Jasmin Documentation

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Jookies LTD

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Jasmin is an open-source SMS Gateway with many enterprise-class features, Jasmin is built to be easily customized to meet the specific needs of messaging exchange growing business.

Based on strong message routing algorithms, Jasmin provides flexibility to define rule based routing based on various criteria: sender ID, source, destination and many combinations. Auto reconnection and re-routing mechanism managing peak hours or link failover for high availability services.

Jasmin is written in Python and Twisted framework for serving highly scalable applications, SMS message delivery can be done through HTTP and SMPP protocols, intelligent routing can be configured in real-time through an API, cli interface or a web backend\(^1\).

\(^1\) Web backend is provided under a commercial license, c.f. Support
CHAPTER 1

Features

- SMPP Client / Server
- HTTP Client / Server
- Based on AMQP broker for store&forward mechanisms
- Advanced message routing: Simple & static, Roundrobin, Failover, Leastcost ..
- Standard message filtering: TransparentFilter, ConnectorFilter, UserFilter ..
- Advanced message filtering: EvalPyFilter
- Flexible billing support
- Supports Unicode (UTF-8 / 16) for sending out multilingual SMS
- Supports easy creation and sending of specialized/binary SMS like mono Ringtones, WAP Push, Vcards
- Supports concatenated (multipart) SMS contents (long SMS)

Jasmin is designed for performance, high traffic loads and full in-memory execution.
CHAPTER 2

Getting started

• **Installation** – Install and run Jasmin SMS Gateway
• **Receiving SMS** – Basic push/pull SMS application via HTTP
• **RESTful API** – RESTful API technical specification
• **SMPP Server API** – SMPP Server API technical specification
• **Routing** – Running basic SMS and routing scenarios
• **User FAQ** – Frequently asked questions
3.1 Architecture overview

Jasmin is composed of several components with scoped responsibilities:

1. **jCli**: Telnet management console, refer to *Management CLI overview* for more details.
2. **SMPP Client Manager PB**: A PerspectBroker providing facilities to manage (add, remove, list, start, stop . . .) SMPP client connectors,
3. **Router**: A PerspectBroker providing facilities to manage message routes, groups, users, http connectors and filters,
4. **DLR Thrower**: A service for delivering acknowledgement receipts back to third party applications through HTTP, refer to *HTTP API* for more details,
5. **DeliverSM Thrower**: A service for delivering MO SMS (Mobile originated) to third party applications through HTTP, refer to *HTTP API* for more details,
6. **Restful API**: A Restful API to be used by third party application to send MT SMS (Mobile Terminated) and launch batches, refer to *RESTful API* for more details.
7. **HTTP API**: A HTTP Server to be used by third party application to send MT SMS (Mobile Terminated), refer to *HTTP API* for more details.
8. **SMPP Server API**: A SMPP Server to be used by third party application to send and receive SMS through a stateful tcp protocol, refer to *SMPP Server API* for more details.

Jasmin core and its external connectors (used for AMQP, Redis, SMPP, HTTP, Telnet . . .) are written in Python and are mainly based on Twisted matrix, a event-driven networking engine.
Fig. 1: Jasmin SMS Gateway high level design
3.2 Support

3.2.1 Getting Help

The easiest way to get help with the project is to open an issue on Github.
The forum is also available for support.

3.2.2 Commercial Support

We offer commercial support for Jasmin, commercial solution hosting, as well as remote and on-site consulting and engineering.
You can contact us at support@jasminsms.com or raise a demand through our Helpdesk to learn more.

3.3 Installation

The Installation section is intended to get you up and running quickly with a simple SMS sending scenario through HTTP API or SMPP Server API.
Jasmin installation is provided as rpm & deb Linux packages, docker image and pypi package.

**Important:** Jasmin needs a working RabbitMQ and Redis servers, more info in Prerequisites & Dependencies below.

3.3.1 Prerequisites & Dependencies

Jasmin requires Python 2.7 or newer (but not Python 3) with a functioning pip module.

**Hint:** Latest pip module installation: `# curl https://bootstrap.pypa.io/get-pip.py | python`

Depending on the Linux distribution you are using, you may need to install the following dependencies:

- RabbitMQ Server, Ubuntu package name: `rabbitmq-server`. RabbitMQ is used heavily by Jasmin as its core AMQP.
- Redis Server, Ubuntu package name: `redis-server`. Redis is used mainly for mapping message ID’s when receiving delivery receipts.
- header files and a static library for Python, Ubuntu package name: `python-dev`
- Foreign Function Interface library (development files), Ubuntu package name: `libffi-dev`
- Secure Sockets Layer toolkit - development files, Ubuntu package name: `libssl-dev`
- Twisted Matrix, Python Event-driven networking engine, Ubuntu package name: `python-twisted`
### 3.3.2 Ubuntu

Jasmin can be installed through **DEB** packages hosted on Packagecloud:

```
sudo apt-get install python-jasmin
```

**Note:** Ubuntu 15.04 and higher versions are supported.

Once Jasmin installed, you may simply start the **jasmind** service:

```
sudo systemctl enable jasmind
sudo systemctl start jasmind
```

**Note:** redis and rabbitmq must be started with jasmin.

### 3.3.3 RHEL & CentOS

Jasmin can be installed through **RPM** packages hosted on Packagecloud:

```
sudo yum install python-jasmin
```

**Note:** Red Hat Enterprise Linux 7 & CentOS 7 are supported.

You may get the following error if **RabbitMQ** or **Redis** server are not installed:

```
No package redis available.
No package rabbitmq-server available.
```

These requirements are available from the **EPEL repository**, you'll need to enable it before installing Jasmin:

```
## RHEL/CentOS 7 64-Bit ##
```

Once Jasmin installed, you may simply start the **jasmind** service:

```
sudo systemctl enable jasmind
sudo systemctl start jasmind
```

**Note:** redis and rabbitmq must be started with jasmin.

### 3.3.4 Pypi

Having another OS not covered by package installations described above? using the Python package installer will be possible, you may have to follow these instructions:
System user

Jasmin system service is running under the *jasmin* system user, you will have to create this user under *jasmin* group:

```
sudo useradd jasmin
```

System folders

In order to run as a POSIX system service, Jasmin requires the creation of the following folders before installation:

```
/etc/jasmin
/etc/jasmin/resource
/etc/jasmin/store #> Must be owned by jasmin user
/var/log/jasmin #> Must be owned by jasmin user
```

Installation

The last step is to install jasmin through pip:

```
sudo pip install jasmin
```

systemd scripts must be downloaded from [here](https://github.com/jookies/jasmin/tree/master/misc/config/systemd) and manually installed into your system, once placed in `/lib/systemd/system` jasmin shall be enabled and started:

```
sudo systemctl enable jasmind
sudo systemctl start jasmind
```

Note: redis and rabbitmq must be started with jasmin.

3.3.5 Docker

Containers are ideal for microservice architectures and for environments that scale rapidly or release often, Here’s more from Docker’s website.

Installing Docker

Before we get into containers, we’ll need to get Docker running locally. You can do this by installing the package for your system (tip: you can find yours [here](https://github.com/jookies/jasmin/tree/master/misc/config/systemd)). Running a Mac? You’ll need to install the boot2docker application before using Docker. Once that’s set up, you’re ready to start using Jasmin container!

Pulling Jasmin image

This command will pull latest jasmin docker image to your computer:

```
docker pull jookies/jasmin
```

You should have Jasmin image listed in your local docker images:
# docker images

<table>
<thead>
<tr>
<th>REPOSITORY</th>
<th>TAG</th>
<th>IMAGE ID</th>
<th>CREATED</th>
</tr>
</thead>
<tbody>
<tr>
<td>jasmin</td>
<td>latest</td>
<td>0e4cf8879899</td>
<td>36 minutes ago</td>
</tr>
</tbody>
</table>

Note: The Jasmin docker image is a self-contained/standalone box including Jasmin+Redis+RabbitMQ.

## Starting Jasmin in a container

This command will create a new docker container with name *jasmin_01* which run as a demon:

```bash
docker run -d -p 1401:1401 -p 2775:2775 -p 8990:8990 --name jasmin_01 jookies/jasmin:latest
```

Note that we used the parameter `-p` three times, it defines port forwarding from host computer to the container, typing `-p 2775:2775` will map the container’s 2775 port to your host 2775 port; this can be useful in case you’ll be running multiple containers of Jasmin where you keep a port offset of 10 between each, example:

```bash
docker run -d -p 1411:1401 -p 2785:2775 -p 8990:8990 --name jasmin_02 jookies/jasmin:latest
docker run -d -p 1421:1401 -p 2795:2775 -p 9000:8990 --name jasmin_03 jokies/jasmin:latest
docker run -d -p 1431:1401 -p 2805:2775 -p 9010:8990 --name jasmin_04 jokies/jasmin:latest
```

You should have the container running by typing the following:

```bash
# docker ps
CONTAINER ID  IMAGE                COMMAND                  CREATED       STATUS    PORTS NAMES
0a2fafbe60d0  jokies/jasmin:latest  /docker-entrypoint.sh      43 minutes ago Up 41 minutes 0.0.0.0:1401->1401/tcp, 0.0.0.0:2775->2775/tcp, 0.0.0.0:8990->8990/tcp
```

And in order to control the container *jasmin_01*, use:

```bash
docker stop jasmin_01
docker start jasmin_01
```

It’s possible to access log files located in `/var/log/jasmin` inside the container by mounting it as a shared folder:

```bash
docker run -d -v /home/user/jasmin_logs:/var/log/jasmin --name jasmin_100 jokies/jasmin:latest
```

### 3.3.6 Sending your first SMS

For the really impatient, if you want to give Jasmin a whirl right now and send your first SMS, you’ll have to connect to Management CLI overview and setup a connection to your SMS-C, let’s assume you have the following SMPP connection parameters as provided from your partner:
Table 1: Basic SMPP connection parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Host</td>
<td>Host of remote SMS-C</td>
<td>172.16.10.67</td>
</tr>
<tr>
<td>Port</td>
<td>SMPP port on remote SMS-C</td>
<td>2775</td>
</tr>
<tr>
<td>Username</td>
<td>Authentication user-name</td>
<td>smppclient1</td>
</tr>
<tr>
<td>Password</td>
<td>Authentication password</td>
<td>password</td>
</tr>
<tr>
<td>Throughput</td>
<td>Maximum sent SMS/second</td>
<td>110</td>
</tr>
</tbody>
</table>

Note: In the next sections we’ll be heavily using jClI console, if you feel lost, please refer to Management CLI overview for detailed information.

1. Adding SMPP connection

Connect to jClI console through telnet (telnet 127.0.0.1 8990) using jcliadmin/jclipwd default authentication parameters and add a new connector with an CID=DEMO_CONNECTOR:

```plaintext
Authentication required.
Username: jcliadmin
Password:
Welcome to Jasmin console
Type help or ? to list commands.
Session ref: 2
jcli : smppccm -a
> cid DEMO_CONNECTOR
> host 172.16.10.67
> port 2775
> username smppclient1
> password password
> submit_throughput 110
> ok
Successfully added connector [DEMO_CONNECTOR]
```

2. Starting the connector

Let’s start the newly added connector:
3. Configure simple route

We’ll configure a default route to send all SMS through our newly created DEMO_CONNECTOR:

```
jcli : mtrouter -a
Adding a new MT Route: (ok: save, ko: exit)
  > type defaultroute
  jasmin.routing.Routes.DefaultRoute arguments:
    connector
  > connector smppc(DEMO_CONNECTOR)
  > rate 0.00
  > ok
Successfully added MTRoute [DefaultRoute] with order:0
```

4. Create a user

In order to use Jasmin’s HTTP API to send SMS messages, you have to get a valid user account, that’s what we’re going to do below.

First we have to create a group to put the new user in:

```
jcli : group -a
  Adding a new Group: (ok: save, ko: exit)
  > gid foogroup
  > ok
Successfully added Group [foogroup]
```

And then create the new user:

```
jcli : user -a
Adding a new User: (ok: save, ko: exit)
  > username foo
  > password bar
  > gid foogroup
  > uid foo
  > ok
Successfully added User [foo] to Group [foogroup]
```

5. Send SMS

Sending outbound SMS (MT) is simply done through Jasmin’s HTTP API (refer to HTTP API for detailed information about sending and receiving SMS and receipts):
Calling the above url from any browser will send an SMS to 06222172 with **hello** content, if you receive a response like the below example it means your SMS is accepted for delivery:

```
Success "9ab2867c-96ce-4405-b890-8d35d52c8e01"
```

For more troubleshooting about message delivery, you can check details in related log files in `/var/log/jasmin`:

<table>
<thead>
<tr>
<th>Log file-name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>messages.log</td>
<td>Information about queued, rejected, received and sent messages</td>
</tr>
<tr>
<td>default-DEMO_CONNECTOR.log</td>
<td>The SMPP connector log file</td>
</tr>
</tbody>
</table>

### 3.4 RESTful API

The RESTful API allows developers to expand and build their apps on Jasmin. The API makes it easy to send messages to one or many destinations, check balance and routing, as well as **enabling bulk messaging**.

This API is built on the [Falcon web framework](http://falconry.readthedocs.io) and relying on a standard WSGI architecture, this makes it simple and scalable.

If you need to use a stateful tcp protocol (SMPP v3.4), please refer to [SMPP Server API](http://jasmin.readthedocs.io/en/latest/smpp_server.html).

SMS Messages can be transmitted using the RESTful api, the following requirements must be met to enable the service:

- You need a Jasmin user account
- You need sufficient credit on your Jasmin user account

#### 3.4.1 Installation

The RESTful API’s made available starting from **v0.9rc16**, it can be launched as a system service, so simply start it by typing:

```
sudo systemctl start jasmin-restapi
```

**Note:** The RESTful API works on Ubuntu16.04 and CentOS/RHEL 7.x out of the box, some requirements may be installed manually if you are using older Ubuntu distributions.

If you are not using rpm/deb packages to install Jasmin then that systemd service may not be installed on your system, you still can launch the RESTful API manually:

```
celery -A jasmin.protocols.rest.tasks worker -l INFO -c 4 --autoscale=10,3
twistd -n --pidfile=/tmp/twistd-web-restapi.pid web --wsgi=jasmin.protocols.rest.api
```

Configuration file for Celery and the Web server can be found in `/etc/jasmin/rest-api.py.conf`.

---

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Note: You may also use any other WSGI server for better performance, eg: gunicorn with parallel workers ...

## Services

The Services resource represents all web services currently available via Jasmin’s RESTful API.

<table>
<thead>
<tr>
<th>Method</th>
<th>Service</th>
<th>Description / Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>POST</td>
<td>/secure/send</td>
<td>Send a single message to one destination address.</td>
</tr>
<tr>
<td>POST</td>
<td>/secure/sendbatch</td>
<td>Send multiple messages to one or more destination addresses.</td>
</tr>
<tr>
<td>GET</td>
<td>/secure/balance</td>
<td>Get user account’s balance and quota.</td>
</tr>
<tr>
<td>GET</td>
<td>/secure/rate</td>
<td>Check a route and it's rate.</td>
</tr>
<tr>
<td>GET</td>
<td>/ping</td>
<td>A simple check to ensure this is a Jasmin API.</td>
</tr>
</tbody>
</table>

### 3.4.2 Authentication

Services having the `/secure` path (such as Send a single message and Route check) require authentication using Basic Auth which transmits Jasmin account credentials as username/password pairs, encoded using base64.

Example:

```bash
curl -X GET -H 'Authorization: Basic Zm9vOmJhcg==' http://127.0.0.1:8080/secure/balance
```

We have passed the base64 encoded credentials through the Authorization header, ‘Zm9vOmJhcg==’ is the encoded username:password pair (‘foo:bar’), you can use any tool to base64 encode/decode.

If wrong or no authentication credentials are provided, a 401 Unauthorized error will be returned.

### 3.4.3 Send a single message

Send a single message to one destination address.

Definition:

```bash
http://<jasmin host>:<rest api port>/secure/send
```

Parameters are the same as the old http api.

Examples:

```bash
curl -X POST -H 'Authorization: Basic Zm9vOmJhcg==' -d '{
  "to": 19012233451,
  "from": "Jookies",
  "content": "Hello",
  "dlr": "yes",
  "dlr-level": 3
}' http://127.0.0.1:8080/secure/send
```
**Note:** Do not include **username** and **password** in the parameters, they are already provided through the **Authorization header**.

Result Format:

```json
{"data": "Success \"c723d42a-c3ee-452c-940b-3d8e8b944868\""
```

If successful, response header HTTP status code will be **200 OK** and and the message will be sent, the **message id** will be returned in **data**.

### 3.4.4 Send multiple messages

Send multiple messages to one or more destination addresses.

**Definition:**

```
http://<jasmin host>:<rest api port>/secure/sendbatch
```

Example of sending same message to multiple destinations:

```bash
curl -X POST -H 'Authorization: Basic Zm9vOmJhcg==' -d '{
"messages": [
  {
    "to": [
      "33333331",
      "33333332",
      "33333333"
    ],
    "content": "Same content goes to 3 numbers"
  }
]
}' http://127.0.0.1:8080/secure/sendbatch
```

Result Format:

```json
{"data": {
"batchId": "af268b6b-1ace-4413-b9d2-529f4942fd9e",
"messageCount": 3
}}
```

If successful, response header HTTP status code will be **200 OK** and and the messages will be sent, the **batch id** and total **message count** will be returned in **data**.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Example(s)</th>
<th>Presence</th>
<th>Description / Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>messages</strong></td>
<td>[{“to”: 1, “content”: &quot;hi&quot;}, {“to”: 2, “content”: &quot;hello&quot;}]</td>
<td>Mandatory</td>
<td>A Json list of messages, every message contains the /secure/send parameters</td>
</tr>
<tr>
<td><strong>globals</strong></td>
<td>{“from”: “Jookies”}</td>
<td>Optional</td>
<td>May contain any global message parameter, c.f. examples</td>
</tr>
<tr>
<td><strong>batch_config</strong></td>
<td>{“callback_url”: “<a href="http://127.0.0.1:7877%E2%80%9D">http://127.0.0.1:7877”</a>, “schedule_at”: “2017-11-15 09:00:00”}</td>
<td>Optional</td>
<td>May contain the following parameters: callback_url or/and errback_url (used for batch tracking in real time c.f. examples), schedule_at (used for scheduling sendouts c.f. examples).</td>
</tr>
</tbody>
</table>

3.4. RESTful API
**Note:** The Rest API server has an advanced QoS control to throttle pushing messages back to Jasmin, you may fine-tune it through the `http_throughput_per_worker` and `smart_qos` parameters.

### 3.4.5 Send binary messages

Sending binary messages can be done using *single* or *batch* messaging APIs.

It’s made possible by replacing the `content` parameter by the `hex_content`, the latter shall contain your binary data hex value.

Example of sending a message with coding=8:

```
curl -X POST -H 'Authorization: Basic Zm9vOmJhcg==' -d '{
  "to": 19012233451,
  "from": "Jookies",
  "coding": 8,
  "hex_content": "0623063106460628"
}' http://127.0.0.1:8080/secure/send
```

The `hex_content` used in the above example is the UTF16BE encoding of arabic word “” (‘x06x23x06x31x06x46x06x28’).

Same goes for sending batches with binary data:

```
curl -X POST -H 'Authorization: Basic Zm9vOmJhcg==' -d '{
  "messages": [
    {
      "to": ["33333331", "33333332", "33333333"],
      "hex_content": "0623063106460628"
    }
  ]
}' http://127.0.0.1:8080/secure/sendbatch
```

**Usage examples:**

The `ref :parameter <restapi-POST_sendbatch_params>` listed above can be used in many ways to setup a sendout batch, we’re going to list some use cases to show the flexibility of these parameters:

**Example 1, send different messages to different numbers:**

```
{
  "messages": [
    {
      "from": "Brand1",
      "to": ["55555551", "55555552", "55555553"],
      "content": "Message 1 goes to 3 numbers"
    }
  ]
}
```

(continues on next page)
Example 2, using global vars:

From the previous Example (#1) we used the same “from” address for two different messages (“from”: “Brand2”), in the below example we’re going to make the “from” a global variable, and we are asking for level3 dlr for all sendouts:

```json
{
   "globals": {
      "from": "Brand2",
      "dlr-level": 3,
      "dlr": "yes",
      "dlr-url": "http://some.fancy/url"
   }
   "messages": [
   {
      "from": "Brand1",
      "to": [
         "55555551",
         "55555552",
         "55555553"
      ],
      "content": "Message 1 goes to 3 numbers"
   },
   {
      "from": "Brand2",
      "to": "7777771",
      "content": "Message 3 goes to 1 number"
   }
   ]
}
```

So, `globals` are vars to be inherited in `messages`, we still can force a local value in some messages like the “from”: “Brand1” in the above example.
Example 3, using callbacks:

As explained, Jasmin is enqueuing a sendout batch everytime you call `/secure/sendbatch`, the batch job will run and call Jasmin’s http api to deliver the messages, since this is running in background you can ask for success or/and error callbacks to follow the batch progress.

```json
{
    "batch_config": {
        "callback_url": "http://127.0.0.1:7877/successful_batch",
        "errback_url": "http://127.0.0.1:7877/errored_batch"
    },
    "messages": [
        {
            "to": ["55555551", "55555552", "55555553"],
            "content": "Hello world!"
        },
        {
            "to": "7777771",
            "content": "Holà!"
        }
    ]
}
```

About callbacks:

The RESTful api is a wrapper around Jasmin’s http api, it relies on Celery task queue to process long running batches. When you launch a batch, the api will enqueue the sendouts through Celery and return a batchId, that’s the Celery task id.

Since the batch will be executed in background, the API provides a convenient way to follow its progression through two different callbacks passed inside the batch parameters:

```json
{
    "batch_config": {
        "callback_url": "http://127.0.0.1:7877/successful_batch",
        "errback_url": "http://127.0.0.1:7877/errored_batch"
    },
    "messages": [
        {
            "to": "7777771",
            "content": "Holà!"
        }
    ]
}
```

The `callback_url` will be called (GET) everytime a message is successfully sent, otherwise the `errback_url` is called. In both callbacks the following parameters are passed:
Table 5: Batch callbacks parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Example(s)</th>
<th>Description / Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>batchId</td>
<td>50a4581a-6e46-48a4-b617-bbefe7faa3dc</td>
<td>The batch id</td>
</tr>
<tr>
<td>to</td>
<td>1234567890</td>
<td>The to parameter identifying the destination number</td>
</tr>
<tr>
<td>status</td>
<td>1</td>
<td>1 or 0, indicates the status of a message sendout</td>
</tr>
<tr>
<td>status-Text</td>
<td>“07033084-5cfd-4812-90a4-e4d24f8b6e3d”</td>
<td>Extra text for the status</td>
</tr>
</tbody>
</table>

**About batch scheduling:**

It is possible to schedule the launch of a batch, the API will enqueue the sendouts through Celery and return a `batchId` while deferring message deliveries to the scheduled date & time.

```
{
    "batch_config": {
        "schedule_at": "2017-11-15 09:00:00"
    },
    "messages": [
        {
            "to": "7777771",
            "content": "Good morning !"
        }
    ]
}
```

The above batch will be scheduled for the 15th of November 2017 at 9am, the Rest API will consider it’s local server time to make the delivery, so please make sure it’s accurate to whatever timezone you’re in.

It’s possible to use another `schedule_at` format:

```
{
    "batch_config": {
        "schedule_at": "86400s"
    },
    "messages": [
        {
            "to": "7777771",
            "content": "Good morning !"
        }
    ]
}
```

The above batch will be scheduled for delivery in 1 day from now (86400 seconds = 1 day).

### 3.4.6 Balance check

Get user account’s balance and quota.

