
VNCDoTool Documentation

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Marc Sibson

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1.1 Quick Start

To use vncdotool you will need a VNC server. Most virtualization products include one, or use RealVNC, TightVNC or clone your Desktop using x11vnc.

Once, you have a server running you can install vncdotool from pypi:

```
pip install vncdotool
```

and then send a message to the vncserver with:

```
vncdo -s vncserveraddress type "hello world"
```

You can also take a screen capture with:

```
vncdo -s vncservername capture screen.png
```

More documentation can be found on [Read the Docs](#).

1.2 Feedback

Comments, suggestions and patches are welcome and appreciated. They can be sent to via [GitHub](#), vncdotool@googlegroups.com or sibson+vncdotool@gmail.com.

If you are reporting a bug or issue please include the version of both vncdotool and the VNC server you are using it with.

1.3 Acknowledgements

Thanks to Chris Liechti, techtonik and Todd Whiteman for developing the RFB and DES implementations used by vncdotool. Also, to the [TigerVNC](#) project for creating a community focus RFB specification document

CHAPTER 2

Installation

vncdotool is available on [PyPI](#), so in most cases you should be able to simply run:

```
pip install vncdotool
```

vncdotool relies on a number of libraries, the two major ones are [PIL](#), the Python Imaging Library and [Twisted](#), an asynchronous networking library. While vncdotool should work with any recent version of these libraries sometimes things break. If you are having issues getting things to work you can try using a stable set of libraries and if you aren't already using it, and you should be, use a [virtualenv](#):

```
pip install virtualenv
virtualenv venv-vncdotool
# XXX requirements.txt from vncdotool source tree
pip install -r requirements.txt
pip install -e .
```

2.1 Windows

If you are not familiar with Python, the most reliable way to install vncdotool is to use binary packages. Currently, (Oct 2013) PIL only provides 32bit binary packages for Windows, so you will need to install a 32bit python.

1. Download and install python-2.7.5.exe from the [Python Downloads](#) website
2. Open up Powershell, and paste in the following:

```
[Environment]::SetEnvironmentVariable("Path", "$env:Path;C:\Python27\;  
↪C:\Python27\Scripts\","User")
```

3. Restart your Windows Machine
4. Upon Restart, go to the [Twisted Downloads](#) and get and install 32bit Twisted, Twisted-13.1.0.win32-py2.7.exe
5. Download and install PIL-1.1.7.win32-py2.7.exe, from [PIL Downloads](#).
6. Download ez_setup.py and get_pip.py and save them to your *Python/Scripts* folder, C:\Python27\Scripts

7. Open up Powershell and type the following:

```
pip install pip --upgrade
pip install distribute
pip install setuptools --upgrade
pip install Twisted --upgrade
pip install vncdotool < -- Finally install vncdotool
```

8. At a Powershell prompt:

```
vncdo.exe --server som.eip.add.res type "Hello World"
```

9. If Hello World shows up on the remote machine that has a VNC server running then its time to celebrate. Otherwise, first check you can connect from your local machine to the remote using a normal GUI VNC Client. Once you get the normal GUI client working try vncdotool again and if you still have problems contact sibson+vncdotool@gmail.com.

3.1 Basic Usage

Once installed you can use the `vncdo tool` command to send key-presses. Alphanumerics are straightforward just specify the character. For other keys longer names are used:

```
> vncdo key a
> vncdo key 5
> vncdo key .
> vncdo key enter
> vncdo key shift-a
> vncdo key ctrl-C
> vncdo key ctrl-alt-del
```

To type longer strings when entering data or commands you can use the `type c` command, which does not support special characters:

```
> vncdo type "hello world"
```

You can control the mouse pointer with `move` and `click` commands. NOTE, you should almost always issue a `move` before a `click`, as in:

```
> vncdo move 100 100 click 1
```

The following would seem to be equivalent but would actually click at (0, 0). This occurs due to how click events are encoded by VNC, meaning you need to initialise the position of the mouse.:

```
> vncdo move 100 100
> vncdo click 1
```

