

Setup of the WLANs “DHBW-KA” and “eduroam” at DHBW Karlsruhe

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1. General information about DHBW-KA and eduroam

The WLAN with the SSID “**DHBW-KA**” is encrypted with WPA2 Enterprise and is only provided at DHBW Karlsruhe. Users are authenticated in the teaching domain dh-karlsruhe.de. An authentication with the user credentials of the management domain dhw-karlsruhe.de or dhw-karlsruhe.aa does not work.

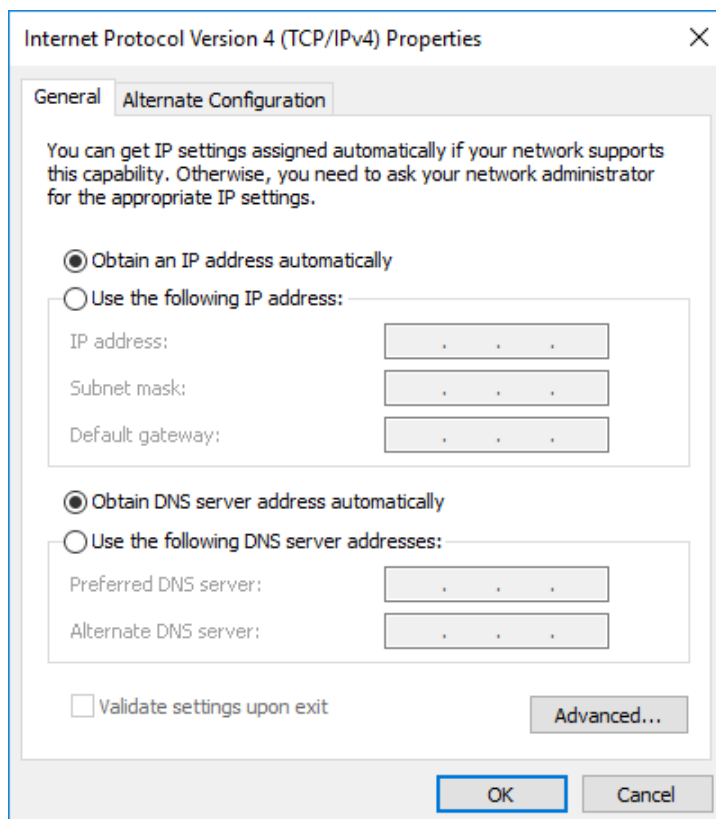
The WLAN with the SSID “DHBW KA” is encrypted and should be used at the Duale Hochschule Baden-Württemberg Karlsruhe whenever possible.

The SSID “**eduroam**” is available at many educational institutions worldwide and also at some other parts of the city of Karlsruhe. The setup of this WLAN is identical to “DHBW-KA”. The user name must be specified in the form "user@dh-karlsruhe.de", whereby upper and lower case is important for the user. eduroam is also encrypted with WPA2 Enterprise, of course. A list of participating locations is available at <https://map.eduroam.de>.

At <https://cat.eduroam.org> you can download an installation file, which makes the secure setup of “eduroam” much easier. It is recommended to use this option. To do this, click on the button "Download your eduroam installation program" on the website and search for DHBW Karlsruhe. Usually you will be offered the appropriate installation program for your operating system, otherwise you can select it via the link "All Platforms".

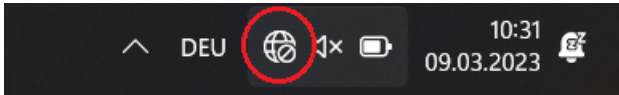
2. Prerequisites

Please make sure that your Wi-Fi connection assigns the IP address automatically via DHCP.

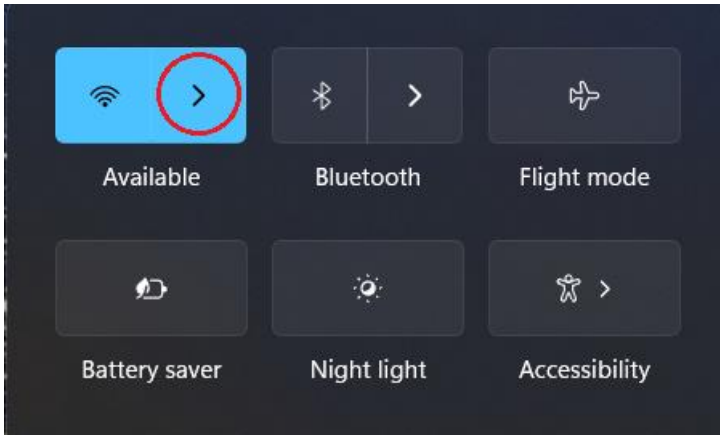


3. Setup on Windows 10 and 11

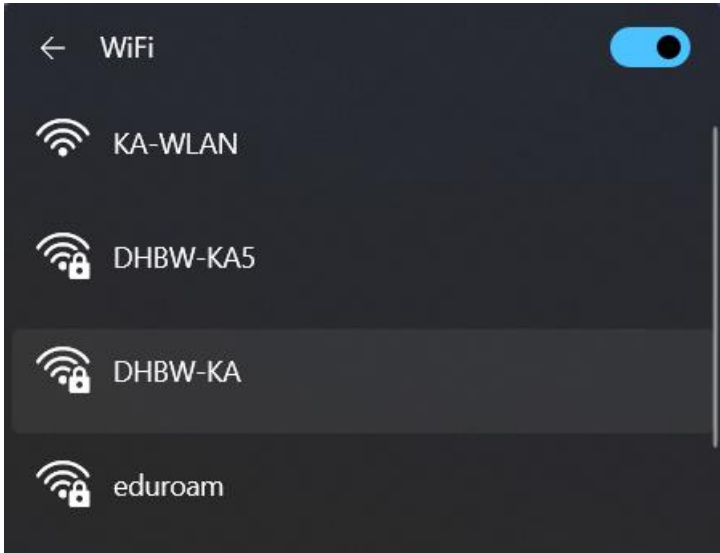
To connect to the network please follow these instructions. Click on the network icon in the system tray:



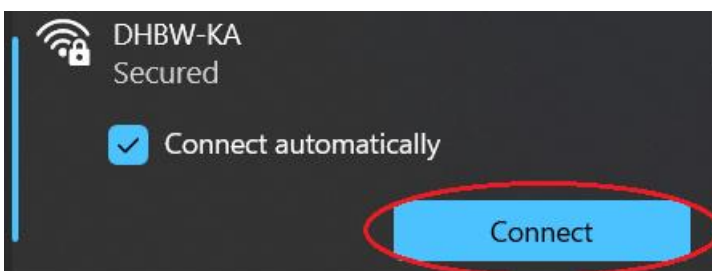
If you are using Windows 11, you have to click the arrow next the WLAN icon:



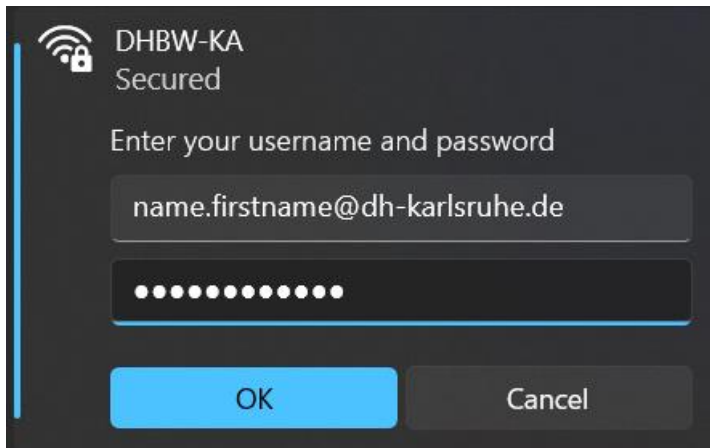
Select the „DHBW-KA“ or „eduroam“ SSID (network):



