Wireless Network Setup for Linux Clients

This guide has the purpose to help Linux users (any distro) to setup the connection to Sissa Wi-Fi.
The user must have a basic knowledge of the Linux system and must know the foundamental commands and procedures of this environment.

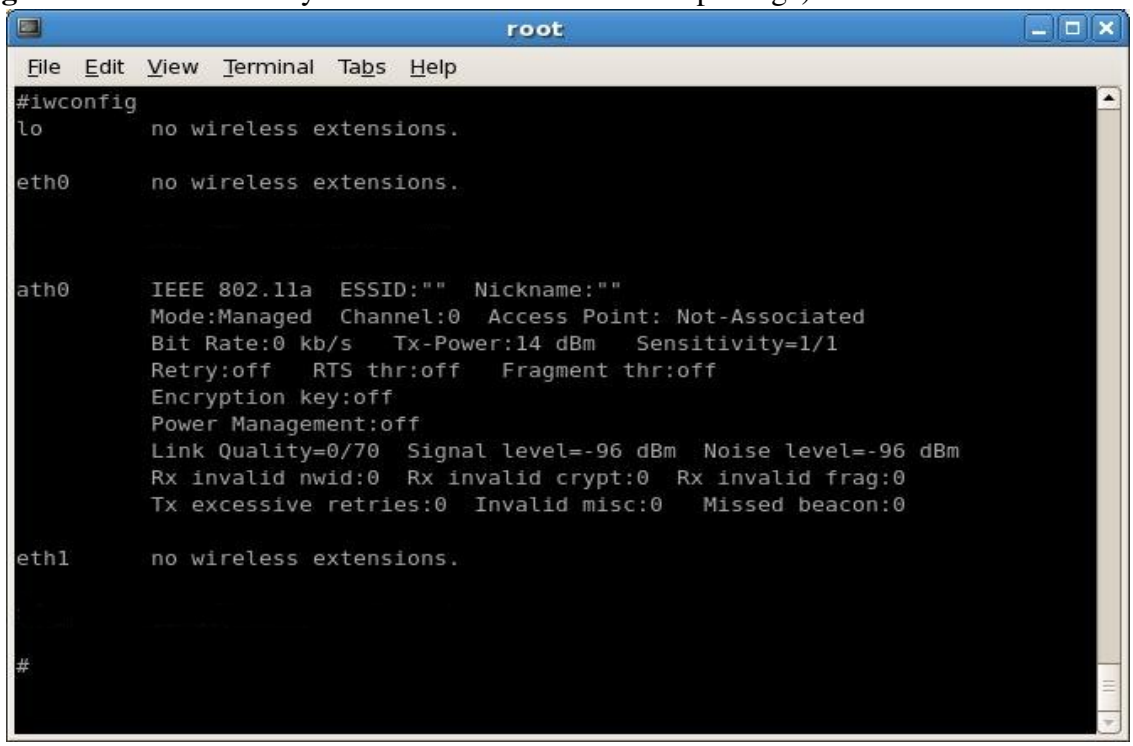
Available Sissa wireless networks (SSID)are:

- **SISSA-WiFi** (scientific and general purpose network: students, faculty, and long-term visitors)
- **SISSA-AMM** (staff network: administrative and techincal personnel)

Important: in order to successfully log into one of the Sissa wireless networks **your password must have been updated after december 31, 2007**!!

Before you can setup a wireless connection you must verify that your *wireless network interface card* (WNIC) is propery installed.

1. To identify the WNIC, as 'root' user, open a terminal window and type the command **iwconfig** (to use **iwconfig** and **iwlist** commands you must install **wireless-tools** package):

