Rocky Enterprise Linux 9.2 Manual Pages on command 'iwconfig.8'

$ man iwconfig.8

IWCONFIG(8)   Linux Programmer's Manual   IWCONFIG(8)

NAME

   iwconfig - configure a wireless network interface

SYNOPSIS

   iwconfig [interface]

   iwconfig interface [essid X] [nwid N] [mode M] [freq F]

            [channel C][sens S][ap A][nick NN]

            [rate R] [rts RT] [frag FT] [txpower T]

            [enc E] [key K] [power P] [retry R]

            [modu M] [commit]

   iwconfig --help

   iwconfig --version

DESCRIPTION

   Iwconfig is similar to ifconfig(8), but is dedicated to the wireless interfaces. It is

   used to set the parameters of the network interface which are specific to the wireless op?

   eration (for example : the frequency). Iwconfig may also be used to display those parame?

   ters, and the wireless statistics (extracted from /proc/net/wireless).

   All these parameters and statistics are device dependent. Each driver will provide only

   some of them depending on hardware support, and the range of values may change. Please re?

   fer to the man page of each device for details.

PARAMETERS

   essid Set the ESSID (or Network Name - in some products it may also be called Domain ID).

       The ESSID is used to identify cells which are part of the same virtual network.

As opposed to the AP Address or NWID which define a single cell, the ESSID defines

a group of cells connected via repeaters or infrastructure, where the user may roam

transparently.

With some cards, you may disable the ESSID checking (ESSID promiscuous) with off or

any (and on to reenable it).

If the ESSID of your network is one of the special keywords (off, on or any), you

should use -- to escape it.

Examples :

    iwconfig eth0 essid any

    iwconfig eth0 essid "My Network"

    iwconfig eth0 essid -- "ANY"

nwid Set the Network ID. As all adjacent wireless networks share the same medium, this

parameter is used to differentiate them (create logical colocated networks) and

identify nodes belonging to the same cell.

This parameter is only used for pre-802.11 hardware, the 802.11 protocol uses the

ESSID and AP Address for this function.

With some cards, you may disable the Network ID checking (NWID promiscuous) with

off (and on to reenable it).

Examples :

    iwconfig eth0 nwid AB34

    iwconfig eth0 nwid off

nick[name]

Set the nickname, or the station name. Some 802.11 products do define it, but this

is not used as far as the protocols (MAC, IP, TCP) are concerned and completely

useless as far as configuration goes. Only some wireless diagnostic tools may use

it.

Example :

    iwconfig eth0 nickname "My Linux Node"

mode Set the operating mode of the device, which depends on the network topology. The

mode can be Ad-Hoc (network composed of only one cell and without Access Point),

Managed (node connects to a network composed of many Access Points, with roaming),

Master (the node is the synchronisation master or acts as an Access Point), Re?

peater (the node forwards packets between other wireless nodes), Secondary (the

node acts as a backup master/repeater), Monitor (the node is not associated with any cell and passively monitor all packets on the frequency) or Auto.

Example :

    iwconfig eth0 mode Managed

    iwconfig eth0 mode Ad-Hoc

freq/channel

Set the operating frequency or channel in the device. A value below 1000 indicates a channel number, a value greater than 1000 is a frequency in Hz. You may append the suffix k, M or G to the value (for example, "2.46G" for 2.46 GHz frequency), or add enough '0'.

Channels are usually numbered starting at 1, and you may use iwlist(8) to get the total number of channels, list the available frequencies, and display the current frequency as a channel. Depending on regulations, some frequencies/channels may not be available.

When using Managed mode, most often the Access Point dictates the channel and the driver may refuse the setting of the frequency. In Ad-Hoc mode, the frequency set?ting may only be used at initial cell creation, and may be ignored when joining an existing cell.

You may also use off or auto to let the card pick up the best channel (when sup?ported).

Examples :

    iwconfig eth0 freq 2422000000

    iwconfig eth0 freq 2.422G

    iwconfig eth0 channel 3

    iwconfig eth0 channel auto

ap   Force the card to register to the Access Point given by the address, if it is pos?sible. This address is the cell identity of the Access Point, as reported by wire?less scanning, which may be different from its network MAC address. If the wireless link is point to point, set the address of the other end of the link. If the link is ad-hoc, set the cell identity of the ad-hoc network.

When the quality of the connection goes too low, the driver may revert back to au?tomatic mode (the card selects the best Access Point in range).

You may also use off to re-enable automatic mode without changing the current Ac?

cess Point, or you may use any or auto to force the card to reassociate with the

currently best Access Point.

Example :

iwconfig eth0 ap 00:60:1D:01:23:45

iwconfig eth0 ap any

iwconfig eth0 ap off

rate/bit[rate]

For cards supporting multiple bit rates, set the bit-rate in b/s. The bit-rate is

the speed at which bits are transmitted over the medium, the user speed of the link

is lower due to medium sharing and various overhead.

