lwIP

1.4.1

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Contents

Chapter 1

Todo List

File asn1_dec.c
: not optimised (yet), favor correctness over speed, favor speed over size

File asn1_enc.c
: not optimised (yet), favor correctness over speed, favor speed over size

globalScope> Global LWIP_NETIF_TX_SINGLE_PBUF
: : TCP and IP-frag do not work with this, yet:

File snmp_structs.h
: namespace prefixes

Chapter 2

Data Structure Index

2.1 Data Structures

Here are the data structures with brief descriptions:

Chapter 3

File Index

3.1 File List

Here is a list of all files with brief descriptions:

Chapter 4

Data Structure Documentation

4.1 chap_state Struct Reference

```
#include <chap.h>
```

Data Fields

- int unit
- int clientstate
- int serverstate
- u_char challenge [MAX_CHALLENGE_LENGTH]
- u_char chal_len
- u_char chal_id
- u_char chal_type
- u_char id
- char ∗ chal_name
- int chal_interval
- int timeouttime
- int max_transmits
- int chal_transmits
- int resp_transmits
- u_char response [MAX_RESPONSE_LENGTH]
- u_char resp_length
- u_char resp_id
- u_char resp_type
- char ∗ resp_name

4.1.1 Detailed Description

Definition at line 99 of file chap.h.

4.1.2 Field Documentation

4.1.2.1 u_char chal_id

Definition at line 105 of file chap.h.

4.1.2.2 int chal_interval

Definition at line 109 of file chap.h.

4.1.2.3 u_char chal_len

Definition at line 104 of file chap.h.

4.1.2.4 char∗ chal_name

Definition at line 108 of file chap.h.

4.1.2.5 int chal_transmits

Definition at line 112 of file chap.h.

4.1.2.6 u_char chal_type

Definition at line 106 of file chap.h.

4.1.2.7 u_char challenge[MAX_CHALLENGE_LENGTH]

Definition at line 103 of file chap.h.

4.1.2.8 int clientstate

Definition at line 101 of file chap.h.

4.1.2.9 u_char id

Definition at line 107 of file chap.h.

4.1.2.10 int max_transmits

Definition at line 111 of file chap.h.

4.1.2.11 u_char resp_id

Definition at line 116 of file chap.h.

4.1.2.12 u_char resp_length

Definition at line 115 of file chap.h.

4.1.2.13 char∗ resp_name

Definition at line 118 of file chap.h.

4.1.2.14 int resp_transmits

Definition at line 113 of file chap.h.

4.1.2.15 u_char resp_type

Definition at line 117 of file chap.h.

4.1.2.16 u_char response[MAX_RESPONSE_LENGTH]

Definition at line 114 of file chap.h.

4.1.2.17 int serverstate

Definition at line 102 of file chap.h.

4.1.2.18 int timeouttime

Definition at line 110 of file chap.h.

4.1.2.19 int unit

Definition at line 100 of file chap.h.

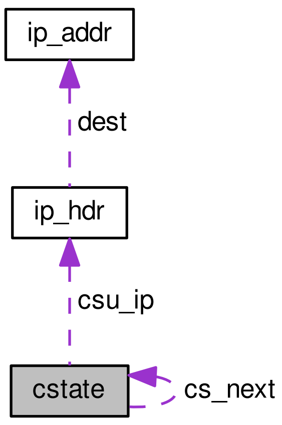
The documentation for this struct was generated from the following file:

- src/netif/ppp/chap.h

4.2 cstate Struct Reference

`#include <vj.h>`

Collaboration diagram for cstate:



Data Fields

- struct cstate ∗ cs_next
- u_short cs_hlen
- u_char cs_id
- u_char cs_filler
- union {
    char csu_hdr [MAX_HDR]
    struct ip_hdr csu_ip
  } vjcs_u

4.2.1 Detailed Description

Definition at line 105 of file vj.h.

4.2.2 Field Documentation

4.2.2.1 u_char cs_filler

Definition at line 109 of file vj.h.

4.2.2.2 u_short cs_hlen

Definition at line 107 of file vj.h.

4.2.2.3 u_char cs_id

Definition at line 108 of file vj.h.

4.2.2.4 struct cstate∗ cs_next

Definition at line 106 of file vj.h.

4.2.2.5 char csu_hdr[MAX_HDR]

Definition at line 111 of file vj.h.

4.2.2.6 struct ip_hdr csu_ip

Definition at line 112 of file vj.h.

4.2.2.7 union { ... } vjcs_u

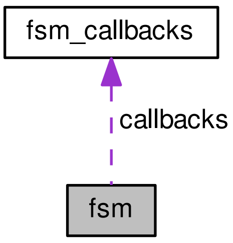
The documentation for this struct was generated from the following file:

- src/netif/ppp/vj.h

4.3 fsm Struct Reference

```
#include <fsm.h>
```

Collaboration diagram for fsm:



Data Fields

- int unit
- u_short protocol
- int state
- int flags
- u_char id
- u_char reqid
- u_char seen_ack
- int timeouttime
- int maxconfreqtransmits
- int retransmits
- int maxtermtransmits
- int nakloops
- int maxnakloops
- struct fsm_callbacks ∗ callbacks
- char ∗ term_reason
- int term_reason_len

4.3.1 Detailed Description

Definition at line 78 of file fsm.h.

4.3.2 Field Documentation

4.3.2.1 struct fsm_callbacks∗ callbacks

Definition at line 92 of file fsm.h.

4.3.2.2 int flags

Definition at line 82 of file fsm.h.

4.3.2.3 u_char id

Definition at line 83 of file fsm.h.

4.3.2.4 int maxconfreqtransmits

Definition at line 87 of file fsm.h.

4.3.2.5 int maxnakloops

Definition at line 91 of file fsm.h.

4.3.2.6 int maxtermtransmits

Definition at line 89 of file fsm.h.

4.3.2.7 int nakloops

Definition at line 90 of file fsm.h.

4.3.2.8 u_short protocol

Definition at line 80 of file fsm.h.

4.3.2.9 u_char reqid

Definition at line 84 of file fsm.h.

4.3.2.10 int retransmits

Definition at line 88 of file fsm.h.

4.3.2.11 u_char seen_ack

Definition at line 85 of file fsm.h.

4.3.2.12 int state

Definition at line 81 of file fsm.h.

4.3.2.13 char∗ term_reason

Definition at line 93 of file fsm.h.

4.3.2.14 int term_reason_len

Definition at line 94 of file fsm.h.

4.3.2.15 int timeouttime

Definition at line 86 of file fsm.h.

4.3.2.16 int unit

Definition at line 79 of file fsm.h.

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

- src/netif/ppp/fsm.h

4.4 fsm_callbacks Struct Reference

```
#include <fsm.h>
```

Data Fields

- void(∗ resetci)(fsm ∗)
- int(∗ cilen)(fsm ∗)
- void(∗ addci)(fsm ∗, u_char ∗, int ∗)
- int(∗ ackci)(fsm ∗, u_char ∗, int)
- int(∗ nakci)(fsm ∗, u_char ∗, int)
- int(∗ rejci)(fsm ∗, u_char ∗, int)
- int(∗ reqci)(fsm ∗, u_char ∗, int ∗, int)
- void(∗ up)(fsm ∗)
- void(∗ down)(fsm ∗)
- void(∗ starting)(fsm ∗)
- void(∗ finished)(fsm ∗)
- void(∗ protreject)(int)
- void(∗ retransmit)(fsm ∗)
- int(∗ extcode)(fsm ∗, int, u_char, u_char ∗, int)
- char ∗ proto_name

4.4.1 Detailed Description

Definition at line 98 of file fsm.h.

4.4.2 Field Documentation

4.4.2.1 int(∗ ackci) (fsm ∗, u_char ∗, int)

Definition at line 102 of file fsm.h.

4.4.2.2 void(∗ addci) (fsm ∗, u_char ∗, int ∗)

Definition at line 101 of file fsm.h.

4.4.2.3 int(∗ cilen) (fsm ∗)

Definition at line 100 of file fsm.h.

4.4.2.4 void(∗ down) (fsm ∗)

Definition at line 107 of file fsm.h.

4.4.2.5 int(∗ extcode) (fsm ∗, int, u_char, u_char ∗, int)

Definition at line 112 of file fsm.h.

4.4.2.6 void(∗ finished) (fsm ∗)

Definition at line 109 of file fsm.h.

4.4.2.7 int(∗ nakci) (fsm ∗, u_char ∗, int)

Definition at line 103 of file fsm.h.

4.4.2.8 char∗ proto_name

Definition at line 113 of file fsm.h.

4.4.2.9 void(∗ protreject) (int)

Definition at line 110 of file fsm.h.

4.4.2.10 int(∗ rejci) (fsm ∗, u_char ∗, int)

Definition at line 104 of file fsm.h.

4.4.2.11 int(∗ reqci) (fsm ∗, u_char ∗, int ∗, int)

Definition at line 105 of file fsm.h.

4.4.2.12 void(∗ resetci) (fsm ∗)

Definition at line 99 of file fsm.h.

4.4.2.13 void(∗ retransmit) (fsm ∗)

Definition at line 111 of file fsm.h.

4.4.2.14 void(∗ starting) (fsm ∗)

Definition at line 108 of file fsm.h.

4.4.2.15 void(∗ up) (fsm ∗)

Definition at line 106 of file fsm.h.

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

- src/netif/ppp/fsm.h

4.5 icmp_echo_hdr Struct Reference

```
#include <icmp.h>
```

Public Member Functions

- PACK_STRUCT_FIELD (u8_t type)
- PACK_STRUCT_FIELD (u8_t code)
- PACK_STRUCT_FIELD (u16_t chksum)
- PACK_STRUCT_FIELD (u16_t id)
- PACK_STRUCT_FIELD (u16_t seqno)

4.5.1 Detailed Description

This is the standard ICMP header only that the u32_t data is splitted to two u16_t like ICMP echo needs it. This header is also used for other ICMP types that do not use the data part.

Definition at line 79 of file icmp.h.

4.5.2 Member Function Documentation

4.5.2.1 PACK_STRUCT_FIELD (u8_t *type*)

4.5.2.2 PACK_STRUCT_FIELD (u8_t *code*)

4.5.2.3 PACK_STRUCT_FIELD (u16_t *chksum*)

4.5.2.4 PACK_STRUCT_FIELD (u16_t *id*)

4.5.2.5 PACK_STRUCT_FIELD (u16_t *seqno*)

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

- src/include/ipv4/lwip/icmp.h

4.6 in_addr Struct Reference

```
#include <inet.h>
```

Data Fields

- u32_t s_addr

4.6.1 Detailed Description

For compatibility with BSD code

Definition at line 44 of file inet.h.

4.6.2 Field Documentation

4.6.2.1 u32_t s_addr

Definition at line 45 of file inet.h.

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

- src/include/ipv4/lwip/inet.h

4.7 ip_addr Struct Reference

```
#include <ip_addr.h>
```

Public Member Functions

- PACK_STRUCT_FIELD (u32_t addr[4])

Data Fields

- u32_t addr

4.7.1 Detailed Description

Definition at line 44 of file ip_addr.h.

4.7.2 Member Function Documentation

4.7.2.1 PACK_STRUCT_FIELD (u32_t *addr[4]*)

4.7.3 Field Documentation

4.7.3.1 u32_t addr

Definition at line 45 of file ip_addr.h.

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

- src/include/ipv4/lwip/ip_addr.h

4.8 ip_addr2 Struct Reference

```
#include <ip_addr.h>
```

Public Member Functions

- PACK_STRUCT_FIELD (u16_t addrw[2])
- PACK_STRUCT_FIELD (u16_t addrw[2])

4.8.1 Detailed Description

Definition at line 75 of file ip_addr.h.

4.8.2 Member Function Documentation

4.8.2.1 PACK_STRUCT_FIELD (u16_t *addrw[2]*)

4.8.2.2 PACK_STRUCT_FIELD (u16_t *addrw[2]*)

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

- src/include/ipv4/lwip/ip_addr.h

4.9 ip_addr_packed Struct Reference

```
#include <ip_addr.h>
```

Public Member Functions

- PACK_STRUCT_FIELD (u32_t addr)

4.9.1 Detailed Description

Definition at line 54 of file ip_addr.h.

4.9.2 Member Function Documentation

4.9.2.1 PACK_STRUCT_FIELD (u32_t *addr*)

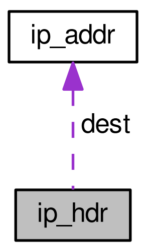
The documentation for this struct was generated from the following file:

- src/include/ipv4/lwip/ip_addr.h

4.10 ip_hdr Struct Reference

```
#include <ip.h>
```

Collaboration diagram for ip_hdr:



Public Member Functions

- PACK_STRUCT_FIELD (u8_t _v_hl)
- PACK_STRUCT_FIELD (u8_t _tos)
- PACK_STRUCT_FIELD (u16_t _len)
- PACK_STRUCT_FIELD (u16_t _id)
- PACK_STRUCT_FIELD (u16_t _offset)
- PACK_STRUCT_FIELD (u8_t _ttl)
- PACK_STRUCT_FIELD (u8_t _proto)
- PACK_STRUCT_FIELD (u16_t _chksum)
- PACK_STRUCT_FIELD (ip_addr_p_t src)
- PACK_STRUCT_FIELD (ip_addr_p_t dest)

Data Fields

- u8_t tclass1:4
- u8_t v:4
- u8_t flow1:4
- u8_t tclass2:4
- u16_t flow2
- u16_t len
- u8_t nexthdr
- u8_t hoplim
- struct ip_addr src dest

4.10.1 Detailed Description

Definition at line 116 of file ip.h.

4.10.2 Member Function Documentation

4.10.2.1 PACK_STRUCT_FIELD (u8_t *_v_hl*)

4.10.2.2 PACK_STRUCT_FIELD (u8_t *_tos*)

4.10.2.3 PACK_STRUCT_FIELD (u16_t *_len*)

4.10.2.4 PACK_STRUCT_FIELD (u16_t *_id*)

4.10.2.5 PACK_STRUCT_FIELD (u16_t *_offset*)

4.10.2.6 PACK_STRUCT_FIELD (u8_t *_ttl*)

4.10.2.7 PACK_STRUCT_FIELD (u8_t *_proto*)

4.10.2.8 PACK_STRUCT_FIELD (u16_t *_chksum*)

4.10.2.9 PACK_STRUCT_FIELD (ip_addr_p_t *src*)

4.10.2.10 PACK_STRUCT_FIELD (ip_addr_p_t *dest*)

4.10.3 Field Documentation

4.10.3.1 struct ip_addr src dest

Definition at line 96 of file ip.h.

4.10.3.2 u8_t flow1

Definition at line 87 of file ip.h.

4.10.3.3 u16_t flow2

Definition at line 92 of file ip.h.

4.10.3.4 u8_t hoplim

Definition at line 95 of file ip.h.

4.10.3.5 u16_t len

Definition at line 93 of file ip.h.

4.10.3.6 u8_t nexthdr

Definition at line 94 of file ip.h.

4.10.3.7 u8_t tclass1

Definition at line 86 of file ip.h.

4.10.3.8 u8_t tclass2

Definition at line 87 of file ip.h.

4.10.3.9 u8_t v

Definition at line 86 of file ip.h.

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

- src/include/ipv4/lwip/ip.h

4.11 ip_pcb Struct Reference

```
#include <ip.h>
```

Data Fields

- IP_PCB

4.11.1 Detailed Description

Definition at line 89 of file ip.h.

4.11.2 Field Documentation

4.11.2.1 IP_PCB

Definition at line 91 of file ip.h.

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

- src/include/ipv4/lwip/ip.h

4.12 ipcp_options Struct Reference

```
#include <ipcp.h>
```

Data Fields

- u_int neg_addr: 1
- u_int old_addrs: 1
- u_int req_addr: 1
- u_int default_route: 1
- u_int proxy_arp: 1
- u_int neg_vj: 1
- u_int old_vj: 1
- u_int accept_local: 1
- u_int accept_remote: 1
- u_int req_dns1: 1
- u_int req_dns2: 1
- u_short vj_protocol
- u_char maxslotindex
- u_char cflag
- u32_t ouraddr

- u32_t hisaddr
- u32_t dnsaddr [2]
- u32_t winsaddr [2]

4.12.1 Detailed Description

Definition at line 78 of file ipcp.h.

4.12.2 Field Documentation

4.12.2.1 u_int accept_local

Definition at line 86 of file ipcp.h.

4.12.2.2 u_int accept_remote

Definition at line 87 of file ipcp.h.

4.12.2.3 u_char cflag

Definition at line 92 of file ipcp.h.

4.12.2.4 u_int default_route

Definition at line 82 of file ipcp.h.

4.12.2.5 u32_t dnsaddr[2]

Definition at line 94 of file ipcp.h.

4.12.2.6 u32_t hisaddr

Definition at line 93 of file ipcp.h.

4.12.2.7 u_char maxslotindex

Definition at line 91 of file ipcp.h.

4.12.2.8 u_int neg_addr

Definition at line 79 of file ipcp.h.

4.12.2.9 u_int neg_vj

Definition at line 84 of file ipcp.h.

4.12.2.10 u_int old_addrs

Definition at line 80 of file ipcp.h.

4.12.2.11 u_int old_vj

Definition at line 85 of file ipcp.h.

4.12.2.12 u32_t ouraddr

Definition at line 93 of file ipcp.h.

4.12.2.13 u_int proxy_arp

Definition at line 83 of file ipcp.h.

4.12.2.14 u_int req_addr

Definition at line 81 of file ipcp.h.

4.12.2.15 u_int req_dns1

Definition at line 88 of file ipcp.h.

4.12.2.16 u_int req_dns2

Definition at line 89 of file ipcp.h.

4.12.2.17 u_short vj_protocol

Definition at line 90 of file ipcp.h.

4.12.2.18 u32_t winsaddr[2]

Definition at line 95 of file ipcp.h.

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

- src/netif/ppp/ipcp.h

4.13 lcp_options Struct Reference

```
#include <lcp.h>
```

Data Fields

- u_int passive: 1
- u_int silent: 1
- u_int restart: 1
- u_int neg_mru: 1
- u_int neg_asyncmap: 1
- u_int neg_upap: 1
- u_int neg_chap: 1
- u_int neg_magicnumber: 1

- u_int neg_pcompression: 1
- u_int neg_accompression: 1
- u_int neg_lqr: 1
- u_int neg_cbcp: 1
- u_short mru
- u_char chap_mdtype
- u32_t asyncmap
- u32_t magicnumber
- int numloops
- u32_t lqr_period

4.13.1 Detailed Description

Definition at line 83 of file lcp.h.

4.13.2 Field Documentation

4.13.2.1 u32_t asyncmap

Definition at line 106 of file lcp.h.

4.13.2.2 u_char chap_mdtype

Definition at line 105 of file lcp.h.

4.13.2.3 u32_t lqr_period

Definition at line 109 of file lcp.h.

4.13.2.4 u32_t magicnumber

Definition at line 107 of file lcp.h.

4.13.2.5 u_short mru

Definition at line 101 of file lcp.h.

4.13.2.6 u_int neg_accompression

Definition at line 93 of file lcp.h.

4.13.2.7 u_int neg_asyncmap

Definition at line 88 of file lcp.h.

4.13.2.8 u_int neg_cbcp

Definition at line 95 of file lcp.h.

4.13.2.9 u_int neg_chap

Definition at line 90 of file lcp.h.

4.13.2.10 u_int neg_lqr

Definition at line 94 of file lcp.h.

4.13.2.11 u_int neg_magicnumber

Definition at line 91 of file lcp.h.

4.13.2.12 u_int neg_mru

Definition at line 87 of file lcp.h.

4.13.2.13 u_int neg_pcompression

Definition at line 92 of file lcp.h.

4.13.2.14 u_int neg_upap

Definition at line 89 of file lcp.h.

4.13.2.15 int numloops

Definition at line 108 of file lcp.h.

4.13.2.16 u_int passive

Definition at line 84 of file lcp.h.

4.13.2.17 u_int restart

Definition at line 86 of file lcp.h.

4.13.2.18 u_int silent

Definition at line 85 of file lcp.h.

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

- src/netif/ppp/lcp.h

4.14 MD5_CTX Struct Reference

```
#include <md5.h>
```

Data Fields

- u32_t i [2]
- u32_t buf [4]
- unsigned char in [64]
- unsigned char digest [16]

4.14.1 Detailed Description

Definition at line 44 of file md5.h.

4.14.2 Field Documentation

4.14.2.1 u32_t buf[4]

Definition at line 46 of file md5.h.

4.14.2.2 unsigned char digest[16]

Definition at line 48 of file md5.h.

4.14.2.3 u32_t i[2]

Definition at line 45 of file md5.h.

4.14.2.4 unsigned char in[64]

Definition at line 47 of file md5.h.

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

- src/netif/ppp/md5.h

4.15 mem Struct Reference

Data Fields

- mem_size_t next
- mem_size_t prev
- u8_t used

4.15.1 Detailed Description

The heap is made up as a list of structs of this type. This does not have to be aligned since for getting its size, we only use the macro SIZEOF_STRUCT_MEM, which automatically alignes.

Definition at line 156 of file mem.c.

4.15.2 Field Documentation

4.15.2.1 mem_size_t next

index (-> ram[next]) of the next struct

Definition at line 158 of file mem.c.

4.15.2.2 mem_size_t prev

index (-> ram[prev]) of the previous struct

Definition at line 160 of file mem.c.

4.15.2.3 u8_t used

1: this area is used; 0: this area is unused

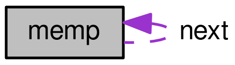
Definition at line 162 of file mem.c.

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

- src/core/mem.c

4.16 memp Struct Reference

Collaboration diagram for memp:



Data Fields

- struct memp ∗ next

4.16.1 Detailed Description

Definition at line 66 of file memp.c.

4.16.2 Field Documentation

4.16.2.1 struct memp∗ next

Definition at line 67 of file memp.c.

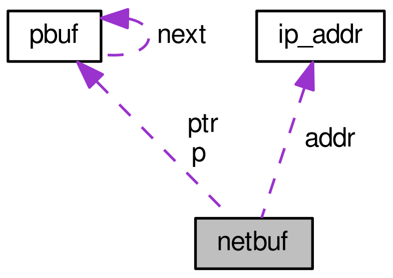
The documentation for this struct was generated from the following file:

- src/core/memp.c

4.17 netbuf Struct Reference

```
#include <netbuf.h>
```

Collaboration diagram for netbuf:



Data Fields

- struct pbuf ∗ p
- struct pbuf ∗ ptr
- ip_addr_t addr
- u16_t port

4.17.1 Detailed Description

Definition at line 48 of file netbuf.h.

4.17.2 Field Documentation

4.17.2.1 ip_addr_t addr

Definition at line 50 of file netbuf.h.

4.17.2.2 struct pbuf∗ p

Definition at line 49 of file netbuf.h.

4.17.2.3 u16_t port

Definition at line 51 of file netbuf.h.

4.17.2.4 struct pbuf ∗ ptr

Definition at line 49 of file netbuf.h.

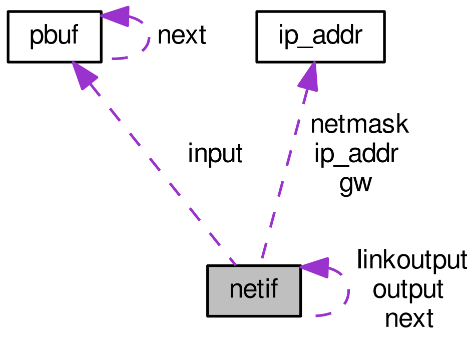
The documentation for this struct was generated from the following file:

- src/include/lwip/netbuf.h

4.18 netif Struct Reference

```
#include <netif.h>
```

Collaboration diagram for netif:



Data Fields

- struct netif ∗ next
- ip_addr_t ip_addr
- ip_addr_t netmask
- ip_addr_t gw
- netif_input_fn input
- netif_output_fn output
- netif_linkoutput_fn linkoutput
- void ∗ state
- u16_t mtu
- u8_t hwaddr_len
- u8_t hwaddr [NETIF_MAX_HWADDR_LEN]
- u8_t flags
- char name [2]
- u8_t num

4.18.1 Detailed Description

Generic data structure used for all lwIP network interfaces. The following fields should be filled in by the initialization function for the device driver: hwaddr_len, hwaddr[], mtu, flags

Definition at line 136 of file netif.h.

4.18.2 Field Documentation

4.18.2.1 u8_t flags

flags (see NETIF_FLAG_ above)

Definition at line 192 of file netif.h.

4.18.2.2 ip_addr_t gw

Definition at line 143 of file netif.h.

4.18.2.3 u8_t hwaddr[NETIF_MAX_HWADDR_LEN]

link level hardware address of this interface

Definition at line 190 of file netif.h.

4.18.2.4 u8_t hwaddr_len

number of bytes used in hwaddr

Definition at line 188 of file netif.h.

4.18.2.5 netif_input_fn input

This function is called by the network device driver to pass a packet up the TCP/IP stack.

Definition at line 147 of file netif.h.

4.18.2.6 ip_addr_t ip_addr

IP address configuration in network byte order

Definition at line 141 of file netif.h.

4.18.2.7 netif_linkoutput_fn linkoutput

This function is called by the ARP module when it wants to send a packet on the interface. This function outputs the pbuf as-is on the link medium.

Definition at line 155 of file netif.h.

4.18.2.8 u16_t mtu

maximum transfer unit (in bytes)

Definition at line 186 of file netif.h.

4.18.2.9 char name[2]

descriptive abbreviation

Definition at line 194 of file netif.h.

4.18.2.10 ip_addr_t netmask

Definition at line 142 of file netif.h.

4.18.2.11 struct netif∗ next

pointer to next in linked list

Definition at line 138 of file netif.h.

4.18.2.12 u8_t num

number of this interface

Definition at line 196 of file netif.h.

4.18.2.13 netif_output_fn output

This function is called by the IP module when it wants to send a packet on the interface. This function typically first resolves the hardware address, then sends the packet.

Definition at line 151 of file netif.h.

4.18.2.14 void∗ state

This field can be set by the device driver and could point to state information for the device.

Definition at line 172 of file netif.h.

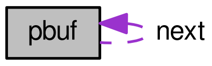
The documentation for this struct was generated from the following file:

- src/include/lwip/netif.h

4.19 pbuf Struct Reference

```
#include <pbuf.h>
```

Collaboration diagram for pbuf:



Data Fields

- struct pbuf ∗ next
- void ∗ payload
- u16_t tot_len
- u16_t len
- u8_t type
- u8_t flags
- u16_t ref

4.19.1 Detailed Description

Definition at line 79 of file pbuf.h.

4.19.2 Field Documentation

4.19.2.1 u8_t flags

misc flags

Definition at line 102 of file pbuf.h.

4.19.2.2 u16_t len

length of this buffer

Definition at line 96 of file pbuf.h.

4.19.2.3 struct pbuf∗ next

next pbuf in singly linked pbuf chain

Definition at line 81 of file pbuf.h.

4.19.2.4 void∗ payload

pointer to the actual data in the buffer

Definition at line 84 of file pbuf.h.

4.19.2.5 u16_t ref

the reference count always equals the number of pointers that refer to this pbuf. This can be pointers from an application, the stack itself, or pbuf->next pointers from a chain.

Definition at line 109 of file pbuf.h.

4.19.2.6 u16_t tot_len

total length of this buffer and all next buffers in chain belonging to the same packet.

For non-queue packet chains this is the invariant: p->tot_len == p->len + (p->next? p->next->tot_len: 0)

Definition at line 93 of file pbuf.h.

4.19.2.7 u8_t type

pbuf_type as u8_t instead of enum to save space

Definition at line 99 of file pbuf.h.

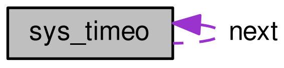
The documentation for this struct was generated from the following file:

- src/include/lwip/pbuf.h

4.20 sys_timeo Struct Reference

`#include <timers.h>`

Collaboration diagram for sys_timeo:



Data Fields

- struct sys_timeo ∗ next
- u32_t time
- sys_timeout_handler h
- void ∗ arg

4.20.1 Detailed Description

Definition at line 67 of file timers.h.

4.20.2 Field Documentation

4.20.2.1 void∗ arg

Definition at line 71 of file timers.h.

4.20.2.2 sys_timeout_handler h

Definition at line 70 of file timers.h.

4.20.2.3 struct sys_timeo∗ next

Definition at line 68 of file timers.h.

4.20.2.4 u32_t time

Definition at line 69 of file timers.h.

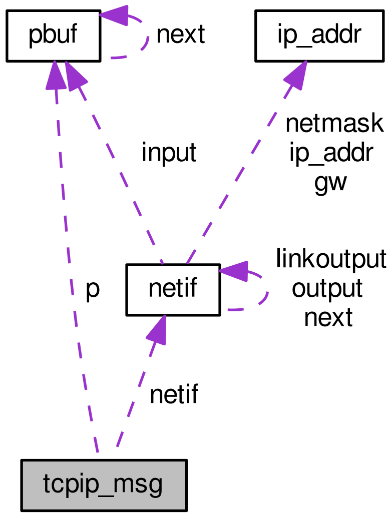
The documentation for this struct was generated from the following file:

- src/include/lwip/timers.h

4.21 tcpip_msg Struct Reference

```
#include <tcpip.h>
```

Collaboration diagram for tcpip_msg:



Data Fields

- enum tcpip_msg_type type
- sys_sem_t ∗ sem
- union {
    struct {
      struct pbuf ∗ p
      struct netif ∗ netif
    } inp
    struct {
      tcpip_callback_fn function
      void ∗ ctx
    } cb
  } msg

4.21.1 Detailed Description

Definition at line 133 of file tcpip.h.

4.21.2 Field Documentation

4.21.2.1 struct { ... } cb

4.21.2.2 void∗ ctx

Definition at line 149 of file tcpip.h.

4.21.2.3 tcpip_callback_fn function

Definition at line 148 of file tcpip.h.

4.21.2.4 struct { ... } inp

4.21.2.5 union { ... } msg

4.21.2.6 struct netif∗ netif

Definition at line 145 of file tcpip.h.

4.21.2.7 struct pbuf∗ p

Definition at line 144 of file tcpip.h.

4.21.2.8 sys_sem_t∗ sem

Definition at line 135 of file tcpip.h.

4.21.2.9 enum tcpip_msg_type type

Definition at line 134 of file tcpip.h.

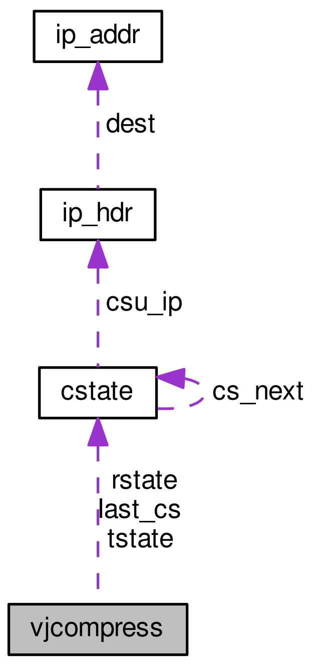
The documentation for this struct was generated from the following file:

- src/include/lwip/tcpip.h

4.22 vjcompress Struct Reference

```
#include <vj.h>
```

Collaboration diagram for vjcompress:



Data Fields

- struct cstate ∗ last_cs
- u_char last_recv
- u_char last_xmit
- u_short flags
- u_char maxSlotIndex
- u_char compressSlot
- struct cstate tstate [MAX_SLOTS]
- struct cstate rstate [MAX_SLOTS]

4.22.1 Detailed Description

Definition at line 133 of file vj.h.

4.22.2 Field Documentation

4.22.2.1 u_char compressSlot

Definition at line 139 of file vj.h.

4.22.2.2 u_short flags

Definition at line 137 of file vj.h.

4.22.2.3 struct cstate∗ last_cs

Definition at line 134 of file vj.h.

4.22.2.4 u_char last_recv

Definition at line 135 of file vj.h.

4.22.2.5 u_char last_xmit

Definition at line 136 of file vj.h.

4.22.2.6 u_char maxSlotIndex

Definition at line 138 of file vj.h.

4.22.2.7 struct cstate rstate[MAX_SLOTS]

Definition at line 144 of file vj.h.

4.22.2.8 struct cstate tstate[MAX_SLOTS]

Definition at line 143 of file vj.h.

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

- src/netif/ppp/vj.h

4.23 vjstat Struct Reference

```
#include <vj.h>
```

Data Fields

- unsigned long vjs_packets
- unsigned long vjs_compressed
- unsigned long vjs_searches
- unsigned long vjs_misses
- unsigned long vjs_uncompressedin
- unsigned long vjs_compressedin
- unsigned long vjs_errorin
- unsigned long vjs_tossed

4.23.1 Detailed Description

Definition at line 119 of file vj.h.

4.23.2 Field Documentation

4.23.2.1 unsigned long vjs_compressed

Definition at line 121 of file vj.h.

4.23.2.2 unsigned long vjs_compressedin

Definition at line 125 of file vj.h.

4.23.2.3 unsigned long vjs_errorin

Definition at line 126 of file vj.h.

4.23.2.4 unsigned long vjs_misses

Definition at line 123 of file vj.h.

4.23.2.5 unsigned long vjs_packets

Definition at line 120 of file vj.h.

4.23.2.6 unsigned long vjs_searches

Definition at line 122 of file vj.h.

4.23.2.7 unsigned long vjs_tossed

Definition at line 127 of file vj.h.

4.23.2.8 unsigned long vjs_uncompressedin

Definition at line 124 of file vj.h.

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

- src/netif/ppp/vj.h

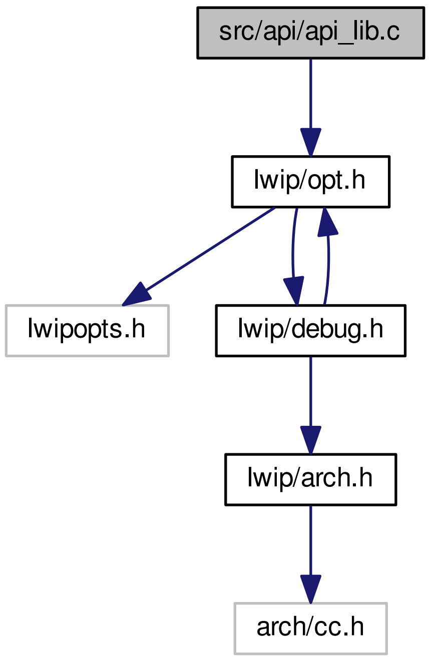
Chapter 5

File Documentation

5.1 src/api/api_lib.c File Reference

```
#include "lwip/opt.h"
```

Include dependency graph for api_lib.c:

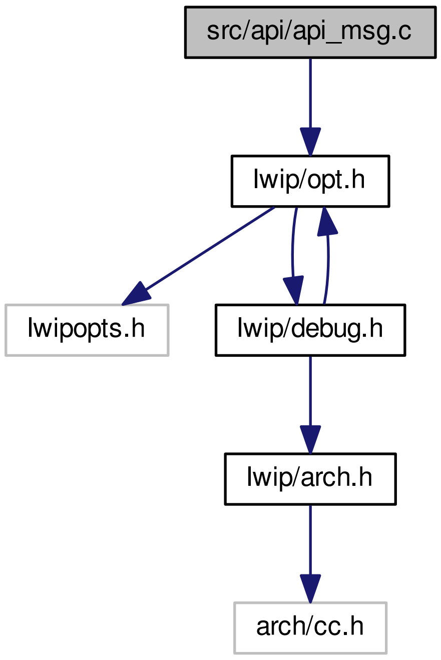


5.1.1 Detailed Description

Sequential API External module

5.2 src/api/api_msg.c File Reference

```
#include "lwip/opt.h"
```
Include dependency graph for api_msg.c:



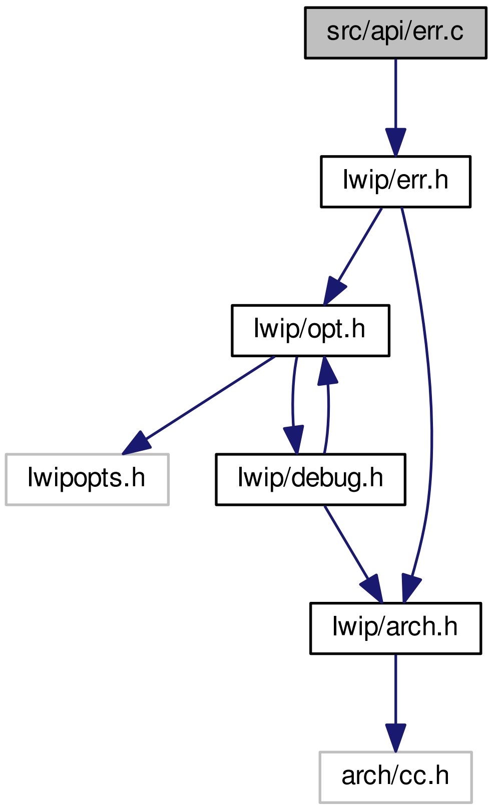
5.2.1 Detailed Description

Sequential API Internal module

5.3 src/api/err.c File Reference

```
#include "lwip/err.h"
```

Include dependency graph for err.c:

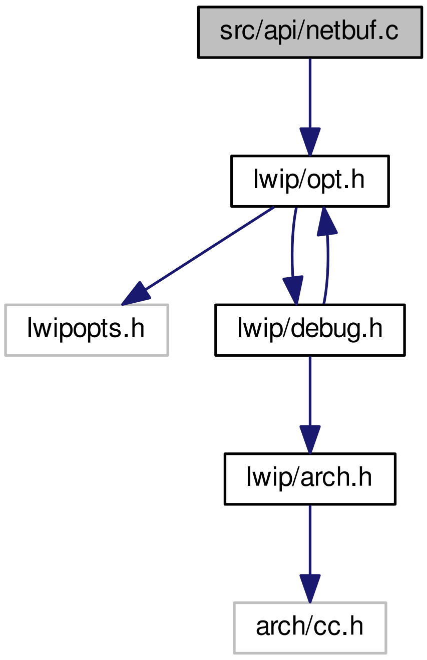


5.3.1 Detailed Description

Error Management module

5.4 src/api/netbuf.c File Reference

```
#include "lwip/opt.h"
```
Include dependency graph for netbuf.c:

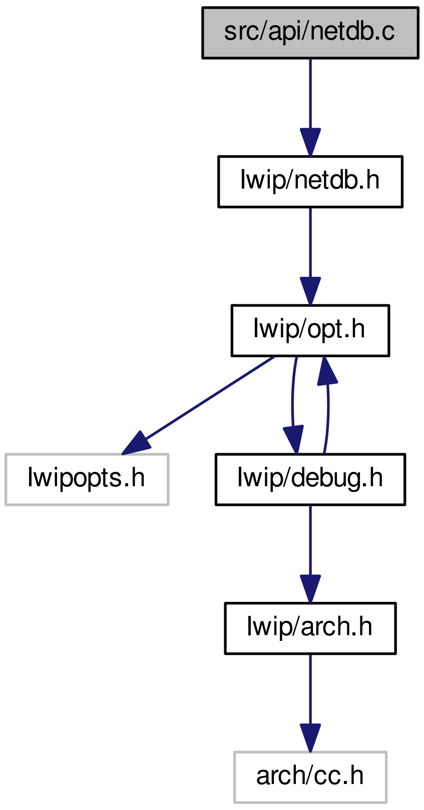


5.4.1 Detailed Description

Network buffer management

5.5 src/api/netdb.c File Reference

```
#include "lwip/netdb.h"
```
Include dependency graph for netdb.c:

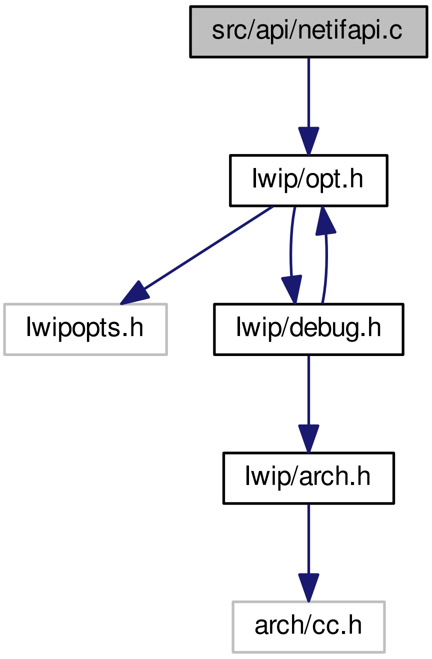


5.5.1 Detailed Description

API functions for name resolving

5.6 src/api/netifapi.c File Reference

```
#include "lwip/opt.h"
```
Include dependency graph for netifapi.c:



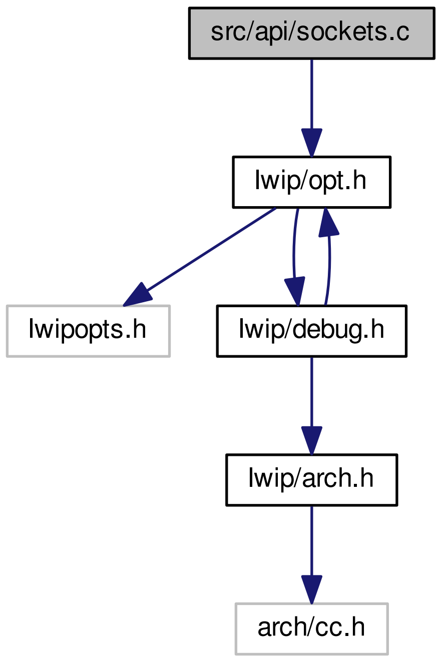
5.6.1 Detailed Description

Network Interface Sequential API module

5.7 src/api/sockets.c File Reference

```
#include "lwip/opt.h"
```

Include dependency graph for sockets.c:



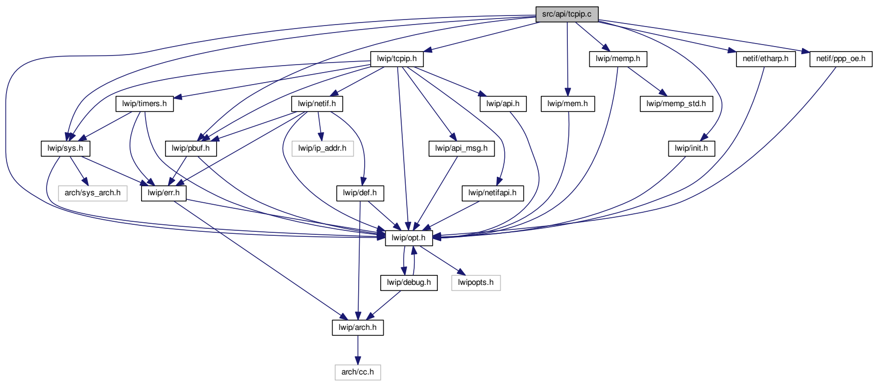
5.7.1 Detailed Description

Sockets BSD-Like API module

5.8 src/api/tcpip.c File Reference

```
#include "lwip/opt.h"
#include "lwip/sys.h"
#include "lwip/memp.h"
#include "lwip/mem.h"
#include "lwip/pbuf.h"
#include "lwip/tcpip.h"
#include "lwip/init.h"
#include "netif/etharp.h"
#include "netif/ppp_oe.h"
```

Include dependency graph for tcpip.c:



Functions

- err_t tcpip_input (struct pbuf ∗p, struct netif ∗inp)
- err_t tcpip_callback_with_block (tcpip_callback_fn function, void ∗ctx, u8_t block)
- struct tcpip_callback_msg ∗ tcpip_callbackmsg_new (tcpip_callback_fn function, void ∗ctx)
- void tcpip_callbackmsg_delete (struct tcpip_callback_msg ∗msg)
- err_t tcpip_trycallback (struct tcpip_callback_msg ∗msg)
- void tcpip_init (tcpip_init_done_fn initfunc, void ∗arg)
- err_t pbuf_free_callback (struct pbuf ∗p)
- err_t mem_free_callback (void ∗m)

5.8.1 Detailed Description

Sequential API Main thread module

5.8.2 Function Documentation

5.8.2.1 err_t mem_free_callback (void ∗ *m*)

A simple wrapper function that allows you to free heap memory from interrupt context.

