07. WireGuard

Overview

WireGuard is a modern, high-performance VPN protocol built into the Linux kernel. It is the fastest protocol supported by PUQVPNCP, offering:

- **Minimal overhead** — only ~60 bytes per packet
- **Quick connections** — sub-second handshake
- **Strong cryptography** — Curve25519, ChaCha20, Poly1305
- **Roaming support** — seamlessly switch between Wi-Fi and cellular

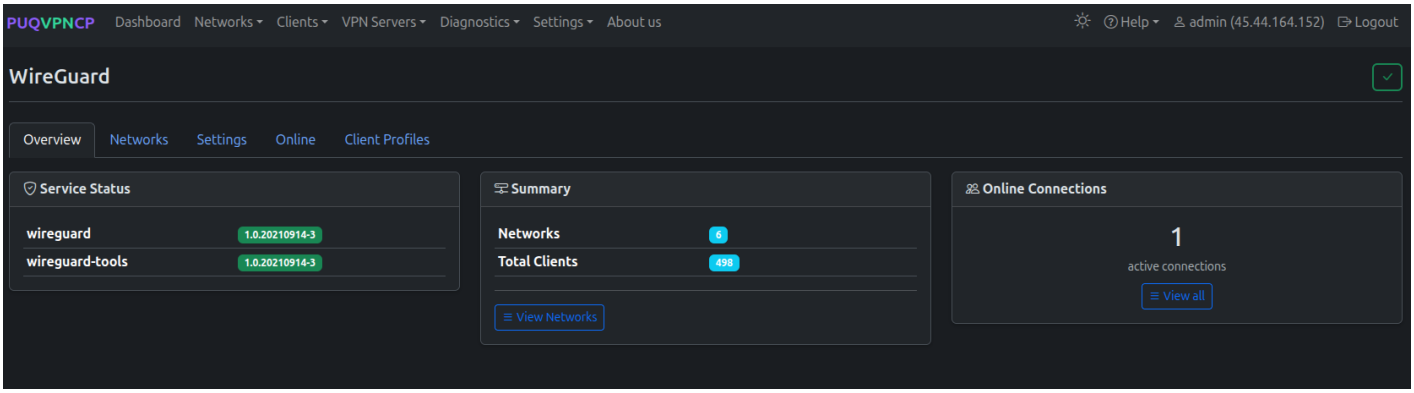
WireGuard is ideal for mobile devices, low-latency applications, and high-throughput scenarios.

> **Need Anti-Censorship or DPI Bypass?** If standard WireGuard packets are detected or throttled by deep packet inspection (DPI) firewalls, use **AmneziaWG** — a specialized WireGuard fork with header obfuscation and junk packet injection.

> **Requirement:** `wireguard` and `wireguard-tools` packages must be installed. Check via **Settings > Environment**.

Navigate to **VPN Servers > WireGuard** to access WireGuard management. The page has 5 tabs: Overview, Networks, Settings, Online, Client Profiles.

Overview Tab



WireGuard overview — service status, summary, online connections

The Overview tab shows:

Card	Description
Service Status	Installed `wireguard` and `wireguard-tools` package versions
Summary	Total number of WireGuard networks and clients
Online Connections	Number of currently active WireGuard connections with a link to view all

