

---

# **CDR-Stats Documentation**

***Release 3.1.0***

**Arezqui Belaid**

October 26, 2015



|          |                                                              |           |
|----------|--------------------------------------------------------------|-----------|
| <b>1</b> | <b>Getting Started</b>                                       | <b>3</b>  |
| 1.1      | Overview . . . . .                                           | 3         |
| 1.2      | Dashboard . . . . .                                          | 4         |
| 1.3      | Admin Panel . . . . .                                        | 5         |
| 1.4      | Architecture . . . . .                                       | 5         |
| 1.5      | Features . . . . .                                           | 7         |
| 1.6      | Utility . . . . .                                            | 7         |
| <b>2</b> | <b>Installation</b>                                          | <b>9</b>  |
| 2.1      | Overview . . . . .                                           | 9         |
| 2.2      | Install CDR-Stats . . . . .                                  | 11        |
| 2.3      | Configure Postgresql for Remote Access . . . . .             | 12        |
| 2.4      | CDR-Pusher Installation . . . . .                            | 14        |
| 2.5      | Configure Asterisk with CDR-Stats and CDR-Pusher . . . . .   | 18        |
| 2.6      | Configure FreeSWITCH with CDR-Stats and CDR-Pusher . . . . . | 23        |
| 2.7      | Configure Kamailio with CDR-Stats and CDR-Pusher . . . . .   | 26        |
| <b>3</b> | <b>Configuration and Defaults</b>                            | <b>31</b> |
| 3.1      | General Configuration . . . . .                              | 31        |
| 3.2      | Country Reporting . . . . .                                  | 33        |
| 3.3      | Configuration for Asterisk . . . . .                         | 34        |
| 3.4      | Realtime configuration for Asterisk . . . . .                | 35        |
| 3.5      | Configuration for FreeSWITCH . . . . .                       | 35        |
| 3.6      | Realtime configuration for FreeSWITCH . . . . .              | 36        |
| 3.7      | Resetting CDR Data . . . . .                                 | 36        |
| 3.8      | Celery Configuration . . . . .                               | 37        |
| 3.9      | ACL Control . . . . .                                        | 39        |
| <b>4</b> | <b>Celery</b>                                                | <b>41</b> |
| 4.1      | Celery Installation . . . . .                                | 41        |
| <b>5</b> | <b>Troubleshooting</b>                                       | <b>45</b> |
| 5.1      | Where to find the log files . . . . .                        | 45        |
| 5.2      | Run in debug mode . . . . .                                  | 45        |
| 5.3      | Celerymon . . . . .                                          | 45        |
| <b>6</b> | <b>User Guide</b>                                            | <b>47</b> |
| 6.1      | Overview . . . . .                                           | 47        |

|           |                                                   |            |
|-----------|---------------------------------------------------|------------|
| <b>7</b>  | <b>PostgreSQL</b>                                 | <b>71</b>  |
| 7.1       | Materialized views . . . . .                      | 71         |
| <b>8</b>  | <b>Developer doc</b>                              | <b>73</b>  |
| 8.1       | Prerequisites . . . . .                           | 73         |
| 8.2       | Coding Style & Structure . . . . .                | 73         |
| 8.3       | Database Design . . . . .                         | 74         |
| 8.4       | Objects Description . . . . .                     | 74         |
| 8.5       | Objects used by the VoIP Billing module . . . . . | 77         |
| 8.6       | CDR-Stats Views . . . . .                         | 79         |
| 8.7       | CDR-Stats Tasks . . . . .                         | 82         |
| 8.8       | Test Case Descriptions . . . . .                  | 82         |
| 8.9       | Javascript Files . . . . .                        | 83         |
| <b>9</b>  | <b>API Reference</b>                              | <b>85</b>  |
| 9.1       | SwitchSerializer . . . . .                        | 85         |
| 9.2       | VoIPRateList . . . . .                            | 85         |
| 9.3       | VoipCallResource . . . . .                        | 86         |
| <b>10</b> | <b>Contributing</b>                               | <b>89</b>  |
| 10.1      | Community Code of Conduct . . . . .               | 90         |
| 10.2      | Reporting Bugs . . . . .                          | 91         |
| 10.3      | Versions . . . . .                                | 92         |
| 10.4      | Branches . . . . .                                | 92         |
| 10.5      | Tags . . . . .                                    | 93         |
| 10.6      | Working on Features & Patches . . . . .           | 93         |
| 10.7      | Coding Style . . . . .                            | 95         |
| 10.8      | Contacts . . . . .                                | 97         |
| 10.9      | Release Procedure . . . . .                       | 98         |
| <b>11</b> | <b>Resources</b>                                  | <b>99</b>  |
| 11.1      | Getting Help . . . . .                            | 99         |
| 11.2      | Bug tracker . . . . .                             | 99         |
| 11.3      | Documentation . . . . .                           | 99         |
| 11.4      | Support . . . . .                                 | 100        |
| 11.5      | License . . . . .                                 | 100        |
| <b>12</b> | <b>Frequently Asked Questions</b>                 | <b>101</b> |
| 12.1      | General . . . . .                                 | 101        |
| 12.2      | CDR Import . . . . .                              | 101        |
| 12.3      | Debugging . . . . .                               | 102        |
| <b>13</b> | <b>Indices and tables</b>                         | <b>105</b> |
|           | <b>Python Module Index</b>                        | <b>107</b> |

**Version** 3.1

**Release** 3.1.0

**Date** October 26, 2015

Contents:



---

## Getting Started

---

**Web** <http://www.cdr-stats.org/>

**Download** <http://www.cdr-stats.org/download/>

**Source** <https://github.com/cdr-stats/cdr-stats/>

**Keywords** VoIP, Freeswitch, Asterisk, Django, Python, Call, Reporting, CDR

—

CDR-Stats is free and open source **CDR** (Call Detail Record) mediation, rating, analysis and reporting application for Freeswitch, Asterisk and other type of VoIP Switch. It allows you to interrogate your **CDR** to provide reports and statistics via a simple to use, yet powerful, web interface.

It is based on the [Django](#) Python Framework, [Celery](#), [Gevent](#), [PostgreSQL](#) and [InfluxDB](#).

- *Overview*
- *Dashboard*
- *Admin Panel*
- *Architecture*
- *Features*
- *Utility*

### 1.1 Overview

CDR-Stats is an application that allows rating, browsing and analysing **CDR**.

Different reporting tools are provided:

- Dashboard: Overview of call activity
- Search CDR: Search, filter, display and export CDR
- Overview: Analyse call traffic by hour, day and month
- Daily Comparison: Compare call traffic day on day
- Country Report: Call statistics by country
- World Map: Call statistics overlaid on a world map
- Call Cost and Carrier Costs
- Mail daily aggregated reports

- Threat Control: Detect abnormal call patterns
- Destination Alerts: Unexpected destination alerts

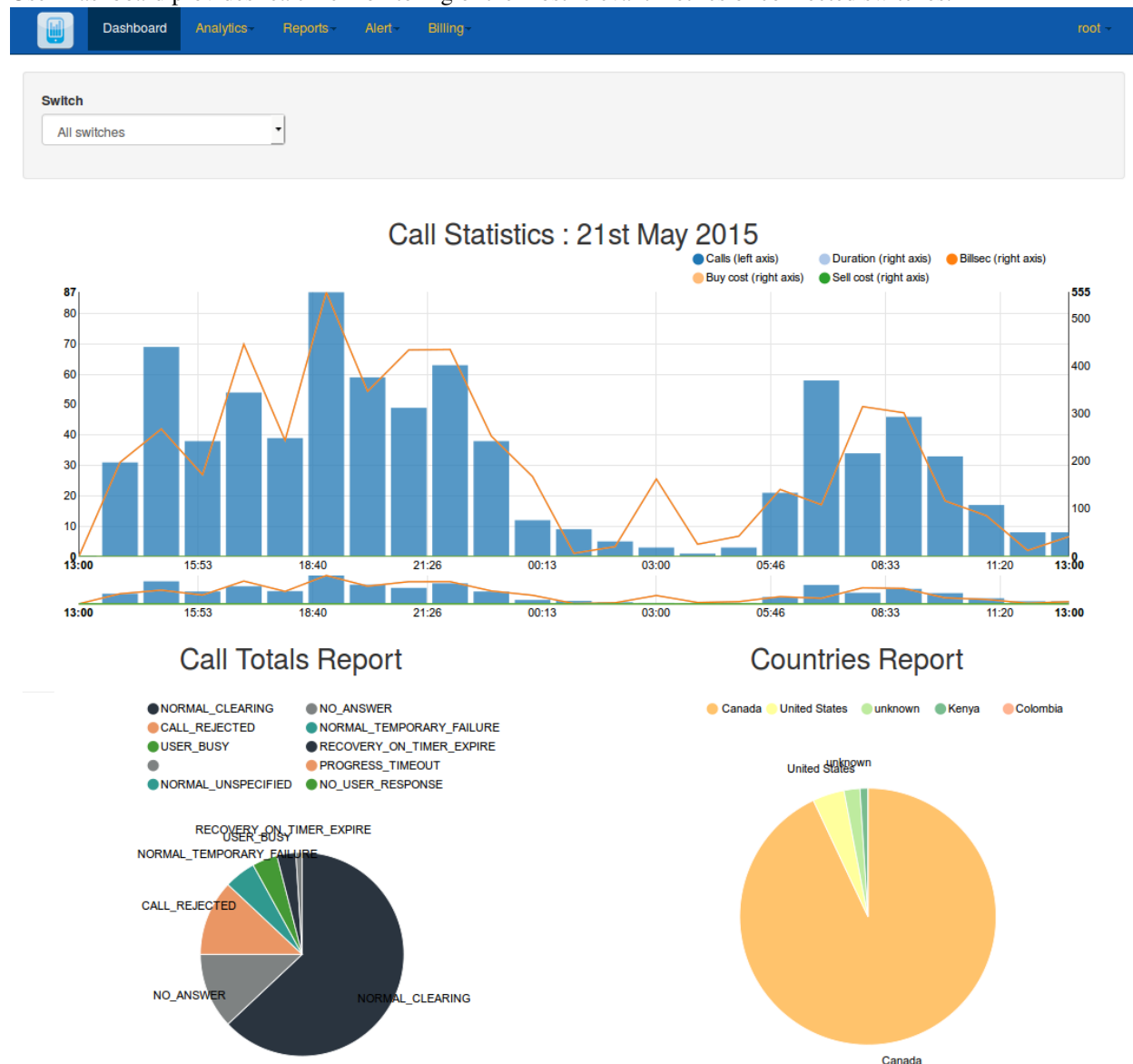
CDR Stats uses PostgreSQL, a scalable, high performance database system used to analyse large quantities of CDR data. PostgreSQL provides Materialized views which make it perfect to build analytic application which do heavy aggregation and recently PostgreSQL comes with Jsonb field which make it easy to store custom data from variety of switch.

Out of the box, CDR-Stats supports Freeswitch, Asterisk, Kamailio, SipWise, Veraz using connectors that get the CDRs and push them to centralized database. Connectors any switch systems can be built.

For list of the last supported Switches, please refer to <http://www.cdr-stats.org/pricing/switch-connectors/>

## 1.2 Dashboard

User Dashboard provides realtime monitoring of the most relevant metrics of connected switches.



## 1.3 Admin Panel

The Admin Panel allows the administrators to configure the entire reporting platform, import CDR in CSV format, configure users, switch connections and automatic alarms.

CDR-STATS V3.0.0-BETA    BOOKMARKS    APPLICATIONS    ADMINISTRATION    CUSTOMER PANEL    Welcome, root. () / Change password / Log out

### Dashboard

**General**

User   Task Manager   Recent Actions

**Auth**

Admins   Add   Change

Customers   Add   Change

Groups   Add   Change

**Sites**

Sites   Add   Change

**User\_Profile**

Accountcodes   Add   Change

**Alert**

**Cdr\_Alert**

Alarms   Add   Change

Alarms report   Add   Change

Alert remove prefixes   Add   Change

Blacklist   Change

Whitelist   Change

**CDR Voip**

**Cdr**

Calls   Add   Change

Hangup causes   Add   Change

**Voip Gateway**

**Voip\_Gateway**

Gateways   Add   Change

Providers   Add   Change

**Voip Billing**

**Voip\_Billing**

Ban plans   Add   Change

Ban prefixes   Add   Change

Carrier plans   Add   Change

Carrier rates   Add   Change

Retail plans   Add   Change

Retail rates   Add   Change

VoIP plans   Add   Change

Rebilling

**Quick links**

[Go to CDR-Stats.org](#)   [Change password](#)   [Log out](#)

**Latest CDR-Stats News**

[CDR-Stats V3 - coming soon](#)   April 7, 2015

[CDR-Stats V2 Screencast - Call & VoIP Monitoring](#)   Jan. 29, 2013

[CDR-Stats Version 2 released](#)   Jan. 25, 2013

[CDR-Stats V2.0.0RC1](#)   Dec. 12, 2012

[CDR-Stats Beta 8 Released](#)   Dec. 4, 2012

**Country Dialcode**

**Country Dialcode**

Countries   Add   Change

Prefixes   Add   Change

**Switch**

**Switch**

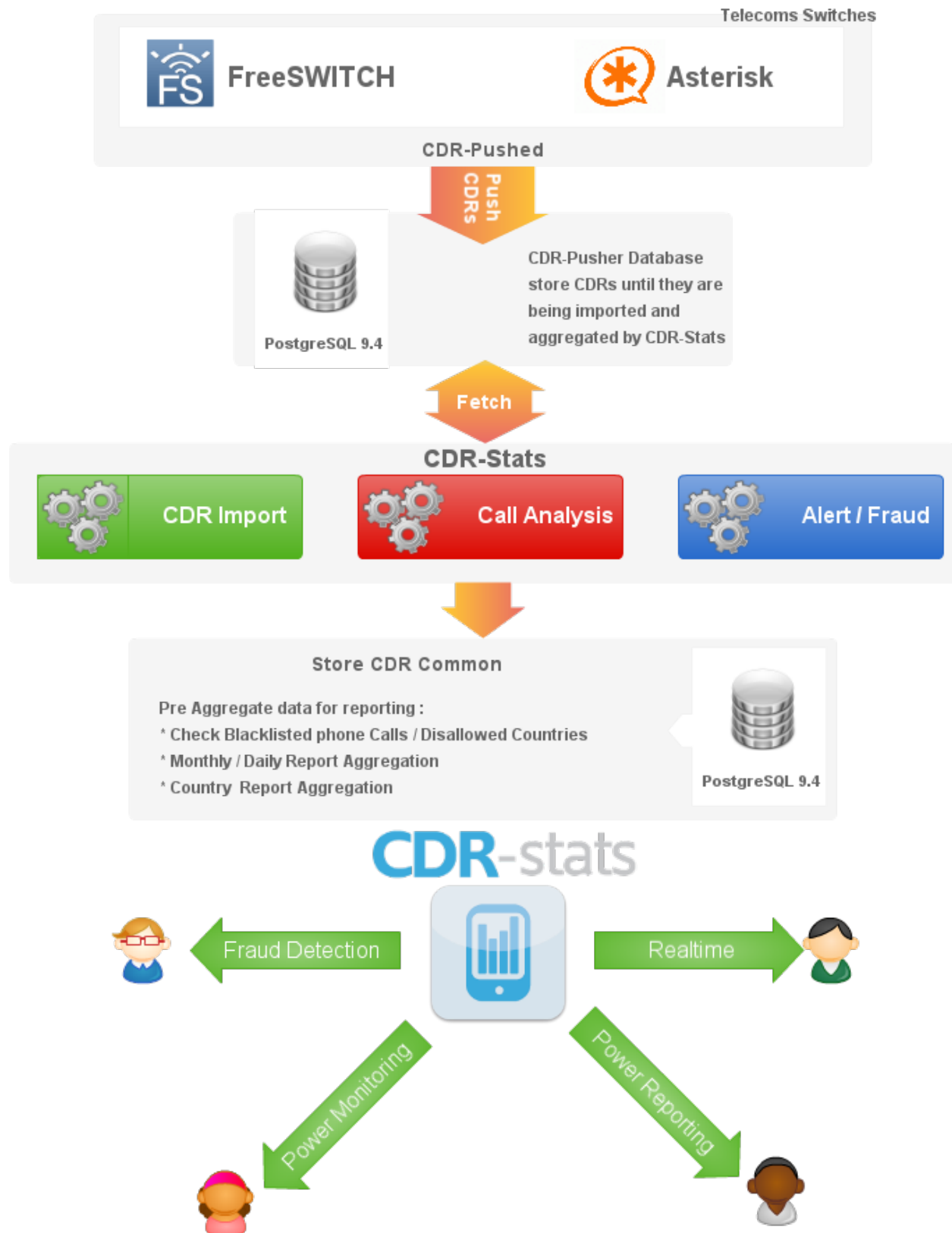
Switches   Add   Change

## 1.4 Architecture

CDR-Stats uses PostgreSQL as the underlying CDR store. PostgreSQL with Materialized view allows querying and analysis of many millions of records without noticeable loss of performance, and can easily be scaled as demand increases.

Postgresql is used for managing CDR-Stats in terms of users and managing the web framework, Django.

Celery, a task manager runs in the background, and monitors the CDR coming into the system, and alerts the systems administrator when unusual behaviour is discovered. What is determined as unusual behaviour is determined by the administrator who can configure alerts for increases in dropped calls, average length of calls, or calls to unusual destinations.



CDR-Stats works hand in hand with [CDR-Pusher](#) which has been built to create an totally independent, easy to install, high performance CDRs Collector. CDR-Pusher is installed on your local Telcoms Switch (e.g. Asterisk), the

application will harvest CDRs in Realtime and push them to a central CDR-Stats Database.

## 1.5 Features

Many features are provided on CDR-Stats, from browsing millions of CDRs, call rating, providing efficient search facilities to build reporting such as monthly reports and comparing call traffic with previous days.

|                     |                                                                                                                                          |
|---------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Telephony Reporting | Leading open source switches Freeswitch, Asterisk, supported as standard.                                                                |
| Multi-switch        | Monitor traffic from many switches in one location                                                                                       |
| Multi-tenant        | Slowing many customers to monitor their own CDR on one instance of CDR-Stats.                                                            |
| Distributed         | Runs on one or more machines. Supports broker <i>clustering</i> and <i>HA</i> . New workers can be set up without central configuration. |
| Fraud detection     | Visualise traffic which helps to identify unusual patterns.                                                                              |
| Fraud Alert         | Send emails to the administrator when fraud are or suspicious paterns occur                                                              |
| Error Emails        | Can be configured to send emails to the administrator if a tasks fails.                                                                  |
| Import CDR          | Import CDR files in custom format                                                                                                        |
| World Map view      | See where the traffic originates and terminates on a Map                                                                                 |
| Compare traffic     | See how your traffic evolves, and patterns change.                                                                                       |
| Mail Reporting      | Send daily mail reports of telecoms traffic                                                                                              |
| Realtime Reporting  | Traffic displayed in realtime                                                                                                            |
| Blacklist           | Blacklist Phone number patterns to receive alarms                                                                                        |
| Geographic alerts   | Set alert if calls go to disallowed countries                                                                                            |
| Call Rating         | Each call individually rated                                                                                                             |

## 1.6 Utility

CDR-Stats is a simple-to-use tool to provide easy rating and analysis of calls. It is a recommended addition to telephony servers, whether it be a simple in-house PBX or large capacity VoIP switch. It shows in in near realtime what calls are going through, can detect errors and failures, and alert the systems administrator is unexpected traffic is noted.



## Installation

Contents:

### 2.1 Overview

CDR-Stats is a web-based telecoms application for analysing, reporting and rating on CDR (Call Detail Records) for multiple tenants delivered from Asterisk, Freeswitch and other supported telecoms switches.

#### Daily comparison

Select date\*

2015-04-08

Compare

- 4 days

Switch

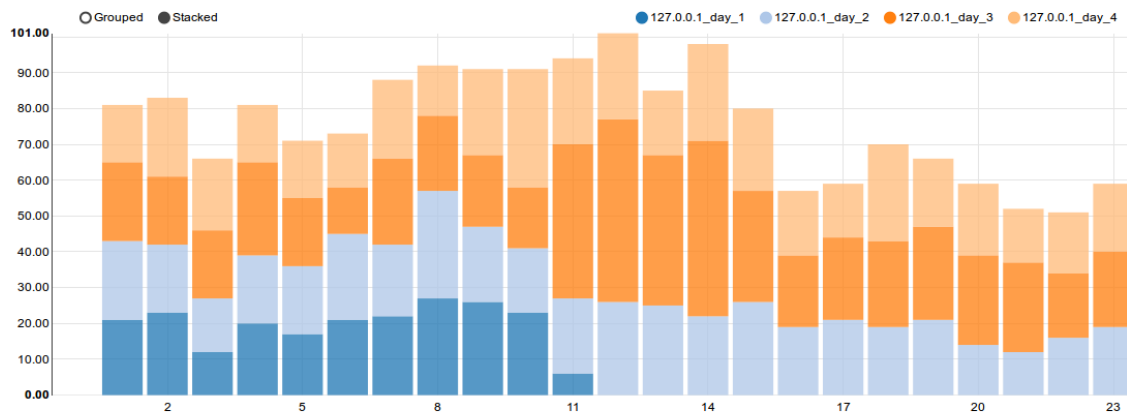
All switches

Metric

calls

Q Search

Call Statistics - 8th April 2015 with previous days - Showing: Nbcalls



Powered by CDR-Stats - [Call Monitoring & Analytics Software](#)

CDR-Stats is built on Open Source Software where the core components are Django, PostgreSQL, Celery, Redis, Socket.IO, Bower and Bootstrap Framework. There are many more Python and Django dependencies needed but if

you are not a developer, you might want to skip those details as CDR-Stats can simply be installed using a script which installs transparently and seamlessly, CDR-Stats and the stack for you.

### 2.1.1 Install requirements

The *requirements* files provides a way to create an environment where all the dependencies needed for the CDR-Stats are installed.

To get started with CDR-Stats the following must be installed:

- python >= 2.7 (programming language)
- nginx - Http Server
- django Framework >= 1.7 (Python based Web framework)
- celery >= 3.0 (Asynchronous task queue/job queue based on distributed message passing)
- linaro\_django\_pagination (Utilities for creating robust pagination tools throughout a django application)
- django-uuidfield >= 0.2 (Provides a UUIDField for your Django models)
- kombu >= 1.0.2 (An AMQP - Advanced Message Queuing Protocol messaging framework for Python)
- python-dateutil >= 1.5 (Extensions to the standard datetime module)
- redis >= 2.2.2 (Redis Python Client)
- django-notification >= 0.1.3 (User notification management for the Django web framework)
- django-country-dialcode - Django reusable application to manage Dial code of Countries

and many more, please find a full list of our requirements to our requirements files:

- <https://github.com/cdr-stats/cdr-stats/blob/develop/requirements/basic.txt>
- <https://github.com/cdr-stats/cdr-stats/blob/develop/requirements/django.txt>

There is also 2 extra requirements files for developers and to run our tests:

- <https://github.com/cdr-stats/cdr-stats/blob/develop/requirements/dev.txt>
- <https://github.com/cdr-stats/cdr-stats/blob/develop/requirements/test.txt>

The requirements must be installed into a virtual environment so that the dependencies of the application do not interfere with other applications on the server. More information can be found about virtualenv at: <http://pypi.python.org/pypi/virtualenv>

PIP is a tool for installing and managing Python packages, more information about PIP : <http://www.pip-installer.org/en/latest/index.html>

Using PIP, you can easily install all the requirements:

```
$ pip install -r requirements/all.txt
```

### 2.1.2 Running CDR-Stats manually

Inside CDR-Stats directory you should run, the following:

```
$ python manage.py syncdb --noinput  
  
$ python manage.py collectstatic
```

```
$ python manage.py migrate
$ python manage.py createsuperuser
$ python manage.py runserver
```

`syncdb` will create a database named `test.db` in `database` folder of the CDR-Stats directory. CDR-Stats is configured to do this, but can be changed by modifying `settings.py` where the `DATABASES` dictionary is constructed. there is more information about this in the Django documentation.

