# Mikrotik -> Basic

# Introduction

With this scenario we assume you have:

- A recent installation of RADIUSdesk which includes Dynamic RADIUS Clients support.
  - We will use our **Radiusdesk Hosted** server which has an IP Address of **178.32.59.137** in this document.
  - Our **Radiusdesk Hosted** server has a site wide RADIUS shared secret of **RDhostedXYZ2525**.
- A new (or reset to defaults) Mikrotik RouterBOARD 751U which you will set up from scratch.
- You want to run a Captive portal on the Mikrotik's WiFi interface.

## Getting started

- To reset the RouterBOARD 751U simply hold the **reset** button in during start-up until the **ACT** LED starts flashing. Now release the **reset** button.
- You should now be able to connect on any of the Ethernet ports 2-5. (Port 1 needs to connect to the Internet).
- If you connect with a machine which has DHCP enabled; you will get a 192.168.88.x IP Address while the RouterBOARD 751U can be reached through 192.168.88.1.
- The default username is **admin** with **no password**.

## Our approach

We will take the following configuration approach. This approach very common on the 751U.

- Ethernet port 1 (Marked PoE) will be used to connect the 751U to the Internet. (Typically a DSL router's Ethernet port)
- Ethernet port 1 will be configured to be a **DCHP Client**.
- Ethernet ports 2-5 will be used as a Ethernet switch which runs a DHCP Server and NAT traffic between Ethernet port 1 and Ethernet ports 2-5.
- The WiFi interface will be used to run the Captive Portal (Hotspot) on.
- This Captive Portal will regulate traffic between the WiFi interface and Ethernet port 1.

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# Prepare Mikrotik

**Captive Portal or Hotspot?**

- Mikrotik uses the term Hotspot to refer to a Captive Portal.
- We prefer to use Captive Portal which is technically speaking more correct.

In order to get a Captive Portal up and running on the Mikrotik we will need to configure and confirm the following items. We assume a device reset to factory defaults.

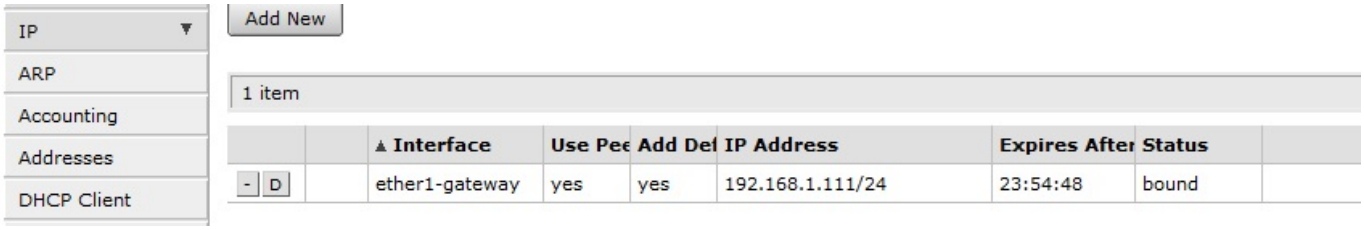
1. Set the Mikrotik's identity.
2. Confirm the **Ethernet-1** port is a DHCP client and did receive a valid IP Address from our DSL router.
3. Remove **wlan1** WiFi interface from the bridge with the name **bridge**.
4. Add a RADIUS server.
5. Configure a Hotspot running on the **wlan1** WiFi interface.
    1. Configure a DHCP pool that the hotspot will use for assigning IP Addresses.
    2. Configure a Profile that makes use of the RADIUS server which we already defined.