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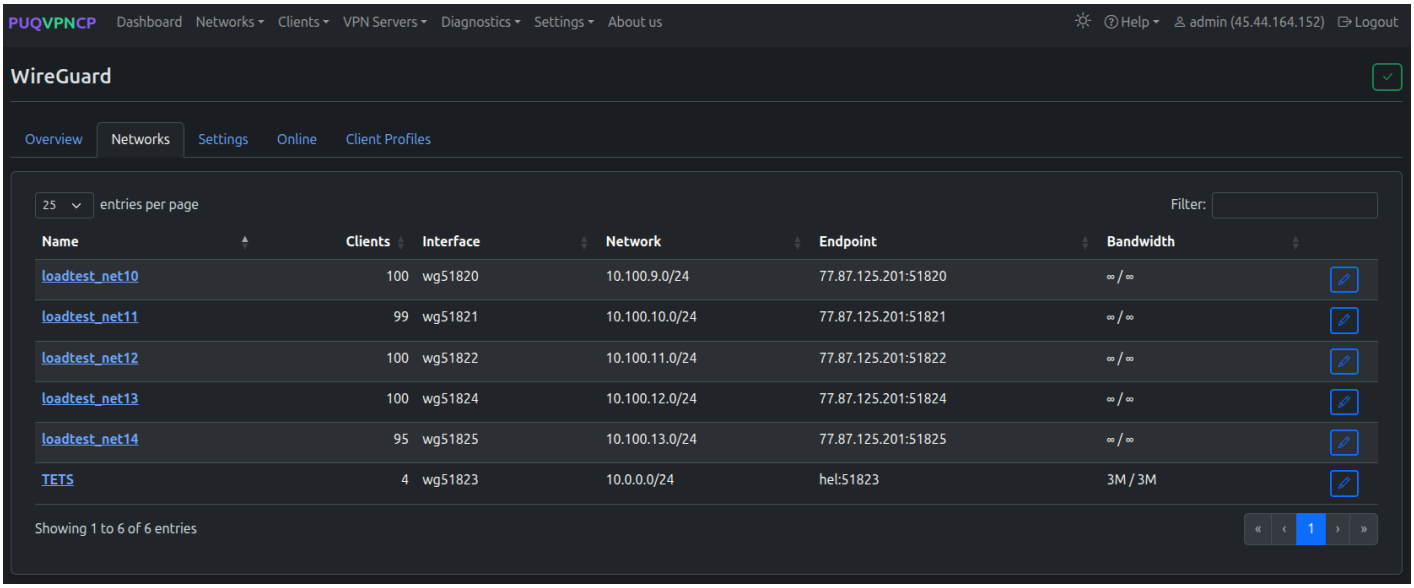
Networks Tab



WireGuard networks — list of all WireGuard interfaces

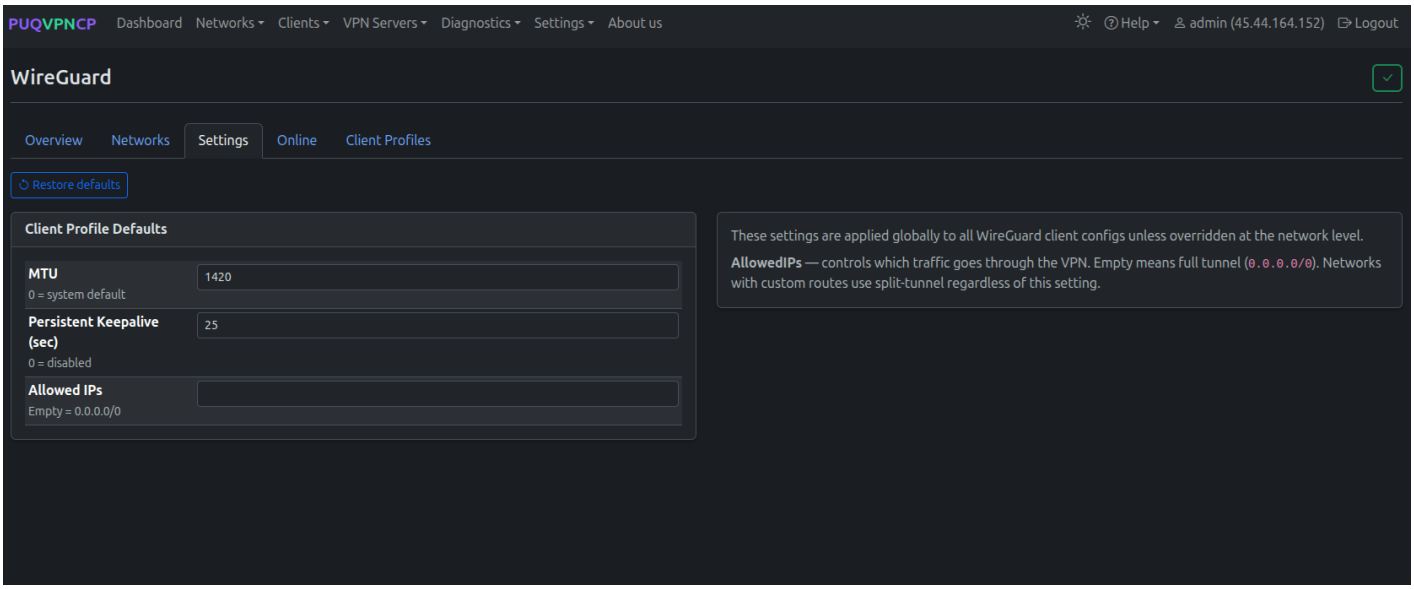
Shows all networks that have WireGuard enabled:

Column	Description
Name	Network name (link to network edit page)

Column	Description
Clients	Number of WireGuard clients in this network
Interface	WireGuard interface name (e.g., `wg51820`)
Network	Subnet assigned to this network
Endpoint	Server IP and UDP port for client connections
Bandwidth	Upload / download bandwidth limits

Each network has its own WireGuard interface with independent settings. See the Networks page for per-network WireGuard configuration.

