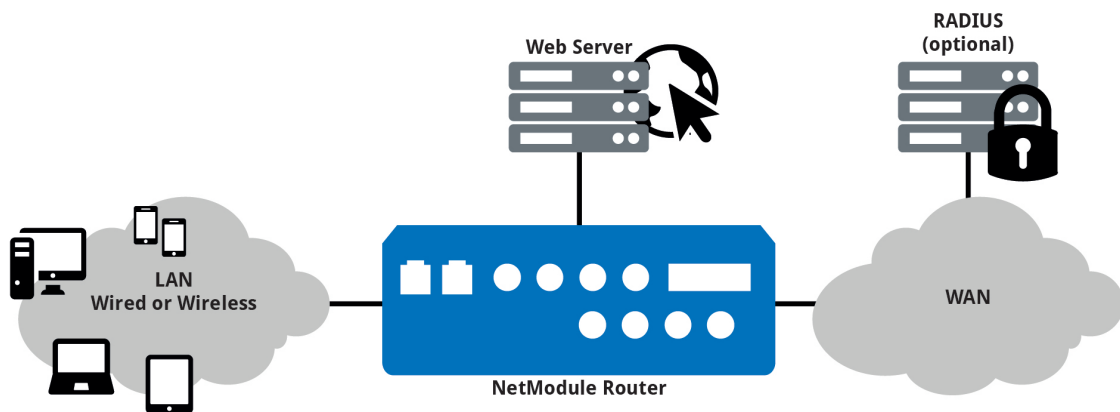# HOTSPOT Manual

NetModule Router How To

Hotspot Router Software Version 1.11
Manual Version 1.11

NetModule AG, Switzerland

November 19, 2018

Legal Notice

The specifications and information regarding the products in this manual are subject to change without notice. We would like to point out that NetModule makes no representation or warranties with respect to the contents herein and shall not be responsible for any loss or damage caused to the user by the direct or indirect use of this information This document may contain information about third party products or processes. Such third party information is generally out of influence of NetModule and therefore NetModule shall not be responsible for the correctness or legitimacy of this information. Users must take full responsibility for their application of any products.

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Contents

List of Figures

1 Conformity

This chapter provides general information for putting the router into operation.

1.1 Safety Instructions

NetModule routers must be used in compliance with any and all applicable national and international laws and with any special restrictions regulating the utilization of the communication module in prescribed applications and environments.

We would like to point out that only the original accessories, shipping with the router, must be used in order to prevent possible injury to health or damage to appliances and to ensure that all the relevant provisions have been complied with. Unauthorized modifications or utilization of unapproved accessories may void the warranty. The routers must not be opened. However, it is possible to replace any pluggable SIM cards even during operation.

All circuits connected to the interfaces of the router must comply with the requirements of Safety Extra Low Voltage (SELV) circuits and have to be designed for indoor use only. Interconnections must not leave the building nor penetrate the body shell of a vehicle. Possible antenna circuits must be limited to over-voltage transient levels below $1\,500\,V_{DC}$ (according to IEC 62368-1, TNV-1 circuit levels) by using safety approved components.

HotSpot routers shall only be used with a certified (CE or equivalent) power supply which must have a power limited and SELV circuit[1] output.

They are basically designed for indoor use. Do not expose the communication module to extreme ambient conditions and protect the communication module against dust, moisture and high temperature.

We remind the user of the duty to observe the restrictions concerning the utilization of radio devices at petrol stations, in chemical facilities or in the course of blasting works in which explosives are used. Switch off the communication module when traveling by plane.

You need to pay increased attention when using the communication module close to personal medical devices, such as cardiac pacemakers or hearing aids. NetModule routers may also cause interference in the nearer distance of TV sets, radio receivers and personal computers.

Avoid any installation of the antenna during a lightning. Always keep a distance of more than 40 cm from the antenna in order to reduce exposure to electromagnetic fields below the legal limits. This distance applies to $\frac{\lambda}{4}$- and $\frac{\lambda}{2}$-antennas. Larger distances may apply to antennas with higher gain.

Any Ethernet cabling must be shielded, the Ethernet section of this manual provides more information.

Devices with a WLAN interface may be operated only with applicable Regulatory Domain configured. Special attention must be paid to country, number of antennas and the antenna gain. A misconfiguration will lead to loss of the approval.

Cellular antennas attached to the router must have an antenna gain of equal or less than 2.5 dBi. If an extension cable is used to attach the antenna, the antenna gain may be higher by

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[1]**Note:** Power supplies for routers with the Pb option (72-110 V_{DC}) cannot be a SELV circuit, since the voltage is greater than 60 V_{DC}.

the amount of cable attenuation. The user is responsible for the compliance with the legal regulations.

We highly recommended creating a copy of a working system configuration. It can be downloaded using the Web Manager and easily applied to a newer software release afterwards as we generally guarantee backward compatibility.

1.2 Declaration of Conformity

NetModule hereby declares that under our own responsibility that the routers comply with the relevant standards following the provisions of the *RED Directive 2014/53/EU*. The signed version of the *Declarations of Conformity* can be found on the NetModule web page.

1.3 Waste Disposal

In accordance with the requirements of the *Council Directive 2002/96/EC* regarding Waste Electrical and Electronic Equipment (WEEE), you are urged to ensure that this product will be segregated from other waste at end-of-life and delivered to the WEEE collection system in your country for proper recycling.

