

# OPL1000\_WIFI\_BLE\_API\_GUIDE

MP1.4

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# Contents

<b>1</b>	<b>SDK PREVIEW</b>	<b>1</b>
<b>2</b>	<b>Module Index</b>	<b>3</b>
2.1	Modules . . . . .	3
<b>3</b>	<b>Data Structure Index</b>	<b>5</b>
3.1	Data Structures . . . . .	5
<b>4</b>	<b>Module Documentation</b>	<b>9</b>
4.1	BLE ALL APIs . . . . .	9
4.1.1	Detailed Description . . . . .	9
4.1.2	Function Documentation . . . . .	9
4.1.2.1	LeSmpGetBondIdFromAddr() . . . . .	9
4.2	BLE CM APIs . . . . .	10
4.2.1	Detailed Description . . . . .	11
4.2.2	Typedef Documentation . . . . .	11
4.2.2.1	LE_CM_MSG_ADD_TO_RESOLVING_LIST_CFM_T . . . . .	11
4.2.2.2	LE_CM_MSG_ADD_TO_WHITE_LIST_CFM_T . . . . .	11
4.2.2.3	LE_CM_MSG_CANCEL_CONNECTION_CFM_T . . . . .	12
4.2.2.4	LE_CM_MSG_CLEAR_RESOLVING_LIST_CFM_T . . . . .	12
4.2.2.5	LE_CM_MSG_CLEAR_WHITE_LIST_CFM_T . . . . .	12
4.2.2.6	LE_CM_MSG_CREATE_CONNECTION_CFM_T . . . . .	12
4.2.2.7	LE_CM_MSG_ENTER_ADVERTISING_CFM_T . . . . .	12
4.2.2.8	LE_CM_MSG_ENTER_SCANNING_CFM_T . . . . .	12
4.2.2.9	LE_CM_MSG_EXIT_ADVERTISING_CFM_T . . . . .	12

4.2.2.10	LE_CM_MSG_EXIT_SCANNING_CFM_T . . . . .	12
4.2.2.11	LE_CM_MSG_PHY_UPDATE_COMPLETE_IND_T . . . . .	13
4.2.2.12	LE_CM_MSG_REMOVE_FROM_RESOLVING_LIST_CFM_T . . . . .	13
4.2.2.13	LE_CM_MSG_REMOVE_FROM_WHITE_LIST_CFM_T . . . . .	13
4.2.2.14	LE_CM_MSG_SET_ADVERTISING_DATA_CFM_T . . . . .	13
4.2.2.15	LE_CM_MSG_SET_ADVERTISING_PARAMS_CFM_T . . . . .	13
4.2.2.16	LE_CM_MSG_SET_CHANNEL_MAP_CFM_T . . . . .	13
4.2.2.17	LE_CM_MSG_SET_DEFAULT_PHY_CFM_T . . . . .	13
4.2.2.18	LE_CM_MSG_SET_RANDOM_ADDRESS_CFM_T . . . . .	13
4.2.2.19	LE_CM_MSG_SET_RPA_TIMEOUT_CFM_T . . . . .	14
4.2.2.20	LE_CM_MSG_SET_SCAN_PARAMS_CFM_T . . . . .	14
4.2.2.21	LE_CM_MSG_SET_SCAN_RSP_DATA_CFM_T . . . . .	14
4.2.3	Enumeration Type Documentation . . . . .	14
4.2.3.1	anonymous enum . . . . .	14
4.2.4	Function Documentation . . . . .	15
4.2.4.1	LeCmInit() . . . . .	15
4.3	BLE GAP APIs . . . . .	17
4.3.1	Detailed Description . . . . .	19
4.3.2	Macro Definition Documentation . . . . .	19
4.3.2.1	GAP_ADTYPE_128BIT_COMPLETE . . . . .	19
4.3.2.2	GAP_ADTYPE_128BIT_MORE . . . . .	19
4.3.2.3	GAP_ADTYPE_16BIT_COMPLETE . . . . .	20
4.3.2.4	GAP_ADTYPE_16BIT_MORE . . . . .	20
4.3.2.5	GAP_ADTYPE_32BIT_COMPLETE . . . . .	20
4.3.2.6	GAP_ADTYPE_32BIT_MORE . . . . .	20
4.3.2.7	GAP_ADTYPE_3D_INFO_DATA . . . . .	20
4.3.2.8	GAP_ADTYPE_ADV_INTERVAL . . . . .	20
4.3.2.9	GAP_ADTYPE_APPEARANCE . . . . .	20
4.3.2.10	GAP_ADTYPE_FLAGS . . . . .	20
4.3.2.11	GAP_ADTYPE_FLAGS_BREDR_NOT_SUPPORTED . . . . .	21

4.3.2.12	GAP_ADTYPE_FLAGS_GENERAL . . . . .	21
4.3.2.13	GAP_ADTYPE_FLAGS_LIMITED . . . . .	21
4.3.2.14	GAP_ADTYPE_LE_BD_ADDR . . . . .	21
4.3.2.15	GAP_ADTYPE_LE_ROLE . . . . .	21
4.3.2.16	GAP_ADTYPE_LOCAL_NAME_COMPLETE . . . . .	21
4.3.2.17	GAP_ADTYPE_LOCAL_NAME_SHORT . . . . .	21
4.3.2.18	GAP_ADTYPE_MANUFACTURER_SPECIFIC . . . . .	21
4.3.2.19	GAP_ADTYPE_OOB_CLASS_OF_DEVICE . . . . .	22
4.3.2.20	GAP_ADTYPE_OOB_SIMPLE_PAIRING_HASHC . . . . .	22
4.3.2.21	GAP_ADTYPE_OOB_SIMPLE_PAIRING_RANDR . . . . .	22
4.3.2.22	GAP_ADTYPE_POWER_LEVEL . . . . .	22
4.3.2.23	GAP_ADTYPE_PUBLIC_TARGET_ADDR . . . . .	22
4.3.2.24	GAP_ADTYPE_RANDOM_TARGET_ADDR . . . . .	22
4.3.2.25	GAP_ADTYPE_SERVICE_DATA . . . . .	22
4.3.2.26	GAP_ADTYPE_SERVICE_DATA_128BIT . . . . .	22
4.3.2.27	GAP_ADTYPE_SERVICE_DATA_32BIT . . . . .	23
4.3.2.28	GAP_ADTYPE_SERVICES_LIST_128BIT . . . . .	23
4.3.2.29	GAP_ADTYPE_SERVICES_LIST_16BIT . . . . .	23
4.3.2.30	GAP_ADTYPE_SIGNED_DATA . . . . .	23
4.3.2.31	GAP_ADTYPE_SIMPLE_PAIRING_HASHC_256 . . . . .	23
4.3.2.32	GAP_ADTYPE_SIMPLE_PAIRING_RANDR_256 . . . . .	23
4.3.2.33	GAP_ADTYPE_SLAVE_CONN_INTERVAL_RANGE . . . . .	23
4.3.2.34	GAP_ADTYPE_SM_OOB_FLAG . . . . .	23
4.3.2.35	GAP_ADTYPE_SM_TK . . . . .	24
4.3.2.36	GAP_PUBLIC_ADDR . . . . .	24
4.3.2.37	GAP_RAND_ADDR_NRPA . . . . .	24
4.3.2.38	GAP_RAND_ADDR_RPA . . . . .	24
4.3.2.39	GAP_RAND_ADDR_STATIC . . . . .	24
4.3.2.40	GAP_SCAN_TYPE_ACTIVE . . . . .	24
4.3.2.41	GAP_SCAN_TYPE_PASSIVE . . . . .	24

4.3.2.42	GAP_TX_PWR_CURR_VAL . . . . .	24
4.3.2.43	GAP_TX_PWR_MAX_VAL . . . . .	25
4.3.2.44	GAPBOND_IO_CAP_DISPLAY_ONLY . . . . .	25
4.3.2.45	GAPBOND_IO_CAP_DISPLAY_YES_NO . . . . .	25
4.3.2.46	GAPBOND_IO_CAP_KEYBOARD_DISPLAY . . . . .	25
4.3.2.47	GAPBOND_IO_CAP_KEYBOARD_ONLY . . . . .	25
4.3.2.48	GAPBOND_IO_CAP_NO_INPUT_NO_OUTPUT . . . . .	25
4.3.2.49	GAPBOND_PAIRING_MODE_INITIATE . . . . .	25
4.3.2.50	GAPBOND_PAIRING_MODE_NO_PAIRING . . . . .	25
4.3.2.51	GAPBOND_PAIRING_MODE_WAIT_FOR_REQ . . . . .	26
4.3.2.52	LE_GAP_ADV_MAX_SIZE . . . . .	26
4.3.3	Function Documentation . . . . .	26
4.3.3.1	LeGapAddToResolvingList() . . . . .	26
4.3.3.2	LeGapAddToWhiteList() . . . . .	26
4.3.3.3	LeGapAdvertisingEnable() . . . . .	27
4.3.3.4	LeGapCentralConnectReq() . . . . .	27
4.3.3.5	LeGapCentralSetDataChannel() . . . . .	27
4.3.3.6	LeGapClearResolvingList() . . . . .	29
4.3.3.7	LeGapClearWhiteList() . . . . .	29
4.3.3.8	LeGapConnectCancelReq() . . . . .	29
4.3.3.9	LeGapConnParaRequestRsp() . . . . .	29
4.3.3.10	LeGapConnUpdateRequest() . . . . .	30
4.3.3.11	LeGapConnUpdateResponse() . . . . .	30
4.3.3.12	LeGapDisconnectReq() . . . . .	31
4.3.3.13	LeGapGenRandAddr() . . . . .	31
4.3.3.14	LeGapGetBtAddr() . . . . .	31
4.3.3.15	LeGapReadAdvChannelTxPower() . . . . .	32
4.3.3.16	LeGapReadChannelMap() . . . . .	32
4.3.3.17	LeGapReadPhy() . . . . .	32
4.3.3.18	LeGapReadResolvingListSize() . . . . .	32

4.3.3.19	LeGapReadRssi()	32
4.3.3.20	LeGapReadTxPower()	33
4.3.3.21	LeGapReadWhiteListSize()	33
4.3.3.22	LeGapRemoveFromWhiteList()	33
4.3.3.23	LeGapScanningReq()	34
4.3.3.24	LeGapSetAdvData()	34
4.3.3.25	LeGapSetAdvParameter()	35
4.3.3.26	LeGapSetConnParameter()	35
4.3.3.27	LeGapSetDataChannelPduLen()	35
4.3.3.28	LeGapSetDefaultPhy()	36
4.3.3.29	LeGapSetPhy()	36
4.3.3.30	LeGapSetRandAddr()	36
4.3.3.31	LeGapSetRpaTimeout()	37
4.3.3.32	LeGapSetStaticAddr()	37
4.3.3.33	LeSetScanParameter()	37
4.3.3.34	LeSetScanRspData()	38
4.4	BLE GATT APIs	39
4.4.1	Detailed Description	43
4.4.2	Macro Definition Documentation	43
4.4.2.1	CHAR_AGGREGATE_DESCRIPTOR	43
4.4.2.2	CHAR_CLIENT_CONFIG_DESCRIPTOR	44
4.4.2.3	CHAR_DECL_UUID16_ATTR_VAL	44
4.4.2.4	CHAR_EXT_PROP_DESCRIPTOR	44
4.4.2.5	CHAR_PRESENT_FORMAT_DESCRIPTOR	44
4.4.2.6	CHAR_SERVER_CONFIG_DESCRIPTOR	44
4.4.2.7	CHAR_USER_DESC_DESCRIPTOR	44
4.4.2.8	CHARACTERISTIC_DECL_UUID128	45
4.4.2.9	CHARACTERISTIC_DECL_UUID16	45
4.4.2.10	CHARACTERISTIC_UUID128	45
4.4.2.11	CHARACTERISTIC_UUID16	45

4.4.2.12	GATT_CHAR_AGG_FORMAT_UUID . . . . .	45
4.4.2.13	GATT_CHAR_EXT_PROPS_UUID . . . . .	45
4.4.2.14	GATT_CHAR_FORMAT_UUID . . . . .	46
4.4.2.15	GATT_CHAR_USER_DESC_UUID . . . . .	46
4.4.2.16	GATT_CHARACTERISTIC_UUID . . . . .	46
4.4.2.17	GATT_CLIENT_CHAR_CFG_UUID . . . . .	46
4.4.2.18	GATT_EXT_REPORT_REF_UUID . . . . .	46
4.4.2.19	GATT_INCLUDE_UUID . . . . .	46
4.4.2.20	GATT_PRIMARY_SERVICE_UUID . . . . .	46
4.4.2.21	GATT_REPORT_REF_UUID . . . . .	46
4.4.2.22	GATT_SECONDARY_SERVICE_UUID . . . . .	47
4.4.2.23	GATT_SERV_CHAR_CFG_UUID . . . . .	47
4.4.2.24	GATT_VALID_RANGE_UUID . . . . .	47
4.4.2.25	INCLUDE_DECL_UUID128 . . . . .	47
4.4.2.26	INCLUDE_DECL_UUID128_ATTR_VAL . . . . .	47
4.4.2.27	INCLUDE_DECL_UUID16_ATTR_VAL . . . . .	47
4.4.2.28	INCLUDE_DECL_UINT16 . . . . .	47
4.4.2.29	LE_ATT_UUID_SIZE . . . . .	48
4.4.2.30	LE_GATT_CHAR_PROP_AUTH . . . . .	48
4.4.2.31	LE_GATT_CHAR_PROP_BCAST . . . . .	48
4.4.2.32	LE_GATT_CHAR_PROP_EXT_PROP . . . . .	48
4.4.2.33	LE_GATT_CHAR_PROP_IND . . . . .	48
4.4.2.34	LE_GATT_CHAR_PROP_NTF . . . . .	48
4.4.2.35	LE_GATT_CHAR_PROP_RD . . . . .	48
4.4.2.36	LE_GATT_CHAR_PROP_WR . . . . .	49
4.4.2.37	LE_GATT_CHAR_PROP_WR_NO_RESP . . . . .	49
4.4.2.38	LE_GATT_CLIENT_CFG_INDICATION . . . . .	49
4.4.2.39	LE_GATT_CLIENT_CFG_NOTIFICATION . . . . .	49
4.4.2.40	LE_GATT_EXT_PROP_RELIABLE_WR . . . . .	49
4.4.2.41	LE_GATT_EXT_PROP_WR_AUX . . . . .	49



4.4.2.42	LE_GATT_FLAG_PREPARE_WRITE . . . . .	49
4.4.2.43	LE_GATT_FLAG_WRITE_CMD . . . . .	49
4.4.2.44	LE_GATT_FLAG_WRITE_REQ . . . . .	50
4.4.2.45	LE_GATT_PERM_AUTH_READABLE . . . . .	50
4.4.2.46	LE_GATT_PERM_AUTH_WRITABLE . . . . .	50
4.4.2.47	LE_GATT_PERM_NONE . . . . .	50
4.4.2.48	LE_GATT_PERM_READ . . . . .	50
4.4.2.49	LE_GATT_PERM_RELIABLE_WRITE . . . . .	50
4.4.2.50	LE_GATT_PERM_WRITE_CMD . . . . .	50
4.4.2.51	LE_GATT_PERM_WRITE_REQ . . . . .	50
4.4.2.52	LE_GATT_PERMIT_AUTHEN_READ . . . . .	51
4.4.2.53	LE_GATT_PERMIT_AUTHEN_WRITE . . . . .	51
4.4.2.54	LE_GATT_PERMIT_AUTHOR_READ . . . . .	51
4.4.2.55	LE_GATT_PERMIT_AUTHOR_WRITE . . . . .	51
4.4.2.56	LE_GATT_PERMIT_ENCRYPT_READ . . . . .	51
4.4.2.57	LE_GATT_PERMIT_ENCRYPT_WRITE . . . . .	51
4.4.2.58	LE_GATT_PERMIT_READ . . . . .	51
4.4.2.59	LE_GATT_PERMIT_READABLE . . . . .	51
4.4.2.60	LE_GATT_PERMIT_SC_AUTHEN_READ . . . . .	52
4.4.2.61	LE_GATT_PERMIT_SC_AUTHEN_WRITE . . . . .	52
4.4.2.62	LE_GATT_PERMIT_WRITABLE . . . . .	52
4.4.2.63	LE_GATT_PERMIT_WRITE . . . . .	52
4.4.2.64	PRIMARY_SERVICE_DECL_UUID128 . . . . .	52
4.4.2.65	PRIMARY_SERVICE_DECL_UUID16 . . . . .	52
4.4.2.66	SECONDARY_SERVICE_DECL_UUID128 . . . . .	52
4.4.2.67	SECONDARY_SERVICE_DECL_UUID16 . . . . .	53
4.4.3	Enumeration Type Documentation . . . . .	53
4.4.3.1	anonymous enum . . . . .	53
4.4.4	Function Documentation . . . . .	54
4.4.4.1	LeGattAccessReadRsp() . . . . .	54

4.4.4.2	LeGattAccessWriteRsp()	54
4.4.4.3	LeGattChangeAttrVal()	55
4.4.4.4	LeGattCharValConfirmation()	55
4.4.4.5	LeGattCharValIndicate()	56
4.4.4.6	LeGattCharValNotify()	56
4.4.4.7	LeGattExchangeMtuReq()	57
4.4.4.8	LeGattExchangeMtuRsp()	57
4.4.4.9	LeGattExecuteWriteCharValReliable()	58
4.4.4.10	LeGattFindAllCharacteristic()	58
4.4.4.11	LeGattFindAllCharDescriptor()	58
4.4.4.12	LeGattFindAllPrimaryService()	59
4.4.4.13	LeGattFindCharacteristicByUuid()	59
4.4.4.14	LeGattFindIncludedService()	60
4.4.4.15	LeGattFindPrimaryServiceByUuid()	60
4.4.4.16	LeGattGetAttrHandle()	61
4.4.4.17	LeGattGetAttrVal()	61
4.4.4.18	LeGattGetAttrValLen()	61
4.4.4.19	LeGattGetAttrValMaxLen()	63
4.4.4.20	LeGattInit()	63
4.4.4.21	LeGattModifyAttrVal()	64
4.4.4.22	LeGattPrepareWriteCharValReliable()	64
4.4.4.23	LeGattReadCharValByUuid()	65
4.4.4.24	LeGattReadCharValue()	65
4.4.4.25	LeGattReadLongCharVal()	66
4.4.4.26	LeGattReadMultipleCharVal()	66
4.4.4.27	LeGattRegisterIncludeService()	66
4.4.4.28	LeGattRegisterService()	67
4.4.4.29	LeGattSignedWriteNoRsp()	67
4.4.4.30	LeGattStopCurrentProcedure()	68
4.4.4.31	LeGattWriteCharVal()	68

4.4.4.32	<a href="#">LeGattWriteCharValReliable()</a>	69
4.4.4.33	<a href="#">LeGattWriteLongCharVal()</a>	69
4.4.4.34	<a href="#">LeGattWriteNoRsp()</a>	70
4.4.5	<a href="#">Variable Documentation</a>	70
4.4.5.1	<a href="#">gcCharacteristicUuid</a>	70
4.4.5.2	<a href="#">gcCharAggregateUuid</a>	70
4.4.5.3	<a href="#">gcCharExtPropUuid</a>	71
4.4.5.4	<a href="#">gcCharFormatUuid</a>	71
4.4.5.5	<a href="#">gcCharUserDescUuid</a>	71
4.4.5.6	<a href="#">gcClientCharConfigUuid</a>	71
4.4.5.7	<a href="#">gcExtReportRefUuid</a>	71
4.4.5.8	<a href="#">gcIncludeUuid</a>	71
4.4.5.9	<a href="#">gcPrimaryServiceUuid</a>	71
4.4.5.10	<a href="#">gcReportRefUuid</a>	71
4.4.5.11	<a href="#">gcSecondaryServiceUuid</a>	72
4.4.5.12	<a href="#">gcServerCharConfigUuid</a>	72
4.4.5.13	<a href="#">gcValidRangeUuid</a>	72
4.5	<a href="#">BLE MSG APIs</a>	73
4.5.1	<a href="#">Detailed Description</a>	74
4.5.2	<a href="#">Macro Definition Documentation</a>	74
4.5.2.1	<a href="#">LE_ATT_MSG_BASE</a>	74
4.5.2.2	<a href="#">LE_CM_MSG_BASE</a>	74
4.5.2.3	<a href="#">LE_GATT_MSG_BASE</a>	75
4.5.2.4	<a href="#">LE_HCI_MSG_BASE</a>	75
4.5.2.5	<a href="#">LE_L2CAP_MSG_BASE</a>	75
4.5.2.6	<a href="#">LE_SMP_MSG_BASE</a>	75
4.5.2.7	<a href="#">LE_SYS_MSG_BASE</a>	75
4.5.2.8	<a href="#">MESSAGE_ALLOCATE</a>	75
4.5.2.9	<a href="#">MESSAGE_BULID</a>	75
4.5.2.10	<a href="#">MESSAGE_DATA_BULID</a>	76

4.5.2.11	MESSAGE_OFFSET . . . . .	76
4.5.2.12	T_HOUR . . . . .	76
4.5.2.13	T_MIN . . . . .	76
4.5.2.14	T_SEC . . . . .	76
4.5.3	Typedef Documentation . . . . .	76
4.5.3.1	MESSAGE . . . . .	76
4.5.3.2	MESSAGEID . . . . .	77
4.5.3.3	MsgData . . . . .	77
4.5.3.4	MsgLock . . . . .	77
4.5.3.5	MSGLOCK . . . . .	77
4.5.3.6	MSGSUBID . . . . .	77
4.5.3.7	MSGTIMER . . . . .	77
4.5.3.8	Task . . . . .	77
4.5.3.9	TASK . . . . .	77
4.5.3.10	TASKHANDLER . . . . .	78
4.5.3.11	TASKPACK . . . . .	78
4.5.4	Enumeration Type Documentation . . . . .	78
4.5.4.1	anonymous enum . . . . .	78
4.5.5	Function Documentation . . . . .	78
4.5.5.1	LeCancelAllMessage() . . . . .	78
4.5.5.2	LeCancelAllSubMessage() . . . . .	79
4.5.5.3	LeCancelFirstMessage() . . . . .	79
4.5.5.4	LeCancelFirstSubMessage() . . . . .	80
4.5.5.5	LeGetSubMsgId() . . . . .	80
4.5.5.6	LeHostCreateTask() . . . . .	80
4.5.5.7	LeHostMessageLoop() . . . . .	81
4.5.5.8	LeSendMessage() . . . . .	81
4.5.5.9	LeSendMessageAfter() . . . . .	81
4.5.5.10	LeSendMessageUnlock() . . . . .	82
4.5.5.11	LeSendSubMessage() . . . . .	82

4.5.5.12	LeSendSubMessageAfter()	83
4.5.5.13	LeSendSubMessageUnlock()	83
4.6	BLE SMP APIs	85
4.6.1	Detailed Description	86
4.6.2	Macro Definition Documentation	86
4.6.2.1	LE_MAX_BOND_COUNT	86
4.6.2.2	LE_SM_IO_CAP_DISP_ONLY	86
4.6.2.3	LE_SM_IO_CAP_DISP_YES_NO	86
4.6.2.4	LE_SM_IO_CAP_KEYBOARD_DISP	87
4.6.2.5	LE_SM_IO_CAP_KEYBOARD_ONLY	87
4.6.2.6	LE_SM_IO_CAP_NO_IO	87
4.6.2.7	LE_SM_PAIR_MITM_NO	87
4.6.2.8	LE_SM_PAIR_MITM_YES	87
4.6.2.9	LE_SM_PAIR_OOB_NO	87
4.6.2.10	LE_SM_PAIR_OOB_YES	87
4.6.2.11	LE_SM_PAIR_SC_NO	87
4.6.2.12	LE_SM_PAIR_SC_YES	88
4.6.3	Enumeration Type Documentation	88
4.6.3.1	anonymous enum	88
4.6.3.2	anonymous enum	88
4.6.4	Function Documentation	89
4.6.4.1	LeSmpInit()	89
4.6.4.2	LeSmpOobAuthDataRsp()	89
4.6.4.3	LeSmpOobPresent()	89
4.6.4.4	LeSmpPasskeyInput()	90
4.6.4.5	LeSmpScOobComputeConfirmVal()	90
4.6.4.6	LeSmpScOobDataRsp()	91
4.6.4.7	LeSmpSecurityReq()	91
4.6.4.8	LeSmpSecurityRsp()	91
4.6.4.9	LeSmpSetDefaultConfig()	92

4.6.4.10	LeSmpUserConfirmRsp()	92
4.7	WIFI APIs	93
4.7.1	Detailed Description	94
4.7.2	Macro Definition Documentation	94
4.7.2.1	WIFI_BEACON_INTERVAL_LENGTH	94
4.7.2.2	WIFI_CAPABILITY_INFO_LENGTH	95
4.7.2.3	WIFI_LENGTH_802_11	95
4.7.2.4	WIFI_LENGTH_PASSPHRASE	95
4.7.2.5	WIFI_MAC_ADDRESS_LENGTH	95
4.7.2.6	WIFI_MAC_NUM_OF_CHANNELS	95
4.7.2.7	WIFI_MAX_LENGTH_OF_SSID	95
4.7.2.8	WIFI_MAX_SCAN_AP_NUM	96
4.7.2.9	WIFI_MAX_SUPPORTED_RATES	96
4.7.3	Typedef Documentation	96
4.7.3.1	wifi_ap_record_t	96
4.7.3.2	wifi_event_notify_cb_t	96
4.7.4	Enumeration Type Documentation	96
4.7.4.1	wifi_auto_connet_mode_e	96
4.7.5	Function Documentation	97
4.7.5.1	wifi_event_process_handler()	97
4.7.5.2	wifi_install_default_event_handlers()	97
4.7.5.3	wifi_register_event_handler()	98
4.8	WIFI Common APIs	99
4.8.1	Detailed Description	99
4.8.2	Typedef Documentation	99
4.8.2.1	wifi_event_cb_t	99
4.8.3	Function Documentation	99
4.8.3.1	wifi_event_loop_init()	99
4.8.3.2	wifi_event_loop_send()	100
4.8.3.3	wifi_event_loop_set_cb()	100

4.8.3.4	wifi_event_process_handler()	101
4.9	WIFI STA APIs	102
4.9.1	Detailed Description	106
4.9.2	Macro Definition Documentation	106
4.9.2.1	WIFI_READY_TIME	106
4.9.3	Typedef Documentation	106
4.9.3.1	wifi_auto_connect_clear_ap_info_fp_t	106
4.9.3.2	wifi_auto_connect_get_ap_info_fp_t	106
4.9.3.3	wifi_auto_connect_get_ap_num_fp_t	107
4.9.3.4	wifi_auto_connect_get_mode_fp_t	107
4.9.3.5	wifi_auto_connect_init_fp_t	107
4.9.3.6	wifi_auto_connect_reset_fp_t	107
4.9.3.7	wifi_auto_connect_set_ap_num_fp_t	107
4.9.3.8	wifi_auto_connect_set_mode_fp_t	107
4.9.3.9	wifi_auto_connect_start_fp_t	107
4.9.3.10	wifi_config_get_bandwidth_fp_t	107
4.9.3.11	wifi_config_get_bssid_fp_t	108
4.9.3.12	wifi_config_get_channel_fp_t	108
4.9.3.13	wifi_config_get_dtim_interval_fp_t	108
4.9.3.14	wifi_config_get_listen_interval_fp_t	108
4.9.3.15	wifi_config_get_mac_address_fp_t	108
4.9.3.16	wifi_config_get_opmode_fp_t	108
4.9.3.17	wifi_config_get_ssid_fp_t	108
4.9.3.18	wifi_config_set_bandwidth_fp_t	108
4.9.3.19	wifi_config_set_bssid_fp_t	109
4.9.3.20	wifi_config_set_channel_fp_t	109
4.9.3.21	wifi_config_set_dtim_interval_fp_t	109
4.9.3.22	wifi_config_set_listen_interval_fp_t	109
4.9.3.23	wifi_config_set_mac_address_fp_t	109
4.9.3.24	wifi_config_set_opmode_fp_t	109

4.9.3.25	wifi_config_set_ssid_fp_t . . . . .	109
4.9.3.26	wifi_connection_connect_fp_t . . . . .	110
4.9.3.27	wifi_connection_disconnect_ap_fp_t . . . . .	110
4.9.3.28	wifi_connection_disconnect_sta_fp_t . . . . .	110
4.9.3.29	wifi_connection_get_rssi_fp_t . . . . .	110
4.9.3.30	wifi_connection_register_event_handler_fp_t . . . . .	110
4.9.3.31	wifi_connection_scan_start_fp_t . . . . .	110
4.9.3.32	wifi_connection_unregister_event_handler_fp_t . . . . .	110
4.9.3.33	wifi_convert_auth_mode_fp_t . . . . .	111
4.9.3.34	wifi_deinit_fp_t . . . . .	111
4.9.3.35	wifi_event_handler_t . . . . .	111
4.9.3.36	wifi_fast_connect_get_mode_fp_t . . . . .	111
4.9.3.37	wifi_fast_connect_set_mode_fp_t . . . . .	111
4.9.3.38	wifi_fast_connect_start_fp_t . . . . .	112
4.9.3.39	wifi_get_config_fp_t . . . . .	112
4.9.3.40	wifi_init_complete_cb_t . . . . .	112
4.9.3.41	wifi_init_fp_t . . . . .	112
4.9.3.42	wifi_result_t . . . . .	112
4.9.3.43	wifi_scan_get_ap_list_fp_t . . . . .	112
4.9.3.44	wifi_scan_get_ap_num_fp_t . . . . .	113
4.9.3.45	wifi_scan_get_ap_records_fp_t . . . . .	113
4.9.3.46	wifi_scan_start_fp_t . . . . .	113
4.9.3.47	wifi_scan_stop_fp_t . . . . .	113
4.9.3.48	wifi_set_config_fp_t . . . . .	113
4.9.3.49	wifi_sta_get_ap_info_fp_t . . . . .	113
4.9.3.50	wifi_start_fp_t . . . . .	113
4.9.3.51	wifi_stop_fp_t . . . . .	113
4.9.4	Function Documentation . . . . .	114
4.9.4.1	wifi_auto_connect_clear_ap_info() . . . . .	114
4.9.4.2	wifi_auto_connect_get_ap_info() . . . . .	114



4.9.4.3	wifi_auto_connect_get_ap_num()	115
4.9.4.4	wifi_auto_connect_get_mode()	115
4.9.4.5	wifi_auto_connect_get_saved_ap_num()	116
4.9.4.6	wifi_auto_connect_init()	116
4.9.4.7	wifi_auto_connect_reset()	116
4.9.4.8	wifi_auto_connect_set_ap_num()	117
4.9.4.9	wifi_auto_connect_set_mode()	117
4.9.4.10	wifi_auto_connect_start()	118
4.9.4.11	wifi_auto_connect_update_ch()	118
4.9.4.12	wifi_config_get_bandwidth()	118
4.9.4.13	wifi_config_get_bssid()	119
4.9.4.14	wifi_config_get_channel()	119
4.9.4.15	wifi_config_get_dtim_interval()	120
4.9.4.16	wifi_config_get_listen_interval()	120
4.9.4.17	wifi_config_get_mac_address()	120
4.9.4.18	wifi_config_get_mac_tx_data_rate()	121
4.9.4.19	wifi_config_get_opmode()	121
4.9.4.20	wifi_config_get_skip_dtim()	121
4.9.4.21	wifi_config_get_ssid()	122
4.9.4.22	wifi_config_get_sta_mac_address_from_flash()	122
4.9.4.23	wifi_config_set_bandwidth()	122
4.9.4.24	wifi_config_set_bssid()	123
4.9.4.25	wifi_config_set_channel()	123
4.9.4.26	wifi_config_set_dtim_interval()	124
4.9.4.27	wifi_config_set_listen_interval()	124
4.9.4.28	wifi_config_set_mac_address()	124
4.9.4.29	wifi_config_set_mac_tx_data_rate()	125
4.9.4.30	wifi_config_set_opmode()	125
4.9.4.31	wifi_config_set_skip_dtim()	125
4.9.4.32	wifi_config_set_ssid()	126

4.9.4.33	wifi_connection_connect()	127
4.9.4.34	wifi_connection_connect_from_ac_index()	127
4.9.4.35	wifi_connection_connect_from_ac_list()	128
4.9.4.36	wifi_connection_disconnect_ap()	128
4.9.4.37	wifi_connection_disconnect_sta()	128
4.9.4.38	wifi_connection_get_rssi()	129
4.9.4.39	wifi_connection_register_event_handler()	129
4.9.4.40	wifi_connection_scan_start()	130
4.9.4.41	wifi_connection_unregister_event_handler()	130
4.9.4.42	wifi_convert_auth_mode()	131
4.9.4.43	wifi_deinit()	131
4.9.4.44	wifi_fast_connect_get_mode()	131
4.9.4.45	wifi_fast_connect_set_mode()	132
4.9.4.46	wifi_fast_connect_start()	132
4.9.4.47	wifi_get_config()	133
4.9.4.48	wifi_init()	133
4.9.4.49	wifi_scan_get_ap_list()	134
4.9.4.50	wifi_scan_get_ap_num()	134
4.9.4.51	wifi_scan_get_ap_records()	135
4.9.4.52	wifi_scan_scan_stop()	135
4.9.4.53	wifi_scan_start()	135
4.9.4.54	wifi_set_config()	136
4.9.4.55	wifi_sta_get_ap_info()	136
4.9.4.56	wifi_start()	137
4.9.4.57	wifi_stop()	137
4.9.5	Variable Documentation	137
4.9.5.1	wifi_auto_connect_clear_ap_info_api	138
4.9.5.2	wifi_auto_connect_get_ap_info_api	138
4.9.5.3	wifi_auto_connect_get_ap_num_api	138
4.9.5.4	wifi_auto_connect_get_mode_api	138

4.9.5.5	wifi_auto_connect_init_api . . . . .	138
4.9.5.6	wifi_auto_connect_reset_api . . . . .	138
4.9.5.7	wifi_auto_connect_set_ap_num_api . . . . .	138
4.9.5.8	wifi_auto_connect_set_mode_api . . . . .	138
4.9.5.9	wifi_auto_connect_start_api . . . . .	139
4.9.5.10	wifi_config_get_bandwidth_api . . . . .	139
4.9.5.11	wifi_config_get_bssid_api . . . . .	139
4.9.5.12	wifi_config_get_channel_api . . . . .	139
4.9.5.13	wifi_config_get_dtim_interval_api . . . . .	139
4.9.5.14	wifi_config_get_listen_interval_api . . . . .	139
4.9.5.15	wifi_config_get_mac_address_api . . . . .	139
4.9.5.16	wifi_config_get_opmode_api . . . . .	139
4.9.5.17	wifi_config_get_ssid_api . . . . .	140
4.9.5.18	wifi_config_set_bandwidth_api . . . . .	140
4.9.5.19	wifi_config_set_bssid_api . . . . .	140
4.9.5.20	wifi_config_set_channel_api . . . . .	140
4.9.5.21	wifi_config_set_dtim_interval_api . . . . .	140
4.9.5.22	wifi_config_set_listen_interval_api . . . . .	140
4.9.5.23	wifi_config_set_mac_address_api . . . . .	140
4.9.5.24	wifi_config_set_opmode_api . . . . .	140
4.9.5.25	wifi_config_set_ssid_api . . . . .	141
4.9.5.26	wifi_connection_connect_api . . . . .	141
4.9.5.27	wifi_connection_disconnect_ap_api . . . . .	141
4.9.5.28	wifi_connection_disconnect_sta_api . . . . .	141
4.9.5.29	wifi_connection_get_rssi_api . . . . .	141
4.9.5.30	wifi_connection_register_event_handler_api . . . . .	141
4.9.5.31	wifi_connection_scan_start_api . . . . .	141
4.9.5.32	wifi_connection_unregister_event_handler_api . . . . .	141
4.9.5.33	wifi_convert_auth_mode_api . . . . .	142
4.9.5.34	wifi_deinit_api . . . . .	142

4.9.5.35	wifi_fast_connect_get_mode_api . . . . .	142
4.9.5.36	wifi_fast_connect_set_mode_api . . . . .	142
4.9.5.37	wifi_fast_connect_start_api . . . . .	142
4.9.5.38	wifi_get_config_api . . . . .	142
4.9.5.39	wifi_init_api . . . . .	142
4.9.5.40	wifi_scan_get_ap_list_api . . . . .	142
4.9.5.41	wifi_scan_get_ap_num_api . . . . .	143
4.9.5.42	wifi_scan_get_ap_records_api . . . . .	143
4.9.5.43	wifi_scan_start_api . . . . .	143
4.9.5.44	wifi_scan_stop_api . . . . .	143
4.9.5.45	wifi_set_config_api . . . . .	143
4.9.5.46	wifi_sta_get_ap_info_api . . . . .	143
4.9.5.47	wifi_start_api . . . . .	143
4.9.5.48	wifi_stop_api . . . . .	143
4.10	Enumeration . . . . .	144
4.10.1	Detailed Description . . . . .	144
4.10.2	Enumeration Type Documentation . . . . .	144
4.10.2.1	wifi_auth_mode_t . . . . .	145
4.10.2.2	wifi_bandwidth_t . . . . .	145
4.10.2.3	wifi_cipher_type_t . . . . .	145
4.10.2.4	wifi_event_t . . . . .	146
4.10.2.5	wifi_mac_data_rate_t . . . . .	146
4.10.2.6	wifi_mode_t . . . . .	146
4.10.2.7	wifi_reason_code_t . . . . .	147
4.10.2.8	wifi_scan_method_t . . . . .	148
4.10.2.9	wifi_scan_type_t . . . . .	148
4.10.2.10	wifi_sort_method_t . . . . .	148

<b>5</b>	<b>Data Structure Documentation</b>	<b>149</b>
5.1	<a href="#">_wpa_ie_data Struct Reference</a>	149
5.1.1	<a href="#">Field Documentation</a>	149
5.1.1.1	<a href="#">capabilities</a>	149
5.1.1.2	<a href="#">group_cipher</a>	149
5.1.1.3	<a href="#">key_mgmt</a>	150
5.1.1.4	<a href="#">mgmt_group_cipher</a>	150
5.1.1.5	<a href="#">num_pmkid</a>	150
5.1.1.6	<a href="#">pairwise_cipher</a>	150
5.1.1.7	<a href="#">pmkid</a>	150
5.1.1.8	<a href="#">proto</a>	150
5.2	<a href="#">asso_data Struct Reference</a>	150
5.2.1	<a href="#">Field Documentation</a>	151
5.2.1.1	<a href="#">eap_workaround</a>	151
5.2.1.2	<a href="#">eapol_flags</a>	151
5.2.1.3	<a href="#">group_cipher</a>	151
5.2.1.4	<a href="#">key_mgmt</a>	151
5.2.1.5	<a href="#">leap</a>	151
5.2.1.6	<a href="#">mgmt_group_cipher</a>	152
5.2.1.7	<a href="#">non_leap</a>	152
5.2.1.8	<a href="#">pairwise_cipher</a>	152
5.2.1.9	<a href="#">passphrase</a>	152
5.2.1.10	<a href="#">proto</a>	152
5.2.1.11	<a href="#">psk</a>	152
5.2.1.12	<a href="#">psk_set</a>	152
5.3	<a href="#">auto_conn_info_t Struct Reference</a>	152
5.3.1	<a href="#">Field Documentation</a>	153
5.3.1.1	<a href="#">ap_channel</a>	153
5.3.1.2	<a href="#">beacon_interval</a>	153
5.3.1.3	<a href="#">bssid</a>	153

5.3.1.4	capabilities	153
5.3.1.5	dtim_prod	154
5.3.1.6	fast_connect	154
5.3.1.7	free_ocpy	154
5.3.1.8	hid_ssid	154
5.3.1.9	hid_ssid_len	154
5.3.1.10	latest_beacon_rx_time	154
5.3.1.11	passphrase	154
5.3.1.12	psk	154
5.3.1.13	rsn_ie	155
5.3.1.14	rsi	155
5.3.1.15	ssid	155
5.3.1.16	ssid_len	155
5.3.1.17	supported_rates	155
5.3.1.18	wpa_data	155
5.3.1.19	wpa_ie	155
5.4	auto_connect_cfg_t Struct Reference	155
5.4.1	Field Documentation	156
5.4.1.1	flag	156
5.4.1.2	front	156
5.4.1.3	max_save_num	156
5.4.1.4	pFCInfo	156
5.4.1.5	rear	156
5.4.1.6	retryCount	157
5.4.1.7	targetIdx	157
5.4.1.8	uFCapNum	157
5.5	event_msg_t Struct Reference	157
5.5.1	Detailed Description	157
5.5.2	Field Documentation	157
5.5.2.1	event	157

5.5.2.2	length	158
5.5.2.3	param	158
5.6	hap_control_t Struct Reference	158
5.6.1	Field Documentation	158
5.6.1.1	hap_ap_info	158
5.6.1.2	hap_bitvector	158
5.6.1.3	hap_en	158
5.6.1.4	hap_final_index	159
5.6.1.5	hap_index	159
5.6.1.6	hap_ssid	159
5.7	LE_BT_ADDR_T Struct Reference	159
5.7.1	Field Documentation	159
5.7.1.1	addr	159
5.7.1.2	type	159
5.8	LE_CM_CONNECTION_COMPLETE_IND_T Struct Reference	160
5.8.1	Field Documentation	160
5.8.1.1	conn_hdl	160
5.8.1.2	conn_interval	160
5.8.1.3	conn_latency	160
5.8.1.4	dev_id	160
5.8.1.5	peer_addr	161
5.8.1.6	peer_addr_type	161
5.8.1.7	role	161
5.8.1.8	status	161
5.8.1.9	supervision_timeout	161
5.9	LE_CM_MSG_ADVERTISE_REPORT_IND_T Struct Reference	161
5.9.1	Field Documentation	162
5.9.1.1	addr	162
5.9.1.2	addr_type	162
5.9.1.3	data	162

5.9.1.4	event_type	162
5.9.1.5	len	162
5.9.1.6	rss	162
5.10	LE_CM_MSG_CONN_PARA_REQ_T Struct Reference	162
5.10.1	Field Documentation	163
5.10.1.1	conn_hdl	163
5.10.1.2	itv_max	163
5.10.1.3	itv_min	163
5.10.1.4	latency	163
5.10.1.5	sv_tmo	163
5.11	LE_CM_MSG_CONN_UPDATE_COMPLETE_IND_T Struct Reference	163
5.11.1	Field Documentation	164
5.11.1.1	conn_hdl	164
5.11.1.2	interval	164
5.11.1.3	latency	164
5.11.1.4	status	164
5.11.1.5	supervision_timeout	164
5.12	LE_CM_MSG_DATA_LEN_CHANGE_IND_T Struct Reference	164
5.12.1	Field Documentation	165
5.12.1.1	conn_hdl	165
5.12.1.2	max_rx_octets	165
5.12.1.3	max_rx_time	165
5.12.1.4	max_tx_octets	165
5.12.1.5	max_tx_time	165
5.13	LE_CM_MSG_DIRECT_ADV_REPORT_IND_T Struct Reference	165
5.13.1	Field Documentation	166
5.13.1.1	direct_addr	166
5.13.1.2	direct_addr_type	166
5.13.1.3	peer_addr	166
5.13.1.4	peer_addr_type	166



5.13.1.5 rssi . . . . .	166
5.14 LE_CM_MSG_DISCONNECT_COMPLETE_IND_T Struct Reference . . . . .	166
5.14.1 Field Documentation . . . . .	167
5.14.1.1 conn_hdl . . . . .	167
5.14.1.2 reason . . . . .	167
5.14.1.3 status . . . . .	167
5.15 LE_CM_MSG_ENCRYPTION_CHANGE_IND_T Struct Reference . . . . .	167
5.15.1 Field Documentation . . . . .	167
5.15.1.1 conn_hdl . . . . .	168
5.15.1.2 devid . . . . .	168
5.15.1.3 enabled . . . . .	168
5.15.1.4 status . . . . .	168
5.16 LE_CM_MSG_ENCRYPTION_REFRESH_IND_T Struct Reference . . . . .	168
5.16.1 Field Documentation . . . . .	168
5.16.1.1 conn_hdl . . . . .	168
5.16.1.2 devid . . . . .	169
5.16.1.3 enabled . . . . .	169
5.16.1.4 status . . . . .	169
5.17 LE_CM_MSG_INIT_COMPLETE_CFM_T Struct Reference . . . . .	169
5.17.1 Field Documentation . . . . .	169
5.17.1.1 status . . . . .	169
5.18 LE_CM_MSG_LTK_REQ_IND_T Struct Reference . . . . .	169
5.18.1 Field Documentation . . . . .	170
5.18.1.1 conn_hdl . . . . .	170
5.18.1.2 devid . . . . .	170
5.18.1.3 ediv . . . . .	170
5.18.1.4 rand . . . . .	170
5.19 LE_CM_MSG_READ_ADV_TX_POWER_CFM_T Struct Reference . . . . .	170
5.19.1 Field Documentation . . . . .	171
5.19.1.1 pwr_level . . . . .	171

5.19.1.2	status	171
5.20	LE_CM_MSG_READ_BD_ADDR_CFM_T Struct Reference	171
5.20.1	Field Documentation	171
5.20.1.1	bd_addr	171
5.20.1.2	status	171
5.21	LE_CM_MSG_READ_CHANNEL_MAP_CFM_T Struct Reference	172
5.21.1	Field Documentation	172
5.21.1.1	ch_map	172
5.21.1.2	conn_hdl	172
5.21.1.3	status	172
5.22	LE_CM_MSG_READ_PHY_CFM_T Struct Reference	172
5.22.1	Field Documentation	173
5.22.1.1	conn_hdl	173
5.22.1.2	rx_phy	173
5.22.1.3	status	173
5.22.1.4	tx_phy	173
5.23	LE_CM_MSG_READ_RESOLVING_LIST_SIZE_CFM_T Struct Reference	173
5.23.1	Field Documentation	173
5.23.1.1	size	173
5.23.1.2	status	174
5.24	LE_CM_MSG_READ_RSSI_CFM_T Struct Reference	174
5.24.1	Field Documentation	174
5.24.1.1	conn_hdl	174
5.24.1.2	rssi	174
5.24.1.3	status	174
5.25	LE_CM_MSG_READ_TX_POWER_CFM_T Struct Reference	174
5.25.1	Field Documentation	175
5.25.1.1	conn_hdl	175
5.25.1.2	status	175
5.25.1.3	tx_power	175

5.26 LE_CM_MSG_READ_WHITE_LIST_SIZE_CFM_T Struct Reference . . . . .	175
5.26.1 Field Documentation . . . . .	175
5.26.1.1 size . . . . .	176
5.26.1.2 status . . . . .	176
5.27 LE_CM_MSG_SET_DATA_LENGTH_CFM_T Struct Reference . . . . .	176
5.27.1 Field Documentation . . . . .	176
5.27.1.1 conn_hdl . . . . .	176
5.27.1.2 status . . . . .	176
5.28 LE_CM_MSG_SET_DISCONNECT_CFM_T Struct Reference . . . . .	176
5.28.1 Field Documentation . . . . .	177
5.28.1.1 handle . . . . .	177
5.28.1.2 status . . . . .	177
5.29 LE_CM_MSG_SET_PHY_CFM_T Struct Reference . . . . .	177
5.29.1 Field Documentation . . . . .	177
5.29.1.1 conn_hdl . . . . .	177
5.29.1.2 status . . . . .	177
5.30 LE_CM_MSG_SIGNAL_UPDATE_REQ_T Struct Reference . . . . .	178
5.30.1 Field Documentation . . . . .	178
5.30.1.1 conn_hdl . . . . .	178
5.30.1.2 identifier . . . . .	178
5.30.1.3 interval_max . . . . .	178
5.30.1.4 interval_min . . . . .	178
5.30.1.5 slave_latency . . . . .	178
5.30.1.6 timeout_multiplier . . . . .	179
5.31 LE_CM_REQ_STATUS_T Struct Reference . . . . .	179
5.31.1 Field Documentation . . . . .	179
5.31.1.1 status . . . . .	179
5.32 LE_CONN_PARA_T Struct Reference . . . . .	179
5.32.1 Field Documentation . . . . .	179
5.32.1.1 itv_max . . . . .	179

5.32.1.2	itv_min	180
5.32.1.3	latency	180
5.32.1.4	sv_timeout	180
5.33	LE_GAP_ADVERTISING_PARAM_T Struct Reference	180
5.33.1	Field Documentation	180
5.33.1.1	channel_map	180
5.33.1.2	filter_policy	181
5.33.1.3	interval_max	181
5.33.1.4	interval_min	181
5.33.1.5	own_addr_type	181
5.33.1.6	peer_addr	181
5.33.1.7	peer_addr_type	181
5.33.1.8	type	181
5.34	LE_GAP_CONN_PARAM_T Struct Reference	181
5.34.1	Field Documentation	182
5.34.1.1	interval_max	182
5.34.1.2	interval_min	182
5.34.1.3	latency	182
5.34.1.4	supervision_timeout	182
5.35	LE_GAP_SCAN_PARAM_T Struct Reference	182
5.35.1	Field Documentation	183
5.35.1.1	filter_policy	183
5.35.1.2	interval	183
5.35.1.3	own_addr_type	183
5.35.1.4	type	183
5.35.1.5	window	183
5.36	LE_GATT_ATTR_T Struct Reference	183
5.36.1	Field Documentation	184
5.36.1.1	format	184
5.36.1.2	handle	184

5.36.1.3	len	184
5.36.1.4	maxLen	184
5.36.1.5	permit	184
5.36.1.6	pUuid	184
5.36.1.7	pVal	184
5.37	LE_GATT_MSG_ACCESS_READ_IND_T Struct Reference	185
5.37.1	Field Documentation	185
5.37.1.1	conn_hdl	185
5.37.1.2	devid	185
5.37.1.3	handle	185
5.37.1.4	offset	185
5.38	LE_GATT_MSG_ACCESS_WRITE_IND_T Struct Reference	185
5.38.1	Field Documentation	186
5.38.1.1	conn_hdl	186
5.38.1.2	devid	186
5.38.1.3	flag	186
5.38.1.4	handle	186
5.38.1.5	len	186
5.38.1.6	offset	187
5.38.1.7	pVal	187
5.39	LE_GATT_MSG_CHAR_DESCRIPTOR_INFO_IND_T Struct Reference	187
5.39.1	Field Documentation	187
5.39.1.1	conn_hdl	187
5.39.1.2	devid	187
5.39.1.3	format	187
5.39.1.4	handle	188
5.39.1.5	uuid	188
5.40	LE_GATT_MSG_CHARACTERISTIC_DECL_INFO_IND_T Struct Reference	188
5.40.1	Field Documentation	188
5.40.1.1	conn_hdl	188

5.40.1.2	devid	188
5.40.1.3	format	189
5.40.1.4	handle	189
5.40.1.5	property	189
5.40.1.6	uuid	189
5.40.1.7	val_hdl	189
5.41	LE_GATT_MSG_CHARACTERISTIC_VAL_IND_T Struct Reference	189
5.41.1	Field Documentation	190
5.41.1.1	att_err	190
5.41.1.2	conn_hdl	190
5.41.1.3	devid	190
5.41.1.4	handle	190
5.41.1.5	len	190
5.41.1.6	offset	190
5.41.1.7	val	190
5.42	LE_GATT_MSG_CONFIRMATION_CFM_T Struct Reference	191
5.42.1	Field Documentation	191
5.42.1.1	conn_hdl	191
5.42.1.2	devid	191
5.42.1.3	handle	191
5.43	LE_GATT_MSG_EXCHANGE_MTU_CFM_T Struct Reference	191
5.43.1	Field Documentation	192
5.43.1.1	conn_hdl	192
5.43.1.2	current_rx_mtu	192
5.43.1.3	devid	192
5.44	LE_GATT_MSG_EXCHANGE_MTU_IND_T Struct Reference	192
5.44.1	Field Documentation	192
5.44.1.1	client_rx_mtu	192
5.44.1.2	conn_hdl	193
5.44.1.3	devid	193

5.45 LE_GATT_MSG_EXECUTE_WRITE_RELIABLE_CFM_T Struct Reference . . . . .	193
5.45.1 Field Documentation . . . . .	193
5.45.1.1 att_err . . . . .	193
5.45.1.2 conn_hdl . . . . .	193
5.45.1.3 devid . . . . .	193
5.45.1.4 err_hdl . . . . .	194
5.45.1.5 status . . . . .	194
5.46 LE_GATT_MSG_FIND_ALL_CHAR_DESC_CFM_T Struct Reference . . . . .	194
5.46.1 Field Documentation . . . . .	194
5.46.1.1 att_err . . . . .	194
5.46.1.2 conn_hdl . . . . .	194
5.46.1.3 devid . . . . .	194
5.46.1.4 handle . . . . .	195
5.46.1.5 status . . . . .	195
5.47 LE_GATT_MSG_FIND_ALL_PRIMARY_SERVICE_CFM_T Struct Reference . . . . .	195
5.47.1 Field Documentation . . . . .	195
5.47.1.1 att_err . . . . .	195
5.47.1.2 conn_hdl . . . . .	195
5.47.1.3 devid . . . . .	195
5.47.1.4 handle . . . . .	196
5.47.1.5 status . . . . .	196
5.48 LE_GATT_MSG_FIND_CHARACTERISTIC_CFM_T Struct Reference . . . . .	196
5.48.1 Field Documentation . . . . .	196
5.48.1.1 att_err . . . . .	196
5.48.1.2 conn_hdl . . . . .	196
5.48.1.3 devid . . . . .	196
5.48.1.4 handle . . . . .	197
5.48.1.5 status . . . . .	197
5.49 LE_GATT_MSG_FIND_INCLUDED_SERVICE_CFM_T Struct Reference . . . . .	197
5.49.1 Field Documentation . . . . .	197

5.49.1.1	att_err	197
5.49.1.2	conn_hdl	197
5.49.1.3	devid	197
5.49.1.4	handle	198
5.49.1.5	status	198
5.50	LE_GATT_MSG_FIND_PRIMARY_SERVICE_BY_UUID_CFM_T Struct Reference	198
5.50.1	Field Documentation	198
5.50.1.1	att_err	198
5.50.1.2	conn_hdl	198
5.50.1.3	devid	198
5.50.1.4	handle	199
5.50.1.5	status	199
5.51	LE_GATT_MSG_INCLUDE_SERVICE_INFO_IND_T Struct Reference	199
5.51.1	Field Documentation	199
5.51.1.1	conn_hdl	199
5.51.1.2	devid	199
5.51.1.3	end_hdl	200
5.51.1.4	format	200
5.51.1.5	handle	200
5.51.1.6	start_hdl	200
5.51.1.7	uuid	200
5.52	LE_GATT_MSG_INDICATE_IND_T Struct Reference	200
5.52.1	Field Documentation	200
5.52.1.1	conn_hdl	201
5.52.1.2	devid	201
5.52.1.3	handle	201
5.52.1.4	len	201
5.52.1.5	val	201
5.53	LE_GATT_MSG_NOTIFY_CFM_T Struct Reference	201
5.53.1	Field Documentation	201



5.53.1.1	conn_hdl	202
5.53.1.2	devid	202
5.53.1.3	handle	202
5.53.1.4	status	202
5.54	LE_GATT_MSG_NOTIFY_IND_T Struct Reference	202
5.54.1	Field Documentation	202
5.54.1.1	conn_hdl	202
5.54.1.2	devid	203
5.54.1.3	handle	203
5.54.1.4	len	203
5.54.1.5	val	203
5.55	LE_GATT_MSG_OPERATION_TIMEOUT_T Struct Reference	203
5.55.1	Field Documentation	203
5.55.1.1	att_op	203
5.55.1.2	conn_hdl	204
5.55.1.3	devid	204
5.56	LE_GATT_MSG_PREPARE_WRITE_RELIABLE_CFM_T Struct Reference	204
5.56.1	Field Documentation	204
5.56.1.1	att_err	204
5.56.1.2	conn_hdl	204
5.56.1.3	devid	204
5.56.1.4	handle	205
5.56.1.5	status	205
5.57	LE_GATT_MSG_READ_CHAR_VAL_BY_UUID_CFM_T Struct Reference	205
5.57.1	Field Documentation	205
5.57.1.1	att_err	205
5.57.1.2	conn_hdl	205
5.57.1.3	devid	205
5.57.1.4	handle	206
5.57.1.5	status	206

5.58 LE_GATT_MSG_READ_CHARACTERISTIC_VALUE_CFM_T Struct Reference . . . . .	206
5.58.1 Field Documentation . . . . .	206
5.58.1.1 att_err . . . . .	206
5.58.1.2 conn_hdl . . . . .	206
5.58.1.3 devid . . . . .	206
5.58.1.4 handle . . . . .	207
5.58.1.5 status . . . . .	207
5.59 LE_GATT_MSG_READ_LONG_CHAR_VAL_CFM_T Struct Reference . . . . .	207
5.59.1 Field Documentation . . . . .	207
5.59.1.1 att_err . . . . .	207
5.59.1.2 conn_hdl . . . . .	207
5.59.1.3 devid . . . . .	207
5.59.1.4 handle . . . . .	208
5.59.1.5 status . . . . .	208
5.60 LE_GATT_MSG_READ_MULTIPLE_CHAR_VAL_CFM_T Struct Reference . . . . .	208
5.60.1 Field Documentation . . . . .	208
5.60.1.1 att_err . . . . .	208
5.60.1.2 conn_hdl . . . . .	208
5.60.1.3 devid . . . . .	209
5.60.1.4 err_hdl . . . . .	209
5.60.1.5 len . . . . .	209
5.60.1.6 status . . . . .	209
5.60.1.7 val . . . . .	209
5.61 LE_GATT_MSG_SERVICE_INFO_IND_T Struct Reference . . . . .	209
5.61.1 Field Documentation . . . . .	210
5.61.1.1 conn_hdl . . . . .	210
5.61.1.2 devid . . . . .	210
5.61.1.3 end_hdl . . . . .	210
5.61.1.4 format . . . . .	210
5.61.1.5 start_hdl . . . . .	210

5.61.1.6	uuid	210
5.62	LE_GATT_MSG_SIGNED_WRITE_CFM_T Struct Reference	210
5.62.1	Field Documentation	211
5.62.1.1	conn_hdl	211
5.62.1.2	devid	211
5.62.1.3	handle	211
5.62.1.4	status	211
5.63	LE_GATT_MSG_WRITE_CHAR_VAL_RELIABLE_CFM_T Struct Reference	211
5.63.1	Field Documentation	212
5.63.1.1	att_err	212
5.63.1.2	conn_hdl	212
5.63.1.3	devid	212
5.63.1.4	handle	212
5.63.1.5	status	212
5.64	LE_GATT_MSG_WRITE_CHAR_VALUE_CFM_T Struct Reference	212
5.64.1	Field Documentation	213
5.64.1.1	att_err	213
5.64.1.2	conn_hdl	213
5.64.1.3	devid	213
5.64.1.4	handle	213
5.64.1.5	status	213
5.65	LE_GATT_MSG_WRITE_LONG_CHAR_VALUE_CFM_T Struct Reference	213
5.65.1	Field Documentation	214
5.65.1.1	att_err	214
5.65.1.2	conn_hdl	214
5.65.1.3	devid	214
5.65.1.4	handle	214
5.65.1.5	status	214
5.66	LE_GATT_MSG_WRITE_NO_RSP_CFM_T Struct Reference	214
5.66.1	Field Documentation	215

5.66.1.1	conn_hdl	215
5.66.1.2	devid	215
5.66.1.3	handle	215
5.66.1.4	status	215
5.67	LE_GATT_SERVICE_T Struct Reference	215
5.67.1	Field Documentation	215
5.67.1.1	endHdl	216
5.67.1.2	pAttr	216
5.67.1.3	startHdl	216
5.67.1.4	svc_id	216
5.68	LE_SMP_MSG_ENCRYPTION_CHANGE_IND_T Struct Reference	216
5.68.1	Field Documentation	216
5.68.1.1	conn_hdl	216
5.68.1.2	enable	217
5.69	LE_SMP_MSG_ENCRYPTION_REFRESH_IND_T Struct Reference	217
5.69.1	Field Documentation	217
5.69.1.1	conn_hdl	217
5.69.1.2	status	217
5.70	LE_SMP_MSG_OOB_DATA_REQUEST_IND_T Struct Reference	217
5.70.1	Field Documentation	217
5.70.1.1	conn_hdl	218
5.71	LE_SMP_MSG_PAIRING_ACTION_IND_T Struct Reference	218
5.71.1	Field Documentation	218
5.71.1.1	action	218
5.71.1.2	conn_hdl	218
5.71.1.3	lost_bond	218
5.71.1.4	sc	218
5.72	LE_SMP_MSG_PAIRING_COMPLETE_IND_T Struct Reference	219
5.72.1	Field Documentation	219
5.72.1.1	authenticated	219

5.72.1.2	bonded	219
5.72.1.3	conn_hdl	219
5.72.1.4	peer_id_addr	219
5.72.1.5	sc	219
5.72.1.6	status	220
5.73	LE_SMP_MSG_PASSKEY_DISPLAY_IND_T Struct Reference	220
5.73.1	Field Documentation	220
5.73.1.1	conn_hdl	220
5.73.1.2	passkey	220
5.74	LE_SMP_MSG_PASSKEY_INPUT_IND_T Struct Reference	220
5.74.1	Field Documentation	220
5.74.1.1	conn_hdl	221
5.75	LE_SMP_MSG_SC_OOB_DATA_REQUEST_IND_T Struct Reference	221
5.75.1	Field Documentation	221
5.75.1.1	conn_hdl	221
5.76	LE_SMP_MSG_SLAVE_SECURITY_REQUEST_IND_T Struct Reference	221
5.76.1	Field Documentation	221
5.76.1.1	bondable	222
5.76.1.2	conn_hdl	222
5.76.1.3	keypress	222
5.76.1.4	mitm	222
5.76.1.5	sc	222
5.77	LE_SMP_MSG_USER_CONFIRM_IND_T Struct Reference	222
5.77.1	Field Documentation	222
5.77.1.1	confirm_num	223
5.77.1.2	conn_hdl	223
5.78	LE_SMP_SC_OOB_DATA_T Struct Reference	223
5.78.1	Field Documentation	223
5.78.1.1	confirm	223
5.78.1.2	rand	223

5.79 LE_SYS_MSG_BUF_OVERFLOW_T Struct Reference . . . . .	223
5.79.1 Field Documentation . . . . .	224
5.79.1.1 conn_hdl . . . . .	224
5.80 mw_blewifi_cbs_store_t Struct Reference . . . . .	224
5.80.1 Field Documentation . . . . .	224
5.80.1.1 manufacture_name . . . . .	224
5.81 mw_wifi_auto_connect_ap_info_t Struct Reference . . . . .	224
5.81.1 Field Documentation . . . . .	225
5.81.1.1 ap_channel . . . . .	225
5.81.1.2 beacon_interval . . . . .	225
5.81.1.3 bssid . . . . .	225
5.81.1.4 capabilities . . . . .	225
5.81.1.5 dtim_prod . . . . .	226
5.81.1.6 fast_connect . . . . .	226
5.81.1.7 free_ocpy . . . . .	226
5.81.1.8 hid_ssid . . . . .	226
5.81.1.9 hid_ssid_len . . . . .	226
5.81.1.10 latest_beacon_rx_time . . . . .	226
5.81.1.11 passphrase . . . . .	226
5.81.1.12 psk . . . . .	226
5.81.1.13 rsn_ie . . . . .	227
5.81.1.14 rssi . . . . .	227
5.81.1.15 ssid . . . . .	227
5.81.1.16 ssid_len . . . . .	227
5.81.1.17 supported_rates . . . . .	227
5.81.1.18 wpa_data . . . . .	227
5.81.1.19 wpa_ie . . . . .	227
5.82 mw_wifi_sta_info_t Struct Reference . . . . .	227
5.82.1 Field Documentation . . . . .	228
5.82.1.1 au8Dot11MACAddress . . . . .	228

5.82.1.2	u8SkipDtimPeriods	228
5.83	MwFimAutoConnectCFG_t Struct Reference	228
5.83.1	Field Documentation	228
5.83.1.1	flag	228
5.83.1.2	front	229
5.83.1.3	max_save_num	229
5.83.1.4	rear	229
5.83.1.5	targetIdx	229
5.84	rx_eapol_data Struct Reference	229
5.84.1	Field Documentation	229
5.84.1.1	frame_buffer	229
5.84.1.2	frame_length	230
5.85	S_WIFI_MLME_SCAN_CFG Struct Reference	230
5.85.1	Detailed Description	230
5.85.2	Field Documentation	230
5.85.2.1	ptScanReport	230
5.85.2.2	tScanType	230
5.85.2.3	u32ActiveScanDur	230
5.85.2.4	u32PassiveScanDur	231
5.85.2.5	u8aBssid	231
5.85.2.6	u8aSsid	231
5.85.2.7	u8Channel	231
5.85.2.8	u8MaxScanApNum	231
5.85.2.9	u8ResendCnt	231
5.86	scan_info_t Struct Reference	231
5.86.1	Field Documentation	232
5.86.1.1	ap_channel	232
5.86.1.2	beacon_interval	232
5.86.1.3	bssid	232
5.86.1.4	capabilities	232

5.86.1.5	dtim_prod	233
5.86.1.6	free_ocpy	233
5.86.1.7	latest_beacon_rx_time	233
5.86.1.8	rsn_ie	233
5.86.1.9	rsssi	233
5.86.1.10	ssid	233
5.86.1.11	ssid_len	233
5.86.1.12	supported_rates	233
5.86.1.13	wpa_data	234
5.86.1.14	wpa_ie	234
5.87	scan_report_t Struct Reference	234
5.87.1	Field Documentation	234
5.87.1.1	pScanInfo	234
5.87.1.2	uScanApNum	234
5.88	T_RfCmd Struct Reference	234
5.88.1	Field Documentation	235
5.88.1.1	iArgc	235
5.88.1.2	saArgv	235
5.88.1.3	u32Type	235
5.89	T_RfEvt Struct Reference	235
5.89.1	Field Documentation	235
5.89.1.1	pParam	236
5.89.1.2	u16RfMode	236
5.89.1.3	u16RxCnt	236
5.89.1.4	u16RxCrcOkCnt	236
5.89.1.5	u32Freq	236
5.89.1.6	u32Mode	236
5.89.1.7	u32RfChannel	236
5.89.1.8	u32Type	236
5.89.1.9	u8Freq	237



5.89.1.10 u8IpcEnable . . . . .	237
5.89.1.11 u8Len . . . . .	237
5.89.1.12 u8Pkt . . . . .	237
5.89.1.13 u8Reserved . . . . .	237
5.89.1.14 u8Status . . . . .	237
5.89.1.15 u8Unicast . . . . .	237
5.90 wifi_active_scan_time_t Struct Reference . . . . .	237
5.90.1 Detailed Description . . . . .	238
5.90.2 Field Documentation . . . . .	238
5.90.2.1 max . . . . .	238
5.90.2.2 min . . . . .	238
5.91 wifi_ap_config_t Struct Reference . . . . .	238
5.91.1 Detailed Description . . . . .	239
5.91.2 Field Documentation . . . . .	239
5.91.2.1 auth_mode . . . . .	239
5.91.2.2 beacon_interval . . . . .	239
5.91.2.3 channel . . . . .	239
5.91.2.4 encrypt_type . . . . .	239
5.91.2.5 max_connection . . . . .	239
5.91.2.6 password . . . . .	239
5.91.2.7 password_length . . . . .	240
5.91.2.8 ssid . . . . .	240
5.91.2.9 ssid_hidden . . . . .	240
5.91.2.10 ssid_length . . . . .	240
5.92 wifi_auto_connect_info_t Struct Reference . . . . .	240
5.92.1 Detailed Description . . . . .	240
5.92.2 Field Documentation . . . . .	241
5.92.2.1 ap_channel . . . . .	241
5.92.2.2 beacon_interval . . . . .	241
5.92.2.3 bssid . . . . .	241

