

# IP Accounting Guide

1. [Overview](#)
2. [Enabling the IP Accounting module in HeroTill](#)
  - 2.1. [IP Accounting Settings](#)
    - 2.1.1. [Default IP Pair Threshold](#)
    - 2.1.2. [Fetch Method](#)
    - 2.1.3. [Default Web URL Port](#)
    - 2.1.4. [Default Scheduler File Creation Interval](#)
    - 2.1.5. [User Data for Traffic Identification](#)
    - 2.1.6. [Fetch IP Accounting Data from All MikroTik Routers](#)
    - 2.1.7. [NTP Timer Server IP:](#)
  - 2.2. [Capped Page setup](#)
  - 2.3. [Dynamic IP Queue Setup](#)
3. [MikroTik router configuration management:](#)
  - 3.1. [Enabling routers individually](#)
  - 3.2. [Disabling routers individually](#)
  - 3.3. [Maintaining user speed limits](#)
    - 3.3.1. [Capped Accounts](#)
    - 3.3.2. [Sub Accounts](#)

### [3.3.3. Hard capped and suspended accounts](#)

## [4. Monitoring and collecting IP Accounting usage information](#)

### [4.1. How does HeroTill know which queues to check?](#)

### [4.2. IP Accounting Processing log](#)

### [4.3. Choosing a fetch method:](#)

#### [4.3.1. MikroTik API](#)

#### [4.3.2. Router Accounting URL](#)

#### [4.3.3. Router Scheduler Script and FTP \(Scheduled file dumping\)](#)

#### [4.3.4. Suggested method](#)

## [5. Managing user IP address assignments](#)

### [5.1. Adding IP Pools to a router](#)

### [5.2. High site IP ranges](#)

### [5.3. User IP Allocation](#)

### [5.4. IP Exclusions](#)

## [6. Creating IP Accounting user accounts](#)

## [7. IP Accounting based billing](#)

### [7.1. Monthly billing](#)

### [7.2. Suspensions](#)

### [7.3. Capped accounts](#)

# 1. Overview

HeroTill normally uses radius accounting to track the data usage for each individual user. This means that there needs to be a radius account in HeroTill as well as a PPPoE authenticated radius session on a router on the network. HeroTill then reads the FreeRADIUS generated accounting info to process usage, and auto blocks the PPPoE account from authentication once it is capped, so uses radius speed attributes to throttle the user once a soft cap limit has been reached.

When IP Accounting is used, there is no PPPoE dialup and no FreeRADIUS session involved. This means that the usage information is pulled from the High site router the user is connected to. This is done by using the MikroTik IP Accounting feature, which maintains a table in memory for each source and destination IP Pair.

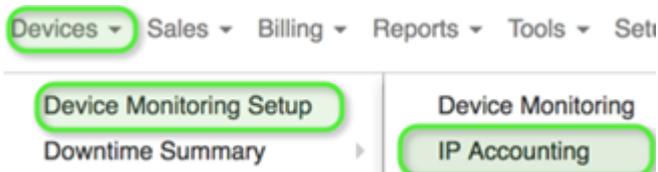
Speed limits are enforced by creating static queues for each radius user's fixed IP on a specified breakout router. Once a user has reached a soft or hard cap limit, the static queue needs to be adjusted accordingly. For this to work each HeroTill radius user accounts that use IP Accounting must have a fixed IP address assigned. To ensure no conflicting IP addresses are used, IP address lists will be maintained and assigned to individual High site routers. User accounts will then be able to select available IP's from these lists.

Capped and suspended accounts will be blocked by a firewall rule on the breakout routers, which will redirect traffic from all users in special capped or suspended address lists. This means that it is crucial that all router firewalls are setup correctly.

## 2. Enabling the IP Accounting module in HeroTill

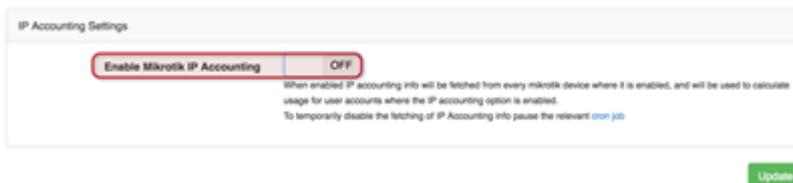
The IP Accounting module can be turned on or off on a global level. If the module is disabled, there will be no IP Accounting switches or settings visible on the system.

To enable the IP accounting module in HeroTill, go to “**Devices**” - “**Device Monitoring Setup**” and then click on the “**IP Accounting**” option.



You will see the following on the screen once it has finished loading:

### IP Accounting Setup



Click on the “**Enable Mikrotik IP Accounting**” button to enable the module. After the MikroTik IP Accounting function has been enabled, more settings will appear. Carefully read through the text in the **blue** section before continuing with the module setup.

## 2.1. IP Accounting Settings

IP Accounting Settings

**Enable Mikrotik IP Accounting**

When enabled IP accounting info will be fetched from every mikrotik device where it is enabled, and will be used to calculate usage for user accounts where the IP accounting option is enabled.  
To temporarily disable the fetching of IP Accounting info pause the relevant cron job.

