RASH Documentation

Release 0.1.3

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CHAPTER 1

What is this?

Shell history is useful. But it can be more useful if it logs more data points. For example, if you forget which *make* target to run for certain project, you'd want to search shell commands that are run in particular directory. Wouldn't it be nice if you can do this?:

```
rash search --cwd . "make*"
```

RASH records many data points and they are stored in SQLite database. Here is a list of recorded information [1].

1. Current directory (`$PWD`).
2. Exit code (`$?`)
3. Exit code of pipes (`$PIPESTATUS` / `$pipestatus`)
4. The time command is started and terminated.
5. Environment variable (`$PATH`, `$SHELL`, `$TERM`, `$HOST`, etc.)
6. Real terminal. `$TERM` is used to fake programs. RASH can detect if you are in tmux, byobu, screen, gnome-terminal, etc.
7. Session information. If you go back and forth in some terminals, RASH does not loose in which sequence you ran the commands in which terminal.

RASH also has interactive search interface. You can see the search result as you type. If you are using zsh, you can execute the result instantaneously.

[1] If you are curious, checkout `rash record --help`.

CHAPTER 2

Install

RASH is written in Python. The easiest way to install is to use *pip* (or *easy_install*, if you wish). You may need *sudo* for installing it in a system directory.:

```
pip install rash
pip install percol  # if you want interactive search feature
```

If you use virtualenv to install RASH, you may have trouble when switching environment. In that case, it is safe to make an alias to full path of the rash executable.:

```
alias rash="PATH/TO/VIRTUALENV/bin/rash"
```

If you want to use developmental version, just clone the git repository and add the following in your RC file.:

```
alias rash="PATH/TO/RASH/rash_cli.py"
```

CHAPTER 3

Setup

Add this to your *.zshrc* or *.bashrc*. That's all.:

```
eval "$(rash init)"
```

For more information, see `rash init --help`.

CHAPTER 4

Usage

4.1 Searching history – `rash search`

After your shell history is accumulated by RASH, it's the time to make use of the history! See `rash search --help` for detailed information. Here is some examples.

Forget how to run automated test for the current project?:

```
rash search --cwd . --include-pattern "*test*" --include-pattern "tox*"
```

All git commands you ran in one week.:

```
rash search --time-after "1 week ago" "git*"
```

Some intensive task you ran in the current project that succeeded and took longer than 30 minutes.:

```
rash search --cwd-under . --include-exit-code 0 --duration-longer-than 30m
```

What did I do after *cd*-ing to some directory?:

```
rash search --after-context 5 "cd SOME-DIRECTORY"
```

All failed commands you ran at this directory.:

```
rash search --cwd . --exclude-exit-code 0
```

Count number of commands you ran in one day:

```
rash search --limit -1 --no-unique --time-after "1 day ago" | wc -l
```

4.2 Showing detailed information – `rash show`

If you give `--with-command-id` to `rash search` command, it prints out ID number for each command history.:

```
% rash search --with-command-id --limit 5 "*git*"
 359  git log
1253  git help clone
1677  git help diff
1678  git diff --word-diff
1780  git merge
```

You can see all information associated with a command with `rash show` command:

```
rash show 1677
```

4.3 Interactive search – `rash isearch`

Searching history using command line is not fast. You can use `rash isearch` command to interactively search history and see the result immediately as you type.

You need percol to use this feature.

Zsh user can setup a keybind like this:

```
# Type `Ctrl-x r` to start isearch
bindkey "^Xr" rash-zle-isearch
```

Defining this function in your rc file can be handy and it is usable for bash users.:

```
rash-isearch(){
  eval "$(rash isearch)"
}
```

CHAPTER 5

Dependency

RASH tested against Python 2.6, 2.7 and 3.2. However, as some dependencies are not Python 3 compatible, some functionality is missing when used with Python 3.

Python modules:

- watchdog [1]
- parsedatetime [2]

5.1 Platforms

UNIX-like systems RASH is tested in Linux and I am using in Linux. It should work in other UNIX-like systems like BSD.

Mac OS I guess it works. Not tested.

MS Windows Probably no one wants to use a shell tool in windows, but I try to avoid stuff that is platform specific. Only the daemon launcher will not work on Windows but there is several ways to avoid using it. See `rash init --help`.

5.2 Shells

RASH currently supports zsh and bash.