5.92.2.4	capabilities	241
5.92.2.5	dtim_prod	241
5.92.2.6	fast_connect	241
5.92.2.7	hid_ssid	241
5.92.2.8	rsssi	242
5.92.2.9	ssid	242
5.92.2.10	supported_rates	242
5.93	wifi_cmd_t Struct Reference	242
5.93.1	Field Documentation	242
5.93.1.1	arg1	242
5.93.1.2	cmd_type	242
5.93.1.3	prvData	243
5.93.1.4	reserved	243
5.94	wifi_config_t Union Reference	243
5.94.1	Detailed Description	243
5.94.2	Field Documentation	243
5.94.2.1	ap_config	243
5.94.2.2	sta_config	243
5.95	wifi_event_info_t Union Reference	244
5.95.1	Detailed Description	244
5.95.2	Field Documentation	244
5.95.2.1	connected	244
5.95.2.2	disconnected	244
5.95.2.3	got_ip	244
5.95.2.4	scan_done	244
5.96	wifi_event_sta_connected_t Struct Reference	245
5.96.1	Detailed Description	245
5.96.2	Field Documentation	245
5.96.2.1	authmode	245
5.96.2.2	bssid	245

5.96.2.3	channel	245
5.96.2.4	ssid	245
5.96.2.5	ssid_len	246
5.97	wifi_event_sta_disconnected_t Struct Reference	246
5.97.1	Detailed Description	246
5.97.2	Field Documentation	246
5.97.2.1	bssid	246
5.97.2.2	reason	246
5.97.2.3	ssid	246
5.97.2.4	ssid_len	247
5.98	wifi_event_sta_got_ip_t Struct Reference	247
5.98.1	Field Documentation	247
5.98.1.1	ip_changed	247
5.99	wifi_event_sta_scan_done_t Struct Reference	247
5.99.1	Detailed Description	247
5.99.2	Field Documentation	247
5.99.2.1	number	248
5.99.2.2	scan_id	248
5.99.2.3	status	248
5.100	wifi_evt_t Struct Reference	248
5.100.1	Field Documentation	248
5.100.1.1	evt_type	248
5.100.1.2	prvData	248
5.101	wifi_fast_scan_threshold_t Struct Reference	249
5.101.1	Detailed Description	249
5.101.2	Field Documentation	249
5.101.2.1	authmode	249
5.101.2.2	rsssi	249
5.102	wifi_init_config_t Struct Reference	249
5.102.1	Detailed Description	250

5.102.2 Field Documentation . . . . .	250
5.102.2.1 event_handler . . . . .	250
5.102.2.2 magic . . . . .	250
5.103wifi_scan_config_t Struct Reference . . . . .	250
5.103.1 Detailed Description . . . . .	250
5.103.2 Field Documentation . . . . .	250
5.103.2.1 bssid . . . . .	251
5.103.2.2 channel . . . . .	251
5.103.2.3 scan_time . . . . .	251
5.103.2.4 scan_type . . . . .	251
5.103.2.5 show_hidden . . . . .	251
5.103.2.6 ssid . . . . .	251
5.104wifi_scan_info_t Struct Reference . . . . .	251
5.104.1 Detailed Description . . . . .	252
5.104.2 Field Documentation . . . . .	252
5.104.2.1 auth_mode . . . . .	252
5.104.2.2 beacon_interval . . . . .	252
5.104.2.3 bssid . . . . .	252
5.104.2.4 capability_info . . . . .	252
5.104.2.5 channel . . . . .	253
5.104.2.6 dtim_period . . . . .	253
5.104.2.7 group_cipher . . . . .	253
5.104.2.8 pairwise_cipher . . . . .	253
5.104.2.9 rssi . . . . .	253
5.104.2.10ssid . . . . .	253
5.104.2.11ssid_length . . . . .	253
5.105wifi_scan_list_t Struct Reference . . . . .	254
5.105.1 Detailed Description . . . . .	254
5.105.2 Field Documentation . . . . .	254
5.105.2.1 ap_record . . . . .	254

5.105.2.2 num . . . . .	254
5.106wifi_scan_time_t Union Reference . . . . .	254
5.106.1 Detailed Description . . . . .	255
5.106.2 Field Documentation . . . . .	255
5.106.2.1 active . . . . .	255
5.106.2.2 passive . . . . .	255
5.107wifi_sta_config_t Struct Reference . . . . .	255
5.107.1 Detailed Description . . . . .	255
5.107.2 Field Documentation . . . . .	256
5.107.2.1 bssid . . . . .	256
5.107.2.2 bssid_present . . . . .	256
5.107.2.3 password . . . . .	256
5.107.2.4 password_length . . . . .	256
5.107.2.5 scan_method . . . . .	256
5.107.2.6 sort_method . . . . .	256
5.107.2.7 ssid . . . . .	256
5.107.2.8 ssid_length . . . . .	257
5.107.2.9 threshold . . . . .	257
5.108wifi_wpa_ie_data_t Struct Reference . . . . .	257
5.108.1 Detailed Description . . . . .	257
5.108.2 Field Documentation . . . . .	257
5.108.2.1 capabilities . . . . .	257
5.108.2.2 group_cipher . . . . .	258
5.108.2.3 key_mgmt . . . . .	258
5.108.2.4 mgmt_group_cipher . . . . .	258
5.108.2.5 num_pmkid . . . . .	258
5.108.2.6 pairwise_cipher . . . . .	258
5.108.2.7 pmkid . . . . .	258
5.108.2.8 proto . . . . .	258



# Chapter 1

## SDK PREVIEW

- BLE APIs :
  - GAP APIs : ble GAP APIs
  - GATT APIs : ble GATT APIs
  - CM APIs : ble CM APIs
  - MSG APIs : ble MSG APIs
  - SMP APIs : ble SMP APIs
- WiFi APIs :
  - Station APIs : station APIs
  - Common APIs : common APIs
  - Enumerations : enumerations





## Chapter 2

# Module Index

### 2.1 Modules

Here is a list of all modules:

BLE ALL APIs . . . . .	9
BLE CM APIs . . . . .	10
BLE GAP APIs . . . . .	17
BLE GATT APIs . . . . .	39
BLE MSG APIs . . . . .	73
BLE SMP APIs . . . . .	85
WIFI APIs . . . . .	93
WIFI Common APIs . . . . .	99
WIFI STA APIs . . . . .	102
Enumeration . . . . .	144



## Chapter 3

# Data Structure Index

### 3.1 Data Structures

Here are the data structures with brief descriptions:

<a href="#">_wpa_ie_data</a>	149
<a href="#">asso_data</a>	150
<a href="#">auto_conn_info_t</a>	152
<a href="#">auto_connect_cfg_t</a>	155
<a href="#">event_msg_t</a>	
Send information to event by <a href="#">event_msg_t</a>	157
<a href="#">hap_control_t</a>	158
<a href="#">LE_BT_ADDR_T</a>	159
<a href="#">LE_CM_CONNECTION_COMPLETE_IND_T</a>	160
<a href="#">LE_CM_MSG_ADVERTISE_REPORT_IND_T</a>	161
<a href="#">LE_CM_MSG_CONN_PARA_REQ_T</a>	162
<a href="#">LE_CM_MSG_CONN_UPDATE_COMPLETE_IND_T</a>	163
<a href="#">LE_CM_MSG_DATA_LEN_CHANGE_IND_T</a>	164
<a href="#">LE_CM_MSG_DIRECT_ADV_REPORT_IND_T</a>	165
<a href="#">LE_CM_MSG_DISCONNECT_COMPLETE_IND_T</a>	166
<a href="#">LE_CM_MSG_ENCRYPTION_CHANGE_IND_T</a>	167
<a href="#">LE_CM_MSG_ENCRYPTION_REFRESH_IND_T</a>	168
<a href="#">LE_CM_MSG_INIT_COMPLETE_CFM_T</a>	169
<a href="#">LE_CM_MSG_LTK_REQ_IND_T</a>	169
<a href="#">LE_CM_MSG_READ_ADV_TX_POWER_CFM_T</a>	170
<a href="#">LE_CM_MSG_READ_BD_ADDR_CFM_T</a>	171
<a href="#">LE_CM_MSG_READ_CHANNEL_MAP_CFM_T</a>	172
<a href="#">LE_CM_MSG_READ_PHY_CFM_T</a>	172
<a href="#">LE_CM_MSG_READ_RESOLVING_LIST_SIZE_CFM_T</a>	173
<a href="#">LE_CM_MSG_READ_RSSI_CFM_T</a>	174
<a href="#">LE_CM_MSG_READ_TX_POWER_CFM_T</a>	174
<a href="#">LE_CM_MSG_READ_WHITE_LIST_SIZE_CFM_T</a>	175
<a href="#">LE_CM_MSG_SET_DATA_LENGTH_CFM_T</a>	176
<a href="#">LE_CM_MSG_SET_DISCONNECT_CFM_T</a>	176
<a href="#">LE_CM_MSG_SET_PHY_CFM_T</a>	177
<a href="#">LE_CM_MSG_SIGNAL_UPDATE_REQ_T</a>	178
<a href="#">LE_CM_REQ_STATUS_T</a>	179
<a href="#">LE_CONN_PARA_T</a>	179
<a href="#">LE_GAP_ADVERTISING_PARAM_T</a>	180
<a href="#">LE_GAP_CONN_PARAM_T</a>	181

LE_GAP_SCAN_PARAM_T	182
LE_GATT_ATTR_T	183
LE_GATT_MSG_ACCESS_READ_IND_T	185
LE_GATT_MSG_ACCESS_WRITE_IND_T	185
LE_GATT_MSG_CHAR_DESCRIPTOR_INFO_IND_T	187
LE_GATT_MSG_CHARACTERISTIC_DECL_INFO_IND_T	188
LE_GATT_MSG_CHARACTERISTIC_VAL_IND_T	189
LE_GATT_MSG_CONFIRMATION_CFM_T	191
LE_GATT_MSG_EXCHANGE_MTU_CFM_T	191
LE_GATT_MSG_EXCHANGE_MTU_IND_T	192
LE_GATT_MSG_EXECUTE_WRITE_RELIABLE_CFM_T	193
LE_GATT_MSG_FIND_ALL_CHAR_DESC_CFM_T	194
LE_GATT_MSG_FIND_ALL_PRIMARY_SERVICE_CFM_T	195
LE_GATT_MSG_FIND_CHARACTERISTIC_CFM_T	196
LE_GATT_MSG_FIND_INCLUDED_SERVICE_CFM_T	197
LE_GATT_MSG_FIND_PRIMARY_SERVICE_BY_UUID_CFM_T	198
LE_GATT_MSG_INCLUDE_SERVICE_INFO_IND_T	199
LE_GATT_MSG_INDICATE_IND_T	200
LE_GATT_MSG_NOTIFY_CFM_T	201
LE_GATT_MSG_NOTIFY_IND_T	202
LE_GATT_MSG_OPERATION_TIMEOUT_T	203
LE_GATT_MSG_PREPARE_WRITE_RELIABLE_CFM_T	204
LE_GATT_MSG_READ_CHAR_VAL_BY_UUID_CFM_T	205
LE_GATT_MSG_READ_CHARACTERISTIC_VALUE_CFM_T	206
LE_GATT_MSG_READ_LONG_CHAR_VAL_CFM_T	207
LE_GATT_MSG_READ_MULTIPLE_CHAR_VAL_CFM_T	208
LE_GATT_MSG_SERVICE_INFO_IND_T	209
LE_GATT_MSG_SIGNED_WRITE_CFM_T	210
LE_GATT_MSG_WRITE_CHAR_VAL_RELIABLE_CFM_T	211
LE_GATT_MSG_WRITE_CHAR_VALUE_CFM_T	212
LE_GATT_MSG_WRITE_LONG_CHAR_VALUE_CFM_T	213
LE_GATT_MSG_WRITE_NO_RSP_CFM_T	214
LE_GATT_SERVICE_T	215
LE_SMP_MSG_ENCRYPTION_CHANGE_IND_T	216
LE_SMP_MSG_ENCRYPTION_REFRESH_IND_T	217
LE_SMP_MSG_OOB_DATA_REQUEST_IND_T	217
LE_SMP_MSG_PAIRING_ACTION_IND_T	218
LE_SMP_MSG_PAIRING_COMPLETE_IND_T	219
LE_SMP_MSG_PASSKEY_DISPLAY_IND_T	220
LE_SMP_MSG_PASSKEY_INPUT_IND_T	220
LE_SMP_MSG_SC_OOB_DATA_REQUEST_IND_T	221
LE_SMP_MSG_SLAVE_SECURITY_REQUEST_IND_T	221
LE_SMP_MSG_USER_CONFIRM_IND_T	222
LE_SMP_SC_OOB_DATA_T	223
LE_SYS_MSG_BUF_OVERFLOW_T	223
mw_blewifi_cbs_store_t	224
mw_wifi_auto_connect_ap_info_t	224
mw_wifi_sta_info_t	227
MwFimAutoConnectCFG_t	228
rx_eapol_data	229
S_WIFI_MLME_SCAN_CFG	230
scan_info_t	231
scan_report_t	234
T_RfCmd	234
T_RfEvt	235
wifi_active_scan_time_t	
Range of active scan times per channel	237

<a href="#">wifi_ap_config_t</a>	
This structure is the Wi-Fi configuration for initialization for Soft-AP mode . . . . .	238
<a href="#">wifi_auto_connect_info_t</a>	
This structure is the Wi-Fi auto connect for save in the flash (FIM) . . . . .	240
<a href="#">wifi_cmd_t</a> . . . . .	242
<a href="#">wifi_config_t</a>	
Wi-Fi configuration for initialization . . . . .	243
<a href="#">wifi_event_info_t</a>	
Wifi_event_info_t . . . . .	244
<a href="#">wifi_event_sta_connected_t</a>	
Wifi_event_sta_connected_t . . . . .	245
<a href="#">wifi_event_sta_disconnected_t</a>	
Wifi_event_sta_disconnected_t . . . . .	246
<a href="#">wifi_event_sta_got_ip_t</a> . . . . .	247
<a href="#">wifi_event_sta_scan_done_t</a>	
Wifi_event_sta_scan_done_t . . . . .	247
<a href="#">wifi_evt_t</a> . . . . .	248
<a href="#">wifi_fast_scan_threshold_t</a>	
Structure describing parameters for a Wi-Fi fast scan . . . . .	249
<a href="#">wifi_init_config_t</a>	
WiFi stack configuration parameters . . . . .	249
<a href="#">wifi_scan_config_t</a>	
Parameters for an SSID scan . . . . .	250
<a href="#">wifi_scan_info_t</a>	
This structure defines the inforamtion of scanned APs . . . . .	251
<a href="#">wifi_scan_list_t</a>	
This structure defines the list of scanned APs with their corresponding information . . . . .	254
<a href="#">wifi_scan_time_t</a>	
Aggregate of active & passive scan time per channel . . . . .	254
<a href="#">wifi_sta_config_t</a>	
This structure is the Wi-Fi configuration for initialization for STA mode . . . . .	255
<a href="#">wifi_wpa_ie_data_t</a>	
This structure is the Wi-Fi auto connect with wpa information for save in the flash (FIM) . . . . .	257



## Chapter 4

# Module Documentation

### 4.1 BLE ALL APIs

BLE ALL APIs.

#### Modules

- [BLE CM APIs](#)
- [BLE GAP APIs](#)
- [BLE GATT APIs](#)
- [BLE MSG APIs](#)
- [BLE SMP APIs](#)

#### Functions

- `UINT8 LeSmpGetBondIdFromAddr (LE\_BT\_ADDR\_T *peer_addr)`

#### 4.1.1 Detailed Description

BLE ALL APIs.

#### 4.1.2 Function Documentation

##### 4.1.2.1 `LeSmpGetBondIdFromAddr()`

```
UINT8 LeSmpGetBondIdFromAddr (
    LE\_BT\_ADDR\_T * peer_addr )
```

## 4.2 BLE CM APIs

### Data Structures

- struct [LE\\_CM\\_CONNECTION\\_COMPLETE\\_IND\\_T](#)
- struct [LE\\_CM\\_MSG\\_ADVERTISE\\_REPORT\\_IND\\_T](#)
- struct [LE\\_CM\\_MSG\\_CONN\\_PARA\\_REQ\\_T](#)
- struct [LE\\_CM\\_MSG\\_CONN\\_UPDATE\\_COMPLETE\\_IND\\_T](#)
- struct [LE\\_CM\\_MSG\\_DATA\\_LEN\\_CHANGE\\_IND\\_T](#)
- struct [LE\\_CM\\_MSG\\_DIRECT\\_ADV\\_REPORT\\_IND\\_T](#)
- struct [LE\\_CM\\_MSG\\_DISCONNECT\\_COMPLETE\\_IND\\_T](#)
- struct [LE\\_CM\\_MSG\\_ENCRYPTION\\_CHANGE\\_IND\\_T](#)
- struct [LE\\_CM\\_MSG\\_ENCRYPTION\\_REFRESH\\_IND\\_T](#)
- struct [LE\\_CM\\_MSG\\_INIT\\_COMPLETE\\_CFM\\_T](#)
- struct [LE\\_CM\\_MSG\\_LTK\\_REQ\\_IND\\_T](#)
- struct [LE\\_CM\\_MSG\\_READ\\_ADV\\_TX\\_POWER\\_CFM\\_T](#)
- struct [LE\\_CM\\_MSG\\_READ\\_BD\\_ADDR\\_CFM\\_T](#)
- struct [LE\\_CM\\_MSG\\_READ\\_CHANNEL\\_MAP\\_CFM\\_T](#)
- struct [LE\\_CM\\_MSG\\_READ\\_PHY\\_CFM\\_T](#)
- struct [LE\\_CM\\_MSG\\_READ\\_RESOLVING\\_LIST\\_SIZE\\_CFM\\_T](#)
- struct [LE\\_CM\\_MSG\\_READ\\_RSSI\\_CFM\\_T](#)
- struct [LE\\_CM\\_MSG\\_READ\\_TX\\_POWER\\_CFM\\_T](#)
- struct [LE\\_CM\\_MSG\\_READ\\_WHITE\\_LIST\\_SIZE\\_CFM\\_T](#)
- struct [LE\\_CM\\_MSG\\_SET\\_DATA\\_LENGTH\\_CFM\\_T](#)
- struct [LE\\_CM\\_MSG\\_SET\\_DISCONNECT\\_CFM\\_T](#)
- struct [LE\\_CM\\_MSG\\_SET\\_PHY\\_CFM\\_T](#)
- struct [LE\\_CM\\_MSG\\_SIGNAL\\_UPDATE\\_REQ\\_T](#)
- struct [LE\\_CM\\_REQ\\_STATUS\\_T](#)

### Typedefs

- typedef [LE\\_CM\\_REQ\\_STATUS\\_T](#) [LE\\_CM\\_MSG\\_ADD\\_TO\\_RESOLVING\\_LIST\\_CFM\\_T](#)
- typedef [LE\\_CM\\_REQ\\_STATUS\\_T](#) [LE\\_CM\\_MSG\\_ADD\\_TO\\_WHITE\\_LIST\\_CFM\\_T](#)
- typedef [LE\\_CM\\_REQ\\_STATUS\\_T](#) [LE\\_CM\\_MSG\\_CANCEL\\_CONNECTION\\_CFM\\_T](#)
- typedef [LE\\_CM\\_REQ\\_STATUS\\_T](#) [LE\\_CM\\_MSG\\_CLEAR\\_RESOLVING\\_LIST\\_CFM\\_T](#)
- typedef [LE\\_CM\\_REQ\\_STATUS\\_T](#) [LE\\_CM\\_MSG\\_CLEAR\\_WHITE\\_LIST\\_CFM\\_T](#)
- typedef [LE\\_CM\\_REQ\\_STATUS\\_T](#) [LE\\_CM\\_MSG\\_CREATE\\_CONNECTION\\_CFM\\_T](#)
- typedef [LE\\_CM\\_REQ\\_STATUS\\_T](#) [LE\\_CM\\_MSG\\_ENTER\\_ADVERTISING\\_CFM\\_T](#)
- typedef [LE\\_CM\\_REQ\\_STATUS\\_T](#) [LE\\_CM\\_MSG\\_ENTER\\_SCANNING\\_CFM\\_T](#)
- typedef [LE\\_CM\\_REQ\\_STATUS\\_T](#) [LE\\_CM\\_MSG\\_EXIT\\_ADVERTISING\\_CFM\\_T](#)
- typedef [LE\\_CM\\_REQ\\_STATUS\\_T](#) [LE\\_CM\\_MSG\\_EXIT\\_SCANNING\\_CFM\\_T](#)
- typedef [LE\\_CM\\_MSG\\_READ\\_PHY\\_CFM\\_T](#) [LE\\_CM\\_MSG\\_PHY\\_UPDATE\\_COMPLETE\\_IND\\_T](#)
- typedef [LE\\_CM\\_REQ\\_STATUS\\_T](#) [LE\\_CM\\_MSG\\_REMOVE\\_FROM\\_RESOLVING\\_LIST\\_CFM\\_T](#)
- typedef [LE\\_CM\\_REQ\\_STATUS\\_T](#) [LE\\_CM\\_MSG\\_REMOVE\\_FROM\\_WHITE\\_LIST\\_CFM\\_T](#)
- typedef [LE\\_CM\\_REQ\\_STATUS\\_T](#) [LE\\_CM\\_MSG\\_SET\\_ADVERTISING\\_DATA\\_CFM\\_T](#)
- typedef [LE\\_CM\\_REQ\\_STATUS\\_T](#) [LE\\_CM\\_MSG\\_SET\\_ADVERTISING\\_PARAMS\\_CFM\\_T](#)
- typedef [LE\\_CM\\_REQ\\_STATUS\\_T](#) [LE\\_CM\\_MSG\\_SET\\_CHANNEL\\_MAP\\_CFM\\_T](#)
- typedef [LE\\_CM\\_REQ\\_STATUS\\_T](#) [LE\\_CM\\_MSG\\_SET\\_DEFAULT\\_PHY\\_CFM\\_T](#)
- typedef [LE\\_CM\\_REQ\\_STATUS\\_T](#) [LE\\_CM\\_MSG\\_SET\\_RANDOM\\_ADDRESS\\_CFM\\_T](#)
- typedef [LE\\_CM\\_REQ\\_STATUS\\_T](#) [LE\\_CM\\_MSG\\_SET\\_RPA\\_TIMEOUT\\_CFM\\_T](#)
- typedef [LE\\_CM\\_REQ\\_STATUS\\_T](#) [LE\\_CM\\_MSG\\_SET\\_SCAN\\_PARAMS\\_CFM\\_T](#)
- typedef [LE\\_CM\\_REQ\\_STATUS\\_T](#) [LE\\_CM\\_MSG\\_SET\\_SCAN\\_RSP\\_DATA\\_CFM\\_T](#)



## Enumerations

- enum {  
LE\_CM\_MSG\_INIT\_COMPLETE\_CFM = LE\_CM\_MSG\_BASE, LE\_CM\_MSG\_SET\_DISCONNECT\_CFM,  
LE\_CM\_MSG\_DISCONNECT\_COMPLETE\_IND, LE\_CM\_MSG\_SET\_ADVERTISING\_DATA\_CFM,  
LE\_CM\_MSG\_SET\_SCAN\_RSP\_DATA\_CFM, LE\_CM\_MSG\_SET\_ADVERTISING\_PARAMS\_CFM,  
LE\_CM\_MSG\_ENTER\_ADVERTISING\_CFM, LE\_CM\_MSG\_EXIT\_ADVERTISING\_CFM,  
LE\_CM\_MSG\_SET\_SCAN\_PARAMS\_CFM, LE\_CM\_MSG\_ENTER\_SCANNING\_CFM, LE\_CM\_MSG\_EXIT\_SCANNING\_CFM,  
LE\_CM\_MSG\_CREATE\_CONNECTION\_CFM,  
LE\_CM\_MSG\_CANCEL\_CONNECTION\_CFM, LE\_CM\_MSG\_READ\_TX\_POWER\_CFM, LE\_CM\_MSG\_READ\_BD\_ADDR\_CFM,  
LE\_CM\_MSG\_READ\_RSSI\_CFM,  
LE\_CM\_MSG\_SET\_RANDOM\_ADDRESS\_CFM, LE\_CM\_MSG\_READ\_ADV\_TX\_POWER\_CFM, LE\_CM\_MSG\_READ\_WHITE\_LIST\_CFM,  
LE\_CM\_MSG\_CLEAR\_WHITE\_LIST\_CFM,  
LE\_CM\_MSG\_ADD\_TO\_WHITE\_LIST\_CFM, LE\_CM\_MSG\_REMOVE\_FROM\_WHITE\_LIST\_CFM,  
LE\_CM\_MSG\_SET\_CHANNEL\_MAP\_CFM, LE\_CM\_MSG\_READ\_CHANNEL\_MAP\_CFM,  
LE\_CM\_MSG\_SET\_DATA\_LENGTH\_CFM, LE\_CM\_MSG\_DATA\_LEN\_CHANGE\_IND, LE\_CM\_MSG\_ADD\_TO\_RESOLVING\_LIST\_CFM,  
LE\_CM\_MSG\_REMOVE\_FROM\_RESOLVING\_LIST\_CFM,  
LE\_CM\_MSG\_CLEAR\_RESOLVING\_LIST\_CFM, LE\_CM\_MSG\_READ\_RESOLVING\_LIST\_SIZE\_CFM,  
LE\_CM\_MSG\_SET\_RPA\_TIMEOUT\_CFM, LE\_CM\_MSG\_SIGNAL\_UPDATE\_REQ,  
LE\_CM\_MSG\_CONN\_UPDATE\_COMPLETE\_IND, LE\_CM\_MSG\_CONN\_PARAM\_REQ, LE\_CM\_MSG\_ENCRYPTION\_CHANNEL\_UPDATE\_CFM,  
LE\_CM\_MSG\_ENCRYPTION\_REFRESH\_IND,  
LE\_CM\_MSG\_LTK\_REQ\_IND, LE\_CM\_MSG\_ADVERTISE\_REPORT\_IND, LE\_CM\_MSG\_DIRECT\_ADV\_REPORT\_IND,  
LE\_CM\_CONNECTION\_COMPLETE\_IND,  
LE\_CM\_MSG\_READ\_LOCAL\_RPA\_CFM, LE\_CM\_MSG\_READ\_PHY\_CFM, LE\_CM\_MSG\_SET\_DEFAULT\_PHY\_CFM,  
LE\_CM\_MSG\_SET\_PHY\_CFM,  
LE\_CM\_MSG\_PHY\_UPDATE\_COMPLETE\_IND, LE\_CM\_MSG\_TOP }

*BLE connection management message id.*

## Functions

- void [LeCmInit](#) (TASK appTask)  
*BLE Connection Management Module Init.*

### 4.2.1 Detailed Description

### 4.2.2 Typedef Documentation

#### 4.2.2.1 LE\_CM\_MSG\_ADD\_TO\_RESOLVING\_LIST\_CFM\_T

```
typedef LE_CM_REQ_STATUS_T LE_CM_MSG_ADD_TO_RESOLVING_LIST_CFM_T
```

#### 4.2.2.2 LE\_CM\_MSG\_ADD\_TO\_WHITE\_LIST\_CFM\_T

```
typedef LE_CM_REQ_STATUS_T LE_CM_MSG_ADD_TO_WHITE_LIST_CFM_T
```

#### 4.2.2.3 LE\_CM\_MSG\_CANCEL\_CONNECTION\_CFM\_T

```
typedef LE_CM_REQ_STATUS_T LE_CM_MSG_CANCEL_CONNECTION_CFM_T
```

#### 4.2.2.4 LE\_CM\_MSG\_CLEAR\_RESOLVING\_LIST\_CFM\_T

```
typedef LE_CM_REQ_STATUS_T LE_CM_MSG_CLEAR_RESOLVING_LIST_CFM_T
```

#### 4.2.2.5 LE\_CM\_MSG\_CLEAR\_WHITE\_LIST\_CFM\_T

```
typedef LE_CM_REQ_STATUS_T LE_CM_MSG_CLEAR_WHITE_LIST_CFM_T
```

#### 4.2.2.6 LE\_CM\_MSG\_CREATE\_CONNECTION\_CFM\_T

```
typedef LE_CM_REQ_STATUS_T LE_CM_MSG_CREATE_CONNECTION_CFM_T
```

#### 4.2.2.7 LE\_CM\_MSG\_ENTER\_ADVERTISING\_CFM\_T

```
typedef LE_CM_REQ_STATUS_T LE_CM_MSG_ENTER_ADVERTISING_CFM_T
```

#### 4.2.2.8 LE\_CM\_MSG\_ENTER\_SCANNING\_CFM\_T

```
typedef LE_CM_REQ_STATUS_T LE_CM_MSG_ENTER_SCANNING_CFM_T
```

#### 4.2.2.9 LE\_CM\_MSG\_EXIT\_ADVERTISING\_CFM\_T

```
typedef LE_CM_REQ_STATUS_T LE_CM_MSG_EXIT_ADVERTISING_CFM_T
```

#### 4.2.2.10 LE\_CM\_MSG\_EXIT\_SCANNING\_CFM\_T

```
typedef LE_CM_REQ_STATUS_T LE_CM_MSG_EXIT_SCANNING_CFM_T
```

**4.2.2.11 LE\_CM\_MSG\_PHY\_UPDATE\_COMPLETE\_IND\_T**

```
typedef LE_CM_MSG_READ_PHY_CFM_T LE_CM_MSG_PHY_UPDATE_COMPLETE_IND_T
```

**4.2.2.12 LE\_CM\_MSG\_REMOVE\_FROM\_RESOLVING\_LIST\_CFM\_T**

```
typedef LE_CM_REQ_STATUS_T LE_CM_MSG_REMOVE_FROM_RESOLVING_LIST_CFM_T
```

**4.2.2.13 LE\_CM\_MSG\_REMOVE\_FROM\_WHITE\_LIST\_CFM\_T**

```
typedef LE_CM_REQ_STATUS_T LE_CM_MSG_REMOVE_FROM_WHITE_LIST_CFM_T
```

**4.2.2.14 LE\_CM\_MSG\_SET\_ADVERTISING\_DATA\_CFM\_T**

```
typedef LE_CM_REQ_STATUS_T LE_CM_MSG_SET_ADVERTISING_DATA_CFM_T
```

**4.2.2.15 LE\_CM\_MSG\_SET\_ADVERTISING\_PARAMS\_CFM\_T**

```
typedef LE_CM_REQ_STATUS_T LE_CM_MSG_SET_ADVERTISING_PARAMS_CFM_T
```

**4.2.2.16 LE\_CM\_MSG\_SET\_CHANNEL\_MAP\_CFM\_T**

```
typedef LE_CM_REQ_STATUS_T LE_CM_MSG_SET_CHANNEL_MAP_CFM_T
```

**4.2.2.17 LE\_CM\_MSG\_SET\_DEFAULT\_PHY\_CFM\_T**

```
typedef LE_CM_REQ_STATUS_T LE_CM_MSG_SET_DEFAULT_PHY_CFM_T
```

**4.2.2.18 LE\_CM\_MSG\_SET\_RANDOM\_ADDRESS\_CFM\_T**

```
typedef LE_CM_REQ_STATUS_T LE_CM_MSG_SET_RANDOM_ADDRESS_CFM_T
```

#### 4.2.2.19 LE\_CM\_MSG\_SET\_RPA\_TIMEOUT\_CFM\_T

```
typedef LE_CM_REQ_STATUS_T LE_CM_MSG_SET_RPA_TIMEOUT_CFM_T
```

#### 4.2.2.20 LE\_CM\_MSG\_SET\_SCAN\_PARAMS\_CFM\_T

```
typedef LE_CM_REQ_STATUS_T LE_CM_MSG_SET_SCAN_PARAMS_CFM_T
```

#### 4.2.2.21 LE\_CM\_MSG\_SET\_SCAN\_RSP\_DATA\_CFM\_T

```
typedef LE_CM_REQ_STATUS_T LE_CM_MSG_SET_SCAN_RSP_DATA_CFM_T
```

### 4.2.3 Enumeration Type Documentation

#### 4.2.3.1 anonymous enum

```
anonymous enum
```

BLE connection management message id.

##### Enumerator

LE_CM_MSG_INIT_COMPLETE_CFM	initialize complete
LE_CM_MSG_SET_DISCONNECT_CFM	set disconnect confirm
LE_CM_MSG_DISCONNECT_COMPLETE_IND	disconnect complete indication
LE_CM_MSG_SET_ADVERTISING_DATA_CFM	set advertising data confirm
LE_CM_MSG_SET_SCAN_RSP_DATA_CFM	set scan response data confirm
LE_CM_MSG_SET_ADVERTISING_PARAMS_CFM	set advertising parameters confirm
LE_CM_MSG_ENTER_ADVERTISING_CFM	enter advertising confirm
LE_CM_MSG_EXIT_ADVERTISING_CFM	exit advertising confirm
LE_CM_MSG_SET_SCAN_PARAMS_CFM	set scan parameters confirm
LE_CM_MSG_ENTER_SCANNING_CFM	enter scanning confirm
LE_CM_MSG_EXIT_SCANNING_CFM	exit scanning confirm
LE_CM_MSG_CREATE_CONNECTION_CFM	create connection confirm
LE_CM_MSG_CANCEL_CONNECTION_CFM	cancel connection confirm
LE_CM_MSG_READ_TX_POWER_CFM	read tx power confirm
LE_CM_MSG_READ_BD_ADDR_CFM	read device address confirm
LE_CM_MSG_READ_RSSI_CFM	read RSSI confirm
LE_CM_MSG_SET_RANDOM_ADDRESS_CFM	set random address confirm
LE_CM_MSG_READ_ADV_TX_POWER_CFM	read advertising tx power confirm
LE_CM_MSG_READ_WHITE_LIST_SIZE_CFM	read whitelist size confirm

## Enumerator

LE_CM_MSG_CLEAR_WHITE_LIST_CFM	clear whitelist confirm
LE_CM_MSG_ADD_TO_WHITE_LIST_CFM	add to whitelist confirm
LE_CM_MSG_REMOVE_FROM_WHITE_LIST_CFM	remove from whitelist confirm
LE_CM_MSG_SET_CHANNEL_MAP_CFM	set channel map confirm
LE_CM_MSG_READ_CHANNEL_MAP_CFM	read channel map confirm
LE_CM_MSG_SET_DATA_LENGTH_CFM	set data length confirm
LE_CM_MSG_DATA_LEN_CHANGE_IND	data length change indication
LE_CM_MSG_ADD_TO_RESOLVING_LIST_CFM	add to resolving list confirm
LE_CM_MSG_REMOVE_FROM_RESOLVING_LIST_CFM	remove from resolving list confirm
LE_CM_MSG_CLEAR_RESOLVING_LIST_CFM	clear resolving list confirm
LE_CM_MSG_READ_RESOLVING_LIST_SIZE_CFM	read resolving list size confirm
LE_CM_MSG_SET_RPA_TIMEOUT_CFM	set resolving private address timeout confirm
LE_CM_MSG_SIGNAL_UPDATE_REQ	signal update request
LE_CM_MSG_CONN_UPDATE_COMPLETE_IND	connection update complete indication
LE_CM_MSG_CONN_PARA_REQ	connection parameters request
LE_CM_MSG_ENCRYPTION_CHANGE_IND	encryption change indication
LE_CM_MSG_ENCRYPTION_REFRESH_IND	encryption refresh indication
LE_CM_MSG_LTK_REQ_IND	long term key indication
LE_CM_MSG_ADVERTISE_REPORT_IND	advertising report indication
LE_CM_MSG_DIRECT_ADV_REPORT_IND	direct advertising report indication
LE_CM_CONNECTION_COMPLETE_IND	connection complete indication
LE_CM_MSG_READ_LOCAL_RPA_CFM	read local resolving private address confirm
LE_CM_MSG_READ_PHY_CFM	
LE_CM_MSG_SET_DEFAULT_PHY_CFM	
LE_CM_MSG_SET_PHY_CFM	
LE_CM_MSG_PHY_UPDATE_COMPLETE_IND	
LE_CM_MSG_TOP	top of CM message id

## 4.2.4 Function Documentation

## 4.2.4.1 LeCmInit()

```
void LeCmInit (
    TASK appTask )
```

BLE Connection Management Module Init.

## Parameters

<i>the</i>	reference of BLE task.
------------	------------------------

**Returns**

None.

## 4.3 BLE GAP APIs

### Data Structures

- struct [LE\\_GAP\\_ADVERTISING\\_PARAM\\_T](#)
- struct [LE\\_GAP\\_CONN\\_PARAM\\_T](#)
- struct [LE\\_GAP\\_SCAN\\_PARAM\\_T](#)

### Macros

- `#define GAP_ADTYPE_128BIT_COMPLETE 0x07`
- `#define GAP_ADTYPE_128BIT_MORE 0x06`
- `#define GAP_ADTYPE_16BIT_COMPLETE 0x03`
- `#define GAP_ADTYPE_16BIT_MORE 0x02`
- `#define GAP_ADTYPE_32BIT_COMPLETE 0x05`
- `#define GAP_ADTYPE_32BIT_MORE 0x04`
- `#define GAP_ADTYPE_3D_INFO_DATA 0x3D`
- `#define GAP_ADTYPE_ADV_INTERVAL 0x1A`
- `#define GAP_ADTYPE_APPEARANCE 0x19`
- `#define GAP_ADTYPE_FLAGS 0x01`
- `#define GAP_ADTYPE_FLAGS_BREDR_NOT_SUPPORTED 0x04`
- `#define GAP_ADTYPE_FLAGS_GENERAL 0x02`
- `#define GAP_ADTYPE_FLAGS_LIMITED 0x01`
- `#define GAP_ADTYPE_LE_BD_ADDR 0x1B`
- `#define GAP_ADTYPE_LE_ROLE 0x1C`
- `#define GAP_ADTYPE_LOCAL_NAME_COMPLETE 0x09`
- `#define GAP_ADTYPE_LOCAL_NAME_SHORT 0x08`
- `#define GAP_ADTYPE_MANUFACTURER_SPECIFIC 0xFF`
- `#define GAP_ADTYPE_OOB_CLASS_OF_DEVICE 0x0D`
- `#define GAP_ADTYPE_OOB_SIMPLE_PAIRING_HASHC 0x0E`
- `#define GAP_ADTYPE_OOB_SIMPLE_PAIRING_RANDR 0x0F`
- `#define GAP_ADTYPE_POWER_LEVEL 0x0A`
- `#define GAP_ADTYPE_PUBLIC_TARGET_ADDR 0x17`
- `#define GAP_ADTYPE_RANDOM_TARGET_ADDR 0x18`
- `#define GAP_ADTYPE_SERVICE_DATA 0x16`
- `#define GAP_ADTYPE_SERVICE_DATA_128BIT 0x21`
- `#define GAP_ADTYPE_SERVICE_DATA_32BIT 0x20`
- `#define GAP_ADTYPE_SERVICES_LIST_128BIT 0x15`
- `#define GAP_ADTYPE_SERVICES_LIST_16BIT 0x14`
- `#define GAP_ADTYPE_SIGNED_DATA 0x13`
- `#define GAP_ADTYPE_SIMPLE_PAIRING_HASHC_256 0x1D`
- `#define GAP_ADTYPE_SIMPLE_PAIRING_RANDR_256 0x1E`
- `#define GAP_ADTYPE_SLAVE_CONN_INTERVAL_RANGE 0x12`
- `#define GAP_ADTYPE_SM_OOB_FLAG 0x11`
- `#define GAP_ADTYPE_SM_TK 0x10`
- `#define GAP_PUBLIC_ADDR 0`
- `#define GAP_RAND_ADDR_NRPA 2`
- `#define GAP_RAND_ADDR_RPA 3`
- `#define GAP_RAND_ADDR_STATIC 1`
- `#define GAP_SCAN_TYPE_ACTIVE 1`
- `#define GAP_SCAN_TYPE_PASSIVE 0`
- `#define GAP_TX_PWR_CURR_VAL 0`
- `#define GAP_TX_PWR_MAX_VAL 1`

- `#define GAPBOND_IO_CAP_DISPLAY_ONLY 0x00`
- `#define GAPBOND_IO_CAP_DISPLAY_YES_NO 0x01`
- `#define GAPBOND_IO_CAP_KEYBOARD_DISPLAY 0x04`
- `#define GAPBOND_IO_CAP_KEYBOARD_ONLY 0x02`
- `#define GAPBOND_IO_CAP_NO_INPUT_NO_OUTPUT 0x03`
- `#define GAPBOND_PAIRING_MODE_INITIATE 0x02`
- `#define GAPBOND_PAIRING_MODE_NO_PAIRING 0x00`
- `#define GAPBOND_PAIRING_MODE_WAIT_FOR_REQ 0x01`
- `#define LE_GAP_ADV_MAX_SIZE 31`

## Functions

- `LE_ERR_STATE LeGapAddToResolvingList (LE_BT_ADDR_T *bt_addr, UINT8 *irk)`  
*Add device to resolving-list.*
- `LE_ERR_STATE LeGapAddToWhiteList (LE_BT_ADDR_T *bt_addr)`  
*Add device to whitelist.*
- `LE_ERR_STATE LeGapAdvertisingEnable (BOOL start)`  
*Enable or disable advertising function.*
- `LE_ERR_STATE LeGapCentralConnectReq (LE_BT_ADDR_T *taddr, UINT8 own_addr_type)`  
*Central connect request.*
- `LE_ERR_STATE LeGapCentralSetDataChannel (UINT8 *ch)`  
*Central set data channel.*
- `LE_ERR_STATE LeGapClearResolvingList (void)`  
*Clear the resolving-list in the controller.*
- `LE_ERR_STATE LeGapClearWhiteList (void)`  
*Clear whitelist in the controller.*
- `LE_ERR_STATE LeGapConnectCancelReq (void)`  
*Cancel connect request.*
- `void LeGapConnParaRequestRsp (UINT16 conn_hdl, BOOL accept)`  
*Connection parameters request response.*
- `LE_ERR_STATE LeGapConnUpdateRequest (UINT16 conn_hdl, LE_CONN_PARA_T *para)`  
*Connection parameters update request.*
- `void LeGapConnUpdateResponse (UINT16 conn_hdl, UINT8 identifier, BOOL accept)`  
*Connection parameters update response.*
- `LE_ERR_STATE LeGapDisconnectReq (UINT16 conn_hdl)`  
*Disconnect the physical connection.*
- `LE_ERR_STATE LeGapGenRandAddr (UINT8 type, BD_ADDR addr)`  
*Called to generation random address.*
- `void LeGapGetBtAddr (void)`  
*Get owner device address.*
- `void LeGapReadAdvChannelTxPower (void)`  
*Read ADV channel txpower.*
- `LE_ERR_STATE LeGapReadChannelMap (UINT16 conn_hdl)`  
*Read channel map.*
- `LE_ERR_STATE LeGapReadPhy (UINT16 conn_hdl)`
- `void LeGapReadResolvingListSize (void)`  
*Read the resolving-list size in the controller.*
- `LE_ERR_STATE LeGapReadRssi (UINT16 conn_hdl)`  
*Read RSSI value from controller.*
- `LE_ERR_STATE LeGapReadTxPower (UINT16 conn_hdl, UINT8 type)`  
*Read tx power value for the specified connection.*



- void [LeGapReadWhiteListSize](#) (void)  
*Read whitelist size in the controller.*
- LE\_ERR\_STATE [LeGapRemoveFromWhiteList](#) (LE\_BT\_ADDR\_T \*bt\_addr)  
*Remove device from whitelist.*
- LE\_ERR\_STATE [LeGapScanningReq](#) (BOOL start, BOOL filter)  
*Request scanning start.*
- LE\_ERR\_STATE [LeGapSetAdvData](#) (UINT8 len, UINT8 \*data)  
*Called to set ADV data.*
- LE\_ERR\_STATE [LeGapSetAdvParameter](#) (LE\_GAP\_ADVERTISING\_PARAM\_T \*params)  
*Called to set ADV parameters.*
- LE\_ERR\_STATE [LeGapSetConnParameter](#) (UINT16 interval\_min, UINT16 interval\_max, UINT16 slave\_latency, UINT16 supervision\_timeout)  
*Called to set connection parameters.*
- LE\_ERR\_STATE [LeGapSetDataChannelPduLen](#) (UINT16 conn\_hdl, UINT16 tx\_octets, UINT16 tx\_time)  
*Set data channel PDU length.*
- LE\_ERR\_STATE [LeGapSetDefaultPhy](#) (UINT8 tx, UINT8 rx)
- LE\_ERR\_STATE [LeGapSetPhy](#) (UINT16 conn\_hdl, UINT8 tx, UINT8 rx, UINT16 option)
- LE\_ERR\_STATE [LeGapSetRandAddr](#) (BD\_ADDR addr)  
*Called to set random address.*
- LE\_ERR\_STATE [LeGapSetRpaTimeout](#) (UINT16 timeout)  
*Set resolvable private address timeout.*
- LE\_ERR\_STATE [LeGapSetStaticAddr](#) (BD\_ADDR addr)  
*Called to set static address.*
- LE\_ERR\_STATE [LeSetScanParameter](#) (LE\_GAP\_SCAN\_PARAM\_T \*params)  
*Called to set scan parameters.*
- LE\_ERR\_STATE [LeSetScanRspData](#) (UINT8 len, UINT8 \*data)  
*Called to set scan response data.*

### 4.3.1 Detailed Description

### 4.3.2 Macro Definition Documentation

#### 4.3.2.1 GAP\_ADTYPE\_128BIT\_COMPLETE

```
#define GAP_ADTYPE_128BIT_COMPLETE 0x07
```

#### 4.3.2.2 GAP\_ADTYPE\_128BIT\_MORE

```
#define GAP_ADTYPE_128BIT_MORE 0x06
```

#### 4.3.2.3 GAP\_ADTYPE\_16BIT\_COMPLETE

```
#define GAP_ADTYPE_16BIT_COMPLETE 0x03
```

#### 4.3.2.4 GAP\_ADTYPE\_16BIT\_MORE

```
#define GAP_ADTYPE_16BIT_MORE 0x02
```

#### 4.3.2.5 GAP\_ADTYPE\_32BIT\_COMPLETE

```
#define GAP_ADTYPE_32BIT_COMPLETE 0x05
```

#### 4.3.2.6 GAP\_ADTYPE\_32BIT\_MORE

```
#define GAP_ADTYPE_32BIT_MORE 0x04
```

#### 4.3.2.7 GAP\_ADTYPE\_3D\_INFO\_DATA

```
#define GAP_ADTYPE_3D_INFO_DATA 0x3D
```

#### 4.3.2.8 GAP\_ADTYPE\_ADV\_INTERVAL

```
#define GAP_ADTYPE_ADV_INTERVAL 0x1A
```

#### 4.3.2.9 GAP\_ADTYPE\_APPEARANCE

```
#define GAP_ADTYPE_APPEARANCE 0x19
```

#### 4.3.2.10 GAP\_ADTYPE\_FLAGS

```
#define GAP_ADTYPE_FLAGS 0x01
```

**4.3.2.11 GAP\_ADTYPE\_FLAGS\_BREDR\_NOT\_SUPPORTED**

```
#define GAP_ADTYPE_FLAGS_BREDR_NOT_SUPPORTED 0x04
```

**4.3.2.12 GAP\_ADTYPE\_FLAGS\_GENERAL**

```
#define GAP_ADTYPE_FLAGS_GENERAL 0x02
```

**4.3.2.13 GAP\_ADTYPE\_FLAGS\_LIMITED**

```
#define GAP_ADTYPE_FLAGS_LIMITED 0x01
```

**4.3.2.14 GAP\_ADTYPE\_LE\_BD\_ADDR**

```
#define GAP_ADTYPE_LE_BD_ADDR 0x1B
```

**4.3.2.15 GAP\_ADTYPE\_LE\_ROLE**

```
#define GAP_ADTYPE_LE_ROLE 0x1C
```

**4.3.2.16 GAP\_ADTYPE\_LOCAL\_NAME\_COMPLETE**

```
#define GAP_ADTYPE_LOCAL_NAME_COMPLETE 0x09
```

**4.3.2.17 GAP\_ADTYPE\_LOCAL\_NAME\_SHORT**

```
#define GAP_ADTYPE_LOCAL_NAME_SHORT 0x08
```

**4.3.2.18 GAP\_ADTYPE\_MANUFACTURER\_SPECIFIC**

```
#define GAP_ADTYPE_MANUFACTURER_SPECIFIC 0xFF
```

#### 4.3.2.19 GAP\_ADTYPE\_OOB\_CLASS\_OF\_DEVICE

```
#define GAP_ADTYPE_OOB_CLASS_OF_DEVICE 0x0D
```

#### 4.3.2.20 GAP\_ADTYPE\_OOB\_SIMPLE\_PAIRING\_HASHC

```
#define GAP_ADTYPE_OOB_SIMPLE_PAIRING_HASHC 0x0E
```

#### 4.3.2.21 GAP\_ADTYPE\_OOB\_SIMPLE\_PAIRING\_RANDR

```
#define GAP_ADTYPE_OOB_SIMPLE_PAIRING_RANDR 0x0F
```

#### 4.3.2.22 GAP\_ADTYPE\_POWER\_LEVEL

```
#define GAP_ADTYPE_POWER_LEVEL 0x0A
```

#### 4.3.2.23 GAP\_ADTYPE\_PUBLIC\_TARGET\_ADDR

```
#define GAP_ADTYPE_PUBLIC_TARGET_ADDR 0x17
```

#### 4.3.2.24 GAP\_ADTYPE\_RANDOM\_TARGET\_ADDR

```
#define GAP_ADTYPE_RANDOM_TARGET_ADDR 0x18
```

#### 4.3.2.25 GAP\_ADTYPE\_SERVICE\_DATA

```
#define GAP_ADTYPE_SERVICE_DATA 0x16
```

#### 4.3.2.26 GAP\_ADTYPE\_SERVICE\_DATA\_128BIT

```
#define GAP_ADTYPE_SERVICE_DATA_128BIT 0x21
```

**4.3.2.27 GAP\_ADTYPE\_SERVICE\_DATA\_32BIT**

```
#define GAP_ADTYPE_SERVICE_DATA_32BIT 0x20
```

**4.3.2.28 GAP\_ADTYPE\_SERVICES\_LIST\_128BIT**

```
#define GAP_ADTYPE_SERVICES_LIST_128BIT 0x15
```

**4.3.2.29 GAP\_ADTYPE\_SERVICES\_LIST\_16BIT**

```
#define GAP_ADTYPE_SERVICES_LIST_16BIT 0x14
```

**4.3.2.30 GAP\_ADTYPE\_SIGNED\_DATA**

```
#define GAP_ADTYPE_SIGNED_DATA 0x13
```

**4.3.2.31 GAP\_ADTYPE\_SIMPLE\_PAIRING\_HASHC\_256**

```
#define GAP_ADTYPE_SIMPLE_PAIRING_HASHC_256 0x1D
```

**4.3.2.32 GAP\_ADTYPE\_SIMPLE\_PAIRING\_RANDR\_256**

```
#define GAP_ADTYPE_SIMPLE_PAIRING_RANDR_256 0x1E
```

**4.3.2.33 GAP\_ADTYPE\_SLAVE\_CONN\_INTERVAL\_RANGE**

```
#define GAP_ADTYPE_SLAVE_CONN_INTERVAL_RANGE 0x12
```

**4.3.2.34 GAP\_ADTYPE\_SM\_OOB\_FLAG**

```
#define GAP_ADTYPE_SM_OOB_FLAG 0x11
```

#### 4.3.2.35 GAP\_ADTYPE\_SM\_TK

```
#define GAP_ADTYPE_SM_TK 0x10
```

#### 4.3.2.36 GAP\_PUBLIC\_ADDR

```
#define GAP_PUBLIC_ADDR 0
```

#### 4.3.2.37 GAP\_RAND\_ADDR\_NRPA

```
#define GAP_RAND_ADDR_NRPA 2
```

#### 4.3.2.38 GAP\_RAND\_ADDR\_RPA

```
#define GAP_RAND_ADDR_RPA 3
```

#### 4.3.2.39 GAP\_RAND\_ADDR\_STATIC

```
#define GAP_RAND_ADDR_STATIC 1
```

#### 4.3.2.40 GAP\_SCAN\_TYPE\_ACTIVE

```
#define GAP_SCAN_TYPE_ACTIVE 1
```

#### 4.3.2.41 GAP\_SCAN\_TYPE\_PASSIVE

```
#define GAP_SCAN_TYPE_PASSIVE 0
```

#### 4.3.2.42 GAP\_TX\_PWR\_CURR\_VAL

```
#define GAP_TX_PWR_CURR_VAL 0
```

**4.3.2.43 GAP\_TX\_PWR\_MAX\_VAL**

```
#define GAP_TX_PWR_MAX_VAL 1
```

**4.3.2.44 GAPBOND\_IO\_CAP\_DISPLAY\_ONLY**

```
#define GAPBOND_IO_CAP_DISPLAY_ONLY 0x00
```

**4.3.2.45 GAPBOND\_IO\_CAP\_DISPLAY\_YES\_NO**

```
#define GAPBOND_IO_CAP_DISPLAY_YES_NO 0x01
```

**4.3.2.46 GAPBOND\_IO\_CAP\_KEYBOARD\_DISPLAY**

```
#define GAPBOND_IO_CAP_KEYBOARD_DISPLAY 0x04
```

**4.3.2.47 GAPBOND\_IO\_CAP\_KEYBOARD\_ONLY**

```
#define GAPBOND_IO_CAP_KEYBOARD_ONLY 0x02
```

**4.3.2.48 GAPBOND\_IO\_CAP\_NO\_INPUT\_NO\_OUTPUT**

```
#define GAPBOND_IO_CAP_NO_INPUT_NO_OUTPUT 0x03
```

**4.3.2.49 GAPBOND\_PAIRING\_MODE\_INITIATE**

```
#define GAPBOND_PAIRING_MODE_INITIATE 0x02
```

**4.3.2.50 GAPBOND\_PAIRING\_MODE\_NO\_PAIRING**

```
#define GAPBOND_PAIRING_MODE_NO_PAIRING 0x00
```

#### 4.3.2.51 GAPBOND\_PAIRING\_MODE\_WAIT\_FOR\_REQ

```
#define GAPBOND_PAIRING_MODE_WAIT_FOR_REQ 0x01
```

#### 4.3.2.52 LE\_GAP\_ADV\_MAX\_SIZE

```
#define LE_GAP_ADV_MAX_SIZE 31
```

### 4.3.3 Function Documentation

#### 4.3.3.1 LeGapAddToResolvingList()

```
LE_ERR_STATE LeGapAddToResolvingList (
    LE_BT_ADDR_T * bt_addr,
    UINT8 * irk )
```

Add device to resolving-list.

##### Parameters

<i>bt_addr</i>	BT device address.
<i>irk</i>	IRK, Identity Resolving Key

##### Returns

- SYS\_ERR\_SUCCESS: success.
- others: refer to error code in [ble\\_err.h](#).

#### 4.3.3.2 LeGapAddToWhiteList()

```
LE_ERR_STATE LeGapAddToWhiteList (
    LE_BT_ADDR_T * bt_addr )
```

Add device to whitelist.

##### Parameters

<i>bt_addr</i>	BT device address.
----------------	--------------------



## Returns

- `SYS_ERR_SUCCESS`: success.
- others: refer to error code in [ble\\_err.h](#).

#### 4.3.3.3 LeGapAdvertisingEnable()

```
LE_ERR_STATE LeGapAdvertisingEnable (
    BOOL start )
```

Enable or disable advertising function.

## Parameters

<i>start</i>	TRUE is enable, FALSE is disable.
--------------	-----------------------------------

## Returns

- `SYS_ERR_SUCCESS`: success.
- others: refer to error code in [ble\\_err.h](#).

#### 4.3.3.4 LeGapCentralConnectReq()

```
LE_ERR_STATE LeGapCentralConnectReq (
    LE_BT_ADDR_T * taddr,
    UINT8 own_addr_type )
```

Central connect request.

## Parameters

<i>taddr</i>	advertisers device address.
<i>own_addr_type</i>	owner address type.

## Returns

- `SYS_ERR_SUCCESS`: success.
- others: refer to error code in [ble\\_err.h](#).

#### 4.3.3.5 LeGapCentralSetDataChannel()

```
LE_ERR_STATE LeGapCentralSetDataChannel (
    UINT8 * ch )
```

Central set data channel.

## Parameters

<i>ch</i>	data channel.
-----------	---------------

## Returns

- `SYS_ERR_SUCCESS`: success.
- others: refer to error code in [ble\\_err.h](#).

**4.3.3.6 LeGapClearResolvingList()**

```
LE_ERR_STATE LeGapClearResolvingList (  
    void )
```

Clear the resolving-list in the controller.

## Returns

- `SYS_ERR_SUCCESS`: success.
- others: refer to error code in [ble\\_err.h](#).

**4.3.3.7 LeGapClearWhiteList()**

```
LE_ERR_STATE LeGapClearWhiteList (  
    void )
```

Clear whitelist in the controller.

## Returns

- `SYS_ERR_SUCCESS`: success.
- others: refer to error code in [ble\\_err.h](#).

**4.3.3.8 LeGapConnectCancelReq()**

```
LE_ERR_STATE LeGapConnectCancelReq (  
    void )
```

Cancel connect request.

## Returns

- `SYS_ERR_SUCCESS`: success.
- others: refer to error code in [ble\\_err.h](#).

**4.3.3.9 LeGapConnParaRequestRsp()**

```
void LeGapConnParaRequestRsp (  
    UINT16 conn_hdl,  
    BOOL accept )
```

Connection parameters request response.

**Parameters**

<i>conn_hdl</i>	connection handle.
<i>accept</i>	TRUE is accept, FALSE is not.

**Returns**

None.

**4.3.3.10 LeGapConnUpdateRequest()**

```
LE_ERR_STATE LeGapConnUpdateRequest (
    UINT16 conn_hdl,
    LE_CONN_PARA_T * para )
```

Connection parameters update request.

**Parameters**

<i>conn_hdl</i>	connection handle.
<i>para</i>	update connection parameters.

**Returns**

None.

**4.3.3.11 LeGapConnUpdateResponse()**

```
void LeGapConnUpdateResponse (
    UINT16 conn_hdl,
    UINT8 identifier,
    BOOL accept )
```

Connection parameters update response.

**Parameters**

<i>conn_hdl</i>	connection handle.
<i>identifier</i>	TBD
<i>accept</i>	accept request, or not.

**Returns**

None.

#### 4.3.3.12 LeGapDisconnectReq()

```
LE_ERR_STATE LeGapDisconnectReq (
    UINT16 conn_hdl )
```

Disconnect the physical connection.

##### Parameters

<i>conn_hdl</i>	connection handle.
-----------------	--------------------

##### Returns

- SYS\_ERR\_SUCCESS: success.
- others: refer to error code in [ble\\_err.h](#).

#### 4.3.3.13 LeGapGenRandAddr()

```
LE_ERR_STATE LeGapGenRandAddr (
    UINT8 type,
    BD_ADDR addr )
```

Called to generation random address.

##### Parameters

<i>type</i>	address type.
<i>addr</i>	address.

##### Returns

- SYS\_ERR\_SUCCESS: success.
- others: refer to error code in [ble\\_err.h](#).

#### 4.3.3.14 LeGapGetBtAddr()

```
void LeGapGetBtAddr (
    void )
```

Get owner device address.

#### 4.3.3.15 LeGapReadAdvChannelTxPower()

```
void LeGapReadAdvChannelTxPower (
    void )
```

Read ADV channel txpower.

#### 4.3.3.16 LeGapReadChannelMap()

```
LE_ERR_STATE LeGapReadChannelMap (
    UINT16 conn_hdl )
```

Read channel map.

##### Parameters

<i>conn_hdl</i>	connection handle.
-----------------	--------------------

##### Returns

- SYS\_ERR\_SUCCESS: success.
- others: refer to error code in [ble\\_err.h](#).

#### 4.3.3.17 LeGapReadPhy()

```
LE_ERR_STATE LeGapReadPhy (
    UINT16 conn_hdl )
```

#### 4.3.3.18 LeGapReadResolvingListSize()

```
void LeGapReadResolvingListSize (
    void )
```

Read the resolving-list size in the controller.

##### Returns

- SYS\_ERR\_SUCCESS: success.
- others: refer to error code in [ble\\_err.h](#).

#### 4.3.3.19 LeGapReadRssi()

```
LE_ERR_STATE LeGapReadRssi (
    UINT16 conn_hdl )
```

Read RSSI value from controller.

## Parameters

<i>conn_hdl</i>	connection handle.
-----------------	--------------------

## Returns

- `SYS_ERR_SUCCESS`: success.
- others: refer to error code in [ble\\_err.h](#).

## 4.3.3.20 LeGapReadTxPower()

```
LE_ERR_STATE LeGapReadTxPower (
    UINT16 conn_hdl,
    UINT8 type )
```

Read tx power value for the specified connection.

## Parameters

<i>conn_hdl</i>	connection handle.
<i>type</i>	current tx power, or maximum tx power. Don't support.

## Returns

- `SYS_ERR_SUCCESS`: success.
- others: refer to error code in [ble\\_err.h](#).

## 4.3.3.21 LeGapReadWhiteListSize()

```
void LeGapReadWhiteListSize (
    void )
```

Read whitelist size in the controller.

## 4.3.3.22 LeGapRemoveFromWhiteList()

```
LE_ERR_STATE LeGapRemoveFromWhiteList (
    LE_BT_ADDR_T * bt_addr )
```

Remove device from whitelist.

Remove device from resolving-list.

**Parameters**

<i>bt_addr</i>	BT device address.
----------------	--------------------

**Returns**

- `SYS_ERR_SUCCESS`: success.
- others: refer to error code in [ble\\_err.h](#).

**4.3.3.23 LeGapScanningReq()**

```
LE_ERR_STATE LeGapScanningReq (  
    BOOL start,  
    BOOL filter )
```

Request scanning start.

**Parameters**

<i>start</i>	TRUE is start, FALSE is not.
<i>filter</i>	scan policy, refer to <code>LE_HCI_SCAN_FILT_*</code> in <a href="#">ble_hci_if.h</a>

**Returns**

- `SYS_ERR_SUCCESS`: success.
- others: refer to error code in [ble\\_err.h](#).

**4.3.3.24 LeGapSetAdvData()**

```
LE_ERR_STATE LeGapSetAdvData (  
    UINT8 len,  
    UINT8 * data )
```

Called to set ADV data.

**Parameters**

<i>len</i>	ADV data length.
<i>data</i>	ADV data.

**Returns**

- `SYS_ERR_SUCCESS`: success.
- others: refer to error code in [ble\\_err.h](#).



## 4.3.3.25 LeGapSetAdvParameter()

```
LE_ERR_STATE LeGapSetAdvParameter (
    LE_GAP_ADVERTISING_PARAM_T * params )
```

Called to set ADV parameters.

## Parameters

<i>params</i>	advertising params.
---------------	---------------------

## Returns

- SYS\_ERR\_SUCCESS: success.
- others: refer to error code in [ble\\_err.h](#).

## 4.3.3.26 LeGapSetConnParameter()

```
LE_ERR_STATE LeGapSetConnParameter (
    UINT16 interval_min,
    UINT16 interval_max,
    UINT16 slave_latency,
    UINT16 supervision_timeout )
```

Called to set connection parameters.

## Parameters

<i>interval_min</i>	mininum connection interval.
<i>interval_max</i>	maxinum connection interval.
<i>slave_latency</i>	slave letency.
<i>supervision_timeout</i>	supervison timeout.

## Returns

- SYS\_ERR\_SUCCESS: success.
- others: refer to error code in [ble\\_err.h](#).

## 4.3.3.27 LeGapSetDataChannelPduLen()

```
LE_ERR_STATE LeGapSetDataChannelPduLen (
    UINT16 conn_hdl,
```

```
UINT16 tx_octets,  
UINT16 tx_time )
```

Set data channel PDU length.

#### Parameters

<i>tx_octets</i>	the maximum number of octets in the Payload field that the local device will send to the remote device.
<i>tx_time</i>	the maximum number of microseconds that the local device will take to transmit a PDU to the remote device.

#### Returns

- `SYS_ERR_SUCCESS`: success.
- others: refer to error code in [ble\\_err.h](#).

#### 4.3.3.28 LeGapSetDefaultPhy()

```
LE_ERR_STATE LeGapSetDefaultPhy (  
    UINT8 tx,  
    UINT8 rx )
```

#### 4.3.3.29 LeGapSetPhy()

```
LE_ERR_STATE LeGapSetPhy (  
    UINT16 conn_hdl,  
    UINT8 tx,  
    UINT8 rx,  
    UINT16 option )
```

#### 4.3.3.30 LeGapSetRandAddr()

```
LE_ERR_STATE LeGapSetRandAddr (  
    BD_ADDR addr )
```

Called to set random address.

#### Parameters

<i>addr</i>	the random address which should be set.
-------------	---

## Returns

- `SYS_ERR_SUCCESS`: success.
- others: refer to error code in [ble\\_err.h](#).

4.3.3.31 `LeGapSetRpaTimeout()`

```
LE_ERR_STATE LeGapSetRpaTimeout (
    UINT16 timeout )
```

Set resolvable private address timeout.

## Parameters

<i>timeout</i>	RPA_Timeout, measured in seconds.
----------------	-----------------------------------

## Returns

- `SYS_ERR_SUCCESS`: success.
- others: refer to error code in [ble\\_err.h](#).

4.3.3.32 `LeGapSetStaticAddr()`

```
LE_ERR_STATE LeGapSetStaticAddr (
    BD_ADDR addr )
```

Called to set static address.

## Parameters

<i>addr</i>	the static address which should be set.
-------------	---

## Returns

- `SYS_ERR_SUCCESS`: success.
- others: refer to error code in [ble\\_err.h](#).

4.3.3.33 `LeSetScanParameter()`

```
LE_ERR_STATE LeSetScanParameter (
    LE_GAP_SCAN_PARAM_T * params )
```

Called to set scan parameters.

#### Parameters

<i>params</i>	scan parameters.
---------------	------------------

#### Returns

- `SYS_ERR_SUCCESS`: success.
- others: refer to error code in [ble\\_err.h](#).

#### 4.3.3.34 LeSetScanRspData()

```
LE_ERR_STATE LeSetScanRspData (
    UINT8 len,
    UINT8 * data )
```

Called to set scan response data.

#### Parameters

<i>len</i>	scan response data length.
<i>data</i>	scan response data.

#### Returns

- `SYS_ERR_SUCCESS`: success.
- others: refer to error code in [ble\\_err.h](#).

