



WIFI Reference Manual

C API Reference

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Chapter 1

Main Page

1.1 Introduction

NXP's WiFi functionality enables customers to quickly develop applications of interest to add connectivity to different sensors and appliances.

1.1.1 Developer Documentation

This manual provides developer reference documentation for WiFi driver and WLAN Connection Manager.

In addition to the reference documentation in this manual, you can also explore the source code.

Note

The File Documentation provides documentation for all the APIs that are available in WiFi driver and connection manager.

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Chapter 2

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2.1 Data Structures

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Chapter 4

Data Structure Documentation

4.1 cli_command Struct Reference

Data Fields

- const char * [name](#)
- const char * [help](#)
- void(* [function](#))(int argc, char **argv)

4.1.1 Detailed Description

Structure for registering CLI commands

4.1.2 Field Documentation

4.1.2.1 name

```
const char* cli_command::name
```

The name of the CLI command

4.1.2.2 help

```
const char* cli_command::help
```

The help text associated with the command

4.1.2.3 function

```
void(* cli_command::function) (int argc, char **argv)
```

The function that should be invoked for this command.

The documentation for this struct was generated from the following file:

- [cli.h](#)

4.2 ipv4_config Struct Reference

Data Fields

- unsigned [addr_type](#): 2
- unsigned [address](#)
- unsigned [gw](#)
- unsigned [netmask](#)
- unsigned [dns1](#)
- unsigned [dns2](#)

4.2.1 Detailed Description

This data structure represents an IPv4 address

4.2.2 Field Documentation

4.2.2.1 addr_type

```
unsigned ipv4_config::addr_type
```

Set to [ADDR_TYPE_DHCP](#) to use DHCP to obtain the IP address or [ADDR_TYPE_STATIC](#) to use a static IP. In case of static IP address ip, gw, netmask and dns members must be specified. When using DHCP, the ip, gw, netmask and dns are overwritten by the values obtained from the DHCP server. They should be zeroed out if not used.

4.2.2.2 address

```
unsigned ipv4_config::address
```

The system's IP address in network order.

4.2.2.3 gw

```
unsigned ipv4_config::gw
```

The system's default gateway in network order.

4.2.2.4 netmask

```
unsigned ipv4_config::netmask
```

The system's subnet mask in network order.

4.2.2.5 dns1

```
unsigned ipv4_config::dns1
```

The system's primary dns server in network order.

4.2.2.6 dns2

```
unsigned ipv4_config::dns2
```

The system's secondary dns server in network order.

The documentation for this struct was generated from the following file:

- [wlan.h](#)

4.3 os_queue_pool_t Struct Reference

Data Fields

- int [size](#)

4.3.1 Detailed Description

Structure used for queue definition

4.3.2 Field Documentation

4.3.2.1 size

```
int os_queue_pool_t::size
```

Size of the queue

The documentation for this struct was generated from the following file:

- [wm_os.h](#)

4.4 os_thread_stack_t Struct Reference

Data Fields

- int [size](#)

4.4.1 Detailed Description

Structure to be used during call to the function [os_thread_create\(\)](#). Please use the macro [os_thread_stack_define](#) instead of using this structure directly.

4.4.2 Field Documentation

4.4.2.1 size

```
int os_thread_stack_t::size
```

Total stack size

The documentation for this struct was generated from the following file:

- [wm_os.h](#)

4.5 wifi_antcfg_t Struct Reference

Data Fields

- t_u32 [ant_mode](#)
- t_u16 [evaluate_time](#)

4.5.1 Detailed Description

Type definition of [wifi_antcfg_t](#)

4.5.2 Field Documentation

4.5.2.1 ant_mode

```
t_u32 wifi_antcfg_t::ant_mode
```

Antenna Mode

4.5.2.2 evaluate_time

```
t_u16 wifi_antcfg_t::evaluate_time
```

Evaluate Time

The documentation for this struct was generated from the following file:

- [wifi-decl.h](#)

4.6 wifi_auto_reconnect_config_t Struct Reference

Data Fields

- [t_u8 reconnect_counter](#)
- [t_u8 reconnect_interval](#)
- [t_u16 flags](#)

4.6.1 Detailed Description

Auto reconnect structure

4.6.2 Field Documentation

4.6.2.1 reconnect_counter

```
t_u8 wifi_auto_reconnect_config_t::reconnect_counter
```

Reconnect counter

4.6.2.2 reconnect_interval

`t_u8 wifi_auto_reconnect_config_t::reconnect_interval`

Reconnect interval

4.6.2.3 flags

`t_u16 wifi_auto_reconnect_config_t::flags`

Flags

The documentation for this struct was generated from the following file:

- [wifi-decl.h](#)

4.7 wifi_bandcfg_t Struct Reference

Data Fields

- `t_u32` [config_bands](#)
- `t_u32` [fw_bands](#)

4.7.1 Detailed Description

Type definition of [wifi_bandcfg_t](#)

4.7.2 Field Documentation

4.7.2.1 config_bands

`t_u32 wifi_bandcfg_t::config_bands`

Infra band

4.7.2.2 fw_bands

`t_u32 wifi_bandcfg_t::fw_bands`

fw supported band

The documentation for this struct was generated from the following file:

- [wifi-decl.h](#)

4.8 wifi_cal_data_t Struct Reference

Data Fields

- `t_u16` [data_len](#)
- `t_u8 *` [data](#)

4.8.1 Detailed Description

Calibration Data

4.8.2 Field Documentation

4.8.2.1 data_len

```
t_u16 wifi_cal_data_t::data_len
```

Calibration data length

4.8.2.2 data

```
t_u8* wifi_cal_data_t::data
```

Calibration data

The documentation for this struct was generated from the following file:

- [wifi-decl.h](#)

4.9 wifi_chan_info_t Struct Reference

Data Fields

- `t_u8` [chan_num](#)
- `t_u16` [chan_freq](#)
- `bool` [passive_scan_or_radar_detect](#)

4.9.1 Detailed Description

Data structure for Channel attributes

4.9.2 Field Documentation

4.9.2.1 chan_num

```
t_u8 wifi_chan_info_t::chan_num
```

Channel Number

4.9.2.2 chan_freq

```
t_u16 wifi_chan_info_t::chan_freq
```

Channel frequency for this channel

4.9.2.3 passive_scan_or_radar_detect

```
bool wifi_chan_info_t::passive_scan_or_radar_detect
```

Passive Scan or RADAR Detect

The documentation for this struct was generated from the following file:

- [wifi-decl.h](#)

4.10 wifi_chan_list_param_set_t Struct Reference

Data Fields

- int [no_of_channels](#)
- [wifi_chan_scan_param_set_t](#) [chan_scan_param](#) [1]

4.10.1 Detailed Description

Channel list parameter set

4.10.2 Field Documentation

4.10.2.1 no_of_channels

```
int wifi_chan_list_param_set_t::no_of_channels
```

number of channels

4.10.2.2 chan_scan_param

```
wifi_chan_scan_param_set_t wifi_chan_list_param_set_t::chan_scan_param[1]
```

channel scan array

The documentation for this struct was generated from the following file:

- [wifi-decl.h](#)

4.11 wifi_chan_scan_param_set_t Struct Reference

Data Fields

- `t_u8` [chan_number](#)
- `t_u16` [min_scan_time](#)
- `t_u16` [max_scan_time](#)

4.11.1 Detailed Description

Channel scan parameters

4.11.2 Field Documentation

4.11.2.1 chan_number

```
t_u8 wifi_chan_scan_param_set_t::chan_number
```

channel number

4.11.2.2 min_scan_time

```
t_u16 wifi_chan_scan_param_set_t::min_scan_time
```

minimum scan time

4.11.2.3 max_scan_time

```
t_u16 wifi_chan_scan_param_set_t::max_scan_time
```

maximum scan time

The documentation for this struct was generated from the following file:

- [wifi-decl.h](#)

4.12 wifi_chanlist_t Struct Reference

Data Fields

- [t_u8 num_chans](#)
- [wifi_chan_info_t chan_info](#) [54]

4.12.1 Detailed Description

Data structure for Channel List Config

4.12.2 Field Documentation

4.12.2.1 num_chans

```
t_u8 wifi_chanlist_t::num_chans
```

Number of Channels

4.12.2.2 chan_info

```
wifi_chan_info_t wifi_chanlist_t::chan_info[54]
```

Channel Info

The documentation for this struct was generated from the following file:

- [wifi-decl.h](#)

4.13 wifi_channel_desc_t Struct Reference

Data Fields

- t_u16 [start_freq](#)
- t_u8 [chan_width](#)
- t_u8 [chan_num](#)

4.13.1 Detailed Description

Data structure for Channel descriptor

Set CFG data for Tx power limitation

start_freq: Starting Frequency of the band for this channel

2407, 2414 or 2400 for 2.4 GHz

5000

4000

chan_width: Channel Width

20

chan_num : Channel Number

4.13.2 Field Documentation

4.13.2.1 start_freq

t_u16 wifi_channel_desc_t::start_freq

Starting frequency of the band for this channel

4.13.2.2 chan_width

t_u8 wifi_channel_desc_t::chan_width

Channel width

4.13.2.3 chan_num

t_u8 wifi_channel_desc_t::chan_num

Channel Number

The documentation for this struct was generated from the following file:

- [wifi-decl.h](#)

4.14 wifi_cw_mode_ctrl_t Struct Reference

Data Fields

- t_u8 [mode](#)
- t_u8 [channel](#)
- t_u8 [chanInfo](#)
- t_u16 [txPower](#)
- t_u16 [pktLength](#)
- t_u32 [rateInfo](#)

4.14.1 Detailed Description

CW_MODE_CTRL structure

4.14.2 Field Documentation

4.14.2.1 mode

t_u8 wifi_cw_mode_ctrl_t::mode

Mode of Operation 0:Disable 1: Tx Continuous Packet 2 : Tx Continuous Wave

4.14.2.2 channel

t_u8 wifi_cw_mode_ctrl_t::channel

channel

4.14.2.3 chanInfo

t_u8 wifi_cw_mode_ctrl_t::chanInfo

channel info

4.14.2.4 txPower

t_u16 wifi_cw_mode_ctrl_t::txPower

Tx Power level in dBm

4.14.2.5 pktLength

t_u16 wifi_cw_mode_ctrl_t::pktLength

Packet Length

4.14.2.6 rateInfo

t_u32 wifi_cw_mode_ctrl_t::rateInfo

bit rate info

The documentation for this struct was generated from the following file:

- [wifi-decl.h](#)

4.15 wifi_data_rate_t Struct Reference

Data Fields

- t_u32 [tx_data_rate](#)
- t_u32 [rx_data_rate](#)
- t_u32 [tx_ht_bw](#)
- t_u32 [tx_ht_gi](#)
- t_u32 [rx_ht_bw](#)
- t_u32 [rx_ht_gi](#)
- t_u32 [tx_mcs_index](#)
- t_u32 [rx_mcs_index](#)
- t_u32 [tx_rate_format](#)
- t_u32 [rx_rate_format](#)

4.15.1 Detailed Description

Data structure for cmd get data rate

4.15.2 Field Documentation

4.15.2.1 tx_data_rate

t_u32 wifi_data_rate_t::tx_data_rate

Tx data rate

4.15.2.2 rx_data_rate

t_u32 wifi_data_rate_t::rx_data_rate

Rx data rate

4.15.2.3 tx_ht_bw

t_u32 wifi_data_rate_t::tx_ht_bw

Tx channel bandwidth

4.15.2.4 tx_ht_gi

t_u32 wifi_data_rate_t::tx_ht_gi

Tx guard interval

4.15.2.5 rx_ht_bw

t_u32 wifi_data_rate_t::rx_ht_bw

Rx channel bandwidth

4.15.2.6 rx_ht_gi

t_u32 wifi_data_rate_t::rx_ht_gi

Rx guard interval

4.15.2.7 tx_mcs_index

t_u32 wifi_data_rate_t::tx_mcs_index

MCS index

4.15.2.8 rx_mcs_index

t_u32 wifi_data_rate_t::rx_mcs_index

MCS index

4.15.2.9 tx_rate_format

t_u32 wifi_data_rate_t::tx_rate_format

LG rate: 0, HT rate: 1, VHT rate: 2

4.15.2.10 rx_rate_format

```
t_u32 wifi_data_rate_t::rx_rate_format
```

LG rate: 0, HT rate: 1, VHT rate: 2

The documentation for this struct was generated from the following file:

- [wifi-decl.h](#)

4.16 wifi_domain_param_t Struct Reference

Data Fields

- t_u8 [country_code](#) [COUNTRY_CODE_LEN]
- int [no_of_sub_band](#)
- [wifi_sub_band_set_t](#) [sub_band](#) [1]

4.16.1 Detailed Description

Data structure for domain parameters

This structure is accepted by wlan_uap_set_domain_params() API. This information is used to generate the country info IE.

4.16.2 Field Documentation

4.16.2.1 country_code

```
t_u8 wifi_domain_param_t::country_code[COUNTRY_CODE_LEN]
```

Country code

4.16.2.2 no_of_sub_band

```
int wifi_domain_param_t::no_of_sub_band
```

subbands count

4.16.2.3 sub_band

`wifi_sub_band_set_t` `wifi_domain_param_t::sub_band[1]`

Set of subbands of `no_of_sub_band` number of elements

The documentation for this struct was generated from the following file:

- [wifi-decl.h](#)

4.17 wifi_ds_rate Struct Reference

Data Fields

- enum `wifi_ds_command_type` [sub_command](#)
- union {
 - [wifi_rate_cfg_t](#) `rate_cfg`
 - [wifi_data_rate_t](#) `data_rate`
- } `param`

4.17.1 Detailed Description

Type definition of [wifi_ds_rate](#)

4.17.2 Field Documentation

4.17.2.1 sub_command

`enum wifi_ds_command_type` `wifi_ds_rate::sub_command`

Sub-command

4.17.2.2 rate_cfg

`wifi_rate_cfg_t` `wifi_ds_rate::rate_cfg`

Rate configuration for MLAN_OID_RATE_CFG

4.17.2.3 data_rate

`wifi_data_rate_t` `wifi_ds_rate::data_rate`

Data rate for MLAN_OID_GET_DATA_RATE

4.17.2.4 param

```
union { ... } wifi_ds_rate::param
```

Rate configuration parameter

The documentation for this struct was generated from the following file:

- [wifi-decl.h](#)

4.18 wifi_ed_mac_ctrl_t Struct Reference

Data Fields

- [t_u16 ed_ctrl_2g](#)
- [t_s16 ed_offset_2g](#)

4.18.1 Detailed Description

Type definition of [wifi_ed_mac_ctrl_t](#)

4.18.2 Field Documentation

4.18.2.1 ed_ctrl_2g

```
t_u16 wifi_ed_mac_ctrl_t::ed_ctrl_2g
```

ED CTRL 2G

4.18.2.2 ed_offset_2g

```
t_s16 wifi_ed_mac_ctrl_t::ed_offset_2g
```

ED Offset 2G

The documentation for this struct was generated from the following file:

- [wifi-decl.h](#)

4.19 wififlt_cfg_t Struct Reference

Data Fields

- [t_u32 criteria](#)
- [t_u16 nentries](#)
- [wifi_mef_entry_t mef_entry](#)

4.19.1 Detailed Description

Wifi filter config struct

4.19.2 Field Documentation

4.19.2.1 criteria

`t_u32 wififlt_cfg_t::criteria`

Filter Criteria

4.19.2.2 nentries

`t_u16 wififlt_cfg_t::nentries`

Number of entries

4.19.2.3 mef_entry

`wifi_mef_entry_t wififlt_cfg_t::mef_entry`

MEF entry

The documentation for this struct was generated from the following file:

- [wifi-decl.h](#)

4.20 wifi_fw_version_ext_t Struct Reference

Data Fields

- `uint8_t` [version_str_sel](#)
- `char` [version_str](#) [[MLAN_MAX_VER_STR_LEN](#)]

4.20.1 Detailed Description

Extended Firmware version

4.20.2 Field Documentation

4.20.2.1 version_str_sel

```
uint8_t wifi_fw_version_ext_t::version_str_sel
```

ID for extended version select

4.20.2.2 version_str

```
char wifi_fw_version_ext_t::version_str[MLAN_MAX_VER_STR_LEN]
```

Firmware version string

The documentation for this struct was generated from the following file:

- [wifi-decl.h](#)

4.21 wifi_fw_version_t Struct Reference

Data Fields

- char [version_str](#) [MLAN_MAX_VER_STR_LEN]

4.21.1 Detailed Description

Firmware version

4.21.2 Field Documentation

4.21.2.1 version_str

```
char wifi_fw_version_t::version_str[MLAN_MAX_VER_STR_LEN]
```

Firmware version string

The documentation for this struct was generated from the following file:

- [wifi-decl.h](#)

4.22 wifi_mac_addr_t Struct Reference

Data Fields

- char [mac](#) [MLAN_MAC_ADDR_LENGTH]

4.22.1 Detailed Description

MAC address

4.22.2 Field Documentation

4.22.2.1 mac

```
char wifi_mac_addr_t::mac[MLAN_MAC_ADDR_LENGTH]
```

Mac address array

The documentation for this struct was generated from the following file:

- [wifi-decl.h](#)

4.23 wifi_mef_entry_t Struct Reference

Data Fields

- t_u8 [mode](#)
- t_u8 [action](#)
- t_u8 [filter_num](#)
- [wifi_mef_filter_t filter_item](#) [MAX_NUM_FILTERS]
- t_u8 [rpn](#) [MAX_NUM_FILTERS]

4.23.1 Detailed Description

MEF entry struct

4.23.2 Field Documentation

4.23.2.1 mode

t_u8 wifi_mef_entry_t::mode

mode: bit0—hostsleep mode; bit1—non hostsleep mode

4.23.2.2 action

t_u8 wifi_mef_entry_t::action

action: 0—discard and not wake host; 1—discard and wake host; 3—allow and wake host;

4.23.2.3 filter_num

t_u8 wifi_mef_entry_t::filter_num

filter number

4.23.2.4 filter_item

wifi_mef_filter_t wifi_mef_entry_t::filter_item[MAX_NUM_FILTERS]

filter array

4.23.2.5 rpn

t_u8 wifi_mef_entry_t::rpn[MAX_NUM_FILTERS]

rpn array

The documentation for this struct was generated from the following file:

- [wifi-decl.h](#)

4.24 wifi_mef_filter_t Struct Reference

Data Fields

- t_u16 [type](#)
- t_u32 [pattern](#)
- t_u16 [offset](#)
- t_u16 [num_bytes](#)
- t_u16 [repeat](#)
- t_u8 [num_byte_seq](#)
- t_u8 [byte_seq](#) [MAX_NUM_BYTE_SEQ]
- t_u8 [num_mask_seq](#)
- t_u8 [mask_seq](#) [MAX_NUM_MASK_SEQ]

4.24.1 Detailed Description

Type definition of filter_item support three match methods: <1>Byte comparison type=0x41 <2>Decimal comparison type=0x42 <3>Bit comparison type=0x43

4.24.2 Field Documentation

4.24.2.1 type

```
t_u16 wifi_mef_filter_t::type
```

BYTE 0X41; Decimal 0X42; Bit 0x43

4.24.2.2 pattern

```
t_u32 wifi_mef_filter_t::pattern
```

value

4.24.2.3 offset

```
t_u16 wifi_mef_filter_t::offset
```

offset

4.24.2.4 num_bytes

```
t_u16 wifi_mef_filter_t::num_bytes
```

number of bytes

4.24.2.5 repeat

```
t_u16 wifi_mef_filter_t::repeat
```

repeat

4.24.2.6 num_byte_seq

```
t_u8 wifi_mef_filter_t::num_byte_seq
```

byte number

4.24.2.7 byte_seq

```
t_u8 wifi_mef_filter_t::byte_seq[MAX_NUM_BYTE_SEQ]
```

array

4.24.2.8 num_mask_seq

```
t_u8 wifi_mef_filter_t::num_mask_seq
```

mask numbers

4.24.2.9 mask_seq

```
t_u8 wifi_mef_filter_t::mask_seq[MAX_NUM_MASK_SEQ]
```

array

The documentation for this struct was generated from the following file:

- [wifi-decl.h](#)

4.25 wifi_nat_keep_alive_t Struct Reference

Data Fields

- t_u16 [interval](#)
- t_u8 [dst_mac](#) [MLAN_MAC_ADDR_LENGTH]
- t_u32 [dst_ip](#)
- t_u16 [dst_port](#)

4.25.1 Detailed Description

TCP nat keep alive information

4.25.2 Field Documentation

4.25.2.1 interval

```
t_u16 wifi_nat_keep_alive_t::interval
```

Keep alive interval

4.25.2.2 dst_mac

```
t_u8 wifi_nat_keep_alive_t::dst_mac[MLAN_MAC_ADDR_LENGTH]
```

Destination MAC address

4.25.2.3 dst_ip

```
t_u32 wifi_nat_keep_alive_t::dst_ip
```

Destination IP

4.25.2.4 dst_port

```
t_u16 wifi_nat_keep_alive_t::dst_port
```

Destination port

The documentation for this struct was generated from the following file:

- [wifi-decl.h](#)

4.26 wifi_pkt_stats_t Struct Reference

Data Fields

- t_u32 [mcast_tx_frame](#)
- t_u32 [failed](#)
- t_u32 [retry](#)
- t_u32 [multi_retry](#)
- t_u32 [frame_dup](#)
- t_u32 [rts_success](#)
- t_u32 [rts_failure](#)
- t_u32 [ack_failure](#)
- t_u32 [rx_frag](#)
- t_u32 [mcast_rx_frame](#)
- t_u32 [fcs_error](#)
- t_u32 [tx_frame](#)
- t_u32 [reserved](#)
- t_u32 [wep_icv_error](#) [4]
- t_u32 [bcn_rcv_cnt](#)
- t_u32 [bcn_miss_cnt](#)
- t_u32 [tx_frag_cnt](#)
- t_u32 [qos_tx_frag_cnt](#) [8]
- t_u32 [qos_failed_cnt](#) [8]
- t_u32 [qos_retry_cnt](#) [8]
- t_u32 [qos_multi_retry_cnt](#) [8]
- t_u32 [qos_frm_dup_cnt](#) [8]
- t_u32 [qos_rts_suc_cnt](#) [8]

- t_u32 qos_rts_failure_cnt [8]
- t_u32 qos_ack_failure_cnt [8]
- t_u32 qos_rx_frag_cnt [8]
- t_u32 qos_tx_frm_cnt [8]
- t_u32 qos_discarded_frm_cnt [8]
- t_u32 qos_mpdus_rx_cnt [8]
- t_u32 qos_retries_rx_cnt [8]
- t_u32 cmacicv_errors
- t_u32 cmac_replays
- t_u32 mgmt_ccmp_replays
- t_u32 tkipicv_errors
- t_u32 tkip_replays
- t_u32 ccmp_decrypt_errors
- t_u32 ccmp_replays
- t_u32 tx_amsdu_cnt
- t_u32 failed_amsdu_cnt
- t_u32 retry_amsdu_cnt
- t_u32 multi_retry_amsdu_cnt
- t_u64 tx_octets_in_amsdu_cnt
- t_u32 amsdu_ack_failure_cnt
- t_u32 rx_amsdu_cnt
- t_u64 rx_octets_in_amsdu_cnt
- t_u32 tx_ampdu_cnt
- t_u32 tx_mpdus_in_ampdu_cnt
- t_u64 tx_octets_in_ampdu_cnt
- t_u32 ampdu_rx_cnt
- t_u32 mpdu_in_rx_ampdu_cnt
- t_u64 rx_octets_in_ampdu_cnt
- t_u32 ampdu_delimiter_crc_error_cnt

4.26.1 Detailed Description

WiFi Statistics counter

4.26.2 Field Documentation

4.26.2.1 mcast_tx_frame

```
t_u32 wifi_pkt_stats_t::mcast_tx_frame
```

Multicast transmitted frame count

4.26.2.2 failed

```
t_u32 wifi_pkt_stats_t::failed
```

Failure count

4.26.2.3 retry

t_u32 wifi_pkt_stats_t::retry

Retry count

4.26.2.4 multi_retry

t_u32 wifi_pkt_stats_t::multi_retry

Multi entry count

4.26.2.5 frame_dup

t_u32 wifi_pkt_stats_t::frame_dup

Duplicate frame count

4.26.2.6 rts_success

t_u32 wifi_pkt_stats_t::rts_success

RTS success count

4.26.2.7 rts_failure

t_u32 wifi_pkt_stats_t::rts_failure

RTS failure count

4.26.2.8 ack_failure

t_u32 wifi_pkt_stats_t::ack_failure

Ack failure count

4.26.2.9 rx_frag

t_u32 wifi_pkt_stats_t::rx_frag

Rx fragmentation count

4.26.2.10 mcast_rx_frame

t_u32 wifi_pkt_stats_t::mcast_rx_frame

Multicast Tx frame count

4.26.2.11 fcs_error

```
t_u32 wifi_pkt_stats_t::fcs_error
```

FCS error count

4.26.2.12 tx_frame

```
t_u32 wifi_pkt_stats_t::tx_frame
```

Tx frame count

4.26.2.13 reserved

```
t_u32 wifi_pkt_stats_t::reserved
```

Reserved

4.26.2.14 wep_icv_error

```
t_u32 wifi_pkt_stats_t::wep_icv_error[4]
```

WEP ICV error count

4.26.2.15 bcn_rcv_cnt

```
t_u32 wifi_pkt_stats_t::bcn_rcv_cnt
```

Beacon receive count

4.26.2.16 bcn_miss_cnt

```
t_u32 wifi_pkt_stats_t::bcn_miss_cnt
```

Beacon miss count

4.26.2.17 tx_frag_cnt

```
t_u32 wifi_pkt_stats_t::tx_frag_cnt
```

Tx frag count

4.26.2.18 qos_tx_frag_cnt

```
t_u32 wifi_pkt_stats_t::qos_tx_frag_cnt[8]
```

Qos Tx frag count

4.26.2.19 qos_failed_cnt

```
t_u32 wifi_pkt_stats_t::qos_failed_cnt[8]
```

Qos failed count

4.26.2.20 qos_retry_cnt

```
t_u32 wifi_pkt_stats_t::qos_retry_cnt[8]
```

Qos retry count

4.26.2.21 qos_multi_retry_cnt

```
t_u32 wifi_pkt_stats_t::qos_multi_retry_cnt[8]
```

Qos multi retry count

4.26.2.22 qos_frm_dup_cnt

```
t_u32 wifi_pkt_stats_t::qos_frm_dup_cnt[8]
```

Qos frame dup count

4.26.2.23 qos_rts_suc_cnt

```
t_u32 wifi_pkt_stats_t::qos_rts_suc_cnt[8]
```

Qos rts success count

4.26.2.24 qos_rts_failure_cnt

```
t_u32 wifi_pkt_stats_t::qos_rts_failure_cnt[8]
```

Qos rts failure count

4.26.2.25 qos_ack_failure_cnt

```
t_u32 wifi_pkt_stats_t::qos_ack_failure_cnt[8]
```

Qos ack failure count

4.26.2.26 qos_rx_frag_cnt

```
t_u32 wifi_pkt_stats_t::qos_rx_frag_cnt[8]
```

Qos Rx frag count

4.26.2.27 qos_tx_frm_cnt

```
t_u32 wifi_pkt_stats_t::qos_tx_frm_cnt[8]
```

Qos Tx frame count

4.26.2.28 qos_discarded_frm_cnt

```
t_u32 wifi_pkt_stats_t::qos_discarded_frm_cnt[8]
```

Qos discarded frame count

4.26.2.29 qos_mpdus_rx_cnt

```
t_u32 wifi_pkt_stats_t::qos_mpdus_rx_cnt[8]
```

Qos mpdus Rx count

4.26.2.30 qos_retries_rx_cnt

```
t_u32 wifi_pkt_stats_t::qos_retries_rx_cnt[8]
```

