22. AmneziaWG (Anti-Censorship)

Overview

AmneziaWG is a specialized fork of WireGuard designed to evade Deep Packet Inspection (DPI) and strict internet censorship systems. While standard WireGuard has easily detectable packet signatures, AmneziaWG obfuscates traffic while retaining WireGuard's speed and performance.

Key Capabilities

- **Header Obfuscation** — randomizes message headers (H1, H2, H3, H4) so DPI firewalls cannot detect WireGuard handshakes or data packets
- **Junk Packet Injection** — sends random junk packets (Jc count, within Jmin–Jmax byte size) before connection initiation to confuse DPI pattern analyzers
- **Variable Junk Packet Sizes** — custom sizes for initiation junk (S1) and response junk (S2)
- **High Performance** — runs with kernel module speed (`amneziawg`), offering WireGuard throughput with anti-censorship resistance
- **Cross-Platform Clients** — supported on Windows, macOS, Linux, Android, and iOS via Amnezia VPN client applications

> **Requirement:** `amneziawg` (kernel module or DKMS) and `amneziawg-tools` packages must be installed on the host. Check via **Settings > Environment**.

Installation

AmneziaWG requires the kernel module (`amneziawg-dkms`) and CLI tools (`amneziawg-tools`). Choose the instructions corresponding to your operating system:

Debian 12 (Bookworm)

> **Important for Debian 12:** Debian 12 uses `glibc 2.36`. The Ubuntu 24.04 (`noble`) package requires `libc6 >= 2.38`, so attempting to use `noble` will result in broken package dependencies. You **must** use the Ubuntu 22.04 (`jammy`) PPA.
>
> The keyring is saved directly in `.asc` format, so no `gpg` or `gnupg` package is required:

```
# 1. Install build tools, DKMS, and current kernel headers
apt-get update && apt-get install -y curl build-essential dkms linux-headers-$(uname -r)

# 2. Add the official Amnezia PPA repository keyring (ASCII format)
mkdir -p /etc/apt/keyrings
curl -fsSL
"https://keyserver.ubuntu.com/pks/lookup?op=get&search=0x75C9DD72C799870E310542E24166F2C2572908
-o /etc/apt/keyrings/amnezia.asc

# 3. Add Launchpad PPA source (jammy for Debian 12)
echo "deb [signed-by=/etc/apt/keyrings/amnezia.asc]
https://ppa.launchpadcontent.net/amnezia/ppa/ubuntu jammy main" >
/etc/apt/sources.list.d/amnezia.list

# 4. Install the DKMS module and tools
apt-get update && apt-get install -y amneziawg-dkms amneziawg-tools

# 5. Load the kernel module
modprobe amneziawg
```

Debian 13 (Trixie)

> On **Debian 13**, glibc is 2.40+, so the Ubuntu 24.04 (`noble`) PPA is used:

```
# 1. Install build tools, DKMS, and current kernel headers
apt-get update && apt-get install -y curl build-essential dkms linux-headers-$(uname -r)

# 2. Add the official Amnezia PPA repository keyring (ASCII format)
mkdir -p /etc/apt/keyrings
curl -fsSL
"https://keyserver.ubuntu.com/pks/lookup?op=get&search=0x75C9DD72C799870E310542E24166F2C2572908
```

```
-o /etc/apt/keyrings/amnezia.asc

# 3. Add Launchpad PPA source (noble for Debian 13)
echo "deb [signed-by=/etc/apt/keyrings/amnezia.asc]
https://ppa.launchpadcontent.net/amnezia/ppa/ubuntu noble main" >
/etc/apt/sources.list.d/amnezia.list

# 4. Install the DKMS module and tools
apt-get update && apt-get install -y amneziawg-dkms amneziawg-tools

# 5. Load the kernel module
modprobe amneziawg
```

Ubuntu (22.04 / 24.04 LTS)

Option 1: Using `add-apt-repository` (standard):

```
add-apt-repository -y ppa:amnezia/ppa
apt-get update && apt-get install -y amneziawg-dkms amneziawg-tools
modprobe amneziawg
```