Parameters

m	the heap memory to free

Returns

ERR_OK if callback could be enqueued, an err_t if not

Definition at line 506 of file tcpip.c.

5.8.2.2 err_t pbuf_free_callback (struct pbuf ∗ *p*)

A simple wrapper function that allows you to free a pbuf from interrupt context.

Parameters

p	The pbuf (chain) to be dereferenced.

Returns

ERR_OK if callback could be enqueued, an err_t if not

Definition at line 493 of file tcpip.c.

5.8.2.3 err_t tcpip_callback_with_block (**tcpip_callback_fn** *function,* void ∗ *ctx,* u8_t *block*)

Call a specific function in the thread context of tcpip_thread for easy access synchronization. A function called in that way may access lwIP core code without fearing concurrent access.

Parameters

f	the function to call
ctx	parameter passed to f
block	1 to block until the request is posted, 0 to non-blocking mode

Returns

ERR_OK if the function was called, another err_t if not

Definition at line 211 of file tcpip.c.

5.8.2.4 void tcpip_callbackmsg_delete (struct tcpip_callback_msg ∗ *msg*)

Free a callback message allocated by tcpip_callbackmsg_new().

Parameters

msg	the message to free

Definition at line 425 of file tcpip.c.

5.8.2.5 struct tcpip_callback_msg∗ tcpip_callbackmsg_new (**tcpip_callback_fn** *function,* void ∗ *ctx*)

Allocate a structure for a static callback message and initialize it. This is intended to be used to send "static" messages from interrupt context.

Parameters

function	the function to call
ctx	parameter passed to function

Returns

a struct pointer to pass to tcpip_trycallback().

Definition at line 408 of file tcpip.c.

5.8.2.6 void tcpip_init (**tcpip_init_done_fn** *initfunc,* void ∗ *arg*)

Initialize this module:

- initialize all sub modules
- start the tcpip_thread

Parameters

initfunc	a function to call when tcpip_thread is running and finished initializing
arg	argument to pass to initfunc

Definition at line 455 of file tcpip.c.

5.8.2.7 err_t tcpip_input (struct pbuf ∗ *p*, struct netif ∗ *inp*)

Pass a received packet to tcpip_thread for input processing

Parameters

p	the received packet, p->payload pointing to the Ethernet header or to an IP header (if inp doesn't have NETIF_FLAG_ETHARP or NETIF_FLAG_ETHERNET flags)
inp	the network interface on which the packet was received

Definition at line 161 of file tcpip.c.

5.8.2.8 err_t tcpip_trycallback (struct tcpip_callback_msg ∗ *msg*)

Try to post a callback-message to the tcpip_thread mbox This is intended to be used to send "static" messages from interrupt context.

Parameters

msg	pointer to the message to post

Returns

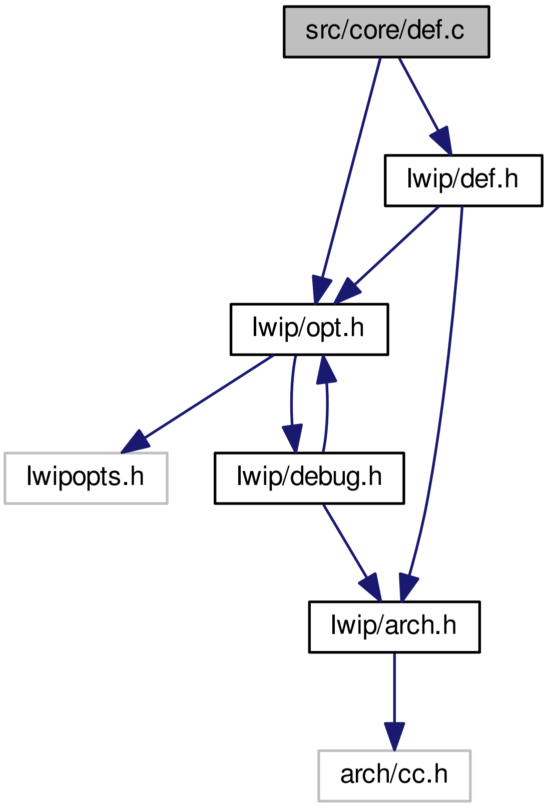
sys_mbox_trypost() return code

Definition at line 438 of file tcpip.c.

5.9 src/core/def.c File Reference

```
#include "lwip/opt.h"
#include "lwip/def.h"
```

Include dependency graph for def.c:



Functions

- u16_t lwip_htons (u16_t n)
- u16_t lwip_ntohs (u16_t n)
- u32_t lwip_htonl (u32_t n)
- u32_t lwip_ntohl (u32_t n)

5.9.1 Detailed Description

Common functions used throughout the stack.

5.9.2 Function Documentation

5.9.2.1 u32_t lwip_htonl (u32_t *n*)

Convert an u32_t from host- to network byte order.

Parameters

n	u32_t in host byte order

Returns

n in network byte order

Definition at line 88 of file def.c.

5.9.2.2 u16_t lwip_htons (u16_t *n*)

These are reference implementations of the byte swapping functions. Again with the aim of being simple, correct and fully portable. Byte swapping is the second thing you would want to optimize. You will need to port it to your architecture and in your cc.h:

#define LWIP_PLATFORM_BYTESWAP 1 #define LWIP_PLATFORM_HTONS(x) <your_htons> #define LWIP↩
_PLATFORM_HTONL(x) <your_htonl>

Note ntohs() and ntohl() are merely references to the htonx counterparts. Convert an u16_t from host- to network byte order.

Parameters

n	u16_t in host byte order

Returns

n in network byte order

Definition at line 64 of file def.c.

5.9.2.3 u32_t lwip_ntohl (u32_t *n*)

Convert an u32_t from network- to host byte order.

Parameters

n	u32_t in network byte order

Returns

n in host byte order

Definition at line 103 of file def.c.

5.9.2.4 u16_t lwip_ntohs (u16_t *n*)

Convert an u16_t from network- to host byte order.

Parameters

n	u16_t in network byte order

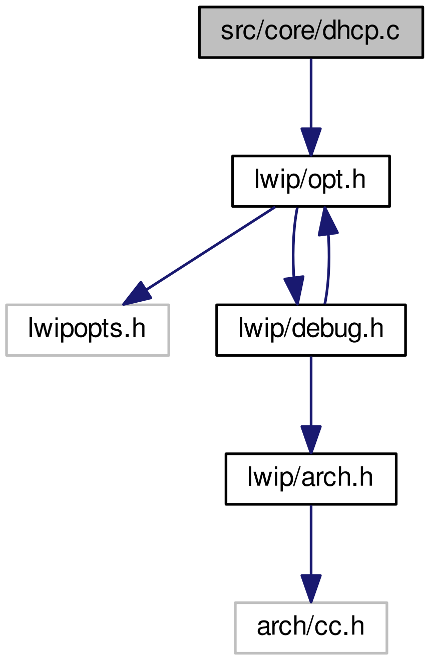
Returns

n in host byte order

Definition at line 76 of file def.c.

5.10 src/core/dhcp.c File Reference

```
#include "lwip/opt.h"
```
Include dependency graph for dhcp.c:

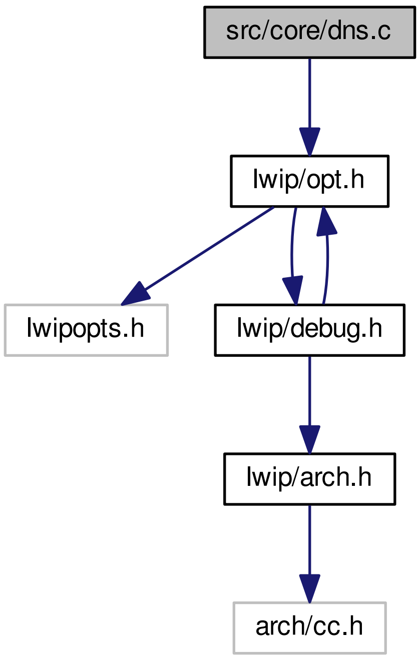


5.10.1 Detailed Description

Dynamic Host Configuration Protocol client

5.11 src/core/dns.c File Reference

```
#include "lwip/opt.h"
```
Include dependency graph for dns.c:



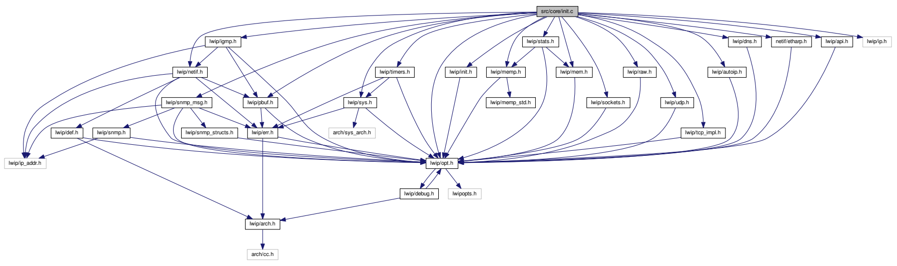
5.11.1 Detailed Description

DNS - host name to IP address resolver.

5.12 src/core/init.c File Reference

```
#include "lwip/opt.h"
#include "lwip/init.h"
#include "lwip/stats.h"
#include "lwip/sys.h"
#include "lwip/mem.h"
#include "lwip/memp.h"
#include "lwip/pbuf.h"
#include "lwip/netif.h"
#include "lwip/sockets.h"
#include "lwip/ip.h"
#include "lwip/raw.h"
#include "lwip/udp.h"
#include "lwip/tcp_impl.h"
#include "lwip/snmp_msg.h"
#include "lwip/autoip.h"
#include "lwip/igmp.h"
#include "lwip/dns.h"
#include "lwip/timers.h"
#include "netif/etharp.h"
#include "lwip/api.h"
```

Include dependency graph for init.c:



Macros

- #define LWIP_DISABLE_TCP_SANITY_CHECKS 0
- #define LWIP_DISABLE_MEMP_SANITY_CHECKS 0

Functions

- void lwip_init (void)

5.12.1 Detailed Description

Modules initialization

5.12.2 Macro Definition Documentation

5.12.2.1 #define LWIP_DISABLE_MEMP_SANITY_CHECKS 0

Definition at line 240 of file init.c.

5.12.2.2 #define LWIP_DISABLE_TCP_SANITY_CHECKS 0

Definition at line 237 of file init.c.

5.12.3 Function Documentation

5.12.3.1 void lwip_init (void)

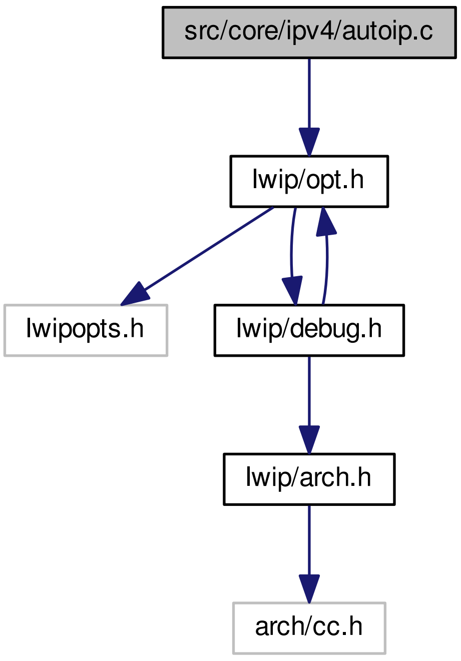
Perform Sanity check of user-configurable values, and initialize all modules.

Definition at line 289 of file init.c.

5.13 src/core/ipv4/autoip.c File Reference

`#include "lwip/opt.h"`

Include dependency graph for autoip.c:

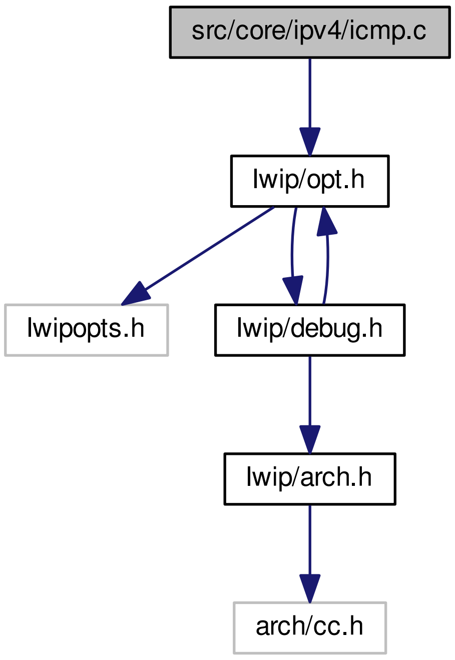


5.13.1 Detailed Description

AutoIP Automatic LinkLocal IP Configuration

5.14 src/core/ipv4/icmp.c File Reference

`#include "lwip/opt.h"`
Include dependency graph for icmp.c:



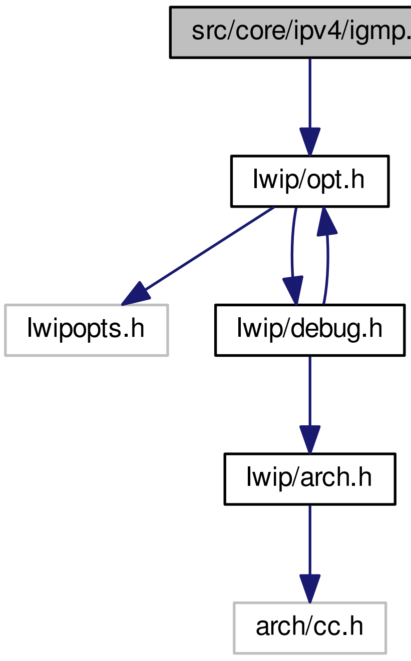
5.14.1 Detailed Description

ICMP - Internet Control Message Protocol

5.15 src/core/ipv4/igmp.c File Reference

```
#include "lwip/opt.h"
```

Include dependency graph for igmp.c:



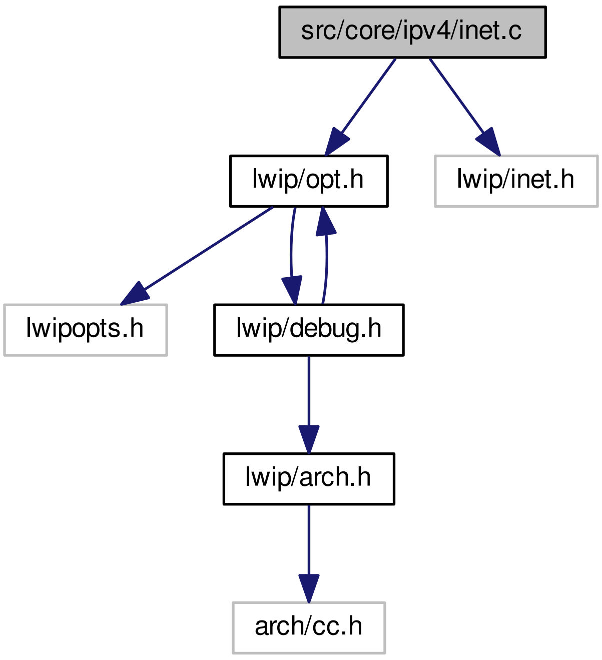
5.15.1 Detailed Description

IGMP - Internet Group Management Protocol

5.16 src/core/ipv4/inet.c File Reference

```
#include "lwip/opt.h"
#include "lwip/inet.h"
```

Include dependency graph for inet.c:



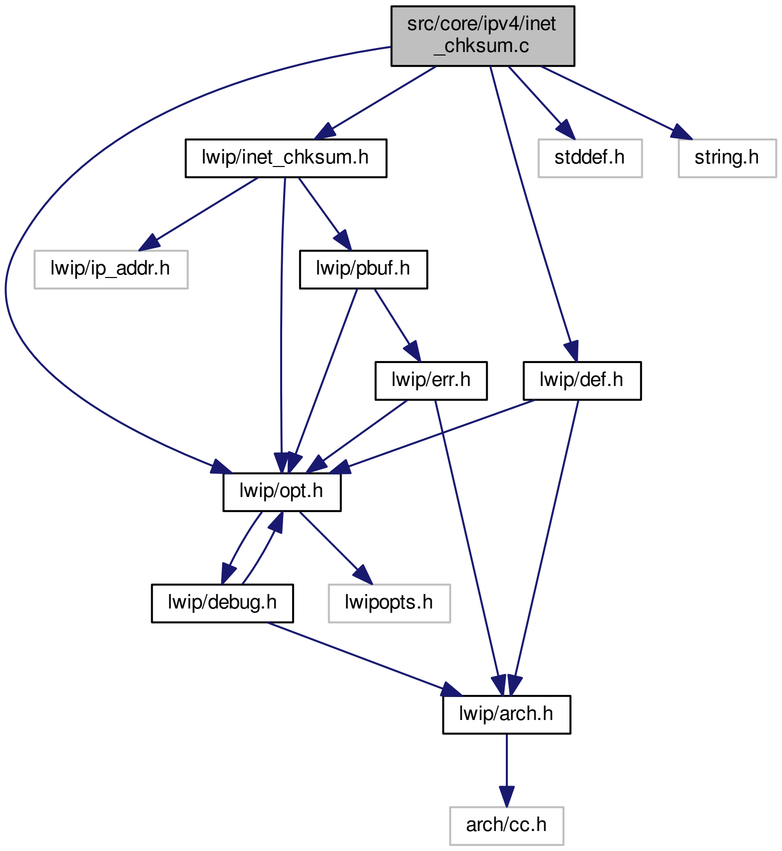
5.16.1 Detailed Description

Functions common to all TCP/IPv4 modules, such as the byte order functions.

5.17 src/core/ipv4/inet_chksum.c File Reference

```
#include "lwip/opt.h"
#include "lwip/inet_chksum.h"
#include "lwip/def.h"
#include <stddef.h>
#include <string.h>
```

Include dependency graph for inet_chksum.c:



Macros

- #define LWIP_CHKSUM lwip_standard_chksum
- #define LWIP_CHKSUM_ALGORITHM 2

Functions

- u16_t inet_chksum_pseudo (struct pbuf ∗p, ip_addr_t ∗src, ip_addr_t ∗dest, u8_t proto, u16_t proto_len)
- u16_t inet_chksum_pseudo_partial (struct pbuf ∗p, ip_addr_t ∗src, ip_addr_t ∗dest, u8_t proto, u16_t proto←
_len, u16_t chksum_len)
- u16_t inet_chksum (void ∗dataptr, u16_t len)
- u16_t inet_chksum_pbuf (struct pbuf ∗p)

5.17.1 Detailed Description

Incluse internet checksum functions.

5.17.2 Macro Definition Documentation

5.17.2.1 #define LWIP_CHKSUM lwip_standard_chksum

Definition at line 59 of file inet_chksum.c.

5.17.2.2 #define LWIP_CHKSUM_ALGORITHM 2

Definition at line 61 of file inet_chksum.c.

5.17.3 Function Documentation

5.17.3.1 u16_t inet_chksum (void ∗ *dataptr,* u16_t *len*)

Definition at line 396 of file inet_chksum.c.

5.17.3.2 u16_t inet_chksum_pbuf (struct pbuf ∗ *p*)

Calculate a checksum over a chain of pbufs (without pseudo-header, much like inet_chksum only pbufs are used).

Parameters

p	pbuf chain over that the checksum should be calculated

Returns

checksum (as u16_t) to be saved directly in the protocol header

Definition at line 409 of file inet_chksum.c.

5.17.3.3 u16_t inet_chksum_pseudo (struct pbuf ∗ *p,* ip_addr_t ∗ *src,* ip_addr_t ∗ *dest,* u8_t *proto,* u16_t *proto_len*)

Definition at line 272 of file inet_chksum.c.

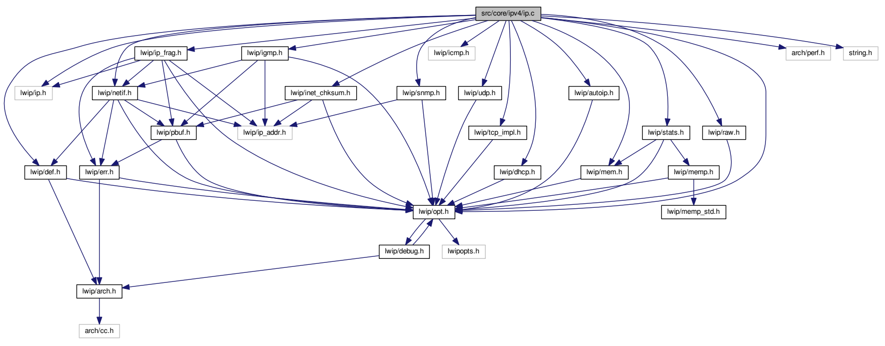
5.17.3.4 u16_t inet_chksum_pseudo_partial (struct pbuf ∗ *p,* ip_addr_t ∗ *src,* ip_addr_t ∗ *dest,* u8_t *proto,* u16_t *proto_len,* u16_t *chksum_len*)

Definition at line 332 of file inet_chksum.c.

5.18 src/core/ipv4/ip.c File Reference

```
#include "lwip/opt.h"
#include "lwip/ip.h"
#include "lwip/def.h"
#include "lwip/mem.h"
#include "lwip/ip_frag.h"
#include "lwip/inet_chksum.h"
#include "lwip/netif.h"
#include "lwip/icmp.h"
#include "lwip/igmp.h"
#include "lwip/raw.h"
#include "lwip/udp.h"
#include "lwip/tcp_impl.h"
#include "lwip/snmp.h"
#include "lwip/dhcp.h"
#include "lwip/autoip.h"
#include "lwip/stats.h"
#include "arch/perf.h"
#include <string.h>
```

Include dependency graph for ip.c:



Macros

- #define LWIP_INLINE_IP_CHKSUM 1
- #define CHECKSUM_GEN_IP_INLINE 0
- #define IP_ACCEPT_LINK_LAYER_ADDRESSING 0

Functions

- struct netif ∗ ip_route (ip_addr_t ∗dest)
- err_t ip_input (struct pbuf ∗p, struct netif ∗inp)
- err_t ip_output_if (struct pbuf ∗p, ip_addr_t ∗src, ip_addr_t ∗dest, u8_t ttl, u8_t tos, u8_t proto, struct netif ∗netif)
- err_t ip_output (struct pbuf ∗p, ip_addr_t ∗src, ip_addr_t ∗dest, u8_t ttl, u8_t tos, u8_t proto)

Variables

- struct netif ∗ current_netif
- const struct ip_hdr ∗ current_header
- ip_addr_t current_iphdr_src
- ip_addr_t current_iphdr_dest

5.18.1 Detailed Description

This is the IPv4 layer implementation for incoming and outgoing IP traffic.

See also

ip_frag.c

5.18.2 Macro Definition Documentation

5.18.2.1 #define CHECKSUM_GEN_IP_INLINE 0

Definition at line 69 of file ip.c.

5.18.2.2 #define IP_ACCEPT_LINK_LAYER_ADDRESSING 0

Definition at line 93 of file ip.c.

5.18.2.3 #define LWIP_INLINE_IP_CHKSUM 1

Set this to 0 in the rare case of wanting to call an extra function to generate the IP checksum (in contrast to calculating it on-the-fly).

Definition at line 64 of file ip.c.

5.18.3 Function Documentation

5.18.3.1 err_t ip_input (struct pbuf ∗ *p*, struct netif ∗ *inp*)

This function is called by the network interface device driver when an IP packet is received. The function does the basic checks of the IP header such as packet size being at least larger than the header size etc. If the packet was not destined for us, the packet is forwarded (using ip_forward). The IP checksum is always checked.

Finally, the packet is sent to the upper layer protocol input function.

Parameters

p	the received IP packet (p->payload points to IP header)
inp	the netif on which this packet was received

Returns

ERR_OK if the packet was processed (could return ERR_∗ if it wasn't processed, but currently always returns ERR_OK)

Definition at line 305 of file ip.c.

5.18.3.2 err_t ip_output (struct pbuf ∗ *p*, ip_addr_t ∗ *src*, ip_addr_t ∗ *dest*, u8_t *ttl*, u8_t *tos*, u8_t *proto*)

Simple interface to ip_output_if. It finds the outgoing network interface and calls upon ip_output_if to do the actual work.

Parameters

p	the packet to send (p->payload points to the data, e.g. next protocol header; if dest == IP_HDRINCL, p already includes an IP header and p->payload points to that IP header)
src	the source IP address to send from (if src == IP_ADDR_ANY, the IP address of the netif used to send is used as source address)
dest	the destination IP address to send the packet to
ttl	the TTL value to be set in the IP header
tos	the TOS value to be set in the IP header
proto	the PROTOCOL to be set in the IP header

Returns

ERR_RTE if no route is found see ip_output_if() for more return values

Definition at line 818 of file ip.c.

5.18.3.3 err_t ip_output_if (struct pbuf ∗ *p,* ip_addr_t ∗ *src,* ip_addr_t ∗ *dest,* u8_t *ttl,* u8_t *tos,* u8_t *proto,* struct netif ∗ *netif*)

Sends an IP packet on a network interface. This function constructs the IP header and calculates the IP header checksum. If the source IP address is NULL, the IP address of the outgoing network interface is filled in as source address. If the destination IP address is IP_HDRINCL, p is assumed to already include an IP header and p->payload points to it instead of the data.

Parameters

p	the packet to send (p->payload points to the data, e.g. next protocol header; if dest == IP_HDRINCL, p already includes an IP header and p->payload points to that IP header)
src	the source IP address to send from (if src == IP_ADDR_ANY, the IP address of the netif used to send is used as source address)
dest	the destination IP address to send the packet to
ttl	the TTL value to be set in the IP header
tos	the TOS value to be set in the IP header
proto	the PROTOCOL to be set in the IP header
netif	the netif on which to send this packet

Returns

ERR_OK if the packet was sent OK ERR_BUF if p doesn't have enough space for IP/LINK headers returns errors returned by netif->output

Note

ip_id: RFC791 "some host may be able to simply use unique identifiers independent of destination"

Definition at line 641 of file ip.c.

5.18.3.4 struct netif∗ ip_route (ip_addr_t ∗ *dest*)

Finds the appropriate network interface for a given IP address. It searches the list of network interfaces linearly. A match is found if the masked IP address of the network interface equals the masked IP address given to the function.

Parameters

dest	the destination IP address for which to find the route

Returns

the netif on which to send to reach dest

Definition at line 124 of file ip.c.

5.18.4 Variable Documentation

5.18.4.1 const struct ip_hdr∗ current_header

Header of the input packet currently being processed.

Definition at line 105 of file ip.c.

5.18.4.2 ip_addr_t current_iphdr_dest

Destination IP address of current_header

Definition at line 109 of file ip.c.

5.18.4.3 ip_addr_t current_iphdr_src

Source IP address of current_header

Definition at line 107 of file ip.c.

5.18.4.4 struct netif∗ current_netif

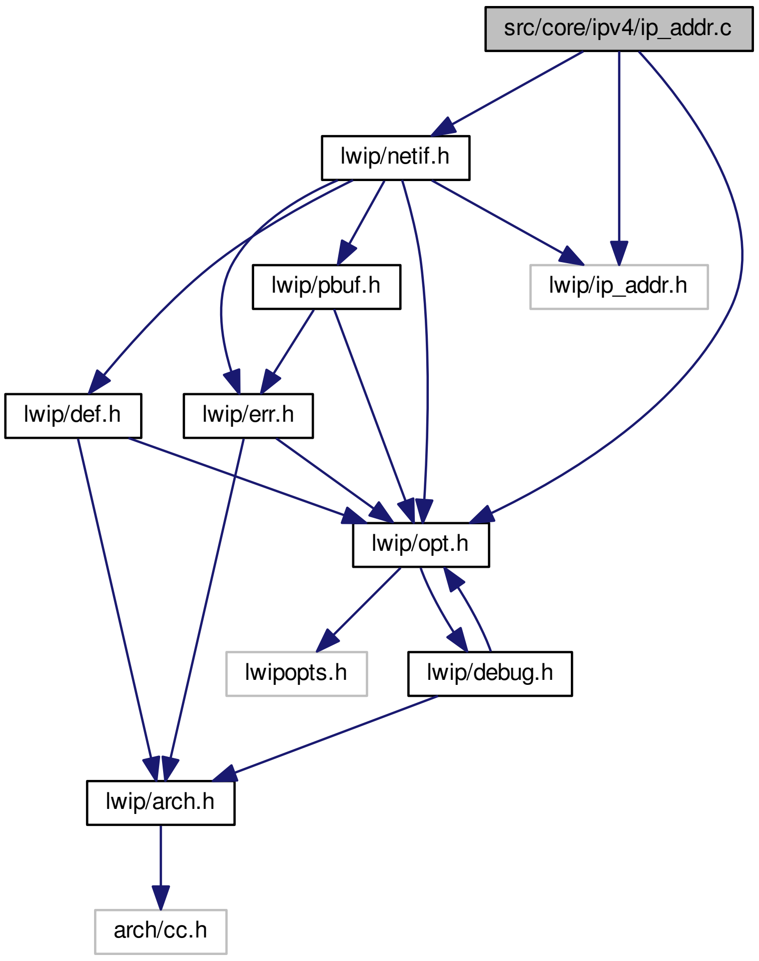
The interface that provided the packet for the current callback invocation.

Definition at line 100 of file ip.c.

5.19 src/core/ipv4/ip_addr.c File Reference

```
#include "lwip/opt.h"
#include "lwip/ip_addr.h"
#include "lwip/netif.h"
```

Include dependency graph for ip_addr.c:



Macros

- #define in_range(c, lo, up) ((u8_t)c >= lo && (u8_t)c <= up)
- #define isprint(c) in_range(c, 0x20, 0x7f)
- #define isdigit(c) in_range(c, '0', '9')
- #define isxdigit(c) (isdigit(c) || in_range(c, 'a', 'f') || in_range(c, 'A', 'F'))
- #define islower(c) in_range(c, 'a', 'z')
- #define isspace(c) (c == ' ' || c == '\f' || c == '\n' || c == '\r' || c == '\t' || c == '\v')

Functions

- u8_t ip4_addr_isbroadcast (u32_t addr, const struct netif ∗netif)
- u8_t ip4_addr_netmask_valid (u32_t netmask)
- u32_t ipaddr_addr (const char ∗cp)
- int ipaddr_aton (const char ∗cp, ip_addr_t ∗addr)
- char ∗ ipaddr_ntoa (const ip_addr_t ∗addr)
- char ∗ ipaddr_ntoa_r (const ip_addr_t ∗addr, char ∗buf, int buflen)

Variables

- const ip_addr_t ip_addr_any = { IPADDR_ANY }
- const ip_addr_t ip_addr_broadcast = { IPADDR_BROADCAST }

5.19.1 Detailed Description

This is the IPv4 address tools implementation.

5.19.2 Macro Definition Documentation

5.19.2.1 #define in_range(*c,* *lo,* *up*) ((u8_t)c >= lo && (u8_t)c <= up)

Definition at line 114 of file ip_addr.c.

5.19.2.2 #define isdigit(*c*) in_range(c, '0', '9')

Definition at line 116 of file ip_addr.c.

5.19.2.3 #define islower(*c*) in_range(c, 'a', 'z')

Definition at line 118 of file ip_addr.c.

5.19.2.4 #define isprint(*c*) in_range(c, 0x20, 0x7f)

Definition at line 115 of file ip_addr.c.

5.19.2.5 #define isspace(*c*) (c == ' ' || c == '\f' || c == '\n' || c == '\r' || c == '\t' || c == '\v')

Definition at line 119 of file ip_addr.c.

5.19.2.6 #define isxdigit(*c*) (isdigit(c) || in_range(c, 'a', 'f') || in_range(c, 'A', 'F'))

Definition at line 117 of file ip_addr.c.

5.19.3 Function Documentation

5.19.3.1 u8_t ip4_addr_isbroadcast (u32_t *addr,* const struct netif ∗ *netif*)

Determine if an address is a broadcast address on a network interface

Parameters

addr	address to be checked
netif	the network interface against which the address is checked

Returns

returns non-zero if the address is a broadcast address

Definition at line 55 of file ip_addr.c.

5.19.3.2 u8_t ip4_addr_netmask_valid (u32_t *netmask*)

Checks if a netmask is valid (starting with ones, then only zeros)

Parameters

netmask	the IPv4 netmask to check (in network byte order!)

Returns

1 if the netmask is valid, 0 if it is not

Definition at line 90 of file ip_addr.c.

5.19.3.3 u32_t ipaddr_addr (const char ∗ *cp*)

Ascii internet address interpretation routine. The value returned is in network order.

Parameters

cp	IP address in ascii represenation (e.g. "127.0.0.1")

Returns

ip address in network order

Definition at line 130 of file ip_addr.c.

5.19.3.4 int ipaddr_aton (const char ∗ *cp,* ip_addr_t ∗ *addr*)

Check whether "cp" is a valid ascii representation of an Internet address and convert to a binary address. Returns 1 if the address is valid, 0 if not. This replaces inet_addr, the return value from which cannot distinguish between failure and a local broadcast address.

Parameters

cp	IP address in ascii represenation (e.g. "127.0.0.1")
addr	pointer to which to save the ip address in network order

Returns

1 if cp could be converted to addr, 0 on failure

Definition at line 152 of file ip_addr.c.

5.19.3.5 char∗ ipaddr_ntoa (const ip_addr_t ∗ *addr*)

Convert numeric IP address into decimal dotted ASCII representation. returns ptr to static buffer; not reentrant!

Parameters

addr	ip address in network order to convert

Returns

pointer to a global static (!) buffer that holds the ASCII represenation of addr

Definition at line 261 of file ip_addr.c.

5.19.3.6 char∗ ipaddr_ntoa_r (const ip_addr_t ∗ *addr,* char ∗ *buf,* int *buflen*)

Same as ipaddr_ntoa, but reentrant since a user-supplied buffer is used.

Parameters

addr	ip address in network order to convert
buf	target buffer where the string is stored
buflen	length of buf

Returns

either pointer to buf which now holds the ASCII representation of addr or NULL if buf was too small

Definition at line 276 of file ip_addr.c.

5.19.4 Variable Documentation

5.19.4.1 const **ip_addr_t** ip_addr_any = { **IPADDR_ANY** }

Definition at line 44 of file ip_addr.c.

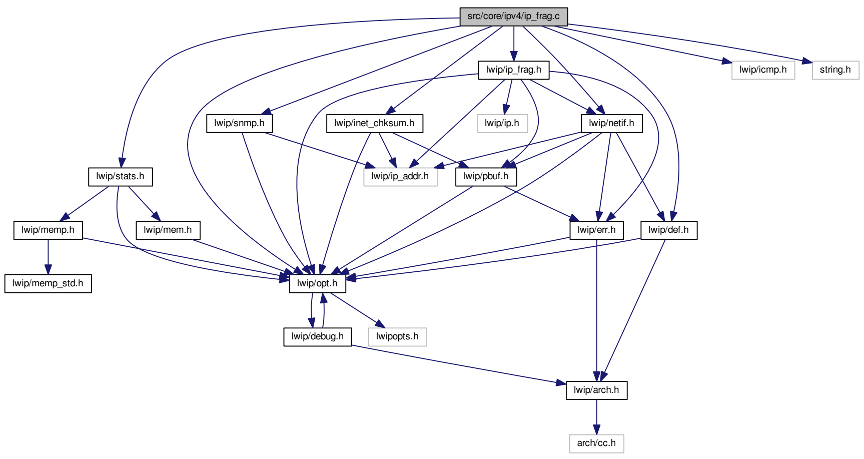
5.19.4.2 const **ip_addr_t** ip_addr_broadcast = { **IPADDR_BROADCAST** }

Definition at line 45 of file ip_addr.c.

5.20 src/core/ipv4/ip_frag.c File Reference

```
#include "lwip/opt.h"
#include "lwip/ip_frag.h"
#include "lwip/def.h"
#include "lwip/inet_chksum.h"
#include "lwip/netif.h"
#include "lwip/snmp.h"
#include "lwip/stats.h"
#include "lwip/icmp.h"
#include <string.h>
```

Include dependency graph for ip_frag.c:



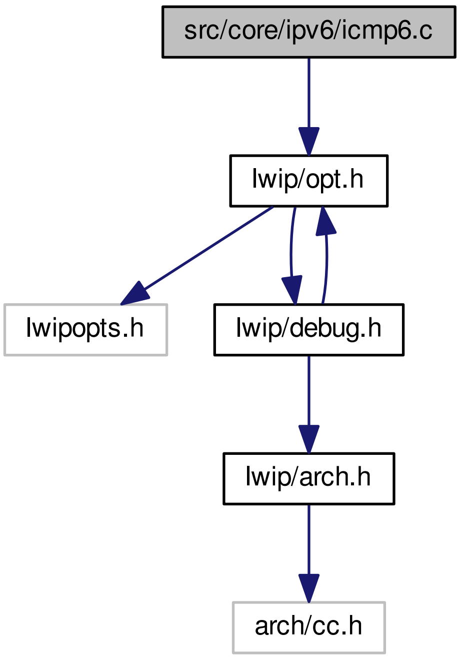
5.20.1 Detailed Description

This is the IPv4 packet segmentation and reassembly implementation.