`collectstatic` will fetch all necessary media files and put them into `static` folder defined in the settings module.

`migrate` will applying database migration to update the database schemas of CDR-Stats to its latest version.

`createsuperuser` will create a super user, to access to the admin section of CDR-Stats.

`runserver` runs an embedded webserver to test the site. By default it will run on <http://localhost:8000>. This is configurable and more information about `runserver` is in Django documentation.

## 2.2 Install CDR-Stats

### 2.2.1 Download and Install CDR-Stats

Our install script supports Debian 7.x and Debian 8.x 64 bit version, we recommend the latest version of Debian.

Install CDR-Stats *Master* branch:

This will copy and un the *master* install script:

```
cd /usr/src/ ; rm install-cdr-stats.sh ; wget --no-check-certificate https://raw.githubusercontent.com/cdr-stats/cdr-stats/master/install-cdr-stats.sh ;
```

During the installation, a number of self explanatory questions will be asked, including the root username and password.

On completion CDR-Stats will be ready to use once it is configured to your requirements in `settings_local.py` as described in the next section, and the CDR-Pusher is installed, usually to your switch, to send CDR to CDR-Stats.

### 2.2.2 Config file - settings.py & settings\_local.py

The main config file for CDR-Stats is located at `/usr/share/cdrstats/cdr_stats/settings_local.py`

Before importing CDR, there are some settings that need to be changed to suit your location.

#### Email Backend

Configure these settings to register to your SMTP server for sending outbound mail.

#### Allowed Hosts

Normally, this IP address will be configured correctly as part of the installation process, however if the IP address changes, or if you are accessing via another IP, e.g. port forwarding through a firewall or you use an FQDN, the additional IP addresses via which you access CDR-Stats will need to be added here enclosed in single 'quotation' marks and separated with a comma.

## General

The general settings deal with how the dialled digits are treated in order to normalise them for matching to a rate.

PHONENUMBER\_PREFIX\_LIMIT\_MIN & PHONENUMBER\_PREFIX\_LIMIT\_MAX are used to determine how many digits are used to match against the dialcode prefix database, e.g:

```
PHONENUMBER_PREFIX_LIMIT_MIN = 2
PHONENUMBER_PREFIX_LIMIT_MAX = 5
```

If a phone number has less digits than PHONENUMBER\_MIN\_DIGITS it will be considered an extension:

```
PHONENUMBER_MIN_DIGITS = 6
PHONENUMBER_MAX_DIGITS = 9
```

If a phone number has more digits than PHONENUMBER\_DIGITS\_MIN but less than PHONE\_DIGITS\_MAX then the phone number will be considered as local or national call and the LOCAL\_DIALCODE will be added:

```
LOCAL_DIALCODE = 1
```

Set the dialcode of your country (44 for UK, 1 for US):

```
PREFIX_TO_IGNORE = "+,0,00,000,0000,00000,011,55555,99999"
```

List of prefixes to ignore, these prefixes are removed from the phone number prior to analysis.

## Country Examples

So for the USA, to cope with 10 or 11 digit dialling, PHONENUMBER\_MAX\_DIGITS would be set to 10, and LOCAL\_DIALCODE set to 1. Thus 10 digit numbers would have a 1 added, but 11 digit numbers are left untouched.

In the UK, the number of significant digits is either 9 or 10 after the “0” trunk code. So to ensure that all UK numbers had 44 prefixed to them and the single leading 0 removed, the prefixes to ignore would include 0, the PHONENUMBER\_MAX\_DIGITS would be set to 10, and the LOCAL\_DIALCODE would be 44.

In Spain, where there is no “0” trunk code, and the length of all numbers is 9, then the PHONENUMBER\_MAX\_DIGITS would be set to 9, and the LOCAL\_DIALCODE set to 34.

When any changes are made to this file, then Celery should be restarted to apply the changes.

## 2.3 Configure Postgresql for Remote Access

### 2.3.1 2.1 First backup your conf files

Backup postgresql.conf & pg\_hba.conf:

```
cp /etc/postgresql/9.4/main/postgresql.conf /etc/postgresql/9.4/main/postgresql.conf.bkup
cp /etc/postgresql/9.4/main/pg_hba.conf /etc/postgresql/9.4/main/pg_hba.conf.bkup
```

### 2.3.2 2.2 Allow TCP/IP socket

Edit the PostgreSQL configuration file, using a text editor such as vi.

Configure PostgreSQL to listen for remote connections:

```
sed -i "s/#listen_addresses = 'localhost'/listen_addresses = '*'/" /etc/postgresql/9.4/main/postgresql.conf
```

### 2.3.3 2.3 Enable client authentication

Configure PostgreSQL to accept remote connections (from any host on your network):

```
cat >> /etc/postgresql/9.4/main/pg_hba.conf <<EOF
# Accept all IPv4 connections
host      all             all             <SWICH_IP>/24             md5
EOF
```

Make sure you replace <SWICH\_IP>/24 with your actual network IP address range.

If you want to accept CDR from only from one IP address, then enter the IP in switch, followed by /32, e.g. <SWICH\_IP>/32

### 2.3.4 2.4 Restart PostgreSQL Server

Restart PostgreSQL for the changes to take effect:

```
/etc/init.d/postgresql restart
```

### 2.3.5 2.5 Setup firewall Iptables

Make sure iptables is not blocking communication, open port 5432:

```
iptables -A INPUT -p tcp -s 0/0 --sport 1024:65535 -d <SWICH_IP> --dport 5432 -m state --state NEW,ESTABLISHED
iptables -A OUTPUT -p tcp -s <SWICH_IP> --sport 5432 -d 0/0 --dport 1024:65535 -m state --state ESTABLISHED,NEW
```

Restart firewall:

```
/etc/init.d/iptables restart
```

### 2.3.6 2.6 Test your setup

In order to test, you will need to install PostgreSQL client, on Debian you can install as follows:

```
apt-get install postgresql-client
```

For CentOS:

```
yum install postgresql
```

Use psql command from client system. Connect to remote server using IP address and login using vivek username and sales database, enter:

```
$ psql -h <POSTGRESQL_IP> -U USERNAME -d CDRPUSHER_DBNAME
```

Replace POSTGRESQL\_IP, USERNAME and CDRPUSHER\_DBNAME, with the one from your CDR-Stats server.

Check *settings\_local.py* for the username and password.

## 2.4 CDR-Pusher Installation

CDR-Pusher is a Go Application that will push your CDRs (Call Detail Record) from your Telco Switch (Asterisk, FreeSWITCH or other supported switch <http://www.cdr-stats.org/pricing/switch-connectors/>) to the centralized PostgreSQL Database CDR-Pusher on the CDR-Stats server.rebo

### 2.4.1 3.1 Install / Run

Install Golang dependencies (Debian/Ubuntu):

```
$ apt-get -y install mercurial git bzr bison
$ apt-get -y install bison
```

Install GVM to select which version of Golang you want to install:

```
$ bash < <(curl -s -S -L https://raw.githubusercontent.com/moovweb/gvm/master/binscripts/gvm-install.sh)
$ source /root/.gvm/scripts/gvm
$ gvm install go1.4.2 --binary
$ gvm use go1.4.2 --default
```

Make sure you are running by default Go version  $\geq 1.4.2$ , check by typing the following:

```
$ go version
```

To install and run the cdr-pusher application, follow these steps:

```
$ mkdir /opt/app
$ cd /opt/app
$ git clone https://github.com/cdr-stats/cdr-pusher.git
$ cd cdr-pusher
$ export GOPATH=`pwd`
$ make build
$ ./bin/cdr-pusher
```

The config file cdr-pusher.yaml is installed at the following location: /etc/cdr-pusher.yaml

### 2.4.2 3.2 Configuration file

Config file /etc/cdr-pusher.yaml:

```
# CDR FETCHING - SOURCE
# -----

# storage_source_type: DB backend type where CDRs are stored
# (accepted values: "sqlite3" and "mysql")
storage_source: "sqlite3"

# db_file: specify the database path and name
db_file: "/usr/local/freeswitch/cdr.db"

# Database DNS
# Use this with Mysql
db_dns: ""

# db_table: the DB table name
db_table: "cdr"
```

```

# db_flag_field defines the table field that will be added/used to track the import
db_flag_field: "flag_imported"

# max_fetch_batch: Max number of CDR to push in batch (value: 1-1000)
max_fetch_batch: 100

# heartbeat: Frequency of check for new CDRs in seconds
heartbeat: 1

# cdr_fields is list of fields that will be fetched (from SQLite3) and pushed (to PostgreSQL)
# - if dest_field is callid, it will be used in riak as key to insert
cdr_fields:
  - orig_field: uuid
    dest_field: callid
    type_field: string
  - orig_field: caller_id_name
    dest_field: caller_id_name
    type_field: string
  - orig_field: caller_id_number
    dest_field: caller_id_number
    type_field: string
  - orig_field: destination_number
    dest_field: destination_number
    type_field: string
  - orig_field: hangup_cause_q850
    dest_field: hangup_cause_id
    type_field: int
  - orig_field: duration
    dest_field: duration
    type_field: int
  - orig_field: billsec
    dest_field: billsec
    type_field: int
  # - orig_field: account_code
  #   dest_field: accountcode
  #   type_field: string
  - orig_field: "datetime(start_stamp)"
    dest_field: starting_date
    type_field: date
  # - orig_field: "strftime('%s', answer_stamp)" # convert to epoch
  - orig_field: "datetime(answer_stamp)"
    dest_field: extradata
    type_field: jsonb
  - orig_field: "datetime(end_stamp)"
    dest_field: extradata
    type_field: jsonb

# CDR PUSHING - DESTINATION
# -----

# storage_dest_type defines where push the CDRs (accepted values: "postgres" or "riak")
storage_destination: "postgres"

# Used when storage_dest_type = postgres
# datasourcename: connect string to connect to PostgreSQL used by sql.Open
pg_datasourcename: "user=postgres password=password host=localhost port=5432 dbname=cdr-pusher sslmode=disable"

# Used when storage_dest_type = postgres

```

```
# pg_store_table: the DB table name to store CDRs in Postgres
table_destination: "cdr_import"

# Used when storage_dest_type = riak
# riak_connect: connect string to connect to Riak used by riak.ConnectClient
riak_connect: "127.0.0.1:8087"

# Used when storage_dest_type = postgres
# riak_bucket: the bucket name to store CDRs in Riak
riak_bucket: "cdr_import"

# switch_ip: leave this empty to default to your external IP (accepted value: ""|"your IP")
switch_ip: ""

# cdr_source_type: write the id of the cdr sources type
# (accepted value: unknown: 0, csv: 1, api: 2, freeswitch: 3, asterisk: 4, yate: 5, kamailio: 6, opentel)
cdr_source_type: 0

# SETTINGS FOR FAKE GENERATOR
# -----

# fake_cdr will populate the SQLite database with fake CDRs for testing purposes (accepted value: "yes"|"no")
fake_cdr: "no"

# fake_amount_cdr is the number of CDRs to generate into the SQLite database for testing (value: 1-1000)
# this amount of CDRs will be created every second
fake_amount_cdr: 1000
```

## 2.4.3 3.3 Deployment

CDR-Pusher application aims to be run as Service, it can easily be run by Supervisor.

### 3.3.1 Install Supervisor

Some Linux distributions offer a version of Supervisor that is installable through the system package manager. These packages may include distribution-specific changes to Supervisor:

```
$ apt-get install supervisor
```

### 3.3.2 Configure CDR-Pusher with Supervisor

Create an Supervisor conf file for cdr-pusher:

```
$ vim /etc/supervisor/conf.d/cdr-pusher-prog.conf
```

A supervisor configuration could look as follow:

```
[program:cdr-pusher]
autostart=true
autorestart=true
startretries=10
startsecs = 5
directory = /opt/app/cdr-pusher/bin
command = /opt/app/cdr-pusher/bin/cdr-pusher
user = root
```

```
redirect_stderr = true
stdout_logfile = /var/log/cdr-pusher/cdr-pusher.log
stdout_logfile_maxbytes=50MB
stdout_logfile_backups=10
```

Make sure the director to store the logs is created, in this case you should create ‘/var/log/cdr-pusher’:

```
$ mkdir /var/log/cdr-pusher
```

### 3.3.4 Supervisord Manage

Supervisord provides 2 commands, supervisord and supervisorctl:

```
supervisord: Initialize Supervisord, run configed processes
supervisorctl stop programX: Stop process programX. programX is config name in [program:mypkg].
supervisorctl start programX: Run the process.
supervisorctl restart programX: Restart the process.
supervisorctl stop groupworker: Restart all processes in group groupworker
supervisorctl stop all: Stop all processes. Notes: start, restart and stop won't reload the latest c
supervisorctl reload: Reload the latest configs.
supervisorctl update: Reload all the processes where the config has changed.
```

### 3.3.5 Supervisord Service

You can also use supervisor using the supervisor service:

```
$ /etc/init.d/supervisor start
```

## 2.4.4 3.4 Configure CDR-Pusher

Edit */etc/cdr-pusher.yaml*

Get started by configuring the CDR source, this is your original CDR backend, for instance on Asterisk this can be MySQL, SQLite or PostgreSQL.

For Mysql & PostgreSQL you will need to configure the DNS too: <https://github.com/go-sql-driver/mysql>

Some of the settings to configure:

```
# storage_source_type: DB backend type where CDRs are stored
# (accepted values: "sqlite3" and "mysql")
storage_source: "mysql"

# Database DNS
db_dns: "root:password@/accounting"
```

Then configure the ‘CDR Pushing’ section, here you will need to define where the CDRs will go, this will ‘almost’ always be the ‘cdr-pusher’ database living on your CDR-Stats server.

Check your CDR-Stats installation, you should find the Database settings for cdr-pusher database in settings\_local.py

Some of the settings to configure:

```
# storage_dest_type defines where push the CDRs (accepted values: "postgres", "riak" or "both")
storage_destination: "postgres"
```

```
# Used when storage_dest_type = postgres
pg_datasourcename: "user=postgres password=password host=localhost port=5432 dbname=cdr-pusher sslmode=disable"
```

## 2.4.5 3.5 Configure your Switch CDR with CDR-Pusher

You will need to configure CDR-Pusher and you Telco Switch to work together, for this we put some individual instructions for :

> Configure FreeSWITCH with CDR-Stats and CDR-Pusher - *Configure FreeSWITCH with CDR-Stats and CDR-Pusher*

> Configure Asterisk with CDR-Stats and CDR-Pusher - *Configure Asterisk with CDR-Stats and CDR-Pusher*

> Configure Kamailio with CDR-Stats and CDR-Pusher - *Configure Kamailio with CDR-Stats and CDR-Pusher*

## 2.4.6 3.6 Restart Supervisor

After changes in CDR-Pusher configuration you will need to restart supervisor, you can do so with gently with:

```
/etc/init.d/supervisor stop
/etc/init.d/supervisor start
```

## 2.4.7 3.7 Troubleshooting

An easy way to verify that CDR-Stats is running smoothly is to look at the logs.

Find the import log activity on CDR-Stats at:

```
tail -f /var/log/cdr-stats/djcelery_error.log
```

Find the import log activity on CDR-Pusher at:

```
tail -f /var/log/cdr-pusher/cdr-pusher.log
```

Check out the CDR-Stats Database 'import\_cdr' to see realtime import:

```
python manage.py dbshell --database=import_cdr
```

Specific configuration per switch:

## 2.5 Configure Asterisk with CDR-Stats and CDR-Pusher

Asterisk supports many backends to store CDRs: SQLite3, PostgreSQL, MySQL and many more.

In this document, we will explain how to configure Asterisk to store CDRs in SQLite3 or Mysql then configure CDR-Pusher to send the CDR to CDR-Stats. Sqlite3 is the one we will recommend as this is by far the easiest to setup.

### 2.5.1 Store Asterisk CDRs to SQLITE3

The `cdr_sqlite` module was deprecated and has been removed. Users of this module should use the `cdr_sqlite3_custom` module instead.



```
password=password
user=asteriskcdruser
table=cdr
;port=3306
;sock=/tmp/mysql.sock
;userfield=1
```

Enable the last option *userfield* if you wish to use SetCDRUserField.

Configure with your hostname, dbname, password, user and table.

After installation, restart asterisk.

To check that CDR are being written to the MySQL DB with the following:

```
$ mysql -uasteriskcdruser -pasteriskcdrdb asteriskcdrdb
$ SELECT * FROM cdr LIMIT 10;
```

The result will be:

```

Reading table information for completion of table and column names
You can turn off this feature to get a quicker startup with -A

Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 4862
Server version: 5.5.44-0ubuntu0.12.04.1 (Ubuntu)

Copyright (c) 2000, 2015, Oracle and/or its affiliates. All rights reserved.

Oracle is a registered trademark of Oracle Corporation and/or its
affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> select * from cdr LIMIT 10;
...
...

CTRL-D exits the MySQL console

```

### 2.5.3 Configure CDR-pusher to collect CDRs

Once your CDRs will be stored to a SQLite Database, you will have to install CDR-Pusher on your Asterisk server.

You can find instructions how to install CDR-Pusher here: <https://github.com/cdr-stats/cdr-pusher>

To install Supervisor on CentOS 6 or RHEL6, the procedure is more complex, here it's how we do it:

```
$ yum -y install python-setuptools
$ easy_install supervisor
$ wget https://raw.githubusercontent.com/cdr-stats/cdr-stats/develop/install/supervisor
$ wget https://raw.githubusercontent.com/cdr-stats/cdr-stats/develop/install/supervisor
$ chmod +x /etc/init.d/supervisor
$ supervisord --version
```

```
$ /etc/init.d/supervisor stop ; sleep 2 ; /etc/init.d/supervisor start
```

Also make sure you have recent version of Git.

Check your git version with:

```
git $ version
```

If your git version  $\leq 1.7.4$ , then you will need to install a recent version, you can follow the instructions here how to install a recent Git on CentOS6 here: <http://tecadmin.net/how-to-upgrade-git-version-1-7-10-on-centos-6/>

After installation of CDR-Pusher you can find the configuration file at `/etc/cdr-pusher.yaml`. You will need to configure properly some settings in order to connect CDR-pusher to your SQLite or MySQL CDR backend and to your CDR-Stats server.

## 2.5.4 Configure CDR-Pusher for SQLite3

Here some of the settings you need to change to fetch SQLite CDR form Asterisk, edit `/etc/cdr-pusher.yaml`:

```
# storage_source_type: type to CDRs to push
storage_source: "sqlite3"

# db_file: specify the database path and name
db_file: "/var/log/asterisk/master.db"

# db_table: the DB table name
db_table: "cdr"

# cdr_fields is list of fields that will be fetched (from SQLite3) and pushed (to PostgreSQL)
# - if dest_field is callid, it will be used in riak as key to insert
cdr_fields:
  - orig_field: uniqueid
    dest_field: callid
    type_field: string
  - orig_field: "'" AS cidnum"
    dest_field: caller_id_number
    type_field: string
  - orig_field: clid
    dest_field: caller_id_name
    type_field: string
  - orig_field: destination
    dest_field: destination_number
    type_field: string
  - orig_field: "CASE WHEN disposition='ANSWER' THEN 16 WHEN disposition='ANSWERED' THEN 16 WHEN d
    dest_field: hangup_cause_id
    type_field: int
  - orig_field: CAST(duration AS INTEGER)
    dest_field: duration
    type_field: int
  - orig_field: CAST(billsec AS INTEGER)
    dest_field: billsec
    type_field: int
  - orig_field: "datetime(calldate) "
    dest_field: starting_date
    type_field: date
  - orig_field: accountcode
    dest_field: accountcode
```

```
    type_field: string
- orig_field: channel
  dest_field: extradata
  type_field: jsonb
- orig_field: lastapp
  dest_field: extradata
  type_field: jsonb
- orig_field: dcontext
  dest_field: extradata
  type_field: jsonb
```

## 2.5.5 Configure CDR-Pusher for MySQL

Here some of the settings you need to change to fetch MySQL CDR from Asterisk, edit `/etc/cdr-pusher.yaml`:

```
# storage_source_type: type to CDRs to push
storage_source: "mysql"

# db_file: specify the database path and name
db_file: ""

# Database DNS
# Use this with MySQL
db_dns: "username:password@/database"

# db_table: the DB table name
db_table: "cdr"

# cdr_fields is list of fields that will be fetched and pushed (to PostgreSQL)
# - if dest_field is callid, it will be used in riak as key to insert
cdr_fields:
  - orig_field: uniqueid
    dest_field: callid
    type_field: string
  - orig_field: clid
    dest_field: caller_id_name
    type_field: string
  - orig_field: "" AS cidnum
    dest_field: caller_id_number
    type_field: string
  - orig_field: dst
    dest_field: destination_number
    type_field: string
  - orig_field: "CASE disposition WHEN 'ANSWER' THEN 16 WHEN 'ANSWERED' THEN 16 WHEN 'BUSY' THEN 1"
    dest_field: hangup_cause_id
    type_field: int
  - orig_field: duration
    dest_field: duration
    type_field: int
  - orig_field: billsec
    dest_field: billsec
    type_field: int
  - orig_field: accountcode
    dest_field: accountcode
    type_field: string
  - orig_field: calldate
    dest_field: starting_date
```

```

    type_field: date
-   orig_field: userfield
    dest_field: extradata
    type_field: jsonb
-   orig_field: dcontext
    dest_field: extradata
    type_field: jsonb
-   orig_field: channel
    dest_field: extradata
    type_field: jsonb
-   orig_field: lastapp
    dest_field: extradata
    type_field: jsonb
-   orig_field: lastdata
    dest_field: extradata
    type_field: jsonb

```

CDR-Pusher always needs a Primary Key to import CDRs, therefore if you use MySQL, please ensure that you have a Primary Key in your *cdr* table as it will not be there by default.

You can create a Primary Key with:

```
ALTER TABLE cdr ADD COLUMN id int(10) UNSIGNED PRIMARY KEY AUTO_INCREMENT FIRST;
```

## 2.5.6 Send CDRs from backend to the CDR-Stats Core DB

The application *cdr-pusher* will need your correct CDR-Stats server settings to push CDRs properly to the core DB, you set this in `/etc/cdr-pusher.yaml` by changing:

```
pg_datasourcename: "user=postgres password=password host=localhost port=5432 dbname=cdr-pusher sslmode=disable"
```

Replace `'postgres'`, `'password'` and `'localhost'` by your CDR-Stats server settings and make sure you configured Remote Access to PostgreSQL, this is described in our documentation here [Configure PostgreSQL for Remote Access](#).

You may need to configure these settings as well:

```

# switch_ip: leave this empty to default to your external IP (accepted value: ""|"your IP")
switch_ip: ""

# cdr_source_type: write the id of the cdr sources type
# (accepted value: unknown: 0, csv: 1, api: 2, freeswitch: 3, asterisk: 4, yate: 5, kamailio: 6, openvms: 7)
cdr_source_type: 4

```

## 2.5.7 Restart CDR-Pusher

After changes in `/etc/cdr-pusher.yaml` CDR-pusher will need to be restarted, do this with the following command:

```

$ /etc/init.d/supervisor stop
$ /etc/init.d/supervisor start

```

## 2.6 Configure FreeSWITCH with CDR-Stats and CDR-Pusher

FreeSWITCH supports many backed to store CDRs, we will cover SQLite here.