Option 2: Using direct keyring (minimal systems):

```
mkdir -p /etc/apt/keyrings
curl -fsSL
"https://keyserver.ubuntu.com/pks/lookup?op=get&search=0x75C9DD72C799870E310542E24166F2C257290828
-o /etc/apt/keyrings/amnezia.asc
echo "deb [signed-by=/etc/apt/keyrings/amnezia.asc]
https://ppa.launchpadcontent.net/amnezia/ppa/ubuntu $(. /etc/os-release && echo
$VERSION_CODENAME) main" > /etc/apt/sources.list.d/amnezia.list
apt-get update && apt-get install -y amneziawg-dkms amneziawg-tools
modprobe amneziawg
```

Verification

Verify that the module has been compiled and loaded into the kernel:

```
# Check DKMS compilation status (should show 'installed')
dkms status

# Check that the kernel module is active
```

```
lsmod | grep amneziawg

# Check that the awg CLI utility is available
awg --version
```

Troubleshooting DKMS Compilation & Kernel Updates

If `dkms status` shows `added` or `error`, or if you upgrade the system kernel:

```
apt-get install -y build-essential dkms linux-headers-$(uname -r)
dpkg-reconfigure amneziawg-dkms
modprobe amneziawg
```

> **Note on DNS / resolvconf:** If you run `awg-quick` manually and receive `/usr/bin/awg-quick: resolvconf: command not found`, install `openresolv`:
>
> ```
> apt-get install -y openresolv
> ```

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

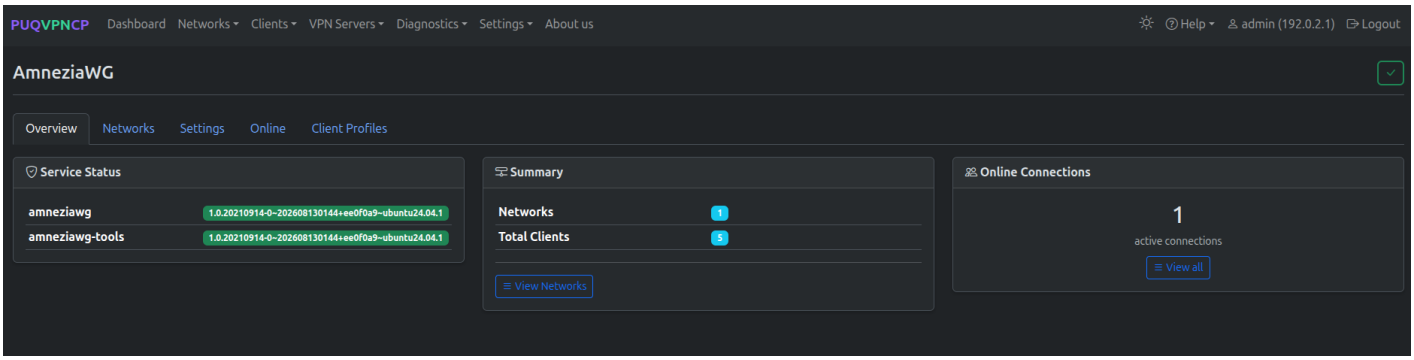
Obfuscation Parameters Explained

Parameter	Default	Description
H1	Random	Header type for handshake initiation packets
H2	Random	Header type for handshake response packets
H3	Random	Header type for cookie reply packets
H4	Random	Header type for data transport packets
Jc	4	Number of junk packets injected before handshake (1–128)
Jmin	40	Minimum byte size of junk packets
Jmax	70	Maximum byte size of junk packets
S1	15	Initiation packet junk size in bytes

Parameter	Default	Description
S2	20	Response packet junk size in bytes

Each network can inherit the global defaults or define custom obfuscation values to match specific ISP bypass requirements.

