PLANX OpenVPN Installation and Configuration Guide

Version: V1

Contents

Important Notes

- Please ensure that you are not connected to any other VPN connection while running the PLANX OpenVPN. Tunnelblick will not work if another VPN client is running (e.g., 'Cisco AnyConnect Secure Mobility Client', or NIH VPN).

- Generic Linux instructions are provided in the Linux section, but exact steps on Linux may vary based on distribution. The general instructions provided are based on an Ubuntu flow.

- If you are using a Windows platform, you must run OpenVPN with install/run with admin rights every time you run OpenVPN (not just on initial installation)

- The OpenVPN configuration e-mails are sent from <support@datacommons.io>.
    - Make sure this e-mail is listed as a 'safe sender'.
    - If the enrollment e-mails are not received, check your spam folder, or with your e-mail administrator.
- If there is a connectivity issue, make sure UDP traffic to port 1194 is allowed through your firefwall to *csoc-prod-vpn.planx-pla.net, csoc-test-vpn.planx-pla.net*.
- As of now we have two VPN services running as *csoc-prod-vpn.planx-pla.net*, *csoc-test-vpn.planx-pla.net* , providing access to planx prod and planx qa/dev environments respectively.
- Instead of a consistent password, we will be using two factor authentication token combined with a certificate included in your ovpn config file. You will need to install a TOTP capable 2FA application on a mobile device as described below. Once configured, this APP will generate a new 6 digit token every 30 seconds and will be used in place of the password.

Introduction

The purpose of this document is to provide instructions on how to install and configure OpenVPN to connect to the PLANX internal environment. Once connected, the following PLANX resources can be accessed.

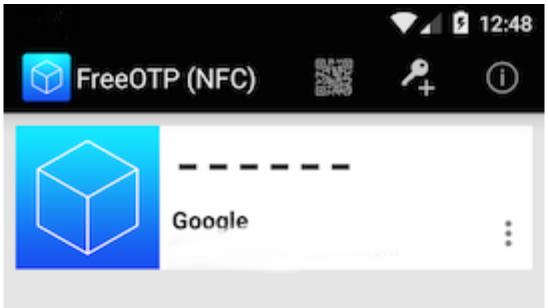
1) If on planxprod-vpn ; you should be able to access the prod resources e.g. commons admin vm.
2) If on planxtest-vpn; you should be able to access the test environment (dev and qa) resources e.g. cdistest admin vm.

Installing the Two Factor Auth (2FA) TOTP Client

- ANDROID
  - (Recommended) FreeOTP – https://play.google.com/store/apps/details?id=org.fedorahosted.freeotp
  - Google Authenticator – https://play.google.com/store/apps/details?id=com.google.android.apps.authenticator2
    - Google Authenticator may ask you to tie it to a Google Account, you can safely skip past this if you desire
- iPhone
  - (Recommended) FreeOTP – https://itunes.apple.com/us/app/freeotp-authenticatorhttps://itunes.apple.com/us/app/freeotp-authenticatorhttps://itunes.apple.com/us/app/freeotp-authenticatorhttps://itunes.apple.com/us/app/freeotp-authenticator
  - Google Authenticator – https://itunes.apple.com/us/app/google-authenticatorhttps://itunes.apple.com/us/app/google-authenticatorhttps://itunes.apple.com/us/app/google-authenticatorhttps://itunes.apple.com/us/app/google-authenticator
    - Google Authenticator may ask you to tie it to a Google Account, you can safely skip past this if you desire

FreeOTP Setup

- Obtain the link to your 2FA TOTP QR Code as described below in "Obtaining your OpenVPN config files and 2FA/TOTP code"
- Open FreeOTP
- Tap the miniature QR code in the top middle of the app.

- 

- It will open a QR scanner, showing a live stream from your camera with a white Square overlayed.
- Using the on screen display, place the QRCode into the center of the square
- When aligned properly, the QR scanner will close and return you to the main screen.

Obtaining your OpenVPN config files and 2FA/TOTP code.

In order to use OpenVPN to connect to the PLANX environment, you will need to utilize configuration files and a username/password as outlined in other sections in this guide. This information will be sent in an email from support@datacommons.io . It will contain the following two things:

- PLANX VPN Configuration Files: This email contains your configuration files. They will be packaged as a zip file attachment to the email.

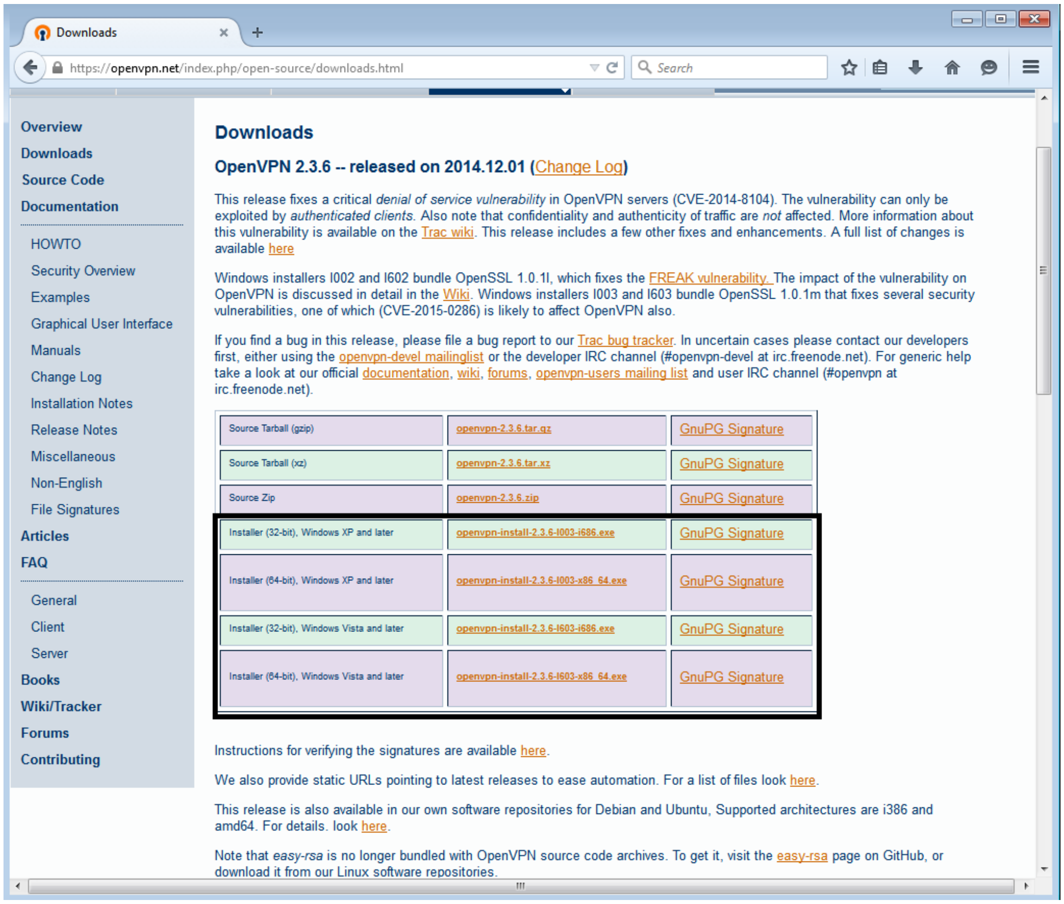
- URL to the QR Code: A url to a svg file that you will scan later with the preferred 2FA/TOTP application. This URL is only valid for 48 hours, and should NOT be shared with anyone NOR pasted into sites/applications such as slack.

Windows Installation of OpenVPN Client

- On Windows, the official client installer and instructions can be downloaded from: https://openvpn.net/index.php/open-source/downloads.html

- First, determine whether you are running Windows in 32-bit or 64-bit:
    - To **find** out if your computer is running a **32-bit or 64-bit** version of **Windows** in **Windows** 7 or **Windows** Vista, do the following: Open System by clicking the Start button , right-clicking Computer, and then clicking Properties. Under System, you can view the system type.
- Windows 10 users: Please see “Setting static Metric on VPN TAP” in the appendix after you successfully install the OpenVPN client. You can preform these steps on already established VPN connection.