## 2.6.1 Collect CDRs from SQLITE

FreeSWITCH mod\_cdr\_sqlite is used to locally store the CDRs, to configure CDR SQLite backend in FreeSWITCH you can find instruction here: [https://wiki.freeswitch.org/wiki/Mod\\_cdr\\_sqlite](https://wiki.freeswitch.org/wiki/Mod_cdr_sqlite)

Once your CDRs will be stored to a SQLite Database, you will have to install CDR-Pusher on your FreeSWITCH server. You can find instruction how to install CDR-Pusher here: <https://github.com/cdr-stats/cdr-stats>

After installation of CDR-Pusher you can find the configuration file at `/etc/cdr-pusher.yaml`. You will need to configure properly some settings in order to connect CDR-pusher to your SQLite CDR backend and to your CDR-Stats server.

By tweaking the configuration of Mod\_cdr\_sqlite and CDR-Pusher you can define custom fields that you want to import to CDR-stats.

Here an example of `'cdr_sqlite.conf'` that show how custom fields can be defined to store some specific CDR variables to your CDR backend:

```
<configuration name="cdr_sqlite.conf" description="SQLite CDR">
  <settings>
    <!-- SQLite database name (.db suffix will be automatically appended) -->
    <!-- <param name="db-name" value="cdr"/> -->
    <!-- CDR table name -->
    <!-- <param name="db-table" value="cdr"/> -->
    <!-- Log a-leg (a), b-leg (b) or both (ab) -->
    <param name="legs" value="a"/>
    <!-- Default template to use when inserting records -->
    <param name="default-template" value="example"/>
    <!-- This is like the info app but after the call is hung up -->
    <!--<param name="debug" value="true"/>-->
  </settings>
  <templates>
    <!-- Note that field order must match SQL table schema, otherwise insert will fail -->
    <template name="example">"${caller_id_name}", "${caller_id_number}", "${destination_number}", "${con
  </templates>
</configuration>
```

## 2.6.2 Configure CDR-pusher to collect CDRs

Here some of the settings you need to change to fetch CDR from Asterisk, edit `/etc/cdr-pusher.yaml`:

```
# storage_source_type: DB backend type where CDRs are stored
# (accepted values: "sqlite3" and "mysql")
storage_sourcestorage_source: "sqlite3"

# db_file: specify the database path and name
# db_file: "/usr/local/freeswitch/cdr.db"

# cdr_fields is list of fields that will be fetched (from SQLite3) and pushed (to PostgreSQL)
# - if dest_field is callid, it will be used in riak as key to insert
cdr_fields:
  - orig_field: uuid
    dest_field: callid
    type_field: string
  - orig_field: caller_id_name
    dest_field: caller_id_name
    type_field: string
  - orig_field: caller_id_number
```

```

    dest_field: caller_id_number
    type_field: string
  - orig_field: destination_number
    dest_field: destination_number
    type_field: string
  - orig_field: hangup_cause_q850
    dest_field: hangup_cause_id
    type_field: int
  - orig_field: duration
    dest_field: duration
    type_field: int
  - orig_field: billsec
    dest_field: billsec
    type_field: int
# - orig_field: account_code
#   dest_field: accountcode
#   type_field: string
  - orig_field: "datetime(start_stamp)"
    dest_field: starting_date
    type_field: date
# - orig_field: "strftime('%s', answer_stamp)" # convert to epoch
  - orig_field: "datetime(answer_stamp)"
    dest_field: extradata
    type_field: jsonb
  - orig_field: "datetime(end_stamp)"
    dest_field: extradata
    type_field: jsonb

```

### 2.6.3 Send CDRs from backend to the CDR-Stats Core DB

The application cdr-pusher will need your correct CDR-Stats server settings to push CDRs properly to the core DB, you set this in '/etc/cdr-pusher.yaml' by changing:

```
pg_datasourcename: "user=postgres password=password host=localhost port=5432 dbname=cdr-pusher sslmode=disable"
```

Replace 'postgres', 'password' and 'localhost' by your CDR-Stats server settings and make sure you configured Remote Access to PostgreSQL, this is described in our documentation here [Configure PostgreSQL for Remote Access](#).

You may want to configure properly those 2 settings also:

```

# switch_ip: leave this empty to default to your external IP (accepted value: ""|"your IP")
switch_ip: ""

# cdr_source_type: write the id of the cdr sources type
# (accepted value: unknown: 0, csv: 1, api: 2, freeswitch: 3, asterisk: 4, yate: 5, kamailio: 6, operswitch: 7)
cdr_source_type: 3

```

### 2.6.4 Restart CDR-Pusher

After changes in '/etc/cdr-pusher.yaml' CDR-pusher will need to be restarted, do this with the following command:

```

$ /etc/init.d/supervisor stop
$ /etc/init.d/supervisor start

```

## 2.7 Configure Kamailio with CDR-Stats and CDR-Pusher

In Kamailio, you can store easily your CDR using Mysql, using the 'acc module' ([kamailio.org/docs/modules/4.0.x/modules/acc.html](http://kamailio.org/docs/modules/4.0.x/modules/acc.html)). You will need to configure Kamailio to store CDRs to Mysql and afterwards you will have to install CDR-Pusher on your Kamailio server to push those CDRs to the CDR-Stats server.

### 2.7.1 Collect CDRs from Kamailio MYSQL Database

Kamailio and module acc can help you storing your CDRs to a Mysql database. Here you can find some of the SQL schema and procedure that will be needed to achieve it <http://siremis.asipto.com/install-accounting/>

Simeris have some documentation on how to setup accounting services: <http://kb.asipto.com/siremis:install40x:accounting>

You will end up with a Mysql cdr table similar to this one:

```
CREATE TABLE `cdrs` (  
  `cdr_id` bigint(20) NOT NULL AUTO_INCREMENT,  
  `src_username` varchar(64) NOT NULL DEFAULT '',  
  `src_domain` varchar(128) NOT NULL DEFAULT '',  
  `dst_username` varchar(64) NOT NULL DEFAULT '',  
  `dst_domain` varchar(128) NOT NULL DEFAULT '',  
  `dst_ouusername` varchar(64) NOT NULL DEFAULT '',  
  `call_start_time` datetime NOT NULL DEFAULT '0000-00-00 00:00:00',  
  `duration` int(10) unsigned NOT NULL DEFAULT '0',  
  `sip_call_id` varchar(128) NOT NULL DEFAULT '',  
  `sip_from_tag` varchar(128) NOT NULL DEFAULT '',  
  `sip_to_tag` varchar(128) NOT NULL DEFAULT '',  
  `src_ip` varchar(64) NOT NULL DEFAULT '',  
  `cost` int(11) NOT NULL DEFAULT '0',  
  `rated` int(11) NOT NULL DEFAULT '0',  
  `created` datetime NOT NULL,  
  PRIMARY KEY (`cdr_id`),  
  UNIQUE KEY `uk_cft` (`sip_call_id`,`sip_from_tag`,`sip_to_tag`)  
) ENGINE=InnoDB AUTO_INCREMENT=8 DEFAULT CHARSET=latin1;
```

You will have to install the stored procedure 'kamailio\_cdrs' & 'kamailio\_rating' and call them from your Kamailio config.

In order to register failed calls to missed\_calls, you will need to set flag 'FLT\_ACCFAILED' and 'FLT\_ACCMISSED' as follow:

```
if (is_method("INVITE"))  
{  
  setflag(FLT_ACC); # do accounting  
    setflag(FLT_ACCFAILED); # -- this is added to record failed calls  
    setflag(FLT_ACCMISSED);  
}
```

### 2.7.2 Install Triggers to regroup CDRs

The triggers will push your new Kamailio CDRs to a new table *collection\_cdrs*. This table helps to merge both table entries 'cdr and 'missed\_calls', that way we could send the CDRs easily from CDR-Pusher application.

Connect to your Kamailio Mysql Database and create the following table and triggers:

```

DROP TABLE IF EXISTS `collection_cdrs`;

CREATE TABLE `collection_cdrs` (
  `id` bigint(20) NOT NULL auto_increment,
  `cdr_id` bigint(20) NOT NULL default '0',
  `src_username` varchar(64) NOT NULL default '',
  `src_domain` varchar(128) NOT NULL default '',
  `dst_username` varchar(64) NOT NULL default '',
  `dst_domain` varchar(128) NOT NULL default '',
  `dst_ouusername` varchar(64) NOT NULL default '',
  `call_start_time` datetime NOT NULL default '0000-00-00 00:00:00',
  `duration` int(10) unsigned NOT NULL default '0',
  `sip_call_id` varchar(128) NOT NULL default '',
  `sip_from_tag` varchar(128) NOT NULL default '',
  `sip_to_tag` varchar(128) NOT NULL default '',
  `src_ip` varchar(64) NOT NULL default '',
  `cost` integer NOT NULL default '0',
  `rated` integer NOT NULL default '0',
  `sip_code` char(3) NOT NULL default '',
  `sip_reason` varchar(32) NOT NULL default '',
  `created` datetime NOT NULL,
  `flag_imported` integer NOT NULL default '0',
  PRIMARY KEY (`id`)
);

DELIMITER //
CREATE TRIGGER copy_cdrs
AFTER INSERT
  ON cdrs FOR EACH ROW
BEGIN
  INSERT INTO collection_cdrs SET
    cdr_id = NEW.cdr_id,
    src_username = NEW.src_username,
    src_domain = NEW.src_domain,
    dst_username = NEW.dst_username,
    dst_domain = NEW.dst_domain,
    dst_ouusername = NEW.dst_ouusername,
    call_start_time = NEW.call_start_time,
    duration = NEW.duration,
    sip_call_id = NEW.sip_call_id,
    sip_from_tag = NEW.sip_from_tag,
    sip_to_tag = NEW.sip_to_tag,
    src_ip = NEW.src_ip,
    cost = NEW.cost,
    rated = NEW.rated,
    sip_code = 200,
    sip_reason = ''
  ;
END; //
DELIMITER ;

DELIMITER //
CREATE TRIGGER copy_missed_calls
AFTER INSERT
  ON missed_calls FOR EACH ROW
BEGIN
  INSERT INTO collection_cdrs SET
    cdr_id = NEW.cdr_id,

```

```
src_username = NEW.src_user,
src_domain = NEW.src_domain,
dst_username = NEW.dst_user,
dst_domain = NEW.dst_domain,
dst_ouusername = NEW.dst_ouser,
call_start_time = NEW.time,
duration = 0,
sip_call_id = NEW.callid,
sip_from_tag = NEW.from_tag,
sip_to_tag = NEW.to_tag,
src_ip = NEW.src_ip,
cost = 0,
rated = 0,
sip_code = NEW.sip_code,
sip_reason = NEW.sip_reason
;
END; //
DELIMITER ;
```

### 2.7.3 Import previous CDRs and Missed Calls

If you were already collecting CDRs in Kamailio, you may want to import the existing ones to the table 'collection cdrs', you can do the following with those SQL commands:

```
-- !!! Only do the following once !!!

-- import cdrs
INSERT collection_cdrs (cdr_id, src_username, src_domain, dst_username, dst_domain, dst_ouusername, ca

-- import missed_calls
INSERT collection_cdrs (cdr_id, src_username, src_domain, dst_username, dst_domain, dst_ouusername, ca
```

### 2.7.4 Install CDR-Pusher

Once your CDRs will be stored to a Mysql Database, you will have to install CDR-Pusher on your Kamailio server. You can find instruction how to install CDR-Pusher here: <https://github.com/cdr-stats/cdr-stats>

After installation of CDR-Pusher you can find the configuration file at '/etc/cdr-pusher.yaml'. You will need to configure properly some settings in order to connect CDR-pusher to your Mysql CDR backend and to your CDR-Stats server.

### 2.7.5 Configure CDR-pusher to collect CDRs

Here some of the settings you need to change to fetch CDR form Kamailio, edit '/etc/cdr-pusher.yaml':

```
# storage_source_type: DB backend type where CDRs are stored
# (accepted values: "sqlite3" and "mysql")
storage_source: "mysql"

# Database DNS
db_dns: "username:password@/database"

# db_table: the DB table name
```

```

db_table: "collection cdrs"

# cdr_fields is list of fields that will be fetched (from SQLite3) and pushed (to PostgreSQL)
# - if dest_field is callid, it will be used in riak as key to insert
cdr_fields:
  - orig_field: sip_call_id
    dest_field: callid
    type_field: string
  - orig_field: src_username
    dest_field: caller_id_number
    type_field: string
  - orig_field: src_username
    dest_field: caller_id_name
    type_field: string
  - orig_field: dst_username
    dest_field: destination_number
    type_field: string
  - orig_field: "CASE sip_code WHEN '400' THEN 41 WHEN '401' THEN 21 WHEN '402' THEN 21 WHEN '403' THEN 21"
    dest_field: hangup_cause_id
    type_field: int
  - orig_field: CONVERT(duration, UNSIGNED INTEGER)
    dest_field: duration
    type_field: int
  - orig_field: CONVERT(duration, UNSIGNED INTEGER)
    dest_field: billsec
    type_field: int
  - orig_field: "call_start_time"
    dest_field: starting_date
    type_field: date

```

### 2.7.6 Send CDRs from backend to the CDR-Stats Core DB

The application cdr-pusher will need your correct CDR-Stats server settings to push CDRs properly to the core DB, you set this in `/etc/cdr-pusher.yaml` by changing:

```
pg_datasourcename: "user=postgres password=password host=localhost port=5432 dbname=cdr-pusher sslmode=disable"
```

Replace `'postgres'`, `'password'` and `'localhost'` by your CDR-Stats server settings and make sure you configured Remote Access to PostgreSQL, this is described in our documentation here [Configure PostgreSQL for Remote Access](#).

You may want to configure properly those 2 settings also:

```

# switch_ip: leave this empty to default to your external IP (accepted value: ""|"your IP")
switch_ip: ""

# cdr_source_type: write the id of the cdr sources type
# (accepted value: unknown: 0, csv: 1, api: 2, freeswitch: 3, asterisk: 4, yate: 5, kamailio: 6, operswitch: 7)
cdr_source_type: 6

```

### 2.7.7 Restart CDR-Pusher

After changes in `/etc/cdr-pusher.yaml` CDR-pusher will need to be restarted, do this with the following command:

```

/etc/init.d/supervisor stop
/etc/init.d/supervisor start

```



---

## Configuration and Defaults

---

Contents:

### 3.1 General Configuration

Some of the more important parts of the configuration module for the `cdr_stats`, `settings_local.py`, are explained below.

`APPLICATION_DIR` now contains the full path of the project folder and can be used elsewhere in the `settings.py` module so that the project may be moved around the system without having to worry about changing any hard-coded paths:

```
import os.path
APPLICATION_DIR = os.path.dirname(globals()['__file__'])
```

Turns on debug mode allowing the browser user to see project settings and temporary variables.

```
DEBUG = True
```

Sends all errors from the production server to the admin's email address:

```
ADMINS = ( ('xyz', 'xyz@abc.com') )
```

Sets up the options required for Django to connect to your database engine:

```
DATABASES = {
    'default': {
        # Add 'postgresql_psycopg2', 'postgresql', 'mysql', 'sqlite3', 'oracle'
        'ENGINE': 'django.db.backends.postgresql_psycopg2',
        'NAME': 'DATABASENAME',
        'USER': 'DB_USERNAME',
        'PASSWORD': 'DB_PASSWORD',
        'HOST': 'DB_HOSTNAME',
        'PORT': 'DB_PORT',
        'OPTIONS': {
            #Postgresql Autocommit
            'autocommit': True,
        }
    },
    'import_cdr': {
        'ENGINE': 'django.db.backends.postgresql_psycopg2',
        'NAME': 'cdr-pusher',
        'USER': 'postgres',
```

```
'PASSWORD': 'password',
'HOST': 'localhost',
'PORT': '5433',
'OPTIONS': {
    'autocommit': True,
}
}
```

There are 2 database connections, 'default' is the main database of CDR-Stats this contains all the tables. The second database 'import\_cdr' is used to import the CDRs from your switch. This database could be on another database server but putting it on the CDR-Stats server is ideal.

CDR-Stats doesn't pull CDRs from your switch, it's the job of the switch to push the CDRs to CDR-Stats.

A mechanism is required to get your CDRs to the 'import\_cdr' database, to assist with this, we created CDR-pusher project. CDR-Pusher will usually be installed on your switch server, CDR-Pusher is a Go application that can be extended, it could import CDRs from a different CDRs Database (SQLite, PostgreSQL) and/or from CDR logs files. For more info please visit <https://github.com/cdr-stats/cdr-pusher>

Tells Django where to find your media files such as images that the HTML templates might use.

```
MEDIA_ROOT = os.path.join(APPLICATION_DIR, 'static')

ROOT_URLCONF = 'urls'
```

Tells Django to start finding URL matches at in the `urls.py` module in the `cdr_stats` project folder.

```
TEMPLATE_DIRS = ( os.path.join(APPLICATION_DIR, 'templates'), )
```

Tells Django where to find the HTML template files:

```
INSTALLED_APPS = (
    'django.contrib.auth',
    'django.contrib.contenttypes',
    'django.contrib.sessions',
    'django.contrib.sites',
    'django.contrib.admin',
    ...
    'cdr',
    'cdr_alert',
    ...
)
```

Tells Django which applications (custom and external) to use in the project. The custom applications, `cdr` etc. are stored in the project folder along with these custom applications.

### 3.1.1 Mail server

To configure the SMTP client so that reports and alerts are sent via email, edit `/usr/share/cdrstats/cdr_stats/settings_local.py`, and identify the email section:

```
#EMAIL_BACKEND
#=====
# Email configuration
DEFAULT_FROM_EMAIL = 'CDR-Stats <cdr-...@localhost.com>'
EMAIL_BACKEND = 'django.core.mail.backends.smtp.EmailBackend'
EMAIL_USE_TLS = True
EMAIL_HOST = 'smtp.gmail.com'
```

```
EMAIL_PORT = 587
EMAIL_HOST_USER = 'user...@gmail.com'
EMAIL_HOST_PASSWORD = 'password'
EMAIL_SUBJECT_PREFIX = '[CDR-Stats] '
```

Fill in the details to match your SMTP server. The above example is for Gmail. When done, restart Celery and Apache.

To test that the email is working, from the command line type:

```
$ cd /usr/src/cdr-stats/
$ workon cdr-stats
$ python manage.py send_daily_report
```

## 3.2 Country Reporting

CDR-Stats is able to identify the destination country of the call. This is a useful fraud prevention measure, so that calls to unexpected destinations are immediately apparent. Places that should not be called should be added in the Blacklist in the admin section so that these destinations are highlighted in the call data records.

However, in order to get accurate reporting, the call detail records have to be in international format, e.g. in the USA, this means 11 digit numbers, beginning with a 1, and for other countries, the numbers called should be prefixed with the international dial code.

There is a facility for manipulating the dialled digits reported in the call detail records, as well as identifying calls as internal calls. This is done in the “general” section of `/usr/share/cdrstats/cdr_stats/settings_local.py`.

### 3.2.1 1. Prefix Limits

`PREFIX_LIMIT_MIN` & `PREFIX_LIMIT_MAX` are used to determine how many digits are used to match against the dialcode prefix database, e.g:

```
PREFIX_LIMIT_MIN = 2
PREFIX_LIMIT_MAX = 5
```

### 3.2.2 2. Phone Number Length

If a phone number has less significant digits than `PN_MIN_DIGITS` it will be considered an extension:

```
PN_MIN_DIGITS = 6
PN_MAX_DIGITS = 9
```

*NB The Number of significant digits does not include national (0) or international dialing codes (00 or 011), or where 9 is pressed for an outside line.*

### 3.2.3 3. Adding Country Code

If a phone number has more digits than `PN_DIGITS_MIN` but less than `PN_DIGITS_MAX` then the phone number will be considered as local or national call and the `LOCAL_DIALCODE` will be added:

```
LOCAL_DIALCODE = 1
```

Set the dialcode of your country e.g. 44 for UK, 1 for US

### 3.2.4 4. Prefixes to Ignore

List of prefixes to ignore, these prefixes are removed from the phone number prior to analysis. In cases where customers dial 9 for an outside line, 9, 90 or 900 may need to be removed as well to ensure accurate reporting:

```
PREFIX_TO_IGNORE = "+,0,00,000,0000,00000,011,55555,99999"
```

### 3.2.5 Examples

So for the USA, to cope with 10 or 11 digit dialling, PN\_MAX\_DIGITS would be set to 10, and LOCAL\_DIALCODE set to 1. Thus 10 digit numbers would have a 1 added, but 11 digit numbers are left untouched.

In the UK, the number of significant digits is either 9 or 10 after the “0” trunk code. So to ensure that all UK numbers had 44 prefixed to them and the single leading 0 removed, the prefixes to ignore would include 0, the PN\_MAX\_DIGITS would be set to 10, and the LOCAL\_DIALCODE would be 44.

In Spain, where there is no “0” trunk code, and the length of all numbers is 9, then the PN\_MAX\_DIGITS would be set to 9, and the LOCAL\_DIALCODE set to 34.

NB: After changing this file, then both celery and apache should be restarted.

## 3.3 Configuration for Asterisk

### 3.3.1 Import configuration for Asterisk

Review your database settings and ensure the second database exists and that is configured correctly:

```
# DATABASE SETTINGS
# =====
DATABASES = {
    'default': {
        'ENGINE': 'django.db.backends.postgresql_psycopg2',
        'NAME': 'cdrstats-billing',
        'USER': 'postgres',
        'PASSWORD': 'password',
        'HOST': 'localhost',
        'PORT': '5433',
        'OPTIONS': {
            # PostgreSQL Autocommit
            'autocommit': True,
        }
    },
    'import_cdr': {
        'ENGINE': 'django.db.backends.postgresql_psycopg2',
        'NAME': 'cdr-pusher',
        'USER': 'postgres',
        'PASSWORD': 'password',
        'HOST': 'localhost',
        'PORT': '5433',
        'OPTIONS': {
            'autocommit': True,
        }
    }
}
```

You will need to push CDRs from the Asterisk CDR datastore to a CDR-Stats 'import\_cdr' database. To help on this job we created CDR-Pusher, please visit the website and the instructions there to install and configure CDR-Stats correctly: <https://github.com/cdr-stats/cdr-stats>

## 3.4 Realtime configuration for Asterisk

The Asterisk Manager settings allow CDR-Stats to retrieve Realtime information to show the number of concurrent calls both in realtime and historically.

In Asterisk, add a new user in manager.conf, or one of its #include's for CDR-Stats. Further information about Asterisk Manager can be found here : <http://www.voip-info.org/wiki/view/Asterisk+config+manager.conf>

The collection of realtime information is done via Collectd (<https://collectd.org/>) and InfluxDB (<http://influxdb.com/>).

## 3.5 Configuration for FreeSWITCH

### 3.5.1 Import configuration for FreeSWITCH

Review your database settings and ensure the second database exists and that is configured correctly:

```
# DATABASE SETTINGS
# =====
DATABASES = {
    'default': {
        'ENGINE': 'django.db.backends.postgresql_psycopg2',
        'NAME': 'cdrstats-billing',
        'USER': 'postgres',
        'PASSWORD': 'password',
        'HOST': 'localhost',
        'PORT': '5433',
        'OPTIONS': {
            # PostgreSQL Autocommit
            'autocommit': True,
        }
    },
    'import_cdr': {
        'ENGINE': 'django.db.backends.postgresql_psycopg2',
        'NAME': 'cdr-pusher',
        'USER': 'postgres',
        'PASSWORD': 'password',
        'HOST': 'localhost',
        'PORT': '5433',
        'OPTIONS': {
            'autocommit': True,
        }
    }
}
```

You will need to push your CDRs from FreeSWITCH CDR datastore to a CDR-Stats 'import\_cdr' database. To help on this job we created CDR-Pusher, please visit the website and the instructions there to install and configure CDR-Stats correctly: <https://github.com/cdr-stats/cdr-stats>

## 3.6 Realtime configuration for FreeSWITCH

The FreeSWITCH Event Socket Library allow CDR-Stats to retrieve Realtime information to show the number of concurrent calls both in realtime and historically.

The collection of realtime information is done via Collectd (<https://collectd.org/>) and InfluxDB (<http://influxdb.com/>).

