Getting Started

Get to know and set up DCPM

dcpm
Data Center
Performance Manager

Contents

Welcome

About this document

Thank you for choosing the Racktivity Data Center Performance Manager solution.
This document explains the basic structure, components and work flow of the DCPM platform and will guide you through a basic configuration.

We advise to carefully read this guide before using the software.

About DCPM

The Data Center Performance Manager platform is a browser based application that monitors and manages power and other environmental parameters in data centers. All data is collected and presented to the user in an easy to use and intuitive User Interface (UI).

The DCPM UI has, amongst others, the following features:

- Monitor & manage power of your data centers, Points of Presence (PoPs), head ends, …
- Create reports and graphs of the collected data
- Enable alarms
- Add both Racktivity hardware (EnergySwitch, EnergySensor, DC^{2}Sensor) and 3rd party vendor devices
- Fully customizable dashboards
- Extract reports

Many types of devices can be connected to your DCPM system, including the Racktivity EnergySwitches (AC smart Power Distribution Units (PDUs)), EnergySensors (environmental sensors), DC^{2}Sensors (DC monitoring) and 3rd party devices.
A typical PDU consists of 8 or more power outlets that deliver power to your rack equipment and come in different form factors. Depending on the type of PDU connected to DCPM you will be able to monitor (for power related metrics) and manage (outlet toggling) it to the outlet level.

In DCPM, you are not limited to working with only 1 data center: monitor and manage many data centers and remote locations spread out over different locations all in 1 system.
In short, Racktivity's Data Center Performance Manager is the ideal platform to monitor and manage the power of your IT infrastructure.

Interface

Spaces

A Space is a logical group of pages and can be found on the left side of the navigation. Hold your cursor over the current Space in the navigation pane to see the full list:
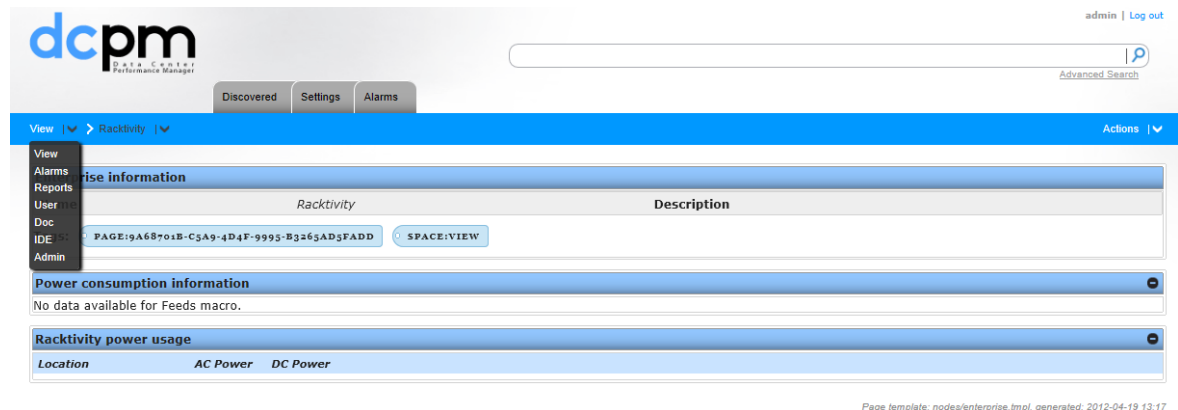
By default the following spaces are available to the user:

- **View**
  Shows the structure of your organization with all monitoring data.
- **Alarms**
  Shows all data related to alarms (operator panel, history…)
- **Reports**
  Displays reports for your infrastructure.
- **User**
  Shows the available dashboards.
- **Doc**
  DCPM documentation.
- **IDE**
  Integrated development environment where you can customize templates, widgets, …
- **Admin**
  Administration space for settings, devices, …

Spaces can be created and maintained by an administrator through the General section of the Admin space which enables users to have their own Space with custom dashboards, maps, …

Components

Components are the basic elements DCPM uses to structure your organization and depict the logical drill down of IT assets and can be found in the View Space. Whilst there are many Components available, only some are essential. Meaning that without these it will not be able to populate DCPM.