Settings Tab



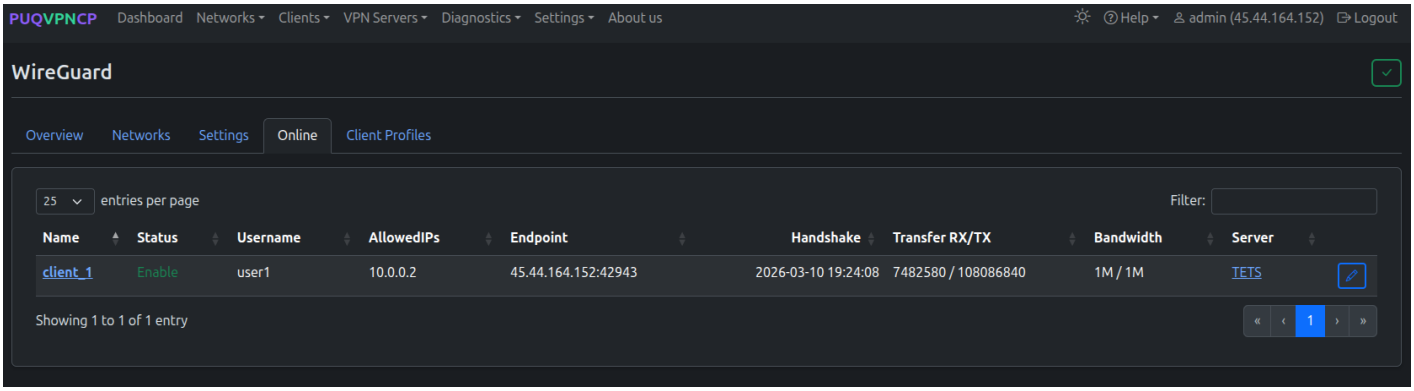
WireGuard settings — client profile defaults

Configure global defaults for WireGuard client profiles. These settings are applied to all WireGuard client configs unless overridden at the network level.

Setting	Description	Default
MTU	Tunnel MTU (0 = system default)	1420
Persistent Keepalive (sec)	Keepalive interval (0 = disabled)	25
Allowed IPs	Controls which traffic goes through VPN. Empty = full tunnel (`0.0.0.0/0`). Networks with custom routes use split-tunnel regardless of this setting	(empty)

Use the **Restore defaults** button to reset all settings to their original values.