Definition:

```
http://<jasmin host>:<rest api port>/secure/balance
```
Parameters are the same as the old http api.

Examples:

```bash
curl -X GET -H 'Authorization: Basic Zm9vOmJhcg==' http://127.0.0.1:8080/secure/balance
```

**Note:** Do not include username and password in the parameters, they are already provided through the Authorization header.

Result Format:

```json
{"data": {"balance": "10.23", "sms_count": "ND"}}
```

If successful, response header HTTP status code will be 200 OK, the balance and the sms count will be returned in data.

### 3.4.7 Route check

Check a route and it’s rate.

**Definition:**

```
http://<jasmin host>:<rest api port>/secure/rate
```

Parameters are the same as the old http api.

Examples:

```bash
curl -X GET -H 'Authorization: Basic Zm9vOmJhcg==' http://127.0.0.1:8080/secure/rate?to=19012233451
```

**Note:** Do not include username and password in the parameters, they are already provided through the Authorization header.

Result Format:

```json
{"data": {"submit_sm_count": 1, "unit_rate": 0.02}}
```

If successful, response header HTTP status code will be 200 OK, the message rate and “pdu count” will be returned in data.

### 3.4.8 Ping

A simple check to ensure this is a responsive Jasmin API, it is used by third party apps like Web campaigners, cluster service checks, etc..

**Definition:**

```
http://<jasmin host>:<rest api port>/ping
```

Examples:
curl -X GET http://127.0.0.1:8080/ping

Result Format:

```json
{"data": "Jasmin/PONG"}
```

If successful, response header HTTP status code will be **200 OK** and a static “Jasmin/PONG” value in **data**.

### 3.5 HTTP API

This document is targeted at software designers/programmers wishing to integrate SMS messaging as a function into their applications using HTTP protocol, e.g. in connection with WEB-server, unified messaging, information services etc..

If you need to use a stateful tcp protocol (**SMPP v3.4**), please refer to **SMPP Server API**.

SMS Messages can be transmitted using HTTP protocol, the following requirements must be met to enable the service:

- You need a Jasmin user account
- You need sufficient credit on your Jasmin user account

**Note:** The ABCs:

- **MT** is referred to Mobile Terminated, a SMS-MT is an SMS sent to mobile
- **MO** is referred to Mobile Originated, a SMS-MO is an SMS sent from mobile

#### 3.5.1 Features

The ja-http API allows you to:

- Send and receive SMS through Jasmin’s connectors,
- Receive http callbacks for delivery notification (**receipts**) when SMS-MT is received (or not) on mobile station,
- Send and receive long (more than 160 characters) SMS, unicode/binary content and receive http callbacks when a mobile station send you a SMS-MO.
- Check your balance status,
- Check a message rate price before sending it.

#### 3.5.2 Sending SMS-MT

In order to deliver **SMS-MT** messages, Data is transferred using **HTTP GET/POST** requests. The Jasmin gateway accepts requests at the following URL:

http://127.0.0.1:1401/send

**Note:** Host 127.0.0.1 and port 1401 are default values and configurable in `/etc/jasmin/jasmin.cfg`, see `jasmin.cfg / http-api`

---

1 **Billing**
This guide will help understand how the API works and provide *Examples* for sending SMS-MT.

**HTTP request parameters**

When calling Jasmin’s URL from an application, the below parameters must be passed (at least mandatory ones), the api will return a message id on success, see *HTTP response*.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value / Pattern</th>
<th>Example(s)</th>
<th>Presence</th>
<th>Description / Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>to</strong></td>
<td>Destination address</td>
<td>20203050</td>
<td>Mandatory</td>
<td>Destination address, only one address is supported per request</td>
</tr>
<tr>
<td><strong>from</strong></td>
<td>Originating address</td>
<td>20203050, Jasmin</td>
<td>Optional</td>
<td>Originating address, In case rewriting of the sender’s address is supported or permitted by the SMS-C used to transmit the message, this number is transmitted as the originating address</td>
</tr>
<tr>
<td><strong>coding</strong></td>
<td>0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 13 or 14</td>
<td>1</td>
<td>Optional</td>
<td>Sets the Data Coding Scheme bits, default is 0, accepts values all allowed values in SMPP protocol¹</td>
</tr>
<tr>
<td><strong>username</strong></td>
<td>Text (30 char. max)</td>
<td>jasmin_user</td>
<td>Mandatory</td>
<td>Username for Jasmin user account.</td>
</tr>
<tr>
<td><strong>password</strong></td>
<td>Text (30 char. max)</td>
<td>jasmin_pass</td>
<td>Mandatory</td>
<td>Password for Jasmin user account.</td>
</tr>
<tr>
<td><strong>priority</strong></td>
<td>0, 1, 2 or 3</td>
<td>2</td>
<td>Optional</td>
<td>Default is 0 (lowest priority)</td>
</tr>
<tr>
<td><strong>sdt</strong></td>
<td>String</td>
<td>0000000001 (send in 1 minute)</td>
<td>Optional</td>
<td>Specifies the scheduled delivery time at which the message delivery should be first attempted, default is value is None (message will take SMSC’s default). Supports Absolute and Relative Times per SMPP v3.4 Issue 1.2</td>
</tr>
<tr>
<td><strong>validity-period</strong></td>
<td>Integer</td>
<td>1440</td>
<td>Optional</td>
<td>Message validity (minutes) to be passed to SMSC, default is value is None (message will take SMSC’s default)</td>
</tr>
<tr>
<td><strong>dlr</strong></td>
<td>yes or no</td>
<td>yes</td>
<td>Optional</td>
<td>Default is no (no DLR will be tracked)</td>
</tr>
<tr>
<td><strong>dlr-url</strong></td>
<td>HTTP(s) URL</td>
<td><a href="http://host/dlr.php">http://host/dlr.php</a></td>
<td>Mandatory if dlr</td>
<td>If a DLR is requested (dlr = ‘yes’), dlr-url MUST be set, if not, dlr value is reconsidered as ‘no’</td>
</tr>
<tr>
<td><strong>dlr-level</strong></td>
<td>1, 2 or 3</td>
<td>2</td>
<td>Mandatory if dlr</td>
<td>1: SMS-C level, 2: Terminal level, 3: Both</td>
</tr>
<tr>
<td><strong>dlr-method</strong></td>
<td>GET or POST</td>
<td>GET</td>
<td>Mandatory if dlr</td>
<td>DLR is transmitted through http to a third party application using GET or POST method.</td>
</tr>
<tr>
<td><strong>tags</strong></td>
<td>Text</td>
<td>1,702,9901</td>
<td>Optional</td>
<td>Will tag the routable to help interceptor or router enable specific business logics.</td>
</tr>
<tr>
<td><strong>content</strong></td>
<td>Text</td>
<td>Hello world !</td>
<td>Mandatory if hex-content not defined</td>
<td>Content to be sent</td>
</tr>
<tr>
<td><strong>hex-content</strong></td>
<td>Binary hex value</td>
<td>062306310628</td>
<td>Mandatory if content not defined</td>
<td>Binary to be sent</td>
</tr>
</tbody>
</table>
HTTP response

When the request is validated, a SubmitSM PDU is set up with the provided request parameters and sent to the routed connector through a AMQP queue, a queued message-id is returned:

Success "07033084-5cfd-4812-90a4-e4d24ff6e3d"

Otherwise, an error is returned:

Error "No route found"

Table 7: HTTP response code details

<table>
<thead>
<tr>
<th>HTTP Code</th>
<th>HTTP Body</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>200</td>
<td>Success “07033084-5cfd-4812-90a4-e4d24ff6e3d”</td>
<td>Message is successfully queued, messaged-id is returned</td>
</tr>
<tr>
<td>400</td>
<td>Error “Mandatory arguments not found, please refer to the HTTPAPI specifications.”</td>
<td>Request parameters validation error</td>
</tr>
<tr>
<td>400</td>
<td>Error “Argument _ is unknown.”</td>
<td>Request parameters validation error</td>
</tr>
<tr>
<td>400</td>
<td>Error “Argument _ has an invalid value: _.”</td>
<td>Request parameters validation error</td>
</tr>
<tr>
<td>400</td>
<td>Error “Mandatory argument _ is not found.”</td>
<td>Request parameters validation error</td>
</tr>
<tr>
<td>400</td>
<td>dynamic messages</td>
<td>Credentials validation error, c.f. User credentials</td>
</tr>
<tr>
<td>403</td>
<td>Error “Authentication failure for username: _”</td>
<td>Authentication error</td>
</tr>
<tr>
<td>403</td>
<td>Error “Authorization failed for username: _”</td>
<td>Credentials validation error, c.f. User credentials</td>
</tr>
<tr>
<td>403</td>
<td>Error “Cannot charge submit_sm, check RouterPB log file for details”</td>
<td>User charging error</td>
</tr>
<tr>
<td>412</td>
<td>Error “No route found”</td>
<td>Message routing error</td>
</tr>
<tr>
<td>500</td>
<td>Error “Cannot send submit_sm, check SMPPClientManagerPB log file for details”</td>
<td>Fallback error, checking log file will provide better details</td>
</tr>
</tbody>
</table>

Examples

Here is an example of how to send simple GSM 03.38 messages:

```python
import urllib.request, urllib.error, urllib.parse

baseParams = {'username':'foo', 'password':'bar', 'to':'+336222172', 'content':'Hello '}

# Send an SMS-MT with minimal parameters
urllib.request.urlopen("http://127.0.0.1:1401/send?$s" % urllib.parse.urlencode(baseParams)).read()

# Send an SMS-MT with defined originating address
baseParams['from'] = 'Jasmin GW'
urllib.request.urlopen("http://127.0.0.1:1401/send?$s" % urllib.parse.urlencode(baseParams)).read()
```

Here is an example of how to request acknowledgement when sending a SMS:
# Python example

```python
import urllib.request, urllib.error, urllib.parse

# Send an SMS-MT and request terminal level acknowledgement callback to http://
# myserver/acknowledgement
params = {'username':'foo', 'password':'bar', 'to':'+336222172', 'content':'Hello',
          'dlr-url': 'http://myserver/acknowledgement', 'dlr-level':2}
urllib.request.urlopen("http://127.0.0.1:1401/send?%s" % urllib.parse.
 urlopen\(\ldots\)).read()

And more use cases for sending long, UCS2 (UTF16) and binary messages:

```python
baseParams = {'username':'foo', 'password':'bar', 'to':'+336222172', 'content':'Hello -'
             }

# Sending long content (more than 160 chars):
baseParams['content'] = 'Very long message ....................................
                        ..............................................................
                        ..............................................................
urllib.request.urlopen("http://127.0.0.1:1401/send?%s" % urllib.parse.
 urlopen\(\ldots\)).read()

# Sending UCS2 (UTF-16) arabic content
baseParams['content'] = '\x06\x23\x06\x31\x06\x46\x06\x28'  
baseParams['coding'] = 8
urllib.request.urlopen("http://127.0.0.1:1401/send?%s" % urllib.parse.
 urlopen\(\ldots\)).read()

# Sending UCS2 (UTF-16) arabic binary content
baseParams['hex-content'] = '0623063106460628'
baseParams['coding'] = 8
urllib.request.urlopen("http://127.0.0.1:1401/send?%s" % urllib.parse.
 urlopen\(\ldots\)).read()

In PHP:

```php
<?php
// Sending simple message using PHP
// http://jasminsms.com

$baseurl = 'http://127.0.0.1:1401/send'
$params = '?username=foo'
$params.= '&password=bar'
$params.= '&to='.urlencode('+336222172')
$params.= '&content='.urlencode('Hello world !')
$response = file_get_contents($baseurl.$params);
?>

In Ruby:
# Sending simple message using Ruby
# http://jasminsms.com

```ruby
require 'net/http'

uri = URI('http://127.0.0.1:1401/send')
params = { :username => 'foo', :password => 'bar',
          :to => '+336222172', :content => 'Hello world' }
uri.query = URI.encode_www_form(params)
response = Net::HTTP.get_response(uri)
```

**jasmin.cfg / http-api**

The `jasmin.cfg` file (*INI format, located in /etc/jasmin*) contain a section called **http-api** where all ja-http API related config elements are:

```ini
[http-api]
bind = 0.0.0.0
port = 1401
long_content_max_parts = 5
long_content_split = udh
access_log = /var/log/jasmin/http-access.log
log_level = INFO
log_file = /var/log/jasmin/http-api.log
log_format = %(asctime)s %(levelname)-8s %(process)d %(message)s
log_date_format = %Y-%m-%d %H:%M:%S
```

**Table 8: [http-api] configuration section**

<table>
<thead>
<tr>
<th>Element</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>bind</td>
<td>0.0.0.0</td>
<td>The HTTP API listener will only bind to this specified address, given 0.0.0.0 the listener will bind on all interfaces.</td>
</tr>
<tr>
<td>port</td>
<td>1401</td>
<td>The binding TCP port.</td>
</tr>
<tr>
<td>long_content_max_parts</td>
<td>5</td>
<td>If the message to be sent is to be split into several parts. This is the maximum number of individual SMS-MT messages that can be used.</td>
</tr>
<tr>
<td>long_content_split</td>
<td>udh</td>
<td>Splitting method: ’udh’: Will split using 6-byte long User Data Header, ’sar’: Will split using sar_total_segments, sar_segment_seqnum, and sar_msg_ref_num options.</td>
</tr>
<tr>
<td>access_log</td>
<td>/var/log/jasmin/http-access.log</td>
<td>Where to log all http requests (and errors).</td>
</tr>
<tr>
<td>log_*</td>
<td>INFO</td>
<td>Python’s logging module configuration.</td>
</tr>
</tbody>
</table>

### 3.5.3 Receiving DLR

When requested through dlr-* fields when *Sending SMS-MT*, a delivery receipt (DLR) will be sent back to the application url (set in dlr-url) through HTTP GET/POST depending on dlr-method.

The receiving end point must reply back using a “200 OK” status header and a body containing an acknowledgement of receiving the DLR, if one or both of these conditions are not met, the DLRThrower service will consider reshipment of the same message if `config/dlr-thrower/max_retries` is not reached (see `jasmin.cfg / dlr-thrower`).

3.5. HTTP API 27
In order to acknowledge DLR receipt, the receiving end point must reply back with **exactly** the following html body content:

```
ACK/Jasmin
```

**Note:** It is very important to acknowledge back each received DLR, this will prevent to receive the same message many times, c.f. *Processing* for details.

**Note:** Reshipment of a message will be delayed for `config/dlr-thrower/retry_delay` seconds (see *jasmin.cfg / dlr-thrower*).

### HTTP Parameters for a level 1 DLR

The following parameters are sent to the receiving end point (at dlr-url) when the DLR’s dlr-level is set to 1 (SMS-C level only)

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value / Pattern</th>
<th>Example(s)</th>
<th>Presence</th>
<th>Description / Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>Universally Unique IDentifier (UUID)</td>
<td>16fd2706-8baf-433b-82eb-8c7fada847da</td>
<td>Always</td>
<td>Internal Jasmin’s gateway message id used for tracking messages</td>
</tr>
<tr>
<td>message_status</td>
<td>ESME_* SMPP Command status</td>
<td>ESME_ROK, ESME_RINVNUMDESTS</td>
<td>Always</td>
<td>The delivery status</td>
</tr>
<tr>
<td>level</td>
<td>1</td>
<td>1</td>
<td>Always</td>
<td>This is a static value indicating the dlr-level originally requested</td>
</tr>
<tr>
<td>connector</td>
<td>SMPP Connector ID</td>
<td>demo_cid</td>
<td>Always</td>
<td>The SMPP Connector used to send the message</td>
</tr>
</tbody>
</table>

### HTTP Parameters for a level 2 or 3 DLR

The following parameters are sent to the receiving end point (at dlr-url) when DLR’s dlr-level is set to 2 or 3 (Terminal level or all levels)
Table 10: ja-http parameters for a level 2 or 3 DLR

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value / Pattern</th>
<th>Example(s)</th>
<th>Presence</th>
<th>Description / Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>Universally Unique IDentifier (UUID)</td>
<td>16fd2706-8baf-433b-82eb-8c7fada847da</td>
<td>Always</td>
<td>Internal Jasmin’s gateway message id used for tracking messages</td>
</tr>
<tr>
<td>id_sms</td>
<td>Integer</td>
<td>2567</td>
<td>Always</td>
<td>Message id returned from the SMS-C</td>
</tr>
<tr>
<td>message_status</td>
<td>ESME_*.SMPP Command status</td>
<td>ESME_ROK, ESME_RINVNDSTS</td>
<td>Always</td>
<td>The delivery status</td>
</tr>
<tr>
<td>level</td>
<td>1</td>
<td>1</td>
<td>Always</td>
<td>This is a static value indicating the dlr-level originally requested</td>
</tr>
<tr>
<td>conncctor</td>
<td>SMPP Connector ID</td>
<td>demo_cid</td>
<td>Always</td>
<td>The SMPP Connector used to send the message</td>
</tr>
<tr>
<td>sub_date</td>
<td>Date &amp; time format: YYMMD-Dhhmm</td>
<td>1311022338</td>
<td>Optional</td>
<td>The time and date at which the short message was submitted</td>
</tr>
<tr>
<td>done_date</td>
<td>Date &amp; time format: YYMMD-Dhhmm</td>
<td>1311022338</td>
<td>Optional</td>
<td>The time and date at which the short message reached it’s final state</td>
</tr>
<tr>
<td>sub</td>
<td>Integer</td>
<td>1</td>
<td>Optional</td>
<td>Number of short messages originally submitted. This is only relevant when the original message was submitted to a distribution list. The value is padded with leading zeros if necessary</td>
</tr>
<tr>
<td>dlvrd</td>
<td>Integer</td>
<td>1</td>
<td>Optional</td>
<td>Number of short messages delivered. This is only relevant where the original message was submitted to a distribution list. The value is padded with leading zeros if necessary</td>
</tr>
<tr>
<td>err</td>
<td>Integer</td>
<td>0</td>
<td>Optional</td>
<td>Where appropriate this may hold a Network specific error code or an SMSC error code for the attempted delivery of the message</td>
</tr>
<tr>
<td>text</td>
<td>Text (20 char. max)</td>
<td>Hello foo bar</td>
<td>Optional</td>
<td>The first 20 characters of the short message</td>
</tr>
</tbody>
</table>

**Processing**

The flowchart below describes how dlr delivery and retrying policy is done inside DLRThrower service:

```
[dlr-thrower]
http_timeout = 30
retry_delay = 30
max_retries = 3
log_level = INFO
```

(continues on next page)
6 log_file = /var/log/jasmin/dlr-thrower.log
7 log_format = %(asctime)s %(levelname)-8s %(process)d %(message)s
8 log_date_format = %Y-%m-%d %H:%M:%S

Table 11: [http-api] configuration section

<table>
<thead>
<tr>
<th>Element</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>http_timeout</td>
<td>30</td>
<td>Sets socket timeout in seconds for outgoing client http connections.</td>
</tr>
<tr>
<td>retry_delay</td>
<td>30</td>
<td>Define how many seconds should pass within the queuing system for retrying a failed throw.</td>
</tr>
<tr>
<td>max_retries</td>
<td>3</td>
<td>Define how many retries should be performed for failing throws of DLR.</td>
</tr>
<tr>
<td>log_*</td>
<td>Python’s logging module configuration.</td>
<td></td>
</tr>
</tbody>
</table>

3.5.4 Receiving SMS-MO

SMS-MO incoming messages (Mobile Originated) are forwarded by Jasmin to defined URLs using simple HTTP GET/POST, the forwarding is made by deliverSmHttpThrower service, and the URL of the receiving endpoint is selected through a route checking process (c.f. The message router).

Receiving endpoint is a third party application which acts on the messages received and potentially generates replies, (HTTP Client connector manager for more details about HTTP Client connector management).

The parameters below are transmitted for each SMS-MO, the receiving end point must provide an url (set in jasminApi.HttpConnector.baseurl) and parse the below parameters using GET or POST method (depends on jasminApi.HttpConnector.method).

The receiving end point must reply back using a “200 OK” status header and a body containing an acknowledgement of receiving the SMS-MO, if one or both of these conditions are not met, the deliverSmHttpThrower service will consider reshipment of the same message if config/deliversm-thrower/max_retries is not reached, (see jasmin.cfg / deliversm-thrower).

In order to acknowledge SMS-MO receipt, the receiving end point must reply back with exactly the following html body content:

ACK/Jasmin

Note: It is very important to acknowledge back each received SMS-MO, this will prevent to receive the same message many times, c.f. Processing for details

Note: Reshipment of a message will be delayed for config/deliversm-thrower/retry_delay seconds (see jasmin.cfg / deliversm-thrower).

HTTP Parameters

When receiving an URL call from Jasmin’s deliverSmHttpThrower service, the below parameters are delivered (at least Always present ones).
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value / Pattern</th>
<th>Example(s)</th>
<th>Presence</th>
<th>Description / Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>Universally Unique IDen-</td>
<td>16fd2706-8baf-433b-82eb-8c7fada847da</td>
<td>Always</td>
<td>Internal Jasmin’s gateway message id</td>
</tr>
<tr>
<td></td>
<td>tifier (UUID)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>from</td>
<td>Originating address</td>
<td>+21620203060, 20203060, Jasmin</td>
<td>Always</td>
<td>Originating address</td>
</tr>
<tr>
<td>to</td>
<td>Destination address</td>
<td>+21620203060, 20203060, Jasmin</td>
<td>Always</td>
<td>Destination address, only one address is supported per request</td>
</tr>
<tr>
<td>origin-connector</td>
<td>Alphanumeric id</td>
<td>23, bcd, MTN, clickatell, beepsend</td>
<td>Always</td>
<td>Jasmin http connector id</td>
</tr>
<tr>
<td>priority</td>
<td>1, 2 or 3</td>
<td>2</td>
<td>Optional</td>
<td>Default is 1 (lowest priority)</td>
</tr>
<tr>
<td>coding</td>
<td>Numeric</td>
<td>8</td>
<td>Optional</td>
<td>Default is 0, accepts values all allowed values in SMPP protocol</td>
</tr>
<tr>
<td>validity</td>
<td>YYYY-MM-DD hh:mm:ss</td>
<td>2013-07-16 00:46:54</td>
<td>Optional</td>
<td>The validity period parameter indicates the Jasmin GW expiration time, after which the message should be discarded if not delivered to the destination</td>
</tr>
<tr>
<td>content</td>
<td>Text</td>
<td>Hello world !</td>
<td>Always</td>
<td>Content of the message</td>
</tr>
<tr>
<td>binary</td>
<td>Hexlified binary content</td>
<td>062A063062A</td>
<td>Always</td>
<td>Content of the message in binary hexlified form</td>
</tr>
</tbody>
</table>

**Note:** When receiving multiple parts of a long SMS-MO, `deliverSmHttpThrower service` will concatenate the content of all the parts and then throw one http call with concatenated `content`.

**Processing**

The flowchart below describes how message delivery and retrying policy are done inside `deliverSmHttpThrower service`:

**jasmin.cfg / deliversm-thrower**

The `jasmin.cfg` file (*INI format, located in /etc/jasmin*) contain a section called `deliversm-thrower` where all `deliverSmHttpThrower service` related config elements are:

```ini
[deliversm-thrower]
http_timeout = 30
retry_delay = 30
max_retries = 3
log_level = INFO
log_file = /var/log/jasmin/deliversm-thrower.log
```

(continues on next page)
log_format = %(asctime)s (%levelname)-8s (%process)d (%message)s
log_date_format = %Y-%m-%d %H:%M:%S

Table 13: [http-api] configuration section

<table>
<thead>
<tr>
<th>Element</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>http_timeout</td>
<td>30</td>
<td>Sets socket timeout in seconds for outgoing client http connections.</td>
</tr>
<tr>
<td>retry_delay</td>
<td>30</td>
<td>Define how many seconds should pass within the queuing system for retrying a failed throw.</td>
</tr>
<tr>
<td>max_retries</td>
<td>3</td>
<td>Define how many retries should be performed for failing throws of SMS-MO.</td>
</tr>
<tr>
<td>log_*</td>
<td></td>
<td>Python’s logging module configuration.</td>
</tr>
</tbody>
</table>

3.5.5 Checking account balance

In order to check user account balance and quotas, user may request a HTTP GET/POST from the following URL:

http://127.0.0.1:1401/balance

**Note:** Host 127.0.0.1 and port 1401 are default values and configurable in /etc/jasmin/jasmin.cfg, see jasmin.cfg / http-api.

HTTP request parameters

Table 14: ja-http balance request parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value / Pattern</th>
<th>Example(s)</th>
<th>Presence</th>
<th>Description / Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>username</td>
<td>Text (30 char. max)</td>
<td>jasmin_user</td>
<td>Mandatory</td>
<td>Username for Jasmin user account.</td>
</tr>
<tr>
<td>password</td>
<td>Text (30 char. max)</td>
<td>jasmin_pass</td>
<td>Mandatory</td>
<td>Password for Jasmin user account.</td>
</tr>
</tbody>
</table>

HTTP response

Successful response:

```json
{"balance": 100.0, "sms_count": "ND"}
```

Otherwise, an error is returned.

Examples

Here is an example of how to check balance:

```python
# Python example
# http://jasminsms.com
import urllib.request, urllib.error, urllib.parse
import json

# Check user balance
params = {'username':'foo', 'password':'bar'}
response = urllib.request.urlopen("http://127.0.0.1:1401/balance?%s" % urllib.parse.urlencode(params)).read()
```

(continues on next page)
response = json.loads(response)
print('Balance:', response['balance'])
print('SMS Count:', response['sms_count'])
#Balance: 100.0
#SMS Count: ND

3.5.6 Checking rate price

It is possible to ask Jasmin’s HTTPAPI for a message rate price before sending it, the request will lookup the route to be considered for the message and will provide the rate price if defined.

Request is done through **HTTP GET/POST** to the following URL:

http://127.0.0.1:1401/rate

**Note:** Host 127.0.0.1 and port 1401 are default values and configurable in /etc/jasmin/jasmin.cfg, see jasmin.cfg / http-api.

### HTTP request parameters

Table 15: ja-http rate request parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value / Pattern</th>
<th>Example(s)</th>
<th>Presence</th>
<th>Description / Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>to</td>
<td>Destination address</td>
<td>20203050</td>
<td>Mandatory</td>
<td>Destination address, only one address is supported per request</td>
</tr>
<tr>
<td>from</td>
<td>Originating address</td>
<td>20203050 Jasmin</td>
<td>Optional</td>
<td>Originating address, In case rewriting of the sender’s address is supported or permitted by the SMS-C used to transmit the message, this number is transmitted as the originating address</td>
</tr>
<tr>
<td>coding</td>
<td>0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 13 or 14</td>
<td>1</td>
<td>Optional</td>
<td>Sets the Data Coding Scheme bits, default is 0, accepts values all allowed values in SMPP protocol</td>
</tr>
<tr>
<td>username</td>
<td>Text (30 char. max)</td>
<td>jasmin_user</td>
<td>Mandatory</td>
<td>Username for Jasmin user account.</td>
</tr>
<tr>
<td>password</td>
<td>Text (30 char. max)</td>
<td>jasmin_pass</td>
<td>Mandatory</td>
<td>Password for Jasmin user account.</td>
</tr>
<tr>
<td>content</td>
<td>Text</td>
<td>Hello world!</td>
<td>Optional</td>
<td>Content to be sent</td>
</tr>
</tbody>
</table>

### HTTP response

Successful response:

```json
{"submit_sm_count": 2, "unit_rate": 2.8}
```
Where `submit_sm_count` is the number of message units if the `content` is longer than 160 characters, `content` parameter is optional for requesting rate price.

Otherwise, an error is returned.

Otherwise, an error is returned:

```shell
Error "No route found"
```

### Examples

Here is an example of how to check rate price:

```python
# Python example
# http://jasminsms.com
import urllib.request, urllib.error, urllib.parse
import urllib.request, urllib.parse, urllib.error
import json

# Check message rate price
params = {'username':'foo', 'password':'bar', 'to': '06222172'}
response = urllib.request.urlopen("http://127.0.0.1:1401/rate?%s" % urllib.parse.urlencode(params)).read()
response = json.loads(response)

print('Unit rate price:', response['unit_rate'])
print('Units:', response['submit_sm_count'])

#Unit rate price: 2.8
#Units: 1
```

### Table 16: Data coding schemes

<table>
<thead>
<tr>
<th>Bitmask</th>
<th>Value</th>
<th>Meaning</th>
</tr>
</thead>
<tbody>
<tr>
<td>0 0 0 0 0 0 0</td>
<td>0</td>
<td>SMSC Default Alphabet</td>
</tr>
<tr>
<td>0 0 0 0 0 0 1</td>
<td>1</td>
<td>IA5 (CCITT T.50)/ASCII (ANSI X3.4)</td>
</tr>
<tr>
<td>0 0 0 0 0 1 0</td>
<td>2</td>
<td>Octet unspecified (8-bit binary)</td>
</tr>
<tr>
<td>0 0 0 0 0 1 1</td>
<td>3</td>
<td>Latin 1 (ISO-8859-1)</td>
</tr>
<tr>
<td>0 0 0 0 1 0 0</td>
<td>4</td>
<td>Octet unspecified (8-bit binary)</td>
</tr>
<tr>
<td>0 0 0 0 1 0 1</td>
<td>5</td>
<td>JIS (X 0208-1990)</td>
</tr>
<tr>
<td>0 0 0 0 1 1 0</td>
<td>6</td>
<td>Cyrillic (ISO-8859-5)</td>
</tr>
<tr>
<td>0 0 0 0 1 1 1</td>
<td>7</td>
<td>Latin/Hebrew (ISO-8859-8)</td>
</tr>
<tr>
<td>0 0 0 1 0 0 0</td>
<td>8</td>
<td>UCS2 (ISO/IEC-10646)</td>
</tr>
<tr>
<td>0 0 0 1 0 0 1</td>
<td>9</td>
<td>Pictogram Encoding</td>
</tr>
<tr>
<td>0 0 0 1 0 1 0</td>
<td>10</td>
<td>ISO-2022-JP (Music Codes)</td>
</tr>
<tr>
<td>0 0 0 1 1 0 1</td>
<td>13</td>
<td>Extended Kanji JIS(X 0212-1990)</td>
</tr>
<tr>
<td>0 0 0 1 1 1 0</td>
<td>14</td>
<td>KS C 5601</td>
</tr>
</tbody>
</table>

### 3.6 SMPP Server API

This document is targeted at software designers/programmers wishing to integrate SMS messaging through a stateful tcp protocol **SMPP v3.4**, if you feel this does not fit your needs and that you are more “web-service-guy” then you still can try **HTTP API**.
SMS Messages can be transmitted using SMPP protocol, the following requirements must be met to enable the service:

- You need a Jasmin user account
- You need sufficient credit on your Jasmin user account

Note: The ABCs:
- MT is referred to Mobile Terminated, a SMS-MT is an SMS sent to mobile
- MO is referred to Mobile Originated, a SMS-MO is an SMS sent from mobile

### 3.6.1 Features

The SMPP Server API allows you to send and receive SMS and delivery receipts (DLR) through Jasmin’s connectors, send and receive long (more than 160 characters) SMS and unicode/binary content.

**jasmin.cfg / smpp-server**

The `jasmin.cfg` file (INI format, located in `/etc/jasmin`) contain a section called `smpp-server` where all SMPP Server API related config elements are:

```ini
[smpp-server]
id = "smpps_01"
binding = 0.0.0.0
port = 2775

sessionInitTimerSecs = 30
enquireLinkTimerSecs = 30
inactivityTimerSecs = 300
responseTimerSecs = 60
pduReadTimerSecs = 30

log_level = INFO
log_file = /var/log/jasmin/default-smpps_01.log
log_format = %(asctime)s %(levelname)-8s %(process)d %(message)s
log_date_format = %Y-%m-%d %H:%M:%S
```

<table>
<thead>
<tr>
<th>Element</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>id</td>
<td>smpps_01</td>
<td>The SMPP Server id, used to identify the instance in case you use multiple servers per Jasmin process.</td>
</tr>
<tr>
<td>bind</td>
<td>0.0.0.0</td>
<td>The SMPP Server API listener will only bind to this specified address, given 0.0.0.0 the listener will bind on all interfaces.</td>
</tr>
<tr>
<td>port</td>
<td>2775</td>
<td>The binding TCP port.</td>
</tr>
<tr>
<td>sessionInitTimerSecs</td>
<td>30</td>
<td>Protocol tuning parameter: timeout for a bind request.</td>
</tr>
<tr>
<td>enquireLinkTimerSecs</td>
<td>30</td>
<td>Protocol tuning parameter: timeout for an enquire_link request.</td>
</tr>
<tr>
<td>inactivityTimerSecs</td>
<td>300</td>
<td>Protocol tuning parameter: inactivity timeout.</td>
</tr>
<tr>
<td>responseTimerSecs</td>
<td>60</td>
<td>Protocol tuning parameter: global request timeout.</td>
</tr>
<tr>
<td>pduReadTimerSecs</td>
<td>30</td>
<td>Protocol tuning parameter: binary pdu ready timeout.</td>
</tr>
<tr>
<td>log_level</td>
<td>INFO</td>
<td>Python’s logging module configuration.</td>
</tr>
<tr>
<td>log_file</td>
<td>/var/log/jasmin/default-smpps_01.log</td>
<td></td>
</tr>
<tr>
<td>log_format</td>
<td>%(asctime)s %(levelname)-8s %(process)d %(message)s</td>
<td></td>
</tr>
<tr>
<td>log_date_format</td>
<td>%Y-%m-%d %H:%M:%S</td>
<td></td>
</tr>
</tbody>
</table>

1 Billing

### 3.6. SMPP Server API
Binding to SMPP Server

Using a proper SMPP Client application (or a Jasmin SMPP Client), the following parameters must be considered:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Value / Pattern</th>
<th>Example(s)</th>
<th>Presence</th>
<th>Description / Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>system_id</td>
<td>Text (30 char. max)</td>
<td>jasmin_user</td>
<td>Mandatory</td>
<td>Username for Jasmin user account.</td>
</tr>
<tr>
<td>password</td>
<td>Text (30 char. max)</td>
<td>jasmin_pass</td>
<td>Mandatory</td>
<td>Password for Jasmin user account.</td>
</tr>
</tbody>
</table>

Supported SMPP PDUs

Jasmin’s SMPP Server is supporting the following PDUs:
- bind_transmitter
- bind_transceiver
- bind_receiver
- unbind
- submit_sm
- deliver_sm
- enquire_link

3.7 The message router

The message router is Jasmin’s decision making component for routing every type of exchanged message through the gateway:

1. MO Messages (deliver_sm)
2. MT Messages (submit_sm)

The router is provisioned through:

- Perspective broker interface (python programmatic API)
- jCli modules: MO router manager and MT router manager

Each time a message is requiring a route decision the following process is executed:

3.7.1 Process flow

There’s one MORoutingTable and one MTRoutingTable objects holding respective routes for each direction (MT or MO), these are Route objects that hold one or many Filter (s) objects and one destination Connector (or many connectors in some specific cases, c.f. Multiple connectors).

As explained by the above routing process flow figure, for each message and depending on its direction, a routing table is loaded and an iterative testing is run in order to select a final destination connector or to reject (returning no connector) it, routes are selected in descendant order, and their respective filter objects are tested against the Routable object (It is an extension of the low-level SMPP PDU object representing a message, more information in Routable).
Fig. 2: Routing process flow

3.7. The message router
### Examples

#### MO Routing

Having the below MO routing table set through a jCli console session:

```
jcli : morouter -l
#MO Route order Type Connector ID(s) Filter(s)
#3  StaticMORoute http_3
   -> <DestinationAddrFilter (dst_addr=^\+33\d+)>  
#20 RandomRoundrobinMORoute http_1, http_2
   -> <DateIntervalFilter (2015-06-01,2015-08-31)>, <TimeIntervalFilter (08:00:00, 18:00:00)>  
#0  DefaultRoute http_def
Total MO Routes: 3
```

The following routing cases are considered:

- MO message is routed to http_3 if:
  - Its destination address matches the regular expression "^+33\d+"

- MO message is routed to http_1 OR http_2 if:
  - Its received in summer months (June, July and August) of year 2015 and in working hours interval (8pm to 6am)

- MO message is routed to http_def if:
  - None of the above routes are matched (fallback / default route)

#### MT Routing

Having the below MT routing table set through a jCli console session:

```
jcli : mrouter -l
#MT Route order Type Rate Connector ID(s) Filter(s)
#100 RandomRoundrobinMTRoute 0.00 smpp_1, smpp_2
   -> <DestinationAddrFilter (dst_addr=^\+33\d+)>  
#91 StaticMTRoute 0.00 smpp_4
   -> <GroupFilter (gid=G2)>, <TimeIntervalFilter (08:00:00,18:00:00)>  
#90 StaticMTRoute 0.00 smpp_3
   -> <GroupFilter (gid=G2)>  
Total MT Routes: 3
```

The following routing cases are considered:

- MT message is routed to smpp_1 OR smpp_2 if:
  - Its destination address matches the regular expression "^+33\d+

- MT message is routed to smpp_4 if:
  - Its sent by a user in group G2 and in working hours interval (8pm to 6am)

- MT message is routed to smpp_3 if:
  - Its sent by a user in group G2
Note: The route order is very important: if we swap last both routes (#90 and #91) we will run into a shadowing route where all MT messages sent by a user in group G2 will be routed to smpp_3, no matter what time of the day it is.

Note: In this example, there’s no DefaultRoute, this will lead to message rejection if none of the configured routes are matched.

Note: Route’s rate are discussed in Billing.

3.7.2 Router components

The router components are mainly python objects having the unique responsibility of routing messages to Jasmin connectors.

**Routable**

The **Routable** class is extended by child classes to hold necessary information about the message to be routed.

![Diagram](image)

Fig. 3: jasmin.routing.Routables.

The **SimpleRoutablePDU** is only used for Jasmin unit testing. **RoutableSubmitSm** and **RoutableDeliverSm** are used depending on the message direction:

- **MO**: RoutableDeliverSm
- **MT**: RoutableSubmitSm
All routables provide a tagging api through the `addTag()`, `hasTag()`, `getTags()`, `removeTag()`, `flushTags()` methods, this feature is mainly used in the `interceptor`, there’s a concrete example of such usage here.

Table 19: RoutableSubmitSm attributes

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDU</td>
<td>smpp.pdu.pdu_types.PDURequest</td>
<td>The SMPP submit_sm PDU</td>
</tr>
<tr>
<td>user</td>
<td>jasmin.routing.jasminApi.User</td>
<td>Jasmin user sending the message</td>
</tr>
<tr>
<td>date_time</td>
<td>datetime.datetime</td>
<td>Date &amp; time of message send request</td>
</tr>
</tbody>
</table>

Table 20: RoutableDeliverSm attributes

<table>
<thead>
<tr>
<th>Attribute</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDU</td>
<td>smpp.pdu.pdu_types.PDURequest</td>
<td>The SMPP deliver_sm PDU</td>
</tr>
<tr>
<td>connector</td>
<td>jasmin.routing.jasminApi.Connector</td>
<td>Jasmin origin connector of the message</td>
</tr>
<tr>
<td>date_time</td>
<td>datetime.datetime</td>
<td>Date &amp; time of message reception</td>
</tr>
</tbody>
</table>

**Connector**

The `Connector` class is extended by child classes to represent concrete HTTP or SMPP Client connectors.

![Diagram of JASMIN objects and classes](image)

Fig. 4: jasmin.routing.jasminApi.Connector and childs

**Filter**

The `Filter` class is extended by child classes to define specific filters which are run by Jasmin router to match a desired `Routable`, every filter have a public `match(routable)` method returning a boolean value (`True` if the filter matches the given `Routable`).

As explained, filters provide an advanced and customizable method to match for routables and decide which route to consider, the figure below shows the `Filter` implementations provided by Jasmin, you can extend the `Filter` class and build a new filter of your own.
The `usedFor` attribute indicates the filter-route compatibility, as some filters are not suitable for both MO and MT routes like the examples below:

- **UserFilter** and **GroupFilter**: MO Messages are not identified by a user or a group, they are received through a connector

- **ConnectorFilter**: MT Messages are not coming from a connector, they are sent by a known user/group.

![Diagram of JASMIN Filters](image)

**Fig. 5: jasmin.routing.Filters.***

### Route

A **Route** class holds one or many filters, the `matchFilters(routable)` method is called to match the given routable against every filter of the **Route** (using AND operation when there’s many filters), if the matching succeed, the Jamsin router will ask for the **Connector** to consider by calling `getConnector()` method which will return back the **Route**’s connector.

Static and default routes are the simplest implemented routes, the difference between them is:

- **DefaultRoute**’s `matchFilter()` method will always return True, it is usually a fallback route matching any Routable

- **StaticMORoute** and **StaticMTRoute** will return one **Connector** after matching the filters with `matchFilters(routable)` method

There’s a lot of things you can do by extending the **Route** class, here’s a bunch of possibilities:

- **Best quality routing**: Implement a connector scoring system to always return the best quality route for a given message

### Multiple connectors

When extending **Route** class, it is possible to customize the behavior of the route and that’s what **RoundrobinMORoute** and **RoundrobinMTRoute** do, they are initially provisioned with a set of connectors, and the `getConnector()` method is overloaded to return a random connector from it; this can be a basic usage of a load balancer route.
Fig. 6: jasmin.routing.Routes.*
The newly added (Jasmin 0.9b10+) has new **FailoverMORoute** and **FailoverMTRoute** routes, they are also extending the **Route** class to provide failover on top of multiple connectors.

**RoutingTable**

The **RoutingTable** class is extended by destination-specific child classes (MO or MT), each class provide a **Route** provisioning api:

- **add(route, order)**: Will add a new route at a given order, will replace an older route having the same order
- **remove(order)**: Will remove the route at the given order
- **getAll()**: Will return all the provisioned routes
- **flush()**: Will remove all provisioned routes

The **getRouteFor(routable)** will get the right route to consider for a given routable, this method will iterate through all the provisioned routes in descendant order to call their respective **matchFilters(routable)** method.

**3.8 Interception**

Starting from 0.7.0, Jasmin provides a convenient way for users to hook third party logics on **intercepted** messages (submit_sm or deliver_sm) before proceding to **The message router**.

Interception of message is based on filter matching, just like the router; every intercepted message will be handed to a user-script written in **Python**.

This feature permits users to implement custom behaviors on top of Jasmin router, here’s some possible scenarios:

- Billing & charging of MO messages,
• Implement HLR lookup for a better SMS MT routing,
• Change a pdu content: fix npi/ton, prefixing/suffixing numbers, etc...
• Modify Jasmin’s response for the message: send back a ESME_RINVDESTADR instead of ESME_ROK for example.
• etc..

3.8.1 Enabling interceptor

Jasmin’s interceptor is a system service that run separately from Jasmin, it can be hosted on remote server as well; interceptord is a system service just like jasmind, so simply start it by typing:

```bash
sudo systemctl start jasmin-interceptord
```

Note: After starting the interceptord service, you may check /var/log/jasmin/interceptor.log to ensure everything is okay.

Then you need to enable communication between jasmind and interceptord services by editing jasmind start script (locate the jasmind.service file in /etc/systemd) and replacing the following line:

```bash
ExecStart=/usr/bin/jasmind.py --username jcliadmin --password jclipwd
```

by:

```bash
ExecStart=/usr/bin/jasmind.py --username jcliadmin --password jclipwd --enable-interceptor-client
```

The last step is to restart jasmind and check /var/log/jasmin/interceptor.log to ensure connection has been successfully established by finding the following line:

```bash
INFO XXXX Authenticated Avatar: iadmin
```

3.8.2 Intercepting a message

As stated earlier, interceptor is behaving similarly to The message router, here’s an example of setting up a MO message (deliver_sm) interception rule through jcli management console:

```bash
jcli : mointerceptor -a
Adding a new MO Interceptor: (ok: save, ko: exit)
> type DefaultInterceptor
<class 'jasmin.routing.Interceptors.DefaultInterceptor'> arguments:
script > script python3(/opt/jasmin-scripts/interception/mo-interceptor.py)
> ok
Successfully added MOInterceptor [DefaultInterceptor] with order:0
```

Same thing apply to setting up a MT message (submit_sm) interception rule, here’s another example using a filtered rule instead of a default one:

```bash
jcli : mointerceptor -a
Adding a new MO Interceptor: (ok: save, ko: exit)
> type DefaultInterceptor
<class 'jasmin.routing.Interceptors.DefaultInterceptor'> arguments:
script > script python3(/opt/jasmin-scripts/interception/mo-interceptor.py)
> ok
Successfully added MOInterceptor [DefaultInterceptor] with order:0
```
As shown in the above examples, the interception rules are straightforward, any matched message will be handed to the script you set through the `script python3(<path_to_pyfile>)` instruction.

When your python script is called it will get the following global variables set:

- **routable**: one of the `jasmin.routing.Routables.Routable` inheriters (`Routable` for more details)
- **smpp_status**: (default to 0) it is the smpp response that Jasmin must return for the message, more details in [Controlling response](#)
- **http_status**: (default to 0) it is the http response that Jasmin must return for the message, more details in [Controlling response](#)

The script can:

- Override **routable** parameters like setting destination or source addresses, short message, etc...
- Tag the **routable** to help the router matching a desired rule (useful for HRL lookup routing)
- Control Jasmin response by setting **smpp_status** and/or **http_status**.

Some practical examples are given below.

### 3.8.3 Controlling response

The interceptor script can reject message before it goes to the router, this can be useful for implementing third party controls like:

- Billing and charging authorization: reject message if user has no credits,
- Reject some illegal message content,
- Enable anti-spam to protect destination users from getting flooded,
- etc...

In order to reject a message, depending on the source of message (httpapi ?, smpp server ?, smpp client ?) the script must set **smpp_status** and/or **http_status** accordingly to the error to be returned back, here’s an error mapping table for smpp:

<table>
<thead>
<tr>
<th>Value</th>
<th>SMPP Status</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>ESME_RO</td>
<td>No error</td>
</tr>
<tr>
<td>1</td>
<td>ESME_RINMSGLEN</td>
<td>Message length is invalid</td>
</tr>
<tr>
<td>2</td>
<td>ESME_RINCMLEN</td>
<td>Command length is invalid</td>
</tr>
<tr>
<td>3</td>
<td>ESME_RINVDID</td>
<td>Command ID invalid</td>
</tr>
<tr>
<td>4</td>
<td>ESME_RINVDISBND</td>
<td>Status for given command</td>
</tr>
</tbody>
</table>

[Table 21: **smpp_status** Error mapping](#)

Continued on next page
<table>
<thead>
<tr>
<th>Value</th>
<th>SMPP Status</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>ESME_RALYBND</td>
<td>ESME Already in Bound State</td>
</tr>
<tr>
<td>6</td>
<td>NVIRLIR</td>
<td>Invalid Priority Flag</td>
</tr>
<tr>
<td>7</td>
<td>NVINVREGDLVFLG</td>
<td>Invalid Registered Delivery Flag</td>
</tr>
<tr>
<td>8</td>
<td>NSYSERR</td>
<td>System Error</td>
</tr>
<tr>
<td>265</td>
<td>NINVBCASTAREA</td>
<td>Broadcast Area Format is invalid</td>
</tr>
<tr>
<td>10</td>
<td>NVINVSADDR</td>
<td>Invalid Service Address</td>
</tr>
<tr>
<td>11</td>
<td>NVINVDSTADR</td>
<td>Invalid Dest Addr</td>
</tr>
<tr>
<td>12</td>
<td>NVINVMMSGID</td>
<td>Message ID is invalid</td>
</tr>
<tr>
<td>13</td>
<td>NVINVPASWD</td>
<td>Invalid Password</td>
</tr>
<tr>
<td>15</td>
<td>NVINVSYSID</td>
<td>Invalid System ID</td>
</tr>
<tr>
<td>272</td>
<td>NINVBCAST_REP</td>
<td>Invalidated Broadcasts is invalid</td>
</tr>
<tr>
<td>17</td>
<td>CAMEL</td>
<td>CAMEL Failed</td>
</tr>
<tr>
<td>274</td>
<td>NINVBCASTCHAN</td>
<td>Broadcast Channel Indicator is invalid</td>
</tr>
<tr>
<td>19</td>
<td>RREPLACE</td>
<td>Replace SM Failed</td>
</tr>
<tr>
<td>20</td>
<td>MSGQFULL</td>
<td>Message Queue Full</td>
</tr>
<tr>
<td>21</td>
<td>NINVBCASTSER</td>
<td>Invalid Service Type</td>
</tr>
<tr>
<td>196</td>
<td>NPROHIBITED</td>
<td>ESME Prohibited from using specified operation</td>
</tr>
<tr>
<td>260</td>
<td>NINVDCS</td>
<td>Invalid Data Coding Scheme</td>
</tr>
<tr>
<td>261</td>
<td>NSRCADDR</td>
<td>Invalid submit_sm</td>
</tr>
<tr>
<td>262</td>
<td>NINVBCASTSUBUNITN</td>
<td>Source Address Sub unit is Invalid</td>
</tr>
<tr>
<td>263</td>
<td>NINVBCASTFREQ</td>
<td>Broadcast Frequency Interval is invalid</td>
</tr>
<tr>
<td>257</td>
<td>NINVBCASTSRVGRP</td>
<td>Broadcast Service Group is invalid</td>
</tr>
<tr>
<td>270</td>
<td>RBCASTQUERYFAIL</td>
<td>query_broadcast_sm operation failed</td>
</tr>
<tr>
<td>51</td>
<td>NINVNUMDESTS</td>
<td>Invalid number of destinations</td>
</tr>
<tr>
<td>52</td>
<td>NINVDLNAME</td>
<td>Invalid Distribution List Name</td>
</tr>
<tr>
<td>267</td>
<td>NINVBCASTCN</td>
<td>Broadcast Content Type is invalid</td>
</tr>
<tr>
<td>266</td>
<td>NINVNUMBCASTAREAS</td>
<td>Validated Broadcast Areas is invalid</td>
</tr>
<tr>
<td>192</td>
<td>NINVBCASTSRV</td>
<td>Broadcast Service Group is invalid</td>
</tr>
<tr>
<td>264</td>
<td>NINVBCASTALIAS</td>
<td>Broadcast Alias Name is invalid</td>
</tr>
<tr>
<td>270</td>
<td>RBCASTQUERYFAIL</td>
<td>query_broadcast_sm operation failed</td>
</tr>
<tr>
<td>66</td>
<td>NINVNUMSTALL</td>
<td>Operation failed</td>
</tr>
<tr>
<td>67</td>
<td>NINVBCASTSR</td>
<td>Cannot Submit to Distribution List</td>
</tr>
<tr>
<td>68</td>
<td>NSUBMITFAIL</td>
<td>submit_sm or submit_multi failed</td>
</tr>
<tr>
<td>69</td>
<td>RSMERROR</td>
<td>ESME Not authorised to use specified service_type</td>
</tr>
<tr>
<td>72</td>
<td>NSRCADDR</td>
<td>Source address TON</td>
</tr>
<tr>
<td>73</td>
<td>NINVBCASTSR</td>
<td>Source address NPI</td>
</tr>
<tr>
<td>258</td>
<td>NINVBCASTSR</td>
<td>Broadcast Service Type is unavailable</td>
</tr>
<tr>
<td>269</td>
<td>RSMERROR</td>
<td>Submission operation failed</td>
</tr>
<tr>
<td>80</td>
<td>NINVDESTTON</td>
<td>Destination address TON</td>
</tr>
<tr>
<td>81</td>
<td>NINVDESTNPI</td>
<td>Destination address NPI</td>
</tr>
<tr>
<td>83</td>
<td>NINVBCASTTYPE</td>
<td>Broadcast type field</td>
</tr>
<tr>
<td>84</td>
<td>NINVNUMMSGS</td>
<td>Number of messages</td>
</tr>
<tr>
<td>85</td>
<td>NINVREPFLAG</td>
<td>Invalid replace_if_present_flag set</td>
</tr>
<tr>
<td>88</td>
<td>NINVNUMMSS</td>
<td>Error (ESME has exceeded allowed message limits</td>
</tr>
</tbody>
</table>

Continued on next page
Table 21 – continued from previous page

<table>
<thead>
<tr>
<th>Value</th>
<th>SMPP Status</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>271</td>
<td>ESME_RBCASTCANCELFAIL</td>
<td>Operation failed to cancel broadcast SM.</td>
</tr>
<tr>
<td>97</td>
<td>ESME_RINVСHED</td>
<td>Scheduled Delivery Time is invalid.</td>
</tr>
<tr>
<td>98</td>
<td>ESME_RINVEXPIRY</td>
<td>Message validity period (expiry time) is invalid.</td>
</tr>
<tr>
<td>99</td>
<td>ESME_RINVDFTMSGID</td>
<td>Predefined message ID is invalid or not found.</td>
</tr>
<tr>
<td>100</td>
<td>ESME_RX_T_APPN</td>
<td>ESME Receiver Temporary App Error Code.</td>
</tr>
<tr>
<td>101</td>
<td>ESME_RX_P_APPN</td>
<td>ESME Receiver Permanent App Error Code.</td>
</tr>
<tr>
<td>102</td>
<td>ESME_RX_R_APPN</td>
<td>ESME Receiver Reject Message Error Code.</td>
</tr>
<tr>
<td>103</td>
<td>ESME_RQUERYFAIL</td>
<td>Query SM request failed.</td>
</tr>
<tr>
<td>259</td>
<td>ESME_RSERTYPDENIED</td>
<td>Service Type is denied.</td>
</tr>
<tr>
<td>194</td>
<td>ESME_RINVPARLEN</td>
<td>Invalid Parameter Length.</td>
</tr>
<tr>
<td>268</td>
<td>ESME_RINVBCASTMSGCLASS</td>
<td>Broadcast Message Class is invalid.</td>
</tr>
<tr>
<td>255</td>
<td>ESME_RUNKNOWNERR</td>
<td>Unknown Error.</td>
</tr>
<tr>
<td>254</td>
<td>ESME_RDELIVERYFAILURE</td>
<td>Delivery Failure (used for data_sm_resp).</td>
</tr>
<tr>
<td>195</td>
<td>ESME_RMISSINGOPTPARAM</td>
<td>Expected optional parameter is missing.</td>
</tr>
</tbody>
</table>

As for HTTP errors, the value you set in `http_status` will be the HTTP error code to return.

**Note:** When setting `http_status` to some value different from 0, the `smpp_status` value will be automatically set to **255** (ESME_RUNKNOWNERR).

**Note:** When setting `smpp_status` to some value different from 0, the `http_status` value will be automatically set to **520** (Unknown error).

**Note:** When setting `smpp_status` to 0, the routing process will be bypassed and an ESME_ROK status is returned.

Checkout the *MO Charging* example to see how’s rejection is done.

### 3.8.4 Scripting examples

You’ll find below some helping examples of scripts used to intercept MO and/or MT messages.

#### HLR Lookup routing

The following script will help the router decide where to send the MT message, let’s say we have some HLR lookup webservice to call in order to know to which network the destination number belong, and then tag the routable for later filtering in router:

```
"This script will call HLR lookup api to get the MCC/MNC of the destination number"

import requests, json

hlr_lookup_url = "https://api.some-provider.com/hlr/lookup"
data = json.dumps({'number': routable.pdu.params['destination_addr']})
r = requests.post(hlr_lookup_url, data, auth=('user', '*****'))
```

(continues on next page)
if r.json['mnc'] == '214':
    # Spain
    if r.json['mcc'] == '01':
        # Vodaphone
        routable.addTag(21401)
    elif r.json['mcc'] == '03':
        # Orange
        routable.addTag(21403)
    elif r.json['mcc'] == '25':
        # Lyca mobile
        routable.addTag(21425)

The script is tagging the routable if destination is Vodaphone, Orange or Lyca mobile; that’s because we need to route message to different connector based on destination network, let’s say:

- **Vodaphone** needs to be routed through **connectorA**
- **Orange** needs to be routed through **connectorB**
- **Lyca mobile** needs to be routed through **connectorC**
- All the rest needs to be routed through **connectorD**

Here’s the routing table to execute the above example:

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```
```
data = sck.recv(4096)
buffer += data
if len(data) < 4096:
    break
response = json.loads(buffer.decode())
if response.get('id') != request.get('id'):
    raise Exception("expected id=%s, received id=%s: %s"
                    % (request.get('id'), response.get('id'), response.get('error')))

if response.get('error') is not None:
    raise Exception(response.get('error'))

return response.get('result')
sck = None
globals() ['sck'] = sck
globals() ['json'] = json
try:
sck = socket.create_connection((CGR_HOST, CGR_PORT))

# Prepare for RPC call
name = "ApierV2.GetMaxUsage"
params = [{
    "Category": "sms-mt",
    "Usage": "1",
    "Direction": "*outbound",
    "ReqType": "*subscribers",
    "TOR": "*sms-mt",
    "ExtraFields": {"Cli": routable.pdu.params['source_addr']},
    "Destination": routable.pdu.params['destination_addr'],
    "Account": "*subscribers",
    "Tenant": "*subscribers",
    "SetupTime": datetime.utcnow().isoformat() + 'Z'}]

result = call(sck, name, params)
except Exception as e:
    # We got an error when calling for charging
    # Return ESME_RDELEIVERYFAILURE
    smpp_status = 254
else:
    # CGRateS has returned a value
    if type(result) == int and result >= 1:
        # Return ESME_ROK
        smpp_status = 0
    else:
        # Return ESME_RDELEIVERYFAILURE
        smpp_status = 254
finally:
    if sck is not None:
        sck.close()
Overriding source address

There’s some cases where you need to override sender-id due to some MNO policies, in the following example all intercepted messages will have their sender-id set to 123456789:

```python
"This script will override sender-id"
routeable.pdu.params['source_addr'] = '123456789'
```

Note: Some pdu parameters require locking to protect them from being updated by Jasmin, more on this.

Changing TON or NPI

In order to change the ton or npi value for source or destination address, the according values need to be set and locked, in order to prevent them from getting overwritten by the client connector:

```python
from smpp.pdu.pdu_types import AddrTon, AddrNpi
routeable.pdu.params['source_addr_ton'] = AddrTon.ALPHANUMERIC;
routeable.lockPduParam('source_addr_ton');
routeable.pdu.params['source_addr_npi'] = AddrNpi.ISDN;
routeable.lockPduParam('source_addr_npi');

routeable.pdu.params['dest_addr_ton'] = AddrTon.INTERNATIONAL;
routeable.lockPduParam('dest_addr_ton');
routeable.pdu.params['dest_addr_npi'] = AddrNpi.ISDN;
routeable.lockPduParam('dest_addr_npi');
```

Activate logging

The following is an example of activating log inside a script:

```python
"This is how logging is done inside interception script"

import logging

# Set logger
logger = logging.getLogger('logging-example')
if len(logger.handlers) != 1:
    hdlr = logging.FileHandler('/var/log/jasmin/some_file.log')
    formatter = logging.Formatter('%(asctime)s %(levelname)s %(message)s')
    hdlr.setFormatter(formatter)
    logger.addHandler(hdlr)
    logger.setLevel(logging.DEBUG)

logger.info('Got pdu: %s' % routable.pdu)
```

Enforcing DLR

Ask for DLR for all submit_sm pdus, no matter the downstream user choice, can be used for route qualification and scoring purposes.
"This script will enforce sending message while asking for DLR"

```python
from smpp.pdu.pdu_types import RegisteredDeliveryReceipt, RegisteredDelivery

routable.pdu.params['registered_delivery'] = RegisteredDelivery(
    RegisteredDeliveryReceipt.SMSC_DELIVERY_RECEIPT_REQUESTED)
```

## 3.9 Programming examples

Subsequent chapters present how to send and receive messages through Jasmin HTTP API and some more advanced use cases, such as manipulating receipts and complex routings, will look like.

It is assumed the reader has already installed Jasmin and at least read the HTTP API and The message router chapters and knows enough about Jasmin’s architecture/design concepts.

### 3.9.1 Sending SMS

Sending a SMS is done through the HTTP API:

```python
# Python example
# http://jasminsms.com
import urllib.request, urllib.error, urllib.parse

baseParams = {'username':'foo', 'password':'bar', 'to':'+336222172', 'content':'Hello'}

# Send an SMS-MT with minimal parameters
urllib.request.urlopen("http://127.0.0.1:1401/send?%s" % urllib.parse.urlencode(baseParams)).read()

# Send an SMS-MT with defined originating address
baseParams['from'] = 'Jasmin GW'
urllib.request.urlopen("http://127.0.0.1:1401/send?%s" % urllib.parse.urlencode(baseParams)).read()
```

In PHP:

```php
<?php
// Sending simple message using PHP
// http://jasminsms.com

$baseurl = 'http://127.0.0.1:1401/send'
$params = '?username=foo'
$params.= '&password=bar'
$params.= '&to='.urlencode('+336222172')
$params.= '&content='.urlencode('Hello world !')

$response = file_get_contents($baseurl.$params);
?>
```

In Ruby:

```ruby
3.9. Programming examples 53
```
# Sending simple message using Ruby
# http://jasminsms.com

```ruby
require 'net/http'

uri = URI('http://127.0.0.1:1401/send')
params = { :username => 'foo', :password => 'bar',
           :to => '+336222172', :content => 'Hello world' }
uri.query = URI.encode_www_form(params)
response = Net::HTTP.get_response(uri)
```

c.f. HTTP API for more details about sending SMS with receipt enquiry, long content etc ...

## 3.9.2 Receiving SMS

Receiving a SMS is done through the HTTP API, this a PHP script pointed by Jasmin for every received SMS (using routing):

```php
<?php
// Receiving simple message using PHP through HTTP Post
// This example will store every received SMS to a SQL table
// http://jasminsms.com

$MO_SMS = $_POST;

$db = pg_connect('host=127.0.0.1 port=5432 dbname=sms_demo user=jasmin_
                  password=jajapwd');
if (!$db)
    // We'll not ACK the message, Jasmin will resend it later
    die("Error connecting to DB");

$QUERY = "INSERT INTO sms_mo(id, from, to, cid, priority, coding, validity, content)
VALUES (%s, %s, %s, %s, %s, %s, %s, %s);";
$Q = sprintf($QUERY, pg_escape_string($MO_SMS['id']),
             pg_escape_string($MO_SMS['from']),
             pg_escape_string($MO_SMS['to']),
             pg_escape_string($MO_SMS['origin-connector']),
             pg_escape_string($MO_SMS['priority']),
             pg_escape_string($MO_SMS['coding']),
             pg_escape_string($MO_SMS['validity']),
             pg_escape_string($MO_SMS['content']));

pg_query($Q);
pg_close($db);

// Acking back Jasmin is mandatory
echo "ACK/Jasmin";
```

In the above example, there’s an error handling where the message is not ACKed if there’s a database connection problem, if it occurs, the script will return “Error connecting to DB” when Jasmin HTTP thrower is waiting for a “ACL/Jasmin”, this will lead to a message re-queue and later re-delivery to the same script, this behaviour is explained in Processing.
Another example of an interactive SMS application:

```php
// Will filter received messages, if the syntax is correct (weather <city name>)
// it will provide a 'fake' weather forecast back to the user.
// http://jasminsms.com

$MO_SMS = $_POST;

// Acking back Jasmin is mandatory
echo "ACK/Jasmin";

// Syntax check
if (!preg_match('/^(weather) (.*)/', $MO_SMS['content'], $matches))
    $RESPONSE = "SMS Syntax error, please type 'weather city' to get a fresh weather forecast";
else
    $RESPONSE = $matches[2]." forecast: Sunny 21°C, 13Knots NW light wind";

// Send $RESPONSE back to the user ($MO_SMS['from'])
$baseurl = 'http://127.0.0.1:1401/send'
$params = '?username=foo'
$params.= '&password=bar'
$params.= '&to='.urlencode($MO_SMS['from'])
$params.= '&content='.urlencode($RESPONSE)
$response = file_get_contents($baseurl.$params);

// Note:
// If you need to check if the message is really delivered (or at least, taken by Jasmin for delivery)
// you must test for $response value, it must begin with "Success", c.f. HTTP API doc for more details

c.f. HTTP API for more details.

3.9.3 Routing

c.f. MO router manager and MT router manager for routing scenarios. c.f. The message router for details about routing.

3.10 Management CLI overview

jCli is Jasmin’s CLI interface, it is an advanced console to manage and configure everything needed to start messaging through Jasmin, from users to connectors and message routing management.

jCli is multi-profile configurator where it is possible to create a testing, staging and production profiles to hold different sets of configurations depending on the desired execution environment.

In order to connect to jCli and start managing Jasmin, the following requirements must be met:

- You need a jCli admin account
- You need to have a connection to jCli’s tcp port
Jasmin management through jCli is done using different modules (users, groups, filters, smpp connectors, http connectors ...), these are detailed in Management CLI Modules, before going to this part, you have to understand how to:

- **Configure** jCli to change it’s binding host and port, authentication and logging parameters,
- **Authenticate** to jCli and discover basic commands to navigate through the console,
- **Know how** to persist to disk the current configuration before restarting or load a specific configuration profile to run test scenarios for example

### 3.10.1 Architecture

The Jasmin CLI interface is designed to be a user interactive interface on front of the Perspective brokers provided by Jasmin.

In the above figure, every Jasmin CLI module (blue boxes) is connected to its perspective broker, and below you find more details on the Perspective brokers used and the actions they are exposing:

- **SMPPClientManagerPB** which provides the following actions:
  1. **persist**: Persist current configuration to disk
  2. **load**: Load configuration from disk
  3. **is_persisted**: Used to check if the current configuration is persisted or not
  4. **connector_add**: Add a SMPP Client connector
  5. **connector_remove**: Remove a SMPP Client connector
  6. **connector_list**: List all SMPP Client connectors
  7. **connector_start**: Start a SMPP Client connector
  8. **connector_stop**: Stop a SMPP Client connector
  9. **connector_stopall**: Stop all SMPP Client connectors
  10. **service_status**: Return a SMPP Client connector service status (running or not)
11. **session_state**: Return a SMPP Client connector session state (SMPP binding status)
12. **connector_details**: Get all details for a given SMPP Client connector
13. **connector_config**: Returns a SMPP Client connector configuration
14. **submit_sm**: Send a submit_sm

- **RouterPB** which provides the following actions:
  1. **persist**: Persist current configuration to disk
  2. **load**: Load configuration from disk
  3. **is_persisted**: Used to check if the current configuration is persisted or not
  4. **user_add**: Add a new user
  5. **user_authenticate**: Authenticate username/password with the existent users
  6. **user_remove**: Remove a user
  7. **user_remove_all**: Remove all users
  8. **user_get_all**: Get all users
  9. **user_update_quota**: Update a user quota
10. **group_add**: Add a group
11. **group_remove**: Remove a group
12. **group_remove_all**: Remove all groups
13. **group_get_all**: Get all groups
14. **mtroute_add**: Add a new MT route
15. **moroute_add**: Add a new MO route
16. **mtroute_remove**: Remove a MT route
17. **moroute_remove**: Remove a MO route
18. **mtroute_flush**: Flush MT routes
19. **moroute_flush**: Flush MO routes
20. **mtroute_get_all**: Get all MT routes
21. **moroute_get_all**: Get all MO routes
22. **mtinterceptor_add**: Add a new MT interceptor
23. **mointerceptor_add**: Add a new MO interceptor
24. **mtinterceptor_remove**: Remove a MT interceptor
25. **mointerceptor_remove**: Remove a MO interceptor
26. **mtinterceptor_flush**: Flush MT interceptor
27. **mointerceptor_flush**: Flush MO interceptor
28. **mtinterceptor_get_all**: Get all MT interceptors
29. **mointerceptor_get_all**: Get all MO interceptors
Note: (*) These actions are not exposed through jCli

Hint: SMPPClientManagerPB and RouterPB are available for third party applications to implement specific business processes, there’s a FAQ subject including an example of how an external application can use these Perspective Brokers.

### 3.10.2 Configuration

The `jasmin.cfg` file (INI format, located in `/etc/jasmin`) contains a `jcli` section where all JCli interface related config elements are:

```ini
[jcli]
bind = 127.0.0.1
port = 8990
authentication = True
admin_username = jcliadmin
# MD5 password digest hex encoded
admin_password = 79e9b0aa3f3e7c53e916f7ac47439bcb
log_level = INFO
log_file = /var/log/jasmin/jcli.log
log_format = %(asctime)s %(levelname)-8s %(process)d %(message)s
log_date_format = %Y-%m-%d %H:%M:%S
```

<table>
<thead>
<tr>
<th>Element</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>bind</td>
<td>127.0.0.1</td>
<td>jCli will only bind to this specified address.</td>
</tr>
<tr>
<td>port</td>
<td>8990</td>
<td>The binding TCP port.</td>
</tr>
<tr>
<td>authentication</td>
<td>True</td>
<td>If set to False, anonymous user can connect to jCli and admin user account is no more needed</td>
</tr>
<tr>
<td>admin_username</td>
<td>jcliadmin</td>
<td>The admin username</td>
</tr>
<tr>
<td>admin_password</td>
<td>jclipwd</td>
<td>The admin MD5 crypted password</td>
</tr>
<tr>
<td>log_*</td>
<td></td>
<td>Python’s logging module configuration.</td>
</tr>
</tbody>
</table>

**Warning:** Don’t set `authentication` to False if you’re not sure about what you are doing

### 3.10.3 First connection & authentication

In order to connect to jCli, initiate a telnet session with the hostname/ip and port of jCli as set in `Configuration`:

```
telnet 127.0.0.1 8990
```

And depending on whether `authentication` is set to True or False, you may have to authenticate using the `admin_username` and `admin_password`, here’s an example of an authenticated connection:
Authentication required.
Username: jcliadmin
Password:
Welcome to Jasmin console
Type help or ? to list commands.
Session ref: 2
jcli :

Once successfully connected, you’ll get a welcome message, your session id (Session ref) and a prompt (jcli : ) where you can start typing your commands and use Management CLI Modules.

Available commands:

Using tabulation will help you discover the available commands:

```
jcli : [TABULATION]
persist load user group filter mointerceptor mtinterceptor morouter mtrouter smppccm →httpccm quit help
```

Or type `help` and you’ll get detailed listing of the available commands with comprehensive descriptions:

```
jcli : help
Available commands:
=====================
persist Persist current configuration profile to disk in PROFILE
load Load configuration PROFILE profile from disk
user User management
group Group management
filter Filter management
mointerceptor MO Interceptor management
mtinterceptor MT Interceptor management
morouter MO Router management
mtrouter MT Router management
smppccm SMPP connector management
httpccm HTTP client connector management