Qos retry rx count

4.26.2.31 cmacicv_errors

```
t_u32 wifi_pkt_stats_t::cmacicv_errors
```

CMAC ICV errors count

4.26.2.32 cmac_replays

```
t_u32 wifi_pkt_stats_t::cmac_replays
```

CMAC replays count

4.26.2.33 mgmt_ccmp_replays

```
t_u32 wifi_pkt_stats_t::mgmt_ccmp_replays
```

mgmt CCMP replays count

4.26.2.34 tkipicv_errors

```
t_u32 wifi_pkt_stats_t::tkipicv_errors
```

TKIP ICV errors count

4.26.2.35 tkip_replays

t_u32 wifi_pkt_stats_t::tkip_replays

TKIP replays count

4.26.2.36 ccmp_decrypt_errors

t_u32 wifi_pkt_stats_t::ccmp_decrypt_errors

CCMP decrypt errors count

4.26.2.37 ccmp_replays

t_u32 wifi_pkt_stats_t::ccmp_replays

CCMP replays count

4.26.2.38 tx_amsdu_cnt

t_u32 wifi_pkt_stats_t::tx_amsdu_cnt

Tx amsdu count

4.26.2.39 failed_amsdu_cnt

t_u32 wifi_pkt_stats_t::failed_amsdu_cnt

failed amsdu count

4.26.2.40 retry_amsdu_cnt

t_u32 wifi_pkt_stats_t::retry_amsdu_cnt

retry amsdu count

4.26.2.41 multi_retry_amsdu_cnt

t_u32 wifi_pkt_stats_t::multi_retry_amsdu_cnt

multi-retry amsdu count

4.26.2.42 tx_octets_in_amsdu_cnt

t_u64 wifi_pkt_stats_t::tx_octets_in_amsdu_cnt

Tx octets in amsdu count

4.26.2.43 amsdu_ack_failure_cnt

t_u32 wifi_pkt_stats_t::amsdu_ack_failure_cnt

amsdu ack failure count

4.26.2.44 rx_amsdu_cnt

t_u32 wifi_pkt_stats_t::rx_amsdu_cnt

Rx amsdu count

4.26.2.45 rx_octets_in_amsdu_cnt

t_u64 wifi_pkt_stats_t::rx_octets_in_amsdu_cnt

Rx octets in amsdu count

4.26.2.46 tx_ampdu_cnt

t_u32 wifi_pkt_stats_t::tx_ampdu_cnt

Tx ampdu count

4.26.2.47 tx_mpdu_in_ampdu_cnt

t_u32 wifi_pkt_stats_t::tx_mpdu_in_ampdu_cnt

tx mpdu in ampdu count

4.26.2.48 tx_octets_in_ampdu_cnt

t_u64 wifi_pkt_stats_t::tx_octets_in_ampdu_cnt

tx octets in ampdu count

4.26.2.49 ampdu_rx_cnt

t_u32 wifi_pkt_stats_t::ampdu_rx_cnt

ampdu Rx count

4.26.2.50 mpdu_in_rx_ampdu_cnt

t_u32 wifi_pkt_stats_t::mpdu_in_rx_ampdu_cnt

mpdu in Rx ampdu count

4.26.2.51 rx_octets_in_ampdu_cnt

t_u64 wifi_pkt_stats_t::rx_octets_in_ampdu_cnt

Rx octets ampdu count

4.26.2.52 ampdu_delimiter_crc_error_cnt

t_u32 wifi_pkt_stats_t::ampdu_delimiter_crc_error_cnt

ampdu delimiter CRC error count

The documentation for this struct was generated from the following file:

- [wifi.h](#)

4.27 wifi_rate_cfg_t Struct Reference

Data Fields

- t_u32 [rate_format](#)
- t_u32 [rate_index](#)
- t_u32 [rate](#)

4.27.1 Detailed Description

Data structure for cmd txratecfg

4.27.2 Field Documentation

4.27.2.1 rate_format

t_u32 wifi_rate_cfg_t::rate_format

LG rate: 0, HT rate: 1, VHT rate: 2

4.27.2.2 rate_index

t_u32 wifi_rate_cfg_t::rate_index

Rate/MCS index (0xFF: auto)

4.27.2.3 rate

```
t_u32 wifi_rate_cfg_t::rate
```

Rate rate

The documentation for this struct was generated from the following file:

- [wifi-decl.h](#)

4.28 wifi_remain_on_channel_t Struct Reference

Data Fields

- uint16_t [remove](#)
- uint8_t [status](#)
- uint8_t [bandcfg](#)
- uint8_t [channel](#)
- uint32_t [remain_period](#)

4.28.1 Detailed Description

Remain on channel info structure

4.28.2 Field Documentation

4.28.2.1 remove

```
uint16_t wifi_remain_on_channel_t::remove
```

Remove

4.28.2.2 status

```
uint8_t wifi_remain_on_channel_t::status
```

Current status

4.28.2.3 bandcfg

```
uint8_t wifi_remain_on_channel_t::bandcfg
```

band configuration

4.28.2.4 channel

```
uint8_t wifi_remain_on_channel_t::channel
```

Channel

4.28.2.5 remain_period

```
uint32_t wifi_remain_on_channel_t::remain_period
```

Remain on channel period

The documentation for this struct was generated from the following file:

- [wifi-decl.h](#)

4.29 wifi_rf_channel_t Struct Reference

Data Fields

- uint16_t [current_channel](#)
- uint16_t [rf_type](#)

4.29.1 Detailed Description

Rf channel

4.29.2 Field Documentation

4.29.2.1 current_channel

```
uint16_t wifi_rf_channel_t::current_channel
```

Current channel

4.29.2.2 rf_type

```
uint16_t wifi_rf_channel_t::rf_type
```

RF Type

The documentation for this struct was generated from the following file:

- [wifi-decl.h](#)

4.30 wifi_rssi_info_t Struct Reference

Data Fields

- [int16_t data_rssi_last](#)
- [int16_t data_nf_last](#)
- [int16_t data_rssi_avg](#)
- [int16_t data_nf_avg](#)
- [int16_t bcn_snr_last](#)
- [int16_t bcn_snr_avg](#)
- [int16_t data_snr_last](#)
- [int16_t data_snr_avg](#)
- [int16_t bcn_rssi_last](#)
- [int16_t bcn_nf_last](#)
- [int16_t bcn_rssi_avg](#)
- [int16_t bcn_nf_avg](#)

4.30.1 Detailed Description

RSSI information

4.30.2 Field Documentation

4.30.2.1 data_rssi_last

```
int16_t wifi_rssi_info_t::data_rssi_last
```

Data RSSI last

4.30.2.2 data_nf_last

```
int16_t wifi_rssi_info_t::data_nf_last
```

Data nf last

4.30.2.3 data_rssi_avg

```
int16_t wifi_rssi_info_t::data_rssi_avg
```

Data RSSI average

4.30.2.4 data_nf_avg

```
int16_t wifi_rssi_info_t::data_nf_avg
```

Data nf average

4.30.2.5 bcn_snr_last

```
int16_t wifi_rssi_info_t::bcn_snr_last
```

BCN SNR

4.30.2.6 bcn_snr_avg

```
int16_t wifi_rssi_info_t::bcn_snr_avg
```

BCN SNR average

4.30.2.7 data_snr_last

```
int16_t wifi_rssi_info_t::data_snr_last
```

Data SNR last

4.30.2.8 data_snr_avg

```
int16_t wifi_rssi_info_t::data_snr_avg
```

Data SNR average

4.30.2.9 bcn_rssi_last

```
int16_t wifi_rssi_info_t::bcn_rssi_last
```

BCN RSSI

4.30.2.10 bcn_nf_last

```
int16_t wifi_rssi_info_t::bcn_nf_last
```

BCN nf

4.30.2.11 bcn_rssi_avg

```
int16_t wifi_rssi_info_t::bcn_rssi_avg
```

BCN RSSI average

4.30.2.12 bcn_nf_avg

```
int16_t wifi_rssi_info_t::bcn_nf_avg
```

BCN nf average

The documentation for this struct was generated from the following file:

- [wifi-decl.h](#)

4.31 wifi_scan_chan_list_t Struct Reference

Data Fields

- uint8_t [num_of_chan](#)
- uint8_t [chan_number](#) [MLAN_MAX_CHANNEL]

4.31.1 Detailed Description

Channel list structure

4.31.2 Field Documentation

4.31.2.1 num_of_chan

```
uint8_t wifi_scan_chan_list_t::num_of_chan
```

Number of channels

4.31.2.2 chan_number

```
uint8_t wifi_scan_chan_list_t::chan_number [MLAN_MAX_CHANNEL]
```

Channel number

The documentation for this struct was generated from the following file:

- [wifi-decl.h](#)

4.32 wifi_scan_channel_list_t Struct Reference

Data Fields

- `t_u8 chan_number`
- `t_u8 scan_type`
- `t_u16 scan_time`

4.32.1 Detailed Description

Scan channel list

4.32.2 Field Documentation

4.32.2.1 chan_number

`t_u8 wifi_scan_channel_list_t::chan_number`

Channel number

4.32.2.2 scan_type

`t_u8 wifi_scan_channel_list_t::scan_type`

Scan type Active = 1, Passive = 2

4.32.2.3 scan_time

`t_u16 wifi_scan_channel_list_t::scan_time`

Scan time

The documentation for this struct was generated from the following file:

- [wifi-decl.h](#)

4.33 wifi_scan_params_v2_t Struct Reference

Data Fields

- `t_u8 bssid` [MLAN_MAC_ADDR_LENGTH]
- `char ssid` [MLAN_MAX_SSID_LENGTH+1]
- `t_u8 num_channels`
- `wifi_scan_channel_list_t chan_list` [MAX_CHANNEL_LIST]
- `t_u8 num_probes`
- `int(* cb)` (unsigned int count)

4.33.1 Detailed Description

V2 scan parameters

4.33.2 Field Documentation

4.33.2.1 bssid

```
t_u8 wifi_scan_params_v2_t::bssid[MLAN_MAC_ADDR_LENGTH]
```

BSSID to scan

4.33.2.2 ssid

```
char wifi_scan_params_v2_t::ssid[MLAN_MAX_SSID_LENGTH+1]
```

SSID to scan

4.33.2.3 num_channels

```
t_u8 wifi_scan_params_v2_t::num_channels
```

Number of channels

4.33.2.4 chan_list

```
wifi_scan_channel_list_t wifi_scan_params_v2_t::chan_list[MAX_CHANNEL_LIST]
```

Channel list with channel information

4.33.2.5 num_probes

```
t_u8 wifi_scan_params_v2_t::num_probes
```

Number of probes

4.33.2.6 cb

```
int(* wifi_scan_params_v2_t::cb) (unsigned int count)
```

Callback to be called when scan is completed

The documentation for this struct was generated from the following file:

- [wifi-decl.h](#)

4.34 wifi_scan_result Struct Reference

Data Fields

- uint8_t [bssid](#) [MLAN_MAC_ADDR_LENGTH]
- bool [is_ibss_bit_set](#)
- uint8_t [ssid](#) [MLAN_MAX_SSID_LENGTH]
- int [ssid_len](#)
- uint8_t [Channel](#)
- uint8_t [RSSI](#)
- uint16_t [beacon_period](#)
- uint8_t [dtim_period](#)
- _SecurityMode_t [WPA_WPA2_WEP](#)
- _Cipher_t [wpa_mcstCipher](#)
- _Cipher_t [wpa_ucstCipher](#)
- _Cipher_t [rsn_mcstCipher](#)
- _Cipher_t [rsn_ucstCipher](#)
- bool [is_pmf_required](#)
- bool [phtcap_ie_present](#)
- bool [phtinfo_ie_present](#)
- bool [wmm_ie_present](#)
- uint8_t [band](#)
- bool [wps_IE_exist](#)
- uint16_t [wps_session](#)
- bool [wpa2_entp_IE_exist](#)
- uint8_t [trans_mode](#)
- uint8_t [trans_bssid](#) [MLAN_MAC_ADDR_LENGTH]
- uint8_t [trans_ssid](#) [MLAN_MAX_SSID_LENGTH]
- int [trans_ssid_len](#)

4.34.1 Detailed Description

Scan result information

4.34.2 Field Documentation

4.34.2.1 bssid

```
uint8_t wifi_scan_result::bssid[MLAN_MAC_ADDR_LENGTH]
```

BSSID array

4.34.2.2 is_ibss_bit_set

```
bool wifi_scan_result::is_ibss_bit_set
```

Is bssid set?

4.34.2.3 ssid

```
uint8_t wifi_scan_result::ssid[MLAN_MAX_SSID_LENGTH]
```

ssid array

4.34.2.4 ssid_len

```
int wifi_scan_result::ssid_len
```

SSID length

4.34.2.5 Channel

```
uint8_t wifi_scan_result::Channel
```

Channel associated to the BSSID

4.34.2.6 RSSI

```
uint8_t wifi_scan_result::RSSI
```

Received signal strength

4.34.2.7 beacon_period

```
uint16_t wifi_scan_result::beacon_period
```

Beacon period

4.34.2.8 dtim_period

```
uint8_t wifi_scan_result::dtim_period
```

DTIM period

4.34.2.9 WPA_WPA2_WEP

```
_SecurityMode_t wifi_scan_result::WPA_WPA2_WEP
```

Security mode info

4.34.2.10 wpa_mcstCipher

```
_Cipher_t wifi_scan_result::wpa_mcstCipher
```

WPA multicast cipher

4.34.2.11 wpa_ucstCipher

```
_Cipher_t wifi_scan_result::wpa_ucstCipher
```

WPA unicast cipher

4.34.2.12 rsn_mcstCipher

```
_Cipher_t wifi_scan_result::rsn_mcstCipher
```

No security multicast cipher

4.34.2.13 rsn_ucstCipher

```
_Cipher_t wifi_scan_result::rsn_ucstCipher
```

No security unicast cipher

4.34.2.14 is_pmf_required

```
bool wifi_scan_result::is_pmf_required
```

Is pmf required flag WPA_WPA2 = 0 => Security not enabled = 1 => WPA mode = 2 => WPA2 mode = 3 => WEP mode

4.34.2.15 phtcap_ie_present

```
bool wifi_scan_result::phtcap_ie_present
```

PHT CAP IE present info

4.34.2.16 phtinfo_ie_present

```
bool wifi_scan_result::phtinfo_ie_present
```

PHT INFO IE present info

4.34.2.17 wmm_ie_present

```
bool wifi_scan_result::wmm_ie_present
```

WMM IE present info

4.34.2.18 band

```
uint8_t wifi_scan_result::band
```

Band info

4.34.2.19 wps_IE_exist

```
bool wifi_scan_result::wps_IE_exist
```

WPS IE exist info

4.34.2.20 wps_session

```
uint16_t wifi_scan_result::wps_session
```

WPS session

4.34.2.21 wpa2_entp_IE_exist

```
bool wifi_scan_result::wpa2_entp_IE_exist
```

WPA2 enterprise IE exist info

4.34.2.22 trans_mode

```
uint8_t wifi_scan_result::trans_mode
```

Trans mode

4.34.2.23 trans_bssid

```
uint8_t wifi_scan_result::trans_bssid[MLAN_MAC_ADDR_LENGTH]
```

Trans bssid array

4.34.2.24 trans_ssid

```
uint8_t wifi_scan_result::trans_ssid[MLAN_MAX_SSID_LENGTH]
```

Trans ssid array

4.34.2.25 trans_ssid_len

```
int wifi_scan_result::trans_ssid_len
```

Trans bssid length

The documentation for this struct was generated from the following file:

- [wifi-decl.h](#)

4.35 wifi_sta_info_t Struct Reference

Data Fields

- `t_u8` [mac](#) [MLAN_MAC_ADDR_LENGTH]
- `t_u8` [power_mgmt_status](#)
- `t_s8` [rssi](#)

4.35.1 Detailed Description

Station information structure

4.35.2 Field Documentation

4.35.2.1 mac

```
t_u8 wifi_sta_info_t::mac[MLAN_MAC_ADDR_LENGTH]
```

MAC address buffer

4.35.2.2 power_mgmt_status

```
t_u8 wifi_sta_info_t::power_mgmt_status
```

Power management status 0 = active (not in power save) 1 = in power save status

4.35.2.3 rssi

```
t_s8 wifi_sta_info_t::rssi
```

RSSI: dBm

The documentation for this struct was generated from the following file:

- [wifi-decl.h](#)

4.36 wifi_sta_list_t Struct Reference

Data Fields

- int [count](#)

4.36.1 Detailed Description

Note: This is variable length structure. The size of array `mac_list` is equal to `count`. The caller of the API which returns this structure does not need to separately free the array `mac_list`. It only needs to free the `sta_list_t` object after use.

4.36.2 Field Documentation

4.36.2.1 count

```
int wifi_sta_list_t::count
```

Count

The documentation for this struct was generated from the following file:

- [wifi-decl.h](#)

4.37 wifi_sub_band_set_t Struct Reference

Data Fields

- t_u8 [first_chan](#)
- t_u8 [no_of_chan](#)
- t_u8 [max_tx_pwr](#)

4.37.1 Detailed Description

Data structure for subband set

For uAP 11d support

4.37.2 Field Documentation

4.37.2.1 first_chan

`t_u8 wifi_sub_band_set_t::first_chan`

First channel

4.37.2.2 no_of_chan

`t_u8 wifi_sub_band_set_t::no_of_chan`

Number of channels

4.37.2.3 max_tx_pwr

`t_u8 wifi_sub_band_set_t::max_tx_pwr`

Maximum Tx power in dBm

The documentation for this struct was generated from the following file:

- [wifi-decl.h](#)

4.38 wifi_tbtt_offset_t Struct Reference

Data Fields

- `t_u32 min_tbtt_offset`
- `t_u32 max_tbtt_offset`
- `t_u32 avg_tbtt_offset`

4.38.1 Detailed Description

TBTT offset structure

4.38.2 Field Documentation

4.38.2.1 min_tbtt_offset

`t_u32 wifi_tbtt_offset_t::min_tbtt_offset`

Min TBTT offset

4.38.2.2 max_tbtt_offset

```
t_u32 wifi_tbtt_offset_t::max_tbtt_offset
```

Max TBTT offset

4.38.2.3 avg_tbtt_offset

```
t_u32 wifi_tbtt_offset_t::avg_tbtt_offset
```

AVG TBTT offset

The documentation for this struct was generated from the following file:

- [wifi-decl.h](#)

4.39 wifi_tcp_keep_alive_t Struct Reference

Data Fields

- t_u8 [enable](#)
- t_u8 [reset](#)
- t_u32 [timeout](#)
- t_u16 [interval](#)
- t_u16 [max_keep_alives](#)
- t_u8 [dst_mac](#) [MLAN_MAC_ADDR_LENGTH]
- t_u32 [dst_ip](#)
- t_u16 [dst_tcp_port](#)
- t_u16 [src_tcp_port](#)
- t_u32 [seq_no](#)

4.39.1 Detailed Description

TCP keep alive information

4.39.2 Field Documentation

4.39.2.1 enable

```
t_u8 wifi_tcp_keep_alive_t::enable
```

Enable keep alive

4.39.2.2 reset

```
t_u8 wifi_tcp_keep_alive_t::reset
```

Reset

4.39.2.3 timeout

```
t_u32 wifi_tcp_keep_alive_t::timeout
```

Keep alive timeout

4.39.2.4 interval

```
t_u16 wifi_tcp_keep_alive_t::interval
```

Keep alive interval

4.39.2.5 max_keep_alives

```
t_u16 wifi_tcp_keep_alive_t::max_keep_alives
```

Maximum keep alives

4.39.2.6 dst_mac

```
t_u8 wifi_tcp_keep_alive_t::dst_mac[MLAN_MAC_ADDR_LENGTH]
```

Destination MAC address

4.39.2.7 dst_ip

```
t_u32 wifi_tcp_keep_alive_t::dst_ip
```

Destination IP

4.39.2.8 dst_tcp_port

```
t_u16 wifi_tcp_keep_alive_t::dst_tcp_port
```

Destination TCP port

4.39.2.9 src_tcp_port

```
t_u16 wifi_tcp_keep_alive_t::src_tcp_port
```

Source TCP port

4.39.2.10 seq_no

```
t_u32 wifi_tcp_keep_alive_t::seq_no
```

Sequence number

The documentation for this struct was generated from the following file:

- [wifi-decl.h](#)

4.40 wifi_tx_power_t Struct Reference

Data Fields

- uint16_t [current_level](#)
- uint8_t [max_power](#)
- uint8_t [min_power](#)

4.40.1 Detailed Description

Tx power levels

4.40.2 Field Documentation

4.40.2.1 current_level

```
uint16_t wifi_tx_power_t::current_level
```

Current power level

4.40.2.2 max_power

```
uint8_t wifi_tx_power_t::max_power
```

Maximum power level

4.40.2.3 min_power

```
uint8_t wifi_tx_power_t::min_power
```

Minimum power level

The documentation for this struct was generated from the following file:

- [wifi-decl.h](#)

4.41 wifi_txpwrlimit_config_t Struct Reference

Data Fields

- [t_u8 num_mod_grps](#)
- [wifi_channel_desc_t chan_desc](#)
- [wifi_txpwrlimit_entry_t txpwrlimit_entry](#) [10]

4.41.1 Detailed Description

Data structure for TRPC config

For TRPC support

4.41.2 Field Documentation

4.41.2.1 num_mod_grps

`t_u8 wifi_txpwrlimit_config_t::num_mod_grps`

Number of modulation groups

4.41.2.2 chan_desc

`wifi_channel_desc_t wifi_txpwrlimit_config_t::chan_desc`

Chnannel descriptor

4.41.2.3 txpwrlimit_entry

`wifi_txpwrlimit_entry_t wifi_txpwrlimit_config_t::txpwrlimit_entry`[10]

Channel Modulation groups

The documentation for this struct was generated from the following file:

- [wifi-decl.h](#)

4.42 wifi_txpwrlimit_entry_t Struct Reference

Data Fields

- [t_u8 mod_group](#)
- [t_u8 tx_power](#)

4.42.1 Detailed Description

Data structure for Modulation Group

mod_group : ModulationGroup
0: CCK (1,2,5.5,11 Mbps)
1: OFDM (6,9,12,18 Mbps)
2: OFDM (24,36 Mbps)
3: OFDM (48,54 Mbps)
4: HT20 (0,1,2)
5: HT20 (3,4)
6: HT20 (5,6,7)
7: HT40 (0,1,2)
8: HT40 (3,4)
9: HT40 (5,6,7)
10: HT2_20 (8,9,10)
11: HT2_20 (11,12)
12: HT2_20 (13,14,15)
tx_power : Power Limit in dBm

4.42.2 Field Documentation

4.42.2.1 mod_group

t_u8 wifi_txpwrlimit_entry_t::mod_group

Modulation group

4.42.2.2 tx_power

t_u8 wifi_txpwrlimit_entry_t::tx_power

Tx Power

The documentation for this struct was generated from the following file:

- [wifi-decl.h](#)

4.43 wifi_txpwrlimit_t Struct Reference

Data Fields

- [wifi_SubBand_t](#) subband
- t_u8 num_chans
- [wifi_txpwrlimit_config_t](#) txpwrlimit_config [40]

4.43.1 Detailed Description

Data structure for Channel TRPC config

For TRPC support

4.43.2 Field Documentation

4.43.2.1 subband

```
wifi_SubBand_t wifi_txpwrlimit_t::subband
```

SubBand

4.43.2.2 num_chans

```
t_u8 wifi_txpwrlimit_t::num_chans
```

Number of Channels

4.43.2.3 txpwrlimit_config

```
wifi_txpwrlimit_config_t wifi_txpwrlimit_t::txpwrlimit_config[40]
```

TRPC config

The documentation for this struct was generated from the following file:

- [wifi-decl.h](#)

4.44 wlan_cipher Struct Reference

Data Fields

- uint8_t [wep40](#): 1
- uint8_t [wep104](#): 1
- uint8_t [tkip](#): 1
- uint8_t [ccmp](#): 1
- uint8_t [rsvd](#): 4

4.44.1 Detailed Description

Wlan Cipher structure

4.44.2 Field Documentation

4.44.2.1 wep40

```
uint8_t wlan_cipher::wep40
```

1 bit value can be set for wep40

4.44.2.2 wep104

```
uint8_t wlan_cipher::wep104
```

1 bit value can be set for wep104

4.44.2.3 tkip

```
uint8_t wlan_cipher::tkip
```

1 bit value can be set for tkip

4.44.2.4 ccmp

```
uint8_t wlan_cipher::ccmp
```

1 bit value can be set for ccmp

4.44.2.5 rsvd

```
uint8_t wlan_cipher::rsvd
```

4 bits are reserved

The documentation for this struct was generated from the following file:

- [wlan.h](#)

4.45 wlan_ip_config Struct Reference

Data Fields

- struct [ipv4_config](#) ipv4

4.45.1 Detailed Description

Network IP configuration.

This data structure represents the network IP configuration for IPv4 as well as IPv6 addresses

4.45.2 Field Documentation

4.45.2.1 ipv4

```
struct ipv4\_config wlan_ip_config::ipv4
```

The network IPv4 address configuration that should be associated with this interface.

The documentation for this struct was generated from the following file:

- [wlan.h](#)

4.46 wlan_network Struct Reference

Data Fields

- char [name](#) [[WLAN_NETWORK_NAME_MAX_LENGTH](#)]
- char [ssid](#) [[IEEEtypes_SSID_SIZE](#)+1]
- char [bssid](#) [[IEEEtypes_ADDRESS_SIZE](#)]
- unsigned int [channel](#)
- enum [wlan_bss_type](#) type
- enum [wlan_bss_role](#) role
- struct [wlan_network_security](#) security
- struct [wlan_ip_config](#) ip
- unsigned [ssid_specific](#): 1
- unsigned [bssid_specific](#): 1
- unsigned [channel_specific](#): 1
- unsigned [security_specific](#): 1
- uint16_t [beacon_period](#)
- uint8_t [dtim_period](#)

4.46.1 Detailed Description

WLAN Network Profile

This data structure represents a WLAN network profile. It consists of an arbitrary name, WiFi configuration, and IP address configuration.

Every network profile is associated with one of the two interfaces. The network profile can be used for the station interface (i.e. to connect to an Access Point) by setting the role field to [WLAN_BSS_ROLE_STA](#). The network profile can be used for the micro-AP interface (i.e. to start a network of our own.) by setting the mode field to [WLAN_BSS_ROLE_UAP](#).

If the mode field is [WLAN_BSS_ROLE_STA](#), either of the SSID or BSSID fields are used to identify the network, while the other members like channel and security settings characterize the network.

If the mode field is [WLAN_BSS_ROLE_UAP](#), the SSID, channel and security fields are used to define the network to be started.

In both the above cases, the address field is used to determine the type of address assignment to be used for this interface.

4.46.2 Field Documentation

4.46.2.1 name

```
char wlan_network::name[WLAN_NETWORK_NAME_MAX_LENGTH]
```

The name of this network profile. Each network profile that is added to the WLAN Connection Manager must have a unique name.

4.46.2.2 ssid

```
char wlan_network::ssid[IEEEtypes_SSID_SIZE+1]
```

The network SSID, represented as a C string of up to 32 characters in length. If this profile is used in the micro-AP mode, this field is used as the SSID of the network. If this profile is used in the station mode, this field is used to identify the network. Set the first byte of the SSID to NULL (a 0-length string) to use only the BSSID to find the network.

4.46.2.3 bssid

```
char wlan_network::bssid[IEEEtypes_ADDRESS_SIZE]
```

The network BSSID, represented as a 6-byte array. If this profile is used in the micro-AP mode, this field is ignored. If this profile is used in the station mode, this field is used to identify the network. Set all 6 bytes to 0 to use any BSSID, in which case only the SSID will be used to find the network.

4.46.2.4 channel

```
unsigned int wlan_network::channel
```

The channel for this network.

If this profile is used in micro-AP mode, this field specifies the channel to start the micro-AP interface on. Set this to 0 for auto channel selection.

If this profile is used in the station mode, this constrains the channel on which the network to connect should be present. Set this to 0 to allow the network to be found on any channel.

4.46.2.5 type

```
enum wlan_bss_type wlan_network::type
```

BSS type

4.46.2.6 role

```
enum wlan_bss_role wlan_network::role
```

The network wireless mode enum `wlan_bss_role`. Set this to specify what type of wireless network mode to use. This can either be `WLAN_BSS_ROLE_STA` for use in the station mode, or it can be `WLAN_BSS_ROLE_UAP` for use in the micro-AP mode.

4.46.2.7 security

```
struct wlan_network_security wlan_network::security
```

The network security configuration specified by struct `wlan_network_security` for the network.

4.46.2.8 ip

```
struct wlan_ip_config wlan_network::ip
```

The network IP address configuration specified by struct `wlan_ip_config` that should be associated with this interface.