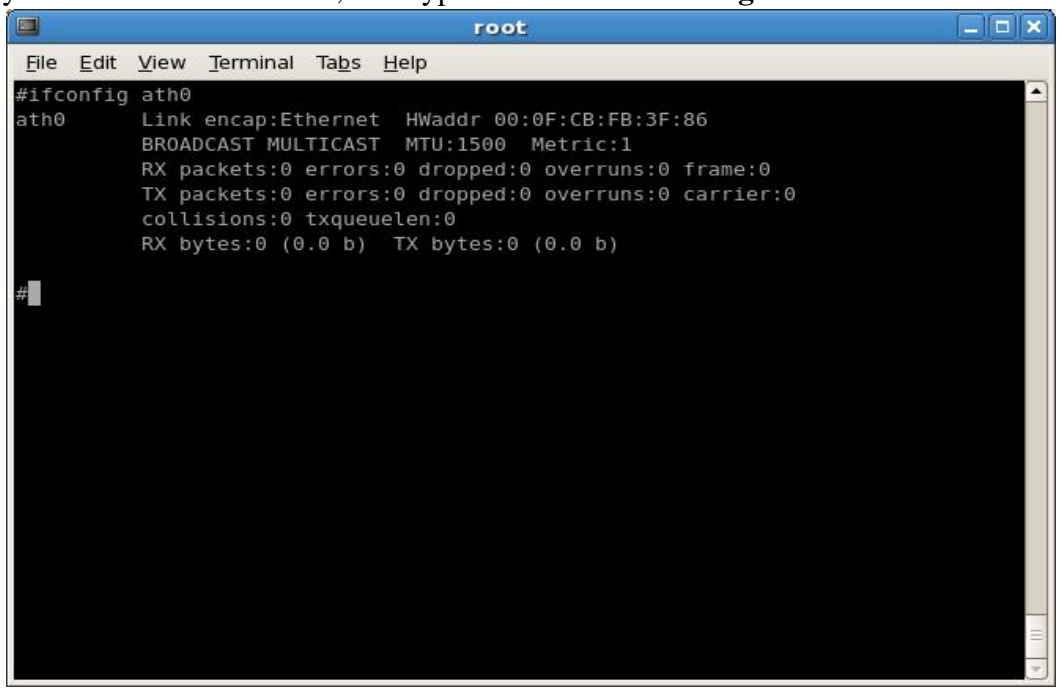


We see that **ath0** is the WNIC device, since i have an *atheros* chipset in my laptop.
On your computer, with a different WNIC chipset, you could see **eth1**, **wifi0**, or other device names that **ath0**.

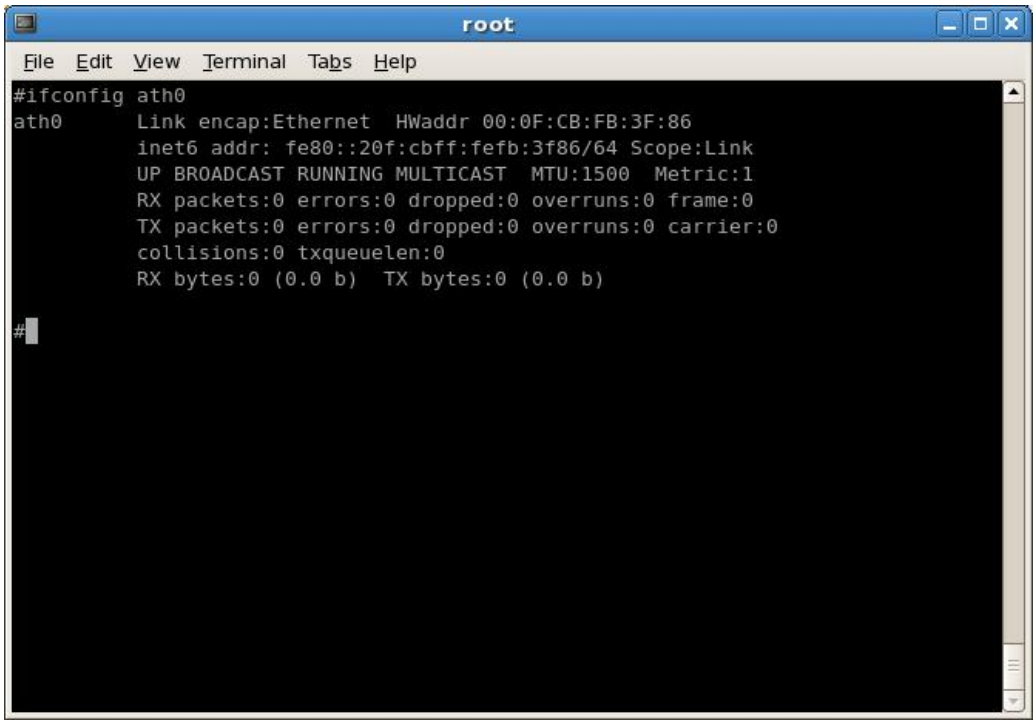
If you don't see any network device with wireless extensions in the command output, the WNIC is not properly configured on your system!

