

# Sakis3G invocation

## From Sakis3G wiki

**Notice:** Not all pages of Wiki are reviewed yet for being current with version 0.2.0e, and might still describe 0.2.0d. Excuse me for the inconvenience. Issue will be fixed in the upcoming days.



This wiki is supposed to hold all information required for letting someone use Sakis3G script. Feel free to register and contribute to this effort.

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This page will, more or less, match man page of latest Sakis3G script version, describing the various ways to use it through command line. Changes on this page will be reflected on the man page of next version.

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## Synopsis

```
sakis3g [actors] [switches] [variables]
sakis3g disassemble destination
sakis3g getfile file
sakis3g ls
sakis3g usb_modeswitch [options]
sakis3g man [ sakis3g | sakis3g.conf | usb_modeswitch ]
sakis3g version
sakis3g help
```

## Description

Sakis3G script is built around some fundamental requirements:

1. As less as possible disk size requirements: latest version weights 210KB (214619 bytes).
2. As few as possible third-party dependencies: Nothing more than you should need if manually setting up.
3. As fast as possible installation procedure: There is no installation, download and make it executable.
4. As clean as possible operation: No files are installed/modified on your disk.
5. No configuration is required: No need for configuring wvdial, pppd, udev, hal or usb\_modeswitch.
6. As good as possible user experience: "sakis3g connect" or "sakis3g disconnect", or no arguments at all for a simple UI to appear.

This script comes to fill in the gap of no/partial support to some distributions for using USB modems, or to work around the "clumsy way" others do. While major distributions will gradually find their way into reliably, and in a unified way, support these devices, this script will end-up as a lightweight replacement to NetworkManager/ModemManager bundle, or to gnome-ppp/wvdial bundle, or to kppp for small footprint distributions.

Ultimate goal of Sakis3G script is to provide Linux ([/web/20121126005643/http://www.kernel.org/](http://www.kernel.org/)) users with a solution, for utilizing 3G/UMTS/GPRS modems and connections, easier than any other operating system's users are supplied with. Just because it is possible. And it is not just possible, it's easy enough for a shell script to achieve it!

## Command line

When invoking Sakis3G script from command line, you can use either:

1. Actors and chains scheme,
2. or a "special form" invocation method.

Actors and chains scheme allows using as arguments:

1. Actors which assemble chains,
2. Switches, and
3. Variables

## Actors and chains

### Actors

Each **actor** refers to a specific action Sakis3G script should execute. Many programs provide a similar functionality, allowing to execute a specific action by explicitly defining it through command line. When no **actor** is defined in command line, behavior depends upon selected UI. As a general rule, when using an interactive UI, menu actor is implied leading to *Main Menu* appearing.

### Common actors

connect, start

Attempts to establish a data connection with operator.

reconnect, restart

Drops current data connection and, using same connection settings, connects again. Useful when data connection seems *stalled* (it is still up but no traffic occurs).

disconnect, stop


Drops all currently running P-t-P connections.

switchonly

Only switches USB modem.

recompile

- Displays information about current connection.
- report  
Generates a report for providing feedback.
- desktop  
Creates a shortcut for Sakis3G script on your desktop.
- helper  
Enables *Helper mode* for script to occupy a slot in notification area.

 **Note:** You may find a list of all available actors below.

See also: Examples

## Chains

Sakis3G script allows defining more than one **actors**, which altogether form a **Chain**.

- An **actor** may be referenced twice or more within a **chain**, leading into being executed an equivalent count of times.
- Whenever an **actor** is terminated (successfully or not), it sets its result code accordingly.
- If result code is not **0** (zero), which denotes success, or if no other **actor** is specified in **chain**, then:
  - Sakis3G script itself terminates, returning result code previously set.
- If result code equals to **0** (zero), next **actor** in **chain** is executed.

See also: Examples

## Special actors


In order to allow more sophisticated **chains** there are some *special actors* available. *Special actors* never display errors or notifications, allowing to avoid expected error messages:

- connected  
Returns **0** (zero) if currently connected.
- disconnected  
Returns **0** (zero) if not currently connected.
- plugged  
Returns **0** (zero) when a USB modem is currently plugged.
- unplugged  
Returns **0** (zero) when no USB modem is currently plugged.
- switched  
Returns **0** (zero) when a USB modem is currently plugged, and no switchable modem is detected.
- switchable  
Returns **0** (zero) when a switchable modem is detected.
- wait, sleep  
Waits for one second and then unconditionally returns **0** (zero).