- Depending on your Windows OS and PC, download:
    - Installer (32-bit), Windows XP
    - Installer (64-bit), Windows XP
    - Installer (32-bit), Windows Vista and later (includes Windows 7, 8, & 10)
    - Installer (64-bit), Windows Vista and later (includes Windows 7, 8, & 10)



Downloads

OpenVPN 2.3.6 -- released on 2014.12.01 (Change Log)

This release fixes a critical *denial of service vulnerability* in OpenVPN servers (CVE-2014-8104). The vulnerability can only be exploited by *authenticated clients*. Also note that confidentiality and authenticity of traffic are *not* affected. More information about this vulnerability is available on the Trac wiki. This release includes a few other fixes and enhancements. A full list of changes is available here

Windows installers I002 and I602 bundle OpenSSL 1.0.1l, which fixes the FREAK vulnerability. The impact of the vulnerability on OpenVPN is discussed in detail in the Wiki. Windows installers I003 and I603 bundle OpenSSL 1.0.1m that fixes several security vulnerabilities, one of which (CVE-2015-0286) is likely to affect OpenVPN also.

If you find a bug in this release, please file a bug report to our Trac bug tracker. In uncertain cases please contact our developers first, either using the openvpn-devel mailinglist or the developer IRC channel (#openvpn-devel at irc.freenode.net). For generic help take a look at our official documentation, wiki, forums, openvpn-users mailing list and user IRC channel (#openvpn at irc.freenode.net).

Source Tarball (gzip)	openvpn-2.3.6.tar.gz	GnuPG Signature
Source Tarball (xz)	openvpn-2.3.6.tar.xz	GnuPG Signature
Source Zip	openvpn-2.3.6.zip	GnuPG Signature
Installer (32-bit), Windows XP and later	openvpn-install-2.3.6-I003-i686.exe	GnuPG Signature
Installer (64-bit), Windows XP and later	openvpn-install-2.3.6-I003-x86_64.exe	GnuPG Signature
Installer (32-bit), Windows Vista and later	openvpn-install-2.3.6-I603-i686.exe	GnuPG Signature
Installer (64-bit), Windows Vista and later	openvpn-install-2.3.6-I603-x86_64.exe	GnuPG Signature

Instructions for verifying the signatures are available here.

We also provide static URLs pointing to latest releases to ease automation. For a list of files look here.

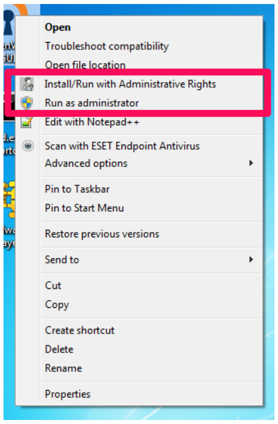
This release is also available in our own software repositories for Debian and Ubuntu, Supported architectures are i386 and amd64. For details. look here.

Note that *easy-rsa* is no longer bundled with OpenVPN source code archives. To get it, visit the easy-rsa page on GitHub, or download it from our Linux software repositories.

- The user will need to enter administrative credentials in order to install software on workstation.
    - If you are unable to obtain administrative credentials, you may need to contact your system administrator.
- Download and unzip the zip file containing your OpenVPN configuration files that were provided by the PLANX Team.
    - The file should be named: “<username>-planxprod-vpn.ovpn”

Run OpenVPN GUI on Windows

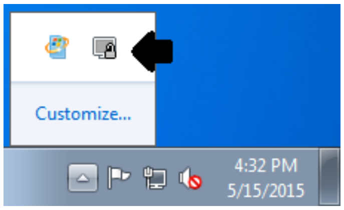
- Once installed right click the openvpn icon, and depending on your setup, select “Install/Run with Administrator Rights” or “Run as administrator”.



  - Depending on your security settings you may receive a “registry” error. If so skip to “Running OpenVPN from cmd.exe “

- Copy the <username>-planxprod-vpn.ovpn to “C:\Program Files\OpenVPN\config”

- Check System Tray for the OpenVPN icon. Depending on your windows setup, the icon may be “hidden”. If so, expand the System Tray in the bottom right by clicking the up arrow.

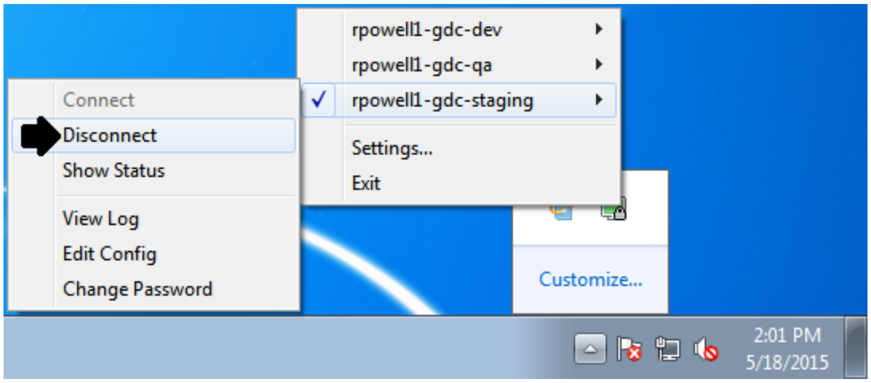


- Right Click the System Tray icon. The copied configuration files should show up at the top of the menu. Mouse over to <username>-planxprod-. Click “Connect” from the available options.

- Where it says “Username” enter the provided <username>
- Where it says “Password” enter the 2FA/TOTP token from your phone app.
- You are connected to PLANX OpenVPN.

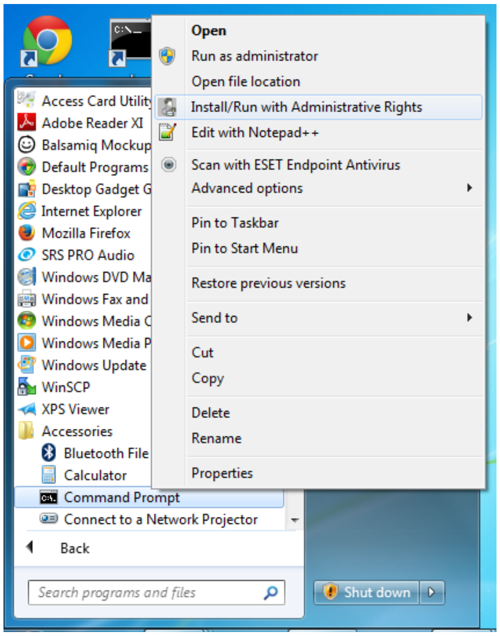
Disconnecting from OpenVPN

- To disconnect from the VPN, right click the system tray icon, select the environment, and click “Disconnect”


rpowell1-gdc-dev
rpowell1-gdc-qa
✓ rpowell1-gdc-staging
Settings...
Exit
Connect
Disconnect
Show Status
View Log
Edit Config
Change Password
Customize...
2:01 PM
5/18/2015

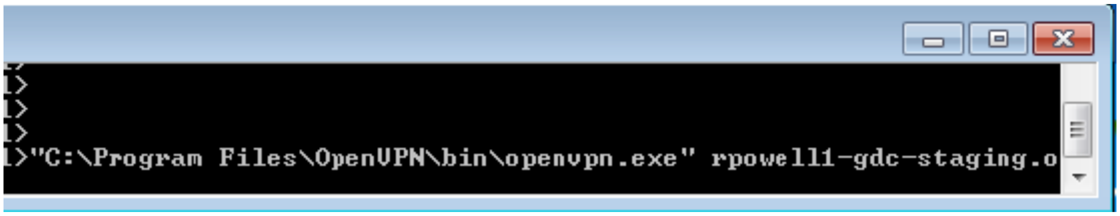
Run OpenVPN via the cmd.exe

- Click the “Start Menu”,
- Click “All Programs”
- Click “Accessories”
- Right Click “Command Prompt”
- Click select “Install/Run with Administrator Rights” or “Run as administrator”



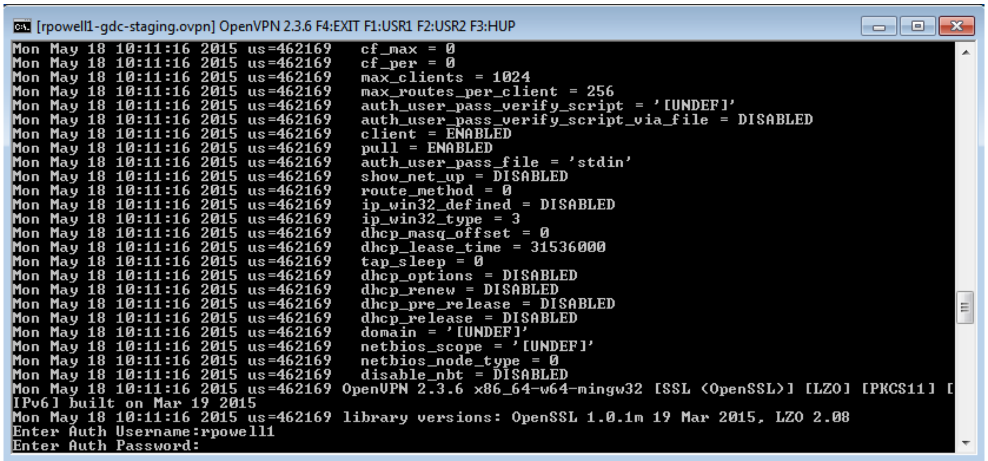
- Enter in Administrative account password for your workstation.