When using IP Accounting please note the following:

- Details will enable IP accounting on each Mikrotik router (via the mikrotik API) where accounting data is being fetched from.
- Consider fetching IP Accounting from the highest router where the user connects, rather than from the breakout router.
- Queues to limit the user speed will be auto created on the router where the user's ip address was last detected.
- User (radius) accounts that needs to use IP accounting instead of radius to count usage needs to be switched from radius to IP accounting.
- All radius accounts using IP accounting must have a static IP address assigned in order to link accounting data to radius user accounts.

**Default IP Pair Threshold** 8192

The number of IP Pairs to keep track of inside the Mikrotik router. The maximum limit is 8192 pairs, although some Mikrotik routers may be able to handle a higher number, as high as 262144.  
If the number of IP pairs being tracked on the router exceeds this limit, the additional IP accounting data will be ignored. Once the IP accounting data is read the table is flushed from memory and starts accumulating again.

**Fetch Method** Router Scheduler Script & FTP

When using the Mikrotik Accounting of please ensure web access to accounting info is enabled and the Data for server's source IP is allowed and that the correct web port is defined under each Network Device, as these may vary depending on hotspot usage, etc.  
When using FTP a scheduled script will be auto installed on the Mikrotik router to save IP accounting data into files, which will then be retrieved via FTP.

**Default Web URL Port** 80

**Default Scheduler File Creation Interval** 60

**Use Data for Traffic Identification**

When enabled (together with extended usage logging) all traffic will be logged for classification, including radius, hotspot, etc... not just IP Accounting based accounts.  
The traffic will be stored in the data database and the breakdown will be available in each customer's usage portal as well as the system usage report.

**Fetch IP Accounting Data from all Mikrotik Routers**

When enabled all Mikrotik devices defined under Network Devices will be scanned for IP Accounting data.  
The frequency of the scans can be configured via the relevant cron job.  
When disabled you need to enable IP accounting on each individual Network Device and configure the device accordingly.

**NTP Time Server IP** 148.84.24.58

To ensure that logs are recorded accurately the NTP client settings on the Mikrotik router will be update to use the time source specified above.

### 2.1.1. Default IP Pair Threshold

Here you can add the IP Pair Threshold. If the router is old or has outdated firmware, the threshold will be lower. New routers tend to be able to take a higher threshold. It is advised to always allow the maximum number of IP Pairings. Please see section 3 for more information.

### 2.1.2. Fetch Method

There are three distinct methods available to fetch IP accounting information from the routers:

- MikroTik API
- Router Accounting URL
- Router Scheduler Script and FTP.

### The “**Fetch Method**”

chosen is used as the default for all routers, but can be overridden on individual routers is required. For more information on which fetch method to choose, please refer to section 4 (Monitoring and collecting IP Accounting usage information).

### **2.1.3. Default Web URL Port**

This section is only applicable should you choose to use the Router Accounting URL as your preferred fetch method. The default port will always be on 80. In the case that you have made any manual changes to the router, please remember to adjust the port in the IP Accounting set up to the correct port.

Once the default port has been set, it will automatically pull through to all new devices that are installed onto the network. Please note that this is only the default port number and that individual routers on the network can have different port numbers



### **2.1.4. Default Scheduler File Creation Interval**

This section is only applicable should you choose to make use of the Router scheduler script & FTP setting fetch method. This number equals the number of seconds you would like to extract data for. Ideally, this number should not be higher than 60 (1 minute) as the systems cron job interval is 60 seconds.

In short, the shorter the time is set for, the more files the script will extract from the router which will lead to more processing and strain on your server. However, you should know that the less files are extracted over a longer period of time (depending on how busy the line is versus the amount of time set), the more your chances are or losing traffic data.

### 2.1.5. User Data for Traffic Identification

If enabled, the IP accounting data will be analysed and classified like net flow data classification. This adds additional depth to the user control panel by tracking data to specific fields such as **Apple**, **Browsing**, **Facebook**, **Google**, **Mail**, **Video**, **Other** and **Unclassified**.



The intensity of the analysis can be configured under the extended logging system settings. Please note that this will however add significant processing overhead to the server.

### 2.1.6. Fetch IP Accounting Data from All MikroTik Routers

With the IP Accounting module, you can choose whether you want to enable the IP Accounting for only certain routers or for all routers. Please note that if a High site router is assigned to a specific user who has the IP Accounting enabled, that the IP Accounting will then be automatically be enabled for the High site router.

### 2.1.6.1. Enable All MikroTik Routers

If you would like to enable the “**Fetch IP Accounting Data from all MikroTik Routers**” toggle switch. Once enabled, a scheduled job will try to pull accounting information from all MikroTik routers defined in the system.

### 2.1.6.2. Enable individual MikroTik Routers

For more information on how to enable and disable individual MikroTik routers, please refer to 3.1 and 3.2.

### 2.1.7. NTP Timer Server IP:

All files that are exported from the router will be saved onto a local server and the file name will be saved with a certain date and time. This means that the date and time on the router should be set up correct to ensure that the files are not saved incorrectly. To do this, you will need to have a time server set up. It is preferred that the time server should be within your network. After your time server is set up, add the IP address to the NTP Time Server IP field and click on the update button. Please note that this is a mandatory field for all ISP's using the IP Accounting module.

