

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 (11 / 12 / 13)

“Important for Debian: AmneziaWG is compiled on your server as a kernel module via DKMS. On Debian, DKMS requires kernel headers (`|linux-headers-$(uname -r)|`) and build tools (`|build-essential|`). Without them, the DKMS build will fail.

Copy and run the complete installation block as root:

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

# 2. Add the official Amnezia PPA repository keyring and source
mkdir -p /etc/apt/keyrings && curl -fsSL
"https://keyserver.ubuntu.com/pks/lookup?op=get&search=0x75C9DD72C799870E310542E24166F2C2572908:
| gpg --dearmor --yes -o /etc/apt/keyrings/amnezia.gpg
echo "deb [signed-by=/etc/apt/keyrings/amnezia.gpg]
https://ppa.launchpadcontent.net/amnezia/ppa/ubuntu noble main" >
/etc/apt/sources.list.d/amnezia.list

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

# 4. 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 GPG keyring (minimal systems):

```
mkdir -p /etc/apt/keyrings && curl -fsSL
"https://keyserver.ubuntu.com/pks/lookup?op=get&search=0x75C9DD72C799870E310542E24166F2C2572908:
| gpg --dearmor --yes -o /etc/apt/keyrings/amnezia.gpg
echo "deb [signed-by=/etc/apt/keyrings/amnezia.gpg]
https://ppa.launchpadcontent.net/amnezia/ppa/ubuntu noble 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.

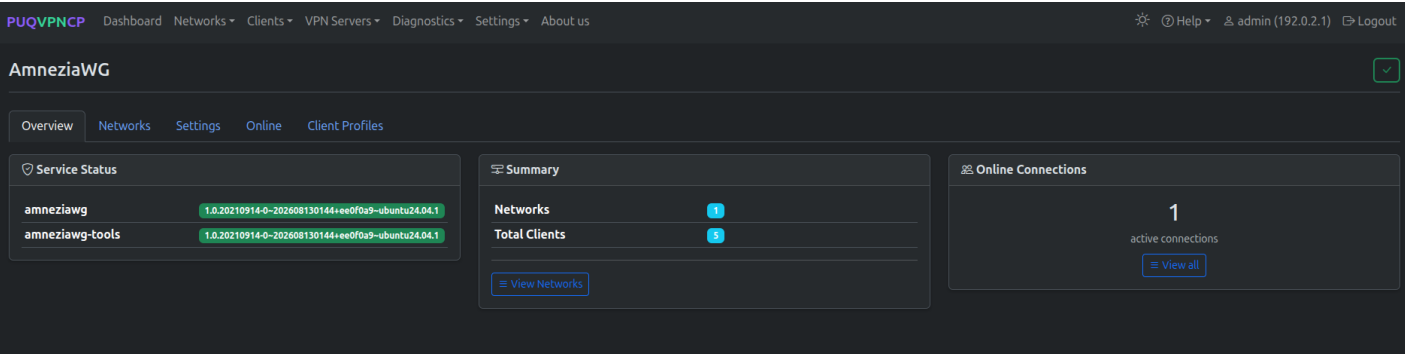
Obfuscation Parameters Explained

Parameter	Default	Description
H1	Random	Header type for handshake initiation packets

Parameter	Default	Description
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
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.

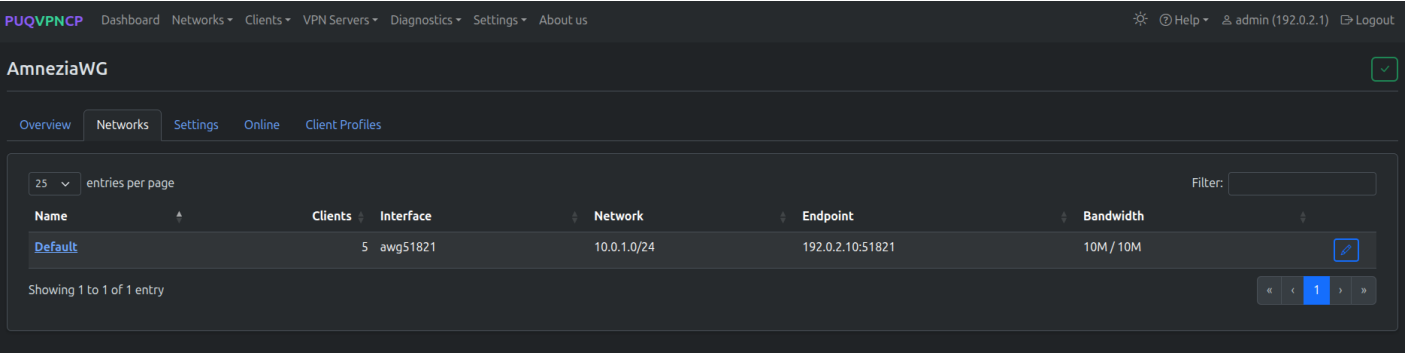
Overview Tab



The Overview tab displays:

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

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., <code>awg51821</code>)
Network	Subnet assigned to this network
Endpoint	Server IP and UDP port for AmneziaWG client connections
Bandwidth	Upload / download bandwidth limits

Settings Tab

PUQVPNCP

Dashboard

Networks

Clients

VPN Servers

Diagnostics

Settings

About us

🔧 Help

admin (192.0.2.1)

Logout

AmneziaWG

OverviewNetworksSettingsOnlineClient Profiles

Restore defaults

Client Profile Defaults

MTU

1420

0 = system default

Persistent Keepalive (sec)

25

0 = disabled

Allowed IPs

Empty = 0.0.0.0/0

Default Obfuscation Parameters

Junk packet count (Jc)

4

Default: 4

Junk min size (Jmin)

40

Default: 40

Junk max size (Jmax)

70

Default: 70

Init padding size (S1)

15

Default: 45

Response padding size (S2)

20

Default: 40

These settings are applied globally to all AmneziaWG client configs unless overridden at the network level.

AllowedIPs — controls which traffic goes through the VPN. Empty means full tunnel (0.0.0.0/0). Networks with custom routes use split-tunnel regardless of this setting.

About AmneziaWG Obfuscation

Jc, Jmin, Jmax — Adds random junk packets before handshake to mask protocol signature from deep packet inspection (DPI).

S1, S2 — Appends random padding to handshake initiation (S1) and response (S2) packets so message sizes do not match standard WireGuard.