[1] These modules do not support Python 3. They are not installed in if you use Python 3 and related functionality is disabled.

CHAPTER 6

Design principle

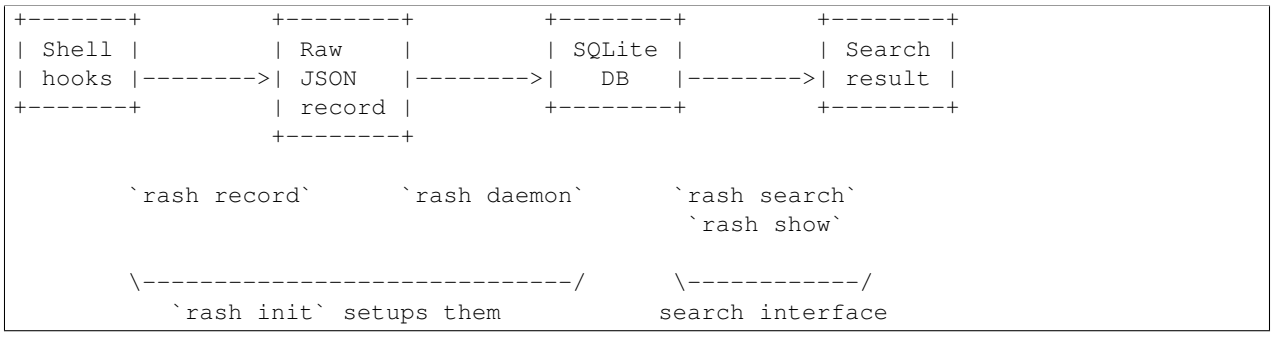
RASH's design is focused on sparseness. There are several stages of data transformation until you see the search result, and they are done by separated processes.

First, `rash record` command dumps shell history in raw JSON record. This part of program does not touches to DB to make process very fast. As there is no complex transformation in this command, probably in the future version it is better to rewrite it entirely in shell function.

Second, `rash daemon` runs in background and watches the directory to store JSON record. When JSON record arrives, it insert the data into database.

`rash record` and `rash daemon` are setup by simple shell snippet `eval $(rash init)`.

Finally, you can search through command history using search interface such as *rash search*. This search is very fast as you don't read all JSON records in separated files.



CHAPTER 7

License

RASH is licensed under GPL v3. See COPYING for details.