Should you choose to only enable individual routers, you will need to update each router by clicking on the “**Update Router**” button to ensure that all the settings have synced to the router. When clicking on the “**Update Router**” button, the NTP time setting will automatically be added to that individual router.

## 2.2. Capped Page setup

All capped packages that run through the IP Accounting module, will be managed by a router or different routers (depending on your infrastructure). These routers will usually be your breakout routers. For the IP Accounting module to successfully cap packages, you will need to configure the firewall on your router(s). If the firewall on your routers are not configured, you will not be able to cap the customers and they will be able to continue to surf the internet.

We suggest that you set up your routers firewalls in one of the following ways:

- Either block the customer off the internet.
- Redirect the customer to a hotspot which will enable them to top-up.
- Redirect the customer to a proxy with a static page.

**Green:** In the green section, you can choose whether you want to enable the capped IP address lists.

**Red:** In this section, you will add a name for your capped lists. HeroTill will automatically add all capped IP Addresses as well as automatically remove all IP addresses that has been topped up.

**Yellow:** Here you will select the routers on which your capped lists should be maintained. This will usually be your breakout routers.

## 2.3. Dynamic IP Queue Setup

Just like with your capped page setup, your queue setup will also take place through your breakout routers. If the routers are not setup correctly, the customer's speed limits will not be enforced. When configuring the router, you can set up the capped and speed queues on the same router or on different routers.

**Blue:** In this section, you can choose whether you want to enable or disable the queue.

**Purple:** In this section, you will add a name for your capped lists. HeroTill will automatically add all capped IP Addresses as well as automatically remove all IP addresses that has been topped up.

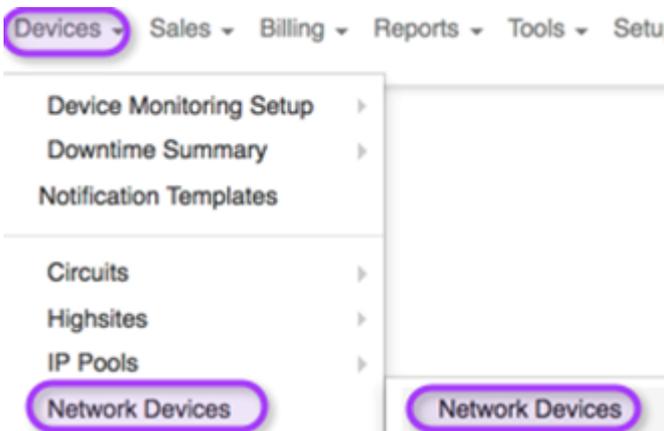
Please note that HeroTill has a background job that resets all queues to their original state every 5 minutes. After your changes has been made, please click on the **“Update”** button to save your changes.

## 3. MikroTik router configuration management:

HeroTill will automatically periodically check all routers set to use IP accounting and enable the settings on the router if it is not enabled. If

the schedule script method is enabled, then HeroTill will also verify that the script and correct schedule is defined on the various routers.

To find a list of all network devices, go to **“Devices”** - **“Network Devices”** and then click on the **“Network Devices”** option.



After the screen is finished loading, look for the router that you would like to enable to IP Accounting functionality for. Once you have found the router, click on the **blue** edit button found on the right-hand side of the screen.

Network Devices

All Locations | All Manufacturers | Normal | + Add Device | Refresh

Show 10 Rows | Search: | Copy Columns | Export Columns CSV | Export Columns Excel | Show / Hide Columns

Model	SW Ver	Description	Location	IP Address	CPU	Last Scan	Last Config Change	Last Detected Change	Last Backup	Down MTD	Scan Status	
Mikrotik CRS125-24G-1S	6.40.4				13%	2017-10-17 13:03:54 <small>4 minute ago</small>	2017-10-17 12:18:22 <small>an hour ago</small>	2017-10-11 08:57:28 <small>4 days ago</small>	2017-10-05 14:31:53 <small>12 days ago</small>	4 minutes	Ping 11 ms Scan 11 sec	  
Mikrotik RB3011UAS	6.40.3				4%	2017-10-17 13:03:55 <small>4 minute ago</small>		2017-10-09 11:03:34 <small>8 days ago</small>	2017-09-22 12:01:08 <small>21 days ago</small>	1 minutes	Ping 12 ms Scan 12 sec	  

### 3.1. Enabling routers individually

After clicking on the edit button found on the right-hand side of the device, you will see the following pop-up screen. Click on the “**IP Accounting**” tab to start editing the specific router properties.