Control commands:
===================
quit Disconnect from console
help List available commands with "help" or detailed help with "help cmd".
```

More detailed help for a specific command can be obtained running `help cmd` where `cmd` is the command you need help for:

```
jcli : help user
User management
Usage: user [options]

Options:
  -l, --list List all users or a group users when provided with GID
  -a, --add Add user
  -u UID, --update=UID Update user using it's UID
```

(continues on next page)
-r UID, --remove=UID Remove user using it's UID
-s UID, --show=UID Show user using it's UID

Interactivity:

When running a command you may enter an interactive session, for example, adding a user with user -a will start an interactive session where you have to indicate the user parameters, the prompt will be changed from jcli : to > indicating you are in an interactive session:

```
jcli : user -a
Adding a new User: (ok: save, ko: exit)
> username foo
> password bar
> uid u1
> gid g1
> ok
Successfully added User [u1] to Group [g1]
```

In the above example, user parameters were **username**, **password**, **uid** and **gid**, note that there’s no order in entering these parameters, and you may use a simple TABULATION to get the parameters you have to enter:

```
...> [TABULATION]
username password gid uid
...
```

3.10.4 Profiles and persistence

Everything done using the Jasmin console will be set in runtime memory, and it will remain there until Jasmin is stopped, that’s where persistence is needed to keep the same configuration when restarting.

Persist

Typing **persist** command below will persist runtime configuration to disk using the default profile set in Configuration:

```
jcli : persist
mtrouter configuration persisted (profile:jcli-prod)
smppc configuration persisted (profile:jcli-prod)
group configuration persisted (profile:jcli-prod)
user configuration persisted (profile:jcli-prod)
httpcc configuration persisted (profile:jcli-prod)
mointerceptor configuration persisted (profile:jcli-prod)
filter configuration persisted (profile:jcli-prod)
mtinterceptor configuration persisted (profile:jcli-prod)
morouter configuration persisted (profile:jcli-prod)
```

It is possible to persist to a defined profile:

```
jcli : persist -p testing
```
Important: On Jasmin startup, `jcli-prod` profile is automatically loaded, any other profile can only be manually loaded through `load -p AnyProfile`.

Load

Like `persist` command, there’s a `load` command which will loaded a configuration profile from disk, typing `load` command below will load the default profil set in `Configuration` from disk:

```
jcli : load
mtrouter configuration loaded (profile:jcli-prod)
smppcc configuration loaded (profile:jcli-prod)
group configuration loaded (profile:jcli-prod)
user configuration loaded (profile:jcli-prod)
httpcc configuration loaded (profile:jcli-prod)
mointerceptor configuration loaded (profile:jcli-prod)
filter configuration loaded (profile:jcli-prod)
mnterceptor configuration loaded (profile:jcli-prod)
morouter configuration loaded (profile:jcli-prod)
```

It is possible to load to a defined profile:

```
jcli : load -p testing
```

Note: When loading a profile, any defined current runtime configuration will lost and replaced by this profile configuration.

3.11 Management CLI Modules

As shown in the architecture figure `Architecture`, jCli is mainly composed of management modules interfacing two Perspective brokers (`SMPPClientManagerPB` and `RouterPB`), each module is identified as a manager of a defined scope:

- User management
- Group management
- etc..

Note: `filter` and `httpccm` modules are not interfacing any Perspective broker, they are facilitating the reuse of created filters and HTTP Client connectors in MO and MT routers, e.g. a HTTP Client connector may be created once and used many times in MO Routes.

3.11.1 User manager

The User manager module is accessible through the `user` command and is providing the following features:
Table 23: **user** command line options

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-l, --list</td>
<td>List all users or a group users when provided with GID</td>
</tr>
<tr>
<td>-a, --add</td>
<td>Add user</td>
</tr>
<tr>
<td>-e, --enable</td>
<td>Enable user</td>
</tr>
<tr>
<td>-d, --disable</td>
<td>Disable user</td>
</tr>
<tr>
<td>-u UID, --update=UID</td>
<td>Update user using it’s UID</td>
</tr>
<tr>
<td>-r UID, --remove=UID</td>
<td>Remove user using it’s UID</td>
</tr>
<tr>
<td>-s UID, --show=UID</td>
<td>Show user using it’s UID</td>
</tr>
<tr>
<td>--smpp-unbind=UID</td>
<td>Unbind user from smpp server using it’s UID</td>
</tr>
<tr>
<td>--smpp-ban=UID</td>
<td>Unbind and ban user from smpp server using it’s UID</td>
</tr>
</tbody>
</table>

A User object is required for:

- **SMPP Server API** authentication to send a SMS (c.f. *Sending SMS-MT*)
- **HTTP API** authentication to send a SMS (c.f. *Sending SMS-MT*)
- Creating a **UserFilter** using the **filter** manager (c.f. *Filter manager*)

Every User **must** be a member of a Group, so before adding a new User, there must be at least one Group available, Groups are identified by **GID** (Group ID).

When adding a User, the following parameters are required:

- **username**: A unique username used for authentication
- **password**
- **uid**: A unique identifier, can be same as **username**
- **gid**: Group Identifier
- **mt_messaging_cred (optional)**: MT Messaging credentials (c.f. *User credentials*)

Here’s an example of adding a new User to the **marketing** group:

```
jcli : user -a
Adding a new User: (ok: save, ko: exit)
> username foo
> password bar
> gid marketing
> uid foo
> ok
Successfully added User [foo] to Group [marketing]
```

All the above parameters can be displayed after User creation, except the password:
Listing Users will show currently added Users with their UID, GID and Username:

```
jcli : user -l
#User id | Group id | Username | Balance | MT | SMS | Throughput
#foo    | 1        | foo      | ND      | ND | ND/ND
Total Users: 1
```

Note: When listing a disabled user, his User id will be prefixed by !, same thing apply to group.

User credentials

**MT Messaging section**

As seen above, User have an optional `mt_messaging_cred` parameter which define a set of sections:

- **Authorizations**: Privileges to send messages and set some defined parameters,
- **Value filters**: Restrictions on some parameter values (such as source address),
- **Default values**: Default parameter values to be set by Jasmin when not manually set by User,
- **Quotas**: Everything about Billing,

For each section of the above, there’s keys to be defined when adding/updating a user, the example below show how to set a source address `value filter`, a balance of **44.2, unlimited** sms_count and limit SMS throughput in smpp server to 2 messages per second:
jcli : user -a
Adding a new User: (ok: save, ko: exit)
> username foo
> password bar
> gid marketing
> uid foo
> mt_messaging_cred valuefilter src_addr ^JASMIN$
> mt_messaging_cred quota balance 44.2
> mt_messaging_cred quota sms_count none
> mt_messaging_cred quota smpps_throughput 2
> ok
Successfully added User [foo] to Group [marketing]

Note: Setting none value to a user quota will set it as unlimited quota.

In the below tables, you can find exhaustive list of keys for each mt_messaging_cred section:

Table 24: authorization section keys

<table>
<thead>
<tr>
<th>Key</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>http_send</td>
<td>True</td>
<td>Privilege to send SMS through Sending SMS-MT (default is True)</td>
</tr>
<tr>
<td>http_balance</td>
<td>True</td>
<td>Privilege to check balance through Checking account balance (default is True)</td>
</tr>
<tr>
<td>http_rate</td>
<td>True</td>
<td>Privilege to check a message rate through Checking rate price (default is True)</td>
</tr>
<tr>
<td>http_bulk</td>
<td>False</td>
<td>Privilege to send bulks through http api (Deprecated and will be removed)</td>
</tr>
<tr>
<td>smpps_send</td>
<td>True</td>
<td>Privilege to send SMS through SMPP Server API (default is True)</td>
</tr>
<tr>
<td>http_long_content</td>
<td>True</td>
<td>Privilege to send long content SMS through Sending SMS-MT (default is True)</td>
</tr>
<tr>
<td>dlr_level</td>
<td>True</td>
<td>Privilege to set dlr-level parameter (default is True)</td>
</tr>
<tr>
<td>http_dlr_method</td>
<td>True</td>
<td>Privilege to set dlr-method HTTP parameter (default is True)</td>
</tr>
<tr>
<td>src_addr</td>
<td>True</td>
<td>Privilege to define source address of SMS-MT (default is True)</td>
</tr>
<tr>
<td>priority</td>
<td>True</td>
<td>Privilege to define priority of SMS-MT (default is True)</td>
</tr>
<tr>
<td>validity_period</td>
<td>True</td>
<td>Privilege to define validity_period of SMS-MT (default is True)</td>
</tr>
<tr>
<td>hex_content</td>
<td>True</td>
<td>Privilege to send binary message using the hex-content parameter (default is NOT SET)</td>
</tr>
</tbody>
</table>

Note: Authorizations keys prefixed by http_ or smpps_ are only applicable for their respective channels.

Table 25: valuefilter section keys

<table>
<thead>
<tr>
<th>Key</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>src_addr</td>
<td>.*</td>
<td>Regex pattern to validate source address of SMS-MT</td>
</tr>
<tr>
<td>dst_addr</td>
<td>.*</td>
<td>Regex pattern to validate destination address of SMS-MT</td>
</tr>
<tr>
<td>content</td>
<td>.*</td>
<td>Regex pattern to validate content of SMS-MT</td>
</tr>
<tr>
<td>priority</td>
<td>^[0-3]$</td>
<td>Regex pattern to validate priority of SMS-MT</td>
</tr>
<tr>
<td>validity_period</td>
<td>^d+$</td>
<td>Regex pattern to validate validity_period of SMS-MT</td>
</tr>
</tbody>
</table>

Table 26: defaultValue section keys

<table>
<thead>
<tr>
<th>Key</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>src_addr</td>
<td>None</td>
<td>Default source address of SMS-MT</td>
</tr>
</tbody>
</table>
Table 27: quota section keys

<table>
<thead>
<tr>
<th>Key</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>balance</td>
<td>ND</td>
<td>c.f. 1. Balance quota</td>
</tr>
<tr>
<td>sms_count</td>
<td>ND</td>
<td>c.f. 2. sms_count quota</td>
</tr>
<tr>
<td>early_percent</td>
<td>ND</td>
<td>c.f. Asynchronous billing</td>
</tr>
<tr>
<td>http_throughput</td>
<td>ND</td>
<td>Max. number of messages per second to accept through HTTP API</td>
</tr>
<tr>
<td>smpps_throughput</td>
<td>ND</td>
<td>Max. number of messages per second to accept through SMPP Server</td>
</tr>
</tbody>
</table>

**Note:** It is possible to increment a quota by indicating a sign, ex: +10 will increment a quota value by 10, -22.4 will decrease a quota value by 22.4.

**SMPP Server section**

User have an other optional `smpps_cred` parameter which define a specialized set of sections for defining his credentials for using the *SMPP Server API*:

- **Authorizations:** Privileges to bind,
- **Quotas:** Maximum bound connections at a time (multi binding),

For each section of the above, there’s keys to be defined when adding/updating a user, the example below show how to authorize binding and set max_bindings to 2:

```
jcli : user -a
Adding a new User: (ok: save, ko: exit)
> username foo
> password bar
> gid marketing
> uid foo
> smpps_cred authorization bind yes
> smpps_cred quota max_bindings 2
> ok
Successfully added User [foo] to Group [marketing]
```

In the below tables, you can find exhaustive list of keys for each `smpps_cred` section:

**Table 28: authorization section keys**

<table>
<thead>
<tr>
<th>Key</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>bind</td>
<td>True</td>
<td>Privilege to bind to SMPP Server API</td>
</tr>
</tbody>
</table>

**Table 29: quota section keys**

<table>
<thead>
<tr>
<th>Key</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>max_bindings</td>
<td>ND</td>
<td>Maximum bound connections at a time (multi binding)</td>
</tr>
</tbody>
</table>

**Note:** It is possible to increment a quota by indicating a sign, ex: +10 will increment a quota value by 10, -2 will decrease a quota value by 2.
3.11.2 Group manager

The Group manager module is accessible through the `group` command and is providing the following features:

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-l, –list</td>
<td>List groups</td>
</tr>
<tr>
<td>-a, –add</td>
<td>Add group</td>
</tr>
<tr>
<td>-e, –enable</td>
<td>Enable group</td>
</tr>
<tr>
<td>-d, –disable</td>
<td>Disable group</td>
</tr>
<tr>
<td>-r GID, –remove=GID</td>
<td>Remove group using it’s GID</td>
</tr>
</tbody>
</table>

Table 30: `group` command line options

A Group object is required for:

- Creating a User using the `user` manager (c.f. User manager)
- Creating a GroupFilter using the `filter` manager (c.f. Filter manager)

When adding a Group, only one parameter is required:
- **gid**: Group Identifier

Here’s an example of adding a new Group:

```
jcli : group -a
Adding a new Group: (ok: save, ko: exit)
> gid marketing
> ok
Successfully added Group [marketing]
```

Listing Groups will show currently added Groups with their GID:

```
jcli : group -l
#Group id
#marketing
Total Groups: 1
```

**Note:** When listing a disabled group, its group id will be prefixed by !.

3.11.3 MO router manager

The MO Router manager module is accessible through the `morouter` command and is providing the following features:
Table 31: `morouter` command line options

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>-l</code></td>
<td>List MO routes</td>
</tr>
<tr>
<td><code>-a</code></td>
<td>Add a new MO route</td>
</tr>
<tr>
<td><code>-r</code> OR <code>-r e</code></td>
<td>Remove MO route using it’s ORDER</td>
</tr>
<tr>
<td><code>-s</code> OR <code>-s e</code></td>
<td>Show MO route using it’s ORDER</td>
</tr>
<tr>
<td><code>-f</code></td>
<td>Flush MO routing table</td>
</tr>
</tbody>
</table>

Note: MO Route is used to route inbound messages (SMS MO) through two possible channels: http and smpps (SMPP Server).

MO Router helps managing Jasmin’s MORoutingTable, which is responsible of providing routes to received SMS MO, here are the basics of Jasmin MO routing mechanism:

1. **MORoutingTable** holds ordered **MORoute** objects (each MORoute has a unique order)
2. A **MORoute** is composed of:
   - **Filters**: One or many filters (c.f. Filter manager)
   - **Connector**: One connector (can be many in some situations)
3. There’s many objects inheriting **MORoute** to provide flexible ways to route messages:
   - **DefaultRoute**: A route without a filter, this one can only set with the lowest order to be a default/fallback route
   - **StaticMORoute**: A basic route with Filters and one Connector
   - **RandomRoundrobinMORoute**: A route with Filters and many Connectors, will return a random Connector if its Filters are matched, can be used as a load balancer route
   - **FailoverMORoute**: A route with Filters and many Connectors, will return an available (connected) Connector if its Filters are matched
4. When a SMS MO is received, Jasmin will ask for the right **MORoute** to consider, all routes are checked in descendant order for their respective Filters (when a **MORoute** have many filters, they are checked with an AND boolean operator)
5. When a **MORoute** is considered (its Filters are matching a received SMS MO), Jasmin will use its Connector to send the SMS MO.

Check *The message router* for more details about Jasmin’s routing.

When adding a MO Route, the following parameters are required:

- **type**: One of the supported MO Routes: DefaultRoute, StaticMORoute, RandomRoundrobinMORoute
- **order**: MO Route order

When choosing the MO Route type, additional parameters may be added to the above required parameters.

Here’s an example of adding a **DefaultRoute** to a HTTP Client Connector (http_default):
jcli : morouter -a
Adding a new MO Route: (ok: save, ko: exit)
> type DefaultRoute
jasmin.routing.Routes.DefaultRoute arguments:
connector
> connector http(http_default)
> ok
Successfully added MORoute [DefaultRoute] with order:0

Note: You don’t have to set order parameter when the MO Route type is DefaultRoute, it will be automatically set to 0

Here’s an example of adding a StaticMORoute to a HTTP Client Connector (http_1):

jcli : morouter -a
Adding a new MO Route: (ok: save, ko: exit)
> type StaticMORoute
jasmin.routing.Routes.StaticMORoute arguments:
filters, connector
> order 10
> filters filter_1
> connector http(http_1)
> ok
Successfully added MORoute [StaticMORoute] with order:10

Here’s an example of adding a StaticMORoute to a SMPP Server user (user_1):

jcli : morouter -a
Adding a new MO Route: (ok: save, ko: exit)
> type StaticMORoute
jasmin.routing.Routes.StaticMORoute arguments:
filters, connector
> order 15
> filters filter_2
> connector smpps(user_1)
> ok
Successfully added MORoute [StaticMORoute] with order:15

Note: When routing to a smpps connector like the above example the user_1 designates the username of the concerned user, if he’s already bound to Jasmin’s SMPP Server API routed messages will be delivered to him, if not, queuing will take care of delivery.

Here’s an example of adding a RandomRoundrobinMORoute to two HTTP Client Connectors (http_2 and http_3):

jcli : morouter -a
Adding a new MO Route: (ok: save, ko: exit)
> type RandomRoundrobinMORoute
jasmin.routing.Routes.RandomRoundrobinMORoute arguments:
filters, connectors
> filters filter_3;filter_1
> connectors http(http_2);http(http_3)
> order 20
> ok
Successfully added MORoute [RandomRoundrobinMORoute] with order:20
Note: It is possible to use a **RoundRobinMORoute** with a mix of connectors, example: **connectors** smpps(user_1);http(http_1);http(http_3).

Here’s an example of adding a **FailoverMORoute** to two HTTP Client Connectors (http_4 and http_5):

```bash
jcli : morouter -a
Adding a new MO Route: (ok: save, ko: exit)
> type FailoverMORoute
jasmin.routing.Routes.FailoverMORoute arguments:
filters, connectors
> filters filter_4
> connectors http(http_4);http(http_5)
> order 30
> ok
Successfully added MORoute [FailoverMORoute] with order:20
```

Note: It is **not possible** to use a **FailoverMORoute** with a mix of connectors, example: **connectors** smpps(user_1);http(http_1);http(http_3).

Once the above MO Routes are added to **MORoutingTable**, it is possible to list these routes:

```bash
jcli : morouter -l
#Order Type Connector ID(s) Filter(s)
#30 FailoverMORoute http(http_4), http(http_5) <T>, <T>
#20 RandomRoundrobinMORoute http(http_2), http(http_3) <T>, <T>
#15 StaticMORoute smpps(user_1) <T>
#10 StaticMORoute http(http_1) <T>
#0 DefaultRoute http(http_default)
Total MO Routes: 3
```

Note: Filters and Connectors were created before creating these routes, please check *Filter manager* and *HTTP Client connector manager* for further details.

It is possible to obtain more information of a defined route by typing **moroute -s <order>**:

```bash
jcli : morouter -s 20
RandomRoundrobinMORoute to 2 connectors:
  - http(http_2)
  - http(http_3)

jcli : morouter -s 10
StaticMORoute to http(http_1)

jcli : morouter -s 0
DefaultRoute to http(http_default)
```

More control commands:

- **morouter -r <order>**: Remove route at defined *order*
- **morouter -f**: Flush MORoutingTable (unrecoverable)
3.11.4 MT router manager

The MT Router manager module is accessible through the `mtrouter` command and is providing the following features:

```
Table 32: mtrouter command line options

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-l, --list</td>
<td>List MT routes</td>
</tr>
<tr>
<td>-a, --add</td>
<td>Add a new MT route</td>
</tr>
<tr>
<td>-r, --remove=ORDER</td>
<td>Remove MT route using it's ORDER</td>
</tr>
<tr>
<td>-s, --show=ORDER</td>
<td>Show MT route using it's ORDER</td>
</tr>
<tr>
<td>-f, --flush</td>
<td>Flush MT routing table</td>
</tr>
</tbody>
</table>
```

Note: MT Route is used to route outbound messages (SMS MT) through one channel: smppc (SMPP Client).

MT Router helps managing Jasmin’s MTRoutingTable, which is responsible of providing routes to outgoing SMS MT, here are the basics of Jasmin MT routing mechanism:

1. **MTRoutingTable** holds ordered **MTRoute** objects (each MTRoute has a unique order)
2. A **MTRoute** is composed of:
   - **Filters**: One or many filters (c.f. Filter manager)
   - **Connector**: One connector (can be many in some situations)
   - **Rate**: For billing purpose, the rate of sending one message through this route; it can be zero to mark the route as FREE (NOT RATED) (c.f. Billing)
3. There’s many objects inheriting **MTRoute** to provide flexible ways to route messages:
   - **DefaultRoute**: A route without a filter, this one can only set with the lowest order to be a default/fallback route
   - **StaticMTRoute**: A basic route with Filters and one Connector
   - **RandomRoundrobinMTRoute**: A route with Filters and many Connectors, will return a random Connector if its Filters are matching, can be used as a load balancer route
   - **FailoverMTRoute**: A route with Filters and many Connectors, will return an available (connected) Connector if its Filters are matched
4. When a SMS MT is to be sent, Jasmin will ask for the right MTRoute to consider, all routes are checked in descendant order for their respective Filters (when a MTRoute have many filters, they are checked with an AND boolean operator)
5. When a MTRoute is considered (its Filters are matching an outgoing SMS MT), Jasmin will use its Connector to send the SMS MT.

Check *The message router* for more details about Jasmin’s routing.

When adding a MT Route, the following parameters are required:
- **type**: One of the supported MT Routes: DefaultRoute, StaticMTRoute, RandomRoundrobinMTRoute
• **order**: MO Route order

• **rate**: The route rate, can be zero

When choosing the MT Route **type**, additional parameters may be added to the above required parameters.

Here’s an example of adding a **DefaultRoute** to a SMPP Client Connector (smppcc_default):

```
jcli : mtrouter -a
Adding a new MT Route: (ok: save, ko: exit)
> type DefaultRoute
jasmin.routing.Routes.DefaultRoute arguments:
connector > connector smppc(smppcc_default)
> rate 0.0
> ok
Successfully added MTRoute [DefaultRoute] with order:0
```

**Note:** You don’t have to set **order** parameter when the MT Route type is **DefaultRoute**, it will be automatically set to 0.

Here’s an example of adding a **StaticMTRoute** to a SMPP Client Connector (smppcc_1):

```
jcli : mtrouter -a
Adding a new MT Route: (ok: save, ko: exit)
> type StaticMTRoute
jasmin.routing.Routes.StaticMTRoute arguments:
filters, connector > filters filter_1;filter_2
> order 10
> connector smppc(smppcc_1)
> rate 0.0
> ok
Successfully added MTRoute [StaticMTRoute] with order:10
```

Here’s an example of adding a **RandomRoundrobinMTRoute** to two SMPP Client Connectors (smppcc_2 and smppcc_3):

```
jcli : mtrouter -a
Adding a new MT Route: (ok: save, ko: exit)
> order 20
> type RandomRoundrobinMTRoute
jasmin.routing.Routes.RandomRoundrobinMTRoute arguments:
filters, connectors > filters filter_3
> connectors smppc(smppcc_2);smppc(smppcc_3)
> rate 0.0
> ok
Successfully added MTRoute [RandomRoundrobinMTRoute] with order:20
```

Here’s an example of adding a **FailoverMTRoute** to two SMPP Client Connectors (smppcc_4 and smppcc_5):