From top to bottom, DCPM contains the following Components:
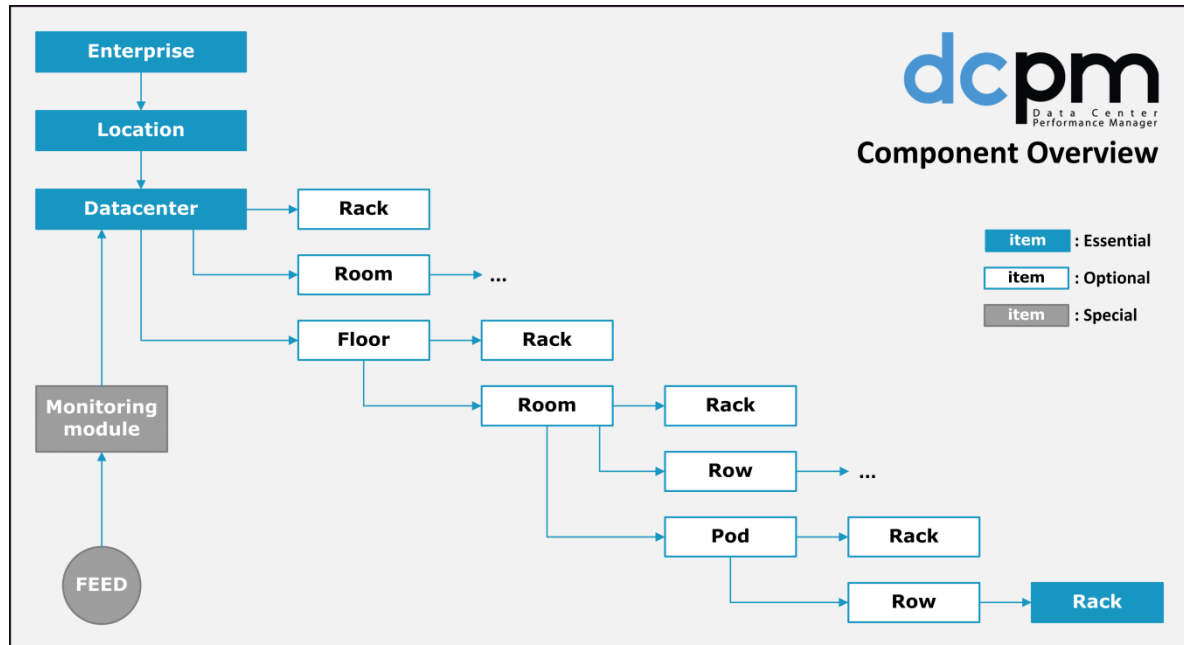
At least the following Components need to be defined before DCPM can be populated with devices (pictured in blue in the picture above):

- **Enterprise**: Every DCPM instance has 1 Enterprise that defines your organization. It cannot be deleted.
- **Location**: Geographical location or region of the Components below.
- **Datacenter**: Datacenter in which the Components below are located.
- **Rack**: The rack in which the devices are mounted.

Optional Components (pictured in white in the picture above):

- **Floor**
- **Room**
- **Pod**
- **Row**

Special Components (pictured in grey in the picture above):

- **Feed**: Is connected to a datacenter and shows the incoming power. Used for capacity planning. Example: Define maximum capacity per feed, sub-feed…
  Feeds can be extended with sub-feeds resulting in a more elaborate feed tree.
  Feed information can be retrieved on the datacenter level.

- **Monitoring module**
  These can be various types of feed monitoring whereby we measure the incoming feed accurately for better capacity planning.
 A monitoring module is connected to a feed.

