Tunnel Client FAQ

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Revised: Kate Lance
Author: Karl Auer

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A. Tunnelling

1   How does tunnelling work?

You run client software (gogoc) on your computer. The client software uses your normal IPv4 Internet connection to connect to the IPv6Now tunnel broker. The client and broker set up a tunnel between your computer and the broker. The tunnel carries your IPv6 traffic over the IPv4 Internet, so your computer operates with an IPv6 address.
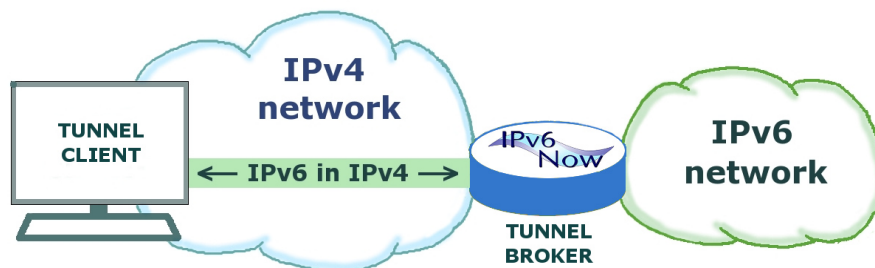
This is the fastest and easiest way to get IPv6 connectivity. So long as you have access to the IPv4 Internet, the client can connect you to the IPv6 Internet. Only the machine the client is running on will receive an address, and only that machine will be able to see the IPv6 Internet.

If you have a Now6 or Grow6 account that includes an IPv6 prefix, then every IPv6-capable computer on your local network can connect as well. In that the case the client sets up the tunnel and requests a prefix from the broker. The broker delivers a prefix, and the client starts a route advertiser on the machine it is running on. Any IPv6-enabled hosts on your local network will be able to acquire IPv6 addresses with the delivered prefix. We call this a *prefixed tunnel*.

2   What operating systems are supported?

The client software runs on:

Windows operating systems, with 32-bit and 64-bit versions.

Unix operating systems such as Linux, FreeBSD, OpenBSD, NetBSD, Darwin, Solaris, and OpenWRT.

Unfortunately, NAT traversal is not yet supported in NetBSD, Solaris and OpenBSD. If using the client on these operating systems you must be directly connected to the Internet, not behind a NAT device.

3   Where can I get the software?

In Linux distributions the client software is usually available under the name *gogoc*.

Otherwise, you may be able to simply install a pre-packaged version, called gogoCLIENT, with your system's package manager. If your operating system does not already contain the package, you can obtain it from: www.go6.net. Click "Services", then "Download Freenet6 Client".

4   How do I install the software for Linux?

See the Linux HowTo.

5   How do I install the software for Windows?

See the Windows HowTo.

6   How do I install the software for other operating systems?

See the Linux Howto as a guide (it will not be exactly applicable, but will be very close). Instead of using "target=linux" use "target=xxx", where "xxx" is one of "freebsd", "linux", "netbsd", "darwin", "solaris", "openbsd" or "openwrt".

If you are running a very recent Linux and/or using GCC 4.3+, you may see compile errors, with things like strcmp() not resolving in some files. For each file with these problems, add this line below the other header includes:

```
#include <cstring>
```

For those files which still do not compile, add this line also:

```
#include <stdlib.h>
```

7   What about security?

When a tunnel is up, your IPv6 traffic is being tunnelled through any IPv4 firewall or packet filtering devices you might have on your network. Those devices are almost certainly inspecting and checking only your IPv4 traffic; your IPv6 traffic is bypassing them.

You should take appropriate steps to protect the computer running the Gateway6 client and any other IPv6-enabled computers on your network.

How to do this is beyond the scope of this document, but at a minimum you should ensure that the client host and any other IPv6-capable hosts on your network are running local firewalling or packet-filtering software, and that services you do not use on those machines are switched off.

8   What sites out there can I talk to?

With the tunnel up, you should be able to access IPv6-only sites on the Internet. For instance, IPv6 Now's home page shows whether you have arrived via IPv4 or IPv6.

Most major content providers such as Google, Akamai, Yahoo, etc are available over IPv6. Google "IPv6-only web sites" and you will find many lists of IPv6 resources.

9   Why do I see only the IPv4 version of an IPv6-accessible site?

Many web browsers cache DNS results and all cache site data. If you've viewed a site using IPv4, then start your tunnel and try to browse the same site again, the browser may show you its cached version, or it may use it's cached DNS results to get the IPv4 version again. Depending on the browser, clearing the cache or doing a forced reload may solve the problem; with some browsers you may have to restart the browser.

10 What else can I do with this?

That's a huge topic. As described in this document and in the HowTo documents, the client software is used in its simplest form either to get one host connected to the IPv6 Internet, or to get one subnet connected to the Internet using basic defaults. But you can do more:

- The client can set up tunnels to other hosts in the local network (look at the proxy_client parameter in the client configuration).

