

API

Our API is running at <https://api.vpsfree.cz>. The API can be used to perform any action that you can do in the web interface. In fact, the web interface running at <https://vpsadmin.vpsfree.cz> uses the API and calls it for every action.

API Documentation

The API documentation, i.e. a list of objects, possible actions as well as input and output parameters can be found at <https://api.vpsfree.cz/v6.0/>.

Even without logging in, you can see a list of all objects, i.e. even those that only administrators can work with. On the top right, you can log in using the same credentials as in vpsAdmin. Afterwards, you will only see the objects, actions and parameters that the user who is currently logged in can work with.

Working with the API

The API is built on the [HaveAPI](#) framework which we have developed. The framework creates a [self-describing](#) API, which means that premade generic clients can be used:

- Ruby - <https://github.com/vpsfreecz/vpsfree-client>
- PHP - <https://github.com/vpsfreecz/haveapi/tree/master/clients/php>
- JavaScript - <https://github.com/vpsfreecz/haveapi/tree/master/clients/js>
- Go - <https://github.com/vpsfreecz/haveapi/tree/master/clients/go>
- The HaveAPI web interface - <https://github.com/vpsfreecz/haveapi-webui>
- A file system based on FUSE - <https://github.com/vpsfreecz/haveapi-fs>

Usage examples can always be found in the `README.md` of each client. In general, the client receives the API URL, then the client downloads the documentation and uses it for setup.

The API is [RESTful](#), so any REST client can be used for simple actions. A description of the custom data transfer protocol that HaveAPI clients abstract can be found in [the documentation](#).

Authentication

There are two authentication methods available. The first and simpler one is HTTP basic. The name and password must be sent along with every API request. This is a good choice for one-off actions. However, if you need to call the API several times or automatically, storing the password on the disk or copying it constantly is not a good idea.

Another method is authentication using tokens. The way this method works is that the client first requests a token to be created, one for which the client needs the name, password and possibly TOTP. As soon as the client receives the token, the name and password can be forgotten since it is

the token that is then used for further authentication.

There can be several types of tokens with different lifetimes:

- fixed - token validity is fixed
- renewable_manual - token validity can be manually extended
- renewable_auto - token validity is extended after every request
- permanent - the token is valid permanently, or until it is deleted

The type of token and time period by which its validity is extended is chosen by the client.

CLI

The [Ruby client](#) also includes a CLI. In order for it to work properly, you need Ruby ≥ 2.0 and Ruby header files, OpenSSL and ncurses (mostly packages with the `-dev` or `-devel` suffix)

If you're using OS X, you first need to install OpenSSL using [Homebrew](#) and only then can you install EventMachine (a gem required by the client).

```
$ brew install openssl
$ sudo gem install eventmachine -- --with-opt-include="/usr/local/opt/openssl/"
```

It can be installed using ruby gems:

```
$ gem install vpsfree-client
```

Installing in Windows 10 Using a Ubuntu Linux Subsystem

Installing Ubuntu (Windows 10 Subsystem for Linux)

1. in Windows 10, enable Developer Mode, let it install
2. in the Programs and Features menu, open Turn Windows Features On or Off, scroll to the very bottom, choose Windows Subsystem for Linux, run the installation and let the computer restart
3. after the restart, run bash in the Start menu as admin
4. create a Unix username and password
5. press the Y key and let the Ubuntu base be installed

Installing Dependencies

```
sudo apt-get install ruby2.0 ruby2.0-dev libssl-dev make g++
```

A Quick & Dirty Fix to Set Ruby2.0 as Default Instead of 1.9

```
sudo rm /usr/bin/ruby /usr/bin/gem /usr/bin/irb /usr/bin/rdoc /usr/bin/erb
sudo ln -s /usr/bin/ruby2.0 /usr/bin/ruby
sudo ln -s /usr/bin/gem2.0 /usr/bin/gem
sudo ln -s /usr/bin/irb2.0 /usr/bin/irb
sudo ln -s /usr/bin/rdoc2.0 /usr/bin/rdoc
sudo ln -s /usr/bin/erb2.0 /usr/bin/erb
sudo gem update --system
sudo gem pristine --all
```

Source: <http://blog.costan.us/2014/04/restoring-ruby-20-on-ubuntu-1404.html>

Installing vpsfree-client

```
sudo gem install vpsfree-client
```

After the installation, `vpsfreectl` should be available in `$PATH`. If not, this can be fixed easily:

```
$ gem env | grep "EXECUTABLE DIRECTORY"
```