4.46.2.9 ssid_specific

```
unsigned wlan_network::ssid_specific
```

If set to 1, the `ssid` field contains the specific SSID for this network. The WLAN Connection Manager will only connect to networks whose SSID matches. If set to 0, the `ssid` field contents are not used when deciding whether to connect to a network, the BSSID field is used instead and any network whose BSSID matches is accepted.

This field will be set to 1 if the network is added with the SSID specified (not an empty string), otherwise it is set to 0.

4.46.2.10 bssid_specific

```
unsigned wlan_network::bssid_specific
```

If set to 1, the `bssid` field contains the specific BSSID for this network. The WLAN Connection Manager will not connect to any other network with the same SSID unless the BSSID matches. If set to 0, the WLAN Connection Manager will connect to any network whose SSID matches.

This field will be set to 1 if the network is added with the BSSID specified (not set to all zeroes), otherwise it is set to 0.

4.46.2.11 channel_specific

```
unsigned wlan_network::channel_specific
```

If set to 1, the `channel` field contains the specific channel for this network. The WLAN Connection Manager will not look for this network on any other channel. If set to 0, the WLAN Connection Manager will look for this network on any available channel.

This field will be set to 1 if the network is added with the channel specified (not set to 0), otherwise it is set to 0.

4.46.2.12 security_specific

```
unsigned wlan_network::security_specific
```

If set to 0, any security that matches is used. This field is internally set when the security type parameter above is set to WLAN_SECURITY_WILDCARD.

4.46.2.13 beacon_period

```
uint16_t wlan_network::beacon_period
```

Beacon period of associated BSS

4.46.2.14 dtim_period

```
uint8_t wlan_network::dtim_period
```

DTIM period of associated BSS

The documentation for this struct was generated from the following file:

- [wlan.h](#)

4.47 wlan_network_security Struct Reference

Data Fields

- enum [wlan_security_type](#) type
- struct [wlan_cipher](#) mcstCipher
- struct [wlan_cipher](#) ucstCipher
- bool [is_pmf_required](#)
- char [psk](#) [WLAN_PSK_MAX_LENGTH]
- char [psk_len](#)
- char [password](#) [WLAN_PASSWORD_MAX_LENGTH]
- char [password_len](#)
- char [pmk](#) [WLAN_PMK_LENGTH]
- bool [pmk_valid](#)
- bool [mfpc](#)
- bool [mfpr](#)

4.47.1 Detailed Description

Network security configuration

4.47.2 Field Documentation

4.47.2.1 type

```
enum wlan_security_type wlan_network_security::type
```

Type of network security to use specified by enum wlan_security_type.

4.47.2.2 mcstCipher

```
struct wlan_cipher wlan_network_security::mcstCipher
```

Type of network security Group Cipher suite used internally

4.47.2.3 ucstCipher

```
struct wlan_cipher wlan_network_security::ucstCipher
```

Type of network security Pairwise Cipher suite used internally

4.47.2.4 is_pmf_required

```
bool wlan_network_security::is_pmf_required
```

Is PMF required

4.47.2.5 psk

```
char wlan_network_security::psk[WLAN_PSK_MAX_LENGTH]
```

Pre-shared key (network password). For WEP networks this is a hex byte sequence of length psk_len, for WPA and WPA2 networks this is an ASCII pass-phrase of length psk_len. This field is ignored for networks with no security.

4.47.2.6 psk_len

```
char wlan_network_security::psk_len
```

Length of the WEP key or WPA/WPA2 pass phrase, [WLAN_PSK_MIN_LENGTH](#) to [WLAN_PSK_MAX_LENGTH](#). Ignored for networks with no security.

4.47.2.7 password

```
char wlan_network_security::password[WLAN_PASSWORD_MAX_LENGTH]
```

WPA3 SAE password, for WPA3 SAE networks this is an ASCII password of length password_len. This field is ignored for networks with no security.

4.47.2.8 password_len

```
char wlan_network_security::password_len
```

Length of the WPA3 SAE Password, WLAN_PASSWORD_MIN_LENGTH to WLAN_PASSWORD_MAX_LENGTH. Ignored for networks with no security.

4.47.2.9 pmk

```
char wlan_network_security::pmk[WLAN_PMK_LENGTH]
```

Pairwise Master Key. When pmk_valid is set, this is the PMK calculated from the PSK for WPA/PSK networks. If pmk_valid is not set, this field is not valid. When adding networks with [wlan_add_network](#), users can initialize pmk and set pmk_valid in lieu of setting the psk. After successfully connecting to a WPA/PSK network, users can call [wlan_get_current_network](#) to inspect pmk_valid and pmk. Thus, the pmk value can be populated in subsequent calls to [wlan_add_network](#). This saves the CPU time required to otherwise calculate the PMK.

4.47.2.10 pmk_valid

```
bool wlan_network_security::pmk_valid
```

Flag reporting whether pmk is valid or not.

4.47.2.11 mfpc

```
bool wlan_network_security::mfpc
```

Management Frame Protection Capable (MFPC)

4.47.2.12 mfpr

```
bool wlan_network_security::mfpr
```

Management Frame Protection Required (MFPR)

The documentation for this struct was generated from the following file:

- [wlan.h](#)

4.48 wlan_scan_result Struct Reference

Data Fields

- char `ssid` [33]
- unsigned int `ssid_len`
- char `bssid` [6]
- unsigned int `channel`
- enum `wlan_bss_type` type
- enum `wlan_bss_role` role
- unsigned `wmm`: 1
- unsigned `wpa2_entp`: 1
- unsigned `wep`: 1
- unsigned `wpa`: 1
- unsigned `wpa2`: 1
- unsigned `wpa3_sae`: 1
- unsigned char `rssi`
- char `trans_ssid` [33]
- unsigned int `trans_ssid_len`
- char `trans_bssid` [6]
- uint16_t `beacon_period`
- uint8_t `dtim_period`

4.48.1 Detailed Description

Scan Result

4.48.2 Field Documentation

4.48.2.1 ssid

```
char wlan_scan_result::ssid[33]
```

The network SSID, represented as a NULL-terminated C string of 0 to 32 characters. If the network has a hidden SSID, this will be the empty string.

4.48.2.2 ssid_len

```
unsigned int wlan_scan_result::ssid_len
```

SSID length

4.48.2.3 bssid

```
char wlan_scan_result::bssid[6]
```

The network BSSID, represented as a 6-byte array.

4.48.2.4 channel

```
unsigned int wlan_scan_result::channel
```

The network channel.

4.48.2.5 type

```
enum wlan_bss_type wlan_scan_result::type
```

The network wireless type.

4.48.2.6 role

```
enum wlan_bss_role wlan_scan_result::role
```

The network wireless mode.

4.48.2.7 wmm

```
unsigned wlan_scan_result::wmm
```

The network supports WMM. This is set to 0 if the network does not support WMM or if the system does not have WMM support enabled.

4.48.2.8 wpa2_entp

```
unsigned wlan_scan_result::wpa2_entp
```

WPA2 Enterprise security

4.48.2.9 wep

```
unsigned wlan_scan_result::wep
```

The network uses WEP security.

4.48.2.10 wpa

```
unsigned wlan_scan_result::wpa
```

The network uses WPA security.

4.48.2.11 wpa2

```
unsigned wlan_scan_result::wpa2
```

The network uses WPA2 security

4.48.2.12 wpa3_sae

```
unsigned wlan_scan_result::wpa3_sae
```

The network uses WPA3 SAE security

4.48.2.13 rssi

```
unsigned char wlan_scan_result::rssi
```

The signal strength of the beacon

4.48.2.14 trans_ssid

```
char wlan_scan_result::trans_ssid[33]
```

The network SSID, represented as a NULL-terminated C string of 0 to 32 characters. If the network has a hidden SSID, this will be the empty string.

4.48.2.15 trans_ssid_len

```
unsigned int wlan_scan_result::trans_ssid_len
```

SSID length

4.48.2.16 trans_bssid

```
char wlan_scan_result::trans_bssid[6]
```

The network BSSID, represented as a 6-byte array.

4.48.2.17 beacon_period

```
uint16_t wlan_scan_result::beacon_period
```

Beacon Period

4.48.2.18 dtim_period

```
uint8_t wlan_scan_result::dtim_period
```

DTIM Period

The documentation for this struct was generated from the following file:

- [wlan.h](#)

Chapter 5

File Documentation

5.1 cli.h File Reference

CLI module.

5.1.1 Detailed Description

5.1.2 Usage

The CLI module lets you register commands with the CLI interface. Modules that wish to register the commands should initialize the struct `cli_command` structure and pass this to `cli_register_command()`. These commands will then be available on the CLI.

5.1.3 Function Documentation

5.1.3.1 cli_register_command()

```
int cli_register_command (
    const struct cli_command * command )
```

Register a CLI command

This function registers a command with the command-line interface.

Parameters

in	<i>command</i>	The structure to register one CLI command
----	----------------	---

Returns

0 on success
1 on failure

5.1.3.2 cli_unregister_command()

```
int cli_unregister_command (
    const struct cli_command * command )
```

Unregister a CLI command

This function unregisters a command from the command-line interface.

Parameters

in	<i>command</i>	The structure to unregister one CLI command
----	----------------	---

Returns

0 on success
1 on failure

5.1.3.3 cli_init()

```
int cli_init (
    void )
```

Initialize the CLI module

Returns

WM_SUCCESS on success
error code otherwise.

5.1.3.4 cli_stop()

```
int cli_stop (
    void )
```

Stop the CLI thread and carry out the cleanup

Returns

WM_SUCCESS on success
error code otherwise.

5.1.3.5 cli_register_commands()

```
int cli_register_commands (
    const struct cli_command * commands,
    int num_commands )
```

Register a batch of CLI commands

Often, a module will want to register several commands.

Parameters

in	<i>commands</i>	Pointer to an array of commands.
in	<i>num_commands</i>	Number of commands in the array.

Returns

0 on success

1 on failure

5.1.3.6 cli_unregister_commands()

```
int cli_unregister_commands (
    const struct cli_command * commands,
    int num_commands )
```

Unregister a batch of CLI commands

Parameters

in	<i>commands</i>	Pointer to an array of commands.
in	<i>num_commands</i>	Number of commands in the array.

Returns

0 on success

1 on failure

5.1.3.7 cli_get_echo_mode()

```
bool cli_get_echo_mode ( )
```

Get the 'echo' mode for CLI

Returns

true if echo is enabled
false if echo is disabled

5.1.3.8 cli_set_echo_mode()

```
void cli_set_echo_mode (
    bool enabled )
```

Set the 'echo' mode for CLI

Parameters

in	<i>enabled</i>	Set 'true' to enable echo and 'false' to disable.
----	----------------	---

5.2 dhcp-server.h File Reference

DHCP server.

5.2.1 Detailed Description

The DHCP Server is required in the provisioning mode of the application to assign IP Address to Wireless Clients that connect to the WM.

5.2.2 Function Documentation**5.2.2.1 dhcpcd_cli_init()**

```
int dhcpcd_cli_init (
    void )
```

Register DHCP server commands

This function registers the CLI dhcp-stat for the DHCP server. dhcp-stat command displays ip to associated client mac mapping.

Returns

-WM_E_DHCPD_REGISTER_CMDS if cli init operation failed.
WM_SUCCESS if cli init operation success.

5.2.2.2 print_dhcp_stat()

```
void print_dhcp_stat ( )
```

Print DHCP stats

This function prints the dhcp-stat for the DHCP server. dhcp-stat command displays ip to associated client mac mapping.

5.2.2.3 dhcp_server_start()

```
int dhcp_server_start (
    void * intrfc_handle )
```

Start DHCP server

This starts the DHCP server on the interface specified. Typically DHCP server should be running on the micro-AP interface but it can also run on wifi direct interface if configured as group owner. Use [net_get_uap_handle\(\)](#) to get micro-AP interface handle.

Parameters

in	<i>intrfc_handle</i>	The interface handle on which DHCP server will start
----	----------------------	--

Returns

WM_SUCCESS on success or error code

5.2.2.4 dhcp_enable_dns_server()

```
void dhcp_enable_dns_server (
    char ** domain_names )
```

Start DNS server

This starts the DNS server on the interface specified for dhcp server. This function needs to be used before [dhcp_server_start\(\)](#) function and can be invoked on receiving [WLAN_REASON_INITIALIZED](#) event in the application before starting micro-AP.

The application needs to define its own list of domain names with the last entry as NULL. The dns server handles dns queries and if domain name match is found then resolves it to device ip address. Currently the maximum length for each domain name is set to 32 bytes.

Eg. `char *domain_names[] = {"nxpprov.net", "www.nxpprov.net", NULL};`

```
dhcp_enable_dns_server(domain_names);
```

However, application can also start dns server without any domain names specified to solve following issue. Some of the client devices do not show WiFi signal strength symbol when connected to micro-AP in open mode, if dns queries are not resolved. With dns server support enabled, dns server responds with `ERROR_REFUSED` indicating that the DNS server refuses to provide whatever data client is asking for.

Parameters

in	<i>domain_names</i>	Pointer to the list of domain names or NULL.
----	---------------------	--

5.2.2.5 dhcp_server_stop()

```
void dhcp_server_stop (
    void )
```

Stop DHCP server

5.2.2.6 dhcp_server_lease_timeout()

```
int dhcp_server_lease_timeout (
    uint32_t val )
```

Configure the DHCP dynamic IP lease time

This API configures the dynamic IP lease time, which should be invoked before DHCP server initialization

Parameters

in	<i>val</i>	Number of seconds, use (60U*60U*number of hours) for clarity. Max value is (60U*60U*24U*49700U)
----	------------	---

Returns

Error status code

5.2.2.7 dhcp_get_ip_from_mac()

```
int dhcp_get_ip_from_mac (
    uint8_t * client_mac,
    uint32_t * client_ip )
```

Get IP address corresponding to MAC address from dhcpd ip-mac mapping

This API returns IP address mapping to the MAC address present in cache. IP-MAC cache stores MAC to IP mapping of previously or currently connected clients.

Parameters

in	<i>client_mac</i>	Pointer to a six byte array containing the MAC address of the client
out	<i>client_ip</i>	Pointer to IP address of the client

Returns

WM_SUCCESS on success or -WM_FAIL.

5.2.2.8 dhcp_stat()

```
void dhcp_stat ( )
```

Print DHCP stats on the console

This API prints DHCP stats on the console

5.2.3 Enumeration Type Documentation**5.2.3.1 wm_dhcpd_errno**

```
enum wm_dhcpd_errno
```

DHCPD Error Codes

Enumerator

WM_E_DHCPD_SERVER_RUNNING	Dhcp server is already running
WM_E_DHCPD_THREAD_CREATE	Failed to create dhcp thread
WM_E_DHCPD_MUTEX_CREATE	Failed to create dhcp mutex
WM_E_DHCPD_REGISTER_CMDS	Failed to register dhcp commands
WM_E_DHCPD_RESP_SEND	Failed to send dhcp response
WM_E_DHCPD_DNS_IGNORE	Ignore as msg is not a valid dns query
WM_E_DHCPD_BUFFER_FULL	Buffer overflow occurred
WM_E_DHCPD_INVALID_INPUT	The input message is NULL or has incorrect length
WM_E_DHCPD_INVALID_OPCODE	Invalid opcode in the dhcp message
WM_E_DHCPD_INCORRECT_HEADER	Invalid header type or incorrect header length
WM_E_DHCPD_SPOOF_NAME	Spoof length is either NULL or it exceeds max length
WM_E_DHCPD_BCAST_ADDR	Failed to get broadcast address
WM_E_DHCPD_IP_ADDR	Failed to look up requested IP address from the interface
WM_E_DHCPD_NETMASK	Failed to look up requested netmask from the interface
WM_E_DHCPD_SOCKET	Failed to create the socket
WM_E_DHCPD_ARP_SEND	Failed to send Gratuitous ARP
WM_E_DHCPD_IOCTL_CALL	Error in ioctl call
WM_E_DHCPD_INIT	Failed to init dhcp server

5.3 iperf.h File Reference

This file provides the support for network utility iperf.

5.3.1 Function Documentation

5.3.1.1 iperf_cli_init()

```
int iperf_cli_init ( )
```

Register the Network Utility CLI command iperf.

Note

This function can only be called by the application after [wlan_init\(\)](#) called.

Returns

WM_SUCCESS if the CLI commands are registered
-WM_FAIL otherwise (for example if this function was called while the CLI commands were already registered)

5.3.1.2 iperf_cli_deinit()

```
int iperf_cli_deinit ( )
```

Unregister Network Utility CLI command iperf.

Returns

WM_SUCCESS if the CLI commands are unregistered
-WM_FAIL otherwise

5.4 wifi-decl.h File Reference

Wifi structure declarations.

5.4.1 Macro Documentation

5.4.1.1 MLAN_MAX_VER_STR_LEN

```
#define MLAN_MAX_VER_STR_LEN 128
```

Version string buffer length

5.4.1.2 BSS_TYPE_STA

```
#define BSS_TYPE_STA 0
```

BSS type : STA

5.4.1.3 BSS_TYPE_UAP

```
#define BSS_TYPE_UAP 1
```

BSS type : UAP

5.4.1.4 MLAN_MAX_SSID_LENGTH

```
#define MLAN_MAX_SSID_LENGTH (32)
```

MLAN Maximum SSID Length

5.4.1.5 MLAN_MAX_PASS_LENGTH

```
#define MLAN_MAX_PASS_LENGTH (64)
```

MLAN Maximum PASSPHRASE Length

5.4.2 Enumeration Type Documentation**5.4.2.1 wifi_SubBand_t**

```
enum wifi_SubBand_t
```

Wifi subband enum

Enumerator

SubBand_2_4_GHz	Subband 2.4 GHz
SubBand_5_GHz↔ _0	Subband 5 GHz 0
SubBand_5_GHz↔ _1	Subband 5 GHz 1
SubBand_5_GHz↔ _2	Subband 5 GHz 2
SubBand_5_GHz↔ _3	Subband 5 GHz 3

5.5 wifi.h File Reference

This file contains interface to wifi driver.

5.5.1 Function Documentation

5.5.1.1 wifi_init()

```
int wifi_init (
    const uint8_t * fw_ram_start_addr,
    const size_t size )
```

Initialize Wi-Fi driver module.

Performs SDIO init, downloads Wi-Fi Firmware, creates Wi-Fi Driver and command response processor thread.

Also creates mutex, and semaphores used in command and data synchronizations.

Parameters

in	<i>fw_ram_start_addr</i>	address of stored Wi-Fi Firmware.
in	<i>size</i>	Size of Wi-Fi Firmware.

Returns

WM_SUCCESS on success or -WM_FAIL on error.

5.5.1.2 wifi_init_fcc()

```
int wifi_init_fcc (
    const uint8_t * fw_ram_start_addr,
    const size_t size )
```

Initialize Wi-Fi driver module for FCC Certification.

Performs SDIO init, downloads Wi-Fi Firmware, creates Wi-Fi Driver and command response processor thread.

Also creates mutex, and semaphores used in command and data synchronizations.

Parameters

in	<i>fw_ram_start_addr</i>	address of stored Manufacturing Wi-Fi Firmware.
in	<i>size</i>	Size of Manufacturing Wi-Fi Firmware.

Returns

WM_SUCCESS on success or -WM_FAIL on error.

5.5.1.3 wifi_deinit()

```
void wifi_deinit (
    void )
```

Deinitialize Wi-Fi driver module.

Performs SDIO deinit, send shutdown command to Wi-Fi Firmware, deletes Wi-Fi Driver and command processor thread.

Also deletes mutex and semaphores used in command and data synchronizations.

5.5.1.4 wifi_register_data_input_callback()

```
int wifi_register_data_input_callback (
    void(*) (const uint8_t interface, const uint8_t *buffer, const uint16_t len) data↔
    _input_callback )
```

Register Data callback function with Wi-Fi Driver to receive DATA from SDIO.

This callback function is used to send data received from Wi-Fi firmware to the networking stack.

Parameters

in	<i>data_input_callback</i>	Function that needs to be called
----	----------------------------	----------------------------------

Returns

WM_SUCCESS

5.5.1.5 wifi_deregister_data_input_callback()

```
void wifi_deregister_data_input_callback ( )
```

Deregister Data callback function from Wi-Fi Driver

5.5.1.6 wifi_register_amsdu_data_input_callback()

```
int wifi_register_amsdu_data_input_callback (
    void(*) (uint8_t interface, uint8_t *buffer, uint16_t len) amsdu_data_intput↔
    callback )
```

Register Data callback function with Wi-Fi Driver to receive processed AMSDU DATA from Wi-Fi driver.

This callback function is used to send data received from Wi-Fi firmware to the networking stack.

Parameters

in	<i>amsdu_data_input_callback</i>	Function that needs to be called
----	----------------------------------	----------------------------------

Returns

WM_SUCESS

5.5.1.7 wifi_deregister_amsdu_data_input_callback()

```
void wifi_deregister_amsdu_data_input_callback ( )
```

Deregister Data callback function from Wi-Fi Driver

5.5.1.8 wifi_low_level_output()

```
int wifi_low_level_output (
    const uint8_t interface,
    const uint8_t * buffer,
    const uint16_t len )
```

Wi-Fi Driver low level output function.

Data received from upper layer is passed to Wi-Fi Driver for transmission.

Parameters

in	<i>interface</i>	Interface on which DATA frame will be transmitted. 0 for Station interface, 1 for uAP interface and 2 for Wi-Fi Direct interface.
in	<i>buffer</i>	A pointer pointing to DATA frame.
in	<i>len</i>	Length of DATA frame.

Returns

WM_SUCCESS on success or -WM_E_NOMEM if memory is not available or -WM_E_BUSY if SDIO is busy.

5.5.1.9 wifi_set_packet_retry_count()

```
void wifi_set_packet_retry_count (
    const int count )
```

API to enable packet retries at wifi driver level.

This API sets retry count which will be used by wifi driver to retry packet transmission in case there was failure in earlier attempt. Failure may happen due to SDIO write port un-availability or other failures in SDIO write operation.

Note

Default value of retry count is zero.

Parameters

in	<i>count</i>	No of retry attempts.
----	--------------	-----------------------

5.5.1.10 wifi_sta_ampdu_tx_enable()

```
void wifi_sta_ampdu_tx_enable (  
    void )
```

This API can be used to enable AMPDU support on the go when station is a transmitter.

5.5.1.11 wifi_sta_ampdu_tx_disable()

```
void wifi_sta_ampdu_tx_disable (  
    void )
```

This API can be used to disable AMPDU support on the go when station is a transmitter.

5.5.1.12 wifi_sta_ampdu_rx_enable()

```
void wifi_sta_ampdu_rx_enable (  
    void )
```

This API can be used to enable AMPDU support on the go when station is a receiver.

5.5.1.13 wifi_sta_ampdu_rx_disable()

```
void wifi_sta_ampdu_rx_disable (  
    void )
```

This API can be used to disable AMPDU support on the go when station is a receiver.

5.5.1.14 wifi_get_device_mac_addr()

```
int wifi_get_device_mac_addr (  
    wifi_mac_addr_t * mac_addr )
```

Get the device MAC address

Parameters

out	<i>mac_addr</i>	Mac address
-----	-----------------	-------------

Returns

WM_SUCCESS

5.5.1.15 wifi_get_firmware_version()

```
int wifi_get_firmware_version (
    wifi_fw_version_t * ver )
```

Get the string representation of the wlan firmware version.

Parameters

out	<i>ver</i>	Version
-----	------------	---------

Returns

WM_SUCCESS on success or error code.

5.5.1.16 wifi_get_firmware_version_ext()

```
int wifi_get_firmware_version_ext (
    wifi_fw_version_ext_t * version_ext )
```

Get the string representation of the wlan firmware extended version.

Parameters

out	<i>version_ext</i>	Extended Version
-----	--------------------	------------------

Returns

WM_SUCCESS on success or error code.

5.5.1.17 wifi_get_device_firmware_version_ext()

```
int wifi_get_device_firmware_version_ext (
    wifi_fw_version_ext_t * fw_ver_ext )
```


Get the cached string representation of the wlan firmware extended version.

Confidential

Parameters

in	<i>fw_ver_ext</i>	Firmware Version Extended
----	-------------------	---------------------------

Returns

WM_SUCCESS

5.5.1.18 wifi_get_last_cmd_sent_ms()

```
unsigned wifi_get_last_cmd_sent_ms (  
    void )
```

Get the timestamp of the last command sent to the firmware

Returns

Timestamp in millisec of the last command sent

5.5.1.19 wifi_update_last_cmd_sent_ms()

```
void wifi_update_last_cmd_sent_ms ( )
```

This will update the last command sent variable value to current time. This is used for power management.

5.5.1.20 wifi_register_event_queue()

```
int wifi_register_event_queue (  
    os_queue_t * event_queue )
```

Register an event queue with the wifi driver to receive events

The list of events which can be received from the wifi driver are enumerated in the file [wifi_events.h](#)

Parameters

in	<i>event_queue</i>	The queue to which wifi driver will post events.
----	--------------------	--

Note

Only one queue can be registered. If the registered queue needs to be changed unregister the earlier queue first.

Returns

Standard SDK return codes

5.5.1.21 wifi_unregister_event_queue()

```
int wifi_unregister_event_queue (
    os_queue_t * event_queue )
```

Unregister an event queue from the wifi driver.

Parameters

in	<i>event_queue</i>	The queue to which was registered earlier with the wifi driver.
----	--------------------	---

Returns

Standard SDK return codes

5.5.1.22 wifi_get_scan_result()

```
int wifi_get_scan_result (
    unsigned int index,
    struct wifi_scan_result ** desc )
```

Get scan list

Parameters

in	<i>index</i>	Index
out	<i>desc</i>	Descriptor of type wifi_scan_result

Returns

WM_SUCCESS on success or error code.

5.5.1.23 wifi_get_scan_result_count()

```
int wifi_get_scan_result_count (
    unsigned * count )
```

Get the count of elements in the scan list

Parameters

<code>in, out</code>	<code>count</code>	Pointer to a variable which will hold the count after this call returns
----------------------	--------------------	---

Warning

The count returned by this function is the current count of the elements. A scan command given to the driver or some other background event may change this count in the wifi driver. Thus when the API [wifi_get_scan_result](#) is used to get individual elements of the scan list, do not assume that it will return exactly 'count' number of elements. Your application should not consider such situations as a major event.

Returns

Standard SDK return codes.

5.5.1.24 `wifi_uap_bss_sta_list()`

```
int wifi_uap_bss_sta_list (
    wifi_sta_list_t ** list )
```

Returns the current STA list connected to our uAP

This function gets its information after querying the firmware. It will block till the response is received from firmware or a timeout.

Parameters

<code>in, out</code>	<code>list</code>	After this call returns this points to the structure wifi_sta_list_t allocated by the callee. This is variable length structure and depends on count variable inside it. The caller needs to free this buffer after use.. If this function is unable to get the sta list, the value of list parameter will be NULL
----------------------	-------------------	---

Note

The caller needs to explicitly free the buffer returned by this function.

Returns

void

5.5.1.25 `wifi_set_cal_data()`

```
void wifi_set_cal_data (
    uint8_t * cdata,
    unsigned int clen )
```

Set wifi calibration data in firmware.

This function may be used to set wifi calibration data in firmware.

Parameters

in	<i>cdata</i>	The calibration data
in	<i>clen</i>	Length of calibration data

5.5.1.26 wifi_set_mac_addr()

```
void wifi_set_mac_addr (
    uint8_t * mac )
```

Set wifi MAC address in firmware at load time.

This function may be used to set wifi MAC address in firmware.

Parameters

in	<i>mac</i>	The new MAC Address
----	------------	---------------------

5.5.1.27 _wifi_set_mac_addr()

```
void _wifi_set_mac_addr (
    uint8_t * mac )
```

Set wifi MAC address in firmware at run time.

This function may be used to set wifi MAC address in firmware.

Parameters

in	<i>mac</i>	The new MAC Address
----	------------	---------------------

5.5.1.28 wifi_add_mcast_filter()

```
int wifi_add_mcast_filter (
    uint8_t * mac_addr )
```

Add Multicast Filter by MAC Address

Multicast filters should be registered with the WiFi driver for IP-level multicast addresses to work. This API allows for registration of such filters with the WiFi driver.