5.21 src/core/ipv6/icmp6.c File Reference

```
#include "lwip/opt.h"
```

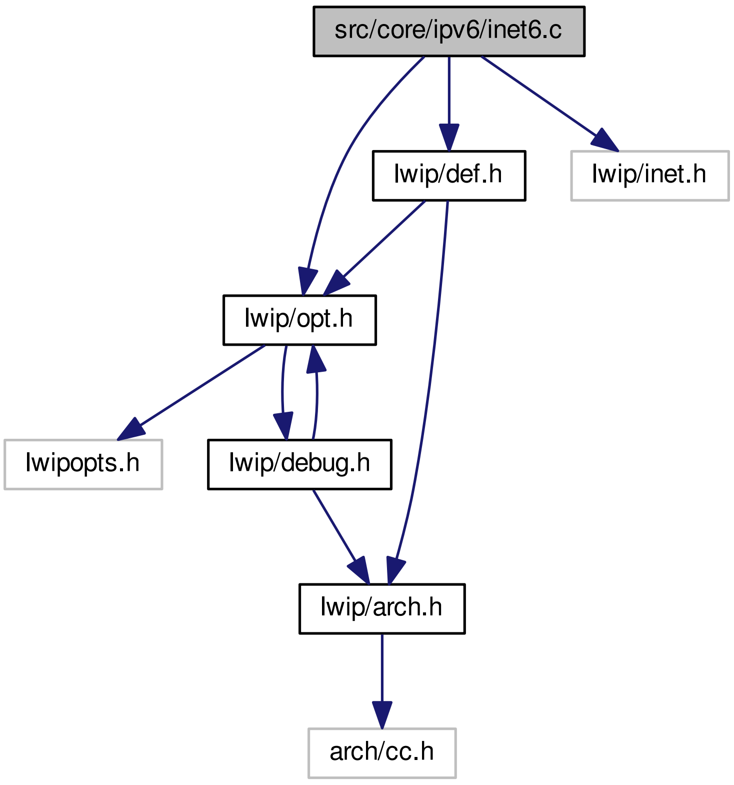
Include dependency graph for icmp6.c:



5.22 src/core/ipv6/inet6.c File Reference

```
#include "lwip/opt.h"
#include "lwip/def.h"
#include "lwip/inet.h"
```

Include dependency graph for inet6.c:



Functions

- u16_t inet_chksum_pseudo (struct pbuf ∗p, struct ip_addr ∗src, struct ip_addr ∗dest, u8_t proto, u32_↩ t proto_len)
- u16_t inet_chksum (void ∗dataptr, u16_t len)
- u16_t inet_chksum_pbuf (struct pbuf ∗p)

5.22.1 Detailed Description

Functions common to all TCP/IPv6 modules, such as the Internet checksum and the byte order functions.

5.22.2 Function Documentation

5.22.2.1 u16_t inet_chksum (void ∗ *dataptr,* u16_t *len*)

Definition at line 129 of file inet6.c.

5.22.2.2 u16_t inet_chksum_pbuf (struct pbuf ∗ *p*)

Calculate a checksum over a chain of pbufs (without pseudo-header, much like inet_chksum only pbufs are used).

Parameters

p	pbuf chain over that the checksum should be calculated

Returns

checksum (as u16_t) to be saved directly in the protocol header

Definition at line 140 of file inet6.c.

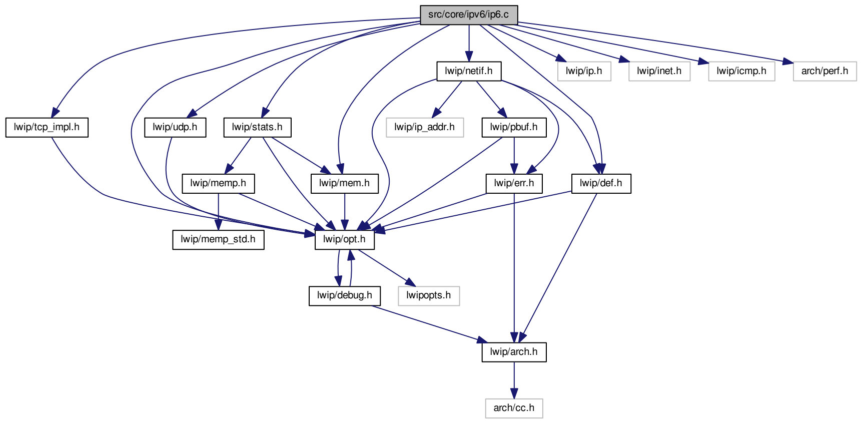
5.22.2.3 u16_t inet_chksum_pseudo (struct **pbuf** ∗ *p,* struct **ip_addr** ∗ *src,* struct **ip_addr** ∗ *dest,* u8_t *proto,* u32_t *proto_len*)

Definition at line 80 of file inet6.c.

5.23 src/core/ipv6/ip6.c File Reference

```
#include "lwip/opt.h"
#include "lwip/def.h"
#include "lwip/mem.h"
#include "lwip/ip.h"
#include "lwip/inet.h"
#include "lwip/netif.h"
#include "lwip/icmp.h"
#include "lwip/udp.h"
#include "lwip/tcp_impl.h"
#include "lwip/stats.h"
#include "arch/perf.h"
```

Include dependency graph for ip6.c:



Functions

- void ip_init (void)
- struct netif ∗ ip_route (struct ip_addr ∗dest)
- void ip_input (struct pbuf ∗p, struct netif ∗inp)
- err_t ip_output_if (struct pbuf ∗p, struct ip_addr ∗src, struct ip_addr ∗dest, u8_t ttl, u8_t proto, struct netif ∗netif)
- err_t ip_output (struct pbuf ∗p, struct ip_addr ∗src, struct ip_addr ∗dest, u8_t ttl, u8_t proto)

5.23.1 Function Documentation

5.23.1.1 void ip_init (void)

Definition at line 63 of file ip6.c.

5.23.1.2 void ip_input (struct **pbuf** ∗ *p*, struct **netif** ∗ *inp*)

This function is called by the network interface device driver when an IP packet is received. The function does the basic checks of the IP header such as packet size being at least larger than the header size etc. If the packet was not destined for us, the packet is forwarded (using ip_forward). The IP checksum is always checked.

Finally, the packet is sent to the upper layer protocol input function.

Parameters

p	the received IP packet (p->payload points to IP header)
inp	the netif on which this packet was received

Returns

ERR_OK if the packet was processed (could return ERR_∗ if it wasn't processed, but currently always returns ERR_OK)

Definition at line 157 of file ip6.c.

5.23.1.3 err_t ip_output (struct **pbuf** ∗ *p*, struct **ip_addr** ∗ *src*, struct **ip_addr** ∗ *dest*, u8_t *ttl*, u8_t *proto*)

Definition at line 317 of file ip6.c.

5.23.1.4 err_t ip_output_if (struct **pbuf** ∗ *p*, struct **ip_addr** ∗ *src*, struct **ip_addr** ∗ *dest*, u8_t *ttl*, u8_t *proto*, struct **netif** ∗ *netif*)

Definition at line 260 of file ip6.c.

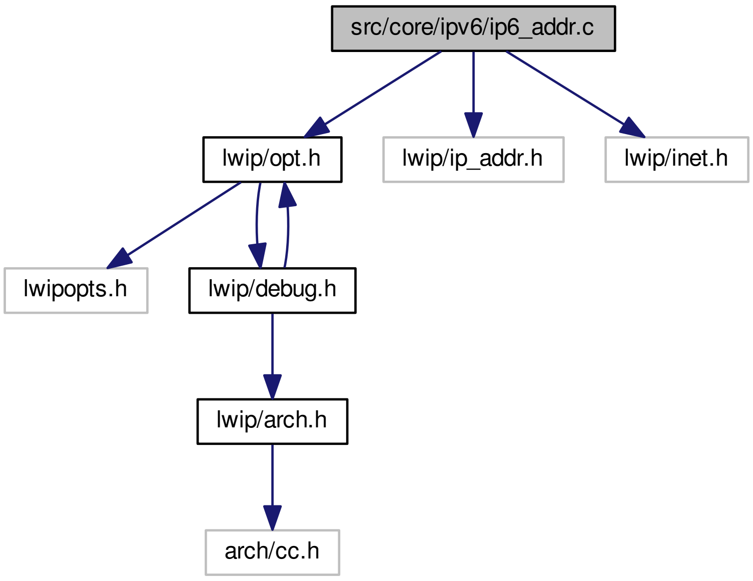
5.23.1.5 struct **netif**∗ ip_route (struct **ip_addr** ∗ *dest*)

Definition at line 75 of file ip6.c.

5.24 src/core/ipv6/ip6_addr.c File Reference

```
#include "lwip/opt.h"
#include "lwip/ip_addr.h"
#include "lwip/inet.h"
```

Include dependency graph for ip6_addr.c:



Functions

- u8_t ip_addr_netcmp (struct ip_addr ∗addr1, struct ip_addr ∗addr2, struct ip_addr ∗mask)
- u8_t ip_addr_cmp (struct ip_addr ∗addr1, struct ip_addr ∗addr2)
- void ip_addr_set (struct ip_addr ∗dest, struct ip_addr ∗src)
- u8_t ip_addr_isany (struct ip_addr ∗addr)

5.24.1 Function Documentation

5.24.1.1 u8_t ip_addr_cmp (struct ip_addr ∗ *addr1*, struct ip_addr ∗ *addr2*)

Definition at line 49 of file ip6_addr.c.

5.24.1.2 u8_t ip_addr_isany (struct ip_addr ∗ *addr*)

Definition at line 68 of file ip6_addr.c.

5.24.1.3 u8_t ip_addr_netcmp (struct ip_addr ∗ *addr1*, struct ip_addr ∗ *addr2*, struct ip_addr ∗ *mask*)

Definition at line 38 of file ip6_addr.c.

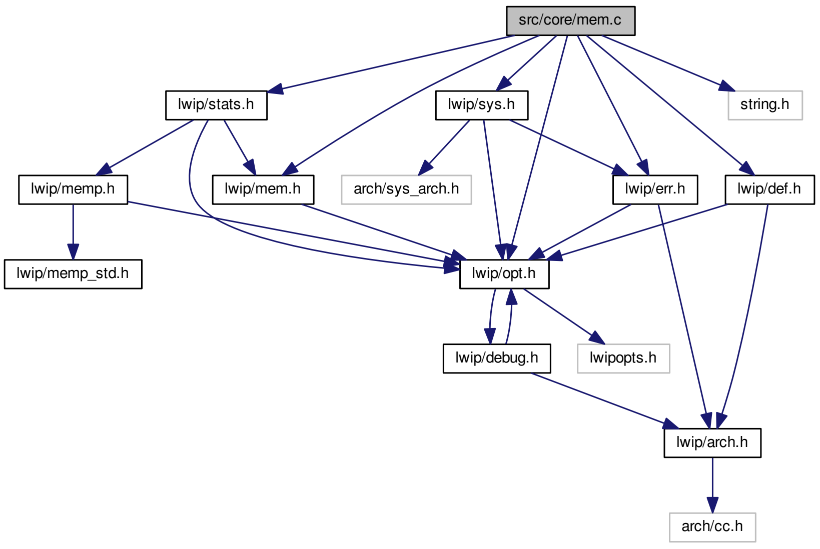
5.24.1.4 void ip_addr_set (struct ip_addr ∗ *dest*, struct ip_addr ∗ *src*)

Definition at line 58 of file ip6_addr.c.

5.25 src/core/mem.c File Reference

```
#include "lwip/opt.h"
#include "lwip/def.h"
#include "lwip/mem.h"
#include "lwip/sys.h"
#include "lwip/stats.h"
#include "lwip/err.h"
#include <string.h>
```

Include dependency graph for mem.c:



Data Structures

- struct mem

Macros

- #define MIN_SIZE 12
- #define MIN_SIZE_ALIGNED LWIP_MEM_ALIGN_SIZE(MIN_SIZE)
- #define SIZEOF_STRUCT_MEM LWIP_MEM_ALIGN_SIZE(sizeof(struct mem))
- #define MEM_SIZE_ALIGNED LWIP_MEM_ALIGN_SIZE(MEM_SIZE)
- #define LWIP_RAM_HEAP_POINTER ram_heap
- #define LWIP_MEM_FREE_DECL_PROTECT()
- #define LWIP_MEM_FREE_PROTECT() sys_mutex_lock(&mem_mutex)
- #define LWIP_MEM_FREE_UNPROTECT() sys_mutex_unlock(&mem_mutex)
- #define LWIP_MEM_ALLOC_DECL_PROTECT()
- #define LWIP_MEM_ALLOC_PROTECT()
- #define LWIP_MEM_ALLOC_UNPROTECT()

Functions

- void mem_init (void)

- void mem_free (void ∗rmem)
- void ∗ mem_trim (void ∗rmem, mem_size_t newsize)
- void ∗ mem_malloc (mem_size_t size)
- void ∗ mem_calloc (mem_size_t count, mem_size_t size)

Variables

- u8_t ram_heap [MEM_SIZE_ALIGNED+(2 ∗SIZEOF_STRUCT_MEM)+MEM_ALIGNMENT]

5.25.1 Detailed Description

Dynamic memory manager

This is a lightweight replacement for the standard C library malloc().

If you want to use the standard C library malloc() instead, define MEM_LIBC_MALLOC to 1 in your lwipopts.h

To let mem_malloc() use pools (prevents fragmentation and is much faster than a heap but might waste some memory), define MEM_USE_POOLS to 1, define MEM_USE_CUSTOM_POOLS to 1 and create a file "lwippools.h" that includes a list of pools like this (more pools can be added between _START and _END):

Define three pools with sizes 256, 512, and 1512 bytes LWIP_MALLOC_MEMPOOL_START LWIP_MALLOC_↩ MEMPOOL(20, 256) LWIP_MALLOC_MEMPOOL(10, 512) LWIP_MALLOC_MEMPOOL(5, 1512) LWIP_MALL↩ OC_MEMPOOL_END

5.25.2 Macro Definition Documentation

5.25.2.1 #define LWIP_MEM_ALLOC_DECL_PROTECT( )

Definition at line 217 of file mem.c.

5.25.2.2 #define LWIP_MEM_ALLOC_PROTECT( )

Definition at line 218 of file mem.c.

5.25.2.3 #define LWIP_MEM_ALLOC_UNPROTECT( )

Definition at line 219 of file mem.c.

5.25.2.4 #define LWIP_MEM_FREE_DECL_PROTECT( )

Definition at line 213 of file mem.c.

5.25.2.5 #define LWIP_MEM_FREE_PROTECT( ) sys_mutex_lock(&mem_mutex)

Definition at line 214 of file mem.c.

5.25.2.6 #define LWIP_MEM_FREE_UNPROTECT( ) sys_mutex_unlock(&mem_mutex)

Definition at line 215 of file mem.c.

5.25.2.7 #define LWIP_RAM_HEAP_POINTER ram_heap

Definition at line 183 of file mem.c.

5.25.2.8 #define MEM_SIZE_ALIGNED LWIP_MEM_ALIGN_SIZE(MEM_SIZE)

Definition at line 174 of file mem.c.

5.25.2.9 #define MIN_SIZE 12

All allocated blocks will be MIN_SIZE bytes big, at least! MIN_SIZE can be overridden to suit your needs. Smaller values save space, larger values could prevent too small blocks to fragment the RAM too much.

Definition at line 169 of file mem.c.

5.25.2.10 #define MIN_SIZE_ALIGNED LWIP_MEM_ALIGN_SIZE(MIN_SIZE)

Definition at line 172 of file mem.c.

5.25.2.11 #define SIZEOF_STRUCT_MEM LWIP_MEM_ALIGN_SIZE(sizeof(struct mem))

Definition at line 173 of file mem.c.

5.25.3 Function Documentation

5.25.3.1 void∗ mem_calloc (mem_size_t *count,* mem_size_t *size*)

Contiguously allocates enough space for count objects that are size bytes of memory each and returns a pointer to the allocated memory.

The allocated memory is filled with bytes of value zero.

Parameters

count	number of objects to allocate
size	size of the objects to allocate

Returns

pointer to allocated memory / NULL pointer if there is an error

Definition at line 646 of file mem.c.

5.25.3.2 void mem_free (void ∗ *rmem*)

Put a struct mem back on the heap

Parameters

rmem	is the data portion of a struct mem as returned by a previous call to mem_malloc()

Definition at line 311 of file mem.c.

5.25.3.3 void mem_init (void)

Zero the heap and initialize start, end and lowest-free

Definition at line 274 of file mem.c.

5.25.3.4 void∗ mem_malloc (**mem_size_t** *size*)

Adam's mem_malloc() plus solution for bug #17922 Allocate a block of memory with a minimum of 'size' bytes.

Parameters

size	is the minimum size of the requested block in bytes.

Returns

pointer to allocated memory or NULL if no free memory was found.

Note that the returned value will always be aligned (as defined by MEM_ALIGNMENT).

Definition at line 494 of file mem.c.

5.25.3.5 void∗ mem_trim (void ∗ *rmem,* **mem_size_t** *newsize*)

Shrink memory returned by mem_malloc().

Parameters

rmem	pointer to memory allocated by mem_malloc the is to be shrinked
newsize	required size after shrinking (needs to be smaller than or equal to the previous size)

Returns

for compatibility reasons: is always == rmem, at the moment or NULL if newsize is > old size, in which case rmem is NOT touched or freed!

Definition at line 369 of file mem.c.

5.25.4 Variable Documentation

5.25.4.1 u8_t ram_heap[MEM_SIZE_ALIGNED+(2 ∗SIZEOF_STRUCT_MEM)+MEM_ALIGNMENT]

If you want to relocate the heap to external memory, simply define LWIP_RAM_HEAP_POINTER as a void-pointer to that location. If so, make sure the memory at that location is big enough (see below on how that space is calculated). the heap. we need one struct mem at the end and some room for alignment

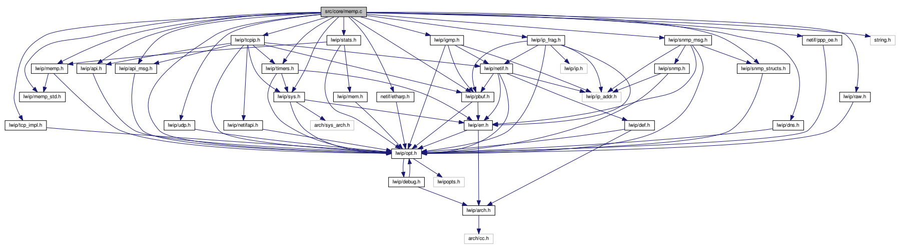
Definition at line 182 of file mem.c.

5.26 src/core/memp.c File Reference

```
#include "lwip/opt.h"
```

```
#include "lwip/memp.h"
#include "lwip/pbuf.h"
#include "lwip/udp.h"
#include "lwip/raw.h"
#include "lwip/tcp_impl.h"
#include "lwip/igmp.h"
#include "lwip/api.h"
#include "lwip/api_msg.h"
#include "lwip/tcpip.h"
#include "lwip/sys.h"
#include "lwip/timers.h"
#include "lwip/stats.h"
#include "netif/etharp.h"
#include "lwip/ip_frag.h"
#include "lwip/snmp_structs.h"
#include "lwip/snmp_msg.h"
#include "lwip/dns.h"
#include "netif/ppp_oe.h"
#include <string.h>
#include "lwip/memp_std.h"
```

Include dependency graph for memp.c:



Data Structures

- struct memp

Macros

- #define MEMP_SIZE 0
- #define MEMP_ALIGN_SIZE(x) (LWIP_MEM_ALIGN_SIZE(x))
- #define LWIP_MEMPOOL(name, num, size, desc) LWIP_MEM_ALIGN_SIZE(size),
- #define LWIP_MEMPOOL(name, num, size, desc) (num),
- #define LWIP_MEMPOOL(name, num, size, desc) + ((num) ∗ (MEMP_SIZE + MEMP_ALIGN_SIZE(size)))

Functions

- void memp_init (void)
- void ∗ memp_malloc (memp_t type)
- void memp_free (memp_t type, void ∗mem)

5.26.1 Detailed Description

Dynamic pool memory manager

lwIP has dedicated pools for many structures (netconn, protocol control blocks, packet buffers, ...). All these pools are managed here.

5.26.2 Macro Definition Documentation

5.26.2.1 #define LWIP_MEMPOOL(*name,* *num,* *size,* *desc*) LWIP_MEM_ALIGN_SIZE(size),

5.26.2.2 #define LWIP_MEMPOOL(*name,* *num,* *size,* *desc*) (num),

5.26.2.3 #define LWIP_MEMPOOL(*name,* *num,* *size,* *desc*) + ((num) ∗ (MEMP_SIZE + MEMP_ALIGN_SIZE(size)))

5.26.2.4 #define MEMP_ALIGN_SIZE(*x*) (LWIP_MEM_ALIGN_SIZE(x))

Definition at line 111 of file memp.c.

5.26.2.5 #define MEMP_SIZE 0

Definition at line 110 of file memp.c.

5.26.3 Function Documentation

5.26.3.1 void memp_free (memp_t *type,* void ∗ *mem*)

Put an element back into its pool.

Parameters

type	the pool where to put mem
mem	the memp element to free

Definition at line 435 of file memp.c.

5.26.3.2 void memp_init (void)

Initialize this module.

Carves out memp_memory into linked lists for each pool-type.

Definition at line 338 of file memp.c.

5.26.3.3 void∗ memp_malloc (memp_t *type*)

Get an element from a specific pool.

Parameters

type	the pool to get an element from

the debug version has two more parameters:

Parameters

file	file name calling this function
line	number of line where this function is called

Returns

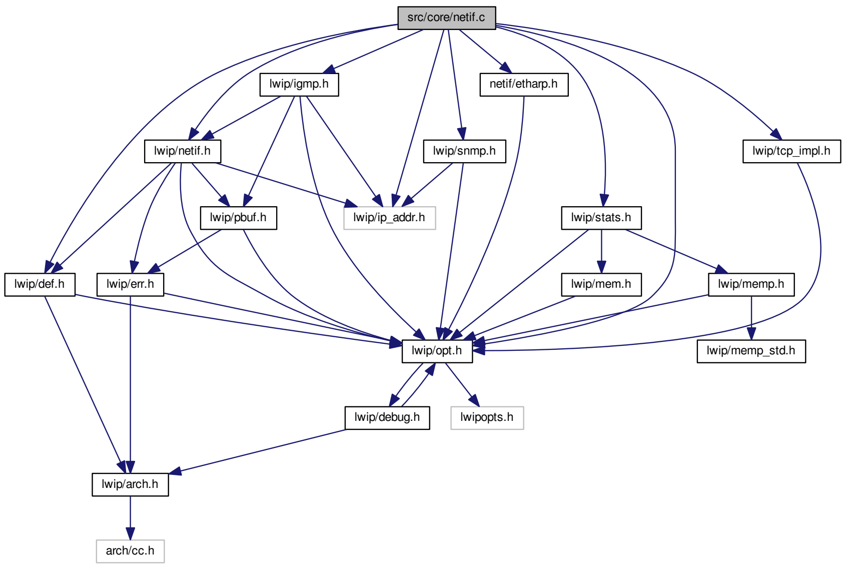
a pointer to the allocated memory or a NULL pointer on error

Definition at line 390 of file memp.c.

5.27 src/core/netif.c File Reference

```
#include "lwip/opt.h"
#include "lwip/def.h"
#include "lwip/ip_addr.h"
#include "lwip/netif.h"
#include "lwip/tcp_impl.h"
#include "lwip/snmp.h"
#include "lwip/igmp.h"
#include "netif/etharp.h"
#include "lwip/stats.h"
```

Include dependency graph for netif.c:



Macros

- #define NETIF_STATUS_CALLBACK(n)
- #define NETIF_LINK_CALLBACK(n)

Functions

- void netif_init (void)
- struct netif ∗ netif_add (struct netif ∗netif, ip_addr_t ∗ipaddr, ip_addr_t ∗netmask, ip_addr_t ∗gw, void ∗state, netif_init_fn init, netif_input_fn input)
- void netif_set_addr (struct netif ∗netif, ip_addr_t ∗ipaddr, ip_addr_t ∗netmask, ip_addr_t ∗gw)
- void netif_remove (struct netif ∗netif)
- struct netif ∗ netif_find (char ∗name)
- void netif_set_ipaddr (struct netif ∗netif, ip_addr_t ∗ipaddr)

- void netif_set_gw (struct netif ∗netif, ip_addr_t ∗gw)
- void netif_set_netmask (struct netif ∗netif, ip_addr_t ∗netmask)
- void netif_set_default (struct netif ∗netif)
- void netif_set_up (struct netif ∗netif)
- void netif_set_down (struct netif ∗netif)
- void netif_set_link_up (struct netif ∗netif)
- void netif_set_link_down (struct netif ∗netif)

Variables

- struct netif ∗ netif_list
- struct netif ∗ netif_default

5.27.1 Detailed Description

lwIP network interface abstraction

5.27.2 Macro Definition Documentation

5.27.2.1 #define NETIF_LINK_CALLBACK(*n*)

Definition at line 72 of file netif.c.

5.27.2.2 #define NETIF_STATUS_CALLBACK(*n*)

Definition at line 66 of file netif.c.

5.27.3 Function Documentation

5.27.3.1 struct netif∗ netif_add (struct netif ∗ *netif,* ip_addr_t ∗ *ipaddr,* ip_addr_t ∗ *netmask,* ip_addr_t ∗ *gw,* void ∗ *state,* netif_init_fn *init,* netif_input_fn *input*)

Add a network interface to the list of lwIP netifs.

Parameters

netif	a pre-allocated netif structure
ipaddr	IP address for the new netif
netmask	network mask for the new netif
gw	default gateway IP address for the new netif
state	opaque data passed to the new netif
init	callback function that initializes the interface
input	callback function that is called to pass ingress packets up in the protocol layer stack.

Returns

netif, or NULL if failed.

Definition at line 139 of file netif.c.

5.27.3.2 struct netif∗ netif_find (char ∗ *name*)

Find a network interface by searching for its name

Parameters

name	the name of the netif (like netif->name) plus concatenated number in ascii representation (e.g. 'en0')

Definition at line 290 of file netif.c.

5.27.3.3 void netif_init (void)

Definition at line 106 of file netif.c.

5.27.3.4 void netif_remove (struct netif ∗ *netif*)

Remove a network interface from the list of lwIP netifs.

Parameters

netif	the network interface to remove

Definition at line 235 of file netif.c.

5.27.3.5 void netif_set_addr (struct netif ∗ *netif,* ip_addr_t ∗ *ipaddr,* ip_addr_t ∗ *netmask,* ip_addr_t ∗ *gw*)

Change IP address configuration for a network interface (including netmask and default gateway).

Parameters

netif	the network interface to change
ipaddr	the new IP address
netmask	the new netmask
gw	the new default gateway

Definition at line 221 of file netif.c.

5.27.3.6 void netif_set_default (struct netif ∗ *netif*)

Set a network interface as the default network interface (used to output all packets for which no specific route is found)

Parameters

netif	the default network interface

Definition at line 430 of file netif.c.

5.27.3.7 void netif_set_down (struct netif ∗ *netif*)

Bring an interface down, disabling any traffic processing.

Note

: Enabling DHCP on a down interface will make it come up once configured.

See also

dhcp_start()

Definition at line 490 of file netif.c.

5.27.3.8 void netif_set_gw (struct netif * *netif*, ip_addr_t * *gw*)

Change the default gateway for a network interface

Parameters

netif	the network interface to change
gw	the new default gateway

Note

call netif_set_addr() if you also want to change ip address and netmask

Definition at line 388 of file netif.c.

5.27.3.9 void netif_set_ipaddr (struct netif ∗ *netif*, ip_addr_t ∗ *ipaddr*)

Change the IP address of a network interface

Parameters

netif	the network interface to change
ipaddr	the new IP address

Note

call netif_set_addr() if you also want to change netmask and default gateway

Definition at line 323 of file netif.c.

5.27.3.10 void netif_set_link_down (struct netif ∗ *netif*)

Called by a driver when its link goes down

Definition at line 574 of file netif.c.

5.27.3.11 void netif_set_link_up (struct netif ∗ *netif*)

Called by a driver when its link goes up

Definition at line 535 of file netif.c.

5.27.3.12 void netif_set_netmask (struct netif ∗ *netif*, ip_addr_t ∗ *netmask*)

Change the netmask of a network interface

Parameters

netif	the network interface to change
netmask	the new netmask

Note

call netif_set_addr() if you also want to change ip address and default gateway

Definition at line 409 of file netif.c.

5.27.3.13 void netif_set_up (struct netif ∗ *netif*)

Bring an interface up, available for processing traffic.

Note

: Enabling DHCP on a down interface will make it come up once configured.

See also

dhcp_start()

Definition at line 453 of file netif.c.

5.27.4 Variable Documentation

5.27.4.1 struct netif∗ netif_default

The default network interface.

Definition at line 76 of file netif.c.

5.27.4.2 struct netif∗ netif_list

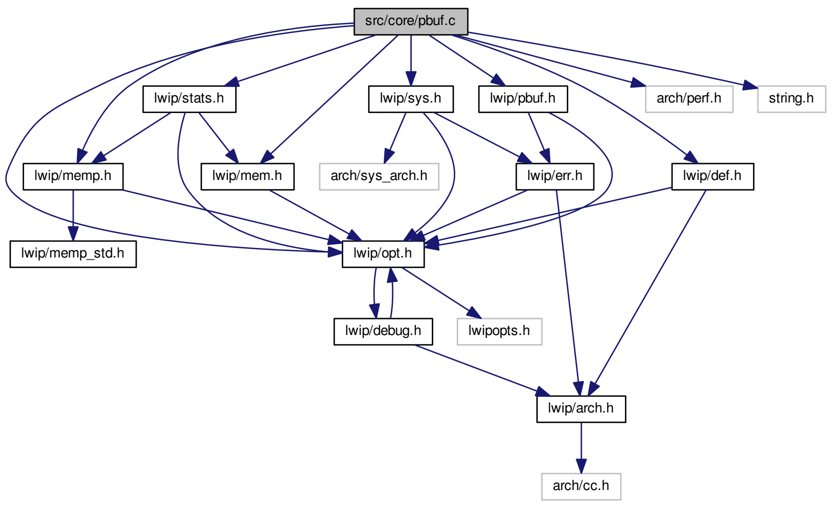
The list of network interfaces.

Definition at line 75 of file netif.c.

5.28 src/core/pbuf.c File Reference

```
#include "lwip/opt.h"
#include "lwip/stats.h"
#include "lwip/def.h"
#include "lwip/mem.h"
#include "lwip/memp.h"
#include "lwip/pbuf.h"
#include "lwip/sys.h"
#include "arch/perf.h"
#include <string.h>
```

Include dependency graph for pbuf.c:



Macros

- #define SIZEOF_STRUCT_PBUF LWIP_MEM_ALIGN_SIZE(sizeof(struct pbuf))
- #define PBUF_POOL_BUFSIZE_ALIGNED LWIP_MEM_ALIGN_SIZE(PBUF_POOL_BUFSIZE)
- #define PBUF_POOL_IS_EMPTY()

Functions

- struct pbuf ∗ pbuf_alloc (pbuf_layer layer, u16_t length, pbuf_type type)
- void pbuf_realloc (struct pbuf ∗p, u16_t new_len)
- u8_t pbuf_header (struct pbuf ∗p, s16_t header_size_increment)
- u8_t pbuf_free (struct pbuf ∗p)
- u8_t pbuf_clen (struct pbuf ∗p)
- void pbuf_ref (struct pbuf ∗p)
- void pbuf_cat (struct pbuf ∗h, struct pbuf ∗t)
- void pbuf_chain (struct pbuf ∗h, struct pbuf ∗t)
- struct pbuf ∗ pbuf_dechain (struct pbuf ∗p)
- err_t pbuf_copy (struct pbuf ∗p_to, struct pbuf ∗p_from)
- u16_t pbuf_copy_partial (struct pbuf ∗buf, void ∗dataptr, u16_t len, u16_t offset)
- err_t pbuf_take (struct pbuf ∗buf, const void ∗dataptr, u16_t len)
- struct pbuf ∗ pbuf_coalesce (struct pbuf ∗p, pbuf_layer layer)
- u8_t pbuf_get_at (struct pbuf ∗p, u16_t offset)
- u16_t pbuf_memcmp (struct pbuf ∗p, u16_t offset, const void ∗s2, u16_t n)
- u16_t pbuf_memfind (struct pbuf ∗p, const void ∗mem, u16_t mem_len, u16_t start_offset)
- u16_t pbuf_strstr (struct pbuf ∗p, const char ∗substr)

5.28.1 Detailed Description

Packet buffer management

Packets are built from the pbuf data structure. It supports dynamic memory allocation for packet contents or can reference externally managed packet contents both in RAM and ROM. Quick allocation for incoming packets is provided through pools with fixed sized pbufs.

A packet may span over multiple pbufs, chained as a singly linked list. This is called a "pbuf chain".

Multiple packets may be queued, also using this singly linked list. This is called a "packet queue".

So, a packet queue consists of one or more pbuf chains, each of which consist of one or more pbufs. CURRENTLY, PACKET QUEUES ARE NOT SUPPORTED!!! Use helper structs to queue multiple packets.

The differences between a pbuf chain and a packet queue are very precise but subtle.

The last pbuf of a packet has a ->tot_len field that equals the ->len field. It can be found by traversing the list. If the last pbuf of a packet has a ->next field other than NULL, more packets are on the queue.

Therefore, looping through a pbuf of a single packet, has an loop end condition (tot_len == p->len), NOT (next == NULL).

5.28.2 Macro Definition Documentation

5.28.2.1 #define PBUF_POOL_BUFSIZE_ALIGNED LWIP_MEM_ALIGN_SIZE(PBUF_POOL_BUFSIZE)

Definition at line 85 of file pbuf.c.

5.28.2.2 #define PBUF_POOL_IS_EMPTY( )

Definition at line 88 of file pbuf.c.

5.28.2.3 #define SIZEOF_STRUCT_PBUF LWIP_MEM_ALIGN_SIZE(sizeof(struct pbuf))

Definition at line 82 of file pbuf.c.

5.28.3 Function Documentation

5.28.3.1 struct pbuf∗ pbuf_alloc (pbuf_layer *layer,* u16_t *length,* pbuf_type *type*)

Allocates a pbuf of the given type (possibly a chain for PBUF_POOL type).

The actual memory allocated for the pbuf is determined by the layer at which the pbuf is allocated and the requested size (from the size parameter).

Parameters

layer	flag to define header size
length	size of the pbuf's payload
type	this parameter decides how and where the pbuf should be allocated as follows:

- PBUF_RAM: buffer memory for pbuf is allocated as one large chunk. This includes protocol headers as well.
- PBUF_ROM: no buffer memory is allocated for the pbuf, even for protocol headers. Additional headers must be prepended by allocating another pbuf and chain in to the front of the ROM pbuf. It is assumed that the memory used is really similar to ROM in that it is immutable and will not be changed. Memory which is dynamic should generally not be attached to PBUF_ROM pbufs. Use PBUF_REF instead.
- PBUF_REF: no buffer memory is allocated for the pbuf, even for protocol headers. It is assumed that the pbuf is only being used in a single thread. If the pbuf gets queued, then pbuf_take should be called to copy the buffer.
- PBUF_POOL: the pbuf is allocated as a pbuf chain, with pbufs from the pbuf pool that is allocated during pbuf_init().

Returns

the allocated pbuf. If multiple pbufs where allocated, this is the first pbuf of a pbuf chain.

Definition at line 207 of file pbuf.c.

5.28.3.2 void pbuf_cat (struct pbuf ∗ *h,* struct pbuf ∗ *t*)

Concatenate two pbufs (each may be a pbuf chain) and take over the caller's reference of the tail pbuf.

Note

The caller MAY NOT reference the tail pbuf afterwards. Use pbuf_chain() for that purpose.

See also

pbuf_chain()

Definition at line 745 of file pbuf.c.

5.28.3.3 void pbuf_chain (struct pbuf ∗ *h,* struct pbuf ∗ *t*)

Chain two pbufs (or pbuf chains) together.

The caller MUST call pbuf_free(t) once it has stopped using it. Use pbuf_cat() instead if you no longer use t.

Parameters

h	head pbuf (chain)
t	tail pbuf (chain)

Note

> The pbufs MUST belong to the same packet.
> MAY NOT be called on a packet queue.

The ->tot_len fields of all pbufs of the head chain are adjusted. The ->next field of the last pbuf of the head chain is adjusted. The ->ref field of the first pbuf of the tail chain is adjusted.

Definition at line 786 of file pbuf.c.

5.28.3.4 u8_t pbuf_clen (struct pbuf ∗ *p*)

Count number of pbufs in a chain

Parameters

p	first pbuf of chain

Returns

> the number of pbufs in a chain

Definition at line 704 of file pbuf.c.

5.28.3.5 struct pbuf∗ pbuf_coalesce (struct pbuf ∗ *p,* pbuf_layer *layer*)

Creates a single pbuf out of a queue of pbufs.

Remarks

> : Either the source pbuf 'p' is freed by this function or the original pbuf 'p' is returned, therefore the caller has to check the result!

Parameters

p	the source pbuf
layer	pbuf_layer of the new pbuf

Returns

> a new, single pbuf (p->next is NULL) or the old pbuf if allocation fails

Definition at line 1010 of file pbuf.c.

5.28.3.6 err_t pbuf_copy (struct pbuf ∗ *p_to,* struct pbuf ∗ *p_from*)

Create PBUF_RAM copies of pbufs.

Used to queue packets on behalf of the lwIP stack, such as ARP based queueing.

Note

> You MUST explicitly use p = pbuf_take(p);
> Only one packet is copied, no packet queue!

Parameters

p_to	pbuf destination of the copy
p_from	pbuf source of the copy

Returns

ERR_OK if pbuf was copied ERR_ARG if one of the pbufs is NULL or p_to is not big enough to hold p_from

Definition at line 852 of file pbuf.c.

5.28.3.7 u16_t pbuf_copy_partial (struct pbuf ∗ *buf,* void ∗ *dataptr,* u16_t *len,* u16_t *offset*)

Copy (part of) the contents of a packet buffer to an application supplied buffer.

Parameters

buf	the pbuf from which to copy data
dataptr	the application supplied buffer
len	length of data to copy (dataptr must be big enough). No more than buf->tot_len will be copied, irrespective of len
offset	offset into the packet buffer from where to begin copying len bytes

Returns

the number of bytes copied, or 0 on failure

Definition at line 918 of file pbuf.c.

5.28.3.8 struct pbuf∗ pbuf_dechain (struct pbuf ∗ *p*)

Dechains the first pbuf from its succeeding pbufs in the chain.

Makes p->tot_len field equal to p->len.

Parameters

p	pbuf to dechain

Returns

remainder of the pbuf chain, or NULL if it was de-allocated.

Note

May not be called on a packet queue.

Definition at line 803 of file pbuf.c.

5.28.3.9 u8_t pbuf_free (struct pbuf ∗ *p*)

Dereference a pbuf chain or queue and deallocate any no-longer-used pbufs at the head of this chain or queue.

Decrements the pbuf reference count. If it reaches zero, the pbuf is deallocated.

For a pbuf chain, this is repeated for each pbuf in the chain, up to the first pbuf which has a non-zero reference count after decrementing. So, when all reference counts are one, the whole chain is free'd.

Parameters

p	The pbuf (chain) to be dereferenced.

Returns

the number of pbufs that were de-allocated from the head of the chain.

Note

MUST NOT be called on a packet queue (Not verified to work yet).
the reference counter of a pbuf equals the number of pointers that refer to the pbuf (or into the pbuf).

Definition at line 618 of file pbuf.c.

5.28.3.10 u8_t pbuf_get_at (struct pbuf ∗ *p*, u16_t *offset*)

Get one byte from the specified position in a pbuf WARNING: returns zero for offset >= p->tot_len

Parameters

p	pbuf to parse
offset	offset into p of the byte to return

Returns

byte at an offset into p OR ZERO IF 'offset' >= p->tot_len

Definition at line 1077 of file pbuf.c.

5.28.3.11 u8_t pbuf_header (struct pbuf ∗ *p*, s16_t *header_size_increment*)

Adjusts the payload pointer to hide or reveal headers in the payload.

Adjusts the ->payload pointer so that space for a header (dis)appears in the pbuf payload.

The ->payload, ->tot_len and ->len fields are adjusted.

Parameters

p	pbuf to change the header size.
header_size_↩ increment	Number of bytes to increment header size which increases the size of the pbuf. New space is on the front. (Using a negative value decreases the header size.) If hdr_size_inc is 0, this function does nothing and returns succesful.

PBUF_ROM and PBUF_REF type buffers cannot have their sizes increased, so the call will fail. A check is made that the increase in header size does not move the payload pointer in front of the start of the buffer.

Returns

non-zero on failure, zero on success.

Definition at line 511 of file pbuf.c.

5.28.3.12 u16_t pbuf_memcmp (struct pbuf ∗ *p*, u16_t *offset*, const void ∗ *s2*, u16_t *n*)

Compare pbuf contents at specified offset with memory s2, both of length n

Parameters

p	pbuf to compare
offset	offset into p at wich to start comparing
s2	buffer to compare
n	length of buffer to compare

Returns

zero if equal, nonzero otherwise (0xffff if p is too short, diffoffset+1 otherwise)

Definition at line 1104 of file pbuf.c.

5.28.3.13 u16_t pbuf_memfind (struct pbuf ∗ *p,* const void ∗ *mem,* u16_t *mem_len,* u16_t *start_offset*)

Find occurrence of mem (with length mem_len) in pbuf p, starting at offset start_offset.

Parameters

p	pbuf to search, maximum length is 0xFFFE since 0xFFFF is used as return value 'not found'
mem	search for the contents of this buffer
mem_len	length of 'mem'
start_offset	offset into p at which to start searching

Returns

0xFFFF if substr was not found in p or the index where it was found

Definition at line 1140 of file pbuf.c.