- By adding route control to the template scripts, multiple tunnels can be open at once.

- With further modifications to the scripts, IPv6 firewalling or packet filtering can be integrated, or route advertising can be precisely controlled.

The possibilities are endless. If you have particular requirements and would like professional assistance, IPv6Now can help – call us for more information.

B. Troubleshooting

1 I've got problems – how can I troubleshoot?

If you have problems, the first thing to do is turn on logging.

Windows users can use the "Log" tab to set this up.

Unix users should edit the configuration file and set the various logging options as desired. The simplest way is to set *log_file* to 3 and *log_filename* to (say) "/tmp/gw6c.log". When everything is working, set the logging options back to something less verbose.

Remember, you will need to restart the client before configuration changes take effect.

2 The connection times out

You need to have a *working IPv4 connection* to the Internet.

Your IPv4 Internet connection needs to allow the tunnel setup protocol through (and back!) By default, the tunnel setup protocol uses port 3653, so *port 3653 must be open for outbound connections*.

Your firewall must not block protocol 41, inbound or outbound.

If you are behind a NAT device, you must use the *v6udpv4* or *v6anyv4* tunnel mode (the *tunnel_mode* configuration item). If you don't know whether you are behind a NAT device, use *v6anyv4* and the client will work it out.

If you are behind a NAT device and are using NetBSD, OpenBSD, or Solaris, it won't work. NAT traversal is not yet supported for these operating systems.

3 I get an authentication failure

Make certain you are using the *correct user name and password*. Remember that both the username and the password are *case sensitive* – capital letters and lower case letters are NOT the same.

Make sure you are talking to the correct tunnel broker for the user name and password you are using. For IPv6Now, *the server configuration item* must be set to *broker.ipv6now.com.au.*

Make sure that the authentication method (the *auth_method* configuration item) is set to one the broker accepts. For IPv6Now, set it to *passdss-3des-1.*

4   The client runs, but stops and I don't have a tunnel (non-Windows)

You *must* run the client as the root user. This problem will be obvious in the last few lines of the log.

Another possibility is that your operating system does not have the appropriate tunnel interface(s) configured into it. Such problems will also usually be very obvious in the log. For example, Linux requires the "tun" interface to be available. Depending on your operating system, you may need to recompile the kernel or load the appropriate module, operations which are beyond the scope of this document.

Most modern operating systems and their recent distributions have the required interfaces built in already.

See also Prefix Issues, item 3, below.

C. Prefix Issues

1   I'm requesting a prefix, but I'm not getting one

Is your account set up to send you a prefix? (e.g. Now6, Grow6, *not* Try6).

Problems with the prefix length are usually very obvious in the log.

If you're using Windows, make sure you click Apply after changes.

2   I'm getting a different prefix length to the one I requested

You will get the prefix length your broker account is configured for, regardless of what you request.

IPv6Now will generally send a /64 prefix unless other arrangements have been made.

Problems with the prefix length are usually very obvious in the log.

If you're using Windows, make sure you click Apply after changes.

3   I'm getting a prefix, but it's not being advertised

Problems with route advertising usually look like this: The client sets up a tunnel, everything seems fine, then the tunnel client terminates for no apparent reason.

The client does route advertising by starting an external route advertiser after setting up the tunnel. If it can't carry out this step, it will terminate – but only *after* it has reported all is well with the tunnel!

The *route advertiser* is not part of the client software distribution, and may have to be installed separately. For example, under Linux it is called *radvd.*

Problems with the route advertiser are usually very obvious in the client log. You should

also look at the logs of the route advertiser itself – read the documentation on your route advertiser to find out where its log file is and how to configure it.

Check you have specified the correct interface for route advertisements.

Check the interface you specified is present and running properly.

4 Why do the IPv6 addresses on my other hosts hang around?

If you have other machines on your network that have acquired addresses from your tunnel client host with your requested prefix, they will keep those addresses even if the tunnel has gone away. This is normal. The addresses will expire eventually, or you can remove them manually.

You can edit the template script to start the route advertiser with different options if you wish, but this is beyond the scope of this document.

5 I'm running the client from a script, and it just hangs

There is a small "gotcha" with the passdss-3des-1 authentication method: The first time through, it will ask you to confirm that you want to connect to the (hitherto) "unknown" broker. If you run the client from a script and redirect the output, you will never see the prompt, and the client will wait patiently forever.

The same thing may happen if you set up an icon or similar launcher in your window manager.

If the IPv6Now broker changes its key, the same thing will happen the next time you try to connect. (IPv6Now will advise all customers in the unliekly event of this happening.)

This only applies to Unix-based systems – in the Windows version of the client, this security measure is turned off.