## 4.4 BLE GATT APIs

### Data Structures

- struct [LE\\_GATT\\_ATTR\\_T](#)
- struct [LE\\_GATT\\_MSG\\_ACCESS\\_READ\\_IND\\_T](#)
- struct [LE\\_GATT\\_MSG\\_ACCESS\\_WRITE\\_IND\\_T](#)
- struct [LE\\_GATT\\_MSG\\_CHAR\\_DESCRIPTOR\\_INFO\\_IND\\_T](#)
- struct [LE\\_GATT\\_MSG\\_CHARACTERISTIC\\_DECL\\_INFO\\_IND\\_T](#)
- struct [LE\\_GATT\\_MSG\\_CHARACTERISTIC\\_VAL\\_IND\\_T](#)
- struct [LE\\_GATT\\_MSG\\_CONFIRMATION\\_CFM\\_T](#)
- struct [LE\\_GATT\\_MSG\\_EXCHANGE\\_MTU\\_CFM\\_T](#)
- struct [LE\\_GATT\\_MSG\\_EXCHANGE\\_MTU\\_IND\\_T](#)
- struct [LE\\_GATT\\_MSG\\_EXECUTE\\_WRITE\\_RELIABLE\\_CFM\\_T](#)
- struct [LE\\_GATT\\_MSG\\_FIND\\_ALL\\_CHAR\\_DESC\\_CFM\\_T](#)
- struct [LE\\_GATT\\_MSG\\_FIND\\_ALL\\_PRIMARY\\_SERVICE\\_CFM\\_T](#)
- struct [LE\\_GATT\\_MSG\\_FIND\\_CHARACTERISTIC\\_CFM\\_T](#)
- struct [LE\\_GATT\\_MSG\\_FIND\\_INCLUDED\\_SERVICE\\_CFM\\_T](#)
- struct [LE\\_GATT\\_MSG\\_FIND\\_PRIMARY\\_SERVICE\\_BY\\_UUID\\_CFM\\_T](#)
- struct [LE\\_GATT\\_MSG\\_INCLUDE\\_SERVICE\\_INFO\\_IND\\_T](#)
- struct [LE\\_GATT\\_MSG\\_INDICATE\\_IND\\_T](#)
- struct [LE\\_GATT\\_MSG\\_NOTIFY\\_CFM\\_T](#)
- struct [LE\\_GATT\\_MSG\\_NOTIFY\\_IND\\_T](#)
- struct [LE\\_GATT\\_MSG\\_OPERATION\\_TIMEOUT\\_T](#)
- struct [LE\\_GATT\\_MSG\\_PREPARE\\_WRITE\\_RELIABLE\\_CFM\\_T](#)
- struct [LE\\_GATT\\_MSG\\_READ\\_CHAR\\_VAL\\_BY\\_UUID\\_CFM\\_T](#)
- struct [LE\\_GATT\\_MSG\\_READ\\_CHARACTERISTIC\\_VALUE\\_CFM\\_T](#)
- struct [LE\\_GATT\\_MSG\\_READ\\_LONG\\_CHAR\\_VAL\\_CFM\\_T](#)
- struct [LE\\_GATT\\_MSG\\_READ\\_MULTIPLE\\_CHAR\\_VAL\\_CFM\\_T](#)
- struct [LE\\_GATT\\_MSG\\_SERVICE\\_INFO\\_IND\\_T](#)
- struct [LE\\_GATT\\_MSG\\_SIGNED\\_WRITE\\_CFM\\_T](#)
- struct [LE\\_GATT\\_MSG\\_WRITE\\_CHAR\\_VAL\\_RELIABLE\\_CFM\\_T](#)
- struct [LE\\_GATT\\_MSG\\_WRITE\\_CHAR\\_VALUE\\_CFM\\_T](#)
- struct [LE\\_GATT\\_MSG\\_WRITE\\_LONG\\_CHAR\\_VALUE\\_CFM\\_T](#)
- struct [LE\\_GATT\\_MSG\\_WRITE\\_NO\\_RSP\\_CFM\\_T](#)
- struct [LE\\_GATT\\_SERVICE\\_T](#)

### Macros

- [#define CHAR\\_AGGREGATE\\_DESCRIPTOR](#)(len, pVal) {0, LE\_GATT\_UUID16, (UINT16 \*)&gcCharAggregateUuid, LE\_GATT\_PERMIT\_READ, 0, len, (UINT8 \*)&pVal}}
- [#define CHAR\\_CLIENT\\_CONFIG\\_DESCRIPTOR](#)(permit, pVal) {0, LE\_GATT\_UUID16, (UINT16 \*)&gcClientCharConfigUuid, LE\_GATT\_PERMIT\_READ | permit, 0, 2, (UINT8 \*)&pVal}}
- [#define CHAR\\_DECL\\_UUID16\\_ATTR\\_VAL](#)(prop, type) {(prop), 0, 0, UINT16\_LO(type), UINT16\_HI(type)}
- [#define CHAR\\_EXT\\_PROP\\_DESCRIPTOR](#)(pVal) {0, LE\_GATT\_UUID16, (UINT16 \*)&gcCharExtPropUuid, LE\_GATT\_PERMIT\_READ, 0, 2, (UINT8 \*)&pVal}}
- [#define CHAR\\_PRESENT\\_FORMAT\\_DESCRIPTOR](#)(pVal) {0, LE\_GATT\_UUID16, (UINT16 \*)&gcCharFormatUuid, LE\_GATT\_PERMIT\_READ, 0, 7, (UINT8 \*)&pVal}}
- [#define CHAR\\_SERVER\\_CONFIG\\_DESCRIPTOR](#)(permit, pVal) {0, LE\_GATT\_UUID16, (UINT16 \*)&gcServerCharConfigUuid, LE\_GATT\_PERMIT\_READ | permit, 0, 2, (UINT8 \*)&pVal}}
- [#define CHAR\\_USER\\_DESC\\_DESCRIPTOR](#)(permit, maxLen, len, pVal) {0, LE\_GATT\_UUID16, (UINT16 \*)&gcCharUserDescUuid, permit, maxLen, len, (UINT8 \*)&pVal}}

- `#define CHARACTERISTIC_DECL_UUID128(pVal) {0, LE_GATT_UUID16, (UINT16 *)&gcCharacteristicUuid, LE_GATT_PERMIT_READ, 0, 19, (UINT8 *)&pVal}`
- `#define CHARACTERISTIC_DECL_UUID16(pVal) {0, LE_GATT_UUID16, (UINT16 *)&gcCharacteristicUuid, LE_GATT_PERMIT_READ, 0, 5, (UINT8 *)&pVal}`
- `#define CHARACTERISTIC_UUID128(pUuid, permit, maxLen, len, pVal) {0, LE_GATT_UUID128, (UINT16 *)&pUuid, permit, maxLen, len, (UINT8 *)&pVal}`
- `#define CHARACTERISTIC_UUID16(pUuid, permit, maxLen, len, pVal) {0, LE_GATT_UUID16, (UINT16 *)&pUuid, permit, maxLen, len, (UINT8 *)&pVal}`
- `#define GATT_CHAR_AGG_FORMAT_UUID 0x2905`
- `#define GATT_CHAR_EXT_PROPS_UUID 0x2900`
- `#define GATT_CHAR_FORMAT_UUID 0x2904`
- `#define GATT_CHAR_USER_DESC_UUID 0x2901`
- `#define GATT_CHARACTERISTIC_UUID 0x2803`
- `#define GATT_CLIENT_CHAR_CFG_UUID 0x2902`
- `#define GATT_EXT_REPORT_REF_UUID 0x2907`
- `#define GATT_INCLUDE_UUID 0x2802`
- `#define GATT_PRIMARY_SERVICE_UUID 0x2800`
- `#define GATT_REPORT_REF_UUID 0x2908`
- `#define GATT_SECONDARY_SERVICE_UUID 0x2801`
- `#define GATT_SERV_CHAR_CFG_UUID 0x2903`
- `#define GATT_VALID_RANGE_UUID 0x2906`
- `#define INCLUDE_DECL_UUID128(pVal) {0, LE_GATT_UUID16, (UINT16 *)&gcIncludeUuid, LE_GATT_PERMIT_READ, 0, 4, (UINT8 *)&pVal}`
- `#define INCLUDE_DECL_UUID128_ATTR_VAL() {0, 0, 0, 0}`
- `#define INCLUDE_DECL_UUID16_ATTR_VAL(uuid) {0, 0, 0, 0, UINT16_LO(uuid), UINT16_HI(uuid)}`
- `#define INCLUDE_DECL_UUID16(pVal) {0, LE_GATT_UUID16, (UINT16 *)&gcIncludeUuid, LE_GATT_PERMIT_READ, 0, 6, (UINT8 *)&pVal}`
- `#define LE_ATT_UUID_SIZE 2`
- `#define LE_GATT_CHAR_PROP_AUTH 0x40`
- `#define LE_GATT_CHAR_PROP_BCAST 0x01`
- *Characteristic Properties Bit.*
- `#define LE_GATT_CHAR_PROP_EXT_PROP 0x80`
- `#define LE_GATT_CHAR_PROP_IND 0x20`
- `#define LE_GATT_CHAR_PROP_NTF 0x10`
- `#define LE_GATT_CHAR_PROP_RD 0x02`
- `#define LE_GATT_CHAR_PROP_WR 0x08`
- `#define LE_GATT_CHAR_PROP_WR_NO_RESP 0x04`
- `#define LE_GATT_CLIENT_CFG_INDICATION 0x02`
- `#define LE_GATT_CLIENT_CFG_NOTIFICATION 0x01`
- `#define LE_GATT_EXT_PROP_RELIABLE_WR 0x0001`
- `#define LE_GATT_EXT_PROP_WR_AUX 0x0002`
- `#define LE_GATT_FLAG_PREPARE_WRITE 0x02`
- `#define LE_GATT_FLAG_WRITE_CMD 0x01`
- `#define LE_GATT_FLAG_WRITE_REQ 0x00`
- `#define LE_GATT_PERM_AUTH_READABLE (0x1<<4)`
- `#define LE_GATT_PERM_AUTH_WRITABLE (0x1<<6)`
- `#define LE_GATT_PERM_NONE (0x00)`
- `#define LE_GATT_PERM_READ (0x1<<1)`
- `#define LE_GATT_PERM_RELIABLE_WRITE (0x1<<5)`
- `#define LE_GATT_PERM_WRITE_CMD (0x1<<2)`
- `#define LE_GATT_PERM_WRITE_REQ (0x1<<3)`
- `#define LE_GATT_PERMIT_AUTHEN_READ (0x0040)`
- `#define LE_GATT_PERMIT_AUTHEN_WRITE (0x0080)`
- `#define LE_GATT_PERMIT_AUTHOR_READ (0x0004)`
- `#define LE_GATT_PERMIT_AUTHOR_WRITE (0x0008)`

- `#define LE_GATT_PERMIT_ENCRYPT_READ (0x0010)`
- `#define LE_GATT_PERMIT_ENCRYPT_WRITE (0x0020)`
- `#define LE_GATT_PERMIT_READ (0x0001)`
- `#define LE_GATT_PERMIT_READABLE (LE_GATT_PERMIT_READ | LE_GATT_PERMIT_AUTHEN_READ | LE_GATT_PERMIT_AUTHOR_READ | LE_GATT_PERMIT_ENCRYPT_READ | LE_GATT_PERMIT_SC_AUTHEN_READ)`
- `#define LE_GATT_PERMIT_SC_AUTHEN_READ (0x0100)`
- `#define LE_GATT_PERMIT_SC_AUTHEN_WRITE (0x0200)`
- `#define LE_GATT_PERMIT_WRITABLE (LE_GATT_PERMIT_WRITE | LE_GATT_PERMIT_AUTHEN_WRITE | LE_GATT_PERMIT_AUTHOR_WRITE | LE_GATT_PERMIT_ENCRYPT_WRITE | LE_GATT_PERMIT_SC_AUTHEN_WRITE)`
- `#define LE_GATT_PERMIT_WRITE (0x0002)`
- `#define PRIMARY_SERVICE_DECL_UUID128(pUuid) {0, LE_GATT_UUID16, (UINT16 *)&gcPrimaryServiceUuid, LE_GATT_PERMIT_READ, 0, 16, (UINT8 *)&pUuid}`
- `#define PRIMARY_SERVICE_DECL_UUID16(pUuid) {0, LE_GATT_UUID16, (UINT16 *)&gcPrimaryServiceUuid, LE_GATT_PERMIT_READ, 0, 2, (UINT8 *)&pUuid}`
- `#define SECONDARY_SERVICE_DECL_UUID128(pUuid) {0, LE_GATT_UUID16, (UINT16 *)&gcSecondaryServiceUuid, LE_GATT_PERMIT_READ, 0, 16, (UINT8 *)&pUuid}`
- `#define SECONDARY_SERVICE_DECL_UUID16(pUuid) {0, LE_GATT_UUID16, (UINT16 *)&gcSecondaryServiceUuid, LE_GATT_PERMIT_READ, 0, 2, (UINT8 *)&pUuid}`

## Enumerations

- enum {  
`LE_GATT_MSG_INIT_CFM = LE_GATT_MSG_BASE, LE_GATT_MSG_EXCHANGE_MTU_IND, LE_GATT_MSG_EXCHANGE_MTU_RSP, LE_GATT_MSG_ACCESS_READ_IND, LE_GATT_MSG_ACCESS_WRITE_IND, LE_GATT_MSG_SERVICE_INFO_IND, LE_GATT_MSG_FIND_ALL_PRIMARY_SERVICES_IND, LE_GATT_MSG_FIND_PRIMARY_SERVICE_BY_UUID_CFM, LE_GATT_MSG_INCLUDE_SERVICE_INFO_IND, LE_GATT_MSG_FIND_INCLUDED_SERVICE_CFM, LE_GATT_MSG_CHARACTERISTIC_DECL_INFO_IND, LE_GATT_MSG_FIND_CHARACTERISTIC_CFM, LE_GATT_MSG_CHAR_DESCRIPTOR_INFO_IND, LE_GATT_MSG_FIND_ALL_CHAR_DESC_CFM, LE_GATT_MSG_CHARACTERISTIC_VAL_IND, LE_GATT_MSG_READ_CHARACTERISTIC_VALUE_CFM, LE_GATT_MSG_READ_CHAR_VAL_BY_UUID_CFM, LE_GATT_MSG_READ_LONG_CHAR_VAL_CFM, LE_GATT_MSG_READ_MULTIPLE_CHAR_VAL_CFM, LE_GATT_MSG_WRITE_CHAR_VALUE_CFM, LE_GATT_MSG_WRITE_LONG_CHAR_VALUE_CFM, LE_GATT_MSG_WRITE_CHAR_VAL_RELIABLE_CFM, LE_GATT_MSG_PREPARE_WRITE_RELIABLE_CFM, LE_GATT_MSG_EXECUTE_WRITE_RELIABLE_CFM, LE_GATT_MSG_WRITE_NO_RSP_CFM, LE_GATT_MSG_SIGNED_WRITE_CFM, LE_GATT_MSG_NOTIFY_IND, LE_GATT_MSG_NOTIFY_CFM, LE_GATT_MSG_INDICATE_IND, LE_GATT_MSG_CONFIRMATION_CFM, LE_GATT_MSG_OPERATION_TIMEOUT, LE_GATT_MSG_SIGN_RESOLUTION_FAIL, LE_GATT_MSG_TOP }`

*BLE GATT message id.*

## Functions

- `LE_ERR_STATE LeGattAccessReadRsp (UINT16 conn_hdl, UINT16 handle, UINT8 att_err)`  
*Gatt access read response.*
- `LE_ERR_STATE LeGattAccessWriteRsp (UINT16 conn_hdl, UINT8 method, UINT16 handle, UINT8 att_err)`  
*Gatt access write response.*
- `LE_ERR_STATE LeGattChangeAttrVal (LE_GATT_SERVICE_T *svc, UINT16 attrId, UINT16 len, void *val)`  
*Change attribute value.*
- `LE_ERR_STATE LeGattCharValConfirmation (UINT16 conn_hdl)`  
*Prepare write characteristic value response.*
- `LE_ERR_STATE LeGattCharValIndicate (UINT16 conn_hdl, UINT16 hdl, UINT16 len, UINT8 *pval)`  
*Gatt characteristic value indication.*

- LE\_ERR\_STATE [LeGattCharValNotify](#) (UINT16 conn\_hdl, UINT16 hdl, UINT16 len, UINT8 \*pval)  
*Gatt characteristic value notification.*
- LE\_ERR\_STATE [LeGattExchangeMtuReq](#) (UINT16 conn\_hdl, UINT16 mtu)  
*Exchange MTU request.*
- LE\_ERR\_STATE [LeGattExchangeMtuRsp](#) (UINT16 conn\_hdl, UINT16 mtu)  
*Exchange MTU response.*
- LE\_ERR\_STATE [LeGattExecuteWriteCharValReliable](#) (UINT16 conn\_hdl, BOOL yesno)  
*Execute write characteristic value request.*
- LE\_ERR\_STATE [LeGattFindAllCharacteristic](#) (UINT16 conn\_hdl, UINT16 start\_hdl, UINT16 end\_hdl)  
*Find all characteristic.*
- LE\_ERR\_STATE [LeGattFindAllCharDescriptor](#) (UINT16 conn\_hdl, UINT16 start\_hdl, UINT16 end\_hdl)  
*Find all characteristic description.*
- LE\_ERR\_STATE [LeGattFindAllPrimaryService](#) (UINT16 conn\_hdl)  
*Find all primary service.*
- LE\_ERR\_STATE [LeGattFindCharacteristicByUuid](#) (UINT16 conn\_hdl, UINT16 start\_hdl, UINT16 end\_hdl, UINT8 format, UINT16 \*uuid)  
*Find characteristic by UUID.*
- LE\_ERR\_STATE [LeGattFindIncludedService](#) (UINT16 conn\_hdl, UINT16 start\_hdl, UINT16 end\_hdl)  
*Find include service.*
- LE\_ERR\_STATE [LeGattFindPrimaryServiceByUuid](#) (UINT16 conn\_hdl, UINT8 format, UINT16 \*uuid)  
*Find primary service by UUID.*
- UINT16 [LeGattGetAttrHandle](#) (LE\_GATT\_SERVICE\_T \*svc, UINT16 attrId)  
*Get attribute handle.*
- LE\_ERR\_STATE [LeGattGetAttrVal](#) (LE\_GATT\_SERVICE\_T \*svc, UINT16 attrId, UINT16 \*len, void \*val)  
*Get attribute value.*
- UINT16 [LeGattGetAttrValLen](#) (LE\_GATT\_SERVICE\_T \*svc, UINT16 attrId)  
*Get the length of attribute value.*
- UINT16 [LeGattGetAttrValMaxLen](#) (LE\_GATT\_SERVICE\_T \*svc, UINT16 attrId)  
*Get the max length of attribute value.*
- void [LeGattInit](#) (TASK appTask)  
*BLE Gatt module init.*
- LE\_ERR\_STATE [LeGattModifyAttrVal](#) (LE\_GATT\_SERVICE\_T \*svc, UINT16 attrId, UINT16 offset, UINT16 len, void \*val)  
*Modify attribute value.*
- LE\_ERR\_STATE [LeGattPrepareWriteCharValReliable](#) (UINT16 conn\_hdl, UINT16 handle, UINT16 offset, UINT16 len, UINT8 \*val)  
*Prepare write characteristic value request.*
- LE\_ERR\_STATE [LeGattReadCharValByUuid](#) (UINT16 conn\_hdl, UINT16 start\_hdl, UINT16 end\_hdl, UINT8 format, UINT16 \*uuid)  
*Read a characteristic value by UUID.*
- LE\_ERR\_STATE [LeGattReadCharValue](#) (UINT16 conn\_hdl, UINT16 handle)  
*Read a characteristic value.*
- LE\_ERR\_STATE [LeGattReadLongCharVal](#) (UINT16 conn\_hdl, UINT16 handle, UINT16 offset)  
*Read a long characteristic value.*
- LE\_ERR\_STATE [LeGattReadMultipleCharVal](#) (UINT16 conn\_hdl, UINT16 count, UINT16 \*handle)  
*Read Multiple characteristic values.*
- LE\_ERR\_STATE [LeGattRegisterIncludeService](#) (UINT16 inc\_hdl, UINT16 start\_hdl, UINT16 end\_hdl, UI↔NT16 uuid)  
*Called to register an include service.*
- LE\_GATT\_SERVICE\_T \* [LeGattRegisterService](#) (LE\_GATT\_ATTR\_T \*attrTable, UINT16 numAttr)  
*Called to register a service.*



- LE\_ERR\_STATE [LeGattSignedWriteNoRsp](#) (UINT16 conn\_hdl, UINT16 handle, UINT16 len, UINT8 \*val)  
*Signed write without response.*
- void [LeGattStopCurrentProcedure](#) (UINT16 conn\_hdl)  
*Stop current procedure.*
- LE\_ERR\_STATE [LeGattWriteCharVal](#) (UINT16 conn\_hdl, UINT16 handle, UINT16 len, UINT8 \*val)  
*Write characteristic value.*
- LE\_ERR\_STATE [LeGattWriteCharValReliable](#) (UINT16 conn\_hdl, UINT16 handle, UINT16 offset, UINT16 len, UINT8 \*val)  
*Write characteristic value reliable.*
- LE\_ERR\_STATE [LeGattWriteLongCharVal](#) (UINT16 conn\_hdl, UINT16 handle, UINT16 offset, UINT16 len, UINT8 \*val)  
*Write long characteristic value.*
- LE\_ERR\_STATE [LeGattWriteNoRsp](#) (UINT16 conn\_hdl, UINT16 handle, UINT16 len, UINT8 \*val)  
*Write without response.*

## Variables

- const UINT16 [gcCharacteristicUuid](#)
- const UINT16 [gcCharAggregateUuid](#)
- const UINT16 [gcCharExtPropUuid](#)
- const UINT16 [gcCharFormatUuid](#)
- const UINT16 [gcCharUserDescUuid](#)
- const UINT16 [gcClientCharConfigUuid](#)
- const UINT16 [gcExtReportRefUuid](#)
- const UINT16 [gcIncludeUuid](#)
- const UINT16 [gcPrimaryServiceUuid](#)
- const UINT16 [gcReportRefUuid](#)
- const UINT16 [gcSecondaryServiceUuid](#)
- const UINT16 [gcServerCharConfigUuid](#)
- const UINT16 [gcValidRangeUuid](#)

### 4.4.1 Detailed Description

### 4.4.2 Macro Definition Documentation

#### 4.4.2.1 CHARAggregateDescriptor

```
#define CHARAggregateDescriptor(  
    len,  
    pVal ) {0, LE_GATT_UUID16, (UINT16 *)&gcCharAggregateUuid, LE_GATT_PERMIT_READ,  
0, len, (UINT8 *) (pVal)}
```

#### 4.4.2.2 CHAR\_CLIENT\_CONFIG\_DESCRIPTOR

```
#define CHAR_CLIENT_CONFIG_DESCRIPTOR(  
    permit,  
    pVal ) {0, LE_GATT_UUID16, (UINT16 *)&gcClientCharConfigUuid, LE_GATT_PERMIT_READ  
| permit, 0, 2, (UINT8 *) (pVal)}
```

#### 4.4.2.3 CHAR\_DECL\_UUID16\_ATTR\_VAL

```
#define CHAR_DECL_UUID16_ATTR_VAL(  
    prop,  
    type ) {(prop), 0, 0, UINT16_LO(type), UINT16_HI(type)}
```

#### 4.4.2.4 CHAR\_EXT\_PROP\_DESCRIPTOR

```
#define CHAR_EXT_PROP_DESCRIPTOR(  
    pVal ) {0, LE_GATT_UUID16, (UINT16 *)&gcCharExtPropUuid, LE_GATT_PERMIT_READ, 0,  
2, (UINT8 *) (pVal)}
```

#### 4.4.2.5 CHAR\_PRESENT\_FORMAT\_DESCRIPTOR

```
#define CHAR_PRESENT_FORMAT_DESCRIPTOR(  
    pVal ) {0, LE_GATT_UUID16, (UINT16 *)&gcCharFormatUuid, LE_GATT_PERMIT_READ, 0,  
7, (UINT8 *) (pVal)}
```

#### 4.4.2.6 CHAR\_SERVER\_CONFIG\_DESCRIPTOR

```
#define CHAR_SERVER_CONFIG_DESCRIPTOR(  
    permit,  
    pVal ) {0, LE_GATT_UUID16, (UINT16 *)&gcServerCharConfigUuid, LE_GATT_PERMIT_READ  
| permit, 0, 2, (UINT8 *) (pVal)}
```

#### 4.4.2.7 CHAR\_USER\_DESC\_DESCRIPTOR

```
#define CHAR_USER_DESC_DESCRIPTOR(  
    permit,  
    maxLen,  
    len,  
    pVal ) {0, LE_GATT_UUID16, (UINT16 *)&gcCharUserDescUuid, permit, maxLen, len,  
(UINT8 *) (pVal)}
```

#### 4.4.2.8 CHARACTERISTIC\_DECL\_UUID128

```
#define CHARACTERISTIC_DECL_UUID128(  
    pVal ) {0, LE_GATT_UUID16, (UINT16 *)&gcCharacteristicUuid, LE_GATT_PERMIT_READ,  
    0, 19, (UINT8 *) (pVal)}
```

#### 4.4.2.9 CHARACTERISTIC\_DECL\_UUID16

```
#define CHARACTERISTIC_DECL_UUID16(  
    pVal ) {0, LE_GATT_UUID16, (UINT16 *)&gcCharacteristicUuid, LE_GATT_PERMIT_READ,  
    0, 5, (UINT8 *) (pVal)}
```

#### 4.4.2.10 CHARACTERISTIC\_UUID128

```
#define CHARACTERISTIC_UUID128(  
    pUuid,  
    permit,  
    maxLen,  
    len,  
    pVal ) {0, LE_GATT_UUID128, (UINT16 *)pUuid, permit, maxLen, len, (UINT8 *) (pVal)}
```

#### 4.4.2.11 CHARACTERISTIC\_UUID16

```
#define CHARACTERISTIC_UUID16(  
    pUuid,  
    permit,  
    maxLen,  
    len,  
    pVal ) {0, LE_GATT_UUID16, (UINT16 *)pUuid, permit, maxLen, len, (UINT8 *) (pVal)}
```

#### 4.4.2.12 GATT\_CHAR\_AGG\_FORMAT\_UUID

```
#define GATT_CHAR_AGG_FORMAT_UUID 0x2905
```

#### 4.4.2.13 GATT\_CHAR\_EXT\_PROPS\_UUID

```
#define GATT_CHAR_EXT_PROPS_UUID 0x2900
```

#### 4.4.2.14 GATT\_CHAR\_FORMAT\_UUID

```
#define GATT_CHAR_FORMAT_UUID 0x2904
```

#### 4.4.2.15 GATT\_CHAR\_USER\_DESC\_UUID

```
#define GATT_CHAR_USER_DESC_UUID 0x2901
```

#### 4.4.2.16 GATT\_CHARACTERISTIC\_UUID

```
#define GATT_CHARACTERISTIC_UUID 0x2803
```

#### 4.4.2.17 GATT\_CLIENT\_CHAR\_CFG\_UUID

```
#define GATT_CLIENT_CHAR_CFG_UUID 0x2902
```

#### 4.4.2.18 GATT\_EXT\_REPORT\_REF\_UUID

```
#define GATT_EXT_REPORT_REF_UUID 0x2907
```

#### 4.4.2.19 GATT\_INCLUDE\_UUID

```
#define GATT_INCLUDE_UUID 0x2802
```

#### 4.4.2.20 GATT\_PRIMARY\_SERVICE\_UUID

```
#define GATT_PRIMARY_SERVICE_UUID 0x2800
```

#### 4.4.2.21 GATT\_REPORT\_REF\_UUID

```
#define GATT_REPORT_REF_UUID 0x2908
```

#### 4.4.2.22 GATT\_SECONDARY\_SERVICE\_UUID

```
#define GATT_SECONDARY_SERVICE_UUID 0x2801
```

#### 4.4.2.23 GATT\_SERV\_CHAR\_CFG\_UUID

```
#define GATT_SERV_CHAR_CFG_UUID 0x2903
```

#### 4.4.2.24 GATT\_VALID\_RANGE\_UUID

```
#define GATT_VALID_RANGE_UUID 0x2906
```

#### 4.4.2.25 INCLUDE\_DECL\_UUID128

```
#define INCLUDE_DECL_UUID128(  
    pVal ) {0, LE_GATT_UUID16, (UINT16 *)&gcIncludeUuid, LE_GATT_PERMIT_READ, 0, 4,  
(UINT8 *) (pVal)}
```

#### 4.4.2.26 INCLUDE\_DECL\_UUID128\_ATTR\_VAL

```
#define INCLUDE_DECL_UUID128_ATTR_VAL( ) {0, 0, 0, 0}
```

#### 4.4.2.27 INCLUDE\_DECL\_UUID16\_ATTR\_VAL

```
#define INCLUDE_DECL_UUID16_ATTR_VAL(  
    uuid ) {0, 0, 0, 0, UINT16_LO(uuid), UINT16_HI(uuid)}
```

#### 4.4.2.28 INCLUDE\_DECL\_UUIN16

```
#define INCLUDE_DECL_UUIN16(  
    pVal ) {0, LE_GATT_UUID16, (UINT16 *)&gcIncludeUuid, LE_GATT_PERMIT_READ, 0, 6,  
(UINT8 *) (pVal)}
```

#### 4.4.2.29 LE\_ATT\_UUID\_SIZE

```
#define LE_ATT_UUID_SIZE 2
```

#### 4.4.2.30 LE\_GATT\_CHAR\_PROP\_AUTH

```
#define LE_GATT_CHAR_PROP_AUTH 0x40
```

#### 4.4.2.31 LE\_GATT\_CHAR\_PROP\_BCAST

```
#define LE_GATT_CHAR_PROP_BCAST 0x01
```

Characteristic Properties Bit.

#### 4.4.2.32 LE\_GATT\_CHAR\_PROP\_EXT\_PROP

```
#define LE_GATT_CHAR_PROP_EXT_PROP 0x80
```

#### 4.4.2.33 LE\_GATT\_CHAR\_PROP\_IND

```
#define LE_GATT_CHAR_PROP_IND 0x20
```

#### 4.4.2.34 LE\_GATT\_CHAR\_PROP\_NTF

```
#define LE_GATT_CHAR_PROP_NTF 0x10
```

#### 4.4.2.35 LE\_GATT\_CHAR\_PROP\_RD

```
#define LE_GATT_CHAR_PROP_RD 0x02
```

**4.4.2.36 LE\_GATT\_CHAR\_PROP\_WR**

```
#define LE_GATT_CHAR_PROP_WR 0x08
```

**4.4.2.37 LE\_GATT\_CHAR\_PROP\_WR\_NO\_RESP**

```
#define LE_GATT_CHAR_PROP_WR_NO_RESP 0x04
```

**4.4.2.38 LE\_GATT\_CLIENT\_CFG\_INDICATION**

```
#define LE_GATT_CLIENT_CFG_INDICATION 0x02
```

**4.4.2.39 LE\_GATT\_CLIENT\_CFG\_NOTIFICATION**

```
#define LE_GATT_CLIENT_CFG_NOTIFICATION 0x01
```

**4.4.2.40 LE\_GATT\_EXT\_PROP\_RELIABLE\_WR**

```
#define LE_GATT_EXT_PROP_RELIABLE_WR 0x0001
```

**4.4.2.41 LE\_GATT\_EXT\_PROP\_WR\_AUX**

```
#define LE_GATT_EXT_PROP_WR_AUX 0x0002
```

**4.4.2.42 LE\_GATT\_FLAG\_PREPARE\_WRITE**

```
#define LE_GATT_FLAG_PREPARE_WRITE 0x02
```

**4.4.2.43 LE\_GATT\_FLAG\_WRITE\_CMD**

```
#define LE_GATT_FLAG_WRITE_CMD 0x01
```

#### 4.4.2.44 LE\_GATT\_FLAG\_WRITE\_REQ

```
#define LE_GATT_FLAG_WRITE_REQ 0x00
```

#### 4.4.2.45 LE\_GATT\_PERM\_AUTH\_READABLE

```
#define LE_GATT_PERM_AUTH_READABLE (0x1<<4)
```

#### 4.4.2.46 LE\_GATT\_PERM\_AUTH\_WRITABLE

```
#define LE_GATT_PERM_AUTH_WRITABLE (0x1<<6)
```

#### 4.4.2.47 LE\_GATT\_PERM\_NONE

```
#define LE_GATT_PERM_NONE (0x00)
```

#### 4.4.2.48 LE\_GATT\_PERM\_READ

```
#define LE_GATT_PERM_READ (0x1<<1)
```

#### 4.4.2.49 LE\_GATT\_PERM\_RELIABLE\_WRITE

```
#define LE_GATT_PERM_RELIABLE_WRITE (0x1<<5)
```

#### 4.4.2.50 LE\_GATT\_PERM\_WRITE\_CMD

```
#define LE_GATT_PERM_WRITE_CMD (0x1<<2)
```

#### 4.4.2.51 LE\_GATT\_PERM\_WRITE\_REQ

```
#define LE_GATT_PERM_WRITE_REQ (0x1<<3)
```



**4.4.2.52 LE\_GATT\_PERMIT\_AUTHEN\_READ**

```
#define LE_GATT_PERMIT_AUTHEN_READ (0x0040)
```

**4.4.2.53 LE\_GATT\_PERMIT\_AUTHEN\_WRITE**

```
#define LE_GATT_PERMIT_AUTHEN_WRITE (0x0080)
```

**4.4.2.54 LE\_GATT\_PERMIT\_AUTHOR\_READ**

```
#define LE_GATT_PERMIT_AUTHOR_READ (0x0004)
```

**4.4.2.55 LE\_GATT\_PERMIT\_AUTHOR\_WRITE**

```
#define LE_GATT_PERMIT_AUTHOR_WRITE (0x0008)
```

**4.4.2.56 LE\_GATT\_PERMIT\_ENCRYPT\_READ**

```
#define LE_GATT_PERMIT_ENCRYPT_READ (0x0010)
```

**4.4.2.57 LE\_GATT\_PERMIT\_ENCRYPT\_WRITE**

```
#define LE_GATT_PERMIT_ENCRYPT_WRITE (0x0020)
```

**4.4.2.58 LE\_GATT\_PERMIT\_READ**

```
#define LE_GATT_PERMIT_READ (0x0001)
```

**4.4.2.59 LE\_GATT\_PERMIT\_READABLE**

```
#define LE_GATT_PERMIT_READABLE (LE_GATT_PERMIT_READ | LE_GATT_PERMIT_AUTHEN_READ | LE_GATT_PERMIT_AUTHOR_READ  
| LE_GATT_PERMIT_ENCRYPT_READ | LE_GATT_PERMIT_SC_AUTHEN_READ)
```

#### 4.4.2.60 LE\_GATT\_PERMIT\_SC\_AUTHEN\_READ

```
#define LE_GATT_PERMIT_SC_AUTHEN_READ (0x0100)
```

#### 4.4.2.61 LE\_GATT\_PERMIT\_SC\_AUTHEN\_WRITE

```
#define LE_GATT_PERMIT_SC_AUTHEN_WRITE (0x0200)
```

#### 4.4.2.62 LE\_GATT\_PERMIT\_WRITABLE

```
#define LE_GATT_PERMIT_WRITABLE (LE_GATT_PERMIT_WRITE | LE_GATT_PERMIT_AUTHEN_WRITE | LE_GATT_PERMIT_AUTHOR_WRITE |  
LE_GATT_PERMIT_ENCRYPT_WRITE | LE_GATT_PERMIT_SC_AUTHEN_WRITE)
```

#### 4.4.2.63 LE\_GATT\_PERMIT\_WRITE

```
#define LE_GATT_PERMIT_WRITE (0x0002)
```

#### 4.4.2.64 PRIMARY\_SERVICE\_DECL\_UUID128

```
#define PRIMARY_SERVICE_DECL_UUID128(  
    pUuid ) {0, LE_GATT_UUID16, (UINT16 *)&gcPrimaryServiceUuid, LE_GATT_PERMIT_READ,  
0, 16, (UINT8 *) (pUuid)}
```

#### 4.4.2.65 PRIMARY\_SERVICE\_DECL\_UUID16

```
#define PRIMARY_SERVICE_DECL_UUID16(  
    pUuid ) {0, LE_GATT_UUID16, (UINT16 *)&gcPrimaryServiceUuid, LE_GATT_PERMIT_READ,  
0, 2, (UINT8 *) (pUuid)}
```

#### 4.4.2.66 SECONDARY\_SERVICE\_DECL\_UUID128

```
#define SECONDARY_SERVICE_DECL_UUID128(  
    pUuid ) {0, LE_GATT_UUID16, (UINT16 *)&gcSecondaryServiceUuid, LE_GATT_PERMIT_READ,  
0, 16, (UINT8 *) (pUuid)}
```

## 4.4.2.67 SECONDARY\_SERVICE\_DECL\_UUID16

```
#define SECONDARY_SERVICE_DECL_UUID16(  
    pUuid ) {0, LE_GATT_UUID16, (UINT16 *)&gcSecondaryServiceUuid, LE_GATT_PERMIT_READ,  
    0, 2, (UINT8 *) (pUuid)}
```

## 4.4.3 Enumeration Type Documentation

## 4.4.3.1 anonymous enum

anonymous enum

BLE GATT message id.

## Enumerator

LE_GATT_MSG_INIT_CFM	initialize confirm message
LE_GATT_MSG_EXCHANGE_MTU_IND	exchange MTU indication
LE_GATT_MSG_EXCHANGE_MTU_CFM	exchange MTU confirm
LE_GATT_MSG_ACCESS_READ_IND	access read indication
LE_GATT_MSG_ACCESS_WRITE_IND	access write indication
LE_GATT_MSG_SERVICE_INFO_IND	service information indication
LE_GATT_MSG_FIND_ALL_PRIMARY_SERVICE_↔ _CFM	find all primary service confirm
LE_GATT_MSG_FIND_PRIMARY_SERVICE_BY_↔ _UUID_CFM	find primary service by UUID confirm
LE_GATT_MSG_INCLUDE_SERVICE_INFO_IND	include service information
LE_GATT_MSG_FIND_INCLUDED_SERVICE_CFM	find include service confirm
LE_GATT_MSG_CHARACTERISTIC_DECL_INFO_↔ _IND	characteristic declaration info indication
LE_GATT_MSG_FIND_CHARACTERISTIC_CFM	find characteristic confirm
LE_GATT_MSG_CHAR_DESCRIPTOR_INFO_IND	characteristic descriptor info indication
LE_GATT_MSG_FIND_ALL_CHAR_DESC_CFM	find all characteristic descriptors confirm
LE_GATT_MSG_CHARACTERISTIC_VAL_IND	characteristic value, indication message
LE_GATT_MSG_READ_CHARACTERISTIC_VAL_↔ _UE_CFM	read characteristic value, confirm message
LE_GATT_MSG_READ_CHAR_VAL_BY_UUID_↔ _CFM	read characteristic value by UUID confirm message
LE_GATT_MSG_READ_LONG_CHAR_VAL_CFM	read long characteristic value confirm message
LE_GATT_MSG_READ_MULTIPLE_CHAR_VAL_↔ _CFM	read multiple characteristic value confirm
LE_GATT_MSG_WRITE_CHAR_VALUE_CFM	write characteristic value confirm
LE_GATT_MSG_WRITE_LONG_CHAR_VALUE_↔ _CFM	write long characteristic value confirm
LE_GATT_MSG_WRITE_CHAR_VAL_RELIABLE_↔ _CFM	write characteristic value reliable confirm
LE_GATT_MSG_PREPARE_WRITE_RELIABLE_↔ _CFM	prepare write reliable confirm

## Enumerator

LE_GATT_MSG_EXECUTE_WRITE_RELIABLE_CFM	execute write reliable confirm
LE_GATT_MSG_WRITE_NO_RSP_CFM	write no response confirm
LE_GATT_MSG_SIGNED_WRITE_CFM	signed write confirm
LE_GATT_MSG_NOTIFY_IND	notify indication
LE_GATT_MSG_NOTIFY_CFM	notify confirm
LE_GATT_MSG_INDICATE_IND	indicate indication
LE_GATT_MSG_CONFIRMATION_CFM	confirmation confirm
LE_GATT_MSG_OPERATION_TIMEOUT	operation timeout
LE_GATT_MSG_SIGN_RESOLUTION_FAIL	sign resolution fail
LE_GATT_MSG_TOP	top of GATT message id

## 4.4.4 Function Documentation

## 4.4.4.1 LeGattAccessReadRsp()

```
LE_ERR_STATE LeGattAccessReadRsp (
    UINT16 conn_hdl,
    UINT16 handle,
    UINT8 att_err )
```

Gatt access read response.

## Parameters

<i>conn_hdl</i>	connection handle.
<i>handle</i>	attribute handle.
<i>att_err</i>	0 is OK, others refer to LE_ATT_ERR_* in <a href="#">ble_att_if.h</a> .

## Returns

- SYS\_ERR\_SUCCESS: success.
- others: refer to error code in [ble\\_err.h](#).

## 4.4.4.2 LeGattAccessWriteRsp()

```
LE_ERR_STATE LeGattAccessWriteRsp (
    UINT16 conn_hdl,
    UINT8 method,
    UINT16 handle,
    UINT8 att_err )
```

Gatt access write response.

## Parameters

<i>conn_hdl</i>	connection handle.
<i>method</i>	refer to LE_GATT_FLAG_* in <a href="#">ble_gatt_if.h</a>
<i>handle</i>	attribute handle.
<i>att_err</i>	0 is OK, others refer to LE_ATT_ERR_* in <a href="#">ble_att_if.h</a> .

## Returns

- SYS\_ERR\_SUCCESS: success.
- others: refer to error code in [ble\\_err.h](#).

## 4.4.4.3 LeGattChangeAttrVal()

```
LE_ERR_STATE LeGattChangeAttrVal (
    LE_GATT_SERVICE_T * svc,
    UINT16 attrId,
    UINT16 len,
    void * val )
```

Change attribute value.

## Parameters

	<i>svc</i>	service.
	<i>attrId</i>	attribute index of service.
in	<i>len</i>	attribute value length.
in	<i>val</i>	attribute value.

## Returns

- SYS\_ERR\_SUCCESS: success.
- others: refer to error code in [ble\\_err.h](#).

## 4.4.4.4 LeGattCharValConfirmation()

```
LE_ERR_STATE LeGattCharValConfirmation (
    UINT16 conn_hdl )
```

Prepare write characteristic value response.

## Parameters

<i>conn_hdl</i>	connection handle.
-----------------	--------------------

**Returns**

- `SYS_ERR_SUCCESS`: success.
- others: refer to error code in [ble\\_err.h](#).

**4.4.4.5 LeGattCharValIndicate()**

```
LE_ERR_STATE LeGattCharValIndicate (
    UINT16 conn_hdl,
    UINT16 hdl,
    UINT16 len,
    UINT8 * pval )
```

Gatt characteristic value indication.

**Parameters**

<i>conn_hdl</i>	connection handle.
<i>hdl</i>	characteristic value handle.
<i>len</i>	value length.
<i>pval</i>	value.

**Returns**

- `SYS_ERR_SUCCESS`: success.
- others: refer to error code in [ble\\_err.h](#).

**4.4.4.6 LeGattCharValNotify()**

```
LE_ERR_STATE LeGattCharValNotify (
    UINT16 conn_hdl,
    UINT16 hdl,
    UINT16 len,
    UINT8 * pval )
```

Gatt characteristic value notification.

**Parameters**

<i>conn_hdl</i>	connection handle.
<i>hdl</i>	characteristic value handle.
<i>len</i>	value length.
<i>pval</i>	value.

## Returns

- `SYS_ERR_SUCCESS`: success.
- others: refer to error code in [ble\\_err.h](#).

4.4.4.7 `LeGattExchangeMtuReq()`

```
LE_ERR_STATE LeGattExchangeMtuReq (
    UINT16 conn_hdl,
    UINT16 mtu )
```

Exchange MTU request.

## Parameters

<i>conn_hdl</i>	connection handle.
<i>mtu</i>	MTU.

## Returns

- `SYS_ERR_SUCCESS`: success.
- others: refer to error code in [ble\\_err.h](#).

4.4.4.8 `LeGattExchangeMtuRsp()`

```
LE_ERR_STATE LeGattExchangeMtuRsp (
    UINT16 conn_hdl,
    UINT16 mtu )
```

Exchange MTU response.

## Parameters

<i>conn_hdl</i>	connection handle.
<i>mtu</i>	MTU.

## Returns

- `SYS_ERR_SUCCESS`: success.
- others: refer to error code in [ble\\_err.h](#).

#### 4.4.4.9 LeGattExecuteWriteCharValReliable()

```
LE_ERR_STATE LeGattExecuteWriteCharValReliable (
    UINT16 conn_hdl,
    BOOL yesno )
```

Execute write characteristic value request.

##### Parameters

<i>conn_hdl</i>	connection handle.
<i>yesno</i>	execute write or not.

##### Returns

- `SYS_ERR_SUCCESS`: success.
- others: refer to error code in [ble\\_err.h](#).

#### 4.4.4.10 LeGattFindAllCharacteristic()

```
LE_ERR_STATE LeGattFindAllCharacteristic (
    UINT16 conn_hdl,
    UINT16 start_hdl,
    UINT16 end_hdl )
```

Find all characteristic.

##### Parameters

<i>conn_hdl</i>	connection handle.
<i>start_hdl</i>	start handle.
<i>end_hdl</i>	end handle.

##### Returns

- `SYS_ERR_SUCCESS`: success.
- others: refer to error code in [ble\\_err.h](#).

#### 4.4.4.11 LeGattFindAllCharDescriptor()

```
LE_ERR_STATE LeGattFindAllCharDescriptor (
    UINT16 conn_hdl,
    UINT16 start_hdl,
    UINT16 end_hdl )
```

Find all characteristic description.



## Parameters

<i>conn_hdl</i>	connection handle.
<i>start_hdl</i>	start handle.
<i>end_hdl</i>	end handle.

## Returns

- `SYS_ERR_SUCCESS`: success.
- others: refer to error code in [ble\\_err.h](#).

4.4.4.12 `LeGattFindAllPrimaryService()`

```
LE_ERR_STATE LeGattFindAllPrimaryService (
    UINT16 conn_hdl )
```

Find all primary service.

## Parameters

<i>conn_hdl</i>	connection handle.
-----------------	--------------------

## Returns

- `SYS_ERR_SUCCESS`: success.
- others: refer to error code in [ble\\_err.h](#).

4.4.4.13 `LeGattFindCharacteristicByUuid()`

```
LE_ERR_STATE LeGattFindCharacteristicByUuid (
    UINT16 conn_hdl,
    UINT16 start_hdl,
    UINT16 end_hdl,
    UINT8 format,
    UINT16 * uuid )
```

Find characteristic by UUID.

## Parameters

<i>conn_hdl</i>	connection handle.
<i>start_hdl</i>	start handle.
<i>end_hdl</i>	end handle.
<i>format</i>	UUID type.
<i>uuid</i>	UUID.

**Returns**

- `SYS_ERR_SUCCESS`: success.
- others: refer to error code in [ble\\_err.h](#).

**4.4.4.14 LeGattFindIncludedService()**

```
LE_ERR_STATE LeGattFindIncludedService (
    UINT16 conn_hdl,
    UINT16 start_hdl,
    UINT16 end_hdl )
```

Find include service.

**Parameters**

<i>conn_hdl</i>	connection handle.
<i>start_hdl</i>	start handle.
<i>end_hdl</i>	end handle.

**Returns**

- `SYS_ERR_SUCCESS`: success.
- others: refer to error code in [ble\\_err.h](#).

**4.4.4.15 LeGattFindPrimaryServiceByUuid()**

```
LE_ERR_STATE LeGattFindPrimaryServiceByUuid (
    UINT16 conn_hdl,
    UINT8 format,
    UINT16 * uuid )
```

Find primary service by UUID.

**Parameters**

<i>conn_hdl</i>	connection handle.
<i>format</i>	UUID type.
<i>uuid</i>	UUID.

**Returns**

- `SYS_ERR_SUCCESS`: success.
- others: refer to error code in [ble\\_err.h](#).

## 4.4.4.16 LeGattGetAttrHandle()

```

UINT16 LeGattGetAttrHandle (
    LE_GATT_SERVICE_T * svc,
    UINT16 attrId )

```

Get attribute handle.

## Parameters

<i>svc</i>	service.
<i>attrId</i>	attribute index of service.

## Returns

- SYS\_ERR\_SUCCESS: success.
- others: refer to error code in [ble\\_err.h](#).

## 4.4.4.17 LeGattGetAttrVal()

```

LE_ERR_STATE LeGattGetAttrVal (
    LE_GATT_SERVICE_T * svc,
    UINT16 attrId,
    UINT16 * len,
    void * val )

```

Get attribute value.

## Parameters

	<i>svc</i>	service.
	<i>attrId</i>	attribute index of service.
out	<i>len</i>	attribute value length.
out	<i>val</i>	attribute value.

## Returns

- SYS\_ERR\_SUCCESS: success.
- others: refer to error code in [ble\\_err.h](#).

## 4.4.4.18 LeGattGetAttrValLen()

```

UINT16 LeGattGetAttrValLen (
    LE_GATT_SERVICE_T * svc,
    UINT16 attrId )

```

Get the length of attribute value.

## Parameters

<i>svc</i>	service.
<i>attr↔ Id</i>	attribute index of service.

## Returns

- `SYS_ERR_SUCCESS`: success.
- others: refer to error code in [ble\\_err.h](#).

4.4.4.19 `LeGattGetAttrValMaxLen()`

```
UINT16 LeGattGetAttrValMaxLen (
    LE_GATT_SERVICE_T * svc,
    UINT16 attrId )
```

Get the max length of attribute value.

## Parameters

<i>svc</i>	service.
<i>attr↔ Id</i>	attribute index of service.

## Returns

- `SYS_ERR_SUCCESS`: success.
- others: refer to error code in [ble\\_err.h](#).

4.4.4.20 `LeGattInit()`

```
void LeGattInit (
    TASK appTask )
```

BLE Gatt module init.

## Parameters

<i>appTask</i>	the reference of BLE task.
----------------	----------------------------

## Returns

None.

#### 4.4.4.21 LeGattModifyAttrVal()

```
LE_ERR_STATE LeGattModifyAttrVal (
    LE_GATT_SERVICE_T * svc,
    UINT16 attrId,
    UINT16 offset,
    UINT16 len,
    void * val )
```

Modify attribute value.

##### Parameters

<i>svc</i>	servie.
<i>attrId</i>	attribute index of service.
<i>offset</i>	modify offset.
<i>len</i>	modify length.
<i>val</i>	modify value.

##### Returns

- `SYS_ERR_SUCCESS`: success.
- others: refer to error code in [ble\\_err.h](#).

#### 4.4.4.22 LeGattPrepareWriteCharValReliable()

```
LE_ERR_STATE LeGattPrepareWriteCharValReliable (
    UINT16 conn_hdl,
    UINT16 handle,
    UINT16 offset,
    UINT16 len,
    UINT8 * val )
```

Prepare write characteristic value request.

##### Parameters

<i>conn_hdl</i>	connection handle.
<i>handle</i>	characteristic value handle.
<i>offset</i>	offset written.
<i>len</i>	length written.
<i>val</i>	value.

**Returns**

- `SYS_ERR_SUCCESS`: success.
- others: refer to error code in [ble\\_err.h](#).

**4.4.4.23 LeGattReadCharValByUuid()**

```
LE_ERR_STATE LeGattReadCharValByUuid (
    UINT16 conn_hdl,
    UINT16 start_hdl,
    UINT16 end_hdl,
    UINT8 format,
    UINT16 * uuid )
```

Read a characteristic value by UUID.

**Parameters**

<i>conn_hdl</i>	connection handle.
<i>start_hdl</i>	start handle.
<i>end_hdl</i>	end handle.
<i>format</i>	UUID type.
<i>uuid</i>	UUID.

**Returns**

- `SYS_ERR_SUCCESS`: success.
- others: refer to error code in [ble\\_err.h](#).

**4.4.4.24 LeGattReadCharValue()**

```
LE_ERR_STATE LeGattReadCharValue (
    UINT16 conn_hdl,
    UINT16 handle )
```

Read a characteristic value.

**Parameters**

<i>conn_hdl</i>	connection handle.
<i>handle</i>	characteristic value handle.

**Returns**

- `SYS_ERR_SUCCESS`: success.
- others: refer to error code in [ble\\_err.h](#).

#### 4.4.4.25 LeGattReadLongCharVal()

```
LE_ERR_STATE LeGattReadLongCharVal (
    UINT16 conn_hdl,
    UINT16 handle,
    UINT16 offset )
```

Read a long characteristic value.

##### Parameters

<i>conn_hdl</i>	connection handle.
<i>handle</i>	characteristic value handle.
<i>offset</i>	characteristic value offset.

##### Returns

- `SYS_ERR_SUCCESS`: success.
- others: refer to error code in [ble\\_err.h](#).

#### 4.4.4.26 LeGattReadMultipleCharVal()

```
LE_ERR_STATE LeGattReadMultipleCharVal (
    UINT16 conn_hdl,
    UINT16 count,
    UINT16 * handle )
```

Read Multiple characteristic values.

##### Parameters

<i>conn_hdl</i>	connection handle.
<i>count</i>	handle count.
<i>handle</i>	handle table.

##### Returns

- `SYS_ERR_SUCCESS`: success.
- others: refer to error code in [ble\\_err.h](#).

#### 4.4.4.27 LeGattRegisterIncludeService()

```
LE_ERR_STATE LeGattRegisterIncludeService (
    UINT16 inc_hdl,
```



```
UINT16 start_hdl,  
UINT16 end_hdl,  
UINT16 uuid )
```

Called to register an include service.

#### Parameters

<i>inc_hdl</i>	include service handle.
<i>start_hdl</i>	start handle.
<i>end_hdl</i>	end handle.
<i>uuid</i>	include service UUID.

#### Returns

- `SYS_ERR_SUCCESS`: success.
- others: refer to error code in [ble\\_err.h](#).

#### 4.4.4.28 LeGattRegisterService()

```
LE_GATT_SERVICE_T* LeGattRegisterService (  
    LE_GATT_ATTR_T * attrTable,  
    UINT16 numAttr )
```

Called to register a service.

#### Parameters

<i>attrTable</i>	service attribute table.
<i>numAttr</i>	the attribute number of service.

#### Returns

- `SYS_ERR_SUCCESS`: success.
- others: refer to error code in [ble\\_err.h](#).

#### 4.4.4.29 LeGattSignedWriteNoRsp()

```
LE_ERR_STATE LeGattSignedWriteNoRsp (  
    UINT16 conn_hdl,  
    UINT16 handle,  
    UINT16 len,  
    UINT8 * val )
```

Signed write without response.

**Parameters**

<i>conn_hdl</i>	connection handle.
<i>handle</i>	characteristic value handle.
<i>len</i>	length of the data to be written.
<i>val</i>	the value to be written.

**Returns**

- `SYS_ERR_SUCCESS`: success.
- others: refer to error code in [ble\\_err.h](#).

**4.4.4.30 LeGattStopCurrentProcedure()**

```
void LeGattStopCurrentProcedure (
    UINT16 conn_hdl )
```

Stop current procedure.

**Parameters**

<i>conn_hdl</i>	connection handle.
-----------------	--------------------

**Returns**

- `SYS_ERR_SUCCESS`: success.
- others: refer to error code in [ble\\_err.h](#).

**4.4.4.31 LeGattWriteCharVal()**

```
LE_ERR_STATE LeGattWriteCharVal (
    UINT16 conn_hdl,
    UINT16 handle,
    UINT16 len,
    UINT8 * val )
```

Write characteristic value.

**Parameters**

<i>conn_hdl</i>	connection handle.
<i>handle</i>	characteristic value handle.
<i>len</i>	length of the data to be written.
<i>val</i>	the value to be written.

## Returns

- `SYS_ERR_SUCCESS`: success.
- others: refer to error code in [ble\\_err.h](#).

4.4.4.32 `LeGattWriteCharValReliable()`

```
LE_ERR_STATE LeGattWriteCharValReliable (
    UINT16 conn_hdl,
    UINT16 handle,
    UINT16 offset,
    UINT16 len,
    UINT8 * val )
```

Write characteristic value reliable.

## Parameters

<i>conn_hdl</i>	connection handle.
<i>handle</i>	characteristic value handle.
<i>offset</i>	offset written.
<i>len</i>	length written.
<i>val</i>	value.

## Returns

- `SYS_ERR_SUCCESS`: success.
- others: refer to error code in [ble\\_err.h](#).

4.4.4.33 `LeGattWriteLongCharVal()`

```
LE_ERR_STATE LeGattWriteLongCharVal (
    UINT16 conn_hdl,
    UINT16 handle,
    UINT16 offset,
    UINT16 len,
    UINT8 * val )
```

Write long characteristic value.

## Parameters

<i>conn_hdl</i>	connection handle.
<i>handle</i>	characteristic value handle.
<i>offset</i>	value position offset.
<i>len</i>	length of the data to be written.
<i>val</i>	the value to be written.

**Returns**

- `SYS_ERR_SUCCESS`: success.
- others: refer to error code in [ble\\_err.h](#).

**4.4.4.34 LeGattWriteNoRsp()**

```
LE_ERR_STATE LeGattWriteNoRsp (
    UINT16 conn_hdl,
    UINT16 handle,
    UINT16 len,
    UINT8 * val )
```

Write without response.

**Parameters**

<i>conn_hdl</i>	connection handle.
<i>handle</i>	characteristic value handle.
<i>len</i>	length of the data to be written.
<i>val</i>	the value to be written.

**Returns**

- `SYS_ERR_SUCCESS`: success.
- others: refer to error code in [ble\\_err.h](#).

**4.4.5 Variable Documentation****4.4.5.1 gcCharacteristicUuid**

```
const UINT16 gcCharacteristicUuid
```

**4.4.5.2 gcCharAggregateUuid**

```
const UINT16 gcCharAggregateUuid
```

#### 4.4.5.3 gcCharExtPropUuid

```
const UINT16 gcCharExtPropUuid
```

#### 4.4.5.4 gcCharFormatUuid

```
const UINT16 gcCharFormatUuid
```

#### 4.4.5.5 gcCharUserDescUuid

```
const UINT16 gcCharUserDescUuid
```

#### 4.4.5.6 gcClientCharConfigUuid

```
const UINT16 gcClientCharConfigUuid
```

#### 4.4.5.7 gcExtReportRefUuid

```
const UINT16 gcExtReportRefUuid
```

#### 4.4.5.8 gcIncludeUuid

```
const UINT16 gcIncludeUuid
```

#### 4.4.5.9 gcPrimaryServiceUuid

```
const UINT16 gcPrimaryServiceUuid
```

#### 4.4.5.10 gcReportRefUuid

```
const UINT16 gcReportRefUuid
```

#### 4.4.5.11 gcSecondaryServiceUuid

```
const UINT16 gcSecondaryServiceUuid
```

#### 4.4.5.12 gcServerCharConfigUuid

```
const UINT16 gcServerCharConfigUuid
```

#### 4.4.5.13 gcValidRangeUuid

```
const UINT16 gcValidRangeUuid
```

## 4.5 BLE MSG APIs

### Data Structures

- struct [LE\\_SYS\\_MSG\\_BUF\\_OVERFLOW\\_T](#)

### Macros

- `#define LE_ATT_MSG_BASE 0x1400`
- `#define LE_CM_MSG_BASE 0x1100`
- `#define LE_GATT_MSG_BASE 0x1500`
- `#define LE_HCI_MSG_BASE 0x1000`
- `#define LE_L2CAP_MSG_BASE 0x1200`
- `#define LE_SMP_MSG_BASE 0x1300`
- `#define LE_SYS_MSG_BASE 0x8000`
- `#define MESSAGE_ALLOCATE(M, S) PanicUnlessMalloc(sizeof(M##_T) + S)`
- `#define MESSAGE_BULID(M) M##_T *msg = PanicUnlessMalloc(sizeof(M##_T))`
- `#define MESSAGE_DATA_BULID(M, S) M##_T *msg = PanicUnlessMalloc(sizeof(M##_T) + S)`
- `#define MESSAGE_OFFSET(M) ((UINT8 *)msg + sizeof(M##_T))`
- `#define T_HOUR(h) ((UINT32)((h) * (UINT32)1000 * (UINT32)60) * (UINT32)60)`
- `#define T_MIN(m) ((UINT32)((m) * (UINT32)1000 * (UINT32)60))`
- `#define T_SEC(s) ((UINT32)((s) * (UINT32)1000))`

### Typedefs

- `typedef MsgData MESSAGE`
- `typedef UINT16 MESSAGEID`
- `typedef void const * MsgData`
- `typedef const UINT8 * MsgLock`
- `typedef MsgLock MSGLOCK`
- `typedef UINT16 MSGSUBID`
- `typedef UINT32 MSGTIMER`
- `typedef TASKPACK * Task`
- `typedef Task TASK`
- `typedef void(* TASKHANDLER) (Task, UINT16, MsgData)`
- `typedef void ** TASKPACK`

### Enumerations

- `enum { LE_SYS_MSG_BUF_OVERFLOW = (LE_SYS_MSG_BASE + 1), LE_SYS_MSG_TOP }`  
*BLE system message id.*

## Functions

- UINT16 [LeCancelAllMessage](#) (TASK task, MESSAGEID id)  
*Cancel all message in queue.*
- UINT16 [LeCancelAllSubMessage](#) (TASK task, MESSAGEID id, MSGSUBID subId)  
*Cancel all sub message in queue.*
- BOOL [LeCancelFirstMessage](#) (TASK task, MESSAGEID id)  
*Cancel the first message in queue.*
- BOOL [LeCancelFirstSubMessage](#) (TASK task, MESSAGEID id, MSGSUBID subId)  
*Cancel the first sub message in queue.*
- UINT16 [LeGetSubMsgId](#) (UINT16 \*s)  
*Get sub message id.*
- BOOL [LeHostCreateTask](#) (TASK task, TASKHANDLER hdl)  
*Create BLE task.*
- void [LeHostMessageLoop](#) (void)  
*message loop run.*
- void [LeSendMessage](#) (TASK task, MESSAGEID msgId, MESSAGE msg)  
*Send message to BLE task.*
- void [LeSendMessageAfter](#) (TASK task, MESSAGEID msgId, MESSAGE msg, UINT32 delay)  
*Delay, then send message to BLE task.*
- void [LeSendMessageUnlock](#) (TASK task, MESSAGEID id, MESSAGE msg, MSGLOCK lock)  
*Send message until lock is 0.*
- void [LeSendSubMessage](#) (TASK task, MESSAGEID msgId, MSGSUBID subId, MESSAGE msg)  
*Send sub message.*
- void [LeSendSubMessageAfter](#) (TASK task, MESSAGEID msgId, MSGSUBID subId, MESSAGE msg, UINT32 delay)  
*Delay, then send sub message.*
- void [LeSendSubMessageUnlock](#) (TASK task, MESSAGEID id, MSGSUBID subId, MESSAGE msg, MSGLOCK lock)  
*Send sub message until lock is 0.*

### 4.5.1 Detailed Description

### 4.5.2 Macro Definition Documentation

#### 4.5.2.1 LE\_ATT\_MSG\_BASE

```
#define LE_ATT_MSG_BASE 0x1400
```

#### 4.5.2.2 LE\_CM\_MSG\_BASE

```
#define LE_CM_MSG_BASE 0x1100
```



#### 4.5.2.3 LE\_GATT\_MSG\_BASE

```
#define LE_GATT_MSG_BASE 0x1500
```

#### 4.5.2.4 LE\_HCI\_MSG\_BASE

```
#define LE_HCI_MSG_BASE 0x1000
```

#### 4.5.2.5 LE\_L2CAP\_MSG\_BASE

```
#define LE_L2CAP_MSG_BASE 0x1200
```

#### 4.5.2.6 LE\_SMP\_MSG\_BASE

```
#define LE_SMP_MSG_BASE 0x1300
```

#### 4.5.2.7 LE\_SYS\_MSG\_BASE

```
#define LE_SYS_MSG_BASE 0x8000
```

#### 4.5.2.8 MESSAGE\_ALLOCATE

```
#define MESSAGE_ALLOCATE(  
    M,  
    S ) PanicUnlessMalloc(sizeof(M##_T) + S)
```

#### 4.5.2.9 MESSAGE\_BULID

```
#define MESSAGE_BULID(  
    M ) M##_T *msg = PanicUnlessMalloc(sizeof(M##_T))
```

#### 4.5.2.10 MESSAGE\_DATA\_BULID

```
#define MESSAGE_DATA_BULID(  
    M,  
    S ) M##_T *msg = PanicUnlessMalloc(sizeof(M##_T) + S)
```

#### 4.5.2.11 MESSAGE\_OFFSET

```
#define MESSAGE_OFFSET(  
    M ) ((UINT8 *)msg + sizeof(M##_T))
```

#### 4.5.2.12 T\_HOUR

```
#define T_HOUR(  
    h ) ((UINT32)(h) * (UINT32)1000 * (UINT32)60 * (UINT32)60)
```

#### 4.5.2.13 T\_MIN

```
#define T_MIN(  
    m ) ((UINT32)(m) * (UINT32)1000 * (UINT32)60)
```

#### 4.5.2.14 T\_SEC

```
#define T_SEC(  
    s ) ((UINT32)(s) * (UINT32)1000)
```

### 4.5.3 Typedef Documentation

#### 4.5.3.1 MESSAGE

```
typedef MsgData MESSAGE
```

#### 4.5.3.2 MESSAGEID

```
typedef UINT16 MESSAGEID
```

#### 4.5.3.3 MsgData

```
typedef void const* MsgData
```

#### 4.5.3.4 MsgLock

```
typedef const UINT8* MsgLock
```

#### 4.5.3.5 MSGLOCK

```
typedef MsgLock MSGLOCK
```

#### 4.5.3.6 MSGSUBID

```
typedef UINT16 MSGSUBID
```

#### 4.5.3.7 MSGTIMER

```
typedef UINT32 MSGTIMER
```

#### 4.5.3.8 Task

```
typedef TASKPACK* Task
```

#### 4.5.3.9 TASK

```
typedef Task TASK
```

#### 4.5.3.10 TASKHANDLER

```
typedef void(* TASKHANDLER) (Task, UINT16, MsgData)
```

#### 4.5.3.11 TASKPACK

```
typedef void** TASKPACK
```

### 4.5.4 Enumeration Type Documentation

#### 4.5.4.1 anonymous enum

anonymous enum

BLE system message id.

##### Enumerator

LE_SYS_MSG_BUF_OVERFLOW	message buffer overflow
LE_SYS_MSG_TOP	top of system message id

### 4.5.5 Function Documentation

#### 4.5.5.1 LeCancelAllMessage()

```
UINT16 LeCancelAllMessage (
    TASK task,
    MESSAGEID id )
```

Cancel all message in queue.

##### Parameters

<i>task</i>	task.
<i>id</i>	message id.

**Returns**

0 is ok, others is error.

**4.5.5.2 LeCancelAllSubMessage()**

```
UINT16 LeCancelAllSubMessage (
    TASK task,
    MESSAGEID id,
    MSGSUBID subId )
```

Cancel all sub message in queue.

**Parameters**

<i>task</i>	the task of recvice message.
<i>id</i>	message id.
<i>sub↔ id</i>	sub message id.

**Returns**

0 is ok, others is error.

**4.5.5.3 LeCancelFirstMessage()**

```
BOOL LeCancelFirstMessage (
    TASK task,
    MESSAGEID id )
```

Cancel the first message in queue.

**Parameters**

<i>task</i>	task.
<i>id</i>	message id.

**Returns**

True is ok, false is error.