CDR-Stats can get CDR from both Freeswitch and Asterisk, or a combination of both. Other Telco Switches are supported, please contact us for further information.

## 3.7 Resetting CDR Data

Sometimes, some experimentation is required to get the optimum settings for country reporting, to achieve this the data can be removed from CDR-Stats and re-imported from the CDR data store correctly.

### 3.7.1 1. Stop Celery

Stop CDR-Stats celery:

```
/etc/init.d/cdr-stats-celeryd stop
```

### 3.7.2 2. Empty the CDR-Stats dbshell

Enter in the virtualenv and launch dbshell the following commands:

```
$ workon cdr-stats
$ cd /usr/share/cdrstats/
$ python manage.py dbshell
```

Now you are connected on PostgreSQL cli, this is the internal database of CDR-Stats.

The following command will delete all the CDRs, make sure you know what are you doing here and that your CDRs are backed in the upstream CDR data store.

```
$ DELETE FROM voip_cdr;
```

CTRL-D exits the console.

### 3.7.3 3. Flag the CDR records for reimport

Enter in the virtualenv and launch dbshell the following commands:

```
$ workon cdr-stats
$ cd /usr/share/cdrstats/
$ python manage.py dbshell --database=import_cdr
```

Enter the postgresql password found in *settings\_local.py* conf file.

Now you are connected on PostgreSQL cli, you can flag CDRs for reimport:

```
$ UPDATE cdr_import SET imported=FALSE;
```

CTRL-D exits the console.

### 3.7.4 4. Start Celery

Start CDR-Stats celery:

```
/etc/init.d/cdr-stats-celeryd start
```

### 3.7.5 5. Wait while the CDR are re-imported

Go to the diagnostic page to check if CDR-Stats is correctly configured and if data is being imported.

## 3.8 Celery Configuration

### 3.8.1 After installing Broker (Redis or Rabbitmq)

#### 1. Redis Settings

This is a configuration example for Redis.

```
# Redis Settings
CARROT_BACKEND = "ghettoq.taproot.Redis"

BROKER_HOST = "localhost" # Maps to redis host.
BROKER_PORT = 6379        # Maps to redis port.
BROKER_VHOST = "0"        # Maps to database number.

CELERY_RESULT_BACKEND = "redis"
REDIS_HOST = "localhost"
REDIS_PORT = 6379
REDIS_DB = 0
#REDIS_CONNECT_RETRY = True
```

#### 2. Rabbitmq Settings

This is a configuration example for Rabbitmq.

```
BROKER_HOST = "localhost"
BROKER_PORT = 5672
BROKER_USER = "root"
BROKER_PASSWORD = "root"
BROKER_VHOST = "localhost"

CELERY_RESULT_BACKEND = "amqp"
```

### 3.8.2 Launch celery/celerybeat in debug mode

To run celeryd

```
$ python manage.py celeryd -E -l debug
```

To run celerybeat

```
$ python manage.py celerybeat --schedule=/var/run/celerybeat-schedule
```

To run both

```
$ python manage.py celeryd -E -B -l debug
```

### 3.8.3 Running celeryd/celerybeat as a daemon (Debian/Ubuntu)

To configure celeryd as a daemon, it is necessary to configure the location of celeryconfig

```
$ cd install/celery-init/etc/default/
```

1. Open celeryd in text editor & change the following variables

Configuration file: `/etc/default/celeryd`

Init script: `celeryd`.

Usage : `/etc/init.d/celeryd {start|stop|force-reload|restart|try-restart|status}`:

```
# Where to chdir at start
CELERYD_CHDIR="/path/to/cdr-stats/"

# Path to celeryd
CELERYD="/path/to/cdr-stats/manage.py celeryd"

# Extra arguments to celeryd
CELERYD_OPTS="--time-limit=300"

# Name of the celery config module.
CELERY_CONFIG_MODULE="celeryconfig"

# Extra Available options
# %n will be replaced with the nodename.
# Full path to the PID file. Default is /var/run/celeryd.pid.
CELERYD_PID_FILE="/var/run/celery/%n.pid"

# Full path to the celeryd log file. Default is /var/log/celeryd.log
CELERYD_LOG_FILE="/var/log/celery/%n.log"

# User/Group to run celeryd as. Default is current user.
# Workers should run as an unprivileged user.
CELERYD_USER="celery"
CELERYD_GROUP="celery"
```

2. Open celeryd (for periodic task) in text editor & add the following variables

Configuration file: `/etc/default/celerybeat` or `/etc/default/celeryd`

Init script: `celerybeat`

Usage: `/etc/init.d/celerybeat {start|stop|force-reload|restart|try-restart|status}`:

```
# Path to celerybeat
CELERYBEAT="/path/to/cdr-stats/manage.py celerybeat"

# Extra arguments to celerybeat
CELERYBEAT_OPTS="--schedule=/var/run/celerybeat-schedule"
```

3. Copy the configuration file & init scripts to `/etc` dir:

```
$ cp etc/default/celeryd /etc/default/  
  
$ cp etc/init.d/celeryd /etc/init.d/  
  
$ cp etc/init.d/celerybeat /etc/init.d/
```

#### 4. Run/Start or Stop celery as a daemon:

```
$ /etc/init.d/celeryd start or stop  
  
$ /etc/init.d/celerybeat start or stop
```

### 3.8.4 Troubleshooting

If celeryd will not start as a daemon, try running it in verbose mode:

```
$ sh -x /etc/init.d/celeryd start  
  
$ sh -x /etc/init.d/celerybeat start
```

## 3.9 ACL Control

One of the benefits of CDR-Stats is ACL access, allowing numerous people to access CDR-Stats each viewing their own CDR with permissions assigned to allow viewing different parts of the interface.

### 3.9.1 Add Customer

To add a new user, enter the admin screen and Add Customer. Enter a username and password, (twice for authentication), optionally add address details, then enter the accountcode of the customer which corresponds to the accountcode that is delivered in the CDR. When done, click save, and the customer details will be saved and the page reloaded and now displays the user permissions available.

Permissions can be added individually by selecting the permission and then pressing the right arrow to move the permission from the left field to the right field. When done, click save. The permissions to assign to the user are those beginning with user\_profile and cdr\_alert.

### 3.9.2 Group Permissions

When you have many customers who are all to have the same permissions, you can add a group, assign the group the desired permissions, then add the customer to the group.

From the admin screens, Click add group, give it a name, assign permissions then save. Finally edit the customer, select the groups to which the customer will belong, then click save. The customer will then inherit permissions from their group.



---

## Celery

---

### 4.1 Celery Installation

#### 4.1.1 Celery

Celery is an asynchronous task queue/job queue based on distributed message passing. It is focused on real-time operation, but supports scheduling as well.

You can install Celery either via the Python Package Index (PyPI) or from source:

```
$ pip install celery
```

#### Downloading and installing from source

To Download the latest version [click here](#).

You can install it by doing the following:

```
$ tar xvfz celery-X.X.X.tar.gz
$ cd celery-X.X.X
$ python setup.py build
$ python setup.py install # as root
```

#### Using the development version

You can clone the repository by doing the following:

```
$ git clone git://github.com/ask/celery.git
```

#### Celery Configuration

**After installing Broker (Redis or Rabbitmq)**

**1. Redis Settings** This is a configuration example for Redis.

```
# Redis Settings
CARROT_BACKEND = "ghettoq.taproot.Redis"

BROKER_HOST = "localhost" # Maps to redis host.
BROKER_PORT = 6379        # Maps to redis port.
BROKER_VHOST = "0"        # Maps to database number.

CELERY_RESULT_BACKEND = "redis"
REDIS_HOST = "localhost"
REDIS_PORT = 6379
REDIS_DB = 0
#REDIS_CONNECT_RETRY = True
```

**2. Rabbitmq Settings** This is a configuration example for Rabbitmq.

```
BROKER_HOST = "localhost"
BROKER_PORT = 5672
BROKER_USER = "root"
BROKER_PASSWORD = "root"
BROKER_VHOST = "localhost"

CELERY_RESULT_BACKEND = "amqp"
```

**Launch celery/celerybeat in debug mode** To run celeryd

```
$ python manage.py celeryd -E -l debug
```

To run celerybeat

```
$ python manage.py celerybeat --schedule=/var/run/celerybeat-schedule
```

To run both

```
$ python manage.py celeryd -E -B -l debug
```

**Running celeryd/celerybeat as a daemon (Debian/Ubuntu)** To configure celeryd as a daemon, it is necessary to configure the location of celeryconfig

```
$ cd install/celery-init/etc/default/
```

## 1. Open celeryd in text editor &amp; change the following variables

Configuration file: /etc/default/celeryd

Init script: `celeryd`.

Usage : /etc/init.d/celeryd {start|stop|force-reload|restart|try-restart|status}:

```
# Where to chdir at start
CELERYD_CHDIR="/path/to/cdr-stats/"

# Path to celeryd
CELERYD="/path/to/cdr-stats/manage.py celeryd"

# Extra arguments to celeryd
CELERYD_OPTS="--time-limit=300"
```

```
# Name of the celery config module.
CELERY_CONFIG_MODULE="celeryconfig"

# Extra Available options
# %n will be replaced with the nodename.
# Full path to the PID file. Default is /var/run/celeryd.pid.
CELERYD_PID_FILE="/var/run/celery/%n.pid"

# Full path to the celeryd log file. Default is /var/log/celeryd.log
CELERYD_LOG_FILE="/var/log/celery/%n.log"

# User/Group to run celeryd as. Default is current user.
# Workers should run as an unprivileged user.
CELERYD_USER="celery"
CELERYD_GROUP="celery"
```

2. Open celeryd (for periodic task) in text editor & add the following variables

Configuration file: /etc/default/celerybeat or /etc/default/celeryd

Init script: `celerybeat`

Usage: /etc/init.d/celerybeat {start|stop|force-reload|restart|try-restart|status}:

```
# Path to celerybeat
CELERYBEAT="/path/to/cdr-stats/manage.py celerybeat"

# Extra arguments to celerybeat
CELERYBEAT_OPTS="--schedule=/var/run/celerybeat-schedule"
```

3. Copy the configuration file & init scripts to /etc dir:

```
$ cp etc/default/celeryd /etc/default/

$ cp etc/init.d/celeryd /etc/init.d/

$ cp etc/init.d/celerybeat /etc/init.d/
```

4. Run/Start or Stop celery as a daemon:

```
$ /etc/init.d/celeryd start or stop

$ /etc/init.d/celerybeat start or stop
```

**Troubleshooting** If celeryd will not start as a daemon, try running it in verbose mode:

```
$ sh -x /etc/init.d/celeryd start

$ sh -x /etc/init.d/celerybeat start
```



---

## Troubleshooting

---

- *Where to find the log files*
- *Run in debug mode*
- *Celerymon*

### 5.1 Where to find the log files

All the logs are centralized into one single directory **/var/log/cdr-stats/**

**cdr-stats.log** : All the logger events from Django

**cdr-stats-db.log** : This contains all the Database queries performed by the UI

**gunicorn\_cdr\_stats.log** : All the logger events from Gunicorn

**djcelery\_error.log** : This contains celery activity

**djcelerybeat\_error.log** : This contains celerybeat activity

### 5.2 Run in debug mode

Make sure services are stopped first:

```
$ /etc/init.d/supervisor stop
```

Then run in debug mode:

```
$ workon cdr-stats
$ cd /usr/share/cdrstats/
$ python manage.py celeryd -EB --loglevel=DEBUG
```

### 5.3 Celerymon

- <https://github.com/ask/celerymon>

Running the monitor :

Start celery with the `-events` option on, so celery sends events for celerymon to capture:

```
$ workon cdr-stats
$ cd /usr/share/cdrstats/
$ python manage.py celeryd -E
```

Run the monitor server:

```
$ workon cdr-stats
$ cd /usr/share/cdrstats/
$ python manage.py celerymon
```

However, in production the monitor is best run in the background as a daemon:

```
$ workon cdr-stats
$ cd /usr/share/cdrstats/
$ python manage.py celerymon --detach
```

For a complete listing of the command line arguments available, with a short description, use the help command:

```
$ workon cdr-stats
$ cd /usr/share/cdrstats/
$ python manage.py help celerymon
```

Visit the webserver celerymon stats by going to: <http://localhost:8989>

## 6.1 Overview

CDR-Stats is a web based application built on a Django Web framework which uses PostgreSQL as the CDR data store.

Celery (<http://celeryproject.org/>) is an asynchronous task queue/job queue based on distributed message. It is used to build the backend system to monitor CDR, detect unusual activity, and react by sending an alert email.

### CDR Stats Management Features

- CDR Mediation
- CDR Rating
- Multi-tenant design that allows call detail records from multiple switches or PBX systems.
- Custom alarm triggers can be set to email the administrator for a range of conditions including unusual average call durations, failed calls, and unexpected destinations called.
- Graphical tools help detect unusual call patterns which may indicate suspicious or fraudulent activity.
- Import Call Detail Records in CSV format
- Configure Switches for import
- Create Customer and assign accountcode
- Configure alert to detect unusual increase/decrease of Traffic

### CDR Stats Customer Portal Features

- Password management
- Call Details Record
- Monthly, Daily, Hourly Call reporting
- Impact Reporting
- Country Reporting
- Realtime Reporting of calls in progress
- View Fraudulent Calls
- Concurrent Call Statistic
- Configure Mail Reporting

- Top 10 destination Traffic
- Export to CSV
- Automated daily reporting.
- Call cost reports

### 6.1.1 How to use CDR-Stats

CDR-Stats has two main areas, the admin screen and the customer portal. The admin and customer areas are described in detail in the following pages.

CDR-Stats has been designed to be responsive, that is to say the the layout changes depending on the size and resolution of the browser viewing the pages.

#### Admin Panel

The Admin section allows you to create administrators who have access the admin screens. Levels of access can be set.

The Admin UI is located at <http://localhost:8000/admin/>

- *Dashboard*
- *CDR Manual Import / Export*
- *Alarm*
- *Alarm-report*
- *Blacklist*
- *Whitelist*
- *Alert-remove-prefix*
- *Switch*
- *HangupCause*
- *CDR View*

#### Dashboard

Dashboard page for the admin interface after successful login with superuser credentials

CDR-STATS V3.0.0-BETA    BOOKMARKS    APPLICATIONS    ADMINISTRATION    CUSTOMER PANEL    Welcome, root. () / Change password / Log out

### Dashboard

#### General

User    Task Manager    Recent Actions

##### Auth

Admins [Add](#) [Change](#)

Customers [Add](#) [Change](#)

Groups [Add](#) [Change](#)

##### Sites

Sites [Add](#) [Change](#)

##### User\_Profile

Accountcodes [Add](#) [Change](#)

#### Alert

##### Cdr\_Alert

Alarms [Add](#) [Change](#)

Alarms report [Add](#) [Change](#)

Alert remove prefixes [Add](#) [Change](#)

Blacklist [Change](#)

Whitelist [Change](#)

#### CDR Voip

##### Cdr

Calls [Add](#) [Change](#)

Hangup causes [Add](#) [Change](#)

##### Voip Gateway

###### Voip\_Gateway

Gateways [Add](#) [Change](#)

Providers [Add](#) [Change](#)

##### Voip Billing

###### Voip\_Billing

Ban plans [Add](#) [Change](#)

Ban prefixes [Add](#) [Change](#)

Carrier plans [Add](#) [Change](#)

Carrier rates [Add](#) [Change](#)

Retail plans [Add](#) [Change](#)

Retail rates [Add](#) [Change](#)

VoIP plans [Add](#) [Change](#)

Rebilling

#### Quick links

[Go to CDR-Stats.org](#)    [Change password](#)    [Log out](#)

#### Latest CDR-Stats News

[CDR-Stats V3 - coming soon](#)    April 7, 2015

[CDR-Stats V2 Screencast - Call & VoIP Monitoring](#)    Jan. 29, 2013

[CDR-Stats Version 2 released](#)    Jan. 25, 2013

[CDR-Stats V2.0.0RC1](#)    Dec. 12, 2012

[CDR-Stats Beta 8 Released](#)    Dec. 4, 2012

#### Country Dialcode

##### Country Dialcode

Countries [Add](#) [Change](#)

Prefixes [Add](#) [Change](#)

#### Switch

##### Switch

Switches [Add](#) [Change](#)

## CDR Manual Import / Export

There is a tool in CDR-Stats to manually import CDRs from CSV, JSON, Excel & YAML. The first line of the import file should contain the following header names "switch,cdr\_source\_type,callid,caller\_id\_number,caller\_id\_name,destination\_number,dialcode,state,channel,starting\_date,duration,bills

Example of a CDR csv file to import:

```
switch,cdr_source_type,callid,caller_id_number,caller_id_name,destination_number,dialcode,state,chan
127.0.0.1,1,96aa82fe-7bd1-11e5-a230-5c514f6a0f72,904151440,CallerIDName,+34798400122,34,,2015-10-21
127.0.0.1,1,c9135e4a-7bd1-11e5-a230-5c514f6a0f72,904234320,CallerIDName,+34798401111,34,,2015-10-21
127.0.0.1,1,cfaf8b56-7bd1-11e5-a230-5c514f6a0f72,901110380,CallerIDName,+34650104877,34,,2015-10-21
127.0.0.1,1,3c64a168-7bd2-11e5-a230-5c514f6a0f72,904234320,CallerIDName,+34798401111,34,,2015-10-21
127.0.0.1,1,41b20dd9-7bd2-11e5-a230-5c514f6a0f72,904231111,CallerIDName,+34650104877,34,,2015-10-21
```

Note:

```
- cdr_source_type is an integer to define from where the CDR comes from (UNKNOWN = 0, CSV = 1, API = 2)
- extradata is a JSON field, if empty you have to set it as `{}`
```

From CDR Import admin page, you will also be able to export your CDRs to CSV, JSON, HTML, ODS, Excel & YAML.

URL:

- [http://localhost:8000/admin/import\\_cdr/cdrimport/import/](http://localhost:8000/admin/import_cdr/cdrimport/import/)
- [http://localhost:8000/admin/import\\_cdr/cdrimport/export/](http://localhost:8000/admin/import_cdr/cdrimport/export/)

[Home](#) » [Import\\_cdr](#) » [CDRs Import](#) » Import

## Import

This importer will import the following fields: switch, cdr\_source\_type, callid, caller\_id\_number, caller\_id\_name, destination\_number, dialcode, state, channel, starting\_date, duration, billsec, progressec, answersec, waitsec, hangup\_cause\_id, hangup\_cause, direction, country\_code, accountcode, buy\_rate, buy\_cost, sell\_rate, sell\_cost, extradata

File to import:  CDRImport-2015-10-26.csv

Format:

[Home](#) » [Import\\_cdr](#) » [CDRs Import](#) » Import

## Import

Below is a preview of data to be imported. If you are satisfied with the results, click 'Confirm import'

### Preview

|     | switch    | cdr_source_type | callid                               | caller_id_number | caller_id_name | destination_number | dialcode | state | channel | starting_date       | duration | billsec | progressec | answersec |
|-----|-----------|-----------------|--------------------------------------|------------------|----------------|--------------------|----------|-------|---------|---------------------|----------|---------|------------|-----------|
| New | 127.0.0.1 | 1               | 96aa81fe-7bd1-11e5-a230-5c514f6a0f72 | 904151440        | CallerIDName   | +34798400122       | 34       |       |         | 2015-10-21 12:13:10 | 55       | 50      |            |           |
| New | 127.0.0.1 | 1               | c9136e3a-7bd1-11e5-a230-5c514f6a0f72 | 904234320        | CallerIDName   | +34798401111       | 34       |       |         | 2015-10-21 12:33:15 | 15       | 10      |            |           |
| New | 127.0.0.1 | 1               | cfa8b66-7bd1-11e5-a230-5c514f6a0f72  | 901110380        | CallerIDName   | +34650104877       | 34       |       |         | 2015-10-21 12:53:16 | 41       | 34      |            |           |
| New | 127.0.0.1 | 1               | 3c64a138-7bd2-11e5-a230-5c514f6a0f72 | 904234320        | CallerIDName   | +34798401111       | 34       |       |         | 2015-10-21 12:53:16 | 16       | 11      |            |           |
| New | 127.0.0.1 | 1               | 41b20dd8-7bd2-11e5-a230-5c514f6a0f72 | 904231111        | CallerIDName   | +34650104877       | 34       |       |         | 2015-10-21 12:53:16 | 8        | 5       |            |           |

## Alarm

The alarm list will be displayed from the following URL. You can add a new alarm by clicking Add alarm and adding the name of the alarm and its description, Also from the alarm list, click on the alarm that you want to update.

URL:

- [http://localhost:8000/admin/cdr\\_alert/alarm/](http://localhost:8000/admin/cdr_alert/alarm/)

### Select Alarm to change

0 of 1 selected

| ID                       | Name | Period     | Type | Value                         | Status | Condition |              |
|--------------------------|------|------------|------|-------------------------------|--------|-----------|--------------|
| <input type="checkbox"/> | 1    | Alarm name | Day  | ALOC (Average Length of Call) | 10.00  | Active    | Is less than |

1 Alarm

To Add/Update alarm

URL:

- [http://localhost:8000/admin/cdr\\_alert/alarm/add/](http://localhost:8000/admin/cdr_alert/alarm/add/)
- [http://localhost:8000/admin/cdr\\_alert/alarm/1/](http://localhost:8000/admin/cdr_alert/alarm/1/)

**Add Alarm**

|                                |                                                                                                                                                                            |
|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Name:</b>                   | <input type="text" value="Alarm name"/>                                                                                                                                    |
| <b>Period:</b>                 | <input type="text" value="Day"/><br><small>Interval to apply alarm</small>                                                                                                 |
| <b>Type:</b>                   | <input type="text" value="ALOC (Average Length of Call)"/><br><small>ALOC (average length of call) ; ASR (answer seize ratio) ; CIC (Consecutive Incomplete Calls)</small> |
| <b>Condition:</b>              | <input type="text" value="Is less than"/>                                                                                                                                  |
| <b>Value:</b>                  | <input type="text" value="10"/><br><small>Input the value for the alert</small>                                                                                            |
| <b>Alert condition add on:</b> | <input type="text" value="Same day"/>                                                                                                                                      |
| <b>Status:</b>                 | <input type="text" value="Active"/>                                                                                                                                        |
| <b>Email to send alarm:</b>    | <input type="text" value="admin@cdr-stats.com"/>                                                                                                                           |

**Alarm-report**

The alarmreport will be displayed from the following URL.

**URL:**

- [http://localhost:8000/admin/cdr\\_alert/alarmreport/](http://localhost:8000/admin/cdr_alert/alarmreport/)

**Select Alarm Report to change** Add Alarm Report +

Search

Action:  Go 0 of 1 selected

| <input type="checkbox"/> | ID | Alarm      | Calculated value | Date                      |
|--------------------------|----|------------|------------------|---------------------------|
| <input type="checkbox"/> | 1  | Alarm name | 10.000           | April 25, 2012, 1:05 a.m. |

1 Alarm Report

To Add/Update alarmreport

**URL:**

- [http://localhost:8000/admin/cdr\\_alert/alarmreport/add/](http://localhost:8000/admin/cdr_alert/alarmreport/add/)
- [http://localhost:8000/admin/cdr\\_alert/alarmreport/1/](http://localhost:8000/admin/cdr_alert/alarmreport/1/)

**Add Alarm Report**

|                          |                                         |
|--------------------------|-----------------------------------------|
| <b>Alarm:</b>            | <input type="text" value="Alarm name"/> |
|                          | <small>Select Alarm</small>             |
| <b>Calculated value:</b> | <input type="text" value="10"/>         |
| <b>Status:</b>           | <input type="text" value="Alarm Sent"/> |

**Blacklist**

The blacklist will be displayed from the following URL. You can add a new blacklist by clicking **Blacklist** by country and selecting the country name and its prefixes, Also from the blacklist, click on the blacklist that you want to update.

