



# eduroam under Linux with wpa\_supplicant

Stand: b'05. Mai 2020'

## 1 Preface

This guide describes how to configure wpa\_supplicant on the command line. On the The use of a graphical user interface has been abandoned. This means that this manual can be used on almost all Linux versions, but is more suitable for experienced Linux users of Interest.

For more user-friendly installation instructions via graphical user interfaces, see <https://www.cms.hu-berlin.de/dl/netze/wlan/config/eduroam/>.

*Hinweis:* Diverse Abkürzungen und fachspezifische Begriffe sind im [Glossar](#) erklärt.

### **Wichtige Parameter für die Konfiguration auf einen Blick:**

SSID: eduroam

Sicherheit: 802.1x EAP

EAP-Methode: TTLS

Phase 2-Authentifizierung: PAP

CA-Zertifikat: T-Telesec Global Root Class 2

Identität: *Der eigene Benutzername*

Passwort: *Das eigene Passwort*

Anonyme Identität: anonymous@wlan.hu-berlin.de

Authentifizierungsserver: srv1-radius.cms.hu-berlin.de; srv2-radius.cms.hu-berlin.de

**Die Angabe des CA-Zertifikats ist wichtig, um die Sicherheit Ihrer Verbindung und Ihres Passworts zu gewährleisten.**

In this guide we assume that the **WLAN card** used has the ID **wlan0**. If this is not the case for you, the corresponding digits must be adjusted.

## 2 Preparation

The root certificate "T-Telesec Global Root Class 2" is required for configuration, which can be found at [https://www.cms.hu-berlin.de/dl/netze/wlan/config/eduroam/t-telesec\\_globalroot\\_class\\_2.pem](https://www.cms.hu-berlin.de/dl/netze/wlan/config/eduroam/t-telesec_globalroot_class_2.pem). Save it in any folder on your computer, z. B. in `~/t-telesec_globalroot_class_2.pem`.

In addition, the CMS provides a template for the configuration file for which is used for this manual: [wpa\\_supplicant.conf](#). First save it in a directory of your choice, z. B. in `~/wpa_supplicant.conf`.

## 3 Configuration

All commands that require root privileges are preceded by a "sudo". If that doesn't work for you, you must become root before executing it.

1. Move the downloaded certificate file into the configuration directory of wpa\_supplicant:  
`sudo mv /t-telesec_globalroot_class_2.pem /etc/wpa_supplicant/`
2. Now adapt the downloaded `wpa_supplicant.conf` with an editor of your choice.

- a) *YourNameHere* replace with your user identification.

Hinweis: Abhängig davon an welcher Einrichtung Sie Ihren Account haben, müssen Sie eine Erweiterung an Ihren Benutzernamen anhängen. Die Erweiterung können Sie der folgenden Tabelle entnehmen. Wenn Sie nicht wissen, wo Sie Ihren Account haben, ist er wahrscheinlich beim CMS (zentraler HU-Account).

Einrichtung	Erweiterung
Physik	@physik.hu-berlin.de
Mathematik	@mathematik.hu-berlin.de
Informatik	@informatik.hu-berlin.de
CMS	keine Erweiterung

- b) *YourPasswordHere* replace with your own password. If this is not secure enough for you, you can also remove the password line from the configuration file. Then you will always be asked for it before connecting.
  - c) Now only the path to the certificate file has to be adjusted, if you do not want to store the file at the suggested location.
3. Move the downloaded and customized `wpa_supplicant.conf` to `/etc/wpa_supplicant`:  
`sudo mv wpa_supplicant.conf /etc/wpa_supplicant`
  4. Especially if you have written your password in the `wpa_supplicant.conf`, you should protect the file from unauthorized access:  
`sudo chmod 0600 /etc/wpa_supplicant/wpa_supplicant.conf`

## 4 Test

Now the connection can already be tested manually. Possible automatic configuration tools for the network can cause problems during the connection test. To be able to

perform the test, these should be terminated. For system-d based systems this can be done with:

```
sudo systemctl stop NetworkManager.service
```

Now *wpa\_supplicant* can be started manually:

```
sudo wpa_supplicant -i wlan0 -D wext -c /etc/wpa_supplicant/wpa_supplicant.conf -d
```

This starts *wpa\_supplicant* in debug mode. The output is very detailed and should end approximately as follows:

```
CTRL-EVENT-CONNECTED - Connection to 00:11:88:27:75:88 completed (auth) [id=0 id_str=]
wpa_driver_wext_set_operstate: operstate 0->1 (UP)
WEXT: Operstate: linkmode=-1, operstate=6
EAPOL: External notification - portValid=1
EAPOL: SUPP_PAE entering state AUTHENTICATED
RTM_NEWLINK: operstate=1 ifi_flags=0x11043 ([UP] [RUNNING] [LOWER_UP])
RTM_NEWLINK, IFLA_IFNAME: Interface 'wlan0' added
```

If you have not specified a password, you should see the output *CTRL-REQ-PASSWORD-0:Password needed for SSID eduroam*. Then you have to enter your password in a second console using *wpa\_cli*:

```
sudo wpa_cli
```

```
wpa_cli v0.7.3
```

```
Copyright (c) 2004-2010, Jouni Malinen <j@w1.fi> and contributors
```

```
This program is free software. You can distribute it and/or modify it
under the terms of the GNU General Public License version 2.
```

```
Alternatively, this software may be distributed under the terms of the
BSD license. See README and COPYING for more details.
```

```
Selected interface 'wlan0'
```

```
Interactive mode
```

```
<2>CTRL-REQ-PASSWORD-0:Password needed for SSID eduroam
```

```
> password 0 <YourPassword>
```

```
OK
```

```
<2>CTRL-EVENT-EAP-SUCCESS EAP authentication completed successfully (based on lower
layer success)
```

```
<2>WPA: Key negotiation completed with 00:11:88:27:75:80 [PTK=CCMP GTK=CCMP]
```

```
<2>CTRL-EVENT-CONNECTED - Connection to 00:11:88:27:75:80 completed (auth) [id=0
id_str=]
```

```
> q
```

Nun muss dem Interface noch eine IP zugeordnet werden:

```
sudo dhclient wlan0
```

Jetzt sollte die Netzverbindung stehen und kann z.B. mittels `ping www.hu-berlin.de` getestet werden.

## 5 Make changes permanent

By adapting the file `/etc/network/interfaces` (e.g. via `sudo gvim /etc/network/interfaces`) the WPA connection can be included in the system configuration. It will then be available after system startup, and there should be no more problems with automatic network configuration tools like the *NetworkManager* on Ubuntu.

The settings for the WLAN interface should look as follows:

```
auto wlan0
iface wlan0 inet dhcp
wpa-conf /etc/wpa_supplicant/wpa_supplicant.conf
```

If you have not written your password to the `wpa_supplicant.conf`, you must enter the password after system startup using `wpa_cli` and configure the interface by manually calling `sudo dhclient wlan0`.

The WLAN connection via eduroam should now work.

More detailed information about configuring WPA on Linux (specialized on Ubuntu) can be found at [https://wiki.ubuntuusers.de/WLAN/wpa\\_supplicant](https://wiki.ubuntuusers.de/WLAN/wpa_supplicant).