This command will display the location of all executables installed using gem. All you need to do is add that folder to `$PATH`, e.g.:

```
$ PATH="$PATH:/home/user/.gem/ruby/2.0.0/bin"
```

Usage

```
$ vpsfreectl --help
Usage: vpsfreectl [options] <resource> <action> [objects ids] [--
[parameters]]
  -u, --api URL                API URL
  -a, --auth METHOD             Authentication method
  --list-versions              List all available API versions
  --list-auth-methods [VERSION]
                               List available authentication methods
  --list-resources [VERSION]   List all resource in API version
  --list-actions [VERSION]     List all resources and actions in API
version
  --version VERSION            Use specified API version
  -c, --columns                Print output in columns
  -H, --no-header              Hide header row
  -L, --list-parameters        List output parameters
  -o, --output PARAMETERS     Parameters to display, separated by a
comma
```

```

-r, --rows Print output in rows
-s, --sort PARAMETER Sort output by parameter
--save Save credentials to config file for
later use
--raw Print raw response as is
--timestamp Display Datetime parameters as
timestamp
--utc Display Datetime parameters in UTC
--localtime Display Datetime parameters in local
timezone
--date-format FORMAT Display Datetime in custom format
-v, --[no-]verbose Run verbosely
--client-version Show client version
--protocol-version Show protocol version
--check-compatibility Check compatibility with API server
-h, --help Show this message

```

Commands:

```

action_state wait <STATE ID> Block until the action is finished
vps remote_console VPS_ID Open VPS remote console
vps migrate_many VPS_ID... Migrate multiple VPSes using a
migration plan
snapshot download [SNAPSHOT_ID] Download a snapshot as an archive or a
stream
snapshot send SNAPSHOT_ID Download a snapshot stream and write it
on stdout
backup dataset [DATASET_ID] FILESYSTEM Backup dataset locally
backup vps [VPS_ID] FILESYSTEM Backup VPS locally
ip_traffic top Live IP traffic monitor

```

Available resources:

```

cluster
cluster_resource
cluster_resource_package
cluster_resource_package.item
dataset
dataset.snapshot
dataset.plan
dataset.property_history
dataset_plan
dns_resolver
environment
environment.config_chain
environment.dataset_plan
host_ip_address
integrity_check
integrity_fact
integrity_object
ip_address
ip_traffic
ip_traffic_monitor

```

```
language
location
mail_log
mail_recipient
mail_template
mail_template.recipient
mail_template.translation
migration_plan
migration_plan.vps_migration
network
network_interface
node
node.status
object_history
os_template
pool
session_token
snapshot_download
system_config
transaction
transaction_chain
user
user.environment_config
user.cluster_resource
user.public_key
user.mail_role_recipient
user.mail_template_recipient
user.state_log
user_cluster_resource_package
user_cluster_resource_package.item
user_namespace
user_namespace_map
user_namespace_map.entry
user_session
vps
vps.state_log
vps.config
vps.feature
vps.mount
vps.outage_window
vps.console_token
vps.status
vps_config
monitored_event
monitored_event.log
outage
outage.entity
outage.handler
outage_update
user_outage
vps_outage
```

```
vps_outage_mount
help_box
news_log
incoming_payment
payment_stats
user_account
user_payment
user_request
user_request.registration
user_request.change
action_state
```

By choosing an authentication method, object or action, help will have new options available:

```
$ vpsfreectl --auth basic --help
$ vpsfreectl vps --help
$ vpsfreectl vps list --help
```

Authentication

HTTP Basic

You can either pass the username and password using the `--username` and `--password` parameters or you can skip the parameters and the program will prompt the user to input the credentials.

```
$ vpsfreectl --auth basic user current
```

Tokens

Authentication using tokens creates a few new options:

```
$ vpsfreectl --auth token --help
...
-a, --auth METHOD           Authentication method
-s, --save                  Save credentials to config file for
later
--user USER                User name
--password PASSWORD        Password
--token TOKEN               Token
--token-lifetime LIFETIME  Token lifetime, defaults to
renewable_auto
--token-interval SECONDS   How long will token be valid in seconds
--new-token                 Request new token
--token-via VIA            Send token as a query parameter or in
HTTP header (query_param, header)
...
```

Again, you don't have to send the username and password as parameters, the program will request them.

One-time token:

```
$ vpsfreectl --auth token user current
```

After finishing, the token is forgotten and next time you will need to request a new one. A token for a use like this makes no sense.