You may append the suffix k, M or G to the value (decimal multiplier : 10^3, 10^6

and 10^9 b/s), or add enough '0'. Values below 1000 are card specific, usually an

index in the bit-rate list. Use auto to select automatic bit-rate mode (fallback to

lower rate on noisy channels), which is the default for most cards, and fixed to

revert back to fixed setting. If you specify a bit-rate value and append auto, the

driver will use all bit-rates lower and equal than this value.

Examples :

iwconfig eth0 rate 11M

iwconfig eth0 rate auto

iwconfig eth0 rate 5.5M auto

txpower

For cards supporting multiple transmit powers, sets the transmit power in dBm. If W

is the power in Watt, the power in dBm is $P = 30 + 10.\log(W)$. If the value is

postfixed by mW, it will be automatically converted to dBm.

In addition, on and off enable and disable the radio, and auto and fixed enable and

disable power control (if those features are available).

Examples :

iwconfig eth0 txpower 15

iwconfig eth0 txpower 30mW

iwconfig eth0 txpower auto

iwconfig eth0 txpower off

sens   Set the sensitivity threshold. This define how sensitive is the card to poor oper?

ating conditions (low signal, interference). Positive values are assumed to be the

raw value used by the hardware or a percentage, negative values are assumed to be dBm. Depending on the hardware implementation, this parameter may control various functions.

On modern cards, this parameter usually control handover/roaming threshold, the lowest signal level for which the hardware remains associated with the current Ac? cess Point. When the signal level goes below this threshold the card starts looking for a new/better Access Point. Some cards may use the number of missed beacons to trigger this. For high density of Access Points, a higher threshold make sure the card is always associated with the best AP, for low density of APs, a lower thresh? old minimise the number of failed handoffs.

On more ancient card this parameter usually controls the defer threshold, the low? est signal level for which the hardware considers the channel busy. Signal levels above this threshold make the hardware inhibits its own transmission whereas sig? nals weaker than this are ignored and the hardware is free to transmit. This is usually strongly linked to the receive threshold, the lowest signal level for which the hardware attempts packet reception. Proper setting of these thresholds prevent the card to waste time on background noise while still receiving weak transmis? sions. Modern designs seems to control those thresholds automatically.

Example :

    iwconfig eth0 sens -80

    iwconfig eth0 sens 2

retry Most cards have MAC retransmissions, and some allow to set the behaviour of the retry mechanism.

To set the maximum number of retries, enter limit `value'. This is an absolute value (without unit), and the default (when nothing is specified). To set the max? imum length of time the MAC should retry, enter lifetime `value'. By defaults, this value is in seconds, append the suffix m or u to specify values in millisec? onds or microseconds.

You can also add the short, long, min and max modifiers. If the card supports auto? matic mode, they define the bounds of the limit or lifetime. Some other cards de? fine different values depending on packet size, for example in 802.11 min limit is the short retry limit (non RTS/CTS packets).

Examples :

iwconfig eth0 retry 16

iwconfig eth0 retry lifetime 300m

iwconfig eth0 retry short 12

iwconfig eth0 retry min limit 8

rts[_threshold]

RTS/CTS adds a handshake before each packet transmission to make sure that the channel is clear. This adds overhead, but increases performance in case of hidden nodes or a large number of active nodes. This parameter sets the size of the small? est packet for which the node sends RTS ; a value equal to the maximum packet size disables the mechanism. You may also set this parameter to auto, fixed or off.

Examples :

iwconfig eth0 rts 250

iwconfig eth0 rts off

frag[mentation_threshold]

Fragmentation allows to split an IP packet in a burst of smaller fragments trans? mitted on the medium. In most cases this adds overhead, but in a very noisy envi? ronment this reduces the error penalty and allow packets to get through interfer? ence bursts. This parameter sets the maximum fragment size which is always lower than the maximum packet size.

This parameter may also control Frame Bursting available on some cards, the ability to send multiple IP packets together. This mechanism would be enabled if the frag? ment size is larger than the maximum packet size.

You may also set this parameter to auto, fixed or off.

Examples :

iwconfig eth0 frag 512

iwconfig eth0 frag off

key/enc[ryption]

Used to manipulate encryption or scrambling keys and security mode.

To set the current encryption key, just enter the key in hex digits as XXXX-XXXX-XXXX-XXXX or XXXXXXXX. To set a key other than the current key, prepend or append [index] to the key itself (this won't change which is the active key). You can also enter the key as an ASCII string by using the s: prefix. Passphrase is currently not supported.

To change which key is the currently active key, just enter [index] (without enter?

ing any key value).

off and on disable and reenable encryption.

The security mode may be open or restricted, and its meaning depends on the card

used. With most cards, in open mode no authentication is used and the card may also

accept non-encrypted sessions, whereas in restricted mode only encrypted sessions

are accepted and the card will use authentication if available.

If you need to set multiple keys, or set a key and change the active key, you need

to use multiple key directives. Arguments can be put in any order, the last one

will take precedence.