Overview Tab

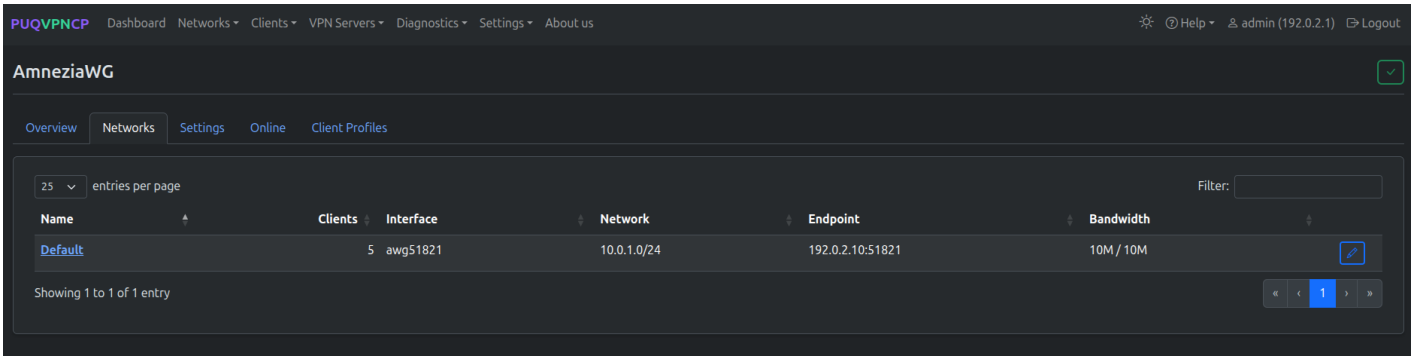


The Overview tab displays:

Card	Description
Service Status	Installed `amneziawg` kernel module and `amneziawg-tools` package versions
Summary	Total number of AmneziaWG networks and clients configured
Online Connections	Real-time count of connected AmneziaWG peers with live bandwidth stats

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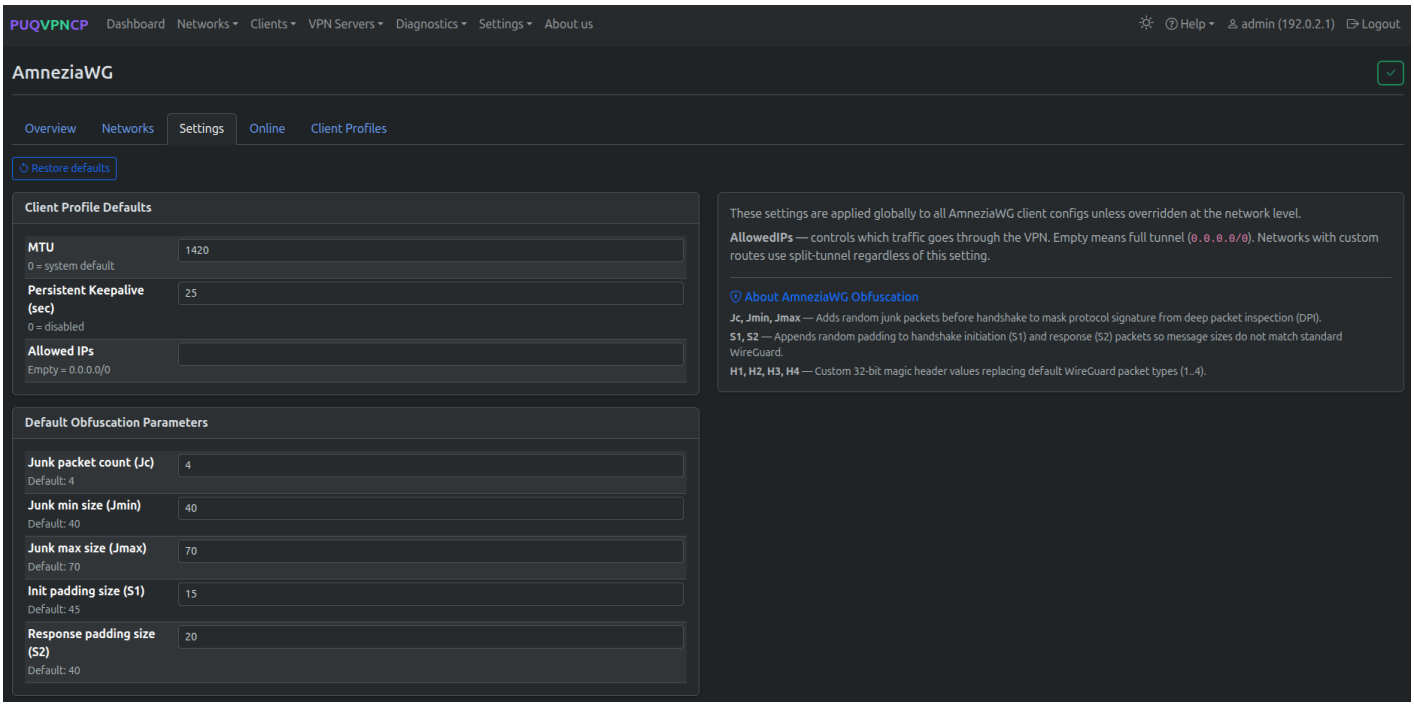
Networks Tab