- Type ***”C:\Program Files\OpenVPN\bin\openvpn.exe” “C:\Program Files\OpenVPN\config\<filename>.ovpn”*** (see example below)



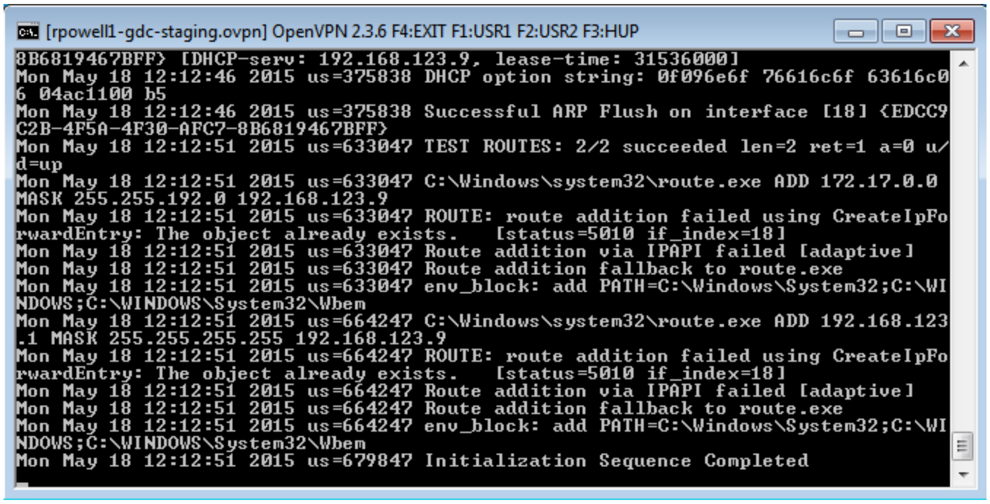
```
>
>
>
>"C:\Program Files\OpenVPN\bin\openvpn.exe" rpowell1-gdc-staging.o
```

- Select ‘enter/return’ and the VPN client will attempt to connect.
  - Note, there will be a fair amount of unimportant text that will scroll up your screen.
  - When prompted for a username and password, add the environment and 2FA/TOTP token as described above in the GUI section.


[rpowell1-gdc-staging.ovpn] OpenVPN 2.3.6 F4:EXIT F1:USR1 F2:USR2 F3:HUP

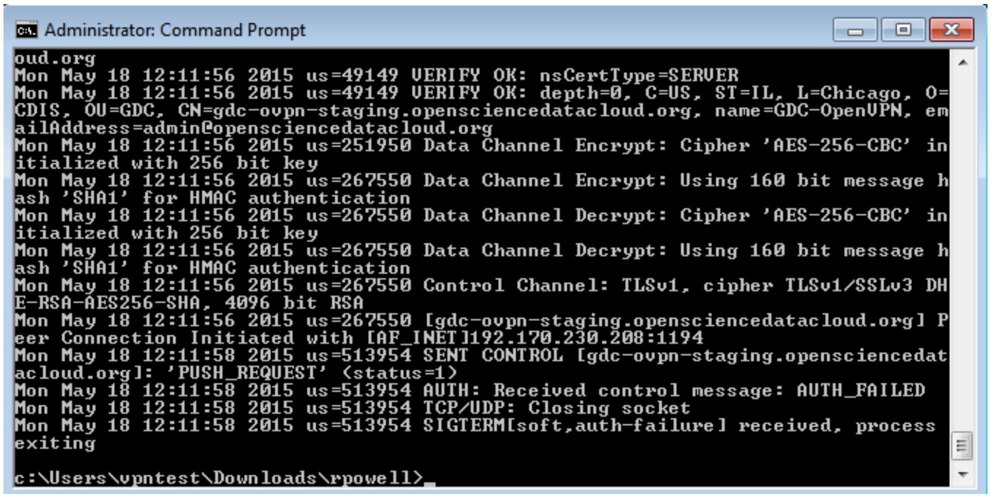
```
Mon May 18 10:11:16 2015 us=462169   cf_max = 0
Mon May 18 10:11:16 2015 us=462169   cf_per = 0
Mon May 18 10:11:16 2015 us=462169   max_clients = 1024
Mon May 18 10:11:16 2015 us=462169   max_routes_per_client = 256
Mon May 18 10:11:16 2015 us=462169   auth_user_pass_verify_script = '[UNDEF]'
Mon May 18 10:11:16 2015 us=462169   auth_user_pass_verify_script_via_file = DISABLED
Mon May 18 10:11:16 2015 us=462169   client = ENABLED
Mon May 18 10:11:16 2015 us=462169   pull = ENABLED
Mon May 18 10:11:16 2015 us=462169   auth_user_pass_file = 'stdin'
Mon May 18 10:11:16 2015 us=462169   show_net_up = DISABLED
Mon May 18 10:11:16 2015 us=462169   route_method = 0
Mon May 18 10:11:16 2015 us=462169   ip_win32_defined = DISABLED
Mon May 18 10:11:16 2015 us=462169   ip_win32_type = 3
Mon May 18 10:11:16 2015 us=462169   dhcp_masq_offset = 0
Mon May 18 10:11:16 2015 us=462169   dhcp_lease_time = 31536000
Mon May 18 10:11:16 2015 us=462169   tap_sleep = 0
Mon May 18 10:11:16 2015 us=462169   dhcp_options = DISABLED
Mon May 18 10:11:16 2015 us=462169   dhcp_renew = DISABLED
Mon May 18 10:11:16 2015 us=462169   dhcp_pre_release = DISABLED
Mon May 18 10:11:16 2015 us=462169   dhcp_release = DISABLED
Mon May 18 10:11:16 2015 us=462169   domain = '[UNDEF]'
Mon May 18 10:11:16 2015 us=462169   netbios_scope = '[UNDEF]'
Mon May 18 10:11:16 2015 us=462169   netbios_node_type = 0
Mon May 18 10:11:16 2015 us=462169   disable_nbt = DISABLED
Mon May 18 10:11:16 2015 us=462169 OpenVPN 2.3.6 x86_64-w64-mingw32 [SSL (OpenSSL)] [LZO] [PKCS11] [
[IPv6] built on Mar 19 2015
Mon May 18 10:11:16 2015 us=462169 library versions: OpenSSL 1.0.1m 19 Mar 2015, LZO 2.08
Enter Auth Username:rpowell1
Enter Auth Password:
```

- Connected:


[rpowell1-gdc-staging.ovpn] OpenVPN 2.3.6 F4:EXIT F1:USR1 F2:USR2 F3:HUP

```
8B6819467BFF} [DHCP-serv: 192.168.123.9, lease-time: 31536000]
Mon May 18 12:12:46 2015 us=375838 DHCP option string: 0f096e6f 76616c6f 63616c0
6 04ac1100 b5
Mon May 18 12:12:46 2015 us=375838 Successful ARP Flush on interface [18] {EDCC9
C2B-4F5A-4F30-AFC7-8B6819467BFF}
Mon May 18 12:12:51 2015 us=633047 TEST ROUTES: 2/2 succeeded len=2 ret=1 a=0 u/
d=up
Mon May 18 12:12:51 2015 us=633047 C:\Windows\system32\route.exe ADD 172.17.0.0
MASK 255.255.192.0 192.168.123.9
Mon May 18 12:12:51 2015 us=633047 ROUTE: route addition failed using CreateIpFo
rwardEntry: The object already exists.   [status=5010 if_index=18]
Mon May 18 12:12:51 2015 us=633047 Route addition via IPAPI failed [adaptive]
Mon May 18 12:12:51 2015 us=633047 Route addition fallback to route.exe
Mon May 18 12:12:51 2015 us=633047 env_block: add PATH=C:\Windows\System32;C:\WI
NDOWS;C:\WINDOWS\System32\Wbem
Mon May 18 12:12:51 2015 us=664247 C:\Windows\system32\route.exe ADD 192.168.123
.1 MASK 255.255.255.255 192.168.123.9
Mon May 18 12:12:51 2015 us=664247 ROUTE: route addition failed using CreateIpFo
rwardEntry: The object already exists.   [status=5010 if_index=18]
Mon May 18 12:12:51 2015 us=664247 Route addition via IPAPI failed [adaptive]
Mon May 18 12:12:51 2015 us=664247 Route addition fallback to route.exe
Mon May 18 12:12:51 2015 us=664247 env_block: add PATH=C:\Windows\System32;C:\WI
NDOWS;C:\WINDOWS\System32\Wbem
Mon May 18 12:12:51 2015 us=679847 Initialization Sequence Completed
```