Notes:

- The maximum number of possible levels is 8.
- A parent can house many children (i.e.: multiple floors in 1 datacenter), but the children cannot be of a different type.
  Example: When you have created a floor in a datacenter, you can't create a room as child under that same datacenter. The created room will be automatically moved as a child of the floor.
  So when you have an existing datacenter with only 4 rooms and you want to add a floor, the first floor created will automatically house the 4 existing rooms. The second floor you add will be blank.
- A rack is the lowest and only Component that can contain devices (PDUs). PDUs can be added through an **auto discovery** function (Actions menu > edit rack). All PDUs are referred to as EnergySwitches by default but can be named differently.

Pages

Pages are the representation of the available content. Pages for Components are created using templates and contain predefined content relevant to that type of Component. These templates can be edited in the IDE Space.

To create a Page, hold your cursor over the Actions item in the navigation pane and select New Page. User-created pages not for Components do not contain predefined information based on templates. Pages use the wiki markdown syntax, described here.

For example, the datacenter Component page displays relevant information by default:
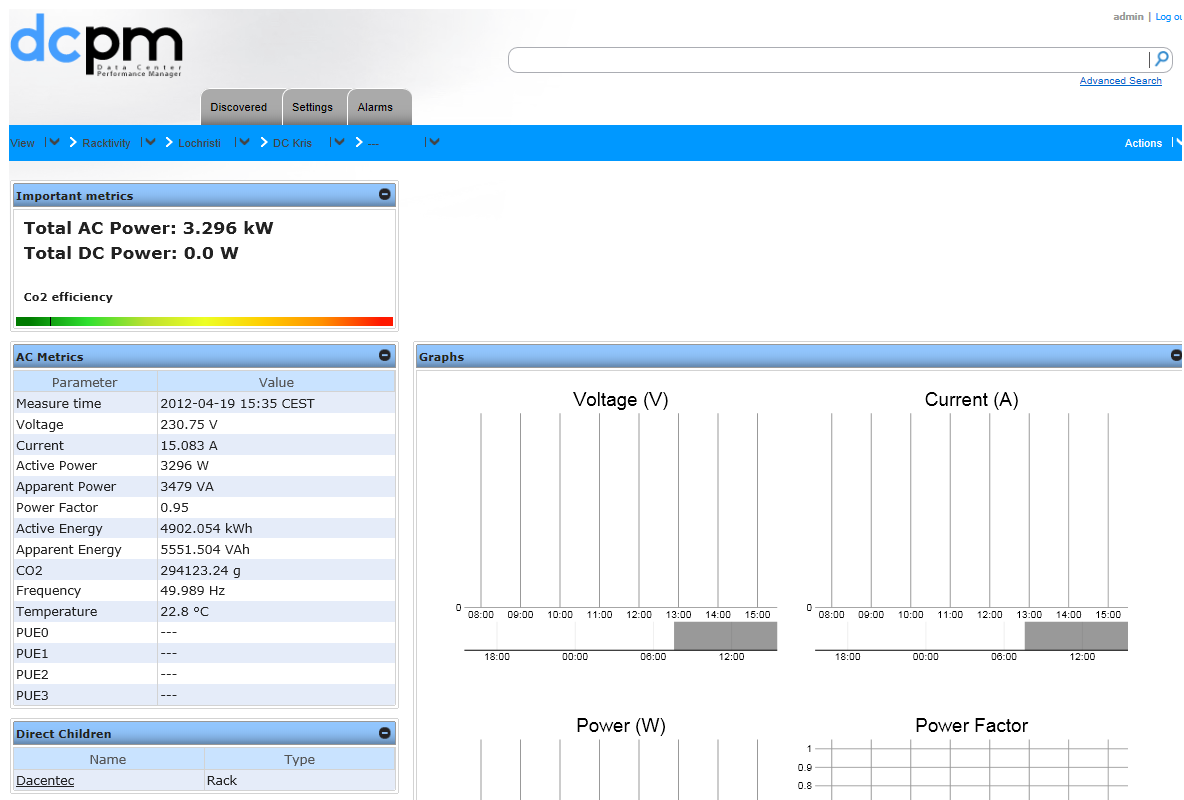
Tags & Labels

Almost all Spaces, Pages, Components, ... have the option to attach Tags and Labels (optionally).

