This document had described the way to inform the wpa_supplicant to do the WiFi connection by using the wpa_cli. The wpa_supplicant had supported all kinds of security connections and WPS defined in the 802.11 specification. So, we suggest use the wpa_supplicant to do the WiFi connection rather than the iwconfig wireless tool.

**A) WPA_SUPPLICANT + WPA_CLI User Guide**

1. start wpa_supplicant in the background
   ```
   wpa_supplicant -Dwext -iwlan0 -c /tmp/net/wpa.conf -B
   ```

2. Scanning AP and See Results
   ```
   wpa_cli -p/var/run/wpa_supplicant scan
   wpa_cli -p/var/run/wpa_supplicant scan_results
   ```

3. Connect to AP
   a. OPEN
   ```
   wpa_cli -p/var/run/wpa_supplicant remove_network 0
   wpa_cli -p/var/run/wpa_supplicant ap_scan 1
   wpa_cli -p/var/run/wpa_supplicant add_network
   wpa_cli -p/var/run/wpa_supplicant set_network 0 ssid "dlink"
   wpa_cli -p/var/run/wpa_supplicant set_network 0 key_mgmt NONE
   wpa_cli -p/var/run/wpa_supplicant select_network 0
   ```

   b. WEP40 with open system
   ```
   wpa_cli -p/var/run/wpa_supplicant remove_network 0
   wpa_cli -p/var/run/wpa_supplicant ap_scan 1
   wpa_cli -p/var/run/wpa_supplicant add_network
   wpa_cli -p/var/run/wpa_supplicant set_network 0 ssid "dlink"
   wpa_cli -p/var/run/wpa_supplicant set_network 0 key_mgmt NONE
   wpa_cli -p/var/run/wpa_supplicant set_network 0 wep_key0 1234567890
   wpa_cli -p/var/run/wpa_supplicant set_network 0 wep_tx_keyidx 0
   wpa_cli -p/var/run/wpa_supplicant select_network 0
   ```

   c. WEP40 with shared key mode
   ```
   wpa_cli -p/var/run/wpa_supplicant remove_network 0
   wpa_cli -p/var/run/wpa_supplicant ap_scan 1
   wpa_cli -p/var/run/wpa_supplicant add_network
   wpa_cli -p/var/run/wpa_supplicant set_network 0 ssid "dlink"
   wpa_cli -p/var/run/wpa_supplicant set_network 0 key_mgmt NONE
   wpa_cli -p/var/run/wpa_supplicant set_network 0 wep_key0 1234567890
   wpa_cli -p/var/run/wpa_supplicant set_network 0 wep_tx_keyidx 0
   wpa_cli -p/var/run/wpa_supplicant set_network 0 auth_alg SHARED
   ```
d.WEP104 with open system
wpa_cli -p/var/run/wpa_supplicant remove_network 0
wpa_cli -p/var/run/wpa_supplicant ap_scan 1
wpa_cli -p/var/run/wpa_supplicant add_network
wpa_cli -p/var/run/wpa_supplicant set_network 0 ssid "dlink"
wpa_cli -p/var/run/wpa_supplicant set_network 0 key_mgmt NONE
wpa_cli -p/var/run/wpa_supplicant set_network 0 wep_key0 12345678901234567890123456
wpa_cli -p/var/run/wpa_supplicant set_network 0 wep_tx_keyidx 0
wpa_cli -p/var/run/wpa_supplicant select_network 0

e.WEP104 with shared key mode
wpa_cli -p/var/run/wpa_supplicant remove_network 0
wpa_cli -p/var/run/wpa_supplicant ap_scan 1
wpa_cli -p/var/run/wpa_supplicant add_network
wpa_cli -p/var/run/wpa_supplicant set_network 0 ssid "dlink"
wpa_cli -p/var/run/wpa_supplicant set_network 0 key_mgmt NONE
wpa_cli -p/var/run/wpa_supplicant set_network 0 wep_key0 12345678901234567890123456
wpa_cli -p/var/run/wpa_supplicant set_network 0 wep_tx_keyidx 0
wpa_cli -p/var/run/wpa_supplicant add_network
wpa_cli -p/var/run/wpa_supplicant set_network 0 auth_alg SHARED
wpa_cli -p/var/run/wpa_supplicant select_network 0

#If wep key is ASCII type, use the following cmd:
#WEP40:  wpa_cli -p/var/run/wpa_supplicant set_network 0 wep_key0 "12345"
#WEP104: wpa_cli -p/var/run/wpa_supplicant set_network 0 wep_key0 "12345678901234567890123456"

#WEP key index is X from 0 to 3, change X for other key index and select it.
#wpa_cli -p/var/run/wpa_supplicant set_network 0 wep_keyX 12345678901234567890123456
#wpa_cli -p/var/run/wpa_supplicant set_network 0 wep_tx_keyidx X

f.TKIP and AES
wpa_cli -p/var/run/wpa_supplicant remove_network 0
wpa_cli -p/var/run/wpa_supplicant ap_scan 1
wpa_cli -p/var/run/wpa_supplicant add_network
wpa_cli -p/var/run/wpa_supplicant set_network 0 ssid "dlink"
wpa_cli -p/var/run/wpa_supplicant set_network 0 psk "12345678"n
wpa_cli -p/var/run/wpa_supplicant select_network 0