See also: Examples

## Operators


In order to allow even more sophisticated **chains**, *special actors* imitating what we usually call *unary operators*, are also offered:

 **Note:** Keep in mind that while "*not connected*" is equal to "*disconnected*", you should be cautious when using "*not*" operator and avoid making false assumptions. As an example, "*not switched*" is not (always) equivalent to "*switchable*", and vice versa.

See also: Examples

## Special forms

*Special forms* refer to invocation methods of Sakis3G script which do not fall under the actors and chains concept. Executing or not a *special form*, depends on first command line argument. Remaining arguments (if any) are then considered arguments to that special form.

 **Note:** Using variables, switches and actors, when first argument refers to a *special form*, is completely useless.

disassemble directory

Extracts Sakis3G embedded package within destination directory and exits.

getfile file

Extracts file from Sakis3G embedded package and displays it on standard output.

- Relative path of file is also supported if able to uniquely identify file within package.
- Wildcard characters are not supported.
- File should exist within Sakis3G embedded package.

ls

Displays contents of Sakis3G embedded package and exits.

- No further arguments exist, allowing output to be filtered.

usb\_modeswitch [options]

Provides direct access to the embedded Usb-ModeSwitch binary.

- Any subsequent command line arguments are passed to Usb-ModeSwitch.
- Consult *usb\_modeswitch(1)* for a detailed list of acceptable arguments.

man [ sakis3g | sakis3g.conf | usb\_modeswitch ]

Result depends on argument following man keyword:

Argument	Destination	Description
No argument	<i>sakis3g(1)</i>	Displays <u>man page</u> of Sakis3G script.
sakis3g		
sakis3g.conf	<i>sakis3g.conf(5)</i>	Displays <u>man page</u> of Sakis3G configuration.
usb_modeswitch	<i>usb_modeswitch(1)</i>	Displays <u>man page</u> of embedded Usb-ModeSwitch version.

version

Displays Sakis3G script version and exits.

- --version is also recognized as an equivalent form.



help

Displays a minimal help page and exists.

See also: Examples

## Result codes

Sakis3G script properly sets result code upon exit. These result codes may, or may not, be applicable when using a **special form**.

Code	Description
0	No error occurred, or Connected. [ status actor ]
1	Failed to become root through sudo, or Unexpected internal error.
2	Reserved.
3	No method for acquiring root privileges.
4	Required utility not found within PATH.   <b>Note:</b> Displayed on terminal only.
5	Sakis3G itself, not found within PATH.   <b>Note:</b> Displayed on terminal only.
6	Not connected, or unable to detect if connected. [ status actor ]
7	Unable to locate/enumerate connected USB devices.
8	Error while setting up modem.
9	Failed to unload existing driver.
10	Failed to locate appropriate driver for use with USB modem.
11	Failed to load appropriate driver for USB modem.
12	Wrong PIN. Aborting to prevent SIM LOCK.
13	Modem is unable to register a network.
95	Failed to connect (wvdial or pppd failed to connect).
98	User interaction required or user requested to terminate.
99	Unknown error.

## Actor Reference

Actor	Synonyms	Type	Description
<b>about</b>		Normal	Displays copyright information about Sakis3G script.
<b>clicked</b>		Normal	When creating a desktop shortcut, this <b>actor</b> is by default placed as argument. It initiates <b>menu</b> actor, unless selected UI is interactive terminal or terminal, in which case it initiates <b>toggle</b> actor. You can later modify desktop shortcut, to explicitly call an <b>actor</b> of your taste instead.
<b>connect</b>	start	Normal	Attempts to establish a data connection with operator, calling <b>prepare</b> actor if necessary.