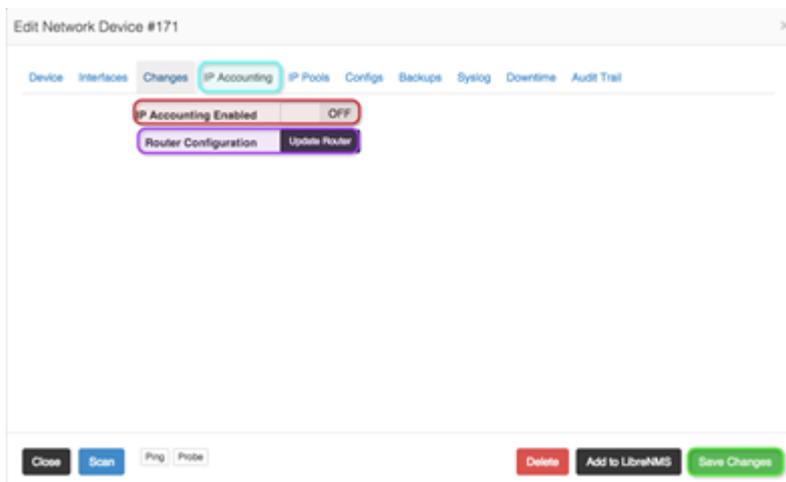
- Red:** In this section, you can enable the IP Accounting functionality for the specific device.
- Yellow:** Here you can add the IP Pair Threshold. If the router is old or has outdated firmware, the threshold will be lower. New routers tend to be able to take a higher threshold. It is advised to always allow the maximum number of IP Pairings. If the router is unable to handle such a large amount of IP Pairings, you will receive an error notification when clicking on the black “**Update Router**” button. Please see section 3 for more information.
- Dark blue:** In this section, you can choose the fetch method. Please refer to section 4 for more information.
- Purple:** This is where you need to add the scheduler file creation interval. This can be anything from 10 – 60 seconds. Please refer to 2.1.4. for more information.

- Black:** After filling in all the details, it is crucial that you first click on the “**Update Router**” button before clicking on the save changes button.
- Green:** In this section, you will be able to view all IP accounting files that have been extracted from this specific router.

After all details have been filled in and you have clicked on the update router button, click on the “**Save Changes**” button.

## 3.2. Disabling routers individually

After clicking on the edit button found on the right-hand side of the device, you will see the following pop-up screen. Click on the “**IP Accounting**” tab to start editing the specific router properties.



- Red:** To disable the router for IP Account tracking, ensure that the toggle switch is on “**Off**”.
- Purple:** Click on the “**Update Router**” button to ensure changes are saved to the router.
- Green:** After your changes has been made and you have clicked on the update router button, click on the “**Save Changes**” button.

## 3.3. Maintaining user speed limits

It is important that all queues and caps are properly setup on the breakout router as the customer's queues and cap will be managed through the customer's IP address. Even though helpdesk agents can adjust the customer's queues, HeroTill runs a background job that resets all queues to their original state every 5 minutes.

HeroTill will only allow the following factors to influence the customer's queue:

- • Package changes
- • Capped packages
- Top-ups
- • Uncapped packages
- • Soft capped packages
- • Adding new accounts
- • Expiring accounts.

### 3.3.1. Capped Accounts

HeroTill will ensure that an IP based queue is created on these routers for every IP Accounting based user account. Once a user account's speed is adjusted in HeroTill, is capped or reaches a soft limit, their queue will be adjusted accordingly on these routers. As the 'queue maintenance' is run as a background job it may take up to two minutes before speed limits are adjusted in line with the package changes made to the user account.

### 3.3.2. Sub Accounts

When sub-user accounts are created in HeroTill (for example a home and business account share the same package) then both accounts need to share the same data and speed limits. In these scenarios, a queue with multiple IP addresses will be created. This multi IP queue will include the IP address of the parent account, as well as the IP address of each child

account. MikroTik will then enforce the speed limit across these accounts, assuming all the accounts use the same breakout router.

### **3.3.3. Hard capped and suspended accounts**

Accounts that need to be blocked (hard capped, suspended and expired) will use a firewall rule on the breakout router to redirect the user to a web proxy page displaying a static age. To achieve this HeroTill will automatically add or remove capped and blocked user IP addresses from specific address lists used by the firewall rules, on the breakout routers.

## **4. Monitoring and collecting IP Accounting usage information**

To read IP Accounting usage information, the MikroTik router where the user connects, needs to have IP Accounting enabled. Once enabled, the router will keep a memory table of IP pairs, containing the source and destination IP's, as well as the data consumed.

After this data is read, the table will be cleared.

This table has a finite limit of only 8192 pairs. Note that some routers allow a larger value of up to 262144 entries. Once the limit is reached the additional IP pair information is discarded, so it is important to read this information frequently enough so that the limit is not exceeded and no information is lost.

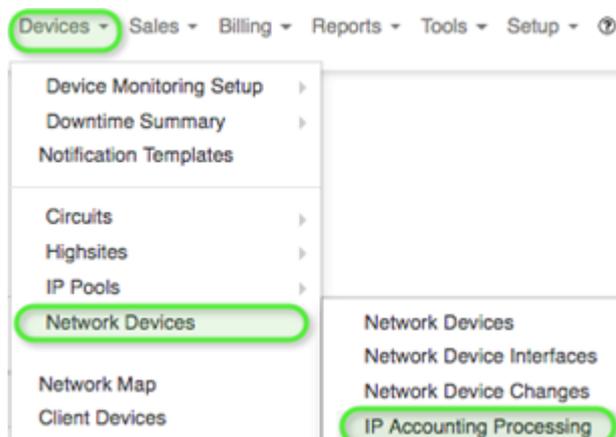
## 4.1. How does HeroTill know which queues to check?

On the router, you will be able to find a list of all queues. All the queues, for each IP accounting user, will have a unique identifier in the form of a pre-fix. HeroTill will only look at the queues that start with **DT\_AUTO\_QUE\_USERNAME OF CUSTOMER ACCOUNT**.