```
jcli : mtrouter -a
Adding a new MT Route: (ok: save, ko: exit)
> order 30
> type FailoverMTRoute
jasmin.routing.Routes.FailoverMTRoute arguments:
(continues on next page)
```

---

3.11. Management CLI Modules
filters, connectors
> filters filter_4
> connectors smppc(smppcc_4);smppc(smppcc_5)
> rate 0.0
> ok
Successfully added MTRoute [FailoverMTRoute] with order:20

Once the above MT Routes are added to MTRoutingTable, it is possible to list these routes:

<table>
<thead>
<tr>
<th>#Order</th>
<th>Type</th>
<th>Rate</th>
<th>Connector ID(s)</th>
<th>Filter(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>#20</td>
<td>FailoverMTRoute</td>
<td>0 (!)</td>
<td>smppc(smppcc_3), smppc(smppcc_4)</td>
<td>&lt;T&gt;</td>
</tr>
<tr>
<td>#20</td>
<td>RandomRoundrobinMTRoute</td>
<td>0 (!)</td>
<td>smppc(smppcc_2), smppc(smppcc_3)</td>
<td>&lt;T&gt;</td>
</tr>
<tr>
<td>#10</td>
<td>StaticMTRoute</td>
<td>0</td>
<td>smppc(smppcc_1)</td>
<td>&lt;T&gt;, &lt;T&gt;</td>
</tr>
<tr>
<td>#0</td>
<td>DefaultRoute</td>
<td>0</td>
<td>smppc(smppcc_default)</td>
<td></td>
</tr>
</tbody>
</table>

Total MT Routes: 3

Note: Filters and Connectors were created before creating these routes, please check Filter manager and HTTP Client connector manager for further details

It is possible to obtain more information of a defined route by typing mtroute -s <order>:

```
jcli : mtrouter -l
#Order Type                Rate  Connector ID(s)          Filter(s)
#20 FailoverMTRoute        0 (!)  smppc(smppcc_3), smppc(smppcc_4) <T>
#20 RandomRoundrobinMTRoute 0 (!)  smppc(smppcc_2), smppc(smppcc_3) <T>
#10 StaticMTRoute          0 (!)  smppc(smppcc_1)          <T>, <T>
#0 DefaultRoute            0 (!)  smppc(smppcc_default)    
Total MT Routes: 3
```

More control commands:

- `mtrouter -r <order>`: Remove route at defined order
- `mtrouter -f`: Flush MTRoutingTable (unrecoverable)

### 3.11.5 MO interceptor manager

The MO Interceptor manager module is accessible through the `mointerceptor` command and is providing the following features:
Table 33: `mointerceptor` command line options

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-l, –list</td>
<td>List MO interceptors</td>
</tr>
<tr>
<td>-a, –add</td>
<td>Add a new MO interceptors</td>
</tr>
<tr>
<td>-r OR-DER, --remove=ORDER</td>
<td>Remove MO interceptor using it’s ORDER</td>
</tr>
<tr>
<td>-s OR-DER, --show=ORDER</td>
<td>Show MO interceptor using it’s ORDER</td>
</tr>
<tr>
<td>-f, --flush</td>
<td>Flush MO interception table</td>
</tr>
</tbody>
</table>

**Note:** MO Interceptor is used to hand inbound messages (SMS MO) to a user defined script, check *Interception* for more details.

MO Interceptor helps managing Jasmin’s MOInterceptionTable, which is responsible of intercepting SMS MO before routing is made, here are the basics of Jasmin MO interception mechanism:

1. MOInterceptionTable holds ordered MOInterceptor objects (each MOInterceptor has a unique order)
2. A MOInterceptor is composed of:
   - Filters: One or many filters (c.f. *Filter manager*)
   - Script: Path to python script
3. There’s many objects inheriting MOInterceptor to provide flexible ways to route messages:
   - DefaultInterceptor: An interceptor without a filter, this one can only set with the lowest order to be a default/fallback interceptor
   - StaticMOInterceptor: A basic interceptor with Filters and one Script
4. When a SMS MO is received, Jasmin will ask for the right MOInterceptor to consider, all interceptors are checked in descendant order for their respective Filters (when a MOInterceptor have many filters, they are checked with an AND boolean operator)
5. When a MOInterceptor is considered (its Filters are matching a received SMS MO), Jasmin will call its Script with the Routable argument.

Check *Interception* for more details about Jasmin’s interceptor.

When adding a MO Interceptor, the following parameters are required:

- **type**: One of the supported MO Interceptors: DefaultInterceptor, StaticMOInterceptor
- **order**: MO Interceptor order

When choosing the MO Interceptor type, additional parameters may be added to the above required parameters.

Here’s an example of adding a DefaultInterceptor to a python script:

```bash
jcli : mointerceptor -a
Adding a new MO Interceptor: (ok: save, ko: exit)
> type DefaultInterceptor
<class 'jasmin.routing.Interceptors.DefaultInterceptor'> arguments:
```

(continues on next page)
script
> script python3(/opt/jasmin-scripts/interception/mo-interceptor.py)
> ok
Successfully added MOInterceptor [DefaultInterceptor] with order:0

Note: As of now, only python3 script is permitted.

Note: Pay attention that the given script is copied to Jasmin core, do not expect Jasmin to refresh the script code when you update it, you’ll need to redefine the mointerceptor rule again so Jasmin will refresh the script.

Note: You don’t have to set order parameter when the MO Interceptor type is DefaultInterceptor, it will be automatically set to 0

Here’s an example of adding a StaticMOInterceptor to a python script:

```bash
jcli : mointerceptor -a
Adding a new MO Interceptor: (ok: save, ko: exit)
> type StaticMOInterceptor
<class 'jasmin.routing.Interceptors.StaticMOInterceptor'> arguments: filters, script
> order 10
> filters filter_1
> script python3(/opt/jasmin-scripts/interception/mo-interceptor.py)
> ok
Successfully added MOInterceptor [StaticMOInterceptor] with order:10
```

Once the above MO Interceptors are added to MOInterceptionTable, it is possible to list these interceptors:

```bash
jcli : mointerceptor -l
#Order Type Script Filter(s)
#10 StaticMOInterceptor <MOIS (pyCode= ..)> <T>
#0 DefaultInterceptor <MOIS (pyCode= ..)>
Total MO Interceptors: 2
```

Note: Filters were created before creating these interceptors, please check Filter manager for further details

It is possible to obtain more information of a defined interceptor by typing mointerceptor -s <order>:

```bash
jcli : mointerceptor -s 10
StaticMOInterceptor/<MOIS (pyCode= ..)>

jcli : mointerceptor -s 0
DefaultInterceptor/<MOIS (pyCode= ..)>
```

More control commands:

- **mointerceptor -r <order>**: Remove interceptor at defined order
- **mointerceptor -f**: Flush MOInterceptionTable (unrecoverable)
3.11.6 MT interceptor manager

The MT Interceptor manager module is accessible through the `mtinterceptor` command and is providing the following features:

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-l, --list</td>
<td>List MT interceptors</td>
</tr>
<tr>
<td>-a, --add</td>
<td>Add a new MT interceptors</td>
</tr>
<tr>
<td>-r ORDER, --remove=ORDER</td>
<td>Remove MT interceptor using it's ORDER</td>
</tr>
<tr>
<td>-s ORDER, --show=ORDER</td>
<td>Show MT interceptor using it's ORDER</td>
</tr>
<tr>
<td>-f, --flush</td>
<td>Flush MT interception table</td>
</tr>
</tbody>
</table>

Table 34: `mtinterceptor` command line options

Note: MT Interceptor is used to hand outbound messages (SMS MT) to a user defined script, check Interception for more details.

MT Interceptor helps managing Jasmin’s MTInterceptionTable, which is responsible of intercepting SMS MT before routing is made, here are the basics of Jasmin MT interception mechanism:

1. MTInterceptionTable holds ordered MTInterceptor objects (each MTInterceptor has a unique order)
2. A MTInterceptor is composed of:
   - Filters: One or many filters (c.f. Filter manager)
   - Script: Path to python script
3. There’s many objects inheriting MTInterceptor to provide flexible ways to route messages:
   - DefaultInterceptor: An interceptor without a filter, this one can only set with the lowest order to be a default/fallback interceptor
   - StaticMTInterceptor: A basic interceptor with Filters and one Script
4. When a SMS MT is received, Jasmin will ask for the right MTInterceptor to consider, all interceptors are checked in descendant order for their respective Filters (when a MTInterceptor have many filters, they are checked with an AND boolean operator)
5. When a MTInterceptor is considered (its Filters are matching a received SMS MT), Jasmin will call its Script with the Routable argument.

Check Interception for more details about Jasmin’s interceptor.

When adding a MT Interceptor, the following parameters are required:
- **type**: One of the supported MT Interceptors: DefaultInterceptor, StaticMTInterceptor
- **order**: MT Interceptor order

When choosing the MT Interceptor type, additional parameters may be added to the above required parameters.

Here’s an example of adding a DefaultInterceptor to a python script:
```
jcli : mtinterceptor -a
Adding a new MT Interceptor: (ok: save, ko: exit)
> type DefaultInterceptor
<class 'jasmin.routing.Interceptors.DefaultInterceptor'> arguments:
script
> script python3(/opt/jasmin-scripts/interception/mt-interceptor.py)
> ok
Successfully added MTInterceptor [DefaultInterceptor] with order:0
```

**Note:** As of now, only **python3** script is permitted.

**Note:** Pay attention that the given script is copied to Jasmin core, do not expect Jasmin to refresh the script code when you update it, you’ll need to redefine the `mtinterceptor` rule again so Jasmin will refresh the script.

**Note:** You don’t have to set `order` parameter when the MT Interceptor type is `DefaultInterceptor`, it will be automatically set to 0.

Here’s an example of adding a **StaticMTInterceptor** to a python script:

```
jcli : mtinterceptor -a
Adding a new MT Interceptor: (ok: save, ko: exit)
> type StaticMTInterceptor
<class 'jasmin.routing.Interceptors.StaticMTInterceptor'> arguments:
filters, script
> order 10
> filters filter_1
> script python3(/opt/jasmin-scripts/interception/mt-interceptor.py)
> ok
Successfully added MTInterceptor [StaticMTInterceptor] with order:10
```

Once the above MT Interceptors are added to **MTInterceptionTable**, it is possible to list these interceptors:

```
jcli : mtinterceptor -l
#Order Type Script Filter(s)
#10 StaticMTInterceptor <MTIS (pyCode= ..)> <T>
#0 DefaultInterceptor <MTIS (pyCode= ..)>
Total MT Interceptors: 2
```

**Note:** Filters were created before creating these interceptors, please check **Filter manager** for further details

It is possible to obtain more information of a defined interceptor by typing `mtinterceptor -s <order>`:

```
jcli : mtinterceptor -s 10
StaticMTInterceptor/<MTIS (pyCode= ..)><T>

jcli : mtinterceptor -s 0
DefaultInterceptor/<MTIS (pyCode= ..)>
```

More control commands:

- **mtinterceptor -r <order>**: Remove interceptor at defined `order`
• **mtinterceptor -f**: Flush MTInterceptionTable (unrecoverable)

### 3.11.7 SMPP Client connector manager

The SMPP Client connector manager module is accessible through the `smppccm` command and is providing the following features:

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-l, –list</td>
<td>List SMPP connectors</td>
</tr>
<tr>
<td>-a, –add</td>
<td>Add SMPP connector</td>
</tr>
<tr>
<td>-u CID, –update=CID</td>
<td>Update SMPP connector configuration using it’s CID</td>
</tr>
<tr>
<td>-r CID, –remove=CID</td>
<td>Remove SMPP connector using it’s CID</td>
</tr>
<tr>
<td>-s CID, –show=CID</td>
<td>Show SMPP connector using it’s CID</td>
</tr>
<tr>
<td>-1 CID, –start=CID</td>
<td>Start SMPP connector using it’s CID</td>
</tr>
<tr>
<td>-0 CID, –stop=CID</td>
<td>Stop SMPP connector using it’s CID</td>
</tr>
</tbody>
</table>

A SMPP Client connector is used to send/receive SMS through SMPP v3.4 protocol, it is directly connected to MO and MT routers to provide end-to-end message delivery.

Adding a new SMPP Client connector requires knowledge of the parameters detailed in the listing below:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>cid</td>
<td>Connector ID (must be unique)</td>
<td></td>
</tr>
<tr>
<td>logfile</td>
<td></td>
<td>/var/log/jasmin/default-CID.log</td>
</tr>
<tr>
<td>logrotate</td>
<td>When to rotate the log file, possible values: S=Seconds, M=Minutes, H=Hours, D=Days, W0-W6=Weekday (0=Monday) and midnight=Roll over at midnight</td>
<td>midnight</td>
</tr>
<tr>
<td>loglevel</td>
<td>Logging numeric level: 10=DEBUG, 20=INFO, 30=W ARNING, 40=ERROR, 50=CRIT-ICAL</td>
<td>20</td>
</tr>
<tr>
<td>logprivacy</td>
<td>Don’t log message contents if True</td>
<td>False</td>
</tr>
<tr>
<td>host</td>
<td>Server that runs SMSC</td>
<td>127.0.0.1</td>
</tr>
<tr>
<td>port</td>
<td>The port number for the connection to the SMSC.</td>
<td>2775</td>
</tr>
<tr>
<td>ssl</td>
<td>Activate ssl connection</td>
<td>no</td>
</tr>
<tr>
<td>username</td>
<td></td>
<td>smppclient</td>
</tr>
<tr>
<td>password</td>
<td></td>
<td>password</td>
</tr>
<tr>
<td>bind</td>
<td>Bind type: transceiver, receiver or transmitter</td>
<td>transceiver</td>
</tr>
<tr>
<td>bind_to</td>
<td>Timeout for response to bind request</td>
<td>30</td>
</tr>
<tr>
<td>trx_to</td>
<td>Maximum time lapse allowed between transactions, after which, the connection is consid-</td>
<td>300</td>
</tr>
<tr>
<td>res_to</td>
<td>Timeout for responses to any request PDU</td>
<td>60</td>
</tr>
</tbody>
</table>

Continued on next page.
<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
<th>Default</th>
</tr>
</thead>
<tbody>
<tr>
<td>pdu_red_to</td>
<td>Timeout for reading a single PDU, this is the maximum lapse of time between receiving PDU’s header and its complete read, if the PDU reading timed out, the connection is considered as ‘corrupt’ and will reconnect</td>
<td>10</td>
</tr>
<tr>
<td>con_loss_retry</td>
<td>connect on connection loss? (yes, no)</td>
<td>yes</td>
</tr>
<tr>
<td>con_loss_delay</td>
<td>connect delay on connection loss (seconds)</td>
<td>10</td>
</tr>
<tr>
<td>con_fail_retry</td>
<td>connect on connection failure? (yes, no)</td>
<td>yes</td>
</tr>
<tr>
<td>con_fail_delay</td>
<td>connect delay on connection failure (seconds)</td>
<td>10</td>
</tr>
<tr>
<td>src_addr</td>
<td>Default source address of each SMS-MT if not set while sending it, can be numeric or alphanumeric, when not defined it will take SMSC default</td>
<td>Not defined</td>
</tr>
<tr>
<td>src_ton</td>
<td>Source address TON setting for the link: 0=Unknown, 1=International, 2=National, 3=Network specific, 4=Subscriber number, 5=Alphanumeric, 6=Abbreviated</td>
<td>2</td>
</tr>
<tr>
<td>src_npi</td>
<td>Source address NPI setting for the link: 0=Unknown, 1=ISDN, 3=Data, 4=Telex, 6=Land mobile, 8=National, 9=Private, 10=Ermes, 14=Internet, 18=WAP Client ID</td>
<td>1</td>
</tr>
<tr>
<td>dst_ton</td>
<td>Destination address TON setting for the link: 0=Unknown, 1=International, 2=National, 3=Network specific, 4=Subscriber number, 5=Alphanumeric, 6=Abbreviated</td>
<td>1</td>
</tr>
<tr>
<td>dst_npi</td>
<td>Destination address NPI setting for the link: 0=Unknown, 1=ISDN, 3=Data, 4=Telex, 6=Land mobile, 8=National, 9=Private, 10=Ermes, 14=Internet, 18=WAP Client ID</td>
<td>1</td>
</tr>
<tr>
<td>bind_ton</td>
<td>Bind address TON setting for the link: 0=Unknown, 1=International, 2=National, 3=Network specific, 4=Subscriber number, 5=Alphanumeric, 6=Abbreviated</td>
<td>0</td>
</tr>
<tr>
<td>bind_npi</td>
<td>Bind address NPI setting for the link: 0=Unknown, 1=ISDN, 3=Data, 4=Telex, 6=Land mobile, 8=National, 9=Private, 10=Ermes, 14=Internet, 18=WAP Client ID</td>
<td>1</td>
</tr>
<tr>
<td>validity</td>
<td>Default validity period of each SMS-MT if not set while sending it, when not defined it will take SMSC default (seconds)</td>
<td>Not defined</td>
</tr>
<tr>
<td>priority</td>
<td>SMS-MT default priority if not set while sending it: 0, 1, 2 or 3</td>
<td>0</td>
</tr>
<tr>
<td>requeue_delay</td>
<td>Delay to be considered when requeuing a rejected message</td>
<td>120</td>
</tr>
<tr>
<td>addr_range</td>
<td>Indicates which MS’s can send messages to this connector, seems to be an informative value</td>
<td>Not defined</td>
</tr>
<tr>
<td>systype</td>
<td>The system_type parameter is used to categorize the type of ESME that is binding to the SMSC. Examples include “VMS” (voice mail system) and “OTA” (over-the-air activation system).</td>
<td>Not defined</td>
</tr>
<tr>
<td>dlr_expiry</td>
<td>When a SMS-MT is not acked, it will remain waiting in memory for dlr_expiry seconds, after this period, any received ACK will be ignored</td>
<td>86400</td>
</tr>
<tr>
<td>submit_throughput</td>
<td>MS-MT throttling in MPS (Messages per second), set to 0 (zero) for unlimited throughput</td>
<td>1</td>
</tr>
<tr>
<td>proto_id</td>
<td>Used to indicate protocol id in SMS-MT and SMS-MO</td>
<td>Not defined</td>
</tr>
<tr>
<td>coding</td>
<td>Default coding of each SMS-MT if not set while sending it: 0=SMSC Default, 1=IA5 ASCII, 2=Octet unspecified, 3=Latin1, 4=Octet unspecified common, 5=JIS, 6=Cyrillic, 7=ISO-8859-8, 8=UCS2, 9=Pictogram, 10=ISO-2022-JP, 13=Extended Kanji Jis, 14=KSC 5601</td>
<td>0</td>
</tr>
<tr>
<td>elink_interval</td>
<td>Enquire link interval (seconds)</td>
<td>30</td>
</tr>
<tr>
<td>def_msg_id</td>
<td>Specifies the SMSC index of a pre-defined (‘canned’) message.</td>
<td>0</td>
</tr>
<tr>
<td>ripf</td>
<td>Replace if present flag: 0=Do not replace, 1=Replace</td>
<td>0</td>
</tr>
<tr>
<td>dlr_msgid</td>
<td>Indicates how to read msg id when receiving a receipt: 0=Msg id is identical in submit_sm_res and deliver_sm, 1=submit_sm_res msg-id is in hexadecimal base, deliver_sm msg-id is in decimal base, 2=submit_sm_res msg-id is in decimal base, deliver_sm_msg-id is in hexadecimal base.</td>
<td>0</td>
</tr>
</tbody>
</table>

Note: When adding a SMPP Client connector, only it’s cid is required, all the other parameters will be set to their default value.
respective defaults.

**Note:** Connector restart is required only when changing the following parameters: host, port, username, password, systemType, logfile, loglevel; any other change is applied without requiring connector to be restarted.

Here’s an example of adding a new transmitter SMPP Client connector with cid=Demo:

```
jcli : smppccm -a
Adding a new connector: (ok: save, ko: exit)
> cid Demo
> bind transmitter
> ok
Successfully added connector [Demo]
```

All the above parameters can be displayed after connector creation:

```
jcli : smppccm -s Demo
ripf 0
con_fail_delay 10
dlr_expiry 86400
coding 0
submit_throughput 1
elink_interval 10
bind_to 30
port 2775
con_fail_retry yes
password password
src_addr None
bind_npi 1
addr_range None
dst_ton 1
res_to 60
def_msg_id 0
priority 0
con_loss_retry yes
username smppclient
dst_npi 1
validity None
requeue_delay 120
host 127.0.0.1
src_npi 1
trx_to 300
logfile /var/log/jasmin/default-Demo.log
systype
cid Demo
loglevel 20
bind transmitter
proto_id None
con_loss_delay 10
bind_ton 0
pdu_red_to 10
src_ton 2
```

**Note:** From the example above, you can see that showing a connector details will return all it’s parameters even those you did not enter while creating/updating the connector, they will take their respective default values as explained in

3.11. Management CLI Modules 79
**SMPP Client connector parameters**

Listing connectors will show currently added SMPP Client connectors with their CID, Service/Session state and start/stop counters:

```
jcli : smppccm -l

#Connector id    Service   Session       Starts  Stops
#888             stopped None    0        0
#Demo            stopped None    0        0

Total connectors: 2
```

Updating an existent connector is the same as creating a new one, simply type `smppccm -u <cid>` where `cid` is the connector id you want to update, you’ll run into a new interactive session to enter the parameters you want to update (c.f. *SMPP Client connector parameters*).

Here’s an example of updating SMPP Client connector’s host:

```
jcli : smppccm -u Demo
Updating connector id [Demo]: (ok: save, ko: exit)
> host 10.10.1.2
> ok
Successfully updated connector [Demo]
```

More control commands:

- `smppccm -1 <cid>`: Start connector and try to connect
- `smppccm -0 <cid>`: Stop connector and disconnect
- `smppccm -r <cid>`: Remove connector (unrecoverable)

### 3.11.8 Filter manager

The Filter manager module is accessible through the `filter` command and is providing the following features:

**Table 37: filter command line options**

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>-l, –list</td>
<td>List filters</td>
</tr>
<tr>
<td>-a, –add</td>
<td>Add filter</td>
</tr>
<tr>
<td>-r FID, –remove=FID</td>
<td>Remove filter using it’s FID</td>
</tr>
<tr>
<td>-s FID, –show=FID</td>
<td>Show filter using it’s FID</td>
</tr>
</tbody>
</table>

Filters are used by MO/MT routers to help decide on which route a message must be delivered, the following flowchart provides details of the routing process:

Jasmin provides many Filters offering advanced flexibilities to message routing:
Fig. 9: Routing process flow
Table 38: Jasmin Filters

<table>
<thead>
<tr>
<th>Name</th>
<th>Routes</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>TransparentFilter</td>
<td>All</td>
<td>This filter will always match any message criteria</td>
</tr>
<tr>
<td>ConnectorFilter</td>
<td>MO</td>
<td>Will match the source connector of a message</td>
</tr>
<tr>
<td>UserFilter</td>
<td>MT</td>
<td>Will match the owner of a MT message</td>
</tr>
<tr>
<td>GroupFilter</td>
<td>MT</td>
<td>Will match the owner’s group of a MT message</td>
</tr>
<tr>
<td>SourceAddrFilter</td>
<td>All</td>
<td>Will match the source address of a MO message</td>
</tr>
<tr>
<td>DestinationAddrFilter</td>
<td>All</td>
<td>Will match the destination address of a MT message</td>
</tr>
<tr>
<td>ShortMessageFilter</td>
<td>All</td>
<td>Will match the content of a message</td>
</tr>
<tr>
<td>DateIntervalFilter</td>
<td>All</td>
<td>Will match the date of a message</td>
</tr>
<tr>
<td>TimeIntervalFilter</td>
<td>All</td>
<td>Will match the time of a message</td>
</tr>
<tr>
<td>TagFilter</td>
<td>All</td>
<td>Will check if message has a defined tag</td>
</tr>
<tr>
<td>EvalPyFilter</td>
<td>All</td>
<td>Will pass the message to a third party python script for user-defined filtering</td>
</tr>
</tbody>
</table>

Check *The message router* for more details about Jasmin’s routing.

When adding a Filter, the following parameters are required:

- **type**: One of the supported Filters: TransparentFilter, ConnectorFilter, UserFilter, GroupFilter, SourceAddrFilter, DestinationAddrFilter, ShortMessageFilter, DateIntervalFilter, TimeIntervalFilter, TagFilter, EvalPyFilter
- **fid**: Filter id (must be unique)

When choosing the Filter **type**, additional parameters may be added to the above required parameters:

Table 39: Filters parameters

<table>
<thead>
<tr>
<th>Name</th>
<th>Example</th>
<th>Parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td>TransparentFilter</td>
<td></td>
<td>No parameters are required</td>
</tr>
<tr>
<td>ConnectorFilter</td>
<td>cid</td>
<td>cid of the connector to match</td>
</tr>
<tr>
<td>UserFilter</td>
<td>uid</td>
<td>uid of the user to match</td>
</tr>
<tr>
<td>GroupFilter</td>
<td>gid</td>
<td>gid of the group to match</td>
</tr>
<tr>
<td>SourceAddrFilter</td>
<td>source_addr</td>
<td>Regular expression to match source address</td>
</tr>
<tr>
<td>DestinationAddrFilter</td>
<td>destination_addr</td>
<td>Regular expression to match destination address</td>
</tr>
<tr>
<td>ShortMessageFilter</td>
<td>short_message</td>
<td>Regular expression to match message content</td>
</tr>
<tr>
<td>DateIntervalFilter</td>
<td>dateInterval</td>
<td>Two dates separated by ; (date format is YYYY-MM-DD)</td>
</tr>
<tr>
<td>TimeIntervalFilter</td>
<td>timeInterval</td>
<td>Two timestamps separated by ; (timestamp format is HH:MM:SS)</td>
</tr>
<tr>
<td>TagFilter</td>
<td>tag</td>
<td>numeric tag to match</td>
</tr>
<tr>
<td>EvalPyFilter</td>
<td>pyCode</td>
<td>Path to a python script. (External business logic for more details)</td>
</tr>
</tbody>
</table>

Here’s an example of adding a **TransparentFilter**