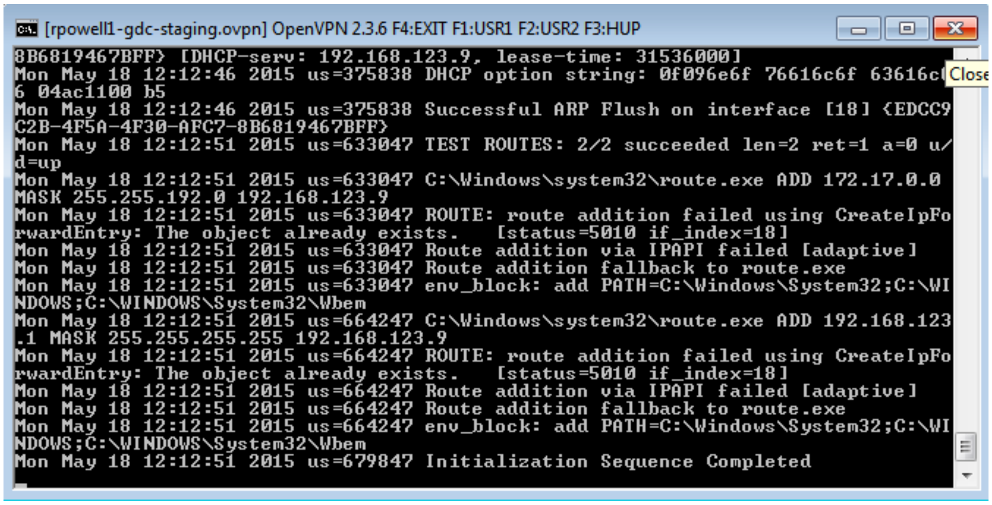
- Not connected



```
oud.org
Mon May 18 12:11:56 2015 us=49149 VERIFY OK: nsCertType=SERVER
Mon May 18 12:11:56 2015 us=49149 VERIFY OK: depth=0, C=US, ST=IL, L=Chicago, O=
CDIS, OU=GDC, CN=gdc-ovpn-staging.opensciencedatacloud.org, name=GDC-OpenVPN, em
ailAddress=admin@opensciencedatacloud.org
Mon May 18 12:11:56 2015 us=251950 Data Channel Encrypt: Cipher 'AES-256-CBC' in
itialized with 256 bit key
Mon May 18 12:11:56 2015 us=267550 Data Channel Encrypt: Using 160 bit message h
ash 'SHA1' for HMAC authentication
Mon May 18 12:11:56 2015 us=267550 Data Channel Decrypt: Cipher 'AES-256-CBC' in
itialized with 256 bit key
Mon May 18 12:11:56 2015 us=267550 Data Channel Decrypt: Using 160 bit message h
ash 'SHA1' for HMAC authentication
Mon May 18 12:11:56 2015 us=267550 Control Channel: TLSv1, cipher TLSv1/SSLv3 DH
E-RSA-AES256-SHA, 4096 bit RSA
Mon May 18 12:11:56 2015 us=267550 [gdc-ovpn-staging.opensciencedatacloud.org] P
eer Connection Initiated with [AF_INET]192.170.230.208:1194
Mon May 18 12:11:58 2015 us=513954 SENT CONTROL [gdc-ovpn-staging.opensciencedat
acloud.org]: 'PUSH_REQUEST' (status=1)
Mon May 18 12:11:58 2015 us=513954 AUTH: Received control message: AUTH_FAILED
Mon May 18 12:11:58 2015 us=513954 TCP/UDP: Closing socket
Mon May 18 12:11:58 2015 us=513954 SIGTERM[soft,auth-failure] received, process
exiting

c:\Users\vpntest\Downloads\rpowell>_
```

- To close the VPN connection, simply close your “Command Prompt” window by clicking the X in the upper right corner.


[rpowell1-gdc-staging.ovpn] OpenVPN 2.3.6 F4:EXIT F1:USR1 F2:USR2 F3:HUP
Close

```
8B6819467BFF} [DHCP-serv: 192.168.123.9, lease-time: 31536000]
Mon May 18 12:12:46 2015 us=375838 DHCP option string: 0f096e6f 76616c6f 63616c
6 04ac1100 b5
Mon May 18 12:12:46 2015 us=375838 Successful ARP Flush on interface [18] {EDCC9
C2B-4F5A-4F30-AFC7-8B6819467BFF}
Mon May 18 12:12:51 2015 us=633047 TEST ROUTES: 2/2 succeeded len=2 ret=1 a=0 u/
d=up
Mon May 18 12:12:51 2015 us=633047 C:\Windows\system32\route.exe ADD 172.17.0.0
MASK 255.255.192.0 192.168.123.9
Mon May 18 12:12:51 2015 us=633047 ROUTE: route addition failed using CreateIpFo
rwardEntry: The object already exists.   [status=5010 if_index=18]
Mon May 18 12:12:51 2015 us=633047 Route addition via IPAPI failed [adaptive]
Mon May 18 12:12:51 2015 us=633047 Route addition fallback to route.exe
Mon May 18 12:12:51 2015 us=633047 env_block: add PATH=C:\Windows\System32;C:\WI
NDOWS;C:\WINDOWS\System32\Wbem
Mon May 18 12:12:51 2015 us=664247 C:\Windows\system32\route.exe ADD 192.168.123
.1 MASK 255.255.255.255 192.168.123.9
Mon May 18 12:12:51 2015 us=664247 ROUTE: route addition failed using CreateIpFo
rwardEntry: The object already exists.   [status=5010 if_index=18]
Mon May 18 12:12:51 2015 us=664247 Route addition via IPAPI failed [adaptive]
Mon May 18 12:12:51 2015 us=664247 Route addition fallback to route.exe
Mon May 18 12:12:51 2015 us=664247 env_block: add PATH=C:\Windows\System32;C:\WI
NDOWS;C:\WINDOWS\System32\Wbem
Mon May 18 12:12:51 2015 us=679847 Initialization Sequence Completed
```

Test Connection on Windows

- Open New Cmd Prompt Window:
  - Click the “Start Menu”,
  - Click “All Programs”
  - Click “Accessories”
  - Right Click “Command Prompt”
  - Click select “Install/Run with Administrator Rights” or “Run as administrator”
- In newly opened Command prompt window: If on planxprod-vpn, try ssh,telnet or netcat to the csoc prod vms ; if on planxtest-vpn, try ssh,telnet or netcat to the csoc dev/qa vms

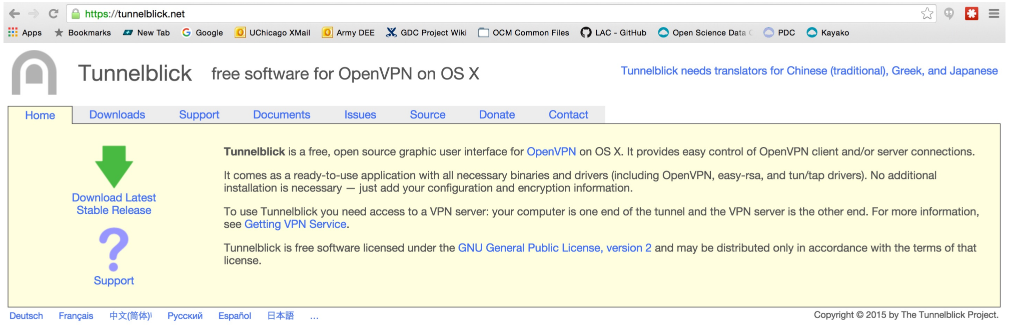
Troubleshooting Help for Windows

- Please ensure you are started both the OpenVPN client and the cmd prompt for nslookup check with Admin privileges.