Tag

A tag is a combination of a name and a value. It is defined by the user and used in search results and reporting.

Label

A label is a string used in search results.

Navigation

The DCPM main navigation is based on breadcrumbs. A breadcrumb navigation (or "breadcrumb trail") is a type of **secondary navigation scheme** that reveals the user's location in an application. We use this type of navigation to support the hierarchical structures of the datacenters.

Main window

Most screens within DCPM are based on the same layout, as described below:
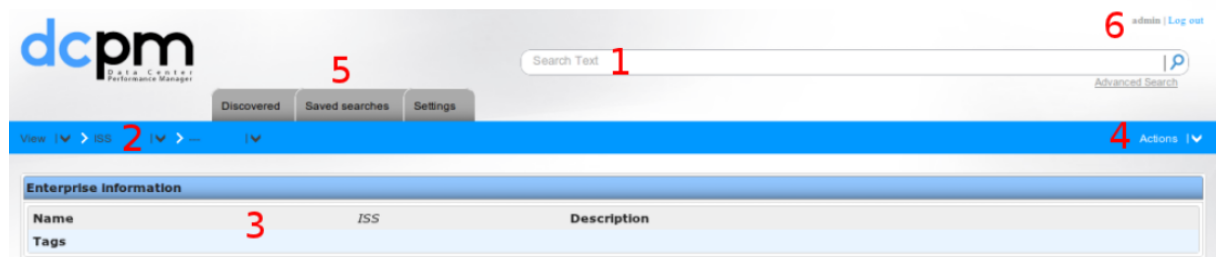
1. **Search box**
   Search the entire system for a specific string. Click **Advanced Search** for more options.
2. **Navigation pane**
   Shows your current location in the Enterprise. Move your mouse over the different Components to see more options and levels.
3. **Details pane**
   Content of the current Page.
4. **Actions menu**
   Shows the possible actions for your current location. For example, if you are on the Enterprise Page the Action menu can show the following:
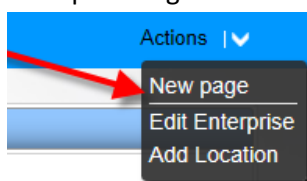
5. **Bookmarks section**
   Shortcuts to Pages in a specific Space that are visible to all users. Bookmarks can be changed by the administrator in the Admin Space (Settings > General).
6. **Log out**

Installation

Prerequisites

Before installing, please ensure the following prerequisites are met:

- 64 Bit Linux system
- Supported platforms:
    - Ubuntu 10.10+
    - Debian 6.0+
    - CentOS 6.0+
    - RedHat Enterprise Linux 6+
- Perl should be installed on the server.
- The following ports should be available on the server and access should be allowed by the firewall:
    - 80 (HTTP)
    - 443 (HTTPS)
    - 161 -162 (SNMP)
    - 502 (Modbus TCP)
    - 21 (FTP)

Installing DCPM

- Download the installation package from the URL provided by Racktivity
- Unpack the installer:
    - `tar -xzf installationpackage.tgz`
- Execute the following code as root:
    - `./debootstrap-installer.sh`

The above instructions will install the DCPM software platform in "/srv/chroot/dcpm/"
When the installation has finished you can browse to the IP address of the server.