#### 4.5.5.4 LeCancelFirstSubMessage()

```
BOOL LeCancelFirstSubMessage (
    TASK task,
    MESSAGEID id,
    MSGSUBID subId )
```

Cancel the first sub message in queue.

##### Parameters

<i>task</i>	the task of recvice message.
<i>id</i>	message id.
<i>subId</i>	sub message id.

##### Returns

True is ok, false is error.

#### 4.5.5.5 LeGetSubMsgId()

```
UINT16 LeGetSubMsgId (
    UINT16 * s )
```

Get sub message id.

##### Parameters

<i>sub</i>	message id.
------------	-------------

##### Returns

0 is ok, others is error.

#### 4.5.5.6 LeHostCreateTask()

```
BOOL LeHostCreateTask (
    TASK task,
    TASKHANDLER hdl )
```

Create BLE task.

**Parameters**

<i>task</i>	the reference of BLE task.
<i>hdl</i>	callback handle of BLE task.

**Returns**

TRUE is success, FALSE is failed.

**4.5.5.7 LeHostMessageLoop()**

```
void LeHostMessageLoop (
    void )
```

message loop run.

**Returns**

None.

**4.5.5.8 LeSendMessage()**

```
void LeSendMessage (
    TASK task,
    MESSAGEID msgId,
    MESSAGE msg )
```

Send message to BLE task.

**Parameters**

<i>task</i>	reference of BLE task.
<i>msgId</i>	message ID.
<i>msg</i>	message.

**Returns**

None.

**4.5.5.9 LeSendMessageAfter()**

```
void LeSendMessageAfter (
    TASK task,
```

```

MESSAGEID msgId,
MESSAGE msg,
UINT32 delay )

```

Delay, then send message to BLE task.

#### Parameters

<i>task</i>	reference of BLE task.
<i>msg</i> ↔ <i>Id</i>	message ID.
<i>msg</i>	message.
<i>delay</i>	delay time, ms.

#### Returns

None.

#### 4.5.5.10 LeSendMessageUnlock()

```

void LeSendMessageUnlock (
    TASK task,
    MESSAGEID id,
    MESSAGE msg,
    MSGLOCK lock )

```

Send message until lock is 0.

#### Parameters

<i>task</i>	the task of recvice message.
<i>id</i>	message id.
<i>msg</i>	message.
<i>lock</i>	lock number.

#### Returns

None.

#### 4.5.5.11 LeSendSubMessage()

```

void LeSendSubMessage (
    TASK task,
    MESSAGEID msgId,
    MSGSUBID subId,
    MESSAGE msg )

```

Send sub message.



## Parameters

<i>task</i>	the task of recvice message.
<i>msg↔ Id</i>	message id.
<i>subId</i>	sub message id.
<i>msg</i>	message.

## Returns

None.

## 4.5.5.12 LeSendSubMessageAfter()

```
void LeSendSubMessageAfter (
    TASK task,
    MESSAGEID msgId,
    MSGSUBID subId,
    MESSAGE msg,
    UINT32 delay )
```

Delay, then send sub message.

## Parameters

<i>task</i>	the task of recvice message.
<i>msg↔ Id</i>	message id.
<i>subId</i>	sub message id.
<i>msg</i>	message.
<i>delay</i>	delay time.

## Returns

None.

## 4.5.5.13 LeSendSubMessageUnlock()

```
void LeSendSubMessageUnlock (
    TASK task,
    MESSAGEID id,
    MSGSUBID subId,
    MESSAGE msg,
    MSGLOCK lock )
```

Send sub message until lock is 0.

**Parameters**

<i>task</i>	the task of recvice message.
<i>id</i>	message id.
<i>sub</i> $\leftrightarrow$ <i>Id</i>	sub message id.
<i>msg</i>	message.
<i>lock</i>	lock number.

**Returns**

None.

## 4.6 BLE SMP APIs

### Data Structures

- struct [LE\\_SMP\\_MSG\\_ENCRYPTION\\_CHANGE\\_IND\\_T](#)
- struct [LE\\_SMP\\_MSG\\_ENCRYPTION\\_REFRESH\\_IND\\_T](#)
- struct [LE\\_SMP\\_MSG\\_OOB\\_DATA\\_REQUEST\\_IND\\_T](#)
- struct [LE\\_SMP\\_MSG\\_PAIRING\\_ACTION\\_IND\\_T](#)
- struct [LE\\_SMP\\_MSG\\_PAIRING\\_COMPLETE\\_IND\\_T](#)
- struct [LE\\_SMP\\_MSG\\_PASSKEY\\_DISPLAY\\_IND\\_T](#)
- struct [LE\\_SMP\\_MSG\\_PASSKEY\\_INPUT\\_IND\\_T](#)
- struct [LE\\_SMP\\_MSG\\_SC\\_OOB\\_DATA\\_REQUEST\\_IND\\_T](#)
- struct [LE\\_SMP\\_MSG\\_SLAVE\\_SECURITY\\_REQUEST\\_IND\\_T](#)
- struct [LE\\_SMP\\_MSG\\_USER\\_CONFIRM\\_IND\\_T](#)
- struct [LE\\_SMP\\_SC\\_OOB\\_DATA\\_T](#)

### Macros

- `#define LE_MAX_BOND_COUNT 8`
- `#define LE_SM_IO_CAP_DISP_ONLY 0x00`
- `#define LE_SM_IO_CAP_DISP_YES_NO 0x01`
- `#define LE_SM_IO_CAP_KEYBOARD_DISP 0x04`
- `#define LE_SM_IO_CAP_KEYBOARD_ONLY 0x02`
- `#define LE_SM_IO_CAP_NO_IO 0x03`
- `#define LE_SM_PAIR_MITM_NO 0x00`
- `#define LE_SM_PAIR_MITM_YES 0x01`
- `#define LE_SM_PAIR_OOB_NO 0x00`
- `#define LE_SM_PAIR_OOB_YES 0x01`
- `#define LE_SM_PAIR_SC_NO 0x00`
- `#define LE_SM_PAIR_SC_YES 0x01`

### Enumerations

- enum {  
[LE\\_SMP\\_MSG\\_SLAVE\\_SECURITY\\_REQUEST\\_IND](#) = [LE\\_SMP\\_MSG\\_BASE](#), [LE\\_SMP\\_MSG\\_PAIRING\\_ACTION\\_IND](#),  
[LE\\_SMP\\_MSG\\_PASSKEY\\_DISPLAY\\_IND](#), [LE\\_SMP\\_MSG\\_PASSKEY\\_INPUT\\_IND](#),  
[LE\\_SMP\\_MSG\\_OOB\\_DATA\\_REQUEST\\_IND](#), [LE\\_SMP\\_MSG\\_SC\\_OOB\\_DATA\\_REQUEST\\_IND](#), [LE\\_SMP\\_MSG\\_USER\\_CONFIRM\\_IND](#),  
[LE\\_SMP\\_MSG\\_ENCRYPTION\\_CHANGE\\_IND](#),  
[LE\\_SMP\\_MSG\\_ENCRYPTION\\_REFRESH\\_IND](#), [LE\\_SMP\\_MSG\\_PAIRING\\_COMPLETE\\_IND](#), [LE\\_SMP\\_LONG\\_TERM\\_KEY\\_IND](#),  
[LE\\_SMP\\_KEYS\\_IND](#),  
[LE\\_SMP\\_MSG\\_TOP](#) }  
*BLE SMP message id.*
- enum {  
[LE\\_SMP\\_PAIR\\_JUST\\_WORK](#), [LE\\_SMP\\_PAIR\\_OOB](#), [LE\\_SMP\\_PAIR\\_PASSKEY\\_INPUT](#), [LE\\_SMP\\_PAIR\\_DISPLAY](#),  
[LE\\_SMP\\_PAIR\\_NUM\\_COMPARE](#) }

## Functions

- void [LeSmpInit](#) (TASK appTask)  
*BLE SMP Module Init.*
- void [LeSmpOobAuthDataRsp](#) (UINT16 conn\_hdl, UINT8 \*data, UINT16 len)  
*SMP OOB authenticate data response.*
- UINT16 [LeSmpOobPresent](#) (UINT16 conn\_hdl, BOOL oob\_present)  
*SMP OOB present.*
- void [LeSmpPasskeyInput](#) (UINT16 conn\_hdl, UINT32 passkey)  
*Input passkey.*
- UINT16 [LeSmpScOobComputeConfirmVal](#) (UINT8 \*rand, UINT8 \*confirm)  
*SMP secure connection OOB compute confirm value.*
- void [LeSmpScOobDataRsp](#) (UINT16 conn\_hdl, UINT8 \*our\_rand, [LE\\_SMP\\_SC\\_OOB\\_DATA\\_T](#) \*peer)  
*OOB data response.*
- UINT16 [LeSmpSecurityReq](#) (UINT16 conn\_hdl)  
*BLE SMP security request.*
- UINT16 [LeSmpSecurityRsp](#) (UINT16 conn\_hdl, BOOL accept)  
*BLE SMP security request.*
- UINT16 [LeSmpSetDefaultConfig](#) (UINT8 iocap, BOOL mitm, BOOL sc, BOOL bond)  
*Set default configure for pairing.*
- UINT16 [LeSmpUserConfirmRsp](#) (UINT16 conn\_hdl, BOOL accept)  
*User confirm response.*

### 4.6.1 Detailed Description

### 4.6.2 Macro Definition Documentation

#### 4.6.2.1 LE\_MAX\_BOND\_COUNT

```
#define LE_MAX_BOND_COUNT 8
```

#### 4.6.2.2 LE\_SM\_IO\_CAP\_DISP\_ONLY

```
#define LE_SM_IO_CAP_DISP_ONLY 0x00
```

display only

#### 4.6.2.3 LE\_SM\_IO\_CAP\_DISP\_YES\_NO

```
#define LE_SM_IO_CAP_DISP_YES_NO 0x01
```

display + yes or no

#### 4.6.2.4 LE\_SM\_IO\_CAP\_KEYBOARD\_DISP

```
#define LE_SM_IO_CAP_KEYBOARD_DISP 0x04
```

display + keyboard

#### 4.6.2.5 LE\_SM\_IO\_CAP\_KEYBOARD\_ONLY

```
#define LE_SM_IO_CAP_KEYBOARD_ONLY 0x02
```

keyboard only

#### 4.6.2.6 LE\_SM\_IO\_CAP\_NO\_IO

```
#define LE_SM_IO_CAP_NO_IO 0x03
```

no input and output

#### 4.6.2.7 LE\_SM\_PAIR\_MITM\_NO

```
#define LE_SM_PAIR_MITM_NO 0x00
```

#### 4.6.2.8 LE\_SM\_PAIR\_MITM\_YES

```
#define LE_SM_PAIR_MITM_YES 0x01
```

#### 4.6.2.9 LE\_SM\_PAIR\_OOB\_NO

```
#define LE_SM_PAIR_OOB_NO 0x00
```

#### 4.6.2.10 LE\_SM\_PAIR\_OOB\_YES

```
#define LE_SM_PAIR_OOB_YES 0x01
```

#### 4.6.2.11 LE\_SM\_PAIR\_SC\_NO

```
#define LE_SM_PAIR_SC_NO 0x00
```

#### 4.6.2.12 LE\_SM\_PAIR\_SC\_YES

```
#define LE_SM_PAIR_SC_YES 0x01
```

### 4.6.3 Enumeration Type Documentation

#### 4.6.3.1 anonymous enum

```
anonymous enum
```

BLE SMP message id.

##### Enumerator

LE_SMP_MSG_SLAVE_SECURITY_REQUEST_IND	slave security request
LE_SMP_MSG_PAIRING_ACTION_IND	pairing action indication
LE_SMP_MSG_PASSKEY_DISPLAY_IND	passkey display indication
LE_SMP_MSG_PASSKEY_INPUT_IND	passkey input indication
LE_SMP_MSG_OOB_DATA_REQUEST_IND	OOB data request indication
LE_SMP_MSG_SC_OOB_DATA_REQUEST_IND	SC OOB data request indication
LE_SMP_MSG_USER_CONFIRM_IND	user confirm indication
LE_SMP_MSG_ENCRYPTION_CHANGE_IND	encryption change indication
LE_SMP_MSG_ENCRYPTION_REFRESH_IND	encryption refresh indication
LE_SMP_MSG_PAIRING_COMPLETE_IND	pairing complete indication
LE_SMP_LONG_TERM_KEY_REQ	long term key request
LE_SMP_KEYS_IND	keys indication
LE_SMP_MSG_TOP	top of SMP message id

#### 4.6.3.2 anonymous enum

```
anonymous enum
```

##### Enumerator

LE_SMP_PAIR_JUST_WORK	just work
LE_SMP_PAIR_OOB	out of band
LE_SMP_PAIR_PASSKEY_INPUT	passkey entry
LE_SMP_PAIR_DISPLAY	display
LE_SMP_PAIR_NUM_COMPARE	number compare

## 4.6.4 Function Documentation

### 4.6.4.1 LeSmpInit()

```
void LeSmpInit (
    TASK appTask )
```

BLE SMP Module Init.

#### Parameters

<i>appTask</i>	the reference of BLE task.
----------------	----------------------------

#### Returns

None.

### 4.6.4.2 LeSmpOobAuthDataRsp()

```
void LeSmpOobAuthDataRsp (
    UINT16 conn_hdl,
    UINT8 * data,
    UINT16 len )
```

SMP OOB authenticate data response.

#### Parameters

<i>conn_hdl</i>	connection handle.
<i>data</i>	response data.
<i>len</i>	data length.

#### Returns

None.

### 4.6.4.3 LeSmpOobPresent()

```
UINT16 LeSmpOobPresent (
    UINT16 conn_hdl,
    BOOL oob_present )
```

SMP OOB present.

**Parameters**

<i>conn_hdl</i>	connection handle.
<i>oob_present</i>	present or not.

**Returns**

0 is Ok, others refer to SMP\_ERR\_\* in [ble\\_err.h](#).

**4.6.4.4 LeSmpPasskeyInput()**

```
void LeSmpPasskeyInput (
    UINT16 conn_hdl,
    UINT32 passkey )
```

Input passkey.

**Parameters**

<i>conn_hdl</i>	connection handle.
<i>passkey</i>	passkey.

**Returns**

None.

**4.6.4.5 LeSmpScOobComputeConfirmVal()**

```
UINT16 LeSmpScOobComputeConfirmVal (
    UINT8 * rand,
    UINT8 * confirm )
```

SMP secure connection OOB compute confirm value.

**Parameters**

<i>rand</i>	random data.
<i>confirm</i>	confirm data.

**Returns**

0 is Ok, others refer to SMP\_ERR\_\* in [ble\\_err.h](#).



#### 4.6.4.6 LeSmpScOobDataRsp()

```
void LeSmpScOobDataRsp (
    UINT16 conn_hdl,
    UINT8 * our_rand,
    LE_SMP_SC_OOB_DATA_T * peer )
```

OOB data response.

##### Parameters

<i>conn_hdl</i>	connection handle.
<i>our_rand</i>	our random data.
<i>peer</i>	peer OOB data.

##### Returns

None.

#### 4.6.4.7 LeSmpSecurityReq()

```
UINT16 LeSmpSecurityReq (
    UINT16 conn_hdl )
```

BLE SMP security request.

##### Parameters

<i>conn_hdl</i>	connection handle.
-----------------	--------------------

##### Returns

0 is Ok, others refer to SMP\_ERR\_\* in [ble\\_err.h](#).

#### 4.6.4.8 LeSmpSecurityRsp()

```
UINT16 LeSmpSecurityRsp (
    UINT16 conn_hdl,
    BOOL accept )
```

BLE SMP security request.

##### Parameters

<i>conn_hdl</i>	connection handle.
<i>accept</i>	TRUE is accept, FALSE is not.

**Returns**

0 is Ok, others refer to SMP\_ERR\_\* in [ble\\_err.h](#).

**4.6.4.9 LeSmpSetDefaultConfig()**

```
UINT16 LeSmpSetDefaultConfig (
    UINT8 iocap,
    BOOL mitm,
    BOOL sc,
    BOOL bond )
```

Set default configure for pairing.

**Parameters**

<i>iocap</i>	IO capability.
<i>mitm</i>	TRUE is MITM protected, FALSE is not.
<i>sc</i>	TRUE is request BLE secure connection pairing, FALSE is not.
<i>bond</i>	TRUE: bonding, FALSE: no bonding.

**Returns**

0 is Ok, others refer to SMP\_ERR\_\* in [ble\\_err.h](#).

**4.6.4.10 LeSmpUserConfirmRsp()**

```
UINT16 LeSmpUserConfirmRsp (
    UINT16 conn_hdl,
    BOOL accept )
```

User confirm response.

**Parameters**

<i>conn_hdl</i>	connection handle.
<i>accept</i>	yes or no.

**Returns**

0 is Ok, others refer to SMP\_ERR\_\* in [ble\\_err.h](#).

## 4.7 WIFI APIS

WIFI APIS.

### Modules

- [WIFI Common APIs](#)
- [WIFI STA APIs](#)
- [Enumeration](#)

### Data Structures

- struct [wifi\\_active\\_scan\\_time\\_t](#)  
*Range of active scan times per channel.*
- struct [wifi\\_ap\\_config\\_t](#)  
*This structure is the Wi-Fi configuration for initialization for Soft-AP mode.*
- struct [wifi\\_auto\\_connect\\_info\\_t](#)  
*This structure is the Wi-Fi auto connect for save in the flash (FIM).*
- union [wifi\\_config\\_t](#)  
*Wi-Fi configuration for initialization.*
- struct [wifi\\_fast\\_scan\\_threshold\\_t](#)  
*Structure describing parameters for a Wi-Fi fast scan.*
- struct [wifi\\_init\\_config\\_t](#)  
*WiFi stack configuration parameters.*
- struct [wifi\\_scan\\_config\\_t](#)  
*Parameters for an SSID scan.*
- struct [wifi\\_scan\\_info\\_t](#)  
*This structure defines the inforamtion of scanned APs.*
- struct [wifi\\_scan\\_list\\_t](#)  
*This structure defines the list of scanned APs with their corresponding information.*
- union [wifi\\_scan\\_time\\_t](#)  
*Aggregate of active & passive scan time per channel.*
- struct [wifi\\_sta\\_config\\_t](#)  
*This structure is the Wi-Fi configuration for initialization for STA mode.*
- struct [wifi\\_wpa\\_ie\\_data\\_t](#)  
*This structure is the Wi-Fi auto connect with wpa information for save in the flash (FIM).*

### Macros

- #define [WIFI\\_BEACON\\_INTERVAL\\_LENGTH](#) (2)  
*Beacon interval length in a frame header.*
- #define [WIFI\\_CAPABILITY\\_INFO\\_LENGTH](#) (2)  
*Length of capability information in a frame header.*
- #define [WIFI\\_LENGTH\\_802\\_11](#) (24)  
*Length of 802.11 MAC header.*
- #define [WIFI\\_LENGTH\\_PASSPHRASE](#) (64)  
*The maximum length of passphrase used in WPA-PSK and WPA2-PSK encryption types.*
- #define [WIFI\\_MAC\\_ADDRESS\\_LENGTH](#) (6)

- *MAC address length.*
- `#define WIFI_MAC_NUM_OF_CHANNELS (14)`  
*maximum number of WIFI channels*
- `#define WIFI_MAX_LENGTH_OF_SSID (32+1)`  
*The maximum length of SSID.*
- `#define WIFI_MAX_SCAN_AP_NUM (16)`  
*maximum number of ap list items which can stored*
- `#define WIFI_MAX_SUPPORTED_RATES (8)`  
*maximum number of supported data rate*

## Typedefs

- `typedef wifi_scan_info_t wifi_ap_record_t`
- `typedef int(* wifi_event_notify_cb_t) (void *data)`

## Enumerations

- `enum wifi_auto_connet_mode_e { WIFI_AUTO_CONNECT_DISABLE, WIFI_AUTO_CONNECT_ENABLE }`  
*WiFi auto connect mode parameters.*

## Functions

- `int wifi_event_process_handler (wifi_event_t event, uint8_t *payload, uint32_t length)`  
*Default event handler for system events.*
- `void wifi_install_default_event_handlers (void)`  
*install default event handler for wifi event (internal use)*
- `int wifi_register_event_handler (wifi_event_t idx, wifi_event_handler_t handler)`  
*register wifi event handler (internal use)*

### 4.7.1 Detailed Description

WIFI APIs.

### 4.7.2 Macro Definition Documentation

#### 4.7.2.1 WIFI\_BEACON\_INTERVAL\_LENGTH

```
#define WIFI_BEACON_INTERVAL_LENGTH (2)
```

Beacon interval length in a frame header.

#### 4.7.2.2 WIFI\_CAPABILITY\_INFO\_LENGTH

```
#define WIFI_CAPABILITY_INFO_LENGTH (2)
```

Length of capability information in a frame header.

#### 4.7.2.3 WIFI\_LENGTH\_802\_11

```
#define WIFI_LENGTH_802_11 (24)
```

Length of 802.11 MAC header.

#### 4.7.2.4 WIFI\_LENGTH\_PASSPHRASE

```
#define WIFI_LENGTH_PASSPHRASE (64)
```

The maximum length of passphrase used in WPA-PSK and WPA2-PSK encryption types.

#### 4.7.2.5 WIFI\_MAC\_ADDRESS\_LENGTH

```
#define WIFI_MAC_ADDRESS_LENGTH (6)
```

MAC address length.

#### 4.7.2.6 WIFI\_MAC\_NUM\_OF\_CHANNELS

```
#define WIFI_MAC_NUM_OF_CHANNELS (14)
```

maximum number of WIFI channels

#### 4.7.2.7 WIFI\_MAX\_LENGTH\_OF\_SSID

```
#define WIFI_MAX_LENGTH_OF_SSID (32+1)
```

The maximum length of SSID.

#### 4.7.2.8 WIFI\_MAX\_SCAN\_AP\_NUM

```
#define WIFI_MAX_SCAN_AP_NUM (16)
```

maximum number of ap list items which can stored

#### 4.7.2.9 WIFI\_MAX\_SUPPORTED\_RATES

```
#define WIFI_MAX_SUPPORTED_RATES (8)
```

maximum number of supported data rate

### 4.7.3 Typedef Documentation

#### 4.7.3.1 wifi\_ap\_record\_t

```
typedef wifi_scan_info_t wifi_ap_record_t
```

#### 4.7.3.2 wifi\_event\_notify\_cb\_t

```
typedef int(* wifi_event_notify_cb_t) (void *data)
```

### 4.7.4 Enumeration Type Documentation

#### 4.7.4.1 wifi\_auto\_connet\_mode\_e

```
enum wifi_auto_connet_mode_e
```

WiFi auto connect mode parameters.

Enumerator

WIFI_AUTO_CONNECT_DISABLE	
WIFI_AUTO_CONNECT_ENABLE	

### 4.7.5 Function Documentation

#### 4.7.5.1 wifi\_event\_process\_handler()

```
int wifi_event_process_handler (
    wifi_event_t event,
    uint8_t * payload,
    uint32_t length )
```

Default event handler for system events.

This function performs default handling of system events. When using event\_loop APIs, it is called automatically before invoking the user-provided callback function.

Applications which implement a custom event loop must call this function as part of event processing.

##### Parameters

in	<i>event</i>	event type Set the event type, Options are <ul style="list-style-type: none"> <li>• WIFI_EVENT_INIT_COMPLETE</li> <li>• WIFI_EVENT_SCAN_COMPLETE</li> <li>• WIFI_EVENT_STA_START</li> <li>• WIFI_EVENT_STA_STOP</li> <li>• WIFI_EVENT_STA_CONNECTED</li> <li>• WIFI_EVENT_STA_DISCONNECTED</li> <li>• WIFI_EVENT_STA_CONNECTION_FAILED</li> <li>• WIFI_EVENT_STA_GOT_IP</li> </ul>
in	<i>payload</i>	Data block that transmitted to event
in	<i>length</i>	The length of data block

##### Returns

0 : success  
other : failed

#### 4.7.5.2 wifi\_install\_default\_event\_handlers()

```
void wifi_install_default_event_handlers (
    void )
```

install default event handler for wifi event (internal use)

#### 4.7.5.3 wifi\_register\_event\_handler()

```
int wifi_register_event_handler (
    wifi_event_t idx,
    wifi_event_handler_t handler )
```

register wifi event handler (internal use)

##### Parameters

in	<i>idx</i>	one of the enums of bt_scan_mode_t
in	<i>handler</i>	the Wi-Fi event handler

##### Returns

0 : success  
other : failed



## 4.8 WIFI Common APIs

### Data Structures

- struct [event\\_msg\\_t](#)  
*Send information to event by [event\\_msg\\_t](#).*
- union [wifi\\_event\\_info\\_t](#)  
*[wifi\\_event\\_info\\_t](#)*
- struct [wifi\\_event\\_sta\\_connected\\_t](#)  
*[wifi\\_event\\_sta\\_connected\\_t](#)*
- struct [wifi\\_event\\_sta\\_disconnected\\_t](#)  
*[wifi\\_event\\_sta\\_disconnected\\_t](#)*
- struct [wifi\\_event\\_sta\\_got\\_ip\\_t](#)
- struct [wifi\\_event\\_sta\\_scan\\_done\\_t](#)  
*[wifi\\_event\\_sta\\_scan\\_done\\_t](#)*

### Typedefs

- typedef int(\* [wifi\\_event\\_cb\\_t](#)) ([wifi\\_event\\_id\\_t](#) event, void \*data, uint16\_t length)  
*Application specified event callback function.*

### Functions

- int [wifi\\_event\\_loop\\_init](#) ([wifi\\_event\\_cb\\_t](#) cb)  
*Event Loop Initialization Create the event handler and call back funtion.*
- int [wifi\\_event\\_loop\\_send](#) ([event\\_msg\\_t](#) \*msg)  
*Send an event to event task.*
- void [wifi\\_event\\_loop\\_set\\_cb](#) ([wifi\\_event\\_cb\\_t](#) cb, void \*ctx)  
*Set application specified event callback function.*
- int [wifi\\_event\\_process\\_handler](#) ([wifi\\_event\\_t](#) event, uint8\_t \*payload, uint32\_t length)  
*Default event handler for system events.*

#### 4.8.1 Detailed Description

#### 4.8.2 Typedef Documentation

##### 4.8.2.1 [wifi\\_event\\_cb\\_t](#)

```
typedef int(* wifi\_event\_cb\_t) (wifi\_event\_id\_t event, void *data, uint16_t length)
```

Application specified event callback function.

#### 4.8.3 Function Documentation

##### 4.8.3.1 [wifi\\_event\\_loop\\_init\(\)](#)

```
int wifi\_event\_loop\_init (  
    wifi\_event\_cb\_t cb )
```

Event Loop Initialization Create the event handler and call back funtion.

**Parameters**

<code>cb</code>	: application specified event callback
-----------------	--

**Returns**

0 : success  
other : failed

**4.8.3.2 wifi\_event\_loop\_send()**

```
int wifi_event_loop_send (
    event_msg_t * msg )
```

Send an event to event task.

**Attention**

1. Other task/modules, such as the TCP/IP module, can call this API to send an event to event task

**Parameters**

<code>event_msg_t</code>	* msg: Send information to event by msg
--------------------------	---

**Returns**

0 : success  
other : failed

**4.8.3.3 wifi\_event\_loop\_set\_cb()**

```
void wifi_event_loop_set_cb (
    wifi_event_cb_t cb,
    void * ctx )
```

Set application specified event callback function.

**Attention**

1. If cb is NULL, means application does not need to handle. If cb is not NULL, it will be called when an event is received and after the default event callback is completed

## Parameters

<i>wifi_event_cb_t</i>	cb : callback
<i>void</i>	*ctx : reserved for user

4.8.3.4 `wifi_event_process_handler()`

```
int wifi_event_process_handler (
    wifi_event_t event,
    uint8_t * payload,
    uint32_t length )
```

Default event handler for system events.

This function performs default handling of system events.

Applications which implement a custom event loop must call this function as part of event processing.

## Parameters

in	<i>event</i>	event type Set the event type,Options are <ul style="list-style-type: none"> <li>• WIFI_EVENT_INIT_COMPLETE</li> <li>• WIFI_EVENT_SCAN_COMPLETE</li> <li>• WIFI_EVENT_STA_START</li> <li>• WIFI_EVENT_STA_STOP</li> <li>• WIFI_EVENT_STA_CONNECTED</li> <li>• WIFI_EVENT_STA_DISCONNECTED</li> <li>• WIFI_EVENT_STA_CONNECTION_FAILED</li> <li>• WIFI_EVENT_STA_GOT_IP</li> </ul>
in	<i>payload</i>	Data block transmitted to event
in	<i>length</i>	The length of the data block

## Returns

0 : success  
other : failed

## 4.9 WIFI STA APIs

### Macros

- `#define WIFI_READY_TIME 2000`

### Typedefs

- `typedef int(* wifi_auto_connect_clear_ap_info_fp_t) (uint8_t index)`
- `typedef int(* wifi_auto_connect_get_ap_info_fp_t) (uint8_t index, wifi_auto_connect_info_t *info)`
- `typedef int(* wifi_auto_connect_get_ap_num_fp_t) (uint8_t *num)`
- `typedef int(* wifi_auto_connect_get_mode_fp_t) (uint8_t *mode)`
- `typedef int(* wifi_auto_connect_init_fp_t) (void)`
- `typedef int(* wifi_auto_connect_reset_fp_t) (void)`
- `typedef int(* wifi_auto_connect_set_ap_num_fp_t) (uint8_t num)`
- `typedef int(* wifi_auto_connect_set_mode_fp_t) (uint8_t mode)`
- `typedef int(* wifi_auto_connect_start_fp_t) (void)`
- `typedef int(* wifi_config_get_bandwidth_fp_t) (wifi_mode_t interface, wifi_bandwidth_t *bandwidth)`
- `typedef int(* wifi_config_get_bssid_fp_t) (uint8_t *bssid)`
- `typedef int(* wifi_config_get_channel_fp_t) (wifi_mode_t interface, uint8_t *channel)`
- `typedef int(* wifi_config_get_dtim_interval_fp_t) (uint8_t *interval)`
- `typedef int(* wifi_config_get_listen_interval_fp_t) (uint8_t *interval)`
- `typedef int(* wifi_config_get_mac_address_fp_t) (wifi_mode_t interface, uint8_t *address)`
- `typedef int(* wifi_config_get_opmode_fp_t) (uint8_t *mode)`
- `typedef int(* wifi_config_get_ssid_fp_t) (uint8_t *ssid, uint8_t *ssid_length)`
- `typedef int(* wifi_config_set_bandwidth_fp_t) (wifi_mode_t interface, wifi_bandwidth_t bandwidth)`
- `typedef int(* wifi_config_set_bssid_fp_t) (uint8_t *bssid)`
- `typedef int(* wifi_config_set_channel_fp_t) (wifi_mode_t interface, uint8_t channel)`
- `typedef int(* wifi_config_set_dtim_interval_fp_t) (uint8_t interval)`
- `typedef int(* wifi_config_set_listen_interval_fp_t) (uint8_t interval)`
- `typedef int(* wifi_config_set_mac_address_fp_t) (wifi_mode_t interface, uint8_t *address)`
- `typedef int(* wifi_config_set_opmode_fp_t) (uint8_t mode)`
- `typedef int(* wifi_config_set_ssid_fp_t) (wifi_mode_t interface, uint8_t *ssid, uint8_t ssid_length)`
- `typedef int(* wifi_connection_connect_fp_t) (wifi_config_t *config)`
- `typedef int(* wifi_connection_disconnect_ap_fp_t) (void)`
- `typedef int(* wifi_connection_disconnect_sta_fp_t) (uint8_t *address)`
- `typedef int(* wifi_connection_get_rssi_fp_t) (int8_t *rssi)`
- `typedef int(* wifi_connection_register_event_handler_fp_t) (wifi_event_t event, wifi_event_handler_t handler)`
- `typedef int(* wifi_connection_scan_start_fp_t) (uint8_t *ssid, uint8_t ssid_length, uint8_t *bssid, uint8_t scan_mode, uint8_t scan_option)`
- `typedef int(* wifi_connection_unregister_event_handler_fp_t) (wifi_event_t event, wifi_event_handler_t handler)`
- `typedef int(* wifi_convert_auth_mode_fp_t) (int wpa_pro, int privacy)`
- `typedef int(* wifi_deinit_fp_t) (void)`
- `typedef int32_t(* wifi_event_handler_t) (wifi_event_t event, uint8_t *payload, uint32_t length)`  
*This defines the Wi-Fi event handler. Call `wifi_connection_register_event_handler()` to register a handler, then the Wi-Fi driver generates an event and sends it to the handler.*
- `typedef int(* wifi_fast_connect_get_mode_fp_t) (uint8_t ap_index, uint8_t *mode)`
- `typedef int(* wifi_fast_connect_set_mode_fp_t) (uint8_t ap_index, uint8_t mode)`
- `typedef int(* wifi_fast_connect_start_fp_t) (uint8_t ap_index)`
- `typedef int(* wifi_get_config_fp_t) (wifi_mode_t interface, wifi_config_t *conf)`
- `typedef void(* wifi_init_complete_cb_t) (void *ctx)`  
*Initialization of complete callback function.*

- typedef int(\* [wifi\\_init\\_fp\\_t](#)) (const [wifi\\_init\\_config\\_t](#) \*config, [wifi\\_init\\_complete\\_cb\\_t](#) init\_cb)
- typedef int32\_t [wifi\\_result\\_t](#)
- typedef int(\* [wifi\\_scan\\_get\\_ap\\_list\\_fp\\_t](#)) ([wifi\\_scan\\_list\\_t](#) \*scan\_list)
- typedef int(\* [wifi\\_scan\\_get\\_ap\\_num\\_fp\\_t](#)) (uint16\_t \*number)
- typedef int(\* [wifi\\_scan\\_get\\_ap\\_records\\_fp\\_t](#)) (uint16\_t \*number, [wifi\\_scan\\_info\\_t](#) \*ap\_records)
- typedef int(\* [wifi\\_scan\\_start\\_fp\\_t](#)) (const [wifi\\_scan\\_config\\_t](#) \*config, bool block)
- typedef int(\* [wifi\\_scan\\_stop\\_fp\\_t](#)) (void)
- typedef int(\* [wifi\\_set\\_config\\_fp\\_t](#)) ([wifi\\_mode\\_t](#) interface, [wifi\\_config\\_t](#) \*conf)
- typedef int(\* [wifi\\_sta\\_get\\_ap\\_info\\_fp\\_t](#)) ([wifi\\_ap\\_record\\_t](#) \*ap\_info)
- typedef int(\* [wifi\\_start\\_fp\\_t](#)) (void)
- typedef int(\* [wifi\\_stop\\_fp\\_t](#)) (void)

## Functions

- int [wifi\\_auto\\_connect\\_clear\\_ap\\_info](#) (uint8\_t index)  
*Clear the AP information which index in the.*
- int [wifi\\_auto\\_connect\\_get\\_ap\\_info](#) (uint8\_t index, [wifi\\_auto\\_connect\\_info\\_t](#) \*info)  
*Get the AP information.*
- int [wifi\\_auto\\_connect\\_get\\_ap\\_num](#) (uint8\_t \*num)  
*Get the maximum number of AP information.*
- int [wifi\\_auto\\_connect\\_get\\_mode](#) (uint8\_t \*mode)  
*Get the auto connect mode.*
- int [wifi\\_auto\\_connect\\_get\\_saved\\_ap\\_num](#) (uint8\_t \*num)  
*Get the current number of AP save in flash.*
- int [wifi\\_auto\\_connect\\_init](#) (void)  
*Initialize function of auto connect.*
- int [wifi\\_auto\\_connect\\_reset](#) (void)  
*Reset all of auto/fast connect configuration.*
- int [wifi\\_auto\\_connect\\_set\\_ap\\_num](#) (uint8\_t num)  
*Set the maximum number of AP information.*
- int [wifi\\_auto\\_connect\\_set\\_mode](#) (uint8\_t mode)  
*Set the auto connect mode.*
- int [wifi\\_auto\\_connect\\_start](#) (void)  
*Start auto connect mechanism.*
- int [wifi\\_auto\\_connect\\_update\\_ch](#) (uint8\_t ac\_index, uint8\_t channel)  
*Update the channel which AP index in auto connect list.*
- int [wifi\\_config\\_get\\_bandwidth](#) ([wifi\\_mode\\_t](#) interface, [wifi\\_bandwidth\\_t](#) \*bandwidth)  
*Get the bandwidth of OPL1000 specified interface.*
- int [wifi\\_config\\_get\\_bssid](#) (uint8\_t \*bssid)  
*get bssid after scan*
- int [wifi\\_config\\_get\\_channel](#) ([wifi\\_mode\\_t](#) interface, uint8\_t \*channel)  
*Get the primary/secondary channel of OPL1000.*
- int [wifi\\_config\\_get\\_dtim\\_interval](#) (uint8\_t \*interval)
- int [wifi\\_config\\_get\\_listen\\_interval](#) (uint8\_t \*interval)
- int [wifi\\_config\\_get\\_mac\\_address](#) ([wifi\\_mode\\_t](#) interface, uint8\_t \*address)  
*Get mac of specified interface.*
- int [wifi\\_config\\_get\\_mac\\_tx\\_data\\_rate](#) ([wifi\\_mac\\_data\\_rate\\_t](#) \*data\_rate)  
*Get the Mac tx data rate in current wifi setting of OPL1000.*
- int [wifi\\_config\\_get\\_opmode](#) (uint8\_t \*mode)
- int [wifi\\_config\\_get\\_skip\\_dtim](#) (uint8\_t \*value)  
*Get the Skip DTIM value in current wifi setting of OPL1000.*

- int [wifi\\_config\\_get\\_ssid](#) (uint8\_t \*ssid, uint8\_t \*ssid\_length)  
*Get ssid value of AP.*
- int [wifi\\_config\\_get\\_sta\\_mac\\_address\\_from\\_flash](#) (uint8\_t \*bssid)  
*Get mac address of station from flash.*
- int [wifi\\_config\\_set\\_bandwidth](#) (wifi\_mode\_t interface, wifi\_bandwidth\_t bandwidth)  
*Set the bandwidth of OPL1000 specified interface.*
- int [wifi\\_config\\_set\\_bssid](#) (uint8\_t \*bssid)  
*config OPL1000 Wi-Fi bssid.*
- int [wifi\\_config\\_set\\_channel](#) (wifi\_mode\_t interface, uint8\_t channel)  
*Set primary/secondary channel of OPL1000.*
- int [wifi\\_config\\_set\\_dtim\\_interval](#) (uint8\_t interval)
- int [wifi\\_config\\_set\\_listen\\_interval](#) (uint8\_t interval)
- int [wifi\\_config\\_set\\_mac\\_address](#) (wifi\_mode\_t interface, uint8\_t \*address)  
*Set MAC address of OPL1000 Wi-Fi station or the soft-AP interface.*
- int [wifi\\_config\\_set\\_mac\\_tx\\_data\\_rate](#) (wifi\_mac\_data\_rate\_t data\_rate)  
*Set the Mac tx data rate setting of OPL1000.*
- int [wifi\\_config\\_set\\_opmode](#) (uint8\_t mode)
- int [wifi\\_config\\_set\\_skip\\_dtim](#) (uint8\_t value, bool save\_flash)  
*Set the Skip DTIM value of OPL1000.*
- int [wifi\\_config\\_set\\_ssid](#) (wifi\_mode\_t interface, uint8\_t \*ssid, uint8\_t ssid\_length)  
*Set the ssid value of the current device.*
- int [wifi\\_connection\\_connect](#) (wifi\_config\_t \*config)  
*Connect OPL1000 Wi-Fi station to certain AP.*
- int [wifi\\_connection\\_connect\\_from\\_ac\\_index](#) (uint8\_t index)  
*Connect OPL1000 Wi-Fi station to certain AP by auto connect index.*
- int [wifi\\_connection\\_connect\\_from\\_ac\\_list](#) (wifi\_config\_t \*config)  
*Connect OPL1000 Wi-Fi station to certain AP in auto connect list.*
- int [wifi\\_connection\\_disconnect\\_ap](#) (void)  
*Disconnect the link between OPL1000 and connected AP.*
- int [wifi\\_connection\\_disconnect\\_sta](#) (uint8\_t \*address)  
*Disconnect the link between the current device and the station.*
- int [wifi\\_connection\\_get\\_rssi](#) (int8\_t \*rssi)  
*get signal strength of AP*
- int [wifi\\_connection\\_register\\_event\\_handler](#) (wifi\_event\_t event, wifi\_event\_handler\_t handler)  
*register wifi call back handler*
- int [wifi\\_connection\\_scan\\_start](#) (uint8\_t \*ssid, uint8\_t ssid\_length, uint8\_t \*bssid, uint8\_t scan\_mode, uint8\_t scan\_option)
- int [wifi\\_connection\\_unregister\\_event\\_handler](#) (wifi\_event\_t event, wifi\_event\_handler\_t handler)  
*unregister wifi call back handler*
- int [wifi\\_convert\\_auth\\_mode](#) (int wpa\_pro, int privacy)
- int [wifi\\_deinit](#) (void)  
*De-init Wi-Fi Initialization and Configuration functions.*
- int [wifi\\_fast\\_connect\\_get\\_mode](#) (uint8\_t ap\_index, uint8\_t \*mode)  
*Get the fast connect mode.*
- int [wifi\\_fast\\_connect\\_set\\_mode](#) (uint8\_t ap\_index, uint8\_t mode)  
*Set the fast connect mode.*
- int [wifi\\_fast\\_connect\\_start](#) (uint8\_t ap\_index)  
*Start fast connect mechanism.*
- int [wifi\\_get\\_config](#) (wifi\_mode\_t interface, wifi\_config\_t \*conf)  
*Get configuration of specified interface.*
- int [wifi\\_init](#) (const wifi\_init\_config\_t \*config, wifi\_init\_complete\_cb\_t init\_cb)

- Init Wi-Fi Initializes the wifi according to the specified parameters in the config.*
- int [wifi\\_scan\\_get\\_ap\\_list](#) ([wifi\\_scan\\_list\\_t](#) \*scan\_list)  
*Get list of APs that found in last scan operation.*
- int [wifi\\_scan\\_get\\_ap\\_num](#) (uint16\_t \*number)  
*Get the number of scanned APs.*
- int [wifi\\_scan\\_get\\_ap\\_records](#) (uint16\_t \*number, [wifi\\_scan\\_info\\_t](#) \*ap\_records)  
*Get AP list found in last scan operation.*
- int [wifi\\_scan\\_scan\\_stop](#) (void)  
*Stop scanning process.*
- int [wifi\\_scan\\_start](#) (const [wifi\\_scan\\_config\\_t](#) \*config, bool block)  
*Scan all available APs. After invoke the [wifi\\_set\\_config\(\)](#) and [wifi\\_start\(\)](#), then call [wifi\\_scan\\_start\(\)](#) to scan APs.*
- int [wifi\\_set\\_config](#) ([wifi\\_mode\\_t](#) interface, [wifi\\_config\\_t](#) \*conf)  
*Set configuration of OPL1000 STA.*
- int [wifi\\_sta\\_get\\_ap\\_info](#) ([wifi\\_ap\\_record\\_t](#) \*ap\_info)  
*Get information of AP which OPL1000 station is associated with.*
- int [wifi\\_start](#) (void)  
*Start Wi-Fi working.*
- int [wifi\\_stop](#) (void)  
*Stop wifi working.*

## Variables

- [wifi\\_auto\\_connect\\_clear\\_ap\\_info\\_fp\\_t](#) [wifi\\_auto\\_connect\\_clear\\_ap\\_info\\_api](#)
- [wifi\\_auto\\_connect\\_get\\_ap\\_info\\_fp\\_t](#) [wifi\\_auto\\_connect\\_get\\_ap\\_info\\_api](#)
- [wifi\\_auto\\_connect\\_get\\_ap\\_num\\_fp\\_t](#) [wifi\\_auto\\_connect\\_get\\_ap\\_num\\_api](#)
- [wifi\\_auto\\_connect\\_get\\_mode\\_fp\\_t](#) [wifi\\_auto\\_connect\\_get\\_mode\\_api](#)
- [wifi\\_auto\\_connect\\_init\\_fp\\_t](#) [wifi\\_auto\\_connect\\_init\\_api](#)
- [wifi\\_auto\\_connect\\_reset\\_fp\\_t](#) [wifi\\_auto\\_connect\\_reset\\_api](#)
- [wifi\\_auto\\_connect\\_set\\_ap\\_num\\_fp\\_t](#) [wifi\\_auto\\_connect\\_set\\_ap\\_num\\_api](#)
- [wifi\\_auto\\_connect\\_set\\_mode\\_fp\\_t](#) [wifi\\_auto\\_connect\\_set\\_mode\\_api](#)
- [wifi\\_auto\\_connect\\_start\\_fp\\_t](#) [wifi\\_auto\\_connect\\_start\\_api](#)
- [wifi\\_config\\_get\\_bandwidth\\_fp\\_t](#) [wifi\\_config\\_get\\_bandwidth\\_api](#)
- [wifi\\_config\\_get\\_bssid\\_fp\\_t](#) [wifi\\_config\\_get\\_bssid\\_api](#)
- [wifi\\_config\\_get\\_channel\\_fp\\_t](#) [wifi\\_config\\_get\\_channel\\_api](#)
- [wifi\\_config\\_get\\_dtim\\_interval\\_fp\\_t](#) [wifi\\_config\\_get\\_dtim\\_interval\\_api](#)
- [wifi\\_config\\_get\\_listen\\_interval\\_fp\\_t](#) [wifi\\_config\\_get\\_listen\\_interval\\_api](#)
- [wifi\\_config\\_get\\_mac\\_address\\_fp\\_t](#) [wifi\\_config\\_get\\_mac\\_address\\_api](#)
- [wifi\\_config\\_get\\_opmode\\_fp\\_t](#) [wifi\\_config\\_get\\_opmode\\_api](#)
- [wifi\\_config\\_get\\_ssid\\_fp\\_t](#) [wifi\\_config\\_get\\_ssid\\_api](#)
- [wifi\\_config\\_set\\_bandwidth\\_fp\\_t](#) [wifi\\_config\\_set\\_bandwidth\\_api](#)
- [wifi\\_config\\_set\\_bssid\\_fp\\_t](#) [wifi\\_config\\_set\\_bssid\\_api](#)
- [wifi\\_config\\_set\\_channel\\_fp\\_t](#) [wifi\\_config\\_set\\_channel\\_api](#)
- [wifi\\_config\\_set\\_dtim\\_interval\\_fp\\_t](#) [wifi\\_config\\_set\\_dtim\\_interval\\_api](#)
- [wifi\\_config\\_set\\_listen\\_interval\\_fp\\_t](#) [wifi\\_config\\_set\\_listen\\_interval\\_api](#)
- [wifi\\_config\\_set\\_mac\\_address\\_fp\\_t](#) [wifi\\_config\\_set\\_mac\\_address\\_api](#)
- [wifi\\_config\\_set\\_opmode\\_fp\\_t](#) [wifi\\_config\\_set\\_opmode\\_api](#)
- [wifi\\_config\\_set\\_ssid\\_fp\\_t](#) [wifi\\_config\\_set\\_ssid\\_api](#)
- [wifi\\_connection\\_connect\\_fp\\_t](#) [wifi\\_connection\\_connect\\_api](#)
- [wifi\\_connection\\_disconnect\\_ap\\_fp\\_t](#) [wifi\\_connection\\_disconnect\\_ap\\_api](#)
- [wifi\\_connection\\_disconnect\\_sta\\_fp\\_t](#) [wifi\\_connection\\_disconnect\\_sta\\_api](#)
- [wifi\\_connection\\_get\\_rssi\\_fp\\_t](#) [wifi\\_connection\\_get\\_rssi\\_api](#)
- [wifi\\_connection\\_register\\_event\\_handler\\_fp\\_t](#) [wifi\\_connection\\_register\\_event\\_handler\\_api](#)

- [wifi\\_connection\\_scan\\_start\\_fp\\_t](#) [wifi\\_connection\\_scan\\_start\\_api](#)
- [wifi\\_connection\\_unregister\\_event\\_handler\\_fp\\_t](#) [wifi\\_connection\\_unregister\\_event\\_handler\\_api](#)
- [wifi\\_convert\\_auth\\_mode\\_fp\\_t](#) [wifi\\_convert\\_auth\\_mode\\_api](#)
- [wifi\\_deinit\\_fp\\_t](#) [wifi\\_deinit\\_api](#)
- [wifi\\_fast\\_connect\\_get\\_mode\\_fp\\_t](#) [wifi\\_fast\\_connect\\_get\\_mode\\_api](#)
- [wifi\\_fast\\_connect\\_set\\_mode\\_fp\\_t](#) [wifi\\_fast\\_connect\\_set\\_mode\\_api](#)
- [wifi\\_fast\\_connect\\_start\\_fp\\_t](#) [wifi\\_fast\\_connect\\_start\\_api](#)
- [wifi\\_get\\_config\\_fp\\_t](#) [wifi\\_get\\_config\\_api](#)
- [wifi\\_init\\_fp\\_t](#) [wifi\\_init\\_api](#)
- [wifi\\_scan\\_get\\_ap\\_list\\_fp\\_t](#) [wifi\\_scan\\_get\\_ap\\_list\\_api](#)
- [wifi\\_scan\\_get\\_ap\\_num\\_fp\\_t](#) [wifi\\_scan\\_get\\_ap\\_num\\_api](#)
- [wifi\\_scan\\_get\\_ap\\_records\\_fp\\_t](#) [wifi\\_scan\\_get\\_ap\\_records\\_api](#)
- [wifi\\_scan\\_start\\_fp\\_t](#) [wifi\\_scan\\_start\\_api](#)
- [wifi\\_scan\\_stop\\_fp\\_t](#) [wifi\\_scan\\_stop\\_api](#)
- [wifi\\_set\\_config\\_fp\\_t](#) [wifi\\_set\\_config\\_api](#)
- [wifi\\_sta\\_get\\_ap\\_info\\_fp\\_t](#) [wifi\\_sta\\_get\\_ap\\_info\\_api](#)
- [wifi\\_start\\_fp\\_t](#) [wifi\\_start\\_api](#)
- [wifi\\_stop\\_fp\\_t](#) [wifi\\_stop\\_api](#)

#### 4.9.1 Detailed Description

#### 4.9.2 Macro Definition Documentation

##### 4.9.2.1 WIFI\_READY\_TIME

```
#define WIFI_READY_TIME 2000
```

#### 4.9.3 Typedef Documentation

##### 4.9.3.1 wifi\_auto\_connect\_clear\_ap\_info\_fp\_t

```
typedef int(* wifi_auto_connect_clear_ap_info_fp_t) (uint8_t index)
```

##### 4.9.3.2 wifi\_auto\_connect\_get\_ap\_info\_fp\_t

```
typedef int(* wifi_auto_connect_get_ap_info_fp_t) (uint8_t index, wifi\_auto\_connect\_info\_t *info)
```



**4.9.3.3 wifi\_auto\_connect\_get\_ap\_num\_fp\_t**

```
typedef int(* wifi_auto_connect_get_ap_num_fp_t) (uint8_t *num)
```

**4.9.3.4 wifi\_auto\_connect\_get\_mode\_fp\_t**

```
typedef int(* wifi_auto_connect_get_mode_fp_t) (uint8_t *mode)
```

**4.9.3.5 wifi\_auto\_connect\_init\_fp\_t**

```
typedef int(* wifi_auto_connect_init_fp_t) (void)
```

**4.9.3.6 wifi\_auto\_connect\_reset\_fp\_t**

```
typedef int(* wifi_auto_connect_reset_fp_t) (void)
```

**4.9.3.7 wifi\_auto\_connect\_set\_ap\_num\_fp\_t**

```
typedef int(* wifi_auto_connect_set_ap_num_fp_t) (uint8_t num)
```

**4.9.3.8 wifi\_auto\_connect\_set\_mode\_fp\_t**

```
typedef int(* wifi_auto_connect_set_mode_fp_t) (uint8_t mode)
```

**4.9.3.9 wifi\_auto\_connect\_start\_fp\_t**

```
typedef int(* wifi_auto_connect_start_fp_t) (void)
```

**4.9.3.10 wifi\_config\_get\_bandwidth\_fp\_t**

```
typedef int(* wifi_config_get_bandwidth_fp_t) (wifi_mode_t interface, wifi_bandwidth_t *bandwidth)
```

#### 4.9.3.11 `wifi_config_get_bssid_fp_t`

```
typedef int(* wifi_config_get_bssid_fp_t) (uint8_t *bssid)
```

#### 4.9.3.12 `wifi_config_get_channel_fp_t`

```
typedef int(* wifi_config_get_channel_fp_t) (wifi\_mode\_t interface, uint8_t *channel)
```

#### 4.9.3.13 `wifi_config_get_dtim_interval_fp_t`

```
typedef int(* wifi_config_get_dtim_interval_fp_t) (uint8_t *interval)
```

#### 4.9.3.14 `wifi_config_get_listen_interval_fp_t`

```
typedef int(* wifi_config_get_listen_interval_fp_t) (uint8_t *interval)
```

#### 4.9.3.15 `wifi_config_get_mac_address_fp_t`

```
typedef int(* wifi_config_get_mac_address_fp_t) (wifi\_mode\_t interface, uint8_t *address)
```

#### 4.9.3.16 `wifi_config_get_opmode_fp_t`

```
typedef int(* wifi_config_get_opmode_fp_t) (uint8_t *mode)
```

#### 4.9.3.17 `wifi_config_get_ssid_fp_t`

```
typedef int(* wifi_config_get_ssid_fp_t) (uint8_t *ssid, uint8_t *ssid_length)
```

#### 4.9.3.18 `wifi_config_set_bandwidth_fp_t`

```
typedef int(* wifi_config_set_bandwidth_fp_t) (wifi\_mode\_t interface, wifi\_bandwidth\_t bandwidth)
```

**4.9.3.19 wifi\_config\_set\_bssid\_fp\_t**

```
typedef int(* wifi_config_set_bssid_fp_t) (uint8_t *bssid)
```

**4.9.3.20 wifi\_config\_set\_channel\_fp\_t**

```
typedef int(* wifi_config_set_channel_fp_t) (wifi_mode_t interface, uint8_t channel)
```

**4.9.3.21 wifi\_config\_set\_dtim\_interval\_fp\_t**

```
typedef int(* wifi_config_set_dtim_interval_fp_t) (uint8_t interval)
```

**4.9.3.22 wifi\_config\_set\_listen\_interval\_fp\_t**

```
typedef int(* wifi_config_set_listen_interval_fp_t) (uint8_t interval)
```

**4.9.3.23 wifi\_config\_set\_mac\_address\_fp\_t**

```
typedef int(* wifi_config_set_mac_address_fp_t) (wifi_mode_t interface, uint8_t *address)
```

**4.9.3.24 wifi\_config\_set\_opmode\_fp\_t**

```
typedef int(* wifi_config_set_opmode_fp_t) (uint8_t mode)
```

**4.9.3.25 wifi\_config\_set\_ssid\_fp\_t**

```
typedef int(* wifi_config_set_ssid_fp_t) (wifi_mode_t interface, uint8_t *ssid, uint8_t ssid_↔  
length)
```

#### 4.9.3.26 `wifi_connection_connect_fp_t`

```
typedef int (* wifi_connection_connect_fp_t) (wifi_config_t *config)
```

#### 4.9.3.27 `wifi_connection_disconnect_ap_fp_t`

```
typedef int (* wifi_connection_disconnect_ap_fp_t) (void)
```

#### 4.9.3.28 `wifi_connection_disconnect_sta_fp_t`

```
typedef int (* wifi_connection_disconnect_sta_fp_t) (uint8_t *address)
```

#### 4.9.3.29 `wifi_connection_get_rssi_fp_t`

```
typedef int (* wifi_connection_get_rssi_fp_t) (int8_t *rssi)
```

#### 4.9.3.30 `wifi_connection_register_event_handler_fp_t`

```
typedef int (* wifi_connection_register_event_handler_fp_t) (wifi_event_t event, wifi_event_handler_t handler)
```

#### 4.9.3.31 `wifi_connection_scan_start_fp_t`

```
typedef int (* wifi_connection_scan_start_fp_t) (uint8_t *ssid, uint8_t ssid_length, uint8_t *bssid, uint8_t scan_mode, uint8_t scan_option)
```

#### 4.9.3.32 `wifi_connection_unregister_event_handler_fp_t`

```
typedef int (* wifi_connection_unregister_event_handler_fp_t) (wifi_event_t event, wifi_event_handler_t handler)
```

#### 4.9.3.33 wifi\_convert\_auth\_mode\_fp\_t

```
typedef int(* wifi_convert_auth_mode_fp_t) (int wpa_pro, int privacy)
```

#### 4.9.3.34 wifi\_deinit\_fp\_t

```
typedef int(* wifi_deinit_fp_t) (void)
```

#### 4.9.3.35 wifi\_event\_handler\_t

```
typedef int32_t(* wifi_event_handler_t) (wifi_event_t event, uint8_t *payload, uint32_t length)
```

This defines the Wi-Fi event handler. Call [wifi\\_connection\\_register\\_event\\_handler\(\)](#) to register a handler, then the Wi-Fi driver generates an event and sends it to the handler.

##### Parameters

in	<i>event</i>	is an optional event to register. For more details, please refer to <a href="#">wifi_event_t</a> .
in	<i>payload</i>	is the payload for the event. When the event is WIFI_EVENT_IOT_CONNECTED in AP mode, payload is the connected STA's MAC address. When the event is WIFI_EVENT_IOT_CONNECTED in STA mode, payload is the connected AP's BSSID.
in	<i>length</i>	is the length of a packet.

##### Returns

The return value is reserved and it is ignored.

#### 4.9.3.36 wifi\_fast\_connect\_get\_mode\_fp\_t

```
typedef int(* wifi_fast_connect_get_mode_fp_t) (uint8_t ap_index, uint8_t *mode)
```

#### 4.9.3.37 wifi\_fast\_connect\_set\_mode\_fp\_t

```
typedef int(* wifi_fast_connect_set_mode_fp_t) (uint8_t ap_index, uint8_t mode)
```

#### 4.9.3.38 `wifi_fast_connect_start_fp_t`

```
typedef int(* wifi_fast_connect_start_fp_t) (uint8_t ap_index)
```

#### 4.9.3.39 `wifi_get_config_fp_t`

```
typedef int(* wifi_get_config_fp_t) (wifi_mode_t interface, wifi_config_t *conf)
```

#### 4.9.3.40 `wifi_init_complete_cb_t`

```
typedef void(* wifi_init_complete_cb_t) (void *ctx)
```

Initialization of complete callback function.

Invoked when Wi-Fi initialization is complete.

##### Parameters

<code>ctx</code>	is context pointer that provided to <code>wifi_init()</code> . It will be passed back to the callback.
------------------	--

#### 4.9.3.41 `wifi_init_fp_t`

```
typedef int(* wifi_init_fp_t) (const wifi_init_config_t *config, wifi_init_complete_cb_t init↔  
_cb)
```

#### 4.9.3.42 `wifi_result_t`

```
typedef int32_t wifi_result_t
```

#### 4.9.3.43 `wifi_scan_get_ap_list_fp_t`

```
typedef int(* wifi_scan_get_ap_list_fp_t) (wifi_scan_list_t *scan_list)
```

**4.9.3.44 wifi\_scan\_get\_ap\_num\_fp\_t**

```
typedef int(* wifi_scan_get_ap_num_fp_t) (uint16_t *number)
```

**4.9.3.45 wifi\_scan\_get\_ap\_records\_fp\_t**

```
typedef int(* wifi_scan_get_ap_records_fp_t) (uint16_t *number, wifi\_scan\_info\_t *ap_records)
```

**4.9.3.46 wifi\_scan\_start\_fp\_t**

```
typedef int(* wifi_scan_start_fp_t) (const wifi\_scan\_config\_t *config, bool block)
```

**4.9.3.47 wifi\_scan\_stop\_fp\_t**

```
typedef int(* wifi_scan_stop_fp_t) (void)
```

**4.9.3.48 wifi\_set\_config\_fp\_t**

```
typedef int(* wifi_set_config_fp_t) (wifi\_mode\_t interface, wifi\_config\_t *conf)
```

**4.9.3.49 wifi\_sta\_get\_ap\_info\_fp\_t**

```
typedef int(* wifi_sta_get_ap_info_fp_t) (wifi\_ap\_record\_t *ap_info)
```

**4.9.3.50 wifi\_start\_fp\_t**

```
typedef int(* wifi_start_fp_t) (void)
```

**4.9.3.51 wifi\_stop\_fp\_t**

```
typedef int(* wifi_stop_fp_t) (void)
```

## 4.9.4 Function Documentation

### 4.9.4.1 `wifi_auto_connect_clear_ap_info()`

```
int wifi_auto_connect_clear_ap_info (
    uint8_t index )
```

Clear the AP information which index in the.

#### Attention

1. API returns false if try to clear AP information which something error

#### Parameters

in	<i>index</i>	The index of AP position <ul style="list-style-type: none"><li>• Range is 0 to 2</li></ul>
----	--------------	--

#### Returns

0 : success  
other : failed

### 4.9.4.2 `wifi_auto_connect_get_ap_info()`

```
int wifi_auto_connect_get_ap_info (
    uint8_t index,
    wifi_auto_connect_info_t * info )
```

Get the AP information.

#### Attention

1. API returns false if try to get AP information which something error

#### Parameters

in	<i>index</i>	The index of AP position <ul style="list-style-type: none"><li>• Range is 0 to 2</li></ul>
out	<i>mode</i>	Get the AP information



**Returns**

0 : success  
other : failed

**4.9.4.3 wifi\_auto\_connect\_get\_ap\_num()**

```
int wifi_auto_connect_get_ap_num (
    uint8_t * num )
```

Get the maximum number of AP information.

**Attention**

1. API returns false if try to get maximum auto connect numbers which something error

**Parameters**

out	<i>num</i>	Get the maximum number of AP information
-----	------------	--

**Returns**

0 : success  
other : failed

**4.9.4.4 wifi\_auto\_connect\_get\_mode()**

```
int wifi_auto_connect_get_mode (
    uint8_t * mode )
```

Get the auto connect mode.

**Attention**

1. API returns false if try to get auto connect mode which something error

**Parameters**

out	<i>mode</i>	Get the auto connect mode
-----	-------------	---------------------------

**Returns**

0 : success  
other : failed

#### 4.9.4.5 wifi\_auto\_connect\_get\_saved\_ap\_num()

```
int wifi_auto_connect_get_saved_ap_num (
    uint8_t * num )
```

Get the current number of AP save in flash.

##### Attention

1. API returns false if try to get current auto connect numbers which something error

##### Parameters

out	num	The current number of AP information will be saved in flash.
-----	-----	--

##### Returns

0 : success  
other : failed

#### 4.9.4.6 wifi\_auto\_connect\_init()

```
int wifi_auto_connect_init (
    void )
```

Initialize function of auto connect.

##### Attention

1. API returns false if try to initial auto connect which something error

##### Returns

0 : success  
other : failed

#### 4.9.4.7 wifi\_auto\_connect\_reset()

```
int wifi_auto_connect_reset (
    void )
```

Reset all of auto/fast connect configuration.

##### Attention

1. API returns false if try to reset auto connect configuration which something error

##### Returns

0 : success  
other : failed

#### 4.9.4.8 wifi\_auto\_connect\_set\_ap\_num()

```
int wifi_auto_connect_set_ap_num (
    uint8_t num )
```

Set the maximum number of AP information.

##### Attention

1. API returns false if try to set maximum auto connect numbers which something error

##### Parameters

in	num	The maximum number of AP information will be saved in flash.
		<ul style="list-style-type: none"><li>• Range is 1 to 3</li></ul>

##### Returns

0 : success  
other : failed

#### 4.9.4.9 wifi\_auto\_connect\_set\_mode()

```
int wifi_auto_connect_set_mode (
    uint8_t mode )
```

Set the auto connect mode.

##### Attention

1. API returns false if try to set auto connect mode which something error

##### Parameters

in	mode	Configure the current wifi working mode,The options are
		<ul style="list-style-type: none"><li>• WIFI_AUTO_CONNECT_ENABLE</li><li>• WIFI_AUTO_CONNECT_DISABLE</li></ul>

##### Returns

0 : success  
other : failed

#### 4.9.4.10 wifi\_auto\_connect\_start()

```
int wifi_auto_connect_start (
    void )
```

Start auto connect mechanism.

##### Attention

1. API returns false if try to start auto connect function which something error

##### Returns

0 : success  
other : failed

#### 4.9.4.11 wifi\_auto\_connect\_update\_ch()

```
int wifi_auto_connect_update_ch (
    uint8_t ac_index,
    uint8_t channel )
```

Update the channel which AP index in auto connect list.

##### Attention

1. API returns false if update channel which something error

##### Parameters

in	<i>index</i>	The index of AP position • Range is 0 to 2
in	<i>channel</i>	The channel of AP's used. • Range is 1 to 14

##### Returns

0 : success  
other : failed

#### 4.9.4.12 wifi\_config\_get\_bandwidth()

```
int wifi_config_get_bandwidth (
    wifi_mode_t interface,
    wifi_bandwidth_t * bandwidth )
```

Get the bandwidth of OPL1000 specified interface.

#### Attention

1. API returns false if try to get an interface which is not enable

#### Parameters

in	<i>interface</i>	Configure the current wifi working mode,The options are <ul style="list-style-type: none"> <li>• WIFI_MODE_STA</li> <li>• WIFI_MODE_AP (currently not support)</li> </ul>
out	<i>bandwidth</i>	Get the bandwidth value of the current wifi module working through the pointer

#### Returns

0 : success  
other : failed

#### 4.9.4.13 wifi\_config\_get\_bssid()

```
int wifi_config_get_bssid (
    uint8_t * bssid )
```

get bssid after scan

#### Parameters

out	<i>bssid</i>	the string of bssid
-----	--------------	---------------------

#### Returns

0 : success  
other : failed

#### 4.9.4.14 wifi\_config\_get\_channel()

```
int wifi_config_get_channel (
    wifi_mode_t interface,
    uint8_t * channel )
```

Get the primary/secondary channel of OPL1000.

#### Attention

1. API returns false if try to get an interface which is not enabled

**Parameters**

in	<i>interface</i>	Configure the current wifi working mode,The options are <ul style="list-style-type: none"> <li>• WIFI_MODE_STA</li> <li>• WIFI_MODE_AP (currently not support)</li> </ul>
out	<i>channel</i>	Get Current module wifi work channel number

**Returns**

0 : success  
other : failed

**4.9.4.15 wifi\_config\_get\_dtim\_interval()**

```
int wifi_config_get_dtim_interval (
    uint8_t * interval )
```

**4.9.4.16 wifi\_config\_get\_listen\_interval()**

```
int wifi_config_get_listen_interval (
    uint8_t * interval )
```

**4.9.4.17 wifi\_config\_get\_mac\_address()**

```
int wifi_config_get_mac_address (
    wifi_mode_t interface,
    uint8_t * address )
```

Get mac of specified interface.

**Parameters**

in	<i>interface</i>	Configure the current wifi working mode,The options are <ul style="list-style-type: none"> <li>• WIFI_MODE_STA</li> <li>• WIFI_MODE_AP (currently not support)</li> </ul>
out	<i>address</i>	Get the MAC address of the device through this interface, The address is similar to this structure: xx:xx:xx:xx:xx:xx

**Returns**

0 : success  
other : failed

**4.9.4.18 wifi\_config\_get\_mac\_tx\_data\_rate()**

```
int wifi_config_get_mac_tx_data_rate (
    wifi_mac_data_rate_t * data_rate )
```

Get the Mac tx data rate in current wifi setting of OPL1000.