Please note that you can only have one queue per IP address. If you have more than one queue per IP address, then HeroTill will eliminate the IP address and que that does not have the unique identifier pre-fix. When setting up the user account and IP, you will need to ensure that you only choose IP's that are allocated to the IP Accounting pool. All user accounts with IP's outside of this pool will also be eliminated.

## 4.2. IP Accounting Processing log

To view the IP Accounting processing log, go to “**Devices**” - “**Network Devices**” and then click on the “**IP Accounting Processing option**”.



Once the screen has loaded, you will see the following:

IP Accounting Processing Log

Search:  Apply Columns Export Columns Report Columns Show More Columns

Highsite	Model	Device Description	IP Address	Process Date	Date Range	Duration	Total Rows	Skipped Rows	Matched Users	Total Data
<span style="color: green;">■</span>	CRS125-24G-1S	CRS125-24G-1S	10.10.10.1	2017-10-20 05:42:12	2017-10-20 05:39:13 - 2017-10-20 05:42:12	00:00:02	281	208	4	2.0 MB
<span style="color: red;">■</span>	CRS125-24G-1S	CRS125-24G-1S	10.10.10.1	2017-10-20 05:39:12	2017-10-20 05:36:13 - 2017-10-20 05:39:12	00:00:01	244	178	3	986.8 KB
<span style="color: red;">■</span>	CRS125-24G-1S	CRS125-24G-1S	10.10.10.1	2017-10-20 05:36:12	2017-10-20 05:32:43 - 2017-10-20 05:36:12	00:00:01	316	256	3	2.3 MB
<span style="color: red;">■</span>	CRS125-24G-1S	CRS125-24G-1S	10.10.10.1	2017-10-20 05:32:42	2017-10-20 05:29:43 - 2017-10-20 05:32:42	00:00:01	233	158	3	896.8 KB
<span style="color: red;">■</span>	CRS125-24G-1S	CRS125-24G-1S	10.10.10.1	2017-10-20 05:29:42	2017-10-20 05:26:43 - 2017-10-20 05:29:42	00:00:01	283	218	3	1.8 MB
<span style="color: red;">■</span>	CRS125-24G-1S	CRS125-24G-1S	10.10.10.1	2017-10-20 05:26:42	2017-10-20 05:23:43 - 2017-10-20 05:26:42	00:00:02	216	149	3	918.0 KB
<span style="color: red;">■</span>	CRS125-24G-1S	CRS125-24G-1S	10.10.10.1	2017-10-20 05:23:42	2017-10-20 05:20:43 - 2017-10-20 05:23:42	00:00:01	260	202	3	972.4 KB
<span style="color: red;">■</span>	CRS125-24G-1S	CRS125-24G-1S	10.10.10.1	2017-10-20 05:20:42	2017-10-20 05:17:13 - 2017-10-20 05:20:42	00:00:02	301	216	3	1.2 MB
<span style="color: red;">■</span>	CRS125-24G-1S	CRS125-24G-1S	10.10.10.1	2017-10-20 05:17:12	2017-10-20 05:14:13 - 2017-10-20 05:17:12	00:00:01	200	147	3	681.3 KB
<span style="color: red;">■</span>	CRS125-24G-1S	CRS125-24G-1S	10.10.10.1	2017-10-20 05:14:12	2017-10-20 05:11:13 - 2017-10-20 05:14:12	00:00:01	272	195	3	1.0 MB

**Green:** Here you can choose to only see data pulled from a certain high site.

**Red:** In this section, you will be able to see more information about the files that has been extracted from the router.

**Blue:** Click on this button to view the specific network device properties.

### 4.3. Choosing a fetch method:

As previously mentioned, there are three methods in which HeroTill can retrieve the IP Accounting information from the relevant MikroTik routers:

- MikroTik API
- Router Accounting URL
- Router Scheduler Script and FTP

#### 4.3.1. MikroTik API

HeroTill will log into the router via the MikroTik API and then retrieve the IP Accounting table data stored on the router.

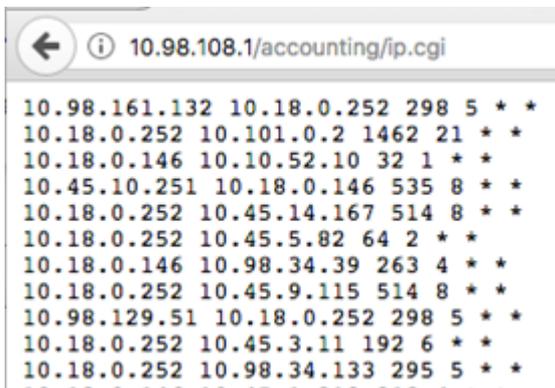
```

Terminal
[apiuser2@Office-RB] > /ip accounting snapshot
[apiuser2@Office-RB] /ip accounting snapshot> take
[apiuser2@Office-RB] /ip accounting snapshot> print
# SRC-ADDRESS DST-ADDRESS PACKETS BYTES SRC-USER DST-USER
0 10.18.0.162 40.97.150.242 66 20759
1 10.98.77.45 10.18.0.146 25 800
2 10.18.0.57 47.88.68.4 9 1358
3 10.18.0.110 172.217.0.131 30 3471
4 208.111.171.129 10.18.0.95 6 2771
5 10.98.46.50 10.18.0.252 2040 331765
6 10.18.0.252 10.45.7.136 462 21632
7 10.18.0.252 10.98.184.51 2436 506740
8 10.18.0.94 162.125.81.3 22 1845
9 192.168.19.187 10.18.0.252 872 59319
  
```

### 4.3.2. Router Accounting URL

HeroTill calls a local URL on the router, which will return a csv based contents of the IP Accounting table data.