5.28.3.14 void pbuf_realloc (struct pbuf ∗ *p,* u16_t *new_len*)

Shrink a pbuf chain to a desired length.

Parameters

p	pbuf to shrink.
new_len	desired new length of pbuf chain

Depending on the desired length, the first few pbufs in a chain might be skipped and left unchanged. The new last pbuf in the chain will be resized, and any remaining pbufs will be freed.

Note

If the pbuf is ROM/REF, only the ->tot_len and ->len fields are adjusted.
May not be called on a packet queue.
Despite its name, pbuf_realloc cannot grow the size of a pbuf (chain).

Definition at line 430 of file pbuf.c.

5.28.3.15 void pbuf_ref (struct pbuf ∗ *p*)

Increment the reference count of the pbuf.

Parameters

p	pbuf to increase reference counter of

Definition at line 723 of file pbuf.c.

5.28.3.16 u16_t pbuf_strstr (struct pbuf ∗ *p*, const char ∗ *substr*)

Find occurrence of substr with length substr_len in pbuf p, start at offset start_offset WARNING: in contrast to strstr(), this one does not stop at the first \0 in the pbuf/source string!

Parameters

p	pbuf to search, maximum length is 0xFFFE since 0xFFFF is used as return value 'not found'
substr	string to search for in p, maximum length is 0xFFFE

Returns

0xFFFF if substr was not found in p or the index where it was found

Definition at line 1168 of file pbuf.c.

5.28.3.17 err_t pbuf_take (struct pbuf ∗ *buf*, const void ∗ *dataptr*, u16_t *len*)

Copy application supplied data into a pbuf. This function can only be used to copy the equivalent of buf->tot_len data.

Parameters

buf	pbuf to fill with data
dataptr	application supplied data buffer
len	length of the application supplied data buffer

Returns

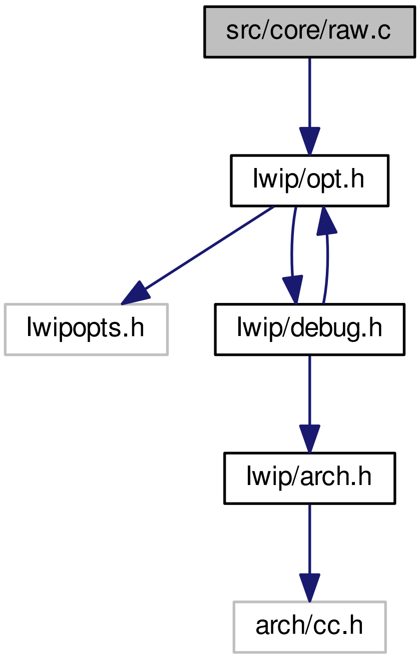
ERR_OK if successful, ERR_MEM if the pbuf is not big enough

Definition at line 966 of file pbuf.c.

5.29 src/core/raw.c File Reference

```
#include "lwip/opt.h"
```

Include dependency graph for raw.c:



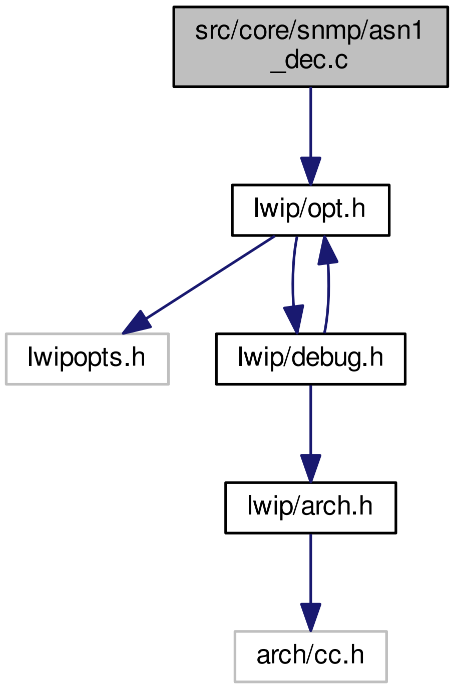
5.29.1 Detailed Description

Implementation of raw protocol PCBs for low-level handling of different types of protocols besides (or overriding) those already available in lwIP.

5.30 src/core/snmp/asn1_dec.c File Reference

```
#include "lwip/opt.h"
```

Include dependency graph for asn1_dec.c:



5.30.1 Detailed Description

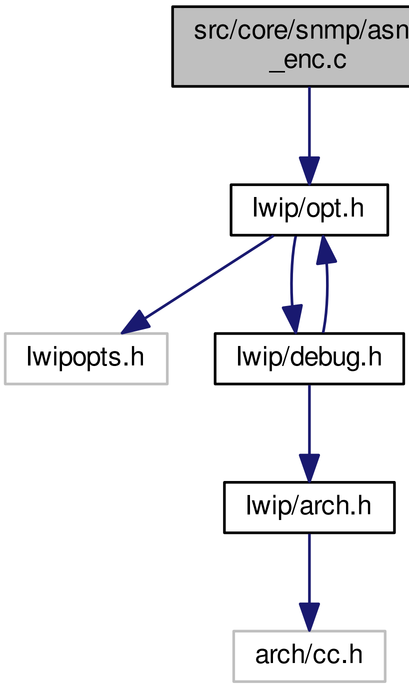
Abstract Syntax Notation One (ISO 8824, 8825) decoding

Todo not optimised (yet), favor correctness over speed, favor speed over size

5.31 src/core/snmp/asn1_enc.c File Reference

```
#include "lwip/opt.h"
```

Include dependency graph for asn1_enc.c:



5.31.1 Detailed Description

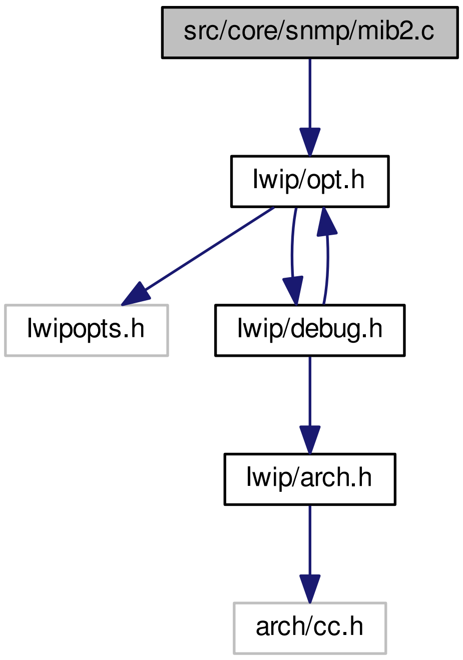
Abstract Syntax Notation One (ISO 8824, 8825) encoding

Todo not optimised (yet), favor correctness over speed, favor speed over size

5.32 src/core/snmp/mib2.c File Reference

```
#include "lwip/opt.h"
```

Include dependency graph for mib2.c:



5.32.1 Detailed Description

Management Information Base II (RFC1213) objects and functions.

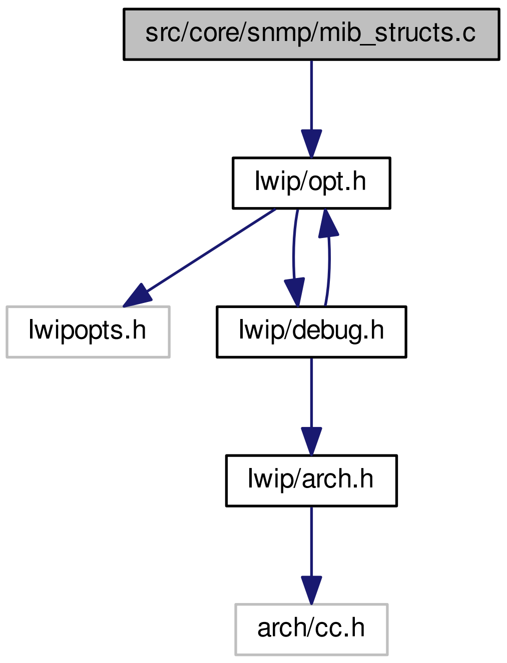
Note

the object identifiers for this MIB-2 and private MIB tree must be kept in sorted ascending order. This to ensure correct getnext operation.

5.33 src/core/snmp/mib_structs.c File Reference

```
#include "lwip/opt.h"
```

Include dependency graph for mib_structs.c:



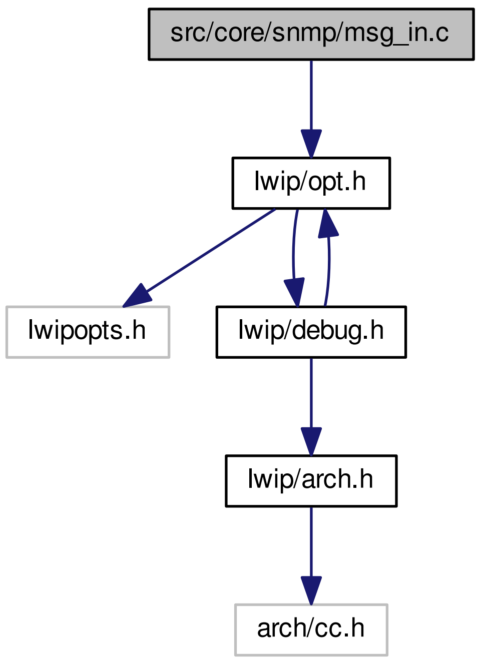
5.33.1 Detailed Description

MIB tree access/construction functions.

5.34 src/core/snmp/msg_in.c File Reference

```
#include "lwip/opt.h"
```

Include dependency graph for msg_in.c:



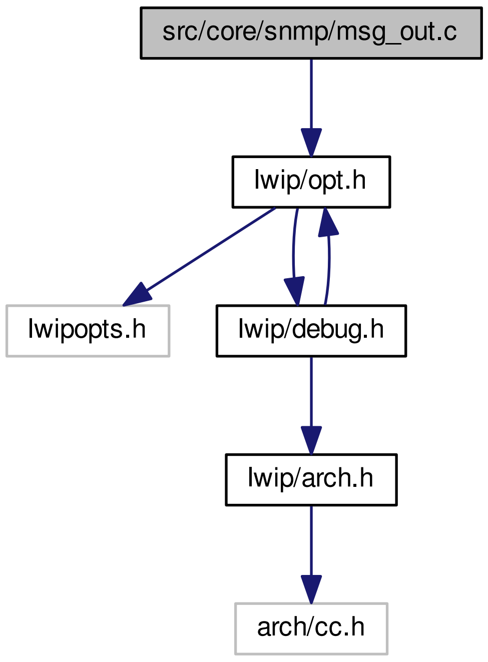
5.34.1 Detailed Description

SNMP input message processing (RFC1157).

5.35 src/core/snmp/msg_out.c File Reference

```
#include "lwip/opt.h"
```

Include dependency graph for msg_out.c:



5.35.1 Detailed Description

SNMP output message processing (RFC1157).

Output responses and traps are build in two passes:

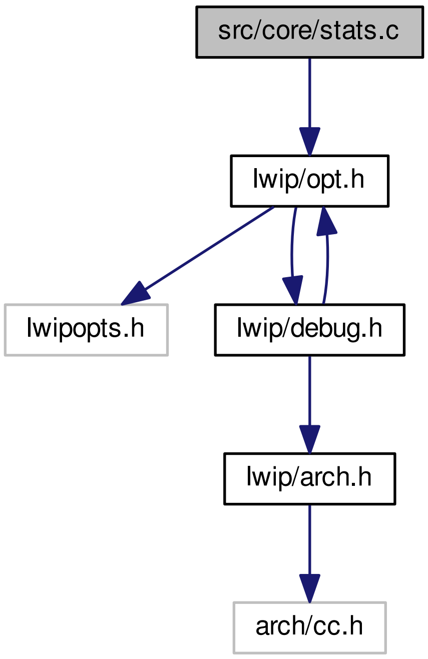
Pass 0: iterate over the output message backwards to determine encoding lengths Pass 1: the actual forward encoding of internal form into ASN1

The single-pass encoding method described by Comer & Stevens requires extra buffer space and copying for reversal of the packet. The buffer requirement can be prohibitively large for big payloads (>= 484) therefore we use the two encoding passes.

5.36 src/core/stats.c File Reference

```
#include "lwip/opt.h"
```

Include dependency graph for stats.c:



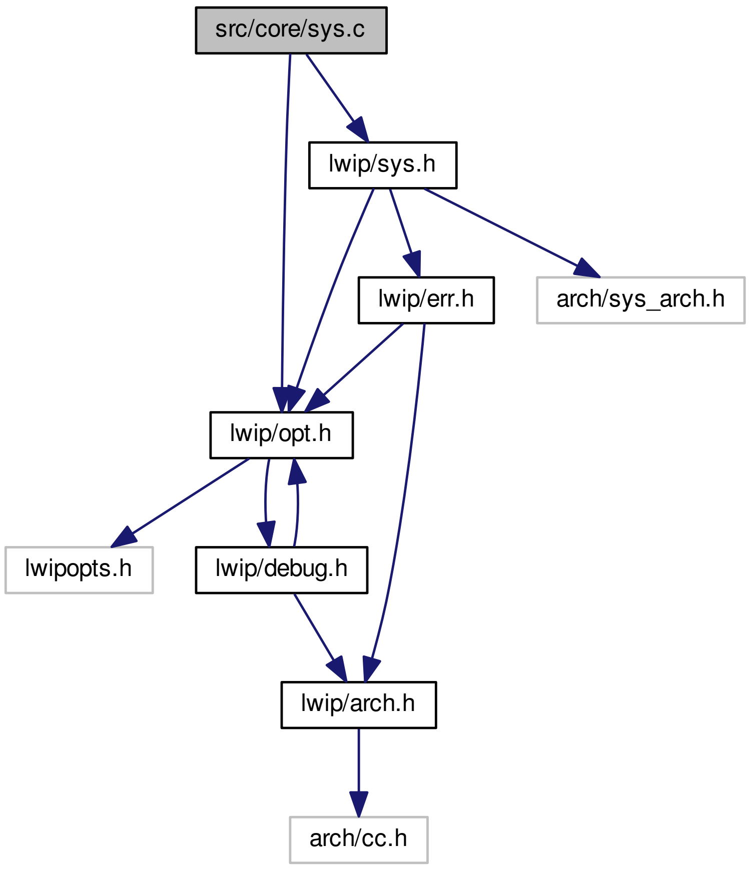
5.36.1 Detailed Description

Statistics module

5.37 src/core/sys.c File Reference

```
#include "lwip/opt.h"
#include "lwip/sys.h"
```

Include dependency graph for sys.c:



Functions

- void sys_msleep (u32_t ms)

5.37.1 Detailed Description

lwIP Operating System abstraction

5.37.2 Function Documentation

5.37.2.1 void sys_msleep (u32_t *ms*)

Sleep for some ms. Timeouts are NOT processed while sleeping.

Parameters

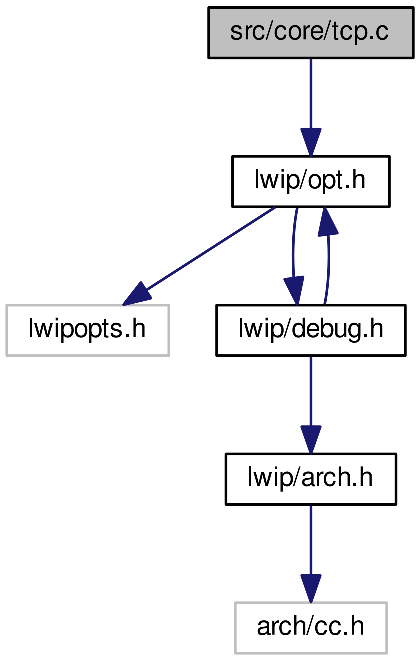
ms	number of milliseconds to sleep

Definition at line 55 of file sys.c.

5.38 src/core/tcp.c File Reference

```
#include "lwip/opt.h"
```

Include dependency graph for tcp.c:



5.38.1 Detailed Description

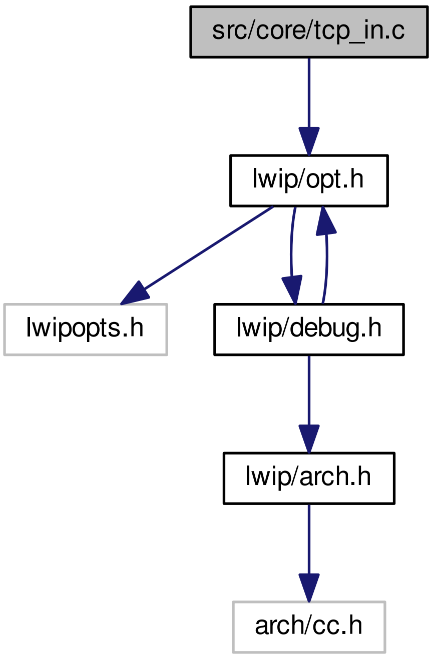
Transmission Control Protocol for IP

This file contains common functions for the TCP implementation, such as functinos for manipulating the data structures and the TCP timer functions. TCP functions related to input and output is found in tcp_in.c and tcp_out.c respectively.

5.39 src/core/tcp_in.c File Reference

```
#include "lwip/opt.h"
```

Include dependency graph for tcp_in.c:



5.39.1 Detailed Description

Transmission Control Protocol, incoming traffic

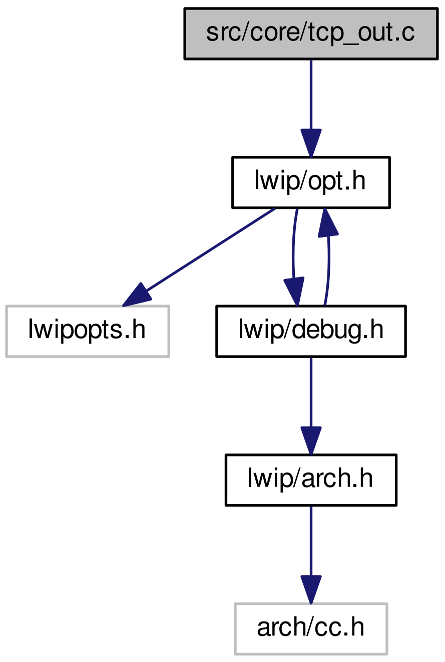
The input processing functions of the TCP layer.

These functions are generally called in the order (ip_input() ->) tcp_input() -> ∗ tcp_process() -> tcp_receive() (-> application).

5.40 src/core/tcp_out.c File Reference

```
#include "lwip/opt.h"
```

Include dependency graph for tcp_out.c:



5.40.1 Detailed Description

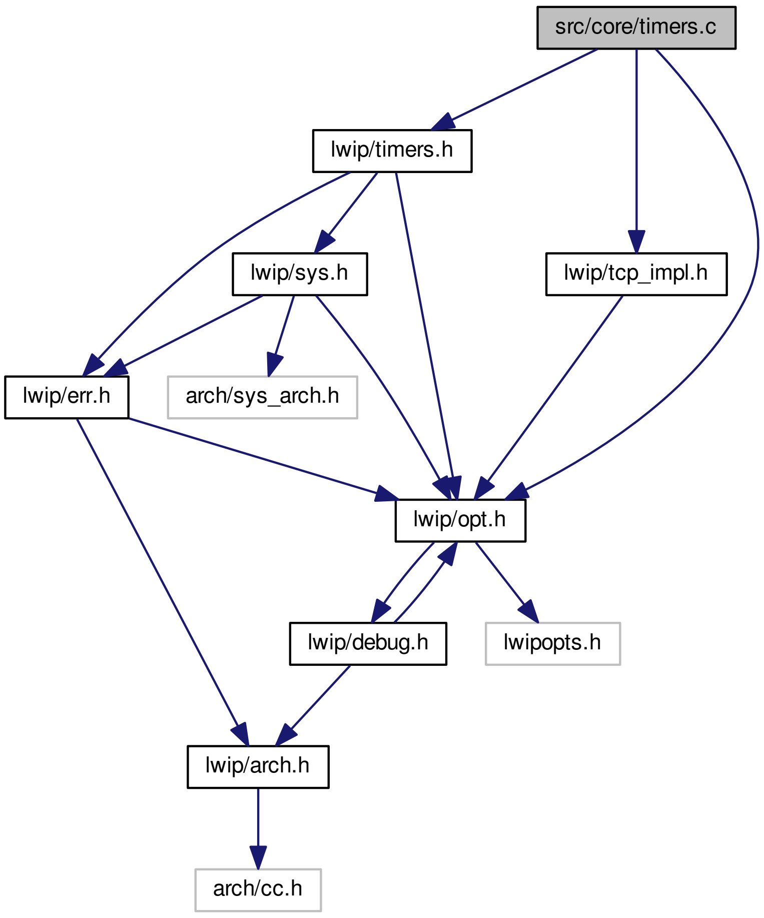
Transmission Control Protocol, outgoing traffic

The output functions of TCP.

5.41 src/core/timers.c File Reference

```
#include "lwip/opt.h"
#include "lwip/timers.h"
#include "lwip/tcp_impl.h"
```

Include dependency graph for timers.c:



Functions

- void tcp_timer_needed (void)

5.41.1 Detailed Description

Stack-internal timers implementation. This file includes timer callbacks for stack-internal timers as well as functions to set up or stop timers and check for expired timers.

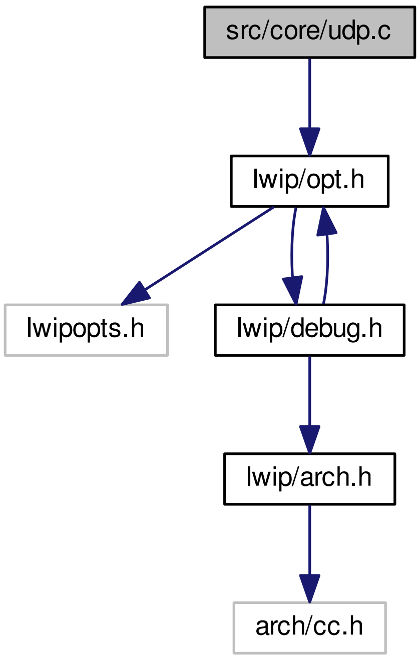
5.41.2 Function Documentation

5.41.2.1 void tcp_timer_needed (void)

Definition at line 484 of file timers.c.

5.42 src/core/udp.c File Reference

```
#include "lwip/opt.h"
```
Include dependency graph for udp.c:



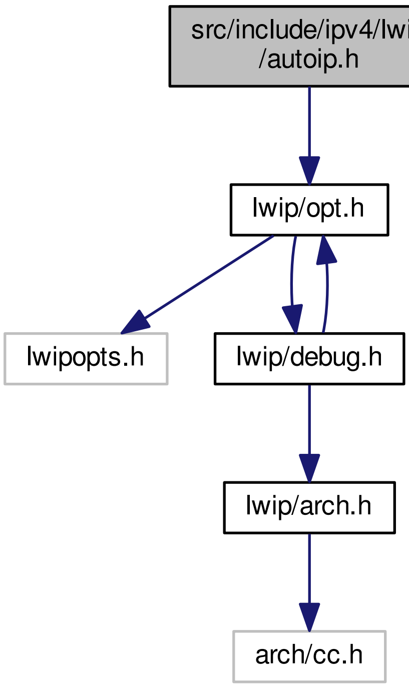
5.42.1 Detailed Description

User Datagram Protocol module

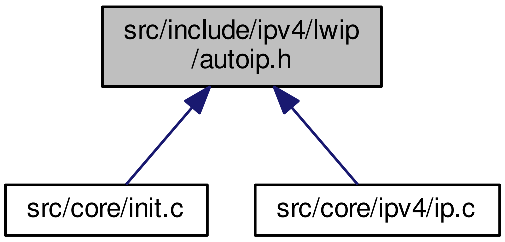
5.43 src/include/ipv4/lwip/autoip.h File Reference

`#include "lwip/opt.h"`

Include dependency graph for autoip.h:



This graph shows which files directly or indirectly include this file:



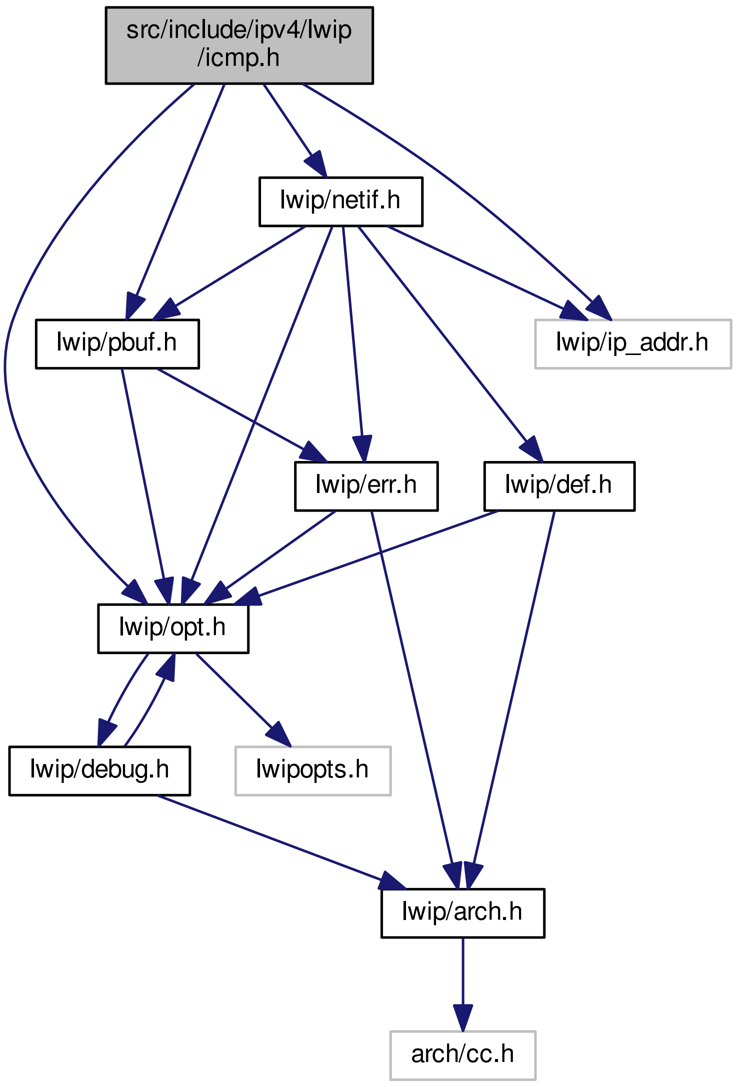
5.43.1 Detailed Description

AutoIP Automatic LinkLocal IP Configuration

5.44 src/include/ipv4/lwip/icmp.h File Reference

```
#include "lwip/opt.h"
#include "lwip/pbuf.h"
#include "lwip/ip_addr.h"
#include "lwip/netif.h"
```

Include dependency graph for icmp.h:



Data Structures

- struct icmp_echo_hdr

Macros

- #define ICMP_ER 0 /∗ echo reply ∗/

- #define ICMP_DUR 3 /∗ destination unreachable ∗/
- #define ICMP_SQ 4 /∗ source quench ∗/
- #define ICMP_RD 5 /∗ redirect ∗/
- #define ICMP_ECHO 8 /∗ echo ∗/
- #define ICMP_TE 11 /∗ time exceeded ∗/
- #define ICMP_PP 12 /∗ parameter problem ∗/
- #define ICMP_TS 13 /∗ timestamp ∗/
- #define ICMP_TSR 14 /∗ timestamp reply ∗/
- #define ICMP_IRQ 15 /∗ information request ∗/
- #define ICMP_IR 16 /∗ information reply ∗/
- #define ICMPH_TYPE(hdr) ((hdr)->type)
- #define ICMPH_CODE(hdr) ((hdr)->code)
- #define ICMPH_TYPE_SET(hdr, t) ((hdr)->type = (t))
- #define ICMPH_CODE_SET(hdr, c) ((hdr)->code = (c))

Enumerations

- enum icmp_dur_type {
  ICMP_DUR_NET = 0, ICMP_DUR_HOST = 1, ICMP_DUR_PROTO = 2, ICMP_DUR_PORT = 3,
  ICMP_DUR_FRAG = 4, ICMP_DUR_SR = 5 }
- enum icmp_te_type { ICMP_TE_TTL = 0, ICMP_TE_FRAG = 1 }

Variables

- PACK_STRUCT_BEGIN struct icmp_echo_hdr PACK_STRUCT_STRUCT

5.44.1 Macro Definition Documentation

5.44.1.1 #define ICMP_DUR 3 /∗ destination unreachable ∗/

Definition at line 45 of file icmp.h.

5.44.1.2 #define ICMP_ECHO 8 /∗ echo ∗/

Definition at line 48 of file icmp.h.

5.44.1.3 #define ICMP_ER 0 /∗ echo reply ∗/

Definition at line 44 of file icmp.h.

5.44.1.4 #define ICMP_IR 16 /∗ information reply ∗/

Definition at line 54 of file icmp.h.

5.44.1.5 #define ICMP_IRQ 15 /∗ information request ∗/

Definition at line 53 of file icmp.h.

5.44.1.6 #define ICMP_PP 12 /∗ parameter problem ∗/

Definition at line 50 of file icmp.h.

5.44.1.7 #define ICMP_RD 5 /∗ redirect ∗/

Definition at line 47 of file icmp.h.

5.44.1.8 #define ICMP_SQ 4 /∗ source quench ∗/

Definition at line 46 of file icmp.h.

5.44.1.9 #define ICMP_TE 11 /∗ time exceeded ∗/

Definition at line 49 of file icmp.h.

5.44.1.10 #define ICMP_TS 13 /∗ timestamp ∗/

Definition at line 51 of file icmp.h.

5.44.1.11 #define ICMP_TSR 14 /∗ timestamp reply ∗/

Definition at line 52 of file icmp.h.

5.44.1.12 #define ICMPH_CODE(*hdr*) ((hdr)->code)

Definition at line 92 of file icmp.h.

5.44.1.13 #define ICMPH_CODE_SET(*hdr*, *c*) ((hdr)->code = (c))

Definition at line 96 of file icmp.h.

5.44.1.14 #define ICMPH_TYPE(*hdr*) ((hdr)->type)

Definition at line 91 of file icmp.h.

5.44.1.15 #define ICMPH_TYPE_SET(*hdr*, *t*) ((hdr)->type = (t))

Combines type and code to an u16_t

Definition at line 95 of file icmp.h.

5.44.2 Enumeration Type Documentation

5.44.2.1 enum icmp_dur_type

Enumerator

ICMP_DUR_NET
ICMP_DUR_HOST
ICMP_DUR_PROTO
ICMP_DUR_PORT
ICMP_DUR_FRAG
ICMP_DUR_SR

Definition at line 56 of file icmp.h.

5.44.2.2 enum icmp_te_type

Enumerator

ICMP_TE_TTL

ICMP_TE_FRAG

Definition at line 65 of file icmp.h.

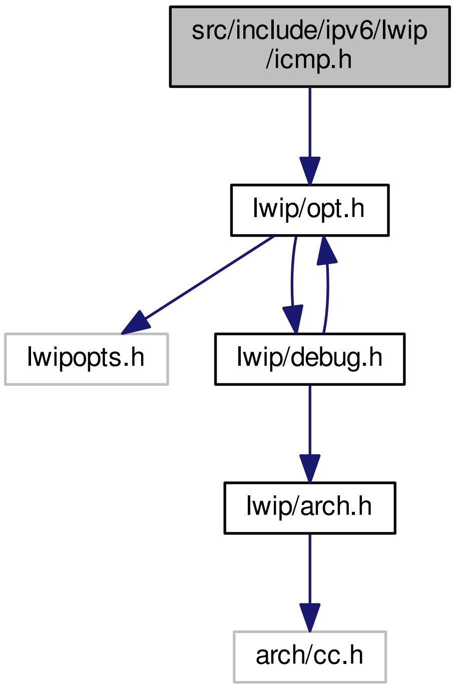
5.44.3 Variable Documentation

5.44.3.1 PACK_STRUCT_END PACK_STRUCT_BEGIN struct ip_addr2 PACK_STRUCT_STRUCT

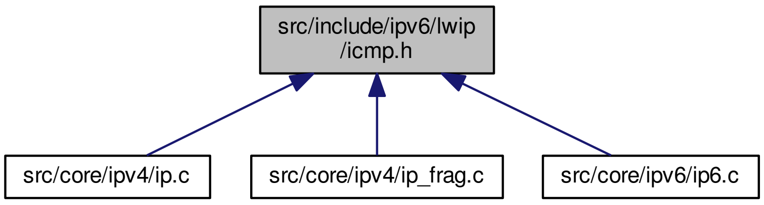
5.45 src/include/ipv6/lwip/icmp.h File Reference

```
#include "lwip/opt.h"
```

Include dependency graph for icmp.h:



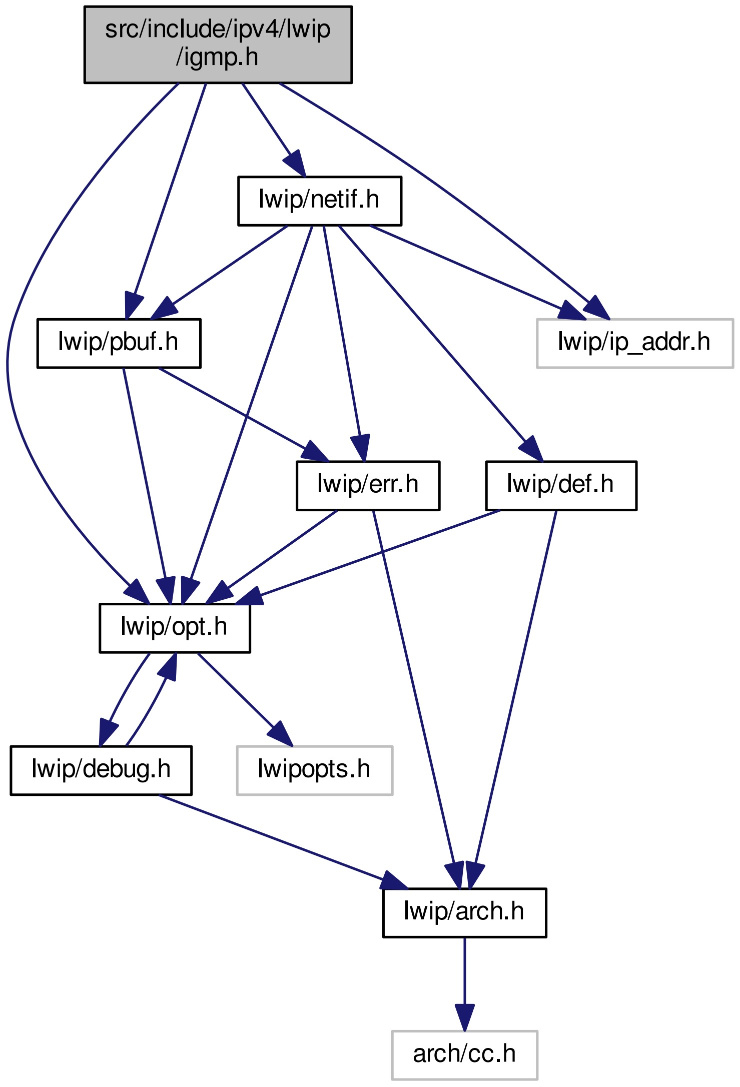
This graph shows which files directly or indirectly include this file:



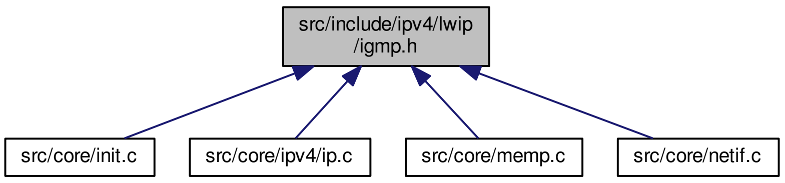
5.46 src/include/ipv4/lwip/igmp.h File Reference

```
#include "lwip/opt.h"
#include "lwip/ip_addr.h"
#include "lwip/netif.h"
#include "lwip/pbuf.h"
```

Include dependency graph for igmp.h:



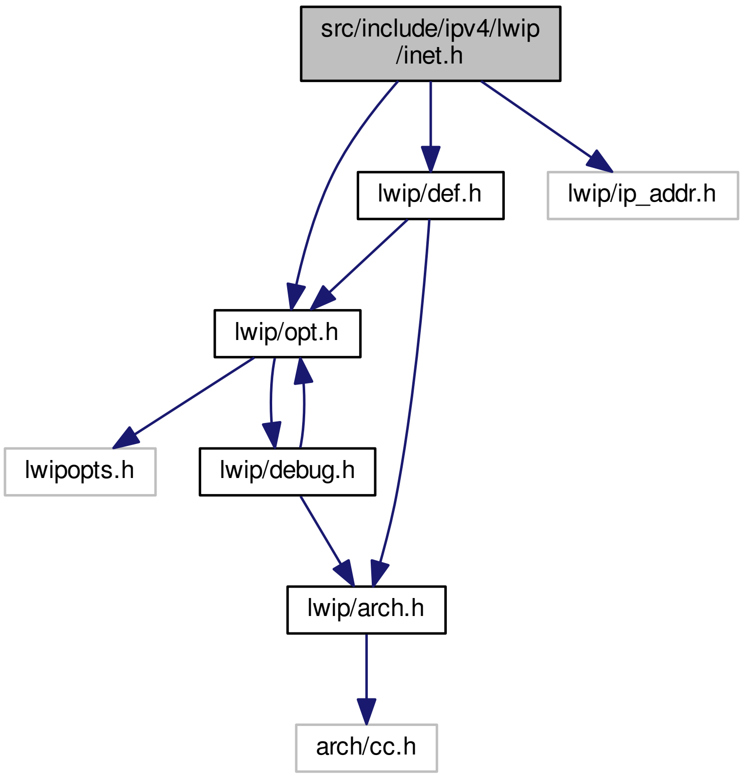
This graph shows which files directly or indirectly include this file:



5.47 src/include/ipv4/lwip/inet.h File Reference

```
#include "lwip/opt.h"
#include "lwip/def.h"
#include "lwip/ip_addr.h"
```

Include dependency graph for inet.h:



Data Structures

- struct in_addr

Macros

- #define INADDR_NONE IPADDR_NONE
- #define INADDR_LOOPBACK IPADDR_LOOPBACK
- #define INADDR_ANY IPADDR_ANY
- #define INADDR_BROADCAST IPADDR_BROADCAST
- #define IN_CLASSA(a) IP_CLASSA(a)
- #define IN_CLASSA_NET IP_CLASSA_NET
- #define IN_CLASSA_NSHIFT IP_CLASSA_NSHIFT
- #define IN_CLASSA_HOST IP_CLASSA_HOST
- #define IN_CLASSA_MAX IP_CLASSA_MAX
- #define IN_CLASSB(b) IP_CLASSB(b)

- #define IN_CLASSB_NET IP_CLASSB_NET
- #define IN_CLASSB_NSHIFT IP_CLASSB_NSHIFT
- #define IN_CLASSB_HOST IP_CLASSB_HOST
- #define IN_CLASSB_MAX IP_CLASSB_MAX
- #define IN_CLASSC(c) IP_CLASSC(c)
- #define IN_CLASSC_NET IP_CLASSC_NET
- #define IN_CLASSC_NSHIFT IP_CLASSC_NSHIFT
- #define IN_CLASSC_HOST IP_CLASSC_HOST
- #define IN_CLASSC_MAX IP_CLASSC_MAX
- #define IN_CLASSD(d) IP_CLASSD(d)
- #define IN_CLASSD_NET IP_CLASSD_NET /∗ These ones aren't really ∗/
- #define IN_CLASSD_NSHIFT IP_CLASSD_NSHIFT /∗ net and host fields, but ∗/
- #define IN_CLASSD_HOST IP_CLASSD_HOST /∗ routing needn't know. ∗/
- #define IN_CLASSD_MAX IP_CLASSD_MAX
- #define IN_MULTICAST(a) IP_MULTICAST(a)
- #define IN_EXPERIMENTAL(a) IP_EXPERIMENTAL(a)
- #define IN_BADCLASS(a) IP_BADCLASS(a)
- #define IN_LOOPBACKNET IP_LOOPBACKNET
- #define inet_addr_from_ipaddr(target_inaddr, source_ipaddr) ((target_inaddr)->s_addr = ip4_addr_get_↵
u32(source_ipaddr))
- #define inet_addr_to_ipaddr(target_ipaddr, source_inaddr) (ip4_addr_set_u32(target_ipaddr, (source_↵
inaddr)->s_addr))
- #define inet_addr_to_ipaddr_p(target_ipaddr_p, source_inaddr) ((target_ipaddr_p) = (ip_addr_t∗)&((source↵
_inaddr)->s_addr))
- #define inet_addr(cp) ipaddr_addr(cp)
- #define inet_aton(cp, addr) ipaddr_aton(cp, (ip_addr_t∗)addr)
- #define inet_ntoa(addr) ipaddr_ntoa((ip_addr_t∗)&(addr))
- #define inet_ntoa_r(addr, buf, buflen) ipaddr_ntoa_r((ip_addr_t∗)&(addr), buf, buflen)

5.47.1 Macro Definition Documentation

5.47.1.1 #define IN_BADCLASS(*a*) IP_BADCLASS(a)

Definition at line 88 of file inet.h.