**Parameters**

out	<i>data_rate</i>	Get the Mac tx data rate <ul style="list-style-type: none"><li>• WIFI_MAC_DATA_RATE_ARA</li><li>• WIFI_MAC_DATA_RATE_1M</li><li>• WIFI_MAC_DATA_RATE_2M</li><li>• WIFI_MAC_DATA_RATE_5_5M</li><li>• WIFI_MAC_DATA_RATE_11M</li></ul>
-----	------------------	--

**Returns**

0 : success  
other : failed

**4.9.4.19 wifi\_config\_get\_opmode()**

```
int wifi_config_get_opmode (
    uint8_t * mode )
```

**4.9.4.20 wifi\_config\_get\_skip\_dtim()**

```
int wifi_config_get_skip_dtim (
    uint8_t * value )
```

Get the Skip DTIM value in current wifi setting of OPL1000.

**Parameters**

out	<i>value</i>	Get the Skip DTIM value in current wifi setting
-----	--------------	---

**Returns**

0 : success  
other : failed

**4.9.4.21 wifi\_config\_get\_ssid()**

```
int wifi_config_get_ssid (
    uint8_t * ssid,
    uint8_t * ssid_length )
```

Get ssid value of AP.

**Parameters**

out	<i>ssid</i>	Get ssid by pointer
out	<i>ssid_length</i>	Get the length of the ssid character

**Returns**

0 : success  
other : failed

**4.9.4.22 wifi\_config\_get\_sta\_mac\_address\_from\_flash()**

```
int wifi_config_get_sta_mac_address_from_flash (
    uint8_t * bssid )
```

Get mac address of station from flash.

**Parameters**

out	<i>address</i>	Get the MAC address of station from flash, The address is similar to this structure: xx:xx:xx:xx:xx:xx
-----	----------------	---

**Returns**

0 : success  
other : failed

**4.9.4.23 wifi\_config\_set\_bandwidth()**

```
int wifi_config_set_bandwidth (
    wifi_mode_t interface,
    wifi_bandwidth_t bandwidth )
```



Set the bandwidth of OPL1000 specified interface.

#### Parameters

in	<i>interface</i>	Configure the current wifi working mode,The options are <ul style="list-style-type: none"><li>• WIFI_MODE_STA</li><li>• WIFI_MODE_AP (currently not support)</li></ul>
in	<i>bandwidth</i>	Set the working bandwidth of wifi

#### Returns

0 : success  
other : failed

#### 4.9.4.24 wifi\_config\_set\_bssid()

```
int wifi_config_set_bssid (  
    uint8_t * bssid )
```

config OPL1000 Wi-Fi bssid.

#### Parameters

in	<i>bssid</i>	the string of bssid
----	--------------	---------------------

#### Returns

0 : success  
other : failed

#### 4.9.4.25 wifi\_config\_set\_channel()

```
int wifi_config_set_channel (  
    wifi_mode_t interface,  
    uint8_t channel )
```

Set primary/secondary channel of OPL1000.

#### Attention

1. This is a special API for sniffer
2. This API should be called after [wifi\\_start\(\)](#)

**Parameters**

in	<i>interface</i>	Configure the current wifi working mode,The options are <ul style="list-style-type: none"> <li>• WIFI_MODE_STA</li> <li>• WIFI_MODE_AP (currently not support)</li> </ul>
in	<i>channel</i>	Set current Wi-Fi work channel number

**Returns**

0 : success  
other : failed

**4.9.4.26 wifi\_config\_set\_dtim\_interval()**

```
int wifi_config_set_dtim_interval (
    uint8_t interval )
```

**4.9.4.27 wifi\_config\_set\_listen\_interval()**

```
int wifi_config_set_listen_interval (
    uint8_t interval )
```

**4.9.4.28 wifi\_config\_set\_mac\_address()**

```
int wifi_config_set_mac_address (
    wifi_mode_t interface,
    uint8_t * address )
```

Set MAC address of OPL1000 Wi-Fi station or the soft-AP interface.

**Attention**

1. This API can only be called when the interface is disabled
2. OPL1000 soft-AP and station have different MAC addresses, do not set them to be the same.

**Parameters**

in	<i>interface</i>	Configure the current wifi working mode,The options are <ul style="list-style-type: none"> <li>• WIFI_MODE_STA</li> <li>• WIFI_MODE_AP (currently not support)</li> </ul>
in	<i>address</i>	set MAC address

**Returns**

0 : success  
other : failed

**4.9.4.29 wifi\_config\_set\_mac\_tx\_data\_rate()**

```
int wifi_config_set_mac_tx_data_rate (
    wifi_mac_data_rate_t data_rate )
```

Set the Mac tx data rate setting of OPL1000.

**Parameters**

in	<i>data_rate</i>	Set the Mac tx data rate
		<ul style="list-style-type: none"><li>• WIFI_MAC_DATA_RATE_ARA</li><li>• WIFI_MAC_DATA_RATE_1M</li><li>• WIFI_MAC_DATA_RATE_2M</li><li>• WIFI_MAC_DATA_RATE_5_5M</li><li>• WIFI_MAC_DATA_RATE_11M</li></ul>

**Returns**

0 : success  
other : failed

**4.9.4.30 wifi\_config\_set\_opmode()**

```
int wifi_config_set_opmode (
    uint8_t mode )
```

**4.9.4.31 wifi\_config\_set\_skip\_dtim()**

```
int wifi_config_set_skip_dtim (
    uint8_t value,
    bool save_flash )
```

Set the Skip DTIM value of OPL1000.

**Parameters**

in	<i>value</i>	Set the Skip DTIM value
in	<i>save_flash</i>	Enable/Disable to write in flash. <ul style="list-style-type: none"> <li>• 0 : Not write in flash. (Only effect in runtime)</li> <li>• 1 : Write in flash and effect the value.</li> </ul>

**Attention**

1. This API will set the skip DTIM value to share memory and stored in flash, please use [wifi\\_config\\_get\\_skip\\_dtim\(\)](#) to check it.
2. The setting will be effect after next connect. We recommend re-connect AP after setting to make sure the value is correct with negotiate between AP.

**Returns**

0 : success  
other : failed

**4.9.4.32 wifi\_config\_set\_ssid()**

```
int wifi_config_set_ssid (
    wifi_mode_t interface,
    uint8_t * ssid,
    uint8_t ssid_length )
```

Set the ssid value of the current device.

**Parameters**

in	<i>interface</i>	Configure the current wifi working mode, The options are <ul style="list-style-type: none"> <li>• WIFI_MODE_STA</li> <li>• WIFI_MODE_AP (currently not support)</li> </ul>
in	<i>ssid</i>	Set the value of ssid
in	<i>ssid_length</i>	The length of ssid parameter

**Returns**

0 : success  
other : failed

#### 4.9.4.33 wifi\_connection\_connect()

```
int wifi_connection_connect (
    wifi_config_t * config )
```

Connect OPL1000 Wi-Fi station to certain AP.

##### Attention

1. This API only impact WIFI\_MODE\_STA or WIFI\_MODE\_AP mode
2. If OPL1000 is connected to an AP, call wifi\_disconnect to disconnect.

##### Parameters

in	<i>config</i>	Establish connection parameters
----	---------------	---------------------------------

##### Returns

0 : success  
other : failed

#### 4.9.4.34 wifi\_connection\_connect\_from\_ac\_index()

```
int wifi_connection_connect_from_ac_index (
    uint8_t index )
```

Connect OPL1000 Wi-Fi station to certain AP by auto connect index.

##### Attention

1. This API only impact WIFI\_MODE\_STA or WIFI\_MODE\_AP mode
2. If OPL1000 is connected to an AP, call wifi\_disconnect to disconnect.
3. Then index should be 0 to begin.

##### Parameters

in	<i>index</i>	The index of AP in auto connect list
----	--------------	--------------------------------------

##### Returns

0 : success  
1 : The index of AP is null  
other : failed

#### 4.9.4.35 `wifi_connection_connect_from_ac_list()`

```
int wifi_connection_connect_from_ac_list (
    wifi_config_t * config )
```

Connect OPL1000 Wi-Fi station to certain AP in auto connect list.

##### Attention

1. This API only impact WIFI\_MODE\_STA or WIFI\_MODE\_AP mode
2. If OPL1000 is connected to an AP, call `wifi_disconnect` to disconnect.

##### Parameters

in	<i>config</i>	Establish connection parameters
----	---------------	---------------------------------

##### Returns

0 : success  
1 : Not found in list  
other : failed

#### 4.9.4.36 `wifi_connection_disconnect_ap()`

```
int wifi_connection_disconnect_ap (
    void )
```

Disconnect the link between OPL1000 and connected AP.

##### Returns

0 : success  
other : failed

#### 4.9.4.37 `wifi_connection_disconnect_sta()`

```
int wifi_connection_disconnect_sta (
    uint8_t * address )
```

Disconnect the link between the current device and the station.

##### Parameters

in	<i>address</i>	station address
----	----------------	-----------------

**Returns**

0 : success  
other : failed

**4.9.4.38 wifi\_connection\_get\_rssi()**

```
int wifi_connection_get_rssi (
    int8_t * rssi )
```

get signal strength of AP

**Attention**

1. If the scan is successful, this API returns signal strength value, otherwise it will get wrong result

**Parameters**

out	<i>rssi</i>	rssi value
-----	-------------	------------

**Returns**

0 : success  
other : failed

**4.9.4.39 wifi\_connection\_register\_event\_handler()**

```
int wifi_connection_register_event_handler (
    wifi_event_t event,
    wifi_event_handler_t handler )
```

register wifi call back handler

## Parameters

in	<i>event</i>	The type of the registered event. Options are <ul style="list-style-type: none"> <li>• WIFI_EVENT_INIT_COMPLETE</li> <li>• WIFI_EVENT_SCAN_COMPLETE</li> <li>• WIFI_EVENT_STA_START</li> <li>• WIFI_EVENT_STA_STOP</li> <li>• WIFI_EVENT_STA_CONNECTED</li> <li>• WIFI_EVENT_STA_DISCONNECTED</li> <li>• WIFI_EVENT_STA_CONNECTION_FAILED</li> <li>• WIFI_EVENT_STA_GOT_IP</li> </ul>
in	<i>handler</i>	registered event handler

## Returns

0 : success  
other : failed

## 4.9.4.40 wifi\_connection\_scan\_start()

```
int wifi_connection_scan_start (
    uint8_t * ssid,
    uint8_t ssid_length,
    uint8_t * bssid,
    uint8_t scan_mode,
    uint8_t scan_option )
```

## 4.9.4.41 wifi\_connection\_unregister\_event\_handler()

```
int wifi_connection_unregister_event_handler (
    wifi_event_t event,
    wifi_event_handler_t handler )
```

unregister wifi call back handler

## Parameters

in	<i>event</i>	The type of the unregistered event. Options please refer to <a href="#">wifi_connection_register_event_handler()</a>
in	<i>handler</i>	unregistered event handler



**Returns**

0 : success  
other : failed

**4.9.4.42 wifi\_convert\_auth\_mode()**

```
int wifi_convert_auth_mode (
    int wpa_pro,
    int privacy )
```

**4.9.4.43 wifi\_deinit()**

```
int wifi_deinit (
    void )
```

De-init Wi-Fi Initialization and Configuration functions.

**Attention**

1. This API should be called if want to remove Wi-Fi driver from the system

**Returns**

0 : success  
other : failed

**4.9.4.44 wifi\_fast\_connect\_get\_mode()**

```
int wifi_fast_connect_get_mode (
    uint8_t ap_index,
    uint8_t * mode )
```

Get the fast connect mode.

**Attention**

1. API returns false if try to get fast connect mode which something error

**Parameters**

in	<i>index</i>	The index of AP position <ul style="list-style-type: none"><li>• Range is 0 to 2</li></ul>
out	<i>mode</i>	Get the fast connect mode

**Returns**

0 : success  
other : failed

**4.9.4.45 wifi\_fast\_connect\_set\_mode()**

```
int wifi_fast_connect_set_mode (
    uint8_t ap_index,
    uint8_t mode )
```

Set the fast connect mode.

**Attention**

1. API returns false if try to set fast connect mode which something error

**Parameters**

in	<i>index</i>	The index of AP position <ul style="list-style-type: none"><li>• Range is 0 to 2</li></ul>
in	<i>mode</i>	The fast connect mode

**Returns**

0 : success  
other : failed

**4.9.4.46 wifi\_fast\_connect\_start()**

```
int wifi_fast_connect_start (
    uint8_t ap_index )
```

Start fast connect mechanism.

**Attention**

1. API returns false if try to start fast connect function which something error

**Parameters**

in	<i>index</i>	The index of AP position <ul style="list-style-type: none"><li>• Range is 0 to 2</li></ul>
----	--------------	--

**Returns**

0 : success  
other : failed

**4.9.4.47 wifi\_get\_config()**

```
int wifi_get_config (
    wifi_mode_t interface,
    wifi_config_t * conf )
```

Get configuration of specified interface.

**Parameters**

in	<i>interface</i>	Configure wifi working mode, The options are <ul style="list-style-type: none"><li>• WIFI_MODE_STA</li><li>• WIFI_MODE_AP (currently not support)</li></ul>
out	<i>conf</i>	return wifi's current operating parameters

**Returns**

0 : success  
other : failed

**4.9.4.48 wifi\_init()**

```
int wifi_init (
    const wifi_init_config_t * config,
    wifi_init_complete_cb_t init_cb )
```

Init Wi-Fi Initializes the wifi according to the specified parameters in the config.

**Attention**

1. This API must be called before other Wi-Fi APIs are invoked

**Parameters**

in	<i>config</i>	pointer to Wi-Fi init configuration structure; can point to a temporary variable.
in	<i>init_cb</i>	pointer to Wi-Fi init complete configuration structure; can point to a temporary variable.

**Returns**

0 : success  
other : failed

**4.9.4.49 wifi\_scan\_get\_ap\_list()**

```
int wifi_scan_get_ap_list (
    wifi_scan_list_t * scan_list )
```

Get list of APs that found in last scan operation.

**Attention**

This API only be called when scan is completed, otherwise it may get wrong value.

**Parameters**

out	<i>scan_list</i>	store APs' informaton that found in last scan operation
-----	------------------	---

**Returns**

0 : success  
other : failed

**4.9.4.50 wifi\_scan\_get\_ap\_num()**

```
int wifi_scan_get_ap_num (
    uint16_t * number )
```

Get the number of scanned APs.

**Parameters**

out	<i>number</i>	store number of APs found in last scan operation
-----	---------------	--

**Attention**

This API only be called when scan is completed, otherwise it may get wrong value.

**Returns**

the scan result of AP number

**4.9.4.51 `wifi_scan_get_ap_records()`**

```
int wifi_scan_get_ap_records (
    uint16_t * number,
    wifi_scan_info_t * ap_records )
```

Get AP list found in last scan operation.

**Parameters**

out	<i>number</i>	As input param, it stores max AP number that <code>ap_records</code> can hold. As output param, it receives the actual AP number that this API returns.
out	<i>ap_records</i>	<code>wifi_scan_info_t</code> array stores the found APs

**Returns**

0 : success  
other : failed

**4.9.4.52 `wifi_scan_scan_stop()`**

```
int wifi_scan_scan_stop (
    void )
```

Stop scanning process.

**Attention**

This API shall be called after `wifi_scan_start()`

**Returns**

0 : success  
other : failed

**4.9.4.53 `wifi_scan_start()`**

```
int wifi_scan_start (
    const wifi_scan_config_t * config,
    bool block )
```

Scan all available APs. After invoke the `wifi_set_config()` and `wifi_start()`, then call `wifi_scan_start()` to scan APs.

**Parameters**

in	<i>config</i>	Configure parameters for scan operation
in	<i>block</i>	if block is true, this API blocks the caller until scan operation is done, otherwise it returns immediately

**Returns**

0 : success  
other : failed

**4.9.4.54 wifi\_set\_config()**

```
int wifi_set_config (
    wifi_mode_t interface,
    wifi_config_t * conf )
```

Set configuration of OPL1000 STA.

**Attention**

1. This API is called only when specified interface is enabled, otherwise API calling will be failed
2. For station configuration, bssid\_set shall be set to 0; set to 1 means user want to check MAC address of certain AP.
3. OPL1000 is limited to working on one channel.

**Parameters**

in	<i>interface</i>	Configure wifi working mode, The options are <ul style="list-style-type: none"> <li>• WIFI_MODE_STA</li> <li>• WIFI_MODE_AP (currently not support)</li> </ul>
in	<i>conf</i>	structure of configuration paremeters

**Returns**

0 : success  
other : failed

**4.9.4.55 wifi\_sta\_get\_ap\_info()**

```
int wifi_sta_get_ap_info (
    wifi_ap_record_t * ap_info )
```

Get information of AP which OPL1000 station is associated with.

**Parameters**

out	<i>ap_info</i>	get AP information from list
-----	----------------	------------------------------

**Returns**

0 : success  
other : failed

**4.9.4.56 wifi\_start()**

```
int wifi_start (
    void )
```

Start Wi-Fi working.

- If mode is WIFI\_MODE\_STA, it creates station control block and starts station

**Returns**

0 : success  
other : failed

**4.9.4.57 wifi\_stop()**

```
int wifi_stop (
    void )
```

Stop wifi working.

- If mode is WIFI\_MODE\_STA, it stops station and releases station control block

**Returns**

0 : success  
other : failed

**4.9.5 Variable Documentation**

#### 4.9.5.1 wifi\_auto\_connect\_clear\_ap\_info\_api

wifi\_auto\_connect\_clear\_ap\_info\_fp\_t wifi\_auto\_connect\_clear\_ap\_info\_api

#### 4.9.5.2 wifi\_auto\_connect\_get\_ap\_info\_api

wifi\_auto\_connect\_get\_ap\_info\_fp\_t wifi\_auto\_connect\_get\_ap\_info\_api

#### 4.9.5.3 wifi\_auto\_connect\_get\_ap\_num\_api

wifi\_auto\_connect\_get\_ap\_num\_fp\_t wifi\_auto\_connect\_get\_ap\_num\_api

#### 4.9.5.4 wifi\_auto\_connect\_get\_mode\_api

wifi\_auto\_connect\_get\_mode\_fp\_t wifi\_auto\_connect\_get\_mode\_api

#### 4.9.5.5 wifi\_auto\_connect\_init\_api

wifi\_auto\_connect\_init\_fp\_t wifi\_auto\_connect\_init\_api

#### 4.9.5.6 wifi\_auto\_connect\_reset\_api

wifi\_auto\_connect\_reset\_fp\_t wifi\_auto\_connect\_reset\_api

#### 4.9.5.7 wifi\_auto\_connect\_set\_ap\_num\_api

wifi\_auto\_connect\_set\_ap\_num\_fp\_t wifi\_auto\_connect\_set\_ap\_num\_api

#### 4.9.5.8 wifi\_auto\_connect\_set\_mode\_api

wifi\_auto\_connect\_set\_mode\_fp\_t wifi\_auto\_connect\_set\_mode\_api



**4.9.5.9 wifi\_auto\_connect\_start\_api**

wifi\_auto\_connect\_start\_fp\_t wifi\_auto\_connect\_start\_api

**4.9.5.10 wifi\_config\_get\_bandwidth\_api**

wifi\_config\_get\_bandwidth\_fp\_t wifi\_config\_get\_bandwidth\_api

**4.9.5.11 wifi\_config\_get\_bssid\_api**

wifi\_config\_get\_bssid\_fp\_t wifi\_config\_get\_bssid\_api

**4.9.5.12 wifi\_config\_get\_channel\_api**

wifi\_config\_get\_channel\_fp\_t wifi\_config\_get\_channel\_api

**4.9.5.13 wifi\_config\_get\_dtim\_interval\_api**

wifi\_config\_get\_dtim\_interval\_fp\_t wifi\_config\_get\_dtim\_interval\_api

**4.9.5.14 wifi\_config\_get\_listen\_interval\_api**

wifi\_config\_get\_listen\_interval\_fp\_t wifi\_config\_get\_listen\_interval\_api

**4.9.5.15 wifi\_config\_get\_mac\_address\_api**

wifi\_config\_get\_mac\_address\_fp\_t wifi\_config\_get\_mac\_address\_api

**4.9.5.16 wifi\_config\_get\_opmode\_api**

wifi\_config\_get\_opmode\_fp\_t wifi\_config\_get\_opmode\_api

#### 4.9.5.17 `wifi_config_get_ssid_api`

`wifi_config_get_ssid_fp_t` `wifi_config_get_ssid_api`

#### 4.9.5.18 `wifi_config_set_bandwidth_api`

`wifi_config_set_bandwidth_fp_t` `wifi_config_set_bandwidth_api`

#### 4.9.5.19 `wifi_config_set_bssid_api`

`wifi_config_set_bssid_fp_t` `wifi_config_set_bssid_api`

#### 4.9.5.20 `wifi_config_set_channel_api`

`wifi_config_set_channel_fp_t` `wifi_config_set_channel_api`

#### 4.9.5.21 `wifi_config_set_dtim_interval_api`

`wifi_config_set_dtim_interval_fp_t` `wifi_config_set_dtim_interval_api`

#### 4.9.5.22 `wifi_config_set_listen_interval_api`

`wifi_config_set_listen_interval_fp_t` `wifi_config_set_listen_interval_api`

#### 4.9.5.23 `wifi_config_set_mac_address_api`

`wifi_config_set_mac_address_fp_t` `wifi_config_set_mac_address_api`

#### 4.9.5.24 `wifi_config_set_opmode_api`

`wifi_config_set_opmode_fp_t` `wifi_config_set_opmode_api`

**4.9.5.25 wifi\_config\_set\_ssid\_api**

wifi\_config\_set\_ssid\_fp\_t wifi\_config\_set\_ssid\_api

**4.9.5.26 wifi\_connection\_connect\_api**

wifi\_connection\_connect\_fp\_t wifi\_connection\_connect\_api

**4.9.5.27 wifi\_connection\_disconnect\_ap\_api**

wifi\_connection\_disconnect\_ap\_fp\_t wifi\_connection\_disconnect\_ap\_api

**4.9.5.28 wifi\_connection\_disconnect\_sta\_api**

wifi\_connection\_disconnect\_sta\_fp\_t wifi\_connection\_disconnect\_sta\_api

**4.9.5.29 wifi\_connection\_get\_rssi\_api**

wifi\_connection\_get\_rssi\_fp\_t wifi\_connection\_get\_rssi\_api

**4.9.5.30 wifi\_connection\_register\_event\_handler\_api**

wifi\_connection\_register\_event\_handler\_fp\_t wifi\_connection\_register\_event\_handler\_api

**4.9.5.31 wifi\_connection\_scan\_start\_api**

wifi\_connection\_scan\_start\_fp\_t wifi\_connection\_scan\_start\_api

**4.9.5.32 wifi\_connection\_unregister\_event\_handler\_api**

wifi\_connection\_unregister\_event\_handler\_fp\_t wifi\_connection\_unregister\_event\_handler\_api

#### 4.9.5.33 `wifi_convert_auth_mode_api`

`wifi_convert_auth_mode_fp_t` `wifi_convert_auth_mode_api`

#### 4.9.5.34 `wifi_deinit_api`

`wifi_deinit_fp_t` `wifi_deinit_api`

#### 4.9.5.35 `wifi_fast_connect_get_mode_api`

`wifi_fast_connect_get_mode_fp_t` `wifi_fast_connect_get_mode_api`

#### 4.9.5.36 `wifi_fast_connect_set_mode_api`

`wifi_fast_connect_set_mode_fp_t` `wifi_fast_connect_set_mode_api`

#### 4.9.5.37 `wifi_fast_connect_start_api`

`wifi_fast_connect_start_fp_t` `wifi_fast_connect_start_api`

#### 4.9.5.38 `wifi_get_config_api`

`wifi_get_config_fp_t` `wifi_get_config_api`

#### 4.9.5.39 `wifi_init_api`

`wifi_init_fp_t` `wifi_init_api`

#### 4.9.5.40 `wifi_scan_get_ap_list_api`

`wifi_scan_get_ap_list_fp_t` `wifi_scan_get_ap_list_api`

**4.9.5.41 wifi\_scan\_get\_ap\_num\_api**

wifi\_scan\_get\_ap\_num\_fp\_t wifi\_scan\_get\_ap\_num\_api

**4.9.5.42 wifi\_scan\_get\_ap\_records\_api**

wifi\_scan\_get\_ap\_records\_fp\_t wifi\_scan\_get\_ap\_records\_api

**4.9.5.43 wifi\_scan\_start\_api**

wifi\_scan\_start\_fp\_t wifi\_scan\_start\_api

**4.9.5.44 wifi\_scan\_stop\_api**

wifi\_scan\_stop\_fp\_t wifi\_scan\_stop\_api

**4.9.5.45 wifi\_set\_config\_api**

wifi\_set\_config\_fp\_t wifi\_set\_config\_api

**4.9.5.46 wifi\_sta\_get\_ap\_info\_api**

wifi\_sta\_get\_ap\_info\_fp\_t wifi\_sta\_get\_ap\_info\_api

**4.9.5.47 wifi\_start\_api**

wifi\_start\_fp\_t wifi\_start\_api

**4.9.5.48 wifi\_stop\_api**

wifi\_stop\_fp\_t wifi\_stop\_api

## 4.10 Enumeration

### Enumerations

- enum `wifi_auth_mode_t` {  
`WIFI_AUTH_OPEN` = 0, `WIFI_AUTH_WEP`, `WIFI_AUTH_WPA_PSK`, `WIFI_AUTH_WPA2_PSK`,  
`WIFI_AUTH_WPA_WPA2_PSK`, `WIFI_AUTH_WPA2_ENTERPRISE` }

*This enumeration defines the wireless authentication mode to indicate the Wi-Fi device authentication attribute.*

- enum `wifi_bandwidth_t` { `WIFI_BW_HT20` = 1, `WIFI_BW_HT40` }
- enum `wifi_cipher_type_t` {  
`WIFI_CIPHER_TYPE_NONE` = 0, `WIFI_CIPHER_TYPE_WEP40`, `WIFI_CIPHER_TYPE_WEP104`,  
`WIFI_CIPHER_TYPE_TKIP`,  
`WIFI_CIPHER_TYPE_CCMP`, `WIFI_CIPHER_TYPE_TKIP_CCMP`, `WIFI_CIPHER_TYPE_UNKNOWN` }

*This enumeration defines wireless security cipher suits.*

- enum `wifi_event_t` {  
`WIFI_EVENT_NONE` = -1, `WIFI_EVENT_INIT_COMPLETE` = 0, `WIFI_EVENT_SCAN_COMPLETE`,  
`WIFI_EVENT_STA_START`,  
`WIFI_EVENT_STA_STOP`, `WIFI_EVENT_STA_CONNECTED`, `WIFI_EVENT_STA_DISCONNECTED`,  
`WIFI_EVENT_STA_CONNECTION_FAILED`,  
`WIFI_EVENT_STA_GOT_IP`, `WIFI_EVENT_STA_AUTO_CONNECT_FAILED`, `WIFI_EVENT_MAX` }

*This enumeration defines the supported events generated by the Wi-Fi driver. The event will be sent to the upper layer handler registered in `wifi_register_event_handler()`.*

- enum `wifi_mac_data_rate_t` {  
`WIFI_MAC_DATA_RATE_ARA` = 0, `WIFI_MAC_DATA_RATE_1M`, `WIFI_MAC_DATA_RATE_2M`,  
`WIFI_MAC_DATA_RATE_5_5M`,  
`WIFI_MAC_DATA_RATE_11M` }

*This enumeration defines wifi mac tx data rates..*

- enum `wifi_mode_t` { `WIFI_MODE_NULL` = 0, `WIFI_MODE_STA`, `WIFI_MODE_AP`, `WIFI_MODE_MAX` }

- enum `wifi_reason_code_t` {  
`WIFI_REASON_CODE_SUCCESS`, `WIFI_REASON_CODE_FIND_AP_FAIL`, `WIFI_REASON_CODE_PREV_AUTH_INVALID`,  
`WIFI_REASON_CODE_DEAUTH_LEAVING_BSS`,  
`WIFI_REASON_CODE_DISASSOC_INACTIVITY`, `WIFI_REASON_CODE_DISASSOC_AP_OVERLOAD`,  
`WIFI_REASON_CODE_CLASS_2_ERR`, `WIFI_REASON_CODE_CLASS_3_ERR`,  
`WIFI_REASON_CODE_DISASSOC_LEAVING_BSS`, `WIFI_REASON_CODE_ASSOC_BEFORE_AUTH`,  
`WIFI_REASON_CODE_DISASSOC_PWR_CAP_UNACCEPTABLE`, `WIFI_REASON_CODE_DISASSOC_SUP_CHS_UNACCO`,  
`WIFI_REASON_CODE_INVALID_INFO_ELEM` = 13, `WIFI_REASON_CODE_MIC_FAILURE`, `WIFI_REASON_CODE_4_WAY`,  
`WIFI_REASON_CODE_GROUP_KEY_UPDATE_TIMEOUT`,  
`WIFI_REASON_CODE_DIFFERENT_INFO_ELEM`, `WIFI_REASON_CODE_GROUP_CIPHER_INVALID_VALID`,  
`WIFI_REASON_CODE_PAIRWISE_CIPHER_INVALID`, `WIFI_REASON_CODE_AKMP_INVALID`,  
`WIFI_REASON_CODE_UNSUPPORTED_RSNE_VERSION`, `WIFI_REASON_CODE_INVALID_RSNE_CAPABILITIES`,  
`WIFI_REASON_CODE_IEEE_802_1X_AUTH_FAILED`, `WIFI_REASON_CODE_CIPHER_REJECTED`,  
`WIFI_REASON_CODE_AUTO_CONNECT_FAILED` = 200, `WIFI_REASON_CODE_CONNECT_NOT_FOUND`,  
`WIFI_REASON_CODE_CONNECT_TIMEOUT` }

*This enumeration defines the reason code of the `WIFI_EVENT_STA_CONNECTION_FAILED` event in `wifi_event_t`.*

*Find the details for the reason code below.*

- enum `wifi_scan_method_t` { `WIFI_FAST_SCAN` = 0, `WIFI_ALL_CHANNEL_SCAN` }
- enum `wifi_scan_type_t` { `WIFI_SCAN_TYPE_ACTIVE` = 0, `WIFI_SCAN_TYPE_PASSIVE`, `WIFI_SCAN_TYPE_MIX` }

*This enumeration defines the wireless STA scan type.*

- enum `wifi_sort_method_t` { `WIFI_CONNECT_AP_BY_SIGNAL` = 0, `WIFI_CONNECT_AP_BY_SECURITY` }

### 4.10.1 Detailed Description

### 4.10.2 Enumeration Type Documentation

## 4.10.2.1 wifi\_auth\_mode\_t

```
enum wifi_auth_mode_t
```

This enumeration defines the wireless authentication mode to indicate the Wi-Fi device authentication attribute.

## Enumerator

WIFI_AUTH_OPEN	authenticate mode : open
WIFI_AUTH_WEP	authenticate mode : WEP
WIFI_AUTH_WPA_PSK	authenticate mode : WPA_PSK
WIFI_AUTH_WPA2_PSK	authenticate mode : WPA2_PSK
WIFI_AUTH_WPA_WPA2_PSK	authenticate mode : WPA_WPA2_PSK
WIFI_AUTH_WPA2_ENTERPRISE	authenticate mode : WPA2_ENTERPRISE

## 4.10.2.2 wifi\_bandwidth\_t

```
enum wifi_bandwidth_t
```

## Enumerator

WIFI_BW_HT20	Bandwidth is HT20
WIFI_BW_HT40	Bandwidth is HT40

## 4.10.2.3 wifi\_cipher\_type\_t

```
enum wifi_cipher_type_t
```

This enumeration defines wireless security cipher suits.

## Enumerator

WIFI_CIPHER_TYPE_NONE	0, the cipher type is none
WIFI_CIPHER_TYPE_WEP40	1, the cipher type is WEP40
WIFI_CIPHER_TYPE_WEP104	2, the cipher type is WEP104
WIFI_CIPHER_TYPE_TKIP	3, the cipher type is TKIP
WIFI_CIPHER_TYPE_CCMP	4, the cipher type is CCMP
WIFI_CIPHER_TYPE_TKIP_CCMP	5, the cipher type is TKIP and CCMP
WIFI_CIPHER_TYPE_UNKNOWN	6, the cipher type is unknown

4.10.2.4 `wifi_event_t`

```
enum wifi_event_t
```

This enumeration defines the supported events generated by the Wi-Fi driver. The event will be sent to the upper layer handler registered in [wifi\\_register\\_event\\_handler\(\)](#).

## Enumerator

WIFI_EVENT_NONE	Reserved
WIFI_EVENT_INIT_COMPLETE	Wi-Fi initialization complete event.
WIFI_EVENT_SCAN_COMPLETE	Scan completed event
WIFI_EVENT_STA_START	station start
WIFI_EVENT_STA_STOP	station stop
WIFI_EVENT_STA_CONNECTED	station connected to AP event
WIFI_EVENT_STA_DISCONNECTED	station disconnected from AP
WIFI_EVENT_STA_CONNECTION_FAILED	Connection has failed. For the reason code, please refer to <a href="#">wifi_reason_code_t</a> .
WIFI_EVENT_STA_GOT_IP	station got IP from connected AP
WIFI_EVENT_STA_AUTO_CONNECT_FAILED	station auto connect failed indication
WIFI_EVENT_MAX	

4.10.2.5 `wifi_mac_data_rate_t`

```
enum wifi_mac_data_rate_t
```

This enumeration defines wifi mac tx data rates..

## Enumerator

WIFI_MAC_DATA_RATE_ARA	Auto Rate Adaptation
WIFI_MAC_DATA_RATE_1M	Fix Mac Tx data rate in 1 Mbps
WIFI_MAC_DATA_RATE_2M	Fix Mac Tx data rate in 2 Mbps
WIFI_MAC_DATA_RATE_5_5M	Fix Mac Tx data rate in 5.5 Mbps
WIFI_MAC_DATA_RATE_11M	Fix Mac Tx data rate in 11 Mbps

4.10.2.6 `wifi_mode_t`

```
enum wifi_mode_t
```

## Enumerator

WIFI_MODE_NULL	null mode
WIFI_MODE_STA	Wi-Fi station mode
WIFI_MODE_AP	Wi-Fi soft-AP mode
WIFI_MODE_MAX	



## 4.10.2.7 wifi\_reason\_code\_t

```
enum wifi_reason_code_t
```

This enumeration defines the reason code of the WIFI\_EVENT\_STA\_CONNECTION\_FAILED event in [wifi\\_event\\_t](#). Find the details for the reason code below.

## Enumerator

WIFI_REASON_CODE_SUCCESS	0 Reserved.
WIFI_REASON_CODE_FIND_AP_FAIL	1 (Internal) No AP found.
WIFI_REASON_CODE_PREV_AUTH_INVALID	2 Previous authentication is no longer valid.
WIFI_REASON_CODE_DEAUTH_LEAVING_BSS	3 Deauthenticated because sending STA is leaving (or has left) IBSS or ES.
WIFI_REASON_CODE_DISASSOC_INACTIVITY	4 Disassociated due to inactivity.
WIFI_REASON_CODE_DISASSOC_AP_OVERLOAD	5 Disassociated because AP is unable to handle all currently associated STAs.
WIFI_REASON_CODE_CLASS_2_ERR	6 Class 2 frame received from nonauthenticated STA.
WIFI_REASON_CODE_CLASS_3_ERR	7 Class 3 frame received from nonauthenticated STA.
WIFI_REASON_CODE_DISASSOC_LEAVING_BSS	8 Disassociated because sending STA is leaving (or has left) BSS.
WIFI_REASON_CODE_ASSOC_BEFORE_AUTH	9 STA requesting (re)association is not authenticated with responding STA.
WIFI_REASON_CODE_DISASSOC_PWR_CAP_UNACCEPTABLE	10 Disassociated because the information in the Power Capability element is unacceptable.
WIFI_REASON_CODE_DISASSOC_SUP_CHS_UNACCEPTABLE	11 Disassociated because the information in the Supported Channels element is unacceptable.
WIFI_REASON_CODE_INVALID_INFO_ELEM	13 Invalid information element.
WIFI_REASON_CODE_MIC_FAILURE	14 Message integrity code (MIC) failure.
WIFI_REASON_CODE_4_WAY_HANDSHAKE_TIMEOUT	15 4-Way Handshake time out.
WIFI_REASON_CODE_GROUP_KEY_UPDATE_TIMEOUT	16 Group Key Handshake time out.
WIFI_REASON_CODE_DIFFERENT_INFO_ELEM	17 Information element in 4-Way Handshake different from (Re)Association Request/Probe Response/Beacon frame.
WIFI_REASON_CODE_GROUP_CIPHER_INVALID	18 Invalid group cipher.
WIFI_REASON_CODE_PAIRWISE_CIPHER_INVALID	19 Invalid pairwise cipher.
WIFI_REASON_CODE_AKMP_INVALID	20 Invalid AKMP.
WIFI_REASON_CODE_UNSUPPORTED_RSNE_VERSION	21 Unsupported RSN information element version.
WIFI_REASON_CODE_INVALID_RSNE_CAPABILITIES	22 Invalid RSN information element capabilities.
WIFI_REASON_CODE_IEEE_802_1X_AUTH_FAILED	23 IEEE 802.1X authentication failed.
WIFI_REASON_CODE_CIPHER_REJECTED	24 Cipher suite rejected because of the security policy.
WIFI_REASON_CODE_AUTO_CONNECT_FAILED	200 Auto connect failed.
WIFI_REASON_CODE_CONNECT_NOT_FOUND	201 The target AP is not found.
WIFI_REASON_CODE_CONNECT_TIMEOUT	202 Connect to AP timeout.

#### 4.10.2.8 wifi\_scan\_method\_t

enum `wifi_scan_method_t`

##### Enumerator

WIFI_FAST_SCAN	Do fast scan, scan will end after find SSID match AP
WIFI_ALL_CHANNEL_SCAN	All channel scan, scan will end after scan all the channel

#### 4.10.2.9 wifi\_scan\_type\_t

enum `wifi_scan_type_t`

This enumeration defines the wireless STA scan type.

##### Enumerator

WIFI_SCAN_TYPE_ACTIVE	Actively scan a network by sending 802.11 probe(s)
WIFI_SCAN_TYPE_PASSIVE	Passively scan a network by listening for beacons from APs
WIFI_SCAN_TYPE_MIX	Active + Passive scan

#### 4.10.2.10 wifi\_sort\_method\_t

enum `wifi_sort_method_t`

##### Enumerator

WIFI_CONNECT_AP_BY_SIGNAL	Sort match AP in scan list by RSSI
WIFI_CONNECT_AP_BY_SECURITY	Sort match AP in scan list by security mode

## Chapter 5

# Data Structure Documentation

### 5.1 `_wpa_ie_data` Struct Reference

```
#include <controller_wifi_com.h>
```

#### Data Fields

- int `capabilities`
- int `group_cipher`
- int `key_mgmt`
- int `mgmt_group_cipher`
- size\_t `num_pmkid`
- int `pairwise_cipher`
- const u8 \* `pmkid`
- int `proto`

#### 5.1.1 Field Documentation

##### 5.1.1.1 `capabilities`

```
int capabilities
```

##### 5.1.1.2 `group_cipher`

```
int group_cipher
```

#### 5.1.1.3 key\_mgmt

```
int key_mgmt
```

#### 5.1.1.4 mgmt\_group\_cipher

```
int mgmt_group_cipher
```

#### 5.1.1.5 num\_pmkid

```
size_t num_pmkid
```

#### 5.1.1.6 pairwise\_cipher

```
int pairwise_cipher
```

#### 5.1.1.7 pmkid

```
const u8* pmkid
```

#### 5.1.1.8 proto

```
int proto
```

## 5.2 asso\_data Struct Reference

```
#include <controller_wifi_com.h>
```

## Data Fields

- unsigned int [eap\\_workaround](#)
- int [eapol\\_flags](#)
- int [group\\_cipher](#)
- int [key\\_mgmt](#)
- int [leap](#)
- int [mgmt\\_group\\_cipher](#)
- int [non\\_leap](#)
- int [pairwise\\_cipher](#)
- char \* [passphrase](#)
- int [proto](#)
- u8 [psk](#) [32]
- int [psk\\_set](#)

### 5.2.1 Field Documentation

#### 5.2.1.1 eap\_workaround

unsigned int eap\_workaround

#### 5.2.1.2 eapol\_flags

int eapol\_flags

#### 5.2.1.3 group\_cipher

int group\_cipher

#### 5.2.1.4 key\_mgmt

int key\_mgmt

#### 5.2.1.5 leap

int leap

#### 5.2.1.6 mgmt\_group\_cipher

```
int mgmt_group_cipher
```

#### 5.2.1.7 non\_leap

```
int non_leap
```

#### 5.2.1.8 pairwise\_cipher

```
int pairwise_cipher
```

#### 5.2.1.9 passphrase

```
char* passphrase
```

#### 5.2.1.10 proto

```
int proto
```

#### 5.2.1.11 psk

```
u8 psk[32]
```

#### 5.2.1.12 psk\_set

```
int psk_set
```

### 5.3 auto\_conn\_info\_t Struct Reference

```
#include <controller_wifi_com.h>
```

## Data Fields

- u8 [ap\\_channel](#)
- u16 [beacon\\_interval](#)
- u8 [bssid](#) [MAC\_ADDR\_LEN]
- u16 [capabilities](#)
- u8 [dtim\\_prod](#)
- u8 [fast\\_connect](#)
- bool [free\\_ocpy](#)
- s8 [hid\\_ssid](#) [IEEE80211\_MAX\_SSID\_LEN+1]
- u8 [hid\\_ssid\\_len](#)
- u64 [latest\\_beacon\\_rx\\_time](#)
- s8 [passphrase](#) [MAX\_LEN\_OF\_PASSPHRASE]
- u8 [psk](#) [32]
- u8 [rsn\\_ie](#) [256]
- s8 [rssi](#)
- s8 [ssid](#) [IEEE80211\_MAX\_SSID\_LEN+1]
- u8 [ssid\\_len](#)
- u8 [supported\\_rates](#) [IEEE80211\_MAX\_SUPPORTED\_RATES]
- [wpa\\_ie\\_data\\_t](#) [wpa\\_data](#)
- u8 [wpa\\_ie](#) [257]

### 5.3.1 Field Documentation

#### 5.3.1.1 ap\_channel

u8 ap\_channel

#### 5.3.1.2 beacon\_interval

u16 beacon\_interval

#### 5.3.1.3 bssid

u8 bssid[MAC\_ADDR\_LEN]

#### 5.3.1.4 capabilities

u16 capabilities

**5.3.1.5 dtim\_prod**

u8 dtim\_prod

**5.3.1.6 fast\_connect**

u8 fast\_connect

**5.3.1.7 free\_ocpy**

bool free\_ocpy

**5.3.1.8 hid\_ssid**

s8 hid\_ssid[IEEE80211\_MAX\_SSID\_LEN+1]

**5.3.1.9 hid\_ssid\_len**

u8 hid\_ssid\_len

**5.3.1.10 latest\_beacon\_rx\_time**

u64 latest\_beacon\_rx\_time

**5.3.1.11 passphrase**

s8 passphrase[MAX\_LEN\_OF\_PASSPHRASE]

**5.3.1.12 psk**

u8 psk[32]



#### 5.3.1.13 rsn\_ie

u8 rsn\_ie[256]

#### 5.3.1.14 rssi

s8 rssi

#### 5.3.1.15 ssid

s8 ssid[IEEE80211\_MAX\_SSID\_LEN+1]

#### 5.3.1.16 ssid\_len

u8 ssid\_len

#### 5.3.1.17 supported\_rates

u8 supported\_rates[IEEE80211\_MAX\_SUPPORTED\_RATES]

#### 5.3.1.18 wpa\_data

wpa\_ie\_data\_t wpa\_data

#### 5.3.1.19 wpa\_ie

u8 wpa\_ie[257]

## 5.4 auto\_connect\_cfg\_t Struct Reference

```
#include <controller_wifi_com.h>
```

## Data Fields

- bool [flag](#)
- s8 [front](#)
- u8 [max\\_save\\_num](#)
- [auto\\_conn\\_info\\_t](#) \* [pFCInfo](#)
- s8 [rear](#)
- u8 [retryCount](#)
- u8 [targetIdx](#)
- u32 [uFCApNum](#)

### 5.4.1 Field Documentation

#### 5.4.1.1 flag

bool flag

#### 5.4.1.2 front

s8 front

#### 5.4.1.3 max\_save\_num

u8 max\_save\_num

#### 5.4.1.4 pFCInfo

[auto\\_conn\\_info\\_t](#)\* [pFCInfo](#)

#### 5.4.1.5 rear

s8 rear

#### 5.4.1.6 retryCount

u8 retryCount

#### 5.4.1.7 targetIdx

u8 targetIdx

#### 5.4.1.8 uFCapNum

u32 uFCapNum

## 5.5 event\_msg\_t Struct Reference

Send information to event by [event\\_msg\\_t](#).

```
#include <event_loop.h>
```

### Data Fields

- uint32\_t [event](#)
- uint32\_t [length](#)
- uint8\_t \* [param](#)

### 5.5.1 Detailed Description

Send information to event by [event\\_msg\\_t](#).

### 5.5.2 Field Documentation

#### 5.5.2.1 event

uint32\_t event

event type

### 5.5.2.2 length

uint32\_t length

Packet length

### 5.5.2.3 param

uint8\_t\* param

event paramment

## 5.6 hap\_control\_t Struct Reference

```
#include <controller_wifi_com_patch.h>
```

### Data Fields

- [auto\\_conn\\_info\\_t](#) \* hap\_ap\_info
- u16 [hap\\_bitvector](#)
- u8 [hap\\_en](#)
- u8 [hap\\_final\\_index](#)
- u8 [hap\\_index](#)
- char [hap\\_ssid](#) [IEEE80211\_MAX\_SSID\_LEN+1]

### 5.6.1 Field Documentation

#### 5.6.1.1 hap\_ap\_info

[auto\\_conn\\_info\\_t](#)\* hap\_ap\_info

#### 5.6.1.2 hap\_bitvector

u16 hap\_bitvector

#### 5.6.1.3 hap\_en

u8 hap\_en

#### 5.6.1.4 hap\_final\_index

u8 hap\_final\_index

#### 5.6.1.5 hap\_index

u8 hap\_index

#### 5.6.1.6 hap\_ssid

char hap\_ssid[IEEE80211\_MAX\_SSID\_LEN+1]

## 5.7 LE\_BT\_ADDR\_T Struct Reference

```
#include <ble.h>
```

### Data Fields

- BD\_ADDR [addr](#)
- UINT8 [type](#)

### 5.7.1 Field Documentation

#### 5.7.1.1 addr

BD\_ADDR addr

address

#### 5.7.1.2 type

UINT8 type

address type

## 5.8 LE\_CM\_CONNECTION\_COMPLETE\_IND\_T Struct Reference

```
#include <ble_cm_if.h>
```

### Data Fields

- UINT16 [conn\\_hdl](#)
- UINT16 [conn\\_interval](#)
- UINT16 [conn\\_latency](#)
- UINT16 [dev\\_id](#)
- BD\_ADDR [peer\\_addr](#)
- UINT8 [peer\\_addr\\_type](#)
- UINT8 [role](#)
- UINT16 [status](#)
- UINT16 [supervison\\_timeout](#)

### 5.8.1 Field Documentation

#### 5.8.1.1 conn\_hdl

UINT16 conn\_hdl

connection handle

#### 5.8.1.2 conn\_interval

UINT16 conn\_interval

connection interval

#### 5.8.1.3 conn\_latency

UINT16 conn\_latency

connection latency

#### 5.8.1.4 dev\_id

UINT16 dev\_id

device ID

#### 5.8.1.5 peer\_addr

BD\_ADDR peer\_addr

peer address

#### 5.8.1.6 peer\_addr\_type

UINT8 peer\_addr\_type

peer address type

#### 5.8.1.7 role

UINT8 role

master or slave

#### 5.8.1.8 status

UINT16 status

refer to LE\_ERR\_STATE in [ble\\_err.h](#)

#### 5.8.1.9 supervison\_timeout

UINT16 supervison\_timeout

supervision timeout

## 5.9 LE\_CM\_MSG\_ADVERTISE\_REPORT\_IND\_T Struct Reference

```
#include <ble_cm_if.h>
```

### Data Fields

- BD\_ADDR [addr](#)
- UINT8 [addr\\_type](#)
- UINT8 [data](#) [1]
- UINT8 [event\\_type](#)
- UINT8 [len](#)
- INT8 [rssi](#)

## 5.9.1 Field Documentation

### 5.9.1.1 addr

BD\_ADDR addr

address

### 5.9.1.2 addr\_type

UINT8 addr\_type

address type

### 5.9.1.3 data

UINT8 data[1]

### 5.9.1.4 event\_type

UINT8 event\_type

### 5.9.1.5 len

UINT8 len

### 5.9.1.6 rssi

INT8 rssi

RSSI

## 5.10 LE\_CM\_MSG\_CONN\_PARA\_REQ\_T Struct Reference

```
#include <ble_cm_if.h>
```



## Data Fields

- UINT16 [conn\\_hdl](#)
- UINT16 [itv\\_max](#)
- UINT16 [itv\\_min](#)
- UINT16 [latency](#)
- UINT32 [sv\\_tmo](#)

### 5.10.1 Field Documentation

#### 5.10.1.1 conn\_hdl

UINT16 conn\_hdl

connection handle

#### 5.10.1.2 itv\_max

UINT16 itv\_max

maximum connection interval

#### 5.10.1.3 itv\_min

UINT16 itv\_min

minimum connection interval

#### 5.10.1.4 latency

UINT16 latency

slave latency

#### 5.10.1.5 sv\_tmo

UINT32 sv\_tmo

supervision timeout

## 5.11 LE\_CM\_MSG\_CONN\_UPDATE\_COMPLETE\_IND\_T Struct Reference

```
#include <ble_cm_if.h>
```

## Data Fields

- UINT16 [conn\\_hdl](#)
- UINT16 [interval](#)
- UINT16 [latency](#)
- UINT16 [status](#)
- UINT32 [supervision\\_timeout](#)

### 5.11.1 Field Documentation

#### 5.11.1.1 conn\_hdl

UINT16 conn\_hdl

connection handle

#### 5.11.1.2 interval

UINT16 interval

connection interval

#### 5.11.1.3 latency

UINT16 latency

slave letency

#### 5.11.1.4 status

UINT16 status

refer to LE\_ERR\_STATE in [ble\\_err.h](#)

#### 5.11.1.5 supervision\_timeout

UINT32 supervision\_timeout

supervision timeout

## 5.12 LE\_CM\_MSG\_DATA\_LEN\_CHANGE\_IND\_T Struct Reference

```
#include <ble_cm_if.h>
```

## Data Fields

- UINT16 [conn\\_hdl](#)
- UINT16 [max\\_rx\\_octets](#)
- UINT16 [max\\_rx\\_time](#)
- UINT16 [max\\_tx\\_octets](#)
- UINT16 [max\\_tx\\_time](#)

### 5.12.1 Field Documentation

#### 5.12.1.1 conn\_hdl

UINT16 conn\_hdl

connection handle

#### 5.12.1.2 max\_rx\_octets

UINT16 max\_rx\_octets

connMaxRxOctets

#### 5.12.1.3 max\_rx\_time

UINT16 max\_rx\_time

connMaxRxTime

#### 5.12.1.4 max\_tx\_octets

UINT16 max\_tx\_octets

connMaxTxOctets

#### 5.12.1.5 max\_tx\_time

UINT16 max\_tx\_time

connMaxTxTime

## 5.13 LE\_CM\_MSG\_DIRECT\_ADV\_REPORT\_IND\_T Struct Reference

```
#include <ble_cm_if.h>
```

## Data Fields

- BD\_ADDR [direct\\_addr](#)
- UINT8 [direct\\_addr\\_type](#)
- BD\_ADDR [peer\\_addr](#)
- UINT8 [peer\\_addr\\_type](#)
- INT8 [rssi](#)

### 5.13.1 Field Documentation

#### 5.13.1.1 direct\_addr

BD\_ADDR direct\_addr

direct address

#### 5.13.1.2 direct\_addr\_type

UINT8 direct\_addr\_type

direct address type

#### 5.13.1.3 peer\_addr

BD\_ADDR peer\_addr

peer address

#### 5.13.1.4 peer\_addr\_type

UINT8 peer\_addr\_type

peer address type

#### 5.13.1.5 rssi

INT8 rssi

RSSI

## 5.14 LE\_CM\_MSG\_DISCONNECT\_COMPLETE\_IND\_T Struct Reference

```
#include <ble_cm_if.h>
```

## Data Fields

- UINT16 [conn\\_hdl](#)
- UINT8 [reason](#)
- UINT16 [status](#)

### 5.14.1 Field Documentation

#### 5.14.1.1 conn\_hdl

UINT16 [conn\\_hdl](#)

connection handle

#### 5.14.1.2 reason

UINT8 [reason](#)

disconnect reason

#### 5.14.1.3 status

UINT16 [status](#)

refer to LE\_ERR\_STATE in [ble\\_err.h](#)

## 5.15 LE\_CM\_MSG\_ENCRYPTION\_CHANGE\_IND\_T Struct Reference

```
#include <ble_cm_if.h>
```

## Data Fields

- UINT16 [conn\\_hdl](#)
- UINT16 [devid](#)
- UINT8 [enabled](#)
- UINT16 [status](#)

### 5.15.1 Field Documentation

#### 5.15.1.1 conn\_hdl

UINT16 conn\_hdl

connection handle

#### 5.15.1.2 devid

UINT16 devid

device ID

#### 5.15.1.3 enabled

UINT8 enabled

#### 5.15.1.4 status

UINT16 status

refer to LE\_ERR\_STATE in [ble\\_err.h](#)

## 5.16 LE\_CM\_MSG\_ENCRYPTION\_REFRESH\_IND\_T Struct Reference

```
#include <ble_cm_if.h>
```

### Data Fields

- UINT16 [conn\\_hdl](#)
- UINT16 [devid](#)
- BOOL [enabled](#)
- UINT16 [status](#)

### 5.16.1 Field Documentation

#### 5.16.1.1 conn\_hdl

UINT16 conn\_hdl

connection handle

#### 5.16.1.2 devid

UINT16 devid

device ID

#### 5.16.1.3 enabled

BOOL enabled

enable or disable

#### 5.16.1.4 status

UINT16 status

refer to LE\_ERR\_STATE in [ble\\_err.h](#)

## 5.17 LE\_CM\_MSG\_INIT\_COMPLETE\_CFM\_T Struct Reference

```
#include <ble_cm_if.h>
```

### Data Fields

- UINT16 [status](#)

### 5.17.1 Field Documentation

#### 5.17.1.1 status

UINT16 status

refer to LE\_ERR\_STATE in [ble\\_err.h](#)

## 5.18 LE\_CM\_MSG\_LTK\_REQ\_IND\_T Struct Reference

```
#include <ble_cm_if.h>
```

## Data Fields

- UINT16 [conn\\_hdl](#)
- UINT16 [devid](#)
- UINT16 [ediv](#)
- UINT8 [rand](#) [8]

## 5.18.1 Field Documentation

### 5.18.1.1 conn\_hdl

UINT16 [conn\\_hdl](#)

connection handle

### 5.18.1.2 devid

UINT16 [devid](#)

device ID

### 5.18.1.3 ediv

UINT16 [ediv](#)

### 5.18.1.4 rand

UINT8 [rand](#)[8]

## 5.19 LE\_CM\_MSG\_READ\_ADV\_TX\_POWER\_CFM\_T Struct Reference

```
#include <ble_cm_if.h>
```

## Data Fields

- INT8 [pwr\\_level](#)
- UINT16 [status](#)



### 5.19.1 Field Documentation

#### 5.19.1.1 pwr\_level

INT8 pwr\_level

power level

#### 5.19.1.2 status

UINT16 status

refer to LE\_ERR\_STATE in [ble\\_err.h](#)

## 5.20 LE\_CM\_MSG\_READ\_BD\_ADDR\_CFM\_T Struct Reference

```
#include <ble_cm_if.h>
```

### Data Fields

- BD\_ADDR [bd\\_addr](#)
- UINT16 [status](#)

### 5.20.1 Field Documentation

#### 5.20.1.1 bd\_addr

BD\_ADDR bd\_addr

#### 5.20.1.2 status

UINT16 status

refer to LE\_ERR\_STATE in [ble\\_err.h](#)

## 5.21 LE\_CM\_MSG\_READ\_CHANNEL\_MAP\_CFM\_T Struct Reference

```
#include <ble_cm_if.h>
```

### Data Fields

- UINT8 [ch\\_map](#) [5]
- UINT16 [conn\\_hdl](#)
- UINT16 [status](#)

### 5.21.1 Field Documentation

#### 5.21.1.1 [ch\\_map](#)

```
UINT8 ch_map[5]
```

channel map

#### 5.21.1.2 [conn\\_hdl](#)

```
UINT16 conn_hdl
```

connection handle

#### 5.21.1.3 [status](#)

```
UINT16 status
```

refer to LE\_ERR\_STATE in [ble\\_err.h](#)

## 5.22 LE\_CM\_MSG\_READ\_PHY\_CFM\_T Struct Reference

```
#include <ble_cm_if.h>
```

### Data Fields

- UINT16 [conn\\_hdl](#)
- UINT8 [rx\\_phy](#)
- UINT16 [status](#)
- UINT8 [tx\\_phy](#)

### 5.22.1 Field Documentation

#### 5.22.1.1 conn\_hdl

UINT16 conn\_hdl

#### 5.22.1.2 rx\_phy

UINT8 rx\_phy

#### 5.22.1.3 status

UINT16 status

#### 5.22.1.4 tx\_phy

UINT8 tx\_phy

## 5.23 LE\_CM\_MSG\_READ\_RESOLVING\_LIST\_SIZE\_CFM\_T Struct Reference

```
#include <ble_cm_if.h>
```

### Data Fields

- [UINT8 size](#)
- [UINT16 status](#)

### 5.23.1 Field Documentation

#### 5.23.1.1 size

UINT8 size

resolving list size

#### 5.23.1.2 status

UINT16 status

refer to LE\_ERR\_STATE in [ble\\_err.h](#)

### 5.24 LE\_CM\_MSG\_READ\_RSSI\_CFM\_T Struct Reference

```
#include <ble_cm_if.h>
```

#### Data Fields

- UINT16 [conn\\_hdl](#)
- INT8 [rssi](#)
- UINT16 [status](#)

#### 5.24.1 Field Documentation

##### 5.24.1.1 conn\_hdl

UINT16 conn\_hdl

connection handle

##### 5.24.1.2 rssi

INT8 rssi

RSSI

##### 5.24.1.3 status

UINT16 status

refer to LE\_ERR\_STATE in [ble\\_err.h](#)

### 5.25 LE\_CM\_MSG\_READ\_TX\_POWER\_CFM\_T Struct Reference

```
#include <ble_cm_if.h>
```

## Data Fields

- UINT16 [conn\\_hdl](#)
- UINT16 [status](#)
- INT8 [tx\\_power](#)

### 5.25.1 Field Documentation

#### 5.25.1.1 conn\_hdl

UINT16 conn\_hdl

connection handle

#### 5.25.1.2 status

UINT16 status

refer to LE\_ERR\_STATE in [ble\\_err.h](#)

#### 5.25.1.3 tx\_power

INT8 tx\_power

tx power

## 5.26 LE\_CM\_MSG\_READ\_WHITE\_LIST\_SIZE\_CFM\_T Struct Reference

```
#include <ble_cm_if.h>
```

## Data Fields

- UINT8 [size](#)
- UINT16 [status](#)

### 5.26.1 Field Documentation

#### 5.26.1.1 size

UINT8 size

white list size

#### 5.26.1.2 status

UINT16 status

refer to LE\_ERR\_STATE in [ble\\_err.h](#)

### 5.27 LE\_CM\_MSG\_SET\_DATA\_LENGTH\_CFM\_T Struct Reference

```
#include <ble_cm_if.h>
```

#### Data Fields

- UINT16 [conn\\_hdl](#)
- UINT16 [status](#)

#### 5.27.1 Field Documentation

##### 5.27.1.1 conn\_hdl

UINT16 conn\_hdl

connection handle

##### 5.27.1.2 status

UINT16 status

refer to LE\_ERR\_STATE in [ble\\_err.h](#)

### 5.28 LE\_CM\_MSG\_SET\_DISCONNECT\_CFM\_T Struct Reference

```
#include <ble_cm_if.h>
```

## Data Fields

- UINT16 [handle](#)
- UINT16 [status](#)

### 5.28.1 Field Documentation

#### 5.28.1.1 handle

UINT16 handle

connection handle

#### 5.28.1.2 status

UINT16 status

refer to LE\_ERR\_STATE in [ble\\_err.h](#)

## 5.29 LE\_CM\_MSG\_SET\_PHY\_CFM\_T Struct Reference

```
#include <ble_cm_if.h>
```

## Data Fields

- UINT16 [conn\\_hdl](#)
- UINT16 [status](#)

### 5.29.1 Field Documentation

#### 5.29.1.1 conn\_hdl

UINT16 conn\_hdl

#### 5.29.1.2 status

UINT16 status

## 5.30 LE\_CM\_MSG\_SIGNAL\_UPDATE\_REQ\_T Struct Reference

```
#include <ble_cm_if.h>
```

### Data Fields

- UINT16 [conn\\_hdl](#)
- UINT16 [identifier](#)
- UINT16 [interval\\_max](#)
- UINT16 [interval\\_min](#)
- UINT16 [slave\\_latency](#)
- UINT32 [timeout\\_multiplier](#)

### 5.30.1 Field Documentation

#### 5.30.1.1 conn\_hdl

UINT16 conn\_hdl

connection handle

#### 5.30.1.2 identifier

UINT16 identifier

#### 5.30.1.3 interval\_max

UINT16 interval\_max

maxinum connection interval

#### 5.30.1.4 interval\_min

UINT16 interval\_min

mininum connection interval

#### 5.30.1.5 slave\_latency

UINT16 slave\_latency

slave latency



#### 5.30.1.6 timeout\_multiplier

UINT32 timeout\_multiplier

## 5.31 LE\_CM\_REQ\_STATUS\_T Struct Reference

```
#include <ble_cm_if.h>
```

### Data Fields

- UINT16 [status](#)

#### 5.31.1 Field Documentation

##### 5.31.1.1 status

UINT16 status

refer to LE\_ERR\_STATE in [ble\\_err.h](#)

## 5.32 LE\_CONN\_PARA\_T Struct Reference

```
#include <ble.h>
```

### Data Fields

- UINT16 [itv\\_max](#)
- UINT16 [itv\\_min](#)
- UINT16 [latency](#)
- UINT16 [sv\\_timeout](#)

#### 5.32.1 Field Documentation

##### 5.32.1.1 itv\_max

UINT16 itv\_max

maximum connection interval

#### 5.32.1.2 itv\_min

UINT16 itv\_min

mininum connection interval

#### 5.32.1.3 latency

UINT16 latency

slave latency

#### 5.32.1.4 sv\_timeout

UINT16 sv\_timeout

supervision timeout

### 5.33 LE\_GAP\_ADVERTISING\_PARAM\_T Struct Reference

```
#include <ble_gap_if.h>
```

#### Data Fields

- [UINT8 channel\\_map](#)
- [UINT8 filter\\_policy](#)
- [UINT16 interval\\_max](#)
- [UINT16 interval\\_min](#)
- [UINT8 own\\_addr\\_type](#)
- [BD\\_ADDR peer\\_addr](#)
- [UINT8 peer\\_addr\\_type](#)
- [UINT8 type](#)

#### 5.33.1 Field Documentation

##### 5.33.1.1 channel\_map

UINT8 channel\_map

advertising channel map

#### 5.33.1.2 filter\_policy

UINT8 filter\_policy

advertising filter policy

#### 5.33.1.3 interval\_max

UINT16 interval\_max

maximum advertising interval

#### 5.33.1.4 interval\_min

UINT16 interval\_min

minimum advertising interval

#### 5.33.1.5 own\_addr\_type

UINT8 own\_addr\_type

owner address type

#### 5.33.1.6 peer\_addr

BD\_ADDR peer\_addr

peer address

#### 5.33.1.7 peer\_addr\_type

UINT8 peer\_addr\_type

peer address type

#### 5.33.1.8 type

UINT8 type

advertising type

## 5.34 LE\_GAP\_CONN\_PARAM\_T Struct Reference

```
#include <ble_gap_if.h>
```

## Data Fields

- UINT16 [interval\\_max](#)
- UINT16 [interval\\_min](#)
- UINT16 [latency](#)
- UINT16 [supervision\\_timeout](#)

### 5.34.1 Field Documentation

#### 5.34.1.1 interval\_max

UINT16 interval\_max

maximum connection interval

#### 5.34.1.2 interval\_min

UINT16 interval\_min

mininum connection interval

#### 5.34.1.3 latency

UINT16 latency

slave latency

#### 5.34.1.4 supervision\_timeout

UINT16 supervision\_timeout

supervision timeout for the LE Link

### 5.35 LE\_GAP\_SCAN\_PARAM\_T Struct Reference

```
#include <ble_gap_if.h>
```

## Data Fields

- UINT8 [filter\\_policy](#)
- UINT16 [interval](#)
- UINT8 [own\\_addr\\_type](#)
- UINT8 [type](#)
- UINT16 [window](#)

### 5.35.1 Field Documentation

#### 5.35.1.1 filter\_policy

UINT8 filter\_policy

scan filter policy

#### 5.35.1.2 interval

UINT16 interval

scan interval

#### 5.35.1.3 own\_addr\_type

UINT8 own\_addr\_type

owner address type

#### 5.35.1.4 type

UINT8 type

scan type

#### 5.35.1.5 window

UINT16 window

scan window

## 5.36 LE\_GATT\_ATTR\_T Struct Reference

```
#include <ble_gatt_if.h>
```

### Data Fields

- UINT8 [format](#)
- UINT16 [handle](#)
- UINT16 [len](#)
- UINT16 [maxLen](#)
- UINT16 [permit](#)
- UINT16 \*const [pUuid](#)
- UINT8 \*const [pVal](#)

### 5.36.1 Field Documentation

#### 5.36.1.1 format

`UINT8 format`

UUID type

#### 5.36.1.2 handle

`UINT16 handle`

handle

#### 5.36.1.3 len

`UINT16 len`

value length

#### 5.36.1.4 maxLen

`UINT16 maxLen`

maximum value length

#### 5.36.1.5 permit

`UINT16 permit`

permit

#### 5.36.1.6 pUuid

`UINT16* const pUuid`

UUID

#### 5.36.1.7 pVal

`UINT8* const pVal`

value

## 5.37 LE\_GATT\_MSG\_ACCESS\_READ\_IND\_T Struct Reference

```
#include <ble_gatt_if.h>
```

### Data Fields

- UINT16 [conn\\_hdl](#)
- UINT16 [devid](#)
- UINT16 [handle](#)
- UINT16 [offset](#)

### 5.37.1 Field Documentation

#### 5.37.1.1 conn\_hdl

UINT16 conn\_hdl

connection handle

#### 5.37.1.2 devid

UINT16 devid

device index

#### 5.37.1.3 handle

UINT16 handle

attribute handle

#### 5.37.1.4 offset

UINT16 offset

attribute handle value

## 5.38 LE\_GATT\_MSG\_ACCESS\_WRITE\_IND\_T Struct Reference

```
#include <ble_gatt_if.h>
```

## Data Fields

- UINT16 [conn\\_hdl](#)
- UINT16 [devid](#)
- UINT8 [flag](#)
- UINT16 [handle](#)
- UINT16 [len](#)
- UINT16 [offset](#)
- UINT8 \* [pVal](#)