Lists all networks that have AmneziaWG enabled:

Column	Description
Name	Network name (link to network edit page)
Clients	Number of AmneziaWG clients in this network
Interface	Interface name (e.g., `awg51821`)
Network	Subnet assigned to this network
Endpoint	Server IP and UDP port for AmneziaWG client connections
Bandwidth	Upload / download bandwidth limits

Settings Tab

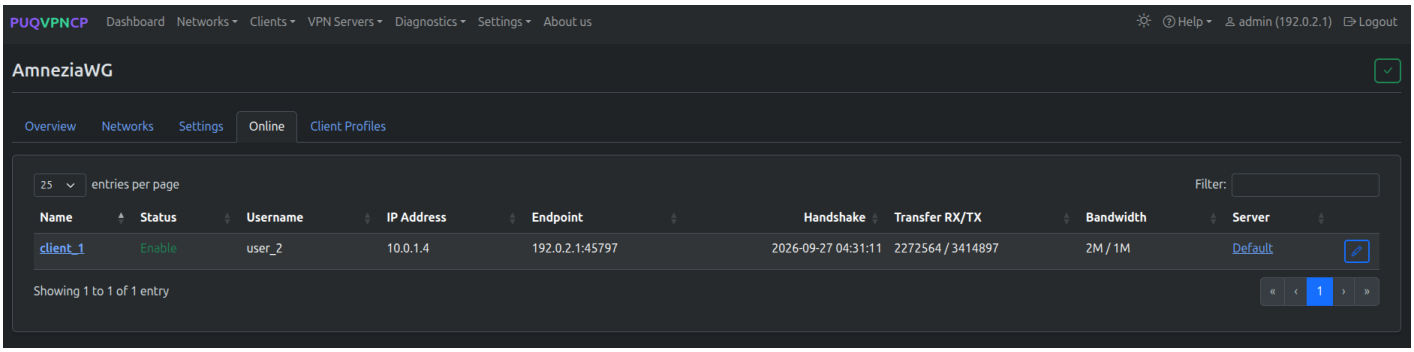


Global defaults for AmneziaWG client profiles:

- **Default MTU** — interface MTU (recommended: 1420 or 1280 for mobile networks)
- **Persistent Keepalive** — interval in seconds to keep NAT sessions active (default: 25s)
- **AllowedIPs** — default route pushed to clients (default: `0.0.0.0/0, ::/0`)
- **Global Junk Settings** — default Jc, Jmin, Jmax, S1, S2 values