CHAPTER 8

More resources

8.1 RASH command line interface

8.1.1 Search interface

rash search

```
usage: rash search [-h] [--match-pattern GLOB] [--include-pattern GLOB]
                   [--exclude-pattern GLOB] [--match-regexp REGEXP]
                   [--include-regexp REGEXP] [--exclude-regexp REGEXP]
                   [--cwd DIR] [--cwd-glob GLOB] [--cwd-under DIR]
                   [--time-after TIME] [--time-before TIME]
                   [--duration-longer-than DURATION]
                   [--duration-less-than DURATION] [--include-exit-code CODE]
                   [--exclude-exit-code CODE] [--include-session ID]
                   [--exclude-session ID] [--match-environ-pattern ENV ENV]
                   [--include-environ-pattern ENV ENV]
                   [--exclude-environ-pattern ENV ENV]
                   [--match-environ-regexp ENV ENV]
                   [--include-environ-regexp ENV ENV]
                   [--exclude-environ-regexp ENV ENV] [--limit NUM]
                   [--no-unique] [--ignore-case] [--reverse]
                   [--sort-by {code,count,program_count,start,stop,success_count,success_ratio,time}]
                   [--sort-by-cwd-distance DIR] [--after-context NUM]
                   [--before-context NUM] [--context NUM]
                   [--context-type {time,session}] [--with-command-id]
                   [--with-session-id] [--format FORMAT] [-f]
                   [--output OUTPUT]
                   [pattern [pattern ...]]

Search command history.

optional arguments:
  -h, --help            show this help message and exit

Filter:
  pattern               Glob pattern to match substring of command. It is as
                        same as --match-pattern/-m except that the pattern is
                        going to be wrapped by `*`s. If you want to use strict
                        glob pattern that matches to entire command, use
                        --match-pattern/-m. (default: None)
```

```
  --match-pattern GLOB, -m GLOB
                        Only commands that match to this glob pattern are
                        listed. Unlike --include-pattern/-g, applying this
                        option multiple times does AND match. (default: [])
  --include-pattern GLOB, -g GLOB
                        glob patterns that matches to commands to include.
                        (default: [])
  --exclude-pattern GLOB, -G GLOB
                        glob patterns that matches to commands to exclude.
                        (default: [])
  --match-regexp REGEXP, -M REGEXP
                        Only commands that matches to this grep pattern are
                        listed. Unlike --include-regexp/-e, applying this
                        option multiple times does AND match. (default: [])
  --include-regexp REGEXP, -e REGEXP
                        Regular expression patterns that matches to commands
                        to include. (default: [])
  --exclude-regexp REGEXP, -E REGEXP
                        Regular expression patterns that matches to commands
                        to exclude. (default: [])
  --cwd DIR, -d DIR     The working directory at the time when the command was
                        run. When given several times, items that match to one
                        of the directory are included in the result. (default:
                        [])
  --cwd-glob GLOB, -D GLOB
                        Same as --cwd but it accepts glob expression.
                        (default: [])
  --cwd-under DIR, -u DIR
                        Same as --cwd but include all subdirectories.
                        (default: [])
  --time-after TIME, -t TIME
                        commands run after the given time (default: None)
  --time-before TIME, -T TIME
                        commands run before the given time (default: None)
  --duration-longer-than DURATION, -S DURATION
                        commands that takes longer than the given time
                        (default: None)
  --duration-less-than DURATION, -s DURATION
                        commands that takes less than the given time (default:
                        None)
  --include-exit-code CODE, -x CODE
                        include command which finished with given exit code.
                        (default: [])
  --exclude-exit-code CODE, -X CODE
                        exclude command which finished with given exit code.
                        (default: [])
  --include-session ID, -n ID
                        include command which is issued in given session.
                        (default: [])
  --exclude-session ID, -N ID
                        exclude command which is issued in given session.
                        (default: [])
  --match-environ-pattern ENV ENV
                        select command which associated with environment
                        variable that matches to given glob pattern. (default:
                        [])
  --include-environ-pattern ENV ENV, -v ENV ENV
                        include command which associated with environment
```

```
                        variable that matches to given glob pattern. (default:
                        [])
  --exclude-environ-pattern ENV ENV, -V ENV ENV
                        exclude command which associated with environment
                        variable that matches to given glob pattern. (default:
                        [])
  --match-environ-regexp ENV ENV
                        select command which associated with environment
                        variable that matches to given glob pattern. (default:
                        [])
  --include-environ-regexp ENV ENV, -w ENV ENV
                        include command which associated with environment
                        variable that matches to given glob pattern. (default:
                        [])
  --exclude-environ-regexp ENV ENV, -W ENV ENV
                        exclude command which associated with environment
                        variable that matches to given glob pattern. (default:
                        [])
  --limit NUM, -l NUM   maximum number of history to show. -1 means no limit.
                        (default: 10)
  --no-unique, -a       Include all duplicates. (default: True)
  --ignore-case, -i     Do case insensitive search. (default: False)

Sorter:
  --reverse, -r         Reverse order of the result. By default, most recent
                        commands are shown. (default: False)
  --sort-by {code,count,program_count,start,stop,success_count,success_ratio,time}
                        Sort keys `count`: number of the time command is
                        executed; `success_count`: number of the time command
                        is succeeded; `program_count`: number of the time
                        *program* is used; `start`(=`time`): the time command
                        is executed; `stop`: the time command is finished;
                        `code`: exit code of the command; Note that --sort-
                        by=count cannot be used with --no-unique. If you don't
                        give anything, it defaults to `count`. However, if you
                        give this option at least once, the default is ignored
                        (i.e., the result is *not* sorted by `count` unless
                        you give it explicitly.). (default: [])
  --sort-by-cwd-distance DIR, -y DIR
                        Sort by distance of recorded cwd fron DIR. Commands
                        run at DIR are listed first, then commands run at one
                        level down or one level up directories, and then two
                        level down/up, and so on. (default: None)

Modifier:
  --after-context NUM, -A NUM
                        Print NUM commands executed after matching commands.
                        See also --context option. (default: None)
  --before-context NUM, -B NUM
                        Print NUM commands executed before matching commands.
                        See also --context option. (default: None)
  --context NUM, -C NUM
                        Print NUM commands executed before and after matching
                        commands. When this option is given --no-unique is
                        implied and --sort-by is ignored. (default: None)
  --context-type {time,session}
                        `session`: commands executed in the same shell
                        session; `time`: commands executed around the same
```

```
                        time; (default: time)

Formatter:
  --with-command-id     Print command ID number. When this is set, --format
                        option has no effect. If --with-session-id is also
                        specified, session ID comes at the first column then
                        command ID comes the next column. (default: False)
  --with-session-id     Print session ID number. When this is set, --format
                        option has no effect. See also: --with-command-id
                        (default: False)
  --format FORMAT       Python string formatter. Available keys: command,
                        exit_code, pipestatus (a list), start, stop, cwd,
                        command_history_id, session_history_id. See also:
                        http://docs.python.org/library/string.html#format-
                        string-syntax (default: {command}\n)
  -f                    Set formatting detail. This can be given multiple
                        times to make more detailed output. For example,
                        giving it once equivalent to passing --with-command-id
                        and one more -f means adding --with-session-id.
                        (default: 0)

Misc:
  --output OUTPUT       Output file to write the results in. Default is
                        stdout. (default: -)
```