HeroTill will automatically set the IP Accounting URL.



```

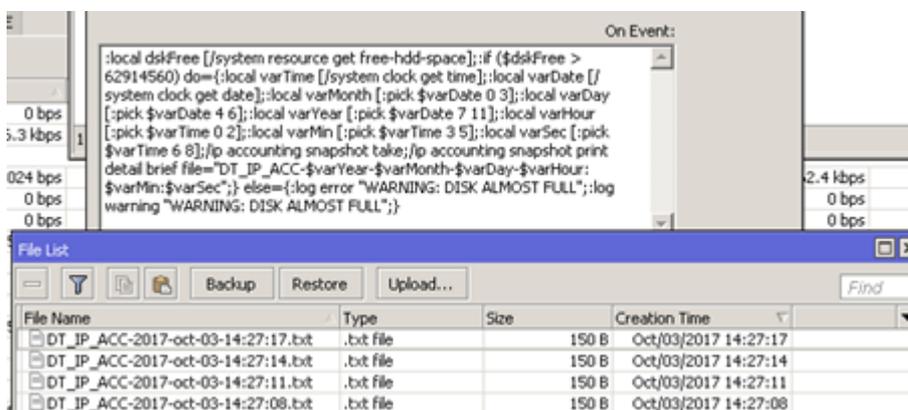
10.98.161.132 10.18.0.252 298 5 * *
10.18.0.252 10.101.0.2 1462 21 * *
10.18.0.146 10.10.52.10 32 1 * *
10.45.10.251 10.18.0.146 535 8 * *
10.18.0.252 10.45.14.167 514 8 * *
10.18.0.252 10.45.5.82 64 2 * *
10.18.0.146 10.98.34.39 263 4 * *
10.18.0.252 10.45.9.115 514 8 * *
10.98.129.51 10.18.0.252 298 5 * *
10.18.0.252 10.45.3.11 192 6 * *
10.18.0.252 10.98.34.133 295 5 * *
  
```

### 4.3.3. Router Scheduler Script and FTP (Scheduled file dumping)

A local script is created on the MikroTik router

that dumps IP Accounting data to a local file every few seconds (30-60). The script checks available free disk space to ensure that it will not dump data if there are less than a predefined amount (2MB) of disk space available.

HeroTill then uses FTP (File Transfer Protocol) to retrieve the files from the router, and deletes the files once they are downloaded to the server. The last file on the router will always be skipped, in case the file is still being written to at the time of download.



#### 4.3.4. Suggested method

All the above methods can be used, either exclusively or in combination. It is however preferred that the scheduled file dumping option is chosen as it is the last likely to result in lost usage data due to the memory table limit being reached. To facilitate the accurate configuration of the script and scheduler on the routers, HeroTill will auto configure the relevant routers when this method is chosen.

Once the usage data has been collected, it is processed exactly like radius based usage information. One of the IP addresses from the IP Pair is matched to a radius account using the fixed IP address assigned to each of the IP Accounting based user accounts. Data is then summarised on a daily and monthly basis, and made available in the end user's usage portal just like Radius, Fibre and LTE based usage data.

If extended logging is enabled within

HeroTill then the remote IP addresses are used to identify and classify the data usage (Dropbox, Facebook, YouTube, etc.), like the way net flow data is analyzed. This allows the customer to view a breakdown of data usage in their end user portal. Please note that the extended logging may be very resource intensive on your HeroTill server.

## 5. Managing user IP address assignments

Every IP Accounting based user account must use a fixed IP address. Two users cannot share the same IP address, as the system will then be unable to allocate data usage to the correct account.

### 5.1. Adding IP Pools to a router

To add an IP Pool to a router, edit the router properties of the specific router that you would like to work on. Once the pop-up screen has loaded, go to the **“IP Pools”** tab.

The screenshot shows the 'Edit Network Device #171' interface. The 'IP Pools' tab is selected and highlighted with a red box. Below the navigation tabs, there is a 'Device Specific IP Pools' section. It includes a 'Refresh' button (green) and an 'Add IP Pool' button (blue). A 'Show 10 Rows' dropdown is present. Below this are buttons for 'Copy Columns Clipboard', 'Export Columns CSV', 'Export Columns Excel', and 'Show/Hide Columns'. A search field is also visible. The main area contains a table with the following columns: Type, Pool Name, Network, Excluded IP's, Realm, Total, Used, and Free. The table is currently empty, displaying 'No data available in table'. At the bottom of the table area, it says 'Showing 0 to 0 of 0 entries' and has 'Previous' and 'Next' navigation buttons. At the very bottom of the interface, there are buttons for 'Close', 'Scan', 'Ping/Probe', 'Delete', 'Add to LibreNMS', and 'Save Changes' (green).