If multicast-mapped MAC address is 00:12:23:34:45:56 then pass *mac_addr* as below: *mac_addr*[0] = 0x00 *mac_addr*[1] = 0x12 *mac_addr*[2] = 0x23 *mac_addr*[3] = 0x34 *mac_addr*[4] = 0x45 *mac_addr*[5] = 0x56

Parameters

in	<i>mac_addr</i>	multicast mapped MAC address
----	-----------------	------------------------------

Returns

0 on Success or else Error

5.5.1.29 wifi_remove_mcast_filter()

```
int wifi_remove_mcast_filter (
    uint8_t * mac_addr )
```

Remove Multicast Filter by MAC Address

This function removes multicast filters for the given multicast-mapped MAC address. If multicast-mapped MAC address is 00:12:23:34:45:56 then pass *mac_addr* as below: *mac_addr*[0] = 0x00 *mac_addr*[1] = 0x12 *mac_addr*[2] = 0x23 *mac_addr*[3] = 0x34 *mac_addr*[4] = 0x45 *mac_addr*[5] = 0x56

Parameters

in	<i>mac_addr</i>	multicast mapped MAC address
----	-----------------	------------------------------

Returns

0 on Success or else Error

5.5.1.30 wifi_get_ipv4_multicast_mac()

```
void wifi_get_ipv4_multicast_mac (
    uint32_t ipaddr,
    uint8_t * mac_addr )
```

Get Multicast Mapped Mac address from IPv4

This function will generate Multicast Mapped MAC address from IPv4 Multicast Mapped MAC address will be in following format: 1) Higher 24-bits filled with IANA Multicast OUI (01-00-5E) 2) 24th bit set as Zero 3) Lower 23-bits filled with IP address (ignoring higher 9bits).

Parameters

in	<i>ipaddr</i>	ipaddress(input)
in	<i>mac_addr</i>	multicast mapped MAC address(output)

Returns

void

5.5.1.31 wifi_get_region_code()

```
int wifi_get_region_code (
    t_u32 * region_code )
```

Get the wifi region code

This function will return one of the following values in the region_code variable.

0x10 : US FCC
0x20 : CANADA
0x30 : EU
0x32 : FRANCE
0x40 : JAPAN
0x41 : JAPAN
0x50 : China
0xfe : JAPAN
0xff : Special

Parameters

out	region_code	Region Code
-----	-------------	-------------

Returns

Standard WMSDK return codes.

5.5.1.32 wifi_set_region_code()

```
int wifi_set_region_code (
    t_u32 region_code )
```

Set the wifi region code.

This function takes one of the values from the following array.

0x10 : US FCC
0x20 : CANADA
0x30 : EU
0x32 : FRANCE
0x40 : JAPAN
0x41 : JAPAN
0x50 : China
0xfe : JAPAN
0xff : Special

Parameters

in	<i>region_code</i>	Region Code
----	--------------------	-------------

Returns

Standard WMSDK return codes.

5.5.1.33 **wifi_get_uap_channel()**

```
int wifi_get_uap_channel (
    int * channel )
```

Get the uAP channel number

Parameters

in	<i>channel</i>	Pointer to channel number. Will be initialized by callee
----	----------------	--

Returns

Standard WMSDK return code

5.5.1.34 **wifi_uap_enable_11d()**

```
int wifi_uap_enable_11d ( )
```

Sets the domain parameters for the uAP.

Note

This API only saves the domain params inside the driver internal structures. The actual application of the params will happen only during starting phase of uAP. So, if the uAP is already started then the configuration will not apply till uAP re-start.

To use this API you will need to fill up the structure [wifi_domain_param_t](#) with correct parameters.

E.g. Programming for US country code

```
wifi_sub_band_set_t sb = { .first_chan = 1, .no_of_chan= 11, .max_tx_pwr = 30, };
```

```
wifi_domain_param_t *dp = os_mem_alloc(sizeof(wifi_domain_param_t) + sizeof(wifi_sub_band_set_t));
```

```
(void)memcpy(dp->country_code, "US\0", COUNTRY_CODE_LEN); dp->no_of_sub_band = 1; (void)memcpy(dp->sub_band, &sb, sizeof(wifi_sub_band_set_t));
```

```
wmprintf("wifi uap set domain params\n\r"); wifi_uap_set_domain_params(dp); os_mem_free(dp);
```

Returns

WM_SUCCESS on success or error code.

5.5.1.35 wifi_get_otp_user_data()

```
int wifi_get_otp_user_data (
    uint8_t * buf,
    uint16_t len )
```

Get User Data from OTP Memory

Parameters

in	<i>buf</i>	Pointer to buffer where data will be stored
in	<i>len</i>	Number of bytes to read

Returns

WM_SUCCESS if user data read operation is successful.
 -WM_FAIL if user data field is not present or command fails.

5.5.1.36 wifi_get_cal_data()

```
int wifi_get_cal_data (
    wifi_cal_data_t * cal_data )
```

Get Calibration data from WLAN firmware

Parameters

out	<i>cal_data</i>	Pointer to calibration data structure where calibration data and it's length will be stored.
-----	-----------------	--

Returns

WM_SUCCESS if cal data read operation is successful.
 -WM_FAIL if cal data field is not present or command fails.

Note

The user of this API should free the allocated buffer for calibration data.

5.5.2 Enumeration Type Documentation**5.5.2.1 anonymous enum**

anonymous enum

WiFi Error Code

Enumerator

WIFI_ERROR_FW_DNLD_FAILED	The Firmware download operation failed.
WIFI_ERROR_FW_NOT_READY	The Firmware ready register not set.
WIFI_ERROR_CARD_NOT_DETECTED	The WiFi card not found.
WIFI_ERROR_FW_NOT_DETECTED	The WiFi Firmware not found.
ADDR_TYPE_STATIC	static IP address
ADDR_TYPE_DHCP	Dynamic IP address
ADDR_TYPE_LLA	Link level address

5.5.2.2 country_code_t

```
enum country_code_t
```

802.11d country codes

Enumerator

COUNTRY_WW	World Wide Safe Mode
COUNTRY_US	US FCC
COUNTRY_CA	IC Canada
COUNTRY_SG	Singapore
COUNTRY_EU	ETSI
COUNTRY_AU	Australia
COUNTRY_KR	Republic Of Korea
COUNTRY_FR	France
COUNTRY_JP	Japan
COUNTRY_CN	China

5.6 wifi_events.h File Reference

Wi-Fi events.

5.6.1 Enumeration Type Documentation

5.6.1.1 wifi_event

```
enum wifi_event
```

Wifi events

Enumerator

WIFI_EVENT_UAP_STARTED	uAP Started
WIFI_EVENT_UAP_CLIENT_ASSOC	uAP Client Assoc
WIFI_EVENT_UAP_CLIENT_DEAUTH	uAP Client De-authentication
WIFI_EVENT_UAP_NET_ADDR_CONFIG	uAP Network Address Configuration
WIFI_EVENT_UAP_STOPPED	uAP Stopped
WIFI_EVENT_UAP_LAST	uAP Last
WIFI_EVENT_SCAN_RESULT	Scan Result
WIFI_EVENT_GET_HW_SPEC	Get hardware spec
WIFI_EVENT_ASSOCIATION	Association
WIFI_EVENT_PMK	PMK
WIFI_EVENT_AUTHENTICATION	Authentication
WIFI_EVENT_DISASSOCIATION	Disassociation
WIFI_EVENT_DEAUTHENTICATION	De-authentication
WIFI_EVENT_LINK_LOSS	Link Loss
WIFI_EVENT_NET_STA_ADDR_CONFIG	Network station address configuration
WIFI_EVENT_NET_INTERFACE_CONFIG	Network interface configuration
WIFI_EVENT_WEP_CONFIG	WEP configuration
WIFI_EVENT_MAC_ADDR_CONFIG	MAC address configuration
WIFI_EVENT_NET_DHCP_CONFIG	Network DHCP configuration
WIFI_EVENT_SUPPLICANT_PMK	Supplicant PMK
WIFI_EVENT_SLEEP	Sleep
WIFI_EVENT_AWAKE	Awake
WIFI_EVENT_IEEE_PS	IEEE PS
WIFI_EVENT_DEEP_SLEEP	Deep Sleep
WIFI_EVENT_PS_INVALID	PS Invalid
WIFI_EVENT_HS_CONFIG	HS configuration
WIFI_EVENT_ERR_MULTICAST	Error Multicast
WIFI_EVENT_ERR_UNICAST	error Unicast
WIFI_EVENT_11N_ADDBA	802.11N add block ack
WIFI_EVENT_11N_BA_STREAM_TIMEOUT	802.11N block Ack stream timeout
WIFI_EVENT_11N_DELBA	802.11n Delete block add
WIFI_EVENT_11N_AGGR_CTRL	802.11n aggregation control
WIFI_EVENT_CHAN_SWITCH_ANN	Channel Switch Announcement
WIFI_EVENT_CHAN_SWITCH	Channel Switch
WIFI_EVENT_LAST	Event to indicate end of Wi-Fi events

5.6.1.2 wifi_event_reason

```
enum wifi_event_reason
```

WiFi Event Reason

Enumerator

WIFI_EVENT_REASON_SUCCESS	Success
WIFI_EVENT_REASON_TIMEOUT	Timeout
WIFI_EVENT_REASON_FAILURE	Failure

5.6.1.3 wlan_bss_type

enum `wlan_bss_type`

Network wireless BSS Type

Enumerator

WLAN_BSS_TYPE_STA	Station
WLAN_BSS_TYPE_UAP	uAP
WLAN_BSS_TYPE_ANY	Any

5.6.1.4 wlan_bss_role

enum `wlan_bss_role`

Network wireless BSS Role

Enumerator

WLAN_BSS_ROLE_STA	Infrastructure network. The system will act as a station connected to an Access Point.
WLAN_BSS_ROLE_UAP	uAP (micro-AP) network. The system will act as an uAP node to which other Wireless clients can connect.
WLAN_BSS_ROLE_ANY	Either Infrastructure network or micro-AP network

5.6.1.5 wifi_wakeup_event_t

enum `wifi_wakeup_event_t`

This enum defines various wakeup events for which wakeup will occur

Enumerator

WIFI_WAKE_ON_ALL_BROADCAST	Wakeup on broadcast
WIFI_WAKE_ON_UNICAST	Wakeup on unicast
WIFI_WAKE_ON_MAC_EVENT	Wakeup on MAC event
WIFI_WAKE_ON_MULTICAST	Wakeup on multicast
WIFI_WAKE_ON_ARP_BROADCAST	Wakeup on ARP broadcast
WIFI_WAKE_ON_MGMT_FRAME	Wakeup on receiving a management frame

5.7 wlan.h File Reference

WLAN Connection Manager.

5.7.1 Detailed Description

The WLAN Connection Manager (WLCMGR) is one of the core components that provides WiFi-level functionality like scanning for networks, starting a network (Access Point) and associating / disassociating with other wireless networks. The WLCMGR manages two logical interfaces, the station interface and the micro-AP interface. Both these interfaces can be active at the same time.

5.7.2 Usage

The WLCMGR is initialized by calling [wlan_init\(\)](#) and started by calling [wlan_start\(\)](#), one of the arguments of this function is a callback handler. Many of the WLCMGR tasks are asynchronous in nature, and the events are provided by invoking the callback handler. The various usage scenarios of the WLCMGR are outlined below:

- **Scanning:** A call to [wlan_scan\(\)](#) initiates an asynchronous scan of the nearby wireless networks. The results are reported via the callback handler.
- **Network Profiles:** Starting / stopping wireless interfaces or associating / disassociating with other wireless networks is managed through network profiles. The network profiles record details about the wireless network like the SSID, type of security, security passphrase among other things. The network profiles can be managed by means of the [wlan_add_network\(\)](#) and [wlan_remove_network\(\)](#) calls.
- **Association:** The [wlan_connect\(\)](#) and [wlan_disconnect\(\)](#) calls can be used to manage connectivity with other wireless networks (Access Points). These calls manage the station interface of the system.
- **Starting a Wireless Network:** The [wlan_start_network\(\)](#) and [wlan_stop_network\(\)](#) calls can be used to start/stop our own (micro-AP) network. These calls manage the micro-AP interface of the system.

5.7.3 Function Documentation

5.7.3.1 wlan_init()

```
int wlan_init (
    const uint8_t * fw_ram_start_addr,
    const size_t size )
```

Initialize the SDIO driver and create the wifi driver thread.

Parameters

in	<i>fw_ram_start_addr</i>	Start address of the WLAN firmware in RAM.
in	<i>size</i>	Size of the WLAN firmware in RAM.

Returns

WM_SUCCESS if the WLAN Connection Manager service has initialized successfully.
 Negative value if initialization failed.

5.7.3.2 wlan_start()

```
int wlan_start (
    int(*) (enum wlan_event_reason reason, void *data) cb )
```

Start the WLAN Connection Manager service.

This function starts the WLAN Connection Manager.

Note

The status of the WLAN Connection Manager is notified asynchronously through the callback, *cb*, with a WLAN_REASON_INITIALIZED event (if initialization succeeded) or WLAN_REASON_INITIALIZATION_FAILED (if initialization failed).

If the WLAN Connection Manager fails to initialize, the caller should stop WLAN Connection Manager via [wlan_stop\(\)](#) and try [wlan_start\(\)](#) again.

Parameters

in	cb	A pointer to a callback function that handles WLAN events. All further WLCMGR events will be notified in this callback. Refer to enum wlan_event_reason for the various events for which this callback is called.
----	----	---

Returns

WM_SUCCESS if the WLAN Connection Manager service has started successfully.
 -WM_E_INVALID if the *cb* pointer is NULL.
 -WM_FAIL if an internal error occurred.
 WLAN_ERROR_STATE if the WLAN Connection Manager is already running.

5.7.3.3 wlan_stop()

```
int wlan_stop (
    void )
```

Stop the WLAN Connection Manager service.

This function stops the WLAN Connection Manager, causing station interface to disconnect from the currently connected network and stop the micro-AP interface.

Returns

WM_SUCCESS if the WLAN Connection Manager service has been stopped successfully.
 WLAN_ERROR_STATE if the WLAN Connection Manager was not running.

5.7.3.4 wlan_deinit()

```
void wlan_deinit (
    int action )
```

Deinitialize SDIO driver, send shutdown command to WLAN firmware and delete the wifi driver thread.

Parameters

<i>action</i>	Additional action to be taken with deinit WLAN_ACTIVE: no action to be taken
---------------	--

5.7.3.5 wlan_initialize_uap_network()

```
void wlan_initialize_uap_network (
    struct wlan_network * net )
```

WLAN initialize micro-AP network information

This API initializes a default micro-AP network. The network ssid, passphrase is initialized to NULL. Channel is set to auto. The IP Address of the micro-AP interface is 192.168.10.1/255.255.255.0. Network name is set to 'uap-network'.

Parameters

<i>out</i>	<i>net</i>	Pointer to the initialized micro-AP network
------------	------------	---

5.7.3.6 wlan_add_network()

```
int wlan_add_network (
    struct wlan_network * network )
```

Add a network profile to the list of known networks.

This function copies the contents of *network* to the list of known networks in the WLAN Connection Manager. The network's 'name' field must be unique and between [WLAN_NETWORK_NAME_MIN_LENGTH](#) and [WLAN_NETWORK_NAME_MAX_LENGTH](#) characters. The network must specify at least an SSID or BSSID. The WLAN Connection Manager may store up to [WLAN_MAX_KNOWN_NETWORKS](#) networks.

Note

Profiles for the station interface may be added only when the station interface is in the [WLAN_DISCONNECTED](#) or [WLAN_CONNECTED](#) state.

This API can be used to add profiles for station or micro-AP interfaces.

Parameters

in	<i>network</i>	A pointer to the wlan_network that will be copied to the list of known networks in the WLAN Connection Manager successfully.
----	----------------	--

Returns

WM_SUCCESS if the contents pointed to by *network* have been added to the WLAN Connection Manager.

-WM_E_INVALID if *network* is NULL or the network name is not unique or the network name length is not valid or network security is [WLAN_SECURITY_WPA3_SAE](#) but Management Frame Protection Capable is not enabled. in [wlan_network_security](#) field.

-WM_E_NOMEM if there was no room to add the network.

WLAN_ERROR_STATE if the WLAN Connection Manager was running and not in the [WLAN_DISCONNECTED](#), [WLAN_ASSOCIATED](#) or [WLAN_CONNECTED](#) state.

5.7.3.7 wlan_remove_network()

```
int wlan_remove_network (
    const char * name )
```

Remove a network profile from the list of known networks.

This function removes a network (identified by its name) from the WLAN Connection Manager, disconnecting from that network if connected.

Note

This function is asynchronous if it is called while the WLAN Connection Manager is running and connected to the network to be removed. In that case, the WLAN Connection Manager will disconnect from the network and generate an event with reason [WLAN_REASON_USER_DISCONNECT](#). This function is synchronous otherwise.

This API can be used to remove profiles for station or micro-AP interfaces. Station network will not be removed if it is in [WLAN_CONNECTED](#) state and uAP network will not be removed if it is in [WLAN_UAP_STARTED](#) state.

Parameters

in	<i>name</i>	A pointer to the string representing the name of the network to remove.
----	-------------	---

Returns

WM_SUCCESS if the network named *name* was removed from the WLAN Connection Manager successfully. Otherwise, the network is not removed.

WLAN_ERROR_STATE if the WLAN Connection Manager was running and the station interface was not in the [WLAN_DISCONNECTED](#) state.

-WM_E_INVALID if *name* is NULL or the network was not found in the list of known networks.

-WM_FAIL if an internal error occurred while trying to disconnect from the network specified for removal.

5.7.3.8 wlan_connect()

```
int wlan_connect (
    char * name )
```

Connect to a wireless network (Access Point).

When this function is called, WLAN Connection Manager starts connection attempts to the network specified by *name*. The connection result will be notified asynchronously to the WLCMGR callback when the connection process has completed.

When connecting to a network, the event refers to the connection attempt to that network.

Calling this function when the station interface is in the [WLAN_DISCONNECTED](#) state will, if successful, cause the interface to transition into the [WLAN_CONNECTING](#) state. If the connection attempt succeeds, the station interface will transition to the [WLAN_CONNECTED](#) state, otherwise it will return to the [WLAN_DISCONNECTED](#) state. If this function is called while the station interface is in the [WLAN_CONNECTING](#) or [WLAN_CONNECTED](#) state, the WLAN Connection Manager will first cancel its connection attempt or disconnect from the network, respectively, and generate an event with reason [WLAN_REASON_USER_DISCONNECT](#). This will be followed by a second event that reports the result of the new connection attempt.

If the connection attempt was successful the WLCMGR callback is notified with the event [WLAN_REASON_SUCCESS](#), while if the connection attempt fails then either of the events, [WLAN_REASON_NETWORK_NOT_FOUND](#), [WLAN_REASON_NETWORK_AUTH_FAILED](#), [WLAN_REASON_CONNECT_FAILED](#) or [WLAN_REASON_ADDRESS_FAILED](#) are reported as appropriate.

Parameters

in	<i>name</i>	A pointer to a string representing the name of the network to connect to.
----	-------------	---

Returns

WM_SUCCESS if a connection attempt was started successfully

WLAN_ERROR_STATE if the WLAN Connection Manager was not running.

-WM_E_INVALID if there are no known networks to connect to or the network specified by *name* is not in the list of known networks or network *name* is NULL.

-WM_FAIL if an internal error has occurred.

5.7.3.9 wlan_disconnect()

```
int wlan_disconnect (
    void )
```

Disconnect from the current wireless network (Access Point).

When this function is called, the WLAN Connection Manager attempts to disconnect the station interface from its currently connected network (or cancel an in-progress connection attempt) and return to the [WLAN_DISCONNECTED](#) state. Calling this function has no effect if the station interface is already disconnected.

Note

This is an asynchronous function and successful disconnection will be notified using the [WLAN_REASON_USER_DISCONNECT](#).

Returns

WM_SUCCESS if successful

WLAN_ERROR_STATE otherwise

5.7.3.10 wlan_start_network()

```
int wlan_start_network (
    const char * name )
```

Start a wireless network (Access Point).

When this function is called, the WLAN Connection Manager starts the network specified by *name*. The network with the specified *name* must be first added using [wlan_add_network](#) and must be a micro-AP network with a valid SSID.

Note

The WLCMGR callback is asynchronously notified of the status. On success, the event [WLAN_REASON_UAP_SUCCESS](#) is reported, while on failure, the event [WLAN_REASON_UAP_START_FAILED](#) is reported.

Parameters

in	<i>name</i>	A pointer to string representing the name of the network to connect to.
----	-------------	---

Returns

WM_SUCCESS if successful.

WLAN_ERROR_STATE if in power save state or uAP already running.

-WM_E_INVALID if *name* was NULL or the network *name* was not found or it not have a specified SSID.

5.7.3.11 wlan_stop_network()

```
int wlan_stop_network (
    const char * name )
```

Stop a wireless network (Access Point).

When this function is called, the WLAN Connection Manager stops the network specified by *name*. The specified network must be a valid micro-AP network that has already been started.

Note

The WLCMGR callback is asynchronously notified of the status. On success, the event [WLAN_REASON_UAP_STOPPED](#) is reported, while on failure, the event [WLAN_REASON_UAP_STOP_FAILED](#) is reported.

Parameters

in	<i>name</i>	A pointer to a string representing the name of the network to stop.
----	-------------	---

Returns

WM_SUCCESS if successful.

WLAN_ERROR_STATE if uAP is in power save state.

-WM_E_INVALID if *name* was NULL or the network *name* was not found or that the network *name* is not a micro-AP network or it is a micro-AP network but does not have a specified SSID.

5.7.3.12 wlan_get_mac_address()

```
int wlan_get_mac_address (
    uint8_t * dest )
```

Retrieve the wireless MAC address of station/micro-AP interface.

This function copies the MAC address of the wireless interface to the 6-byte array pointed to by *dest*. In the event of an error, nothing is copied to *dest*.

Parameters

out	<i>dest</i>	A pointer to a 6-byte array where the MAC address will be copied.
-----	-------------	---

Returns

WM_SUCCESS if the MAC address was copied.

-WM_E_INVALID if *dest* is NULL.

5.7.3.13 wlan_get_address()

```
int wlan_get_address (
    struct wlan_ip_config * addr )
```

Retrieve the IP address configuration of the station interface.

This function retrieves the IP address configuration of the station interface and copies it to the memory location pointed to by *addr*.

Note

This function may only be called when the station interface is in the [WLAN_CONNECTED](#) state.

Parameters

out	<i>addr</i>	A pointer to the wlan_ip_config .
-----	-------------	---

Returns

WM_SUCCESS if successful.

-WM_E_INVALID if *addr* is NULL.

WLAN_ERROR_STATE if the WLAN Connection Manager was not running or was not in the [WLAN_CONNECTED](#) state.

-WM_FAIL if an internal error occurred when retrieving IP address information from the TCP stack.

5.7.3.14 wlan_get_uap_address()

```
int wlan_get_uap_address (
    struct wlan_ip_config * addr )
```

Retrieve the IP address of micro-AP interface.

This function retrieves the current IP address configuration of micro-AP and copies it to the memory location pointed to by *addr*.

Note

This function may only be called when the micro-AP interface is in the [WLAN_UAP_STARTED](#) state.

Parameters

out	<i>addr</i>	A pointer to the wlan_ip_config .
-----	-------------	---

Returns

WM_SUCCESS if successful.

-WM_E_INVALID if *addr* is NULL.

WLAN_ERROR_STATE if the WLAN Connection Manager was not running or the micro-AP interface was not in the [WLAN_UAP_STARTED](#) state.

-WM_FAIL if an internal error occurred when retrieving IP address information from the TCP stack.

5.7.3.15 wlan_get_current_network()

```
int wlan_get_current_network (
    struct wlan_network * network )
```

Retrieve the current network configuration of station interface.

This function retrieves the current network configuration of station interface when the station interface is in the [WLAN_CONNECTED](#) state.

Parameters

out	network	A pointer to the wlan_network .
-----	---------	---

Returns

WM_SUCCESS if successful.

-WM_E_INVALID if *network* is NULL.

WLAN_ERROR_STATE if the WLAN Connection Manager was not running or not in the [WLAN_CONNECTED](#) state.

5.7.3.16 wlan_get_current_uap_network()

```
int wlan_get_current_uap_network (
    struct wlan_network * network )
```

Retrieve the current network configuration of micro-AP interface.

This function retrieves the current network configuration of micro-AP interface when the micro-AP interface is in the [WLAN_UAP_STARTED](#) state.

Parameters

out	network	A pointer to the wlan_network .
-----	---------	---

Returns

WM_SUCCESS if successful.

-WM_E_INVALID if *network* is NULL.

WLAN_ERROR_STATE if the WLAN Connection Manager was not running or not in the [WLAN_UAP_STARTED](#) state.

5.7.3.17 is_uap_started()

```
int is_uap_started (
    void )
```

Retrieve the status information of the micro-AP interface.

Returns

TRUE if micro-AP interface is in [WLAN_UAP_STARTED](#) state.

FALSE otherwise.

5.7.3.18 is_sta_connected()

```
bool is_sta_connected (
    void )
```

Retrieve the status information of the station interface.

Returns

TRUE if station interface is in [WLAN_CONNECTED](#) state.
FALSE otherwise.

5.7.3.19 is_sta_ipv4_connected()

```
bool is_sta_ipv4_connected (
    void )
```

Retrieve the status information of the ipv4 network of station interface.

Returns

TRUE if ipv4 network of station interface is in [WLAN_CONNECTED](#) state.
FALSE otherwise.

5.7.3.20 wlan_get_network()

```
int wlan_get_network (
    unsigned int index,
    struct wlan_network * network )
```

Retrieve the information about a known network using *index*.

This function retrieves the contents of a network at *index* in the list of known networks maintained by the WLAN Connection Manager and copies it to the location pointed to by *network*.

Note

[wlan_get_network_count\(\)](#) may be used to retrieve the number of known networks. [wlan_get_network\(\)](#) may be used to retrieve information about networks at *index* 0 to one minus the number of networks.

This function may be called regardless of whether the WLAN Connection Manager is running. Calls to this function are synchronous.

Parameters

in	<i>index</i>	The index of the network to retrieve.
out	<i>network</i>	A pointer to the wlan_network where the network configuration for the network at <i>index</i> will be copied.

Returns

WM_SUCCESS if successful.
 -WM_E_INVALID if *network* is NULL or *index* is out of range.

5.7.3.21 wlan_get_network_byname()

```
int wlan_get_network_byname (
    char * name,
    struct wlan_network * network )
```

Retrieve information about a known network using *name*.

This function retrieves the contents of a named network in the list of known networks maintained by the WLAN Connection Manager and copies it to the location pointed to by *network*.

Note

This function may be called regardless of whether the WLAN Connection Manager is running. Calls to this function are synchronous.

Parameters

in	<i>name</i>	The name of the network to retrieve.
out	<i>network</i>	A pointer to the wlan_network where the network configuration for the network having name as <i>name</i> will be copied.

Returns

WM_SUCCESS if successful.
 -WM_E_INVALID if *network* is NULL or *name* is NULL.

5.7.3.22 wlan_get_network_count()

```
int wlan_get_network_count (
    unsigned int * count )
```

Retrieve the number of networks known to the WLAN Connection Manager.

This function retrieves the number of known networks in the list maintained by the WLAN Connection Manager and copies it to *count*.

Note

This function may be called regardless of whether the WLAN Connection Manager is running. Calls to this function are synchronous.

Parameters

out	count	A pointer to the memory location where the number of networks will be copied.
-----	-------	---

Returns

WM_SUCCESS if successful.
-WM_E_INVALID if *count* is NULL.

5.7.3.23 wlan_get_connection_state()

```
int wlan_get_connection_state (  
    enum wlan_connection_state * state )
```

Retrieve the connection state of station interface.

This function retrieves the connection state of station interface, which is one of [WLAN_DISCONNECTED](#), [WLAN_CONNECTING](#), [WLAN_ASSOCIATED](#) or [WLAN_CONNECTED](#).

Parameters

out	state	A pointer to the wlan_connection_state where the current connection state will be copied.
-----	-------	---

Returns

WM_SUCCESS if successful.
-WM_E_INVALID if *state* is NULL
WLAN_ERROR_STATE if the WLAN Connection Manager was not running.

5.7.3.24 wlan_get_uap_connection_state()

```
int wlan_get_uap_connection_state (  
    enum wlan_connection_state * state )
```

Retrieve the connection state of micro-AP interface.