1.4 National Restrictions

This product may be generally used in all EU countries (and other countries following the *RED Directive 2014/53/EU*) without any limitation. Please refer to our WLAN Regulatory Database for getting further national radio interface regulations and requirements for a particular country.

1.5 Open Source Software

We inform you that NetModule products may contain in part open-source software. We are distributing such open-source software to you under the terms of GNU General Public License (GPL)[2], GNU Lesser General Public License (LGPL)[3] or other open-source licenses[4]. These licenses allow you to run, copy, distribute, study, change and improve any software covered by GPL, Lesser GPL, or other open-source licenses without any restrictions from us or our end user license agreement on what you may do with that software. Unless required by applicable law or agreed to in writing, software distributed under open-source licenses is distributed on an "AS IS" basis, WITHOUT WARRANTIES OR CONDITIONS OF ANY KIND, either express or implied.

To obtain the corresponding open source codes covered by these licenses, please contact our technical support at router@support.netmodule.com.

Acknowledgements

This product includes:

- PHP, freely available from http://www.php.net
- Software developed by the OpenSSL Project for use in the OpenSSL Toolkit (http://www.openssl.org)
- Cryptographic software written by Eric Young (eay@cryptsoft.com)
- Software written by Tim Hudson (tjh@cryptsoft.com)
- Software written Jean-loup Gailly and Mark Adler
- MD5 Message-Digest Algorithm by RSA Data Security, Inc.
- An implementation of the AES encryption algorithm based on code released by Dr Brian Gladman
- Multiple-precision arithmetic code originally written by David Ireland
- Software from The FreeBSD Project (http://www.freebsd.org)
- CoovaChilli, freely available from https://coova.github.io/

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[2] Please find the GPL text under http://www.gnu.org/licenses/gpl-2.0.txt
[3] Please find the LGPL text under http://www.gnu.org/licenses/lgpl.txt
[4] Please find the license texts of OSI licenses (ISC License, MIT License, PHP License v3.0, zlib License) under http://opensource.org/licenses

2 About this Manual

This manual describes the features of the NetModule Hotspot Standalone Solution and gives at the end of the document a short configuration example.

3 Overview

3.1 Supported NetModule Routers

- NB800
- NB1600
- NB2700
- NB2710
- NB2800
- NB3700
- NB3701
- NB3710
- NB3711
- NB3720
- NB3800

3.2 Feature List

1. Up to four different Hotspot interfaces
2. Administration
    a) Network configuration
    b) Captive portal name
    c) Logging
    d) Upload landing pages
    e) Pre-installed landing pages
3. Advanced
    a) Terms only service
        i. Bandwidth limitations
        ii. Traffic limitations
        iii. Inactivity timeout
        iv. Session timeout
    b) Radius
        i. Radius configuration
        ii. Accounting configuration
4. Walled Garden
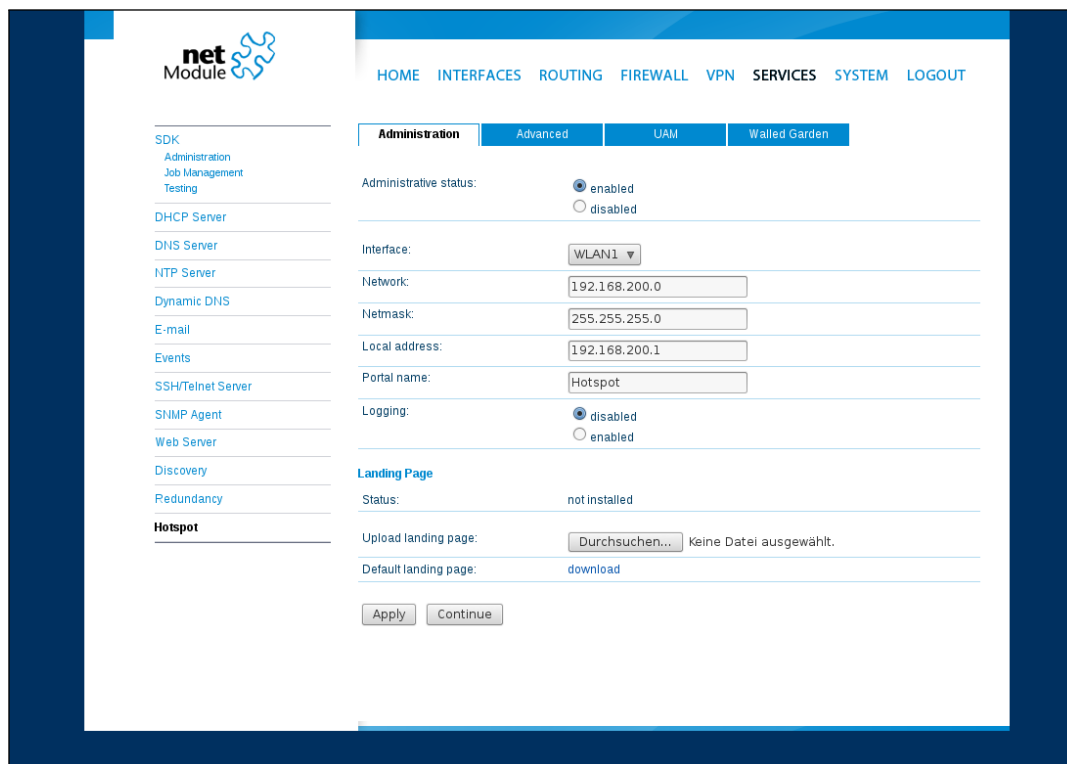
4 Detailed Feature Explanation