<b>disconnected</b>		Special	Returns <b>0</b> (zero) if not currently connected.
<b>helper</b>		Normal	Forces Sakis3G script to enter Helper mode. This <b>actor</b> prevents the rest of the <b>chain</b> from ever being executed.
<b>ignore</b>		Operator	Unconditionally sets result code of next <b>actor</b> , within <b>chain</b> , equal to <b>0</b> (zero), forcing <b>chain</b> to continue regardless of result.
<b>info</b>		Normal	Displays information about currently established connection. Fails if invoked while not connected.
<b>menu</b>		Normal	Displays <i>Main Menu</i> of Sakis3G script. Returns: <ul style="list-style-type: none"> <li>▪ <b>0</b> (zero) if user selected <i>Cancel</i> , or</li> <li>▪ <b>98</b> if user selected <i>Exit</i>, thus terminating execution of <b>chain</b>.</li> </ul>
<b>modem</b>	select	Normal	Executes device selection procedure. Returns <b>0</b> (zero) if a modem was selected. <ul style="list-style-type: none"> <li>▪ This <b>actor</b> does not perform any setup operation.</li> <li>▪ Using this <b>actor</b> as the last one, within a <b>chain</b>, is pointless.</li> </ul>
<b>moremenu</b>	more menumore	Normal	Displays <i>More actions menu</i> of Sakis3G script. Returns: <ul style="list-style-type: none"> <li>▪ <b>0</b> (zero) if user selected <i>Cancel</i> , or</li> <li>▪ <b>98</b> if user selected <i>Exit</i>, thus terminating execution of <b>chain</b>.</li> </ul>
<b>not</b>		Operator	Reverses result code of next <b>actor</b> , within <b>chain</b> .
<b>plugged</b>		Special	Returns <b>0</b> (zero) when a USB modem is currently plugged.
<b>prepare</b>	init	Normal	It attempts to PIN unlock modem, register network and update HAL. Calls <b>setup</b> actor if required.
<b>recompile</b>		Normal	Attempts to recompile embedded Usb-ModeSwitch binary for you.
<b>reconnect</b>	restart	Normal	Attempts to drop current connection (if any), and then attempts to connect again.
<b>report</b>		Normal	Generates a report for providing feedback. Fails if invoked while not connected.
<b>setup</b>		Normal	Attempts to load required kernel module and create appropriate tty node (if not created already), calling <b>switchonly</b> actor if required.
<b>state</b>		Normal	Provided for convenience. Suggests variable values and switches that could help you repeat result of previously executed <b>actor(s)</b> , by avoiding to answer as many questions as possible. Always returns <b>0</b> (zero).
<b>status</b>		Normal	Displays information about current connection status. Returns: <ul style="list-style-type: none"> <li>▪ <b>0</b> (zero) if currently connected.</li> <li>▪ <b>6</b> if not currently connected.</li> </ul>
<b>switchable</b>		Special	Returns <b>0</b> (zero) if a switchable USB modem is currently plugged. <ul style="list-style-type: none"> <li>▪ Result of this <b>actor</b> may be wrong if device is one of those that keep the same USB IDs, even after been mode switched.</li> </ul>
<b>switched</b>		Special	Returns <b>0</b> (zero) if at least one USB modem is currently plugged, and no switchable USB modem is detected. <ul style="list-style-type: none"> <li>▪ Result of this <b>actor</b> may be wrong if device is one of those that keep the same USB IDs, even after been mode switched.</li> </ul>
<b>switchonly</b>		Normal	Attempts to only switch selected USB modem, calling <b>modem</b> actor if necessary.
<b>toggle</b>		Normal	Attempts to toggle current connection status: <ul style="list-style-type: none"> <li>▪ Attempts to disconnect if currently connected, or</li> <li>▪ attempts to connect if not connected</li> </ul>
<b>udevrule</b>		Normal	Provided for convenience. Suggests a udev rule file, that could be used, for repeating results of previously executed <b>actor(s)</b> , immediately upon physical connection of USB modem. Always returns <b>0</b> (zero).
<b>unplugged</b>		Special	Returns <b>0</b> (zero) if no USB modem is currently plugged.