Check the documentation of your WNIC and its drivers for Linux.

2. To verify and switch on the WNIC, now type the command **ifconfig ath0**

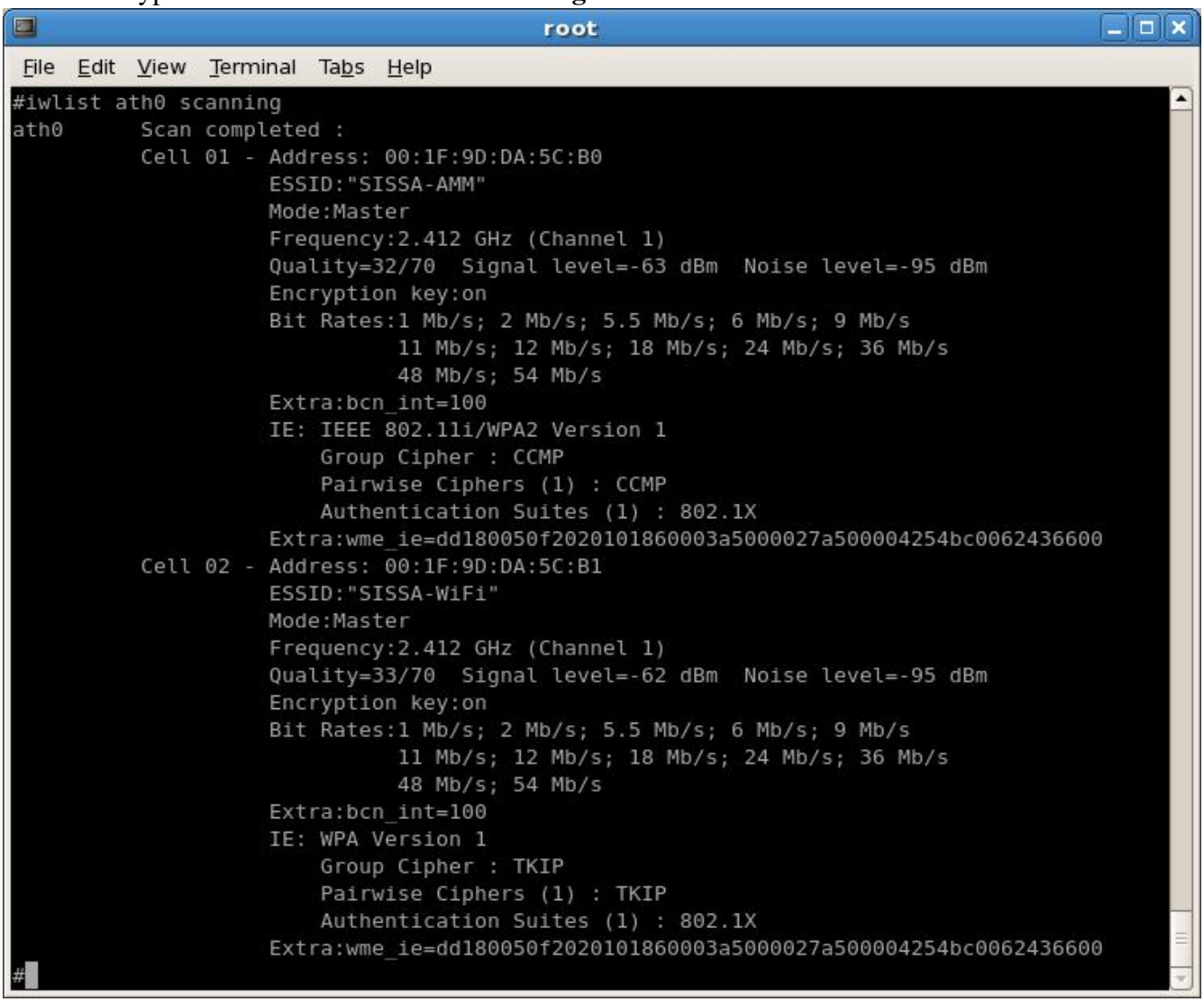


3. Here the WNIC is switched off. To turn it on, type the command **ifconfig ath0 up**, and to verify again **ifconfig ath0**



You should see 'UP', in the second line output, before 'BROADCAST'.

4. Last step: verify that the WNIC works and verify that we are in range of one of the Sissa wireless networks. Type the command **iwlist ath0 scanning**



We see two networks (SSID): SISSA-AMM and SISSA-WiFi.