4.1 Administration

Figure 4.1: Hotspot Feature Administration

Parameter	Administration
Administrative status	Enable or disable the Hotspot instance
Interface	The interface which should be controlled by the Hotspot instance
Network	The network address
Netmask	The netmask
Local address	The local IP address
Portal name	The captive portal name
Logging	If enabled the Hotspot instance will show more logging
Status	Indication if the landing page is installed or not
Upload landing page	Upload customized landing pages
Default landing page	Download a landing page example

4.2 Advanced Settings

Two operational modes are available. The terms-only service (ToS) mode shows a Terms of Service page and the user has to accept these terms before getting access to the Internet. The second mode is for using an RADIUS configuration, which requires an external RADIUS server. In this mode the user is getting an captive portal web page with user login and password field before he can reach the Internet.
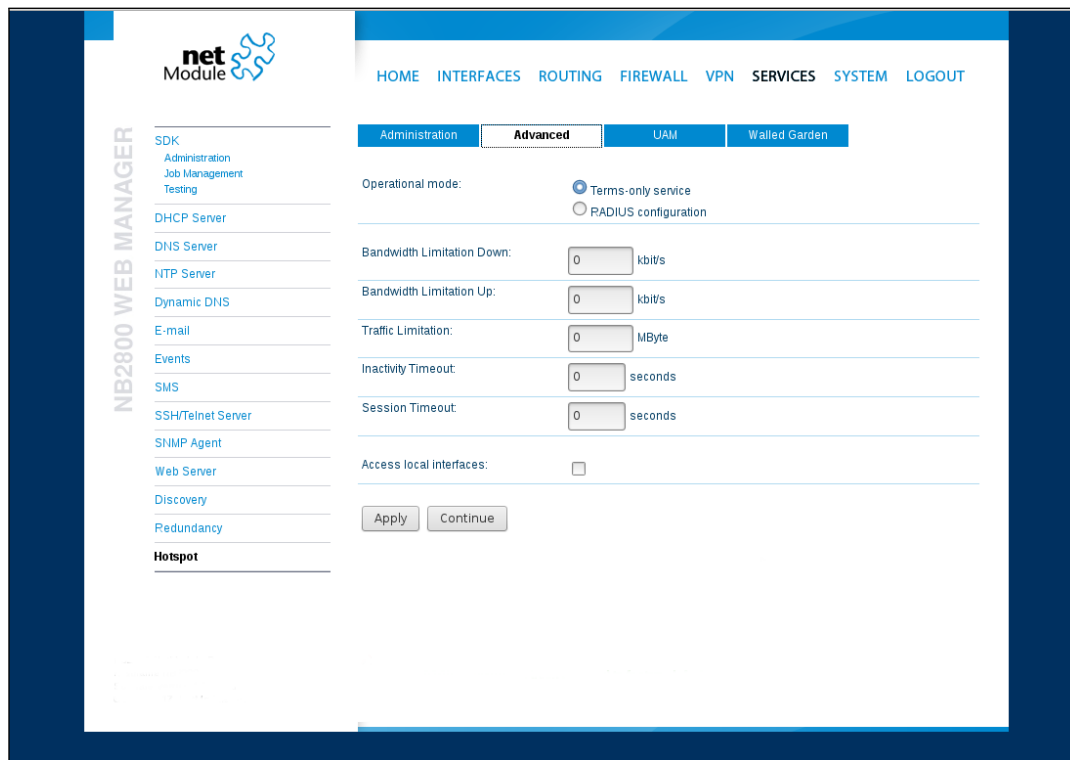
4.2.1 ToS

Figure 4.2: ToS

Parameter	
Bandwidth Limitation	This option limits the bandwidth (up and download) of each user/device which is connected and authenticated to the Hotspot interface. This option is available with ToS only.
Traffic Limitation	With this option it is possible to limit the data consumption per user/client. After reaching the given traffic limitation the user/client will be redirected to the login page again. This option is available. with ToS only.