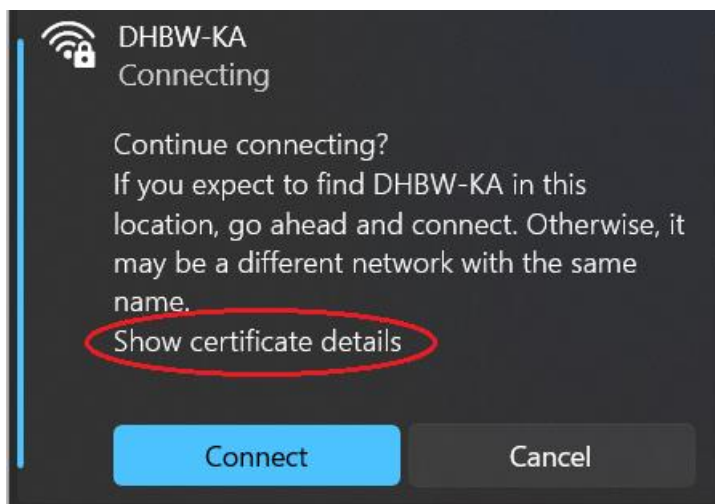
and click on „Connect“:



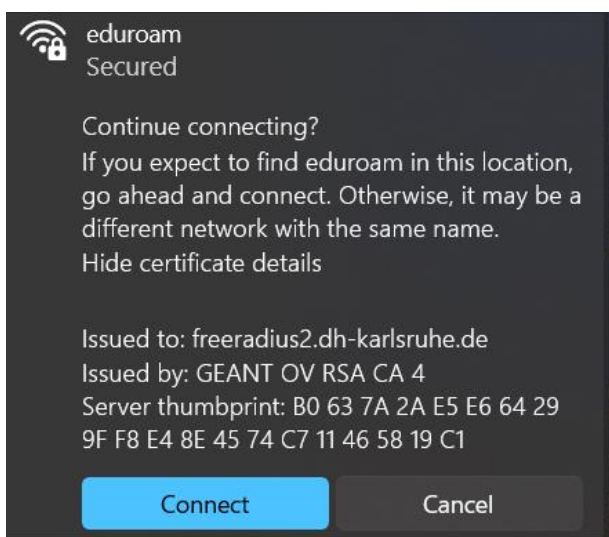
Enter your personal user credentials (name.firstname@dh-karlsruhe.de) in the following screen and confirm the information by clicking “OK”:



Next, please verify the certificate details:

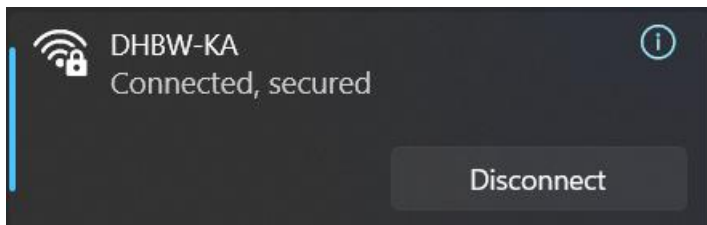


and ensure the certificate thumbprint looks like this:

 <p>eduroam Secured</p> <p>Continue connecting? If you expect to find eduroam in this location, go ahead and connect. Otherwise, it may be a different network with the same name. Hide certificate details</p> <p>Issued to: freeradius2.dh-karlsruhe.de Issued by: GEANT OV RSA CA 4 Server thumbprint: B0 63 7A 2A E5 E6 64 29 9F F8 E4 8E 45 74 C7 11 46 58 19 C1</p> <p>Connect Cancel</p>	<p>Issued to: freeradius.dh-karlsruhe.de Issued by: GEANT OV RSA CA 4 Server thumbprint: C7 FE CD 0F D5 2B C3 F3 FB 12 52 18 E7 7F 1D C9 B2 53 8A D7</p>
	<p>Issued to: bilbo.dh-karlsruhe.de Issued by: GEANT OV RSA CA 4 Server thumbprint: CE AE 46 AF D1 87 02 12 A5 8F 19 2B B6 B1 F5 D8 40 7E 35 26</p>
	<p>Issued to: aragorn.dh-karlsruhe.de Issued by: GEANT OV RSA CA 4 Server thumbprint: BD E8 72 CC 76 AE 24 73 5D C8 A8 EA D5 BC D6 86 A3 BE FE 17</p>

As the certificates are usually exchanged each year, please make sure that you have the latest version of these instructions and also check the current certificate details given in section 10 at the end of this document.

After clicking on “Connect” you should finally be connected to the selected WLAN:



4. Setup on Windows 8.0 and Windows 8.1

The support for Windows 8.0 and Windows 8.1 discontinued on 12th January 2016 and 10th January 2023 respectively. Devices running these operating systems will no longer receive security updates and therefore aren't allowed to connect to the network of the DHBW Karlsruhe anymore. In this case, please upgrade to Windows 10 or Windows 11.

5. Setup on Windows 7 and older Windows versions

Windows 7 and even older operating systems such as Windows Vista and Windows XP are obsolete and no longer supported. It is not allowed to connect devices with these outdated Windows versions with the network of the DHBW Karlsruhe. Please upgrade your device to Windows 10 or Windows 11, if possible.

6. Setup on Linux

Unfortunately, not all Linux distributions can be considered at this point. Please refer to the following general information to get an idea of how to use the “DHBW-KA” or “eduroam” Wi-Fi.

SSID: “DHBW-KA” or “eduroam”

Encryption: “WPA2 Enterprise”

Authentication: “PEAP” with “MSCHAPv2”

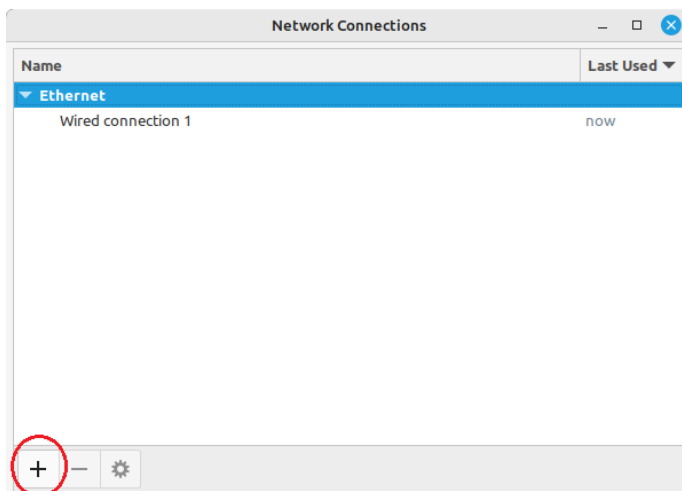
CA certificate: GEANT OV RSA CA 4 / USERTrust RSA Certification Authority

Authentication data: your user credentials from the domain DH-Karlsruhe

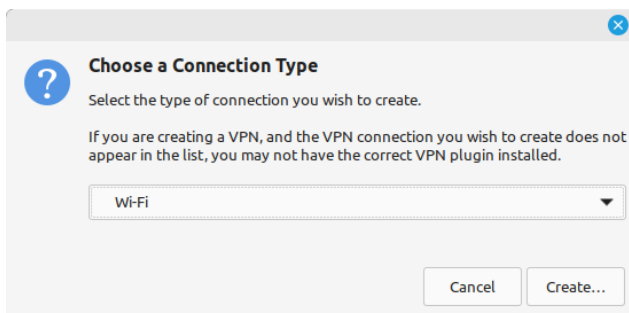
IP-Address: Automatically via DHCP

The example looks like this:

Open Network Connections and add a new connection by clicking on the “+” icon:



Choose “Wi-Fi” as connection type:



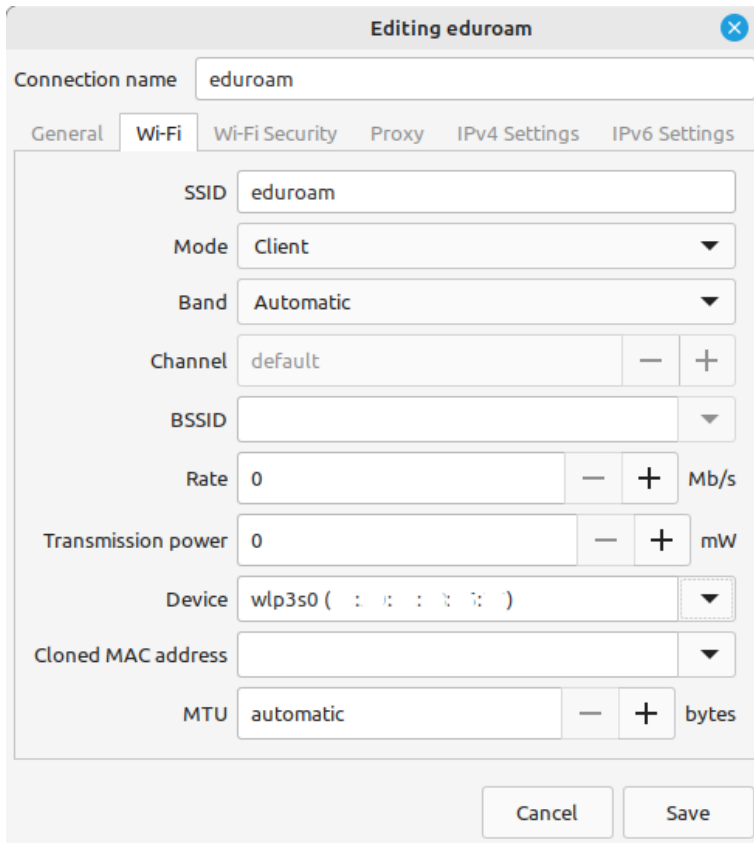
In the “Wi-Fi” tab, please fill in the fields with the following data:

Connection name: random, „eduroam“ for example

SSID: eduroam

Mode: Client

Device: your Wi-Fi adapter (internal or USB stick)



The screenshot shows a window titled "Editing eduroam" with a close button in the top right. Below the title bar is a text field for "Connection name" containing "eduroam". A tabbed interface follows, with "Wi-Fi" selected. The "Wi-Fi" tab contains several settings: "SSID" is "eduroam"; "Mode" is a dropdown menu set to "Client"; "Band" is a dropdown menu set to "Automatic"; "Channel" is "default" with minus and plus buttons; "BSSID" is an empty dropdown menu; "Rate" is "0" with minus and plus buttons and "Mb/s" label; "Transmission power" is "0" with minus and plus buttons and "mW" label; "Device" is "wlp3s0" with a dropdown arrow; "Cloned MAC address" is an empty dropdown menu; "MTU" is "automatic" with minus and plus buttons and "bytes" label. At the bottom are "Cancel" and "Save" buttons.

In the “Wi-Fi Security” tab, fill in the fields using this data:

Security: WPA & WPA Enterprise

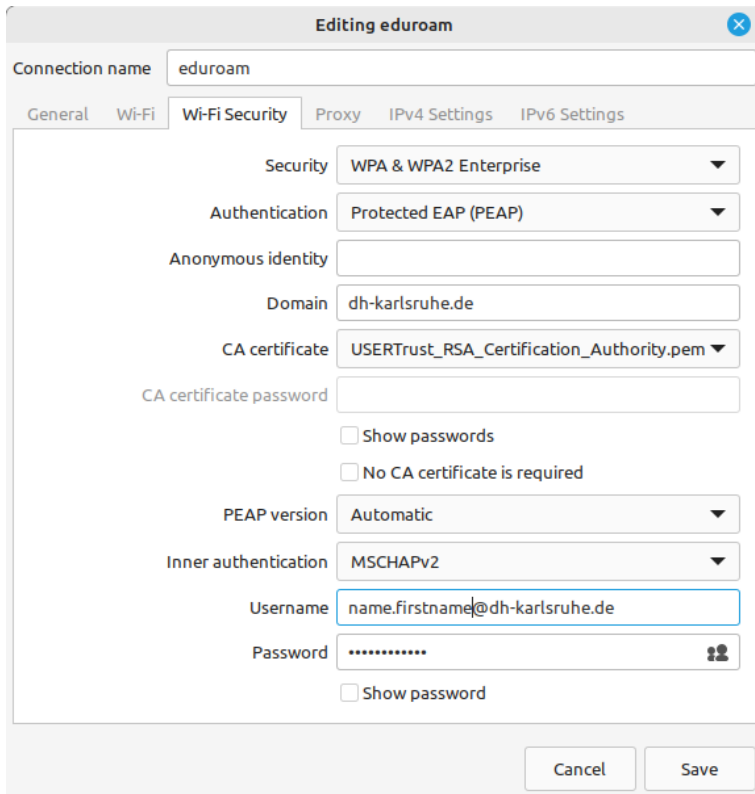
Authentication: Protected EAP (PEAP)

Inner authentication: MSCHAPv2

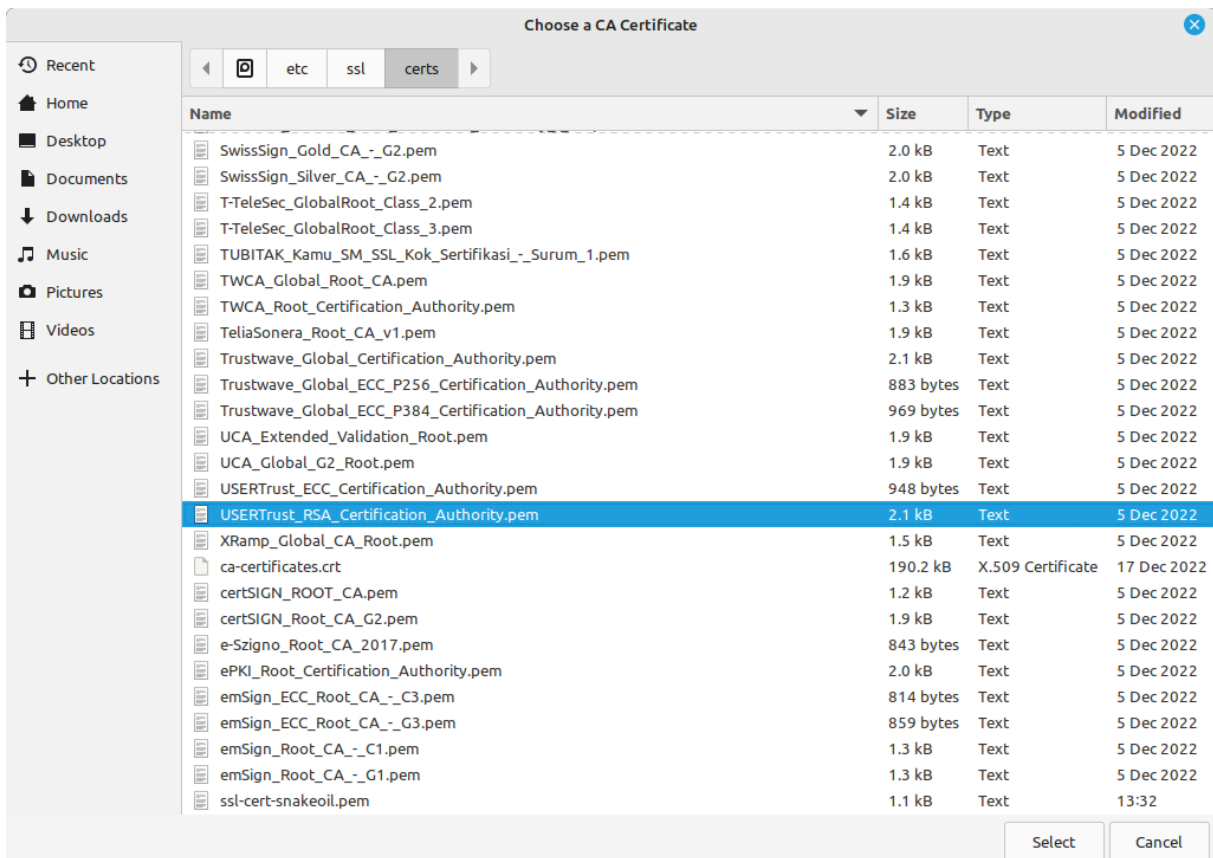
Username: name.firstname@dh-karlsruhe.de

Password: your password for the DH-Karlsruhe domain

Please use your own user credentials instead of “name.firstname@dh-karlsruhe.de”, of course.