5.47.1.2 #define IN_CLASSA(*a*) IP_CLASSA(a)

Definition at line 61 of file inet.h.

5.47.1.3 #define IN_CLASSA_HOST IP_CLASSA_HOST

Definition at line 64 of file inet.h.

5.47.1.4 #define IN_CLASSA_MAX IP_CLASSA_MAX

Definition at line 65 of file inet.h.

5.47.1.5 #define IN_CLASSA_NET IP_CLASSA_NET

Definition at line 62 of file inet.h.

5.47.1.6 #define IN_CLASSA_NSHIFT IP_CLASSA_NSHIFT

Definition at line 63 of file inet.h.

5.47.1.7 #define IN_CLASSB(*b*) IP_CLASSB(b)

Definition at line 67 of file inet.h.

5.47.1.8 #define IN_CLASSB_HOST IP_CLASSB_HOST

Definition at line 70 of file inet.h.

5.47.1.9 #define IN_CLASSB_MAX IP_CLASSB_MAX

Definition at line 71 of file inet.h.

5.47.1.10 #define IN_CLASSB_NET IP_CLASSB_NET

Definition at line 68 of file inet.h.

5.47.1.11 #define IN_CLASSB_NSHIFT IP_CLASSB_NSHIFT

Definition at line 69 of file inet.h.

5.47.1.12 #define IN_CLASSC(*c*) IP_CLASSC(c)

Definition at line 73 of file inet.h.

5.47.1.13 #define IN_CLASSC_HOST IP_CLASSC_HOST

Definition at line 76 of file inet.h.

5.47.1.14 #define IN_CLASSC_MAX IP_CLASSC_MAX

Definition at line 77 of file inet.h.

5.47.1.15 #define IN_CLASSC_NET IP_CLASSC_NET

Definition at line 74 of file inet.h.

5.47.1.16 #define IN_CLASSC_NSHIFT IP_CLASSC_NSHIFT

Definition at line 75 of file inet.h.

5.47.1.17 #define IN_CLASSD(*d*) IP_CLASSD(d)

Definition at line 79 of file inet.h.

5.47.1.18 #define IN_CLASSD_HOST IP_CLASSD_HOST /* routing needn't know. */

Definition at line 82 of file inet.h.

5.47.1.19 #define IN_CLASSD_MAX IP_CLASSD_MAX

Definition at line 83 of file inet.h.

5.47.1.20 #define IN_CLASSD_NET IP_CLASSD_NET /* These ones aren't really */

Definition at line 80 of file inet.h.

5.47.1.21 #define IN_CLASSD_NSHIFT IP_CLASSD_NSHIFT /* net and host fields, but */

Definition at line 81 of file inet.h.

5.47.1.22 #define IN_EXPERIMENTAL(*a*) IP_EXPERIMENTAL(a)

Definition at line 87 of file inet.h.

5.47.1.23 #define IN_LOOPBACKNET IP_LOOPBACKNET

Definition at line 90 of file inet.h.

5.47.1.24 #define IN_MULTICAST(*a*) IP_MULTICAST(a)

Definition at line 85 of file inet.h.

5.47.1.25 #define INADDR_ANY IPADDR_ANY

0.0.0.0

Definition at line 53 of file inet.h.

5.47.1.26 #define INADDR_BROADCAST IPADDR_BROADCAST

255.255.255.255

Definition at line 55 of file inet.h.

5.47.1.27 #define INADDR_LOOPBACK IPADDR_LOOPBACK

127.0.0.1

Definition at line 51 of file inet.h.

5.47.1.28 #define INADDR_NONE IPADDR_NONE

255.255.255.255

Definition at line 49 of file inet.h.

5.47.1.29 #define inet_addr(*cp*) **ipaddr_addr**(cp)

Definition at line 98 of file inet.h.

5.47.1.30 #define inet_addr_from_ipaddr(*target_inaddr,* *source_ipaddr*) ((target_inaddr)->s_addr = **ip4_addr_get_u32**(source_ipaddr))

Definition at line 92 of file inet.h.

5.47.1.31 #define inet_addr_to_ipaddr(*target_ipaddr,* *source_inaddr*) (**ip4_addr_set_u32**(target_ipaddr, (source_inaddr)->s_addr))

Definition at line 93 of file inet.h.

5.47.1.32 #define inet_addr_to_ipaddr_p(*target_ipaddr_p,* *source_inaddr*) ((target_ipaddr_p) = (**ip_addr_t**∗)&((source_inaddr)->s_addr))

Definition at line 95 of file inet.h.

5.47.1.33 #define inet_aton(*cp,* *addr*) **ipaddr_aton**(cp, (**ip_addr_t**∗)addr)

Definition at line 99 of file inet.h.

5.47.1.34 #define inet_ntoa(*addr*) **ipaddr_ntoa**((**ip_addr_t**∗)&(addr))

Definition at line 100 of file inet.h.

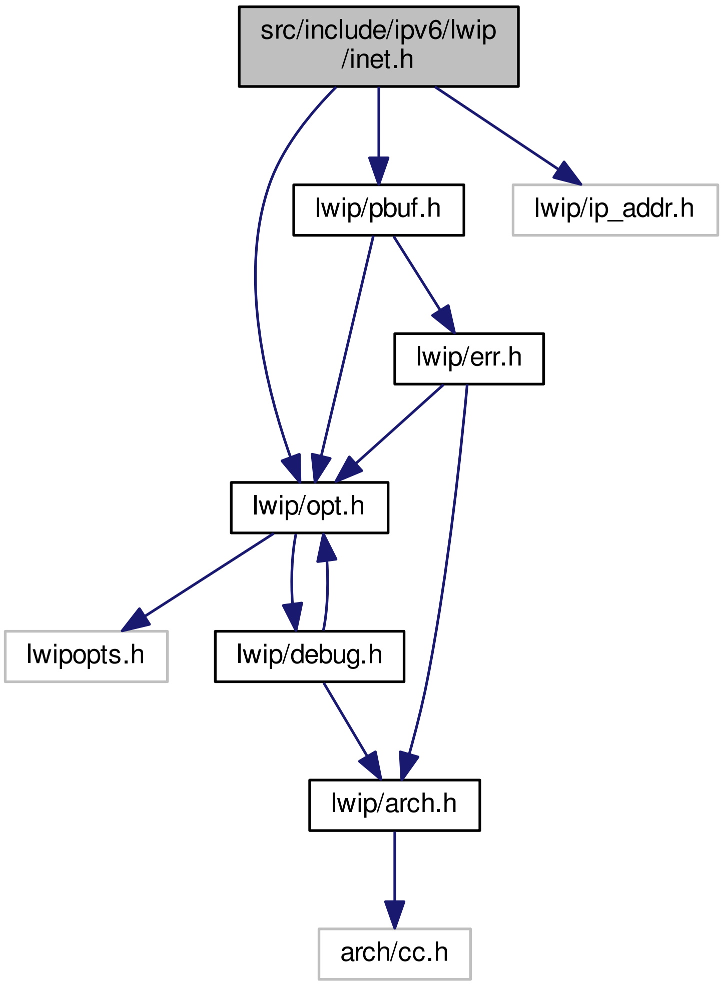
5.47.1.35 #define inet_ntoa_r(*addr,* *buf,* *buflen*) **ipaddr_ntoa_r**((**ip_addr_t**∗)&(addr), buf, buflen)

Definition at line 101 of file inet.h.

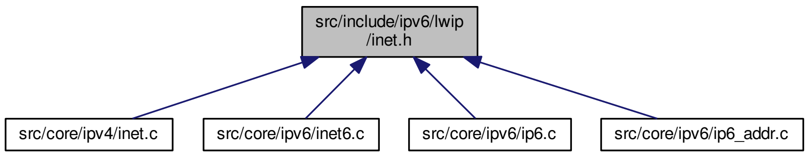
5.48 src/include/ipv6/lwip/inet.h File Reference

```
#include "lwip/opt.h"
#include "lwip/pbuf.h"
#include "lwip/ip_addr.h"
```

Include dependency graph for inet.h:



This graph shows which files directly or indirectly include this file:



Functions

- u16_t inet_chksum (void ∗data, u16_t len)

- u16_t inet_chksum_pbuf (struct pbuf ∗p)
- u16_t inet_chksum_pseudo (struct pbuf ∗p, struct ip_addr ∗src, struct ip_addr ∗dest, u8_t proto, u32_↩
t proto_len)
- u32_t inet_addr (const char ∗cp)
- s8_t inet_aton (const char ∗cp, struct in_addr ∗addr)
- u16_t htons (u16_t n)
- u16_t ntohs (u16_t n)
- u32_t htonl (u32_t n)
- u32_t ntohl (u32_t n)

5.48.1 Function Documentation

5.48.1.1 u32_t htonl (u32_t *n*)

5.48.1.2 u16_t htons (u16_t *n*)

5.48.1.3 u32_t inet_addr (const char ∗ *cp*)

5.48.1.4 s8_t inet_aton (const char ∗ *cp,* struct in_addr ∗ *addr*)

5.48.1.5 u16_t inet_chksum (void ∗ *data,* u16_t *len*)

Definition at line 396 of file inet_chksum.c.

5.48.1.6 u16_t inet_chksum_pbuf (struct pbuf ∗ *p*)

Calculate a checksum over a chain of pbufs (without pseudo-header, much like inet_chksum only pbufs are used).

Parameters

p	pbuf chain over that the checksum should be calculated

Returns

checksum (as u16_t) to be saved directly in the protocol header

Definition at line 409 of file inet_chksum.c.

5.48.1.7 u16_t inet_chksum_pseudo (struct pbuf ∗ *p,* struct ip_addr ∗ *src,* struct ip_addr ∗ *dest,* u8_t *proto,* u32_t *proto_len*)

Definition at line 80 of file inet6.c.

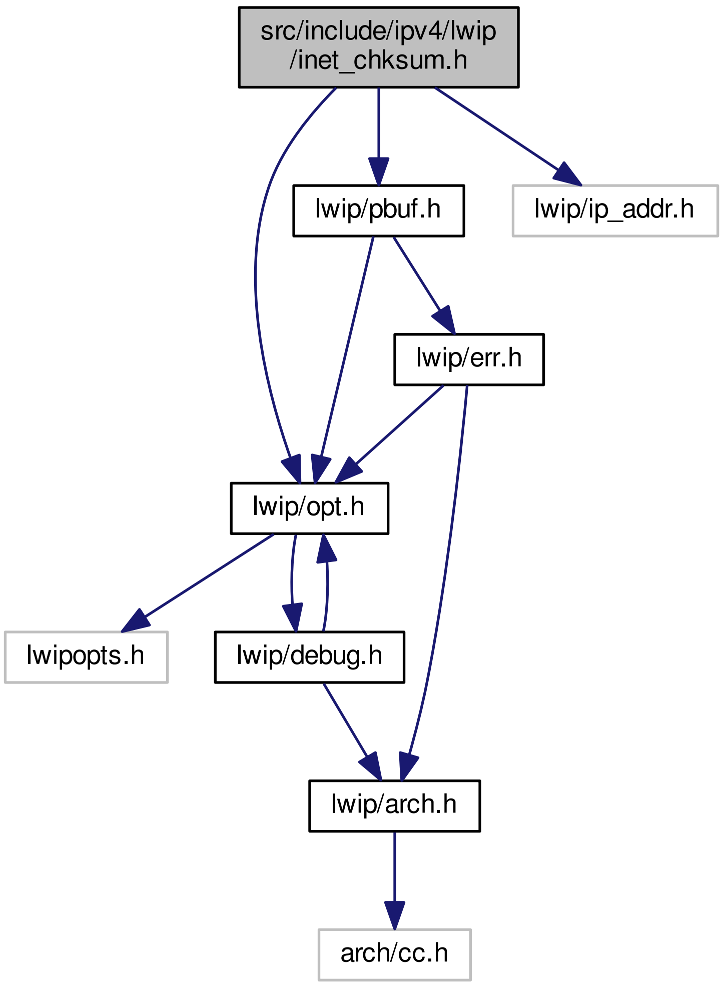
5.48.1.8 u32_t ntohl (u32_t *n*)

5.48.1.9 u16_t ntohs (u16_t *n*)

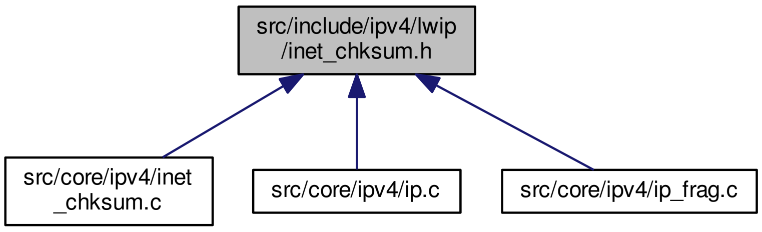
5.49 src/include/ipv4/lwip/inet_chksum.h File Reference

```
#include "lwip/opt.h"
#include "lwip/pbuf.h"
#include "lwip/ip_addr.h"
```

Include dependency graph for inet_chksum.h:



This graph shows which files directly or indirectly include this file:



Macros

- #define SWAP_BYTES_IN_WORD(w) (((w) & 0xff) << 8) | (((w) & 0xff00) >> 8)
- #define FOLD_U32T(u) (((u) >> 16) + ((u) & 0x0000ffffUL))
- #define LWIP_CHKSUM_COPY_ALGORITHM 0

Functions

- u16_t inet_chksum (void ∗dataptr, u16_t len)
- u16_t inet_chksum_pbuf (struct pbuf ∗p)
- u16_t inet_chksum_pseudo (struct pbuf ∗p, ip_addr_t ∗src, ip_addr_t ∗dest, u8_t proto, u16_t proto_len)
- u16_t inet_chksum_pseudo_partial (struct pbuf ∗p, ip_addr_t ∗src, ip_addr_t ∗dest, u8_t proto, u16_t proto←
_len, u16_t chksum_len)

5.49.1 Macro Definition Documentation

5.49.1.1 #define FOLD_U32T(*u*) (((u) >> 16) + ((u) & 0x0000ffffUL))

Split an u32_t in two u16_ts and add them up

Definition at line 53 of file inet_chksum.h.

5.49.1.2 #define LWIP_CHKSUM_COPY_ALGORITHM 0

Definition at line 66 of file inet_chksum.h.

5.49.1.3 #define SWAP_BYTES_IN_WORD(*w*) (((w) & 0xff) << 8) | (((w) & 0xff00) >> 8)

Swap the bytes in an u16_t: much like htons() for little-endian

Definition at line 47 of file inet_chksum.h.

5.49.2 Function Documentation

5.49.2.1 u16_t inet_chksum (void ∗ *dataptr,* u16_t *len*)

Definition at line 396 of file inet_chksum.c.

5.49.2.2 u16_t inet_chksum_pbuf (struct pbuf ∗ *p*)

Calculate a checksum over a chain of pbufs (without pseudo-header, much like inet_chksum only pbufs are used).

Parameters

p	pbuf chain over that the checksum should be calculated

Returns

checksum (as u16_t) to be saved directly in the protocol header

Definition at line 409 of file inet_chksum.c.

5.49.2.3 u16_t inet_chksum_pseudo (struct pbuf ∗ *p,* ip_addr_t ∗ *src,* ip_addr_t ∗ *dest,* u8_t *proto,* u16_t *proto_len*)

Definition at line 272 of file inet_chksum.c.

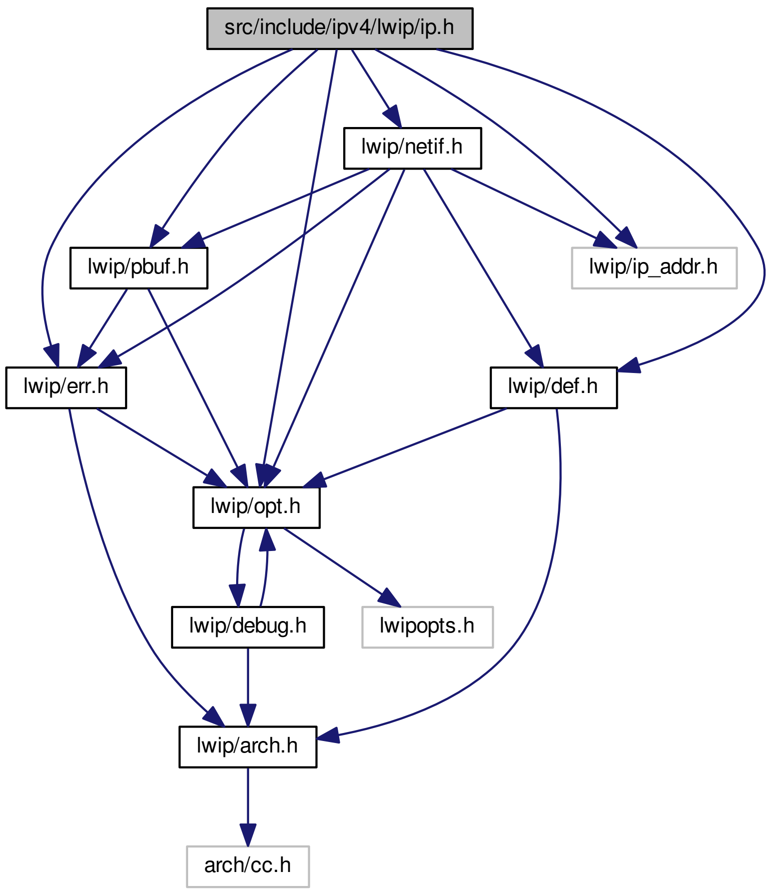
5.49.2.4 u16_t inet_chksum_pseudo_partial (struct pbuf ∗ *p*, ip_addr_t ∗ *src*, ip_addr_t ∗ *dest*, u8_t *proto*, u16_t *proto_len*, u16_t *chksum_len*)

Definition at line 332 of file inet_chksum.c.

5.50 src/include/ipv4/lwip/ip.h File Reference

```
#include "lwip/opt.h"
#include "lwip/def.h"
#include "lwip/pbuf.h"
#include "lwip/ip_addr.h"
#include "lwip/err.h"
#include "lwip/netif.h"
```

Include dependency graph for ip.h:



Data Structures

- struct ip_pcb
- struct ip_hdr

Macros

- #define IP_OPTIONS_SEND LWIP_IGMP
- #define IP_HLEN 20
- #define IP_PROTO_ICMP 1
- #define IP_PROTO_IGMP 2
- #define IP_PROTO_UDP 17
- #define IP_PROTO_UDPLITE 136
- #define IP_PROTO_TCP 6
- #define IP_HDRINCL NULL
- #define IP_PCB_ADDRHINT
- #define IP_PCB
- #define SOF_ACCEPTCONN 0x02U /∗ socket has had listen() ∗/
- #define SOF_REUSEADDR 0x04U /∗ allow local address reuse ∗/
- #define SOF_KEEPALIVE 0x08U /∗ keep connections alive ∗/
- #define SOF_BROADCAST 0x20U /∗ permit to send and to receive broadcast messages (see IP_SOF_B↩ ROADCAST option) ∗/
- #define SOF_LINGER 0x80U /∗ linger on close if data present ∗/
- #define SOF_INHERITED (SOF_REUSEADDR|SOF_KEEPALIVE|SOF_LINGER/∗|SOF_DEBUG|SOF_↩ DONTROUTE|SOF_OOBINLINE∗/)
- #define IP_RF 0x8000U /∗ reserved fragment flag ∗/
- #define IP_DF 0x4000U /∗ dont fragment flag ∗/
- #define IP_MF 0x2000U /∗ more fragments flag ∗/
- #define IP_OFFMASK 0x1fffU /∗ mask for fragmenting bits ∗/
- #define IPH_V(hdr) ((hdr)->_v_hl >> 4)
- #define IPH_HL(hdr) ((hdr)->_v_hl & 0x0f)
- #define IPH_TOS(hdr) ((hdr)->_tos)
- #define IPH_LEN(hdr) ((hdr)->_len)
- #define IPH_ID(hdr) ((hdr)->_id)
- #define IPH_OFFSET(hdr) ((hdr)->_offset)
- #define IPH_TTL(hdr) ((hdr)->_ttl)
- #define IPH_PROTO(hdr) ((hdr)->_proto)
- #define IPH_CHKSUM(hdr) ((hdr)->_chksum)
- #define IPH_VHL_SET(hdr, v, hl) (hdr)->_v_hl = (((v) << 4) | (hl))
- #define IPH_TOS_SET(hdr, tos) (hdr)->_tos = (tos)
- #define IPH_LEN_SET(hdr, len) (hdr)->_len = (len)
- #define IPH_ID_SET(hdr, id) (hdr)->_id = (id)
- #define IPH_OFFSET_SET(hdr, off) (hdr)->_offset = (off)
- #define IPH_TTL_SET(hdr, ttl) (hdr)->_ttl = (u8_t)(ttl)
- #define IPH_PROTO_SET(hdr, proto) (hdr)->_proto = (u8_t)(proto)
- #define IPH_CHKSUM_SET(hdr, chksum) (hdr)->_chksum = (chksum)
- #define ip_init() /∗ Compatibility define, not init needed. ∗/
- #define ip_current_netif() (current_netif)
- #define ip_current_header() (current_header)
- #define ip_current_src_addr() (&current_iphdr_src)
- #define ip_current_dest_addr() (&current_iphdr_dest)
- #define ip_get_option(pcb, opt) ((pcb)->so_options & (opt))
- #define ip_set_option(pcb, opt) ((pcb)->so_options |= (opt))
- #define ip_reset_option(pcb, opt) ((pcb)->so_options &= ∼(opt))
- #define ip_debug_print(p)

Functions

- struct netif ∗ ip_route (ip_addr_t ∗dest)
- err_t ip_input (struct pbuf ∗p, struct netif ∗inp)
- err_t ip_output (struct pbuf ∗p, ip_addr_t ∗src, ip_addr_t ∗dest, u8_t ttl, u8_t tos, u8_t proto)
- err_t ip_output_if (struct pbuf ∗p, ip_addr_t ∗src, ip_addr_t ∗dest, u8_t ttl, u8_t tos, u8_t proto, struct netif ∗netif)

Variables

- PACK_STRUCT_BEGIN struct ip_hdr PACK_STRUCT_STRUCT
- struct netif ∗ current_netif
- const struct ip_hdr ∗ current_header
- ip_addr_t current_iphdr_src
- ip_addr_t current_iphdr_dest

5.50.1 Macro Definition Documentation

5.50.1.1 #define ip_current_dest_addr( ) (&current_iphdr_dest)

Destination IP address of current_header

Definition at line 202 of file ip.h.

5.50.1.2 #define ip_current_header( ) (current_header)

Get the IP header of the current packet. This function must only be called from a receive callback (udp_recv, raw_recv, tcp_accept). It will return NULL otherwise.

Definition at line 198 of file ip.h.

5.50.1.3 #define ip_current_netif( ) (current_netif)

Get the interface that received the current packet. This function must only be called from a receive callback (udp↩_recv, raw_recv, tcp_accept). It will return NULL otherwise.

Definition at line 194 of file ip.h.

5.50.1.4 #define ip_current_src_addr( ) (&current_iphdr_src)

Source IP address of current_header

Definition at line 200 of file ip.h.

5.50.1.5 #define ip_debug_print(*p*)

Definition at line 214 of file ip.h.

5.50.1.6 #define IP_DF 0x4000U /∗ dont fragment flag ∗/

Definition at line 128 of file ip.h.

5.50.1.7 #define ip_get_option(*pcb,* *opt*) ((pcb)->so_options & (opt))

Gets an IP pcb option (SOF_∗ flags)

Definition at line 205 of file ip.h.

5.50.1.8 #define IP_HDRINCL NULL

Definition at line 64 of file ip.h.

5.50.1.9 #define IP_HLEN 20

Definition at line 50 of file ip.h.

5.50.1.10 #define ip_init(*void*) /∗ Compatibility define, not init needed. ∗/

Definition at line 174 of file ip.h.

5.50.1.11 #define IP_MF 0x2000U /∗ more fragments flag ∗/

Definition at line 129 of file ip.h.

5.50.1.12 #define IP_OFFMASK 0x1fffU /∗ mask for fragmenting bits ∗/

Definition at line 130 of file ip.h.

5.50.1.13 #define IP_OPTIONS_SEND LWIP_IGMP

Currently, the function ip_output_if_opt() is only used with IGMP

Definition at line 48 of file ip.h.

5.50.1.14 #define IP_PCB

Value:

```
/* ip addresses in network byte order */ \
  ip_addr_t local_ip; \
  ip_addr_t remote_ip; \
   /* Socket options */  \
  u8_t so_options;      \
   /* Type Of Service */ \
  u8_t tos;              \
  /* Time To Live */     \
  u8_t ttl               \
  /* link layer address resolution hint */ \
  IP_PCB_ADDRHINT
```

Definition at line 76 of file ip.h.

5.50.1.15 #define IP_PCB_ADDRHINT

Definition at line 69 of file ip.h.

5.50.1.16 #define IP_PROTO_ICMP 1

Definition at line 52 of file ip.h.

5.50.1.17 #define IP_PROTO_IGMP 2

Definition at line 53 of file ip.h.

5.50.1.18 #define IP_PROTO_TCP 6

Definition at line 56 of file ip.h.

5.50.1.19 #define IP_PROTO_UDP 17

Definition at line 54 of file ip.h.

5.50.1.20 #define IP_PROTO_UDPLITE 136

Definition at line 55 of file ip.h.

5.50.1.21 #define ip_reset_option(*pcb*, *opt*) ((pcb)->so_options &= ~(opt))

Resets an IP pcb option (SOF_* flags)

Definition at line 209 of file ip.h.

5.50.1.22 #define IP_RF 0x8000U /* reserved fragment flag */

Definition at line 127 of file ip.h.

5.50.1.23 #define ip_set_option(*pcb*, *opt*) ((pcb)->so_options |= (opt))

Sets an IP pcb option (SOF_* flags)

Definition at line 207 of file ip.h.

5.50.1.24 #define IPH_CHKSUM(*hdr*) ((hdr)->_chksum)

Definition at line 154 of file ip.h.

5.50.1.25 #define IPH_CHKSUM_SET(*hdr*, *chksum*) (hdr)->_chksum = (chksum)

Definition at line 163 of file ip.h.

5.50.1.26 #define IPH_HL(*hdr*) ((hdr)->_v_hl & 0x0f)

Definition at line 147 of file ip.h.

5.50.1.27 #define IPH_ID(*hdr*) ((hdr)->_id)

Definition at line 150 of file ip.h.

5.50.1.28 #define IPH_ID_SET(*hdr, id*) (hdr)->_id = (id)

Definition at line 159 of file ip.h.

5.50.1.29 #define IPH_LEN(*hdr*) ((hdr)->_len)

Definition at line 149 of file ip.h.

5.50.1.30 #define IPH_LEN_SET(*hdr, len*) (hdr)->_len = (len)

Definition at line 158 of file ip.h.

5.50.1.31 #define IPH_OFFSET(*hdr*) ((hdr)->_offset)

Definition at line 151 of file ip.h.

5.50.1.32 #define IPH_OFFSET_SET(*hdr, off*) (hdr)->_offset = (off)

Definition at line 160 of file ip.h.

5.50.1.33 #define IPH_PROTO(*hdr*) ((hdr)->_proto)

Definition at line 153 of file ip.h.

5.50.1.34 #define IPH_PROTO_SET(*hdr, proto*) (hdr)->_proto = (u8_t)(proto)

Definition at line 162 of file ip.h.

5.50.1.35 #define IPH_TOS(*hdr*) ((hdr)->_tos)

Definition at line 148 of file ip.h.

5.50.1.36 #define IPH_TOS_SET(*hdr, tos*) (hdr)->_tos = (tos)

Definition at line 157 of file ip.h.

5.50.1.37 #define IPH_TTL(*hdr*) ((hdr)->_ttl)

Definition at line 152 of file ip.h.

5.50.1.38 #define IPH_TTL_SET(*hdr, ttl*) (hdr)->_ttl = (u8_t)(ttl)

Definition at line 161 of file ip.h.

5.50.1.39 #define IPH_V(*hdr*) ((hdr)->_v_hl >> 4)

Definition at line 146 of file ip.h.

5.50.1.40 #define IPH_VHL_SET(*hdr, v, hl*) (hdr)->_v_hl = (((v) << 4) | (hl))

Definition at line 156 of file ip.h.

5.50.1.41 #define SOF_ACCEPTCONN 0x02U /* socket has had listen() */

Definition at line 98 of file ip.h.

5.50.1.42 #define SOF_BROADCAST 0x20U /* permit to send and to receive broadcast messages (see IP_SOF_BROADCAST option) */

Definition at line 102 of file ip.h.

5.50.1.43 #define SOF_INHERITED (SOF_REUSEADDR|SOF_KEEPALIVE|SOF_LINGER/*|SOF_DEBUG|SOF_DON↩ TROUTE|SOF_OOBINLINE*/)

Definition at line 109 of file ip.h.

5.50.1.44 #define SOF_KEEPALIVE 0x08U /* keep connections alive */

Definition at line 100 of file ip.h.

5.50.1.45 #define SOF_LINGER 0x80U /* linger on close if data present */

Definition at line 104 of file ip.h.

5.50.1.46 #define SOF_REUSEADDR 0x04U /* allow local address reuse */

Definition at line 99 of file ip.h.

5.50.2 Function Documentation

5.50.2.1 err_t ip_input (struct pbuf * *p*, struct netif * *inp*)

This function is called by the network interface device driver when an IP packet is received. The function does the basic checks of the IP header such as packet size being at least larger than the header size etc. If the packet was not destined for us, the packet is forwarded (using ip_forward). The IP checksum is always checked.

Finally, the packet is sent to the upper layer protocol input function.

Parameters

p	the received IP packet (p->payload points to IP header)
inp	the netif on which this packet was received

Returns

ERR_OK if the packet was processed (could return ERR_* if it wasn't processed, but currently always returns ERR_OK)

Definition at line 305 of file ip.c.

5.50.2.2 err_t ip_output (struct pbuf ∗ *p*, ip_addr_t ∗ *src*, ip_addr_t ∗ *dest*, u8_t *ttl*, u8_t *tos*, u8_t *proto*)

Simple interface to ip_output_if. It finds the outgoing network interface and calls upon ip_output_if to do the actual work.

Parameters

p	the packet to send (p->payload points to the data, e.g. next protocol header; if dest == IP_HDRINCL, p already includes an IP header and p->payload points to that IP header)
src	the source IP address to send from (if src == IP_ADDR_ANY, the IP address of the netif used to send is used as source address)
dest	the destination IP address to send the packet to
ttl	the TTL value to be set in the IP header
tos	the TOS value to be set in the IP header
proto	the PROTOCOL to be set in the IP header

Returns

ERR_RTE if no route is found see ip_output_if() for more return values

Definition at line 818 of file ip.c.

5.50.2.3 err_t ip_output_if (struct pbuf ∗ *p*, ip_addr_t ∗ *src*, ip_addr_t ∗ *dest*, u8_t *ttl*, u8_t *tos*, u8_t *proto*, struct netif ∗ *netif*)

Sends an IP packet on a network interface. This function constructs the IP header and calculates the IP header checksum. If the source IP address is NULL, the IP address of the outgoing network interface is filled in as source address. If the destination IP address is IP_HDRINCL, p is assumed to already include an IP header and p->payload points to it instead of the data.

Parameters

p	the packet to send (p->payload points to the data, e.g. next protocol header; if dest == IP_HDRINCL, p already includes an IP header and p->payload points to that IP header)
src	the source IP address to send from (if src == IP_ADDR_ANY, the IP address of the netif used to send is used as source address)
dest	the destination IP address to send the packet to
ttl	the TTL value to be set in the IP header
tos	the TOS value to be set in the IP header
proto	the PROTOCOL to be set in the IP header
netif	the netif on which to send this packet

Returns

ERR_OK if the packet was sent OK ERR_BUF if p doesn't have enough space for IP/LINK headers returns errors returned by netif->output

Note

ip_id: RFC791 "some host may be able to simply use unique identifiers independent of destination"

Definition at line 641 of file ip.c.

5.50.2.4 struct netif∗ ip_route (ip_addr_t ∗ *dest*)

Finds the appropriate network interface for a given IP address. It searches the list of network interfaces linearly. A match is found if the masked IP address of the network interface equals the masked IP address given to the function.

Parameters

dest	the destination IP address for which to find the route

Returns

the netif on which to send to reach dest

Definition at line 124 of file ip.c.

5.50.3 Variable Documentation

5.50.3.1 const struct ip_hdr∗ current_header

Header of the input packet currently being processed.

Definition at line 105 of file ip.c.

5.50.3.2 ip_addr_t current_iphdr_dest

Destination IP address of current_header

Definition at line 109 of file ip.c.

5.50.3.3 ip_addr_t current_iphdr_src

Source IP address of current_header

Definition at line 107 of file ip.c.

5.50.3.4 struct netif∗ current_netif

The interface that provided the packet for the current callback invocation.

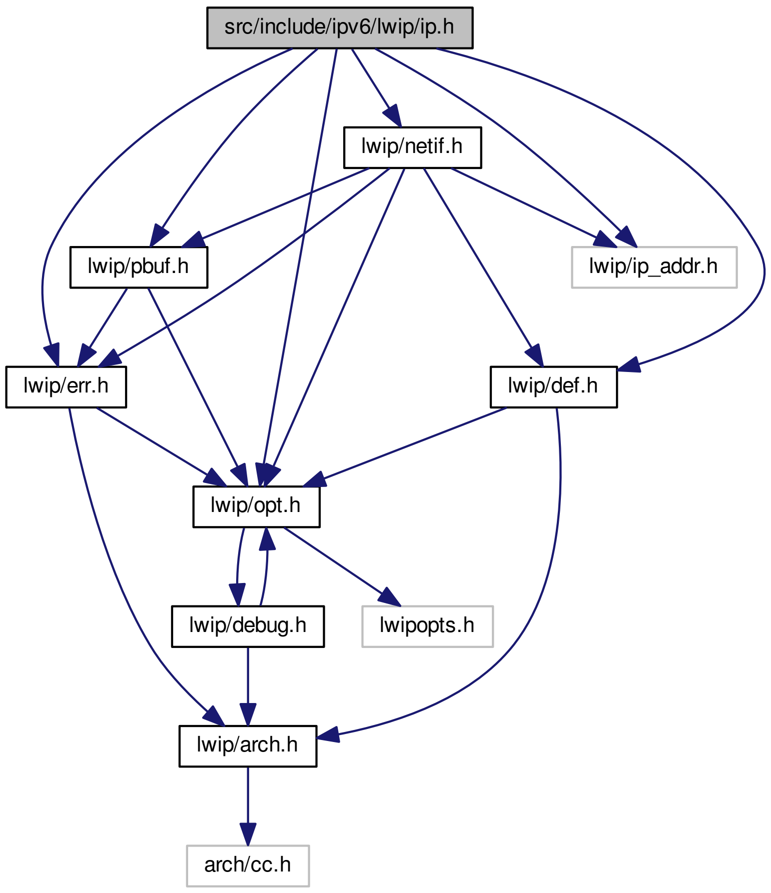
Definition at line 100 of file ip.c.

5.50.3.5 PACK_STRUCT_BEGIN struct ip_hdr PACK_STRUCT_STRUCT

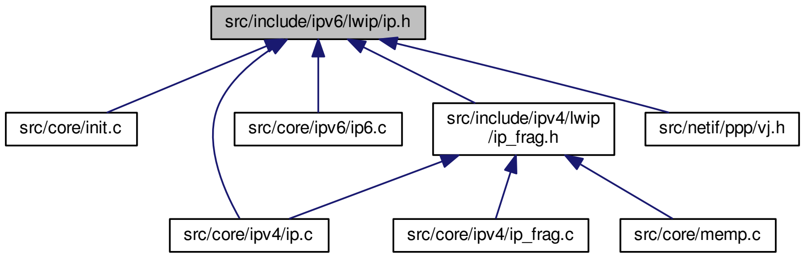
5.51 src/include/ipv6/lwip/ip.h File Reference

```
#include "lwip/opt.h"
#include "lwip/def.h"
#include "lwip/pbuf.h"
#include "lwip/ip_addr.h"
#include "lwip/err.h"
#include "lwip/netif.h"
```

Include dependency graph for ip.h:



This graph shows which files directly or indirectly include this file:



Data Structures

- struct ip_hdr

Macros

- #define IP_HLEN 40
- #define IP_PROTO_ICMP 58
- #define IP_PROTO_UDP 17
- #define IP_PROTO_UDPLITE 136
- #define IP_PROTO_TCP 6
- #define IP_HDRINCL NULL
- #define IP_PCB_ADDRHINT
- #define IP_PCB
- #define IPH_PROTO(hdr) (iphdr->nexthdr)
- #define ip_current_netif() NULL
- #define ip_current_header() NULL

Functions

- void ip_init (void)
- struct netif ∗ ip_route (struct ip_addr ∗dest)
- void ip_input (struct pbuf ∗p, struct netif ∗inp)
- err_t ip_output (struct pbuf ∗p, struct ip_addr ∗src, struct ip_addr ∗dest, u8_t ttl, u8_t proto)
- err_t ip_output_if (struct pbuf ∗p, struct ip_addr ∗src, struct ip_addr ∗dest, u8_t ttl, u8_t proto, struct netif ∗netif)

5.51.1 Macro Definition Documentation

5.51.1.1 #define ip_current_header( ) NULL

Definition at line 118 of file ip.h.

5.51.1.2 #define ip_current_netif( ) NULL

Definition at line 117 of file ip.h.

5.51.1.3 #define IP_HDRINCL NULL

Definition at line 59 of file ip.h.

5.51.1.4 #define IP_HLEN 40

Definition at line 46 of file ip.h.

5.51.1.5 #define IP_PCB

Value:

```
struct ip_addr local_ip; \
  struct ip_addr remote_ip; \
   /* Socket options */  \
  u16_t so_options;      \
   /* Type Of Service */ \
  u8_t tos;              \
  /* Time To Live */     \
  u8_t ttl;              \
  /* link layer address resolution hint */ \
  IP_PCB_ADDRHINT
```

Definition at line 71 of file ip.h.

5.51.1.6 #define IP_PCB_ADDRHINT

Definition at line 64 of file ip.h.

5.51.1.7 #define IP_PROTO_ICMP 58

Definition at line 48 of file ip.h.

5.51.1.8 #define IP_PROTO_TCP 6

Definition at line 51 of file ip.h.

5.51.1.9 #define IP_PROTO_UDP 17

Definition at line 49 of file ip.h.

5.51.1.10 #define IP_PROTO_UDPLITE 136

Definition at line 50 of file ip.h.

5.51.1.11 #define IPH_PROTO(*hdr*) (iphdr->nexthdr)

Definition at line 99 of file ip.h.

5.51.2 Function Documentation

5.51.2.1 void ip_init (void)

Definition at line 63 of file ip6.c.

5.51.2.2 void ip_input (struct **pbuf** ∗ *p,* struct **netif** ∗ *inp*)

This function is called by the network interface device driver when an IP packet is received. The function does the basic checks of the IP header such as packet size being at least larger than the header size etc. If the packet was not destined for us, the packet is forwarded (using ip_forward). The IP checksum is always checked.

Finally, the packet is sent to the upper layer protocol input function.

Parameters

p	the received IP packet (p->payload points to IP header)
inp	the netif on which this packet was received

Returns

ERR_OK if the packet was processed (could return ERR_∗ if it wasn't processed, but currently always returns ERR_OK)

Definition at line 305 of file ip.c.

5.51.2.3 err_t ip_output (struct **pbuf** ∗ *p,* struct **ip_addr** ∗ *src,* struct **ip_addr** ∗ *dest,* u8_t *ttl,* u8_t *proto*)

Definition at line 317 of file ip6.c.

5.51.2.4 err_t ip_output_if (struct pbuf ∗ *p*, struct ip_addr ∗ *src*, struct ip_addr ∗ *dest*, u8_t *ttl*, u8_t *proto*, struct netif ∗ *netif*)

Definition at line 260 of file ip6.c.

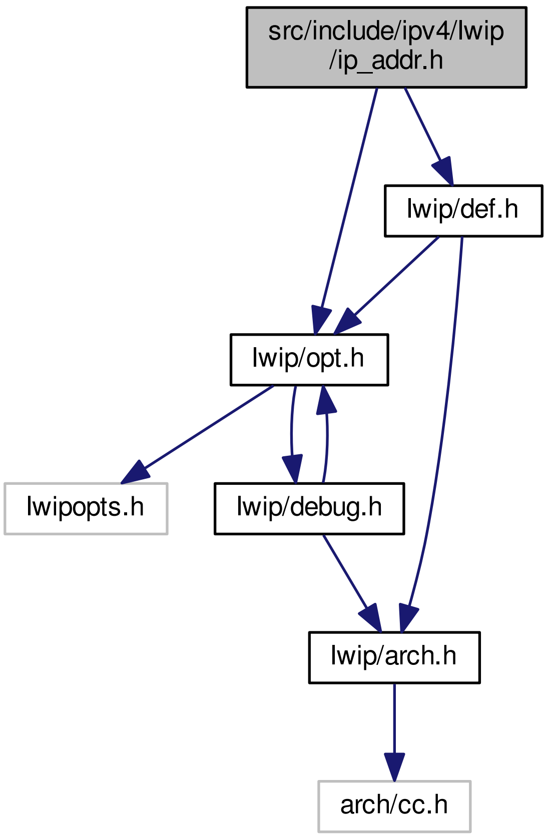
5.51.2.5 struct netif∗ ip_route (struct ip_addr ∗ *dest*)

Definition at line 75 of file ip6.c.

