
-rwxr-xr-x 1 jas jas 1.1M Dec 9 2016 libvpnpipsec.so
-rw-r--r-- 1 jas jas 13K Dec 9 2016 license.txt
-rwxr-xr-x 1 jas jas 480K Dec 9 2016 manifesttool
-rw-r--r-- 1 jas jas 68K Dec 9 2016 OpenSource.html
drwxr-sr-x 2 jas jas 4.0K Dec 9 2016 pixmaps
-rw-r--r-- 1 jas jas 10 Dec 9 2016 update.txt
-rw-r--r-- 1 jas jas 1.8K Dec 9 2016 VeriSignClass3PublicPrimaryCertificationAuthority-G5.pem
-rwxr-xr-x 1 jas jas 65K Dec 9 2016 vpn
-rwxr-xr-x 1 jas jas 724K Dec 9 2016 vpnagentd
-rw-r--r-- 1 jas jas 2.1K Dec 9 2016 vpnagentd_init
-rwxr-xr-x 1 jas jas 424K Dec 9 2016 vpndownloader
-rwxr-xr-x 1 jas jas 396K Dec 9 2016 vpndownloader-cli
-rwxr-xr-x 1 jas jas 24K Dec 9 2016 vpn_install.sh
-rwxr-xr-x 1 jas jas 176K Dec 9 2016 vpnui
-rwxr-xr-x 1 jas jas 8.4K Dec 9 2016 vpn_uninstall.sh
~/Downloads/anyconnect-4.3.05017/vpn]$ ./vpn_install.sh
Installing Cisco AnyConnect Secure Mobility Client...

```

```

Sorry, you need super user privileges to run this script.
~/Downloads/anyconnect-4.3.05017/vpn]$ sudo ./vpn_install.sh
...
Do you accept the terms in the license agreement? [y/n] y
You have accepted the license agreement.
Please wait while Cisco AnyConnect Secure Mobility Client is being installed...
Starting Cisco AnyConnect Secure Mobility Client Agent...
Done!
~/Downloads/anyconnect-4.3.05017/vpn]$ _

```

5. If you get the following message at the end instead:

```
Failed to start vpnapgentd.service: Unit vpnapgentd.service failed to load: No such file or directory.
```

it most likely means you did not install the two Ubuntu packages up in step 1, above.

- o However, if you have installed those two packages, and are still getting this error, then user Steve Murphy wrote me (2015-12-7) with the tip that running the following did install enough dependent packages as to make it work for him:

```
$ sudo apt-get install network-manager-openconnect
```

However, while this may help some users, this normally should not be necessary, and was not in my testing.

6. Now reload systemd, scanning for new or changed units:

```
$ sudo systemctl daemon-reload
```

7. The vpn client should now have been installed on your system and the vpnapgentd process started. You can verify this by looking at the active processes:

```
$ ps auxw | grep vpnapgentd | grep -v grep
root      3049  0.0  0.2 165960  8356 ?        Sl   09:07   0:04 /opt/cisco/anyconnect/bin/vpnapgentd
```

8. During the installation, the vpnapgentd daemon should now be set up to be started each time your system is booted. To verify:

```
$ find /etc/rc?.d -type l -name "*vpnapgentd*"
/etc/rc2.d/K25vpnapgentd
/etc/rc2.d/S85vpnapgentd
/etc/rc3.d/K25vpnapgentd
/etc/rc3.d/S85vpnapgentd
/etc/rc4.d/K25vpnapgentd
/etc/rc4.d/S85vpnapgentd
/etc/rc5.d/K25vpnapgentd
/etc/rc5.d/S85vpnapgentd
```

or

```
$ ls -l /etc/rc?.d/*vpn*
lrwxrwxrwx 1 root root 21 Jun  5 09:07 /etc/rc2.d/K25vpnapgentd -> /etc/init.d/vpnapgentd*
lrwxrwxrwx 1 root root 21 Jun  5 09:07 /etc/rc2.d/S85vpnapgentd -> /etc/init.d/vpnapgentd*
lrwxrwxrwx 1 root root 21 Jun  5 09:07 /etc/rc3.d/K25vpnapgentd -> /etc/init.d/vpnapgentd*
lrwxrwxrwx 1 root root 21 Jun  5 09:07 /etc/rc3.d/S85vpnapgentd -> /etc/init.d/vpnapgentd*
lrwxrwxrwx 1 root root 21 Jun  5 09:07 /etc/rc4.d/K25vpnapgentd -> /etc/init.d/vpnapgentd*
lrwxrwxrwx 1 root root 21 Jun  5 09:07 /etc/rc4.d/S85vpnapgentd -> /etc/init.d/vpnapgentd*
lrwxrwxrwx 1 root root 21 Jun  5 09:07 /etc/rc5.d/K25vpnapgentd -> /etc/init.d/vpnapgentd*
lrwxrwxrwx 1 root root 21 Jun  5 09:07 /etc/rc5.d/S85vpnapgentd -> /etc/init.d/vpnapgentd*
```

9. Make command aliases to point to the vpn and vpnu commands:

```
$ alias vpn='/opt/cisco/anyconnect/bin/vpn'
$ alias vpnu='/opt/cisco/anyconnect/bin/vpnu'
```

10. Also add these aliases to the end of your ~/.bashrc or ~/.bash\_aliases file:

```
$ cat >> ~/.bash_aliases
alias vpn='/opt/cisco/anyconnect/bin/vpn'
alias vpnu='/opt/cisco/anyconnect/bin/vpnu'
^D
$ _
```

(where you don't actually type the "^D": it means you hit Ctrl-D to finish).

If you want to edit your aliases file instead directly, you can run a simple editor, 'nano', which is usually available on Debian and Ubuntu systems:

```
$ nano ~/.bash_aliases
```

## Connecting and Disconnecting

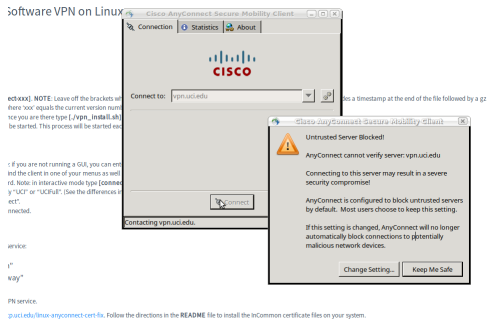
### Connecting (Graphical window)

Just run:

```
$ vpnu
```

And it should show 'vpn.uci.edu' already. Just click Connect.

If you get an error message about an untrusted server or certificate..



..you can fix that following the instructions from Robert in the section [NOTE 1 - Connect-error](#), below.

(By the way, depending on how the installation went, and whatever of the Linux desktop environments you are using (Gnome, Unity, KDE, Mate, Cinnamon, XFCE, etc.) you may also find that the vpnui graphical client now also appears somewhere in your Applications menu. But don't count on it! This is Linux, after all.. :-)

## Connecting (via command-line)

1. To start the client from a command-line prompt in a terminal window, using the alias you made above:

```
$ vpn
```

2. At the **VPN>** prompt, type **connect vpn.uci.edu** and press Enter. (If you get an error message about an untrusted server or certificate, you can fix that following the instructions from Robert in the section [NOTE 1 - Connect-error](#), below.) Otherwise, you should now see:

```
VPN> connect vpn.uci.edu
>> Please enter your UCInetID and password.
0) Default-WebVPN
1) Merage
2) MerageFull
3) UCI
4) UCIFull
```

If you do not see this, but get a connect error instead, please see [NOTE 1 - Connect Error](#) below.

3. Ignore the message about entering your UCInetID and password, for now.
4. Choose one of the choices by number and press return -- usually **UCI** or **UCIFull**. (See the differences in the Tunnels below.) For instance, for **UCI**, press 3 and hit Enter.
5. Enter your UCInetID and password in the Username and Password boxes and press return.
6. At the **accept? [y/n]:** prompt, type **y** and press Enter. You may get several notices the first time about the downloader performing update checks. At the end you should see a **>> state: Connected** message and a new **VPN>** prompt. You are now connected.
7. Either leave the **VPN>** prompt open or if you want your terminal back just type **quit** at the **VPN>** prompt (the connection will remain active).

## Connecting automatically via Command-line (w/o typing in your Username/Password)

I never (not yet?) figured out how to get the Cisco anyconnect software to run via script with command-line parameters sufficient for its running without having to type in your username (UCInetID) and password. I looked into the vpn command / executable supplied by Cisco (in the anyconnect-predeploy package) and running -h on it does not give much help.

Therefore, if you need something command-line and automated, I suggest you use the [alternative method using open-source openvpn/openconnect software](#) which I mentioned at the very top of this document. I include a way to do that in an automated way, and I find it works just as well and just as fast, but without having to install proprietary Cisco software. (This is the age of Ed Snowden's warning to us all, after all.. :-/)

## NOTE 1 - Connect-error

In most cases I have seen, a connection is made. I have, however, seen the below error before only once. It was when the person was installing on a netbook (running Gnome) which was on campus and using the campus wifi system (though I don't know if those factors were the cause). It didn't matter if they answered y or n, they continued to get the error and be denied connection.