### 5.38.1 Field Documentation

#### 5.38.1.1 conn\_hdl

UINT16 conn\_hdl

connection handle

#### 5.38.1.2 devid

UINT16 devid

device ID

#### 5.38.1.3 flag

UINT8 flag

refer to LE\_GATT\_FLAG\_\* in [ble\\_gatt\\_if.h](#)

#### 5.38.1.4 handle

UINT16 handle

attribute handle

#### 5.38.1.5 len

UINT16 len

length written



#### 5.38.1.6 offset

UINT16 offset

attribute handle value

#### 5.38.1.7 pVal

UINT8\* pVal

value written

## 5.39 LE\_GATT\_MSG\_CHAR\_DESCRIPTOR\_INFO\_IND\_T Struct Reference

```
#include <ble_gatt_if.h>
```

### Data Fields

- UINT16 [conn\\_hdl](#)
- UINT16 [devid](#)
- UINT8 [format](#)
- UINT16 [handle](#)
- UINT16 [uuid](#) [8]

### 5.39.1 Field Documentation

#### 5.39.1.1 conn\_hdl

UINT16 conn\_hdl

connection handle

#### 5.39.1.2 devid

UINT16 devid

device ID

#### 5.39.1.3 format

UINT8 format

UUID type

#### 5.39.1.4 handle

UINT16 handle

characteristic descriptor handle

#### 5.39.1.5 uuid

UINT16 uuid[8]

UUID

### 5.40 LE\_GATT\_MSG\_CHARACTERISTIC\_DECL\_INFO\_IND\_T Struct Reference

```
#include <ble_gatt_if.h>
```

#### Data Fields

- UINT16 [conn\\_hdl](#)
- UINT16 [devid](#)
- UINT8 [format](#)
- UINT16 [handle](#)
- UINT8 [property](#)
- UINT16 [uuid](#) [8]
- UINT16 [val\\_hdl](#)

#### 5.40.1 Field Documentation

##### 5.40.1.1 conn\_hdl

UINT16 conn\_hdl

connection handle

##### 5.40.1.2 devid

UINT16 devid

device ID

#### 5.40.1.3 format

UINT8 format

UUID type

#### 5.40.1.4 handle

UINT16 handle

characteristic declaration handle

#### 5.40.1.5 property

UINT8 property

property

#### 5.40.1.6 uuid

UINT16 uuid[8]

UUID

#### 5.40.1.7 val\_hdl

UINT16 val\_hdl

characteristic value handle

## 5.41 LE\_GATT\_MSG\_CHARACTERISTIC\_VAL\_IND\_T Struct Reference

```
#include <ble_gatt_if.h>
```

### Data Fields

- UINT8 [att\\_err](#)
- UINT16 [conn\\_hdl](#)
- UINT16 [devid](#)
- UINT16 [handle](#)
- UINT16 [len](#)
- UINT16 [offset](#)
- UINT8 \* [val](#)

### 5.41.1 Field Documentation

#### 5.41.1.1 att\_err

UINT8 att\_err

0 is ok, others refer to LE\_ATT\_ERR\_\* in [ble\\_att\\_if.h](#)

#### 5.41.1.2 conn\_hdl

UINT16 conn\_hdl

connection handle

#### 5.41.1.3 devid

UINT16 devid

device ID

#### 5.41.1.4 handle

UINT16 handle

characteristic value handle

#### 5.41.1.5 len

UINT16 len

value length

#### 5.41.1.6 offset

UINT16 offset

value position offset

#### 5.41.1.7 val

UINT8\* val

value

## 5.42 LE\_GATT\_MSG\_CONFIRMATION\_CFM\_T Struct Reference

```
#include <ble_gatt_if.h>
```

### Data Fields

- UINT16 [conn\\_hdl](#)
- UINT16 [devid](#)
- UINT16 [handle](#)

### 5.42.1 Field Documentation

#### 5.42.1.1 conn\_hdl

UINT16 conn\_hdl

connection handle

#### 5.42.1.2 devid

UINT16 devid

device ID

#### 5.42.1.3 handle

UINT16 handle

attribute handle

## 5.43 LE\_GATT\_MSG\_EXCHANGE\_MTU\_CFM\_T Struct Reference

```
#include <ble_gatt_if.h>
```

### Data Fields

- UINT16 [conn\\_hdl](#)
- UINT16 [current\\_rx\\_mtu](#)
- UINT16 [devid](#)

### 5.43.1 Field Documentation

#### 5.43.1.1 conn\_hdl

UINT16 conn\_hdl

connection handle

#### 5.43.1.2 current\_rx\_mtu

UINT16 current\_rx\_mtu

current receive MTU

#### 5.43.1.3 devid

UINT16 devid

device ID

## 5.44 LE\_GATT\_MSG\_EXCHANGE\_MTU\_IND\_T Struct Reference

```
#include <ble_gatt_if.h>
```

### Data Fields

- UINT16 [client\\_rx\\_mtu](#)
- UINT16 [conn\\_hdl](#)
- UINT16 [devid](#)

### 5.44.1 Field Documentation

#### 5.44.1.1 client\_rx\_mtu

UINT16 client\_rx\_mtu

client receive MTU

#### 5.44.1.2 conn\_hdl

UINT16 conn\_hdl

connection handle

#### 5.44.1.3 devid

UINT16 devid

device ID

## 5.45 LE\_GATT\_MSG\_EXECUTE\_WRITE\_RELIABLE\_CFM\_T Struct Reference

```
#include <ble_gatt_if.h>
```

### Data Fields

- UINT8 [att\\_err](#)
- UINT16 [conn\\_hdl](#)
- UINT16 [devid](#)
- UINT16 [err\\_hdl](#)
- UINT16 [status](#)

### 5.45.1 Field Documentation

#### 5.45.1.1 att\_err

UINT8 att\_err

0 is ok, others refer to LE\_ATT\_ERR\_\* in [ble\\_att\\_if.h](#)

#### 5.45.1.2 conn\_hdl

UINT16 conn\_hdl

connection handle

#### 5.45.1.3 devid

UINT16 devid

device ID

#### 5.45.1.4 err\_hdl

UINT16 err\_hdl

TBD

#### 5.45.1.5 status

UINT16 status

refer to LE\_ERR\_STATE in [ble\\_err.h](#)

### 5.46 LE\_GATT\_MSG\_FIND\_ALL\_CHAR\_DESC\_CFM\_T Struct Reference

```
#include <ble_gatt_if.h>
```

#### Data Fields

- UINT8 [att\\_err](#)
- UINT16 [conn\\_hdl](#)
- UINT16 [devid](#)
- UINT16 [handle](#)
- UINT16 [status](#)

#### 5.46.1 Field Documentation

##### 5.46.1.1 att\_err

UINT8 att\_err

0 is ok, others refer to LE\_ATT\_ERR\_\* in [ble\\_att\\_if.h](#)

##### 5.46.1.2 conn\_hdl

UINT16 conn\_hdl

connection handle

##### 5.46.1.3 devid

UINT16 devid

device ID



#### 5.46.1.4 handle

UINT16 handle

characteristic descriptor handle

#### 5.46.1.5 status

UINT16 status

refer to LE\_ERR\_STATE in [ble\\_err.h](#)

## 5.47 LE\_GATT\_MSG\_FIND\_ALL\_PRIMARY\_SERVICE\_CFM\_T Struct Reference

```
#include <ble_gatt_if.h>
```

### Data Fields

- UINT8 [att\\_err](#)
- UINT16 [conn\\_hdl](#)
- UINT16 [devid](#)
- UINT16 [handle](#)
- UINT16 [status](#)

### 5.47.1 Field Documentation

#### 5.47.1.1 att\_err

UINT8 att\_err

0 is ok, others refer to LE\_ATT\_ERR\_\* in [ble\\_att\\_if.h](#)

#### 5.47.1.2 conn\_hdl

UINT16 conn\_hdl

connection handle

#### 5.47.1.3 devid

UINT16 devid

device ID

#### 5.47.1.4 handle

UINT16 handle

#### 5.47.1.5 status

UINT16 status

refer to LE\_ERR\_STATE in [ble\\_err.h](#)

### 5.48 LE\_GATT\_MSG\_FIND\_CHARACTERISTIC\_CFM\_T Struct Reference

```
#include <ble_gatt_if.h>
```

#### Data Fields

- UINT8 [att\\_err](#)
- UINT16 [conn\\_hdl](#)
- UINT16 [devid](#)
- UINT16 [handle](#)
- UINT16 [status](#)

#### 5.48.1 Field Documentation

##### 5.48.1.1 att\_err

UINT8 att\_err

0 is ok, others refer to LE\_ATT\_ERR\_\* in [ble\\_att\\_if.h](#)

##### 5.48.1.2 conn\_hdl

UINT16 conn\_hdl

connection handle

##### 5.48.1.3 devid

UINT16 devid

device ID

#### 5.48.1.4 handle

UINT16 handle

characteristic descriptor handle

#### 5.48.1.5 status

UINT16 status

refer to LE\_ERR\_STATE in [ble\\_err.h](#)

## 5.49 LE\_GATT\_MSG\_FIND\_INCLUDED\_SERVICE\_CFM\_T Struct Reference

```
#include <ble_gatt_if.h>
```

### Data Fields

- UINT8 [att\\_err](#)
- UINT16 [conn\\_hdl](#)
- UINT16 [devid](#)
- UINT16 [handle](#)
- UINT16 [status](#)

### 5.49.1 Field Documentation

#### 5.49.1.1 att\_err

UINT8 att\_err

0 is ok, others refer to LE\_ATT\_ERR\_\* in [ble\\_att\\_if.h](#)

#### 5.49.1.2 conn\_hdl

UINT16 conn\_hdl

connection handle

#### 5.49.1.3 devid

UINT16 devid

device ID

#### 5.49.1.4 handle

UINT16 handle

include service start handle

#### 5.49.1.5 status

UINT16 status

refer to LE\_ERR\_STATE in [ble\\_err.h](#)

### 5.50 LE\_GATT\_MSG\_FIND\_PRIMARY\_SERVICE\_BY\_UUID\_CFM\_T Struct Reference

```
#include <ble_gatt_if.h>
```

#### Data Fields

- UINT8 [att\\_err](#)
- UINT16 [conn\\_hdl](#)
- UINT16 [devid](#)
- UINT16 [handle](#)
- UINT16 [status](#)

#### 5.50.1 Field Documentation

##### 5.50.1.1 att\_err

UINT8 att\_err

0 is ok, others refer to LE\_ATT\_ERR\_\* in [ble\\_att\\_if.h](#)

##### 5.50.1.2 conn\_hdl

UINT16 conn\_hdl

connection handle

##### 5.50.1.3 devid

UINT16 devid

device ID

#### 5.50.1.4 handle

UINT16 handle

service start handle

#### 5.50.1.5 status

UINT16 status

refer to LE\_ERR\_STATE in [ble\\_err.h](#)

## 5.51 LE\_GATT\_MSG\_INCLUDE\_SERVICE\_INFO\_IND\_T Struct Reference

```
#include <ble_gatt_if.h>
```

### Data Fields

- UINT16 [conn\\_hdl](#)
- UINT16 [devid](#)
- UINT16 [end\\_hdl](#)
- UINT8 [format](#)
- UINT16 [handle](#)
- UINT16 [start\\_hdl](#)
- UINT16 [uuid](#) [8]

### 5.51.1 Field Documentation

#### 5.51.1.1 conn\_hdl

UINT16 conn\_hdl

connection handle

#### 5.51.1.2 devid

UINT16 devid

device ID

#### 5.51.1.3 end\_hdl

UINT16 end\_hdl

end handle

#### 5.51.1.4 format

UINT8 format

UUID type

#### 5.51.1.5 handle

UINT16 handle

include servie handle

#### 5.51.1.6 start\_hdl

UINT16 start\_hdl

start handle

#### 5.51.1.7 uuid

UINT16 uuid[8]

UUID

## 5.52 LE\_GATT\_MSG\_INDICATE\_IND\_T Struct Reference

```
#include <ble_gatt_if.h>
```

### Data Fields

- UINT16 [conn\\_hdl](#)
- UINT16 [devid](#)
- UINT16 [handle](#)
- UINT16 [len](#)
- UINT8 \* [val](#)

#### 5.52.1 Field Documentation

#### 5.52.1.1 conn\_hdl

UINT16 conn\_hdl

connection handle

#### 5.52.1.2 devid

UINT16 devid

device ID

#### 5.52.1.3 handle

UINT16 handle

attribute handle

#### 5.52.1.4 len

UINT16 len

value length

#### 5.52.1.5 val

UINT8\* val

value

## 5.53 LE\_GATT\_MSG\_NOTIFY\_CFM\_T Struct Reference

```
#include <ble_gatt_if.h>
```

### Data Fields

- UINT16 [conn\\_hdl](#)
- UINT16 [devid](#)
- UINT16 [handle](#)
- UINT16 [status](#)

#### 5.53.1 Field Documentation

#### 5.53.1.1 conn\_hdl

UINT16 conn\_hdl

connection handle

#### 5.53.1.2 devid

UINT16 devid

device ID

#### 5.53.1.3 handle

UINT16 handle

attribute handle

#### 5.53.1.4 status

UINT16 status

refer to LE\_ERR\_STATE in [ble\\_err.h](#)

### 5.54 LE\_GATT\_MSG\_NOTIFY\_IND\_T Struct Reference

```
#include <ble_gatt_if.h>
```

#### Data Fields

- UINT16 [conn\\_hdl](#)
- UINT16 [devid](#)
- UINT16 [handle](#)
- UINT16 [len](#)
- UINT8 \* [val](#)

#### 5.54.1 Field Documentation

##### 5.54.1.1 conn\_hdl

UINT16 conn\_hdl

connection handle



#### 5.54.1.2 devid

UINT16 devid

device ID

#### 5.54.1.3 handle

UINT16 handle

attribute handle

#### 5.54.1.4 len

UINT16 len

value length

#### 5.54.1.5 val

UINT8\* val

value

## 5.55 LE\_GATT\_MSG\_OPERATION\_TIMEOUT\_T Struct Reference

```
#include <ble_gatt_if.h>
```

### Data Fields

- UINT8 [att\\_op](#)
- UINT16 [conn\\_hdl](#)
- UINT16 [devid](#)

### 5.55.1 Field Documentation

#### 5.55.1.1 att\_op

UINT8 att\_op

refer to LE\_ATT\_OP\_\* in [ble\\_att\\_if.h](#)

#### 5.55.1.2 conn\_hdl

UINT16 conn\_hdl

connection handle

#### 5.55.1.3 devid

UINT16 devid

device ID

### 5.56 LE\_GATT\_MSG\_PREPARE\_WRITE\_RELIABLE\_CFM\_T Struct Reference

```
#include <ble_gatt_if.h>
```

#### Data Fields

- UINT8 [att\\_err](#)
- UINT16 [conn\\_hdl](#)
- UINT16 [devid](#)
- UINT16 [handle](#)
- UINT16 [status](#)

#### 5.56.1 Field Documentation

##### 5.56.1.1 att\_err

UINT8 att\_err

0 is ok, others refer to LE\_ATT\_ERR\_\* in [ble\\_att\\_if.h](#)

##### 5.56.1.2 conn\_hdl

UINT16 conn\_hdl

connection handle

##### 5.56.1.3 devid

UINT16 devid

device ID

#### 5.56.1.4 handle

UINT16 handle

attribute handle

#### 5.56.1.5 status

UINT16 status

refer to LE\_ERR\_STATE in [ble\\_err.h](#)

## 5.57 LE\_GATT\_MSG\_READ\_CHAR\_VAL\_BY\_UUID\_CFM\_T Struct Reference

```
#include <ble_gatt_if.h>
```

### Data Fields

- UINT8 [att\\_err](#)
- UINT16 [conn\\_hdl](#)
- UINT16 [devid](#)
- UINT16 [handle](#)
- UINT16 [status](#)

### 5.57.1 Field Documentation

#### 5.57.1.1 att\_err

UINT8 att\_err

0 is ok, others refer to LE\_ATT\_ERR\_\* in [ble\\_att\\_if.h](#)

#### 5.57.1.2 conn\_hdl

UINT16 conn\_hdl

connection handle

#### 5.57.1.3 devid

UINT16 devid

device ID

#### 5.57.1.4 handle

UINT16 handle

characteristic value handle

#### 5.57.1.5 status

UINT16 status

refer to LE\_ERR\_STATE in [ble\\_err.h](#)

### 5.58 LE\_GATT\_MSG\_READ\_CHARACTERISTIC\_VALUE\_CFM\_T Struct Reference

```
#include <ble_gatt_if.h>
```

#### Data Fields

- UINT8 [att\\_err](#)
- UINT16 [conn\\_hdl](#)
- UINT16 [devid](#)
- UINT16 [handle](#)
- UINT16 [status](#)

#### 5.58.1 Field Documentation

##### 5.58.1.1 att\_err

UINT8 att\_err

0 is ok, others refer to LE\_ATT\_ERR\_\* in [ble\\_att\\_if.h](#)

##### 5.58.1.2 conn\_hdl

UINT16 conn\_hdl

connection handle

##### 5.58.1.3 devid

UINT16 devid

device ID

#### 5.58.1.4 handle

UINT16 handle

characteristic value handle

#### 5.58.1.5 status

UINT16 status

refer to LE\_ERR\_STATE in [ble\\_err.h](#)

## 5.59 LE\_GATT\_MSG\_READ\_LONG\_CHAR\_VAL\_CFM\_T Struct Reference

```
#include <ble_gatt_if.h>
```

### Data Fields

- UINT8 [att\\_err](#)
- UINT16 [conn\\_hdl](#)
- UINT16 [devid](#)
- UINT16 [handle](#)
- UINT16 [status](#)

### 5.59.1 Field Documentation

#### 5.59.1.1 att\_err

UINT8 att\_err

0 is ok, others refer to LE\_ATT\_ERR\_\* in [ble\\_att\\_if.h](#)

#### 5.59.1.2 conn\_hdl

UINT16 conn\_hdl

connection handle

#### 5.59.1.3 devid

UINT16 devid

device ID

#### 5.59.1.4 handle

UINT16 handle

characteristic value handle

#### 5.59.1.5 status

UINT16 status

refer to LE\_ERR\_STATE in [ble\\_err.h](#)

## 5.60 LE\_GATT\_MSG\_READ\_MULTIPLE\_CHAR\_VAL\_CFM\_T Struct Reference

```
#include <ble_gatt_if.h>
```

### Data Fields

- UINT8 [att\\_err](#)
- UINT16 [conn\\_hdl](#)
- UINT16 [devid](#)
- UINT16 [err\\_hdl](#)
- UINT16 [len](#)
- UINT16 [status](#)
- UINT8 \* [val](#)

### 5.60.1 Field Documentation

#### 5.60.1.1 att\_err

UINT8 att\_err

0 is ok, others refer to LE\_ATT\_ERR\_\* in [ble\\_att\\_if.h](#)

#### 5.60.1.2 conn\_hdl

UINT16 conn\_hdl

connection handle

#### 5.60.1.3 devid

UINT16 devid

device ID

#### 5.60.1.4 err\_hdl

UINT16 err\_hdl

TBD

#### 5.60.1.5 len

UINT16 len

value length

#### 5.60.1.6 status

UINT16 status

refer to LE\_ERR\_STATE in [ble\\_err.h](#)

#### 5.60.1.7 val

UINT8\* val

value

## 5.61 LE\_GATT\_MSG\_SERVICE\_INFO\_IND\_T Struct Reference

```
#include <ble_gatt_if.h>
```

### Data Fields

- UINT16 [conn\\_hdl](#)
- UINT16 [devid](#)
- UINT16 [end\\_hdl](#)
- UINT8 [format](#)
- UINT16 [start\\_hdl](#)
- UINT16 [uuid](#) [8]

### 5.61.1 Field Documentation

#### 5.61.1.1 conn\_hdl

UINT16 conn\_hdl

connection handle

#### 5.61.1.2 devid

UINT16 devid

device ID

#### 5.61.1.3 end\_hdl

UINT16 end\_hdl

end handle

#### 5.61.1.4 format

UINT8 format

UUID type

#### 5.61.1.5 start\_hdl

UINT16 start\_hdl

start handle

#### 5.61.1.6 uuid

UINT16 uuid[8]

UUID

## 5.62 LE\_GATT\_MSG\_SIGNED\_WRITE\_CFM\_T Struct Reference

```
#include <ble_gatt_if.h>
```



## Data Fields

- UINT16 [conn\\_hdl](#)
- UINT16 [devid](#)
- UINT16 [handle](#)
- UINT16 [status](#)

### 5.62.1 Field Documentation

#### 5.62.1.1 conn\_hdl

UINT16 conn\_hdl

connection handle

#### 5.62.1.2 devid

UINT16 devid

device ID

#### 5.62.1.3 handle

UINT16 handle

attribute handle

#### 5.62.1.4 status

UINT16 status

refer to LE\_ERR\_STATE in [ble\\_err.h](#)

## 5.63 LE\_GATT\_MSG\_WRITE\_CHAR\_VAL\_RELIABLE\_CFM\_T Struct Reference

```
#include <ble_gatt_if.h>
```

## Data Fields

- UINT8 [att\\_err](#)
- UINT16 [conn\\_hdl](#)
- UINT16 [devid](#)
- UINT16 [handle](#)
- UINT16 [status](#)

### 5.63.1 Field Documentation

#### 5.63.1.1 att\_err

UINT8 att\_err

0 is ok, others refer to LE\_ATT\_ERR\_\* in [ble\\_att\\_if.h](#)

#### 5.63.1.2 conn\_hdl

UINT16 conn\_hdl

connection handle

#### 5.63.1.3 devid

UINT16 devid

device ID

#### 5.63.1.4 handle

UINT16 handle

characteristic value handle

#### 5.63.1.5 status

UINT16 status

refer to LE\_ERR\_STATE in [ble\\_err.h](#)

## 5.64 LE\_GATT\_MSG\_WRITE\_CHAR\_VALUE\_CFM\_T Struct Reference

```
#include <ble_gatt_if.h>
```

### Data Fields

- UINT8 [att\\_err](#)
- UINT16 [conn\\_hdl](#)
- UINT16 [devid](#)
- UINT16 [handle](#)
- UINT16 [status](#)

### 5.64.1 Field Documentation

#### 5.64.1.1 att\_err

UINT8 att\_err

0 is ok, others refer to LE\_ATT\_ERR\_\* in [ble\\_att\\_if.h](#)

#### 5.64.1.2 conn\_hdl

UINT16 conn\_hdl

connection handle

#### 5.64.1.3 devid

UINT16 devid

device ID

#### 5.64.1.4 handle

UINT16 handle

attribute handle

#### 5.64.1.5 status

UINT16 status

refer to LE\_ERR\_STATE in [ble\\_err.h](#)

## 5.65 LE\_GATT\_MSG\_WRITE\_LONG\_CHAR\_VALUE\_CFM\_T Struct Reference

```
#include <ble_gatt_if.h>
```

### Data Fields

- UINT8 [att\\_err](#)
- UINT16 [conn\\_hdl](#)
- UINT16 [devid](#)
- UINT16 [handle](#)
- UINT16 [status](#)

## 5.65.1 Field Documentation

### 5.65.1.1 att\_err

UINT8 att\_err

0 is ok, others refer to LE\_ATT\_ERR\_\* in [ble\\_att\\_if.h](#)

### 5.65.1.2 conn\_hdl

UINT16 conn\_hdl

connection handle

### 5.65.1.3 devid

UINT16 devid

device ID

### 5.65.1.4 handle

UINT16 handle

characteristic value handle

### 5.65.1.5 status

UINT16 status

refer to LE\_ERR\_STATE in [ble\\_err.h](#)

## 5.66 LE\_GATT\_MSG\_WRITE\_NO\_RSP\_CFM\_T Struct Reference

```
#include <ble_gatt_if.h>
```

### Data Fields

- UINT16 [conn\\_hdl](#)
- UINT16 [devid](#)
- UINT16 [handle](#)
- UINT16 [status](#)

### 5.66.1 Field Documentation

#### 5.66.1.1 conn\_hdl

UINT16 conn\_hdl

connection handle

#### 5.66.1.2 devid

UINT16 devid

device ID

#### 5.66.1.3 handle

UINT16 handle

attribute handle

#### 5.66.1.4 status

UINT16 status

refer to LE\_ERR\_STATE in [ble\\_err.h](#)

## 5.67 LE\_GATT\_SERVICE\_T Struct Reference

```
#include <ble_gatt_if.h>
```

### Data Fields

- UINT16 [endHdl](#)
- [LE\\_GATT\\_ATTR\\_T](#) \* [pAttr](#)
- UINT16 [startHdl](#)
- UINT16 [svc\\_id](#)

### 5.67.1 Field Documentation

#### 5.67.1.1 endHdl

UINT16 endHdl

end handle

#### 5.67.1.2 pAttr

LE\_GATT\_ATTR\_T\* pAttr

pointer attribute table

#### 5.67.1.3 startHdl

UINT16 startHdl

start handle

#### 5.67.1.4 svc\_id

UINT16 svc\_id

service ID

### 5.68 LE\_SMP\_MSG\_ENCRYPTION\_CHANGE\_IND\_T Struct Reference

```
#include <ble_smp_if.h>
```

#### Data Fields

- UINT16 [conn\\_hdl](#)
- BOOL [enable](#)

#### 5.68.1 Field Documentation

##### 5.68.1.1 conn\_hdl

UINT16 conn\_hdl

connection handle

### 5.68.1.2 enable

BOOL enable

enable or disable

## 5.69 LE\_SMP\_MSG\_ENCRYPTION\_REFRESH\_IND\_T Struct Reference

```
#include <ble_smp_if.h>
```

### Data Fields

- UINT16 [conn\\_hdl](#)
- UINT16 [status](#)

### 5.69.1 Field Documentation

#### 5.69.1.1 conn\_hdl

UINT16 conn\_hdl

connection handle

#### 5.69.1.2 status

UINT16 status

refer to LE\_ERR\_STATE in [ble\\_err.h](#)

## 5.70 LE\_SMP\_MSG\_OOB\_DATA\_REQUEST\_IND\_T Struct Reference

```
#include <ble_smp_if.h>
```

### Data Fields

- UINT16 [conn\\_hdl](#)

### 5.70.1 Field Documentation

### 5.70.1.1 conn\_hdl

UINT16 conn\_hdl

connection handle

## 5.71 LE\_SMP\_MSG\_PAIRING\_ACTION\_IND\_T Struct Reference

```
#include <ble_smp_if.h>
```

### Data Fields

- UINT8 [action](#)
- UINT16 [conn\\_hdl](#)
- BOOL [lost\\_bond](#)
- UINT8 [sc](#)

### 5.71.1 Field Documentation

#### 5.71.1.1 action

UINT8 action

refer to LE\_SM\_IO\_CAP\_\* in [ble\\_smp\\_if.h](#)

#### 5.71.1.2 conn\_hdl

UINT16 conn\_hdl

connection handle

#### 5.71.1.3 lost\_bond

BOOL lost\_bond

remote lost bond

#### 5.71.1.4 sc

UINT8 sc

secure connection



## 5.72 LE\_SMP\_MSG\_PAIRING\_COMPLETE\_IND\_T Struct Reference

```
#include <ble_smp_if.h>
```

### Data Fields

- `UINT8` [authenticated](#)
- `UINT8` [bonded](#)
- `UINT16` [conn\\_hdl](#)
- [LE\\_BT\\_ADDR\\_T](#) [peer\\_id\\_addr](#)
- `UINT8` [sc](#)
- `UINT16` [status](#)

### 5.72.1 Field Documentation

#### 5.72.1.1 `authenticated`

`UINT8` `authenticated`

`authenticated`

#### 5.72.1.2 `bonded`

`UINT8` `bonded`

`bonded`

#### 5.72.1.3 `conn_hdl`

`UINT16` `conn_hdl`

connection handle

#### 5.72.1.4 `peer_id_addr`

[LE\\_BT\\_ADDR\\_T](#) `peer_id_addr`

peer device address

#### 5.72.1.5 `sc`

`UINT8` `sc`

secure connection

#### 5.72.1.6 status

UINT16 status

refer to LE\_ERR\_STATE in [ble\\_err.h](#)

### 5.73 LE\_SMP\_MSG\_PASSKEY\_DISPLAY\_IND\_T Struct Reference

```
#include <ble_smp_if.h>
```

#### Data Fields

- UINT16 [conn\\_hdl](#)
- UINT32 [passkey](#)

#### 5.73.1 Field Documentation

##### 5.73.1.1 conn\_hdl

UINT16 conn\_hdl

connection handle

##### 5.73.1.2 passkey

UINT32 passkey

passkey

### 5.74 LE\_SMP\_MSG\_PASSKEY\_INPUT\_IND\_T Struct Reference

```
#include <ble_smp_if.h>
```

#### Data Fields

- UINT16 [conn\\_hdl](#)

#### 5.74.1 Field Documentation

#### 5.74.1.1 conn\_hdl

UINT16 conn\_hdl

connection handle

### 5.75 LE\_SMP\_MSG\_SC\_OOB\_DATA\_REQUEST\_IND\_T Struct Reference

```
#include <ble_smp_if.h>
```

#### Data Fields

- UINT16 [conn\\_hdl](#)

#### 5.75.1 Field Documentation

##### 5.75.1.1 conn\_hdl

UINT16 conn\_hdl

connection handle

### 5.76 LE\_SMP\_MSG\_SLAVE\_SECURITY\_REQUEST\_IND\_T Struct Reference

```
#include <ble_smp_if.h>
```

#### Data Fields

- UINT8 [bondable](#)
- UINT16 [conn\\_hdl](#)
- UINT8 [keypress](#)
- UINT8 [mitm](#)
- UINT8 [sc](#)

#### 5.76.1 Field Documentation

#### 5.76.1.1 bondable

UINT8 bondable

bonding

#### 5.76.1.2 conn\_hdl

UINT16 conn\_hdl

connection handle

#### 5.76.1.3 keypress

UINT8 keypress

keypress status

#### 5.76.1.4 mitm

UINT8 mitm

MITM

#### 5.76.1.5 sc

UINT8 sc

secure connection

### 5.77 LE\_SMP\_MSG\_USER\_CONFIRM\_IND\_T Struct Reference

```
#include <ble_smp_if.h>
```

#### Data Fields

- UINT32 [confirm\\_num](#)
- UINT16 [conn\\_hdl](#)

#### 5.77.1 Field Documentation

#### 5.77.1.1 confirm\_num

UINT32 confirm\_num

confirm number

#### 5.77.1.2 conn\_hdl

UINT16 conn\_hdl

connection handle

## 5.78 LE\_SMP\_SC\_OOB\_DATA\_T Struct Reference

```
#include <ble_smp_if.h>
```

### Data Fields

- UINT8 [confirm](#) [16]
- UINT8 [rand](#) [16]

### 5.78.1 Field Documentation

#### 5.78.1.1 confirm

UINT8 confirm[16]

confirm data

#### 5.78.1.2 rand

UINT8 rand[16]

random data

## 5.79 LE\_SYS\_MSG\_BUF\_OVERFLOW\_T Struct Reference

```
#include <ble_msg.h>
```

## Data Fields

- UINT16 [conn\\_hdl](#)

### 5.79.1 Field Documentation

#### 5.79.1.1 conn\_hdl

UINT16 [conn\\_hdl](#)

connection handle

## 5.80 mw\_blewifi\_cbs\_store\_t Struct Reference

```
#include <controller_wifi_com.h>
```

## Data Fields

- uint8\_t [manufacture\\_name](#) [STA\_INFO\_MAX\_MANUF\_NAME\_SIZE]

### 5.80.1 Field Documentation

#### 5.80.1.1 manufacture\_name

uint8\_t [manufacture\\_name](#) [STA\_INFO\_MAX\_MANUF\_NAME\_SIZE]

## 5.81 mw\_wifi\_auto\_connect\_ap\_info\_t Struct Reference

```
#include <controller_wifi_com.h>
```

## Data Fields

- u8 [ap\\_channel](#)
- u16 [beacon\\_interval](#)
- u8 [bssid](#) [MAC\_ADDR\_LEN]
- u16 [capabilities](#)
- u8 [dtim\\_prod](#)
- u8 [fast\\_connect](#)
- bool [free\\_ocpy](#)
- s8 [hid\\_ssid](#) [IEEE80211\_MAX\_SSID\_LEN+1]
- u8 [hid\\_ssid\\_len](#)
- u64 [latest\\_beacon\\_rx\\_time](#)
- s8 [passphrase](#) [64]
- u8 [psk](#) [32]
- u8 [rsn\\_ie](#) [256]
- s8 [rssi](#)
- s8 [ssid](#) [IEEE80211\_MAX\_SSID\_LEN+1]
- u8 [ssid\\_len](#)
- u8 [supported\\_rates](#) [IEEE80211\_MAX\_SUPPORTED\_RATES]
- [wpa\\_ie\\_data\\_t](#) [wpa\\_data](#)
- u8 [wpa\\_ie](#) [257]

### 5.81.1 Field Documentation

#### 5.81.1.1 [ap\\_channel](#)

u8 [ap\\_channel](#)

#### 5.81.1.2 [beacon\\_interval](#)

u16 [beacon\\_interval](#)

#### 5.81.1.3 [bssid](#)

u8 [bssid](#)[MAC\_ADDR\_LEN]

#### 5.81.1.4 [capabilities](#)

u16 [capabilities](#)

**5.81.1.5 dtim\_prod**

u8 dtim\_prod

**5.81.1.6 fast\_connect**

u8 fast\_connect

**5.81.1.7 free\_ocpy**

bool free\_ocpy

**5.81.1.8 hid\_ssid**

s8 hid\_ssid[IEEE80211\_MAX\_SSID\_LEN+1]

**5.81.1.9 hid\_ssid\_len**

u8 hid\_ssid\_len

**5.81.1.10 latest\_beacon\_rx\_time**

u64 latest\_beacon\_rx\_time

**5.81.1.11 passphrase**

s8 passphrase[64]

**5.81.1.12 psk**

u8 psk[32]



**5.81.1.13 rsn\_ie**

```
u8 rsn_ie[256]
```

**5.81.1.14 rssi**

```
s8 rssi
```

**5.81.1.15 ssid**

```
s8 ssid[IEEE80211_MAX_SSID_LEN+1]
```

**5.81.1.16 ssid\_len**

```
u8 ssid_len
```

**5.81.1.17 supported\_rates**

```
u8 supported_rates[IEEE80211_MAX_SUPPORTED_RATES]
```

**5.81.1.18 wpa\_data**

```
wpa_ie_data_t wpa_data
```

**5.81.1.19 wpa\_ie**

```
u8 wpa_ie[257]
```

**5.82 mw\_wifi\_sta\_info\_t Struct Reference**

```
#include <controller_wifi_com.h>
```

## Data Fields

- uint8\_t [au8Dot11MACAddress](#) [MAC\_ADDR\_LEN]
- uint8\_t [u8SkipDtimPeriods](#)

### 5.82.1 Field Documentation

#### 5.82.1.1 au8Dot11MACAddress

```
uint8_t au8Dot11MACAddress [MAC_ADDR_LEN]
```

#### 5.82.1.2 u8SkipDtimPeriods

```
uint8_t u8SkipDtimPeriods
```

## 5.83 MwFimAutoConnectCFG\_t Struct Reference

```
#include <controller_wifi_com.h>
```

## Data Fields

- bool [flag](#)
- s8 [front](#)
- u8 [max\\_save\\_num](#)
- s8 [rear](#)
- u8 [targetIdx](#)

### 5.83.1 Field Documentation

#### 5.83.1.1 flag

```
bool flag
```

#### 5.83.1.2 front

s8 front

#### 5.83.1.3 max\_save\_num

u8 max\_save\_num

#### 5.83.1.4 rear

s8 rear

#### 5.83.1.5 targetIdx

u8 targetIdx

## 5.84 rx\_eapol\_data Struct Reference

```
#include <controller_wifi_com.h>
```

### Data Fields

- u8 [frame\\_buffer](#) [384]
- unsigned int [frame\\_length](#)

### 5.84.1 Field Documentation

#### 5.84.1.1 frame\_buffer

u8 frame\_buffer[384]

#### 5.84.1.2 frame\_length

unsigned int frame\_length

### 5.85 S\_WIFI\_MLME\_SCAN\_CFG Struct Reference

```
#include <controller_wifi_com_patch.h>
```

#### Data Fields

- [scan\\_report\\_t](#) \* ptScanReport
- E\_WIFI\_MLME\_SCAN\_TYPE tScanType
- uint32\_t u32ActiveScanDur
- uint32\_t u32PassiveScanDur
- uint8\_t u8aBssid [MAC\_ADDR\_LEN]
- uint8\_t u8aSsid [IEEE80211\_MAX\_SSID\_LEN+1]
- uint8\_t u8Channel
- uint8\_t u8MaxScanApNum
- uint8\_t u8ResendCnt

#### 5.85.1 Detailed Description

The parameter of MLME\_CMD\_SCAN

#### 5.85.2 Field Documentation

##### 5.85.2.1 ptScanReport

[scan\\_report\\_t](#)\* ptScanReport

The scan report which filled by MSQ, report to APS

##### 5.85.2.2 tScanType

E\_WIFI\_MLME\_SCAN\_TYPE tScanType

scan type. active, passive, or mix mode

##### 5.85.2.3 u32ActiveScanDur

uint32\_t u32ActiveScanDur

Scan duration per scan counter in channel. units: millisecond

#### 5.85.2.4 u32PassiveScanDur

```
uint32_t u32PassiveScanDur
```

Scan duration per channel. units: millisecond

#### 5.85.2.5 u8aBssid

```
uint8_t u8aBssid[MAC_ADDR_LEN]
```

Not supported yet. MAC address of AP

#### 5.85.2.6 u8aSsid

```
uint8_t u8aSsid[IEEE80211_MAX_SSID_LEN+1]
```

Not supported yet. SSID of AP

#### 5.85.2.7 u8Channel

```
uint8_t u8Channel
```

Only specific channel or scan all channels

#### 5.85.2.8 u8MaxScanApNum

```
uint8_t u8MaxScanApNum
```

Max scan AP number. When scanned AP number over this value, MSQ will drop the AP with smallest RSSI value

#### 5.85.2.9 u8ResendCnt

```
uint8_t u8ResendCnt
```

Send probe req counter per channel when active scan. After send probe req, it will wait active scan time, and then send next probe req. The total time will be increased by a factor of this value

## 5.86 scan\_info\_t Struct Reference

```
#include <controller_wifi_com.h>
```

## Data Fields

- uint8\_t [ap\\_channel](#)
- uint16\_t [beacon\\_interval](#)
- uint8\_t [bssid](#) [MAC\_ADDR\_LEN]
- uint16\_t [capabilities](#)
- uint8\_t [dtim\\_prod](#)
- unsigned char [free\\_ocpy](#)
- uint64\_t [latest\\_beacon\\_rx\\_time](#)
- u8 [rsn\\_ie](#) [256]
- int8\_t [rssi](#)
- char [ssid](#) [IEEE80211\_MAX\_SSID\_LEN+1]
- uint8\_t [ssid\\_len](#)
- uint8\_t [supported\\_rates](#) [IEEE80211\_MAX\_SUPPORTED\_RATES]
- [wpa\\_ie\\_data\\_t](#) [wpa\\_data](#)
- u8 [wpa\\_ie](#) [257]

### 5.86.1 Field Documentation

#### 5.86.1.1 [ap\\_channel](#)

uint8\_t [ap\\_channel](#)

#### 5.86.1.2 [beacon\\_interval](#)

uint16\_t [beacon\\_interval](#)

#### 5.86.1.3 [bssid](#)

uint8\_t [bssid](#)[MAC\_ADDR\_LEN]

#### 5.86.1.4 [capabilities](#)

uint16\_t [capabilities](#)

**5.86.1.5 dtim\_prod**

```
uint8_t dtim_prod
```

**5.86.1.6 free\_ocpy**

```
unsigned char free_ocpy
```

**5.86.1.7 latest\_beacon\_rx\_time**

```
uint64_t latest_beacon_rx_time
```

**5.86.1.8 rsn\_ie**

```
u8 rsn_ie[256]
```

**5.86.1.9 rssi**

```
int8_t rssi
```

**5.86.1.10 ssid**

```
char ssid[IEEE80211_MAX_SSID_LEN+1]
```

**5.86.1.11 ssid\_len**

```
uint8_t ssid_len
```

**5.86.1.12 supported\_rates**

```
uint8_t supported_rates[IEEE80211_MAX_SUPPORTED_RATES]
```

#### 5.86.1.13 wpa\_data

`wpa_ie_data_t` wpa\_data

#### 5.86.1.14 wpa\_ie

`u8` wpa\_ie[257]

### 5.87 scan\_report\_t Struct Reference

```
#include <controller_wifi_com.h>
```

#### Data Fields

- `scan_info_t` \* pScanInfo
- `u32` uScanApNum

#### 5.87.1 Field Documentation

##### 5.87.1.1 pScanInfo

`scan_info_t`\* pScanInfo

##### 5.87.1.2 uScanApNum

`u32` uScanApNum

### 5.88 T\_RfCmd Struct Reference

```
#include <controller_wifi.h>
```

#### Data Fields

- `int` iArgc
- `char` \* saArgv [RF\_CMD\_PARAM\_NUM]
- `uint32_t` u32Type



### 5.88.1 Field Documentation

#### 5.88.1.1 iArgc

```
int iArgc
```

#### 5.88.1.2 saArgv

```
char* saArgv[RF_CMD_PARAM_NUM]
```

#### 5.88.1.3 u32Type

```
uint32_t u32Type
```

## 5.89 T\_RfEvt Struct Reference

```
#include <controller_wifi.h>
```

### Data Fields

- void \* [pParam](#)
- uint16\_t [u16RfMode](#)
- uint16\_t [u16RxCnt](#)
- uint16\_t [u16RxCrcOkCnt](#)
- uint32\_t [u32Freq](#)
- uint32\_t [u32Mode](#)
- uint32\_t [u32RfChannel](#)
- uint32\_t [u32Type](#)
- uint8\_t [u8Freq](#)
- uint8\_t [u8IpcEnable](#)
- uint8\_t [u8Len](#)
- uint8\_t [u8Pkt](#)
- uint8\_t [u8Reserved](#)
- uint8\_t [u8Status](#)
- uint8\_t [u8Unicast](#)

### 5.89.1 Field Documentation

**5.89.1.1 pParam**

`void* pParam`

**5.89.1.2 u16RfMode**

`uint16_t u16RfMode`

**5.89.1.3 u16RxCnt**

`uint16_t u16RxCnt`

**5.89.1.4 u16RxCrcOkCnt**

`uint16_t u16RxCrcOkCnt`

**5.89.1.5 u32Freq**

`uint32_t u32Freq`

**5.89.1.6 u32Mode**

`uint32_t u32Mode`

**5.89.1.7 u32RfChannel**

`uint32_t u32RfChannel`

**5.89.1.8 u32Type**

`uint32_t u32Type`

**5.89.1.9 u8Freq**

```
uint8_t u8Freq
```

**5.89.1.10 u8IpcEnable**

```
uint8_t u8IpcEnable
```

**5.89.1.11 u8Len**

```
uint8_t u8Len
```

**5.89.1.12 u8Pkt**

```
uint8_t u8Pkt
```

**5.89.1.13 u8Reserved**

```
uint8_t u8Reserved
```

**5.89.1.14 u8Status**

```
uint8_t u8Status
```

**5.89.1.15 u8Unicast**

```
uint8_t u8Unicast
```

**5.90 wifi\_active\_scan\_time\_t Struct Reference**

Range of active scan times per channel.

```
#include <wifi_types.h>
```

## Data Fields

- [uint32\\_t max](#)
- [uint32\\_t min](#)

### 5.90.1 Detailed Description

Range of active scan times per channel.

### 5.90.2 Field Documentation

#### 5.90.2.1 max

```
uint32_t max
```

maximum active scan time per channel, units: millisecond, maximum values 1500ms may cause station to disconnect from AP and are not recommended.

#### 5.90.2.2 min

```
uint32_t min
```

minimum active scan time per channel, units: millisecond

## 5.91 wifi\_ap\_config\_t Struct Reference

This structure is the Wi-Fi configuration for initialization for Soft-AP mode.

```
#include <wifi_types.h>
```

## Data Fields

- [wifi\\_auth\\_mode\\_t auth\\_mode](#)
- [uint16\\_t beacon\\_interval](#)
- [uint8\\_t channel](#)
- [wifi\\_cipher\\_type\\_t encrypt\\_type](#)
- [uint8\\_t max\\_connection](#)
- [uint8\\_t password \[WIFI\\_LENGTH\\_PASSPHRASE\]](#)
- [uint8\\_t password\\_length](#)
- [uint8\\_t ssid \[WIFI\\_MAX\\_LENGTH\\_OF\\_SSID\]](#)
- [uint8\\_t ssid\\_hidden](#)
- [uint8\\_t ssid\\_length](#)

### 5.91.1 Detailed Description

This structure is the Wi-Fi configuration for initialization for Soft-AP mode.

### 5.91.2 Field Documentation

#### 5.91.2.1 auth\_mode

wifi\_auth\_mode\_t auth\_mode

The authentication mode.

#### 5.91.2.2 beacon\_interval

uint16\_t beacon\_interval

Beacon interval, 100 ~ 60000 ms, default 100 ms

#### 5.91.2.3 channel

uint8\_t channel

The channel of Soft-AP.

#### 5.91.2.4 encrypt\_type

wifi\_cipher\_type\_t encrypt\_type

The encryption mode.

#### 5.91.2.5 max\_connection

uint8\_t max\_connection

Max number of stations allowed to connect in, default 4, max 4

#### 5.91.2.6 password

uint8\_t password[WIFI\_LENGTH\_PASSPHRASE]

The password of the Soft-AP.

#### 5.91.2.7 password\_length

```
uint8_t password_length
```

The length of the password.

#### 5.91.2.8 ssid

```
uint8_t ssid[WIFI_MAX_LENGTH_OF_SSID]
```

The SSID of the Soft-AP.

#### 5.91.2.9 ssid\_hidden

```
uint8_t ssid_hidden
```

Broadcast SSID or not, default 0, broadcast the SSID

#### 5.91.2.10 ssid\_length

```
uint8_t ssid_length
```

The length of the SSID.

## 5.92 wifi\_auto\_connect\_info\_t Struct Reference

This structure is the Wi-Fi auto connect for save in the flash (FIM).

```
#include <wifi_types.h>
```

### Data Fields

- `uint8_t ap_channel`
- `uint16_t beacon_interval`
- `uint8_t bssid [WIFI_MAC_ADDRESS_LENGTH]`
- `uint16_t capabilities`
- `uint8_t dtim_prod`
- `uint8_t fast_connect`
- `char hid_ssid [WIFI_MAX_LENGTH_OF_SSID]`
- `int8_t rssi`
- `char ssid [WIFI_MAX_LENGTH_OF_SSID]`
- `uint8_t supported_rates [WIFI_MAX_SUPPORTED_RATES]`

### 5.92.1 Detailed Description

This structure is the Wi-Fi auto connect for save in the flash (FIM).

## 5.92.2 Field Documentation

### 5.92.2.1 ap\_channel

uint8\_t ap\_channel

### 5.92.2.2 beacon\_interval

uint16\_t beacon\_interval

### 5.92.2.3 bssid

uint8\_t bssid[WIFI\_MAC\_ADDRESS\_LENGTH]

### 5.92.2.4 capabilities

uint16\_t capabilities

### 5.92.2.5 dtim\_prod

uint8\_t dtim\_prod

### 5.92.2.6 fast\_connect

uint8\_t fast\_connect

### 5.92.2.7 hid\_ssid

char hid\_ssid[WIFI\_MAX\_LENGTH\_OF\_SSID]

#### 5.92.2.8 rssi

```
int8_t rssi
```

#### 5.92.2.9 ssid

```
char ssid[WIFI_MAX_LENGTH_OF_SSID]
```

#### 5.92.2.10 supported\_rates

```
uint8_t supported_rates[WIFI_MAX_SUPPORTED_RATES]
```

### 5.93 wifi\_cmd\_t Struct Reference

```
#include <controller_wifi.h>
```

#### Data Fields

- u32 [arg1](#):8
- u32 [cmd\\_type](#):8
- void \* [prvData](#)
- u32 [reserved](#):16

#### 5.93.1 Field Documentation

##### 5.93.1.1 arg1

```
u32 arg1
```

##### 5.93.1.2 cmd\_type

```
u32 cmd_type
```



#### 5.93.1.3 prvData

```
void* prvData
```

#### 5.93.1.4 reserved

```
u32 reserved
```

## 5.94 wifi\_config\_t Union Reference

Wi-Fi configuration for initialization.

```
#include <wifi_types.h>
```

### Data Fields

- [wifi\\_ap\\_config\\_t ap\\_config](#)
- [wifi\\_sta\\_config\\_t sta\\_config](#)

### 5.94.1 Detailed Description

Wi-Fi configuration for initialization.

### 5.94.2 Field Documentation

#### 5.94.2.1 ap\_config

```
wifi_ap_config_t ap_config
```

The configurations for the AP. It should be set when the `wifi_mode_t` is `WIFI_MODE_AP`.

#### 5.94.2.2 sta\_config

```
wifi_sta_config_t sta_config
```

The configurations for the STA. It should be set when the `wifi_mode_t` is `WIFI_MODE_STA`.

## 5.95 wifi\_event\_info\_t Union Reference

wifi\_event\_info\_t

```
#include <wifi_event.h>
```

### Data Fields

- [wifi\\_event\\_sta\\_connected\\_t](#) connected
- [wifi\\_event\\_sta\\_disconnected\\_t](#) disconnected
- [wifi\\_event\\_sta\\_got\\_ip\\_t](#) got\_ip
- [wifi\\_event\\_sta\\_scan\\_done\\_t](#) scan\_done

### 5.95.1 Detailed Description

wifi\_event\_info\_t

### 5.95.2 Field Documentation

#### 5.95.2.1 connected

[wifi\\_event\\_sta\\_connected\\_t](#) connected

station connected to AP

#### 5.95.2.2 disconnected

[wifi\\_event\\_sta\\_disconnected\\_t](#) disconnected

station disconnected to AP

#### 5.95.2.3 got\_ip

[wifi\\_event\\_sta\\_got\\_ip\\_t](#) got\_ip

station got IP, first time got IP or when IP is changed

#### 5.95.2.4 scan\_done

[wifi\\_event\\_sta\\_scan\\_done\\_t](#) scan\_done

station scan (APs) done

## 5.96 wifi\_event\_sta\_connected\_t Struct Reference

[wifi\\_event\\_sta\\_connected\\_t](#)

```
#include <wifi_event.h>
```

### Data Fields

- [wifi\\_auth\\_mode\\_t](#) authmode
- uint8\_t bssid [6]
- uint8\_t channel
- uint8\_t ssid [32]
- uint8\_t ssid\_len

### 5.96.1 Detailed Description

[wifi\\_event\\_sta\\_connected\\_t](#)

### 5.96.2 Field Documentation

#### 5.96.2.1 authmode

[wifi\\_auth\\_mode\\_t](#) authmode

#### 5.96.2.2 bssid

uint8\_t bssid[6]

BSSID of connected AP

#### 5.96.2.3 channel

uint8\_t channel

channel of connected AP

#### 5.96.2.4 ssid

uint8\_t ssid[32]

SSID of connected AP

#### 5.96.2.5 ssid\_len

```
uint8_t ssid_len
```

SSID length of connected AP

## 5.97 wifi\_event\_sta\_disconnected\_t Struct Reference

[wifi\\_event\\_sta\\_disconnected\\_t](#)

```
#include <wifi_event.h>
```

### Data Fields

- [uint8\\_t bssid](#) [6]
- [uint8\\_t reason](#)
- [uint8\\_t ssid](#) [32]
- [uint8\\_t ssid\\_len](#)

### 5.97.1 Detailed Description

[wifi\\_event\\_sta\\_disconnected\\_t](#)

### 5.97.2 Field Documentation

#### 5.97.2.1 bssid

```
uint8_t bssid[6]
```

BSSID of disconnected AP

#### 5.97.2.2 reason

```
uint8_t reason
```

reason of disconnection

#### 5.97.2.3 ssid

```
uint8_t ssid[32]
```

SSID of disconnected AP

#### 5.97.2.4 ssid\_len

uint8\_t ssid\_len

SSID length of disconnected AP

## 5.98 wifi\_event\_sta\_got\_ip\_t Struct Reference

```
#include <wifi_event.h>
```

### Data Fields

- bool [ip\\_changed](#)

#### 5.98.1 Field Documentation

##### 5.98.1.1 ip\_changed

bool ip\_changed

## 5.99 wifi\_event\_sta\_scan\_done\_t Struct Reference

[wifi\\_event\\_sta\\_scan\\_done\\_t](#)

```
#include <wifi_event.h>
```

### Data Fields

- uint8\_t [number](#)
- uint8\_t [scan\\_id](#)
- uint32\_t [status](#)

#### 5.99.1 Detailed Description

[wifi\\_event\\_sta\\_scan\\_done\\_t](#)

#### 5.99.2 Field Documentation

#### 5.99.2.1 number

`uint8_t number`

#### 5.99.2.2 scan\_id

`uint8_t scan_id`

#### 5.99.2.3 status

`uint32_t status`

status of scanning APs

### 5.100 wifi\_evt\_t Struct Reference

```
#include <controller_wifi.h>
```

#### Data Fields

- `uint32_t` [evt\\_type](#)
- `void *` [prvData](#)

#### 5.100.1 Field Documentation

##### 5.100.1.1 evt\_type

`uint32_t evt_type`

##### 5.100.1.2 prvData

`void* prvData`

## 5.101 wifi\_fast\_scan\_threshold\_t Struct Reference

Structure describing parameters for a Wi-Fi fast scan.

```
#include <wifi_types.h>
```

### Data Fields

- [wifi\\_auth\\_mode\\_t authmode](#)
- [int8\\_t rssi](#)

#### 5.101.1 Detailed Description

Structure describing parameters for a Wi-Fi fast scan.

#### 5.101.2 Field Documentation

##### 5.101.2.1 authmode

```
wifi_auth_mode_t authmode
```

The weakest authmode to accept in the fast scan mode

##### 5.101.2.2 rssi

```
int8_t rssi
```

The minimum rssi to accept in the fast scan mode

## 5.102 wifi\_init\_config\_t Struct Reference

WiFi stack configuration parameters.

```
#include <wifi_types.h>
```

### Data Fields

- [wifi\\_event\\_notify\\_cb\\_t event\\_handler](#)
- [int magic](#)

### 5.102.1 Detailed Description

WiFi stack configuration parameters.

### 5.102.2 Field Documentation

#### 5.102.2.1 event\_handler

`wifi_event_notify_cb_t` event\_handler

WiFi event handler

#### 5.102.2.2 magic

`int` magic

WiFi init magic number, it should be the last field

## 5.103 wifi\_scan\_config\_t Struct Reference

Parameters for an SSID scan.

```
#include <wifi_types.h>
```

### Data Fields

- `uint8_t` \* `bssid`
- `uint8_t` `channel`
- `wifi_scan_time_t` `scan_time`
- `wifi_scan_type_t` `scan_type`
- `bool` `show_hidden`
- `uint8_t` \* `ssid`

### 5.103.1 Detailed Description

Parameters for an SSID scan.

### 5.103.2 Field Documentation



#### 5.103.2.1 bssid

`uint8_t* bssid`

MAC address of AP

#### 5.103.2.2 channel

`uint8_t channel`

channel, scan the specific channel

#### 5.103.2.3 scan\_time

`wifi_scan_time_t scan_time`

scan time per channel

#### 5.103.2.4 scan\_type

`wifi_scan_type_t scan_type`

scan type, active or passive

#### 5.103.2.5 show\_hidden

`bool show_hidden`

enable to scan AP whose SSID is hidden

#### 5.103.2.6 ssid

`uint8_t* ssid`

SSID of AP

## 5.104 wifi\_scan\_info\_t Struct Reference

This structure defines the information of scanned APs.

```
#include <wifi_types.h>
```

## Data Fields

- [wifi\\_auth\\_mode\\_t](#) `auth_mode`
- `uint16_t` `beacon_interval`
- `uint8_t` `bssid` [[WIFI\\_MAC\\_ADDRESS\\_LENGTH](#)]
- `uint16_t` `capability_info`
- `uint8_t` `channel`
- `uint8_t` `dtim_period`
- [wifi\\_cipher\\_type\\_t](#) `group_cipher`
- [wifi\\_cipher\\_type\\_t](#) `pairwise_cipher`
- `int` `rsi`
- `uint8_t` `ssid` [[WIFI\\_MAX\\_LENGTH\\_OF\\_SSID](#)]
- `uint8_t` `ssid_length`

### 5.104.1 Detailed Description

This structure defines the information of scanned APs.

### 5.104.2 Field Documentation

#### 5.104.2.1 `auth_mode`

`wifi_auth_mode_t` `auth_mode`

Please refer to the definition of [wifi\\_auth\\_mode\\_t](#).

#### 5.104.2.2 `beacon_interval`

`uint16_t` `beacon_interval`

Indicates the beacon interval.

#### 5.104.2.3 `bssid`

`uint8_t` `bssid` [[WIFI\\_MAC\\_ADDRESS\\_LENGTH](#)]

AP's MAC address.

#### 5.104.2.4 `capability_info`

`uint16_t` `capability_info`

The Capability Information field contains a number of subfields that are used to indicate requested or advertised optional capabilities.

#### 5.104.2.5 channel

uint8\_t channel

The channel used.

#### 5.104.2.6 dtim\_period

uint8\_t dtim\_period

The DTIM Period indicates the number of beacon intervals between successive DTIMs. If all TIMs are DTIMs, the DTIM Period field has the value 1.

#### 5.104.2.7 group\_cipher

wifi\_cipher\_type\_t group\_cipher

group cipher of AP

#### 5.104.2.8 pairwise\_cipher

wifi\_cipher\_type\_t pairwise\_cipher

pairwise cipher of AP, Please refer to the definition of #wifi\_encrypt\_type\_t.

#### 5.104.2.9 rssi

int rssi

Records the RSSI value when probe response is received.

#### 5.104.2.10 ssid

uint8\_t ssid[WIFI\_MAX\_LENGTH\_OF\_SSID]

Stores the predefined SSID.

#### 5.104.2.11 ssid\_length

uint8\_t ssid\_length

Length of the SSID.

## 5.105 wifi\_scan\_list\_t Struct Reference

This structure defines the list of scanned APs with their corresponding information.

```
#include <wifi_types.h>
```

### Data Fields

- [wifi\\_scan\\_info\\_t](#) `ap_record` [`WIFI_MAX_SCAN_AP_NUM`]
- `int` `num`

### 5.105.1 Detailed Description

This structure defines the list of scanned APs with their corresponding information.

### 5.105.2 Field Documentation

#### 5.105.2.1 `ap_record`

```
wifi_scan_info_t ap_record[WIFI_MAX_SCAN_AP_NUM]
```

The information about an AP obtained through the scan result is stored

#### 5.105.2.2 `num`

```
int num
```

number of AP in the list

## 5.106 wifi\_scan\_time\_t Union Reference

Aggregate of active & passive scan time per channel.

```
#include <wifi_types.h>
```

### Data Fields

- [wifi\\_active\\_scan\\_time\\_t](#) `active`
- `uint32_t` `passive`

### 5.106.1 Detailed Description

Aggregate of active & passive scan time per channel.

### 5.106.2 Field Documentation

#### 5.106.2.1 active

wifi\_active\_scan\_time\_t active

active scan time per channel, units: millisecond.

#### 5.106.2.2 passive

uint32\_t passive

passive scan time per channel, units: millisecond, maximum values 1500ms may cause station to disconnect from AP and are not recommended.

## 5.107 wifi\_sta\_config\_t Struct Reference

This structure is the Wi-Fi configuration for initialization for STA mode.

```
#include <wifi_types.h>
```

### Data Fields

- uint8\_t bssid [WIFI\_MAC\_ADDRESS\_LENGTH]
- uint8\_t bssid\_present
- uint8\_t password [WIFI\_LENGTH\_PASSPHRASE]
- uint8\_t password\_length
- wifi\_scan\_method\_t scan\_method
- wifi\_sort\_method\_t sort\_method
- uint8\_t ssid [WIFI\_MAX\_LENGTH\_OF\_SSID]
- uint8\_t ssid\_length
- wifi\_fast\_scan\_threshold\_t threshold

### 5.107.1 Detailed Description

This structure is the Wi-Fi configuration for initialization for STA mode.

## 5.107.2 Field Documentation

### 5.107.2.1 bssid

```
uint8_t bssid[WIFI_MAC_ADDRESS_LENGTH]
```

The MAC address of the target AP.

### 5.107.2.2 bssid\_present

```
uint8_t bssid_present
```

The BSSID is present if it is set to 1. Otherwise, it is set to 0.

### 5.107.2.3 password

```
uint8_t password[WIFI_LENGTH_PASSPHRASE]
```

The password of the target AP.

### 5.107.2.4 password\_length

```
uint8_t password_length
```

The length of the password. If the length is 64, the password is regarded as PMK.

### 5.107.2.5 scan\_method

```
wifi_scan_method_t scan_method
```

do all channel scan or fast scan

### 5.107.2.6 sort\_method

```
wifi_sort_method_t sort_method
```

sort the connect AP in the list by rssi or security mode

### 5.107.2.7 ssid

```
uint8_t ssid[WIFI_MAX_LENGTH_OF_SSID]
```

The SSID of the target AP.

#### 5.107.2.8 ssid\_length

```
uint8_t ssid_length
```

The length of the SSID.

#### 5.107.2.9 threshold

```
wifi_fast_scan_threshold_t threshold
```

When scan\_method is set to WIFI\_FAST\_SCAN, only APs which have an auth mode that is more secure than the selected auth mode and a signal stronger than the minimum RSSI will be used.

## 5.108 wifi\_wpa\_ie\_data\_t Struct Reference

This structure is the Wi-Fi auto connect with wpa information for save in the flash (FIM).

```
#include <wifi_types.h>
```

### Data Fields

- int capabilities
- int group\_cipher
- int key\_mgmt
- int mgmt\_group\_cipher
- uint32\_t num\_pmkid
- int pairwise\_cipher
- const uint8\_t \* pmkid
- int proto

### 5.108.1 Detailed Description

This structure is the Wi-Fi auto connect with wpa information for save in the flash (FIM).