5.52 src/include/ipv4/lwip/ip_addr.h File Reference

```
#include "lwip/opt.h"
#include "lwip/def.h"
```

Include dependency graph for ip_addr.h:



Data Structures

- struct ip_addr
- struct ip_addr_packed
- struct ip_addr2

Macros

- #define IP_ADDR_ANY ((ip_addr_t ∗)&ip_addr_any)
- #define IP_ADDR_BROADCAST ((ip_addr_t ∗)&ip_addr_broadcast)
- #define IPADDR_NONE ((u32_t)0xffffffffUL)
- #define IPADDR_LOOPBACK ((u32_t)0x7f000001UL)
- #define IPADDR_ANY ((u32_t)0x00000000UL)
- #define IPADDR_BROADCAST ((u32_t)0xffffffffUL)
- #define IP_CLASSA(a) ((((u32_t)(a)) & 0x80000000UL) == 0)
- #define IP_CLASSA_NET 0xff000000
- #define IP_CLASSA_NSHIFT 24
- #define IP_CLASSA_HOST (0xffffffff & ∼IP_CLASSA_NET)
- #define IP_CLASSA_MAX 128
- #define IP_CLASSB(a) ((((u32_t)(a)) & 0xc0000000UL) == 0x80000000UL)
- #define IP_CLASSB_NET 0xffff0000
- #define IP_CLASSB_NSHIFT 16
- #define IP_CLASSB_HOST (0xffffffff & ∼IP_CLASSB_NET)
- #define IP_CLASSB_MAX 65536
- #define IP_CLASSC(a) ((((u32_t)(a)) & 0xe0000000UL) == 0xc0000000UL)
- #define IP_CLASSC_NET 0xffffff00
- #define IP_CLASSC_NSHIFT 8
- #define IP_CLASSC_HOST (0xffffffff & ∼IP_CLASSC_NET)
- #define IP_CLASSD(a) (((u32_t)(a) & 0xf0000000UL) == 0xe0000000UL)
- #define IP_CLASSD_NET 0xf0000000 /∗ These ones aren't really ∗/
- #define IP_CLASSD_NSHIFT 28 /∗ net and host fields, but ∗/
- #define IP_CLASSD_HOST 0x0fffffff /∗ routing needn't know. ∗/
- #define IP_MULTICAST(a) IP_CLASSD(a)
- #define IP_EXPERIMENTAL(a) (((u32_t)(a) & 0xf0000000UL) == 0xf0000000UL)
- #define IP_BADCLASS(a) (((u32_t)(a) & 0xf0000000UL) == 0xf0000000UL)
- #define IP_LOOPBACKNET 127 /∗ official! ∗/
- #define IP4_ADDR(ipaddr, a, b, c, d)
- #define IPADDR2_COPY(dest, src) SMEMCPY(dest, src, sizeof(ip_addr_t))
- #define ip_addr_copy(dest, src) ((dest).addr = (src).addr)
- #define ip_addr_set(dest, src)
- #define ip_addr_set_zero(ipaddr) ((ipaddr)->addr = 0)
- #define ip_addr_set_any(ipaddr) ((ipaddr)->addr = IPADDR_ANY)
- #define ip_addr_set_loopback(ipaddr) ((ipaddr)->addr = PP_HTONL(IPADDR_LOOPBACK))
- #define ip_addr_set_hton(dest, src)
- #define ip4_addr_set_u32(dest_ipaddr, src_u32) ((dest_ipaddr)->addr = (src_u32))
- #define ip4_addr_get_u32(src_ipaddr) ((src_ipaddr)->addr)
- #define ip_addr_get_network(target, host, netmask) ((target)->addr = ((host)->addr) & ((netmask)->addr))
- #define ip_addr_netcmp(addr1, addr2, mask)
- #define ip_addr_cmp(addr1, addr2) ((addr1)->addr == (addr2)->addr)
- #define ip_addr_isany(addr1) ((addr1) == NULL || (addr1)->addr == IPADDR_ANY)
- #define ip_addr_isbroadcast(ipaddr, netif) ip4_addr_isbroadcast((ipaddr)->addr, (netif))
- #define ip_addr_netmask_valid(netmask) ip4_addr_netmask_valid((netmask)->addr)
- #define ip_addr_ismulticast(addr1) (((addr1)->addr & PP_HTONL(0xf0000000UL)) == PP_HTON↩ L(0xe0000000UL))
- #define ip_addr_islinklocal(addr1) (((addr1)->addr & PP_HTONL(0xffff0000UL)) == PP_HTON↩ L(0xa9fe0000UL))
- #define ip_addr_debug_print(debug, ipaddr)
- #define ip4_addr1(ipaddr) (((u8_t∗)(ipaddr))[0])
- #define ip4_addr2(ipaddr) (((u8_t∗)(ipaddr))[1])
- #define ip4_addr3(ipaddr) (((u8_t∗)(ipaddr))[2])
- #define ip4_addr4(ipaddr) (((u8_t∗)(ipaddr))[3])

- #define ip4_addr1_16(ipaddr) ((u16_t)ip4_addr1(ipaddr))
- #define ip4_addr2_16(ipaddr) ((u16_t)ip4_addr2(ipaddr))
- #define ip4_addr3_16(ipaddr) ((u16_t)ip4_addr3(ipaddr))
- #define ip4_addr4_16(ipaddr) ((u16_t)ip4_addr4(ipaddr))
- #define ip_ntoa(ipaddr) ipaddr_ntoa(ipaddr)

Typedefs

- typedef typedefPACK_STRUCT_END struct ip_addr ip_addr_t
- typedef struct ip_addr_packed ip_addr_p_t

Functions

- u8_t ip4_addr_isbroadcast (u32_t addr, const struct netif ∗netif)
- u8_t ip4_addr_netmask_valid (u32_t netmask)
- u32_t ipaddr_addr (const char ∗cp)
- int ipaddr_aton (const char ∗cp, ip_addr_t ∗addr)
- char ∗ ipaddr_ntoa (const ip_addr_t ∗addr)
- char ∗ ipaddr_ntoa_r (const ip_addr_t ∗addr, char ∗buf, int buflen)

Variables

- PACK_STRUCT_BEGIN struct ip_addr_packed PACK_STRUCT_STRUCT
- const ip_addr_t ip_addr_any
- const ip_addr_t ip_addr_broadcast

5.52.1 Macro Definition Documentation

5.52.1.1 #define IP4_ADDR(*ipaddr, a, b, c, d*)

Value:

```
(ipaddr)->addr = ((u32_t)((a) & 0xff) << 24) | \
                         ((u32_t)((b) & 0xff) << 16) | \
                         ((u32_t)((c) & 0xff) << 8)  | \
                          (u32_t)((d) & 0xff)
```

Set an IP address given by the four byte-parts

Definition at line 139 of file ip_addr.h.

5.52.1.2 #define ip4_addr1(*ipaddr*) (((u8_t∗)(ipaddr))[0])

Definition at line 220 of file ip_addr.h.

5.52.1.3 #define ip4_addr1_16(*ipaddr*) ((u16_t)ip4_addr1(ipaddr))

Definition at line 226 of file ip_addr.h.

5.52.1.4 #define ip4_addr2(*ipaddr*) (((u8_t∗)(ipaddr))[1])

Definition at line 221 of file ip_addr.h.

5.52.1.5 #define ip4_addr2_16(*ipaddr*) ((u16_t)ip4_addr2(ipaddr))

Definition at line 227 of file ip_addr.h.

5.52.1.6 #define ip4_addr3(*ipaddr*) (((u8_t∗)(ipaddr))[2])

Definition at line 222 of file ip_addr.h.

5.52.1.7 #define ip4_addr3_16(*ipaddr*) ((u16_t)ip4_addr3(ipaddr))

Definition at line 228 of file ip_addr.h.

5.52.1.8 #define ip4_addr4(*ipaddr*) (((u8_t∗)(ipaddr))[3])

Definition at line 223 of file ip_addr.h.

5.52.1.9 #define ip4_addr4_16(*ipaddr*) ((u16_t)ip4_addr4(ipaddr))

Definition at line 229 of file ip_addr.h.

5.52.1.10 #define ip4_addr_get_u32(*src_ipaddr*) ((src_ipaddr)->addr)

IPv4 only: get the IP address as an u32_t

Definition at line 181 of file ip_addr.h.

5.52.1.11 #define ip4_addr_set_u32(*dest_ipaddr,* *src_u32*) ((dest_ipaddr)->addr = (src_u32))

IPv4 only: set the IP address given as an u32_t

Definition at line 179 of file ip_addr.h.

5.52.1.12 #define IP_ADDR_ANY ((ip_addr_t ∗)&ip_addr_any)

IP_ADDR_ can be used as a fixed IP address for the wildcard and the broadcast address

Definition at line 92 of file ip_addr.h.

5.52.1.13 #define IP_ADDR_BROADCAST ((ip_addr_t ∗)&ip_addr_broadcast)

Definition at line 93 of file ip_addr.h.

5.52.1.14 #define ip_addr_cmp(*addr1,* *addr2*) ((addr1)->addr == (addr2)->addr)

Definition at line 198 of file ip_addr.h.

5.52.1.15 #define ip_addr_copy(*dest,* *src*) ((dest).addr = (src).addr)

Copy IP address - faster than ip_addr_set: no NULL check

Definition at line 162 of file ip_addr.h.

5.52.1.16 #define ip_addr_debug_print(*debug,* *ipaddr*)

Value:

```
LWIP_DEBUGF(debug, ("%"U16_F".%"U16_F".%"U16_F".%"U16_F,              \
                    ipaddr != NULL ? ip4_addr1_16(ipaddr) : 0,        \
                    ipaddr != NULL ? ip4_addr2_16(ipaddr) : 0,        \
                    ipaddr != NULL ? ip4_addr3_16(ipaddr) : 0,        \
                    ipaddr != NULL ? ip4_addr4_16(ipaddr) : 0))
```

Definition at line 212 of file ip_addr.h.

5.52.1.17 #define ip_addr_get_network(*target,* *host,* *netmask*) ((target)->addr = ((host)->addr) & ((netmask)->addr))

Get the network address by combining host address with netmask

Definition at line 184 of file ip_addr.h.

5.52.1.18 #define ip_addr_isany(*addr1*) ((addr1) == NULL || (addr1)->addr == IPADDR_ANY)

Definition at line 200 of file ip_addr.h.

5.52.1.19 #define ip_addr_isbroadcast(*ipaddr,* netif) ip4_addr_isbroadcast((ipaddr)->addr, (netif))

Definition at line 202 of file ip_addr.h.

5.52.1.20 #define ip_addr_islinklocal(*addr1*) (((addr1)->addr & PP_HTONL(0xffff0000UL)) == PP_HTONL(0xa9fe0000UL))

Definition at line 210 of file ip_addr.h.

5.52.1.21 #define ip_addr_ismulticast(*addr1*) (((addr1)->addr & PP_HTONL(0xf0000000UL)) == PP_HTONL(0xe0000000UL))

Definition at line 208 of file ip_addr.h.

5.52.1.22 #define ip_addr_netcmp(*addr1,* *addr2,* *mask*)

Value:

```
(((addr1)->addr & \
                                              (mask)->addr) == \
                                             ((addr2)->addr & \
                                              (mask)->addr))
```

Determine if two address are on the same network.

- addr1 IP address 1
- addr2 IP address 2
- mask network identifier mask

  Returns

  !0 if the network identifiers of both address match

Definition at line 194 of file ip_addr.h.

5.52.1.23 #define ip_addr_netmask_valid(*netmask*) ip4_addr_netmask_valid((netmask)->addr)

Definition at line 205 of file ip_addr.h.

5.52.1.24 #define ip_addr_set(*dest,* *src*)

Value:

```
((dest)->addr = \
                                    ((src) == NULL ? 0 : \
                                    (src)->addr))
```

Safely copy one IP address to another (src may be NULL)

Definition at line 164 of file ip_addr.h.

5.52.1.25 #define ip_addr_set_any(*ipaddr*) ((ipaddr)->addr = IPADDR_ANY)

Set address to IPADDR_ANY (no need for htonl())

Definition at line 170 of file ip_addr.h.

5.52.1.26 #define ip_addr_set_hton(*dest,* *src*)

Value:

```
((dest)->addr = \
                               ((src) == NULL ? 0:\
                               htonl((src)->
      addr)))
```

Safely copy one IP address to another and change byte order from host- to network-order.

Definition at line 175 of file ip_addr.h.

5.52.1.27 #define ip_addr_set_loopback(*ipaddr*) ((ipaddr)->addr = PP_HTONL(IPADDR_LOOPBACK))

Set address to loopback address

Definition at line 172 of file ip_addr.h.

5.52.1.28 #define ip_addr_set_zero(*ipaddr*) ((ipaddr)->addr = 0)

Set complete address to zero

Definition at line 168 of file ip_addr.h.

5.52.1.29 #define IP_BADCLASS(*a*) (((u32_t)(a) & 0xf0000000UL) == 0xf0000000UL)

Definition at line 132 of file ip_addr.h.

5.52.1.30 #define IP_CLASSA(*a*) ((((u32_t)(a)) & 0x80000000UL) == 0)

Definition at line 108 of file ip_addr.h.

5.52.1.31 #define IP_CLASSA_HOST (0xffffffff & ∼IP_CLASSA_NET)

Definition at line 111 of file ip_addr.h.

5.52.1.32 #define IP_CLASSA_MAX 128

Definition at line 112 of file ip_addr.h.

5.52.1.33 #define IP_CLASSA_NET 0xff000000

Definition at line 109 of file ip_addr.h.

5.52.1.34 #define IP_CLASSA_NSHIFT 24

Definition at line 110 of file ip_addr.h.

5.52.1.35 #define IP_CLASSB(*a*) ((((u32_t)(a)) & 0xc0000000UL) == 0x80000000UL)

Definition at line 114 of file ip_addr.h.

5.52.1.36 #define IP_CLASSB_HOST (0xffffffff & ∼IP_CLASSB_NET)

Definition at line 117 of file ip_addr.h.

5.52.1.37 #define IP_CLASSB_MAX 65536

Definition at line 118 of file ip_addr.h.

5.52.1.38 #define IP_CLASSB_NET 0xffff0000

Definition at line 115 of file ip_addr.h.

5.52.1.39 #define IP_CLASSB_NSHIFT 16

Definition at line 116 of file ip_addr.h.

5.52.1.40 #define IP_CLASSC(*a*) ((((u32_t)(a)) & 0xe0000000UL) == 0xc0000000UL)

Definition at line 120 of file ip_addr.h.

5.52.1.41 #define IP_CLASSC_HOST (0xffffffff & ∼IP_CLASSC_NET)

Definition at line 123 of file ip_addr.h.

5.52.1.42 #define IP_CLASSC_NET 0xffffff00

Definition at line 121 of file ip_addr.h.

5.52.1.43 #define IP_CLASSC_NSHIFT 8

Definition at line 122 of file ip_addr.h.

5.52.1.44 #define IP_CLASSD(*a*) (((u32_t)(a) & 0xf0000000UL) == 0xe0000000UL)

Definition at line 125 of file ip_addr.h.

5.52.1.45 #define IP_CLASSD_HOST 0x0fffffff /∗ routing needn't know. ∗/

Definition at line 128 of file ip_addr.h.

5.52.1.46 #define IP_CLASSD_NET 0xf0000000 /∗ These ones aren't really ∗/

Definition at line 126 of file ip_addr.h.

5.52.1.47 #define IP_CLASSD_NSHIFT 28 /∗ net and host fields, but ∗/

Definition at line 127 of file ip_addr.h.

5.52.1.48 #define IP_EXPERIMENTAL(*a*) (((u32_t)(a) & 0xf0000000UL) == 0xf0000000UL)

Definition at line 131 of file ip_addr.h.

5.52.1.49 #define IP_LOOPBACKNET 127 /∗ official! ∗/

Definition at line 134 of file ip_addr.h.

5.52.1.50 #define IP_MULTICAST(*a*) IP_CLASSD(a)

Definition at line 129 of file ip_addr.h.

5.52.1.51 #define ip_ntoa(*ipaddr*) ipaddr_ntoa(ipaddr)

For backwards compatibility

Definition at line 232 of file ip_addr.h.

5.52.1.52 #define IPADDR2_COPY(*dest,* *src*) SMEMCPY(dest, src, sizeof(ip_addr_t))

MEMCPY-like copying of IP addresses where addresses are known to be 16-bit-aligned if the port is correctly configured (so a port could define this to copying 2 u16_t's) - no NULL-pointer-checking needed.

Definition at line 158 of file ip_addr.h.

5.52.1.53 #define IPADDR_ANY ((u32_t)0x00000000UL)

0.0.0.0

Definition at line 100 of file ip_addr.h.

5.52.1.54 #define IPADDR_BROADCAST ((u32_t)0xffffffffUL)

255.255.255.255

Definition at line 102 of file ip_addr.h.

5.52.1.55 #define IPADDR_LOOPBACK ((u32_t)0x7f000001UL)

127.0.0.1

Definition at line 98 of file ip_addr.h.

5.52.1.56 #define IPADDR_NONE ((u32_t)0xffffffffUL)

255.255.255.255

Definition at line 96 of file ip_addr.h.

5.52.2 Typedef Documentation

5.52.2.1 typedef struct ip_addr_packed ip_addr_p_t

Definition at line 65 of file ip_addr.h.

5.52.2.2 typedef typedefPACK_STRUCT_END struct ip_addr ip_addr_t

ip_addr_t uses a struct for convenience only, so that the same defines can operate both on ip_addr_t as well as on ip_addr_p_t.

Definition at line 64 of file ip_addr.h.

5.52.3 Function Documentation

5.52.3.1 u8_t ip4_addr_isbroadcast (u32_t *addr*, const struct netif ∗ *netif*)

Determine if an address is a broadcast address on a network interface

Parameters

addr	address to be checked
netif	the network interface against which the address is checked

Returns

returns non-zero if the address is a broadcast address

Definition at line 55 of file ip_addr.c.

5.52.3.2 u8_t ip4_addr_netmask_valid (u32_t *netmask*)

Checks if a netmask is valid (starting with ones, then only zeros)

Parameters

netmask	the IPv4 netmask to check (in network byte order!)

Returns

1 if the netmask is valid, 0 if it is not

Definition at line 90 of file ip_addr.c.

5.52.3.3 u32_t ipaddr_addr (const char ∗ *cp*)

Ascii internet address interpretation routine. The value returned is in network order.

Parameters

cp	IP address in ascii represenation (e.g. "127.0.0.1")

Returns

ip address in network order

Definition at line 130 of file ip_addr.c.

5.52.3.4 int ipaddr_aton (const char ∗ *cp,* ip_addr_t ∗ *addr*)

Check whether "cp" is a valid ascii representation of an Internet address and convert to a binary address. Returns 1 if the address is valid, 0 if not. This replaces inet_addr, the return value from which cannot distinguish between failure and a local broadcast address.

Parameters

cp	IP address in ascii represenation (e.g. "127.0.0.1")
addr	pointer to which to save the ip address in network order

Returns

1 if cp could be converted to addr, 0 on failure

Definition at line 152 of file ip_addr.c.

5.52.3.5 char∗ ipaddr_ntoa (const ip_addr_t ∗ *addr*)

returns ptr to static buffer; not reentrant!

Convert numeric IP address into decimal dotted ASCII representation. returns ptr to static buffer; not reentrant!

Parameters

addr	ip address in network order to convert

Returns

pointer to a global static (!) buffer that holds the ASCII represenation of addr

Definition at line 261 of file ip_addr.c.

5.52.3.6 char∗ ipaddr_ntoa_r (const ip_addr_t ∗ *addr,* char ∗ *buf,* int *buflen*)

Same as ipaddr_ntoa, but reentrant since a user-supplied buffer is used.

Parameters

addr	ip address in network order to convert
buf	target buffer where the string is stored
buflen	length of buf

Returns

either pointer to buf which now holds the ASCII representation of addr or NULL if buf was too small

Definition at line 276 of file ip_addr.c.

5.52.4 Variable Documentation

5.52.4.1 const ip_addr_t ip_addr_any

Definition at line 44 of file ip_addr.c.

5.52.4.2 const ip_addr_t ip_addr_broadcast

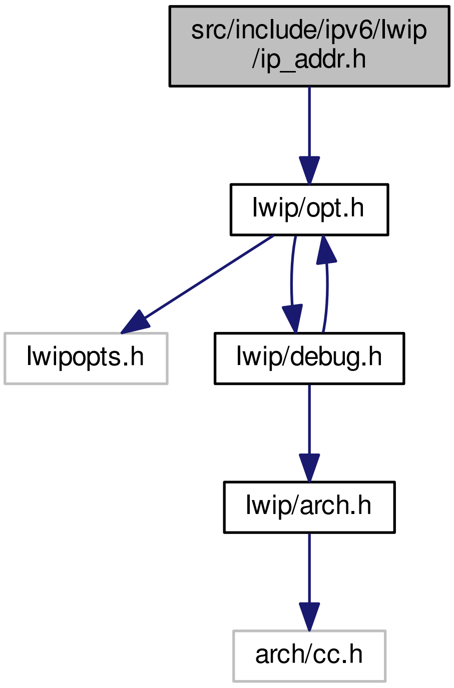
Definition at line 45 of file ip_addr.c.

5.52.4.3 PACK_STRUCT_BEGIN struct ip_addr2 PACK_STRUCT_STRUCT

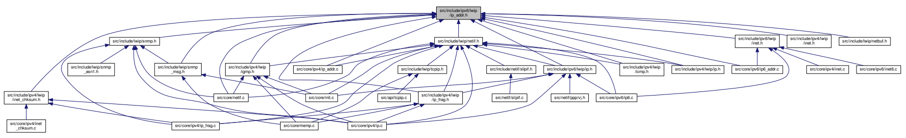
5.53 src/include/ipv6/lwip/ip_addr.h File Reference

```
#include "lwip/opt.h"
```

Include dependency graph for ip_addr.h:



This graph shows which files directly or indirectly include this file:



Data Structures

- struct ip_addr
- struct ip_addr2

Macros

- #define IP_ADDR_ANY 0
- #define IP6_ADDR(ipaddr, a, b, c, d, e, f, g, h)
- #define ip_addr_debug_print(debug, ipaddr)

Functions

- u8_t ip_addr_netcmp (struct ip_addr ∗addr1, struct ip_addr ∗addr2, struct ip_addr ∗mask)
- u8_t ip_addr_cmp (struct ip_addr ∗addr1, struct ip_addr ∗addr2)
- void ip_addr_set (struct ip_addr ∗dest, struct ip_addr ∗src)
- u8_t ip_addr_isany (struct ip_addr ∗addr)

Variables

- PACK_STRUCT_BEGIN struct ip_addr PACK_STRUCT_STRUCT

5.53.1 Macro Definition Documentation

5.53.1.1 #define IP6_ADDR(*ipaddr, a, b, c, d, e, f, g, h*)

Value:

```
do { (ipaddr)->addr[0] = htonl((u32_t)((a & 0xffff) << 16) | (b & 0xffff)); \
                                               (ipaddr)->addr[1] = htonl(((c & 0xffff) << 16) | (d
       & 0xffff)); \
                                               (ipaddr)->addr[2] = htonl(((e & 0xffff) << 16) | (f
       & 0xffff)); \
                                               (ipaddr)->addr[3] = htonl(((g & 0xffff) << 16) | (h
       & 0xffff)); } while(0)
```

Definition at line 71 of file ip_addr.h.

5.53.1.2 #define IP_ADDR_ANY 0

Definition at line 41 of file ip_addr.h.

5.53.1.3 #define ip_addr_debug_print(*debug, ipaddr*)

Value:

```
LWIP_DEBUGF(debug, ("%"X32_F":%"X32_F":%"X32_F":%"X32_F":%"X32_F":%"X32_F":%"X32_F":%"X32_F"\n",
       \
         (ntohl(ipaddr->addr[0]) >> 16) & 0xffff, \
         ntohl(ipaddr->addr[0]) & 0xffff, \
         (ntohl(ipaddr->addr[1]) >> 16) & 0xffff, \
         ntohl(ipaddr->addr[1]) & 0xffff, \
         (ntohl(ipaddr->addr[2]) >> 16) & 0xffff, \
         ntohl(ipaddr->addr[2]) & 0xffff, \
         (ntohl(ipaddr->addr[3]) >> 16) & 0xffff, \
         ntohl(ipaddr->addr[3]) & 0xffff));
```

Definition at line 82 of file ip_addr.h.

5.53.2 Function Documentation

5.53.2.1 u8_t ip_addr_cmp (struct ip_addr ∗ *addr1*, struct ip_addr ∗ *addr2*)

Definition at line 49 of file ip6_addr.c.

5.53.2.2 u8_t ip_addr_isany (struct ip_addr ∗ *addr*)

Definition at line 68 of file ip6_addr.c.

5.53.2.3 u8_t ip_addr_netcmp (struct ip_addr * *addr1*, struct ip_addr * *addr2*, struct ip_addr * *mask*)

Definition at line 38 of file ip6_addr.c.

5.53.2.4 void ip_addr_set (struct ip_addr * *dest*, struct ip_addr * *src*)

Definition at line 58 of file ip6_addr.c.

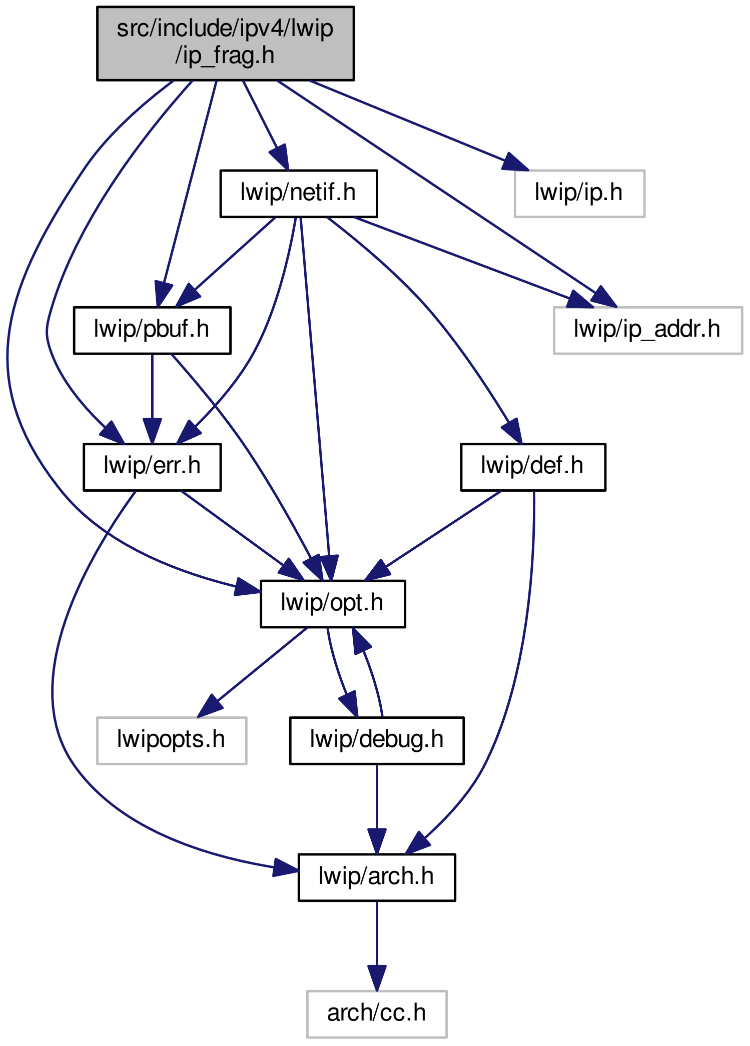
5.53.3 Variable Documentation

5.53.3.1 PACK_STRUCT_END PACK_STRUCT_BEGIN struct ip_addr2 PACK_STRUCT_STRUCT

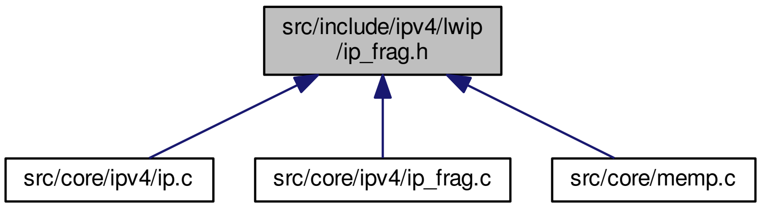
5.54 src/include/ipv4/lwip/ip_frag.h File Reference

```
#include "lwip/opt.h"
#include "lwip/err.h"
#include "lwip/pbuf.h"
#include "lwip/netif.h"
#include "lwip/ip_addr.h"
#include "lwip/ip.h"
```

Include dependency graph for ip_frag.h:

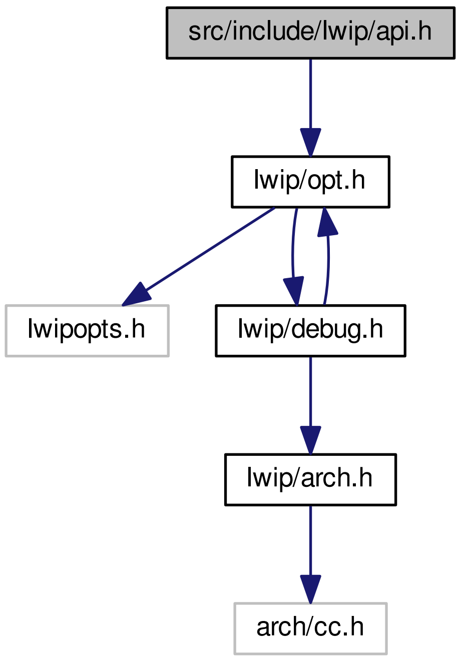


This graph shows which files directly or indirectly include this file:

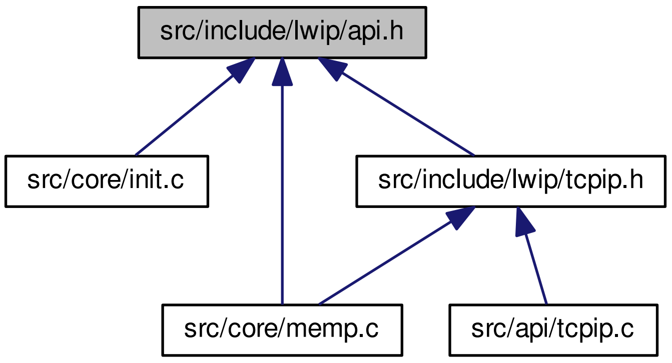


5.55 src/include/lwip/api.h File Reference

```
#include "lwip/opt.h"
```
Include dependency graph for api.h:



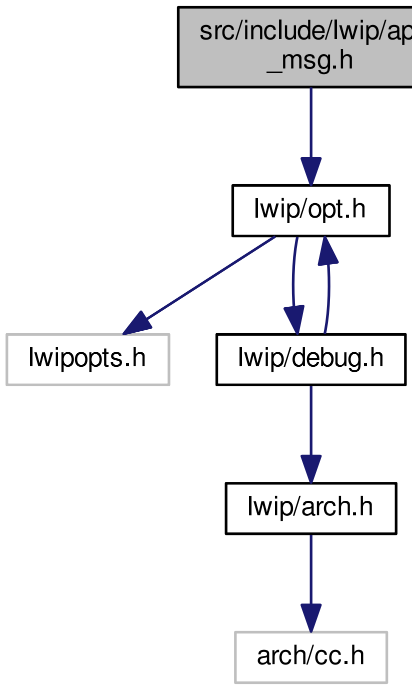
This graph shows which files directly or indirectly include this file:



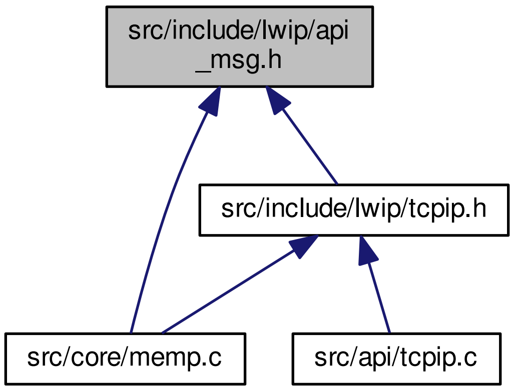
5.56 src/include/lwip/api_msg.h File Reference

```
#include "lwip/opt.h"
```

Include dependency graph for api_msg.h:



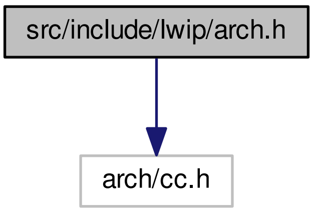
This graph shows which files directly or indirectly include this file:



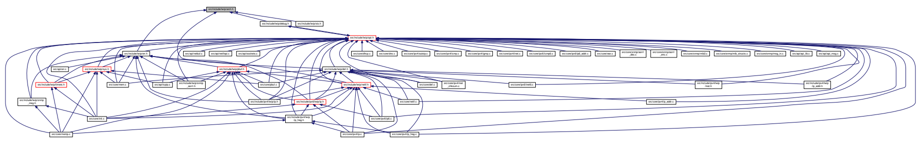
5.57 src/include/lwip/arch.h File Reference

```
#include "arch/cc.h"
```

Include dependency graph for arch.h:



This graph shows which files directly or indirectly include this file:



Macros

- #define LITTLE_ENDIAN 1234
- #define BIG_ENDIAN 4321
- #define SZT_F U32_F
- #define X8_F "02x"
- #define PACK_STRUCT_BEGIN
- #define PACK_STRUCT_END
- #define PACK_STRUCT_FIELD(x) x
- #define LWIP_UNUSED_ARG(x) (void)x

5.57.1 Macro Definition Documentation

5.57.1.1 #define BIG_ENDIAN 4321

Definition at line 40 of file arch.h.

5.57.1.2 #define LITTLE_ENDIAN 1234

Definition at line 36 of file arch.h.

5.57.1.3 #define LWIP_UNUSED_ARG(*x*) (void)x

Definition at line 73 of file arch.h.

5.57.1.4 #define PACK_STRUCT_BEGIN

Definition at line 60 of file arch.h.

5.57.1.5 #define PACK_STRUCT_END

Definition at line 64 of file arch.h.

5.57.1.6 #define PACK_STRUCT_FIELD(*x*) x

Definition at line 68 of file arch.h.

5.57.1.7 #define SZT_F U32_F

Temporary: define format string for size_t if not defined in cc.h

Definition at line 47 of file arch.h.

5.57.1.8 #define X8_F "02x"

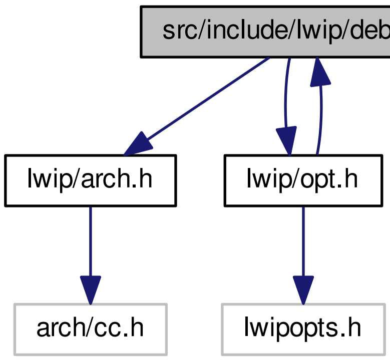
Temporary upgrade helper: define format string for u8_t as hex if not defined in cc.h

Definition at line 52 of file arch.h.

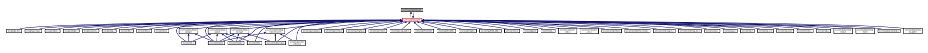
5.58 src/include/lwip/debug.h File Reference

```
#include "lwip/arch.h"
#include "lwip/opt.h"
```

Include dependency graph for debug.h:



This graph shows which files directly or indirectly include this file:



Macros

- #define LWIP_DBG_LEVEL_ALL 0x00
- #define LWIP_DBG_LEVEL_OFF LWIP_DBG_LEVEL_ALL /∗ compatibility define only ∗/
- #define LWIP_DBG_LEVEL_WARNING 0x01 /∗ bad checksums, dropped packets, ... ∗/
- #define LWIP_DBG_LEVEL_SERIOUS 0x02 /∗ memory allocation failures, ... ∗/
- #define LWIP_DBG_LEVEL_SEVERE 0x03
- #define LWIP_DBG_MASK_LEVEL 0x03
- #define LWIP_DBG_ON 0x80U
- #define LWIP_DBG_OFF 0x00U
- #define LWIP_DBG_TRACE 0x40U
- #define LWIP_DBG_STATE 0x20U
- #define LWIP_DBG_FRESH 0x10U
- #define LWIP_DBG_HALT 0x08U
- #define LWIP_ASSERT(message, assertion)
- #define LWIP_ERROR(message, expression, handler)
- #define LWIP_DEBUGF(debug, message)

5.58.1 Macro Definition Documentation

5.58.1.1 #define LWIP_ASSERT(*message,* *assertion*)

Value:

```
do { if(!(assertion)) \
  LWIP_PLATFORM_ASSERT(message); } while(0)
```

Definition at line 66 of file debug.h.

5.58.1.2 #define LWIP_DBG_FRESH 0x10U

flag for LWIP_DEBUGF indicating newly added code, not thoroughly tested yet

Definition at line 61 of file debug.h.

5.58.1.3 #define LWIP_DBG_HALT 0x08U

flag for LWIP_DEBUGF to halt after printing this debug message

Definition at line 63 of file debug.h.

5.58.1.4 #define LWIP_DBG_LEVEL_ALL 0x00

lower two bits indicate debug level

- 0 all
- 1 warning
- 2 serious
- 3 severe

Definition at line 44 of file debug.h.

5.58.1.5 #define LWIP_DBG_LEVEL_OFF LWIP_DBG_LEVEL_ALL /∗ compatibility define only ∗/

Definition at line 45 of file debug.h.

5.58.1.6 #define LWIP_DBG_LEVEL_SERIOUS 0x02 /∗ memory allocation failures, ... ∗/

Definition at line 47 of file debug.h.

5.58.1.7 #define LWIP_DBG_LEVEL_SEVERE 0x03

Definition at line 48 of file debug.h.

5.58.1.8 #define LWIP_DBG_LEVEL_WARNING 0x01 /∗ bad checksums, dropped packets, ... ∗/

Definition at line 46 of file debug.h.

5.58.1.9 #define LWIP_DBG_MASK_LEVEL 0x03

Definition at line 49 of file debug.h.

5.58.1.10 #define LWIP_DBG_OFF 0x00U

flag for LWIP_DEBUGF to disable that debug message

Definition at line 54 of file debug.h.

5.58.1.11 #define LWIP_DBG_ON 0x80U

flag for LWIP_DEBUGF to enable that debug message

Definition at line 52 of file debug.h.

5.58.1.12 #define LWIP_DBG_STATE 0x20U

flag for LWIP_DEBUGF indicating a state debug message (to follow module states)

Definition at line 59 of file debug.h.

5.58.1.13 #define LWIP_DBG_TRACE 0x40U

flag for LWIP_DEBUGF indicating a tracing message (to follow program flow)

Definition at line 57 of file debug.h.

5.58.1.14 #define LWIP_DEBUGF(*debug, message*)

Definition at line 95 of file debug.h.

5.58.1.15 #define LWIP_ERROR(*message, expression, handler*)

Value:

```
do { if (!(expression)) { \
  LWIP_PLATFORM_ASSERT(message); handler;}} while(0)
```

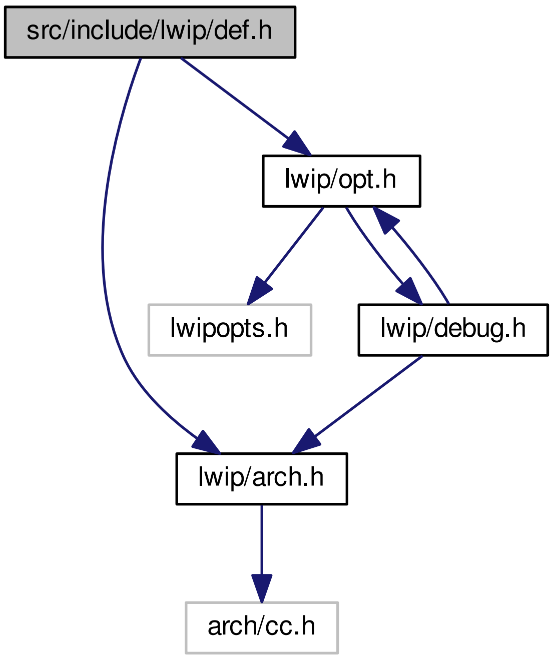
if "expression" isn't true, then print "message" and execute "handler" expression

Definition at line 74 of file debug.h.