This function retrieves the connection state of micro-AP interface, which is one of [WLAN_UAP_STARTED](#), or [WLAN_UAP_STOPPED](#).

Parameters

out	state	A pointer to the wlan_connection_state where the current connection state will be copied.
-----	-------	---

Returns

WM_SUCCESS if successful.
 -WM_E_INVALID if *state* is NULL
 WLAN_ERROR_STATE if the WLAN Connection Manager was not running.

5.7.3.25 wlan_scan()

```
int wlan_scan (
    int(*) (unsigned int count) cb )
```

Scan for wireless networks.

When this function is called, the WLAN Connection Manager starts scan for wireless networks. On completion of the scan the WLAN Connection Manager will call the specified callback function *cb*. The callback function can then retrieve the scan results by using the [wlan_get_scan_result\(\)](#) function.

Note

This function may only be called when the station interface is in the [WLAN_DISCONNECTED](#) or [WLAN_CONNECTED](#) state. Scanning is disabled in the [WLAN_CONNECTING](#) state.

This function will block until it can issue a scan request if called while another scan is in progress.

Parameters

in	cb	A pointer to the function that will be called to handle scan results when they are available.
----	----	---

Returns

WM_SUCCESS if successful.
 -WM_E_NOMEM if failed to allocated memory for [wlan_scan_params_v2_t](#) structure.
 -WM_E_INVALID if *cb* scan result callack functio pointer is NULL.
 WLAN_ERROR_STATE if the WLAN Connection Manager was not running or not in the [WLAN_DISCONNECTED](#) or [WLAN_CONNECTED](#) states.
 -WM_FAIL if an internal error has occurred and the system is unable to scan.

5.7.3.26 wlan_scan_with_opt()

```
int wlan_scan_with_opt (
    wlan_scan_params_v2_t wlan_scan_param )
```

Scan for wireless networks using options provided.

When this function is called, the WLAN Connection Manager starts scan for wireless networks. On completion of the scan the WLAN Connection Manager will call the specified callback function *cb*. The callback function can then retrieve the scan results by using the [wlan_get_scan_result\(\)](#) function.

Note

This function may only be called when the station interface is in the [WLAN_DISCONNECTED](#) or [WLAN_CONNECTED](#) state. Scanning is disabled in the [WLAN_CONNECTING](#) state.

This function will block until it can issue a scan request if called while another scan is in progress.

Parameters

in	<i>wlan_scan_param</i>	A wlan_scan_params_v2_t structure holding a pointer to function that will be called to handle scan results when they are available, SSID of a wireless network, BSSID of a wireless network, number of channels with scan type information and number of probes.
----	------------------------	--

Returns

WM_SUCCESS if successful.

-WM_E_NOMEM if failed to allocated memory for [wlan_scan_params_v2_t](#) structure.

-WM_E_INVALID if *cb* scan result callack function pointer is NULL.

WLAN_ERROR_STATE if the WLAN Connection Manager was not running or not in the [WLAN_DISCONNECTED](#) or [WLAN_CONNECTED](#) states.

-WM_FAIL if an internal error has occurred and the system is unable to scan.

5.7.3.27 wlan_get_scan_result()

```
int wlan_get_scan_result (
    unsigned int index,
    struct wlan_scan_result * res )
```

Retrieve a scan result.

This function may be called to retrieve scan results when the WLAN Connection Manager has finished scanning. It must be called from within the scan result callback (see [wlan_scan\(\)](#)) as scan results are valid only in that context. The callback argument 'count' provides the number of scan results that may be retrieved and [wlan_get_scan_result\(\)](#) may be used to retrieve scan results at *index* 0 through that number.

Note

This function may only be called in the context of the scan results callback.

Calls to this function are synchronous.

Parameters

in	<i>index</i>	The scan result to retrieve.
out	<i>res</i>	A pointer to the wlan_scan_result where the scan result information will be copied.

Returns

WM_SUCCESS if successful.
 -WM_E_INVALID if *res* is NULL
 WLAN_ERROR_STATE if the WLAN Connection Manager was not running
 -WM_FAIL if the scan result at *index* could not be retrieved (that is, *index* is out of range).

5.7.3.28 wlan_set_ed_mac_mode()

```
int wlan_set_ed_mac_mode (
    wlan_ed_mac_ctrl_t wlan_ed_mac_ctrl )
```

Configure ED MAC mode in Wireless Firmware.

Note

When ed mac mode is enabled, Wireless Firmware will behave following way:

when background noise had reached -70dB or above, WiFi chipset/module should hold data transmitting until condition is removed. It is applicable for both 5GHz and 2.4GHz bands.

Parameters

in	<i>wlan_ed_mac_ctrl</i>	Struct with following parameters ed_ctrl_2g 0 - disable EU adaptivity for 2.4GHz band 1 - enable EU adaptivity for 2.4GHz band
----	-------------------------	--

ed_offset_2g 0 - Default Energy Detect threshold (Default: 0x9) offset value range: 0x80 to 0x7F

Note

If 5GH enabled then add following parameters

```
ed_ctrl_5g      0 - disable EU adaptivity for 5GHz band
                 1 - enable EU adaptivity for 5GHz band

ed_offset_5g    0 - Default Energy Detect threshold(Default: 0xC)
                 offset value range: 0x80 to 0x7F
```

Returns

WM_SUCCESS if the call was successful.
 -WM_FAIL if failed.

5.7.3.29 wlan_get_ed_mac_mode()

```
int wlan_get_ed_mac_mode (
    wlan_ed_mac_ctrl_t * wlan_ed_mac_ctrl )
```

This API can be used to get current ED MAC MODE configuration.

Parameters

out	<i>wlan_ed_mac_ctrl</i>	A pointer to wlan_ed_mac_ctrl_t with parameters mentioned in above set API.
-----	-------------------------	---

Returns

WM_SUCCESS if the call was successful.

-WM_FAIL if failed.

5.7.3.30 wlan_set_cal_data()

```
void wlan_set_cal_data (
    uint8_t * cal_data,
    unsigned int cal_data_size )
```

Set wireless calibration data in WLAN firmware.

This function may be called to set wireless calibration data in firmware. This should be call before [wlan_init\(\)](#) function.

Parameters

in	<i>cal_data</i>	The calibration data buffer
in	<i>cal_data_size</i>	Size of calibration data buffer.

5.7.3.31 wlan_set_mac_addr()

```
void wlan_set_mac_addr (
    uint8_t * mac )
```

Set wireless MAC Address in WLAN firmware.

This function may be called to set wireless MAC Address in firmware. This should be call before [wlan_init\(\)](#) function.

Parameters

in	<i>mac</i>	The MAC Address in 6 byte array format like <code>uint8_t mac[] = { 0x00, 0x50, 0x43, 0x21, 0x19, 0x6E};</code>
----	------------	---

5.7.3.32 wlan_configure_listen_interval()

```
void wlan_configure_listen_interval (
    int listen_interval )
```

Configure Listen interval of IEEE power save mode.

Note

Delivery Traffic Indication Message (DTIM): It is a concept in 802.11. It is a time duration after which AP will send out buffered BROADCAST / MULTICAST data and stations connected to the AP should wakeup to take this broadcast / multicast data.

Traffic Indication Map (TIM): It is a bitmap which the AP sends with each beacon. The bitmap has one bit each for a station connected to AP.

Each station is recognized by an Association Id (AID). If AID is say 1 bit number 1 is set in the bitmap if unicast data is present with AP in its buffer for station with AID = 1. Ideally AP does not buffer any unicast data it just sends unicast data to the station on every beacon when station is not sleeping.

When broadcast data / multicast data is to be send AP sets bit 0 of TIM indicating broadcast / multicast.

The occurrence of DTIM is defined by AP.

Each beacon has a number indicating period at which DTIM occurs.

The number is expressed in terms of number of beacons.

This period is called DTIM Period / DTIM interval.

For example:

If AP has DTIM period = 3 the stations connected to AP have to wake up (if they are sleeping) to receive broadcast / multicast data on every third beacon.

Generic:

When DTIM period is X AP buffers broadcast data / multicast data for X beacons. Then it transmits the data no matter whether station is awake or not.

Listen interval:

This is time interval on station side which indicates when station will be awake to listen i.e. accept data.

Long listen interval:

It comes into picture when station sleeps (IEEEPS) and it does not want to wake up on every DTIM. So station is not worried about broadcast data/multicast data in this case.

This should be a design decision what should be chosen. Firmware suggests values which are about 3 times DTIM at the max to gain optimal usage and reliability.

In the IEEEPS power save mode, the WiFi firmware goes to sleep and periodically wakes up to check if the AP has any pending packets for it. A longer listen interval implies that the WiFi card stays in power save for a longer duration at the cost of additional delays while receiving data. Please note that choosing incorrect value for listen interval will cause poor response from device during data transfer. Actual listen interval selected by firmware is equal to closest DTIM.

For e.g.:-

AP beacon period : 100 ms

AP DTIM period : 2

Application request value: 500ms

Actual listen interval = 400ms (This is the closest DTIM). Actual listen interval set will be a multiple of DTIM closest to but lower than the value provided by the application.

This API can be called before/after association. The configured listen interval will be used in subsequent association attempt.

Parameters

in	listen_interval	Listen interval as below 0 : Unchanged, -1 : Disable, 1-49: Value in beacon intervals, >= 50: Value in TUs
----	-----------------	--

5.7.3.33 wlan_configure_null_pkt_interval()

```
void wlan_configure_null_pkt_interval (
    int time_in_secs )
```

Configure Null packet interval of IEEE power save mode.

Note

In IEEEPS station sends a NULL packet to AP to indicate that the station is alive and AP should not kick it off. If null packet is not send some APs may disconnect station which might lead to a loss of connectivity. The time is specified in seconds. Default value is 30 seconds.

This API should be called before configuring IEEEPS

Parameters

in	<i>time_in_secs</i>	: -1 Disables null packet transmission, 0 Null packet interval is unchanged, n Null packet interval in seconds.
----	---------------------	---

5.7.3.34 wlan_set_antcfg()

```
int wlan_set_antcfg (
    uint32_t ant,
    uint16_t evaluate_time )
```

This API can be used to set the mode of Tx/Rx antenna. If SAD is enabled, this API can also used to set SAD antenna evaluate time interval(antenna mode must be antenna diversity when set SAD evaluate time interval).

Parameters

in	<i>ant</i>	Antenna valid values are 1, 2 and 65535 1 : Tx/Rx antenna 1 2 : Tx/Rx antenna 2 0xFFFF: Tx/Rx antenna diversity
in	<i>evaluate_time</i>	SAD evaluate time interval, default value is 6s(0x1770).

Returns

WM_SUCCESS if successful.

WLAN_ERROR_STATE if unsuccessful.

5.7.3.35 wlan_get_antcfg()

```
int wlan_get_antcfg (
    uint32_t * ant,
    uint16_t * evaluate_time )
```

This API can be used to get the mode of Tx/Rx antenna. If SAD is enabled, this API can also used to get SAD antenna evaluate time interval(antenna mode must be antenna diversity when set SAD evaluate time interval).

Parameters

out	<i>ant</i>	pointer to antenna variable.
out	<i>evaluate_time</i>	pointer to evaluate_time variable for SAD.

Returns

WM_SUCCESS if successful.

WLAN_ERROR_STATE if unsuccessful.

5.7.3.36 wlan_get_firmware_version_ext()

```
char* wlan_get_firmware_version_ext ( )
```

Get the wifi firmware version extension string.

Note

This API does not allocate memory for pointer. It just returns pointer of WLCMGR internal static buffer. So no need to free the pointer by caller.

Returns

wifi firmware version extension string pointer stored in WLCMGR

5.7.3.37 wlan_version_extended()

```
void wlan_version_extended ( )
```

Use this API to print wlan driver and firmware extended version.

5.7.3.38 wlan_get_tsf()

```
int wlan_get_tsf (
    uint32_t * tsf_high,
    uint32_t * tsf_low )
```

Use this API to get the TSF from Wi-Fi firmware.

Parameters

in	<i>tsf_high</i>	Pointer to store TSF higher 32bits.
in	<i>tsf_low</i>	Pointer to store TSF lower 32bits.

Returns

WM_SUCCESS if operation is successful.
 -WM_FAIL if command fails.

5.7.3.39 wlan_ieee80211_wake_on()

```
int wlan_ieee80211_wake_on (
    unsigned int wakeup_conditions )
```

Enable IEEE80211 with Host Sleep Configuration

When enabled, it opportunistically puts the wireless card into IEEE80211 mode. Before putting the Wireless card in power save this also sets the hostsleep configuration on the card as specified. This makes the card generate a wakeup for the processor if any of the wakeup conditions are met.

Parameters

in	wakeup_conditions	conditions to wake the host. This should be a logical OR of the conditions in wlan_wakeup_event_t . Typically devices would want to wake up on WAKE_ON_ALL_BROADCAST , WAKE_ON_UNICAST , WAKE_ON_MAC_EVENT , WAKE_ON_MULTICAST , WAKE_ON_ARP_BROADCAST , WAKE_ON_MGMT_FRAME
----	-------------------	---

Returns

WM_SUCCESS if the call was successful.
 WLAN_ERROR_STATE if the call was made in a state where such an operation is illegal.
 -WM_FAIL otherwise.

Note

This function should be used after station gets connected to a network.

5.7.3.40 wlan_ieee80211_sleep_mode_off()

```
int wlan_ieee80211_sleep_mode_off ( )
```

Turn off IEEE Power Save mode.

Note

This call is asynchronous. The system will exit the power-save mode only when all requisite conditions are met.

Returns

WM_SUCCESS if the call was successful.
 WLAN_ERROR_STATE if the call was made in a state where such an operation is illegal.
 -WM_FAIL otherwise.

5.7.3.41 wlan_deepsleepps_on()

```
int wlan_deepsleepps_on ( )
```

Turn on Deep Sleep Power Save mode.

Note

This call is asynchronous. The system will enter the power-save mode only when all requisite conditions are met. For example, wlan should be disconnected for this to work.

Returns

WM_SUCCESS if the call was successful.

WLAN_ERROR_STATE if the call was made in a state where such an operation is illegal.

5.7.3.42 wlan_deepsleepps_off()

```
int wlan_deepsleepps_off ( )
```

Turn off Deep Sleep Power Save mode.

Note

This call is asynchronous. The system will exit the power-save mode only when all requisite conditions are met.

Returns

WM_SUCCESS if the call was successful.

WLAN_ERROR_STATE if the call was made in a state where such an operation is illegal.

5.7.3.43 wlan_get_beacon_period()

```
uint16_t wlan_get_beacon_period ( )
```

Use this API to get the beacon period of associated BSS.

Returns

beacon_period if operation is successful.

0 if command fails.

5.7.3.44 wlan_get_dtim_period()

```
uint8_t wlan_get_dtim_period ( )
```

Use this API to get the dtim period of associated BSS.

Returns

- dtim_period if operation is successful.
- 0 if DTIM IE Is not found in AP's Probe response.

Note

This API should not be called from WLAN event handler registered by application during [wlan_start](#).

5.7.3.45 wlan_get_data_rate()

```
int wlan_get_data_rate (
    wlan_ds_rate * ds_rate )
```

Use this API to get the current tx and rx rates along with bandwidth and guard interval information if rate is 11N.

Parameters

in	ds_rate	A pointer to structure which will have tx, rx rate information along with bandwidth and guard interval information.
----	---------	---

Note

If rate is greater than 11 then it is 11N rate and from 12 MCS0 rate starts. The bandwidth mapping is like value 0 is for 20MHz, 1 is 40MHz, 2 is for 80MHz. The guard interval value zero means Long otherwise Short.

Returns

- WM_SUCCESS if operation is successful.
- WM_FAIL if command fails.

5.7.3.46 wlan_set_pmfcfg()

```
int wlan_set_pmfcfg (
    uint8_t mfpc,
    uint8_t mfpr )
```

Use this API to set the set management frame protection parameters.

Parameters

in	<i>mfpc</i>	Management Frame Protection Capable (MFPC) 1: Management Frame Protection Capable 0: Management Frame Protection not Capable
in	<i>mfpr</i>	Management Frame Protection Required (MFPR) 1: Management Frame Protection Required 0: Management Frame Protection Optional

Note

Default setting is PMF not capable. *mfpc* = 0, *mfpr* = 1 is an invalid combination

Returns

WM_SUCCESS if operation is successful.

-WM_FAIL if command fails.

5.7.3.47 wlan_get_pmfcfg()

```
int wlan_get_pmfcfg (
    uint8_t * mfpc,
    uint8_t * mfpr )
```

Use this API to get the set management frame protection parameters.

Parameters

out	<i>mfpc</i>	Management Frame Protection Capable (MFPC) 1: Management Frame Protection Capable 0: Management Frame Protection not Capable
out	<i>mfpr</i>	Management Frame Protection Required (MFPR) 1: Management Frame Protection Required 0: Management Frame Protection Optional

Returns

WM_SUCCESS if operation is successful.

-WM_FAIL if command fails.

5.7.3.48 wlan_get_current_bssid()

```
int wlan_get_current_bssid (
    uint8_t * bssid )
```

Use this API to get the BSSID of associated BSS.

Parameters

in	<i>bssid</i>	A pointer to array to store the BSSID.
----	--------------	--

Returns

WM_SUCCESS if operation is successful.
-WM_FAIL if command fails.

5.7.3.49 wlan_get_current_channel()

```
uint8_t wlan_get_current_channel ( )
```

Use this API to get the channel number of associated BSS.

Returns

channel number if operation is successful.
0 if command fails.

5.7.3.50 wlan_get_log()

```
int wlan_get_log (
    wlan_pkt_stats_t * stats )
```

Use this API to get the various statistics from Wi-Fi firmware like number of beacons received, missed and so on.

Parameters

in	<i>stats</i>	A pointer to structure where stats collected from Wi-Fi firmware will be copied.
----	--------------	--

Note

Please explore the elements of the [wlan_pkt_stats_t](#) structure for more information on stats.

Returns

WM_SUCCESS if operation is successful.
-WM_FAIL if command fails.

5.7.3.51 wlan_get_ps_mode()

```
int wlan_get_ps_mode (
    enum wlan_ps_mode * ps_mode )
```

Get station interface power save mode.

Parameters

out	<i>ps_mode</i>	A pointer to wlan_ps_mode where station interface power save mode will be stored.
-----	----------------	---

Returns

WM_SUCCESS if successful.

-WM_E_INVALID if *ps_mode* was NULL.

5.7.3.52 wlan_wlcmgr_send_msg()

```
int wlan_wlcmgr_send_msg (
    enum wifi_event event,
    int reason,
    void * data )
```

Send message to WLAN Connection Manager thread.

Parameters

in	<i>event</i>	An event from wifi_event .
in	<i>reason</i>	A reason code.
in	<i>data</i>	A pointer to data buffer associated with event.

Returns

WM_SUCCESS if successful.

-WM_FAIL if failed.

5.7.3.53 wlan_wfa_basic_cli_init()

```
int wlan_wfa_basic_cli_init (
    void )
```

Register WFA basic WLAN CLI commands

This function registers basic WLAN CLI commands like showing version information, MAC address

Note

This function can only be called by the application after [wlan_init\(\)](#) called.

Returns

WLAN_ERROR_NONE if the CLI commands were registered or

WLAN_ERROR_ACTION if they were not registered (for example if this function was called while the CLI commands were already registered).

5.7.3.54 wlan_basic_cli_init()

```
int wlan_basic_cli_init (  
    void )
```

Register basic WLAN CLI commands

This function registers basic WLAN CLI commands like showing version information, MAC address

Note

This function can only be called by the application after [wlan_init\(\)](#) called.

This function gets called by [wlan_cli_init\(\)](#), hence only one function out of these two functions should be called in the application.

Returns

WLAN_ERROR_NONE if the CLI commands were registered or

WLAN_ERROR_ACTION if they were not registered (for example if this function was called while the CLI commands were already registered).

5.7.3.55 wlan_cli_init()

```
int wlan_cli_init (  
    void )
```

Register WLAN CLI commands.

Try to register the WLAN CLI commands with the CLI subsystem. This function is available for the application for use.

Note

This function can only be called by the application after [wlan_init\(\)](#) called.

This function internally calls [wlan_basic_cli_init\(\)](#), hence only one function out of these two functions should be called in the application.

Returns

WM_SUCCESS if the CLI commands were registered or

-WM_FAIL if they were not (for example if this function was called while the CLI commands were already registered).

5.7.3.56 wlan_enhanced_cli_init()

```
int wlan_enhanced_cli_init (
    void )
```

Register WLAN enhanced CLI commands.

Register the WLAN enhanced CLI commands like set or get tx-power, tx-datarate, tx-modulation etc with the CLI subsystem.

Note

This function can only be called by the application after [wlan_init\(\)](#) called.

Returns

WM_SUCCESS if the CLI commands were registered or
-WM_FAIL if they were not (for example if this function was called while the CLI commands were already registered).

5.7.3.57 wlan_get_uap_supported_max_clients()

```
unsigned int wlan_get_uap_supported_max_clients ( )
```

Get maximum number of WLAN firmware supported stations that will be allowed to connect to the uAP.

Returns

Maximum number of WLAN firmware supported stations.

Note

Get operation is allowed in any uAP state.

5.7.3.58 wlan_get_uap_max_clients()

```
int wlan_get_uap_max_clients (
    unsigned int * max_sta_num )
```

Get current maximum number of stations that will be allowed to connect to the uAP.

Parameters

out	<i>max_sta_num</i>	A pointer to variable where current maximum number of stations of uAP interface will be stored.
-----	--------------------	---

Returns

WM_SUCCESS if successful.
-WM_FAIL if unsuccessful.

Note

Get operation is allowed in any uAP state.

5.7.3.59 wlan_set_uap_max_clients()

```
int wlan_set_uap_max_clients (
    unsigned int max_sta_num )
```

Set maximum number of stations that will be allowed to connect to the uAP.

Parameters

in	<i>max_sta_num</i>	Number of maximum stations for uAP.
----	--------------------	-------------------------------------

Returns

WM_SUCCESS if successful.
-WM_FAIL if unsuccessful.

Note

Set operation is not allowed in [WLAN_UAP_STARTED](#) state.

5.7.3.60 wlan_set_htcapinfo()

```
int wlan_set_htcapinfo (
    unsigned int htcapinfo )
```

This API can be used to configure some of parameters in HTCAPInfo IE (such as Short GI, Channel BW, and Green field support)

Parameters

in	<i>htcapinfo</i>	<p>This is a bitmap and should be used as following</p> <p>Bit 29: Green field enable/disable</p> <p>Bit 26: Rx STBC Support enable/disable. (As we support single spatial stream only 1 bit is used for Rx STBC)</p> <p>Bit 25: Tx STBC support enable/disable.</p> <p>Bit 24: Short GI in 40 Mhz enable/disable</p> <p>Bit 23: Short GI in 20 Mhz enable/disable</p> <p>Bit 22: Rx LDPC enable/disable</p> <p>Bit 17: 20/40 Mhz enable disable.</p> <p>Bit 8: Enable/disable 40Mhz Intolarent bit in ht capinfo.</p> <p>0 will reset this bit and 1 will set this bit in htcapinfo attached in assoc request.</p> <p>All others are reserved and should be set to 0.</p>
----	------------------	--

Returns

WM_SUCCESS if successful.

-WM_FAIL if unsuccessful.

5.7.3.61 wlan_set_httxcfg()

```
int wlan_set_httxcfg (
    unsigned short httxcfg )
```

This API can be used to configure various 11n specific configuration for transmit (such as Short GI, Channel BW and Green field support)

Parameters

in	<i>httxcfg</i>	<p>This is a bitmap and should be used as following</p> <p>Bit 15-10: Reserved set to 0</p> <p>Bit 9-8: Rx STBC set to 0x01</p> <p>BIT9 BIT8 Description</p> <p>0 0 No spatial streams</p> <p>0 1 One spatial streams supported</p> <p>1 0 Reserved</p> <p>1 1 Reserved</p> <p>Bit 7: STBC enable/disable</p> <p>Bit 6: Short GI in 40 Mhz enable/disable</p> <p>Bit 5: Short GI in 20 Mhz enable/disable</p> <p>Bit 4: Green field enable/disable</p> <p>Bit 3-2: Reserved set to 1</p> <p>Bit 1: 20/40 Mhz enable disable.</p> <p>Bit 0: LDPC enable/disable</p> <p>When Bit 1 is set then firmware could transmit in 20Mhz or 40Mhz based on rate adaptation. When this bit is reset then firmware will only transmit in 20Mhz.</p>
----	----------------	--

Returns

WM_SUCCESS if successful.
-WM_FAIL if unsuccessful.

5.7.3.62 wlan_set_txratecfg()

```
int wlan_set_txratecfg (
    wlan_ds_rate ds_rate )
```

This API can be used to set the transmit data rate.

Note

The data rate can be set only after association.

Parameters

in	<i>ds_rate</i>	<p>struct contains following fields sub_command It should be WIFI_DS_RATE_CFG and rate_cfg should have following parameters.</p> <p>rate_format - This parameter specifies the data rate format used in this command</p> <p>0: LG 1: HT 2: VHT 0xff: Auto</p> <p>index - This parameter specifies the rate or MCS index</p> <p>If rate_format is 0 (LG),</p> <p>0 1 Mbps 1 2 Mbps 2 5.5 Mbps 3 11 Mbps 4 6 Mbps 5 9 Mbps 6 12 Mbps 7 18 Mbps 8 24 Mbps 9 36 Mbps 10 48 Mbps 11 54 Mbps</p> <p>If rate_format is 1 (HT),</p> <p>0 MCS0 1 MCS1 2 MCS2 3 MCS3 4 MCS4 5 MCS5 6 MCS6 7 MCS7</p> <p>If STREAM_2X2</p> <p>8 MCS8 9 MCS9 10 MCS10 11 MCS11 12 MCS12 13 MCS13 14 MCS14 15 MCS15</p> <p>If rate_format is 2 (VHT),</p> <p>0 MCS0 1 MCS1 2 MCS2 3 MCS3 4 MCS4 5 MCS5 6 MCS6 7 MCS7 8 MCS8 9 MCS9</p> <p>nss - This parameter specifies the NSS. It is valid only for VHT</p> <p>If rate_format is 2 (VHT),</p> <p>1 NSS1 2 NSS2</p>
----	----------------	--

Returns

WM_SUCCESS if successful.
 -WM_FAIL if unsuccessful.

5.7.3.63 wlan_get_txratecfg()

```
int wlan_get_txratecfg (
    wlan_ds_rate * ds_rate )
```

This API can be used to get the transmit data rate.

Parameters

in	<i>ds_rate</i>	A pointer to wlan_ds_rate where Tx Rate configuration will be stored.
----	----------------	---

Returns

WM_SUCCESS if successful.
 -WM_FAIL if unsuccessful.

5.7.3.64 wlan_get_sta_tx_power()

```
int wlan_get_sta_tx_power (
    t_u32 * power_level )
```

Get Station interface transmit power

Parameters

out	<i>power_level</i>	Transmit power level.
-----	--------------------	-----------------------

Returns

WM_SUCCESS if successful.
 -WM_FAIL if unsuccessful.

5.7.3.65 wlan_set_sta_tx_power()

```
int wlan_set_sta_tx_power (
    int power_level )
```

Set Station interface transmit power

Parameters

in	<i>power_level</i>	Transmit power level.
----	--------------------	-----------------------

Returns

WM_SUCCESS if successful.

-WM_FAIL if unsuccessful.

5.7.3.66 wlan_get_mgmt_ie()

```
int wlan_get_mgmt_ie (
    enum wlan_bss_type bss_type,
    IEEEtypes_ElementId_t index,
    void * buf,
    unsigned int * buf_len )
```

Get Management IE for given BSS type (interface) and index.

Parameters

in	<i>bss_type</i>	BSS Type of interface.
in	<i>index</i>	IE index.
out	<i>buf</i>	Buffer to store requested IE data.
out	<i>buf_len</i>	To store length of IE data.

Returns

WM_SUCCESS if successful.

-WM_FAIL if unsuccessful.

5.7.3.67 wlan_set_mgmt_ie()

```
int wlan_set_mgmt_ie (
    enum wlan_bss_type bss_type,
    IEEEtypes_ElementId_t id,
    void * buf,
    unsigned int buf_len )
```

Set Management IE for given BSS type (interface) and index.