# Set the Mikrotik's identity

- We will use a fictional convention and assume that this Mikrotik is the first one deployed in the city of Pretoria, Gauteng province, South Africa.
- The systems identity will thus be **za-gp-pta-001**.
- Connect to the Mikrotik's web interface and select **System → Identity**.
- Specify the Identiry as **za-gp-pta-001** and click **Apply**

# Confirm Ethernet-1's status

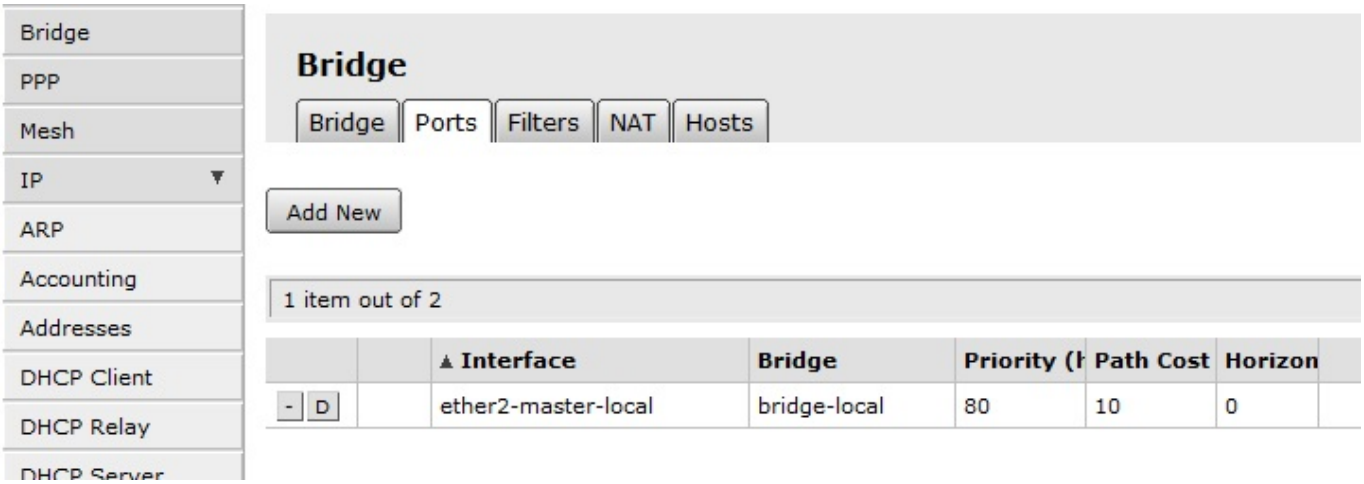
- Connect to the Mikrotik's web interface and select **IP → DHCP Client**.
- The **ether1-gateway** interface should be listed along with it's DHCP supplied IP Address.




- If this is not listed or the interface does not have an IP Address assigned to it; ensure that it is fixed before continuing.