rash show

```
usage: rash show [-h] command_history_id [command_history_id ...]

Show detailed command history by its ID.

positional arguments:
  command_history_id  Integer ID of command history.

optional arguments:
  -h, --help          show this help message and exit
```

rash isearch

```
usage: rash isearch [-h] [--query QUERY] [--query-template QUERY_TEMPLATE]
                    [--caret CARET]
                    [base_query [base_query ...]]

Interactive history search that updated as you type.

The query for this program is the same as the one for
``rash search`` command.

You need percol_ to use this command.

_percol: https://github.com/mooz/percol

If you use zsh, you can setup a keybind like this to quickly
launch iserch and execute the result.::
```

```
  # Type `Ctrl-x r` to start isearch
  bindkey "^Xr" rash-zle-isearch

If you like command or you are not using zsh, you can add
something like the following in your rc file to start and
execute the chosen command.

  rash-isearch(){
    eval "$(rash isearch)"
  }

To pass long and complex query, give them after "--",
like this.::

  rash isearch -- \
    --cwd . \
    --exclude-pattern "*rash *" \
    --include-pattern "*test*" \
    --include-pattern "tox*" \
    --include-pattern "make *test*"

positional arguments:
  base_query            The part of query that is not shown in UI and is
                        impossible to rewrite in this session. Useful for
                        putting long and complex query. (default: None)

optional arguments:
  -h, --help            show this help message and exit
  --query QUERY, -q QUERY
                        default query (default: None)
  --query-template QUERY_TEMPLATE
                        Transform default query using Python string format.
                        (default: None)
  --caret CARET         caret position (default: None)
```

8.1.2 System setup interface

rash init

```
usage: rash init [-h] [--shell SHELL] [--no-daemon]
                 [--daemon-opt DAEMON_OPTIONS]
                 [--daemon-outfile DAEMON_OUTFILE]

Configure your shell.

Add the following line in your shell RC file and then you are
ready to go::

  eval $(rash init)

To check if your shell is supported, simply run::

  rash init --no-daemon

If you want to specify shell other than $SHELL, you can give
--shell option::
```

```
  eval $(rash init --shell zsh)

By default, this command also starts daemon in background to
automatically index shell history records.  To not start daemon,
use --no-daemon option like this::

  eval $(rash init --no-daemon)

To see the other methods to launch the daemon process, see
``rash daemon --help``.

optional arguments:
  -h, --help            show this help message and exit
  --shell SHELL         name of shell you are using. directory before the last
                        / is discarded. It defaults to $SHELL. (default:
                        /bin/bash)
  --no-daemon           Do not start daemon. By default, daemon is started if
                        there is no already running daemon. (default: False)
  --daemon-opt DAEMON_OPTIONS
                        Add options given to daemon. See "rash daemon --help"
                        for available options. It can be specified many times.
                        Note that --no-error is always passed to the daemon
                        command. (default: [])
  --daemon-outfile DAEMON_OUTFILE
                        Path to redirect STDOUT and STDERR of daemon process.
                        This is mostly for debugging. (default: /dev/null)
```