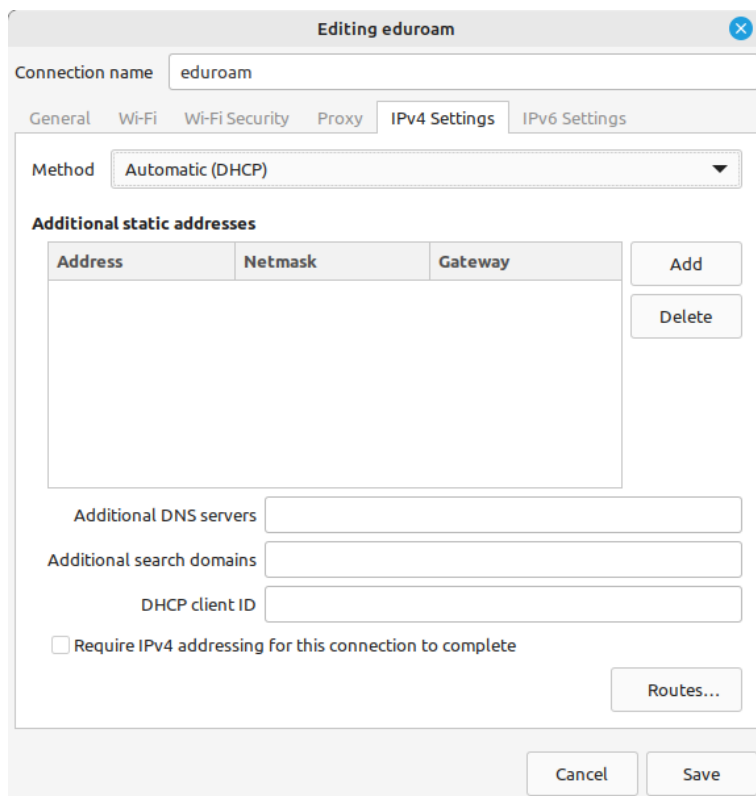
Click on the field next to „CA certificate“ and select the option „Select from file“. The CA certificates are often stored at `/etc/ssl/certs`, however, please refer to the documentation of your Linux distribution to find out where the certificate store is actually located.



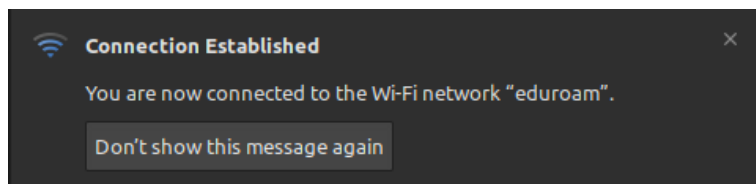
Select „USERTrust RSA Certification Authority“(.pem)“ and confirm this.

If the root certificate „USERTrust RSA Certification Authority“ for the usage of certificates issued by „GEANT OV RSA CA 4“ from GÉANT-TCS (Sectigo) is missing, you can manually download a .crt-file by visiting the official website <https://crt.sh/?CAName=%25GEANT+Vereniging%25> or the direct link <https://crt.sh/?id=2475254782>. For many distributions it will be necessary to save the new file to „/usr/share/ca-certificates“ or „/usr/local/share/ca-certificates“ and update the data of your certificate store. Once again, please refer to the documentation of your Linux distribution for further details.

Finally make that the method “Automatic (DHCP)” is set in the “IPv4 settings” tab:



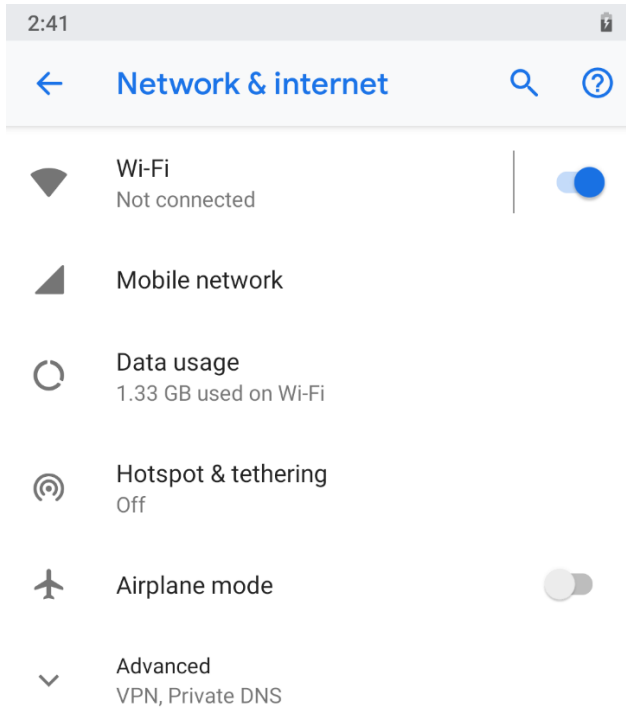
After clicking the “Save” button, your device should automatically and successfully establish a connection to the select W-LAN network:



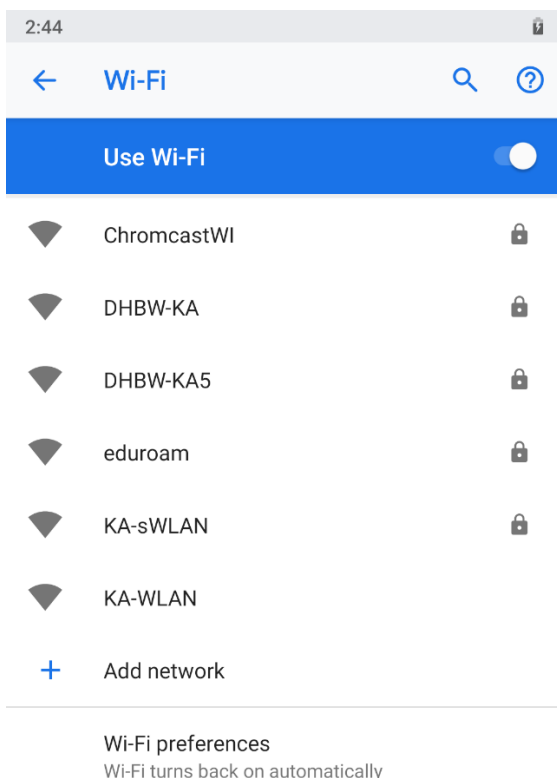
7. Setup on Android

Android 7.0 (and newer) allows the usage of the installed system certificates, so you usually don't need to install any certificate separately.