Saving the token:

```
$ vpsfreectl --auth token --save user current
```

The token is saved in the `~/ .haveapi-client.yml` file and automatically loaded upon the next startup.

```
$ vpsfreectl user current
```

However, a token like this expires within 20 minutes and it is necessary to request a new one. It is possible to create a token with a longer validity right away:

```
$ vpsfreectl --auth token --save --token-interval $((24*60*60)) user current  
# 1 day
```

Or a token with a permanent lifetime straight away:

```
$ vpsfreectl --auth token --save --token-lifetime permanent user current
```

Be careful if you're using tokens with an unlimited validity since anybody with access to `~/ .haveapi-client.yml` can access and use the token.

Actions and Parameters

Objects and actions have the same names as they do in the documentation – they're just written in lowercase letters and underscores are used instead of spaces. Every action has its input and output parameters. These can be displayed using the `--help` parameter if you provide the names of both the object and the action.

```
$ vpsfreectl vps list --help  
...  
Action description:  
List VPS  
  
Input parameters:  
  --offset OFFSET      The offset of the first object  
  --limit LIMIT        The number of objects to retrieve  
  --node NODE          Filter by node
```

```

--location LOCATION      Filter by location
--environment ENVIRONMENT  Filter by environment
--os-template OS_TEMPLATE  OS template
--object-state OBJECT_STATE Object state
-h, --help                Show this message

Output parameters:
id
user                      VPS owner
hostname                  VPS hostname
os_template
dns_resolver              DNS resolver the VPS will use
node                      Node VPS will run on
dataset                   Dataset the VPS resides in
created_at
memory                    Minimally 1024, maximally 12288, step
size is 128
swap                      Minimally 0, maximally 12288, step size
is 128
cpu                       Minimally 1, maximally 8, step size is
1
maintenance_lock
maintenance_lock_reason
object_state
expiration_date           A date after which the state will
progress
running
process_count
used_memory               in MB
used_disk                  in MB
...

```

You can filter VPSs by server, location, environment, distro, state and limit the number of displayed items or pages.

Action parameters are separated from client parameters by two dashes - -. The following command displays the first three VPSs:

```
$ vpsfreectl vps list -- --limit 3
```

If, for example, you want to filter by location, you first have to display a list of locations:

```
$ vpsfreectl location list
ID  Label
3   Praha
4   Brno
5   Playground
```

Now let's display the VPSs found in the "Praha" (Prague) location:


```
$ vpsfreectl vps list -- --location 3
```

Output Formatting

The output can be either formatted into columns or rows. Under default settings, columns are used to display a group of objects and lines are used for a single object. You can choose the format using the `-c` option, `--columns` for columns and `--rows` for rows.

An example of the output formatted in columns (in this case the `--columns` option is unnecessary – it will be chosen automatically since the output contains several objects):

```
$ vpsfreectl vps list --columns
ID  Label
3   Praha
4   Brno
5   Playground
```

An example of the output formatted into rows:

```
$ vpsfreectl location list --rows
  ID: 3
Label: Praha

  ID: 4
Label: Brno

  ID: 5
Label: Playground
```

When used in scripts, the column formatting could be problematic due to the header with parameter names. You can disable it using the `-H`, `--no-header` option so that it won't be displayed.

Choosing the Parameters to Display

The `-o`, `--output` option is used to set what output parameters of the action and in which order they will be displayed. Parameter names are separated by a comma.

```
$ vpsfreectl vps list -o id,hostname,node,os_template
  VPS id: 4710
  Hostname: vps
    Node: node7.prg (#108)
  OS template: CentOS 7 (#43)
```

Sorting

The `-s`, `--sort` option can be used to sort the output in ascending order according to a specific parameter (on the client's side).

```
$ vpsfreectl os_template list --sort label
ID Label Info Supported
42 Arch Linux [TEST] - 0
24 CentOS 6 - 1
43 CentOS 7 - 1
20 Debian 6 - 1
31 Debian 7 - 1
38 Debian 7 [TEST] - 0
46 Debian 8 - 1
33 Fedora 20 - 1
40 Fedora 22 - 1
14 Gentoo 13.0 - 1
37 Gentoo [TEST] - 0
32 OpenSUSE 12.3 - 1
26 Scientific Linux 6.6 - 1
45 Scientific Linux 7 - 0
30 Ubuntu 12.04 - 1
35 Ubuntu 14.04 - 1
39 Ubuntu 14.04 [TEST] - 0
47 openSUSE 13.2 [TEST] - 0
```

Date and Time Format

The client includes several options that are used to choose the date and time format if an action returns a parameter of the type `Datetime`.