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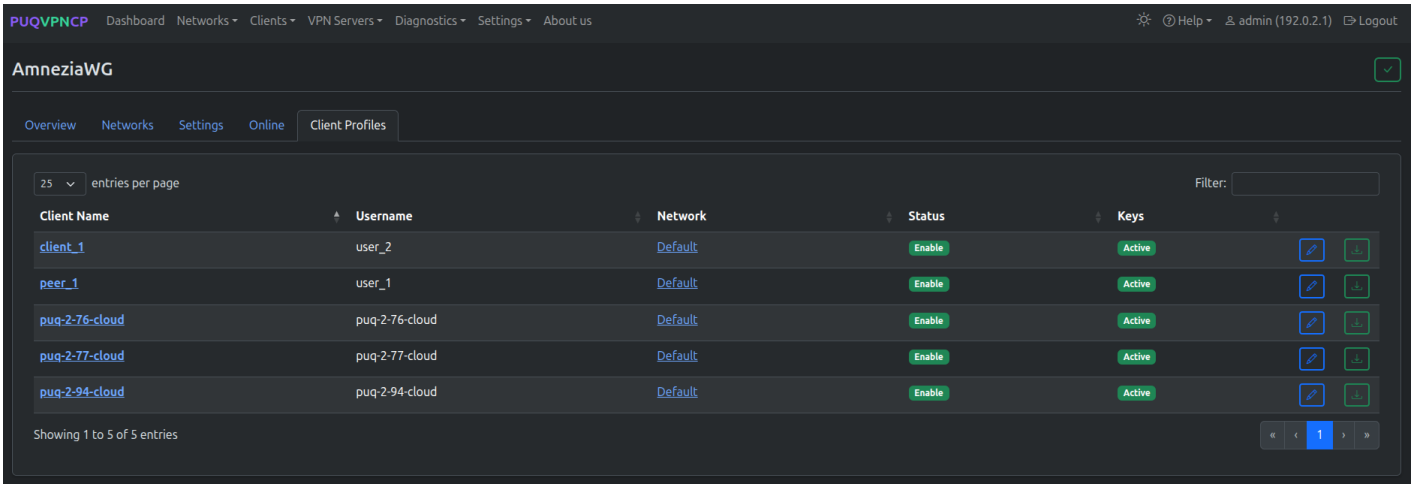
Online Peers Tab



Shows real-time connected peers with active session data:

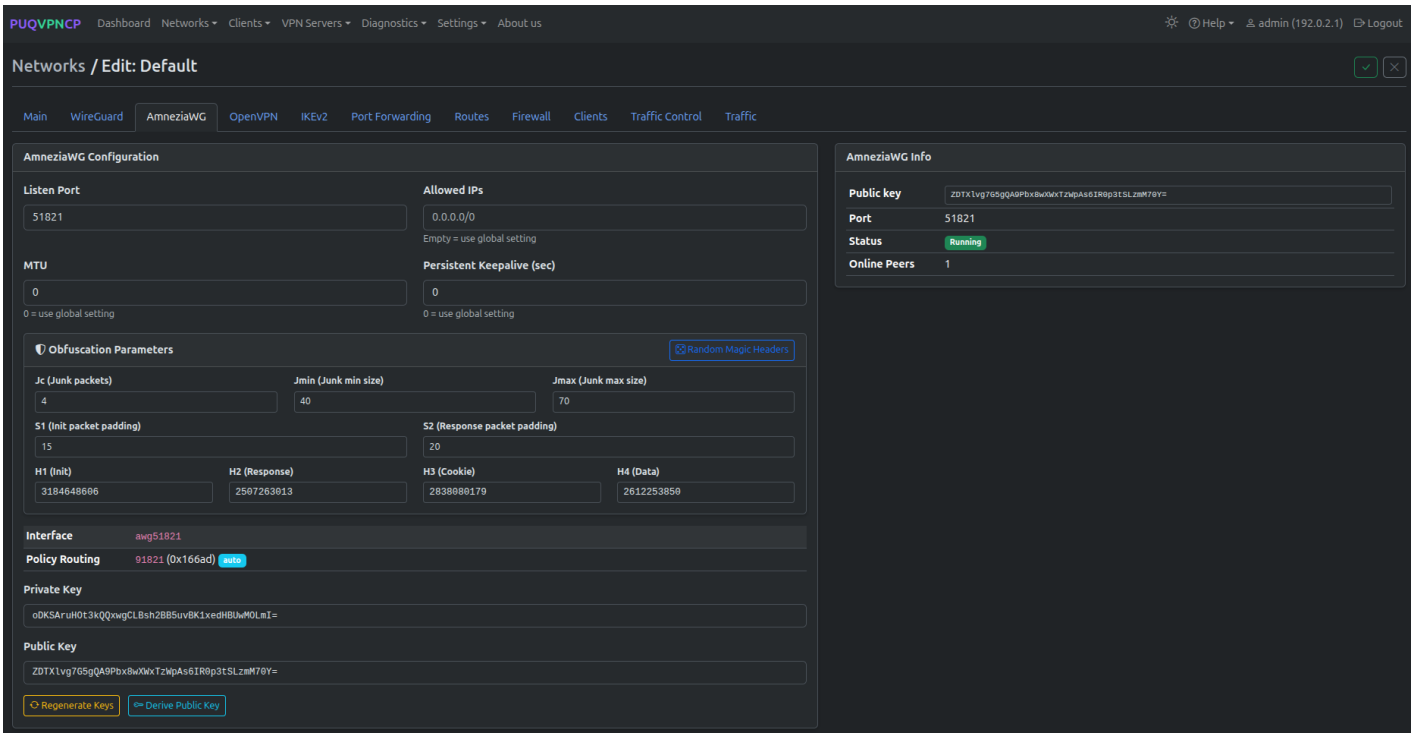
- **Client Name & Username** — client identity
- **IP Address & Endpoint** — assigned tunnel IP and client remote IP:port
- **Latest Handshake** — timestamp of most recent successful handshake
- **Transfer RX/TX** — live byte counters
- **Bandwidth** — configured bandwidth limit for the client