If you have the Python Imaging Library ([Pillow](#)) installed you can also make screen captures of the session:

```
> vncdo capture screenshot.png
```

With [Pillow](#) installed, you can wait for the screen to match a known image:

```
> vncdo expect somescreen.png 0
```

Putting it all together you can specify multiple actions on a single command line. You could automate a login with the following:

```
> vncdo type username key enter expect password_prompt.png  
> vncdo type password move 100 150 click 1 expect welcome_screen.png
```

Sometimes you only care about a portion of the screen, in which case you can use `rcapture` and `reexpect`. For instance, if your login window appears at `x=100, y=200` and is 400 pixels wide by 250 high you could do:

```
> vncdo rcapture region.png 100 200 400 250  
> vncdo reexpect region.png 100 200 0
```

3.2 Running Scripts

For more complex automation you can read commands from `stdin` or a file. The file format is simply a collection of actions:

```
> echo "type hello" | vncdo -
```

Or if you had a file called `login.vdo` with the following content:

```
# select the name text box, enter your name and submit  
move 100 100 click 1 type "my name" key tab key enter  
  
# grab the result  
capture screenshot.png
```

You could run it with the following command:

```
> vncdo login.vdo
```

3.3 Creating Scripts

While you can create scripts by hand it can often be a time consuming process. To make the process easier `vncdotool` provides a log mode that allows a user to record a VNC session to a script which is playable by `vncdo`. `vnclog` act as a man-in-the-middle to record the VNC commands you issue with a client. So you will have your `vnclog` connect to your server and your viewer connect to `vnclog`

vncviewer —> vnclog —> vncserver

For best results be sure to set your `vncviewer` client to use the `RAW` encoding. Others encoding may work but are not fully supported at this time.

The quickest way to get started is to run:

```
> vnclog --viewer vncviewer keylog.vdo
```

For more control you can launch the viewer separately but be sure to connect to the correct ports:

```
> vnclog keylog.vdo
> vncviewer localhost:2 # do something and then exit viewer
> vncdo keylog.vdo
```

By running with `--forever` vnclog will create a new file for every client connection and record each clients activity. This can be useful for quickly recording a number of testcases.:

```
> vnclog --forever --listen 6000 /tmp
> vncviewer localhost::6000
# do some stuff then exit and start new session
> vncviewer localhost::6000
# do some other stuff
> ls /tmp/*.vdo
```

Embedding in Python Applications

`vncdotool` is built with the `Twisted` framework, as such it best integrates with other Twisted Applications. Rewriting your application to use Twisted may not be an option, so `vncdotool` provides a compatibility layer. It uses a separate thread to run the Twisted reactor and communicates with the main program using a thread-safe Queue.

To use the synchronous API you can do the following:

```
from vncdotool import api
client = api.connect('vnchost:display', password=None)
```

You can then call any of the methods available on `vncdotool.client.VNCDoToolClient` and they will block until completion. For example:

```
client.captureScreen('screenshot.png')
client.keyPress('enter')
client.expectScreen('login_success.png', maxrms=10)
```

It is possible to set a per-client timeout in seconds to prevent calls from blocking indefinitely.

```
client.timeout = 10
try:
    client.captureScreen('screenshot.png')
except TimeoutError:
    print('Timeout when capturing screen')
```

In case of too many timeout errors, it is recommended to reset the client connection via the `disconnect` and `connect` methods.

The `vncdotool.client.VNCDoToolClient` supports the context manager protocol.

```
with api.connect('vnchost:display') as client:
    client.captureScreen('screenshot.png')
```

The synchronous API can be used to automate the starting of a Virtual Machine or other application:

```
vmtool.start('myvirtualmachine.img')
client.connect('vmaddress::5950')
client.expectScreen('booted.png')
for k in 'username':
    client.keyPress(k)
client.keyPress('enter')
for k in 'password':
    client.keyPress(k)
client.keyPress('enter')
client.expectScreen('loggedin.png')
client.disconnect()

# continue with your testing session or other work
```