You will run a 5 step initial set up procedure.
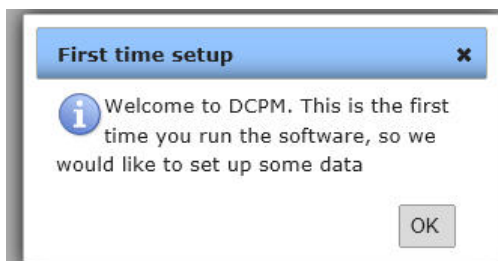
Step1 – enter company name
Step2 – enter company contact details and license key*
Step3 – set up SMTP (mail) information
Step4 – set up SNMP information
Step5 – general preferences

First setup - step 5/5

Please select your preferences

Temperature
The measurement unit for the temperature
- ⦿ Celsius
- ○ Fahrenheit

Currency
Currency used in the system

EURO

Activate keepalive alarms for energy switches
- ☑ Activate Keepalive Checks

Automatically look for module changes
- ☐ Activate Hardware Checks

Interval *
The period (in minutes) at which time we try to discover new devices

120

Country Belgium ▾

Timezone Europe/Brussels ▾

Submit   Cancel

Important: make sure that you activate the **keep alive** alarming for Racktivity Energy Switches.
In case DCPM does not get feedback from the connected device within a period equal to twice the interval period defined, an alarm will be raised.
The alarm is visible in the alarm panel or can be organized on the alarm map.

*should you not have a proper license key, the system can be configured and will be organized in evaluation mode. This incurs limited options to connect max. 2 Energy Switches .

Default credentials

The default login credentials for your DCPM instance:

- Login: **admin**
- Password: **1234**

Please change these as soon as possible.

Initial Setup

After installing DCPM, the only available Component in the navigation Space is Enterprise. Before populating the system with PDUs and other devices it is advised to add the necessary Components similar to your actual infrastructure.

For more information on how Components correlate, please refer to the Components chapter.

Adding and editing Components

The following Components can be added to your DCPM instance. Once created, a Component can be edited by navigating to the applicable Page and selecting Edit in the Actions menu.

Enterprise

Enterprise is the default Component enabled in DCPM and represents the top of the Component hierarchy.

- Use the Action menu to edit and rename to your organization. Give this Component your specific enterprise name.

Location

A location represents the geographical location of the Components below it.

To add a location to the Enterprise:

- Move the cursor over the Actions menu in the navigation pane and select "Add Location".
- The "Create a Location" wizard appears. Fill in the necessary fields and click Submit.
- A confirmation window appears, click OK.
- The location appears as child of the Enterprise Component in the navigation pane. Select it by moving your cursor over the Location breadcrumb and clicking the appropriate item.

**Note:** The data and graphics will not be filled with data until DCPM is also populated with EnergySwitches.

Datacenter

A location can have 1 or more physical datacenter buildings.

To add a datacenter to a location:

- Navigate to the location Page using the navigation pane.
- Move the cursor over the Actions menu in the navigation pane and select "Add Datacenter".

- The "Create Datacenter" wizard appears. Fill in the necessary fields on both tabs (including time zone as this will enable correct time information on graphs and reports) and click Submit.
- The system will prompt a message to add a feed
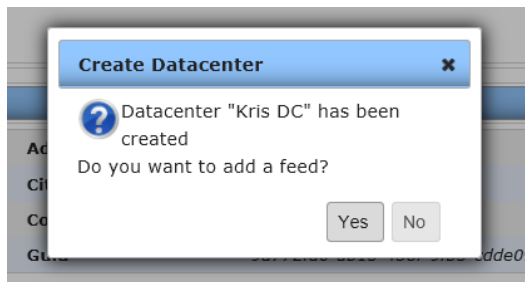
Assign a feed in case you want to measure the incoming power distributed over your datacenter. All feed options will be outlined in the detailed user manual.
- A confirmation window appears, click OK.
- The datacenter appears as child of the location Component in the navigation pane. Select it by moving your cursor over the datacenter breadcrumb and clicking the appropriate item.