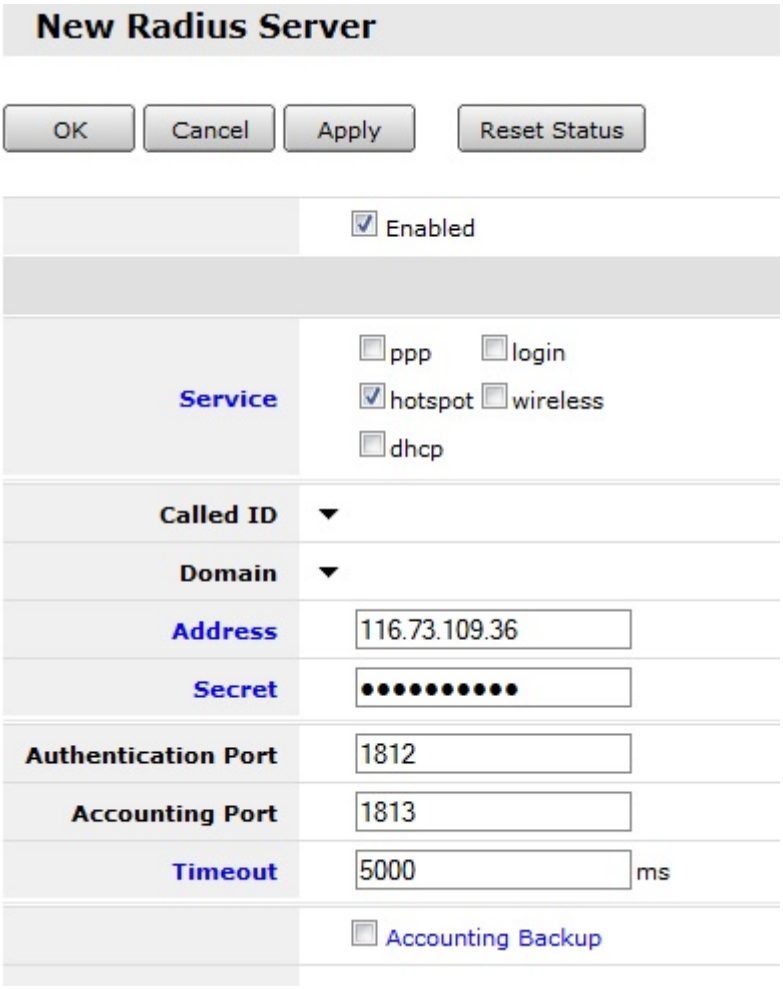
# Remove wlan1 from bridge-local

- Connect to the Mikrotik's web interface and select **Bridge**.
- Select the **Ports** sub-tab to see the list of ports and to which bridge they are assigned.
- By default **wlan1** and **ether2-master-local** will be members of the bridge named **bridge**.
- Remove **wlan1** from the list of ports (thus being a member of the bridge named **bridge**).




# Add a RADIUS server

- Mikrotik allows you to define zero or more RADIUS servers. The Mikrotik will in turn become a client to these pre-defined servers.
- Connect to the Mikrotik's web interface and select **Radius**
- Click the **Add new** button to add a RADIUS server.
    - Select the **Hotspot** service.
    - Specify the IP Address of the RADIUSdesk server running FreeRADIUS. (We use 178.32.59.137)
    - Specify the shared secret. (We use RDhostedXYZ2525)
    - Since our server is somewhere out on the Internet, we increase the timeout to 5000ms.
    - Leave **Accounting Backup** unchecked.




- Next we will set-up the hotspot

# Configure a Hotspot running on the wlan1 WiFi interface

## Add a Hotspot using the setup wizard

- Connect to the Mikrotik's web interface and select **IP → Hotspot**.
- Click the **Hotspot Setup** button. (Do not use the **Add New** option this time)
- Select the **Hotspot Interface** as **wlan1** and click **next**.
- Specify the **Local address of Network** as **10.5.50.1/24**
- Ensure **Masquerade Network** is selected.
- Click **Next** to continue.
- Keep the default value of **Address Pool of Network** (10.5.50.2-10.5.50.254).
- Click **Next** to continue.
- Specify **Select certificate** as **none** since we will not use https.
- Click **Next** to continue.
- Keep the default value for **IP Address of SMTP Server** (0.0.0.0).
- Click **Next** to continue.
- Keep the default value for **DNS Servers**. This will be the value assigned by the DHCP server to the Ethernet-1 interface.
- Click **Next** to continue.
- Keep the default value for **DNS Name** (empty).
- Click **Next** to continue.

- Supply a local admin user for the hotspot with a password.
- Click **Next** to continue.
- This should bring you to the end of the wizard and leave you with an entry in the list of available configured hotspots.

### Understanding the Hotspot configuration

- The **Hotspot Setup** wizard did the following behind the scenes. You are welcome to confirm in order to understand the Mikrotik better.
  - Created a DHCP server pool called **dhcp1** running in interface **wlan1**
    - Confirm by viewing **IP → DHCP Server**.
    - **Networks** sub-tab will contain a *;;;Hotspot network* with the 10.5.50 range.
  - Created a hotspot server profile called **hsprof1**.
    - Confirm by viewing **IP → Hotspot**.
    - **Server Profiles** sub-tab will contain the **hsprof1** entry.

### Modify the created Server Profile

Be sure to do the following steps. Failing to do this will not allow the hotspot to use the RADIUS server.

- We need to tel the **hsprof1** Server Profile to make sure it use RADIUS.
- Connect to the Mikrotik's web interface and select **IP → Hotspot**.
- Select **IP → Hotspot**. Select the **Server Profiles** sub-tab and select **hsprof1**
- Make sure **Use RADIUS** is selected.
- Make sure **Interim Update** has a sane value e.g. 00:10:00 for every 10 minutes.
- Click **Apply** to save this value.
- You can optionally enable MAC authentication and the format of the MAC address. Select **XX-XX-XX-XX-XX-XX** to work with RADIUSdesk.