rash daemon

```
usage: rash daemon [-h] [--no-error] [--restart] [--record-path RECORD_PATH]
                   [--keep-json] [--check-duplicate] [--use-polling]
                   [--log-level {CRITICAL,ERROR,WARNING,INFO,DEBUG}]

Run RASH index daemon.

This daemon watches the directory ``~/.config/rash/data/record``
and translate the JSON files dumped by ``record`` command into
sqlite3 DB at ``~/.config/rash/data/db.sqlite``.

``rash init`` will start RASH automatically by default.
But there are alternative ways to start daemon.

If you want to organize background process in one place such
as supervisord_, it is good to add `--restart` option to force
stop other daemon process if you accidentally started it in
other place.  Here is an example of supervisord_ setup::

  [program:rash-daemon]
  command=rash daemon --restart

.. _supervisord: http://supervisord.org/

Alternatively, you can call ``rash index`` in cron job to
avoid using daemon.  It is useful if you want to use RASH
on NFS, as it looks like watchdog does not work on NFS.::
```

```
  # Refresh RASH DB every 10 minutes
  */10 * * * * rash index

optional arguments:
  -h, --help            show this help message and exit
  --no-error            Do nothing if a daemon is already running. (default:
                        False)
  --restart             Kill already running daemon process if exist.
                        (default: False)
  --record-path RECORD_PATH
                        specify the directory that has JSON records. (default:
                        None)
  --keep-json           Do not remove old JSON files. It turns on --check-
                        duplicate. (default: False)
  --check-duplicate     do not store already existing history in DB. (default:
                        False)
  --use-polling         Use polling instead of system specific notification.
                        This is useful, for example, when your $HOME is on NFS
                        where inotify does not work. (default: False)
  --log-level {CRITICAL,ERROR,WARNING,INFO,DEBUG}
                        logging level. (default: None)
```

rash locate

```
usage: rash locate [-h] [--no-newline] [--output OUTPUT]
                   {base,config,db,daemon_pid,daemon_log}

Print location of RASH related file.

positional arguments:
  {base,config,db,daemon_pid,daemon_log}
                        Name of file to show the path (e.g., config).

optional arguments:
  -h, --help            show this help message and exit
  --no-newline, -n      do not output the trailing newline. (default: False)
  --output OUTPUT       Output file to write the results in. Default is
                        stdout. (default: -)
```

rash version

```
usage: rash version [-h]

Print version number.

optional arguments:
  -h, --help  show this help message and exit
```

8.1.3 Low level commands

rash record

```
usage: rash record [-h] [--record-type {command,init,exit}]
                   [--command COMMAND] [--cwd CWD] [--exit-code EXIT_CODE]
                   [--pipestatus PIPESTATUS [PIPESTATUS ...]] [--start START]
                   [--stop STOP] [--session-id SESSION_ID]
                   [--print-session-id]

Record shell history.

optional arguments:
  -h, --help            show this help message and exit
  --record-type {command,init,exit}
                        type of record to store. (default: command)
  --command COMMAND     command that was ran. (default: None)
  --cwd CWD             Like $PWD, but callee can set it to consider command
                        that changes directory (e.g., cd). (default: None)
  --exit-code EXIT_CODE
                        exit code $? of the command. (default: None)
  --pipestatus PIPESTATUS [PIPESTATUS ...]
                        $pipestatus (zsh) / $PIPESTATUS (bash) (default: None)
  --start START         the time COMMAND is started. (default: None)
  --stop STOP           the time COMMAND is finished. (default: None)
  --session-id SESSION_ID
                        RASH session ID generated by --print-session-id. This
                        option should be used with `command` or `exit`
                        RECORD_TYPE. (default: None)
  --print-session-id    print generated session ID to stdout. This option
                        should be used with `init` RECORD_TYPE. (default:
                        False)
```

rash index

```
usage: rash index [-h] [--keep-json] [--check-duplicate] [record_path]

Convert raw JSON records into sqlite3 DB.

Normally RASH launches a daemon that takes care of indexing.
See ``rash daemon --help``.

positional arguments:
  record_path        specify the directory that has JSON records. (default:
                     None)

optional arguments:
  -h, --help         show this help message and exit
  --keep-json        Do not remove old JSON files. It turns on --check-
                     duplicate. (default: False)
  --check-duplicate  do not store already existing history in DB. (default:
                     False)
```

8.1.4 ZSH functions

rash-zle-isearch

To setup `Ctrl-x r` to start *rash isearch*, add this to your `.zshrc`:

```
bindkey "^Xr" rash-zle-isearch
```

8.2 RASH configuration

class `rash.config.`**Configuration**
RASH configuration interface.