4.Ad-hoc mode
a.OPEN
wpa_cli -p/var/run/wpa_supplicant scan
wpa_cli -p/var/run/wpa_supplicant scan_results
wpa_cli -p/var/run/wpa_supplicant remove_network 0
wpa_cli -p/var/run/wpa_supplicant ap_scan 2
wpa_cli -p/var/run/wpa_supplicant add_network
wpa_cli -p/var/run/wpa_supplicant set_network 0 ssid "Adhoc_test"
wpa_cli -p/var/run/wpa_supplicant set_network 0 mode 1
wpa_cli -p/var/run/wpa_supplicant set_network 0 key_mgmt NONE
wpa_cli -p/var/run/wpa_supplicant select_network 0

b.WEP40
wpa_cli -p/var/run/wpa_supplicant scan
wpa_cli -p/var/run/wpa_supplicant scan_results
wpa_cli -p/var/run/wpa_supplicant remove_network 0
wpa_cli -p/var/run/wpa_supplicant ap_scan 2
wpa_cli -p/var/run/wpa_supplicant add_network
wpa_cli -p/var/run/wpa_supplicant set_network 0 ssid "Adhoc_test"
wpa_cli -p/var/run/wpa_supplicant set_network 0 mode 1
wpa_cli -p/var/run/wpa_supplicant set_network 0 key_mgmt NONE
wpa_cli -p/var/run/wpa_supplicant set_network 0 wep_key0 1234567890
wpa_cli -p/var/run/wpa_supplicant set_network 0 wep_tx_keyidx 0
wpa_cli -p/var/run/wpa_supplicant select_network 0

c.WEP104
wpa_cli -p/var/run/wpa_supplicant scan
wpa_cli -p/var/run/wpa_supplicant scan_results
wpa_cli -p/var/run/wpa_supplicant remove_network 0
wpa_cli -p/var/run/wpa_supplicant ap_scan 2
wpa_cli -p/var/run/wpa_supplicant add_network
wpa_cli -p/var/run/wpa_supplicant set_network 0 ssid "Adhoc_test"
wpa_cli -p/var/run/wpa_supplicant set_network 0 mode 1
wpa_cli -p/var/run/wpa_supplicant set_network 0 key_mgmt NONE
wpa_cli -p/var/run/wpa_supplicant set_network 0 wep_key0 12345678901234567890123456
wpa_cli -p/var/run/wpa_supplicant set_network 0 wep_tx_keyidx 0
wpa_cli -p/var/run/wpa_supplicant select_network 0

5.Save the Current Connection AP configuration file
wpa_cli -p/var/run/wpa_supplicant save_config

6.WPS Connection
Push Button:
wpa_cli -p/var/run/wpa_supplicant remove_network 0
wpa_cli -p/var/run/wpa_supplicant wps_pbc any

Pin Code:

wpa_cli -p/var/run/wpa_supplicant remove_network 0
wpa_cli -p/var/run/wpa_supplicant wps_pin any 12345670
or
wpa_cli -p/var/run/wpa_supplicant remove_network 0
wpa_cli -p/var/run/wpa_supplicant wps_pin any

7. Get Current Status of wpa_supplicant
wpa_cli -p/var/run/wpa_supplicant status

8. Disable current network connection
wpa_cli -p/var/run/wpa_supplicant disable_network 0

(B) WPA_SUPPLICANT + WPA_CLI - Control interface commands

Following commands can be used with wpa_cli

PING
This command can be used to test whether wpa_supplicant is replying to the control interface commands. The expected reply is PONG if the connection is open and wpa_supplicant is processing commands.

STATUS
Request current status information. The output is a text block with each line in variable=value format. For example:

bssid=02:00:01:02:03:04
ssid=test network
pairwise_cipher=CCMP
group_cipher=CCMP
key_mgmt=WPA-PSK
wpa_state=COMPLETED

LIST_NETWORKS
List configured networks.

network id / ssid / bssid / flags
0 example network any [CURRENT]

(note: fields are separated with tabs)

SCAN
Request a new BSS scan.

SCAN_RESULTS
Get the latest scan results.

bssid / frequency / signal level / flags / ssid
00:09:5b:95:e0:4e 2412 208 [WPA-PSK-CCMP] jkm private
00:09:5b:95:e0:4f 2412 209 jkm guest

(note: fields are separated with tabs)
ADD_NETWORK
Add a new network. This command creates a new network with empty configuration. The new network is disabled and once it has been configured it can be enabled with ENABLE_NETWORK command. ADD_NETWORK returns the network id of the new network or FAIL on failure.

SELECT_NETWORK <network id>
Select a network (disable others). Network id can be received from the LIST_NETWORKS command output.

ENABLE_NETWORK <network id>
Enable a network. Network id can be received from the LIST_NETWORKS command output.

DISABLE_NETWORK <network id>
Disable a network. Network id can be received from the LIST_NETWORKS command output. Special network id all can be used to disable all network.

REMOVE_NETWORK <network id>
Remove a network. Network id can be received from the LIST_NETWORKS command output. Special network id all can be used to remove all network.

SET_NETWORK <network id> <variable> <value>
Set network variables. Network id can be received from the LIST_NETWORKS command output. This command uses the same variables and data formats as the configuration file.

- ssid (network name, SSID)
- psk (WPA passphrase or pre-shared key)
- key_mgmt (key management protocol, NONE, WPA-PSK, WPA-EAP)
- proto (WPA WPA2)
- pairwise (CCMP TKIP)
- group (CCMP TKIP WEP40 WEP104)
- wep_key0 (set wep key for key index 0)
- wep_tx_keyidx (select wep key index)

GET_NETWORK <network id> <variable>
Get network variables. Network id can be received from the LIST_NETWORKS command output.

SAVE_CONFIG
Save the current configuration.

AP_SCAN <ap_scan value>
Change ap_scan value: 0 = no scanning, 1 = wpa_supplicant requests scans and uses scan results to select the AP, 2 = wpa_supplicant does not use scanning and just requests driver to associate and take care of AP selection.