5. Once you have verify that your WNIC works, there are several tools you can use to setup a wireless connections on a Linux system. Here we explain how to configurethe one of the most widely used: **wpa_supplicand**

wpa_supplicant

wpa_supplicant is an implementation of the WPA Supplicant component, i.e. , the part that runs in the client stations. It implements WPA key negotiation with a WPA Authenticator (i.e. Access Point) and EAP authentication with Authentication Server (read RADIUS). In addition, it controls the roaming and IEEE 802.11 authentication/association of the wireless LAN driver.

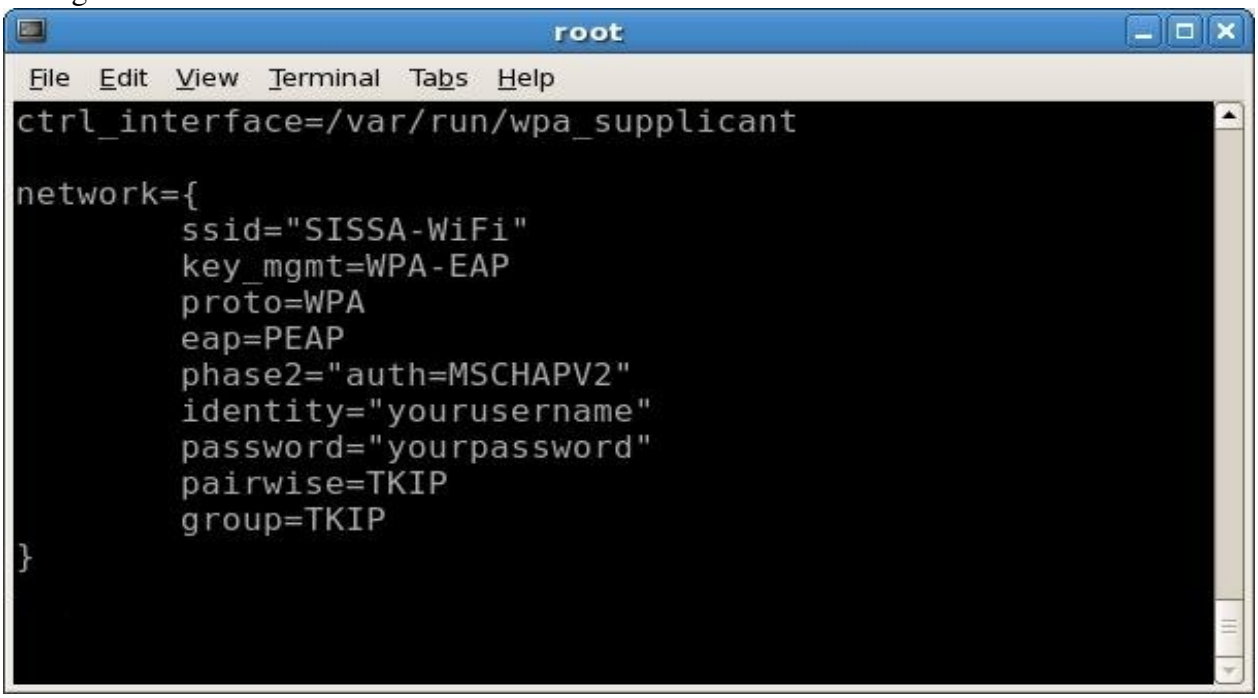
wpa_supplicant is configured using a text file that lists all accepted networks and security policies, by default this file is /etc/wpa_supplicant.conf.

To connect to **SISSA-WiFi** network , the configuration parameters are:

- SSID: **SISSA-WiFi**
- Authentication: **PEAP**
- Inner Authentication: **MSCHAP v2**
- Key management: **WPA Enterprise**
- Encryption: **TKIP** or **AES-CCMP**

1.You need to insert this parameters and your credentials (valid username and password) in the wpa_supplicant configuration file.