CHAPTER 5

Command Reference

5.1 click BUTTON

5.2 capture FILENAME.PNG

5.3 drag X Y

5.4 expect FILENAME.PNG FUZZ

5.5 key KEY

5.6 keydown KEY

5.7 keyup KEY

5.8 move X Y

5.9 mousedown BUTTON

5.10 mousemove X Y

5.11 mouseup BUTTON

5.12 pause SECONDS

5.13 rcapture FILENAME.PNG X Y W H

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5.14 reexpect FILENAME.PNG X Y FUZZ

6.1 1.0.0 (2020-04-10)

- add ZRLE encoding, thanks Adrian Weiler
- drop python2 support
- fix mouseDrag behaviour, thanks Samir Aguiar

6.2 0.13.0 (2019-11-21)

- new flag `--incremental-refreshes`, increased compatibility of capture, thanks Amir Rossert
- exit non-zero and print to stderr for unknown commands, thanks Amir Rossert

6.3 0.12.1 (2018-12-06)

- bugfix `expectRegion` to use cropped images for compare, thanks Michael Fürnschuß
- direct support for building RPMs, thanks Plamen Dimitrov

6.4 0.12.0 (2018-04-07)

- connect via UNIX sockets, thanks Matteo Cafasso
- bugfix, XTightVNC initial connection, thanks Antti Kervinen

6.5 0.11.2 (2017-09-24)

- fix version metadata, thanks Kevin Gottsman

6.6 0.11.1 (2017-07-23)

- add `api.client.disconnect()`
- fix python2.x compatibility, thanks Ostrosablin Vitaly

6.7 0.11.0 (2017-06-09)

- enable `PSEUDO_DESKTOP_SIZE_ENCODING` by default to allow desktop resizing, thanks rebasegod
- python 3.0 support, thanks jamtwister
- added `pastefile` command, thanks Rogan Dawes
- debian packaging improvements, thanks Alexander Kläser
- fix `loggingproxy`, thanks Matthias Weckbecker

6.8 0.10.0 (2016-03-03)

- drop official 2.6 support, it'll probably work for a while still
- use `frombytes` rather than `fromstring` for compatibility with PIL
- `vnclog` works with password protected servers using `-password-required`
- exit more reliably after an error
- use incremental `frameBufferUpdateRequests`, appears to be compatible with more servers
- include basic version negotiation with servers, thanks Ezra Bühler

6.9 0.9.0 (2015-05-08)

- add special keys `[~!@#$$%^&*( )_+{ }|:~<>?] to -force-caps`, for servers that don't handle them, Tyler Oderkirk, Aragats Amirkhanyan
- improve `vnclog` performance with `TCP_NODELAY`, Ian Britten
- by default pause 10ms between sending commands, better compatability with servers
- better handle screen resizing, Daniel Stelter-Gliese
- API, fix deadlocks due to threaded init of PIL, thanks Antti Kervinen
- API, support password protected server, thanks Antti Kervinen
- API, able to connect to multiple servers, Daniel Stelter-Gliese
- drop official support for py2.4 and py2.5
- use Pillow rather than PIL

Thanks to Jan Sedlák, Daniel Stelter-Gliese, Antti Kervinen, Anatoly Techtonik, Tyler Oderkirk and Aragats Amirkhanyan for helping make this release possible

6.10 0.8.0 (2013-08-06)

- improved documentation using sphinx
- regional capture and expect that operate on a portion of the display
- `-force-caps`, better compatibility when sending UPPERCASE to servers
- `-timeout`, exit with an error after a given number of seconds
- experimental synchronous API for easier intergration with non-Twisted apps

6.11 0.3.0 (2012-12-22)