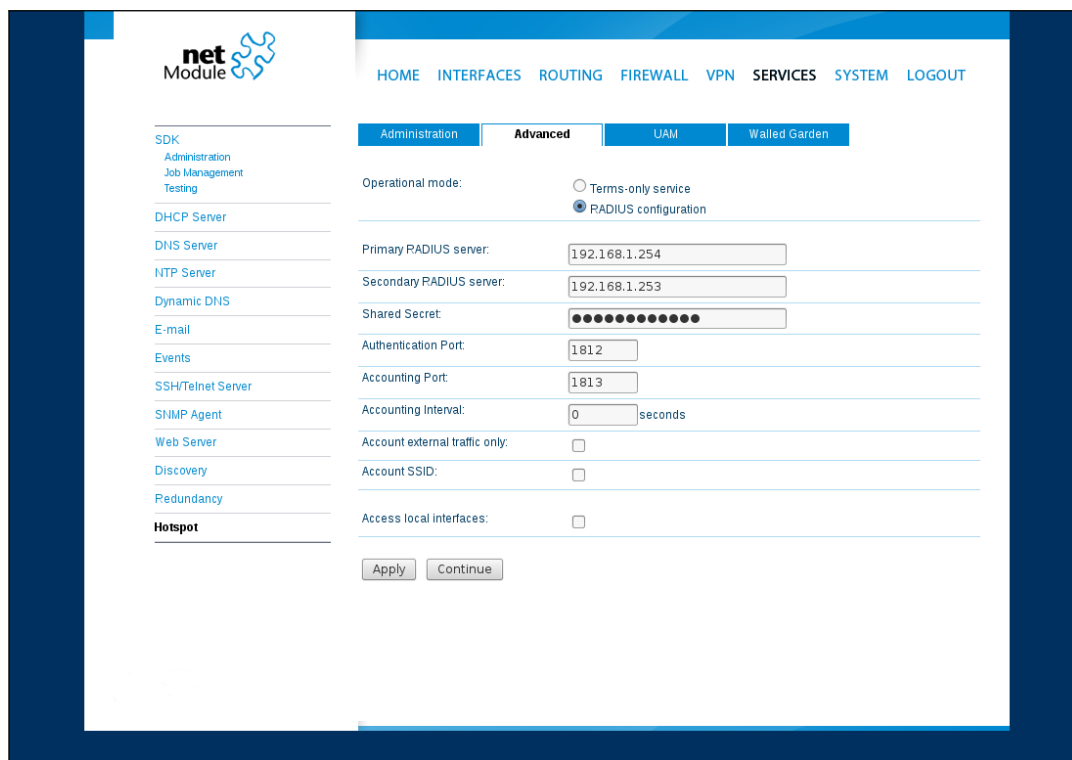| Parameter	
Inactivity Timeout	If a station does not send anything within this timeout the user will be automatically logged out. This option is available with ToS only.
Session Timeout	With this option it is possible to set the maximum session time in seconds. The client will be logout after the session timeout was reached. The default value 0 means unlimited time.
Access local interfaces	If selected, the user can reach services which are connected on a local interface of the router

4.2.2 RADIUS

Figure 4.3: RADIUS

Parameter	
RADIUS Server	The IP address of the radius server. This option is available with RADIUS configuration only
Shared Secret	This option defines the shared secret of the radius server (RADIUS configuration only)

Parameter	
Authentication Port	The authentication port of the radius server. This option is available with radius only.
Accounting Port	The authentication port of the radius server. This option is available with radius only.
Accounting Interval	This interval specifies in which seconds the Hotspot process will report accounting information to the radius server. This option is available with radius only.
Account external traffic only	If enabled the Hotspot process will report external traffic only. This means the internal traffic like Walled Garden traffic will be ignored. This option is available with radius only.
Account SSID	If enabled the Hotspot process will append the MAC of the RADIUS Called Station ID with the SSID of the current WLAN interface separeted by a colon. This option is available with radius only.
Access local interfaces	If selected, the user can reach services which are connected on a local interface of the router

4.3 UAM

With the Universal Access Method (UAM) settings it is possible to configure external services for hotspot e.g. external custom landing page.
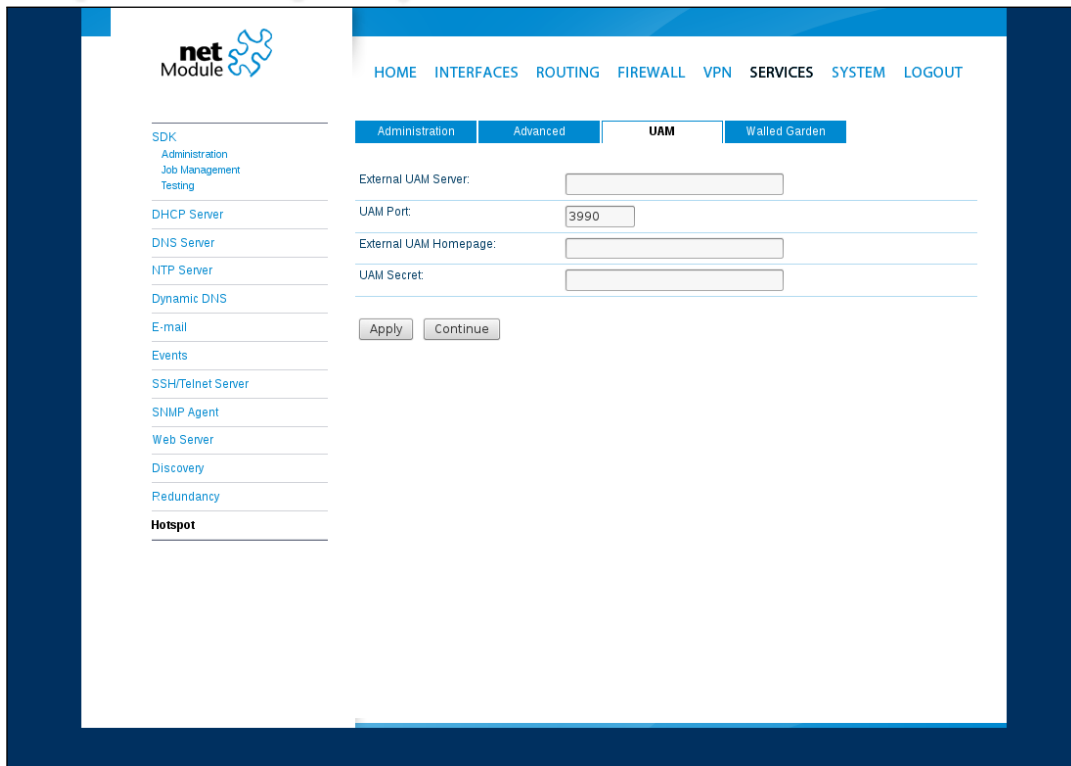
Figure 4.4: UAM

Parameter	
External UAM Server	The URL of the web server for client authentication
UAM Port	If an unauthenticated client tries to access the internet the client will be redirected to this port of the local IP address of the router
External UAM Homepage	The URL of the homepage where unauthenticated clients were redirected
UAM Secret	The shared secret between external UAM server and hotspot process.