### 5.108.2 Field Documentation

#### 5.108.2.1 capabilities

```
int capabilities
```

**5.108.2.2 group\_cipher**

```
int group_cipher
```

**5.108.2.3 key\_mgmt**

```
int key_mgmt
```

**5.108.2.4 mgmt\_group\_cipher**

```
int mgmt_group_cipher
```

**5.108.2.5 num\_pmkid**

```
uint32_t num_pmkid
```

**5.108.2.6 pairwise\_cipher**

```
int pairwise_cipher
```

**5.108.2.7 pmkid**

```
const uint8_t* pmkid
```

**5.108.2.8 proto**

```
int proto
```



# Index

- [\\_wpa\\_ie\\_data](#), [149](#)
      - [capabilities](#), [149](#)
      - [group\\_cipher](#), [149](#)
      - [key\\_mgmt](#), [149](#)
      - [mgmt\\_group\\_cipher](#), [150](#)
      - [num\\_pmkid](#), [150](#)
      - [pairwise\\_cipher](#), [150](#)
      - [pmkid](#), [150](#)
      - [proto](#), [150](#)
  - [action](#)
    - [LE\\_SMP\\_MSG\\_PAIRING\\_ACTION\\_IND\\_T](#), [218](#)
  - [active](#)
    - [wifi\\_scan\\_time\\_t](#), [255](#)
  - [addr](#)
    - [LE\\_BT\\_ADDR\\_T](#), [159](#)
    - [LE\\_CM\\_MSG\\_ADVERTISE\\_REPORT\\_IND\\_T](#), [162](#)
  - [addr\\_type](#)
    - [LE\\_CM\\_MSG\\_ADVERTISE\\_REPORT\\_IND\\_T](#), [162](#)
  - [ap\\_channel](#)
    - [auto\\_conn\\_info\\_t](#), [153](#)
    - [mw\\_wifi\\_auto\\_connect\\_ap\\_info\\_t](#), [225](#)
    - [scan\\_info\\_t](#), [232](#)
    - [wifi\\_auto\\_connect\\_info\\_t](#), [241](#)
  - [ap\\_config](#)
    - [wifi\\_config\\_t](#), [243](#)
  - [ap\\_record](#)
    - [wifi\\_scan\\_list\\_t](#), [254](#)
  - [arg1](#)
    - [wifi\\_cmd\\_t](#), [242](#)
  - [asso\\_data](#), [150](#)
    - [eap\\_workaround](#), [151](#)
    - [eapol\\_flags](#), [151](#)
    - [group\\_cipher](#), [151](#)
    - [key\\_mgmt](#), [151](#)
    - [leap](#), [151](#)
    - [mgmt\\_group\\_cipher](#), [151](#)
    - [non\\_leap](#), [152](#)
    - [pairwise\\_cipher](#), [152](#)
    - [passphrase](#), [152](#)
    - [proto](#), [152](#)
    - [psk](#), [152](#)
    - [psk\\_set](#), [152](#)
  - [att\\_err](#)
    - [LE\\_GATT\\_MSG\\_CHARACTERISTIC\\_VAL\\_IND\\_T](#), [190](#)
    - [LE\\_GATT\\_MSG\\_EXECUTE\\_WRITE\\_RELIABLE\\_CFM\\_T](#), [193](#)
  - [LE\\_GATT\\_MSG\\_FIND\\_ALL\\_CHAR\\_DESC\\_CFM\\_T](#), [194](#)
  - [LE\\_GATT\\_MSG\\_FIND\\_ALL\\_PRIMARY\\_SERVICE\\_CFM\\_T](#), [195](#)
  - [LE\\_GATT\\_MSG\\_FIND\\_CHARACTERISTIC\\_CFM\\_T](#), [196](#)
  - [LE\\_GATT\\_MSG\\_FIND\\_INCLUDED\\_SERVICE\\_CFM\\_T](#), [197](#)
  - [LE\\_GATT\\_MSG\\_FIND\\_PRIMARY\\_SERVICE\\_BY\\_UUID\\_CFM\\_T](#), [198](#)
  - [LE\\_GATT\\_MSG\\_PREPARE\\_WRITE\\_RELIABLE\\_CFM\\_T](#), [204](#)
  - [LE\\_GATT\\_MSG\\_READ\\_CHAR\\_VAL\\_BY\\_UUID\\_CFM\\_T](#), [205](#)
  - [LE\\_GATT\\_MSG\\_READ\\_CHARACTERISTIC\\_VALUE\\_CFM\\_T](#), [206](#)
  - [LE\\_GATT\\_MSG\\_READ\\_LONG\\_CHAR\\_VAL\\_CFM\\_T](#), [207](#)
  - [LE\\_GATT\\_MSG\\_READ\\_MULTIPLE\\_CHAR\\_VAL\\_CFM\\_T](#), [208](#)
  - [LE\\_GATT\\_MSG\\_WRITE\\_CHAR\\_VAL\\_RELIABLE\\_CFM\\_T](#), [212](#)
  - [LE\\_GATT\\_MSG\\_WRITE\\_CHAR\\_VALUE\\_CFM\\_T](#), [213](#)
  - [LE\\_GATT\\_MSG\\_WRITE\\_LONG\\_CHAR\\_VALUE\\_CFM\\_T](#), [214](#)
- [att\\_op](#)
    - [LE\\_GATT\\_MSG\\_OPERATION\\_TIMEOUT\\_T](#), [203](#)
  - [au8Dot11MACAddress](#)
    - [mw\\_wifi\\_sta\\_info\\_t](#), [228](#)
  - [auth\\_mode](#)
    - [wifi\\_ap\\_config\\_t](#), [239](#)
    - [wifi\\_scan\\_info\\_t](#), [252](#)
  - [authenticated](#)
    - [LE\\_SMP\\_MSG\\_PAIRING\\_COMPLETE\\_IND\\_T](#), [219](#)
  - [authmode](#)
    - [wifi\\_event\\_sta\\_connected\\_t](#), [245](#)
    - [wifi\\_fast\\_scan\\_threshold\\_t](#), [249](#)
  - [auto\\_conn\\_info\\_t](#), [152](#)
    - [ap\\_channel](#), [153](#)
    - [beacon\\_interval](#), [153](#)
    - [bssid](#), [153](#)
    - [capabilities](#), [153](#)
    - [dtim\\_prod](#), [153](#)
    - [fast\\_connect](#), [154](#)
    - [free\\_ocpy](#), [154](#)
    - [hid\\_ssid](#), [154](#)
    - [hid\\_ssid\\_len](#), [154](#)

- latest\_beacon\_rx\_time, 154
- passphrase, 154
- psk, 154
- rsn\_ie, 154
- rssi, 155
- ssid, 155
- ssid\_len, 155
- supported\_rates, 155
- wpa\_data, 155
- wpa\_ie, 155
- auto\_connect\_cfg\_t, 155
  - flag, 156
  - front, 156
  - max\_save\_num, 156
  - pFCInfo, 156
  - rear, 156
  - retryCount, 156
  - targetIdx, 157
  - uFCAPNum, 157
- BLE ALL APIs, 9
  - LeSmpGetBondIdFromAddr, 9
- BLE CM APIs, 10
  - LE\_CM\_MSG\_ADD\_TO\_RESOLVING\_LIST\_C↔  
FM\_T, 11
  - LE\_CM\_MSG\_ADD\_TO\_WHITE\_LIST\_CFM\_T, 11
  - LE\_CM\_MSG\_CANCEL\_CONNECTION\_CFM\_T, 11
  - LE\_CM\_MSG\_CLEAR\_RESOLVING\_LIST\_C↔  
M\_T, 12
  - LE\_CM\_MSG\_CLEAR\_WHITE\_LIST\_CFM\_T, 12
  - LE\_CM\_MSG\_CREATE\_CONNECTION\_CFM\_T, 12
  - LE\_CM\_MSG\_ENTER\_ADVERTISING\_CFM\_T, 12
  - LE\_CM\_MSG\_ENTER\_SCANNING\_CFM\_T, 12
  - LE\_CM\_MSG\_EXIT\_ADVERTISING\_CFM\_T, 12
  - LE\_CM\_MSG\_EXIT\_SCANNING\_CFM\_T, 12
  - LE\_CM\_MSG\_PHY\_UPDATE\_COMPLETE\_IN↔  
D\_T, 12
  - LE\_CM\_MSG\_REMOVE\_FROM\_RESOLVING↔  
LIST\_CFM\_T, 13
  - LE\_CM\_MSG\_REMOVE\_FROM\_WHITE\_LIST↔  
\_CFM\_T, 13
  - LE\_CM\_MSG\_SET\_ADVERTISING\_DATA\_C↔  
M\_T, 13
  - LE\_CM\_MSG\_SET\_ADVERTISING\_PARAMS↔  
CFM\_T, 13
  - LE\_CM\_MSG\_SET\_CHANNEL\_MAP\_CFM\_T, 13
  - LE\_CM\_MSG\_SET\_DEFAULT\_PHY\_CFM\_T, 13
  - LE\_CM\_MSG\_SET\_RANDOM\_ADDRESS\_C↔  
M\_T, 13
  - LE\_CM\_MSG\_SET\_RPA\_TIMEOUT\_CFM\_T, 13
  - LE\_CM\_MSG\_SET\_SCAN\_PARAMS\_CFM\_T, 14
  - LE\_CM\_MSG\_SET\_SCAN\_RSP\_DATA\_CFM\_T, 14
  - LeCmInit, 15
- BLE GAP APIs, 17
  - GAP\_ADTYPE\_128BIT\_COMPLETE, 19
  - GAP\_ADTYPE\_128BIT\_MORE, 19
  - GAP\_ADTYPE\_16BIT\_COMPLETE, 19
  - GAP\_ADTYPE\_16BIT\_MORE, 20
  - GAP\_ADTYPE\_32BIT\_COMPLETE, 20
  - GAP\_ADTYPE\_32BIT\_MORE, 20
  - GAP\_ADTYPE\_3D\_INFO\_DATA, 20
  - GAP\_ADTYPE\_ADV\_INTERVAL, 20
  - GAP\_ADTYPE\_APPEARANCE, 20
  - GAP\_ADTYPE\_FLAGS\_BREDR\_NOT\_SUPPO↔  
RTED, 20
  - GAP\_ADTYPE\_FLAGS\_GENERAL, 21
  - GAP\_ADTYPE\_FLAGS\_LIMITED, 21
  - GAP\_ADTYPE\_FLAGS, 20
  - GAP\_ADTYPE\_LE\_BD\_ADDR, 21
  - GAP\_ADTYPE\_LE\_ROLE, 21
  - GAP\_ADTYPE\_LOCAL\_NAME\_COMPLETE, 21
  - GAP\_ADTYPE\_LOCAL\_NAME\_SHORT, 21
  - GAP\_ADTYPE\_MANUFACTURER\_SPECIFIC, 21
  - GAP\_ADTYPE\_OOB\_CLASS\_OF\_DEVICE, 21
  - GAP\_ADTYPE\_OOB\_SIMPLE\_PAIRING\_HAS↔  
HC, 22
  - GAP\_ADTYPE\_OOB\_SIMPLE\_PAIRING\_RAN↔  
DR, 22
  - GAP\_ADTYPE\_POWER\_LEVEL, 22
  - GAP\_ADTYPE\_PUBLIC\_TARGET\_ADDR, 22
  - GAP\_ADTYPE\_RANDOM\_TARGET\_ADDR, 22
  - GAP\_ADTYPE\_SERVICE\_DATA\_128BIT, 22
  - GAP\_ADTYPE\_SERVICE\_DATA\_32BIT, 22
  - GAP\_ADTYPE\_SERVICE\_DATA, 22
  - GAP\_ADTYPE\_SERVICES\_LIST\_128BIT, 23
  - GAP\_ADTYPE\_SERVICES\_LIST\_16BIT, 23
  - GAP\_ADTYPE\_SIGNED\_DATA, 23
  - GAP\_ADTYPE\_SIMPLE\_PAIRING\_HASHC\_256, 23
  - GAP\_ADTYPE\_SIMPLE\_PAIRING\_RANDR\_256, 23
  - GAP\_ADTYPE\_SLAVE\_CONN\_INTERVAL\_RA↔  
NGE, 23
  - GAP\_ADTYPE\_SM\_OOB\_FLAG, 23
  - GAP\_ADTYPE\_SM\_TK, 23
  - GAP\_PUBLIC\_ADDR, 24
  - GAP\_RAND\_ADDR\_NRPA, 24
  - GAP\_RAND\_ADDR\_RPA, 24
  - GAP\_RAND\_ADDR\_STATIC, 24
  - GAP\_SCAN\_TYPE\_ACTIVE, 24
  - GAP\_SCAN\_TYPE\_PASSIVE, 24
  - GAP\_TX\_PWR\_CURR\_VAL, 24
  - GAP\_TX\_PWR\_MAX\_VAL, 24
  - GAPBOND\_IO\_CAP\_DISPLAY\_ONLY, 25
  - GAPBOND\_IO\_CAP\_DISPLAY\_YES\_NO, 25
  - GAPBOND\_IO\_CAP\_KEYBOARD\_DISPLAY, 25
  - GAPBOND\_IO\_CAP\_KEYBOARD\_ONLY, 25
  - GAPBOND\_IO\_CAP\_NO\_INPUT\_NO\_OUTPUT, 25
  - GAPBOND\_PAIRING\_MODE\_INITIATE, 25
  - GAPBOND\_PAIRING\_MODE\_NO\_PAIRING, 25

- GAPBOND\_PAIRING\_MODE\_WAIT\_FOR\_REQ, 25
- LE\_GAP\_ADV\_MAX\_SIZE, 26
- LeGapAddToResolvingList, 26
- LeGapAddToWhiteList, 26
- LeGapAdvertisingEnable, 27
- LeGapCentralConnectReq, 27
- LeGapCentralSetDataChannel, 27
- LeGapClearResolvingList, 29
- LeGapClearWhiteList, 29
- LeGapConnParaRequestRsp, 29
- LeGapConnUpdateRequest, 30
- LeGapConnUpdateResponse, 30
- LeGapConnectCancelReq, 29
- LeGapDisconnectReq, 31
- LeGapGenRandAddr, 31
- LeGapGetBtAddr, 31
- LeGapReadAdvChannelTxPower, 31
- LeGapReadChannelMap, 32
- LeGapReadPhy, 32
- LeGapReadResolvingListSize, 32
- LeGapReadRssi, 32
- LeGapReadTxPower, 33
- LeGapReadWhiteListSize, 33
- LeGapRemoveFromWhiteList, 33
- LeGapScanningReq, 34
- LeGapSetAdvData, 34
- LeGapSetAdvParameter, 35
- LeGapSetConnParameter, 35
- LeGapSetDataChannelPduLen, 35
- LeGapSetDefaultPhy, 36
- LeGapSetPhy, 36
- LeGapSetRandAddr, 36
- LeGapSetRpaTimeout, 37
- LeGapSetStaticAddr, 37
- LeSetScanParameter, 37
- LeSetScanRspData, 38
- BLE GATT APIs, 39
  - CHAR\_AGGREGATE\_DESCRIPTOR, 43
  - CHAR\_CLIENT\_CONFIG\_DESCRIPTOR, 43
  - CHAR\_DECL\_UUID16\_ATTR\_VAL, 44
  - CHAR\_EXT\_PROP\_DESCRIPTOR, 44
  - CHAR\_PRESENT\_FORMAT\_DESCRIPTOR, 44
  - CHAR\_SERVER\_CONFIG\_DESCRIPTOR, 44
  - CHAR\_USER\_DESC\_DESCRIPTOR, 44
  - CHARACTERISTIC\_DECL\_UUID128, 44
  - CHARACTERISTIC\_DECL\_UUID16, 45
  - CHARACTERISTIC\_UUID128, 45
  - CHARACTERISTIC\_UUID16, 45
  - GATT\_CHAR\_AGG\_FORMAT\_UUID, 45
  - GATT\_CHAR\_EXT\_PROPS\_UUID, 45
  - GATT\_CHAR\_FORMAT\_UUID, 45
  - GATT\_CHAR\_USER\_DESC\_UUID, 46
  - GATT\_CHARACTERISTIC\_UUID, 46
  - GATT\_CLIENT\_CHAR\_CFG\_UUID, 46
  - GATT\_EXT\_REPORT\_REF\_UUID, 46
  - GATT\_INCLUDE\_UUID, 46
  - GATT\_PRIMARY\_SERVICE\_UUID, 46
  - GATT\_REPORT\_REF\_UUID, 46
  - GATT\_SECONDARY\_SERVICE\_UUID, 46
  - GATT\_SERV\_CHAR\_CFG\_UUID, 47
  - GATT\_VALID\_RANGE\_UUID, 47
  - gcCharAggregateUuid, 70
  - gcCharExtPropUuid, 70
  - gcCharFormatUuid, 71
  - gcCharUserDescUuid, 71
  - gcCharacteristicUuid, 70
  - gcClientCharConfigUuid, 71
  - gcExtReportRefUuid, 71
  - gcIncludeUuid, 71
  - gcPrimaryServiceUuid, 71
  - gcReportRefUuid, 71
  - gcSecondaryServiceUuid, 71
  - gcServerCharConfigUuid, 72
  - gcValidRangeUuid, 72
  - INCLUDE\_DECL\_UUID128, 47
  - INCLUDE\_DECL\_UUID128\_ATTR\_VAL, 47
  - INCLUDE\_DECL\_UUID16\_ATTR\_VAL, 47
  - INCLUDE\_DECL\_UUIN16, 47
  - LE\_ATT\_UUID\_SIZE, 47
  - LE\_GATT\_CHAR\_PROP\_AUTH, 48
  - LE\_GATT\_CHAR\_PROP\_BCAST, 48
  - LE\_GATT\_CHAR\_PROP\_EXT\_PROP, 48
  - LE\_GATT\_CHAR\_PROP\_IND, 48
  - LE\_GATT\_CHAR\_PROP\_NTF, 48
  - LE\_GATT\_CHAR\_PROP\_RD, 48
  - LE\_GATT\_CHAR\_PROP\_WR\_NO\_RESP, 49
  - LE\_GATT\_CHAR\_PROP\_WR, 48
  - LE\_GATT\_CLIENT\_CFG\_INDICATION, 49
  - LE\_GATT\_CLIENT\_CFG\_NOTIFICATION, 49
  - LE\_GATT\_EXT\_PROP\_RELIABLE\_WR, 49
  - LE\_GATT\_EXT\_PROP\_WR\_AUX, 49
  - LE\_GATT\_FLAG\_PREPARE\_WRITE, 49
  - LE\_GATT\_FLAG\_WRITE\_CMD, 49
  - LE\_GATT\_FLAG\_WRITE\_REQ, 49
  - LE\_GATT\_PERM\_AUTH\_READABLE, 50
  - LE\_GATT\_PERM\_AUTH\_WRITABLE, 50
  - LE\_GATT\_PERM\_NONE, 50
  - LE\_GATT\_PERM\_READ, 50
  - LE\_GATT\_PERM\_RELIABLE\_WRITE, 50
  - LE\_GATT\_PERM\_WRITE\_CMD, 50
  - LE\_GATT\_PERM\_WRITE\_REQ, 50
  - LE\_GATT\_PERMIT\_AUTHEN\_READ, 50
  - LE\_GATT\_PERMIT\_AUTHEN\_WRITE, 51
  - LE\_GATT\_PERMIT\_AUTHOR\_READ, 51
  - LE\_GATT\_PERMIT\_AUTHOR\_WRITE, 51
  - LE\_GATT\_PERMIT\_ENCRYPT\_READ, 51
  - LE\_GATT\_PERMIT\_ENCRYPT\_WRITE, 51
  - LE\_GATT\_PERMIT\_READABLE, 51
  - LE\_GATT\_PERMIT\_READ, 51
  - LE\_GATT\_PERMIT\_SC\_AUTHEN\_READ, 51
  - LE\_GATT\_PERMIT\_SC\_AUTHEN\_WRITE, 52
  - LE\_GATT\_PERMIT\_WRITABLE, 52
  - LE\_GATT\_PERMIT\_WRITE, 52
  - LeGattAccessReadRsp, 54
  - LeGattAccessWriteRsp, 54

- LeGattChangeAttrVal, [55](#)
- LeGattCharValConfirmation, [55](#)
- LeGattCharValIndicate, [56](#)
- LeGattCharValNotify, [56](#)
- LeGattExchangeMtuReq, [57](#)
- LeGattExchangeMtuRsp, [57](#)
- LeGattExecuteWriteCharValReliable, [57](#)
- LeGattFindAllCharDescriptor, [58](#)
- LeGattFindAllCharacteristic, [58](#)
- LeGattFindAllPrimaryService, [59](#)
- LeGattFindCharacteristicByUuid, [59](#)
- LeGattFindIncludedService, [60](#)
- LeGattFindPrimaryServiceByUuid, [60](#)
- LeGattGetAttrHandle, [60](#)
- LeGattGetAttrVal, [61](#)
- LeGattGetAttrValLen, [61](#)
- LeGattGetAttrValMaxLen, [63](#)
- LeGattInit, [63](#)
- LeGattModifyAttrVal, [64](#)
- LeGattPrepareWriteCharValReliable, [64](#)
- LeGattReadCharValByUuid, [65](#)
- LeGattReadCharValue, [65](#)
- LeGattReadLongCharVal, [66](#)
- LeGattReadMultipleCharVal, [66](#)
- LeGattRegisterIncludeService, [66](#)
- LeGattRegisterService, [67](#)
- LeGattSignedWriteNoRsp, [67](#)
- LeGattStopCurrentProcedure, [68](#)
- LeGattWriteCharVal, [68](#)
- LeGattWriteCharValReliable, [69](#)
- LeGattWriteLongCharVal, [69](#)
- LeGattWriteNoRsp, [70](#)
- PRIMARY\_SERVICE\_DECL\_UUID128, [52](#)
- PRIMARY\_SERVICE\_DECL\_UUID16, [52](#)
- SECONDARY\_SERVICE\_DECL\_UUID128, [52](#)
- SECONDARY\_SERVICE\_DECL\_UUID16, [52](#)
- BLE MSG APIs, [73](#)
  - LE\_ATT\_MSG\_BASE, [74](#)
  - LE\_CM\_MSG\_BASE, [74](#)
  - LE\_GATT\_MSG\_BASE, [74](#)
  - LE\_HCI\_MSG\_BASE, [75](#)
  - LE\_L2CAP\_MSG\_BASE, [75](#)
  - LE\_SMP\_MSG\_BASE, [75](#)
  - LE\_SYS\_MSG\_BASE, [75](#)
  - LeCancelAllMessage, [78](#)
  - LeCancelAllSubMessage, [79](#)
  - LeCancelFirstMessage, [79](#)
  - LeCancelFirstSubMessage, [79](#)
  - LeGetSubMsgId, [80](#)
  - LeHostCreateTask, [80](#)
  - LeHostMessageLoop, [81](#)
  - LeSendMessage, [81](#)
  - LeSendMessageAfter, [81](#)
  - LeSendMessageUnlock, [82](#)
  - LeSendSubMessage, [82](#)
  - LeSendSubMessageAfter, [83](#)
  - LeSendSubMessageUnlock, [83](#)
  - MESSAGE\_ALLOCATE, [75](#)
  - MESSAGE\_BULID, [75](#)
  - MESSAGE\_DATA\_BULID, [75](#)
  - MESSAGE\_OFFSET, [76](#)
  - MESSAGEID, [76](#)
  - MESSAGE, [76](#)
  - MSGLOCK, [77](#)
  - MSGSUBID, [77](#)
  - MSGTIMER, [77](#)
  - MsgData, [77](#)
  - MsgLock, [77](#)
  - T\_HOUR, [76](#)
  - T\_MIN, [76](#)
  - T\_SEC, [76](#)
  - TASKHANDLER, [77](#)
  - TASKPACK, [78](#)
  - TASK, [77](#)
  - Task, [77](#)
- BLE SMP APIs, [85](#)
  - LE\_MAX\_BOND\_COUNT, [86](#)
  - LE\_SM\_IO\_CAP\_DISP\_ONLY, [86](#)
  - LE\_SM\_IO\_CAP\_DISP\_YES\_NO, [86](#)
  - LE\_SM\_IO\_CAP\_KEYBOARD\_DISP, [86](#)
  - LE\_SM\_IO\_CAP\_KEYBOARD\_ONLY, [87](#)
  - LE\_SM\_IO\_CAP\_NO\_IO, [87](#)
  - LE\_SM\_PAIR\_MITM\_NO, [87](#)
  - LE\_SM\_PAIR\_MITM\_YES, [87](#)
  - LE\_SM\_PAIR\_OOB\_NO, [87](#)
  - LE\_SM\_PAIR\_OOB\_YES, [87](#)
  - LE\_SM\_PAIR\_SC\_NO, [87](#)
  - LE\_SM\_PAIR\_SC\_YES, [87](#)
  - LeSmpInit, [89](#)
  - LeSmpOobAuthDataRsp, [89](#)
  - LeSmpOobPresent, [89](#)
  - LeSmpPasskeyInput, [90](#)
  - LeSmpScOobComputeConfirmVal, [90](#)
  - LeSmpScOobDataRsp, [90](#)
  - LeSmpSecurityReq, [91](#)
  - LeSmpSecurityRsp, [91](#)
  - LeSmpSetDefaultConfig, [92](#)
  - LeSmpUserConfirmRsp, [92](#)
- bd\_addr
  - LE\_CM\_MSG\_READ\_BD\_ADDR\_CFM\_T, [171](#)
- beacon\_interval
  - auto\_conn\_info\_t, [153](#)
  - mw\_wifi\_auto\_connect\_ap\_info\_t, [225](#)
  - scan\_info\_t, [232](#)
  - wifi\_ap\_config\_t, [239](#)
  - wifi\_auto\_connect\_info\_t, [241](#)
  - wifi\_scan\_info\_t, [252](#)
- bondable
  - LE\_SMP\_MSG\_SLAVE\_SECURITY\_REQUEST\_IND\_T, [221](#)
- bonded
  - LE\_SMP\_MSG\_PAIRING\_COMPLETE\_IND\_T, [219](#)
- bssid
  - auto\_conn\_info\_t, [153](#)
  - mw\_wifi\_auto\_connect\_ap\_info\_t, [225](#)

- scan\_info\_t, 232
- wifi\_auto\_connect\_info\_t, 241
- wifi\_event\_sta\_connected\_t, 245
- wifi\_event\_sta\_disconnected\_t, 246
- wifi\_scan\_config\_t, 250
- wifi\_scan\_info\_t, 252
- wifi\_sta\_config\_t, 256
- bssid\_present
  - wifi\_sta\_config\_t, 256
- CHARAggregate\_DESCRIPTOR
  - BLE GATT APIs, 43
- CHAR\_CLIENT\_CONFIG\_DESCRIPTOR
  - BLE GATT APIs, 43
- CHAR\_DECL\_UUID16\_ATTR\_VAL
  - BLE GATT APIs, 44
- CHAR\_EXT\_PROP\_DESCRIPTOR
  - BLE GATT APIs, 44
- CHAR\_PRESENT\_FORMAT\_DESCRIPTOR
  - BLE GATT APIs, 44
- CHAR\_SERVER\_CONFIG\_DESCRIPTOR
  - BLE GATT APIs, 44
- CHAR\_USER\_DESC\_DESCRIPTOR
  - BLE GATT APIs, 44
- CHARACTERISTIC\_DECL\_UUID128
  - BLE GATT APIs, 44
- CHARACTERISTIC\_DECL\_UUID16
  - BLE GATT APIs, 45
- CHARACTERISTIC\_UUID128
  - BLE GATT APIs, 45
- CHARACTERISTIC\_UUID16
  - BLE GATT APIs, 45
- capabilities
  - \_wpa\_ie\_data, 149
  - auto\_conn\_info\_t, 153
  - mw\_wifi\_auto\_connect\_ap\_info\_t, 225
  - scan\_info\_t, 232
  - wifi\_auto\_connect\_info\_t, 241
  - wifi\_wpa\_ie\_data\_t, 257
- capability\_info
  - wifi\_scan\_info\_t, 252
- ch\_map
  - LE\_CM\_MSG\_READ\_CHANNEL\_MAP\_CFM\_T, 172
- channel
  - wifi\_ap\_config\_t, 239
  - wifi\_event\_sta\_connected\_t, 245
  - wifi\_scan\_config\_t, 251
  - wifi\_scan\_info\_t, 252
- channel\_map
  - LE\_GAP\_ADVERTISING\_PARAM\_T, 180
- client\_rx\_mtu
  - LE\_GATT\_MSG\_EXCHANGE\_MTU\_IND\_T, 192
- cmd\_type
  - wifi\_cmd\_t, 242
- confirm
  - LE\_SMP\_SC\_OOB\_DATA\_T, 223
- confirm\_num
  - LE\_SMP\_MSG\_USER\_CONFIRM\_IND\_T, 222
- conn\_hdl
  - LE\_CM\_CONNECTION\_COMPLETE\_IND\_T, 160
  - LE\_CM\_MSG\_CONN\_PARA\_REQ\_T, 163
  - LE\_CM\_MSG\_CONN\_UPDATE\_COMPLETE\_IND\_T, 164
  - LE\_CM\_MSG\_DATA\_LEN\_CHANGE\_IND\_T, 165
  - LE\_CM\_MSG\_DISCONNECT\_COMPLETE\_IND\_T, 167
  - LE\_CM\_MSG\_ENCRYPTION\_CHANGE\_IND\_T, 167
  - LE\_CM\_MSG\_ENCRYPTION\_REFRESH\_IND\_T, 168
  - LE\_CM\_MSG\_LTK\_REQ\_IND\_T, 170
  - LE\_CM\_MSG\_READ\_CHANNEL\_MAP\_CFM\_T, 172
  - LE\_CM\_MSG\_READ\_PHY\_CFM\_T, 173
  - LE\_CM\_MSG\_READ\_RSSI\_CFM\_T, 174
  - LE\_CM\_MSG\_READ\_TX\_POWER\_CFM\_T, 175
  - LE\_CM\_MSG\_SET\_DATA\_LENGTH\_CFM\_T, 176
  - LE\_CM\_MSG\_SET\_PHY\_CFM\_T, 177
  - LE\_CM\_MSG\_SIGNAL\_UPDATE\_REQ\_T, 178
  - LE\_GATT\_MSG\_ACCESS\_READ\_IND\_T, 185
  - LE\_GATT\_MSG\_ACCESS\_WRITE\_IND\_T, 186
  - LE\_GATT\_MSG\_CHAR\_DESCRIPTOR\_INFO\_IND\_T, 187
  - LE\_GATT\_MSG\_CHARACTERISTIC\_DECL\_INFO\_IND\_T, 188
  - LE\_GATT\_MSG\_CHARACTERISTIC\_VAL\_IND\_T, 190
  - LE\_GATT\_MSG\_CONFIRMATION\_CFM\_T, 191
  - LE\_GATT\_MSG\_EXCHANGE\_MTU\_CFM\_T, 192
  - LE\_GATT\_MSG\_EXCHANGE\_MTU\_IND\_T, 192
  - LE\_GATT\_MSG\_EXECUTE\_WRITE\_RELIABLE\_CFM\_T, 193
  - LE\_GATT\_MSG\_FIND\_ALL\_CHAR\_DESC\_CFM\_T, 194
  - LE\_GATT\_MSG\_FIND\_ALL\_PRIMARY\_SERVICE\_CFM\_T, 195
  - LE\_GATT\_MSG\_FIND\_CHARACTERISTIC\_CFM\_T, 196
  - LE\_GATT\_MSG\_FIND\_INCLUDED\_SERVICE\_CFM\_T, 197
  - LE\_GATT\_MSG\_FIND\_PRIMARY\_SERVICE\_BY\_UUID\_CFM\_T, 198
  - LE\_GATT\_MSG\_INCLUDE\_SERVICE\_INFO\_IND\_T, 199
  - LE\_GATT\_MSG\_INDICATE\_IND\_T, 200
  - LE\_GATT\_MSG\_NOTIFY\_CFM\_T, 201
  - LE\_GATT\_MSG\_NOTIFY\_IND\_T, 202
  - LE\_GATT\_MSG\_OPERATION\_TIMEOUT\_T, 203
  - LE\_GATT\_MSG\_PREPARE\_WRITE\_RELIABLE\_CFM\_T, 204
  - LE\_GATT\_MSG\_READ\_CHAR\_VAL\_BY\_UUID\_CFM\_T, 205
  - LE\_GATT\_MSG\_READ\_CHARACTERISTIC\_VALUE\_CFM\_T, 206
  - LE\_GATT\_MSG\_READ\_LONG\_CHAR\_VAL\_CFM\_T, 207

- FM\_T, 207
- LE\_GATT\_MSG\_READ\_MULTIPLE\_CHAR\_VAL↔  
L\_CFM\_T, 208
- LE\_GATT\_MSG\_SERVICE\_INFO\_IND\_T, 210
- LE\_GATT\_MSG\_SIGNED\_WRITE\_CFM\_T, 211
- LE\_GATT\_MSG\_WRITE\_CHAR\_VAL\_RELIAB↔  
LE\_CFM\_T, 212
- LE\_GATT\_MSG\_WRITE\_CHAR\_VALUE\_CFM↔  
\_T, 213
- LE\_GATT\_MSG\_WRITE\_LONG\_CHAR\_VALU↔  
E\_CFM\_T, 214
- LE\_GATT\_MSG\_WRITE\_NO\_RSP\_CFM\_T, 215
- LE\_SMP\_MSG\_ENCRYPTION\_CHANGE\_IND↔  
\_T, 216
- LE\_SMP\_MSG\_ENCRYPTION\_REFRESH\_IND↔  
\_T, 217
- LE\_SMP\_MSG\_OOB\_DATA\_REQUEST\_IND\_T,  
217
- LE\_SMP\_MSG\_PAIRING\_ACTION\_IND\_T, 218
- LE\_SMP\_MSG\_PAIRING\_COMPLETE\_IND\_T,  
219
- LE\_SMP\_MSG\_PASSKEY\_DISPLAY\_IND\_T, 220
- LE\_SMP\_MSG\_PASSKEY\_INPUT\_IND\_T, 220
- LE\_SMP\_MSG\_SC\_OOB\_DATA\_REQUEST\_I↔  
ND\_T, 221
- LE\_SMP\_MSG\_SLAVE\_SECURITY\_REQUES↔  
T\_IND\_T, 222
- LE\_SMP\_MSG\_USER\_CONFIRM\_IND\_T, 223
- LE\_SYS\_MSG\_BUF\_OVERFLOW\_T, 224
- conn\_interval
  - LE\_CM\_CONNECTION\_COMPLETE\_IND\_T, 160
- conn\_latency
  - LE\_CM\_CONNECTION\_COMPLETE\_IND\_T, 160
- connected
  - wifi\_event\_info\_t, 244
- current\_rx\_mtu
  - LE\_GATT\_MSG\_EXCHANGE\_MTU\_CFM\_T, 192
- data
  - LE\_CM\_MSG\_ADVERTISE\_REPORT\_IND↔  
T, 162
- dev\_id
  - LE\_CM\_CONNECTION\_COMPLETE\_IND\_T, 160
- devid
  - LE\_CM\_MSG\_ENCRYPTION\_CHANGE\_IND\_T,  
168
  - LE\_CM\_MSG\_ENCRYPTION\_REFRESH\_IND\_T,  
168
  - LE\_CM\_MSG\_LTK\_REQ\_IND\_T, 170
  - LE\_GATT\_MSG\_ACCESS\_READ\_IND\_T, 185
  - LE\_GATT\_MSG\_ACCESS\_WRITE\_IND\_T, 186
  - LE\_GATT\_MSG\_CHAR\_DESCRIPTOR\_INFO↔  
IND\_T, 187
  - LE\_GATT\_MSG\_CHARACTERISTIC\_DECL\_IN↔  
FO\_IND\_T, 188
  - LE\_GATT\_MSG\_CHARACTERISTIC\_VAL\_IND↔  
\_T, 190
  - LE\_GATT\_MSG\_CONFIRMATION\_CFM\_T, 191
  - LE\_GATT\_MSG\_EXCHANGE\_MTU\_CFM\_T, 192
  - LE\_GATT\_MSG\_EXCHANGE\_MTU\_IND\_T, 193
  - LE\_GATT\_MSG\_EXECUTE\_WRITE\_RELIABL↔  
E\_CFM\_T, 193
  - LE\_GATT\_MSG\_FIND\_ALL\_CHAR\_DESC\_CF↔  
M\_T, 194
  - LE\_GATT\_MSG\_FIND\_ALL\_PRIMARY\_SERVI↔  
CE\_CFM\_T, 195
  - LE\_GATT\_MSG\_FIND\_CHARACTERISTIC\_CF↔  
M\_T, 196
  - LE\_GATT\_MSG\_FIND\_INCLUDED\_SERVICE↔  
CFM\_T, 197
  - LE\_GATT\_MSG\_FIND\_PRIMARY\_SERVICE\_B↔  
Y\_UUID\_CFM\_T, 198
  - LE\_GATT\_MSG\_INCLUDE\_SERVICE\_INFO\_I↔  
ND\_T, 199
  - LE\_GATT\_MSG\_INDICATE\_IND\_T, 201
  - LE\_GATT\_MSG\_NOTIFY\_CFM\_T, 202
  - LE\_GATT\_MSG\_NOTIFY\_IND\_T, 202
  - LE\_GATT\_MSG\_OPERATION\_TIMEOUT\_T, 204
  - LE\_GATT\_MSG\_PREPARE\_WRITE\_RELIABL↔  
E\_CFM\_T, 204
  - LE\_GATT\_MSG\_READ\_CHAR\_VAL\_BY\_UUID↔  
\_CFM\_T, 205
  - LE\_GATT\_MSG\_READ\_CHARACTERISTIC\_V↔  
ALUE\_CFM\_T, 206
  - LE\_GATT\_MSG\_READ\_LONG\_CHAR\_VAL\_C↔  
FM\_T, 207
  - LE\_GATT\_MSG\_READ\_MULTIPLE\_CHAR\_VAL↔  
L\_CFM\_T, 208
  - LE\_GATT\_MSG\_SERVICE\_INFO\_IND\_T, 210
  - LE\_GATT\_MSG\_SIGNED\_WRITE\_CFM\_T, 211
  - LE\_GATT\_MSG\_WRITE\_CHAR\_VAL\_RELIAB↔  
LE\_CFM\_T, 212
  - LE\_GATT\_MSG\_WRITE\_CHAR\_VALUE\_CFM↔  
\_T, 213
  - LE\_GATT\_MSG\_WRITE\_LONG\_CHAR\_VALU↔  
E\_CFM\_T, 214
  - LE\_GATT\_MSG\_WRITE\_NO\_RSP\_CFM\_T, 215
  - direct\_addr
    - LE\_CM\_MSG\_DIRECT\_ADV\_REPORT\_IND\_T,  
166
  - direct\_addr\_type
    - LE\_CM\_MSG\_DIRECT\_ADV\_REPORT\_IND\_T,  
166
  - disconnected
    - wifi\_event\_info\_t, 244
  - dtim\_period
    - wifi\_scan\_info\_t, 253
  - dtim\_prod
    - auto\_conn\_info\_t, 153
    - mw\_wifi\_auto\_connect\_ap\_info\_t, 225
    - scan\_info\_t, 232
    - wifi\_auto\_connect\_info\_t, 241
  - eap\_workaround
    - asso\_data, 151
  - eapol\_flags
    - asso\_data, 151
  - ediv



- LE\_CM\_MSG\_LTK\_REQ\_IND\_T, 170
- enable
  - LE\_SMP\_MSG\_ENCRYPTION\_CHANGE\_IND\_T, 216
- enabled
  - LE\_CM\_MSG\_ENCRYPTION\_CHANGE\_IND\_T, 168
  - LE\_CM\_MSG\_ENCRYPTION\_REFRESH\_IND\_T, 169
- encrypt\_type
  - wifi\_ap\_config\_t, 239
- end\_hdl
  - LE\_GATT\_MSG\_INCLUDE\_SERVICE\_INFO\_IND\_T, 199
  - LE\_GATT\_MSG\_SERVICE\_INFO\_IND\_T, 210
- endHdl
  - LE\_GATT\_SERVICE\_T, 215
- Enumeration, 144
  - wifi\_auth\_mode\_t, 144
  - wifi\_bandwidth\_t, 145
  - wifi\_cipher\_type\_t, 145
  - wifi\_event\_t, 145
  - wifi\_mac\_data\_rate\_t, 146
  - wifi\_mode\_t, 146
  - wifi\_reason\_code\_t, 147
  - wifi\_scan\_method\_t, 148
  - wifi\_scan\_type\_t, 148
  - wifi\_sort\_method\_t, 148
- err\_hdl
  - LE\_GATT\_MSG\_EXECUTE\_WRITE\_RELIABLE\_CFM\_T, 193
  - LE\_GATT\_MSG\_READ\_MULTIPLE\_CHAR\_VALUES\_CFM\_T, 209
- event
  - event\_msg\_t, 157
- event\_handler
  - wifi\_init\_config\_t, 250
- event\_msg\_t, 157
  - event, 157
  - length, 157
  - param, 158
- event\_type
  - LE\_CM\_MSG\_ADVERTISE\_REPORT\_IND\_T, 162
- evt\_type
  - wifi\_evt\_t, 248
- fast\_connect
  - auto\_conn\_info\_t, 154
  - mw\_wifi\_auto\_connect\_ap\_info\_t, 226
  - wifi\_auto\_connect\_info\_t, 241
- filter\_policy
  - LE\_GAP\_ADVERTISING\_PARAM\_T, 180
  - LE\_GAP\_SCAN\_PARAM\_T, 183
- flag
  - auto\_connect\_cfg\_t, 156
  - LE\_GATT\_MSG\_ACCESS\_WRITE\_IND\_T, 186
  - MwFimAutoConnectCFG\_t, 228
- format
  - LE\_GATT\_ATTR\_T, 184
  - LE\_GATT\_MSG\_CHAR\_DESCRIPTOR\_INFO\_IND\_T, 187
  - LE\_GATT\_MSG\_CHARACTERISTIC\_DECL\_INFO\_IND\_T, 188
  - LE\_GATT\_MSG\_INCLUDE\_SERVICE\_INFO\_IND\_T, 200
  - LE\_GATT\_MSG\_SERVICE\_INFO\_IND\_T, 210
- frame\_buffer
  - rx\_eapol\_data, 229
- frame\_length
  - rx\_eapol\_data, 229
- free\_ocpy
  - auto\_conn\_info\_t, 154
  - mw\_wifi\_auto\_connect\_ap\_info\_t, 226
  - scan\_info\_t, 233
- front
  - auto\_connect\_cfg\_t, 156
  - MwFimAutoConnectCFG\_t, 228
- GAP\_ADTYPE\_128BIT\_COMPLETE
  - BLE GAP APIs, 19
- GAP\_ADTYPE\_128BIT\_MORE
  - BLE GAP APIs, 19
- GAP\_ADTYPE\_16BIT\_COMPLETE
  - BLE GAP APIs, 19
- GAP\_ADTYPE\_16BIT\_MORE
  - BLE GAP APIs, 20
- GAP\_ADTYPE\_32BIT\_COMPLETE
  - BLE GAP APIs, 20
- GAP\_ADTYPE\_32BIT\_MORE
  - BLE GAP APIs, 20
- GAP\_ADTYPE\_3D\_INFO\_DATA
  - BLE GAP APIs, 20
- GAP\_ADTYPE\_ADV\_INTERVAL
  - BLE GAP APIs, 20
- GAP\_ADTYPE\_APPEARANCE
  - BLE GAP APIs, 20
- GAP\_ADTYPE\_FLAGS\_BREDR\_NOT\_SUPPORTED
  - BLE GAP APIs, 20
- GAP\_ADTYPE\_FLAGS\_GENERAL
  - BLE GAP APIs, 21
- GAP\_ADTYPE\_FLAGS\_LIMITED
  - BLE GAP APIs, 21
- GAP\_ADTYPE\_FLAGS
  - BLE GAP APIs, 20
- GAP\_ADTYPE\_LE\_BD\_ADDR
  - BLE GAP APIs, 21
- GAP\_ADTYPE\_LE\_ROLE
  - BLE GAP APIs, 21
- GAP\_ADTYPE\_LOCAL\_NAME\_COMPLETE
  - BLE GAP APIs, 21
- GAP\_ADTYPE\_LOCAL\_NAME\_SHORT
  - BLE GAP APIs, 21
- GAP\_ADTYPE\_MANUFACTURER\_SPECIFIC
  - BLE GAP APIs, 21
- GAP\_ADTYPE\_OOB\_CLASS\_OF\_DEVICE
  - BLE GAP APIs, 21
- GAP\_ADTYPE\_OOB\_SIMPLE\_PAIRING\_HASHC

- BLE GAP APIs, [22](#)
- GAP\_ADTYPE\_OOB\_SIMPLE\_PAIRING\_RANDR
  - BLE GAP APIs, [22](#)
- GAP\_ADTYPE\_POWER\_LEVEL
  - BLE GAP APIs, [22](#)
- GAP\_ADTYPE\_PUBLIC\_TARGET\_ADDR
  - BLE GAP APIs, [22](#)
- GAP\_ADTYPE\_RANDOM\_TARGET\_ADDR
  - BLE GAP APIs, [22](#)
- GAP\_ADTYPE\_SERVICE\_DATA\_128BIT
  - BLE GAP APIs, [22](#)
- GAP\_ADTYPE\_SERVICE\_DATA\_32BIT
  - BLE GAP APIs, [22](#)
- GAP\_ADTYPE\_SERVICE\_DATA
  - BLE GAP APIs, [22](#)
- GAP\_ADTYPE\_SERVICES\_LIST\_128BIT
  - BLE GAP APIs, [23](#)
- GAP\_ADTYPE\_SERVICES\_LIST\_16BIT
  - BLE GAP APIs, [23](#)
- GAP\_ADTYPE\_SIGNED\_DATA
  - BLE GAP APIs, [23](#)
- GAP\_ADTYPE\_SIMPLE\_PAIRING\_HASHC\_256
  - BLE GAP APIs, [23](#)
- GAP\_ADTYPE\_SIMPLE\_PAIRING\_RANDR\_256
  - BLE GAP APIs, [23](#)
- GAP\_ADTYPE\_SLAVE\_CONN\_INTERVAL\_RANGE
  - BLE GAP APIs, [23](#)
- GAP\_ADTYPE\_SM\_OOB\_FLAG
  - BLE GAP APIs, [23](#)
- GAP\_ADTYPE\_SM\_TK
  - BLE GAP APIs, [23](#)
- GAP\_PUBLIC\_ADDR
  - BLE GAP APIs, [24](#)
- GAP\_RAND\_ADDR\_NRPA
  - BLE GAP APIs, [24](#)
- GAP\_RAND\_ADDR\_RPA
  - BLE GAP APIs, [24](#)
- GAP\_RAND\_ADDR\_STATIC
  - BLE GAP APIs, [24](#)
- GAP\_SCAN\_TYPE\_ACTIVE
  - BLE GAP APIs, [24](#)
- GAP\_SCAN\_TYPE\_PASSIVE
  - BLE GAP APIs, [24](#)
- GAP\_TX\_PWR\_CURR\_VAL
  - BLE GAP APIs, [24](#)
- GAP\_TX\_PWR\_MAX\_VAL
  - BLE GAP APIs, [24](#)
- GAPBOND\_IO\_CAP\_DISPLAY\_ONLY
  - BLE GAP APIs, [25](#)
- GAPBOND\_IO\_CAP\_DISPLAY\_YES\_NO
  - BLE GAP APIs, [25](#)
- GAPBOND\_IO\_CAP\_KEYBOARD\_DISPLAY
  - BLE GAP APIs, [25](#)
- GAPBOND\_IO\_CAP\_KEYBOARD\_ONLY
  - BLE GAP APIs, [25](#)
- GAPBOND\_IO\_CAP\_NO\_INPUT\_NO\_OUTPUT
  - BLE GAP APIs, [25](#)
- GAPBOND\_PAIRING\_MODE\_INITIATE
  - BLE GAP APIs, [25](#)
- GAPBOND\_PAIRING\_MODE\_NO\_PAIRING
  - BLE GAP APIs, [25](#)
- GAPBOND\_PAIRING\_MODE\_WAIT\_FOR\_REQ
  - BLE GAP APIs, [25](#)
- GATT\_CHAR\_AGG\_FORMAT\_UUID
  - BLE GATT APIs, [45](#)
- GATT\_CHAR\_EXT\_PROPS\_UUID
  - BLE GATT APIs, [45](#)
- GATT\_CHAR\_FORMAT\_UUID
  - BLE GATT APIs, [45](#)
- GATT\_CHAR\_USER\_DESC\_UUID
  - BLE GATT APIs, [46](#)
- GATT\_CHARACTERISTIC\_UUID
  - BLE GATT APIs, [46](#)
- GATT\_CLIENT\_CHAR\_CFG\_UUID
  - BLE GATT APIs, [46](#)
- GATT\_EXT\_REPORT\_REF\_UUID
  - BLE GATT APIs, [46](#)
- GATT\_INCLUDE\_UUID
  - BLE GATT APIs, [46](#)
- GATT\_PRIMARY\_SERVICE\_UUID
  - BLE GATT APIs, [46](#)
- GATT\_REPORT\_REF\_UUID
  - BLE GATT APIs, [46](#)
- GATT\_SECONDARY\_SERVICE\_UUID
  - BLE GATT APIs, [46](#)
- GATT\_SERV\_CHAR\_CFG\_UUID
  - BLE GATT APIs, [47](#)
- GATT\_VALID\_RANGE\_UUID
  - BLE GATT APIs, [47](#)
- gcCharAggregateUuid
  - BLE GATT APIs, [70](#)
- gcCharExtPropUuid
  - BLE GATT APIs, [70](#)
- gcCharFormatUuid
  - BLE GATT APIs, [71](#)
- gcCharUserDescUuid
  - BLE GATT APIs, [71](#)
- gcCharacteristicUuid
  - BLE GATT APIs, [70](#)
- gcClientCharConfigUuid
  - BLE GATT APIs, [71](#)
- gcExtReportRefUuid
  - BLE GATT APIs, [71](#)
- gcIncludeUuid
  - BLE GATT APIs, [71](#)
- gcPrimaryServiceUuid
  - BLE GATT APIs, [71](#)
- gcReportRefUuid
  - BLE GATT APIs, [71](#)
- gcSecondaryServiceUuid
  - BLE GATT APIs, [71](#)
- gcServerCharConfigUuid
  - BLE GATT APIs, [72](#)
- gcValidRangeUuid
  - BLE GATT APIs, [72](#)
- got\_ip



- wifi\_event\_info\_t, 244
- group\_cipher
  - \_wpa\_ie\_data, 149
  - asso\_data, 151
  - wifi\_scan\_info\_t, 253
  - wifi\_wpa\_ie\_data\_t, 257
- handle
  - LE\_CM\_MSG\_SET\_DISCONNECT\_CFM\_T, 177
  - LE\_GATT\_ATTR\_T, 184
  - LE\_GATT\_MSG\_ACCESS\_READ\_IND\_T, 185
  - LE\_GATT\_MSG\_ACCESS\_WRITE\_IND\_T, 186
  - LE\_GATT\_MSG\_CHAR\_DESCRIPTOR\_INFO\_↔  
IND\_T, 187
  - LE\_GATT\_MSG\_CHARACTERISTIC\_DECL\_IN↔  
FO\_IND\_T, 189
  - LE\_GATT\_MSG\_CHARACTERISTIC\_VAL\_IND↔  
\_T, 190
  - LE\_GATT\_MSG\_CONFIRMATION\_CFM\_T, 191
  - LE\_GATT\_MSG\_FIND\_ALL\_CHAR\_DESC\_CF↔  
M\_T, 194
  - LE\_GATT\_MSG\_FIND\_ALL\_PRIMARY\_SERVI↔  
CE\_CFM\_T, 195
  - LE\_GATT\_MSG\_FIND\_CHARACTERISTIC\_CF↔  
M\_T, 196
  - LE\_GATT\_MSG\_FIND\_INCLUDED\_SERVICE\_↔  
CFM\_T, 197
  - LE\_GATT\_MSG\_FIND\_PRIMARY\_SERVICE\_B↔  
Y\_UUID\_CFM\_T, 198
  - LE\_GATT\_MSG\_INCLUDE\_SERVICE\_INFO\_I↔  
ND\_T, 200
  - LE\_GATT\_MSG\_INDICATE\_IND\_T, 201
  - LE\_GATT\_MSG\_NOTIFY\_CFM\_T, 202
  - LE\_GATT\_MSG\_NOTIFY\_IND\_T, 203
  - LE\_GATT\_MSG\_PREPARE\_WRITE\_RELIABL↔  
E\_CFM\_T, 204
  - LE\_GATT\_MSG\_READ\_CHAR\_VAL\_BY\_UUID↔  
\_CFM\_T, 205
  - LE\_GATT\_MSG\_READ\_CHARACTERISTIC\_V↔  
ALUE\_CFM\_T, 206
  - LE\_GATT\_MSG\_READ\_LONG\_CHAR\_VAL\_C↔  
FM\_T, 207
  - LE\_GATT\_MSG\_SIGNED\_WRITE\_CFM\_T, 211
  - LE\_GATT\_MSG\_WRITE\_CHAR\_VAL\_RELIAB↔  
LE\_CFM\_T, 212
  - LE\_GATT\_MSG\_WRITE\_CHAR\_VALUE\_CFM↔  
\_T, 213
  - LE\_GATT\_MSG\_WRITE\_LONG\_CHAR\_VALU↔  
E\_CFM\_T, 214
  - LE\_GATT\_MSG\_WRITE\_NO\_RSP\_CFM\_T, 215
- hap\_ap\_info
  - hap\_control\_t, 158
- hap\_bitvector
  - hap\_control\_t, 158
- hap\_control\_t, 158
  - hap\_ap\_info, 158
  - hap\_bitvector, 158
  - hap\_en, 158
  - hap\_final\_index, 158
  - hap\_index, 159
  - hap\_ssid, 159
- hap\_en
  - hap\_control\_t, 158
- hap\_final\_index
  - hap\_control\_t, 158
- hap\_index
  - hap\_control\_t, 159
- hap\_ssid
  - hap\_control\_t, 159
- hid\_ssid
  - auto\_conn\_info\_t, 154
  - mw\_wifi\_auto\_connect\_ap\_info\_t, 226
  - wifi\_auto\_connect\_info\_t, 241
- hid\_ssid\_len
  - auto\_conn\_info\_t, 154
  - mw\_wifi\_auto\_connect\_ap\_info\_t, 226
- iArgc
  - T\_RfCmd, 235
- INCLUDE\_DECL\_UUID128
  - BLE GATT APIs, 47
- INCLUDE\_DECL\_UUID128\_ATTR\_VAL
  - BLE GATT APIs, 47
- INCLUDE\_DECL\_UUID16\_ATTR\_VAL
  - BLE GATT APIs, 47
- INCLUDE\_DECL\_UINT16
  - BLE GATT APIs, 47
- identifier
  - LE\_CM\_MSG\_SIGNAL\_UPDATE\_REQ\_T, 178
- interval
  - LE\_CM\_MSG\_CONN\_UPDATE\_COMPLETE\_I↔  
ND\_T, 164
  - LE\_GAP\_SCAN\_PARAM\_T, 183
- interval\_max
  - LE\_CM\_MSG\_SIGNAL\_UPDATE\_REQ\_T, 178
  - LE\_GAP\_ADVERTISING\_PARAM\_T, 181
  - LE\_GAP\_CONN\_PARAM\_T, 182
- interval\_min
  - LE\_CM\_MSG\_SIGNAL\_UPDATE\_REQ\_T, 178
  - LE\_GAP\_ADVERTISING\_PARAM\_T, 181
  - LE\_GAP\_CONN\_PARAM\_T, 182
- ip\_changed
  - wifi\_event\_sta\_got\_ip\_t, 247
- itv\_max
  - LE\_CM\_MSG\_CONN\_PARA\_REQ\_T, 163
  - LE\_CONN\_PARA\_T, 179
- itv\_min
  - LE\_CM\_MSG\_CONN\_PARA\_REQ\_T, 163
  - LE\_CONN\_PARA\_T, 179
- key\_mgmt
  - \_wpa\_ie\_data, 149
  - asso\_data, 151
  - wifi\_wpa\_ie\_data\_t, 258
- keypress
  - LE\_SMP\_MSG\_SLAVE\_SECURITY\_REQUES↔  
T\_IND\_T, 222

- LE\_ATT\_MSG\_BASE
  - BLE MSG APIs, 74
- LE\_ATT\_UUID\_SIZE
  - BLE GATT APIs, 47
- LE\_BT\_ADDR\_T, 159
  - addr, 159
  - type, 159
- LE\_CM\_CONNECTION\_COMPLETE\_IND\_T, 160
  - conn\_hdl, 160
  - conn\_interval, 160
  - conn\_latency, 160
  - dev\_id, 160
  - peer\_addr, 160
  - peer\_addr\_type, 161
  - role, 161
  - status, 161
  - supervision\_timeout, 161
- LE\_CM\_MSG\_ADD\_TO\_RESOLVING\_LIST\_CFM\_T
  - BLE CM APIs, 11
- LE\_CM\_MSG\_ADD\_TO\_WHITE\_LIST\_CFM\_T
  - BLE CM APIs, 11
- LE\_CM\_MSG\_ADVERTISE\_REPORT\_IND\_T, 161
  - addr, 162
  - addr\_type, 162
  - data, 162
  - event\_type, 162
  - len, 162
  - rss\_i, 162
- LE\_CM\_MSG\_BASE
  - BLE MSG APIs, 74
- LE\_CM\_MSG\_CANCEL\_CONNECTION\_CFM\_T
  - BLE CM APIs, 11
- LE\_CM\_MSG\_CLEAR\_RESOLVING\_LIST\_CFM\_T
  - BLE CM APIs, 12
- LE\_CM\_MSG\_CLEAR\_WHITE\_LIST\_CFM\_T
  - BLE CM APIs, 12
- LE\_CM\_MSG\_CONN\_PARA\_REQ\_T, 162
  - conn\_hdl, 163
  - itv\_max, 163
  - itv\_min, 163
  - latency, 163
  - sv\_tmo, 163
- LE\_CM\_MSG\_CONN\_UPDATE\_COMPLETE\_IND\_T, 163
  - conn\_hdl, 164
  - interval, 164
  - latency, 164
  - status, 164
  - supervision\_timeout, 164
- LE\_CM\_MSG\_CREATE\_CONNECTION\_CFM\_T
  - BLE CM APIs, 12
- LE\_CM\_MSG\_DATA\_LEN\_CHANGE\_IND\_T, 164
  - conn\_hdl, 165
  - max\_rx\_octets, 165
  - max\_rx\_time, 165
  - max\_tx\_octets, 165
  - max\_tx\_time, 165
- LE\_CM\_MSG\_DIRECT\_ADV\_REPORT\_IND\_T, 165
  - direct\_addr, 166
  - direct\_addr\_type, 166
  - peer\_addr, 166
  - peer\_addr\_type, 166
  - rss\_i, 166
- LE\_CM\_MSG\_DISCONNECT\_COMPLETE\_IND\_T, 166
  - conn\_hdl, 167
  - reason, 167
  - status, 167
- LE\_CM\_MSG\_ENCRYPTION\_CHANGE\_IND\_T, 167
  - conn\_hdl, 167
  - devid, 168
  - enabled, 168
  - status, 168
- LE\_CM\_MSG\_ENCRYPTION\_REFRESH\_IND\_T, 168
  - conn\_hdl, 168
  - devid, 168
  - enabled, 169
  - status, 169
- LE\_CM\_MSG\_ENTER\_ADVERTISING\_CFM\_T
  - BLE CM APIs, 12
- LE\_CM\_MSG\_ENTER\_SCANNING\_CFM\_T
  - BLE CM APIs, 12
- LE\_CM\_MSG\_EXIT\_ADVERTISING\_CFM\_T
  - BLE CM APIs, 12
- LE\_CM\_MSG\_EXIT\_SCANNING\_CFM\_T
  - BLE CM APIs, 12
- LE\_CM\_MSG\_INIT\_COMPLETE\_CFM\_T, 169
  - status, 169
- LE\_CM\_MSG\_LTK\_REQ\_IND\_T, 169
  - conn\_hdl, 170
  - devid, 170
  - ediv, 170
  - rand, 170
- LE\_CM\_MSG\_PHY\_UPDATE\_COMPLETE\_IND\_T
  - BLE CM APIs, 12
- LE\_CM\_MSG\_READ\_ADV\_TX\_POWER\_CFM\_T, 170
  - pwr\_level, 171
  - status, 171
- LE\_CM\_MSG\_READ\_BD\_ADDR\_CFM\_T, 171
  - bd\_addr, 171
  - status, 171
- LE\_CM\_MSG\_READ\_CHANNEL\_MAP\_CFM\_T, 172
  - ch\_map, 172
  - conn\_hdl, 172
  - status, 172
- LE\_CM\_MSG\_READ\_PHY\_CFM\_T, 172
  - conn\_hdl, 173
  - rx\_phy, 173
  - status, 173
  - tx\_phy, 173
- LE\_CM\_MSG\_READ\_RESOLVING\_LIST\_SIZE\_CFM\_T, 173
  - M\_T, 173
  - size, 173
  - status, 173
- LE\_CM\_MSG\_READ\_RSSI\_CFM\_T, 174
  - conn\_hdl, 174

- rss, [174](#)
  - status, [174](#)
- LE\_CM\_MSG\_READ\_TX\_POWER\_CFM\_T, [174](#)
  - conn\_hdl, [175](#)
  - status, [175](#)
  - tx\_power, [175](#)
- LE\_CM\_MSG\_READ\_WHITE\_LIST\_SIZE\_CFM\_T, [175](#)
  - size, [175](#)
  - status, [176](#)
- LE\_CM\_MSG\_REMOVE\_FROM\_RESOLVING\_LIST\_CFM\_T
  - BLE CM APIs, [13](#)
- LE\_CM\_MSG\_REMOVE\_FROM\_WHITE\_LIST\_CFM\_T
  - BLE CM APIs, [13](#)
- LE\_CM\_MSG\_SET\_ADVERTISING\_DATA\_CFM\_T
  - BLE CM APIs, [13](#)
- LE\_CM\_MSG\_SET\_ADVERTISING\_PARAMS\_CFM\_T
  - BLE CM APIs, [13](#)
- LE\_CM\_MSG\_SET\_CHANNEL\_MAP\_CFM\_T
  - BLE CM APIs, [13](#)
- LE\_CM\_MSG\_SET\_DATA\_LENGTH\_CFM\_T, [176](#)
  - conn\_hdl, [176](#)
  - status, [176](#)
- LE\_CM\_MSG\_SET\_DEFAULT\_PHY\_CFM\_T
  - BLE CM APIs, [13](#)
- LE\_CM\_MSG\_SET\_DISCONNECT\_CFM\_T, [176](#)
  - handle, [177](#)
  - status, [177](#)
- LE\_CM\_MSG\_SET\_PHY\_CFM\_T, [177](#)
  - conn\_hdl, [177](#)
  - status, [177](#)
- LE\_CM\_MSG\_SET\_RANDOM\_ADDRESS\_CFM\_T
  - BLE CM APIs, [13](#)
- LE\_CM\_MSG\_SET\_RPA\_TIMEOUT\_CFM\_T
  - BLE CM APIs, [13](#)
- LE\_CM\_MSG\_SET\_SCAN\_PARAMS\_CFM\_T
  - BLE CM APIs, [14](#)
- LE\_CM\_MSG\_SET\_SCAN\_RSP\_DATA\_CFM\_T
  - BLE CM APIs, [14](#)
- LE\_CM\_MSG\_SIGNAL\_UPDATE\_REQ\_T, [178](#)
  - conn\_hdl, [178](#)
  - identifier, [178](#)
  - interval\_max, [178](#)
  - interval\_min, [178](#)
  - slave\_latency, [178](#)
  - timeout\_multiplier, [178](#)
- LE\_CM\_REQ\_STATUS\_T, [179](#)
  - status, [179](#)
- LE\_CONN\_PARA\_T, [179](#)
  - itv\_max, [179](#)
  - itv\_min, [179](#)
  - latency, [180](#)
  - sv\_timeout, [180](#)
- LE\_GAP\_ADV\_MAX\_SIZE
  - BLE GAP APIs, [26](#)
- LE\_GAP\_ADVERTISING\_PARAM\_T, [180](#)
  - channel\_map, [180](#)
  - filter\_policy, [180](#)
  - interval\_max, [181](#)
  - interval\_min, [181](#)
  - own\_addr\_type, [181](#)
  - peer\_addr, [181](#)
  - peer\_addr\_type, [181](#)
  - type, [181](#)
- LE\_GAP\_CONN\_PARAM\_T, [181](#)
  - interval\_max, [182](#)
  - interval\_min, [182](#)
  - latency, [182](#)
  - supervision\_timeout, [182](#)
- LE\_GAP\_SCAN\_PARAM\_T, [182](#)
  - filter\_policy, [183](#)
  - interval, [183](#)
  - own\_addr\_type, [183](#)
  - type, [183](#)
  - window, [183](#)
- LE\_GATT\_ATTR\_T, [183](#)
  - format, [184](#)
  - handle, [184](#)
  - len, [184](#)
  - maxLen, [184](#)
  - pUuid, [184](#)
  - pVal, [184](#)
  - permit, [184](#)
- LE\_GATT\_CHAR\_PROP\_AUTH
  - BLE GATT APIs, [48](#)
- LE\_GATT\_CHAR\_PROP\_BCAST
  - BLE GATT APIs, [48](#)
- LE\_GATT\_CHAR\_PROP\_EXT\_PROP
  - BLE GATT APIs, [48](#)
- LE\_GATT\_CHAR\_PROP\_IND
  - BLE GATT APIs, [48](#)
- LE\_GATT\_CHAR\_PROP\_NTF
  - BLE GATT APIs, [48](#)
- LE\_GATT\_CHAR\_PROP\_RD
  - BLE GATT APIs, [48](#)
- LE\_GATT\_CHAR\_PROP\_WR\_NO\_RESP
  - BLE GATT APIs, [49](#)
- LE\_GATT\_CHAR\_PROP\_WR
  - BLE GATT APIs, [48](#)
- LE\_GATT\_CLIENT\_CFG\_INDICATION
  - BLE GATT APIs, [49](#)
- LE\_GATT\_CLIENT\_CFG\_NOTIFICATION
  - BLE GATT APIs, [49](#)
- LE\_GATT\_EXT\_PROP\_RELIABLE\_WR
  - BLE GATT APIs, [49](#)
- LE\_GATT\_EXT\_PROP\_WR\_AUX
  - BLE GATT APIs, [49](#)
- LE\_GATT\_FLAG\_PREPARE\_WRITE
  - BLE GATT APIs, [49](#)
- LE\_GATT\_FLAG\_WRITE\_CMD
  - BLE GATT APIs, [49](#)
- LE\_GATT\_FLAG\_WRITE\_REQ
  - BLE GATT APIs, [49](#)

- LE\_GATT\_MSG\_ACCESS\_READ\_IND\_T, 185
  - conn\_hdl, 185
  - devid, 185
  - handle, 185
  - offset, 185
- LE\_GATT\_MSG\_ACCESS\_WRITE\_IND\_T, 185
  - conn\_hdl, 186
  - devid, 186
  - flag, 186
  - handle, 186
  - len, 186
  - offset, 186
  - pVal, 187
- LE\_GATT\_MSG\_BASE
  - BLE MSG APIs, 74
- LE\_GATT\_MSG\_CHAR\_DESCRIPTOR\_INFO\_IND\_T, 187
  - conn\_hdl, 187
  - devid, 187
  - format, 187
  - handle, 187
  - uuid, 188
- LE\_GATT\_MSG\_CHARACTERISTIC\_DECL\_INFO\_I↔ND\_T, 188
  - conn\_hdl, 188
  - devid, 188
  - format, 188
  - handle, 189
  - property, 189
  - uuid, 189
  - val\_hdl, 189
- LE\_GATT\_MSG\_CHARACTERISTIC\_VAL\_IND\_T, 189
  - att\_err, 190
  - conn\_hdl, 190
  - devid, 190
  - handle, 190
  - len, 190
  - offset, 190
  - val, 190
- LE\_GATT\_MSG\_CONFIRMATION\_CFM\_T, 191
  - conn\_hdl, 191
  - devid, 191
  - handle, 191
- LE\_GATT\_MSG\_EXCHANGE\_MTU\_CFM\_T, 191
  - conn\_hdl, 192
  - current\_rx\_mtu, 192
  - devid, 192
- LE\_GATT\_MSG\_EXCHANGE\_MTU\_IND\_T, 192
  - client\_rx\_mtu, 192
  - conn\_hdl, 192
  - devid, 193
- LE\_GATT\_MSG\_EXECUTE\_WRITE\_RELIABLE\_CF↔M\_T, 193
  - att\_err, 193
  - conn\_hdl, 193
  - devid, 193
  - err\_hdl, 193
  - status, 194
- LE\_GATT\_MSG\_FIND\_ALL\_CHAR\_DESC\_CFM\_T, 194
  - att\_err, 194
  - conn\_hdl, 194
  - devid, 194
  - handle, 194
  - status, 195
- LE\_GATT\_MSG\_FIND\_ALL\_PRIMARY\_SERVICE\_C↔CFM\_T, 195
  - att\_err, 195
  - conn\_hdl, 195
  - devid, 195
  - handle, 195
  - status, 196
- LE\_GATT\_MSG\_FIND\_CHARACTERISTIC\_CFM\_T, 196
  - att\_err, 196
  - conn\_hdl, 196
  - devid, 196
  - handle, 196
  - status, 197
- LE\_GATT\_MSG\_FIND\_INCLUDED\_SERVICE\_CFM↔\_T, 197
  - att\_err, 197
  - conn\_hdl, 197
  - devid, 197
  - handle, 197
  - status, 198
- LE\_GATT\_MSG\_FIND\_PRIMARY\_SERVICE\_BY\_U↔UID\_CFM\_T, 198
  - att\_err, 198
  - conn\_hdl, 198
  - devid, 198
  - handle, 198
  - status, 199
- LE\_GATT\_MSG\_INCLUDE\_SERVICE\_INFO\_IND\_T, 199
  - conn\_hdl, 199
  - devid, 199
  - end\_hdl, 199
  - format, 200
  - handle, 200
  - start\_hdl, 200
  - uuid, 200
- LE\_GATT\_MSG\_INDICATE\_IND\_T, 200
  - conn\_hdl, 200
  - devid, 201
  - handle, 201
  - len, 201
  - val, 201
- LE\_GATT\_MSG\_NOTIFY\_CFM\_T, 201
  - conn\_hdl, 201
  - devid, 202
  - handle, 202
  - status, 202
- LE\_GATT\_MSG\_NOTIFY\_IND\_T, 202
  - conn\_hdl, 202
  - devid, 202