Your Mikrotik Hotspot is now configured. Next we will prepare RADIUSdesk.

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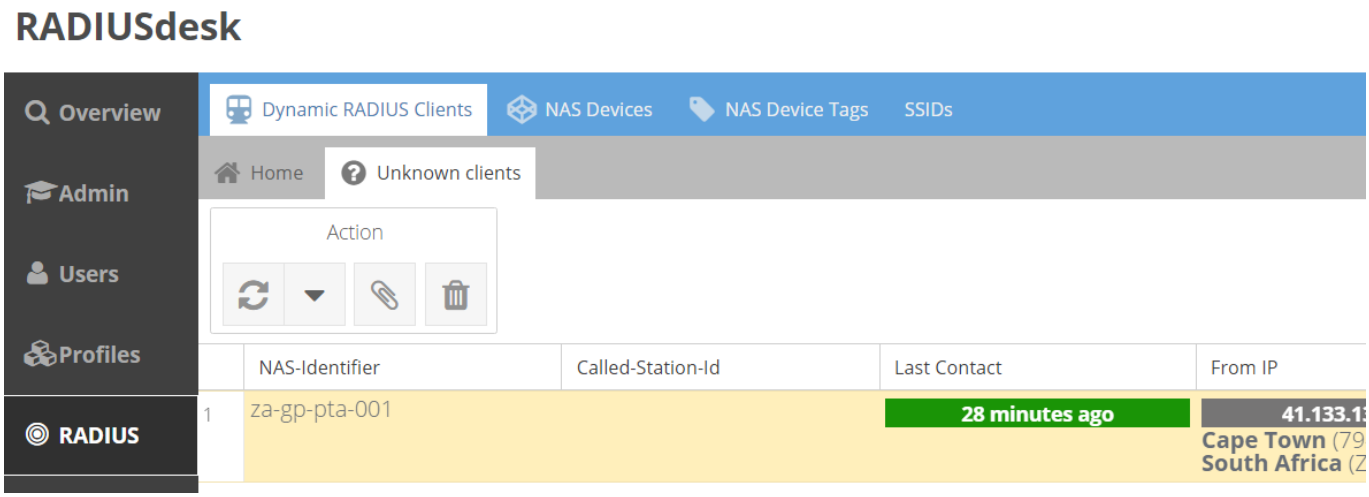
# Prepare RADIUSdesk