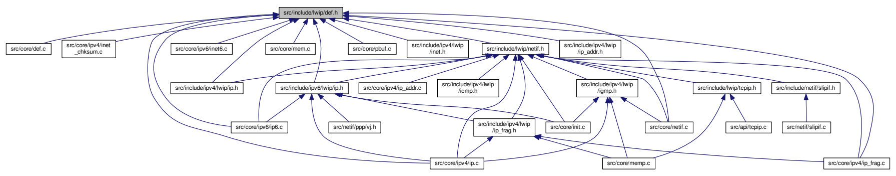
5.59 src/include/lwip/def.h File Reference

```
#include "lwip/arch.h"
#include "lwip/opt.h"
```

Include dependency graph for def.h:



This graph shows which files directly or indirectly include this file:



Macros

- #define LWIP_MAX(x, y) (((x) > (y)) ? (x) : (y))

- #define LWIP_MIN(x, y) (((x) < (y)) ? (x) : (y))
- #define NULL ((void ∗)0)
- #define LWIP_MAKE_U16(a, b) ((a << 8) | b)
- #define LWIP_PLATFORM_BYTESWAP 0
- #define htons(x) lwip_htons(x)
- #define ntohs(x) lwip_ntohs(x)
- #define htonl(x) lwip_htonl(x)
- #define ntohl(x) lwip_ntohl(x)
- #define lwip_htons(x) (x)
- #define lwip_ntohs(x) (x)
- #define lwip_htonl(x) (x)
- #define lwip_ntohl(x) (x)
- #define PP_HTONS(x) (x)
- #define PP_NTOHS(x) (x)
- #define PP_HTONL(x) (x)
- #define PP_NTOHL(x) (x)

5.59.1 Macro Definition Documentation

5.59.1.1 #define htonl(*x*) lwip_htonl(x)

Definition at line 79 of file def.h.

5.59.1.2 #define htons(*x*) lwip_htons(x)

Definition at line 77 of file def.h.

5.59.1.3 #define lwip_htonl(*x*) (x)

Definition at line 86 of file def.h.

5.59.1.4 #define lwip_htons(*x*) (x)

Definition at line 84 of file def.h.

5.59.1.5 #define LWIP_MAKE_U16(*a*, *b*) ((a << 8) | b)

Definition at line 52 of file def.h.

5.59.1.6 #define LWIP_MAX(*x*, *y*) (((x) > (y)) ? (x) : (y))

Definition at line 43 of file def.h.

5.59.1.7 #define LWIP_MIN(*x*, *y*) (((x) < (y)) ? (x) : (y))

Definition at line 44 of file def.h.

5.59.1.8 #define lwip_ntohl(*x*) (x)

Definition at line 87 of file def.h.

5.59.1.9 #define lwip_ntohs(*x*) (x)

Definition at line 85 of file def.h.

5.59.1.10 #define LWIP_PLATFORM_BYTESWAP 0

Definition at line 58 of file def.h.

5.59.1.11 #define ntohl(*x*) lwip_ntohl(x)

Definition at line 80 of file def.h.

5.59.1.12 #define ntohs(*x*) lwip_ntohs(x)

Definition at line 78 of file def.h.

5.59.1.13 #define NULL ((void *)0)

Definition at line 47 of file def.h.

5.59.1.14 #define PP_HTONL(*x*) (x)

Definition at line 90 of file def.h.

5.59.1.15 #define PP_HTONS(*x*) (x)

Definition at line 88 of file def.h.

5.59.1.16 #define PP_NTOHL(*x*) (x)

Definition at line 91 of file def.h.

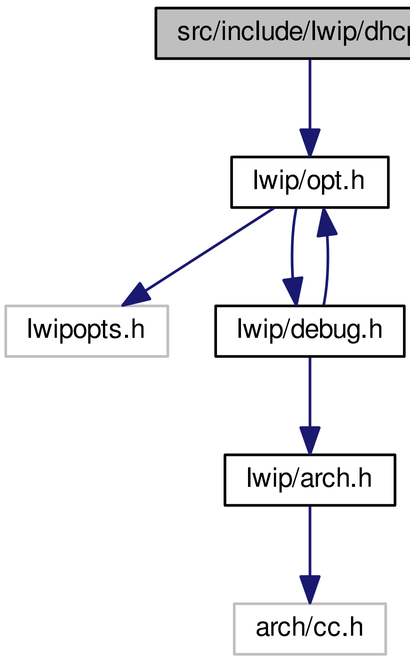
5.59.1.17 #define PP_NTOHS(*x*) (x)

Definition at line 89 of file def.h.

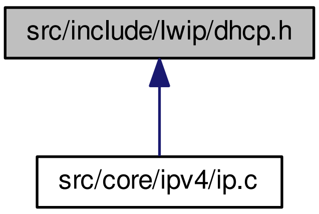
5.60 src/include/lwip/dhcp.h File Reference

```
#include "lwip/opt.h"
```

Include dependency graph for dhcp.h:



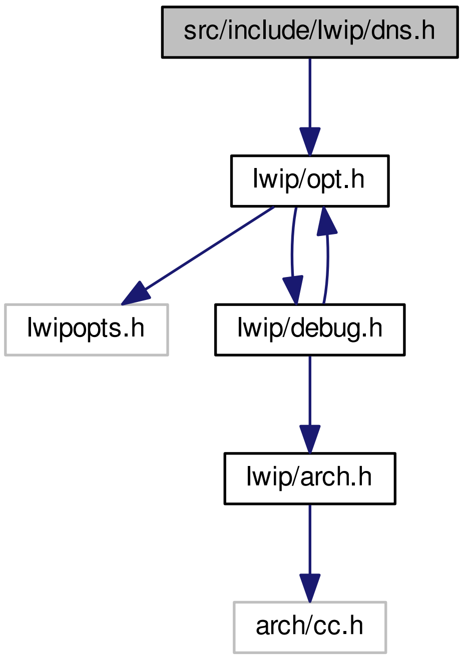
This graph shows which files directly or indirectly include this file:



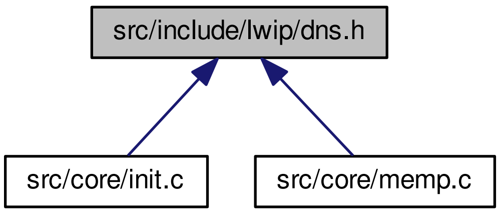
5.61 src/include/lwip/dns.h File Reference

```
#include "lwip/opt.h"
```

Include dependency graph for dns.h:



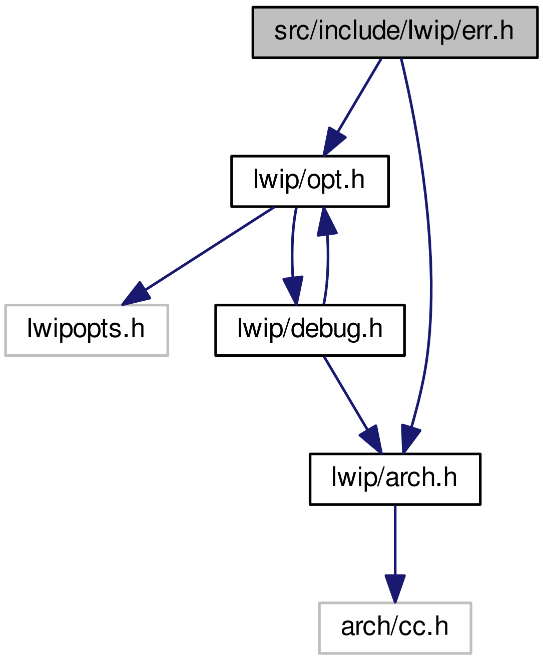
This graph shows which files directly or indirectly include this file:



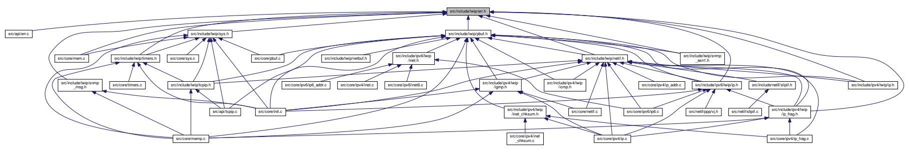
5.62 src/include/lwip/err.h File Reference

```
#include "lwip/opt.h"
#include "lwip/arch.h"
```

Include dependency graph for err.h:



This graph shows which files directly or indirectly include this file:



Macros

- #define ERR_OK 0 /∗ No error, everything OK. ∗/
- #define ERR_MEM -1 /∗ Out of memory error. ∗/
- #define ERR_BUF -2 /∗ Buffer error. ∗/
- #define ERR_TIMEOUT -3 /∗ Timeout. ∗/
- #define ERR_RTE -4 /∗ Routing problem. ∗/
- #define ERR_INPROGRESS -5 /∗ Operation in progress ∗/
- #define ERR_VAL -6 /∗ Illegal value. ∗/
- #define ERR_WOULDBLOCK -7 /∗ Operation would block. ∗/
- #define ERR_USE -8 /∗ Address in use. ∗/
- #define ERR_ISCONN -9 /∗ Already connected. ∗/
- #define ERR_IS_FATAL(e) ((e) < ERR_ISCONN)
- #define ERR_ABRT -10 /∗ Connection aborted. ∗/
- #define ERR_RST -11 /∗ Connection reset. ∗/
- #define ERR_CLSD -12 /∗ Connection closed. ∗/

- #define ERR_CONN -13 /∗ Not connected. ∗/
- #define ERR_ARG -14 /∗ Illegal argument. ∗/
- #define ERR_IF -15 /∗ Low-level netif error ∗/
- #define lwip_strerr(x) ""

Typedefs

- typedef s8_t err_t

5.62.1 Macro Definition Documentation

5.62.1.1 #define ERR_ABRT -10 /∗ Connection aborted. ∗/

Definition at line 65 of file err.h.

5.62.1.2 #define ERR_ARG -14 /∗ Illegal argument. ∗/

Definition at line 70 of file err.h.

5.62.1.3 #define ERR_BUF -2 /∗ Buffer error. ∗/

Definition at line 54 of file err.h.

5.62.1.4 #define ERR_CLSD -12 /∗ Connection closed. ∗/

Definition at line 67 of file err.h.

5.62.1.5 #define ERR_CONN -13 /∗ Not connected. ∗/

Definition at line 68 of file err.h.

5.62.1.6 #define ERR_IF -15 /∗ Low-level netif error ∗/

Definition at line 72 of file err.h.

5.62.1.7 #define ERR_INPROGRESS -5 /∗ Operation in progress ∗/

Definition at line 57 of file err.h.

5.62.1.8 #define ERR_IS_FATAL(*e*) ((e) < ERR_ISCONN)

Definition at line 63 of file err.h.

5.62.1.9 #define ERR_ISCONN -9 /∗ Already connected. ∗/

Definition at line 61 of file err.h.

5.62.1.10 #define ERR_MEM -1 /∗ Out of memory error. ∗/

Definition at line 53 of file err.h.

5.62.1.11 #define ERR_OK 0 /∗ No error, everything OK. ∗/

Definition at line 52 of file err.h.

5.62.1.12 #define ERR_RST -11 /∗ Connection reset. ∗/

Definition at line 66 of file err.h.

5.62.1.13 #define ERR_RTE -4 /∗ Routing problem. ∗/

Definition at line 56 of file err.h.

5.62.1.14 #define ERR_TIMEOUT -3 /∗ Timeout. ∗/

Definition at line 55 of file err.h.

5.62.1.15 #define ERR_USE -8 /∗ Address in use. ∗/

Definition at line 60 of file err.h.

5.62.1.16 #define ERR_VAL -6 /∗ Illegal value. ∗/

Definition at line 58 of file err.h.

5.62.1.17 #define ERR_WOULDBLOCK -7 /∗ Operation would block. ∗/

Definition at line 59 of file err.h.

5.62.1.18 #define lwip_strerr(*x*) ""

Definition at line 78 of file err.h.

5.62.2 Typedef Documentation

5.62.2.1 typedef s8_t err_t

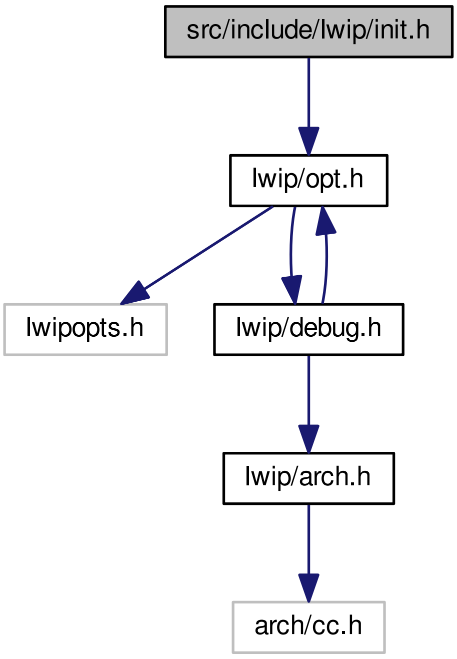
Define LWIP_ERR_T in cc.h if you want to use a different type for your platform (must be signed).

Definition at line 47 of file err.h.

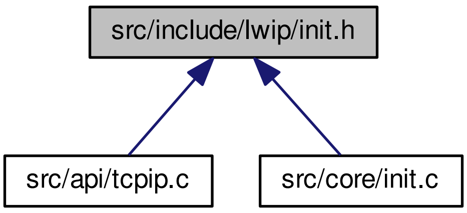
5.63 src/include/lwip/init.h File Reference

```
#include "lwip/opt.h"
```

Include dependency graph for init.h:



This graph shows which files directly or indirectly include this file:



Macros

- #define LWIP_VERSION_MAJOR 1U
- #define LWIP_VERSION_MINOR 4U
- #define LWIP_VERSION_REVISION 1U
- #define LWIP_VERSION_RC 255U
- #define LWIP_RC_RELEASE 255U
- #define LWIP_RC_DEVELOPMENT 0U
- #define LWIP_VERSION_IS_RELEASE (LWIP_VERSION_RC == LWIP_RC_RELEASE)

- #define LWIP_VERSION_IS_DEVELOPMENT (LWIP_VERSION_RC == LWIP_RC_DEVELOPMENT)
- #define LWIP_VERSION_IS_RC ((LWIP_VERSION_RC != LWIP_RC_RELEASE) && (LWIP_VERSION_↵ RC != LWIP_RC_DEVELOPMENT))
- #define LWIP_VERSION

Functions

- void lwip_init (void)

5.63.1 Macro Definition Documentation

5.63.1.1 #define LWIP_RC_DEVELOPMENT 0U

LWIP_VERSION_RC is set to LWIP_RC_DEVELOPMENT for CVS versions

Definition at line 55 of file init.h.

5.63.1.2 #define LWIP_RC_RELEASE 255U

LWIP_VERSION_RC is set to LWIP_RC_RELEASE for official releases

Definition at line 53 of file init.h.

5.63.1.3 #define LWIP_VERSION

Value:

```
(LWIP_VERSION_MAJOR << 24   | LWIP_VERSION_MINOR << 16 |
      \
                        LWIP_VERSION_REVISION << 8 |
      LWIP_VERSION_RC)
```

Provides the version of the stack

Definition at line 62 of file init.h.

5.63.1.4 #define LWIP_VERSION_IS_DEVELOPMENT (LWIP_VERSION_RC == LWIP_RC_DEVELOPMENT)

Definition at line 58 of file init.h.

5.63.1.5 #define LWIP_VERSION_IS_RC ((LWIP_VERSION_RC != LWIP_RC_RELEASE) && (LWIP_VERSION_RC != LWIP_RC_DEVELOPMENT))

Definition at line 59 of file init.h.

5.63.1.6 #define LWIP_VERSION_IS_RELEASE (LWIP_VERSION_RC == LWIP_RC_RELEASE)

Definition at line 57 of file init.h.

5.63.1.7 #define LWIP_VERSION_MAJOR 1U

X.x.x: Major version of the stack

Definition at line 42 of file init.h.

5.63.1.8 #define LWIP_VERSION_MINOR 4U

x.X.x: Minor version of the stack

Definition at line 44 of file init.h.

5.63.1.9 #define LWIP_VERSION_RC 255U

For release candidates, this is set to 1..254 For official releases, this is set to 255 (LWIP_RC_RELEASE) For development versions (CVS), this is set to 0 (LWIP_RC_DEVELOPMENT)

Definition at line 50 of file init.h.

5.63.1.10 #define LWIP_VERSION_REVISION 1U

x.x.X: Revision of the stack

Definition at line 46 of file init.h.

5.63.2 Function Documentation

5.63.2.1 void lwip_init (void)

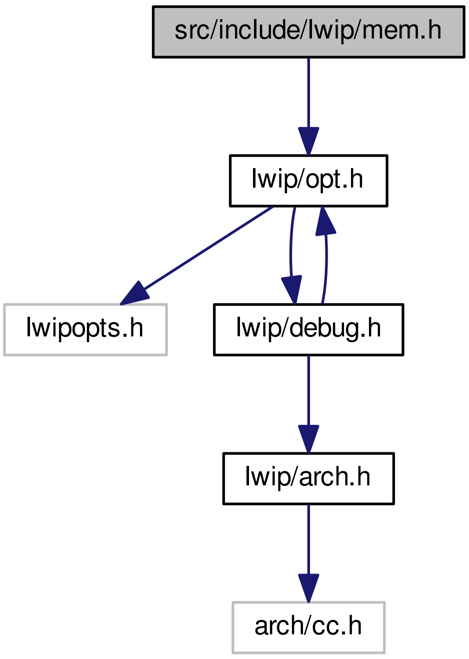
Perform Sanity check of user-configurable values, and initialize all modules.

Definition at line 289 of file init.c.

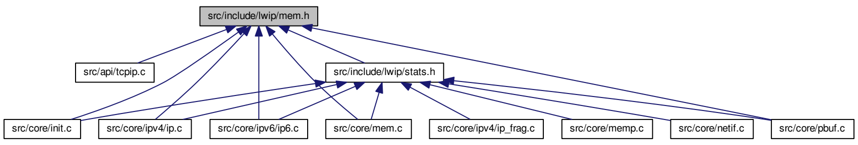
5.64 src/include/lwip/mem.h File Reference

```
#include "lwip/opt.h"
```

Include dependency graph for mem.h:



This graph shows which files directly or indirectly include this file:



Macros

- #define MEM_SIZE_F U16_F
- #define LWIP_MEM_ALIGN_SIZE(size) (((size) + MEM_ALIGNMENT - 1) & ∼(MEM_ALIGNMENT-1))
- #define LWIP_MEM_ALIGN_BUFFER(size) (((size) + MEM_ALIGNMENT - 1))
- #define LWIP_MEM_ALIGN(addr) ((void ∗)(((mem_ptr_t)(addr) + MEM_ALIGNMENT - 1) & ∼(mem_ptr_↩ t)(MEM_ALIGNMENT-1)))

Typedefs

- typedef u16_t mem_size_t

Functions

- void mem_init (void)
- void ∗ mem_trim (void ∗mem, mem_size_t size)
- void ∗ mem_malloc (mem_size_t size)
- void ∗ mem_calloc (mem_size_t count, mem_size_t size)
- void mem_free (void ∗mem)

5.64.1 Macro Definition Documentation

5.64.1.1 #define LWIP_MEM_ALIGN(*addr*) ((void ∗)(((mem_ptr_t)(addr) + **MEM_ALIGNMENT - 1**) & ∼(mem_ptr_t)(**MEM_ALIGNMENT**-1)))

Align a memory pointer to the alignment defined by MEM_ALIGNMENT so that ADDR % MEM_ALIGNMENT == 0

Definition at line 116 of file mem.h.

5.64.1.2 #define LWIP_MEM_ALIGN_BUFFER(*size*) (((size) + **MEM_ALIGNMENT** - 1))

Calculate safe memory size for an aligned buffer when using an unaligned type as storage. This includes a safety-margin on (MEM_ALIGNMENT - 1) at the start (e.g. if buffer is u8_t[] and actual data will be u32_t∗)

Definition at line 109 of file mem.h.

5.64.1.3 #define LWIP_MEM_ALIGN_SIZE(*size*) (((size) + **MEM_ALIGNMENT** - 1) & ∼(**MEM_ALIGNMENT**-1))

Calculate memory size for an aligned buffer - returns the next highest multiple of MEM_ALIGNMENT (e.g. LWIP←_MEM_ALIGN_SIZE(3) and LWIP_MEM_ALIGN_SIZE(4) will both yield 4 for MEM_ALIGNMENT == 4).

Definition at line 101 of file mem.h.

5.64.1.4 #define MEM_SIZE_F U16_F

Definition at line 77 of file mem.h.

5.64.2 Typedef Documentation

5.64.2.1 typedef u16_t **mem_size_t**

Definition at line 76 of file mem.h.

5.64.3 Function Documentation

5.64.3.1 void∗ mem_calloc (**mem_size_t** *count*, **mem_size_t** *size*)

Contiguously allocates enough space for count objects that are size bytes of memory each and returns a pointer to the allocated memory.

The allocated memory is filled with bytes of value zero.

Parameters

count	number of objects to allocate
size	size of the objects to allocate

Returns

pointer to allocated memory / NULL pointer if there is an error

Definition at line 646 of file mem.c.

5.64.3.2 void mem_free (void ∗ *rmem*)

Put a struct mem back on the heap

Parameters

rmem	is the data portion of a struct mem as returned by a previous call to mem_malloc()

Definition at line 311 of file mem.c.

5.64.3.3 void mem_init (void)

Zero the heap and initialize start, end and lowest-free

Definition at line 274 of file mem.c.

5.64.3.4 void∗ mem_malloc (mem_size_t *size*)

Adam's mem_malloc() plus solution for bug #17922 Allocate a block of memory with a minimum of 'size' bytes.

Parameters

size	is the minimum size of the requested block in bytes.

Returns

pointer to allocated memory or NULL if no free memory was found.

Note that the returned value will always be aligned (as defined by MEM_ALIGNMENT).

Definition at line 494 of file mem.c.

5.64.3.5 void∗ mem_trim (void ∗ *rmem,* mem_size_t *newsize*)

Shrink memory returned by mem_malloc().

Parameters

rmem	pointer to memory allocated by mem_malloc the is to be shrinked
newsize	required size after shrinking (needs to be smaller than or equal to the previous size)

Returns

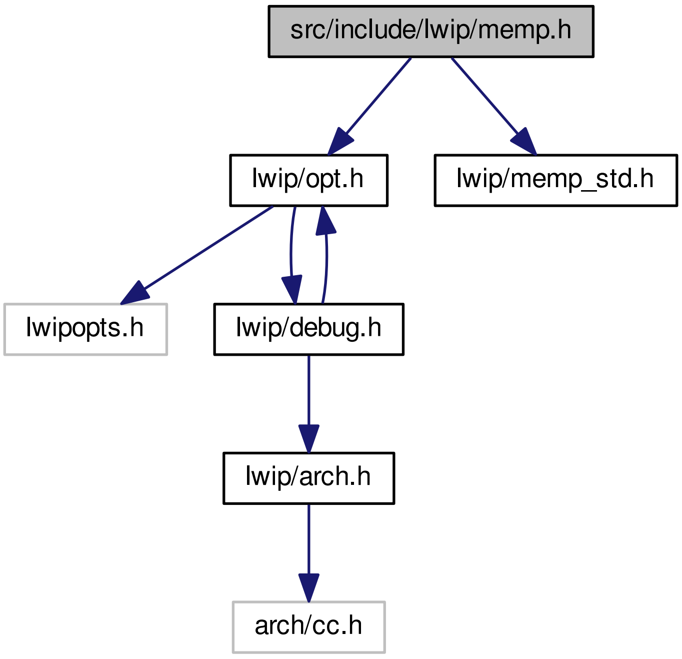
for compatibility reasons: is always == rmem, at the moment or NULL if newsize is $>$ old size, in which case rmem is NOT touched or freed!

Definition at line 369 of file mem.c.

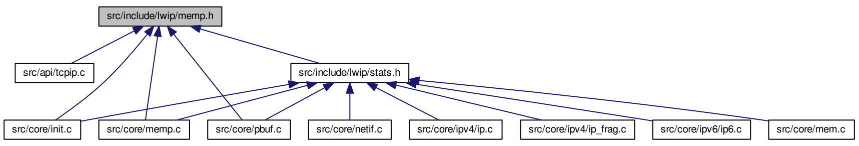
5.65 src/include/lwip/memp.h File Reference

```
#include "lwip/opt.h"
#include "lwip/memp_std.h"
```

Include dependency graph for memp.h:



This graph shows which files directly or indirectly include this file:



Macros

- #define LWIP_MEMPOOL(name, num, size, desc) MEMP_##name,

Enumerations

- enum memp_t { MEMP_MAX }

Functions

- void memp_init (void)
- void ∗ memp_malloc (memp_t type)
- void memp_free (memp_t type, void ∗mem)

5.65.1 Macro Definition Documentation

5.65.1.1 #define LWIP_MEMPOOL(*name,* *num,* *size,* *desc*) MEMP_##name,

Definition at line 44 of file memp.h.

5.65.2 Enumeration Type Documentation

5.65.2.1 enum memp_t

Enumerator

MEMP_MAX

Definition at line 43 of file memp.h.

5.65.3 Function Documentation

5.65.3.1 void memp_free (memp_t *type,* void ∗ *mem*)

Put an element back into its pool.

Parameters

type	the pool where to put mem
mem	the memp element to free

Definition at line 435 of file memp.c.

5.65.3.2 void memp_init (void)

Initialize this module.

Carves out memp_memory into linked lists for each pool-type.

Definition at line 338 of file memp.c.

5.65.3.3 void∗ memp_malloc (memp_t *type*)

Get an element from a specific pool.

Parameters

type	the pool to get an element from

the debug version has two more parameters:

Parameters

file	file name calling this function
line	number of line where this function is called

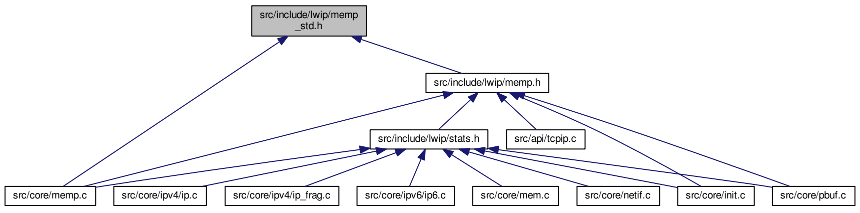
Returns

a pointer to the allocated memory or a NULL pointer on error

Definition at line 390 of file memp.c.

5.66 src/include/lwip/memp_std.h File Reference

This graph shows which files directly or indirectly include this file:



Macros

- #define LWIP_MALLOC_MEMPOOL(num, size) LWIP_MEMPOOL(POOL_##size, num, (size + sizeof(struct memp_malloc_helper)), "MALLOC_"#size)
- #define LWIP_MALLOC_MEMPOOL_START
- #define LWIP_MALLOC_MEMPOOL_END
- #define LWIP_PBUF_MEMPOOL(name, num, payload, desc) LWIP_MEMPOOL(name, num, (MEMP_ALIGN_SIZE(sizeof(struct pbuf)) + MEMP_ALIGN_SIZE(payload)), desc)

5.66.1 Macro Definition Documentation

5.66.1.1 #define LWIP_MALLOC_MEMPOOL(*num*, *size*) LWIP_MEMPOOL(POOL_##size, num, (size + sizeof(struct memp_malloc_helper)), "MALLOC_"#size)

Definition at line 15 of file memp_std.h.

5.66.1.2 #define LWIP_MALLOC_MEMPOOL_END

Definition at line 17 of file memp_std.h.

5.66.1.3 #define LWIP_MALLOC_MEMPOOL_START

Definition at line 16 of file memp_std.h.

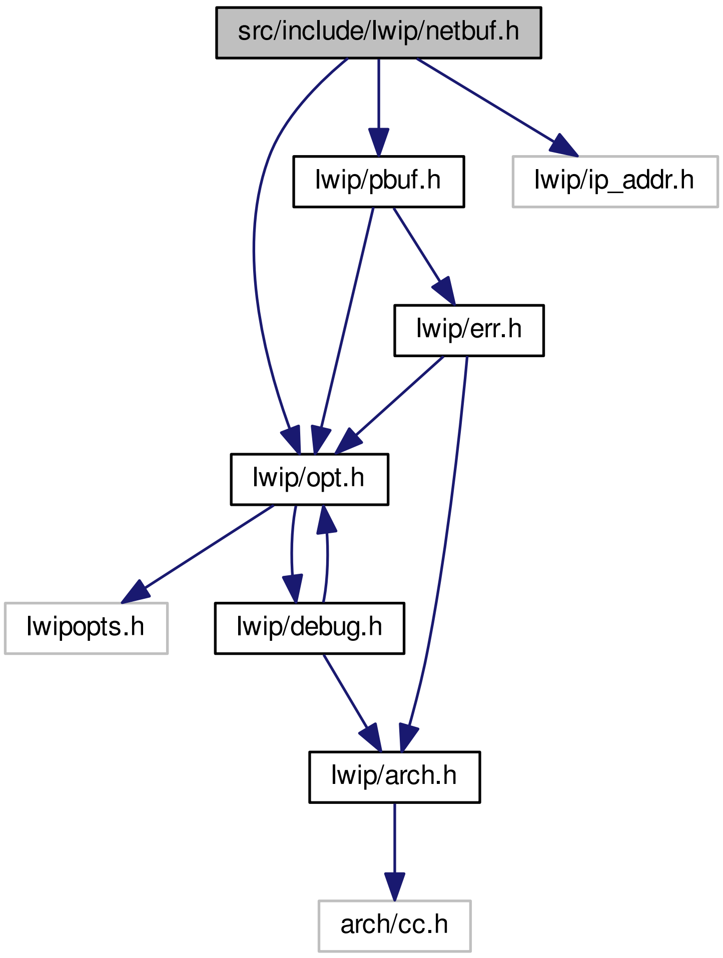
5.66.1.4 #define LWIP_PBUF_MEMPOOL(*name*, *num*, *payload*, *desc*) LWIP_MEMPOOL(name, num, (MEMP_ALIGN_SIZE(sizeof(struct pbuf)) + MEMP_ALIGN_SIZE(payload)), desc)

Definition at line 23 of file memp_std.h.

5.67 src/include/lwip/netbuf.h File Reference

```
#include "lwip/opt.h"
#include "lwip/pbuf.h"
#include "lwip/ip_addr.h"
```

Include dependency graph for netbuf.h:



Data Structures

- struct netbuf

Macros

- #define NETBUF_FLAG_DESTADDR 0x01
- #define NETBUF_FLAG_CHKSUM 0x02
- #define netbuf_copy_partial(buf, dataptr, len, offset) pbuf_copy_partial((buf)->p, (dataptr), (len), (offset))
- #define netbuf_copy(buf, dataptr, len) netbuf_copy_partial(buf, dataptr, len, 0)
- #define netbuf_take(buf, dataptr, len) pbuf_take((buf)->p, dataptr, len)

- #define netbuf_len(buf) ((buf)->p->tot_len)
- #define netbuf_fromaddr(buf) (&((buf)->addr))
- #define netbuf_set_fromaddr(buf, fromaddr) ip_addr_set((&(buf)->addr), fromaddr)
- #define netbuf_fromport(buf) ((buf)->port)

Functions

- struct netbuf ∗ netbuf_new (void)
- void netbuf_delete (struct netbuf ∗buf)
- void ∗ netbuf_alloc (struct netbuf ∗buf, u16_t size)
- void netbuf_free (struct netbuf ∗buf)
- err_t netbuf_ref (struct netbuf ∗buf, const void ∗dataptr, u16_t size)
- void netbuf_chain (struct netbuf ∗head, struct netbuf ∗tail)
- err_t netbuf_data (struct netbuf ∗buf, void ∗∗dataptr, u16_t ∗len)
- s8_t netbuf_next (struct netbuf ∗buf)
- void netbuf_first (struct netbuf ∗buf)

5.67.1 Macro Definition Documentation

5.67.1.1 #define netbuf_copy(*buf*, *dataptr*, *len*) **netbuf_copy_partial**(buf, dataptr, len, 0)

Definition at line 81 of file netbuf.h.

5.67.1.2 #define netbuf_copy_partial(*buf*, *dataptr*, *len*, *offset*) **pbuf_copy_partial**((buf)->p, (dataptr), (len), (offset))

Definition at line 79 of file netbuf.h.

5.67.1.3 #define NETBUF_FLAG_CHKSUM 0x02

This netbuf includes a checksum

Definition at line 46 of file netbuf.h.

5.67.1.4 #define NETBUF_FLAG_DESTADDR 0x01

This netbuf has dest-addr/port set

Definition at line 44 of file netbuf.h.

5.67.1.5 #define netbuf_fromaddr(*buf*) (&((buf)->addr))

Definition at line 84 of file netbuf.h.

5.67.1.6 #define netbuf_fromport(*buf*) ((buf)->port)

Definition at line 86 of file netbuf.h.

5.67.1.7 #define netbuf_len(*buf*) ((buf)->p->tot_len)

Definition at line 83 of file netbuf.h.

5.67.1.8 #define netbuf_set_fromaddr(*buf,* *fromaddr*) ip_addr_set((&(buf)->addr), fromaddr)

Definition at line 85 of file netbuf.h.

5.67.1.9 #define netbuf_take(*buf,* *dataptr,* *len*) pbuf_take((buf)->p, dataptr, len)

Definition at line 82 of file netbuf.h.

5.67.2 Function Documentation

5.67.2.1 void* netbuf_alloc (struct netbuf * *buf,* u16_t *size*)

5.67.2.2 void netbuf_chain (struct netbuf * *head,* struct netbuf * *tail*)

5.67.2.3 err_t netbuf_data (struct netbuf * *buf,* void ** *dataptr,* u16_t * *len*)

5.67.2.4 void netbuf_delete (struct netbuf * *buf*)

5.67.2.5 void netbuf_first (struct netbuf * *buf*)

5.67.2.6 void netbuf_free (struct netbuf * *buf*)

5.67.2.7 struct netbuf* netbuf_new (void)

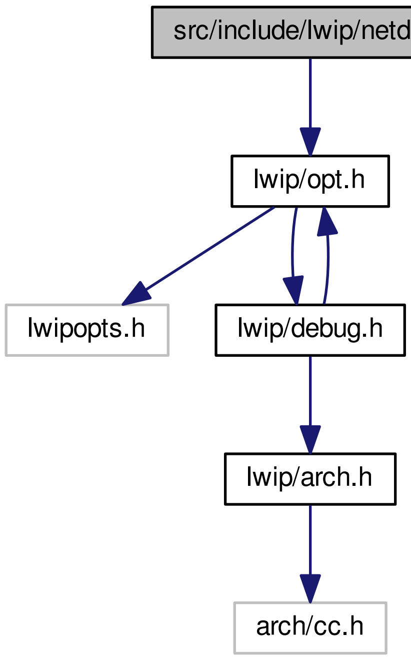
5.67.2.8 s8_t netbuf_next (struct netbuf * *buf*)

5.67.2.9 err_t netbuf_ref (struct netbuf * *buf,* const void * *dataptr,* u16_t *size*)

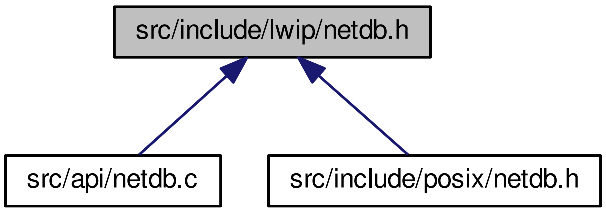
5.68 src/include/lwip/netdb.h File Reference

```
#include "lwip/opt.h"
```

Include dependency graph for netdb.h:



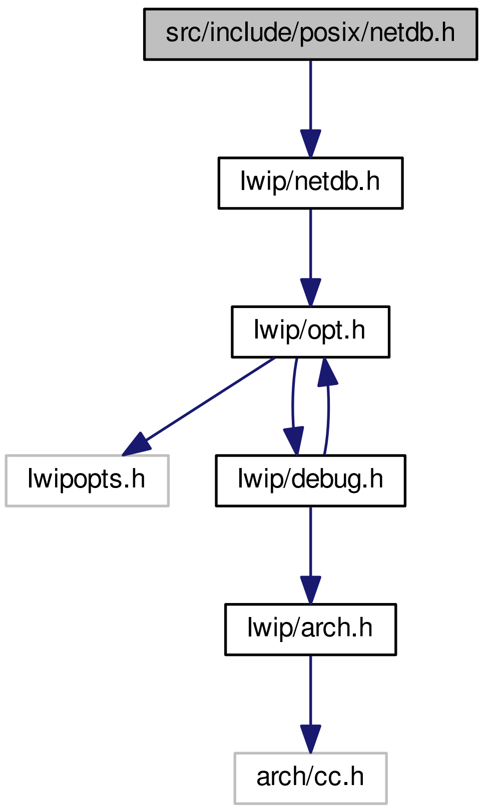
This graph shows which files directly or indirectly include this file:



5.69 src/include/posix/netdb.h File Reference

```
#include "lwip/netdb.h"
```

Include dependency graph for netdb.h:



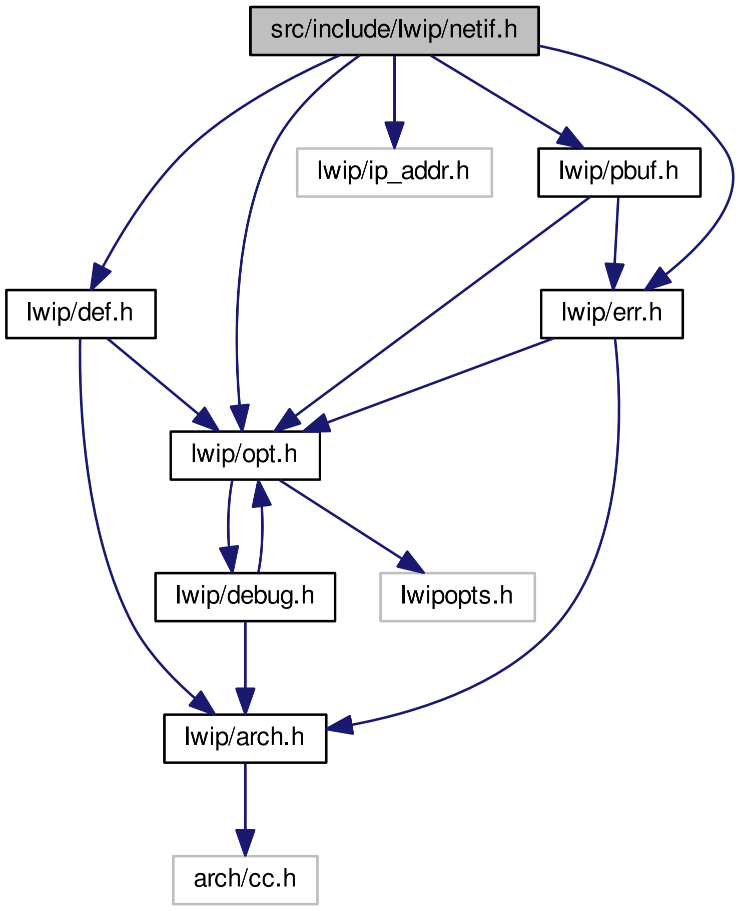
5.69.1 Detailed Description

This file is a posix wrapper for lwip/netdb.h.

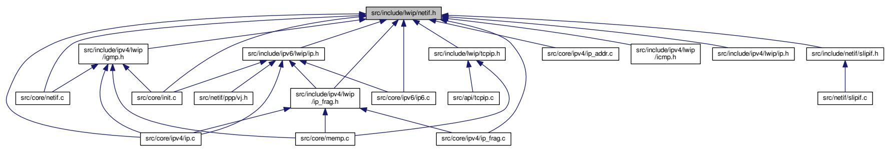
5.70 src/include/lwip/netif.h File Reference

```
#include "lwip/opt.h"
#include "lwip/err.h"
#include "lwip/ip_addr.h"
#include "lwip/def.h"
#include "lwip/pbuf.h"
```

Include dependency graph for netif.h:



This graph shows which files directly or indirectly include this file:



Data Structures

- struct netif

Macros

- #define ENABLE_LOOPBACK (LWIP_NETIF_LOOPBACK || LWIP_HAVE_LOOPIF)
- #define NETIF_MAX_HWADDR_LEN 6U

- #define NETIF_FLAG_UP 0x01U
- #define NETIF_FLAG_BROADCAST 0x02U
- #define NETIF_FLAG_POINTTOPOINT 0x04U
- #define NETIF_FLAG_DHCP 0x08U
- #define NETIF_FLAG_LINK_UP 0x10U
- #define NETIF_FLAG_ETHARP 0x20U
- #define NETIF_FLAG_ETHERNET 0x40U
- #define NETIF_FLAG_IGMP 0x80U
- #define NETIF_INIT_SNMP(netif, type, speed)
- #define netif_is_up(netif) (((netif)->flags & NETIF_FLAG_UP) ? (u8_t)1 : (u8_t)0)
- #define netif_is_link_up(netif) (((netif)->flags & NETIF_FLAG_LINK_UP) ? (u8_t)1 : (u8_t)0)
- #define NETIF_SET_HWADDRHINT(netif, hint)

Typedefs

- typedef err_t(∗ netif_init_fn) (struct netif ∗netif)
- typedef err_t(∗ netif_input_fn) (struct pbuf ∗p, struct netif ∗inp)
- typedef err_t(∗ netif_output_fn) (struct netif ∗netif, struct pbuf ∗p, ip_addr_t ∗ipaddr)
- typedef err_t(∗ netif_linkoutput_fn) (struct netif ∗netif, struct pbuf ∗p)
- typedef void(∗ netif_status_callback_fn) (struct netif ∗netif)
- typedef err_t(∗ netif_igmp_mac_filter_fn) (struct netif ∗netif, ip_addr_t ∗group, u8_t action)

Functions

- void netif_init (void)
- struct netif ∗ netif_add (struct netif ∗netif, ip_addr_t ∗ipaddr, ip_addr_t ∗netmask, ip_addr_t ∗gw, void ∗state, netif_init_fn init, netif_input_fn input)
- void netif_set_addr (struct netif ∗netif, ip_addr_t ∗ipaddr, ip_addr_t ∗netmask, ip_addr_t ∗gw)
- void netif_remove (struct netif ∗netif)
- struct netif ∗ netif_find (char ∗name)
- void netif_set_default (struct netif ∗netif)
- void netif_set_ipaddr (struct netif ∗netif, ip_addr_t ∗ipaddr)
- void netif_set_netmask (struct netif ∗netif, ip_addr_t ∗netmask)
- void netif_set_gw (struct netif ∗netif, ip_addr_t ∗gw)
- void netif_set_up (struct netif ∗netif)
- void netif_set_down (struct netif ∗netif)
- void netif_set_link_up (struct netif ∗netif)
- void netif_set_link_down (struct netif ∗netif)

Variables

- struct netif ∗ netif_list
- struct netif ∗ netif_default

5.70.1 Macro Definition Documentation

5.70.1.1 #define ENABLE_LOOPBACK (LWIP_NETIF_LOOPBACK || LWIP_HAVE_LOOPIF)

Definition at line 37 of file netif.h.