Online Tab

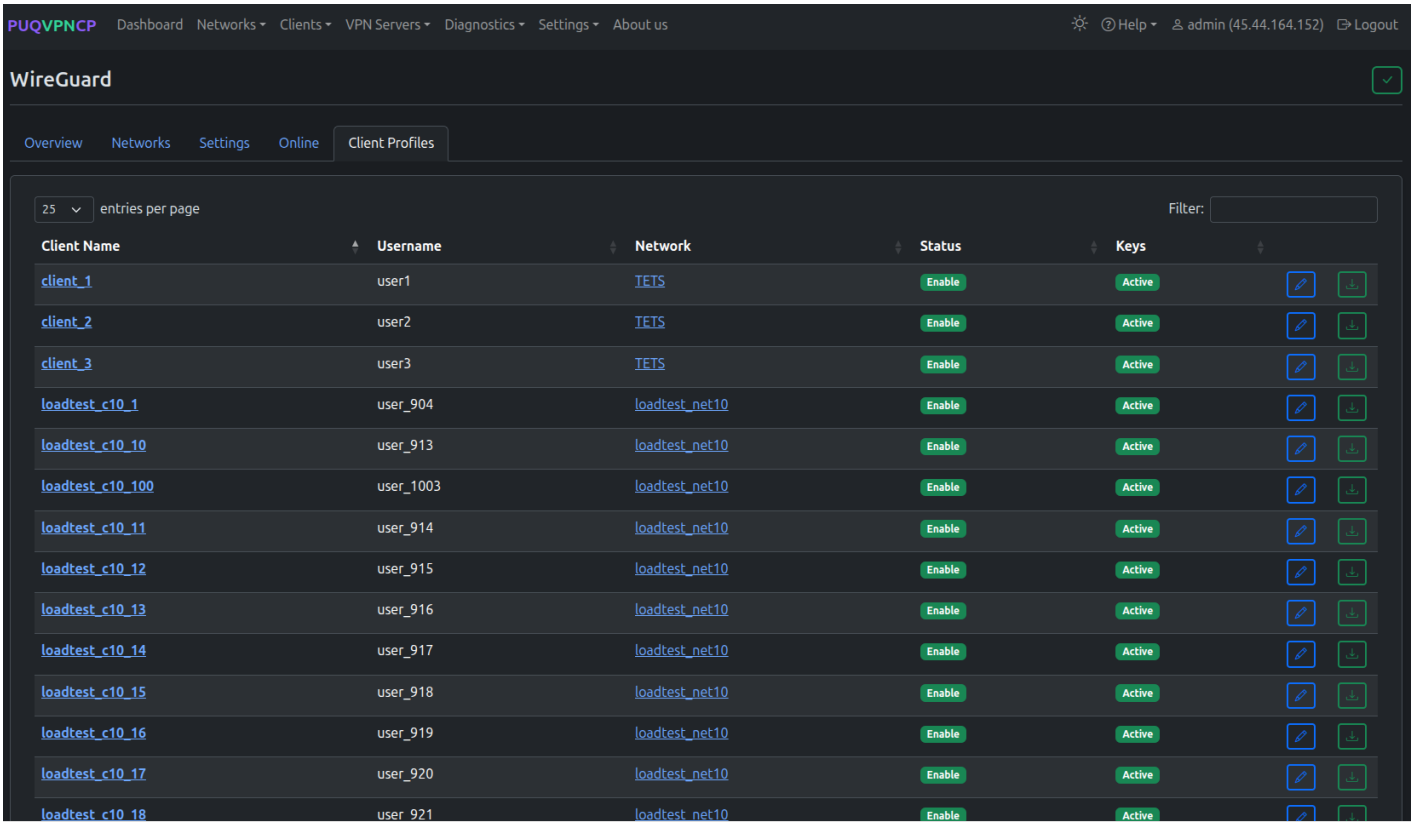


WireGuard online users — currently connected peers

Shows all WireGuard peers with a recent handshake:

Column	Description
Name	Client name (link to client page)
Status	Enable/Disable
Username	System user who owns this client
AllowedIPs	Client's VPN IP address
Endpoint	Client's real IP address and port
Handshake	Last handshake timestamp
Transfer RX/TX	Bytes received / sent
Bandwidth	Configured bandwidth limit
Server	Network name

Client Profiles Tab



WireGuard client profiles — all clients across all networks

Lists all WireGuard clients across all networks:

Column	Description
Client Name	Client name (link to client page)
Username	System user who owns this client
Network	Network this client belongs to
Status	Enable/Disable
Keys	Key status (Active = keys generated)

Each client row has buttons to edit the client and download the WireGuard configuration file.

Client Configuration

Each client automatically gets:

- A unique **WireGuard key pair** (regeneratable)
- A **configuration file** ready to import into any WireGuard client
- A **QR code** for scanning on mobile devices

Supported client platforms:

- **Windows** — official WireGuard app
- **macOS** — official WireGuard app or App Store
- **Linux** — `wg-quick` or NetworkManager
- **Android** — WireGuard app from Google Play
- **iOS** — WireGuard app from App Store
- **Mikrotik** — RouterOS 7+ native WireGuard

How It Works

```
Client App                    PUQVPNCP Server
----------                    ---------------
[WireGuard]  ---- UDP ----->  [wg51823 interface]
                                    |
                              iptables mangle (mark)
                                    |
                              policy routing (table)
                                    |
                              +-------------+
                              |  Upstream   |
                              | (direct or  |
                              |  wgupN)     |
                              +-------------+
                                    |
                              SNAT + forward
                                    |
                                Internet
```

1. Client connects to the WireGuard UDP port
2. Packets arrive on the network's WireGuard interface (e.g., `wg51823`)
3. iptables mangle rules mark the traffic for policy routing
4. Traffic is routed through the configured upstream (direct internet or WireGuard tunnel)
5. SNAT is applied for internet access

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