- main program renamed to `vnedo`, `vncdotool` continues an alias for now
- use `host:display`, `host::port` syntax like other vnc tools, removed `-d`
- `read/play` commands from stdin or file
- `vnclg`, creates scripts from captured interactive sessions
- better control over mouse in screen captures with `-nocursor` and `-localcursor`
- `mousemove`, `sleep` command aliases to match `xdotool`
- `keyup/keydown` commands for more control over keypresses
- send `SetEncodings` on connect, thanks Matias Suarez for fix
- debian packaging
- type “Hello World” now preserves capitalization
- basic compatibility with VNC 4.0 servers, found in some KVMs
- improved `frameUpdate` handling
- `-warp` to replay script faster than real-time
- `-delay`, insert a delay between sending commands

6.12 0.2.0 (2012-08-07)

- add `pause`, `mouseup`, `mousedown`, `drag` commands
- only require Twisted 11.1.0, so we can have py2.4 support
- **bugfixes, thanks Christopher Holm for reporting**
 - `vncdotool type -something` now works
 - no longer silently fail for unsupported image formats

6.13 0.1.1 (2011-05-18)

- add PIL to requires
- fix bug where incorrect mouse button is sent

6.14 0.1.0 (2011-03-03)

- first release
- commands: press, type, move, click, capture, expect

CHAPTER 7

Contributing

Code and Issue tracking is provided by [Github](#). There is also a mailing list setup via [Google Groups](#).

8.1 client Module

Twisted based VNC client protocol and factory

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exception `vncdotool.client.AuthenticationError`

Bases: `exceptions.Exception`

VNC Server requires Authentication

class `vncdotool.client.VMWareClient`

Bases: `vncdotool.client.VNCDoToolClient`

dataReceived (*data*)

class `vncdotool.client.VMWareFactory`

Bases: `vncdotool.client.VNCDoToolFactory`

protocol

alias of `VMWareClient`

class `vncdotool.client.VNCDoToolClient`

Bases: `vncdotool.rfb.RFBClient`

SPECIAL_KEYS_US = `'~!@#$%^&*()_+{}|: "<>?'`

bell ()

buttons = 0

captureRegion (*filename, x, y, w, h, incremental=0*)

Save a region of the current display to filename

captureScreen (*filename, incremental=0*)

Save the current display to filename

cmask = **None**

commitUpdate (*rectangles*)

connectionMade ()

copy_text (*text*)

cursor = **None**

deferred = **None**

drawCursor ()

encoding = 0

expectRegion (*filename, x, y, maxrms=0*)
Wait until a portion of the screen matches the target image
The region compared is defined by the box (x, y), (x + image.width, y + image.height)

expectScreen (*filename, maxrms=0*)
Wait until the display matches a target image
filename: an image file to read and compare against maxrms: the maximum root mean square between histograms of the
screen and target image

image_mode = 'RGBX'

keyDown (*key*)

keyPress (*key*)
Send a key press to the server
key: string: either [a-z] or a from KEYMAP

keyUp (*key*)

mouseDown (*button*)
Send a mouse button down at the last set position
button: int: [1-n]

mouseDrag (*x, y, step=1*)
Move the mouse point to position (x, y) in increments of step

mouseMove (*x, y*)
Move the mouse pointer to position (x, y)

mousePress (*button*)
Send a mouse click at the last set position
button: int: [1-n]

mouseUp (*button*)
Send mouse button released at the last set position
button: int: [1-n]

paste (*message*)

pause (*duration*)

refreshScreen (*incremental=0*)

screen = **None**

```
setImageMode ()  
    Extracts color ordering and 24 vs. 32 bpp info out of the pixel format information  
updateCursor (x, y, width, height, image, mask)  
updateDesktopSize (width, height)  
updateRectangle (x, y, width, height, data)  
vncConnectionMade ()  
vncRequestPassword ()  
x = 0  
y = 0  
class vncdotool.client.VNCDotoolFactory  
    Bases: vncdotool.rfb.RFBFactory  
clientConnectionFailed (connector, reason)  
clientConnectionLost (connector, reason)  
clientConnectionMade (protocol)  
force_caps = False  
nocursor = False  
password = None  
protocol  
    alias of VNCDotoolClient  
pseudocursor = False  
pseudodesktop = True  
shared = True  
vncdotool.client.factory_connect (factory, host, port, family)
```


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