Note: If not using an external UAM server or UAM hompage, leave the configuration parameter empty to use the default values.

4.4 Walled Garden
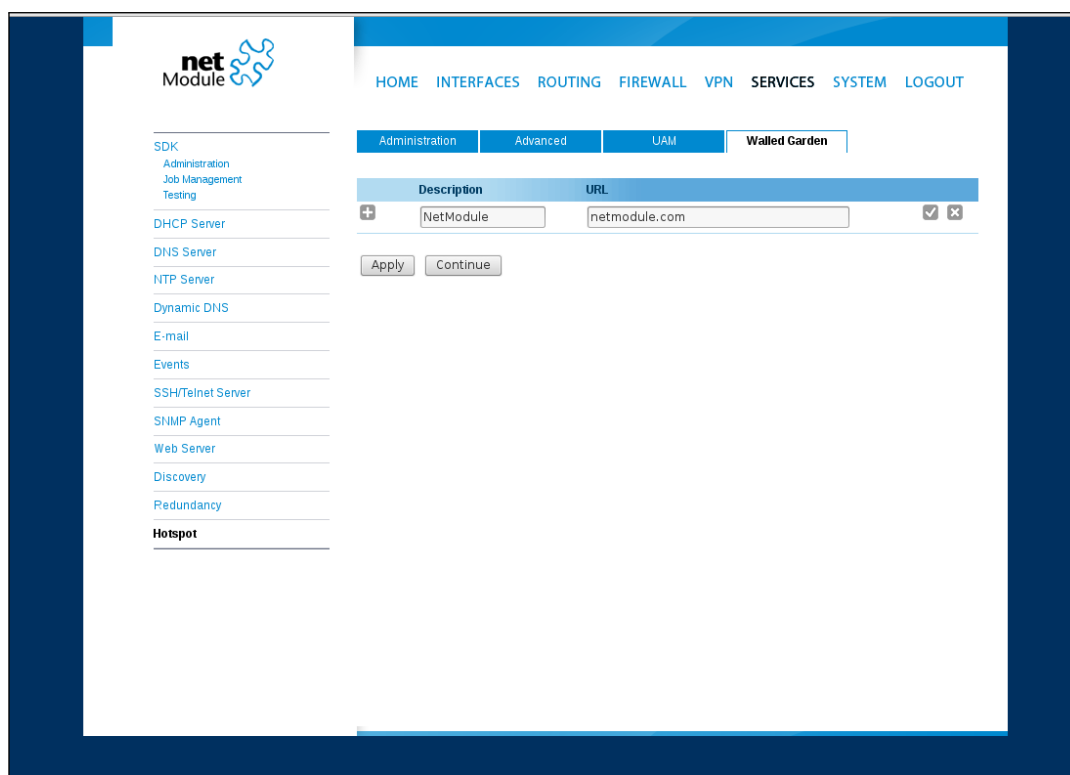
Figure 4.5: HotSpot Feature Walled Garden

With the Walled Garden settings it is possible to offer free services like web pages to the customer/user without having an account or without accepting the ToS agreements. The services which are configured via an URL and a description will be ignored by the captive portal and the user will reach the services directly.

5 Example

This chapter describes how to configure the NetModule standalone hHotspot solution with a small example.