Once a datacenter has been successfully added you have the option of adding **floors**, **rooms** and **racks** to your datacenter by moving the cursor over the Actions menu.
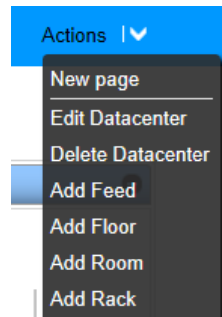
Floor

Floors are physical layers in a datacenter; it is possible that your datacenter building has more than one floor.
To add a floor to a datacenter:
- Navigate to the datacenter Page using the navigation pane.
- Move the cursor over the Actions menu in the navigation pane and select "Add Floor".
- The "Create Floor" wizard appears. Fill in the necessary fields and click Submit.
- A confirmation window appears, click OK.
- The floor appears as child of the datacenter Component in the navigation pane. Select it by moving your cursor over the Datacenter breadcrumb and clicking the appropriate item.

Note: Once a floor has been created, the "Add Room" item will disappear from the Actions menu of its parent datacenter Page. Since a parent can only have children of the same type the "Add Room" has now moved to the Action menu of the floor Page. See the Components chapter for more info.

Room

Depending on the layout of the datacenter, a floor can be one big room by itself, or it can be divided in multiple rooms.
Note: A room can be added to a datacenter or a floor (but not both), see the Components chapter for more info.
To add a room:

- Navigate to the parent Page using the navigation pane.
- Move the cursor over the Actions menu in the navigation pane and select "Add Room".
- The "Create Room" wizard appears. Fill in the necessary fields and click Submit.
- A confirmation window appears, click OK.
- The room appears as child of its parent Component in the navigation pane. Select it by moving your cursor over the parent' breadcrumb and clicking the appropriate item.

Pod

A pod is a part of a datacenter room for easy extension of your space.
To add a pod to a room:

- Navigate to the room Page using the navigation pane.
- Move the cursor over the Actions menu in the navigation pane and select "Add Pod".
- The "Create Pod" wizard appears. Fill in the necessary fields and click Submit.
- A confirmation window appears, click OK.
- The Pod appears as child of the room Component in the navigation pane. Select it by moving your cursor over the parent' breadcrumb and clicking the appropriate item.

Row

The racks that house your servers will most likely be setup in rows.
To add a row:

- Navigate to the parent Page using the navigation pane.
- Move the cursor over the Actions menu in the navigation pane and select "Add Row".
- The "Create Row" wizard appears. Fill in the necessary fields and click Submit.
- A confirmation window appears, click OK.
- The Row appears as child of its parent Component in the navigation pane. Select it by moving your cursor over the parent' breadcrumb and clicking the appropriate item.

Rack

Racks are the cabinets that house your servers and PDUs. The rack Component can be added to almost all other Components and represents the bottom of the Component hierarchy.
To add a rack:

- Navigate to the parent Page using the navigation pane.

- Move the cursor over the Actions menu in the navigation pane and select "Add Rack".
- The "Create Rack" wizard appears. Fill in the necessary fields (optionally set the automatic discovery options (IP addresses or ranges) on the Auto Discovery tab) and click Submit.
  For more info regarding auto discovery refer to the Populating DCPM chapter.
- A confirmation window appears, click OK.
- The Row appears as child of its parent Component in the navigation pane. Select it by moving your cursor over the parent' breadcrumb and clicking the appropriate item.

Feed

A feed is the representation of the incoming power. We identify the feeds on datacenter level.
To create a feed:

- Navigate datacenter page and add feed via actions menu
- Identify the feed name and capacity (A)
- Submit

Feeds can be extended with sub-feeds according to the feed structure within your datacenter.
Example of a feed tree:
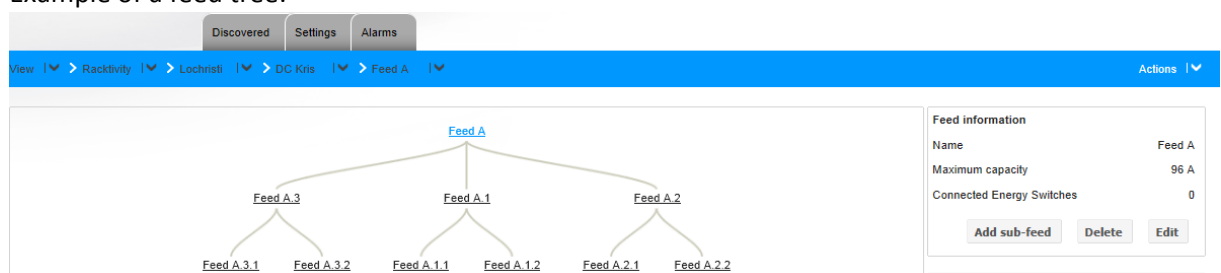
Feed information is aggregated to show the available capacity up till the highest feed level.
Devices (like Energy Switches) can only be connected to the lowest feed level.