**Blue:** To add an IP Pool to the router, click on the blue “**Add**” button.

**Purple:** In this section, you will be able to view a list of all IP Pools linked to this router.

**Green:** After making any changes, remember to click on the “**Save Changes**” button.

## 5.2. High site IP ranges

One or more IP subnets will be assignable to each High site router from within HeroTill. The system will automatically count the number of available IP addresses, and the admin user will be able to exclude reserved IPs from the list of selectable IP addresses, like for example equipment on the High site such as cameras and power monitors.

## 5.3. User IP Allocation

When IP Accounting user accounts are created, the High site where the user will connect must be selected. Once the High site has been chosen, the list of available subnets will be available for selection. Once

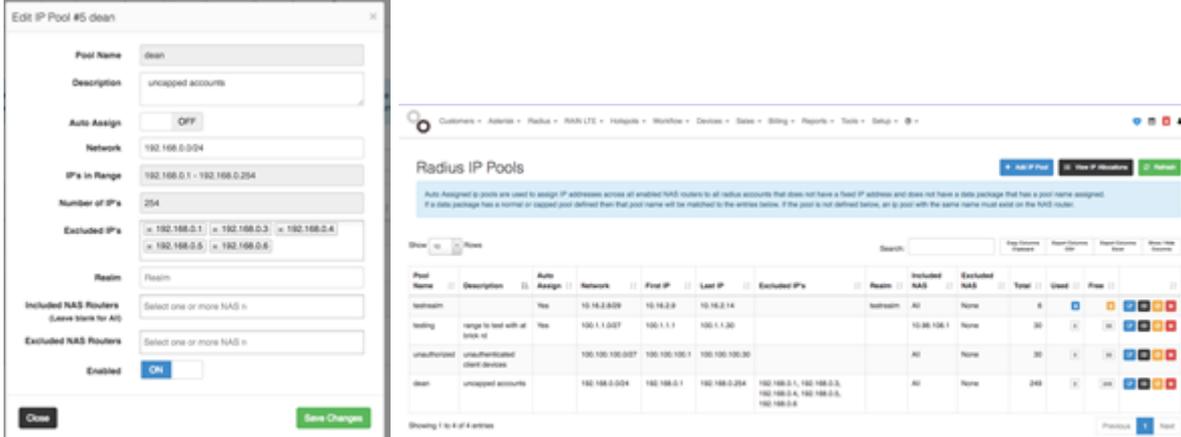
a subnet has been chosen, a free IP can be selected from the list within that subnet.

## 5.4. IP Exclusions

HeroTill will automatically keep track of which IP's are already in use amongst all the IP Accounting user accounts, and will prevent you from selecting an IP that is in use (already allocated) or excluded from selection. IP addresses assigned to other network devices (routers, radios and power monitors) will also be excluded from selection.

HeroTill will also indicate whether the IP address selected is live on the network, by doing a ping test.

The method of managing these IP ranges will be like the way Radius IP pools are being managed.



The image shows two screenshots from the HeroTill web interface. The left screenshot is the 'Edit IP Pool' form for a pool named 'dean'. The right screenshot is the 'Radius IP Pools' management page, which includes a table of existing IP pools.

**Edit IP Pool #5 dean**

- Pool Name: dean
- Description: unassigned accounts
- Auto Assign: OFF
- Network: 192.168.0.0/24
- IPs in Range: 192.168.0.1 - 192.168.0.254
- Number of IPs: 254
- Excluded IPs: 192.168.0.1, 192.168.0.3, 192.168.0.4, 192.168.0.5, 192.168.0.6
- Radius: Radius
- Included NAS Routers: Select one or more NAS in
- Excluded NAS Routers: Select one or more NAS in
- Enabled: ON

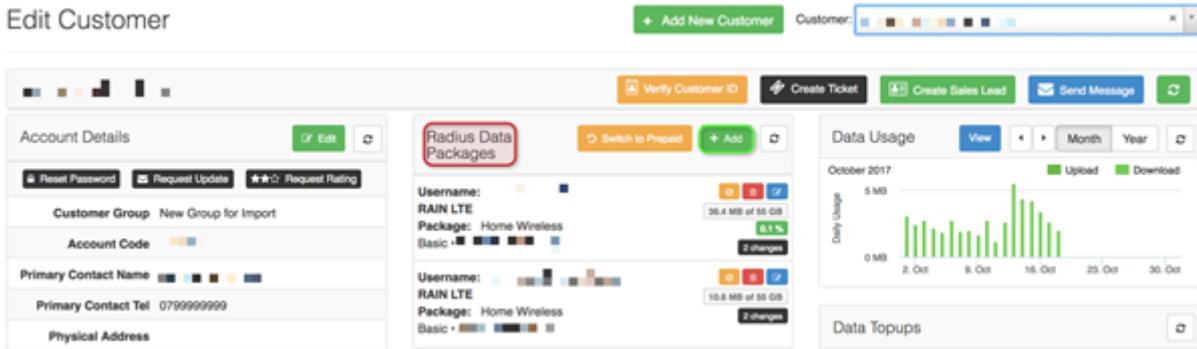
**Radius IP Pools**

Pool Name	Description	Auto Assign	Network	First IP	Last IP	Excluded IPs	Radius	Included NAS	Excluded NAS	Total	Used	Free
testroom		Yes	10.14.2.0/29	10.14.2.9	10.14.2.14		testroom	All	None	6		
testing	range to test with at work-st	Yes	100.1.1.0/27	100.1.1.1	100.1.1.30		10.86.106.1	None	None	30		
unauthorized	unauthenticated client devices		100.100.100.0/27	100.100.100.1	100.100.100.30		All	None	None	30		
dean	unassigned accounts		192.168.0.0/24	192.168.0.1	192.168.0.254	192.168.0.1, 192.168.0.3, 192.168.0.4, 192.168.0.5, 192.168.0.6	All	None	None	249		