**URL:**

- [http://localhost:8000/admin/cdr\\_alert/blacklist/](http://localhost:8000/admin/cdr_alert/blacklist/)

## Select Blacklist to change

Blacklist by country +

| Action:                    | 0 of 1 selected    | Go      |
|----------------------------|--------------------|---------|
| ID                         | Phonenumber prefix | Country |
| <input type="checkbox"/> 1 | 39                 | ITA     |
| 1 Blacklist                |                    |         |

## Blacklist by country

Country: Spain

Select country

☐ Select all prefixes

|                                |                                |                                |                                |                                |                                |                                |                                |                                |
|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| <input type="checkbox"/> 34    | <input type="checkbox"/> 34609 | <input type="checkbox"/> 34625 | <input type="checkbox"/> 34637 | <input type="checkbox"/> 34649 | <input type="checkbox"/> 34658 | <input type="checkbox"/> 34667 | <input type="checkbox"/> 34678 | <input type="checkbox"/> 34690 |
| <input type="checkbox"/> 346   | <input type="checkbox"/> 34610 | <input type="checkbox"/> 34626 | <input type="checkbox"/> 34638 | <input type="checkbox"/> 34650 | <input type="checkbox"/> 34659 | <input type="checkbox"/> 34668 | <input type="checkbox"/> 34679 | <input type="checkbox"/> 34691 |
| <input type="checkbox"/> 3465  | <input type="checkbox"/> 34611 | <input type="checkbox"/> 34627 | <input type="checkbox"/> 34639 | <input type="checkbox"/> 34651 | <input type="checkbox"/> 34660 | <input type="checkbox"/> 34669 | <input type="checkbox"/> 34680 | <input type="checkbox"/> 34692 |
| <input type="checkbox"/> 34600 | <input type="checkbox"/> 34615 | <input type="checkbox"/> 34628 | <input type="checkbox"/> 34640 | <input type="checkbox"/> 34652 | <input type="checkbox"/> 34661 | <input type="checkbox"/> 34670 | <input type="checkbox"/> 34684 | <input type="checkbox"/> 34693 |
| <input type="checkbox"/> 34601 | <input type="checkbox"/> 34616 | <input type="checkbox"/> 34629 | <input type="checkbox"/> 34644 | <input type="checkbox"/> 34653 | <input type="checkbox"/> 34662 | <input type="checkbox"/> 34671 | <input type="checkbox"/> 34685 | <input type="checkbox"/> 34695 |
| <input type="checkbox"/> 34605 | <input type="checkbox"/> 34617 | <input type="checkbox"/> 34630 | <input type="checkbox"/> 34645 | <input type="checkbox"/> 34654 | <input type="checkbox"/> 34663 | <input type="checkbox"/> 34672 | <input type="checkbox"/> 34686 | <input type="checkbox"/> 34696 |
| <input type="checkbox"/> 34606 | <input type="checkbox"/> 34618 | <input type="checkbox"/> 34634 | <input type="checkbox"/> 34646 | <input type="checkbox"/> 34655 | <input type="checkbox"/> 34664 | <input type="checkbox"/> 34675 | <input type="checkbox"/> 34687 | <input type="checkbox"/> 34697 |
| <input type="checkbox"/> 34607 | <input type="checkbox"/> 34619 | <input type="checkbox"/> 34635 | <input type="checkbox"/> 34647 | <input type="checkbox"/> 34656 | <input type="checkbox"/> 34665 | <input type="checkbox"/> 34676 | <input type="checkbox"/> 34688 | <input type="checkbox"/> 34698 |
| <input type="checkbox"/> 34608 | <input type="checkbox"/> 34620 | <input type="checkbox"/> 34636 | <input type="checkbox"/> 34648 | <input type="checkbox"/> 34657 | <input type="checkbox"/> 34666 | <input type="checkbox"/> 34677 | <input type="checkbox"/> 34689 | <input type="checkbox"/> 34699 |

Blacklist the selected prefixes

Blacklist the selected country

## Whitelist

The whitelist will be displayed from the following URL. You can add a new Whitelist by clicking `Whitelist by country` and selecting the country name and its prefixes, Also from the whitelist, click on the blacklist that you want to update.

## URL:

- [http://localhost:8000/admin/cdr\\_alert/whitelist/](http://localhost:8000/admin/cdr_alert/whitelist/)

## Select Whitelist to change

Whitelist by country +

| Action:                    | 0 of 1 selected    | Go      |
|----------------------------|--------------------|---------|
| ID                         | Phonenumber prefix | Country |
| <input type="checkbox"/> 1 | 3749               | ARM     |
| 1 Whitelist                |                    |         |

## Whitelist by country

Country:

Select country

☐ Select all prefixes

☐ 93 ☐ 937 ☐ 3341 ☐ 9370 ☐ 9375 ☐ 9377 ☐ 9378 ☐ 9379

Blacklist the selected prefixes

Blacklist the selected country

### Alert-remove-prefix

The alert remove prefix will be displayed from the following URL. You can add a new remove prefix by clicking Add alert remove prefix and selecting the remove prefix, Also from the alert remove prefix, click on the remove prefix that you want to update.

The Admin UI is located at <http://localhost:8000/>

#### URL:

- [http://localhost:8000/admin/cdr\\_alert/alertremoveprefix/](http://localhost:8000/admin/cdr_alert/alertremoveprefix/)

#### Select Alert Remove Prefix to change

Search

Action:  Go 0 of 1 selected

| ID                         | Label  | Prefix |
|----------------------------|--------|--------|
| <input type="checkbox"/> 1 | Sample | 55555  |

1 Alert Remove Prefix

To Add/Update alert-remove prefix

#### URL:

- [http://localhost:8000/admin/cdr\\_alert/alertremoveprefix/add/](http://localhost:8000/admin/cdr_alert/alertremoveprefix/add/)
- [http://localhost:8000/admin/cdr\\_alert/alertremoveprefix/1/](http://localhost:8000/admin/cdr_alert/alertremoveprefix/1/)

#### Add Alert Remove Prefix

Label:

Prefix:

Save and add another Save and continue editing Save

### Switch

#### URL:

- <http://localhost:8000/admin/cdr/switch/>

## Select Switch to change

Action:   0 of 1 selected

| <input type="checkbox"/> | ID | Name      | Ipaddress | Key uuid                         |
|--------------------------|----|-----------|-----------|----------------------------------|
| <input type="checkbox"/> | 1  | 127.0.0.1 | 127.0.0.1 | 838ab7ac89b744d0beaf9c783c463aeb |

1 Switch

Add Switch

Filter  
 By name   
 By ipaddress

## HangupCause

## URL:

- <http://localhost:8000/admin/cdr/hangupcause/>

## Select Hangupcause to change

Action:   0 of 64 selected

| <input type="checkbox"/> | ID | Code | Enumeration                    | Cause                                                           | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--------------------------|----|------|--------------------------------|-----------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <input type="checkbox"/> | 1  | 0    | UNSPECIFIED                    | Unspecified. No other cause codes applicable.                   | This is usually given by the router when none of the other codes apply. This cause usually occurs in the same type of situations as cause 1, cause 88, and cause 100.                                                                                                                                                                                                                                                                                         |
| <input type="checkbox"/> | 2  | 1    | UNALLOCATED_NUMBER             | Unallocated (unassigned) number [Q.850 value 1]                 | This cause indicates that the called party cannot be reached because, although the called party number is in a valid format, it is not currently allocated (assigned).                                                                                                                                                                                                                                                                                        |
| <input type="checkbox"/> | 3  | 2    | NO_ROUTE_TRANSIT_NET           | No route to specified transit network (national use) [Q.850]    | This cause indicates that the equipment sending this cause has received a request to route the call through a particular transit network, which it does not recognize. The equipment sending this cause does not recognize the transit network either because the transit network does not exist or because that particular transit network, while it does exist, does not serve the equipment which is sending this cause.                                   |
| <input type="checkbox"/> | 4  | 3    | NO_ROUTE_DESTINATION           | No route to destination [Q.850]                                 | This cause indicates that the called party cannot be reached because the network through which the call has been routed does not serve the destination desired. This cause is supported on a network dependent basis.                                                                                                                                                                                                                                         |
| <input type="checkbox"/> | 5  | 6    | CHANNEL_UNACCEPTABLE           | channel unacceptable [Q.850]                                    | This cause indicates that the channel most recently identified is not acceptable to the sending entity for use in this call.                                                                                                                                                                                                                                                                                                                                  |
| <input type="checkbox"/> | 6  | 7    | CALL_AWARDED_DELIVERED         | call awarded, being delivered in an established channel [Q.850] | This cause indicates that the user has been awarded the incoming call, and that the incoming call is being connected to a channel already established to that user for similar calls (e.g. packet-mode x.25 virtual calls).                                                                                                                                                                                                                                   |
| <input type="checkbox"/> | 7  | 16   | NORMAL_CLEARING                | normal call clearing [Q.850]                                    | This cause indicates that the call is being cleared because one of the users involved in the call has requested that the call be cleared. Under normal situations, the source of this cause is not the network.                                                                                                                                                                                                                                               |
| <input type="checkbox"/> | 8  | 17   | USER_BUSY                      | user busy [Q.850]                                               | This cause is used to indicate that the called party is unable to accept another call because the user busy condition has been encountered. This cause value may be generated by the called user or by the network. In the case of user determined user busy it is noted that the user equipment is compatible with the call.                                                                                                                                 |
| <input type="checkbox"/> | 9  | 18   | NO_USER_RESPONSE               | no user responding [Q.850]                                      | This cause is used when a called party does not respond to a call establishment message with either an alerting or connect indication within the prescribed period of time allocated.                                                                                                                                                                                                                                                                         |
| <input type="checkbox"/> | 10 | 19   | NO_ANSWER                      | no answer from user (user alerted) [Q.850]                      | This cause is used when the called party has been alerted but does not respond with a connect indication within a prescribed period of time. Note - This cause is not necessarily generated by Q.931 procedures but may be generated by internal network timers.                                                                                                                                                                                              |
| <input type="checkbox"/> | 11 | 20   | SUBSCRIBER_ABSENT              | subscriber absent [Q.850]                                       | This cause value is used when a mobile station has logged off, radio contact is not obtained with a mobile station or if a personal telecommunication user is temporarily not addressable at any user-network interface. Sofia SIP will normally raise USER_NOT_REGISTERED in such situations.                                                                                                                                                                |
| <input type="checkbox"/> | 12 | 21   | CALL_REJECTED                  | call rejected [Q.850]                                           | This cause indicates that the equipment sending this cause does not wish to accept this call, although it could have accepted the call because the equipment sending this cause is neither busy nor incompatible. The network may also generate this cause, indicating that the call was cleared due to a supplementary service constraint. The diagnostic field may contain additional information about the supplementary service and reason for rejection. |
| <input type="checkbox"/> | 13 | 22   | NUMBER_CHANGED                 | number changed [Q.850]                                          | This cause is returned to a calling party when the called party number indicated by the calling party is no longer assigned. The new called party number may optionally be included in the diagnostic field. If a network does not support this cause, cause no: 1, unallocated (unassigned) number shall be used.                                                                                                                                            |
| <input type="checkbox"/> | 14 | 23   | REDIRECTION_TO_NEW_DESTINATION |                                                                 | This cause is used by a general ISUP protocol mechanism that can be invoked by an exchange that decides that the call should be set-up to a different called number. Such an exchange can invoke a redirection mechanism, by use of this cause value, to request a preceding exchange involved in the call to route the call to the new number.                                                                                                               |
| <input type="checkbox"/> | 15 | 25   | EXCHANGE_ROUTING_ERROR         |                                                                 | This cause indicates that the destination indicated by the user cannot be reached, because an intermediate exchange has released the call due to reaching a limit in executing the hop counter procedure. This cause is generated by an intermediate node, which when decrementing the hop counter value, gives the result 0.                                                                                                                                 |

Add Hangupcause

## CDR View

## URL:

- [http://localhost:8000/admin/cdr/switch/cdr\\_view/](http://localhost:8000/admin/cdr/switch/cdr_view/)

Home » Cdr » Switches » Cdr Search

From: 2013-01-01 To: 2013-02-28 Destination: Begins Switch: All Switches

Account Code: Begins CallerID Number: Begins Duration (Secs): Direction: All

Hangup cause: All Country: All Internal Call Afghanistan Albania

Result: Minutes Seconds

Search

**Calls Detail Records - 1st Jan. 2013 to 28th Feb. 2013**

Call Detail Records Report By Day

Export CSV file Import CDR Rebilling

| Call-date                 | CLID                  | Destination   | Duration | Bill  | Hangup cause      | Account | Buy rate | Buy cost | Sell rate | Sell cost |  |
|---------------------------|-----------------------|---------------|----------|-------|-------------------|---------|----------|----------|-----------|-----------|--|
| Feb. 1, 2013, 4:15 p.m.   | 48092924 - CallerName | 3465778800    | 01:40    | 01:30 | NORMAL_CLEARING   | 123456  | 0.032    | 0.048    | 0.039     | 0.0585    |  |
| Jan. 31, 2013, 2:15 p.m.  | 48092924 - CallerName | 3285778800    | 01:40    | 01:30 | NORMAL_CLEARING   | 123456  | 0.062    | 0.093    | 0.0744    | 0.1116    |  |
| Jan. 31, 2013, 2:15 p.m.  | 48092924 - CallerName | 3465778800    | 01:40    | 01:30 | NORMAL_CLEARING   | 123456  | 0.032    | 0.048    | 0.039     | 0.0585    |  |
| Jan. 31, 2013, 2:12 p.m.  | 48092924 - CallerName | 3465778800    | 01:40    | 01:30 | NORMAL_CLEARING   | 123456  | 0.032    | 0.048    | 0.039     | 0.0585    |  |
| Jan. 29, 2013, 2:43 p.m.  | 48092924 - Areski     | 3465778800    | 01:40    | 00:50 |                   | 123456  | 0.029    | 0.0242   | 0.036     | 0.0292    |  |
| Jan. 29, 2013, 10:34 a.m. | 48092924 - Areski     | 3465778800    | 01:40    | 00:50 |                   | 123456  | 0.029    | 0.0242   | 0.036     | 0.0292    |  |
| Jan. 28, 2013, 7:43 a.m.  | 02067810 - 02067810   | 71032         | 00:00    | 00:00 | CALL_REJECTED     | 1000    | 0.0      | 0.0      | 0.0       | 0.0       |  |
| Jan. 28, 2013, 4:15 a.m.  | 06303708 - 06303708   | +346569714563 | 00:00    | 00:00 | SUBSCRIBER_ABSENT | 1000    | 0.029    | 0.0      | 0.035     | 0.0       |  |
| Jan. 26, 2013, 9:13 p.m.  | 15547394 - 15547394   | 3213260966    | 03:17    | 03:16 | SUBSCRIBER_ABSENT | 1000    | 0.062    | 0.2025   | 0.0744    | 0.243     |  |
| Jan. 25, 2013, 11:54 p.m. | 06720645 - 06720645   | 32143512538   | 00:00    | 00:00 | SUBSCRIBER_ABSENT | 1000    | 0.062    | 0.0      | 0.0744    | 0.0       |  |

Show Rows: 10 Total Calls: 91

1 2 3 4 5 6 7 8 9 10 Next >

## User Panel

The User Interface is the core part of CDR-Stats, this is the one that the users will use to get reporting and take advantage of CDR-Stats capabilities and features.

The User UI is located at <http://localhost:8000/>

- [Index](#)
- [Dashboard](#)
- [CDR-View](#)
- [CDR-Overview](#)
- [CDR-Hourly-Report](#)
- [CDR-Country-Report](#)
- [Mail-Report](#)
- [Concurrent-call-report](#)
- [Realtime-Report](#)
- [World Map Report](#)
- [Alert Settings](#)
- [Alert Report](#)
- [Destination Control](#)
- [Diagnostic CDR-Stats](#)
- [Rates](#)
- [Call Simulator](#)
- [Daily report of Billed call](#)

## Index

Index page for the customer interface after successful login with user credentials

DashboardAnalytics-Reports-Alert-Billing-root-

# CDR-Stats

Call Traffic Analysis And Alert Solution



## CDR-stats

CDR-Stats is a multi-tenant application to browse, analyse and graph CDR (Call Detail Records) with automated threat alerts for multiple switches and PBX systems.

**Call Traffic Analysis and Alert Tools include :**

- Dashboard: Overview of call activity
- Search CDR: Search, filter, display and export CDR
- Daily Comparison: Compare call traffic day on day
- Real-Time Statistics and Concurrent Calls through the day
- Call Country Report and World Map report
- Mail daily aggregated reports
- Threat Control: Detect abnormal call patterns
- Destination Alerts: Unexpected destination alerts

[Learn more »](#)

## Support

Star2Billing S.L. offers consultancy including installation, training and customisation on CDR-Stats. Contact us at [cdr-stats@star2billing.com](mailto:cdr-stats@star2billing.com) for more information

[Get Support »](#)

## Licensing

CDR-Stats is licensed under [MPL V2](#), however an alternative license can be purchased if the MPL V2 license is not suitable for your requirements.

[View Licensing details »](#)

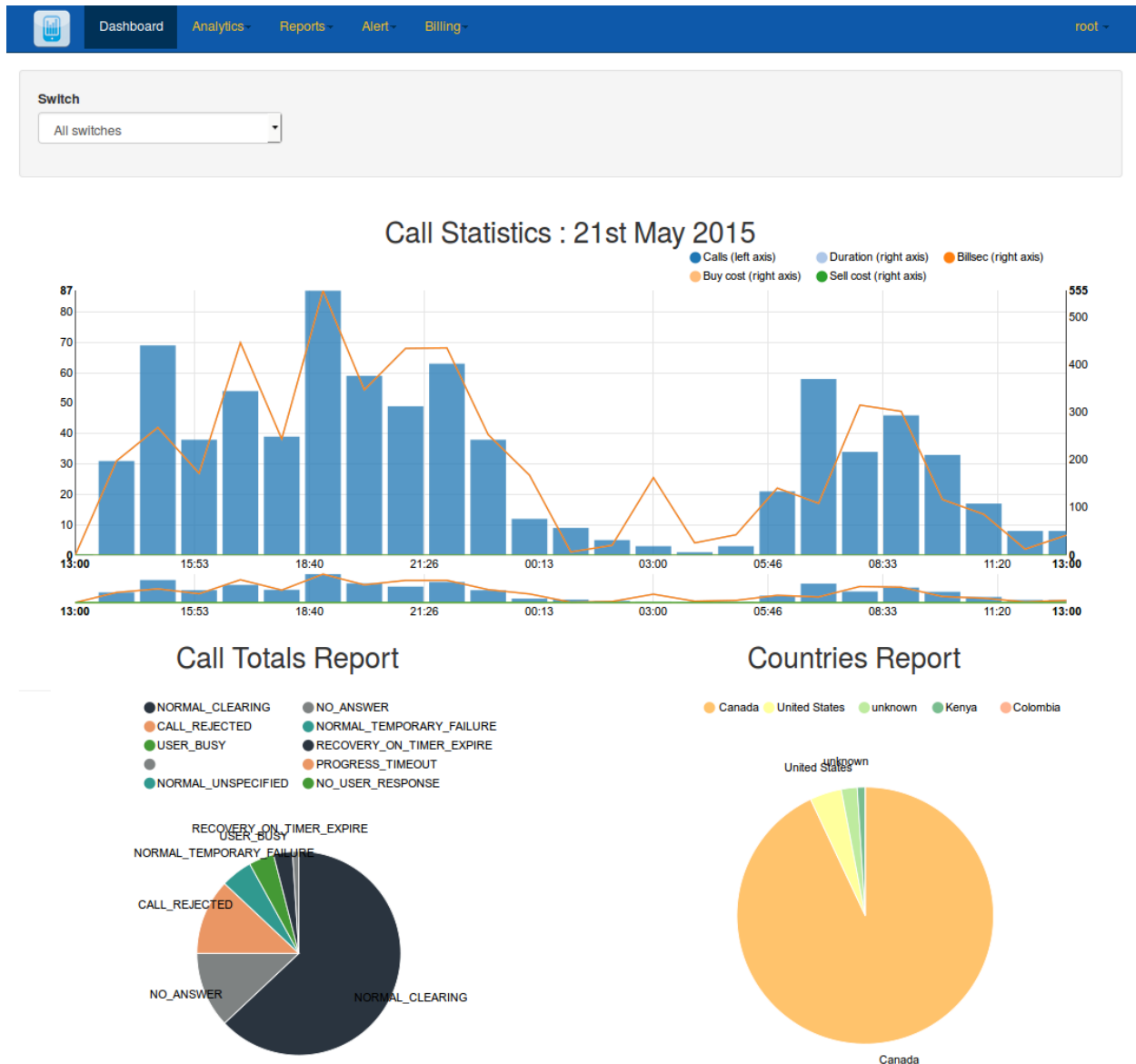
Powered by CDR-Stats - [Call Monitoring & Analytics Software](#)

## Dashboard

The dashboard displays a graphical representation of the last 24 hours calls, call status statistics and calls by country, either aggregated for all switches, or selectable by switch.

### URL:

- <http://localhost:8000/dashboard/>



## CDR-View

Call detail records listed in table format which can be exported to CSV file.

Advanced Search allows further filtering and searching on a range of criteria

The Report by Day shows a graphical illustration of the calls, minutes and average call time.