```
-----
Error:

VPN> connect vpn.uci.edu
connect vpn.uci.edu
>> contacting host (vpn.uci.edu) for login information...
>> notice: Contacting vpn.uci.edu.
VPN> AnyConnect cannot verify the VPN server: vpn.uci.edu
- Certificate is from an untrusted source.
Connecting to this server may result in a severe security compromise!

Most users do not connect to untrusted VPN servers unless the
reason for the error condition is known.

Connect Anyway? [y/n]:
-----
```

Update 2015-12-6: "Robert" wrote me with a solution to this:

- ..the connect error... can be resolved by sym-linking the cisco ca directory to the system ca directory as cisco only seems to include one root certificate by default. Or you can install the certificate chain from the VPN provider - sym-linking the system certs worked fine for me.

```
$ cd /opt/.cisco/certificates
$ sudo mv ca ca.orig
$ sudo ln -sf /etc/ssl/certs/ ca
$ sudo /etc/init.d/vpnagentd restart
```

Credit goes to: <https://plus.google.com/+AndreasKotowicz/posts/2afhvvNZpE6>

Thank you, Robert!

### To disconnect (gui)

1. Just click disconnect in the window

### To disconnect (command-line)

1. At the `VPN>` prompt, type `disconnect` and hit Enter.

### To exit (command-line)

1. At the `VPN>` prompt, type `quit` and hit return.

### De-installation / Removal

1. Run Cisco's provided un-install script

```
$ sudo /opt/cisco/anyconnect/bin/vpn_uninstall.sh
```

2. Optionally, also remove the cisco directory (if you don't need the .log files that were left behind):

```
$ sudo rm -rf /opt/cisco
```

## Additional Hints, Tips, and Handling of Errors and Problems Contributed by Users

Several people have written in to me with some additional tips and solutions which I'll add here:

- From pierrechauffour:

Hi !

Thank you for your web site, a lot of help.

But in "Section 1", lib32z1 and lib32ncurses5 are not available for launch anyconnect

Prefer libpangox-1.0-0 and pangox-compat

I'm not on debian (DEB) but openSuse (RPM)

Best regards

- From zviad aburjania:

Thank you for the instructions, it was very helpful so far but after I type vpn in terminal I get the message: /opt/cisco/anyconnect

This turned out to be a missing library fixable by:

```
sudo apt-get install libxml2:i386 libstdc++6:i386
```

- From zviad aburjania (2):

Hello Jeff,

Thank you for your advice! After installing the package you recommended I was able to make alias to point to the vpn command.

After I did that and typed "vnp" I used to get the error message:

```
>> error: VPN Service not available.
unable to attach to VPN subsystem!
```

after searching the internet I found [this link](#) that was helpful with that problem.

After this everything seems to be fine.

I just wanted to share my experience as I'm very grateful for your help.

Thank you,  
Zviadi

(If that link no longer works, it is just recommended to start `/opt/cisco/anyconnect/bin/vpnagentd` first.)

- From pascal müller:

Pascal researched and found that the error, anyconnect was not able to establish a connection to the specified secure gateway is a known problem with Cisco clients before version 4, when these earlier clients are installed on Ubuntu 16.04+. The solution is either to downgrade your Ubuntu, or upgrade your Cisco client. At my university we have upgraded to offering version 4 (`anyconnect-predeploy-linux-64-4.3.05017-k9.tar.gz`), and this supposedly works with the newer Ubuntu. I did not myself test the new version 4 Anyconnect client with Ubuntu 15.x and 16.x. But I have tested it today (April 27 2017) with my Ubuntu 17.04 system, and it works great.

## Contact / Feedback

Please [email me](#) to let me know how this process went for you, and/or with any suggestions for improvement on this page itself. Thanks.

## Acknowledgements

Thanks to:

1. Mike Iglesias and Sylvia Bass at UCI's OIT for putting up the link to here from their [VPN-Linux page](#).
2. a [page at Georgia Tech](#) (now defunct), from which part of this page (the old Section 2, no longer included) was originally adapted.
3. Joe Remenak for clear, concise feedback on some additional steps (1 and 11) necessary now for the newer 64-bit Ubuntu.
4. Tom Distler, for the Tux/Cisco image at the top of this page, which I mooched from his page, [How to connect Linux to a Cisco VPN using a PCF file](#).
5. James Condie at UCI, who encountered multiple problems with the latest changes in the 4.3.05017 version of Cisco's install -- but patiently stuck with it -- thus encouraging me to update this page once again, and clarify a few additional things for newer Linux users.

6. Philippe Moisan, who caught and reported an incompatibility with the `find vpnagentd` command above in Installation Step 8, for some versions of Linux, and offered also a fix: to put quotes around the `"*vpnagentd"` which should work with all flavors of `find`.

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Last Updated Oct 30 2017