Feeds	Current usage	Usage		Maximum Capacity	Minimal Usage	Maximal Usage
Feed A	15.083 A	15.71%		96.00 A	15.08 A	15.08 A
Feed A.3	7.614 A	23.79%		32.00 A	7.61 A	7.61 A
Feed A.3.2	0 A	0.00%		16.00 A	0.00 A	0.00 A
Feed A.3.1	7.614 A	47.59%		16.00 A	7.61 A	7.61 A
Feed A.2	7.469 A	23.34%		32.00 A	7.47 A	7.47 A
Feed A.2.2	0 A	0.00%		16.00 A	0.00 A	0.00 A
Feed A.2.1	7.469 A	46.68%		16.00 A	7.47 A	7.47 A
Feed A.1	0 A	0.00%		32.00 A	0.00 A	0.00 A
Feed A.1.2	0 A	0.00%		16.00 A	0.00 A	0.00 A
Feed A.1.1	0 A	0.00%		16.00 A	0.00 A	0.00 A

Page template: nodes/reportfeedsdetails.tmpl, generated: 2012-04-19 13:20

Populating DCPM

When you have created your complete structure, it is possible to fill this structure with all available PDUs that will bring information in to DCPM.
In this section we will explain how to find and configure the PDUs in your network.

Discover and configure PDU's

Under a rack you will be able to hang any type of PDUs. These PDUs can be of Racktivity as well as other brands. Finding PDUs in your network is possible via an *autodiscovery* function.

Discover the PDUs

Autodiscovery is possible in case you identified the appropriate IP addresses or ranges to the **Rack** component (see section **adding a rack**). The system scans the given IP ranges based on the autodiscovery interval as defined on the **Settings** page under **preferences**.
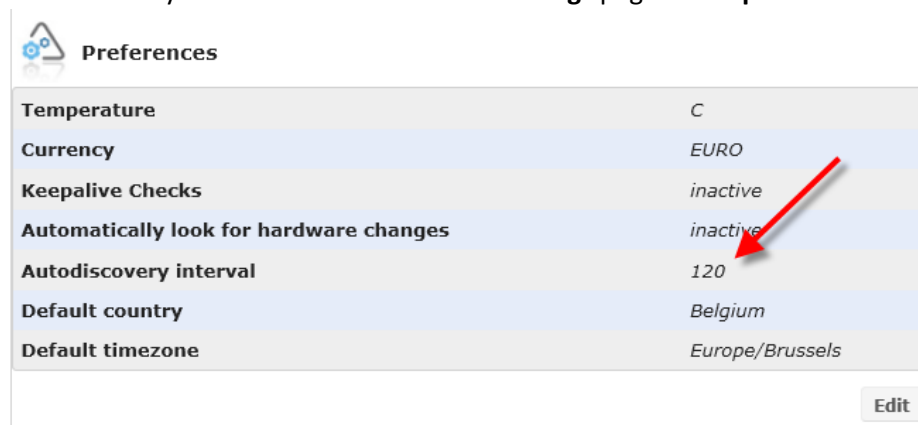
Tips and Tricks