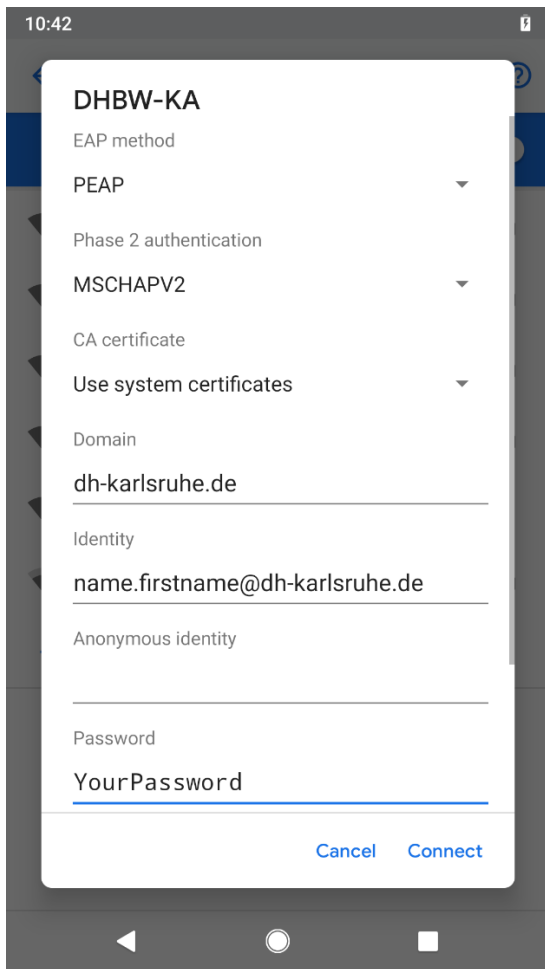
Open the settings for "Network & internet":



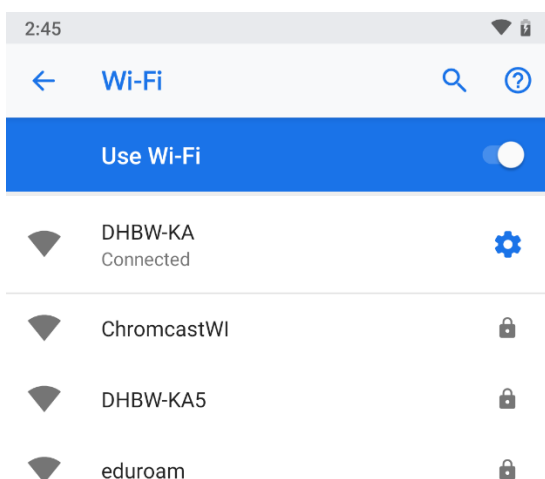
and tap on „Wi-Fi“ and make sure that the setting is switched on:



Tap “DHBW-KA” or “eduroam” and fill in the form as shown in the screenshot below:



Instead of “**name.firstname**” you have to enter your own user credentials and tap “Connect”:



If you do not have the setting option "Use system certificates" on your device or the required root certificate "USERTrust RSA Certification Authority" for the usage of certificates issued by „GEANT OV RSA CA 4“ from GÉANT-TCS (Sectigo) is missing in your certificate store, you can manually download it by using the QR-code below or visiting the official website <https://crt.sh/?CAName=%25GEANT+Vereniging%25> or the direct link at <https://crt.sh/?id=2475254782>.



Please follow the respective instructions for your device and Android version to import the downloaded certificate into the certificate store.

For the valid configuration of "eduroam" as well as the automatic installation of the current root certificate, you can find setup assistants for many different operating systems on <https://cat.eduroam.org>.

Additionally the following apps are available for Android devices:

- „eduroam CAT“ by GÉANT Association
(<https://play.google.com/store/apps/details?id=uk.ac.swansea.eduroamcat>)
- „geteduroam“ by SURF Cooperative
(<https://play.google.com/store/apps/details?id=app.eduroam.geteduroam>)

After starting the corresponding app, please select "DHBW Karlsruhe" as your home institution and follow the instruction to enter your user credentials and set up the profile for "eduroam" properly, see chapter 10.

Connecting to the WLAN of the DHBW Karlsruhe would also work without having the current root certificate installed in theory. However, only by having the valid root certificate and comparing the given thumbprints, you can make sure that you are actually connected to the authentication server of the DHBW Karlsruhe and nobody else is grabbing your personal credentials by emulating our local Wi-Fi networks.

8. Setup on Mac OS X

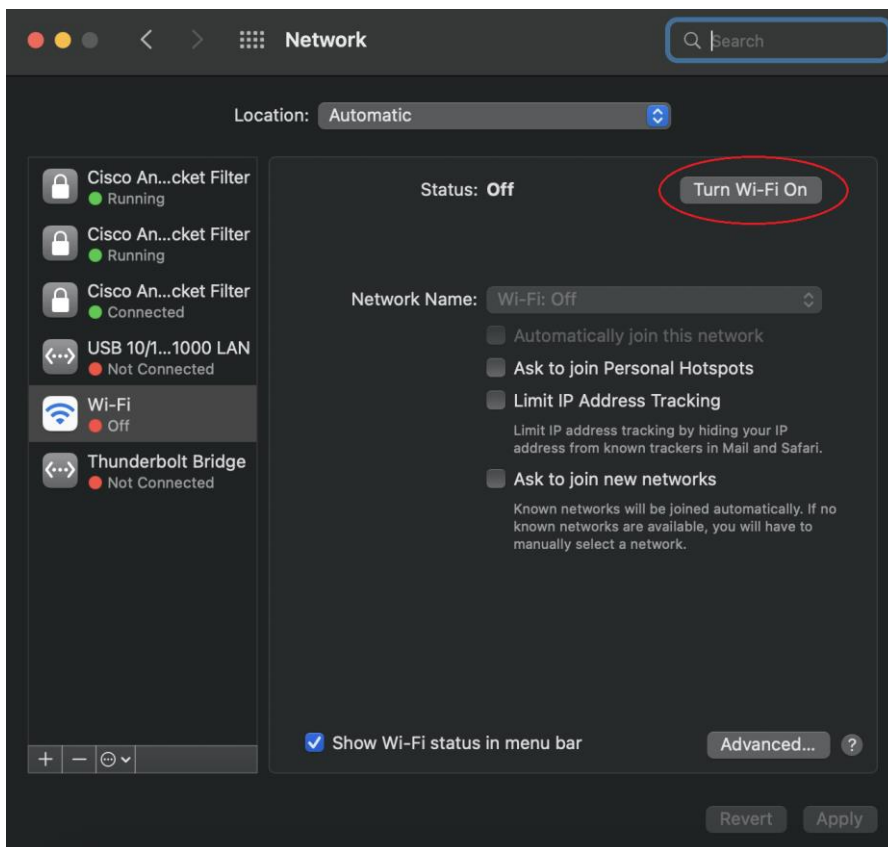
To establish a WLAN connection on a MacBook click on “System preferences”:



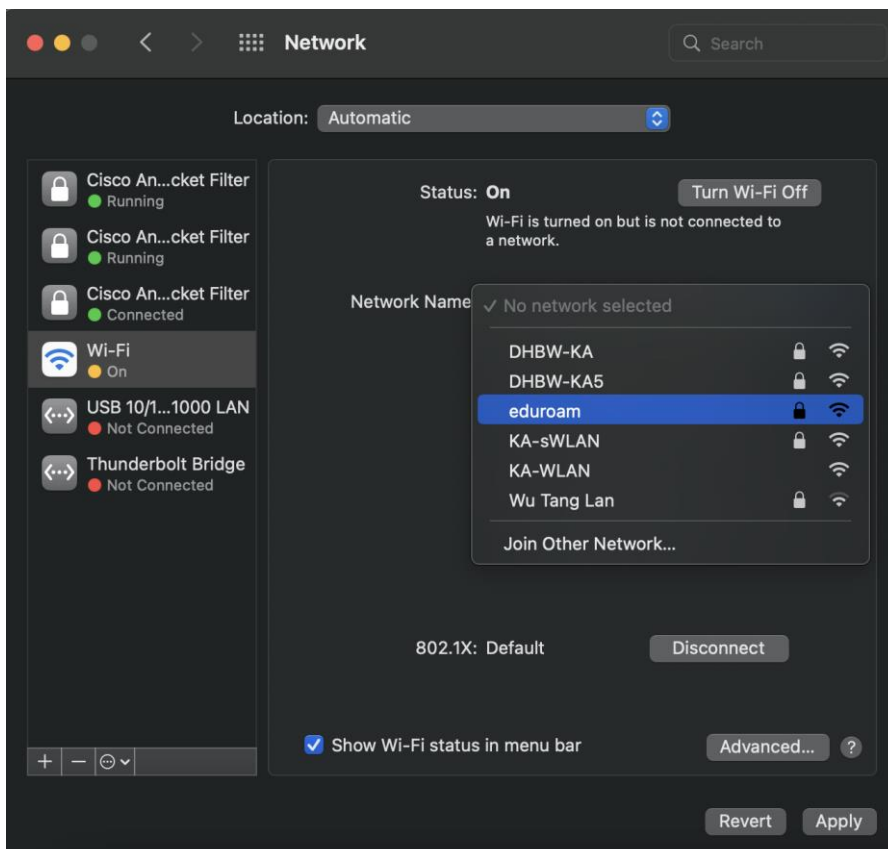
Then on “Network”:



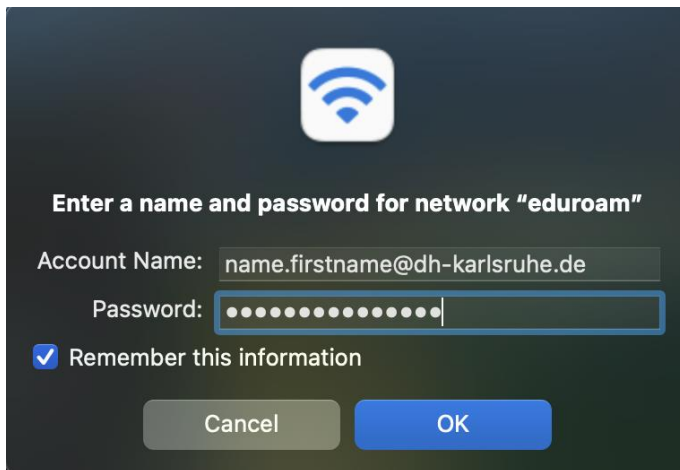
Turn on the Wi-Fi:



and select the network (“DHBW-KA” or “eduroam”) you would like to connect to:

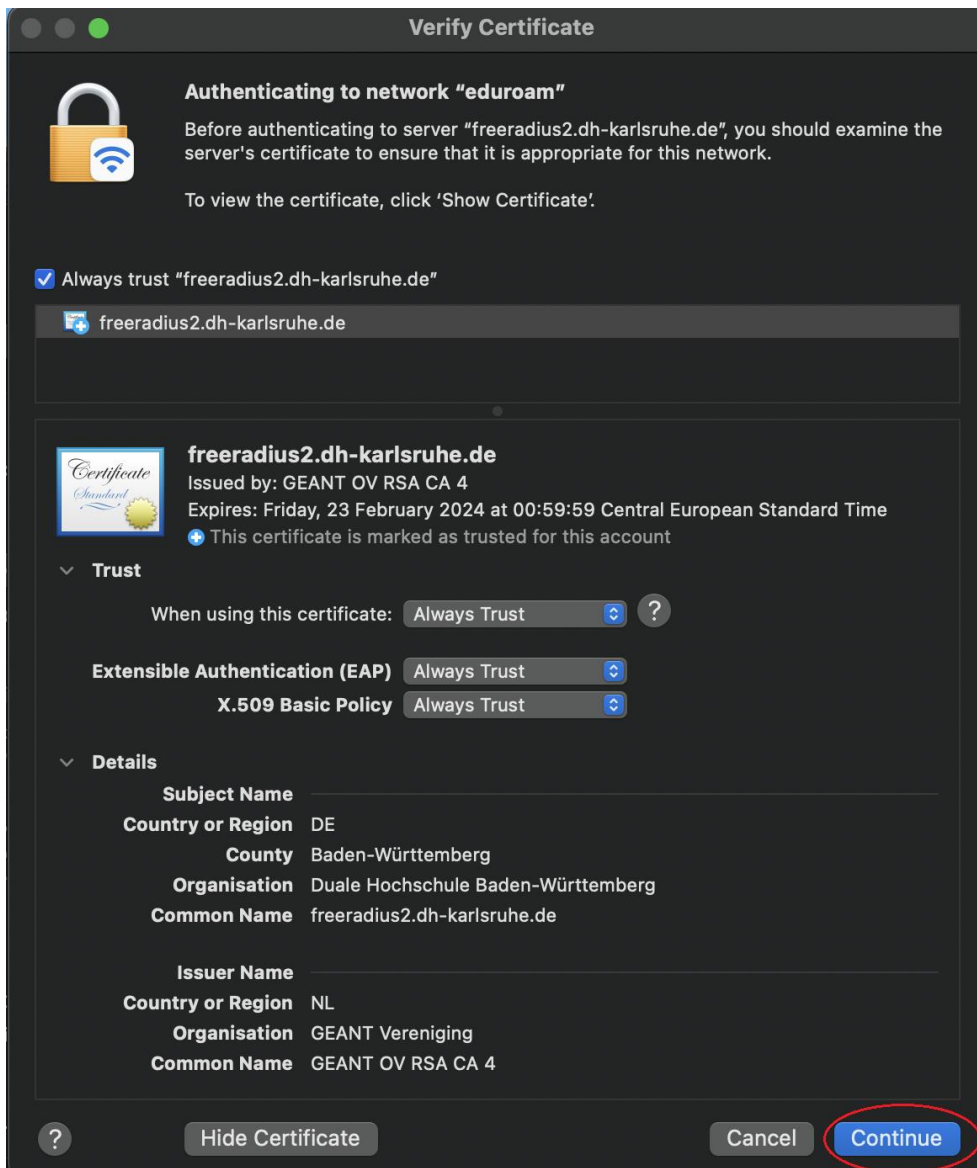


Enter your user credentials:



A dark-themed dialog box for network authentication. At the top is a white Wi-Fi icon. Below it, the text reads "Enter a name and password for network 'eduroam'". There are two input fields: "Account Name:" with the text "name.firstname@dh-karlsruhe.de" and "Password:" with a masked password of 12 dots. A checkbox labeled "Remember this information" is checked. At the bottom are two buttons: "Cancel" and "OK".

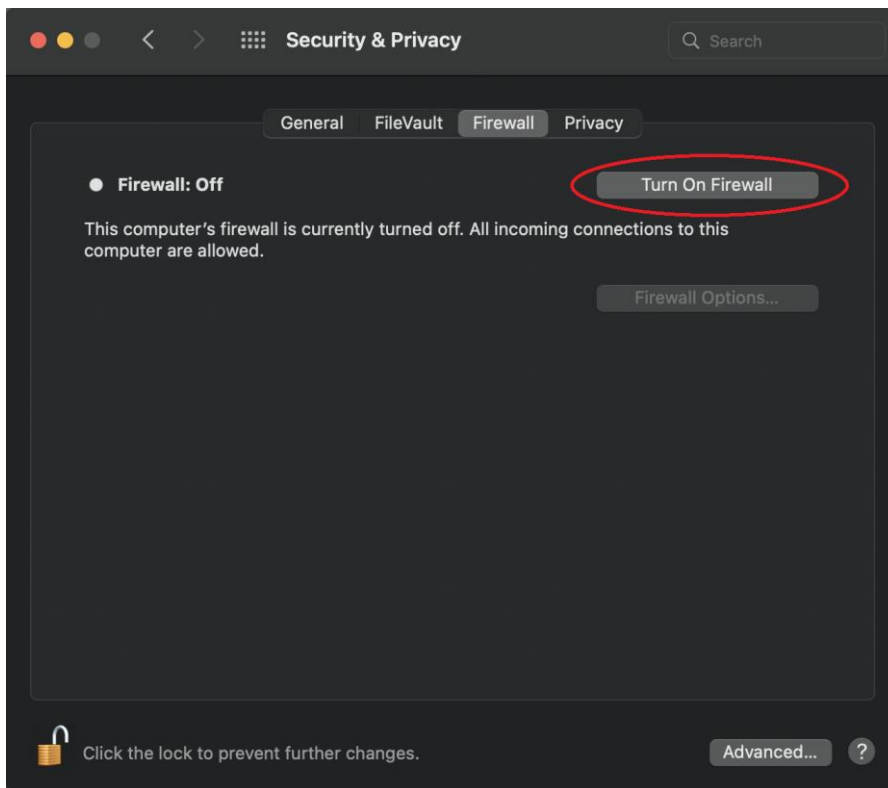
Verify and accept the current certificate:



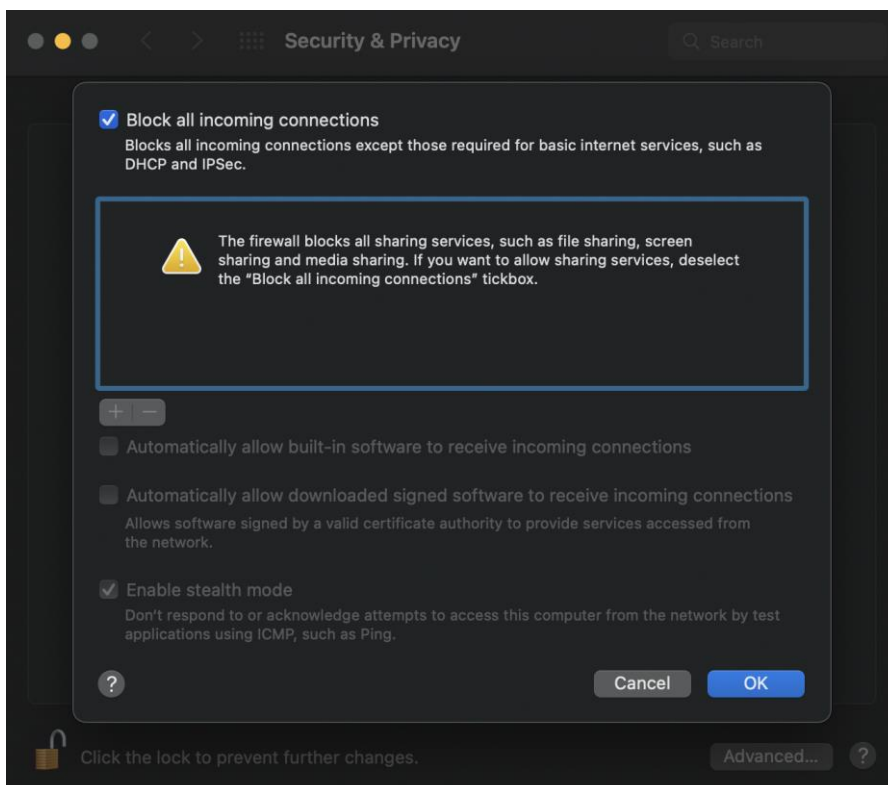
A "Verify Certificate" dialog box with a dark theme. It features a lock icon and the title "Authenticating to network 'eduroam'". The main text says: "Before authenticating to server 'freeradius2.dh-karlsruhe.de', you should examine the server's certificate to ensure that it is appropriate for this network. To view the certificate, click 'Show Certificate'." Below this is a checked checkbox "Always trust 'freeradius2.dh-karlsruhe.de'". A list shows the server "freeradius2.dh-karlsruhe.de". A certificate preview shows a "Certificate Standard" icon, the server name, and details: "Issued by: GEANT OV RSA CA 4", "Expires: Friday, 23 February 2024 at 00:59:59 Central European Standard Time", and "This certificate is marked as trusted for this account". Under "Trust", there are dropdown menus for "When using this certificate:", "Extensible Authentication (EAP)", and "X.509 Basic Policy", all set to "Always Trust". Under "Details", there is a list of fields: "Subject Name", "Country or Region: DE", "County: Baden-Württemberg", "Organisation: Duale Hochschule Baden-Württemberg", "Common Name: freeradius2.dh-karlsruhe.de", "Issuer Name", "Country or Region: NL", "Organisation: GEANT Vereniging", and "Common Name: GEANT OV RSA CA 4". At the bottom are buttons for "Hide Certificate", "Cancel", and "Continue" (which is circled in red).

You should now be connected to the selected network via Wi-Fi.

It's recommended to turn on your firewall and block incoming connections if you don't want to share data with other Wi-Fi users:



Click on "Firewall Options" and make sure all incoming connections are blocked:

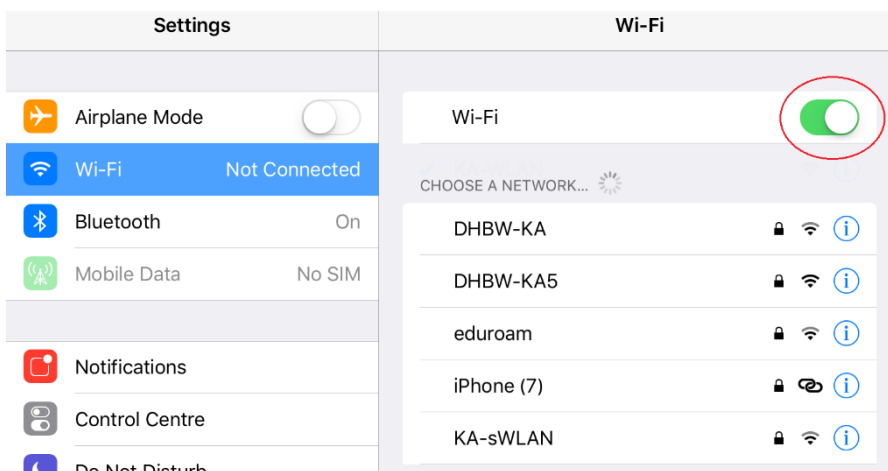


9. Setup on iOS

To connect your iPad or iPhone to the Wi-Fi go to the “Settings”:



Turn on the Wi-Fi in the corresponding menu and select the network (“DHBW-KA” or “eduroam”) you would like to connect to:



Enter your user credentials as follows:

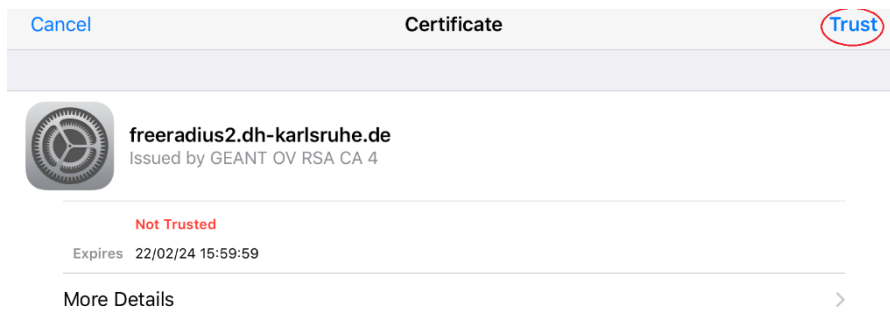
Enter the password for “eduroam”