5.1 Scenario

- WAN uplink via mobile interface
- WLAN
    - 2.4 GHz operation mode
    - Channel 1
    - SSID name „Hotspot"
    - public wlan with no security option
- Hotspot
    - Captive portal name: „Hotspot"
    - Network: 192.168.200.0/24
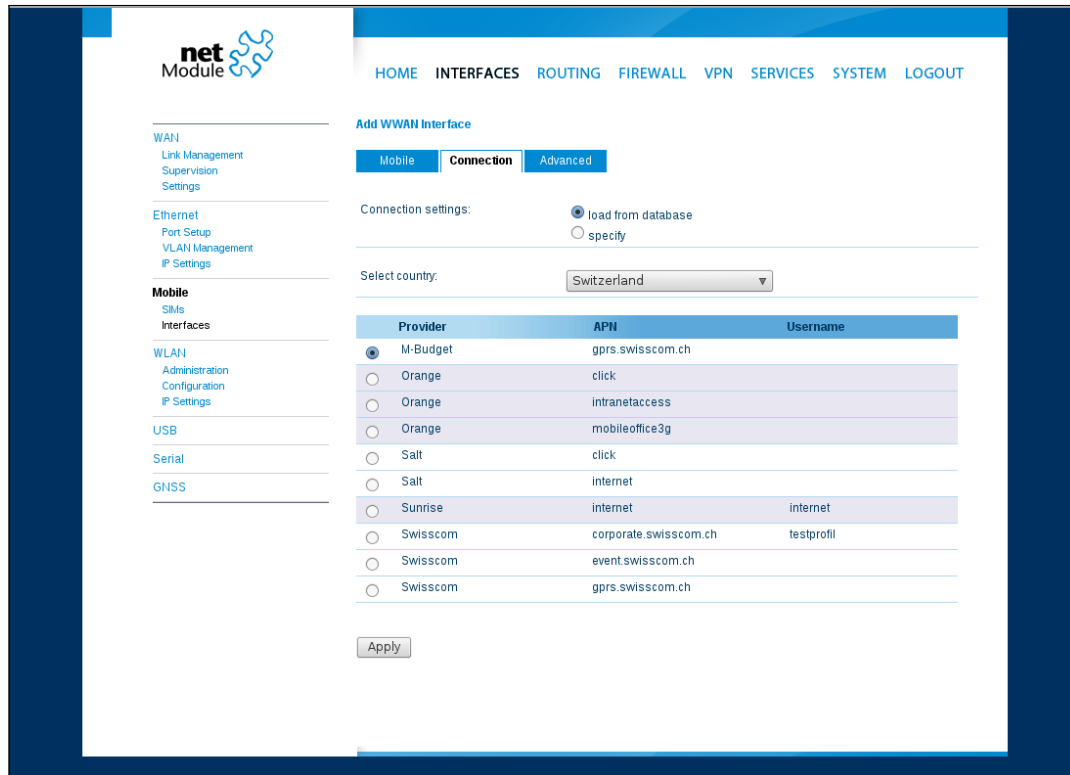   - Operational mode: „terms-only service"

5.2 Prerequisites

- NetModule router with WLAN interface and supporting hotspots.
- Official NetModule router with installed hotspot patch image.
  Download here

The following configurations steps are made with the GUI of the NetModule router. Therefore access the IP-address of the router with an internet browser. The manual uses software version 4.0.0.106 with hotspot version 1.7 on a NetModule NB2800 router (screenshots might look different).

5.3 Configuration

(Mobile->Interfaces->Connection)

Figure 5.1: Mobile WWAN configuration

Configure mobile WWAN interface. For further information how to configure a WWAN uplink please refer to the router user manual.

5.3.1 WLAN Administration
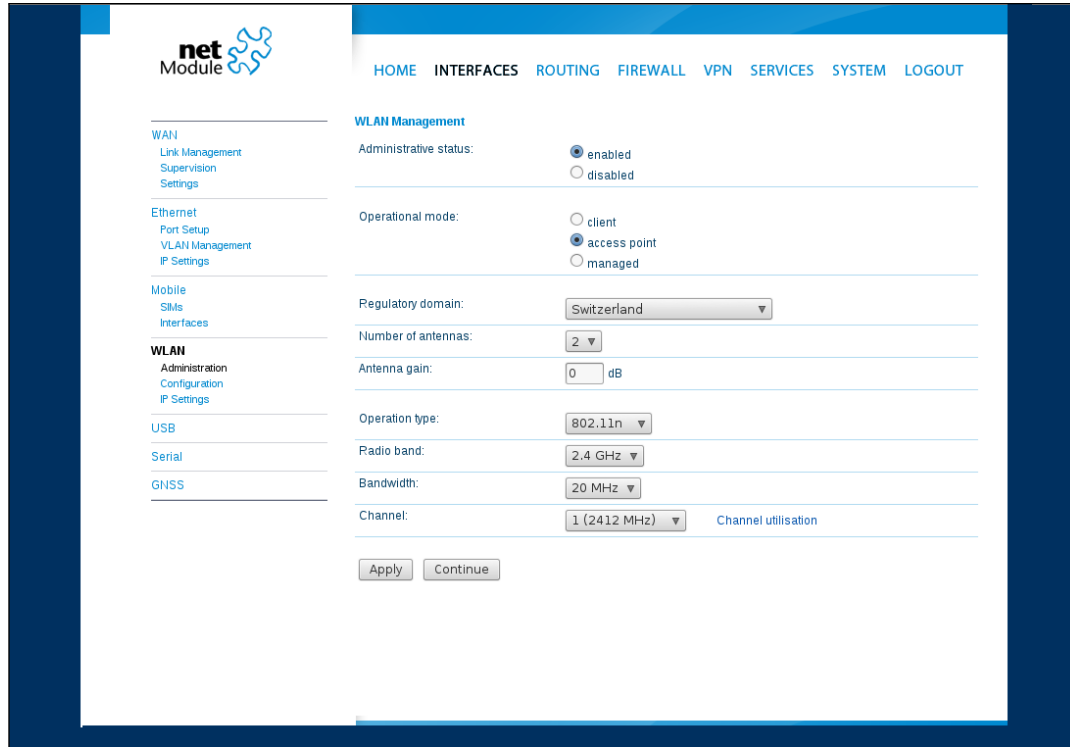
(Interfaces->WLAN->Administration)

Figure 5.2: WLAN administration

Enable administration status and configure WLAN interface as follows:

Parameter	Setting
Regulatory domain	The country where the access point is used
Operation type	To have optimal compatibility use 802.11n or 802.11ac if available
Radio band	2.4 GHz operation
Bandwidth	20Mhz
Channel	1 (2412 MHz)