### URL:

- [http://localhost:8000/cdr\\_view/](http://localhost:8000/cdr_view/)


Dashboard
Analytics
Reports
Alert
Billing
root

**From\***

**To\***

**Switch**

**Destination**

**Type**

**Account code**

**Callerid number**

**Type**

**Direction**

**Duration (secs)**

**Type**

**Result :**

**Country**

### Calls Detail Records - 1st May 2015 to 31st May 2015

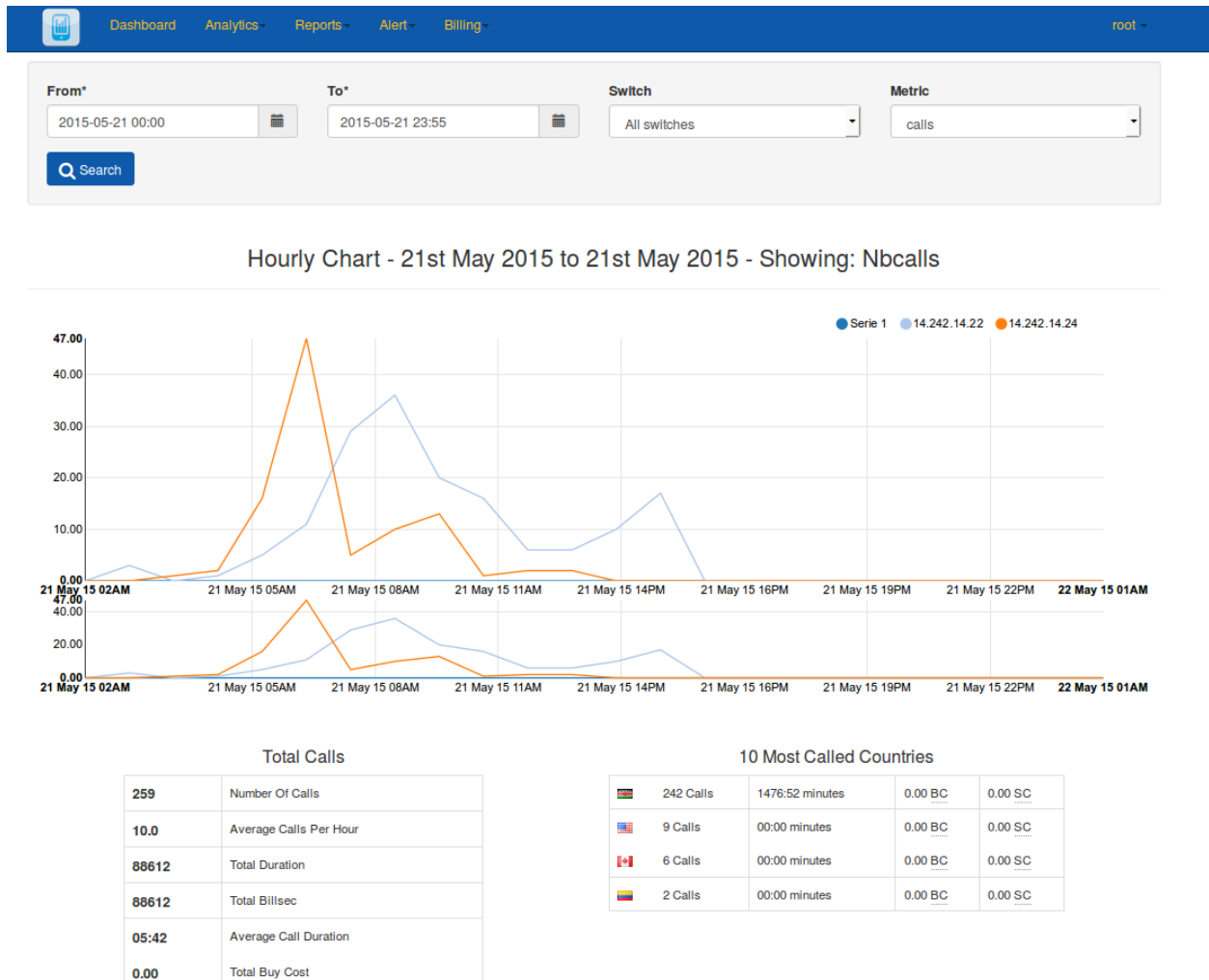
| Call-date                | CLID                               | Destination  | Duration | Bill | Hangup cause               | Account | Buy rate | Buy cost | Sell rate | Sell cost |                                                                                                                                                                             |
|--------------------------|------------------------------------|--------------|----------|------|----------------------------|---------|----------|----------|-----------|-----------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| May 20, 2015, 11:25 a.m. | +26600628441 - Noemie Ziemann      | +28800628441 | 159      | 149  | RESPONSE_TO_STATUS_ENQUIRY | 2       | 0.00     | 0.00     | 0.00      | 0.00      |      |
| May 20, 2015, 11:25 a.m. | +28600781353 - Leilani Kozey       | +30800781353 | 239      | 229  | RESPONSE_TO_STATUS_ENQUIRY | 2       | 0.00     | 0.00     | 0.00      | 0.00      |    |
| May 20, 2015, 11:25 a.m. | +29600943826 - Miss Marcelo Spinka | +25800943826 | 216      | 206  | DESTINATION_OUT_OF_ORDER   | 2       | 0.00     | 0.00     | 0.00      | 0.00      |   |
| May 20, 2015, 11:25 a.m. | +27600535210 - Mr. Ariane Klein    | +31800535210 | 258      | 248  | FACILITY_REJECTED          | 2       | 0.00     | 0.00     | 0.00      | 0.00      |   |
| May 20, 2015, 11:25 a.m. | +36600252759 - Gunnar Stokes       | +28800252759 | 129      | 119  | RESPONSE_TO_STATUS_ENQUIRY | 2       | 0.00     | 0.00     | 0.00      | 0.00      |   |
| May 20, 2015, 11:25 a.m. | +32600859319 - Layla Windler       | +42800859319 | 53       | 43   | FACILITY_REJECTED          | 2       | 0.00     | 0.00     | 0.00      | 0.00      |   |
| May 20, 2015, 11:25 a.m. | +36600782843 - Marilyne Gaylord    | +28800782843 | 87       | 77   | INVALID_NUMBER_FORMAT      | 2       | 0.00     | 0.00     | 0.00      | 0.00      |   |
| May 20, 2015, 11:25 a.m. | +36600495334 - Alessia Collier     | +46800495334 | 69       | 59   | RESPONSE_TO_STATUS_ENQUIRY | 2       | 0.00     | 0.00     | 0.00      | 0.00      |   |
| May 20, 2015, 11:25 a.m. | +27600658127 - Audreanne Kovacek   | +41800658127 | 286      | 276  | DESTINATION_OUT_OF_ORDER   | 2       | 0.00     | 0.00     | 0.00      | 0.00      |   |
| May 20, 2015, 11:25 a.m. | +26600139284 - Bertrand Collins    | +36800139284 | 89       | 79   | RESPONSE_TO_STATUS_ENQUIRY | 2       | 0.00     | 0.00     | 0.00      | 0.00      |   |

## CDR-Overview

A pictorial view of calls with call-count or call-duration from any date or date-range

URL:

- [http://localhost:8000/cdr\\_overview/](http://localhost:8000/cdr_overview/)



## CDR-Hourly-Report

An hourly pictorial view of calls with call-count & call-duration. You can compare different dates

URL:

- [http://localhost:8000/hourly\\_report/](http://localhost:8000/hourly_report/)

## Daily comparison

Select date\*  
2015-04-08

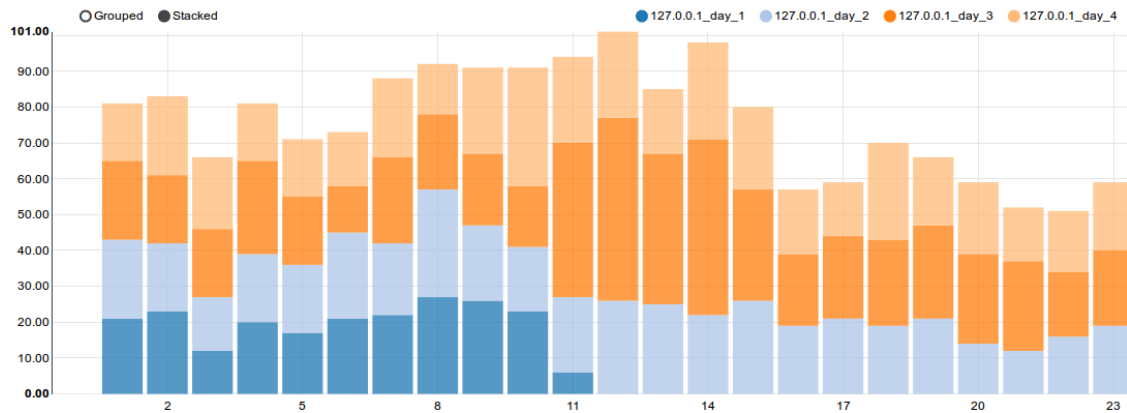
Compare  
- 4 days

Switch  
All switches

Metric  
calls

Search

Call Statistics - 8th April 2015 with previous days - Showing: Nbcalls



Powered by CDR-Stats - Call Monitoring & Analytics Software

## CDR-Country-Report

A pictorial view of all calls by country with the 10 most called countries in a pie chart.

URL:

- [http://localhost:8000/country\\_report/](http://localhost:8000/country_report/)

## Country report

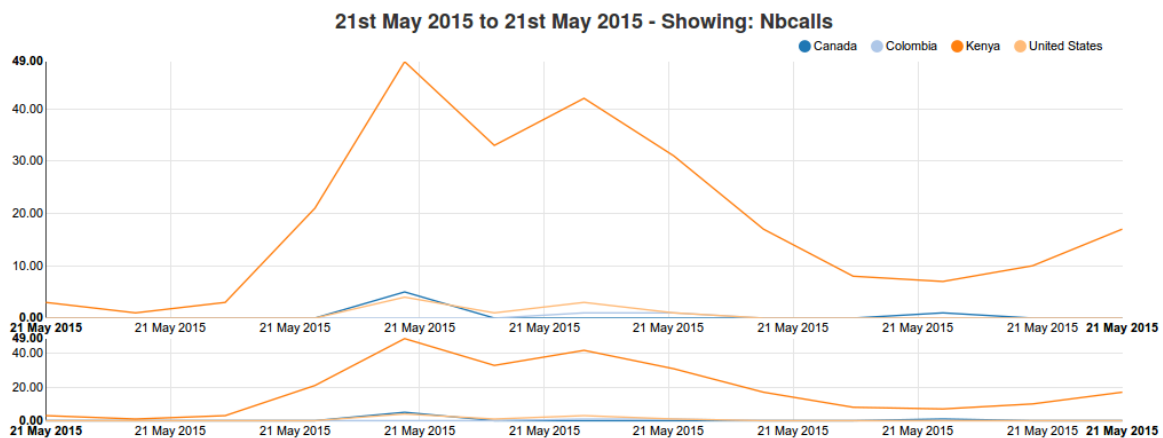
**From\***

**To\***

**Switch**

**Country**

**Metric**



Total Calls

|       |                        |
|-------|------------------------|
| 259   | Number Of Calls        |
| 10.0  | Average Calls Per Hour |
| 88612 | Total Duration         |
| 88612 | Total Billsec          |

10 Most Called Countries

|                                                                                     |           |                 |         |         |
|-------------------------------------------------------------------------------------|-----------|-----------------|---------|---------|
|  | 242 Calls | 1476:52 minutes | 0.00 BC | 0.00 SC |
|  | 9 Calls   | 00:00 minutes   | 0.00 BC | 0.00 SC |
|  | 6 Calls   | 00:00 minutes   | 0.00 BC | 0.00 SC |
|  | 2 Calls   | 00:00 minutes   | 0.00 BC | 0.00 SC |

### Mail-Report

A list of the last 10 calls of the previous day, along with total calls, a breakdown of the call status, and the top 5 countries called.

This report is emailed automatically, email recipients can be set up in the admin section or by adding an email address in the “Email to send a report” field in the Mail Report section.

URL:

- [http://localhost:8000/mail\\_report/](http://localhost:8000/mail_report/)


Dashboard Analytics Reports Alert Billing
root

Email to send the report

Save

Preview of the mail report :

### CDR-Stats report of 20th May 2015

Last 10 Calls

| Date                   | Cld                                | Destination  | Duration | Bill sec | Hangup cause               | Account | Buy cost | Sell cost |     |
|------------------------|------------------------------------|--------------|----------|----------|----------------------------|---------|----------|-----------|-----|
| May 20, 2015, midnight | +30600306089 - Jaclyn Jacobs       | +40800306089 | 00:51    | 00:41    | DESTINATION_OUT_OF_ORDER   | 2       | 0.00000  | 0.00000   |     |
| May 20, 2015, midnight | +29600941082 - Coty Gleason        | +29800941082 | 04:52    | 04:42    | INVALID_NUMBER_FORMAT      | 2       | 0.00000  | 0.00000   |     |
| May 20, 2015, midnight | +27600731687 - Nadia Howe          | +27800731687 | 03:26    | 03:16    | DESTINATION_OUT_OF_ORDER   | 2       | 0.00000  | 0.00000   |     |
| May 20, 2015, midnight | +34600207728 - Royce Herzog        | +48800207728 | 01:59    | 01:49    | RESPONSE_TO_STATUS_ENQUIRY | 2       | 0.00000  | 0.00000   |     |
| May 20, 2015, midnight | +37600719088 - Francesca Ruecker   | +41800719088 | 04:16    | 04:06    | DESTINATION_OUT_OF_ORDER   | 2       | 0.00000  | 0.00000   |     |
| May 20, 2015, midnight | +31800765761 - Ms. Kory VonRueden  | +31800765761 | 03:12    | 03:02    | INVALID_NUMBER_FORMAT      | 2       | 0.00000  | 0.00000   |     |
| May 20, 2015, midnight | +27600899036 - Zoey Schamberger    | +35800899036 | 01:16    | 01:06    | DESTINATION_OUT_OF_ORDER   | 2       | 0.00000  | 0.00000   |     |
| May 20, 2015, midnight | +38600884774 - May Goldner         | +36800884774 | 00:47    | 00:37    | INVALID_NUMBER_FORMAT      | 2       | 0.00000  | 0.00000   |     |
| May 20, 2015, midnight | +26600323627 - Tatyana Dickens     | +30800323627 | 03:23    | 03:13    | FACILITY_REJECTED          | 2       | 0.00000  | 0.00000   |     |
| May 20, 2015, midnight | +27600428811 - Mrs. Carolyn Kemmer | +31800428811 | 02:54    | 02:44    | RESPONSE_TO_STATUS_ENQUIRY | 2       | 0.00000  | 0.00000   |     |
| ...                    | ...                                | ...          | ...      | ...      | ...                        | ...     | ...      | ...       | ... |

### Concurrent-call-report

A report of concurrent calls. The statistics are collated from the realtime report, not from the CDR.

URL:

- [http://localhost:8000/cdr\\_concurrent\\_calls/](http://localhost:8000/cdr_concurrent_calls/)

Select date
Switch

Search

Hide search

### Concurrent Calls



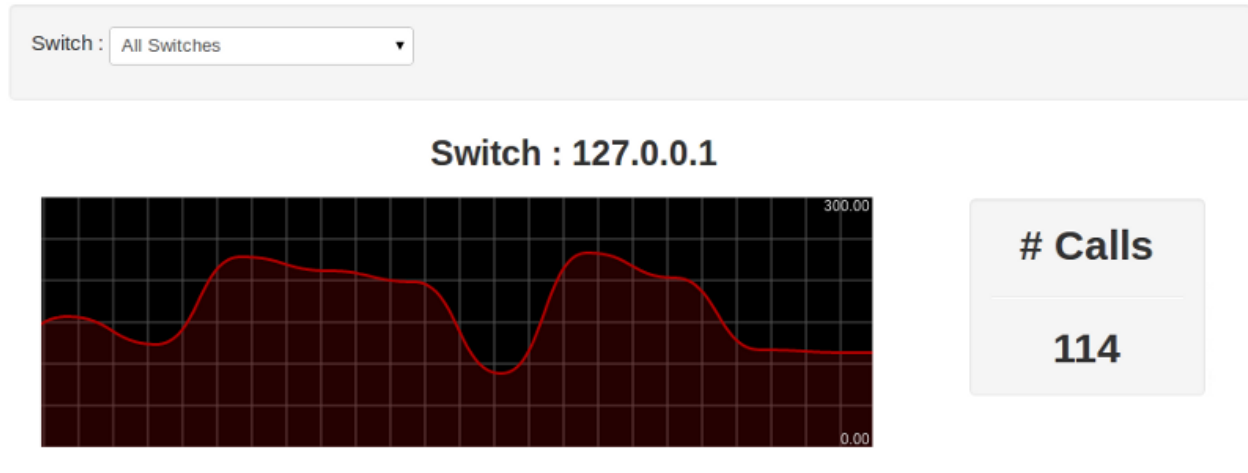
Powered by CDR-Stats - Call Monitoring & Analytics Software

## Realtime-Report

Realtime monitoring of the traffic on the connected telecoms servers, Freeswitch and Asterisk are supported.

URL:

- [http://localhost:8000/cdr\\_realtime/](http://localhost:8000/cdr_realtime/)



Powered by CDR-Stats - [Call Monitoring & Analytics Software](#)

## World Map Report

A distribution map of all calls / durations by country. You can select date criteria and on mouse over on the world map you can get information about each country.

URL:

- [http://localhost:8000/world\\_map/](http://localhost:8000/world_map/)

## World report

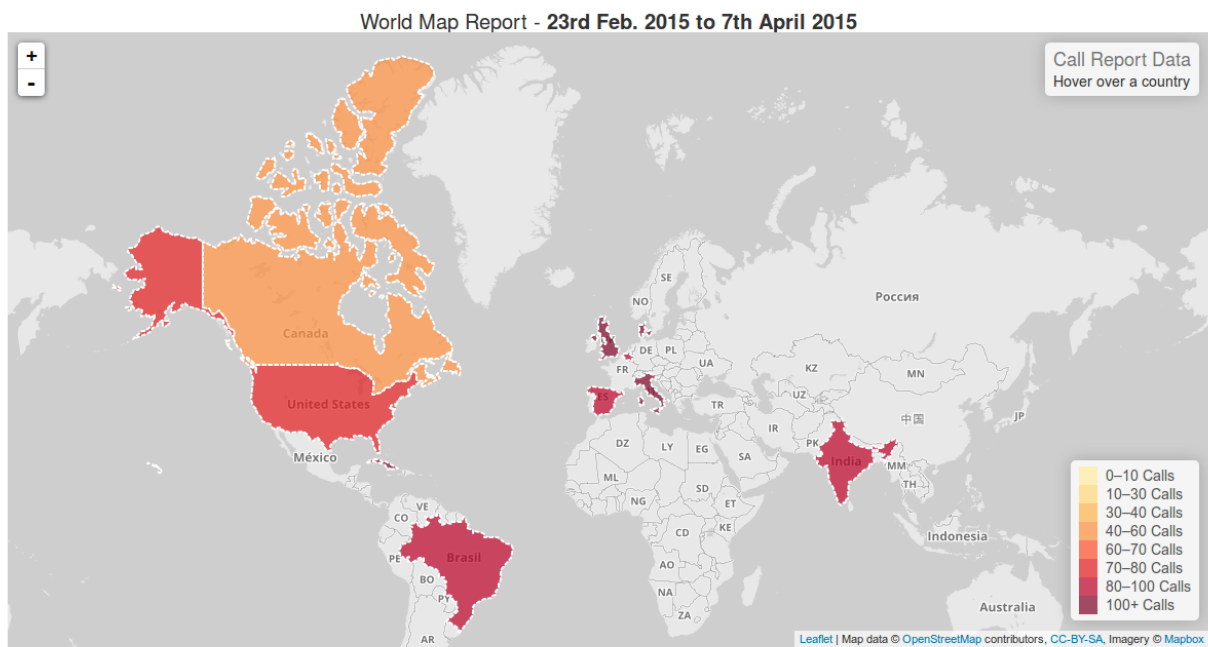
[Country Calls Detail](#) [Country List](#)

**From\***  
2015-02-23 00:00 

**To\***  
2015-04-07 23:55 

**Switch**  
All switches 

 Search



## World report

[Country Calls Detail](#)
[Country List](#)

**From\***  



**To\***  



**Switch**

 Search

World Map Report - 21st May 2015 to 21st May 2015

| Country                                                                                         | Calls     | Duration        | Buy cost | Sell cost |
|-------------------------------------------------------------------------------------------------|-----------|-----------------|----------|-----------|
|  Kenya         | 242 Calls | 1476:52 minutes | 0.0      | 0.0       |
|  United States | 9 Calls   | 00:00 minutes   | 0.0      | 0.0       |
|  Canada        | 6 Calls   | 00:00 minutes   | 0.0      | 0.0       |
|  Colombia      | 2 Calls   | 00:00 minutes   | 0.0      | 0.0       |

Powered by CDR-Stats - [Call Monitoring & Analytics Software](#)

## Alert Settings

URL:

- <http://localhost:8000/alert/>

Alerts list of alerts

Action

Add

|                                                                                     | Id | Name      | Period | Type                          | Condition                        | Value | Status | Date                      | Action                                                                                                                                                                      |
|-------------------------------------------------------------------------------------|----|-----------|--------|-------------------------------|----------------------------------|-------|--------|---------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | 7  | Alert I   | Month  | ASR (Answer Seize Ratio)      | Increase by more than            | 10.00 | Active | Dec. 13, 2012, 12:48 p.m. |   |
|  | 6  | Alert II  | Week   | ALOC (Average Length of Call) | Percentage decrease by more than | 12.00 | Active | Dec. 13, 2012, 12:48 p.m. |   |
|  | 1  | Alert III | Day    | ALOC (Average Length of Call) | Is greater than                  | 10.00 | Active | Dec. 13, 2012, 12:49 p.m. |   |

Total Alarms : 3

Powered by CDR-Stats - [Call Monitoring & Analytics Software](#)

## Alert Report

URL:

- [http://localhost:8000/alert\\_report/](http://localhost:8000/alert_report/)

Alert Records [Report By Day](#)[Q Advanced Search](#)**Alert Report** list of alerts

| <b>ID</b> | <b>Alarm</b> | <b>Calculated value</b> | <b>Status</b> | <b>Date</b>              |
|-----------|--------------|-------------------------|---------------|--------------------------|
| 70        | Alert II     | 6.000                   | Alarm Sent    | Dec. 3, 2012, 11:52 a.m. |
| 69        | Alert I      | 4.000                   | Alarm Sent    | Dec. 3, 2012, 11:52 a.m. |
| 68        | Alert II     | 5.000                   | Alarm Sent    | Dec. 3, 2012, 11:52 a.m. |
| 67        | Alert II     | 4.000                   | No alarm sent | Dec. 3, 2012, 11:52 a.m. |
| 66        | Alert II     | 6.000                   | Alarm Sent    | Dec. 3, 2012, 11:52 a.m. |
| 65        | Alert I      | 7.000                   | Alarm Sent    | Dec. 3, 2012, 11:52 a.m. |
| 64        | Alert I      | 7.000                   | No alarm sent | Dec. 3, 2012, 11:52 a.m. |
| 63        | Alert II     | 9.000                   | No alarm sent | Dec. 3, 2012, 11:52 a.m. |
| 62        | Alert I      | 11.000                  | Alarm Sent    | Dec. 3, 2012, 11:52 a.m. |
| 61        | Alert II     | 9.000                   | No alarm sent | Dec. 3, 2012, 11:52 a.m. |

Total Alarms : 27

1 2 3 [Next »](#)Powered by CDR-Stats - [Call Monitoring & Analytics Software](#)**Destination Control****URL:**

- [http://localhost:8000/trust\\_control/](http://localhost:8000/trust_control/)

**Trust Control** control the blacklist / whitelist**Blacklist**

Action ▾

|                                         |                                          |                                          |
|-----------------------------------------|------------------------------------------|------------------------------------------|
| <input type="checkbox"/>                | <input type="checkbox"/>                 | <input type="checkbox"/>                 |
| <input type="checkbox"/> 355   Albania  | <input type="checkbox"/> 35567   Albania | <input type="checkbox"/> 35569   Albania |
| <input type="checkbox"/> 3554   Albania | <input type="checkbox"/> 35568   Albania |                                          |

Afghanistan ▾

[Blacklist this country](#)[Blacklist this dialcode](#)**Whitelist**

Action ▾

Afghanistan ▾

[Whitelist this country](#)[Whitelist this dialcode](#)

## Diagnostic CDR-Stats

### URL:

- <http://localhost:8000/diagnostic/>



## CDR-Stats Call Traffic Analysis And Alert Solution

### Diagnostic CDR-Stats

PostgreSQL server used to centralize CDRs and the aggregate reporting

|                        |                                        |
|------------------------|----------------------------------------|
| ENGINE                 | django.db.backends.postgresql_psycopg2 |
| HOSTNAME               | localhost                              |
| PORT                   | 5432                                   |
| DATABASE NAME          | cdr-pusher                             |
| USERNAME               | YYYYYYYYYYYY                           |
| TABLE NAME             | cdr_import                             |
| CONNECTION STATUS      | True                                   |
| TOTAL CDR              | 390923                                 |
| TOTAL NOT IMPORTED CDR | 0                                      |

Powered by CDR-Stats - [Call Monitoring & Analytics Software](#)

## Rates

voip call rates.

### URL:

- <http://localhost:8000/rates/>


Dashboard Analytics Reports Alert Billing
root

## CDR-Stats Call Traffic Analysis And Alert Solution

Enter prefix

Action

| Prefix    | Destination       | Rate   |
|-----------|-------------------|--------|
| 447021471 | UK Personal k     | 0.5558 |
| 447021420 | UK Personal f     | 0.5879 |
| 447021021 | UK Personal nat   | 0.1747 |
| 99874703  | Uzbekistan Mobile | 0.5217 |
| 99874580  | Uzbekistan Mobile | 1.0128 |
| 99873725  | Uzbekistan Mobile | 0.4073 |
| 99873710  | Uzbekistan Mobile | 0.9440 |
| 99862530  | Uzbekistan Mobile | 0.4963 |
| 99861795  | Uzbekistan Mobile | 1.0978 |
| 99861220  | Uzbekistan Mobile | 0.5580 |

Total Records : 202

1 2 3 4 5 6 7 8 9 ... 18 19 20 21 Next »

## Call Simulator

voip call simulator.