Parameters

in	<i>bss_type</i>	BSS Type of interface.
in	<i>id</i>	Type/ID of Management IE.
in	<i>buf</i>	Buffer containing IE data.
in	<i>buf_len</i>	Length of IE data.

Returns

IE index if successful.
-WM_FAIL if unsuccessful.

5.7.3.68 wlan_clear_mgmt_ie()

```
int wlan_clear_mgmt_ie (
    enum wlan_bss_type bss_type,
    IEEEtypes_ElementId_t index )
```

Clear Management IE for given BSS type (interface) and index.

Parameters

in	<i>bss_type</i>	BSS Type of interface.
in	<i>index</i>	IE index.

Returns

WM_SUCCESS if successful.
-WM_FAIL if unsuccessful.

5.7.3.69 wlan_get_11d_enable_status()

```
bool wlan_get_11d_enable_status ( )
```

Get current status of 11d support.

Returns

true if 11d support is enabled by application.
false if not enabled.

5.7.3.70 wlan_get_current_signal_strength()

```
int wlan_get_current_signal_strength (
    short * rssi,
    int * snr )
```

Get current RSSI and Signal to Noise ratio from WLAN firmware.

Parameters

in	<i>rss</i>	A pointer to variable to store current RSSI
in	<i>snr</i>	A pointer to variable to store current SNR.

Returns

WM_SUCCESS if successful.

5.7.3.71 wlan_get_average_signal_strength()

```
int wlan_get_average_signal_strength (
    short * rss,
    int * snr )
```

Get average RSSI and Signal to Noise ratio from WLAN firmware.

Parameters

in	<i>rss</i>	A pointer to variable to store current RSSI
in	<i>snr</i>	A pointer to variable to store current SNR.

Returns

WM_SUCCESS if successful.

5.7.3.72 wlan_remain_on_channel()

```
int wlan_remain_on_channel (
    const enum wlan_bss_type bss_type,
    const bool status,
    const uint8_t channel,
    const uint32_t duration )
```

This API is used to set/cancel the remain on channel configuration.

Note

When status is false, channel and duration parameters are ignored.

Parameters

in	<i>bss_type</i>	The interface to set channel.
in	<i>status</i>	false : Cancel the remain on channel configuration true : Set the remain on channel configuration
in	<i>channel</i>	The channel to configure
in	<i>duration</i>	The duration for which to remain on channel in milliseconds.

Returns

WM_SUCCESS on success or error code.

5.7.3.73 wlan_get_otp_user_data()

```
int wlan_get_otp_user_data (
    uint8_t * buf,
    uint16_t len )
```

Get User Data from OTP Memory

Parameters

in	<i>buf</i>	Pointer to buffer where data will be stored
in	<i>len</i>	Number of bytes to read

Returns

WM_SUCCESS if user data read operation is successful.
-WM_E_INVALID if buf is not valid or of insufficient size.
-WM_FAIL if user data field is not present or command fails.

5.7.3.74 wlan_get_cal_data()

```
int wlan_get_cal_data (
    wlan_cal_data_t * cal_data )
```

Get calibration data from WLAN firmware

Parameters

out	<i>cal_data</i>	Pointer to calibration data structure where calibration data and it's length will be stored.
-----	-----------------	--

Returns

WM_SUCCESS if cal data read operation is successful.
-WM_E_INVALID if cal_data is not valid.
-WM_FAIL if command fails.

Note

The user of this API should free the allocated buffer for calibration data.

5.7.3.75 wlan_set_chanlist_and_txpwrlimit()

```
int wlan_set_chanlist_and_txpwrlimit (
    wlan_chanlist_t * chanlist,
    wlan_txpwrlimit_t * txpwrlimit )
```

Set the Channel List and TRPC channel configuration.

Parameters

in	<i>chanlist</i>	A pointer to wlan_chanlist_t Channel List configuration.
in	<i>txpwrlimit</i>	A pointer to wlan_txpwrlimit_t TX PWR Limit configuration.

Returns

WM_SUCCESS on success, error otherwise.

5.7.3.76 wlan_set_chanlist()

```
int wlan_set_chanlist (
    wlan_chanlist_t * chanlist )
```

Set the Channel List configuration.

Parameters

in	<i>chanlist</i>	A pointer to wlan_chanlist_t Channel List configuration.
----	-----------------	--

Returns

WM_SUCCESS on success, error otherwise.

Note

If Region Enforcement Flag is enabled in the OTP then this API will not take effect.

5.7.3.77 wlan_get_chanlist()

```
int wlan_get_chanlist (
    wlan_chanlist_t * chanlist )
```

Get the Channel List configuration.

Parameters

out	<i>chanlist</i>	A pointer to wlan_chanlist_t Channel List configuration.
-----	-----------------	--

Returns

WM_SUCCESS on success, error otherwise.

Note

The [wlan_chanlist_t](#) struct allocates memory for a maximum of 54 channels.

5.7.3.78 wlan_set_txpwrlimit()

```
int wlan_set_txpwrlimit (
    wlan_txpwrlimit_t * txpwrlimit )
```

Set the TRPC channel configuration.

Parameters

in	<i>txpwrlimit</i>	A pointer to wlan_txpwrlimit_t TX PWR Limit configuration.
----	-------------------	--

Returns

WM_SUCCESS on success, error otherwise.

5.7.3.79 wlan_get_txpwrlimit()

```
int wlan_get_txpwrlimit (
    wifi_SubBand_t subband,
    wifi_txpwrlimit_t * txpwrlimit )
```

Get the TRPC channel configuration.

Parameters

in	subband	Where subband is: 0x00 2G subband (2.4G: channel 1-14) 0x10 5G subband0 (5G: channel 36,40,44,48, 52,56,60,64) 0x11 5G subband1 (5G: channel 100,104,108,112, 116,120,124,128, 132,136,140,144) 0x12 5G subband2 (5G: channel 149,153,157,161,165,172) 0x13 5G subband3 (5G: channel 183,184,185,187,188, 189, 192,196; 5G: channel 7,8,11,12,16,34)
out	txpwrlimit	A pointer to wlan_txpwrlimit_t TX PWR Limit configuration structure where Wi-Fi firmware configuration will get copied.

Returns

WM_SUCCESS on success, error otherwise.

Note

application can use [print_txpwrlimit](#) API to print the content of the txpwrlimit structure.

5.7.3.80 wlan_set_reassoc_control()

```
void wlan_set_reassoc_control (
    bool reassoc_control )
```

Set Reassociation Control in WLAN Connection Manager

Note

Reassociation is enabled by default in the WLAN Connection Manager.

Parameters

in	reassoc_control	Reassociation enable/disable
----	-----------------	------------------------------

5.7.3.81 wlan_uap_set_beacon_period()

```
void wlan_uap_set_beacon_period (
    const uint16_t beacon_period )
```

API to set the beacon period of uAP

Parameters

in	<i>beacon_period</i>	Beacon period in TU (1 TU = 1024 micro seconds)
----	----------------------	---

Note

Please call this API before calling uAP start API.

5.7.3.82 wlan_uap_set_hidden_ssid()

```
void wlan_uap_set_hidden_ssid (
    const bool bcast_ssid_ctl )
```

API to control SSID broadcast capability of uAP

This API enables/disables the SSID broadcast feature (also known as the hidden SSID feature). When broadcast SSID is enabled, the AP responds to probe requests from client stations that contain null SSID. When broadcast SSID is disabled, the AP does not respond to probe requests that contain null SSID and generates beacons that contain null SSID.

Parameters

in	<i>bcast_ssid_ctl</i>	Broadcast SSID control if true SSID will be hidden otherwise it will be visible.
----	-----------------------	--

Note

Please call this API before calling uAP start API.

5.7.3.83 wlan_uap_ctrl_deauth()

```
void wlan_uap_ctrl_deauth (
    const bool enable )
```

API to control the deauth during uAP channel switch

Parameters

in	<i>enable</i>	0 – Wi-Fi firmware will use default behaviour. 1 – Wi-Fi firmware will not send deauth packet when uap move to another channel.
----	---------------	---

Note

Please call this API before calling uAP start API.

5.7.3.84 wlan_uap_set_ecsa()

```
void wlan_uap_set_ecsa (
    void )
```

API to enable channel switch announcement functionality on uAP.

Note

Please call this API before calling uAP start API. Also note that 11N should be enabled on uAP. The channel switch announcement IE is transmitted in 7 beacons before the channel switch, during a station connection attempt on a different channel with Ex-AP.

5.7.3.85 wlan_uap_set_htcapinfo()

```
void wlan_uap_set_htcapinfo (
    const uint16_t ht_cap_info )
```

API to set the HT Capability Information of uAP

Parameters

in	ht_cap_info	
		- This is a bitmap and should be used as following Bit 15: L Sig TxOP protection - reserved, set to 0 Bit 14: 40 MHz intolerant - reserved, set to 0 Bit 13: PSMP - reserved, set to 0 Bit 12: DSSS Cck40MHz mode Bit 11: Maximal AMSDU size - reserved, set to 0 Bit 10: Delayed BA - reserved, set to 0 Bits 9:8: Rx STBC - reserved, set to 0 Bit 7: Tx STBC - reserved, set to 0 Bit 6: Short GI 40 MHz Bit 5: Short GI 20 MHz Bit 4: GF preamble Bits 3:2: MIMO power save - reserved, set to 0 Bit 1: SuppChanWidth - set to 0 for 2.4 GHz band Bit 0: LDPC coding - reserved, set to 0

Note

Please call this API before calling uAP start API.

5.7.3.86 wlan_sta_ampdu_tx_enable()

```
void wlan_sta_ampdu_tx_enable (
    void )
```

This API can be used to enable AMPDU support on the go when station is a transmitter.

Note

By default the station AMPDU TX support is on if configuration option is enabled in defconfig.

5.7.3.87 wlan_sta_ampdu_tx_disable()

```
void wlan_sta_ampdu_tx_disable (
    void )
```

This API can be used to disable AMPDU support on the go when station is a transmitter.

Note

By default the station AMPDU RX support is on if configuration option is enabled in defconfig.

5.7.3.88 wlan_sta_ampdu_rx_enable()

```
void wlan_sta_ampdu_rx_enable (
    void )
```

This API can be used to enable AMPDU support on the go when station is a receiver.

5.7.3.89 wlan_sta_ampdu_rx_disable()

```
void wlan_sta_ampdu_rx_disable (
    void )
```

This API can be used to disable AMPDU support on the go when station is a receiver.

5.7.3.90 wlan_uap_set_scan_chan_list()

```
void wlan_uap_set_scan_chan_list (
    wifi_scan_chan_list_t scan_chan_list )
```

Set number of channels and channel number used during automatic channel selection of uAP.

Parameters

in	<i>scan_chan_list</i>	A structure holding the number of channels and channel numbers.
----	-----------------------	---

Note

Please call this API before uAP start API in order to set the user defined channels, otherwise it will have no effect. There is no need to call this API every time before uAP start, if once set same channel configuration

will get used in all upcoming uAP start call. If user wish to change the channels at run time then it make sense to call this API before every uAP start API.

5.7.3.91 wlan_send_hostcmd()

```
int wlan_send_hostcmd (
    void * cmd_buf,
    uint32_t cmd_buf_len,
    void * resp_buf,
    uint32_t resp_buf_len,
    uint32_t * reqd_resp_len )
```

This function sends the host command to f/w and copies back response to caller provided buffer in case of success. Response from firmware is not parsed by this function but just copied back to the caller buffer.

Parameters

in	<i>cmd_buf</i>	Buffer containing the host command with header
in	<i>cmd_buf_len</i>	length of valid bytes in cmd_buf
out	<i>resp_buf</i>	Caller provided buffer, in case of success command response is copied to this buffer Can be same as cmd_buf
in	<i>resp_buf_len</i>	resp_buf's allocated length
out	<i>reqd_resp_len</i>	length of valid bytes in response buffer if successful otherwise invalid.

Returns

WM_SUCCESS in case of success.

WM_E_INBIG in case cmd_buf_len is bigger than the commands that can be handled by driver.

WM_E_INSMALL in case cmd_buf_len is smaller than the minimum length. Minimum length is atleast the length of command header. Please see Note for same.

WM_E_OUTBIG in case the resp_buf_len is not sufficient to copy response from firmware. reqd_resp_len is updated with the response size.

WM_E_INVALID in case cmd_buf_len and resp_buf_len have invalid values.

WM_E_NOMEM in case cmd_buf, resp_buf and reqd_resp_len are NULL

Note

Brief on the Command Header: Start 8 bytes of cmd_buf should have these values set. Firmware would update resp_buf with these 8 bytes at the start.

2 bytes : Command.

2 bytes : Size.

2 bytes : Sequence number.

2 bytes : Result.

Rest of buffer length is Command/Response Body.

5.7.4 Macro Documentation

5.7.4.1 ACTION_GET

```
#define ACTION_GET (0)
```

Action GET

5.7.4.2 ACTION_SET

```
#define ACTION_SET (1)
```

Action SET

5.7.4.3 IEEEtypes_SSID_SIZE

```
#define IEEEtypes_SSID_SIZE 32
```

Maximum SSID length

5.7.4.4 IEEEtypes_ADDRESS_SIZE

```
#define IEEEtypes_ADDRESS_SIZE 6
```

MAC Address length

5.7.4.5 WLAN_RESCAN_LIMIT

```
#define WLAN_RESCAN_LIMIT 5
```

The number of times that the WLAN Connection Manager will look for a network before giving up.

5.7.4.6 WLAN_RECONNECT_LIMIT

```
#define WLAN_RECONNECT_LIMIT 5
```

The number of times that the WLAN Connection Manager will attempt a reconnection with the network before giving up.

5.7.4.7 WLAN_NETWORK_NAME_MIN_LENGTH

```
#define WLAN_NETWORK_NAME_MIN_LENGTH 1
```

The minimum length for network names, see [wlan_network](#). This must be between 1 and [WLAN_NETWORK_NAME_MAX_LENGTH](#)

5.7.4.8 WLAN_NETWORK_NAME_MAX_LENGTH

```
#define WLAN_NETWORK_NAME_MAX_LENGTH 32
```

The space reserved for storing network names, [wlan_network](#)

5.7.4.9 WLAN_PSK_MIN_LENGTH

```
#define WLAN_PSK_MIN_LENGTH 8
```

The space reserved for storing PSK (password) phrases.

5.7.4.10 WLAN_MAX_KNOWN_NETWORKS

```
#define WLAN_MAX_KNOWN_NETWORKS CONFIG_WLAN_KNOWN_NETWORKS
```

The size of the list of known networks maintained by the WLAN Connection Manager

5.7.4.11 WLAN_PMK_LENGTH

```
#define WLAN_PMK_LENGTH 32
```

Length of a pairwise master key (PMK). It's always 256 bits (32 Bytes)

5.7.4.12 WLAN_ERROR_NONE

```
#define WLAN_ERROR_NONE 0
```

The operation was successful.

5.7.4.13 WLAN_ERROR_PARAM

```
#define WLAN_ERROR_PARAM 1
```

The operation failed due to an error with one or more parameters.

5.7.4.14 WLAN_ERROR_NOMEM

```
#define WLAN_ERROR_NOMEM 2
```

The operation could not be performed because there is not enough memory.

5.7.4.15 WLAN_ERROR_STATE

```
#define WLAN_ERROR_STATE 3
```

The operation could not be performed in the current system state.

5.7.4.16 WLAN_ERROR_ACTION

```
#define WLAN_ERROR_ACTION 4
```

The operation failed due to an internal error.

5.7.4.17 WLAN_ERROR_PS_ACTION

```
#define WLAN_ERROR_PS_ACTION 5
```

The operation to change power state could not be performed

5.7.4.18 WLAN_ERROR_NOT_SUPPORTED

```
#define WLAN_ERROR_NOT_SUPPORTED 6
```

The requested feature is not supported

5.7.5 Typedef Documentation

5.7.5.1 wlan_pkt_stats_t

```
typedef wifi_pkt_stats_t wlan_pkt_stats_t
```

Wi-Fi firmware stat from [wifi_pkt_stats_t](#)

5.7.5.2 wlan_scan_channel_list_t

```
typedef wifi_scan_channel_list_t wlan_scan_channel_list_t
```

Configuration for Wireless scan channel list from [wifi_scan_channel_list_t](#)

5.7.5.3 wlan_scan_params_v2_t

```
typedef wifi_scan_params_v2_t wlan_scan_params_v2_t
```

Configuration for wireless scanning parameters v2 from [wifi_scan_params_v2_t](#)

5.7.5.4 wlan_cal_data_t

```
typedef wifi_cal_data_t wlan_cal_data_t
```

Configuration for Wireless Calibration data from [wifi_cal_data_t](#)

5.7.5.5 wlanflt_cfg_t

```
typedef wififlt_cfg_t wlanflt_cfg_t
```

Configuration for Memory Efficient Filters in Wi-Fi firmware from [wififlt_cfg_t](#)

5.7.5.6 wlan_ds_rate

```
typedef wifi_ds_rate wlan_ds_rate
```

Configuration for TX Rate and Get data rate from [wifi_ds_rate](#)

5.7.5.7 wlan_ed_mac_ctrl_t

```
typedef wifi_ed_mac_ctrl_t wlan_ed_mac_ctrl_t
```

Configuration for ED MAC Control parameters from [wifi_ed_mac_ctrl_t](#)

5.7.5.8 wlan_bandcfg_t

```
typedef wifi_bandcfg_t wlan_bandcfg_t
```

Configuration for Band from [wifi_bandcfg_t](#)

5.7.5.9 wlan_cw_mode_ctrl_t

```
typedef wifi_cw_mode_ctrl_t wlan_cw_mode_ctrl_t
```

Configuration for CW Mode parameters from [wifi_cw_mode_ctrl_t](#)

5.7.5.10 wlan_chanlist_t

```
typedef wifi_chanlist_t wlan_chanlist_t
```

Configuration for Channel list from [wifi_chanlist_t](#)

5.7.5.11 wlan_txpwrlimit_t

```
typedef wifi_txpwrlimit_t wlan_txpwrlimit_t
```

Configuration for TX Pwr Limit from [wifi_txpwrlimit_t](#)

5.7.6 Enumeration Type Documentation

5.7.6.1 wm_wlan_errno

```
enum wm_wlan_errno
```

Enum for wlan errors

Enumerator

WLAN_ERROR_FW_DNLD_FAILED	The Firmware download operation failed.
WLAN_ERROR_FW_NOT_READY	The Firmware ready register not set.
WLAN_ERROR_CARD_NOT_DETECTED	The WiFi card not found.
WLAN_ERROR_FW_NOT_DETECTED	The WiFi Firmware not found.
WLAN_BSSID_NOT_FOUND_IN_SCAN_LIST	BSSID not found in scan list

5.7.6.2 wlan_event_reason

```
enum wlan_event_reason
```

WLAN Connection Manager event reason

Enumerator

WLAN_REASON_SUCCESS	The WLAN Connection Manager has successfully connected to a network and is now in the WLAN_CONNECTED state.
WLAN_REASON_CONNECT_FAILED	The WLAN Connection Manager failed to connect before actual connection attempt with AP due to incorrect wlan network profile.
WLAN_REASON_NETWORK_NOT_FOUND	The WLAN Connection Manager could not find the network that it was connecting to (or it has tried all known networks and failed to connect to any of them) and it is now in the WLAN_DISCONNECTED state.
WLAN_REASON_NETWORK_AUTH_FAILED	The WLAN Connection Manager failed to authenticate with the network and is now in the WLAN_DISCONNECTED state.
WLAN_REASON_ADDRESS_SUCCESS	DHCP lease has been renewed.
WLAN_REASON_ADDRESS_FAILED	The WLAN Connection Manager failed to obtain an IP address or TCP stack configuration has failed or the IP address configuration was lost due to a DHCP error. The system is now in the WLAN_DISCONNECTED state.
WLAN_REASON_LINK_LOST	The WLAN Connection Manager has lost the link to the current network.
WLAN_REASON_CHAN_SWITCH	The WLAN Connection Manager has received the channel switch announcement from the current network.
WLAN_REASON_WPS_DISCONNECT	The WLAN Connection Manager has disconnected from the WPS network (or has canceled a connection attempt) by request and is now in the WLAN_DISCONNECTED state.
WLAN_REASON_USER_DISCONNECT	The WLAN Connection Manager has disconnected from the current network (or has canceled a connection attempt) by request and is now in the WLAN_DISCONNECTED state.
WLAN_REASON_INITIALIZED	The WLAN Connection Manager is initialized and is ready for use. That is, it's now possible to scan or to connect to a network.
WLAN_REASON_INITIALIZATION_FAILED	The WLAN Connection Manager has failed to initialize and is therefore not running. It is not possible to scan or to connect to a network. The WLAN Connection Manager should be stopped and started again via wlan_stop() and wlan_start() respectively.

Enumerator

WLAN_REASON_PS_ENTER	The WLAN Connection Manager has entered power save mode.
WLAN_REASON_PS_EXIT	The WLAN Connection Manager has exited from power save mode.
WLAN_REASON_UAP_SUCCESS	The WLAN Connection Manager has started uAP
WLAN_REASON_UAP_CLIENT_ASSOC	A wireless client has joined uAP's BSS network
WLAN_REASON_UAP_CLIENT_DISSOC	A wireless client has left uAP's BSS network
WLAN_REASON_UAP_START_FAILED	The WLAN Connection Manager has failed to start uAP
WLAN_REASON_UAP_STOP_FAILED	The WLAN Connection Manager has failed to stop uAP
WLAN_REASON_UAP_STOPPED	The WLAN Connection Manager has stopped uAP

5.7.6.3 wlan_wakeup_event_t

```
enum wlan_wakeup_event_t
```

Wakeup events for which wakeup will occur

Enumerator

WAKE_ON_ALL_BROADCAST	Wakeup on broadcast
WAKE_ON_UNICAST	Wakeup on unicast
WAKE_ON_MAC_EVENT	Wakeup on MAC event
WAKE_ON_MULTICAST	Wakeup on multicast
WAKE_ON_ARP_BROADCAST	Wakeup on ARP broadcast
WAKE_ON_MGMT_FRAME	Wakeup on receiving a management frame

5.7.6.4 wlan_connection_state

```
enum wlan_connection_state
```

WLAN station/micro-AP/Wi-Fi Direct Connection/Status state

Enumerator

WLAN_DISCONNECTED	The WLAN Connection Manager is not connected and no connection attempt is in progress. It is possible to connect to a network or scan.
WLAN_CONNECTING	The WLAN Connection Manager is not connected but it is currently attempting to connect to a network. It is not possible to scan at this time. It is possible to connect to a different network.

Enumerator

WLAN_ASSOCIATED	The WLAN Connection Manager is not connected but associated.
WLAN_CONNECTED	The WLAN Connection Manager is connected. It is possible to scan and connect to another network at this time. Information about the current network configuration is available.
WLAN_UAP_STARTED	The WLAN Connection Manager has started uAP
WLAN_UAP_STOPPED	The WLAN Connection Manager has stopped uAP
WLAN_SCANNING	The WLAN Connection Manager is not connected and network scan is in progress.
WLAN_ASSOCIATING	The WLAN Connection Manager is not connected and network association is in progress.

5.7.6.5 wlan_ps_mode

```
enum wlan_ps_mode
```

Station Power save mode

Enumerator

WLAN_ACTIVE	Active mode
WLAN_IEEE	IEEE power save mode
WLAN_DEEP_SLEEP	Deep sleep power save mode

5.7.6.6 wlan_security_type

```
enum wlan_security_type
```

Network security types

Enumerator

WLAN_SECURITY_NONE	The network does not use security.
WLAN_SECURITY_WEP_OPEN	The network uses WEP security with open key.
WLAN_SECURITY_WEP_SHARED	The network uses WEP security with shared key.
WLAN_SECURITY_WPA	The network uses WPA security with PSK.
WLAN_SECURITY_WPA2	The network uses WPA2 security with PSK.
WLAN_SECURITY_WPA_WPA2_MIXED	The network uses WPA/WPA2 mixed security with PSK
WLAN_SECURITY_WILDCARD	The network can use any security method. This is often used when the user only knows the name and passphrase but not the security type.
WLAN_SECURITY_WPA3_SAE	The network uses WPA3 security with SAE. Also set the PMF settings using wlan_set_pmfcfg API required for WPA3 SAE
WLAN_SECURITY_WPA2_WPA3_SAE_MIXED	The network uses WPA2/WPA3 SAE mixed security with PSK. This security mode is specific to APs only.

5.7.6.7 anonymous enum

anonymous enum

Address types to be used by the element wlan_ip_config.addr_type below

Enumerator

WIFI_ERROR_FW_DNLD_FAILED	The Firmware download operation failed.
WIFI_ERROR_FW_NOT_READY	The Firmware ready register not set.
WIFI_ERROR_CARD_NOT_DETECTED	The WiFi card not found.
WIFI_ERROR_FW_NOT_DETECTED	The WiFi Firmware not found.
ADDR_TYPE_STATIC	static IP address
ADDR_TYPE_DHCP	Dynamic IP address
ADDR_TYPE_LLA	Link level address

5.8 wlan_11d.h File Reference

WLAN module 11d API.

5.8.1 Function Documentation

5.8.1.1 wlan_enable_11d()

```
static int wlan_enable_11d ( ) [inline], [static]
```

wlan_11d Wi-Fi Region Configuration By default, the SDK builds applications that are compliant with the US region configuration. This implies that the module obeys the US regulations for Wi-Fi transmissions on certified frequency bands. The SDK provides mechanism for configuring various region codes in the applications. This can be performed in one of the following two ways:

I) Specifying Country Code

In this method of configuration, the application defines up-front what is the country code that the device is going to be deployed in. Once configured the Wi-Fi firmware obeys the configured countries regulations. This configuration can be set by making a call to the [wlan_set_country\(\)](#) API. This API should be called after WLAN is initialized but before starting uAP or making any connection attempts on station interface.

For example: wlan_set_country(COUNTRY_CN);

II) Using 802.11D

Note

The FCC does not allow the use of 802.11D in the US starting Jan 1, 2015. In this method of configuration, the Wi-Fi driver of the SDK will scan for Access Points in the vicinity and accordingly configure itself to operate in the available frequency bands. This configuration can be set by making a call to the [wlan_enable_11d\(\)](#) API. This API should be called after WLAN is initialized but before starting uAP or making any connection attempts on station interface.

For example: [wlan_enable_11d\(\)](#); Enable 11D support in WLAN Driver.

Note

This API should be called after WLAN is initialized but before starting uAP or making any connection attempts on station interface.

Either this function or [wlan_set_country\(\)](#) should be used at a time. If both functions are called in the application, then WLAN Driver properties will be set as per the [wlan_set_country\(\)](#) function.

Returns

-WM_FAIL if operation was failed.

WM_SUCCESS if operation was successful.

5.8.1.2 wlan_get_country()

```
static int wlan_get_country ( ) [inline], [static]
```

Get country code from WLAN Driver.

Note

This API should be called after WLAN is initialized but before starting uAP or making any connection attempts on station interface.

Returns

Country code. Refer to [country_code_t](#).

5.8.1.3 wlan_uap_set_country()

```
static int wlan_uap_set_country (
    country\_code\_t country ) [inline], [static]
```

Set country code in WLAN Driver.

Note

This API should be called after WLAN is initialized but before starting uAP interface.

Either this function or [wlan_enable_11d\(\)](#) should be used at a time. If both functions are called in the application, then WLAN Driver properties will be set as per the [wlan_uap_set_country\(\)](#) function.

Parameters

in	country	Country code. Refer to country_code_t .
----	---------	---

Returns

- WM_FAIL if operation was failed.
- WM_SUCCESS if operation was successful.

5.8.1.4 wlan_set_country()

```
static int wlan_set_country (
    country_code_t country ) [inline], [static]
```

Set country code in WLAN Driver.

Note

This API should be called after WLAN is initialized but before making any connection attempts on station interface.

Either this function or [wlan_enable_11d\(\)](#) should be used at a time. If both functions are called in the application, then WLAN Driver properties will be set as per the [wlan_set_country\(\)](#) function.

Parameters

in	country	Country code. Refer to country_code_t .
----	---------	---

Returns

- WM_FAIL if operation was failed.
- WM_SUCCESS if operation was successful.

5.8.1.5 wlan_set_domain_params()

```
static int wlan_set_domain_params (
    wifi_domain_param_t * dp ) [inline], [static]
```

wlan_11d_custom Custom Wi-Fi Region Configuration

Ideally applications should use either [wlan_enable_11d\(\)](#) or [wlan_set_country\(\)](#) APIs to have standard 802.11d functionality as per regulations of Wi-Fi transmissions on certified frequency bands.