If you define an object named `config` in the *configuration file*, it is going to be loaded by RASH. `config` must be an instance of *Configuration*.

configuration file In unix-like systems, it's `~/.config/rash/config.py` or different place if you set `XDG_CONFIG_HOME`. In Mac OS, it's `~/Library/Application Support/RASH/config.py`. Use `rash locate config` to locate the exact place.

Example:

```
>>> from rash.config import Configuration
>>> config = Configuration()
>>> config.isearch.query = '-u .'
```

Here is a list of configuration variables you can set:

Configuration variables	
config.record.environ	Environment variables to record.
config.search.alias	Search query alias.
config.search.kwds_adapter	Transform keyword arguments.
config.isearch.query	Default isearch query.
config.isearch.query_template	Transform default query.
config.isearch.base_query	Default isearch base query.

class `rash.config.`**RecordConfig**
Recording configuration.

environ = None
Environment variables to record.

Each key (str) represent record type (init/exit/command). Each value (list of str) is a list of environment variables to record.

Example usage:

```
>>> config = Configuration()
>>> config.record.environ['command'] += ['VIRTUAL_ENV', 'PYTHONPATH']
```

class `rash.config.`**SearchConfig**
Search configuration.

alias = None
Search query alias.

It must be a dict-like object that maps a str to a list of str when "expanding" search query.

Example:

```
>>> config = Configuration()
>>> config.search.alias['test'] = \
...     ["--exclude-pattern", "*rash *", "--include-pattern", "*test*"]
```

then,:

```
rash search test
```

is equivalent to:

```
rash search --exclude-pattern "*rash *" --include-pattern "*test*"
```

kwds_adapter = None

A function to transform keyword arguments.

This function takes a dictionary from command line argument parser and can modify the dictionary to do whatever you want to do with it. It is much more lower-level and powerful than *alias*. This function must return the modified, or possibly new dictionary.

Example definition that does the same effect as the example in *alias*:

```
>>> def adapter(kwds):
...     if 'test' in kwds.get('pattern', []):
...         kwds['pattern'] = [p for p in kwds['pattern']
...                            if p != 'test']
...         kwds['exclude_pattern'].append("*rash *")
...         kwds['include_pattern'].append("*test*")
...     return kwds
...
>>> config = Configuration()
>>> config.search.kwds_adapter = adapter
```

class rash.config.**ISearchConfig**

Configure how `rash isearch` is started.

See also *SearchConfig*. Once isearch UI is started, *SearchConfig* controls how search query is interpreted. For example, aliases defined in *SearchConfig* can be used in isearch.

query = None

Set default value (str) for `--query` option.

If you want to start isearch with the query `-d .` (only list the command executed at this directory), use the following configuration:

```
>>> config = Configuration()
>>> config.isearch.query = '-d . '
```

As `rash-zle-isearch` passes the current line content to `--query` which override this setting, you need to use *query_template* instead if you want to configure the default query.

query_template = None

Transform default query using Python string format.

The string format should have only one field `{0}`. The query given by `-query` or the one specified by *query* fills that filed. Default value is do-nothing template `'{0}'`.

```
>>> config = Configuration()
>>> config.isearch.query_template = '-d . {0}'
```

base_query = None

Set default value (list of str) for `--base-query` option.

8.3 Tips

8.3.1 Define Zsh ZLE widget

You can use the ZLE widget *rash-zle-isearch* loaded by *rash init* to define your own modified widget. It takes arguments and passes them to *rash isearch* directly. Here is a recipe for "Do What I Mean" search:

```
rash-zle-dwim(){
    rash-zle-isearch --query-template "-x 0 -d . @ {0} "
}
zle -N rash-zle-dwim
bindkey "^Xs" rash-zle-dwim
```

In the *configuration file*, you should define an alias called `@` like this (see also *`config.search.alias`*):

```
config.search.alias['@'] = [...]  # some complex query
```

8.3.2 Using RASH in old version of zsh

RASH depends on `precmd_functions` / `preexec_functions` hooks in zsh. In old version zsh doesn't have it. However, you can use RASH by adding this in your `.zshrc`.

```
precmd(){
    for f in $precmd_functions
    do
        "$f"
    done
}

preexec(){
    for f in $preexec_functions
    do
        "$f"
    done
}
```

- genindex
- modindex
- search

r

A

B

C

E

I

K

Q

R

S

X