5.3.2 WLAN Configuration
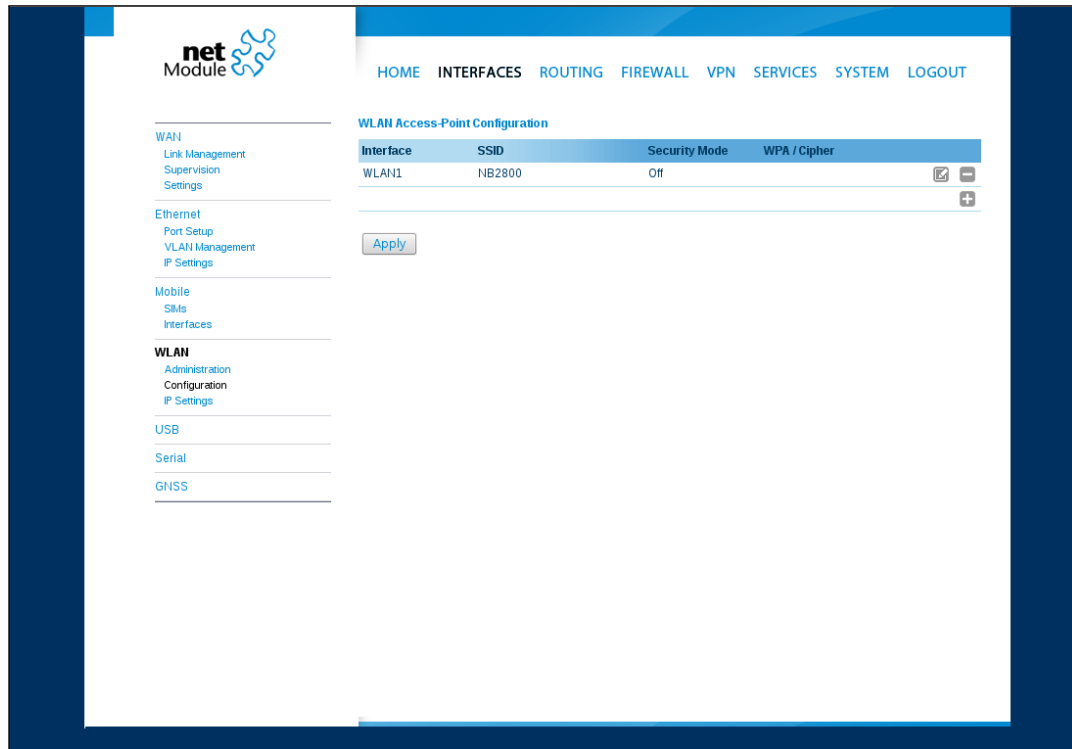
(Interfaces->WLAN->Configuration)

Figure 5.3: WLAN configuration

Press continue and follow up with access point configuration page. Add WLAN interface by clicking the "edit"-button.
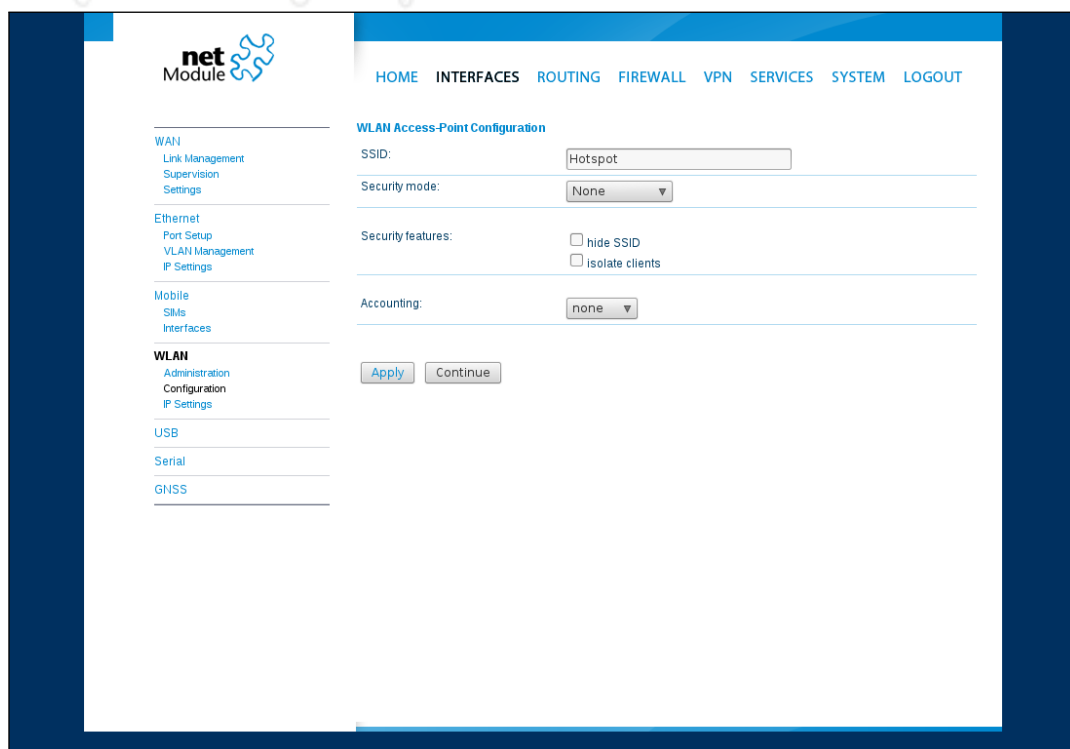
Figure 5.4: WLAN Access Point configuration

Parameter	Setting
SSID	Hotspot
Security mode	none

Apply configuration via "Apply"-button.