URL:

- <http://localhost:8000/simulator/>


Dashboard Analytics Reports Alert Billing
root

## Call Simulator

Destination\*  
  
enter digit only

VoIP plan

| Call Cost | Retail Plan         | Retail Rate |
|-----------|---------------------|-------------|
| 1         | Retail Plan Default | 0.0350      |

Powered by CDR-Stats - Call Monitoring & Analytics Software

## Daily report of Billed call

Daily report of Billed call.

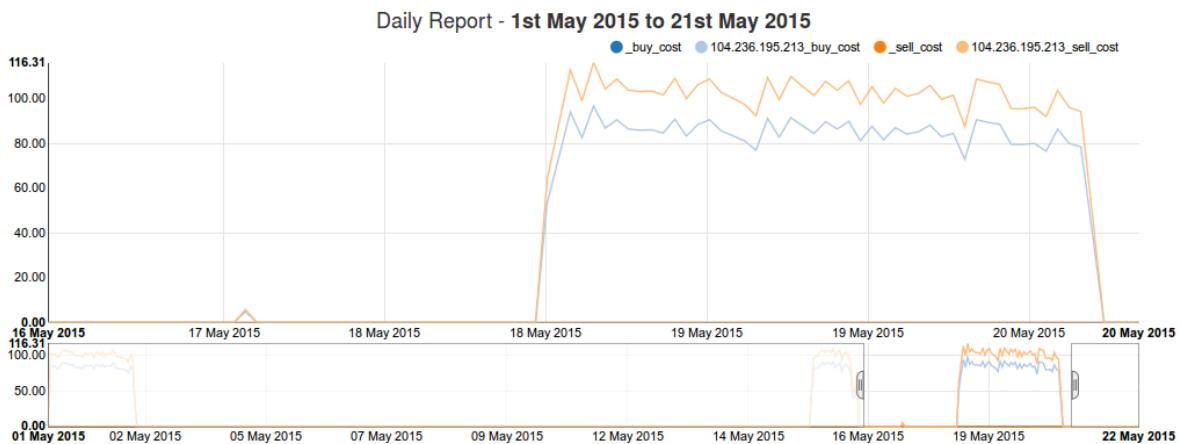
URL:

- [http://localhost:8000/billing\\_report/](http://localhost:8000/billing_report/)



## CDR Billing Report

From\*  To\*  switch



Total Calls

|          |                        |
|----------|------------------------|
| 363925   | Number Of Calls        |
| 15163.0  | Average Calls Per Hour |
| 59871130 | Total Duration         |
| 56231880 | Total Billsec          |
| 02:44    | Average Call Duration  |

10 Most Called Countries

|  |             |                   |            |            |
|--|-------------|-------------------|------------|------------|
|  | 45633 Calls | 125127:43 minutes | 0.00 BC    | 0.00 SC    |
|  | 15421 Calls | 42928:25 minutes  | 0.00 BC    | 0.00 SC    |
|  | 15335 Calls | 42755:49 minutes  | 0.00 BC    | 0.00 SC    |
|  | 15284 Calls | 41651:16 minutes  | 2346.24 BC | 2815.48 SC |
|  | 15263 Calls | 42340:46 minutes  | 0.00 BC    | 0.00 SC    |



---

## PostgreSQL

---

**Web** <http://www.postgresql.org/>

PostgreSQL is an object-relational database management system (ORDBMS) with an emphasis on extensibility and standards-compliance.

PostgreSQL provides few interesting features that make it a perfect choice for CDR-Stats:

- **Materialized view** (<http://www.postgresql.org/docs/9.4/static/rules-materializedviews.html>), these views contains the results of queries, it's ideal for aggregation views, they also can be refreshed since PG 9.4 without locking.
- **Json Types** (<http://www.postgresql.org/docs/9.4/static/datatype-json.html>), are for storing JSON (JavaScript Object Notation) data, this field is ideal to store non-structured data. CDR-Stats aggregate data from several types of telco switches where the type of data received can vary.

- *Materialized views*

### 7.1 Materialized views

We created 2 Materialized views to help on our reporting, here is the schema structure of those 2 views:

```
-- Materialized View
CREATE MATERIALIZED VIEW matv_voip_cdr_aggr_hour AS
  SELECT
    date_trunc('hour', starting_date) as starting_date,
    country_id,
    switch_id,
    cdr_source_type,
    hangup_cause_id,
    user_id,
    count(*) AS nbcalls,
    sum(duration) AS duration,
    sum(billsec) AS billsec,
    sum(buy_cost) AS buy_cost,
    sum(sell_cost) AS sell_cost
  FROM
    voip_cdr
  GROUP BY
```

```
        date_trunc('hour', starting_date), country_id, switch_id, cdr_source_type, hangup_cause_id, u

-- Create index on Materialized view
CREATE UNIQUE INDEX matv_voip_cdr_aggr_hour_date
    ON matv_voip_cdr_aggr_hour (starting_date, country_id, switch_id, cdr_source_type, hangup_cause_id, u

-- Materialized View
CREATE MATERIALIZED VIEW matv_voip_cdr_aggr_min AS
    SELECT
        date_trunc('minute', starting_date) as starting_date,
        country_id,
        switch_id,
        cdr_source_type,
        hangup_cause_id,
        user_id,
        count(*) AS nbcalls,
        sum(duration) AS duration,
        sum(billsec) AS billsec,
        sum(buy_cost) AS buy_cost,
        sum(sell_cost) AS sell_cost
    FROM
        voip_cdr
    GROUP BY
        date_trunc('minute', starting_date), country_id, switch_id, cdr_source_type, hangup_cause_id, u

-- Create index on Materialized view
CREATE UNIQUE INDEX matv_voip_cdr_aggr_min_date
    ON matv_voip_cdr_aggr_min (starting_date, country_id, switch_id, cdr_source_type, hangup_cause_id, u
```

You can drop those views with:

```
-- Drop Materialized View
DROP MATERIALIZED VIEW matv_voip_cdr_aggr_hour;

-- Drop Materialized View
DROP MATERIALIZED VIEW matv_voip_cdr_aggr_min;
```

You can refresh the view as follows, using “CONCURRENTLY” to ensure we do not lock the view:

```
# Refresh without lock
REFRESH MATERIALIZED VIEW CONCURRENTLY matv_voip_cdr_aggr_hour;

# Refresh without lock
REFRESH MATERIALIZED VIEW CONCURRENTLY matv_voip_cdr_aggr_min;
```

The update of the Materialized view is done periodically by a celery task using the above commands “REFRESH MATERIALIZED VIEW”.

---

## Developer doc

---

Contents:

### 8.1 Prerequisites

To fully understand this project, developers will need to have a advanced knowledge of:

- Django : <http://www.djangoproject.com/>
- Celery : <http://www.celeryproject.org/>
- Python : <http://www.python.org/>
- Freeswitch : <http://www.freeswitch.org/>
- Asterisk : <http://www.asterisk.org/>

### 8.2 Coding Style & Structure

#### 8.2.1 Style

Coding follows the [PEP 8 Style Guide for Python Code](#).

#### 8.2.2 Structure

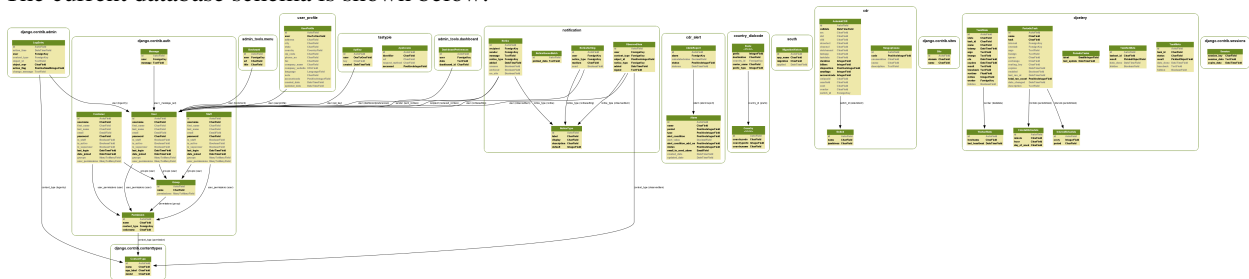
The CDR-Stats directory:

```
|-- api                - The code for APIs
|   |-- api_playground
|-- cdr                - The code for CDR
|   |-- management
|   |-- templatetags
|   |-- fixtures
|-- cdr_alert          - The code for alarm, blacklist, whitelist
|   |-- management
|   |-- fixtures
|-- frontend           - The code for login, logout user
|-- user_profile       - The code for user detail of system
|-- static
```

```
| |-- cdr
| | |-- css
| | |-- js
| | |-- icons
| | |-- images
|-- resources      - This area is used to hold media files
`-- templates      - This area is used to override templates
    |-- admin
    |-- admin_tools
    |-- api_browser
    |-- frontend
```

## 8.3 Database Design

The current database schema is shown below:



Follow this link for more details : [https://github.com/cdr-stats/cdr-stats/raw/master/docs/source/\\_static/images/model\\_cdr-stats.png](https://github.com/cdr-stats/cdr-stats/raw/master/docs/source/_static/images/model_cdr-stats.png)

## 8.4 Objects Description

### 8.4.1 Switch

```
class cdr.models.Switch(*args, **kwargs)
```

This defines the Switch

**Attributes:**

- name - Name of switch.
- ipaddress - ipaddress

**Name of DB table:** voip\_switch

### 8.4.2 HangupCause

```
class cdr.models.HangupCause(*args, **kwargs)
```

This defines the HangupCause

**Attributes:**

- code - ITU-T Q.850 Code.
- enumeration - Enumeration

- cause - cause
- description - cause description

**Name of DB table:** hangup\_cause

### 8.4.3 UserProfile

**class** user\_profile.models.**UserProfile**(\*args, \*\*kwargs)

This defines extra features for the user

**Attributes:**

- accountcode - Account name.
- address -
- city -
- state -
- address -
- country -
- zip\_code -
- phone\_no -
- fax -
- company\_name -
- company\_website -
- language -
- note -

**Relationships:**

- user - Foreign key relationship to the User model.
- userprofile\_gateway - ManyToMany
- userprofile\_voipservergroup - ManyToMany
- dialersetting - Foreign key relationship to the DialerSetting model.

**Name of DB table:** user\_profile

#### 8.4.4 Alarm

#### 8.4.5 AlertRemovePrefix

#### 8.4.6 AlarmReport

#### 8.4.7 Blacklist

#### 8.4.8 Whitelist

#### 8.4.9 VoIPPlan

**class** voip\_billing.models.VoIPPlan(\*args, \*\*kwargs)

VoIPPlans are associated to your clients, this defines the rate at which the VoIP calls are sold to your clients. A VoIPPlan is a collection of VoIPRetailPlans, you can have 1 or more VoIPRetailPlans associated to the VoIPPlan

A client has a single VoIPPlan, VoIPPlan has many VoIPRetailPlans. VoIPRetailPlan has VoIPRetailRates

The LCR system will route the VoIP via the lowest cost carrier.

#### 8.4.10 BanPlan

**class** voip\_billing.models.BanPlan(\*args, \*\*kwargs)

List of Ban Plan which are linked to VoIP Plan

#### 8.4.11 VoIPPlan\_BanPlan

**class** voip\_billing.models.VoIPPlan\_BanPlan(\*args, \*\*kwargs)

OnetoMany relationship between VoIPPlan & BanPlan

#### 8.4.12 BanPrefix

**class** voip\_billing.models.BanPrefix(\*args, \*\*kwargs)

Ban prefixes are linked to Ban plan & VoIP with these prefix will not be authorized to send.

**prefix\_with\_name()**

Return prefix with name on Ban Prefix Listing (changelist\_view)

#### 8.4.13 VoIPRetailPlan

**class** voip\_billing.models.VoIPRetailPlan(\*args, \*\*kwargs)

This contains the VoIPRetailRates to retail to the customer. these plans are associated to the VoIPPlan with a ManyToMany relation. It defines the costs at which we sell the VoIP calls to clients.

VoIPRetailPlan will then contain a set of VoIPRetailRates which will define the cost of sending a VoIP call to each destination. The system can have several VoIPRetailPlans, but only the ones associated to the VoIPplan will be used by the client.

#### 8.4.14 VoIPPlan\_VoIPRetailPlan

**class** voip\_billing.models.VoIPPlan\_VoIPRetailPlan(\*args, \*\*kwargs)  
ManytoMany relationship between VoIPPlan & VoIPRetailPlan

#### 8.4.15 VoIPRetailRate

**class** voip\_billing.models.VoIPRetailRate(\*args, \*\*kwargs)  
A single VoIPRetailRate consists of a retail rate and prefix at which you want to use to sell a VoIP Call to a particular destination. VoIPRetailRates are grouped by VoIPRetailPlan, which will be then in turn be associated to a VoIPPlan

**prefix\_with\_name()**  
Return prefix with name on Retail Rate listing (changelist\_view)

**voip\_retail\_plan\_name()**  
Return Retail Plan name on Retail Rate listing (changelist\_view)

#### 8.4.16 VoIPCarrierPlan

**class** voip\_billing.models.VoIPCarrierPlan(\*args, \*\*kwargs)  
Once the retail price is defined by the VoIPPlan, VoIPRetailPlans and VoIPRetailRates, we also need to know which is the best route to send the VoIP how much it will cost, and which VoIP Gateway to use.

VoIPCarrierPlan is linked to the VoIP Plan, so once we found how to sell the service to the client, we need to look at which carrier (Provider) we want to use, The VoIPCarrierPlan defines this.

The system can have several VoIPCarrierPlans, but only the one associated to the VoIPRetailPlan-VoIPPlan will be used to connect the VoIP of the client.

#### 8.4.17 VoIPCarrierRate

**class** voip\_billing.models.VoIPCarrierRate(\*args, \*\*kwargs)  
The VoIPCarrierRates are a set of all the carrier rate and prefix that will be used to purchase the VoIP from your carrier, VoIPCarrierRates are grouped by VoIPCarrierPlan, which will be then associated to a VoIPRetailPlan

**prefix\_with\_name()**  
Return prefix with name on Carrier Rate listing (changelist\_view)

**voip\_carrier\_plan\_name()**  
Return Carrier Plan name on Carrier Rate listing (changelist\_view)

#### 8.4.18 VoIPPlan\_VoIPCarrierPlan

**class** voip\_billing.models.VoIPPlan\_VoIPCarrierPlan(\*args, \*\*kwargs)  
ManytoMany relationship between VoIPPlan & VoIPCarrierPlan

### 8.5 Objects used by the VoIP Billing module

#### 8.5.1 Prefix

These are the prefixes and destinations. For instance, 44 ; United Kingdom

### 8.5.2 Provider

This defines the VoIP Provider you want to use to deliver your VoIP calls. Each provider will be associated to a Gateway which will link to the Service Provider.

### 8.5.3 VoIPPlan

VoIPPlans are associated to your clients, this defines the rate at which the VoIP calls are sold to your clients. A VoIPPlan is a collection of VoIPRetailPlans, you can have 1 or more VoIPRetailPlans associated to the VoIPPlan.

- A client has a single VoIPPlan
- A VoIPPlan has many VoIPRetailPlans
- A VoIPRetailPlan has VoIPRetailRates

LCR rules will bill the call based on the lowest cost carrier.

### 8.5.4 VoIPRetailPlan

This contains the *VoIPRetailRates*, the list of rates to retail to the customer. These plans are associated to the VoIPPlan with a ManyToMany relation.

It defines the costs at which we sell the VoIP calls to the clients. VoIPRetailPlan will then contain a set of VoIPRetailRates which will define the cost of sending a VoIP to each destination.

The system can have several VoIPRetailPlans, but only the ones associated to the VoIPplan will be used by the client.

### 8.5.5 VoIPPlan\_VoIPRetailPlan

Help to setup the *ManyToMany* relationship between VoIPPlan & VoIPRetailPlan.

### 8.5.6 VoIPRetailRate

A single VoIPRetailRate consists of a retail rate and prefix at which you want to use to sell a VoIP to a particular destination. VoIPRetailRates are grouped by VoIPRetailPlan, which will be then in turn be associated to a VoIPPlan.

### 8.5.7 VoIPCarrierPlan

Once the retail price is defined by the VoIPRetailPlan, we also need to know which is the best route to send the call, what will be our cost, and which Gateway/Provider will be used.

VoIPCarrierPlan is linked to the VoIPRetailPlan, so once we have determined the destination, we need to look at which carrier (Provider) we want to use. The VoIPCarrierPlan defines exactly this.

The system can have several VoIPCarrierPlans, but only the one associated to the VoIPRetailPlan-VoIPPlan will be used to connect the VoIP of the client.

### 8.5.8 VoIPCarrierRate

The VoIPCarrierRates are a set of all the carrier rate and prefix that will be used to purchase the VoIP from your carrier, VoIPCarrierRates are grouped by VoIPCarrierPlan, which will be then associated to a VoIPRetailPlan.

### 8.5.9 VoIPPlan\_VoIPCarrierPlan

Help to setup the *ManytoMany* relationship between VoIPPlan & VoIPCarrierPlan.

### 8.5.10 VoIP Call Report

This gives information of all the call delivered with the carrier charges and revenue of each message.

## 8.6 CDR-Stats Views

### 8.6.1 `cdr_view`

### 8.6.2 `cdr_detail`

### 8.6.3 `cdr_dashboard`

### 8.6.4 `cdr_overview`

### 8.6.5 `cdr_realtime`

### 8.6.6 `cdr_daily_comparison`

### 8.6.7 `cdr_concurrent_calls`

### 8.6.8 `world_map_view`

8.6.9 mail\_report

8.6.10 customer\_detail\_change

8.6.11 alarm\_list

8.6.12 alarm\_add

8.6.13 alarm\_del

8.6.14 alarm\_change

8.6.15 alarm\_test

8.6.16 alert\_report

8.6.17 trust\_control

8.6.18 index

8.6.19 diagnostic

### 8.6.20 login\_view

### 8.6.21 logout\_view

### 8.6.22 pleaselog

### 8.6.23 voip\_rates

### 8.6.24 export\_rate

### 8.6.25 simulator

### 8.6.26 billing\_report

### 8.6.27 cust\_password\_reset

`mod_registration.views.cust_password_reset(request)`

Use `django.contrib.auth.views.password_reset` view method for forgotten password on the Customer UI

This method sends an e-mail to the user's email-id which is entered in `password_reset_form`

### 8.6.28 cust\_password\_reset\_done

`mod_registration.views.cust_password_reset_done(request)`

Use `django.contrib.auth.views.password_reset_done` view method for forgotten password on the Customer UI

This will show a message to the user who is seeking to reset their password.

### 8.6.29 `cust_password_reset_confirm`

```
mod_registration.views.cust_password_reset_confirm(request, uidb64=None,  
                                                    token=None)
```

Use `django.contrib.auth.views.password_reset_confirm` view method for forgotten password on the Customer UI

This will allow a user to reset their password.

### 8.6.30 `cust_password_reset_complete`

```
mod_registration.views.cust_password_reset_complete(request)
```

Use `django.contrib.auth.views.password_reset_complete` view method for forgotten password on the Customer UI

This shows an acknowledgement to the user after successfully resetting their password for the system.

## 8.7 CDR-Stats Tasks

### 8.7.1 `sync_cdr_pending`

### 8.7.2 `chk_alarm`

### 8.7.3 `blacklist_whitelist_notification`

### 8.7.4 `send_cdr_report`

### 8.7.5 `RebillingTask`

```
class voip_billing.tasks.RebillingTask
```

Re-billing for VoIPCall

Usage:

```
RebillingTask.delay(calls_kwargs, voipplan_id)
```

### 8.7.6 `ReaggregateTask`

```
class voip_billing.tasks.RebillingTask
```

Re-billing for VoIPCall

Usage:

```
RebillingTask.delay(calls_kwargs, voipplan_id)
```

## 8.8 Test Case Descriptions

### 8.8.1 Requirement

Run/Start Celery:

```
$ /etc/init.d/celery start
```

or:

```
$ python manage.py celeryd -l info
```

#### Run/Start Redis:

```
$ /etc/init.d/redis-server start
```

## 8.8.2 How to Run Tests

### 1. Run Full Test Suit:

```
$ python manage.py test --verbosity=2
```

### 3. Run CDRStatsAdminInterfaceTestCase:

```
$ python manage.py test cdr.CDRStatsAdminInterfaceTestCase --verbosity=2
```

### 4. Run CDRStatsCustomerInterfaceTestCase:

```
$ python manage.py test cdr.CDRStatsCustomerInterfaceTestCase --verbosity=2
```

## 8.9 Javascript Files

- [jQuery](#) is a fast and concise JavaScript Library that simplifies HTML document traversing, event handling, animating, and Ajax interactions for rapid web development. jQuery is designed to change the way that you write JavaScript.
- [NVD3](#) is an attempt to build re-usable charts and chart components for d3.js without taking away the power that d3.js gives you. This is a very young collection of components, with the goal of keeping these components very customizable, staying away from your standard cookie cutter solutions.
- [Bootstrap](#) is sleek, intuitive, and powerful front-end framework for faster and easier web development.
- [Bootbox](#) is a small JavaScript library which allows you to create programmatic dialog boxes using Twitter's Bootstrap modals, without having to worry about creating, managing or removing any of the required DOM elements or JS event handlers.
- [Bootstrap-datepicker](#) Datepicker for Bootstrap



---

## API Reference

---

Contents:

### 9.1 SwitchSerializer

```
class apirest.switch_serializers.SwitchSerializer(instance=None, data=None,
                                                    files=None, context=None, partial=False, many=False, allow_add_remove=False, **kwargs)
```

**Read:**

CURL Usage:

```
curl -u username:password -H 'Accept: application/json' http://localhost:8000/rest-api/switch/1/
curl -u username:password -H 'Accept: application/json' http://localhost:8000/rest-api/switch/1/
```

Response:

```
{
  "count": 1,
  "next": null,
  "previous": null,
  "results": [
    {
      "url": "http://127.0.0.1:8000/rest-api/switch/1/",
      "name": "localhost",
      "ipaddress": "127.0.0.1",
      "key_uuid": "25116b72-b477-11e1-964f-000c296bd875"
    }
  ]
}
```

### 9.2 VoIPRateList

```
class apirest.view_voip_rate.VoIPRateList(**kwargs)
    List all voip rate
```

**Read:**

CURL Usage:

```
curl -u username:password -H 'Accept: application/json'
http://localhost:8000/rest-api/voip-rate/?recipient_phone_no=4323432&sort_field=prefix&order=asc

curl -u username:password -H 'Accept: application/json'
http://localhost:8000/rest-api/voip-rate/?dialcode=4323432&sort_field=prefix&order=desc
```

## 9.3 VoipCallResource

Testing console of APIs:

**URL :** <http://127.0.0.1:8000/api-explorer/>

**CDR-Stats APIs** Browser playground

| No | Name                        |
|----|-----------------------------|
| 1  | <a href="#">Hangupcause</a> |
| 2  | <a href="#">Switch</a>      |
| 3  | <a href="#">Cdr</a>         |

Powered by CDR-Stats - [Call Monitoring & Analytics Software](#)

To test individual api, click on one api from the api list and you will get a similar screen as follows:

**URL :** <http://127.0.0.1:8000/api-explorer/switch/>

## Switch API Playground

**/switch/**

This resource allows you to manage switches.

| GET                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | /api/v1/switch/ | Returns all switches |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|----------------------|
| <div>GET</div> <div>Request</div> <pre>GET /api/v1/switch/ Content-Type: application/json; charset=utf-8</pre> <div>Response Status</div> <pre>OK (200)</pre> <div>Response Headers</div> <pre>Date: Fri, 19 Oct 2012 10:23:46 GMT Server: WSGIServer/0.1 Python/2.7.3 Vary: Accept-Language, Cookie Content-Type: application/json; charset=utf-8 Content-Language: en Cache-Control: no-cache</pre> <div>Response Body</div> <pre>{   "meta": {     "limit": 20,     "next": null,     "offset": 0,     "previous": null,     "total_count": 4   },   "objects": [     {       "id": "1",       "ipaddress": "127.0.0.1",       "key_uuid": "c80445f8-183f-11e2-964f-000c2925d15f",       "name": "127.0.0.1",       "resource_uri": "/api/v1/switch/1/"     }   ] }</pre> <a href="#">Give feedback about this response</a> |                 |                      |

| GET                                                                                 | /api/v1/switch/{switch-id}/ | Returns a specific switch |
|-------------------------------------------------------------------------------------|-----------------------------|---------------------------|
| <div>URL Parameters</div> <div>switch-id:</div> <input type="text"/> <div>GET</div> |                             |                           |

| POST                                                                                                                                                                           | /api/v1/switch/ | Creates new switch |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|--------------------|
| <div>Data Parameters</div> <div> <div>name:</div> <input type="text" value="localhost"/> <div>ipaddress:</div> <input type="text" value="192.168.1.4"/> </div> <div>POST</div> |                 |                    |

| PUT                                                                                                                                                                                                                                 | /api/v1/switch/{switch-id}/ | Update switch |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|---------------|
| <div>URL Parameters</div> <div>switch-id:</div> <input type="text"/> <div>Data Parameters</div> <div> <div>name:</div> <input type="text" value="localhost"/> <div>ipaddress:</div> <input type="text" value="192.168.1.4"/> </div> |                             |               |

| DELETE                                                               | /api/v1/switch/{switch-id}/ | Delete switch |
|----------------------------------------------------------------------|-----------------------------|---------------|
| <div>URL Parameters</div> <div>switch-id:</div> <input type="text"/> |                             |               |



---

# Contributing

---

This document is highly inspired from the [Celery](#) documentation.