```
jcli : filter -a
Adding a new Filter: (ok: save, ko: exit)
type fid
  > type transparentfilter
  > fid TF
  > ok
Successfully added Filter [TransparentFilter] with fid:TF
```

Here’s an example of adding a **SourceAddrFilter**
Adding a new Filter: (ok: save, ko: exit)
> type sourceaddrfilter
jasmin.routing.Filters.SourceAddrFilter arguments:
> source_addr ^20\d+
> ok
You must set these options before saving: type, fid, source_addr
> fid From20*
> ok
Successfully added Filter [SourceAddrFilter] with fid:From20*

Here’s an example of adding a TimeIntervalFilter

Adding a new Filter: (ok: save, ko: exit)
> fid WorkingHours
> type timeintervalfilter
jasmin.routing.Filters.TimeIntervalFilter arguments:
timeInterval
> timeInterval 08:00:00;18:00:00
> ok
Successfully added Filter [TimeIntervalFilter] with fid:WorkingHours

It is possible to list filters with:

```
jcli : filter -l
#Filter id Type Routes Description
#StartWithHello ShortMessageFilter MO MT <ShortMessageFilter (msg=^hello.*$)>
#ExternalPy EvalPyFilter MO MT <EvalPyFilter (pyCode= ..)> 
#To85111 DestinationAddrFilter MO MT <DestinationAddrFilter (dst_addr=^85111$)> 
#September2014 DateIntervalFilter MO MT <DateIntervalFilter (2014-09-01,2014-09-30)> 
#WorkingHours TimeIntervalFilter MO MT <TimeIntervalFilter (08:00:00,18:00:00)> 
#TFTransparentFilter MO MT <TransparentFilter>
#TG-Spain-Vodacom TagFilter MO MT <TG (tag=21401)> 
#From20* SourceAddrFilter MO MT <SourceAddrFilter (src_addr=^20\d+)> 
Total Filters: 7 
```

It is possible to obtain more information of a specific filter by typing `filter -s <fid>`:

```
jcli : filter -s September2014
DateIntervalFilter:
  Left border = 2014-09-01
  Right border = 2014-09-30
```

More control commands:

- `filter -r <fid>`: Remove filter

**External business logic**

In addition to predefined filters listed above (*Filter manager*), it is possible to extend filtering with external scripts written in Python using the `EvalPyFilter`.

Here’s a very simple example where an `EvalPyFilter` is matching the connector `cid` of a message:
First, write an external python script:

```python
# File @ /opt/jasmin-scripts/routing/abc-connector.py
if routable.connector.cid == 'abc':
    result = True
else:
    result = False
```

Second, create an EvalPyFilter with the python script:

```
jcli : filter -a
Adding a new Filter: (ok: save, ko: exit)
> type EvalPyFilter
jasmin.routing.Filters.EvalPyFilter arguments:
pyCode
> pyCode /opt/jasmin-scripts/routing/abc-connector.py
> fid SimpleThirdParty
> ok
Successfully added Filter [EvalPyFilter] with fid:SimpleThirdParty
```

This example will provide an EvalPyFilter (SimpleThirdParty) that will match any message coming from the connector with `cid = abc`.

Using EvalPyFilter is as simple as the shown example, when the python script is called it will get the following global variables set:

- **routable**: one of the `jasmin.routing.Routables.Routable` inheriters (`Routeable` for more details)
- **result**: (default to `False`) It will be read by Jasmin router at the end of the script execution to check if the filter is matching the message passed through the routable variable, matched=True / unmatched=False

**Note:** It is possible to check for any parameter of the SMPP PDU: TON, NPI, PROTOCOL_ID ... since it is provided through the routable object.

**Note:** Using EvalPyFilter offers the possibility to call external webservices, databases ... for powerful routing or even for logging, rating & billing through external third party systems.

**Hint:** More examples in the this FAQ's question: Can you provide an example of how to use EvalPyFilter?

### 3.11.9 HTTP Client connector manager

The HTTP Client connector manager module is accessible through the `httpccm` command and is providing the following features:
Table 40: `httpccm` command line options

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>-l, --list</code></td>
<td>List HTTP client connectors</td>
</tr>
<tr>
<td><code>-a, --add</code></td>
<td>Add a new HTTP client connector</td>
</tr>
<tr>
<td><code>-r FID, --remove=FID</code></td>
<td>Remove HTTP client connector using it’s CID</td>
</tr>
<tr>
<td><code>-s FID, --show=FID</code></td>
<td>Show HTTP client connector using it’s CID</td>
</tr>
</tbody>
</table>

A HTTP Client connector is used in SMS-MO routing, it is called with the message parameters when it is returned by a matched MO Route (Receiving SMS-MO for more details).

When adding a HTTP Client connector, the following parameters are required:

- **cid**: Connector id (must be unique)
- **url**: URL to be called with message parameters
- **method**: Calling method (GET or POST)

Here’s an example of adding a new HTTP Client connector:

```bash
jcli : httpccm -a
Adding a new Httpcc: (ok: save, ko: exit)
> url http://10.10.20.125/receive-sms/mo.php
> method GET
> cid HTTP-01
> ok
Successfully added Httpcc [HttpConnector] with cid:HTTP-01
```

All the above parameters can be displayed after Connector creation:

```bash
jcli : httpccm -s HTTP-01
HttpConnector:
cid = HTTP-01
baseurl = http://10.10.20.125/receive-sms/mo.php
method = GET
```

Listing Connectors will show currently added Connectors with their CID, Type, Method and Url:

```bash
jcli : httpccm -l
<table>
<thead>
<tr>
<th>#Httpcc id</th>
<th>Type</th>
<th>Method</th>
<th>URL</th>
</tr>
</thead>
<tbody>
<tr>
<td>#HTTP-01</td>
<td>HttpConnector</td>
<td>GET</td>
<td><a href="http://10.10.20.125/receive-sms/mo.php">http://10.10.20.125/receive-sms/mo.php</a></td>
</tr>
</tbody>
</table>
Total Httpccs: 1
```

### 3.11.10 Stats manager

The Stats manager module is responsible for showing real time statistics, aggregated counters and values such as current bound connections of a User, number of http requests, number of sent messages through a Route, Filter, Connector...

**Note**: All values are collected during Jasmin’s uptime and they are lost when Jasmin goes off, Stats manager shall be used for monitoring activities but not for advanced business reports.
The Stats manager module is accessible through the `stats` command and is providing the following features:

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>--user=UID</td>
<td>Show user stats using it’s UID</td>
</tr>
<tr>
<td>--users</td>
<td>Show all users stats</td>
</tr>
<tr>
<td>--smppc=CID</td>
<td>Show smpp connector stats using it’s CID</td>
</tr>
<tr>
<td>--smppcs</td>
<td>Show all smpp connectors stats</td>
</tr>
<tr>
<td>--smppsapi</td>
<td>Show SMPP Server API stats</td>
</tr>
</tbody>
</table>

The Stats manager covers different sections, this includes Users, SMPP Client connectors, Routes (MO and MT), APIs (HTTP and SMPP).

**User statistics**

The Stats manager exposes an overall view of all existent users as well as a per-user information view:

- `stats --users`: Will show an overall view of all existent users
- `stats --user foo`: Will show detailed information for foo

Here’s an example of showing an overall view where users `sandra` and `foo` are actually having 2 and 6 SMPP bound connections, user `bar` is using the HTTP Api only and `sandra` is using both APIs:

```
jcli : stats --users
#User id SMPP Bound connections SMPP L.A. HTTP requests counter HTTP L. A.
->sandra 2 2019-06-02 15:35:01 20
->01 12:12:33
->foo 6 2019-06-02 15:35:10 0 ND
->bar 0 ND 1289 2019-06-02
->02 15:39:12
Total users: 3
```

The columns shown for each user are explained in the following table:

<table>
<thead>
<tr>
<th>Column</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SMPP Bound connections</td>
<td>Number of current bound SMPP connections</td>
</tr>
<tr>
<td>SMPP L.A.</td>
<td>SMPP Server Last Activity date &amp; time</td>
</tr>
<tr>
<td>HTTP requests counter</td>
<td>Counter of all http requests done by the user</td>
</tr>
<tr>
<td>HTTP L.A.</td>
<td>HTTP Api Last Activity date &amp; time</td>
</tr>
</tbody>
</table>

Here’s an example of showing `sandra`’s detailed statistics:
This is clearly a more detailed view for user *sandra*, the following table explains the items shown for *sandra*:

```plaintext
jcli : stats --user sandra
#Item                  Type       Value
#bind_count            SMPP Server 26
#submit_sm_count       SMPP Server 1500
#submit_sm_request_count SMPP Server 1506
#unbind_count          SMPP Server 24
#data_sm_count         SMPP Server 0
#last_activity_at      SMPP Server 2019-06-02 15:35:01
#other_submit_error_count SMPP Server 4
#throttling_error_count SMPP Server 2
#bound_connections_count SMPP Server {'bind_transmitter': 1, 'bind_receiver': 1, 'bind_transceiver': 0}
#elink_count           SMPP Server 16
#qos_last_submit_sm_at SMPP Server 2019-06-02 12:31:23
#deliver_sm_count      SMPP Server 1430
#connects_count        HTTP Api 156
#last_activity_at      HTTP Api 2019-06-01 12:12:33
#rate_request_count    HTTP Api 20
#submit_sm_request_count HTTP Api 102
#qos_last_submit_sm_at HTTP Api 2019-05-22 15:56:02
#balance_request_count HTTP Api 16
```
Table 43: Details user statistics view items

<table>
<thead>
<tr>
<th>Item</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>last_activity</td>
<td>SMPP</td>
<td>Date &amp; time of last received PDU from user</td>
</tr>
<tr>
<td>bind_count</td>
<td>SMPP</td>
<td>Binds counter value</td>
</tr>
<tr>
<td>bound_connections</td>
<td>SMPP</td>
<td>Currently bound connections</td>
</tr>
<tr>
<td>submit_sm_count</td>
<td>SMPP</td>
<td>Number of requested SubmitSM (MT messages)</td>
</tr>
<tr>
<td>submit_sm</td>
<td>SMPP</td>
<td>Number of SubmitSM (MT messages) really sent by user</td>
</tr>
<tr>
<td>throttling_error_count</td>
<td>SMPP</td>
<td>Throttling errors received by user</td>
</tr>
<tr>
<td>other_submit_error</td>
<td>SMPP</td>
<td>Any other error received in response of SubmitSM requests</td>
</tr>
<tr>
<td>elink_count</td>
<td>SMPP</td>
<td>Number of enquire_link PDUs sent by user</td>
</tr>
<tr>
<td>deliver_sm_count</td>
<td>SMPP</td>
<td>Number of DeliverSM (MO messages or receipts) received</td>
</tr>
<tr>
<td>data_sm_count</td>
<td>SMPP</td>
<td>Number of DataSM (MO messages or receipts) received</td>
</tr>
<tr>
<td>qos_last_submit_sm_at</td>
<td>SMPP</td>
<td>Date &amp; time of last SubmitSM (MT Message) sent</td>
</tr>
<tr>
<td>unbind_count</td>
<td>SMPP</td>
<td>Unbinds counter value</td>
</tr>
<tr>
<td>qos_last_submit_sm</td>
<td>HTTP</td>
<td>Date &amp; time of last SubmitSM (MT Message sent)</td>
</tr>
<tr>
<td>connects_count</td>
<td>HTTP</td>
<td>HTTP request counter value</td>
</tr>
<tr>
<td>last_activity</td>
<td>HTTP</td>
<td>Date &amp; time of last HTTP request</td>
</tr>
<tr>
<td>submit_sm_request</td>
<td>HTTP</td>
<td>Number of SubmitSM (MT messages) sent</td>
</tr>
<tr>
<td>rate_request</td>
<td>HTTP</td>
<td>Number of rate requests</td>
</tr>
<tr>
<td>balance_request</td>
<td>HTTP</td>
<td>Number of balance requests</td>
</tr>
</tbody>
</table>

SMPP Client connectors statistics

The Stats manager exposes an overall view of all existent smppc connectors as well as a per-smppc information view:

- **stats --smppcs**: Will show an overall view of all existent smppc connectors
- **stats --smppc foo**: Will show detailed information for foo

Here’s an example of showing an overall view where smppc connectors MTN and ORANGE are actives, connector SFONE made no activity at all:

```
jcli : stats --smppcs
#Connector id  Connected at  Bound at    Disconnected at  Submits   Delivers  --QoS errs Other errs
--
```

(continues on next page)
The columns shown for each user are explained in the following table:

<table>
<thead>
<tr>
<th>Column</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bound count</td>
<td>Binds counter value</td>
</tr>
<tr>
<td>Connected at</td>
<td>Last connection date &amp; time</td>
</tr>
<tr>
<td>Bound at</td>
<td>Last successful bind date &amp; time</td>
</tr>
<tr>
<td>Disconnected at</td>
<td>Last disconnection date &amp; time</td>
</tr>
<tr>
<td>Submits</td>
<td>Number of requested SubmitSM PDUs / Sent SubmitSM PDUs</td>
</tr>
<tr>
<td>Delivers</td>
<td>Number of received DeliverSM PDUs / Number of received DataSM PDUs</td>
</tr>
<tr>
<td>QoS errs</td>
<td>Number of rejected SubmitSM PDUs due to throttling limitation</td>
</tr>
<tr>
<td>Other errs</td>
<td>Number of all other rejections of SubmitSM PDUs</td>
</tr>
</tbody>
</table>

Here’s an example of showing MTN’s detailed statistics:

```
jcli : stats --smppc MTN
#Item Value
#bound_at 2019-06-02 15:35:01
#disconnected_count 2
#other_submit_error_count 0
#submit_sm_count 2300
#created_at 2019-06-01 12:29:42
#bound_count 3
#last_received_elink_at 2019-06-01 12:29:42
#elink_count 34
#throttling_error_count 44
#last_sent_elink_at 2019-06-02 15:32:28
#connected_count 3
#connected_at 2019-06-02 15:35:01
#deliver_sm_count 1302
#data_sm_count 0
#submit_sm_request_count 2344
#last_seqNum 1733
#last_seqNum_at 2019-06-02 15:35:01
#last_sent_pdu_at 2019-06-02 15:35:01
#disconnected_at 2019-06-01 10:18:21
#last_received_pdu_at 2019-06-02 15:36:01
#interceptor_count 0
#interceptor_error_count 0
```

This is clearly a more detailed view for connector MTN, the following table explains the items shown for MTN:
Table 45: Details of smppc statistics view items

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>created_at</td>
<td>Connector creation date &amp; time</td>
</tr>
<tr>
<td>last_received_pdu_at</td>
<td>Date &amp; time of last received PDU</td>
</tr>
<tr>
<td>last_sent_pdu_at</td>
<td>Date &amp; time of last sent PDU</td>
</tr>
<tr>
<td>last_received_elink_at</td>
<td>Date &amp; time of last received enquire_link PDU</td>
</tr>
<tr>
<td>last_sent_elink_at</td>
<td>Date &amp; time of last sent enquire_link PDU</td>
</tr>
<tr>
<td>last_seqNum_at</td>
<td>Date &amp; time of last sequence_number claim</td>
</tr>
<tr>
<td>last_seqNum</td>
<td>Value of last claimed sequence_number</td>
</tr>
<tr>
<td>connected_at</td>
<td>Last connection date &amp; time</td>
</tr>
<tr>
<td>bound_at</td>
<td>Last successful bind date &amp; time</td>
</tr>
<tr>
<td>disconnected_at</td>
<td>Last disconnection date &amp; time</td>
</tr>
<tr>
<td>connected_count</td>
<td>connection date &amp; time</td>
</tr>
<tr>
<td>bound_count</td>
<td>Binds counter value</td>
</tr>
<tr>
<td>disconnected_count</td>
<td>disconnection date &amp; time</td>
</tr>
<tr>
<td>submit_sm_request_count</td>
<td>Number of requested SubmitSM (MT messages)</td>
</tr>
<tr>
<td>submit_sm_count</td>
<td>Number of SubmitSM (MT messages) really sent (having ESME_ROK response)</td>
</tr>
<tr>
<td>throttling_error_count</td>
<td>Throttling errors received</td>
</tr>
<tr>
<td>other_submit_error_count</td>
<td>Any other error received in response of SubmitSM requests</td>
</tr>
<tr>
<td>elink_count</td>
<td>Number of enquire_link PDUs sent</td>
</tr>
<tr>
<td>deliver_sm_count</td>
<td>Number of DeliverSM (MO messages or receipts) received</td>
</tr>
<tr>
<td>data_sm_count</td>
<td>Number of DataSM (MO messages or receipts) received</td>
</tr>
<tr>
<td>interceptor_count</td>
<td>Number of successfully intercepted messages (MO)</td>
</tr>
<tr>
<td>interceptor_error_count</td>
<td>Number of failures when intercepting messages (MO)</td>
</tr>
</tbody>
</table>

**SMPP Server API statistics**

The Stats manager exposes collected statistics in SMPP Server API through the following `jCli` command:

- `stats --smppsapi`

Here’s an example of showing the statistics:

```bash
jcli : stats --smppsapi
#Item              Value
#disconnect_count  2
#bound_rx_count    1
#bound_tx_count    0
#other_submit_error_count 0
#bind_rx_count    0
#bind_trx_count    0
#created_at       2019-06-04 02:22:17
#last_received_elink_at  ND
#elink_count    89
#throttling_error_count 1
#submit_sm_count  199
#connected_count  2
#connect_count    16
#bound_trx_count  1
#data_sm_count    2
#submit_sm_request_count 200
#deliver_sm_count 145
#last_sent_pdu_at 2019-06-05 12:12:13
```

(continues on next page)
The following table explains the items shown in the above example:

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>created_at</td>
<td>Connector creation date &amp; time</td>
</tr>
<tr>
<td>last_received_pdu_at</td>
<td>Date &amp; time of last received PDU</td>
</tr>
<tr>
<td>last_sent_pdu_at</td>
<td>Date &amp; time of last sent PDU</td>
</tr>
<tr>
<td>last_received_elink_at</td>
<td>Date &amp; time of last received enquire link PDU</td>
</tr>
<tr>
<td>connected_count</td>
<td>TCP Connection request count</td>
</tr>
<tr>
<td>disconnect_count</td>
<td>Disconnection count</td>
</tr>
<tr>
<td>bind_trx_count</td>
<td>Transceiver bind request count</td>
</tr>
<tr>
<td>bound_trx_count</td>
<td>Actually bound transceiver connections count</td>
</tr>
<tr>
<td>bind_rx_count</td>
<td>Receiver bind request count</td>
</tr>
<tr>
<td>bound_rx_count</td>
<td>Actually bound receiver connections count</td>
</tr>
<tr>
<td>bind_tx_count</td>
<td>Transmitter bind request count</td>
</tr>
<tr>
<td>bound_tx_count</td>
<td>Actually bound transmitter connections count</td>
</tr>
<tr>
<td>submit_sm_request_count</td>
<td>Number of requested SubmitSM (MT messages)</td>
</tr>
<tr>
<td>submit_sm_count</td>
<td>Number of SubmitSM (MT messages) accepted (returned a ESME_ROK response)</td>
</tr>
<tr>
<td>deliver_sm_count</td>
<td>Number of DeliverSM (MO messages or receipts) sent</td>
</tr>
<tr>
<td>data_sm_count</td>
<td>Number of DataSM (MO messages or receipts) sent</td>
</tr>
<tr>
<td>elink_count</td>
<td>Number of enquire_link PDUs received</td>
</tr>
<tr>
<td>throttling_error_count</td>
<td>Throttling errors returned</td>
</tr>
<tr>
<td>other_submit_error_count</td>
<td>Any other error returned in response of SubmitSM requests</td>
</tr>
<tr>
<td>interceptor_count</td>
<td>Number of successfully intercepted messages (MT)</td>
</tr>
<tr>
<td>interceptor_error_count</td>
<td>Failures when intercepting messages (MT)</td>
</tr>
</tbody>
</table>

### HTTP API statistics

The Stats manager exposes collected statistics in HTTP API through the following `jCli` command:

- `stats --httpapi`

Here’s an example of showing the statistics:

```
jcli : stats --httpapi
#Item                  Value
#server_error_count    120
#last_request_at       ND
#throughput_error_count 4
#success_count         14332
#route_error_count     156
#request_count         20126
#auth_error_count      78
#created_at            2019-06-04 02:22:17
#last_success_at       2019-06-05 18:20:29
```
The following table explains the items shown in the above example:

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>created_at</td>
<td>Connector creation date &amp; time</td>
</tr>
<tr>
<td>last_request_at</td>
<td>Date &amp; time of last http request</td>
</tr>
<tr>
<td>last_success_at</td>
<td>Date &amp; time of last successful http request (SMS is accepted for sending)</td>
</tr>
<tr>
<td>request_count</td>
<td>HTTP request count</td>
</tr>
<tr>
<td>success_count</td>
<td>Successful HTTP request count (SMS is accepted for sending)</td>
</tr>
<tr>
<td>auth_error_count</td>
<td>Authentication errors count</td>
</tr>
<tr>
<td>route_error_count</td>
<td>Route not found errors count</td>
</tr>
<tr>
<td>throughput_error_count</td>
<td>Throughput exceeded errors count</td>
</tr>
<tr>
<td>charging_error_count</td>
<td>Charging/Billing errors count</td>
</tr>
<tr>
<td>server_error_count</td>
<td>Unknown server errors count</td>
</tr>
<tr>
<td>interceptor_count</td>
<td>Number of successfully intercepted messages (MT)</td>
</tr>
<tr>
<td>interceptor_error_count</td>
<td>Number of failures when intercepting messages (MT)</td>
</tr>
</tbody>
</table>

### 3.12 Billing

Jasmin comes with a user billing feature that lets you apply rates on message routes, every time a user sends a SMS through a rated route he’ll get charged, once he runs out of credit no more sending will be permitted.

**Important:** New routes created through *MT router manager* are not rated by default, you must *define* the rate of each route in order to enable billing.

**Note:** Billing is applied on all channels (SMPP Server and HTTP API) the same way.

### 3.12.1 Billing quotas

A user can be charged through 2 types of quotas (balance and/or sms_count), if he reaches the limit of one of these quotas no more sending will be permitted, no matter the used channel (SMPP Server or HTTP API).

#### 1. Balance quota

The route rate will be charged on the user balance, let’s get into these use cases for better comprehension:

- When sending one SMS through a route rated 1.2, user’s balance will get decreased by 1.2
- When sending five SMS through a route rated 0.2, user’s balance will get decreased by 1

### Table 47: Details of httpapi statistics view items

<table>
<thead>
<tr>
<th>Item</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>created_at</td>
<td>Connector creation date &amp; time</td>
</tr>
<tr>
<td>last_request_at</td>
<td>Date &amp; time of last http request</td>
</tr>
<tr>
<td>last_success_at</td>
<td>Date &amp; time of last successful http request (SMS is accepted for sending)</td>
</tr>
<tr>
<td>request_count</td>
<td>HTTP request count</td>
</tr>
<tr>
<td>success_count</td>
<td>Successful HTTP request count (SMS is accepted for sending)</td>
</tr>
<tr>
<td>auth_error_count</td>
<td>Authentication errors count</td>
</tr>
<tr>
<td>route_error_count</td>
<td>Route not found errors count</td>
</tr>
<tr>
<td>throughput_error_count</td>
<td>Throughput exceeded errors count</td>
</tr>
<tr>
<td>charging_error_count</td>
<td>Charging/Billing errors count</td>
</tr>
<tr>
<td>server_error_count</td>
<td>Unknown server errors count</td>
</tr>
<tr>
<td>interceptor_count</td>
<td>Number of successfully intercepted messages (MT)</td>
</tr>
<tr>
<td>interceptor_error_count</td>
<td>Number of failures when intercepting messages (MT)</td>
</tr>
</tbody>
</table>
Important: New users created through User manager will have unlimited balance by default, assuming you’ll apply postpaid billing (or no billing at all), user’s balance must be defined in order to enable billing.

Rate unit

You can see that the rates have no unit or currency, this will offer better flexibility for different business cases, you can consider the rates as:

- Local Jasmin currency and keep a rate for converting to real-life currency.
- Real-life currency
- etc ..

In all cases, Jasmin will never manage the rate unit (or currency), all it does is to ensure users are correctly charged by the rates you define.

Asynchronous billing

As explained later, it is important to know that whatever the used protocol, SMS is always sent asynchronously, this means there’s always an acknowledgment to be received for every sent SMS; Jasmin provides an optional adapted billing algorithm which is able to charge the user asynchronously:

1. A defined percentage of the route rate is charged when the user submits the SMS for sending.
2. The rest is charged when the SMS is acknowledged by the next relay, in SMPP protocol, this means receiving SUBMIT_SM_RESP PDU, more details here.

Asynchronous billing is automatically enabled when the user have early_decrement_balance_percent defined (undefined by default), let’s get back to examples for better comprehension, assuming user have early_decrement_balance_percent = 25:

- When sending one SMS through a route rated 1.2:
  - When sending, user’s balance is decreased by 0.3 (1.2 x 25%)
  - When acknowledged, user’s balance is decreased by 0.9 (the rest)
- When sending five SMS through a route rated 0.2:
  - When sending, user’s balance is decreased by 0.25 (5 x 0.2 x 25%)
  - For each acknowledged SMS, user’s balance is decreased by 0.15
  - When all five sent messages are acknowledged, the final charged amount is 0.75 (the rest)

Using asynchronous billing can be helpful in many use cases:

- Charge only when the SMS is acknowledged
- If SMS is not acknowledged for some reason, user can not fill Jasmin’s queues by SMS requests indefinitely, he’ll get out of credits
- etc ..
2. sms_count quota

Simpler than Balance management, sms_count is a counter to be decreased whenever the user submits the SMS for sending, let’s get into these use cases for better comprehension:

- When sending one SMS through a route, user’s sms_count will get decreased by 1
- When sending five SMS through a route, user’s sms_count will get decreased by 5

Note: When defined, sms_count is always decreased no matter the route is rated or not.

Important: New users created through User manager will have unlimited sms_count by default, assuming you’ll apply postpaid billing (or no billing at all), user’s sms_count must be defined in order to enable billing (or limit).

3.12.2 Process flow

The following process flow shows how billing is done through HTTP Api (same process is applied on SMPP Server), it is including all types of billing:

- balance quota billing (ref) including asynchronous billing (ref)
- sms_count quota billing (ref)

Asynchronous billing call flow

When enabled, Asynchronous billing algorithm can charge user every time an acknowledgment is received for each SMS he sent earlier, the following call flow explain the asynchronous billing algorithm:

In the above figure, user is charged early before submitting SMS to SMSC, and the charged later when the SMSC acknowledge back reception of the message, as detailed earlier, the charged amount in early stage is defined by early_decrement_balance_percent set in user profile.

Note: The route rate is expressed on a per-SUBMIT_SM basis, submitting a long SMS will be splitted into multiple submit_sm SMPP PDUs, each one will be charged on user.

The below figure explain how asynchronous billing is handling long content messages, assuming a user is submitting a message containing 400 characters, which will imply sending 3 submit_sm SMPP PDUs:

Asynchronous billing is mainly relying on AMQP broker (like messaging). The AMQP broker is providing a queuing mechanism, through the following illustration you can see how asynchronous billing is done:

When receiving a SUBMIT_SM_RESP PDU, submit_smResp_event() method is called (more details here), it will check if there’s a remaining bill to charge on user and publish it on bill_request.submit_sm_resp.UID (using billing exchange) where UID is the concerned User ID.

RouterPB’s bill_request_submit_sm_resp_callback() is listening on the same topic and it will be fired whenever it consumes a new bill request, as the Router is holding User objects in memory, it will simply update their balances with the bill amount.

Jasmin is doing everything in-memory for performance reasons, including User charging where the balance must be persisted to disk for later synchronization whenever Jasmin is restarted, this is why RouterPB is automatically persisting Users and Groups to disk every persistence_timer_secs seconds as defined in jasmin.cfg file (INI format, located in /etc/jasmin).
Fig. 10: Billing process flow
Fig. 11: Asynchronous billing call flow
Fig. 12: Asynchronous billing call flow for long content messages
Fig. 13: Asynchronous billing AMQP message exchange
Important: Set **persistence_timer_secs** to a reasonable value, keep in mind that every disk-access operation will cost you few performance points, and don’t set it too high as you can loose Users balance data updates.

### 3.13 Messaging flows

Messaging is heavily relying on an AMQP broker using topics to queue messages for routing, delivering and acking back.

The AMQP broker is providing a strong store & forward queuing mechanism, through the following illustration you can see how every messaging component is asynchronously connected to the broker.

![AMQP Messaging flows](image)

Fig. 14: AMQP Messaging flows

Six main actors are messaging through the “messaging” topic, their business logic are explained in the below paragraphs.

#### 3.13.1 SMPPClientManagerPB

This is a *PerspectiveBroker* (PB) responsible of managing SMPP Client connectors (list, add, remove, start, stop, send SMS, etc . . .), we’ll be only covering the latter (Send SMS).

When the **perspective_submit_sm()** is called with a SubmitSm PDU and destination connector ID, it will build an AMQP Content message and publish it to a queue named **submit.sm.CID** where **CID** is the destination connector ID.
Note: perspective_submit_sm() is called from HTTP API and SMPP Server API after they check with RouterPB for the right connector to send a SubmitSM to.

Every SMPP Connector have a consumer waiting for these messages, once published as explained above, it will be consumed by the destination connector’s submit_sm_callback() method (c.f. SMPPClientSMLListener).

3.13.2 DLRLookup

This is a consumer on the dlr.* AMQP route, added in v0.9, it’s main role is DLR map fetching from Redis database and publishing the dlr to the right thrower (http or smpp).

3.13.3 RouterPB

This is another PerspectiveBroker (PB) responsible of routing DeliverSm messages, these are received through the SMPP client connector’s deliver_sm_event_interceptor() method (c.f. SMPPClientSMLlistener) which publish to deliver.sm.CID, the RouterPB main role is to decide whether to route DeliverSm messages to:

- deliver_sm_thrower.smpps: if the message is to be delivered through SMPP Server API.
- deliver_sm_thrower.http: if the message is to be delivered through a HTTP connector.

3.13.4 SMPPClientSMLListener

Every SMPP Client connector have one attached SMPPClientSMLListener instance, it is responsible for handling messages exchanged through the SMPP Client connector using the following event catchers:

deliver_sm_event_interceptor

Every received DeliverSm PDU is published directly to the broker with the following assumptions:

- If it’s a SMS-MO message it will get published as an AMQP Content message to deliver_sm.CID where CID is the source connector ID, this message will be handled by the RouterPB.
- If it’s a delivery receipt and if it were requested when sending the SubmitSm, it will get published as an AMQP Content message to dlr_thrower.http or dlr_thrower.smpps (depends on the used channel for sending initial SubmitSM) for later delivery by DLRThrower’s dlr_throwing_callback() method.

Note: deliver_sm_event_interceptor() will check for interception rules before proceeding to routing, c.f. Interception for more details.

submit_sm_callback

It is a simple consumer of submit.sm.CID where CID is its connector ID, it will send every message received through SMPP connection.
submit_sm_resp_event

It is called for every received SubmitSmResp PDU, will check if the related SubmitSm was requiring a delivery receipt and will publish it (or not) to `dlr_thrower.http` or `dlr_thrower.smpps` (depends on the used channel for sending initial SubmitSM).

Note: There's no actual reason why messages are published to `submit.sm.resp.CID`, this may change in future.

3.13.5 deliverSmThrower

This is will through any received message from `deliver_sm_thrower.http` to its final http connector, c.f. Receiving SMS-MO for details and from `deliver_sm_thrower.smpps` to its final SMPP Server binding.

3.13.6 DLRThrower

This is will through any received delivery receipt from `dlr_thrower.http` to its final http connector, c.f. Receiving DLR for details and from `dlr_thrower.smpps` to its final SMPP Server binding.

3.14 User FAQ

3.14.1 Could not find a version that satisfies the requirement jasmin

Installing Jasmin using pip will through this error:

```
$ sudo pip install python-jasmin
[sudo] password for richard:
Downloading/unpacking jasmin
  Could not find a version that satisfies the requirement jasmin (from versions: 0.˓→6b1, 0.6b10, 0.6b11, 0.6b12, 0.6b13, 0.6b14, 0.6b2, 0.6b3, 0.6b4, 0.6b5, 0.6b6, 0.˓→6b7, 0.6b8, 0.6b9)
Cleaning up...
No distributions matching the version for jasmin
Storing debug log for failure in /home/richard/.pip/pip.log
```

This is common question, since Jasmin is still tagged as a ‘Beta’ version, pip installation must be done with the --pre parameter:

```
$ sudo pip install --pre python-jasmin
...
```

Hint: This is clearly documented in Installation installation steps.

3.14.2 Cannot connect to telnet console after starting Jasmin

According to the installation guide, Jasmin requires running RabbitMQ and Redis servers, when starting it will wait for these servers to go up.

If you already have these requirements, please check jcli and redis-client logs:
Jasmin Documentation, Release 0.10.2

- /var/log/jasmin/redis-client.log
- /var/log/jasmin/jcli.log

Hint: Please check Prerequisites & Dependencies before installing.

3.14.3 Should i expose my SMPP Server & HTTP API to the public internet for remote users?

As a security best practice, place Jasmin instance(s) behind a firewall and apply whitelisting rules to only accept users you already know, a better solution is to get VPN tunnels with your users.

If for some reasons you cannot consider these practices, here’s a simple iptables configuration that can help to prevent Denial-of-service attacks:

```
iptables -I INPUT -p tcp --dport 2775 -m state --state NEW -m recent --set --name --SMPP_CONNECT
iptables -N RULE_SMPP
iptables -I INPUT -p tcp --dport 2775 -m state --state NEW -m recent --update --seconds 60 --hitcount 3 --name SMPP_CONNECT -j RULE_SMPP
iptables -A RULE_SMPP -j LOG --log-prefix 'DROPPED SMPP CONNECT ' --log-level 7
iptables -A RULE_SMPP -j DROP
```

This will drop any SMPP Connection request coming from the same source IP with more than 3 times per minute...

3.14.4 Does Jasmin persist its configuration to disk?

Since everything in Jasmin runs fully in-memory, what will happen if i restart Jasmin or if it crashes for some reason? how can i ensure my configuration (Connectors, Users, Routes, Filters ...) will be reloaded with the same state they were in before Jasmin goes off?

Jasmin is doing everything in-memory for performance reasons, and is automatically persisting newly updated configurations every persistence_timer_secs seconds as defined in jasmin.cfg file.

Important: Set persistence_timer_secs to a reasonable value, keep in mind that every disk-access operation will cost you few performance points, and don’t set it too high as you can loose critical updates such as User balance updates.

3.14.5 When receiving a DLR: Got a DLR for an unknown message id

The following error may appear in messages.log while receiving a receipt (DLR):

```
WARNING 4403 Got a DLR for an unknown message id: 788821
```

This issue can be caused by one of these:

- The receipt is received and it indicates a message id that did not get sent by Jasmin,

- The receipt is received for a message sent by Jasmin, but message id is not recognize, if it’s the case then find below what you can do.
What's happening:

When sending a message (submit_sm) the upstream connector will reply back with a first receipt (submit_sm_resp) where it indicates the message id for further tracking, then it will send back another receipt (deliver_sm or data_sm) with the same message and different delivery state. The problem occurs when the upstream connector returns the same message id but in different encodings.

Solution:

Use the dlr_msgid parameter as shown in SMPP Client connector manager to indicate the encoding strategy of the upstream partner/connector.

3.14.6 How to hide message content in log files for privacy reasons?

Starting from v0.9.28 it is possible to hide the message content in log files, this is done by tweaking the log_privacy parameter in the SMPP Client connector manager and log_privacy in jasmin.cfg and dlrlookupd.cfg.

3.15 Developer FAQ

3.15.1 How to ‘log’ messages in a third party database?

Jasmin runs without a database, everything is in-memory and messages are exchanged through AMQP broker (RabbitMQ), if you need to get these messages you have to consume from the right queues as described in Messaging flows.

Here’s an example:

Thanks to Pedro’s contribution:

More on this:

```python
# Gist from https://gist.github.com/farirat/5701d71bf6e404d17cb4
import cPickle as pickle
from twisted.internet.defer import inlineCallbacks
from twisted.internet import reactor
from twisted.internet.protocol import ClientCreator
from twisted.python import log
from txamqp.protocol import AMQClient
from txamqp.client import TwistedDelegate
```
import txamqp.spec

@inlineCallbacks
def gotConnection(conn, username, password):
    print("Connected to broker.")
    yield conn.authenticate(username, password)

    print("Authenticated. Ready to receive messages")
    chan = yield conn.channel(1)
    yield chan.channel_open()

    yield chan.queue_declare(queue="someQueueName")

    # Bind to submit.sm.* and submit.sm.resp.* routes
    yield chan.queue_bind(queue="someQueueName", exchange="messaging", routing_key='submit.sm.*')
    yield chan.queue_bind(queue="someQueueName", exchange="messaging", routing_key='submit.sm.resp.*')

    yield chan.basic_consume(queue='someQueueName', no_ack=True, consumer_tag="someTag")

    queue = yield conn.queue("someTag")

    # Wait for messages
    # This can be done through a callback ...
    while True:
        msg = yield queue.get()
        props = msg.content.properties
        pdu = pickle.loads(msg.content.body)

        if msg.routing_key[:15] == 'submit.sm.resp.:
            print('SubmitSMResp: status: %s, msgid: %s' % (pdu.status,)
                  props['message-id'])
        elif msg.routing_key[:10] == 'submit.sm.:
            print('SubmitSM: from %s to %s, content: %s, msgid: %s' % (pdu.params['source_addr'],
                                                                      pdu.params['destination_addr'],
                                                                      pdu.params['short_message'],
                                                                      props['message-id'])
        else:
            print('unknown route')

    yield chan.basic_cancel("someTag")
    yield chan.channel_close()
    chan0 = yield conn.channel(0)
    yield chan0.connection_close()
    reactor.stop()

if __name__ == "__main__":
    
    This example will connect to RabbitMQ broker and consume from two route keys:
    - submit.sm.*: All messages sent through SMPP Connectors
    - submit.sm.resp.*: More relevant than SubmitSM because it contains the sending status

(continues on next page)
Note:
- Messages consumed from submit.sm.resp.* are not verbose enough, they contain only message-id and status
- Message content can be obtained from submit.sm.*, the message-id will be the same when consuming from submit.sm.resp.*, it is used for mapping.
- Billing information is contained in messages consumed from submit.sm.*
- This is a proof of concept, saying anyone can consume from any topic in Jasmin's exchange hack a third party business, more information here: http://docs.jasminsms.com/en/latest/messaging/index.html

```python
host = '127.0.0.1'
port = 5672
vhost = '/'
username = 'guest'
password = 'guest'
spec_file = '/etc/jasmin/resource/amqp0-9-1.xml'

spec = txamqp.spec.load(spec_file)

# Connect and authenticate
d = ClientCreator(reactor,
    AMQClient,
    delegate=TwistedDelegate(),
    vhost=vhost,
    spec=spec).connectTCP(host, port)
d.addCallback(gotConnection, username, password)

def whoops(err):
    if reactor.running:
        log.err(err)
        reactor.stop()

d.addErrback(whoops)
reactor.run()
```

### 3.15.2 How to directly access the Perspective Broker API?

Management tasks can be done directly when accessing PerspectiveBroker API, it will be possible to:

- Manage SMPP Client connectors,
- Check status of all connectors,
- Send SMS,
- Manage Users & Groups,
- Manage Routes (MO / MT),
- Access statistics,
- ...

Here’s an example:
An example of scenario with the following actions:
1. Add and start a SMPP Client connector
2. Provision a DefaultRoute to that connector
3. Provision a User

This is a demonstration of using PB (PerspectiveBroker) API to gain control Jasmin.

The jasmin SMS gateway shall be already running and having a pb listening on 8989.

```python
import pickle as pickle
def runScenario():
    try:
        ## First part, SMPP Client connector management
        # Connect to SMPP Client management PB proxy
        proxy_smpp = SMPPClientManagerPBProxy()
        yield proxy_smpp.connect('127.0.0.1', 8989, 'cmadmin', 'cmpwd')

        # Provision SMPPClientManagerPBProxy with a connector and start it
        connector1 = {'id': 'abc', 'username': 'smppclient1',
                      'reconnectOnConnectionFailure': True}
        config1 = SMPPClientConfig(**connector1)
        yield proxy_smpp.add(config1)
        yield proxy_smpp.start('abc')

        ## Second part, User and Routing management
        # Connect to Router PB proxy
        proxy_router = RouterPBProxy()
        yield proxy_router.connect('127.0.0.1', 8988, 'radmin', 'rpwd')

        # Provision RouterPBProxy with MT routes
        yield proxy_router.mroute_add(DefaultRoute(SmppClientConnector('abc')), 0)
        routes = yield proxy_router.mroute_get_all()
        print("Configured routes:
	%s" % pickle.loads(routes))

        # Provisioning user with users
        g1 = Group(1)
        u1 = User(uid = 1, group = g1, username = 'foo', password = 'bar')
        yield proxy_router.group_add(g1)
        yield proxy_router.user_add(u1)
        users = yield proxy_router.user_get_all()
        print("Users: \n\t%s" % pickle.loads(users))
```

(continues on next page)
## Last, tear down

```python
# Stop connector
yield proxy_smpp.stop('abc')
except Exception as e:
    print("ERROR RUNNING SCENARIO: ", e)
finally:
    reactor.stop()
```

runScenario()
reactor.run()

### 3.15.3 Can you provide an example of how to use EvalPyFilter?

Let’s say you need your filter to pass only messages from username `foo`:

```python
if r.outable.user.username == 'foo':
    result = False
else:
    result = True
```

**Note:** Although `UserFilter` is already there to provide this feature, this is just a simple example of using EvalPyFilter.

So your python script will have a `routable` global variable, it is an instance of `RoutableDeliverSm` if you’re playing with a MO Route and it will be an instance of `RoutableSubmitSm` if you’re considering it with a MT Route.

In order to implement your specific filter, you have to know all the attributes these objects are providing.

Now let’s make an advanced example, the below filter will:

- Connect to a database
- Check if the message `destination_address` is in `blacklisted_numbers` table
- Pass only if the `destination_address` is not blacklisted

```python
"""This is an example of using EvalPyFilter with a database interrogation, it is written for demonstration purpose only.
"""

import MySQLdb as mdb

destination_addr = routable.pdu.params['destination_addr']

try:
    con = mdb.connect('localhost', 'jasmin', 'somepassword', 'jasmin_faq');
    cur = con.cursor()
    cur.execute("SELECT COUNT(msisdn) FROM blacklisted_numbers WHERE msisdn = %s" % destination_addr)
    count = cur.fetchone()
    if count[0] == 0:
        # It is not blacklisted, filter will pass
```

(continues on next page)
result = True

except mdb.Error as e:
    # A DB error, filter will block
    # Error can be logged as well ...
    result = False

finally:
    # Filter will block for any other exception / reason
    result = False

### 3.15.4 How to log events inside an EvalPyFilter ?

It is a usual method to get the filter logging directly to the Router’s log file (default is `router.log`), here’s a very simple example of doing it:

```python
import logging

log = logging.getLogger("jasmin-router")

log.debug('Inside evalpy-test.py')
if routable.user.username == 'Evalpyusr2':
    log.info("Routable's username is Evalpyusr2!")
    result = False
else:
    log.info("Routable's username is not Evalpyusr2: %s" % routable.user.username)
    result = True
```

**Note:** More on python logging: [here](#).

### 3.15.5 How to set an EvalPyFilter for a MT Route ?

I have written my *EvalPyFilter*, how can i use it to filter MT messages ?

Using jCli:

First, create your filter:

```bash
jcli : filter -a
Adding a new Filter: (ok: save, ko: exit)
> type evalpyfilter
> pyCode /some/path/advanced_evalpyfilter.py
> fid blacklist_check
> ok
Successfully added Filter [EvalPyFilter] with fid: blacklist_check
```

Second, create a MT Route:

```bash
jcli : mtrouter -a
Adding a new MT Route: (ok: save, ko: exit)
> type StaticMTRoute
jasmin.routing.Routes.StaticMTRoute arguments:
filters, connector, rate
> filters blacklist_check
```

(continues on next page)
> connector smppc(SOME-SMSC)
> rate 0.0
> order 10
> ok
Successfully added MTRoute [StaticMTRoute] with order:10

And you’re done! Test your filter by sending a SMS through Jasmin’s APIs.

### 3.15.6 PDU params keep resetting to connector defaults even after interception?

When sending MT messages through httpapi, some pdu parameters will be reset to connector defaults even if they were manually updated inside an interceptor script, how can Jasmin avoid updating my pdu params?

After updating a pdu parameter, it must be locked so Jasmin will not re-update it again, here’s an example:

```plaintext
# Set pdu param:
routable.pdu.params['sm_default_msg_id'] = 10
# Lock it:
routable.lockPduParam('sm_default_msg_id')
```

**Note:** Locking pdu parameters is only needed when message is pushed from httpapi.
Links

- Jasmin SMS Gateway home page
- Documentation
- Source code
- Travis CI
CHAPTER 5

License

Jasmin is released under the terms of the [Apache License Version 2]. See ‘LICENSE’ file for details.