- Please ensure that you are not connected to any other VPN connection (e.g. NIH VPN) while running the PLANX OpenVPN.

Mac (OS X) Installation

- The TunnelBlick client is our preferred method for connecting to OpenVPN on OS X and is available from:
  https://tunnelblick.net/



Tunnelblick is a free, open source graphic user interface for OpenVPN on OS X. It provides easy control of OpenVPN client and/or server connections.

It comes as a ready-to-use application with all necessary binaries and drivers (including OpenVPN, easy-rsa, and tun/tap drivers). No additional installation is necessary — just add your configuration and encryption information.

To use Tunnelblick you need access to a VPN server: your computer is one end of the tunnel and the VPN server is the other end. For more information, see Getting VPN Service.

Tunnelblick is free software licensed under the GNU General Public License, version 2 and may be distributed only in accordance with the terms of that license.

Copyright © 2015 by The Tunnelblick Project.

- Install the TunnelBlick software; you will be prompted for administrative credentials on your Mac to install software.

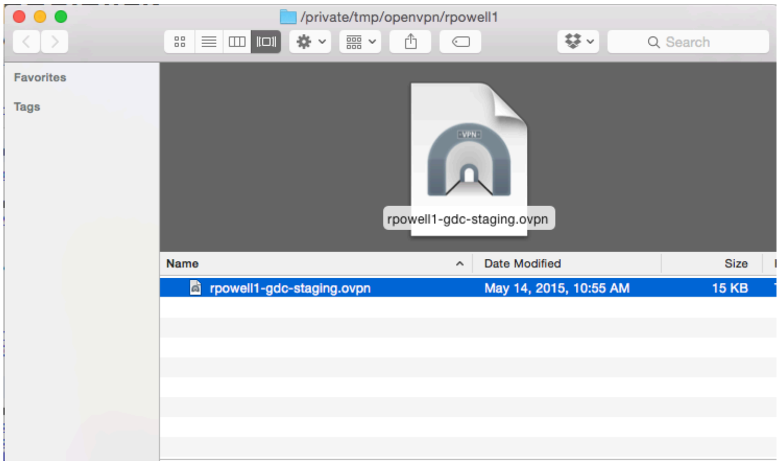
- During the installation process, you may receive two selection prompts:
  - Do you already have VPN config files? *Select Yes.*
  - Do you want to receive a warning about your IP not changing? *Select No.*

- Open TunnelBlick by going to Applications > TunnelBlick.
  - The first time you run it OSX may ask you to confirm that it is safe to run an application downloaded from the Internet. Click OK.

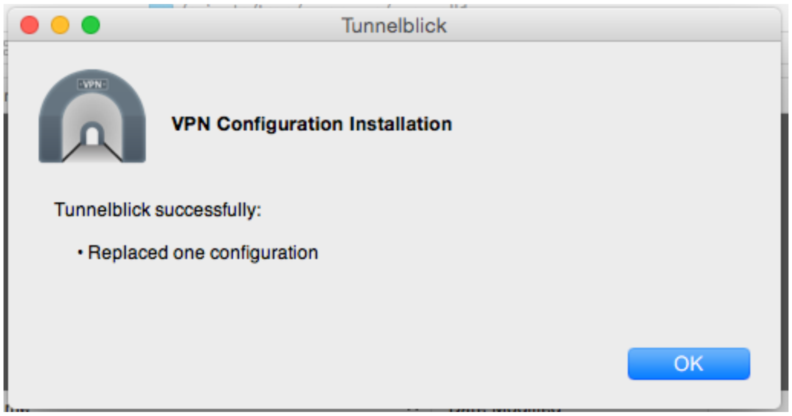
- Once installed, TunnelBlick registers the .ovpn file extension with the OS. Locate the configuration files and double click them. You will be asked to enter your username and password for the Mac to install software.
  - When complete it will inform you that the configuration installation was successful.

- You may need to reboot once Tunnelblick has been installed and configuration imported.
  - Otherwise DNS do not get updated and the system stick to other VPNs configured (https://airvpn.org/topic/11665-tunnelblick-how-to-force-using-airvpn-dns-when-connected-and-routers-dns-when-disconnected/).

  - *Note: Sometimes the Mac TunnelBlick client will hide windows in the background. If this happens, you may need to first quit TunnelBlick by right clicking the icon next to the system clock and then double click the config file again.*



Name	Date Modified	Size
rpowell1-gdc-staging.ovpn	May 14, 2015, 10:55 AM	15 KB

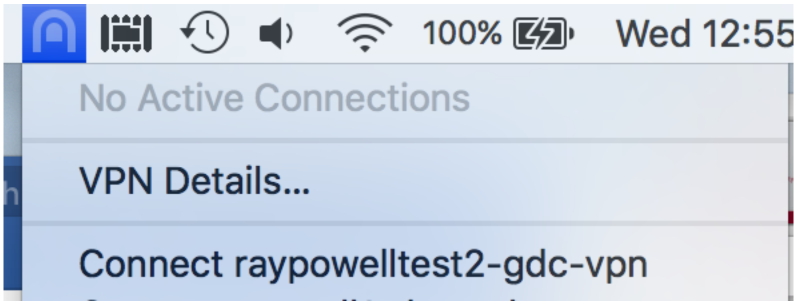


VPN Configuration Installation

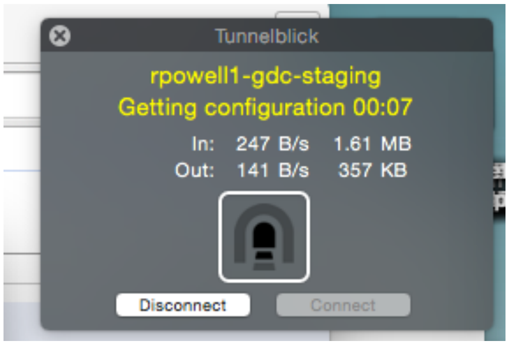
Tunnelblick successfully:

- Replaced one configuration

- TunnelBlick should place an icon in the upper right corner of your Menu Bar.
    - Right clicking will drop down a list of available VPN configurations. Choose "<username>-planxprod-vpn" and click it.



- While connecting you will may see a status message similar to the image below.



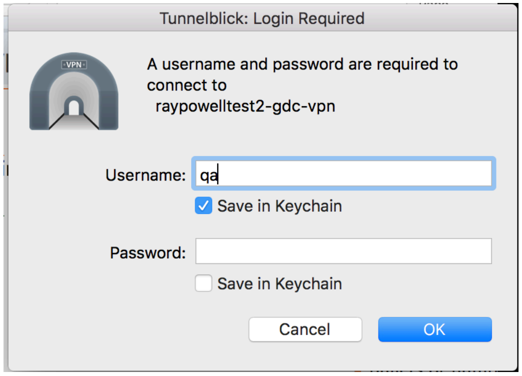
Tunnelblick

rpowell1-gdc-staging

Getting configuration 00:07

In:	247 B/s	1.61 MB
Out:	141 B/s	357 KB

- You will be prompted to enter a username and password.



Tunnelblick: Login Required

A username and password are required to connect to
raypowelltest2-gdc-vpn

Username: qa

☑ Save in Keychain

Password:

□ Save in Keychain

- Where it says “Username” enter your username from <username>-planxprod-vpn. It is okay to click “Save in Keychain” for the username. As it will just prefill the last environment you connected to.
- Where it says “Password” enter the 2FA/TOTP token from your phone app. NOTE: Do NOT click “Save in keychain” under Password, as the 2FA/TOTP token expires after 30 seconds, and you will need to enter a new one each time you connect.
  Click “OK”
- Note: If local NIC obtained IP/DNS after tunnel has been established, it may override OpenVPN DNS.
  - This might happen if a user roams while moving from one room to another, etc.

Disconnecting from VPN

- When you wish to disconnect from the VPN, click the TunnelBlick icon in the Menu Bar then click “Disconnect <username>-planxprod-vpn” for the active VPN connection.