## Examples

**Example #1:** Extract source of Sakis3G script within `/usr/src` folder:

```
# sakis3g disassemble /usr/src
# ls -ld /usr/src/sakis3g-*
drwxr-x--- 2 sakis sakis 4096 2010-04-14 06:04 sakis3g-0.2.0
#
```

**Example #2:** Determine status according to result code:

```
#!/bin/sh
/usr/bin/sakis3g silent status
ret=$?
if [ "${ret}" -eq "0" ]; then
    echo "Connected."
elif [ "${ret}" -eq "6" ]; then
    /usr/bin/sakis3g silent plugged
    ret=$?
    if [ "${ret}" -eq "0" ]; then
        echo "Not connected."
    else
        echo "No modem plugged."
    fi
else
    echo "Error ${ret} occurred." >> /dev/stderr
fi
```

**Example #3:** Extract source of embedded Usb-ModeSwitch version and compile a binary for your own use:

```
$ sakis3g getfile usb_modeswitch.h > usb_modeswitch.h
$ sakis3g getfile usb_modeswitch.c > usb_modeswitch.c
$ gcc -Wall -lusb -o "usb_modeswitch" "usb_modeswitch.c"
```

**Example #4:** Check version of embedded Usb-ModeSwitch binary.

```
$ sakis3g usb_modeswitch --version
```

**Example #5:** Directly use embedded Usb-ModeSwitch binary to switch a ZTE device:

```
$ sakis3g usb_modeswitch -v 19d2 -p 2000 -M "5553424312345678200000080000c85010118010101010000000000"
```

**Example #6:** Display man page of embedded Usb-ModeSwitch version:

```
$ sakis3g man usb_modeswitch
```

**Example #7:** Display Sakis3G script [man page](#):

```
$ sakis3g man
```

**Example #8:** `info` actor will only be executed if `connect` actor succeeded into establishing data connection:

```
$ sakis3g connect info
```

**Example #9:** On this example, `connect` actor will never be executed!

- If **disconnect** actor failed (e.g. you did not provide it with root password), **chain** will anyway stop.
- If **disconnect** actor succeeded, then **info** actor will anyway fail, since no active connection exists.

**Example #10:** Executing **switchonly** actor while no switchable device exists, results into error "*No switchable modem found*" being displayed. Using this example, you avoid seeing the error message, by aborting **chain** before **switchonly** actor being executed:

```
$ sakis3g switchable switchonly
```

**Example #11:** Re-implementing **reconnect** actor:

```
$ sakis3g ignore disconnect connect
```

**Example #12:** Re-implementing **toggle** actor:

```
$ sakis3g connected disconnect || sakis3g disconnected connect
```



**Note:** Using this example, instead of **toggle** actor, is a waste of cpu-cycles.

**Example #13:** Implementing a more clever *reconnect* like behavior. This may be useful when your operator sometimes drops connection after a while:

```
$ sakis3g ignore disconnect connect wait wait wait wait not connected connect
```

**Example #14:** A native language statement:

```
$ sakis3g If not connected anywhere, then connect somewhere.
```

- *"If"*: Unrecognized, ignored.
- *"not"*: **not** operator reversing next **actor**.
- *"connected"*: **connected** special actor.
- *"anywhere,"*: Additional unrecognized text, in order to be able to use comma ",". Using it next to *"connected"* would lead into *"connected,"* being parsed which would be ignored as unrecognized.
- *"then"*: Unrecognized, ignored.
- *"connect"*: **connect** actor.
- *"somewhere."*: Additional unrecognized text, in order to be able to use dot ".". Using it next to *"connect"* would lead into *"connect."* being parsed which would be ignored as unrecognized.

**Example #15:** Exercising our manners:

```
$ sakis3g Can you please connect for me?
```

- *"Can"*, *"you"*: Unrecognized, ignored.
- *"please"*: A synonym of *--voodoo* switch.
- *"connect"*: **connect** actor.
- *"for"*, *"me?"*: Additional unrecognized text, in order to be able to use question mark "?". Using it next to *"connect"* would lead into *"connect?"* being parsed which would be ignored as unrecognized.

## Known bugs



- Either disable verbose messages (`--noverbose` switch), or
  - install and use "zenity" (`--zenity` switch), or
  - use a text-mode UI through "konsole" (`--konsole` switch).
2. Connecting with an operator using CDMA is not yet possible.
  3. If OSD messages output method is `osd_cat/xosd` and font defined by `XOSDFONT` configuration variable does not exist, nothing appears on X screen. Use "`xfontsel`" or "`xlsfonts`" utilities to construct/locate a valid font string for your system.
  4. If you connect using Sakis3G script and then disconnect and connect back by using other software, script may incorrectly report status of connection according to information from previous connection.
  5. Erroneous messages may appear when **invoking script** using only non-recognized arguments.

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