But If application wants to configure custom 802.11d configurations then wlan_set_domain_params API can be used for that.

If applications just want to set a particular region then [wlan_set_region_code\(\)](#) API can be used for the purpose.

Supported region code values are given in wlan_11d.c file.

Sets the domain parameters for the uAP.

Note

This API should be called after WLAN is initialized but before starting uAP

To use this API you will need to fill up the structure `wifi_domain_param_t` with correct parameters.

Note

This API should be called after WLAN is initialized but before making any connection attempts on station interface.

The below section lists all the arrays that can be passed individually or in combination to the API `wlan_set_domain_params()`. These are the sub band sets to be part of the Country Info IE in the uAP beacon. One of them is to be selected according to your region. Please have a look at the example given in the documentation below for reference.

Supported Country Codes: "US" : USA, "CA" : Canada, "SG" : Singapore, "EU" : Europe, "AU" : Australia, "KR" : Republic of Korea, "CN" : China, "FR" : France, "JP" : Japan

Region : US(US) or Canada(CA) or Singapore(SG) 2.4 GHz

```
wifi_sub_band_set_t subband_US_CA_SG_2_4_GHz[] = {
    {1, 11, 20}
```

```
};
```

Region: Europe(EU), Australia(AU), Republic of Korea(KR), China(CN) 2.4 GHz

```
wifi_sub_band_set_t subband_EU_AU_KR_CN_2_4GHz[] = {
    {1, 13, 20}
```

```
};
```

Region: France(FR) 2.4 GHz

```
wifi_sub_band_set_t subband_FR_2_4GHz[] = {
    {1, 9, 20},
    {10, 4, 10}
```

```
};
```

Region: Japan(JP) 2.4 GHz

```
wifi_sub_band_set_t subband_JP_2_4GHz[] = {
    {1, 14, 20},
```

```
};
```

Region: Constrained 2.4 Ghz

```
wifi_sub_band_set_t subband_CS_2_4GHz[] = {
    {1, 9, 20},
    {10, 2, 10}
```

```
};
```

Region: US(US) or Singapore(SG) 5 GHz

```
wifi_sub_band_set_t subband_US_SG_5GHz[] = {
    {36, 1, 20},
    {40, 1, 20},
    {44, 1, 20},
    {48, 1, 20},
    {52, 1, 20},
    {56, 1, 20},
    {60, 1, 20},
    {64, 1, 20},
    {100, 1, 20},
    {104, 1, 20},
    {108, 1, 20},
    {112, 1, 20},
    {116, 1, 20},
    {120, 1, 20},
    {124, 1, 20},
    {128, 1, 20},
    {132, 1, 20},
    {136, 1, 20},
    {140, 1, 20},
    {149, 1, 20},
    {153, 1, 20},
    {157, 1, 20},
    {161, 1, 20},
    {165, 1, 20}
```

```
};
```

Region: Canada(CA) 5 GHz

```
wifi_sub_band_set_t subband_CA_5GHz[] = {
    {36, 1, 20},
    {40, 1, 20},
    {44, 1, 20},
    {48, 1, 20},
    {52, 1, 20},
    {56, 1, 20},
    {60, 1, 20},
    {64, 1, 20},
```

```
{100, 1, 20},
{104, 1, 20},
{108, 1, 20},
{112, 1, 20},
{116, 1, 20},
{132, 1, 20},
{136, 1, 20},
{140, 1, 20},
{149, 1, 20},
{153, 1, 20},
{157, 1, 20},
{161, 1, 20},
{165, 1, 20}
};
Region: Europe/ETSI(EU), Australia(AU), Republic of Korea(KR) 5 GHz
wifi_sub_band_set_t subband_EU_AU_KR_5GHz[] = {
{36, 1, 20},
{40, 1, 20},
{44, 1, 20},
{48, 1, 20},
{52, 1, 20},
{56, 1, 20},
{60, 1, 20},
{64, 1, 20},
{100, 1, 20},
{104, 1, 20},
{108, 1, 20},
{112, 1, 20},
{116, 1, 20},
{120, 1, 20},
{124, 1, 20},
{128, 1, 20},
{132, 1, 20},
{136, 1, 20},
{140, 1, 20}
};
Region: China(CN) 5 GHz
wifi_sub_band_set_t subband_CN_5GHz[] = {
{149, 1, 33},
{153, 1, 33},
{157, 1, 33},
{161, 1, 33},
{165, 1, 33},
};
Region: France(FR) 5 GHz
wifi_sub_band_set_t subband_FR_5GHz[] = {
{36, 1, 20},
{40, 1, 20},
{44, 1, 20},
{48, 1, 20},
{52, 1, 20},
{56, 1, 20},
{60, 1, 20},
{64, 1, 20},
{100, 1, 20},
{104, 1, 20},
{108, 1, 20},
{112, 1, 20},
{116, 1, 20},
{120, 1, 20},
{124, 1, 20},
{128, 1, 20},
{132, 1, 20},
{136, 1, 20},
{140, 1, 20},
{149, 1, 20},
{153, 1, 20},
{157, 1, 20},
{161, 1, 20},
{165, 1, 20}
};
Region: Japan(JP) 5 GHz
wifi_sub_band_set_t subband_JP_5_GHz[] = {
{8, 1, 23},
{12, 1, 23},
{16, 1, 23},
{36, 1, 23},
{40, 1, 23},
{44, 1, 23},
{48, 1, 23},
{52, 1, 23},
{56, 1, 23},
{60, 1, 23},
{64, 1, 23},
{100, 1, 23},
{104, 1, 23},
{108, 1, 23},
```

```

{112, 1, 23},
{116, 1, 23},
{120, 1, 23},
{124, 1, 23},
{128, 1, 23},
{132, 1, 23},
{136, 1, 23},
{140, 1, 23}
};
\code
// We will be using the KR 2.4 and 5 GHz bands for this example
int nr_sb = (sizeof(subband_EU_AU_KR_CN_2_4GHz)
+ sizeof(subband_EU_AU_KR_5GHz))
/ sizeof(wifi_sub_band_set_t);
// We already have space for first sub band info entry in
// wifi_domain_param_t
wifi_domain_param_t *dp = os_mem_alloc(sizeof(wifi_domain_param_t) +
(sizeof(wifi_sub_band_set_t) * (nr_sb - 1)));
// COUNTRY_CODE_LEN is 3. Add extra ' ' as country code is 2 characters
(void)memcpy(dp->country_code, "KR ", COUNTRY_CODE_LEN);
dp->no_of_sub_band = nr_sb;
(void)memcpy(&dp->sub_band[0], &subband_EU_AU_KR_CN_2_4GHz[0],
1 * sizeof(wifi_sub_band_set_t));
(void)memcpy(&dp->sub_band[1], &subband_EU_AU_KR_5GHz,
(nr_sb - 1) * sizeof(wifi_sub_band_set_t));
wlan_set_domain_params(dp);
os_mem_free(dp);

```

Parameters

in	<i>dp</i>	The wifi domain parameters
----	-----------	----------------------------

Returns

- WM_E_INVALID if invalid parameters were passed.
- WM_SUCCESS if operation was successful.

5.8.1.6 wlan_set_region_code()

```

static int wlan_set_region_code (
    uint32_t region_code ) [inline], [static]

```

Set 11D region code.

Parameters

in	<i>region_code</i>	11D region code to set.
----	--------------------	-------------------------

Returns

- WM_FAIL if operation was failed.
- WM_SUCCESS if operation was successful.

5.8.1.7 wlan_11d_country_index_2_string()

```

uint8_t* wlan_11d_country_index_2_string (
    int country )

```

Get country string from country code

This function converts country index to country string

Parameters

in	<i>country</i>	Country index
----	----------------	---------------

Returns

Country string

5.9 wlan_tests.h File Reference

WLAN Connection Manager Tests.

5.9.1 Function Documentation

5.9.1.1 print_txpwrlimit()

```
void print_txpwrlimit (
    wlan_txpwrlimit_t txpwrlimit )
```

Print the TX PWR Limit table received from Wi-Fi firmware

Parameters

in	<i>txpwrlimit</i>	A wlan_txpwrlimit_t struct holding the the TX PWR Limit table received from Wi-Fi firmware.
----	-------------------	---

5.10 wm_net.h File Reference

Network Abstraction Layer.

5.10.1 Detailed Description

This provides the calls related to the network layer. The SDK uses lwIP as the network stack.

Here we document the network utility functions provided by the SDK. The detailed lwIP API documentation can be found at: http://lwip.wikia.com/wiki/Application_API_layers

5.10.2 Function Documentation

5.10.2.1 net_dhcp_hostname_set()

```
int net_dhcp_hostname_set (
    char * hostname )
```

Set hostname for network interface

Parameters

in	<i>hostname</i>	Hostname to be set.
----	-----------------	---------------------

Note

NULL is a valid value for hostname.

Returns

WM_SUCCESS

5.10.2.2 net_socket_blocking()

```
static int net_socket_blocking (
    int sock,
    int state ) [inline], [static]
```

Set socket blocking option as on or off

Parameters

in	<i>sock</i>	socket number to be set for blocking option.
in	<i>state</i>	set blocking on or off

Returns

WM_SUCCESS otherwise standard LWIP error codes.

5.10.2.3 net_get_sock_error()

```
static int net_get_sock_error (
    int sock ) [inline], [static]
```

Get error number from provided socket

Parameters

in	<i>sock</i>	socket number to get error number.
----	-------------	------------------------------------

Returns

error number.

5.10.2.4 net_inet_aton()

```
static uint32_t net_inet_aton (
    const char * cp ) [inline], [static]
```

Converts Internet host address from the IPv4 dotted-decimal notation into binary form (in network byte order)

Parameters

in	<i>cp</i>	IPv4 host address in dotted-decimal notation.
----	-----------	---

Returns

IPv4 address in binary form

5.10.2.5 net_gethostbyname()

```
static int net_gethostbyname (
    const char * cp,
    struct hostent ** hentry ) [inline], [static]
```

Get network host entry

Parameters

in	<i>cp</i>	Hostname or an IPv4 address in the standard dot notation.
in	<i>hentry</i>	Pointer to pointer of host entry structure.

Note

This function is not thread safe. If thread safety is required please use `lwip_getaddrinfo()` - `lwip_freeaddrinfo()` combination.

Returns

WM_SUCESS if operation successful.
 -WM_FAIL if operation fails.

5.10.2.6 net_inet_ntoa()

```
static void net_inet_ntoa (
    unsigned long addr,
    char * cp ) [inline], [static]
```

Converts Internet host address in network byte order to a string in IPv4 dotted-decimal notation

Parameters

in	<i>addr</i>	IP address in network byte order.
out	<i>cp</i>	buffer in which IPv4 dotted-decimal string is returned.

5.10.2.7 net_is_ip_or_ipv6()

```
static bool net_is_ip_or_ipv6 (
    const uint8_t * buffer ) [inline], [static]
```

Check whether buffer is IPv4 or IPV6 packet type

Parameters

in	<i>buffer</i>	pointer to buffer where packet to be checked located.
----	---------------	---

Returns

true if buffer packet type matches with IPv4 or IPv6, false otherwise.

5.10.2.8 net_sock_to_interface()

```
void* net_sock_to_interface (
    int sock )
```

Get interface handle from socket descriptor

Given a socket descriptor this API returns which interface it is bound with.

Parameters

in	sock	socket descriptor
----	------	-------------------

Returns

[out] interface handle

5.10.2.9 net_wlan_init()

```
int net_wlan_init (  
    void )
```

Initialize TCP/IP networking stack

Returns

WM_SUCCESS on success
-WM_FAIL otherwise

5.10.2.10 net_get_sta_handle()

```
void* net_get_sta_handle (  
    void )
```

Get station interface handle

Some APIs require the interface handle to be passed to them. The handle can be retrieved using this API.

Returns

station interface handle

5.10.2.11 net_get_uap_handle()

```
void* net_get_uap_handle (  
    void )
```

Get micro-AP interface handle

Some APIs require the interface handle to be passed to them. The handle can be retrieved using this API.

Returns

micro-AP interface handle

5.10.2.12 net_interface_up()

```
void net_interface_up (  
    void * intrfc_handle )
```

Take interface up

Change interface state to up. Use [net_get_sta_handle\(\)](#), [net_get_uap_handle\(\)](#) to get interface handle.

Parameters

in	<i>intrfc_handle</i>	interface handle
----	----------------------	------------------

Returns

void

5.10.2.13 net_interface_down()

```
void net_interface_down (  
    void * intrfc_handle )
```

Take interface down

Change interface state to down. Use [net_get_sta_handle\(\)](#), [net_get_uap_handle\(\)](#) to get interface handle.

Parameters

in	<i>intrfc_handle</i>	interface handle
----	----------------------	------------------

Returns

void

5.10.2.14 net_interface_dhcp_stop()

```
void net_interface_dhcp_stop (  
    void * intrfc_handle )
```

Stop DHCP client on given interface

Stop the DHCP client on given interface state. Use [net_get_sta_handle\(\)](#), [net_get_uap_handle\(\)](#) to get interface handle.

Parameters

in	<i>intrfc_handle</i>	interface handle
----	----------------------	------------------

Returns

void

5.10.2.15 net_configure_address()

```
int net_configure_address (
    struct wlan_ip_config * addr,
    void * intrfc_handle )
```

Configure IP address for interface

Parameters

in	<i>addr</i>	Address that needs to be configured.
in	<i>intrfc_handle</i>	Handle for network interface to be configured.

Returns

WM_SUCCESS on success or an error code.

5.10.2.16 net_configure_dns()

```
void net_configure_dns (
    struct wlan_ip_config * ip,
    enum wlan_bss_role role )
```

Configure DNS server address

Parameters

in	<i>ip</i>	IP address of the DNS server to set
in	<i>role</i>	Network wireless BSS Role

5.10.2.17 net_get_if_addr()

```
int net_get_if_addr (
    struct wlan_ip_config * addr,
    void * intrfc_handle )
```

Get interface IP Address in [wlan_ip_config](#)

This function will get the IP address of a given interface. Use [net_get_sta_handle\(\)](#), [net_get_uap_handle\(\)](#) to get interface handle.

Parameters

out	<i>addr</i>	wlan_ip_config
in	<i>intrfc_handle</i>	interface handle

Returns

WM_SUCCESS on success or error code.

5.10.2.18 net_get_if_ip_addr()

```
int net_get_if_ip_addr (
    uint32_t * ip,
    void * intrfc_handle )
```

Get interface IP Address

This function will get the IP Address of a given interface. Use [net_get_sta_handle\(\)](#), [net_get_uap_handle\(\)](#) to get interface handle.

Parameters

out	<i>ip</i>	ip address pointer
in	<i>intrfc_handle</i>	interface handle

Returns

WM_SUCCESS on success or error code.

5.10.2.19 net_get_if_ip_mask()

```
int net_get_if_ip_mask (
    uint32_t * mask,
    void * intrfc_handle )
```

Get interface IP Subnet-Mask

This function will get the Subnet-Mask of a given interface. Use [net_get_sta_handle\(\)](#), [net_get_uap_handle\(\)](#) to get interface handle.

Parameters

in	<i>mask</i>	Subnet Mask pointer
in	<i>intrfc_handle</i>	interface

Returns

WM_SUCCESS on success or error code.

5.10.2.20 net_ipv4stack_init()

```
void net_ipv4stack_init (  
    void )
```

Initialize the network stack

This function initializes the network stack. This function is called by [wlan_start\(\)](#).

Applications may optionally call this function directly: if they wish to use the networking stack (loopback interface) without the wlan functionality. if they wish to initialize the networking stack even before wlan comes up.

Note

This function may safely be called multiple times.

5.10.2.21 net_stat()

```
void net_stat (  
    void )
```

Display network statistics

5.11 wm_os.h File Reference

OS Abstraction Layer.

5.11.1 Detailed Description

The OS abstraction layer provides wrapper APIs over some of the commonly used OS primitives. Since the behaviour and semantics of the various OSes differs widely, some abstraction APIs require a specific handling as listed below.

5.11.2 Usage

The OS abstraction layer provides the following types of primitives:

- Thread: Create or delete a thread using [os_thread_create\(\)](#) or [os_thread_delete\(\)](#). Block a thread using [os_thread_sleep\(\)](#). Complete a thread's execution using [os_thread_self_complete\(\)](#).
- Message Queue: Create or delete a message queue using [os_queue_create\(\)](#) or [os_queue_delete\(\)](#). Send a message using [os_queue_send\(\)](#) and received a message using [os_queue_rcv\(\)](#).
- Mutex: Create or delete a mutex using [os_mutex_create\(\)](#) or [os_mutex_delete\(\)](#). Acquire a mutex using [os_mutex_get\(\)](#) and release it using [os_mutex_put\(\)](#).
- Semaphores: Create or delete a semaphore using [os_semaphore_create\(\)](#) / [os_semaphore_create_counting\(\)](#) or [os_semaphore_delete](#). Acquire a semaphore using [os_semaphore_get\(\)](#) and release it using [os_semaphore_put\(\)](#).
- Timers: Create or delete a timer using [os_timer_create\(\)](#) or [os_timer_delete\(\)](#). Change the timer using [os_timer_change\(\)](#). Activate or de-activate the timer using [os_timer_activate\(\)](#) or [os_timer_deactivate\(\)](#). Reset a timer using [os_timer_reset\(\)](#).
- Dynamic Memory Allocation: Dynamically allocate memory using [os_mem_alloc\(\)](#), [os_mem_calloc\(\)](#) or [os_mem_realloc\(\)](#) and free it using [os_mem_free\(\)](#).

5.11.3 Function Documentation

5.11.3.1 `os_ticks_get()`

```
static unsigned os_ticks_get ( ) [inline], [static]
```

Get current OS tick counter value

Returns

32 bit value of ticks since boot-up

5.11.3.2 `os_get_timestamp()`

```
unsigned int os_get_timestamp (
    void )
```

Returns time in micro-secs since bootup

Note

The value returned will wrap around after sometime and caller is expected to guard itself against this.

Returns

Time in micro-secs since bootup

5.11.3.3 `os_thread_create()`

```
static int os_thread_create (
    os_thread_t * thandle,
    const char * name,
    void(*) (os_thread_arg_t arg) main_func,
    void * arg,
    os_thread_stack_t * stack,
    int prio ) [inline], [static]
```

Create new thread

This function starts a new thread. The new thread starts execution by invoking `main_func()`. The parameter `arg` is passed as the sole argument of `main_func()`.

After finishing execution, the new thread should either call:

- [`os_thread_self_complete\(\)`](#) to suspend itself OR
- [`os_thread_delete\(\)`](#) to delete itself

Failing to do this and just returning from `main_func()` will result in undefined behavior.

Parameters

out	<i>thandle</i>	Pointer to a thread handle
in	<i>name</i>	Name of the new thread. A copy of this string will be made by the OS for itself. The maximum name length is defined by the macro configMAX_TASK_NAME_LEN in FreeRTOS header file . Any name length above it will be truncated.
in	<i>main_func</i>	Function pointer to new thread function
in	<i>arg</i>	The sole argument passed to main_func()
in	<i>stack</i>	A pointer to initialized object of type os_thread_stack_t . The object should be created and initialized using os_thread_stack_define() .
in	<i>prio</i>	The priority of the new thread. One value among OS_PRIO_0, OS_PRIO_1, OS_PRIO_2, OS_PRIO_3 and OS_PRIO_4 should be passed. OS_PRIO_0 represents the highest priority and OS_PRIO_4 represents the lowest priority.

Returns

WM_SUCCESS if thread was created successfully
 -WM_FAIL if thread creation failed

5.11.3.4 os_thread_delete()

```
static int os_thread_delete (
    os_thread_t * thandle ) [inline], [static]
```

Terminate a thread

This function deletes a thread. The task being deleted will be removed from all ready, blocked, suspended and event lists.

Parameters

in	<i>thandle</i>	Pointer to the thread handle of the thread to be deleted. If self deletion is required NULL should be passed.
----	----------------	---

Returns

WM_SUCCESS if operation success
 -WM_FAIL if operation fails

5.11.3.5 os_thread_sleep()

```
static void os_thread_sleep (
    int ticks ) [inline], [static]
```

Sleep for specified number of OS ticks

This function causes the calling thread to sleep and block for the given number of OS ticks. The actual time that the task remains blocked depends on the tick rate. The function [os_msec_to_ticks\(\)](#) is provided to convert from real-time to ticks.

Any other thread can wake up this task specifically using the API [os_thread_wait_abort\(\)](#)

Parameters

in	<i>ticks</i>	Number of ticks to sleep
----	--------------	--------------------------

Returns

- 0 If slept for given ticks or more
- Positive value if woken up before given ticks.

Note

The value returned is amount of ticks left before the task was to be originally scheduled to be woken up. So if sleep was for 10 ticks and the task is woken up after 8 ticks then 2 will be returned.

5.11.3.6 os_msec_to_ticks()

```
static unsigned long os_msec_to_ticks (
    unsigned long msec ) [inline], [static]
```

Convert milliseconds to OS ticks

This function converts the given millisecond value to the number of OS ticks.

This is useful as functions like [os_thread_sleep\(\)](#) accept only ticks as input.

Parameters

in	<i>msec</i>	Milliseconds
----	-------------	--------------

Returns

- Number of OS ticks corresponding to msec

5.11.3.7 os_ticks_to_msec()

```
static unsigned long os_ticks_to_msec (
    unsigned long ticks ) [inline], [static]
```

Convert ticks to milliseconds

This function converts the given ticks value to milliseconds. This is useful as some functions, like [os_ticks_get\(\)](#), return values in units of OS ticks.

Parameters

in	<i>ticks</i>	OS ticks
----	--------------	----------

Returns

Number of milliseconds corresponding to ticks

5.11.3.8 os_thread_self_complete()

```
static void os_thread_self_complete (
    os_thread_t * thandle ) [inline], [static]
```

Suspend the given thread

- The function [os_thread_self_complete\(\)](#) will **permanently** suspend the given thread. Passing NULL will suspend the current thread. This function never returns.
- The thread continues to consume system resources. To delete the thread the function [os_thread_delete\(\)](#) needs to be called separately.

Parameters

in	<i>thandle</i>	Pointer to thread handle
----	----------------	--------------------------

5.11.3.9 os_queue_create()

```
int os_queue_create (
    os_queue_t * qhandle,
    const char * name,
    int msgsize,
    os_queue_pool_t * poolname )
```

Create an OS queue

This function creates a new queue instance. This allocates the storage required by the new queue and returns a handle for the queue.

Parameters

out	<i>qhandle</i>	Pointer to the handle of the newly created queue
in	<i>name</i>	String specifying the name of the queue
in	<i>msgsize</i>	The number of bytes each item in the queue will require. Items are queued by copy, not by reference, so this is the number of bytes that will be copied for each posted item. Each item on the queue must be the same size.
in	<i>poolname</i>	The object of the type os_queue_pool_t . The helper macro os_queue_pool_define() helps to define this object.

Returns

WM_SUCCESS if queue creation was successful
 -WM_FAIL if queue creation failed

5.11.3.10 os_queue_send()

```
static int os_queue_send (
    os_queue_t * qhandle,
    const void * msg,
    unsigned long wait ) [inline], [static]
```

Post an item to the back of the queue.

This function posts an item to the back of a queue. The item is queued by copy, not by reference. This function can also be called from an interrupt service routine.

Parameters

in	<i>qhandle</i>	Pointer to the handle of the queue
in	<i>msg</i>	A pointer to the item that is to be placed on the queue. The size of the items the queue will hold was defined when the queue was created, so this many bytes will be copied from msg into the queue storage area.
in	<i>wait</i>	The maximum amount of time, in OS ticks, the task should block waiting for space to become available on the queue, should it already be full. The function os_msec_to_ticks() can be used to convert from real-time to OS ticks. The special values OS_WAIT_FOREVER and OS_NO_WAIT are provided to respectively wait infinitely or return immediately.

Returns

WM_SUCCESS if send operation was successful
 -WM_EINVAL if invalid parameters are passed
 -WM_FAIL if send operation failed

5.11.3.11 os_queue_rcv()

```
static int os_queue_rcv (
    os_queue_t * qhandle,
    void * msg,
    unsigned long wait ) [inline], [static]
```

Receive an item from queue

This function receives an item from a queue. The item is received by copy so a buffer of adequate size must be provided. The number of bytes copied into the buffer was defined when the queue was created.

Parameters

in	<i>qhandle</i>	Pointer to handle of the queue
out	<i>msg</i>	Pointer to the buffer into which the received item will be copied. The size of the items in the queue was defined when the queue was created. This pointer should point to a buffer as many bytes in size.
in	<i>wait</i>	The maximum amount of time, in OS ticks, the task should block waiting for messages to arrive on the queue, should it already be empty. The function <code>os_msec_to_ticks()</code> can be used to convert from real-time to OS ticks. The special values <code>OS_WAIT_FOREVER</code> and <code>OS_NO_WAIT</code> are provided to respectively wait infinitely or return immediately.

Returns

- WM_SUCCESS if receive operation was successful
- WM_EINVAL if invalid parameters are passed
- WM_FAIL if receive operation failed

Note

This function must not be used in an interrupt service routine.

5.11.3.12 os_queue_delete()

```
static int os_queue_delete (
    os_queue_t * qhandle ) [inline], [static]
```

Delete queue

This function deletes a queue. It frees all the memory allocated for storing of items placed on the queue.

Parameters

in	<i>qhandle</i>	Pointer to handle of the queue to be deleted.
----	----------------	---

Returns

Currently always returns WM_SUCCESS

5.11.3.13 os_queue_get_msgs_waiting()

```
static int os_queue_get_msgs_waiting (
    os_queue_t * qhandle ) [inline], [static]
```

Return the number of messages stored in queue.

Parameters

in	<i>qhandle</i>	Pointer to handle of the queue to be queried.
----	----------------	---

Returns

Number of items in the queue
 -WM_E_INVALID if invalid parameters are passed

5.11.3.14 os_setup_idle_function()

```
static int os_setup_idle_function (
    void(*) (void) func ) [inline], [static]
```

Setup idle function

This function sets up a callback function which will be called whenever the system enters the idle thread context.

Parameters

in	<i>func</i>	The callback function
----	-------------	-----------------------

Returns

WM_SUCCESS on success
 -WM_FAIL on error

5.11.3.15 os_setup_tick_function()

```
static int os_setup_tick_function (
    void(*) (void) func ) [inline], [static]
```

Setup tick function

This function sets up a callback function which will be called on every SysTick interrupt.

Parameters

in	<i>func</i>	The callback function
----	-------------	-----------------------

Returns

WM_SUCCESS on success
 -WM_FAIL on error

5.11.3.16 os_remove_idle_function()

```
static int os_remove_idle_function (
    void(*) (void) func ) [inline], [static]
```

Remove idle function

This function removes an idle callback function that was registered previously using [os_setup_idle_function\(\)](#).

Parameters

in	<i>func</i>	The callback function
----	-------------	-----------------------

Returns

WM_SUCCESS on success
-WM_FAIL on error

5.11.3.17 os_remove_tick_function()

```
static int os_remove_tick_function (
    void(*) (void) func ) [inline], [static]
```

Remove tick function

This function removes a tick callback function that was registered previously using [os_setup_tick_function\(\)](#).

Parameters

in	<i>func</i>	Callback function
----	-------------	-------------------

Returns

WM_SUCCESS on success
-WM_FAIL on error

5.11.3.18 os_mutex_create()

```
static int os_mutex_create (
    os_mutex_t * mhandle,
    const char * name,
    int flags ) [inline], [static]
```

Create mutex

This function creates a mutex.

Parameters

out	<i>mhandle</i>	Pointer to a mutex handle
in	<i>name</i>	Name of the mutex
in	<i>flags</i>	Priority inheritance selection. Valid options are OS_MUTEX_INHERIT or OS_MUTEX_NO_INHERIT .

Note

Currently non-inheritance in mutex is not supported.

Returns

WM_SUCCESS on success
-WM_FAIL on error

5.11.3.19 os_mutex_get()

```
static int os_mutex_get (
    os_mutex_t * mhandle,
    unsigned long wait ) [inline], [static]
```

Acquire mutex

This function acquires a mutex. Only one thread can acquire a mutex at any given time. If already acquired the callers will be blocked for the specified time duration.