## Our situation

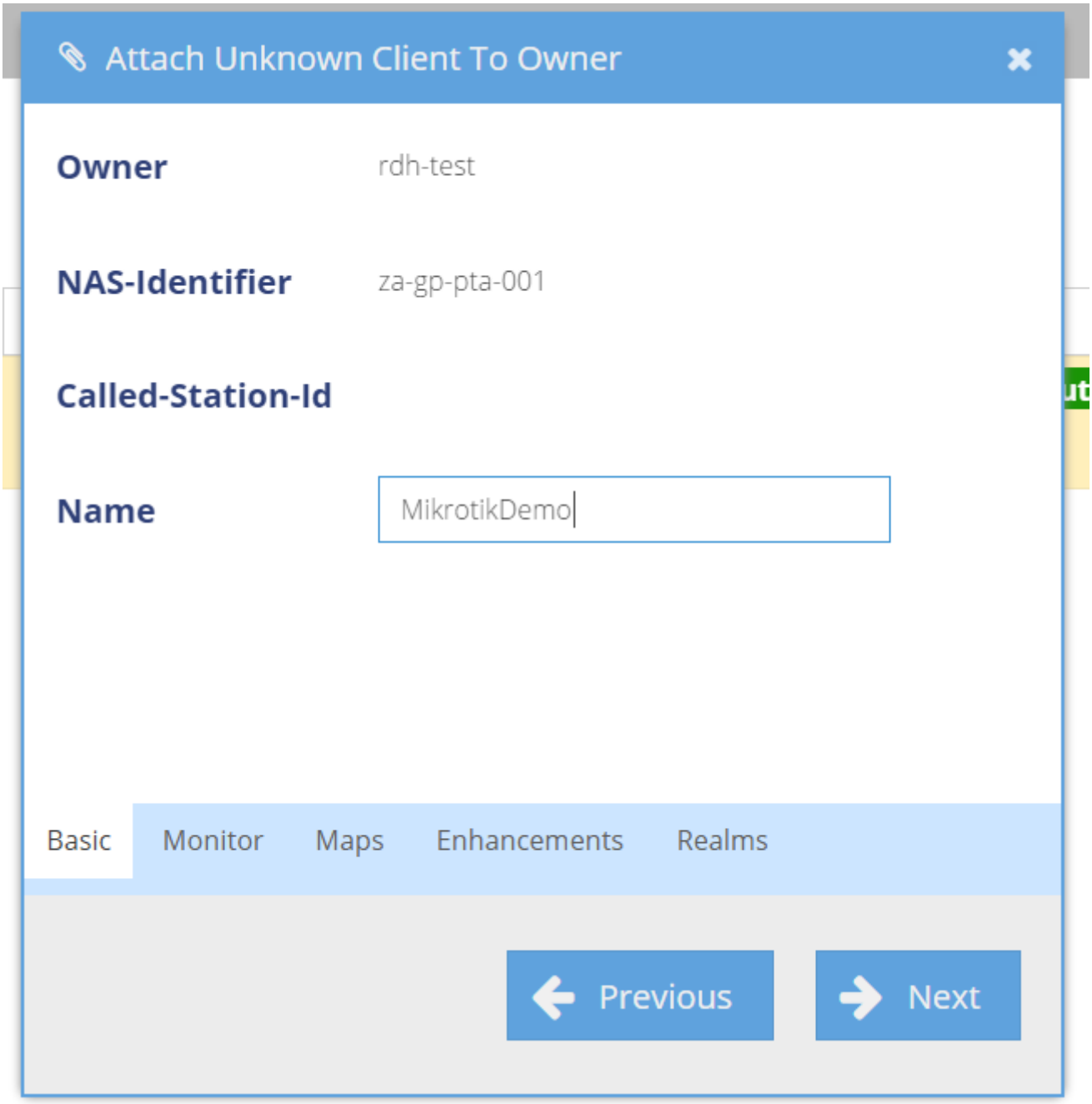
- With our setup in this document, we make use of a VPS server that runs RADIUSdesk somewhere in the cloud. (We use our **Radiusdesk Hosted** server.)
- Recent versions of RADIUSdesk makes it super easy to add a RADIUS client to the FreeRADIUS server to which RADIUSdesk is a front-end.
- One simply have to take care of the following items when you are pointing a RADIUS client to the RADIUSdesk server.

    - Specify the public IP Address of the RADIUSdesk server.
    - Ensure the site wide shared secret is correct. (Check this with the person who configured the RADIUSdesk server)
    - Ensure there is a unique identifier the RADIUS client can identify itself to the server. (We did this by setting the **Identity** of the Mikrotik router.)
- After you took care of that a simply reboot the Mikrotik router while it has an active Internet connection.
- It should then be reported under the **Unknown Clients** list of the **RADIUS → Dynamic RADIUS Clients** applet.