Cancel
Enter Password
Join

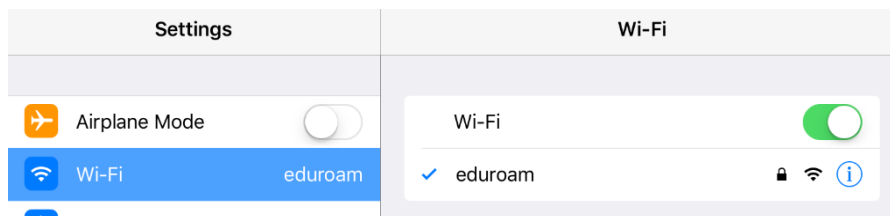
Username name.firstname@dh-karlsruhe.de

Password ●●●●●●●●●●

After tapping on “Join” you have to trust the used certificate once. Please make sure the displayed certificate is issued by „GEANT OV RSA CA 4“ („USERTrust RSA Certification Authority“ / „AAA Certificate Services“):



After that you should now be connected to the selected Wi-Fi:



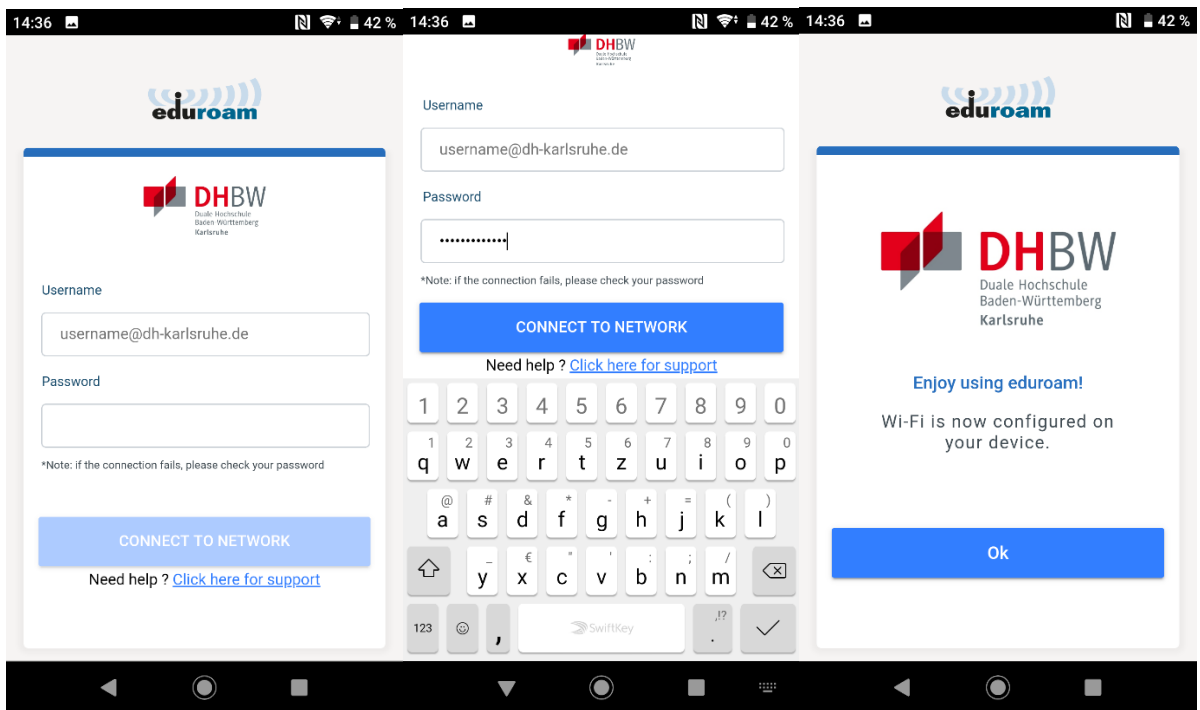
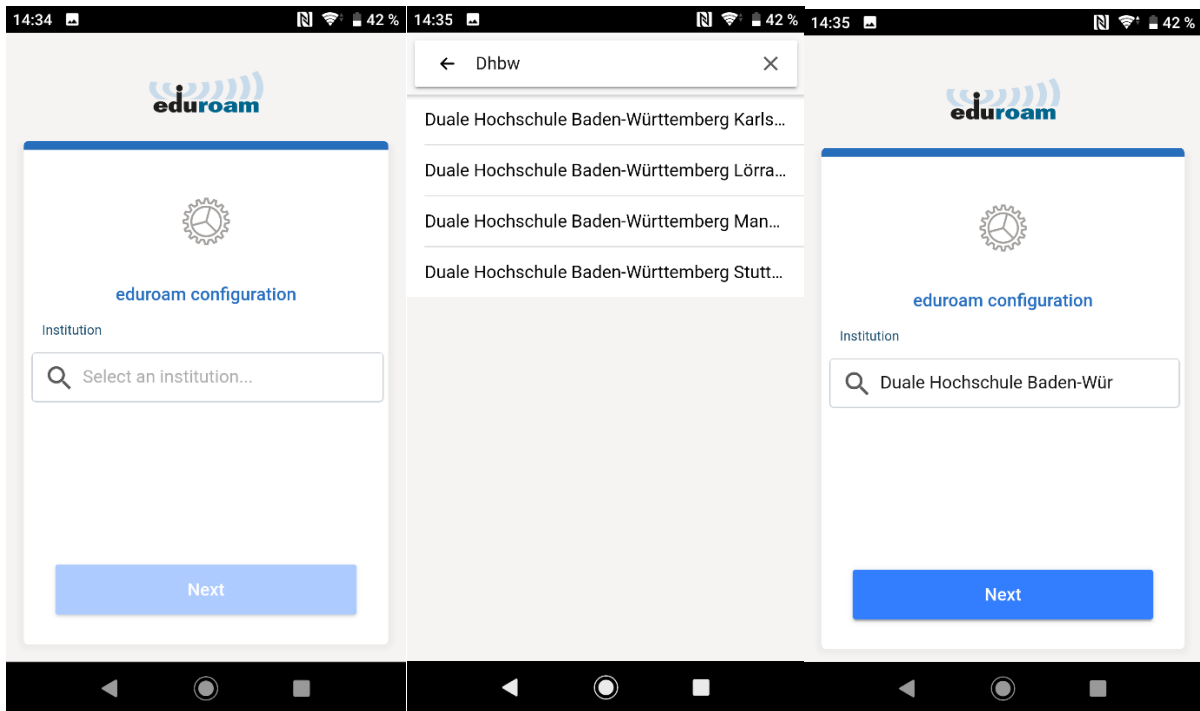
For iOS, the app geteduroam from SURF B.V. is also available in the App Store for setting up eduroam, see the following chapter.

10. The app geteduroam

The geteduroam app can be used on mobile devices for safe and easy setup. This must be installed on the mobile device from the Google Play Store or the Apple App Store.

- Open the app
- type DHBW in the search field, tap the entry “Duale Hochschule Baden-Württemberg Karlsruhe”, confirm with “Next”,
- enter your username and password in the appropriate fields, tap “Connect to network”
- Forbid connecting to suggested networks with “No thanks” and then tap “Save”.

After successfully setting up eduroam, the app can be deleted.



11. Certificate details

Server: freeradius.dh-karlsruhe.de **Issuer:** GEANT OV RSA CA 4
Thumbprint: C7 FE CD 0F D5 2B C3 F3 FB 12 52 18 E7 7F 1D C9 B2 53 8A D7

Server: freeradius2.dh-karlsruhe.de **Issuer:** GEANT OV RSA CA 4
Thumbprint: B0 63 7A 2A E5 E6 64 29 9F F8 E4 8E 45 74 C7 11 46 58 19 C1

Server: bilbo.dh-karlsruhe.de **Issuer:** GEANT OV RSA CA 4
Thumbprint: CE AE 46 AF D1 87 02 12 A5 8F 19 2B B6 B1 F5 D8 40 E 35 26

Server: aragorn.dh-karlsruhe.de **Issuer:** GEANT OV RSA CA 4
Thumbprint: BD E8 72 CC 76 AE 24 73 5D C8 A8 EA D5 BC D6 86 A3 BE FE