

NAME

run - Ralink Technology USB IEEE 802.11a/g/n wireless network driver

SYNOPSIS

To compile this driver into the kernel, place the following lines in your kernel configuration file:

```
device ehci  
device uhci  
device ohci  
device usb  
device run  
device wlan  
device wlan_amrr
```

Firmware is also needed, and provided by:

```
device runfw
```

Alternatively, to load the driver as a module at boot time, place the following lines in loader.conf(5):

```
if_run_load="YES"  
runfw_load="YES"
```

DESCRIPTION

The **run** driver supports USB 2.0 wireless adapters based on the Ralink RT2700U, RT2800U, RT3000U and RT3900E chipsets.

The RT2700U chipset consists of two integrated chips, an RT2770 MAC/BBP and an RT2720 (1T2R) or RT2750 (dual-band 1T2R) radio transceiver.

The RT2800U chipset consists of two integrated chips, an RT2870 MAC/BBP and an RT2820 (2T3R) or RT2850 (dual-band 2T3R) radio transceiver.

The RT3000U is a single-chip solution based on an RT3070 MAC/BBP and an RT3020 (1T1R), RT3021 (1T2R) or RT3022 (2T2R) single-band radio transceiver.

The RT3900E is a single-chip USB 2.0 802.11n solution. The MAC/Baseband Processor can be an RT3593, RT5390, RT5392 or an RT5592. The radio can be an RT3053, RT5370, RT5372 or an RT5572. The RT3053 chip operates in the 2GHz and 5GHz spectra and supports up to 3 transmit paths and 3 receiver paths (3T3R). The RT5370 chip operates in the 2GHz spectrum and supports 1 transmit

path and 1 receiver path (1T1R). The RT5372 chip operates in the 2GHz spectrum and supports up to 2 transmit paths and 2 receiver paths (2T2R). The RT5572 chip operates in the 2GHz and 5GHz spectra and supports up to 2 transmit paths and 2 receiver paths (2T2R).

These are the modes the **run** driver can operate in:

BSS mode Also known as *infrastructure* mode, this is used when associating with an access point, through which all traffic passes. This mode is the default.

Host AP mode In this mode the driver acts as an access point (base station) for other cards.

monitor mode In this mode the driver is able to receive packets without associating with an access point. This disables the internal receive filter and enables the card to capture packets from networks which it wouldn't normally have access to, or to scan for access points.

The **run** driver can be configured to use Wired Equivalent Privacy (WEP) or Wi-Fi Protected Access (WPA-PSK and WPA2-PSK). WPA is the de facto encryption standard for wireless networks. It is strongly recommended that WEP not be used as the sole mechanism to secure wireless communication, due to serious weaknesses in it. The **run** driver offloads both encryption and decryption of data frames to the hardware for the WEP40, WEP104, TKIP(+MIC) and CCMP ciphers.

The **run** driver can be configured at runtime with `ifconfig(8)`.

HARDWARE

The **run** driver supports the following wireless adapters:

- ⊕ Airlink101 AWLL6090
- ⊕ ASUS USB-N11
- ⊕ ASUS USB-N13 ver. A1
- ⊕ ASUS USB-N14
- ⊕ ASUS USB-N66
- ⊕ ASUS WL-160N
- ⊕ Belkin F5D8051 ver 3000
- ⊕ Belkin F5D8053
- ⊕ Belkin F5D8055
- ⊕ Belkin F6D4050 ver 1
- ⊕ Belkin F9L1103
- ⊕ Buffalo WLI-UC-AG300N
- ⊕ Buffalo WLI-UC-G300HP
- ⊕ Buffalo WLI-UC-G300N

- ⊕ Buffalo WLI-UC-G301N
- ⊕ Buffalo WLI-UC-GN
- ⊕ Buffalo WLI-UC-GNM
- ⊕ Buffalo WLI-UC-GNM2
- ⊕ Corega CG-WLUSB2GNL
- ⊕ Corega CG-WLUSB2GNR
- ⊕ Corega CG-WLUSB300AGN
- ⊕ Corega CG-WLUSB300GNM
- ⊕ D-Link DWA-130 rev B1
- ⊕ D-Link DWA-130 rev F1
- ⊕ D-Link DWA-140 rev B1, B2, B3, D1
- ⊕ D-Link DWA-160 rev B2
- ⊕ D-Link DWA-162
- ⊕ DrayTek Vigor N61
- ⊕ Edimax EW-7711UAn
- ⊕ Edimax EW-7711UTn
- ⊕ Edimax EW-7717Un
- ⊕ Edimax EW-7718Un
- ⊕ Edimax EW-7733UnD
- ⊕ Gigabyte GN-WB30N
- ⊕ Gigabyte GN-WB31N
- ⊕ Gigabyte GN-WB32L
- ⊕ Hawking HWDN1
- ⊕ Hawking HWUN1
- ⊕ Hawking HWUN2
- ⊕ Hercules HWNU-300
- ⊕ Linksys WUSB54GC v3
- ⊕ Linksys WUSB600N
- ⊕ Logitech LAN-W150N/U2
- ⊕ Mvix Nubbin MS-811N
- ⊕ Panda Wireless PAU06
- ⊕ Planex GW-USMicroN
- ⊕ Planex GW-US300MiniS
- ⊕ Sitecom WL-182
- ⊕ Sitecom WL-188
- ⊕ Sitecom WL-301
- ⊕ Sitecom WL-302
- ⊕ Sitecom WL-315
- ⊕ SMC SMCWUSBS-N2
- ⊕ Sweex LW303

- ⊕ Sweex LW313
- ⊕ TP-LINK TL-WDN3200
- ⊕ TP-LINK TL-WN321G v4
- ⊕ TP-LINK TL-WN727N v3
- ⊕ Unex DNUR-81
- ⊕ Unex DNUR-82
- ⊕ ZyXEL NWD2705
- ⊕ ZyXEL NWD210N
- ⊕ ZyXEL NWD270N

EXAMPLES

Join an existing BSS network (i.e., connect to an access point):

```
ifconfig wlan create wlandev run0 inet 192.0.2.20/24
```

Join a specific BSS network with network name *my_net*:

```
ifconfig wlan create wlandev run0 ssid my_net up
```

Join a specific BSS network with 64-bit WEP encryption:

```
ifconfig wlan create wlandev run0 ssid my_net \  
wepmode on wepkey 0x1234567890 weptxkey 1 up
```

Join a specific BSS network with 128-bit WEP encryption:

```
ifconfig wlan create wlandev run0 wlanmode adhoc ssid my_net \  
wepmode on wepkey 0x01020304050607080910111213 weptxkey 1
```

DIAGNOSTICS

run%d: failed load firmware of file runfw For some reason, the driver was unable to read the microcode file from the filesystem. The file might be missing or corrupted.

run%d: could not load 8051 microcode An error occurred while attempting to upload the microcode to the onboard 8051 microcontroller unit.

run%d: device timeout A frame dispatched to the hardware for transmission did not complete in time. The driver will reset the hardware. This should not happen.

SEE ALSO

intro(4), netintro(4), runfw(4), usb(4), wlan(4), wlan_amrr(4), wlan_ccmp(4), wlan_tkip(4), wlan_wep(4), wlan_xauth(4), networking(7), hostapd(8), ifconfig(8), wpa_supplicant(8)

HISTORY

The **run** driver first appeared in OpenBSD 4.5.

AUTHORS

The **run** driver was written by Damien Bergamini <damien@openbsd.org>.

CAVEATS

The **run** driver supports some of the 11n capabilities found in the RT2800, RT3000 and RT3900 chipsets.