In order to check whether all racks have the correct IP ranges or to immediately discover the required PDU's, go to the **Settings** page, section **Data collection**, option **Auto discovery**.
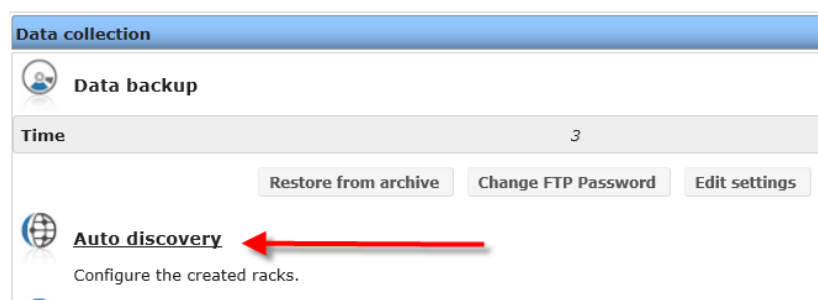
Selecting this option will give you a list of all racks with available IP addresses. You can select the button **Discover** to start an immediate autodiscovery. This way you are not forced to wait on the interval period.

Auto discovery			
Rack	Ip Address		
KDP	192.168.14.117	Discover	Edit
Racktivity		Discover	Edit
	Page 1 of 1		

Remark: In case the IP address is empty you can use function button **edit** to configure the autodiscovery.

Configure the PDUs

All the discovered PDU's are created in the system as **Energy Switch.**
They can be visualized via the **Settings** page, section **Devices,** under **Discovered Energy Switches.**
The list shows all discovered **not configured** devices.
How to configure?
Select the device in the list and click button **Configure.**
A wizard will be displayed asking for following information:

- Credential data
    - Name of the Energy Switch
    - Read user = can only read data
      Important: This is the read user defined to the Energy Switch
    - Admin User = can manage the Energy Switch
      Important: This is the admin user defined to the Energy Switch
    - API port – if not taken automatically

- Attach power feed: select the power feed to which this Energy Switch belongs.

Remark: for non Racktivity devices this wizard will be used to set the SNMP configuration.

Submit the wizard to complete the configuration. This will bring you to the page of the configured Energy Switch.

New data is checked and updated every 5 minutes, starting from the hour.

In case Racktivity Energy Sensors are attached and administrated* by the configured PDU, the sensor will be automatically added as an element of the Energy Switch.

*check the interface of the PDU in case an Energy sensor is attached but not automatically discovered.

You can again edit the data via the actions menu
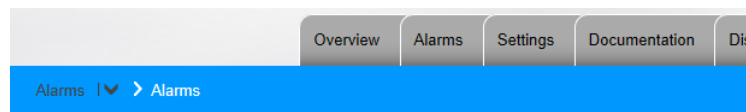Example: name

Alarms

In DCPM alarms can be set for existing components (except enterprise). This way different attributes (like Voltage, Current etc.) can be monitored for every component.

When the values for these attributes exceed certain limits then an alarm is raised.
Different actions can be triggered when an alarm is raised:

- send an e-mail
- send an SNMP trap
- raise an internal event
- persistent alarm

Persistent alarms need to be monitored within DCPM via the **operator panel** in the **alarms** space.

The operator panel has two sections:

- Alarm list section - this contains two list of alarms and a list of warnings.
- Detailed information section - this contains detailed information about the selected alarms from the alarm list.

There are two types of alarms:

- Monitoring alarms - these alarms work on monitored data received from energy switches and also on the aggregated data from the upper levels (rack, room, datacenter etc.)
- SNMP alarms - there alarms can be configured only for energy switches and they work by setting certain thresholds on devices. When the value of a certain parameter exceeds the threshold the device will send an SNMP trap back to DCPM which raises an alarm.

Alarms can be set from the **"User defined alarms**" section at the bottom of the details pages. That section also lists the defined alarms for objects.

object	check ↑	condition	value	type	actions		edit	delete
On device	Power	>	100	monitoring	persistence type: ERROR		Edit	Delete
On device	Voltage	>	10	snmp	persistence type: ERROR		Edit	Delete

Create alarm