H1, H2, H3, H4 — Custom 32-bit magic header values replacing default WireGuard packet types (1..4).

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

Online Peers Tab

PUQVPNCP

Dashboard

Networks

Clients

VPN Servers

Diagnostics

Settings

About us

🔧 Help

admin (192.0.2.1)

Logout

AmneziaWG

OverviewNetworksSettingsOnlineClient Profiles

25 entries per page

Filter:

Name	Status	Username	IP Address	Endpoint	Handshake	Transfer RX/TX	Bandwidth	Server
client_1	Enable	user_2	10.0.1.4	192.0.2.1:45797	2026-09-27 04:31:11	2272564 / 3414897	2M / 1M	Default

Showing 1 to 1 of 1 entry

« 1 »

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

PUQVPNCP

Dashboard

Networks

Clients

VPN Servers

Diagnostics

Settings

About us

🌞

🔗 Help

👤 admin (192.0.2.1)

🚪 Logout

AmneziaWG

Overview

Networks

Settings

Online

Client Profiles

25 entries per page

Filter:

Client Name	Username	Network	Status	Keys	
client_1	user_2	Default	Enable	Active	
peer_1	user_1	Default	Enable	Active	
puq-2-76-cloud	puq-2-76-cloud	Default	Enable	Active	
puq-2-77-cloud	puq-2-77-cloud	Default	Enable	Active	
puq-2-94-cloud	puq-2-94-cloud	Default	Enable	Active	

Showing 1 to 5 of 5 entries

«

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

Network Configuration

PUQVPNCP

Dashboard

Networks

Clients

VPN Servers

Diagnostics

Settings

About us

🌞

🔗 Help

👤 admin (192.0.2.1)

🚪 Logout

Networks / Edit: Default

Main

WireGuard

AmneziaWG

OpenVPN

IKv2

Port Forwarding

Routes

Firewall

Clients

Traffic Control

Traffic

AmneziaWG Configuration

Listen Port

51821

Allowed IPs

0.0.0.0/0

Empty = use global setting

MTU

0

0 = use global setting

Persistent Keepalive (sec)

0

0 = use global setting

Obfuscation Parameters

Jc (Junk packets)

4

Jmin (Junk min size)

40

Jmax (Junk max size)

70

S1 (init packet padding)

15

S2 (Response packet padding)

20

H1 (init)

3184648606

H2 (Response)

2507263013

H3 (Cookie)

2838000179

H4 (Data)

2612253850

Interface

awg51821

Policy Routing

91821 (0x166ad)

📄

Private Key

oDKSAruiH013kQqXwgCLBsh2BB5uv9K1xedHBUwMOLnI=

Public Key

ZDTXlvG76SgQA9Pbx8wXWtZmpAs6IR8p3tSLzmH70Y=

🔄 Regenerate Keys

🔗 Derive Public Key

AmneziaWG Info

Public key

ZDTXlvG76SgQA9Pbx8wXWtZmpAs6IR8p3tSLzmH70Y=

Port

51821

Status

Running

Online Peers

1

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

Client Configuration & QR Codes

The screenshot shows the 'AmneziaWG' tab in the 'Clients / Edit: client_1' section of the PUQVPNCP dashboard. The interface is divided into three main panels:

- AmneziaWG Keys:** Contains input fields for 'Private Key' (QLMyQMSszsEKUNVWwGfKMcVY90J71DGKD2ggHFA=) and 'Public Key' (TFk5VWyd/1981TxXNfPsgcyVvyFAKbocW51/aLGHQw=). Below these are buttons for 'Regenerate Keys', 'Derive Public Key', and 'Save Keys'.
- AmneziaWG Peer Info:** A table displaying configuration parameters:

allowed_ips	10.0.1.4/32
endpoint	192.0.2.1:45797
keepalive	25
latest_handshake	1790476521
transfer_rx	2332916
transfer_tx	3949521
- QR Code:** A large QR code for mobile setup.
- Config Text:** A text area containing the configuration script for the client, with a 'Download' button.

The configuration script in the 'Config Text' panel is as follows:

```
[Interface]
Address = 10.0.1.4/24
DNS = 192.0.1.1,77.87.125.200
MTU = 1420
PrivateKey = QLMYQMSszsEKUNVWwGfKMcVY90J71DGKD2ggHFA=
Jc = 4
Jmin = 40
Jmax = 70
S1 = 15
S2 = 20
H1 = 3184648066
H2 = 2587269013
H3 = 2838888179
H4 = 2612258580

[Peer]
PersistentKeepalive = 25
Endpoint = 192.0.2.10:51821
PublicKey = ZDTXlvG76SgQA9PbWwXtZwPA6IRp3tSLZm70Y=
AllowedIPs = 0.0.0.0/0
```

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

One-Time Links (OTL) for AmneziaWG

PUQVPNCP

Dashboard

Networks

Clients

VPN Servers

Diagnostics

Settings

About us

🌟

🔍 Help

👤 admin (192.0.2.1)

🚪 Logout

One-Time Links

SettingsActive LinksWireGuardAmneziaWGOpenVPNIKEv2

AmneziaWG Section

Enable

Yes

Download Config Button Label

Download config file

Show QR Code

Yes

Show Config Text

Yes

Custom Buttons

Download client Android	https://play.google.com/store/apps/details?id=org.amnezia.awg
Download client iOS	https://apps.apple.com/app/amneziawg/id6478942365
Download client Windows	https://github.com/amnezia-vpn/amneziawg-windows-client/releases
Download client macOS	https://apps.apple.com/app/amneziawg/id6478942365
Download client Android (APK)	https://github.com/amnezia-vpn/amneziawg-android/releases
Official clients AmneziaWG	https://github.com/amnezia-vpn/amneziawg-windows-client/releases

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).



↓ Download config file

Jmax = 70

S1 = 15

S2 = 20

H1 = 3184648606

H2 = 2507263013

H3 = 2838080179

H4 = 2612253850

[Peer]

PersistentKeepalive = 25

Endpoint = 192.0.2.10:51821

PublicKey = ZDTXlvG7G5gQA9Pbx8wXwTzWpAs6IR0p3tSLzmM70Y=

AllowedIPs = 0.0.0.0/0

↗ Download client Android

↗ Download client iOS

↗ Download client Windows

↗ Download client macOS

↗ Download client Android (APK)

↗ Official clients AmneziaWG

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.

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