The simplest solution is to run the client manually the first time, so you can see the prompt and answer "yes". Note that on multi-user operating systems you will have to do this once for each user that uses the client.

Alternatively, see the Linux HowTo for a more permanent solution.

D. DNS Entries

1 What DNS entries will be made for me?

When you connect to the IPv6Now broker, a DNS entry will be made for the name "xxx.tunnels.ipv6now.com.au", where "xxx" is your username. This is your "client tunnel endpoint name". The name will resolve to the IPv6 address allocated to your end of the tunnel (your "client tunnel endpoint address").

Also, a reverse entry will be made for your client tunnel endpoint address, which will resolve back to your client tunnel endpoint name.

If you received a prefix from the broker, and specified a DNS server in your client configuration, the broker will attempt to delegate your prefix to the specified DNS nameserver.

2   How can I see my DNS entries?

Assuming your username is "fred", your client tunnel endpoint name will be "fred.tunnels.ipv6now.com.au". You can look it up with dig or nslookup:

> dig fred.tunnels.ipv6now.com.au AAAA

> nslookup -type=AAAA fred.tunnels.ipv6now.com.au

This will return your client tunnel endpoint address.

Assuming your client tunnel endpoint address is 2406:a000::6:4, you can reverse resolve that back to your client tunnel endpoint name, also using dig or nslookup:

```
dig -x 2406:a000::6:4
nslookup 2406:a000::6:4
```

3   Why aren't my endpoint DNS entries visible?

Make sure you are looking up the correct entries. In particular remember that you must request an AAAA record, not an A record when looking up your client tunnel endpoint name.

If you are definitely checking the correct name/address, then just wait a few minutes before trying again. If your DNS entries are not there in three or four minutes, try the other suggestions here.

Check your tunnel is actually up. Try dropping and reconnecting the tunnel.

4   Why hasn't my prefix been delegated?

Check you definitely specified the correct nameserver(s) in your client configuration.

Check you used the right format to specify the nameservers in your client configuration. For one nameserver it looks like this:

```
dns_server=ns1.mydomain
```

Or use a colon to delimit more than one nameserver name:

```
dns_server=ns1.mydomain:ns2.mydomain
```

Check each nameserver specified in your client configuration is correctly configured. In particular, check each are authoritative for the correct reverse zone!

Check each nameserver you specified is reachable.

See also "How do I configure my nameserver for prefix delegation?

5   How do I configure my nameserver for prefix delegation?

You will need to make a new reverse zone for the prefix you will be allocated. The prefix will be advised to you when you first acquire an IPv6Now account. If necessary, call or email IPv6Now to double-check what prefix you have been allocated.

Set up a reverse zone. Assuming your prefix is 2406:a000:0:100::/64 (this is just an example) and you were configuring BIND9, you would add something like this to named.conf:

```
zone "0.0.1.0.0.0.0.0.0.0.0.a.6.0.4.2.ip6.arpa" IN {
```

```
        type master;
        file
"0.0.1.0.0.0.0.0.0.0.0.a.6.0.4.2.ip6.arpa.zone";
        allow-query { any; };
};
```

You will then need to create the reverse zone file. It would look something like this:

```
$ORIGIN 0.0.1.0.0.0.0.0.0.0.0.a.6.0.4.2.ip6.arpa.
$TTL 60
@ IN     SOA dns.mydomain. hostmaster.mydomain. (
                          2008070301 ; serial
                          1800       ; refresh (30 minutes)
                          600        ; retry (10 minutes)
                          3600       ; expire (1 hour)
                             600            ; minimum (10
minutes)
                          )
@                                 IN NS  dns1.mydomain.
@                                 IN NS  dns2.mydomain.
@                                 IN PTR myv6net.mydomain.
1.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0 IN PTR gateway.mydomain.
2.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0 IN PTR hosta.mydomain.
3.0.0.0.0.0.0.0.0.0.0.0.0.0.0.0 IN PTR hostb.mydomain.
```

Obviously you should use your own domain instead on "mydomain" and should use a serial number format, TTL and SOA values to suit your own needs. The SOA values shown are suitable for experimentation, because they are short.

After making these changes you will need to restart your nameserver (or at least get it to reload its zones). How you do this will depend on the nameserver software you are using and how it is installed. In general, this (as root) will do the job:

```
rndc reload
```

You will need to make suitable changes on any secondaries you may have, too.

6   Can I browse to a site if it doesn't have a DNS entry?

Yes! Just as with IPv4, you can specify the site's IPv6 address to your browser. This is helpful if the site doesn't have a DNS entry, or if for some reason you can't resolve its DNS entry. You can specify an IPv6 address to your browser by enclosing the IPv6 address in square brackets. To get to www.kame.net via its IPv6 address for example:

```
http://[2001:200:0:8002:203:47ff:fea5:3085]
```