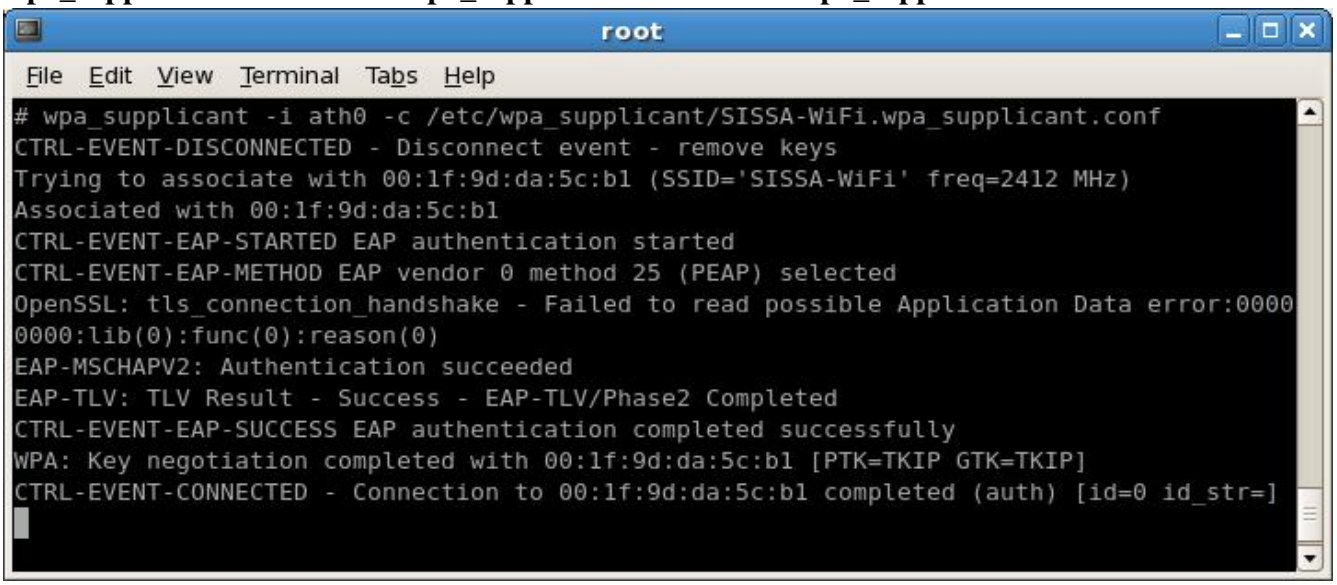
Edit the wpa_supplicant configuration file, say **SISSA-WiF.wpa_supplicant.txt**, and insert the following lines:



Of course, use your own credentials in place of “yourusername” and “yourpassword”

2. Switch on the wireless netwtork interface card with **ifconfig ath0 up**, and start wpa_supplicant on the foreground with the command:

wpa_supplicant -i ath0 -c /etc/wpa_supplicant/SISSA-WiFi.wpa_supplicant.conf



If login succeded you should see at the end of the command output some lines like:

CTRL-EVENT-EAP-SUCCESS EAP authentication completed successfully

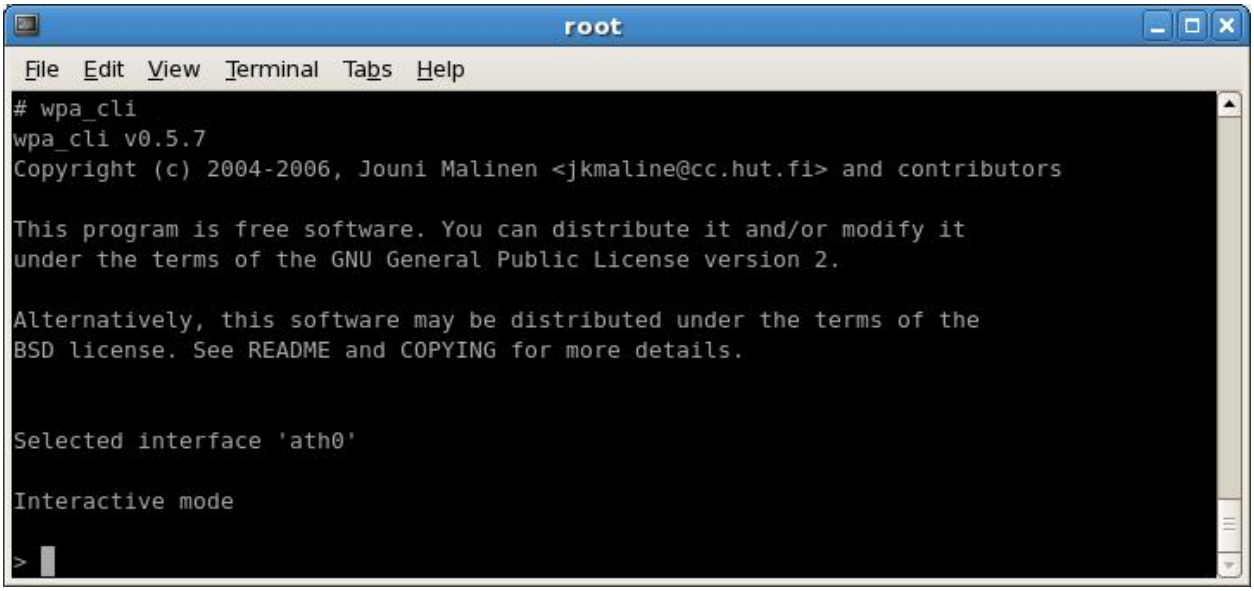
WPA: Key negotiation completed with ... [PTK=TKIP GTK=TKIP]