Test Connection on OSX

- If on planxprod-vpn, try ssh,telnet or netcat to the csoc prod vms ; if on planxtest-vpn, try ssh,telnet or netcat to the csoc dev/qa vms

Troubleshooting Help for Mac Os X

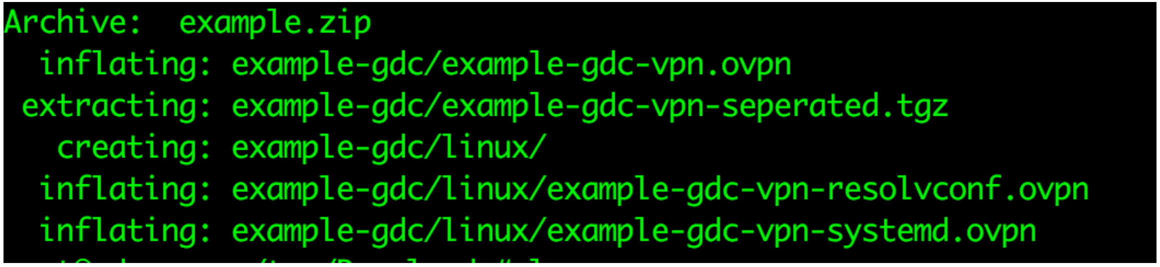
- Please ensure that you are not connected to any other VPN connection (e.g. NIH VPN) while running the PLANX OpenVPN.

Linux (Ubuntu) Installation – Service/CLI (Recommended)

With the acceptance of Systemd handling dns resolution, Network Manager doesn't seem to handle updating your local dns correctly. Until Network Manager stabilizes we recommend starting the service directly via your init .

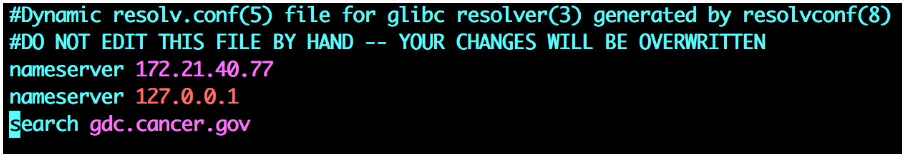
resolv.conf (Ubuntu <=16.04)

- Obtain and unzip your ZIP file containing the OVPN configuration files. You will want to use the file similar to example-planxprod/linux/example-planxprod-vpn-resolvconf.ovpn (Where “example” has been replaced with your name)
    - $unzip example.zip



```
Archive:  example.zip
  inflating: example-gdc/example-gdc-vpn.ovpn
 extracting: example-gdc/example-gdc-vpn-seperated.tgz
   creating: example-gdc/linux/
  inflating: example-gdc/linux/example-gdc-vpn-resolvconf.ovpn
  inflating: example-gdc/linux/example-gdc-vpn-systemd.ovpn
```

- Install openvpn
    - $ sudo apt-get install -y openvpn
- Copy your config file to /etc/openvpn/planxprod.conf
    - $ sudo cp /home/ubuntu/downloads/ example-planxprod/linux/example-planxprod-vpn-resolvconf.ovpn /etc/openvpn/planxprod.conf
- Start openvpn with @planxprod systemctl command.
    - $ sudo systemctl start openvpn@planxprod
- Verify that openvpn has modified your /etc/resolv.conf file. It should look similar to the following. The values may be different, as long as the first DNS server begins with 172.21.x.y you are working properly.
    - $ sudo cat /etc/resolv.conf



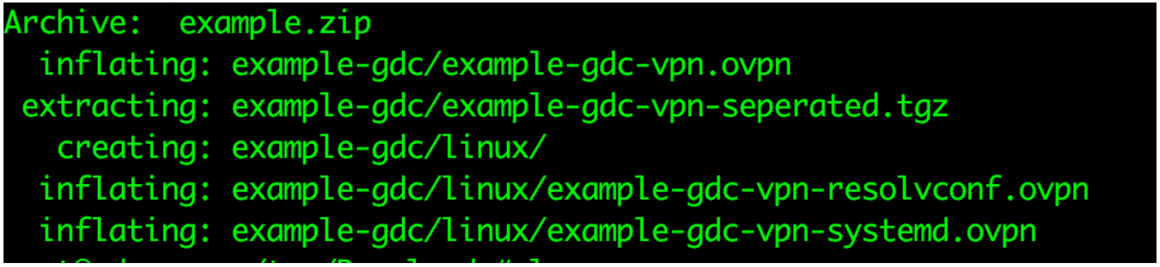
```
#Dynamic resolv.conf(5) file for glibc resolver(3) generated by resolvconf(8)
#DO NOT EDIT THIS FILE BY HAND -- YOUR CHANGES WILL BE OVERWRITTEN
nameserver 172.21.40.77
nameserver 127.0.0.1
search gdc.cancer.gov
```

- You should now be connected to the VPN!

systemd-resolved (Ubuntu >=17.04 and Possibly Fedora)

- Obtain and unzip your ZIP file containing the OVPN configuration files. You will want to use the file similar to example-planxprod/linux/example-planxprod-vpn-systemd.ovpn (Where “example” has been replaced with your name)

  - $unzip example.zip



```
Archive:  example.zip
  inflating: example-gdc/example-gdc-vpn.ovpn
 extracting: example-gdc/example-gdc-vpn-seperated.tgz
   creating: example-gdc/linux/
  inflating: example-gdc/linux/example-gdc-vpn-resolvconf.ovpn
  inflating: example-gdc/linux/example-gdc-vpn-systemd.ovpn
```

- Install openvpn
  - $ sudo apt-get install -y openvpn
- Copy your config file to /etc/openvpn/planxprod.conf
  - $ sudo cp /home/ubuntu/downloads/ example-planxprod/linux/example-planxprod-vpn-systemd.ovpn /etc/openvpn/planxprod.conf
- Check the status of systemd-resolve:
  - $ sudo systemd-resolved --status | grep "DNS Servers"
    - DNS Servers: 128.135.249.50
- Start openvpn with @planxprod
  - $ sudo systemctl start openvpn@planxprod
- You should now be connected to the VPN!

Linux (Ubuntu) Installation – Network Manager

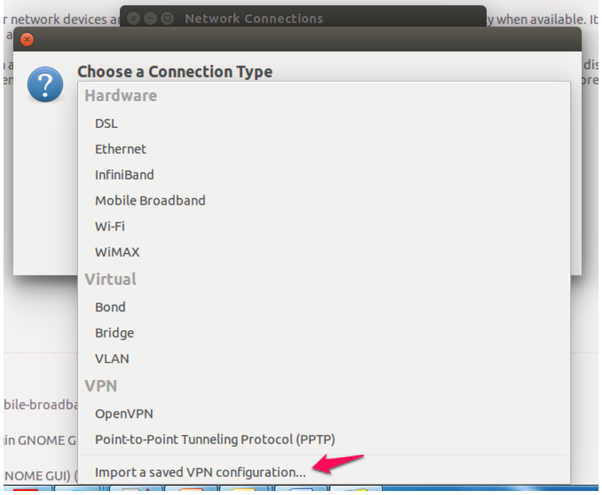
- Network Manager has been acting irregularly on some newer installations and so we do not recommend unless you are capable of trouble shooting issues on your own.
- Installation on Linux will vary by distribution, but most popular repositories have OpenVPN available for download. These generic steps are taken from the context of an Ubuntu flow.
    - For more detailed and specific instructions for using OpenVPN on Linux, please see: https://openvpn.net/index.php/open-source/documentation/howto.html

- Download and install the following packages from your repository of choice:
    - On Ubuntu:

```
apt-get install network-manager network-manager-openvpn network-manager-openvpn-gnome
```

- The included .ovpn file does not work natively on Ubuntu. To work, un-tar "<*username*>-planxprod-vpn-seperated.tgz" to the following:
    -
    - <*username*>-planxprod-vpn/client.key
    - <*username*>-planxprod-vpn.ovpn
    - <*username*>-planxprod-vpn/client.crt
    - <*username*>-planxprod-vpn/ta.key
    - <*username*>-planxprod-vpn/ca.crt

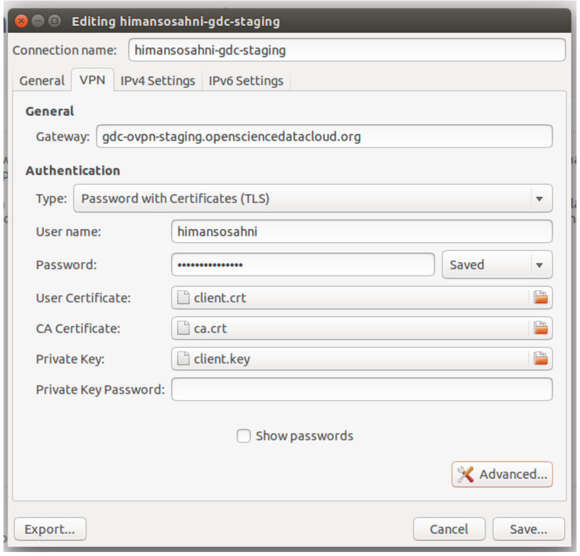
    - You can now add this VPN configuration as a VPN connection in the Desktop GUI:
    - Choose connection Type:



        - Click the network manager icon in the top menu bar and select "Edit Connections…"
        - In the Network Connections box click "Add".