Parameters

in	<i>mhandle</i>	Pointer to mutex handle
in	<i>wait</i>	The maximum amount of time, in OS ticks, the task should block waiting for the mutex to be acquired. The function os_msec_to_ticks() can be used to convert from real-time to OS ticks. The special values OS_WAIT_FOREVER and OS_NO_WAIT are provided to respectively wait infinitely or return immediately.

Returns

WM_SUCCESS when mutex is acquired
-WM_EINVAL if invalid parameters are passed
-WM_FAIL on failure

5.11.3.20 os_mutex_put()

```
static int os_mutex_put (
    os_mutex_t * mhandle ) [inline], [static]
```

Release mutex

This function releases a mutex previously acquired using [os_mutex_get\(\)](#).

Note

The mutex should be released from the same thread context from which it was acquired. If you wish to acquire and release in different contexts, please use [os_semaphore_get\(\)](#) and [os_semaphore_put\(\)](#) variants.

Parameters

in	<i>mhandle</i>	Pointer to the mutex handle
----	----------------	-----------------------------

Returns

WM_SUCCESS when mutex is released
 -WM_E_INVALID if invalid parameters are passed
 -WM_FAIL on failure

5.11.3.21 os_recursive_mutex_create()

```
static int os_recursive_mutex_create (
    os_mutex_t * mhandle,
    const char * name ) [inline], [static]
```

Create recursive mutex

This function creates a recursive mutex. A mutex used recursively can be 'get' repeatedly by the owner. The mutex doesn't become available again until the owner has called [os_recursive_mutex_put\(\)](#) for each successful 'get' request.

Note

This type of mutex uses a priority inheritance mechanism so a task 'get'ing a mutex MUST ALWAYS 'put' the mutex back once no longer required.

Parameters

out	<i>mhandle</i>	Pointer to a mutex handle
in	<i>name</i>	Name of the mutex as NULL terminated string

Returns

WM_SUCCESS on success
 -WM_E_INVALID on invalid parameter.
 -WM_FAIL on error

5.11.3.22 os_recursive_mutex_get()

```
static int os_recursive_mutex_get (
    os_mutex_t * mhandle,
    unsigned long wait ) [inline], [static]
```

Get recursive mutex

This function recursively obtains, or 'get's, a mutex. The mutex must have previously been created using a call to [os_recursive_mutex_create\(\)](#).

Parameters

in	<i>mhandle</i>	Pointer to mutex handle obtained from os_recursive_mutex_create() .
in	<i>wait</i>	The maximum amount of time, in OS ticks, the task should block waiting for the mutex to be acquired. The function os_msec_to_ticks() can be used to convert from real-time to OS ticks. The special values OS_WAIT_FOREVER and OS_NO_WAIT are provided to respectively wait for portMAX_DELAY (0xffffffff) or return immediately.

Returns

WM_SUCCESS when recursive mutex is acquired
 -WM_FAIL on failure

5.11.3.23 os_recursive_mutex_put()

```
static int os_recursive_mutex_put (
    os_mutex_t * mhandle ) [inline], [static]
```

Put recursive mutex

This function recursively releases, or 'give's, a mutex. The mutex must have previously been created using a call to [os_recursive_mutex_create\(\)](#)

Parameters

in	<i>mhandle</i>	Pointer to the mutex handle
----	----------------	-----------------------------

Returns

WM_SUCCESS when mutex is released
 -WM_FAIL on failure

5.11.3.24 os_mutex_delete()

```
static int os_mutex_delete (
    os_mutex_t * mhandle ) [inline], [static]
```


Delete mutex

This function deletes a mutex.

Parameters

in	<i>mhandle</i>	Pointer to the mutex handle
----	----------------	-----------------------------

Note

A mutex should not be deleted if other tasks are blocked on it.

Returns

WM_SUCCESS on success

5.11.3.25 os_event_notify_get()

```
static int os_event_notify_get (  
    unsigned long wait_time ) [inline], [static]
```

Wait for task notification

This function waits for task notification from other task or interrupt context. This is similar to binary semaphore, but uses less RAM and much faster than semaphore mechanism

Parameters

in	<i>wait_time</i>	Timeout specified in no. of OS ticks
----	------------------	--------------------------------------

Returns

WM_SUCCESS when notification is successful

-WM_FAIL on failure or timeout

5.11.3.26 os_event_notify_put()

```
static int os_event_notify_put (  
    os_thread_t task ) [inline], [static]
```

Give task notification

This function gives task notification so that waiting task can be unblocked. This is similar to binary semaphore, but uses less RAM and much faster than semaphore mechanism

Parameters

in	<i>task</i>	Task handle to be notified
----	-------------	----------------------------

Returns

WM_SUCCESS when notification is successful
 -WM_FAIL on failure or timeout

5.11.3.27 os_semaphore_create()

```
static int os_semaphore_create (
    os_semaphore_t * mhandle,
    const char * name ) [inline], [static]
```

Create binary semaphore

This function creates a binary semaphore. A binary semaphore can be acquired by only one entity at a given time.

Parameters

out	<i>mhandle</i>	Pointer to a semaphore handle
in	<i>name</i>	Name of the semaphore

Returns

WM_SUCCESS on success
 -WM_FAIL on error

5.11.3.28 os_semaphore_create_counting()

```
static int os_semaphore_create_counting (
    os_semaphore_t * mhandle,
    const char * name,
    unsigned long maxcount,
    unsigned long initcount ) [inline], [static]
```

Create counting semaphore

This function creates a counting semaphore. A counting semaphore can be acquired 'count' number of times at a given time.

Parameters

out	<i>mhandle</i>	Pointer to a semaphore handle
-----	----------------	-------------------------------

Parameters

in	<i>name</i>	Name of the semaphore
in	<i>maxcount</i>	The maximum count value that can be reached. When the semaphore reaches this value it can no longer be 'put'
in	<i>initcount</i>	The count value assigned to the semaphore when it is created. For e.g. If '0' is passed, then os_semaphore_get() will block until some other thread does an os_semaphore_put() .

Returns

WM_SUCCESS on success

-WM_FAIL on error

5.11.3.29 os_semaphore_get()

```
static int os_semaphore_get (
    os_semaphore_t * mhandle,
    unsigned long wait ) [inline], [static]
```

Acquire semaphore

This function acquires a semaphore. At a given time, a binary semaphore can be acquired only once, while a counting semaphore can be acquired as many as 'count' number of times. Once this condition is reached, the other callers of this function will be blocked for the specified time duration.

Parameters

in	<i>mhandle</i>	Pointer to a semaphore handle
in	<i>wait</i>	The maximum amount of time, in OS ticks, the task should block waiting for the semaphore to be acquired. The function os_msec_to_ticks() can be used to convert from real-time to OS ticks. The special values OS_WAIT_FOREVER and OS_NO_WAIT are provided to respectively wait infinitely or return immediately.

Returns

WM_SUCCESS when semaphore is acquired

-WM_EINVAL if invalid parameters are passed

-WM_FAIL on failure

5.11.3.30 os_semaphore_put()

```
static int os_semaphore_put (
    os_semaphore_t * mhandle ) [inline], [static]
```

Release semaphore

This function releases a semaphore previously acquired using [os_semaphore_get\(\)](#).

Note

This function can also be called from interrupt-context.

Parameters

in	<i>mhandle</i>	Pointer to a semaphore handle
----	----------------	-------------------------------

Returns

WM_SUCCESS when semaphore is released
-WM_E_INVALID if invalid parameters are passed
-WM_FAIL on failure

5.11.3.31 os_semaphore_getcount()

```
static int os_semaphore_getcount (  
    os_semaphore_t * mhandle ) [inline], [static]
```

Get semaphore count

This function returns the current value of a semaphore.

Parameters

in	<i>mhandle</i>	Pointer to a semaphore handle
----	----------------	-------------------------------

Returns

current value of the semaphore

5.11.3.32 os_semaphore_delete()

```
static int os_semaphore_delete (  
    os_semaphore_t * mhandle ) [inline], [static]
```

Delete a semaphore

This function deletes the semaphore.

Parameters

in	<i>mhandle</i>	Pointer to a semaphore handle
----	----------------	-------------------------------

Note

Do not delete a semaphore that has tasks blocked on it (tasks that are in the Blocked state waiting for the semaphore to become available)

Returns

WM_SUCCESS on success

5.11.3.33 os_rwlock_create()

```
int os_rwlock_create (
    os_rw_lock_t * lock,
    const char * mutex_name,
    const char * lock_name )
```

Create reader-writer lock

This function creates a reader-writer lock.

Parameters

in	<i>lock</i>	Pointer to a reader-writer lock handle
in	<i>mutex_name</i>	Name of the mutex
in	<i>lock_name</i>	Name of the lock

Returns

WM_SUCCESS on success

-WM_FAIL on error

5.11.3.34 os_rwlock_delete()

```
void os_rwlock_delete (
    os_rw_lock_t * lock )
```

Delete a reader-write lock

This function deletes a reader-writer lock.

Parameters

in	<i>lock</i>	Pointer to the reader-writer lock handle
----	-------------	--

5.11.3.35 os_rwlock_write_lock()

```
int os_rwlock_write_lock (
    os_rwlock_t * lock,
    unsigned int wait_time )
```

Acquire writer lock

This function acquires a writer lock. While readers can acquire the lock on a sharing basis, writers acquire the lock in an exclusive manner.

Parameters

in	<i>lock</i>	Pointer to the reader-writer lock handle
in	<i>wait_time</i>	The maximum amount of time, in OS ticks, the task should block waiting for the lock to be acquired. The function os_msec_to_ticks() can be used to convert from real-time to OS ticks. The special values OS_WAIT_FOREVER and OS_NO_WAIT are provided to respectively wait infinitely or return immediately.

Returns

WM_SUCCESS on success
-WM_FAIL on error

5.11.3.36 os_rwlock_write_unlock()

```
void os_rwlock_write_unlock (
    os_rwlock_t * lock )
```

Release writer lock

This function releases a writer lock previously acquired using [os_rwlock_write_lock\(\)](#).

Parameters

in	<i>lock</i>	Pointer to the reader-writer lock handle
----	-------------	--

5.11.3.37 os_rwlock_read_lock()

```
int os_rwlock_read_lock (
    os_rwlock_t * lock,
    unsigned int wait_time )
```

Acquire reader lock

This function acquires a reader lock. While readers can acquire the lock on a sharing basis, writers acquire the lock in an exclusive manner.

Parameters

in	<i>lock</i>	pointer to the reader-writer lock handle
in	<i>wait_time</i>	The maximum amount of time, in OS ticks, the task should block waiting for the lock to be acquired. The function os_msec_to_ticks() can be used to convert from real-time to OS ticks. The special values OS_WAIT_FOREVER and OS_NO_WAIT are provided to respectively wait infinitely or return immediately.

Returns

WM_SUCCESS on success
 -WM_FAIL on error

5.11.3.38 os_rwlock_read_unlock()

```
int os_rwlock_read_unlock (
    os_rw_lock_t * lock )
```

Release reader lock

This function releases a reader lock previously acquired using [os_rwlock_read_lock\(\)](#).

Parameters

in	<i>lock</i>	pointer to the reader-writer lock handle
----	-------------	--

Returns

WM_SUCCESS if unlock operation successful.
 -WM_FAIL if unlock operation failed.

5.11.3.39 os_timer_create()

```
int os_timer_create (
    os_timer_t * timer_t,
    const char * name,
    os_timer_tick ticks,
    void(*) (os_timer_arg_t) call_back,
    void * cb_arg,
    os_timer_reload_t reload,
    os_timer_activate_t activate )
```

Create timer

This function creates a timer.

Parameters

out	<i>timer_t</i>	Pointer to the timer handle
in	<i>name</i>	Name of the timer
in	<i>ticks</i>	Period in ticks
in	<i>call_back</i>	Timer expire callback function
in	<i>cb_arg</i>	Timer callback data
in	<i>reload</i>	Reload Options, valid values include OS_TIMER_ONE_SHOT or OS_TIMER_PERIODIC .
in	<i>activate</i>	Activate Options, valid values include OS_TIMER_AUTO_ACTIVATE or OS_TIMER_NO_ACTIVATE

Returns

WM_SUCCESS if timer created successfully
 -WM_FAIL if timer creation fails

5.11.3.40 **os_timer_activate()**

```
int os_timer_activate (
    os_timer_t * timer_t )
```

Activate timer

This function activates (or starts) a timer that was previously created using [os_timer_create\(\)](#). If the timer had already started and was already in the active state, then this call is equivalent to [os_timer_reset\(\)](#).

Parameters

in	<i>timer_t</i>	Pointer to a timer handle
----	----------------	---------------------------

Returns

WM_SUCCESS if timer activated successfully
 -WM_EINVAL if invalid parameters are passed
 -WM_FAIL if timer fails to activate

5.11.3.41 **os_timer_change()**

```
static int os_timer_change (
    os_timer_t * timer_t,
    os_timer_tick ntime,
    os_timer_tick block_time ) [inline], [static]
```

Change timer period

This function changes the period of a timer that was previously created using [os_time_create\(\)](#). This function changes the period of an active or dormant state timer.

Parameters

in	<i>timer_t</i>	Pointer to a timer handle
in	<i>ntime</i>	Time in ticks after which the timer will expire
in	<i>block_time</i>	This option is currently not supported

Returns

WM_SUCCESS on success
 -WM_EINVAL if invalid parameters are passed
 -WM_FAIL on failure

5.11.3.42 os_timer_is_running()

```
static bool os_timer_is_running (
    os_timer_t * timer_t ) [inline], [static]
```

Check the timer active state

This function checks if the timer is in the active or dormant state. A timer is in the dormant state if (a) it has been created but not started, or (b) it has expired and a one-shot timer.

Parameters

in	<i>timer_t</i>	Pointer to a timer handle
----	----------------	---------------------------

Returns

true if timer is active
 false if time is not active

5.11.3.43 os_timer_get_context()

```
static void* os_timer_get_context (
    os_timer_t * timer_t ) [inline], [static]
```

Get the timer context

This function helps to retrieve the timer context i.e. 'cb_arg' passed to [os_timer_create\(\)](#).

Parameters

in	<i>timer_t</i>	Pointer to timer handle. The timer handle is received in the timer callback.
----	----------------	--

Returns

The timer context i.e. the callback argument passed to [os_timer_create\(\)](#).

5.11.3.44 os_timer_reset()

```
static int os_timer_reset (
    os_timer_t * timer_t ) [inline], [static]
```

Reset timer

This function resets a timer that was previously created using [os_timer_create\(\)](#). If the timer had already been started and was already in the active state, then this call will cause the timer to re-evaluate its expiry time so that it is relative to when [os_timer_reset\(\)](#) was called. If the timer was in the dormant state then this call behaves in the same way as [os_timer_activate\(\)](#).

Parameters

in	<i>timer_t</i>	Pointer to a timer handle
----	----------------	---------------------------

Returns

WM_SUCCESS on success
 -WM_E_INVALID if invalid parameters are passed
 -WM_FAIL on failure

5.11.3.45 os_timer_deactivate()

```
static int os_timer_deactivate (
    os_timer_t * timer_t ) [inline], [static]
```

Deactivate timer

This function deactivates (or stops) a timer that was previously started.

Parameters

in	<i>timer_t</i>	handle populated by os_timer_create()
----	----------------	---

Returns

WM_SUCCESS on success
 -WM_E_INVALID if invalid parameters are passed
 -WM_FAIL on failure

5.11.3.46 os_timer_delete()

```
static int os_timer_delete (
    os_timer_t * timer_t ) [inline], [static]
```

Delete timer

This function deletes a timer.

Parameters

in	<i>timer_t</i>	Pointer to a timer handle
----	----------------	---------------------------

Returns

WM_SUCCESS on success
-WM_E_INVALID if invalid parameters are passed
-WM_FAIL on failure

5.11.3.47 os_mem_calloc()

```
static void* os_mem_calloc (
    size_t size ) [inline], [static]
```

Allocate memory and zero it

This function allocates memory dynamically and sets the memory contents to zero.

Parameters

in	<i>size</i>	Size of the memory to be allocated
----	-------------	------------------------------------

Returns

Pointer to the allocated memory
NULL if allocation fails

5.11.3.48 os_dump_mem_stats()

```
static void os_dump_mem_stats (
    void ) [inline], [static]
```

This function dumps complete statistics of the heap memory.

5.11.3.49 **os_disable_all_interrupts()**

```
static void os_disable_all_interrupts ( ) [inline], [static]
```

Disables all interrupts at NVIC level

5.11.3.50 **os_enable_all_interrupts()**

```
static void os_enable_all_interrupts ( ) [inline], [static]
```

Enable all interrupts at NVIC level

5.11.4 Macro Documentation

5.11.4.1 **os_thread_relinquish**

```
#define os_thread_relinquish( ) taskYIELD()
```

Get the current value of free running microsecond counter

Note

This will wraparound after CNTMAX and the caller is expected to take care of this.

Returns

The current value of microsecond counter. Force a context switch

5.11.4.2 **os_ticks_to_unblock**

```
#define os_ticks_to_unblock( ) xTaskGetUnblockTime()
```

Get ticks to next thread wakeup

5.11.4.3 **os_thread_stack_define**

```
#define os_thread_stack_define(  
    stackname,  
    stacksize ) os\_thread\_stack\_t stackname = {(stacksize) / (sizeof(portSTACK_TY←  
PE)) }
```

Helper macro to define the stack size (in bytes) before a new thread is created using the function [os_thread_create\(\)](#).

5.11.4.4 os_queue_pool_define

```
#define os_queue_pool_define(  
    poolname,  
    poolsize ) os_queue_pool_t poolname = {poolsize};
```

Define OS Queue pool

This macro helps define the name and size of the queue to be created using the function [os_queue_create\(\)](#).

5.11.4.5 OS_WAIT_FOREVER

```
#define OS_WAIT_FOREVER portMAX_DELAY
```

Wait Forever

5.11.4.6 OS_NO_WAIT

```
#define OS_NO_WAIT 0
```

Do Not Wait

5.11.4.7 OS_MUTEX_INHERIT

```
#define OS_MUTEX_INHERIT 1
```

Priority Inheritance Enabled

5.11.4.8 OS_MUTEX_NO_INHERIT

```
#define OS_MUTEX_NO_INHERIT 0
```

Priority Inheritance Disabled

5.11.4.9 os_mem_alloc

```
#define os_mem_alloc(  
    size ) pvPortMalloc(size)
```

Allocate memory

This function allocates memory dynamically.

Parameters

in	size	Size of the memory to be allocated
----	------	------------------------------------

Returns

Pointer to the allocated memory
 NULL if allocation fails

5.11.4.10 os_mem_realloc

```
#define os_mem_realloc(  
    old_ptr,  
    new_size ) vPortReAlloc(old_ptr, new_size)
```

Reallocate memory

This function attempts to resize a previously allocated memory block.

Parameters

in	<i>old_ptr</i>	Pointer to earlier allocated memory
in	<i>new_size</i>	The new size

Returns

Pointer to the newly resized memory block
 NULL if reallocation fails

5.11.4.11 os_mem_free

```
#define os_mem_free(  
    ptr ) vPortFree(ptr)
```

Free Memory

This function frees dynamically allocated memory using any of the dynamic allocation primitives.

Parameters

in	<i>ptr</i>	Pointer to the memory to be freed
----	------------	-----------------------------------

5.11.4.12 os_get_runtime_stats

```
#define os_get_runtime_stats(  
    __buff__ ) vTaskGetRunTimeStats(__buff__)
```

Get ASCII formatted run time statistics

Please ensure that your buffer is big enough for the formatted data to fit. Failing to do this may cause memory data corruption.

5.11.5 Typedef Documentation

5.11.5.1 cb_fn

```
typedef int(* cb_fn) (os_rw_lock_t *plock, unsigned int wait_time)
```

This is prototype of reader callback

5.11.6 Enumeration Type Documentation

5.11.6.1 os_timer_reload_t

```
enum os_timer_reload_t
```

OS Timer reload Options

Enumerator

OS_TIMER_ONE_SHOT	Create one shot timer. Timer will be in the dormant state after it expires.
OS_TIMER_PERIODIC	Create a periodic timer. Timer will auto-reload after it expires.

5.11.6.2 os_timer_activate_t

```
enum os_timer_activate_t
```

OS Timer Activate Options

Enumerator

OS_TIMER_AUTO_ACTIVATE	Start the timer on creation.
OS_TIMER_NO_ACTIVATE	Do not start the timer on creation.

5.12 wm_utils.h File Reference

Utility functions.

5.12.1 Detailed Description

Collection of some common helper functions

5.12.2 Function Documentation

5.12.2.1 hex2bin()

```
static unsigned int hex2bin (
    const uint8_t * ibuf,
    uint8_t * obuf,
    unsigned max_olen ) [inline], [static]
```

Convert a given hex string to a equivalent binary representation.

E.g. If your input string of 4 bytes is {'F', 'F', 'F', 'F'} the output string will be of 2 bytes {255, 255} or to put the same in other way {0xFF, 0xFF}

Note that hex2bin is not the same as strtoul as the latter will properly return the integer in the correct machine binary format viz. little endian. hex2bin however does only in-place like replacement of two ASCII characters to one binary number taking 1 byte in memory.

Parameters

in	<i>ibuf</i>	input buffer
out	<i>obuf</i>	output buffer
in	<i>max_olen</i>	Maximum output buffer length

Returns

length of the binary string

5.12.2.2 bin2hex()

```
void bin2hex (
    uint8_t * src,
    char * dest,
    unsigned int src_len,
    unsigned int dest_len )
```

Convert given binary array to equivalent hex representation.

Parameters

in	<i>src</i>	Input buffer
out	<i>dest</i>	Output buffer
in	<i>src_len</i>	Length of the input buffer
in	<i>dest_len</i>	Length of the output buffer

Returns

void

5.12.2.3 random_register_handler()

```
int random_register_handler (  
    random_hdlr_t func )
```

Register a random entropy generator handler

This API allows applications to register their own random entropy generator handlers that will be internally used by [get_random_sequence\(\)](#) to add even more randomization to the byte stream generated by it.

Parameters

in	<i>func</i>	Function pointer of type random_hdlr_t
----	-------------	--

Returns

WM_SUCCESS if successful

-WM_E_NOSPC if there is no space available for additional handlers

5.12.2.4 random_unregister_handler()

```
int random_unregister_handler (  
    random_hdlr_t func )
```

Un-register a random entropy generator handler

This API can be used to un-register a handler registered using [random_register_handler\(\)](#)

Parameters

in	<i>func</i>	Function pointer of type random_hdlr_t used during registering
----	-------------	--

Returns

WM_SUCCESS if successful
 -WM_E_INVALID if the passed pointer is invalid

5.12.2.5 random_register_seed_handler()

```
int random_register_seed_handler (
    random_hdlr_t func )
```

Register a random seed generator handler

For getting better random numbers, the initial seed (ideally required only once on every boot) should also be random. This API allows applications to register their own seed generators. Applications can use any logic such that a different seed is generated every time. A sample seed generator which uses a combination of DAC (generating random noise) and ADC (that internally samples the random noise) along with the flash id has already been provided. Please have a look at [sample_initialise_random_seed\(\)](#).

The seed generator handler is called only once by the [get_random_sequence\(\)](#) function. Applications can also explicitly initialize the seed by calling [random_initialize_seed\(\)](#) after registering a handler.

Parameters

in	func	Function pointer of type random_hdlr_t
----	------	--

Returns

WM_SUCCESS if successful
 -WM_E_NOSPC if there is no space available for additional handlers

5.12.2.6 random_unregister_seed_handler()

```
int random_unregister_seed_handler (
    random_hdlr_t func )
```

Un-register a random seed generator handler

This API can be used to un-register a handler registered using [random_register_seed_handler\(\)](#)

Parameters

in	func	Function pointer of type random_hdlr_t used during registering
----	------	--

Returns

WM_SUCCESS if successful
 -WM_E_INVALID if the passed pointer is invalid

5.12.2.7 random_initialize_seed()

```
void random_initialize_seed ( )
```

Initialize the random number generator's seed

The [get_random_sequence\(\)](#) uses a random number generator that is initialized with a seed when [get_random_sequence\(\)](#) is called for the first time. The handlers registered using [random_register_seed_handler\(\)](#) are used to generate the seed. If an application wants to explicitly initialize the seed, this API can be used. The seed will then not be re-initialized in [get_random_sequence\(\)](#).

5.12.2.8 sample_initialise_random_seed()

```
uint32_t sample_initialise_random_seed ( )
```

Sample random seed generator

This is a sample random seed generator handler that can be registered using [random_register_seed_handler\(\)](#) to generate a random seed. This uses a combination of DAC (generating random noise) and ADC (that internally samples the random noise) along with the flash id to generate a seed. It is recommended to register this handler and immediately call [random_initialize_seed\(\)](#) before executing any other application code, especially if the application is going to use ADC/DAC for its own purpose.

Returns

Random seed

5.12.2.9 get_random_sequence()

```
void get_random_sequence (
    void * buf,
    unsigned int size )
```

Generate random sequence of bytes

This function generates random sequence of bytes in the user provided buffer.

Parameters

out	<i>buf</i>	The buffer to be populated with random data
in	<i>size</i>	The number of bytes of the random sequence required

5.12.2.10 strdup()

```
char* strdup (
    const char * s )
```

Returns a pointer to a new string which is a duplicate of the input string *s*. Memory for the new string is obtained allocated by the function.

It is caller's responsibility to free the memory after its use.

Parameters

in	s	Pointer to string to be duplicated
----	---	------------------------------------

Returns

Pointer to newly allocated string which is duplicate of input string
 NULL on error

5.12.2.11 soft_crc32()

```
uint32_t soft_crc32 (
    const void * data__,
    int data_size,
    uint32_t crc )
```

Calculate CRC32 using software algorithm

Precondition

soft_crc32_init()

[soft_crc32\(\)](#) allows the user to calculate CRC32 values of arbitrary sized buffers across multiple calls.

Parameters

in	<i>data__</i>	Input buffer over which CRC32 is calculated.
in	<i>data_size</i>	Length of the input buffer.
in	<i>crc</i>	Previous CRC32 value used as starting point for given buffer calculation.

Returns

Calculated CRC32 value

5.12.2.12 fill_sequential_pattern()

```
void fill_sequential_pattern (
    void * buffer,
    int size,
    uint8_t first_byte )
```

Fill the given buffer with a sequential pattern starting from given byte.

For example, if the 'first_byte' is 0x45 and buffer size of 5 then buffer will be set to {0x45, 0x46, 0x47, 0x48, 0x49}

Parameters

in	<i>buffer</i>	The pattern will be set to this buffer.
in	<i>size</i>	Number of pattern bytes to the be written to the buffer.
in	<i>first_byte</i>	This is the value of first byte in the sequential pattern.

Returns

void

5.12.2.13 verify_sequential_pattern()

```
bool verify_sequential_pattern (
    const void * buffer,
    int size,
    uint8_t first_byte )
```

Verify if the the given buffer has a sequential pattern starting from given byte.

For example, if the 'first_byte' is 0x45 and buffer size of 5 then buffer will be verified for presence of {0x45, 0x46, 0x47, 0x48, 0x49}

Parameters

in	<i>buffer</i>	The pattern will be verified from this buffer.
in	<i>size</i>	Number of pattern bytes to the be verified from the buffer.
in	<i>first_byte</i>	This is the value of first byte in the sequential pattern.

Returns

'true' If verification successful.

'false' If verification fails.

5.12.3 Macro Documentation

5.12.3.1 dump_hex

```
#define dump_hex(  
    ... )
```

Value:

```
do  
{  
} while (0)
```

5.12.3.2 dump_hex_ascii

```
#define dump_hex_ascii(  
    ... )
```

Value:

```
do  
{  
} while (0)
```

5.12.3.3 dump_ascii

```
#define dump_ascii(  
    ... )
```

Value:

```
do  
{  
} while (0)
```

5.12.3.4 print_ascii

```
#define print_ascii(  
    ... )
```

Value:

```
do  
{  
} while (0)
```

5.12.3.5 dump_json

```
#define dump_json(  
    ... )
```

Value:

```
do  
{  
} while (0)
```

5.12.4 Typedef Documentation

5.12.4.1 random_hdlr_t

```
typedef uint32_t (* random_hdlr_t) (void)
```

Function prototype for a random entropy/seed generator

Returns

a 32bit random number

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