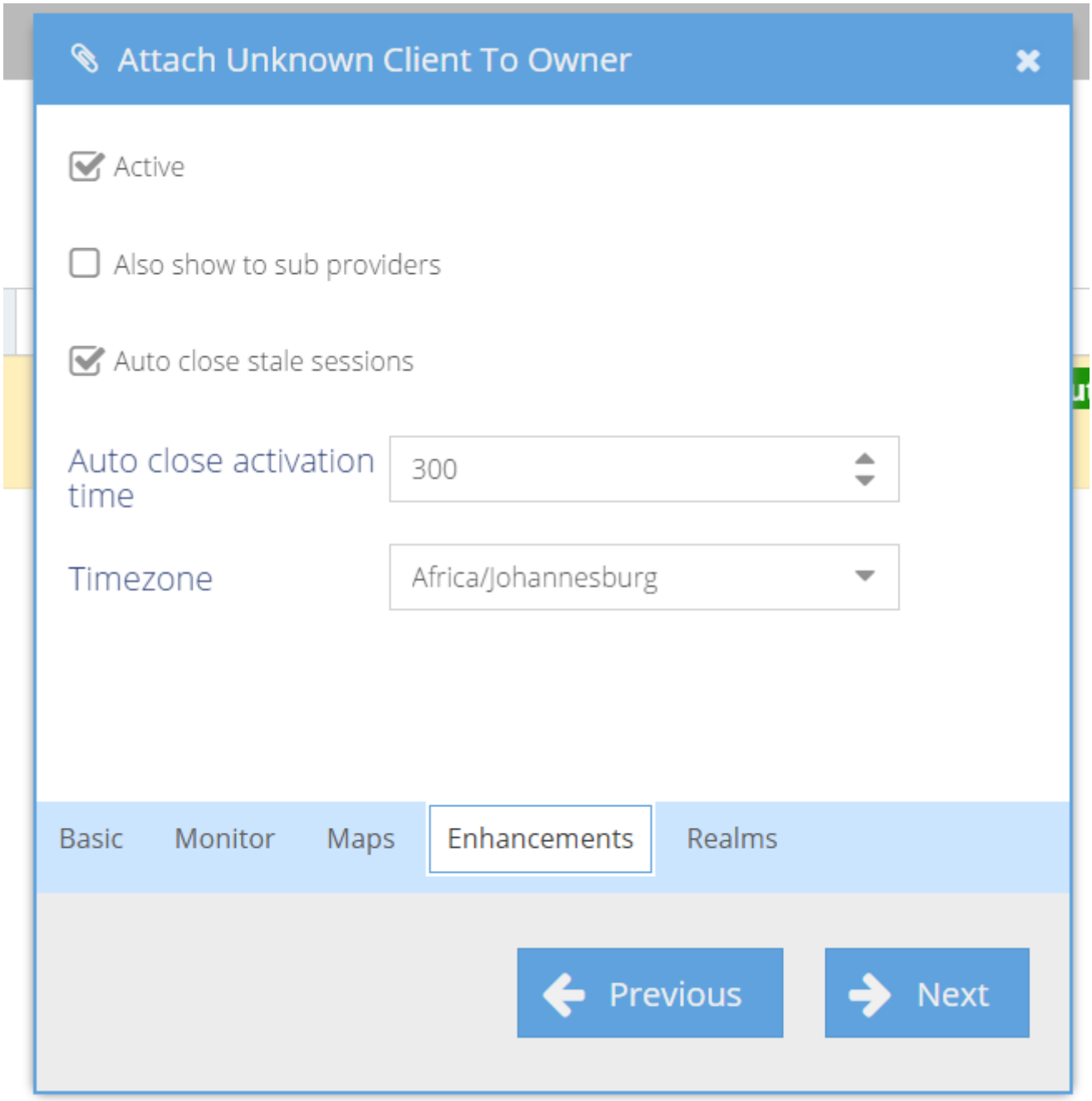



# Converting an Unknown client

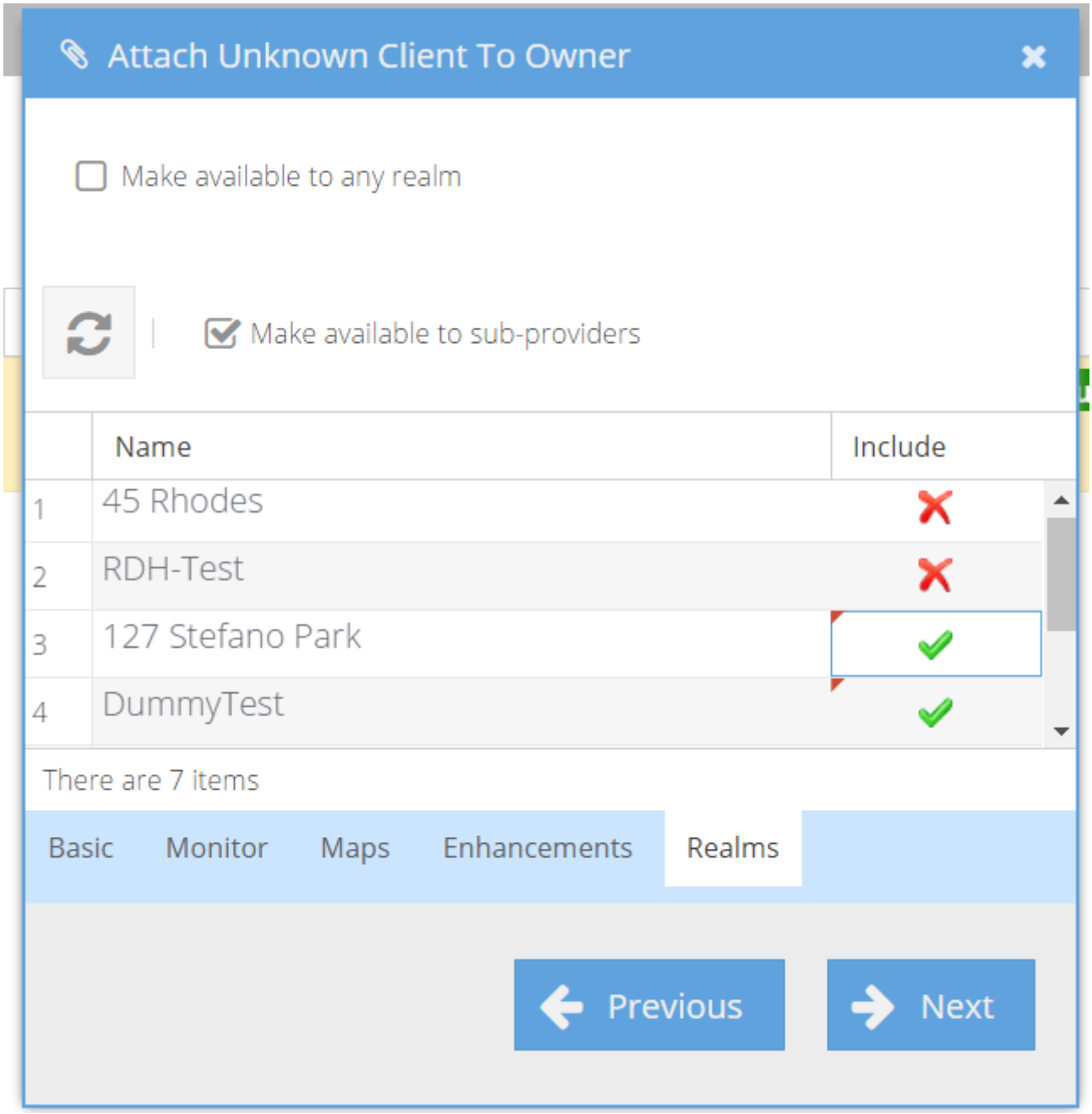
- After the Mikrotik appeared under the **Unknown clients** tab we can convert it to a known client.
- Select the unknown client you want to convert and click on the **Attach** button.
- This will bring up a window where you can select the owner (if there are sub-providers belonging to the user who logged in)
- Next you can give it a name:



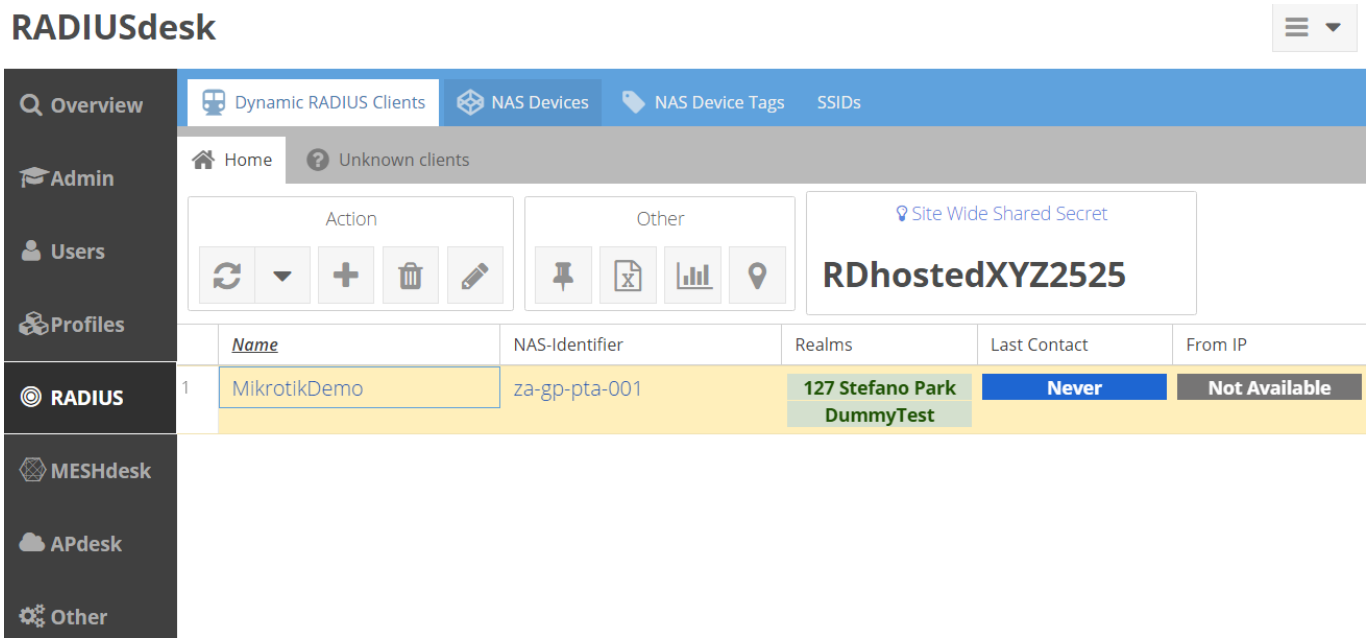

- The **Monitor** and **Maps** sub-tabs you can leave as default.
- The **Enhancements** tab has some handy enhancements. You are also advised to leave the defaults.



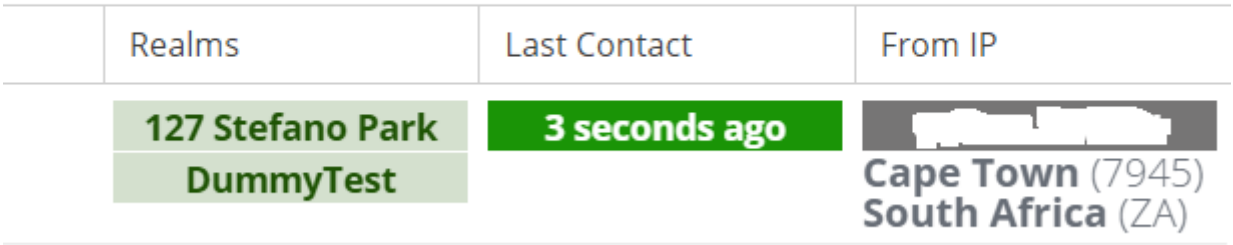

- Finally select some realms who you want to allow to use this RADIUS Client. If the list is empty, click on the **Make available to sub-providers** checkbox to give a list of realms belonging to sub-providers.




- After you click the **Next** button this item will be moved to the list of known Dynamic Radius Clients. As you can see this item indicates that it never contacted the RADIUSdesk server.




- Simply reboot the Mikrotik to confirm that contact is now established:




- This brings us to the end of this section

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# Testing it out

- Reboot the Mikrotik
- Connect to the WiFi Access point which the wlan1 interface advertises and confirm the following
  - You get an IP Address in the 10.5.50.x range
  - The DHCP server assigns you a DNS server's address for name resolution.
  - As soon as you try to visit a website on the Internet you are redirected to the Mikrotik login page.
  - Try to connect with a valid user defined in RADIUSdesk and confirm that the authentication works as intended.
- If things do not work correct; run a debug trace on FreeRADIUS and restart the Mikrotik router.
- Confirm that the Mikrotik router does send an Accounting-On packet to the RADIUS server by looking at the debug output of the FreeRADIUS server.

# What next

Although your system is up and running now you may want to do the following advanced configurations

- Introduce central managed Dynamic Login Pages for Mikrotik.

The Advanced setup page will cover these topics.