- handle, [203](#)
- len, [203](#)
- val, [203](#)
- LE\_GATT\_MSG\_OPERATION\_TIMEOUT\_T, [203](#)
  - att\_op, [203](#)
  - conn\_hdl, [203](#)
  - devid, [204](#)
- LE\_GATT\_MSG\_PREPARE\_WRITE\_RELIABLE\_CFM\_T, [204](#)
  - att\_err, [204](#)
  - conn\_hdl, [204](#)
  - devid, [204](#)
  - handle, [204](#)
  - status, [205](#)
- LE\_GATT\_MSG\_READ\_CHAR\_VAL\_BY\_UUID\_CFM\_T, [205](#)
  - att\_err, [205](#)
  - conn\_hdl, [205](#)
  - devid, [205](#)
  - handle, [205](#)
  - status, [206](#)
- LE\_GATT\_MSG\_READ\_CHARACTERISTIC\_VALUE\_CFM\_T, [206](#)
  - att\_err, [206](#)
  - conn\_hdl, [206](#)
  - devid, [206](#)
  - handle, [206](#)
  - status, [207](#)
- LE\_GATT\_MSG\_READ\_LONG\_CHAR\_VAL\_CFM\_T, [207](#)
  - att\_err, [207](#)
  - conn\_hdl, [207](#)
  - devid, [207](#)
  - handle, [207](#)
  - status, [208](#)
- LE\_GATT\_MSG\_READ\_MULTIPLE\_CHAR\_VAL\_CFM\_T, [208](#)
  - att\_err, [208](#)
  - conn\_hdl, [208](#)
  - devid, [208](#)
  - err\_hdl, [209](#)
  - len, [209](#)
  - status, [209](#)
  - val, [209](#)
- LE\_GATT\_MSG\_SERVICE\_INFO\_IND\_T, [209](#)
  - conn\_hdl, [210](#)
  - devid, [210](#)
  - end\_hdl, [210](#)
  - format, [210](#)
  - start\_hdl, [210](#)
  - uuid, [210](#)
- LE\_GATT\_MSG\_SIGNED\_WRITE\_CFM\_T, [210](#)
  - conn\_hdl, [211](#)
  - devid, [211](#)
  - handle, [211](#)
  - status, [211](#)
- LE\_GATT\_MSG\_WRITE\_CHAR\_VAL\_RELIABLE\_CFM\_T, [211](#)
  - att\_err, [212](#)
  - conn\_hdl, [212](#)
  - devid, [212](#)
  - handle, [212](#)
  - status, [212](#)
- LE\_GATT\_MSG\_WRITE\_CHAR\_VALUE\_CFM\_T, [212](#)
  - att\_err, [213](#)
  - conn\_hdl, [213](#)
  - devid, [213](#)
  - handle, [213](#)
  - status, [213](#)
- LE\_GATT\_MSG\_WRITE\_LONG\_CHAR\_VALUE\_CFM\_T, [213](#)
  - att\_err, [214](#)
  - conn\_hdl, [214](#)
  - devid, [214](#)
  - handle, [214](#)
  - status, [214](#)
- LE\_GATT\_MSG\_WRITE\_NO\_RSP\_CFM\_T, [214](#)
  - conn\_hdl, [215](#)
  - devid, [215](#)
  - handle, [215](#)
  - status, [215](#)
- LE\_GATT\_PERM\_AUTH\_READABLE
  - BLE GATT APIs, [50](#)
- LE\_GATT\_PERM\_AUTH\_WRITABLE
  - BLE GATT APIs, [50](#)
- LE\_GATT\_PERM\_NONE
  - BLE GATT APIs, [50](#)
- LE\_GATT\_PERM\_READ
  - BLE GATT APIs, [50](#)
- LE\_GATT\_PERM\_RELIABLE\_WRITE
  - BLE GATT APIs, [50](#)
- LE\_GATT\_PERM\_WRITE\_CMD
  - BLE GATT APIs, [50](#)
- LE\_GATT\_PERM\_WRITE\_REQ
  - BLE GATT APIs, [50](#)
- LE\_GATT\_PERMIT\_AUTHEN\_READ
  - BLE GATT APIs, [50](#)
- LE\_GATT\_PERMIT\_AUTHEN\_WRITE
  - BLE GATT APIs, [51](#)
- LE\_GATT\_PERMIT\_AUTHOR\_READ
  - BLE GATT APIs, [51](#)
- LE\_GATT\_PERMIT\_AUTHOR\_WRITE
  - BLE GATT APIs, [51](#)
- LE\_GATT\_PERMIT\_ENCRYPT\_READ
  - BLE GATT APIs, [51](#)
- LE\_GATT\_PERMIT\_ENCRYPT\_WRITE
  - BLE GATT APIs, [51](#)
- LE\_GATT\_PERMIT\_READABLE
  - BLE GATT APIs, [51](#)
- LE\_GATT\_PERMIT\_READ
  - BLE GATT APIs, [51](#)
- LE\_GATT\_PERMIT\_SC\_AUTHEN\_READ
  - BLE GATT APIs, [51](#)
- LE\_GATT\_PERMIT\_SC\_AUTHEN\_WRITE
  - BLE GATT APIs, [52](#)
- LE\_GATT\_PERMIT\_WRITABLE

- BLE GATT APIs, 52
- LE\_GATT\_PERMIT\_WRITE
  - BLE GATT APIs, 52
- LE\_GATT\_SERVICE\_T, 215
  - endHdl, 215
  - pAttr, 216
  - startHdl, 216
  - svc\_id, 216
- LE\_HCI\_MSG\_BASE
  - BLE MSG APIs, 75
- LE\_L2CAP\_MSG\_BASE
  - BLE MSG APIs, 75
- LE\_MAX\_BOND\_COUNT
  - BLE SMP APIs, 86
- LE\_SM\_IO\_CAP\_DISP\_ONLY
  - BLE SMP APIs, 86
- LE\_SM\_IO\_CAP\_DISP\_YES\_NO
  - BLE SMP APIs, 86
- LE\_SM\_IO\_CAP\_KEYBOARD\_DISP
  - BLE SMP APIs, 86
- LE\_SM\_IO\_CAP\_KEYBOARD\_ONLY
  - BLE SMP APIs, 87
- LE\_SM\_IO\_CAP\_NO\_IO
  - BLE SMP APIs, 87
- LE\_SM\_PAIR\_MITM\_NO
  - BLE SMP APIs, 87
- LE\_SM\_PAIR\_MITM\_YES
  - BLE SMP APIs, 87
- LE\_SM\_PAIR\_OOB\_NO
  - BLE SMP APIs, 87
- LE\_SM\_PAIR\_OOB\_YES
  - BLE SMP APIs, 87
- LE\_SM\_PAIR\_SC\_NO
  - BLE SMP APIs, 87
- LE\_SM\_PAIR\_SC\_YES
  - BLE SMP APIs, 87
- LE\_SMP\_MSG\_BASE
  - BLE MSG APIs, 75
- LE\_SMP\_MSG\_ENCRYPTION\_CHANGE\_IND\_T, 216
  - conn\_hdl, 216
  - enable, 216
- LE\_SMP\_MSG\_ENCRYPTION\_REFRESH\_IND\_T, 217
  - conn\_hdl, 217
  - status, 217
- LE\_SMP\_MSG\_OOB\_DATA\_REQUEST\_IND\_T, 217
  - conn\_hdl, 217
- LE\_SMP\_MSG\_PAIRING\_ACTION\_IND\_T, 218
  - action, 218
  - conn\_hdl, 218
  - lost\_bond, 218
  - sc, 218
- LE\_SMP\_MSG\_PAIRING\_COMPLETE\_IND\_T, 219
  - authenticated, 219
  - bonded, 219
  - conn\_hdl, 219
  - peer\_id\_addr, 219
  - sc, 219
  - status, 219
- LE\_SMP\_MSG\_PASSKEY\_DISPLAY\_IND\_T, 220
  - conn\_hdl, 220
  - passkey, 220
- LE\_SMP\_MSG\_PASSKEY\_INPUT\_IND\_T, 220
  - conn\_hdl, 220
- LE\_SMP\_MSG\_SC\_OOB\_DATA\_REQUEST\_IND\_T, 221
  - conn\_hdl, 221
- LE\_SMP\_MSG\_SLAVE\_SECURITY\_REQUEST\_IND\_T, 221
  - bondable, 221
  - conn\_hdl, 222
  - keypress, 222
  - mitm, 222
  - sc, 222
- LE\_SMP\_MSG\_USER\_CONFIRM\_IND\_T, 222
  - confirm\_num, 222
  - conn\_hdl, 223
- LE\_SMP\_SC\_OOB\_DATA\_T, 223
  - confirm, 223
  - rand, 223
- LE\_SYS\_MSG\_BASE
  - BLE MSG APIs, 75
- LE\_SYS\_MSG\_BUF\_OVERFLOW\_T, 223
  - conn\_hdl, 224
- latency
  - LE\_CM\_MSG\_CONN\_PARA\_REQ\_T, 163
  - LE\_CM\_MSG\_CONN\_UPDATE\_COMPLETE\_IND\_T, 164
  - LE\_CONN\_PARA\_T, 180
  - LE\_GAP\_CONN\_PARAM\_T, 182
- latest\_beacon\_rx\_time
  - auto\_conn\_info\_t, 154
  - mw\_wifi\_auto\_connect\_ap\_info\_t, 226
  - scan\_info\_t, 233
- LeCancelAllMessage
  - BLE MSG APIs, 78
- LeCancelAllSubMessage
  - BLE MSG APIs, 79
- LeCancelFirstMessage
  - BLE MSG APIs, 79
- LeCancelFirstSubMessage
  - BLE MSG APIs, 79
- LeCmInit
  - BLE CM APIs, 15
- LeGapAddToResolvingList
  - BLE GAP APIs, 26
- LeGapAddToWhiteList
  - BLE GAP APIs, 26
- LeGapAdvertisingEnable
  - BLE GAP APIs, 27
- LeGapCentralConnectReq
  - BLE GAP APIs, 27
- LeGapCentralSetDataChannel
  - BLE GAP APIs, 27
- LeGapClearResolvingList
  - BLE GAP APIs, 29

- LeGapClearWhiteList
  - BLE GAP APIs, [29](#)
- LeGapConnParaRequestRsp
  - BLE GAP APIs, [29](#)
- LeGapConnUpdateRequest
  - BLE GAP APIs, [30](#)
- LeGapConnUpdateResponse
  - BLE GAP APIs, [30](#)
- LeGapConnectCancelReq
  - BLE GAP APIs, [29](#)
- LeGapDisconnectReq
  - BLE GAP APIs, [31](#)
- LeGapGenRandAddr
  - BLE GAP APIs, [31](#)
- LeGapGetBtAddr
  - BLE GAP APIs, [31](#)
- LeGapReadAdvChannelTxPower
  - BLE GAP APIs, [31](#)
- LeGapReadChannelMap
  - BLE GAP APIs, [32](#)
- LeGapReadPhy
  - BLE GAP APIs, [32](#)
- LeGapReadResolvingListSize
  - BLE GAP APIs, [32](#)
- LeGapReadRssi
  - BLE GAP APIs, [32](#)
- LeGapReadTxPower
  - BLE GAP APIs, [33](#)
- LeGapReadWhiteListSize
  - BLE GAP APIs, [33](#)
- LeGapRemoveFromWhiteList
  - BLE GAP APIs, [33](#)
- LeGapScanningReq
  - BLE GAP APIs, [34](#)
- LeGapSetAdvData
  - BLE GAP APIs, [34](#)
- LeGapSetAdvParameter
  - BLE GAP APIs, [35](#)
- LeGapSetConnParameter
  - BLE GAP APIs, [35](#)
- LeGapSetDataChannelPduLen
  - BLE GAP APIs, [35](#)
- LeGapSetDefaultPhy
  - BLE GAP APIs, [36](#)
- LeGapSetPhy
  - BLE GAP APIs, [36](#)
- LeGapSetRandAddr
  - BLE GAP APIs, [36](#)
- LeGapSetRpaTimeout
  - BLE GAP APIs, [37](#)
- LeGapSetStaticAddr
  - BLE GAP APIs, [37](#)
- LeGattAccessReadRsp
  - BLE GATT APIs, [54](#)
- LeGattAccessWriteRsp
  - BLE GATT APIs, [54](#)
- LeGattChangeAttrVal
  - BLE GATT APIs, [55](#)
- LeGattCharValConfirmation
  - BLE GATT APIs, [55](#)
- LeGattCharValIndicate
  - BLE GATT APIs, [56](#)
- LeGattCharValNotify
  - BLE GATT APIs, [56](#)
- LeGattExchangeMtuReq
  - BLE GATT APIs, [57](#)
- LeGattExchangeMtuRsp
  - BLE GATT APIs, [57](#)
- LeGattExecuteWriteCharValReliable
  - BLE GATT APIs, [57](#)
- LeGattFindAllCharDescriptor
  - BLE GATT APIs, [58](#)
- LeGattFindAllCharacteristic
  - BLE GATT APIs, [58](#)
- LeGattFindAllPrimaryService
  - BLE GATT APIs, [59](#)
- LeGattFindCharacteristicByUuid
  - BLE GATT APIs, [59](#)
- LeGattFindIncludedService
  - BLE GATT APIs, [60](#)
- LeGattFindPrimaryServiceByUuid
  - BLE GATT APIs, [60](#)
- LeGattGetAttrHandle
  - BLE GATT APIs, [60](#)
- LeGattGetAttrVal
  - BLE GATT APIs, [61](#)
- LeGattGetAttrValLen
  - BLE GATT APIs, [61](#)
- LeGattGetAttrValMaxLen
  - BLE GATT APIs, [63](#)
- LeGattInit
  - BLE GATT APIs, [63](#)
- LeGattModifyAttrVal
  - BLE GATT APIs, [64](#)
- LeGattPrepareWriteCharValReliable
  - BLE GATT APIs, [64](#)
- LeGattReadCharValByUuid
  - BLE GATT APIs, [65](#)
- LeGattReadCharValue
  - BLE GATT APIs, [65](#)
- LeGattReadLongCharVal
  - BLE GATT APIs, [66](#)
- LeGattReadMultipleCharVal
  - BLE GATT APIs, [66](#)
- LeGattRegisterIncludeService
  - BLE GATT APIs, [66](#)
- LeGattRegisterService
  - BLE GATT APIs, [67](#)
- LeGattSignedWriteNoRsp
  - BLE GATT APIs, [67](#)
- LeGattStopCurrentProcedure
  - BLE GATT APIs, [68](#)
- LeGattWriteCharVal
  - BLE GATT APIs, [68](#)
- LeGattWriteCharValReliable
  - BLE GATT APIs, [69](#)

- LeGattWriteLongCharVal
  - BLE GATT APIs, [69](#)
- LeGattWriteNoRsp
  - BLE GATT APIs, [70](#)
- LeGetSubMsgId
  - BLE MSG APIs, [80](#)
- LeHostCreateTask
  - BLE MSG APIs, [80](#)
- LeHostMessageLoop
  - BLE MSG APIs, [81](#)
- LeSendMessage
  - BLE MSG APIs, [81](#)
- LeSendMessageAfter
  - BLE MSG APIs, [81](#)
- LeSendMessageUnlock
  - BLE MSG APIs, [82](#)
- LeSendSubMessage
  - BLE MSG APIs, [82](#)
- LeSendSubMessageAfter
  - BLE MSG APIs, [83](#)
- LeSendSubMessageUnlock
  - BLE MSG APIs, [83](#)
- LeSetScanParameter
  - BLE GAP APIs, [37](#)
- LeSetScanRspData
  - BLE GAP APIs, [38](#)
- LeSmpGetBondIdFromAddr
  - BLE ALL APIs, [9](#)
- LeSmpInit
  - BLE SMP APIs, [89](#)
- LeSmpOobAuthDataRsp
  - BLE SMP APIs, [89](#)
- LeSmpOobPresent
  - BLE SMP APIs, [89](#)
- LeSmpPasskeyInput
  - BLE SMP APIs, [90](#)
- LeSmpScOobComputeConfirmVal
  - BLE SMP APIs, [90](#)
- LeSmpScOobDataRsp
  - BLE SMP APIs, [90](#)
- LeSmpSecurityReq
  - BLE SMP APIs, [91](#)
- LeSmpSecurityRsp
  - BLE SMP APIs, [91](#)
- LeSmpSetDefaultConfig
  - BLE SMP APIs, [92](#)
- LeSmpUserConfirmRsp
  - BLE SMP APIs, [92](#)
- leap
  - asso\_data, [151](#)
- len
  - LE\_CM\_MSG\_ADVERTISE\_REPORT\_IND\_↔  
T, [162](#)
  - LE\_GATT\_ATTR\_T, [184](#)
  - LE\_GATT\_MSG\_ACCESS\_WRITE\_IND\_T, [186](#)
  - LE\_GATT\_MSG\_CHARACTERISTIC\_VAL\_IND\_↔  
\_T, [190](#)
  - LE\_GATT\_MSG\_INDICATE\_IND\_T, [201](#)
  - LE\_GATT\_MSG\_NOTIFY\_IND\_T, [203](#)
  - LE\_GATT\_MSG\_READ\_MULTIPLE\_CHAR\_VAL\_↔  
L\_CFM\_T, [209](#)
- length
  - event\_msg\_t, [157](#)
- lost\_bond
  - LE\_SMP\_MSG\_PAIRING\_ACTION\_IND\_T, [218](#)
- MESSAGE\_ALLOCATE
  - BLE MSG APIs, [75](#)
- MESSAGE\_BULID
  - BLE MSG APIs, [75](#)
- MESSAGE\_DATA\_BULID
  - BLE MSG APIs, [75](#)
- MESSAGE\_OFFSET
  - BLE MSG APIs, [76](#)
- MESSAGEID
  - BLE MSG APIs, [76](#)
- MESSAGE
  - BLE MSG APIs, [76](#)
- MSGLOCK
  - BLE MSG APIs, [77](#)
- MSGSUBID
  - BLE MSG APIs, [77](#)
- MSGTIMER
  - BLE MSG APIs, [77](#)
- magic
  - wifi\_init\_config\_t, [250](#)
- manufacture\_name
  - mw\_blewifi\_cbs\_store\_t, [224](#)
- max
  - wifi\_active\_scan\_time\_t, [238](#)
- max\_connection
  - wifi\_ap\_config\_t, [239](#)
- max\_rx\_octets
  - LE\_CM\_MSG\_DATA\_LEN\_CHANGE\_IND\_T, [165](#)
- max\_rx\_time
  - LE\_CM\_MSG\_DATA\_LEN\_CHANGE\_IND\_T, [165](#)
- max\_save\_num
  - auto\_connect\_cfg\_t, [156](#)
  - MwFimAutoConnectCFG\_t, [229](#)
- max\_tx\_octets
  - LE\_CM\_MSG\_DATA\_LEN\_CHANGE\_IND\_T, [165](#)
- max\_tx\_time
  - LE\_CM\_MSG\_DATA\_LEN\_CHANGE\_IND\_T, [165](#)
- maxLen
  - LE\_GATT\_ATTR\_T, [184](#)
- mgmt\_group\_cipher
  - \_wpa\_ie\_data, [150](#)
  - asso\_data, [151](#)
  - wifi\_wpa\_ie\_data\_t, [258](#)
- min
  - wifi\_active\_scan\_time\_t, [238](#)
- mitm
  - LE\_SMP\_MSG\_SLAVE\_SECURITY\_REQUEST\_↔  
T\_IND\_T, [222](#)
- MsgData
  - BLE MSG APIs, [77](#)
- MsgLock



- BLE MSG APIs, 77
- mw\_blewifi\_cbs\_store\_t, 224
  - manufacture\_name, 224
- mw\_wifi\_auto\_connect\_ap\_info\_t, 224
  - ap\_channel, 225
  - beacon\_interval, 225
  - bssid, 225
  - capabilities, 225
  - dtim\_prod, 225
  - fast\_connect, 226
  - free\_ocpy, 226
  - hid\_ssid, 226
  - hid\_ssid\_len, 226
  - latest\_beacon\_rx\_time, 226
  - passphrase, 226
  - psk, 226
  - rsn\_ie, 226
  - rsni, 227
  - ssid, 227
  - ssid\_len, 227
  - supported\_rates, 227
  - wpa\_data, 227
  - wpa\_ie, 227
- mw\_wifi\_sta\_info\_t, 227
  - au8Dot11MACAddress, 228
  - u8SkipDtimPeriods, 228
- MwFimAutoConnectCFG\_t, 228
  - flag, 228
  - front, 228
  - max\_save\_num, 229
  - rear, 229
  - targetIdx, 229
- non\_leap
  - asso\_data, 152
- num
  - wifi\_scan\_list\_t, 254
- num\_pmkid
  - \_wpa\_ie\_data, 150
  - wifi\_wpa\_ie\_data\_t, 258
- number
  - wifi\_event\_sta\_scan\_done\_t, 247
- offset
  - LE\_GATT\_MSG\_ACCESS\_READ\_IND\_T, 185
  - LE\_GATT\_MSG\_ACCESS\_WRITE\_IND\_T, 186
  - LE\_GATT\_MSG\_CHARACTERISTIC\_VAL\_IND\_T, 190
- own\_addr\_type
  - LE\_GAP\_ADVERTISING\_PARAM\_T, 181
  - LE\_GAP\_SCAN\_PARAM\_T, 183
- pAttr
  - LE\_GATT\_SERVICE\_T, 216
- pFCInfo
  - auto\_connect\_cfg\_t, 156
- pParam
  - T\_RfEvt, 235
- PRIMARY\_SERVICE\_DECL\_UUID128
- BLE GATT APIs, 52
- PRIMARY\_SERVICE\_DECL\_UUID16
- BLE GATT APIs, 52
- pScanInfo
  - scan\_report\_t, 234
- pUuid
  - LE\_GATT\_ATTR\_T, 184
- pVal
  - LE\_GATT\_ATTR\_T, 184
  - LE\_GATT\_MSG\_ACCESS\_WRITE\_IND\_T, 187
- pairwise\_cipher
  - \_wpa\_ie\_data, 150
  - asso\_data, 152
  - wifi\_scan\_info\_t, 253
  - wifi\_wpa\_ie\_data\_t, 258
- param
  - event\_msg\_t, 158
- passive
  - wifi\_scan\_time\_t, 255
- passkey
  - LE\_SMP\_MSG\_PASSKEY\_DISPLAY\_IND\_T, 220
- passphrase
  - asso\_data, 152
  - auto\_conn\_info\_t, 154
  - mw\_wifi\_auto\_connect\_ap\_info\_t, 226
- password
  - wifi\_ap\_config\_t, 239
  - wifi\_sta\_config\_t, 256
- password\_length
  - wifi\_ap\_config\_t, 239
  - wifi\_sta\_config\_t, 256
- peer\_addr
  - LE\_CM\_CONNECTION\_COMPLETE\_IND\_T, 160
  - LE\_CM\_MSG\_DIRECT\_ADV\_REPORT\_IND\_T, 166
  - LE\_GAP\_ADVERTISING\_PARAM\_T, 181
- peer\_addr\_type
  - LE\_CM\_CONNECTION\_COMPLETE\_IND\_T, 161
  - LE\_CM\_MSG\_DIRECT\_ADV\_REPORT\_IND\_T, 166
  - LE\_GAP\_ADVERTISING\_PARAM\_T, 181
- peer\_id\_addr
  - LE\_SMP\_MSG\_PAIRING\_COMPLETE\_IND\_T, 219
- permit
  - LE\_GATT\_ATTR\_T, 184
- pmkid
  - \_wpa\_ie\_data, 150
  - wifi\_wpa\_ie\_data\_t, 258
- property
  - LE\_GATT\_MSG\_CHARACTERISTIC\_DECL\_IND\_T, 189
- proto
  - \_wpa\_ie\_data, 150
  - asso\_data, 152
  - wifi\_wpa\_ie\_data\_t, 258
- prvData
  - wifi\_cmd\_t, 242

- wifi\_evt\_t, 248
- psk
  - asso\_data, 152
  - auto\_conn\_info\_t, 154
  - mw\_wifi\_auto\_connect\_ap\_info\_t, 226
- psk\_set
  - asso\_data, 152
- ptScanReport
  - S\_WIFI\_MLME\_SCAN\_CFG, 230
- pwr\_level
  - LE\_CM\_MSG\_READ\_ADV\_TX\_POWER\_CFM↔  
\_T, 171
- rand
  - LE\_CM\_MSG\_LTK\_REQ\_IND\_T, 170
  - LE\_SMP\_SC\_OOB\_DATA\_T, 223
- rear
  - auto\_connect\_cfg\_t, 156
  - MwFimAutoConnectCFG\_t, 229
- reason
  - LE\_CM\_MSG\_DISCONNECT\_COMPLETE\_IN↔  
D\_T, 167
  - wifi\_event\_sta\_disconnected\_t, 246
- reserved
  - wifi\_cmd\_t, 243
- retryCount
  - auto\_connect\_cfg\_t, 156
- role
  - LE\_CM\_CONNECTION\_COMPLETE\_IND\_T, 161
- rsn\_ie
  - auto\_conn\_info\_t, 154
  - mw\_wifi\_auto\_connect\_ap\_info\_t, 226
  - scan\_info\_t, 233
- rsni
  - auto\_conn\_info\_t, 155
  - LE\_CM\_MSG\_ADVERTISE\_REPORT\_IND↔  
T, 162
  - LE\_CM\_MSG\_DIRECT\_ADV\_REPORT\_IND\_T, 166
  - LE\_CM\_MSG\_READ\_RSSI\_CFM\_T, 174
  - mw\_wifi\_auto\_connect\_ap\_info\_t, 227
  - scan\_info\_t, 233
  - wifi\_auto\_connect\_info\_t, 241
  - wifi\_fast\_scan\_threshold\_t, 249
  - wifi\_scan\_info\_t, 253
- rx\_eapol\_data, 229
  - frame\_buffer, 229
  - frame\_length, 229
- rx\_phy
  - LE\_CM\_MSG\_READ\_PHY\_CFM\_T, 173
- S\_WIFI\_MLME\_SCAN\_CFG, 230
  - ptScanReport, 230
  - tScanType, 230
  - u32ActiveScanDur, 230
  - u32PassiveScanDur, 230
  - u8Channel, 231
  - u8MaxScanApNum, 231
  - u8ResendCnt, 231
  - u8ABssid, 231
  - u8ASsid, 231
- SECONDARY\_SERVICE\_DECL\_UUID128
  - BLE GATT APIs, 52
- SECONDARY\_SERVICE\_DECL\_UUID16
  - BLE GATT APIs, 52
- saArgv
  - T\_RfCmd, 235
- sc
  - LE\_SMP\_MSG\_PAIRING\_ACTION\_IND\_T, 218
  - LE\_SMP\_MSG\_PAIRING\_COMPLETE\_IND\_T, 219
  - LE\_SMP\_MSG\_SLAVE\_SECURITY\_REQUEST↔  
T\_IND\_T, 222
- scan\_done
  - wifi\_event\_info\_t, 244
- scan\_id
  - wifi\_event\_sta\_scan\_done\_t, 248
- scan\_info\_t, 231
  - ap\_channel, 232
  - beacon\_interval, 232
  - bssid, 232
  - capabilities, 232
  - dtim\_prod, 232
  - free\_ocpy, 233
  - latest\_beacon\_rx\_time, 233
  - rsn\_ie, 233
  - rssi, 233
  - ssid, 233
  - ssid\_len, 233
  - supported\_rates, 233
  - wpa\_data, 233
  - wpa\_ie, 234
- scan\_method
  - wifi\_sta\_config\_t, 256
- scan\_report\_t, 234
  - pScanInfo, 234
  - uScanApNum, 234
- scan\_time
  - wifi\_scan\_config\_t, 251
- scan\_type
  - wifi\_scan\_config\_t, 251
- show\_hidden
  - wifi\_scan\_config\_t, 251
- size
  - LE\_CM\_MSG\_READ\_RESOLVING\_LIST\_SIZE↔  
\_CFM\_T, 173
  - LE\_CM\_MSG\_READ\_WHITE\_LIST\_SIZE\_CFM↔  
\_T, 175
- slave\_latency
  - LE\_CM\_MSG\_SIGNAL\_UPDATE\_REQ\_T, 178
- sort\_method
  - wifi\_sta\_config\_t, 256
- ssid
  - auto\_conn\_info\_t, 155
  - mw\_wifi\_auto\_connect\_ap\_info\_t, 227
  - scan\_info\_t, 233
  - wifi\_ap\_config\_t, 240

- wifi\_auto\_connect\_info\_t, 242
- wifi\_event\_sta\_connected\_t, 245
- wifi\_event\_sta\_disconnected\_t, 246
- wifi\_scan\_config\_t, 251
- wifi\_scan\_info\_t, 253
- wifi\_sta\_config\_t, 256
- ssid\_hidden
  - wifi\_ap\_config\_t, 240
- ssid\_len
  - auto\_conn\_info\_t, 155
  - mw\_wifi\_auto\_connect\_ap\_info\_t, 227
  - scan\_info\_t, 233
  - wifi\_event\_sta\_connected\_t, 245
  - wifi\_event\_sta\_disconnected\_t, 246
- ssid\_length
  - wifi\_ap\_config\_t, 240
  - wifi\_scan\_info\_t, 253
  - wifi\_sta\_config\_t, 256
- sta\_config
  - wifi\_config\_t, 243
- start\_hdl
  - LE\_GATT\_MSG\_INCLUDE\_SERVICE\_INFO\_IND\_T, 200
  - LE\_GATT\_MSG\_SERVICE\_INFO\_IND\_T, 210
- startHdl
  - LE\_GATT\_SERVICE\_T, 216
- status
  - LE\_CM\_CONNECTION\_COMPLETE\_IND\_T, 161
  - LE\_CM\_MSG\_CONN\_UPDATE\_COMPLETE\_IND\_T, 164
  - LE\_CM\_MSG\_DISCONNECT\_COMPLETE\_IND\_T, 167
  - LE\_CM\_MSG\_ENCRYPTION\_CHANGE\_IND\_T, 168
  - LE\_CM\_MSG\_ENCRYPTION\_REFRESH\_IND\_T, 169
  - LE\_CM\_MSG\_INIT\_COMPLETE\_CFM\_T, 169
  - LE\_CM\_MSG\_READ\_ADV\_TX\_POWER\_CFM\_T, 171
  - LE\_CM\_MSG\_READ\_BD\_ADDR\_CFM\_T, 171
  - LE\_CM\_MSG\_READ\_CHANNEL\_MAP\_CFM\_T, 172
  - LE\_CM\_MSG\_READ\_PHY\_CFM\_T, 173
  - LE\_CM\_MSG\_READ\_RESOLVING\_LIST\_SIZE\_CFM\_T, 173
  - LE\_CM\_MSG\_READ\_RSSI\_CFM\_T, 174
  - LE\_CM\_MSG\_READ\_TX\_POWER\_CFM\_T, 175
  - LE\_CM\_MSG\_READ\_WHITE\_LIST\_SIZE\_CFM\_T, 176
  - LE\_CM\_MSG\_SET\_DATA\_LENGTH\_CFM\_T, 176
  - LE\_CM\_MSG\_SET\_DISCONNECT\_CFM\_T, 177
  - LE\_CM\_MSG\_SET\_PHY\_CFM\_T, 177
  - LE\_CM\_REQ\_STATUS\_T, 179
  - LE\_GATT\_MSG\_EXECUTE\_WRITE\_RELIABLE\_CFM\_T, 194
  - LE\_GATT\_MSG\_FIND\_ALL\_CHAR\_DESC\_CFM\_T, 195
  - LE\_GATT\_MSG\_FIND\_ALL\_PRIMARY\_SERVICE\_CFM\_T, 196
  - LE\_GATT\_MSG\_FIND\_CHARACTERISTIC\_CFM\_T, 197
  - LE\_GATT\_MSG\_FIND\_INCLUDED\_SERVICE\_CFM\_T, 198
  - LE\_GATT\_MSG\_FIND\_PRIMARY\_SERVICE\_BY\_UUID\_CFM\_T, 199
  - LE\_GATT\_MSG\_NOTIFY\_CFM\_T, 202
  - LE\_GATT\_MSG\_PREPARE\_WRITE\_RELIABLE\_CFM\_T, 205
  - LE\_GATT\_MSG\_READ\_CHAR\_VAL\_BY\_UUID\_CFM\_T, 206
  - LE\_GATT\_MSG\_READ\_CHARACTERISTIC\_VALUE\_CFM\_T, 207
  - LE\_GATT\_MSG\_READ\_LONG\_CHAR\_VALUE\_CFM\_T, 208
  - LE\_GATT\_MSG\_READ\_MULTIPLE\_CHAR\_VALUES\_CFM\_T, 209
  - LE\_GATT\_MSG\_SIGNED\_WRITE\_CFM\_T, 211
  - LE\_GATT\_MSG\_WRITE\_CHAR\_VAL\_RELIABLE\_CFM\_T, 212
  - LE\_GATT\_MSG\_WRITE\_CHAR\_VALUE\_CFM\_T, 213
  - LE\_GATT\_MSG\_WRITE\_LONG\_CHAR\_VALUE\_CFM\_T, 214
  - LE\_GATT\_MSG\_WRITE\_NO\_RSP\_CFM\_T, 215
  - LE\_SMP\_MSG\_ENCRYPTION\_REFRESH\_IND\_T, 217
  - LE\_SMP\_MSG\_PAIRING\_COMPLETE\_IND\_T, 219
  - wifi\_event\_sta\_scan\_done\_t, 248
- supervision\_timeout
  - LE\_CM\_MSG\_CONN\_UPDATE\_COMPLETE\_IND\_T, 164
  - LE\_GAP\_CONN\_PARAM\_T, 182
- supervision\_timeout
  - LE\_CM\_CONNECTION\_COMPLETE\_IND\_T, 161
- supported\_rates
  - auto\_conn\_info\_t, 155
  - mw\_wifi\_auto\_connect\_ap\_info\_t, 227
  - scan\_info\_t, 233
  - wifi\_auto\_connect\_info\_t, 242
- sv\_timeout
  - LE\_CONN\_PARA\_T, 180
- sv\_tmo
  - LE\_CM\_MSG\_CONN\_PARA\_REQ\_T, 163
- svc\_id
  - LE\_GATT\_SERVICE\_T, 216
- T\_HOUR
  - BLE MSG APIs, 76
- T\_MIN
  - BLE MSG APIs, 76
- T\_RfCmd, 234
  - iArgc, 235
  - saArgv, 235
  - u32Type, 235
- T\_RfEvt, 235

- pParam, 235
- u16RfMode, 236
- u16RxCnt, 236
- u16RxCrcOkCnt, 236
- u32Freq, 236
- u32Mode, 236
- u32RfChannel, 236
- u32Type, 236
- u8Freq, 236
- u8IpcEnable, 237
- u8Len, 237
- u8Pkt, 237
- u8Reserved, 237
- u8Status, 237
- u8Unicast, 237
- T\_SEC
  - BLE MSG APIs, 76
- TASKHANDLER
  - BLE MSG APIs, 77
- TASKPACK
  - BLE MSG APIs, 78
- TASK
  - BLE MSG APIs, 77
- tScanType
  - S\_WIFI\_MLME\_SCAN\_CFG, 230
- targetIdx
  - auto\_connect\_cfg\_t, 157
  - MwFimAutoConnectCFG\_t, 229
- Task
  - BLE MSG APIs, 77
- threshold
  - wifi\_sta\_config\_t, 257
- timeout\_multiplier
  - LE\_CM\_MSG\_SIGNAL\_UPDATE\_REQ\_T, 178
- tx\_phy
  - LE\_CM\_MSG\_READ\_PHY\_CFM\_T, 173
- tx\_power
  - LE\_CM\_MSG\_READ\_TX\_POWER\_CFM\_T, 175
- type
  - LE\_BT\_ADDR\_T, 159
  - LE\_GAP\_ADVERTISING\_PARAM\_T, 181
  - LE\_GAP\_SCAN\_PARAM\_T, 183
- u16RfMode
  - T\_RfEvt, 236
- u16RxCnt
  - T\_RfEvt, 236
- u16RxCrcOkCnt
  - T\_RfEvt, 236
- u32ActiveScanDur
  - S\_WIFI\_MLME\_SCAN\_CFG, 230
- u32Freq
  - T\_RfEvt, 236
- u32Mode
  - T\_RfEvt, 236
- u32PassiveScanDur
  - S\_WIFI\_MLME\_SCAN\_CFG, 230
- u32RfChannel
  - T\_RfEvt, 236
- u32Type
  - T\_RfCmd, 235
  - T\_RfEvt, 236
- u8Channel
  - S\_WIFI\_MLME\_SCAN\_CFG, 231
- u8Freq
  - T\_RfEvt, 236
- u8IpcEnable
  - T\_RfEvt, 237
- u8Len
  - T\_RfEvt, 237
- u8MaxScanApNum
  - S\_WIFI\_MLME\_SCAN\_CFG, 231
- u8Pkt
  - T\_RfEvt, 237
- u8ResendCnt
  - S\_WIFI\_MLME\_SCAN\_CFG, 231
- u8Reserved
  - T\_RfEvt, 237
- u8SkipDtimPeriods
  - mw\_wifi\_sta\_info\_t, 228
- u8Status
  - T\_RfEvt, 237
- u8Unicast
  - T\_RfEvt, 237
- u8aBssid
  - S\_WIFI\_MLME\_SCAN\_CFG, 231
- u8aSsid
  - S\_WIFI\_MLME\_SCAN\_CFG, 231
- uFCApNum
  - auto\_connect\_cfg\_t, 157
- uScanApNum
  - scan\_report\_t, 234
- uuid
  - LE\_GATT\_MSG\_CHAR\_DESCRIPTOR\_INFO\_↔  
IND\_T, 188
  - LE\_GATT\_MSG\_CHARACTERISTIC\_DECL\_IN↔  
FO\_IND\_T, 189
  - LE\_GATT\_MSG\_INCLUDE\_SERVICE\_INFO\_I↔  
ND\_T, 200
  - LE\_GATT\_MSG\_SERVICE\_INFO\_IND\_T, 210
- val
  - LE\_GATT\_MSG\_CHARACTERISTIC\_VAL\_IND↔  
\_T, 190
  - LE\_GATT\_MSG\_INDICATE\_IND\_T, 201
  - LE\_GATT\_MSG\_NOTIFY\_IND\_T, 203
  - LE\_GATT\_MSG\_READ\_MULTIPLE\_CHAR\_VA↔  
L\_CFM\_T, 209
- val\_hdl
  - LE\_GATT\_MSG\_CHARACTERISTIC\_DECL\_IN↔  
FO\_IND\_T, 189
- WIFI APIs, 93
  - WIFI\_BEACON\_INTERVAL\_LENGTH, 94
  - WIFI\_CAPABILITY\_INFO\_LENGTH, 94
  - WIFI\_LENGTH\_802\_11, 95
  - WIFI\_LENGTH\_PASSPHRASE, 95
  - WIFI\_MAC\_ADDRESS\_LENGTH, 95

- WIFI\_MAC\_NUM\_OF\_CHANNELS, 95
- WIFI\_MAX\_LENGTH\_OF\_SSID, 95
- WIFI\_MAX\_SCAN\_AP\_NUM, 95
- WIFI\_MAX\_SUPPORTED\_RATES, 96
- wifi\_ap\_record\_t, 96
- wifi\_auto\_connec\_mode\_e, 96
- wifi\_event\_notify\_cb\_t, 96
- wifi\_event\_process\_handler, 97
- wifi\_install\_default\_event\_handlers, 97
- wifi\_register\_event\_handler, 97
- WIFI Common APIs, 99
  - wifi\_event\_cb\_t, 99
  - wifi\_event\_loop\_init, 99
  - wifi\_event\_loop\_send, 100
  - wifi\_event\_loop\_set\_cb, 100
  - wifi\_event\_process\_handler, 101
- WIFI STA APIs, 102
  - WIFI\_READY\_TIME, 106
  - wifi\_auto\_connect\_clear\_ap\_info, 114
  - wifi\_auto\_connect\_clear\_ap\_info\_api, 137
  - wifi\_auto\_connect\_clear\_ap\_info\_fp\_t, 106
  - wifi\_auto\_connect\_get\_ap\_info, 114
  - wifi\_auto\_connect\_get\_ap\_info\_api, 138
  - wifi\_auto\_connect\_get\_ap\_info\_fp\_t, 106
  - wifi\_auto\_connect\_get\_ap\_num, 115
  - wifi\_auto\_connect\_get\_ap\_num\_api, 138
  - wifi\_auto\_connect\_get\_ap\_num\_fp\_t, 106
  - wifi\_auto\_connect\_get\_mode, 115
  - wifi\_auto\_connect\_get\_mode\_api, 138
  - wifi\_auto\_connect\_get\_mode\_fp\_t, 107
  - wifi\_auto\_connect\_get\_saved\_ap\_num, 115
  - wifi\_auto\_connect\_init, 116
  - wifi\_auto\_connect\_init\_api, 138
  - wifi\_auto\_connect\_init\_fp\_t, 107
  - wifi\_auto\_connect\_reset, 116
  - wifi\_auto\_connect\_reset\_api, 138
  - wifi\_auto\_connect\_reset\_fp\_t, 107
  - wifi\_auto\_connect\_set\_ap\_num, 116
  - wifi\_auto\_connect\_set\_ap\_num\_api, 138
  - wifi\_auto\_connect\_set\_ap\_num\_fp\_t, 107
  - wifi\_auto\_connect\_set\_mode, 117
  - wifi\_auto\_connect\_set\_mode\_api, 138
  - wifi\_auto\_connect\_set\_mode\_fp\_t, 107
  - wifi\_auto\_connect\_start, 117
  - wifi\_auto\_connect\_start\_api, 138
  - wifi\_auto\_connect\_start\_fp\_t, 107
  - wifi\_auto\_connect\_update\_ch, 118
  - wifi\_config\_get\_bandwidth, 118
  - wifi\_config\_get\_bandwidth\_api, 139
  - wifi\_config\_get\_bandwidth\_fp\_t, 107
  - wifi\_config\_get\_bssid, 119
  - wifi\_config\_get\_bssid\_api, 139
  - wifi\_config\_get\_bssid\_fp\_t, 107
  - wifi\_config\_get\_channel, 119
  - wifi\_config\_get\_channel\_api, 139
  - wifi\_config\_get\_channel\_fp\_t, 108
  - wifi\_config\_get\_dtim\_interval, 120
  - wifi\_config\_get\_dtim\_interval\_api, 139
  - wifi\_config\_get\_dtim\_interval\_fp\_t, 108
  - wifi\_config\_get\_listen\_interval, 120
  - wifi\_config\_get\_listen\_interval\_api, 139
  - wifi\_config\_get\_listen\_interval\_fp\_t, 108
  - wifi\_config\_get\_mac\_address, 120
  - wifi\_config\_get\_mac\_address\_api, 139
  - wifi\_config\_get\_mac\_address\_fp\_t, 108
  - wifi\_config\_get\_mac\_tx\_data\_rate, 121
  - wifi\_config\_get\_opmode, 121
  - wifi\_config\_get\_opmode\_api, 139
  - wifi\_config\_get\_opmode\_fp\_t, 108
  - wifi\_config\_get\_skip\_dtim, 121
  - wifi\_config\_get\_ssid, 122
  - wifi\_config\_get\_ssid\_api, 139
  - wifi\_config\_get\_ssid\_fp\_t, 108
  - wifi\_config\_get\_sta\_mac\_address\_from\_flash, 122
  - wifi\_config\_set\_bandwidth, 122
  - wifi\_config\_set\_bandwidth\_api, 140
  - wifi\_config\_set\_bandwidth\_fp\_t, 108
  - wifi\_config\_set\_bssid, 123
  - wifi\_config\_set\_bssid\_api, 140
  - wifi\_config\_set\_bssid\_fp\_t, 108
  - wifi\_config\_set\_channel, 123
  - wifi\_config\_set\_channel\_api, 140
  - wifi\_config\_set\_channel\_fp\_t, 109
  - wifi\_config\_set\_dtim\_interval, 124
  - wifi\_config\_set\_dtim\_interval\_api, 140
  - wifi\_config\_set\_dtim\_interval\_fp\_t, 109
  - wifi\_config\_set\_listen\_interval, 124
  - wifi\_config\_set\_listen\_interval\_api, 140
  - wifi\_config\_set\_listen\_interval\_fp\_t, 109
  - wifi\_config\_set\_mac\_address, 124
  - wifi\_config\_set\_mac\_address\_api, 140
  - wifi\_config\_set\_mac\_address\_fp\_t, 109
  - wifi\_config\_set\_mac\_tx\_data\_rate, 125
  - wifi\_config\_set\_opmode, 125
  - wifi\_config\_set\_opmode\_api, 140
  - wifi\_config\_set\_opmode\_fp\_t, 109
  - wifi\_config\_set\_skip\_dtim, 125
  - wifi\_config\_set\_ssid, 126
  - wifi\_config\_set\_ssid\_api, 140
  - wifi\_config\_set\_ssid\_fp\_t, 109
  - wifi\_connection\_connect, 126
  - wifi\_connection\_connect\_api, 141
  - wifi\_connection\_connect\_fp\_t, 109
  - wifi\_connection\_connect\_from\_ac\_index, 127
  - wifi\_connection\_connect\_from\_ac\_list, 127
  - wifi\_connection\_disconnect\_ap, 128
  - wifi\_connection\_disconnect\_ap\_api, 141
  - wifi\_connection\_disconnect\_ap\_fp\_t, 110
  - wifi\_connection\_disconnect\_sta, 128
  - wifi\_connection\_disconnect\_sta\_api, 141
  - wifi\_connection\_disconnect\_sta\_fp\_t, 110
  - wifi\_connection\_get\_rssi, 129
  - wifi\_connection\_get\_rssi\_api, 141
  - wifi\_connection\_get\_rssi\_fp\_t, 110
  - wifi\_connection\_register\_event\_handler, 129
  - wifi\_connection\_register\_event\_handler\_api, 141

- wifi\_connection\_register\_event\_handler\_fp\_t, 110
- wifi\_connection\_scan\_start, 130
- wifi\_connection\_scan\_start\_api, 141
- wifi\_connection\_scan\_start\_fp\_t, 110
- wifi\_connection\_unregister\_event\_handler, 130
- wifi\_connection\_unregister\_event\_handler\_api, 141
- wifi\_connection\_unregister\_event\_handler\_fp\_t, 110
- wifi\_convert\_auth\_mode, 131
- wifi\_convert\_auth\_mode\_api, 141
- wifi\_convert\_auth\_mode\_fp\_t, 110
- wifi\_deinit, 131
- wifi\_deinit\_api, 142
- wifi\_deinit\_fp\_t, 111
- wifi\_event\_handler\_t, 111
- wifi\_fast\_connect\_get\_mode, 131
- wifi\_fast\_connect\_get\_mode\_api, 142
- wifi\_fast\_connect\_get\_mode\_fp\_t, 111
- wifi\_fast\_connect\_set\_mode, 132
- wifi\_fast\_connect\_set\_mode\_api, 142
- wifi\_fast\_connect\_set\_mode\_fp\_t, 111
- wifi\_fast\_connect\_start, 132
- wifi\_fast\_connect\_start\_api, 142
- wifi\_fast\_connect\_start\_fp\_t, 111
- wifi\_get\_config, 133
- wifi\_get\_config\_api, 142
- wifi\_get\_config\_fp\_t, 112
- wifi\_init, 133
- wifi\_init\_api, 142
- wifi\_init\_complete\_cb\_t, 112
- wifi\_init\_fp\_t, 112
- wifi\_result\_t, 112
- wifi\_scan\_get\_ap\_list, 134
- wifi\_scan\_get\_ap\_list\_api, 142
- wifi\_scan\_get\_ap\_list\_fp\_t, 112
- wifi\_scan\_get\_ap\_num, 134
- wifi\_scan\_get\_ap\_num\_api, 142
- wifi\_scan\_get\_ap\_num\_fp\_t, 112
- wifi\_scan\_get\_ap\_records, 135
- wifi\_scan\_get\_ap\_records\_api, 143
- wifi\_scan\_get\_ap\_records\_fp\_t, 113
- wifi\_scan\_scan\_stop, 135
- wifi\_scan\_start, 135
- wifi\_scan\_start\_api, 143
- wifi\_scan\_start\_fp\_t, 113
- wifi\_scan\_stop\_api, 143
- wifi\_scan\_stop\_fp\_t, 113
- wifi\_set\_config, 136
- wifi\_set\_config\_api, 143
- wifi\_set\_config\_fp\_t, 113
- wifi\_sta\_get\_ap\_info, 136
- wifi\_sta\_get\_ap\_info\_api, 143
- wifi\_sta\_get\_ap\_info\_fp\_t, 113
- wifi\_start, 137
- wifi\_start\_api, 143
- wifi\_start\_fp\_t, 113
- wifi\_stop, 137
- wifi\_stop\_api, 143
- wifi\_stop\_fp\_t, 113
- WIFI\_BEACON\_INTERVAL\_LENGTH
  - WIFI APIs, 94
- WIFI\_CAPABILITY\_INFO\_LENGTH
  - WIFI APIs, 94
- WIFI\_LENGTH\_802\_11
  - WIFI APIs, 95
- WIFI\_LENGTH\_PASSPHRASE
  - WIFI APIs, 95
- WIFI\_MAC\_ADDRESS\_LENGTH
  - WIFI APIs, 95
- WIFI\_MAC\_NUM\_OF\_CHANNELS
  - WIFI APIs, 95
- WIFI\_MAX\_LENGTH\_OF\_SSID
  - WIFI APIs, 95
- WIFI\_MAX\_SCAN\_AP\_NUM
  - WIFI APIs, 95
- WIFI\_MAX\_SUPPORTED\_RATES
  - WIFI APIs, 96
- WIFI\_READY\_TIME
  - WIFI STA APIs, 106
- wifi\_active\_scan\_time\_t, 237
  - max, 238
  - min, 238
- wifi\_ap\_config\_t, 238
  - auth\_mode, 239
  - beacon\_interval, 239
  - channel, 239
  - encrypt\_type, 239
  - max\_connection, 239
  - password, 239
  - password\_length, 239
  - ssid, 240
  - ssid\_hidden, 240
  - ssid\_length, 240
- wifi\_ap\_record\_t
  - WIFI APIs, 96
- wifi\_auth\_mode\_t
  - Enumeration, 144
- wifi\_auto\_connect\_clear\_ap\_info
  - WIFI STA APIs, 114
- wifi\_auto\_connect\_clear\_ap\_info\_api
  - WIFI STA APIs, 137
- wifi\_auto\_connect\_clear\_ap\_info\_fp\_t
  - WIFI STA APIs, 106
- wifi\_auto\_connect\_get\_ap\_info
  - WIFI STA APIs, 114
- wifi\_auto\_connect\_get\_ap\_info\_api
  - WIFI STA APIs, 138
- wifi\_auto\_connect\_get\_ap\_info\_fp\_t
  - WIFI STA APIs, 106
- wifi\_auto\_connect\_get\_ap\_num
  - WIFI STA APIs, 115
- wifi\_auto\_connect\_get\_ap\_num\_api
  - WIFI STA APIs, 138
- wifi\_auto\_connect\_get\_ap\_num\_fp\_t
  - WIFI STA APIs, 106

- wifi\_auto\_connect\_get\_mode
  - WIFI STA APIs, 115
- wifi\_auto\_connect\_get\_mode\_api
  - WIFI STA APIs, 138
- wifi\_auto\_connect\_get\_mode\_fp\_t
  - WIFI STA APIs, 107
- wifi\_auto\_connect\_get\_saved\_ap\_num
  - WIFI STA APIs, 115
- wifi\_auto\_connect\_info\_t, 240
  - ap\_channel, 241
  - beacon\_interval, 241
  - bssid, 241
  - capabilities, 241
  - dtim\_prod, 241
  - fast\_connect, 241
  - hid\_ssid, 241
  - rsi, 241
  - ssid, 242
  - supported\_rates, 242
- wifi\_auto\_connect\_init
  - WIFI STA APIs, 116
- wifi\_auto\_connect\_init\_api
  - WIFI STA APIs, 138
- wifi\_auto\_connect\_init\_fp\_t
  - WIFI STA APIs, 107
- wifi\_auto\_connect\_reset
  - WIFI STA APIs, 116
- wifi\_auto\_connect\_reset\_api
  - WIFI STA APIs, 138
- wifi\_auto\_connect\_reset\_fp\_t
  - WIFI STA APIs, 107
- wifi\_auto\_connect\_set\_ap\_num
  - WIFI STA APIs, 116
- wifi\_auto\_connect\_set\_ap\_num\_api
  - WIFI STA APIs, 138
- wifi\_auto\_connect\_set\_ap\_num\_fp\_t
  - WIFI STA APIs, 107
- wifi\_auto\_connect\_set\_mode
  - WIFI STA APIs, 117
- wifi\_auto\_connect\_set\_mode\_api
  - WIFI STA APIs, 138
- wifi\_auto\_connect\_set\_mode\_fp\_t
  - WIFI STA APIs, 107
- wifi\_auto\_connect\_start
  - WIFI STA APIs, 117
- wifi\_auto\_connect\_start\_api
  - WIFI STA APIs, 138
- wifi\_auto\_connect\_start\_fp\_t
  - WIFI STA APIs, 107
- wifi\_auto\_connect\_update\_ch
  - WIFI STA APIs, 118
- wifi\_auto\_connet\_mode\_e
  - WIFI APIs, 96
- wifi\_bandwidth\_t
  - Enumeration, 145
- wifi\_cipher\_type\_t
  - Enumeration, 145
- wifi\_cmd\_t, 242
  - arg1, 242
  - cmd\_type, 242
  - privData, 242
  - reserved, 243
- wifi\_config\_get\_bandwidth
  - WIFI STA APIs, 118
- wifi\_config\_get\_bandwidth\_api
  - WIFI STA APIs, 139
- wifi\_config\_get\_bandwidth\_fp\_t
  - WIFI STA APIs, 107
- wifi\_config\_get\_bssid
  - WIFI STA APIs, 119
- wifi\_config\_get\_bssid\_api
  - WIFI STA APIs, 139
- wifi\_config\_get\_bssid\_fp\_t
  - WIFI STA APIs, 107
- wifi\_config\_get\_channel
  - WIFI STA APIs, 119
- wifi\_config\_get\_channel\_api
  - WIFI STA APIs, 139
- wifi\_config\_get\_channel\_fp\_t
  - WIFI STA APIs, 108
- wifi\_config\_get\_dtim\_interval
  - WIFI STA APIs, 120
- wifi\_config\_get\_dtim\_interval\_api
  - WIFI STA APIs, 139
- wifi\_config\_get\_dtim\_interval\_fp\_t
  - WIFI STA APIs, 108
- wifi\_config\_get\_listen\_interval
  - WIFI STA APIs, 120
- wifi\_config\_get\_listen\_interval\_api
  - WIFI STA APIs, 139
- wifi\_config\_get\_listen\_interval\_fp\_t
  - WIFI STA APIs, 108
- wifi\_config\_get\_mac\_address
  - WIFI STA APIs, 120
- wifi\_config\_get\_mac\_address\_api
  - WIFI STA APIs, 139
- wifi\_config\_get\_mac\_address\_fp\_t
  - WIFI STA APIs, 108
- wifi\_config\_get\_mac\_tx\_data\_rate
  - WIFI STA APIs, 121
- wifi\_config\_get\_opmode
  - WIFI STA APIs, 121
- wifi\_config\_get\_opmode\_api
  - WIFI STA APIs, 139
- wifi\_config\_get\_opmode\_fp\_t
  - WIFI STA APIs, 108
- wifi\_config\_get\_skip\_dtim
  - WIFI STA APIs, 121
- wifi\_config\_get\_ssid
  - WIFI STA APIs, 122
- wifi\_config\_get\_ssid\_api
  - WIFI STA APIs, 139
- wifi\_config\_get\_ssid\_fp\_t
  - WIFI STA APIs, 108
- wifi\_config\_get\_sta\_mac\_address\_from\_flash
  - WIFI STA APIs, 122



- wifi\_config\_set\_bandwidth
  - WIFI STA APIs, [122](#)
- wifi\_config\_set\_bandwidth\_api
  - WIFI STA APIs, [140](#)
- wifi\_config\_set\_bandwidth\_fp\_t
  - WIFI STA APIs, [108](#)
- wifi\_config\_set\_bssid
  - WIFI STA APIs, [123](#)
- wifi\_config\_set\_bssid\_api
  - WIFI STA APIs, [140](#)
- wifi\_config\_set\_bssid\_fp\_t
  - WIFI STA APIs, [108](#)
- wifi\_config\_set\_channel
  - WIFI STA APIs, [123](#)
- wifi\_config\_set\_channel\_api
  - WIFI STA APIs, [140](#)
- wifi\_config\_set\_channel\_fp\_t
  - WIFI STA APIs, [109](#)
- wifi\_config\_set\_dtim\_interval
  - WIFI STA APIs, [124](#)
- wifi\_config\_set\_dtim\_interval\_api
  - WIFI STA APIs, [140](#)
- wifi\_config\_set\_dtim\_interval\_fp\_t
  - WIFI STA APIs, [109](#)
- wifi\_config\_set\_listen\_interval
  - WIFI STA APIs, [124](#)
- wifi\_config\_set\_listen\_interval\_api
  - WIFI STA APIs, [140](#)
- wifi\_config\_set\_listen\_interval\_fp\_t
  - WIFI STA APIs, [109](#)
- wifi\_config\_set\_mac\_address
  - WIFI STA APIs, [124](#)
- wifi\_config\_set\_mac\_address\_api
  - WIFI STA APIs, [140](#)
- wifi\_config\_set\_mac\_address\_fp\_t
  - WIFI STA APIs, [109](#)
- wifi\_config\_set\_mac\_tx\_data\_rate
  - WIFI STA APIs, [125](#)
- wifi\_config\_set\_opmode
  - WIFI STA APIs, [125](#)
- wifi\_config\_set\_opmode\_api
  - WIFI STA APIs, [140](#)
- wifi\_config\_set\_opmode\_fp\_t
  - WIFI STA APIs, [109](#)
- wifi\_config\_set\_skip\_dtim
  - WIFI STA APIs, [125](#)
- wifi\_config\_set\_ssid
  - WIFI STA APIs, [126](#)
- wifi\_config\_set\_ssid\_api
  - WIFI STA APIs, [140](#)
- wifi\_config\_set\_ssid\_fp\_t
  - WIFI STA APIs, [109](#)
- wifi\_config\_t, [243](#)
  - ap\_config, [243](#)
  - sta\_config, [243](#)
- wifi\_connection\_connect
  - WIFI STA APIs, [126](#)
- wifi\_connection\_connect\_api
  - WIFI STA APIs, [141](#)
- wifi\_connection\_connect\_fp\_t
  - WIFI STA APIs, [109](#)
- wifi\_connection\_connect\_from\_ac\_index
  - WIFI STA APIs, [127](#)
- wifi\_connection\_connect\_from\_ac\_list
  - WIFI STA APIs, [127](#)
- wifi\_connection\_disconnect\_ap
  - WIFI STA APIs, [128](#)
- wifi\_connection\_disconnect\_ap\_api
  - WIFI STA APIs, [141](#)
- wifi\_connection\_disconnect\_ap\_fp\_t
  - WIFI STA APIs, [110](#)
- wifi\_connection\_disconnect\_sta
  - WIFI STA APIs, [128](#)
- wifi\_connection\_disconnect\_sta\_api
  - WIFI STA APIs, [141](#)
- wifi\_connection\_disconnect\_sta\_fp\_t
  - WIFI STA APIs, [110](#)
- wifi\_connection\_get\_rssi
  - WIFI STA APIs, [129](#)
- wifi\_connection\_get\_rssi\_api
  - WIFI STA APIs, [141](#)
- wifi\_connection\_get\_rssi\_fp\_t
  - WIFI STA APIs, [110](#)
- wifi\_connection\_register\_event\_handler
  - WIFI STA APIs, [129](#)
- wifi\_connection\_register\_event\_handler\_api
  - WIFI STA APIs, [141](#)
- wifi\_connection\_register\_event\_handler\_fp\_t
  - WIFI STA APIs, [110](#)
- wifi\_connection\_scan\_start
  - WIFI STA APIs, [130](#)
- wifi\_connection\_scan\_start\_api
  - WIFI STA APIs, [141](#)
- wifi\_connection\_scan\_start\_fp\_t
  - WIFI STA APIs, [110](#)
- wifi\_connection\_unregister\_event\_handler
  - WIFI STA APIs, [130](#)
- wifi\_connection\_unregister\_event\_handler\_api
  - WIFI STA APIs, [141](#)
- wifi\_connection\_unregister\_event\_handler\_fp\_t
  - WIFI STA APIs, [110](#)
- wifi\_convert\_auth\_mode
  - WIFI STA APIs, [131](#)
- wifi\_convert\_auth\_mode\_api
  - WIFI STA APIs, [141](#)
- wifi\_convert\_auth\_mode\_fp\_t
  - WIFI STA APIs, [110](#)
- wifi\_deinit
  - WIFI STA APIs, [131](#)
- wifi\_deinit\_api
  - WIFI STA APIs, [142](#)
- wifi\_deinit\_fp\_t
  - WIFI STA APIs, [111](#)
- wifi\_event\_cb\_t
  - WIFI Common APIs, [99](#)
- wifi\_event\_handler\_t



- WIFI STA APIs, 111
- wifi\_event\_info\_t, 244
  - connected, 244
  - disconnected, 244
  - got\_ip, 244
  - scan\_done, 244
- wifi\_event\_loop\_init
  - WIFI Common APIs, 99
- wifi\_event\_loop\_send
  - WIFI Common APIs, 100
- wifi\_event\_loop\_set\_cb
  - WIFI Common APIs, 100
- wifi\_event\_notify\_cb\_t
  - WIFI APIs, 96
- wifi\_event\_process\_handler
  - WIFI APIs, 97
  - WIFI Common APIs, 101
- wifi\_event\_sta\_connected\_t, 245
  - authmode, 245
  - bssid, 245
  - channel, 245
  - ssid, 245
  - ssid\_len, 245
- wifi\_event\_sta\_disconnected\_t, 246
  - bssid, 246
  - reason, 246
  - ssid, 246
  - ssid\_len, 246
- wifi\_event\_sta\_got\_ip\_t, 247
  - ip\_changed, 247
- wifi\_event\_sta\_scan\_done\_t, 247
  - number, 247
  - scan\_id, 248
  - status, 248
- wifi\_event\_t
  - Enumeration, 145
- wifi\_evt\_t, 248
  - evt\_type, 248
  - prvData, 248
- wifi\_fast\_connect\_get\_mode
  - WIFI STA APIs, 131
- wifi\_fast\_connect\_get\_mode\_api
  - WIFI STA APIs, 142
- wifi\_fast\_connect\_get\_mode\_fp\_t
  - WIFI STA APIs, 111
- wifi\_fast\_connect\_set\_mode
  - WIFI STA APIs, 132
- wifi\_fast\_connect\_set\_mode\_api
  - WIFI STA APIs, 142
- wifi\_fast\_connect\_set\_mode\_fp\_t
  - WIFI STA APIs, 111
- wifi\_fast\_connect\_start
  - WIFI STA APIs, 132
- wifi\_fast\_connect\_start\_api
  - WIFI STA APIs, 142
- wifi\_fast\_connect\_start\_fp\_t
  - WIFI STA APIs, 111
- wifi\_fast\_scan\_threshold\_t, 249
  - authmode, 249
  - rsi, 249
- wifi\_get\_config
  - WIFI STA APIs, 133
- wifi\_get\_config\_api
  - WIFI STA APIs, 142
- wifi\_get\_config\_fp\_t
  - WIFI STA APIs, 112
- wifi\_init
  - WIFI STA APIs, 133
- wifi\_init\_api
  - WIFI STA APIs, 142
- wifi\_init\_complete\_cb\_t
  - WIFI STA APIs, 112
- wifi\_init\_config\_t, 249
  - event\_handler, 250
  - magic, 250
- wifi\_init\_fp\_t
  - WIFI STA APIs, 112
- wifi\_install\_default\_event\_handlers
  - WIFI APIs, 97
- wifi\_mac\_data\_rate\_t
  - Enumeration, 146
- wifi\_mode\_t
  - Enumeration, 146
- wifi\_reason\_code\_t
  - Enumeration, 147
- wifi\_register\_event\_handler
  - WIFI APIs, 97
- wifi\_result\_t
  - WIFI STA APIs, 112
- wifi\_scan\_config\_t, 250
  - bssid, 250
  - channel, 251
  - scan\_time, 251
  - scan\_type, 251
  - show\_hidden, 251
  - ssid, 251
- wifi\_scan\_get\_ap\_list
  - WIFI STA APIs, 134
- wifi\_scan\_get\_ap\_list\_api
  - WIFI STA APIs, 142
- wifi\_scan\_get\_ap\_list\_fp\_t
  - WIFI STA APIs, 112
- wifi\_scan\_get\_ap\_num
  - WIFI STA APIs, 134
- wifi\_scan\_get\_ap\_num\_api
  - WIFI STA APIs, 142
- wifi\_scan\_get\_ap\_num\_fp\_t
  - WIFI STA APIs, 112
- wifi\_scan\_get\_ap\_records
  - WIFI STA APIs, 135
- wifi\_scan\_get\_ap\_records\_api
  - WIFI STA APIs, 143
- wifi\_scan\_get\_ap\_records\_fp\_t
  - WIFI STA APIs, 113
- wifi\_scan\_info\_t, 251
  - auth\_mode, 252

- beacon\_interval, [252](#)
- bssid, [252](#)
- capability\_info, [252](#)
- channel, [252](#)
- dtim\_period, [253](#)
- group\_cipher, [253](#)
- pairwise\_cipher, [253](#)
- rssi, [253](#)
- ssid, [253](#)
- ssid\_length, [253](#)
- wifi\_scan\_list\_t, [254](#)
  - ap\_record, [254](#)
  - num, [254](#)
- wifi\_scan\_method\_t
  - Enumeration, [148](#)
- wifi\_scan\_scan\_stop
  - WIFI STA APIs, [135](#)
- wifi\_scan\_start
  - WIFI STA APIs, [135](#)
- wifi\_scan\_start\_api
  - WIFI STA APIs, [143](#)
- wifi\_scan\_start\_fp\_t
  - WIFI STA APIs, [113](#)
- wifi\_scan\_stop\_api
  - WIFI STA APIs, [143](#)
- wifi\_scan\_stop\_fp\_t
  - WIFI STA APIs, [113](#)
- wifi\_scan\_time\_t, [254](#)
  - active, [255](#)
  - passive, [255](#)
- wifi\_scan\_type\_t
  - Enumeration, [148](#)
- wifi\_set\_config
  - WIFI STA APIs, [136](#)
- wifi\_set\_config\_api
  - WIFI STA APIs, [143](#)
- wifi\_set\_config\_fp\_t
  - WIFI STA APIs, [113](#)
- wifi\_sort\_method\_t
  - Enumeration, [148](#)
- wifi\_sta\_config\_t, [255](#)
  - bssid, [256](#)
  - bssid\_present, [256](#)
  - password, [256](#)
  - password\_length, [256](#)
  - scan\_method, [256](#)
  - sort\_method, [256](#)
  - ssid, [256](#)
  - ssid\_length, [256](#)
  - threshold, [257](#)
- wifi\_sta\_get\_ap\_info
  - WIFI STA APIs, [136](#)
- wifi\_sta\_get\_ap\_info\_api
  - WIFI STA APIs, [143](#)
- wifi\_sta\_get\_ap\_info\_fp\_t
  - WIFI STA APIs, [113](#)
- wifi\_start
  - WIFI STA APIs, [137](#)
- wifi\_start\_api
  - WIFI STA APIs, [143](#)
- wifi\_start\_fp\_t
  - WIFI STA APIs, [113](#)
- wifi\_stop
  - WIFI STA APIs, [137](#)
- wifi\_stop\_api
  - WIFI STA APIs, [143](#)
- wifi\_stop\_fp\_t
  - WIFI STA APIs, [113](#)
- wifi\_wpa\_ie\_data\_t, [257](#)
  - capabilities, [257](#)
  - group\_cipher, [257](#)
  - key\_mgmt, [258](#)
  - mgmt\_group\_cipher, [258](#)
  - num\_pmkid, [258](#)
  - pairwise\_cipher, [258](#)
  - pmkid, [258](#)
  - proto, [258](#)
- window
  - LE\_GAP\_SCAN\_PARAM\_T, [183](#)
- wpa\_data
  - auto\_conn\_info\_t, [155](#)
  - mw\_wifi\_auto\_connect\_ap\_info\_t, [227](#)
  - scan\_info\_t, [233](#)
- wpa\_ie
  - auto\_conn\_info\_t, [155](#)
  - mw\_wifi\_auto\_connect\_ap\_info\_t, [227](#)
  - scan\_info\_t, [234](#)