- `--utc`
- `--localtime`
- `--timestamp`
- `--date-format FORMAT` - format according to [Time#strftime](#)

Updates

In order to make use of new features, the client needs to be updated from time to time. This is done using the following command:

```
$ gem update vpsfree-client
```

Then you can remove the old version:

```
$ gem cleanup vpsfree-client
```

This command only removes the old versions of the `vpsfree-client` gem, but its dependencies remain. In order to remove all old gems, use the following command:

```
$ gem cleanup -n # prints which gems would be deleted
$ gem cleanup # deletes the gems
```

File system

haveapi-fs is a file system based on FUSE, i.e. it makes it possible to mount the API as a file system from userspace. Objects, actions and their parameters can be browsed like folders and files in any program. The file system is installed the same way as a CLI, it just has a different name:

```
$ gem install haveapi-fs
```

Usage

The usage of haveapi-fs is described in detail in [README.md](#). This is just a brief description.

```
$ haveapi-fs https://api.vpsfree.cz /mnt/api.vpsfree.cz
Username: mylogin
Password:

$ cd /mnt/api.vpsfree.cz
$ ls -l
auth_token
cluster
cluster_resource
dataset
dataset_plan
dns_resolver
environment
help.html
help.man
help.md
help.txt
ip_address
language
location
mail_template
migration_plan
node
object_history
os_template
snapshot_download
transaction
transaction_chain
user
user_session
vps
vps_config
```

Each folder contains the files `help.{html,txt,md,man}`, which describe what the current folder contains.

```
$ cat vps/5685/hostname
my-vps

$ echo better-hostname > vps/5685/hostname
$ echo 1 > vps/5685/save
$ cat vps/5685/actions/update/status
1
$ cat vps/5685/hostname
better-hostname
```

The example demonstrates that individual object attributes can simply be changed by writing into a file. The save action can be called by writing a one, or it can be run as an executable file.

In order to get clearer creation/modification of objects, you can use the YAML files `create.yml` or `update.yml`. These files contain parameters in the form of a hash and after saving and closing the file, the corresponding action is performed.

This way, you can perform any operation in the API.

Usage Examples

The following scripts demonstrate ways you can use the API. These scripts can be run from anywhere - manually, from cron, etc.

Although these examples are still valid, the CLI client already contains [commands](#) which make downloading backups even easier.

Daily Downloads of VPS Backups

```
#!/usr/bin/env ruby
# Downloading the last (most recent) backup of all VPSs.
require 'vpsfree/client'

api = VpsFree::Client.new
api.authenticate(:token, token: 'PUT YOUR TOKEN HERE')

api.dataset.list(role: :hypervisor).each do |ds|
  last_snapshot = ds.snapshot.list.last

  # This action may take up to several hours
  dl = api.snapshot_download.create(snapshot: last_snapshot.id)

  unless dl.api_response.ok?
    warn "#{ds.name}@#{last_snapshot.created_at}:
    #{dl.api_response.message}"
    next
  end
end
```

```
# The file is ready for download
puts "Downloading #{id} to #{dl.file_name} (#{dl.size / 1024} GB)"
`wget #{dl.url}`

# Finally, delete the file from the server
dl.delete
end

puts "Done"
```

Daily NAS Backups with a Weekly History

```
#!/usr/bin/env ruby
# Daily NAS snapshotting with a 7-day history
require 'vpsfree/client'

api = VpsFree::Client.new
api.authenticate(:token, token: 'PUT YOUR TOKEN HERE')

api.dataset.list(role: :primary).each do |ds|
  # Creating a new snapshot
  ds.snapshot.create

  # Deleting older snapshots
  t = Time.now - 7 * 24 * 60 * 60
  snapshots = ds.snapshot.list(meta: {count: true})
  deleted = 0
  snapshots.each do |snap|
    # Keep at least 7 snapshots
    break if snapshots.total_count - deleted < 7
    # Deleting redundant snapshots older than 7 days
    if snap.created_at < t
      puts "Delete #{ds.name}@#{snap.created_at}"
      snap.delete
      deleted += 1
    end
  end
end
end
```

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<https://kb.vpsfree.org/> - **Knowledge Base**

Permanent link:

<https://kb.vpsfree.org/manuals/vps/api>

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