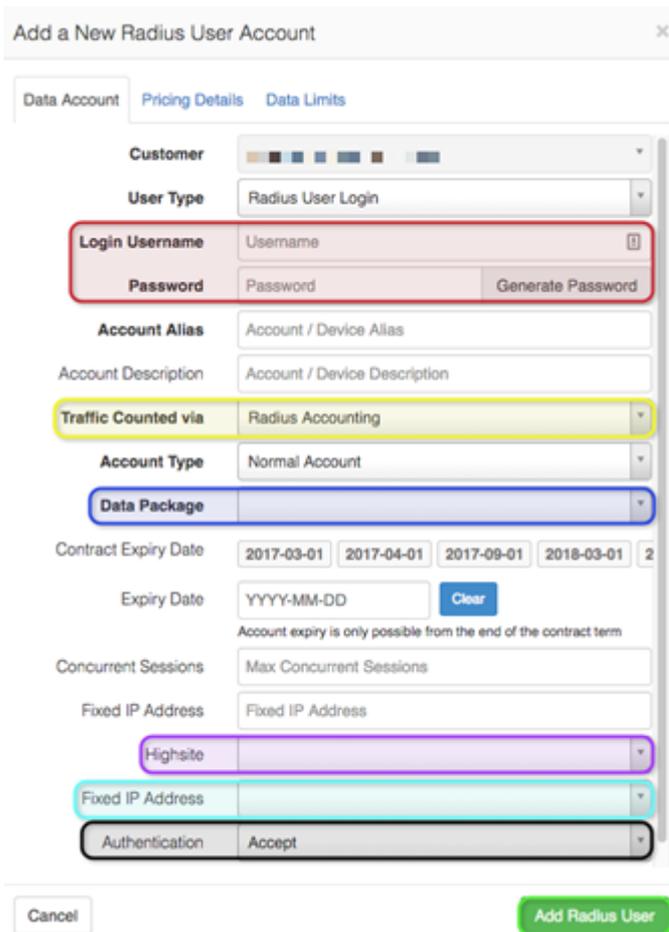
## 6. Creating IP Accounting user accounts

IP Accounting based user accounts are created the same as radius accounts. On the create user pop-up window there is a selector to choose between radius or IP accounting based data traffic counting. (Note that this option is only visible if IP accounting has been enabled in the system)

To create the IP Accounting user account, go to the customer profile (“edit customer” screen) and then “**add**” a new user account in the “**Radius Data Package**” section.



After clicking on the “**add**” button, you will see the following screen:



- Red:** In this section, you will add the customer's username. After adding a username, click on the generate password button.
- Yellow:** In this section, you will need to choose whether you want the traffic to be counted via radius accounting or MikroTik IP Accounting.  
When adding a normal radius account, you will leave the setting on Radius Accounting. When adding an IP Accounting user account, you will need to change the setting to MikroTik IP Accounting.
- Dark blue:** Here you will choose the data package as per the customer request.
- Purple:** The next step will be to choose the high site that the customer will be connected to.
- Light Blue:** Here you will be able to select and IP address from the IP Pool that has been allocated to the specific high site.  
All IP's that are listed here, are IP addresses that are still available for use.
- Black:** Always ensure that the authentication is on accept.
- Green:** When all details have been filled in, click on the "**Add Radius User**" button.

Data package selection, pricing and top-up settings are done in the same way as which you would have added these settings for a normal radius account. Please note that when adding sub-accounts, that they need to follow the same traffic counting method as the parent account.

When IP Accounting is selected, a High site device and fixed IP address must also be selected. The High site selected here is the one where the user must connect, and is where the IP accounting data for this user will be tracked.

## 7. IP Accounting based billing

### 7.1. Monthly billing

Billing for IP Accounting based user accounts is identical to other data accounts like radius, LTE and OpenServe. Monthly recurring billing is generated from the data package cost, and can be overridden on an individual basis.

### 7.2. Suspensions

When IP accounting based users are suspended, the user's IP address is added to a blocked account address list, on a designated router. A firewall rule on that router needs to be configured so that any traffic from any IP in that address list is redirect to a proxy page indicating a suspended accounts message.

If multiple breakout routers are in use then the address lists will need to be auto maintained on all these routers.

### 7.3. Capped accounts

Similar to suspended accounts, hard capped account IP addresses are also added to a central address list on the breakout router, where a similar firewall rule needs to redirect the user to a similar page showing that the user's cap has been reached.

#### Download

Click the link below to download the IP Accounting Guide:

[HeroTill IP Accounting Guide](#)