- On the dropdown menu, under VPN, click “Import a saved VPN configuration…” and click create.
- Select the ovpn file modified above.

Edit OVPN file settings:



Editing himansosahni-gdc-staging

Connection name: himansosahni-gdc-staging

General

Gateway: gdc-ovpn-staging.opensciencedatacloud.org

Authentication

Type: Password with Certificates (TLS)

User name: himansosahni

Password: ••••••••••••••• Saved

User Certificate: client.crt

CA Certificate: ca.crt

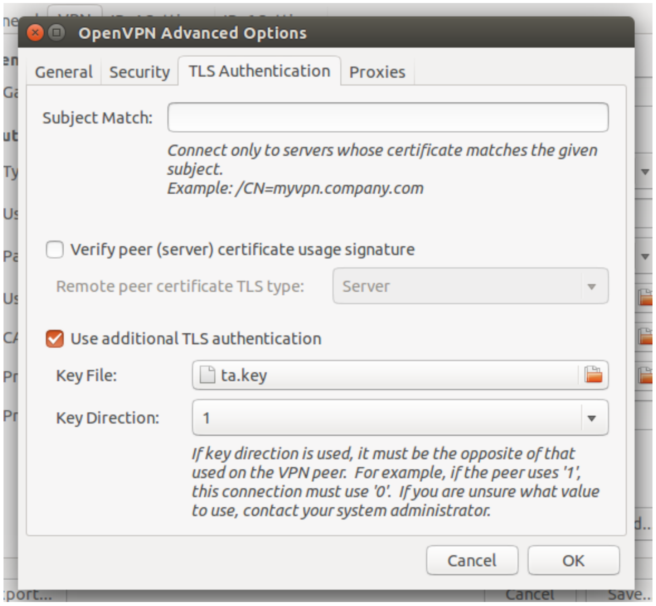
Private Key: client.key

Private Key Password:

□ Show passwords

- Ensure “Password with Certificates (TLS) is selected as the Type underneath “Authentication.”
- Enter your username and password provided for the environment chosen.
- For *User Certificate* choose *client.crt* from above.
- For *CA Certificate* choose *ca.crt* from above.
- For *Private Key choose client.key* from above.
- Click on the *Advanced* button.

Under Advanced Settings:



Subject Match:

Connect only to servers whose certificate matches the given subject.
Example: /CN=myvpn.company.com

☐ Verify peer (server) certificate usage signature

Remote peer certificate TLS type: Server

☑ Use additional TLS authentication

Key File: ta.key

Key Direction: 1

If key direction is used, it must be the opposite of that used on the VPN peer. For example, if the peer uses '1', this connection must use '0'. If you are unsure what value to use, contact your system administrator.

- Click on the *TLS Authentication* tab.
- Check the "Use Additional TLS authentication" box
- Choose *ta.key* from above for *Key File*
- Choose *1* for the *Key Direction*
- Select *OK*
- Select *Save*
- The VPN connection will now be added to your network manager connections list and can be selected.

Test Connection on Linux (Ubuntu)

- Open New Terminal Window:
- In newly opened Terminal window: If on planxprod-vpn, try ssh,telnet or netcat to the csoc prod vms ; if on planxtest-vpn, try ssh,telnet or netcat to the csoc dev/qa vms

Troubleshooting Help for Linux

- Please ensure that you do not have any duplicate resources in Google authenticator prior to taking a screenshot. Google Authenticator will silently fail to add the new secret. IE if you have user@bionimbus-pdc.opensciencedatacloud.org and take picture of a qr for user@bionimbus-pdc.opensciencedatacloud.org it will keep your old one. Please delete your old secret prior to taking a picture of the new secret.

- FreeOTP for Iphones seems to be a bit buggy when adding a secret manually. If you can't seem to add your secret please verify the following:

- Issuer, ID, and Secret are all filled in.
- The format of your secret matches the format specified (ie sha1,sha256,md5, etc)
- Click back and forth between issuer and ID and see if the add button becomes available.

- Please ensure that you are not connected to any other VPN connection (e.g. NIH VPN) while running the PLANX OpenVPN.

Appendix: Editing the Host file

Windows 7 and Windows Vista

1. For Click **Start** -> **All Programs** -> **Accessories**.
2. Right click Notepad and select **Run/Install with administrative rights**.
3. Click **Continue** on the "Windows needs your permission" UAC window.
4. When Notepad opens Click **File** -> **Open**.
5. In the filename field type:
   C:\Windows\System32\Drivers\etc\hosts
6. Click **Open**.
7. Make the necessary changes to the hosts file.
8. Click **File** -> **Save** to save your changes.

Mac OS X 10.6 - 10.1.8

1. Open **Applications** > **Utilities** > **Terminal**.
2. Open the hosts file by typing the following in the Terminal window:

   ```
   sudo nano /private/etc/hosts
   ```

3. Type your user password when prompted.
4. Make the necessary changes to the hosts file.
5. Save the hosts file by pressing **Control+x** and answering **y**.
6. Make your changes take effect by flushing the DNS cache with the following command:

   ```
   dscacheutil -flushcache
   ```

7. New mappings should now take effect.

Linux

1. Open a terminal window.
2. Open the hosts file in a text editor (you can substitute any text editor):

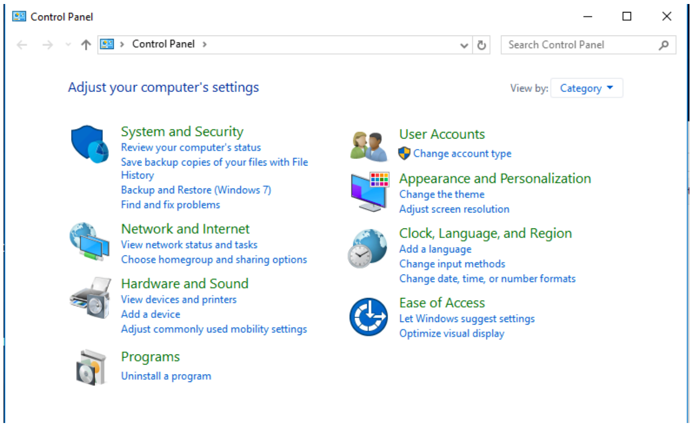
```
sudo nano /etc/hosts
```

3. Enter your password.
4. Make the necessary changes to the hosts file.
5. Press **control-X** (hold control and hit X), then answer **y** when asked if you want to save your changes.

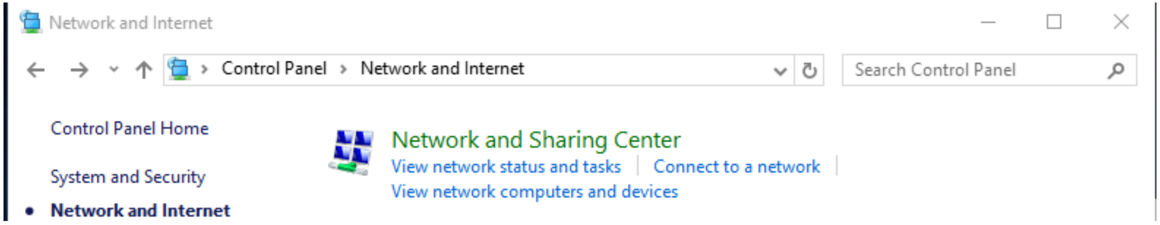
Appendix: Setting static Metric on VPN TAP

Windows 10 changed how windows networking handles multiple connections. This prevents DNS from resolving properly over the VPN. The below steps will adjust your VPN connections "metric" to be below the default value and allow DNS to resume working. These changes should be persistent.