Examples :

    iwconfig eth0 key 0123-4567-89

    iwconfig eth0 key [3] 0123-4567-89

    iwconfig eth0 key s:password [2]

    iwconfig eth0 key [2]

    iwconfig eth0 key open

    iwconfig eth0 key off

    iwconfig eth0 key restricted [3] 0123456789

    iwconfig eth0 key 01-23 key 45-67 [4] key [4]

power Used to manipulate power management scheme parameters and mode.

To set the period between wake ups, enter period `value'. To set the timeout be?

fore going back to sleep, enter timeout `value'. To set the generic level of power

saving, enter saving `value'. You can also add the min and max modifiers. By de?

fault, those values are in seconds, append the suffix m or u to specify values in

milliseconds or microseconds. Sometimes, those values are without units (number of

beacon periods, dwell, percentage or similar).

off and on disable and reenable power management. Finally, you may set the power

management mode to all (receive all packets), unicast (receive unicast packets

only, discard multicast and broadcast) and multicast (receive multicast and broad?

cast only, discard unicast packets).

Examples :

    iwconfig eth0 power period 2

    iwconfig eth0 power 500m unicast

iwconfig eth0 power timeout 300u all

iwconfig eth0 power saving 3

iwconfig eth0 power off

iwconfig eth0 power min period 2 power max period 4

modu[lation]

Force the card to use a specific set of modulations. Modern cards support various

modulations, some which are standard, such as 802.11b or 802.11g, and some propri?

etary. This command force the card to only use the specific set of modulations

listed on the command line. This can be used to fix interoperability issues.

The list of available modulations depend on the card/driver and can be displayed

using iwlist modulation. Note that some card/driver may not be able to select each

modulation listed independently, some may come as a group. You may also set this

parameter to auto let the card/driver do its best.

Examples :

iwconfig eth0 modu 11g

iwconfig eth0 modu CCK OFDMa

iwconfig eth0 modu auto

commit Some cards may not apply changes done through Wireless Extensions immediately (they

may wait to aggregate the changes or apply it only when the card is brought up via

ifconfig). This command (when available) forces the card to apply all pending

changes.

This is normally not needed, because the card will eventually apply the changes,

but can be useful for debugging.

DISPLAY

For each device which supports wireless extensions, iwconfig will display the name of the

MAC protocol used (name of device for proprietary protocols), the ESSID (Network Name),

the NWID, the frequency (or channel), the sensitivity, the mode of operation, the Access

Point address, the bit-rate, the RTS threshold, the fragmentation threshold, the encryp?

tion key and the power management settings (depending on availability).

The parameters displayed have the same meaning and values as the parameters you can set,

please refer to the previous part for a detailed explanation of them.

Some parameters are only displayed in short/abbreviated form (such as encryption). You may

use iwlist(8) to get all the details.

Some parameters have two modes (such as bitrate). If the value is prefixed by `=', it means that the parameter is fixed and forced to that value, if it is prefixed by `:', the parameter is in automatic mode and the current value is shown (and may change).

Access Point/Cell

> An address equal to 00:00:00:00:00:00 means that the card failed to associate with an Access Point (most likely a configuration issue). The Access Point parameter will be shown as Cell in ad-hoc mode (for obvious reasons), but otherwise works the same.

If /proc/net/wireless exists, iwconfig will also display its content. Note that those val?ues will depend on the driver and the hardware specifics, so you need to refer to your driver documentation for proper interpretation of those values.

Link quality

> Overall quality of the link. May be based on the level of contention or interfer?ence, the bit or frame error rate, how good the received signal is, some timing synchronisation, or other hardware metric. This is an aggregate value, and depends totally on the driver and hardware.

Signal level

> Received signal strength (RSSI - how strong the received signal is). May be arbi?trary units or dBm, iwconfig uses driver meta information to interpret the raw value given by /proc/net/wireless and display the proper unit or maximum value (us?ing 8 bit arithmetic). In Ad-Hoc mode, this may be undefined and you should use iwspy.

Noise level

> Background noise level (when no packet is transmitted). Similar comments as for Signal level.

Rx invalid nwid

> Number of packets received with a different NWID or ESSID. Used to detect configu?ration problems or adjacent network existence (on the same frequency).

Rx invalid crypt

> Number of packets that the hardware was unable to decrypt. This can be used to de?tect invalid encryption settings.

Rx invalid frag

> Number of packets for which the hardware was not able to properly re-assemble the

link layer fragments (most likely one was missing).

Tx excessive retries

Number of packets that the hardware failed to deliver. Most MAC protocols will

retry the packet a number of times before giving up.

Invalid misc

Other packets lost in relation with specific wireless operations.

Missed beacon

Number of periodic beacons from the Cell or the Access Point we have missed. Bea?

cons are sent at regular intervals to maintain the cell coordination, failure to

receive them usually indicates that the card is out of range.

AUTHOR

Jean Tourrilhes - jt@hpl.hp.com

FILES

/proc/net/wireless

SEE ALSO

ifconfig(8), iwspy(8), iwlist(8), iwevent(8), iwpriv(8), wireless(7).

wireless-tools   30 March 2006   IWCONFIG(8)