5.3.3 Hotspot Interface

(Services->Hotspot)
Add hotspot interface by clicking the "+"-button
Enable administrative status and continue with following configuration:

Figure 5.5: HotSpot Configuration

Parameter	Setting
Interface	Choose "WLAN1" as interface
Portal name	type "Hotspot" as portal name

Apply configuration: press "Apply"-Button

5.4 Results

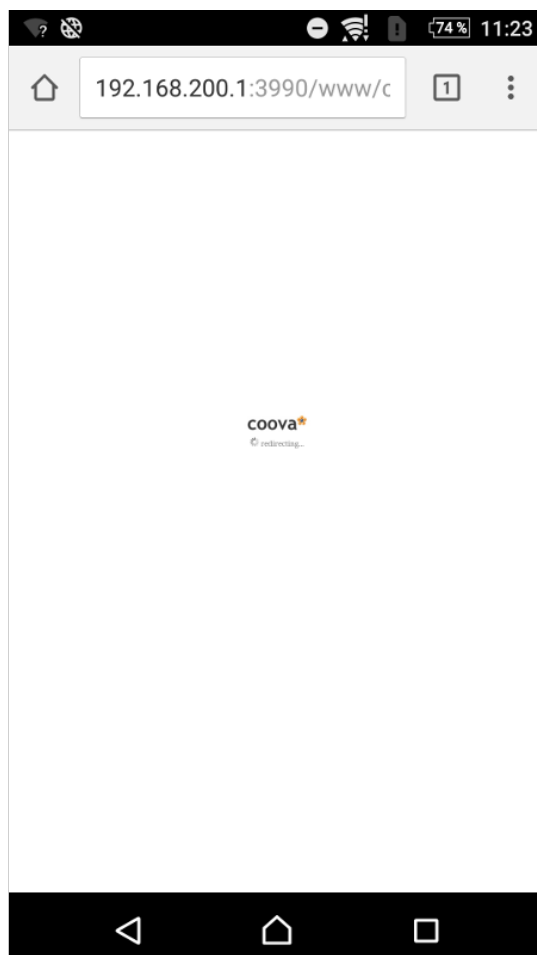Now the client will be redirected to the captive portal site first.
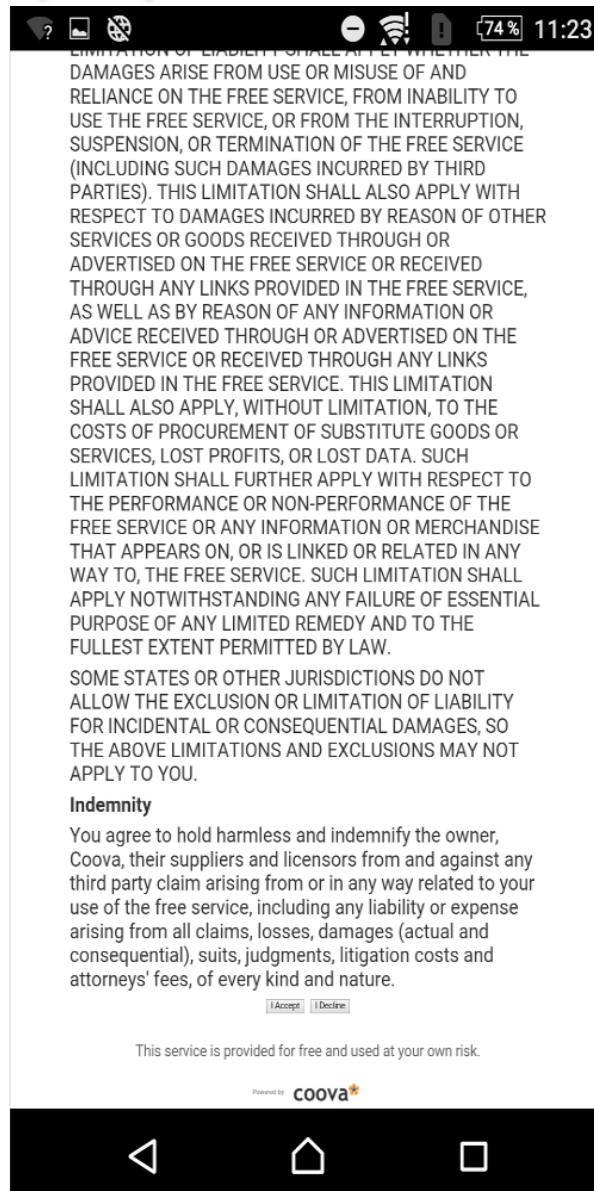

Figure 5.6: Client redirect

Figure 5.7: Client ToS

6 Technical Support

NetModule's mission statement includes a professional and friendly team of support engineers which will be pleased to offer consultancy, provide assistance and deliver solutions in case of technical issues. With their broad-based experience they will be able to narrow down your problem and thus prevent you from getting too much gray hair.

In case of support requests please use the form at our support page and submit a detailed description of your problem together with a tech-support file which contains all the necessary information to speed up the process of analyzing and resolving your problem.

The latest software and documentation material can be found in the technical support area via the NetModule website.