Source code. Email to get push access to prefixed branches.

[A] Shared TODO

1. Rework on-demand semantics to be less sticky.
    a. When people want to turn it off, it needs to turn off without so much fiddling.
2. pthread_cond_timedwait_relative_np in os_darwin.go's semasleep uses MONOTONIC rather than BOOTTIME.
3. Replace minizip with pure swift implementation from somewhere.
4. Change UI perhaps for on-demand? Needs more discussion.
5. Crash when adding lots of VPN configurations from a ZIP file.
6. Handle IPv6 in exclude private IPs logic

[B] Mac TODO

1. Mac App Store updater can't update if the tunnel is still running.
    a. Did our High Sierra-era workaround break? Does this still work with Big Sur?
    b. On-demand breaks this.
    c. What if the app is closed but NetworkExtension is running?
2. Select a tunnel in user A. Switch to user B and delete that tunnel. Switch back to user A. Tunnel is deleted, but details view still shows it, leading to problems.
3. Allow multiple tunnels to be active simultaneously
    a. Check with Apple. OS service manager is buggy.
4. Integrate with wg(8).

[C] iOS TODO

1. On iOS 13, the > next to the switch is weird looking.
2. When the time is right, drop support for iOS 12 and remove conditional #available things.
    a. iOS 13 drops support for iPhone 5S and iPhone 6, and iPad Air 2 and mini 4
3. Notice activations from extension side with regards to 3d touch.
    a. Hard to do, probably not worth it.
4. No space between toggle and arrow in the main servers view
5. You can copy the Off field in edit mode.
6. The button to add a Wifi network only has its icon as a touch target.
7. Widget? Shortcuts app integration?

[D] Apple's bugs

1. *If no DNS is specified, but matchDomains=[""] is specified, the tunnel comes up, but the callback is never called, and so we have to rely on our timeout timer to recheck the status after the 5 second delay.*
    a. *One solution might be to just require a DNS, but it isn't in fact required. And that would be a workaround at best, since that notifier should always trigger.*
    b. *Working around it by not specifying matchDomains when no DNS server is specified.*

2. **Add 1000 tunnels, do some operation, XPC crashes because the kernel can't allocate memory for the IPC.**
3. **Address = 10.0.1.1/24, 10.0.2.1/24, AllowedIPs = 10.0.1.0/24, 10.0.2.0/24**
   Pinging 10.0.1.8 will have src address 10.0.1.1: good
   Pinging 10.0.2.8 will have src address 10.0.1.1 instead of 10.0.2.1: bad
   a. All other OSes do the right thing with the src address
4. **Hitting `ifconfig en0 down` on macOS and then closing and reopening the socket in the network extension gives a useless socket that can receive but not send.**
5. **LTE VPN bug:**
   a. Reboot iPhone with no VPN enabled: status line says: "Wi-Fi" (the signal strength indicator)
   b. Set WireGuard to "On Demand", "Wi-Fi Only": status is "Wi-Fi VPN" (as expected)
   c. Toggle off Wi-Fi from Control Center: status is "LTE" (as expected)
   d. Toggle on Wi-Fi from Control Center: status is "LTE VPN" (but phone is on Wi-Fi)
   e. This is one way, but more generally, it seems like there's some weird network availability situation with the intersection of LTE, Wi-Fi, and VPNs.
   f. Another description of the same bug from Shaun Lipscombe: "There seems to be an issue whereby if you are on WiFi with WireGuard enabled then go out of WiFi range and onto 4G then in some cases the WiFi indicator indicates WiFi not 4G. If you are in range of but not connected to a WiFi point (you're still on 4G) it looks like you are connected to it when you are not."
6. **IPAddress.description works as intended, but is not documented. Does that mean it can change? Similarly, IPAddress parsing is super relaxed -- 0.0 is a valid IP for it.**
7. **On-demand on macOS can only be stored in one tunnel at a time.**
   a. **It gets deleted from other ones, causing strange unexpected behavior.**
8. **In macOS, turning on/off on-demand from System Prefs seems to have no effect**
9. **matchDomains=[“”] doesn't do what the documentation says. Specifically, DNS servers are not used if allowed IPs isn't 0.0.0.0/0.**
10. **Non-IKEv2 protocols don't show up as “Connect X” in the VPN status menu of the system.**
11. **IPv6 addresses smaller than a /120 won't have any effect on iOS.**
12. *Catalina will sometimes delete all network extension profiles.*
    a. *Mac App Store bug.*
    b. *Hopefully resolved now?*
13. **App store: never updates.**
    a. *When app is running and tunnel is active:*
       App Store looks for a running app with the bundle id, finds it, sends it a quit event, then observes that the app is killed but a plugin of the app is still alive, so stalls installation. Console says:
       ```
       storedownloadd      default      18:23:47.079141 +0530      AppHelper:
       <NSRunningApplication: 0x7f9a80d1d0e0 (com.wireguard.macos - 679)> did
       ```

```
terminate
pkd    default      18:23:47.111723 +0530      plugin
/Applications/WireGuard.app/Contents/PlugIns/WireGuardNetworkExtension.ap
pex is still valid.
storedownloadd      default      18:23:47.117280 +0530      AppHelper: At
least one busy plugin is blocking the app at: <NSRunningApplication:
0x7f9a80d1d0e0 (com.wireguard.macos - 679)>
```

b. *When app is not running and tunnel is active:*
   App Store looks for a running app with the bundle id, doesn't find any, so happily proceeds to install the new version. The extension process keeps running (the tunnel remains active) while the app gets updated on disk.

14. *Toggling a toggle slider at strange intervals programmatically results in a half-toggled state where the background shading is wrong.*
    a. *We're working around this by delaying 200ms before programmatic toggles.*
15. *Weird bug: Activate TunnelA. Deactivate TunnelA. Within 4 seconds, activate TunnelB. Wait for 25 seconds. TunnelB turns off by itself.*
    a. *Apple internal bug 47526107/32073323.*
    b. *Working around it by calling exit(0) in the stop handler.*