Client Profiles Tab



Lists all configured AmneziaWG client profiles across networks, indicating network membership, activation status, and cryptographic key status.

Network Configuration

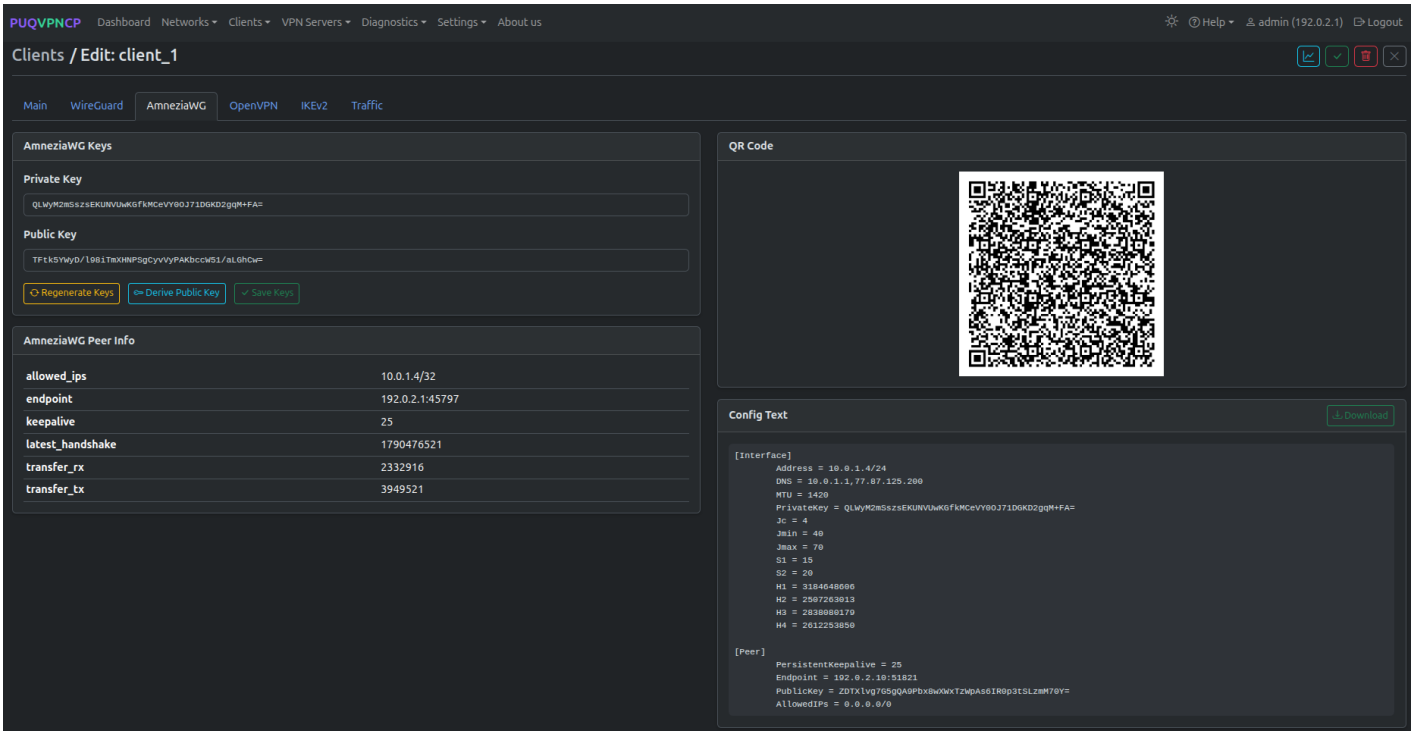


When configuring AmneziaWG inside a network:

- **Listen Port** — UDP port on which AmneziaWG listens
- **Allowed IPs** — IP ranges routed through the tunnel
- **MTU & Persistent Keepalive** — per-network overrides
- **Obfuscation Parameters** — custom H1–H4 headers and Jc/Jmin/Jmax/S1/S2 values

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Client Configuration & QR Codes

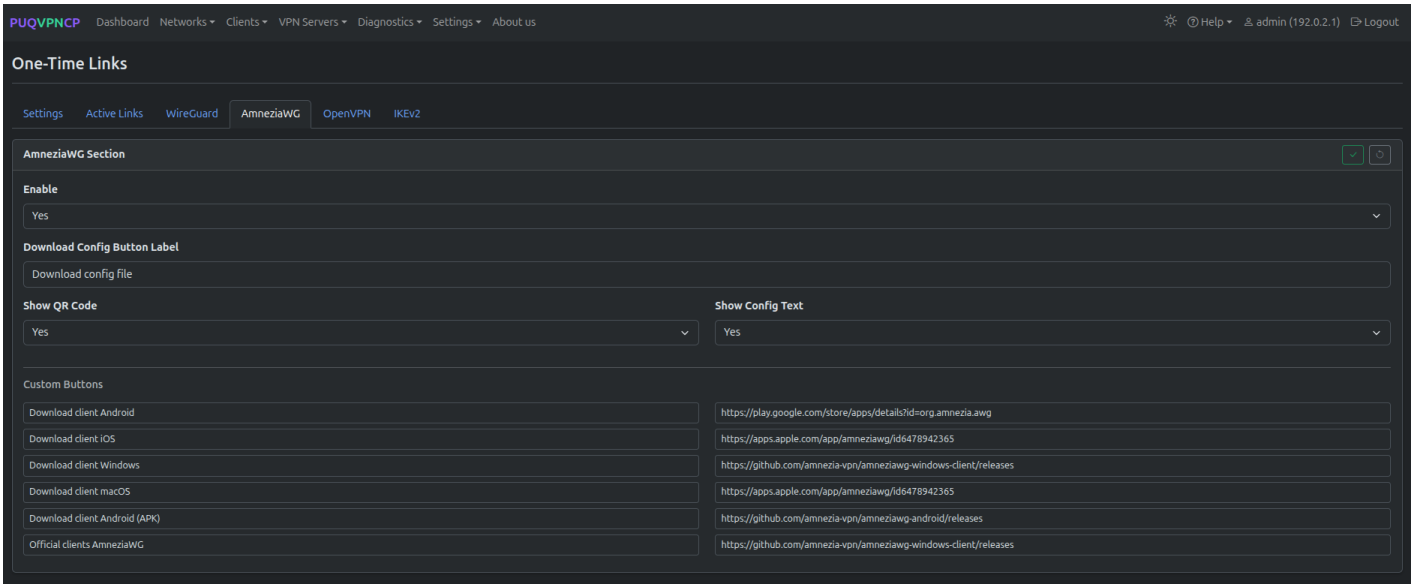


In the client management page, enabling AmneziaWG automatically generates:

1. Standard cryptographic keys adapted for AmneziaWG
2. Obfuscation parameters embedded into client `.conf`
3. QR code for instant mobile setup via AmneziaWG apps on iOS and Android

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One-Time Links (OTL) for AmneziaWG



Administrators can configure the AmneziaWG download page on One-Time Links, setting custom button labels and download links for all supported platforms (Android, iOS, Windows, macOS).



The end-user sees a clean, self-service page with QR code, configuration preview, config file download button, and direct app store links to the official AmneziaWG clients.

Revision #10

Created 28 September 2026 17:06:20 by Ruslan
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