Welcome to CDR-Stats!

This document is fairly extensive and you are not really expected to study this in detail for small contributions;

The most important rule is that contributing must be easy and that the community is friendly and not nitpicking on details such as coding style.

If you're reporting a bug you should read the Reporting bugs section below to ensure that your bug report contains enough information to successfully diagnose the issue, and if you're contributing code you should try to mimic the conventions you see surrounding the code you are working on, but in the end all patches will be cleaned up by the person merging the changes so don't worry too much.

- *Community Code of Conduct*
  - *Be considerate.*
  - *Be respectful.*
  - *Be collaborative.*
  - *When you disagree, consult others.*
  - *When you are unsure, ask for help.*
  - *Step down considerately.*
- *Reporting Bugs*
  - *Bugs*
  - *Issue Trackers*
- *Versions*
- *Branches*
  - *Feature branches*
- *Tags*
- *Working on Features & Patches*
  - *Forking and setting up the repository*
  - *Running the unit test suite*
  - *Creating pull requests*
    - \* *Calculating test coverage*
    - \* *Running the tests on all supported Python versions*
  - *Building the documentation*
  - *Verifying your contribution*
    - \* *pyflakes & PEP8*
- *Coding Style*
- *Contacts*
  - *Committers*
    - \* *Areski Belaid*
  - *Website*
    - \* *Star2Billing*
- *Release Procedure*
  - *Updating the version number*
  - *Releasing*

## 10.1 Community Code of Conduct

The goal is to maintain a diverse community that is pleasant for everyone. That is why we would greatly appreciate it if everyone contributing to and interacting with the community also followed this Code of Conduct.

The Code of Conduct covers our behavior as members of the community, in any forum, mailing list, wiki, website, Internet relay chat (IRC), public meeting or private correspondence.

The Code of Conduct is heavily based on the [Ubuntu Code of Conduct](#), [Celery Code of Conduct](#), and the [Pylons Code of Conduct](#).

### 10.1.1 Be considerate.

Your work will be used by other people, and you in turn will depend on the work of others. Any decision you take will affect users and colleagues, and we expect you to take those consequences into account when making decisions. Even if it's not obvious at the time, our contributions to CDR-Stats will impact the work of others. For example, changes to code, infrastructure, policy, documentation and translations during a release may negatively impact others work.

### 10.1.2 Be respectful.

The CDR-Stats community and its members treat one another with respect. Everyone can make a valuable contribution to CDR-Stats. We may not always agree, but disagreement is no excuse for poor behavior and poor manners. We might all experience some frustration now and then, but we cannot allow that frustration to turn into a personal attack. It's important to remember that a community where people feel uncomfortable or threatened is not a productive one. We expect members of the CDR-Stats community to be respectful when dealing with other contributors as well as with people outside the CDR-Stats project and with users of CDR-Stats.

### 10.1.3 Be collaborative.

Collaboration is central to CDR-Stats and to the larger free software community. We should always be open to collaboration. Your work should be done transparently and patches from CDR-Stats should be given back to the community when they are made, not just when the distribution releases. If you wish to work on new code for existing upstream projects, at least keep those projects informed of your ideas and progress. It may not be possible to get consensus from upstream, or even from your colleagues about the correct implementation for an idea, so don't feel obliged to have that agreement before you begin, but at least keep the outside world informed of your work, and publish your work in a way that allows outsiders to test, discuss and contribute to your efforts.

### 10.1.4 When you disagree, consult others.

Disagreements, both political and technical, happen all the time and the CDR-Stats community is no exception. It is important that we resolve disagreements and differing views constructively and with the help of the community and community process. If you really want to go a different way, then we encourage you to make a derivative distribution or alternate set of packages that still build on the work we've done to utilize as common of a core as possible.

### 10.1.5 When you are unsure, ask for help.

Nobody knows everything, and nobody is expected to be perfect. Asking questions avoids many problems down the road, and so questions are encouraged. Those who are asked questions should be responsive and helpful. However, when asking a question, care must be taken to do so in an appropriate forum.

### 10.1.6 Step down considerately.

Developers on every project come and go and CDR-Stats is no different. When you leave or disengage from the project, in whole or in part, we ask that you do so in a way that minimizes disruption to the project. This means you should tell people you are leaving and take the proper steps to ensure that others can pick up where you leave off.

## 10.2 Reporting Bugs

### 10.2.1 Bugs

Bugs can always be described to the [Mailing list](#), but the best way to report an issue and to ensure a timely response is to use the issue tracker.

1. **Create a GitHub account.**

You need to [create a GitHub account](#) to be able to create new issues and participate in the discussion.

2. **Determine if your bug is really a bug.**

You should not file a bug if you are requesting support. For that you can use the [Mailing list](#), or [IRC](#).

**3. Make sure your bug hasn't already been reported.**

Search through the appropriate Issue tracker. If a bug like yours was found, check if you have new information that could be reported to help the developers fix the bug.

**4. Check if you're using the latest version.**

A bug could be fixed by some other improvements and fixes - it might not have an existing report in the bug tracker. Make sure you're using the latest version.

**5. Collect information about the bug.**

To have the best chance of having a bug fixed, we need to be able to easily reproduce the conditions that caused it. Most of the time this information will be from a Python traceback message, though some bugs might be in design, spelling or other errors on the website/docs/code.

1. If the error is from a Python traceback, include it in the bug report.
2. We also need to know what platform you're running (Windows, OS X, Linux, etc.), the version of your Python interpreter, and the version of related packages that you were running when the bug occurred.

**6. Submit the bug.**

By default [GitHub](#) will email you to let you know when new comments have been made on your bug. In the event you've turned this feature off, you should check back on occasion to ensure you don't miss any questions a developer trying to fix the bug might ask.

## 10.2.2 Issue Trackers

Bugs for a package in the CDR-Stats ecosystem should be reported to the relevant issue tracker.

- CDR-Stats Core: <https://github.com/cdr-stats/cdr-stats/issues/>
- Python-Acapela: <https://github.com/cdr-stats/python-acapela/issues>
- Lua-Acapela: <https://github.com/cdr-stats/lua-acapela/issues>
- Python-NVD3: <https://github.com/areski/python-nvd3/issues>

If you are unsure of the origin of the bug you can ask the [Mailing list](#), or just use the CDR-Stats issue tracker.

## 10.3 Versions

Version numbers consists of a major version, minor version and a release number. We use the versioning semantics described by semver: <http://semver.org>.

Stable releases are published at PyPI while development releases are only available in the GitHub git repository as tags. All version tags starts with "v", so version 0.8.0 is the tag v0.8.0.

## 10.4 Branches

Current active version branches:

- master (<http://github.com/cdr-stats/cdr-stats/tree/master>)
- 2.19.10 (<http://github.com/cdr-stats/cdr-stats/tree/v2.19.10>)

You can see the state of any branch by looking at the Changelog:

<https://github.com/cdr-stats/cdr-stats/blob/master/Changelog>

### 10.4.1 Feature branches

Major new features are worked on in dedicated branches. There is no strict naming requirement for these branches.

Feature branches are removed once they have been merged into a release branch.

## 10.5 Tags

Tags are used exclusively for tagging releases. A release tag is named with the format `vX.Y.Z`, e.g. `v2.3.1`. Experimental releases contain an additional identifier `vX.Y.Z-id`, e.g. `v3.0.0-rc1`. Experimental tags may be removed after the official release.

## 10.6 Working on Features & Patches

---

**Note:** Contributing to CDR-Stats should be as simple as possible, so none of these steps should be considered mandatory.

You can even send in patches by email if that is your preferred work method. We won't like you any less, any contribution you make is always appreciated!

However following these steps may make maintainers life easier, and may mean that your changes will be accepted sooner.

---

### 10.6.1 Forking and setting up the repository

First you need to fork the repository, a good introduction to this is in the Github Guide: [Fork a Repo](#).

After you have cloned the repository you should checkout your copy to a directory on your machine:

```
$ git clone git@github.com:username/cdr-stats.git
```

When the repository is cloned enter the directory to set up easy access to upstream changes:

```
$ cd cdr-stats
$ git remote add upstream git://github.com/cdr-stats/cdr-stats.git
$ git fetch upstream
```

If you need to pull in new changes from upstream you should always use the `--rebase` option to `git pull`:

```
$ git pull --rebase upstream master
```

With this option you don't clutter the history with merging commit notes. See [Rebasing merge commits in git](#). If you want to learn more about rebasing see the [Rebase](#) section in the Github guides.

If you need to work on a different branch than `master` you can fetch and checkout a remote branch like this:

```
$ git checkout --track -b 3.0-devel origin/3.0-devel
```

## 10.6.2 Running the unit test suite

To run the CDR-Stats test suite you need to install a few dependencies. A complete list of the dependencies needed are located in `requirements/test.txt`.

Installing the test requirements:

```
$ pip install -U -r requirements/test.txt
```

When installation of dependencies is complete you can execute the test suite by calling `py.test`:

```
$ py.test
```

Some useful options to `py.test` are:

- `-x`  
Exit instantly on first error or failed test.
- `--ipdb`  
Starts the interactive IPython debugger on errors.
- `-k EXPRESSION`  
Only run tests which match the given substring expression.
- `-v`  
Increase verbose.

If you want to run the tests for a single test file only you can do so like this:

```
$ py.test appointment./tests.py
```

## 10.6.3 Creating pull requests

When your feature/bugfix is complete you may want to submit a pull requests so that it can be reviewed by the maintainers.

Creating pull requests is easy, and also let you track the progress of your contribution. Read the [Pull Requests](#) section in the Github Guide to learn how this is done.

You can also attach pull requests to existing issues by following the steps outlined here: <http://bit.ly/koJoso>

### Calculating test coverage

To calculate test coverage you must first install the `coverage` module.

Installing the coverage module:

```
$ pip install -U coverage
```

Code coverage in HTML:

```
$ nosetests --with-coverage --cover-html
```

The coverage output will then be located at `cdr-stats/tests/cover/index.html`.

Code coverage in XML (Cobertura-style):

```
$ nosetests --with-coverage --cover-xml --cover-xml-file=coverage.xml
```

The coverage XML output will then be located at `coverage.xml`

### Running the tests on all supported Python versions

There is a `tox` configuration file in the top directory of the distribution.

To run the tests for all supported Python versions simply execute:

```
$ tox
```

If you only want to test specific Python versions use the `-e` option:

```
$ tox -e py27
```

## 10.6.4 Building the documentation

To build the documentation you need to install the dependencies listed in `requirements/docs.txt`:

```
$ pip install -U -r requirements/docs.txt
```

After these dependencies are installed you should be able to build the docs by running:

```
$ cd docs
$ rm -rf .build
$ make html
```

Make sure there are no errors or warnings in the build output. After building succeeds the documentation is available at `.build/html`.

## 10.6.5 Verifying your contribution

To use these tools you need to install a few dependencies. These dependencies can be found in `requirements/pkgutils.txt`.

Installing the dependencies:

```
$ pip install -U -r requirements/pkgutils.txt
```

### pyflakes & PEP8

To ensure that your changes conform to PEP8 and to run pyflakes execute:

```
$ flake8 cdr_stats
```

## 10.7 Coding Style

You should probably be able to pick up the coding style from surrounding code, but it is a good idea to be aware of the following conventions.

- All Python code must follow the [PEP-8](#) guidelines.

`pep8.py` is an utility you can use to verify that your code is following the conventions.

- Docstrings must follow the [PEP-257](#) conventions, and use the following style.

Do this:

```
def method(self, arg):  
    """Short description.  
  
    More details.  
  
    """
```

or:

```
def method(self, arg):  
    """Short description."""
```

but not this:

```
def method(self, arg):  
    """  
    Short description.  
    """
```

- Lines should not exceed 78 columns.

You can enforce this in **vim** by setting the `textwidth` option:

```
set textwidth=78
```

If adhering to this limit makes the code less readable, you have one more character to go on, which means 78 is a soft limit, and 79 is the hard limit :)

- Import order
  - Python standard library (*import xxx*)
  - Python standard library ('from xxx import')
  - Third party packages.
  - Other modules from the current package.

or in case of code using Django:

- Python standard library (*import xxx*)
- Python standard library ('from xxx import')
- Third party packages.
- Django packages.
- Other modules from the current package.

Within these sections the imports should be sorted by module name.

Example:

```
import threading  
import time  
  
from collections import deque  
from Queue import Queue, Empty
```

```
from .datastructures import TokenBucket
from .five import zip_longest, items, range
from .utils import timeutils
```

- Wildcard imports must not be used (*from xxx import \**).
- For distributions where Python 2.5 is the oldest support version additional rules apply:
  - Absolute imports must be enabled at the top of every module:

```
from __future__ import absolute_import
```

- If the module uses the with statement and must be compatible with Python 2.5 then it must also enable that:

```
from __future__ import with_statement
```

- Every future import must be on its own line, as older Python 2.5 releases did not support importing multiple features on the same future import line:

```
# Good
from __future__ import absolute_import
from __future__ import with_statement

# Bad
from __future__ import absolute_import, with_statement
```

(Note that this rule does not apply if the package does not include support for Python 2.5)

- Note that we use “new-style” relative imports when the distribution does not support Python versions below 2.5  
This requires Python 2.5 or later:

```
from . import submodule
```

## 10.8 Contacts

This is a list of people that can be contacted for questions regarding the official git repositories, PyPI packages Read the Docs pages.

If the issue is not an emergency then it is better to *report an issue*.

### 10.8.1 Committers

**Areski Belaid**

**github** <https://github.com/areski>

**twitter** <http://twitter.com/#!/areskib>

### 10.8.2 Website

The CDR-Stats Project is run and maintained by

## Star2Billing

**website** <http://star2billing.com/>

**twitter** <https://twitter.com/#!/star2billing>

## 10.9 Release Procedure

### 10.9.1 Updating the version number

The version number must be updated one place:

- `cdr_stats/cdr_stats/__init__.py`

After you have changed these files you must render the README files. There is a script to convert sphinx syntax to generic reStructured Text syntax, and the make target *readme* does this for you:

```
$ make readme
```

Now commit the changes:

```
$ git commit -a -m "Bumps version to X.Y.Z"
```

and make a new version tag:

```
$ git tag vX.Y.Z
$ git push --tags
```

### 10.9.2 Releasing

Commands to make a new public stable release:

```
$ make distcheck # checks pep8, autodoc index, runs tests and more
$ make dist # NOTE: Runs git clean -xdf and removes files not in the repo.
$ python setup.py sdist bdist_wheel upload # Upload package to PyPI
```

If this is a new release series then you also need to do the following:

- **Go to the Read The Docs management interface at:** <http://readthedocs.org/projects/cdr-stats/?fromdocs=cdr-stats>
- Enter “Edit project”
  - Change default branch to the branch of this series, e.g. `2.4` for series 2.4.
- Also add the previous version under the “versions” tab.

---

## Resources

---

- *Getting Help*
  - *Mailing list*
  - *IRC*
- *Bug tracker*
- *Documentation*
- *Support*
- *License*

### 11.1 Getting Help

#### 11.1.1 Mailing list

For discussions about the usage, development, and future of CDR-Stats, please join the [CDR-Stats](#) mailing list.

#### 11.1.2 IRC

Come chat with us on IRC. The **#cdr-stats** channel is located at the [Freenode](#) network.

### 11.2 Bug tracker

If you have any suggestions, bug reports or annoyances please report them to our issue tracker at <https://github.com/cdr-stats/cdr-stats/issues/>

### 11.3 Documentation

The [latest documentation](#) with user guides, tutorials and API references is hosted on CDR-Stats website : <http://www.cdr-stats.org/documentation/>

Beginner's Guide : <http://www.cdr-stats.org/documentation/beginners-guide/>

## 11.4 Support

Star2Billing S.L. offers consultancy including installation, training and customisation

Website : <http://www.star2billing.com>

Email : [cdr-stats@star2billing.com](mailto:cdr-stats@star2billing.com)

## 11.5 License

This software is licensed under the *MPL 2.0 License*. See the `LICENSE` file in the top distribution directory for the full license text.

---

## Frequently Asked Questions

---

- *General*
- *CDR Import*
- *Debugging*

### 12.1 General

#### 12.1.1 What is CDR-Stats?

**Answer:** CDR-Stats is a free and open source web based Call Detail Record analysis application with the ability to display reports and graphs.

#### 12.1.2 Why should I use CDR-Stats?

**Answer:** We foresee two main areas where CDR-Stats would be useful. For telecoms companies who wish to mediate and rate call data records, ultimately to create invoices for their customers, as well as do carrier reconciliation, and for organisations that wish to analyse call patterns. For instance: if you have call detail records from an office PBX, telecoms switch(s), or carrier CDR to analyse then CDR-Stats is a useful tool to analyse the data and look for patterns in the traffic that may indicate problems or potential fraud. Furthermore, CDR-Stats can be configured to send email alerts on detection of unusual activity, as well as send daily reports on traffic.

### 12.2 CDR Import

#### 12.2.1 How to start over and relaunch the import?

**Answer:** First stop celery by stopping supervisor:

```
$ /etc/init.d/supervisor stop
```

Then remove the aggregate data, connect on postgresql and enter the following:

```
DROP MATERIALIZED VIEW matv_voip_cdr_aggr_hour;  
DROP MATERIALIZED VIEW matv_voip_cdr_aggr_min;
```

Recreate the Materialized View as follow:

```
CREATE MATERIALIZED VIEW matv_voip_cdr_aggr_hour AS
SELECT
    date_trunc('hour', starting_date) as starting_date,
    country_id,
    switch_id,
    cdr_source_type,
    hangup_cause_id,
    user_id,
    count(*) AS nbcalls,
    sum(duration) AS duration,
    sum(billsec) AS billsec,
    sum(buy_cost) AS buy_cost,
    sum(sell_cost) AS sell_cost
FROM
    voip_cdr
GROUP BY
    date_trunc('hour', starting_date), country_id, switch_id, cdr_source_type, hangup_cause_id, u

CREATE MATERIALIZED VIEW matv_voip_cdr_aggr_min AS
SELECT
    date_trunc('minute', starting_date) as starting_date,
    country_id,
    switch_id,
    cdr_source_type,
    hangup_cause_id,
    user_id,
    count(*) AS nbcalls,
    sum(duration) AS duration,
    sum(billsec) AS billsec,
    sum(buy_cost) AS buy_cost,
    sum(sell_cost) AS sell_cost
FROM
    voip_cdr
GROUP BY
    date_trunc('minute', starting_date), country_id, switch_id, cdr_source_type, hangup_cause_id,
```

Then, update all your CDRs from 'import\_cdr' PostgreSQL database to be reimported as we flag them after import:

```
UPDATE cdr_import SET imported=FALSE;
```

Restart Celery:

```
$ /etc/init.d/supervisor stop
```

Finally check in the logs file that the CDRs are being imported:

```
tail -f /var/log/cdr-stats/djcelery_error.log
```

## 12.3 Debugging

### 12.3.1 How to debug mail connectivity?

**Answer:** Use mail\_debug to test the mail connectivity:

```
$ workon cdr-stats  
$ cd /usr/share/cdrstats  
$ python manage.py mail_debug
```

### 12.3.2 What should I do if I have problems?

**Answer:**

- Review the installation script, and check that services are running.
- Read the documentation contained in the CDR-Stats website: <http://docs.cdr-stats.org/en/latest/>
- Ask a question on the mailing list: <http://www.cdr-stats.org/community/>
- Get professional support from the CDR-Stats team (Star2Billing): <http://www.cdr-stats.org/support/>



---

## Indices and tables

---

- `genindex`
- `modindex`
- `search`



## **a**

`apirest.switch_serializers`, [85](#)  
`apirest.view_voip_rate`, [85](#)

## **c**

`cdr.models`, [74](#)

## **m**

`mod_registration.views`, [81](#)

## **u**

`user_profile.models`, [75](#)

## **v**

`voip_billing.models`, [76](#)  
`voip_billing.tasks`, [82](#)



## A

apirest.switch\_serializers (module), 85  
apirest.view\_voip\_rate (module), 85

## B

BanPlan (class in voip\_billing.models), 76  
BanPrefix (class in voip\_billing.models), 76

## C

cdr.models (module), 74  
cust\_password\_reset() (in  
mod\_registration.views), 81  
cust\_password\_reset\_complete() (in  
mod\_registration.views), 82  
cust\_password\_reset\_confirm() (in  
mod\_registration.views), 82  
cust\_password\_reset\_done() (in  
mod\_registration.views), 81

## H

HangupCause (class in cdr.models), 74

## M

mod\_registration.views (module), 81

## P

prefix\_with\_name() (voip\_billing.models.BanPrefix  
method), 76  
prefix\_with\_name() (voip\_billing.models.VoIPCarrierRate  
method), 77  
prefix\_with\_name() (voip\_billing.models.VoIPRetailRate  
method), 77

## R

RebillingTask (class in voip\_billing.tasks), 82

## S

Switch (class in cdr.models), 74  
SwitchSerializer (class in apirest.switch\_serializers), 85

## U

user\_profile.models (module), 75  
UserProfile (class in user\_profile.models), 75

## V

voip\_billing.models (module), 76  
voip\_billing.tasks (module), 82  
voip\_carrier\_plan\_name()  
(voip\_billing.models.VoIPCarrierRate  
method), 77  
module voip\_retail\_plan\_name() (voip\_billing.models.VoIPRetailRate  
method), 77  
module VoIPCarrierPlan (class in voip\_billing.models), 77  
VoIPCarrierRate (class in voip\_billing.models), 77  
module VoIPPlan (class in voip\_billing.models), 76  
VoIPPlan\_BanPlan (class in voip\_billing.models), 76  
module VoIPPlan\_VoIPCarrierPlan (class in  
voip\_billing.models), 77  
VoIPPlan\_VoIPRetailPlan (class in voip\_billing.models),  
77  
VoIPRateList (class in apirest.view\_voip\_rate), 85  
VoIPRetailPlan (class in voip\_billing.models), 76  
VoIPRetailRate (class in voip\_billing.models), 77