CTRL-EVENT-CONNECTED - Connection to ... completed (auth) [id=0 id_str=]

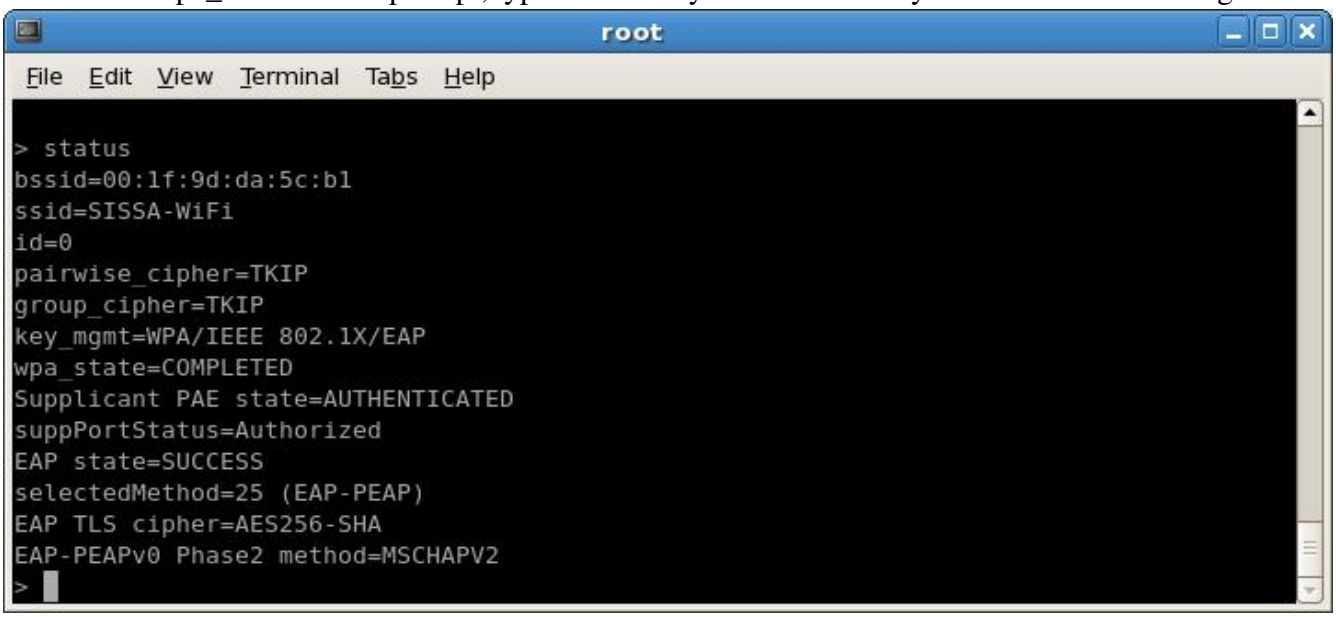
3. Now that you know wpa_supplicant works with this configuration,kill the process and launch it in the background as a daemon (notice the trial -B option):

wpa_supplicant -i ath0 -c /etc/wpa_supplicant/SISSA-WiFi.wpa_supplicant.conf -B

4. Check the wireless connection using the wpa_supplicant command line client **wpa_cli**:



5. from the wpa_cli command prompt, type **status**. If you're connected you should see something like:



You're in! Configure, if necessary, upper layer TCP/IP protocol DHCPto lease a dinamic IP address.

6. When you have finished, to disconnect from the wireless network, from wpa_cli, you can type **logoff**