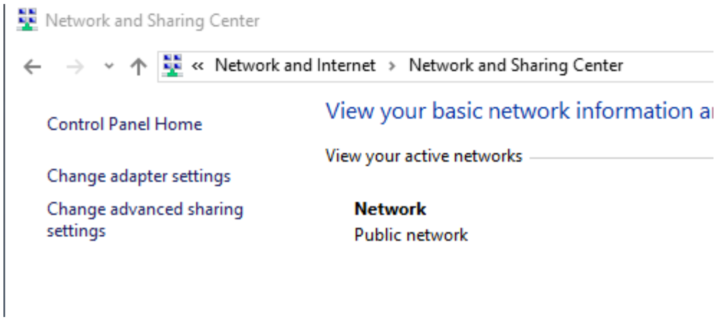
1. Make sure the OpenVPN client has been installed. If it asked for you to reboot, then please reboot before proceeding.
2. Go to Control Panel
3. Select "Network and Internet"


Control Panel
Control Panel
Search Control Panel
Adjust your computer's settings
View by: Category
System and Security
Review your computer's status
Save backup copies of your files with File History
Backup and Restore (Windows 7)
Find and fix problems
Network and Internet
View network status and tasks
Choose homegroup and sharing options
Hardware and Sound
View devices and printers
Add a device
Adjust commonly used mobility settings
Programs
Uninstall a program
User Accounts
Change account type
Appearance and Personalization
Change the theme
Adjust screen resolution
Clock, Language, and Region
Add a language
Change input methods
Change date, time, or number formats
Ease of Access
Let Windows suggest settings
Optimize visual display

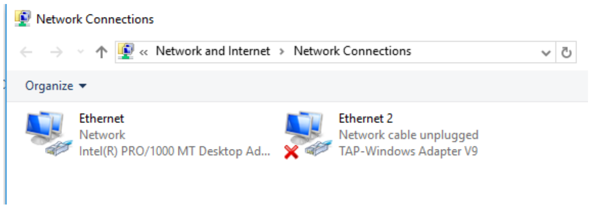
4. Select "Network and Sharing Center"


Network and Internet
Control Panel › Network and Internet
Search Control Panel
Control Panel Home
System and Security
Network and Internet
Network and Sharing Center
View network status and tasks
Connect to a network
View network computers and devices

5. Select ,on the left, "Change Adapter Settings" . This will open a new window showing all your network "adapters" on the computer. Including physical ports and OpenVPN "taps".


Network and Sharing Center
« Network and Internet › Network and Sharing Center
Control Panel Home
Change adapter settings
Change advanced sharing settings
View your basic network information a
View your active networks
Network
Public network

6. The new window will look similar to the picture below. However the number and names of the adapters will be different on every computer. If you are not currently connected to the VPN the "VPN TAP" will have a red X under the icon. Locate the "TAP" interface for OpenVPN.



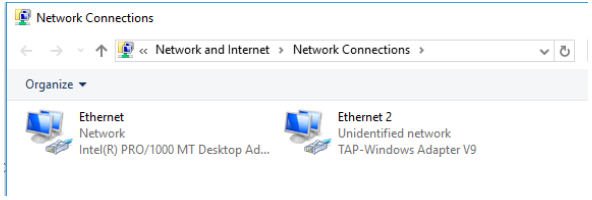
Network Connections

« Network and Internet › Network Connections

Organize ▾

Ethernet
Network
Intel(R) PRO/1000 MT Desktop Ad...

Ethernet 2
Network cable unplugged
TAP-Windows Adapter V9



Network Connections

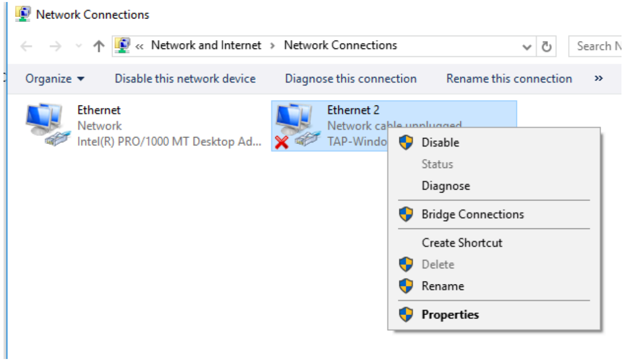
« Network and Internet › Network Connections ›

Organize ▾

Ethernet
Network
Intel(R) PRO/1000 MT Desktop Ad...

Ethernet 2
Unidentified network
TAP-Windows Adapter V9

7. Right click the “TAP” interface and select properties



Network Connections

« Network and Internet › Network Connections

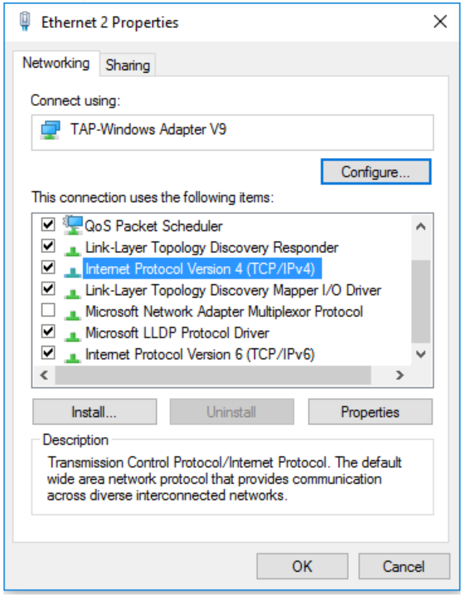
Search N

Organize ▾ Disable this network device Diagnose this connection Rename this connection »

Ethernet
Network
Intel(R) PRO/1000 MT Desktop Ad...

Ethernet 2
Network cable unplugged
TAP-Windo

8. Under “This connection uses the following itms:” you will have some options. Each computer will look slightly different. Scroll down and find the “Internet Protocol Version 4 (TCP/IPv4)” or similar. Do not select the “IPv6” item. Select “Internet Protocol Version 4 (TCP/IPv4)” and then click “Properties”.



Ethernet 2 Properties

Connect using:

TAP-Windows Adapter V9

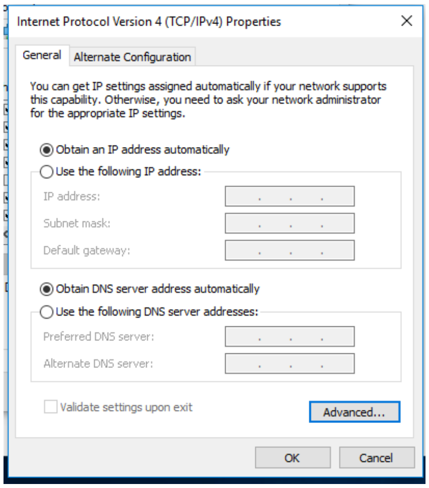
This connection uses the following items:

☑ QoS Packet Scheduler
☑ Link-Layer Topology Discovery Responder
☑ Internet Protocol Version 4 (TCP/IPv4)
☑ Link-Layer Topology Discovery Mapper I/O Driver
☐ Microsoft Network Adapter Multiplexor Protocol
☑ Microsoft LLDP Protocol Driver
☑ Internet Protocol Version 6 (TCP/IPv6)

Description

Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.

9. On the new window click “Advanced” in the bottom right.



Internet Protocol Version 4 (TCP/IPv4) Properties

You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

● Obtain an IP address automatically

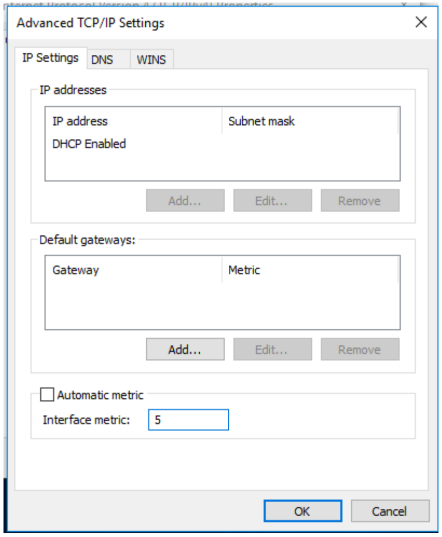
○ Use the following IP address:

● Obtain DNS server address automatically

○ Use the following DNS server addresses:

□ Validate settings upon exit

10. On this last window will be a check box next to “Automatic Metric”. Uncheck that box. Then in the “Interface metric:” box, enter the value “5” (minus the quotes).



Advanced TCP/IP Settings

IP address	Subnet mask
DHCP Enabled	

Gateway	Metric

□ Automatic metric

Interface metric: 5

11. Click “OK” and “CLOSE” until you have closed all the windows we opened above. Your VPN TAP interface will now be given higher priority by Windows 10. Allowing DNS to work properly.