5.70.1.2 #define NETIF_FLAG_BROADCAST 0x02U

If set, the netif has broadcast capability. Set by the netif driver in its init function.

Definition at line 72 of file netif.h.

5.70.1.3 #define NETIF_FLAG_DHCP 0x08U

If set, the interface is configured using DHCP. Set by the DHCP code when starting or stopping DHCP.

Definition at line 78 of file netif.h.

5.70.1.4 #define NETIF_FLAG_ETHARP 0x20U

If set, the netif is an ethernet device using ARP. Set by the netif driver in its init function. Used to check input packet types and use of DHCP.

Definition at line 88 of file netif.h.

5.70.1.5 #define NETIF_FLAG_ETHERNET 0x40U

If set, the netif is an ethernet device. It might not use ARP or TCP/IP if it is used for PPPoE only.

Definition at line 92 of file netif.h.

5.70.1.6 #define NETIF_FLAG_IGMP 0x80U

If set, the netif has IGMP capability. Set by the netif driver in its init function.

Definition at line 95 of file netif.h.

5.70.1.7 #define NETIF_FLAG_LINK_UP 0x10U

If set, the interface has an active link (set by the network interface driver). Either set by the netif driver in its init function (if the link is up at that time) or at a later point once the link comes up (if link detection is supported by the hardware).

Definition at line 84 of file netif.h.

5.70.1.8 #define NETIF_FLAG_POINTTOPOINT 0x04U

If set, the netif is one end of a point-to-point connection. Set by the netif driver in its init function.

Definition at line 75 of file netif.h.

5.70.1.9 #define NETIF_FLAG_UP 0x01U

Whether the network interface is 'up'. This is a software flag used to control whether this network interface is enabled and processes traffic. It is set by the startup code (for static IP configuration) or by dhcp/autoip when an address has been assigned.

Definition at line 69 of file netif.h.

5.70.1.10 #define NETIF_INIT_SNMP(netif, *type*, *speed*)

Definition at line 248 of file netif.h.

5.70.1.11 #define netif_is_link_up(netif) (((netif)->flags & NETIF_FLAG_LINK_UP) ? (u8_t)1 : (u8_t)0)

Ask if a link is up

Definition at line 294 of file netif.h.

5.70.1.12 #define netif_is_up(netif) (((netif)->flags & NETIF_FLAG_UP) ? (u8_t)1 : (u8_t)0)

Ask if an interface is up

Definition at line 282 of file netif.h.

5.70.1.13 #define NETIF_MAX_HWADDR_LEN 6U

must be the maximum of all used hardware address lengths across all types of interfaces in use

Definition at line 61 of file netif.h.

5.70.1.14 #define NETIF_SET_HWADDRHINT(netif, *hint*)

Definition at line 321 of file netif.h.

5.70.2 Typedef Documentation

5.70.2.1 typedef err_t(∗ netif_igmp_mac_filter_fn) (struct netif ∗netif, ip_addr_t ∗group, u8_t action)

Function prototype for netif igmp_mac_filter functions

Definition at line 130 of file netif.h.

5.70.2.2 typedef err_t(∗ netif_init_fn) (struct netif ∗netif)

Function prototype for netif init functions. Set up flags and output/linkoutput callback functions in this function.

Parameters

netif	The netif to initialize

Definition at line 102 of file netif.h.

5.70.2.3 typedef err_t(∗ netif_input_fn) (struct pbuf ∗p, struct netif ∗inp)

Function prototype for netif->input functions. This function is saved as 'input' callback function in the netif struct. Call it when a packet has been received.

Parameters

p	The received packet, copied into a pbuf
inp	The netif which received the packet

Definition at line 109 of file netif.h.

5.70.2.4 typedef err_t(∗ netif_linkoutput_fn) (struct netif ∗netif, struct pbuf ∗p)

Function prototype for netif->linkoutput functions. Only used for ethernet netifs. This function is called by ARP when a packet shall be sent.

Parameters

netif	The netif which shall send a packet
p	The packet to send (raw ethernet packet)

Definition at line 126 of file netif.h.

5.70.2.5 typedef err_t(∗ netif_output_fn) (struct netif ∗netif, struct pbuf ∗p, ip_addr_t ∗ipaddr)

Function prototype for netif->output functions. Called by lwIP when a packet shall be sent. For ethernet netif, set this to 'etharp_output' and set 'linkoutput'.

Parameters

netif	The netif which shall send a packet
p	The packet to send (p->payload points to IP header)
ipaddr	The IP address to which the packet shall be sent

Definition at line 118 of file netif.h.

5.70.2.6 typedef void(∗ netif_status_callback_fn) (struct netif ∗netif)

Function prototype for netif status- or link-callback functions.

Definition at line 128 of file netif.h.

5.70.3 Function Documentation

5.70.3.1 struct netif∗ netif_add (struct netif ∗ *netif,* ip_addr_t ∗ *ipaddr,* ip_addr_t ∗ *netmask,* ip_addr_t ∗ *gw,* void ∗ *state,* netif_init_fn *init,* netif_input_fn *input*)

Add a network interface to the list of lwIP netifs.

Parameters

netif	a pre-allocated netif structure
ipaddr	IP address for the new netif
netmask	network mask for the new netif
gw	default gateway IP address for the new netif
state	opaque data passed to the new netif
init	callback function that initializes the interface
input	callback function that is called to pass ingress packets up in the protocol layer stack.

Returns

netif, or NULL if failed.

Definition at line 139 of file netif.c.

5.70.3.2 struct netif∗ netif_find (char ∗ *name*)

Find a network interface by searching for its name

Parameters

name	the name of the netif (like netif->name) plus concatenated number in ascii representation (e.g. 'en0')

Definition at line 290 of file netif.c.

5.70.3.3 void netif_init (void)

Definition at line 106 of file netif.c.

5.70.3.4 void netif_remove (struct netif ∗ *netif*)

Remove a network interface from the list of lwIP netifs.

Parameters

netif	the network interface to remove

Definition at line 235 of file netif.c.

5.70.3.5 void netif_set_addr (struct netif ∗ *netif,* ip_addr_t ∗ *ipaddr,* ip_addr_t ∗ *netmask,* ip_addr_t ∗ *gw*)

Change IP address configuration for a network interface (including netmask and default gateway).

Parameters

netif	the network interface to change
ipaddr	the new IP address
netmask	the new netmask
gw	the new default gateway

Definition at line 221 of file netif.c.

5.70.3.6 void netif_set_default (struct netif ∗ *netif*)

Set a network interface as the default network interface (used to output all packets for which no specific route is found)

Parameters

netif	the default network interface

Definition at line 430 of file netif.c.

5.70.3.7 void netif_set_down (struct netif ∗ *netif*)

Bring an interface down, disabling any traffic processing.

Note

: Enabling DHCP on a down interface will make it come up once configured.

See also

dhcp_start()

Definition at line 490 of file netif.c.

5.70.3.8 void netif_set_gw (struct netif * *netif,* ip_addr_t * *gw*)

Change the default gateway for a network interface

Parameters

netif	the network interface to change
gw	the new default gateway

Note

call netif_set_addr() if you also want to change ip address and netmask

Definition at line 388 of file netif.c.

5.70.3.9 void netif_set_ipaddr (struct netif ∗ *netif,* ip_addr_t ∗ *ipaddr*)

Change the IP address of a network interface

Parameters

netif	the network interface to change
ipaddr	the new IP address

Note

call netif_set_addr() if you also want to change netmask and default gateway

Definition at line 323 of file netif.c.

5.70.3.10 void netif_set_link_down (struct netif ∗ *netif*)

Called by a driver when its link goes down

Definition at line 574 of file netif.c.

5.70.3.11 void netif_set_link_up (struct netif ∗ *netif*)

Called by a driver when its link goes up

Definition at line 535 of file netif.c.

5.70.3.12 void netif_set_netmask (struct netif ∗ *netif,* ip_addr_t ∗ *netmask*)

Change the netmask of a network interface

Parameters

netif	the network interface to change
netmask	the new netmask

Note

call netif_set_addr() if you also want to change ip address and default gateway

Definition at line 409 of file netif.c.

5.70.3.13 void netif_set_up (struct netif ∗ *netif*)

Bring an interface up, available for processing traffic.

Note

: Enabling DHCP on a down interface will make it come up once configured.

See also

dhcp_start()

Definition at line 453 of file netif.c.

5.70.4 Variable Documentation

5.70.4.1 struct netif∗ netif_default

The default network interface.

Definition at line 76 of file netif.c.

5.70.4.2 struct netif∗ netif_list

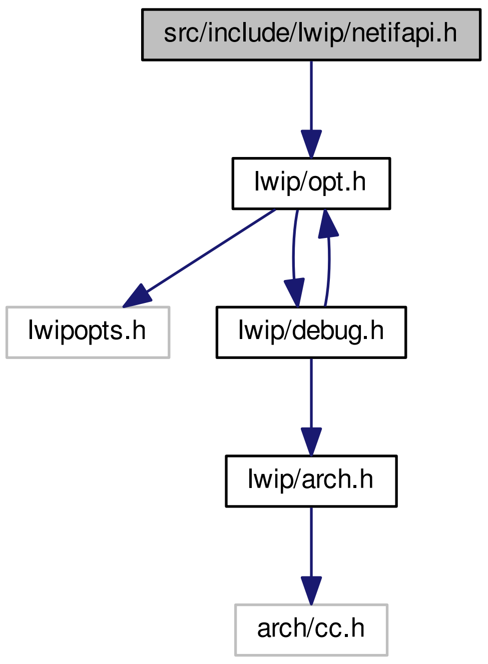
The list of network interfaces.

Definition at line 75 of file netif.c.

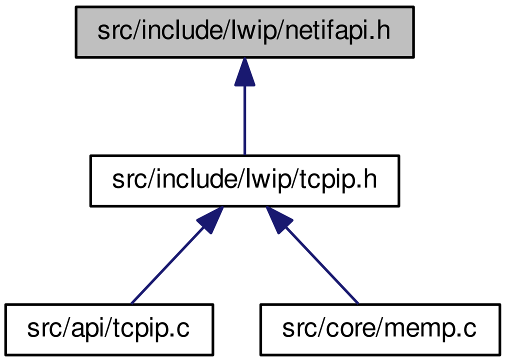
5.71 src/include/lwip/netifapi.h File Reference

```
#include "lwip/opt.h"
```

Include dependency graph for netifapi.h:



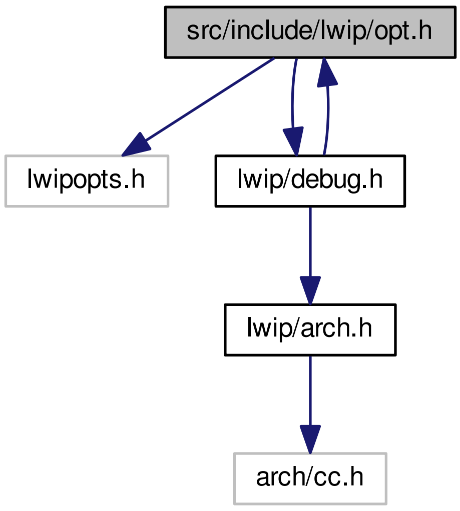
This graph shows which files directly or indirectly include this file:



5.72 src/include/lwip/opt.h File Reference

```
#include "lwipopts.h"
#include "lwip/debug.h"
```

Include dependency graph for opt.h:



Macros

- #define SYS_LIGHTWEIGHT_PROT 0
- #define NO_SYS 0

- #define NO_SYS_NO_TIMERS 0
- #define MEMCPY(dst, src, len) memcpy(dst,src,len)
- #define SMEMCPY(dst, src, len) memcpy(dst,src,len)
- #define MEM_LIBC_MALLOC 0
- #define MEMP_MEM_MALLOC 0
- #define MEM_ALIGNMENT 1
- #define MEM_SIZE 1600
- #define MEMP_SEPARATE_POOLS 0
- #define MEMP_OVERFLOW_CHECK 0
- #define MEMP_SANITY_CHECK 0
- #define MEM_USE_POOLS 0
- #define MEM_USE_POOLS_TRY_BIGGER_POOL 0
- #define MEMP_USE_CUSTOM_POOLS 0
- #define LWIP_ALLOW_MEM_FREE_FROM_OTHER_CONTEXT 0
- #define MEMP_NUM_PBUF 16
- #define MEMP_NUM_RAW_PCB 4
- #define MEMP_NUM_UDP_PCB 4
- #define MEMP_NUM_TCP_PCB 5
- #define MEMP_NUM_TCP_PCB_LISTEN 8
- #define MEMP_NUM_TCP_SEG 16
- #define MEMP_NUM_REASSDATA 5
- #define MEMP_NUM_FRAG_PBUF 15
- #define MEMP_NUM_ARP_QUEUE 30
- #define MEMP_NUM_IGMP_GROUP 8
- #define MEMP_NUM_SYS_TIMEOUT (LWIP_TCP + IP_REASSEMBLY + LWIP_ARP + (2∗LWIP_DHCP) + LWIP_AUTOIP + LWIP_IGMP + LWIP_DNS + PPP_SUPPORT)
- #define MEMP_NUM_NETBUF 2
- #define MEMP_NUM_NETCONN 4
- #define MEMP_NUM_TCPIP_MSG_API 8
- #define MEMP_NUM_TCPIP_MSG_INPKT 8
- #define MEMP_NUM_SNMP_NODE 50
- #define MEMP_NUM_SNMP_ROOTNODE 30
- #define MEMP_NUM_SNMP_VARBIND 2
- #define MEMP_NUM_SNMP_VALUE 3
- #define MEMP_NUM_NETDB 1
- #define MEMP_NUM_LOCALHOSTLIST 1
- #define MEMP_NUM_PPPOE_INTERFACES 1
- #define PBUF_POOL_SIZE 16
- #define LWIP_ARP 1
- #define ARP_TABLE_SIZE 10
- #define ARP_QUEUEING 0
- #define ETHARP_TRUST_IP_MAC 0
- #define ETHARP_SUPPORT_VLAN 0
- #define LWIP_ETHERNET (LWIP_ARP || PPPOE_SUPPORT)
- #define ETH_PAD_SIZE 0
- #define ETHARP_SUPPORT_STATIC_ENTRIES 0
- #define IP_FORWARD 0
- #define IP_OPTIONS_ALLOWED 1
- #define IP_REASSEMBLY 1
- #define IP_FRAG 1
- #define IP_REASS_MAXAGE 3
- #define IP_REASS_MAX_PBUFS 10
- #define IP_FRAG_USES_STATIC_BUF 0
- #define IP_DEFAULT_TTL 255
- #define IP_SOF_BROADCAST 0

- #define IP_SOF_BROADCAST_RECV 0
- #define IP_FORWARD_ALLOW_TX_ON_RX_NETIF 0
- #define LWIP_RANDOMIZE_INITIAL_LOCAL_PORTS 0
- #define LWIP_ICMP 1
- #define ICMP_TTL (IP_DEFAULT_TTL)
- #define LWIP_BROADCAST_PING 0
- #define LWIP_MULTICAST_PING 0
- #define LWIP_RAW 1
- #define RAW_TTL (IP_DEFAULT_TTL)
- #define LWIP_DHCP 0
- #define DHCP_DOES_ARP_CHECK ((LWIP_DHCP) && (LWIP_ARP))
- #define LWIP_AUTOIP 0
- #define LWIP_DHCP_AUTOIP_COOP 0
- #define LWIP_DHCP_AUTOIP_COOP_TRIES 9
- #define LWIP_SNMP 0
- #define SNMP_CONCURRENT_REQUESTS 1
- #define SNMP_TRAP_DESTINATIONS 1
- #define SNMP_PRIVATE_MIB 0
- #define SNMP_SAFE_REQUESTS 1
- #define SNMP_MAX_OCTET_STRING_LEN 127
- #define SNMP_MAX_TREE_DEPTH 15
- #define SNMP_MAX_VALUE_SIZE LWIP_MAX((SNMP_MAX_OCTET_STRING_LEN)+1, sizeof(s32_←
t)∗(SNMP_MAX_TREE_DEPTH))
- #define LWIP_IGMP 0
- #define LWIP_DNS 0
- #define DNS_TABLE_SIZE 4
- #define DNS_MAX_NAME_LENGTH 256
- #define DNS_MAX_SERVERS 2
- #define DNS_DOES_NAME_CHECK 1
- #define DNS_MSG_SIZE 512
- #define DNS_LOCAL_HOSTLIST 0
- #define DNS_LOCAL_HOSTLIST_IS_DYNAMIC 0
- #define LWIP_UDP 1
- #define LWIP_UDPLITE 0
- #define UDP_TTL (IP_DEFAULT_TTL)
- #define LWIP_NETBUF_RECVINFO 0
- #define LWIP_TCP 1
- #define TCP_TTL (IP_DEFAULT_TTL)
- #define TCP_WND (4 ∗ TCP_MSS)
- #define TCP_MAXRTX 12
- #define TCP_SYNMAXRTX 6
- #define TCP_QUEUE_OOSEQ (LWIP_TCP)
- #define TCP_MSS 536
- #define TCP_CALCULATE_EFF_SEND_MSS 1
- #define TCP_SND_BUF (2 ∗ TCP_MSS)
- #define TCP_SND_QUEUELEN ((4 ∗ (TCP_SND_BUF) + (TCP_MSS - 1))/(TCP_MSS))
- #define TCP_SNDLOWAT LWIP_MIN(LWIP_MAX(((TCP_SND_BUF)/2), (2 ∗ TCP_MSS) + 1), (TCP_SN←
D_BUF) - 1)
- #define TCP_SNDQUEUELOWAT LWIP_MAX(((TCP_SND_QUEUELEN)/2), 5)
- #define TCP_OOSEQ_MAX_BYTES 0
- #define TCP_OOSEQ_MAX_PBUFS 0
- #define TCP_LISTEN_BACKLOG 0
- #define TCP_DEFAULT_LISTEN_BACKLOG 0xff
- #define TCP_OVERSIZE TCP_MSS
- #define LWIP_TCP_TIMESTAMPS 0

- #define TCP_WND_UPDATE_THRESHOLD (TCP_WND / 4)
- #define LWIP_EVENT_API 0
- #define LWIP_CALLBACK_API 1
- #define PBUF_LINK_HLEN (14 + ETH_PAD_SIZE)
- #define PBUF_POOL_BUFSIZE LWIP_MEM_ALIGN_SIZE(TCP_MSS+40+PBUF_LINK_HLEN)
- #define LWIP_NETIF_HOSTNAME 0
- #define LWIP_NETIF_API 0
- #define LWIP_NETIF_STATUS_CALLBACK 0
- #define LWIP_NETIF_LINK_CALLBACK 0
- #define LWIP_NETIF_REMOVE_CALLBACK 0
- #define LWIP_NETIF_HWADDRHINT 0
- #define LWIP_NETIF_LOOPBACK 0
- #define LWIP_LOOPBACK_MAX_PBUFS 0
- #define LWIP_NETIF_LOOPBACK_MULTITHREADING (!NO_SYS)
- #define LWIP_NETIF_TX_SINGLE_PBUF 0
- #define LWIP_HAVE_LOOPIF 0
- #define LWIP_HAVE_SLIPIF 0
- #define TCPIP_THREAD_NAME "tcpip_thread"
- #define TCPIP_THREAD_STACKSIZE 0
- #define TCPIP_THREAD_PRIO 1
- #define TCPIP_MBOX_SIZE 0
- #define SLIPIF_THREAD_NAME "slipif_loop"
- #define SLIPIF_THREAD_STACKSIZE 0
- #define SLIPIF_THREAD_PRIO 1
- #define PPP_THREAD_NAME "pppInputThread"
- #define PPP_THREAD_STACKSIZE 0
- #define PPP_THREAD_PRIO 1
- #define DEFAULT_THREAD_NAME "lwIP"
- #define DEFAULT_THREAD_STACKSIZE 0
- #define DEFAULT_THREAD_PRIO 1
- #define DEFAULT_RAW_RECVMBOX_SIZE 0
- #define DEFAULT_UDP_RECVMBOX_SIZE 0
- #define DEFAULT_TCP_RECVMBOX_SIZE 0
- #define DEFAULT_ACCEPTMBOX_SIZE 0
- #define LWIP_TCPIP_CORE_LOCKING 0
- #define LWIP_TCPIP_CORE_LOCKING_INPUT 0
- #define LWIP_NETCONN 1
- #define LWIP_TCPIP_TIMEOUT 1
- #define LWIP_SOCKET 1
- #define LWIP_COMPAT_SOCKETS 1
- #define LWIP_POSIX_SOCKETS_IO_NAMES 1
- #define LWIP_TCP_KEEPALIVE 0
- #define LWIP_SO_SNDTIMEO 0
- #define LWIP_SO_RCVTIMEO 0
- #define LWIP_SO_RCVBUF 0
- #define RECV_BUFSIZE_DEFAULT INT_MAX
- #define SO_REUSE 0
- #define SO_REUSE_RXTOALL 0
- #define LWIP_STATS 1
- #define LWIP_STATS_DISPLAY 0
- #define LINK_STATS 1
- #define ETHARP_STATS (LWIP_ARP)
- #define IP_STATS 1
- #define IPFRAG_STATS (IP_REASSEMBLY || IP_FRAG)
- #define ICMP_STATS 1

- #define IGMP_STATS (LWIP_IGMP)
- #define UDP_STATS (LWIP_UDP)
- #define TCP_STATS (LWIP_TCP)
- #define MEM_STATS ((MEM_LIBC_MALLOC == 0) && (MEM_USE_POOLS == 0))
- #define MEMP_STATS (MEMP_MEM_MALLOC == 0)
- #define SYS_STATS (NO_SYS == 0)
- #define PPP_SUPPORT 0
- #define PPPOE_SUPPORT 0
- #define PPPOS_SUPPORT PPP_SUPPORT
- #define CHECKSUM_GEN_IP 1
- #define CHECKSUM_GEN_UDP 1
- #define CHECKSUM_GEN_TCP 1
- #define CHECKSUM_GEN_ICMP 1
- #define CHECKSUM_CHECK_IP 1
- #define CHECKSUM_CHECK_UDP 1
- #define CHECKSUM_CHECK_TCP 1
- #define LWIP_CHECKSUM_ON_COPY 0
- #define LWIP_DBG_MIN_LEVEL LWIP_DBG_LEVEL_ALL
- #define LWIP_DBG_TYPES_ON LWIP_DBG_ON
- #define ETHARP_DEBUG LWIP_DBG_OFF
- #define NETIF_DEBUG LWIP_DBG_OFF
- #define PBUF_DEBUG LWIP_DBG_OFF
- #define API_LIB_DEBUG LWIP_DBG_OFF
- #define API_MSG_DEBUG LWIP_DBG_OFF
- #define SOCKETS_DEBUG LWIP_DBG_OFF
- #define ICMP_DEBUG LWIP_DBG_OFF
- #define IGMP_DEBUG LWIP_DBG_OFF
- #define INET_DEBUG LWIP_DBG_OFF
- #define IP_DEBUG LWIP_DBG_OFF
- #define IP_REASS_DEBUG LWIP_DBG_OFF
- #define RAW_DEBUG LWIP_DBG_OFF
- #define MEM_DEBUG LWIP_DBG_OFF
- #define MEMP_DEBUG LWIP_DBG_OFF
- #define SYS_DEBUG LWIP_DBG_OFF
- #define TIMERS_DEBUG LWIP_DBG_OFF
- #define TCP_DEBUG LWIP_DBG_OFF
- #define TCP_INPUT_DEBUG LWIP_DBG_OFF
- #define TCP_FR_DEBUG LWIP_DBG_OFF
- #define TCP_RTO_DEBUG LWIP_DBG_OFF
- #define TCP_CWND_DEBUG LWIP_DBG_OFF
- #define TCP_WND_DEBUG LWIP_DBG_OFF
- #define TCP_OUTPUT_DEBUG LWIP_DBG_OFF
- #define TCP_RST_DEBUG LWIP_DBG_OFF
- #define TCP_QLEN_DEBUG LWIP_DBG_OFF
- #define UDP_DEBUG LWIP_DBG_OFF
- #define TCPIP_DEBUG LWIP_DBG_OFF
- #define PPP_DEBUG LWIP_DBG_OFF
- #define SLIP_DEBUG LWIP_DBG_OFF
- #define DHCP_DEBUG LWIP_DBG_OFF
- #define AUTOIP_DEBUG LWIP_DBG_OFF
- #define SNMP_MSG_DEBUG LWIP_DBG_OFF
- #define SNMP_MIB_DEBUG LWIP_DBG_OFF
- #define DNS_DEBUG LWIP_DBG_OFF

5.72.1 Detailed Description

lwIP Options Configuration

5.72.2 Macro Definition Documentation

5.72.2.1 #define API_LIB_DEBUG LWIP_DBG_OFF

API_LIB_DEBUG: Enable debugging in api_lib.c.

Definition at line 1919 of file opt.h.

5.72.2.2 #define API_MSG_DEBUG LWIP_DBG_OFF

API_MSG_DEBUG: Enable debugging in api_msg.c.

Definition at line 1926 of file opt.h.

5.72.2.3 #define ARP_QUEUEING 0

ARP_QUEUEING==1: Multiple outgoing packets are queued during hardware address resolution. By default, only the most recent packet is queued per IP address. This is sufficient for most protocols and mainly reduces TCP connection startup time. Set this to 1 if you know your application sends more than one packet in a row to an IP address that is not in the ARP cache.

Definition at line 444 of file opt.h.

5.72.2.4 #define ARP_TABLE_SIZE 10

ARP_TABLE_SIZE: Number of active MAC-IP address pairs cached.

Definition at line 433 of file opt.h.

5.72.2.5 #define AUTOIP_DEBUG LWIP_DBG_OFF

AUTOIP_DEBUG: Enable debugging in autoip.c.

Definition at line 2109 of file opt.h.

5.72.2.6 #define CHECKSUM_CHECK_IP 1

CHECKSUM_CHECK_IP==1: Check checksums in software for incoming IP packets.

Definition at line 1819 of file opt.h.

5.72.2.7 #define CHECKSUM_CHECK_TCP 1

CHECKSUM_CHECK_TCP==1: Check checksums in software for incoming TCP packets.

Definition at line 1833 of file opt.h.

5.72.2.8 #define CHECKSUM_CHECK_UDP 1

CHECKSUM_CHECK_UDP==1: Check checksums in software for incoming UDP packets.

Definition at line 1826 of file opt.h.

5.72.2.9 #define CHECKSUM_GEN_ICMP 1

CHECKSUM_GEN_ICMP==1: Generate checksums in software for outgoing ICMP packets.

Definition at line 1812 of file opt.h.

5.72.2.10 #define CHECKSUM_GEN_IP 1

CHECKSUM_GEN_IP==1: Generate checksums in software for outgoing IP packets.

Definition at line 1791 of file opt.h.

5.72.2.11 #define CHECKSUM_GEN_TCP 1

CHECKSUM_GEN_TCP==1: Generate checksums in software for outgoing TCP packets.

Definition at line 1805 of file opt.h.

5.72.2.12 #define CHECKSUM_GEN_UDP 1

CHECKSUM_GEN_UDP==1: Generate checksums in software for outgoing UDP packets.

Definition at line 1798 of file opt.h.

5.72.2.13 #define DEFAULT_ACCEPTMBOX_SIZE 0

DEFAULT_ACCEPTMBOX_SIZE: The mailbox size for the incoming connections. The queue size value itself is platform-dependent, but is passed to sys_mbox_new() when the acceptmbox is created.

Definition at line 1379 of file opt.h.

5.72.2.14 #define DEFAULT_RAW_RECVMBOX_SIZE 0

DEFAULT_RAW_RECVMBOX_SIZE: The mailbox size for the incoming packets on a NETCONN_RAW. The queue size value itself is platform-dependent, but is passed to sys_mbox_new() when the recvmbox is created.

Definition at line 1352 of file opt.h.

5.72.2.15 #define DEFAULT_TCP_RECVMBOX_SIZE 0

DEFAULT_TCP_RECVMBOX_SIZE: The mailbox size for the incoming packets on a NETCONN_TCP. The queue size value itself is platform-dependent, but is passed to sys_mbox_new() when the recvmbox is created.

Definition at line 1370 of file opt.h.

5.72.2.16 #define DEFAULT_THREAD_NAME "lwIP"

DEFAULT_THREAD_NAME: The name assigned to any other lwIP thread.

Definition at line 1325 of file opt.h.

5.72.2.17 #define DEFAULT_THREAD_PRIO 1

DEFAULT_THREAD_PRIO: The priority assigned to any other lwIP thread. The priority value itself is platform-dependent, but is passed to sys_thread_new() when the thread is created.

Definition at line 1343 of file opt.h.

5.72.2.18 #define DEFAULT_THREAD_STACKSIZE 0

DEFAULT_THREAD_STACKSIZE: The stack size used by any other lwIP thread. The stack size value itself is platform-dependent, but is passed to sys_thread_new() when the thread is created.

Definition at line 1334 of file opt.h.

5.72.2.19 #define DEFAULT_UDP_RECVMBOX_SIZE 0

DEFAULT_UDP_RECVMBOX_SIZE: The mailbox size for the incoming packets on a NETCONN_UDP. The queue size value itself is platform-dependent, but is passed to sys_mbox_new() when the recvmbox is created.

Definition at line 1361 of file opt.h.

5.72.2.20 #define DHCP_DEBUG LWIP_DBG_OFF

DHCP_DEBUG: Enable debugging in dhcp.c.

Definition at line 2102 of file opt.h.

5.72.2.21 #define DHCP_DOES_ARP_CHECK ((LWIP_DHCP) && (LWIP_ARP))

DHCP_DOES_ARP_CHECK==1: Do an ARP check on the offered address.

Definition at line 689 of file opt.h.

5.72.2.22 #define DNS_DEBUG LWIP_DBG_OFF

DNS_DEBUG: Enable debugging for DNS.

Definition at line 2130 of file opt.h.

5.72.2.23 #define DNS_DOES_NAME_CHECK 1

DNS do a name checking between the query and the response.

Definition at line 838 of file opt.h.

5.72.2.24 #define DNS_LOCAL_HOSTLIST 0

DNS_LOCAL_HOSTLIST: Implements a local host-to-address list. If enabled, you have to define #define DNS_↩ LOCAL_HOSTLIST_INIT {{"host1", 0x123}, {"host2", 0x234}} (an array of structs name/address, where address is an u32_t in network byte order).

Instead, you can also use an external function: #define DNS_LOOKUP_LOCAL_EXTERN(x) extern u32_t my_↩ lookup_function(const char ∗name) that returns the IP address or INADDR_NONE if not found.

Definition at line 857 of file opt.h.

5.72.2.25 #define DNS_LOCAL_HOSTLIST_IS_DYNAMIC 0

If this is turned on, the local host-list can be dynamically changed at runtime.

Definition at line 863 of file opt.h.

5.72.2.26 #define DNS_MAX_NAME_LENGTH 256

DNS maximum host name length supported in the name table.

Definition at line 828 of file opt.h.

5.72.2.27 #define DNS_MAX_SERVERS 2

The maximum of DNS servers

Definition at line 833 of file opt.h.

5.72.2.28 #define DNS_MSG_SIZE 512

DNS message max. size. Default value is RFC compliant.

Definition at line 843 of file opt.h.

5.72.2.29 #define DNS_TABLE_SIZE 4

DNS maximum number of entries to maintain locally.

Definition at line 823 of file opt.h.

5.72.2.30 #define ETH_PAD_SIZE 0

ETH_PAD_SIZE: number of bytes added before the ethernet header to ensure alignment of payload after that header. Since the header is 14 bytes long, without this padding e.g. addresses in the IP header will not be aligned on a 32-bit boundary, so setting this to 2 can speed up 32-bit-platforms.

Definition at line 486 of file opt.h.

5.72.2.31 #define ETHARP_DEBUG LWIP_DBG_OFF

ETHARP_DEBUG: Enable debugging in etharp.c.

Definition at line 1898 of file opt.h.

5.72.2.32 #define ETHARP_STATS (LWIP_ARP)

ETHARP_STATS==1: Enable etharp stats.

Definition at line 1533 of file opt.h.

5.72.2.33 #define ETHARP_SUPPORT_STATIC_ENTRIES 0

ETHARP_SUPPORT_STATIC_ENTRIES==1: enable code to support static ARP table entries (using etharp_↩ add_static_entry/etharp_remove_static_entry).

Definition at line 493 of file opt.h.

5.72.2.34 #define ETHARP_SUPPORT_VLAN 0

ETHARP_SUPPORT_VLAN==1: support receiving ethernet packets with VLAN header. Additionally, you can define ETHARP_VLAN_CHECK to an u16_t VLAN ID to check. If ETHARP_VLAN_CHECK is defined, only VLA↩ N-traffic for this VLAN is accepted. If ETHARP_VLAN_CHECK is not defined, all traffic is accepted. Alternatively, define a function/define ETHARP_VLAN_CHECK_FN(eth_hdr, vlan) that returns 1 to accept a packet or 0 to drop a packet.

Definition at line 470 of file opt.h.

5.72.2.35 #define ETHARP_TRUST_IP_MAC 0

ETHARP_TRUST_IP_MAC==1: Incoming IP packets cause the ARP table to be updated with the source MAC and IP addresses supplied in the packet. You may want to disable this if you do not trust LAN peers to have the correct addresses, or as a limited approach to attempt to handle spoofing. If disabled, lwIP will need to make a new ARP request if the peer is not already in the ARP table, adding a little latency. The peer *is* in the ARP table if it requested our address before. Also notice that this slows down input processing of every IP packet!

Definition at line 458 of file opt.h.

5.72.2.36 #define ICMP_DEBUG LWIP_DBG_OFF

ICMP_DEBUG: Enable debugging in icmp.c.

Definition at line 1940 of file opt.h.

5.72.2.37 #define ICMP_STATS 1

ICMP_STATS==1: Enable ICMP stats.

Definition at line 1555 of file opt.h.

5.72.2.38 #define ICMP_TTL (IP_DEFAULT_TTL)

ICMP_TTL: Default value for Time-To-Live used by ICMP packets.

Definition at line 637 of file opt.h.

5.72.2.39 #define IGMP_DEBUG LWIP_DBG_OFF

IGMP_DEBUG: Enable debugging in igmp.c.

Definition at line 1947 of file opt.h.

5.72.2.40 #define IGMP_STATS (LWIP_IGMP)

IGMP_STATS==1: Enable IGMP stats.

Definition at line 1562 of file opt.h.

5.72.2.41 #define INET_DEBUG LWIP_DBG_OFF

INET_DEBUG: Enable debugging in inet.c.

Definition at line 1954 of file opt.h.

5.72.2.42 #define IP_DEBUG LWIP_DBG_OFF

IP_DEBUG: Enable debugging for IP.

Definition at line 1961 of file opt.h.

5.72.2.43 #define IP_DEFAULT_TTL 255

IP_FRAG_MAX_MTU: Assumed max MTU on any interface for IP frag buffer (requires IP_FRAG_USES_STATI←C_BUF==1) IP_DEFAULT_TTL: Default value for Time-To-Live used by transport layers.

Definition at line 580 of file opt.h.

5.72.2.44 #define IP_FORWARD 0

IP_FORWARD==1: Enables the ability to forward IP packets across network interfaces. If you are going to run lwIP on a device with only one network interface, define this to 0.

Definition at line 508 of file opt.h.

5.72.2.45 #define IP_FORWARD_ALLOW_TX_ON_RX_NETIF 0

IP_FORWARD_ALLOW_TX_ON_RX_NETIF==1: allow ip_forward() to send packets back out on the netif where it was received. This should only be used for wireless networks. ATTENTION: When this is 1, make sure your netif driver correctly marks incoming link-layer-broadcast/multicast packets as such using the corresponding pbuf flags!

Definition at line 608 of file opt.h.

5.72.2.46 #define IP_FRAG 1

IP_FRAG==1: Fragment outgoing IP packets if their size exceeds MTU. Note that this option does not affect incoming packet sizes, which can be controlled via IP_REASSEMBLY.

Definition at line 535 of file opt.h.

5.72.2.47 #define IP_FRAG_USES_STATIC_BUF 0

IP_FRAG_USES_STATIC_BUF==1: Use a static MTU-sized buffer for IP fragmentation. Otherwise pbufs are allocated and reference the original packet data to be fragmented (or with LWIP_NETIF_TX_SINGLE_PBUF==1, new PBUF_RAM pbufs are used for fragments). ATTENTION: IP_FRAG_USES_STATIC_BUF==1 may not be used for DMA-enabled MACs!

Definition at line 565 of file opt.h.

5.72.2.48 #define IP_OPTIONS_ALLOWED 1

IP_OPTIONS_ALLOWED: Defines the behavior for IP options. IP_OPTIONS_ALLOWED==0: All packets with IP options are dropped. IP_OPTIONS_ALLOWED==1: IP options are allowed (but not parsed).

Definition at line 517 of file opt.h.

5.72.2.49 #define IP_REASS_DEBUG LWIP_DBG_OFF

IP_REASS_DEBUG: Enable debugging in ip_frag.c for both frag & reass.

Definition at line 1968 of file opt.h.

5.72.2.50 #define IP_REASS_MAX_PBUFS 10

IP_REASS_MAX_PBUFS: Total maximum amount of pbufs waiting to be reassembled. Since the received pbufs are enqueued, be sure to configure PBUF_POOL_SIZE > IP_REASS_MAX_PBUFS so that the stack is still able to receive packets even if the maximum amount of fragments is enqueued for reassembly!

Definition at line 554 of file opt.h.

5.72.2.51 #define IP_REASS_MAXAGE 3

IP_REASS_MAXAGE: Maximum time (in multiples of IP_TMR_INTERVAL - so seconds, normally) a fragmented IP packet waits for all fragments to arrive. If not all fragments arrived in this time, the whole packet is discarded.

Definition at line 544 of file opt.h.

5.72.2.52 #define IP_REASSEMBLY 1

IP_REASSEMBLY==1: Reassemble incoming fragmented IP packets. Note that this option does not affect outgoing packet sizes, which can be controlled via IP_FRAG.

Definition at line 526 of file opt.h.

5.72.2.53 #define IP_SOF_BROADCAST 0

IP_SOF_BROADCAST=1: Use the SOF_BROADCAST field to enable broadcast filter per pcb on udp and raw send operations. To enable broadcast filter on recv operations, you also have to set IP_SOF_BROADCAST_RECV=1.

Definition at line 589 of file opt.h.

5.72.2.54 #define IP_SOF_BROADCAST_RECV 0

IP_SOF_BROADCAST_RECV (requires IP_SOF_BROADCAST=1) enable the broadcast filter on recv operations.

Definition at line 597 of file opt.h.

5.72.2.55 #define IP_STATS 1

IP_STATS==1: Enable IP stats.

Definition at line 1540 of file opt.h.

5.72.2.56 #define IPFRAG_STATS (IP_REASSEMBLY || IP_FRAG)

IPFRAG_STATS==1: Enable IP fragmentation stats. Default is on if using either frag or reass.

Definition at line 1548 of file opt.h.

5.72.2.57 #define LINK_STATS 1

LINK_STATS==1: Enable link stats.

Definition at line 1526 of file opt.h.

5.72.2.58 #define LWIP_ALLOW_MEM_FREE_FROM_OTHER_CONTEXT 0

Set this to 1 if you want to free PBUF_RAM pbufs (or call mem_free()) from interrupt context (or another context that doesn't allow waiting for a semaphore). If set to 1, mem_malloc will be protected by a semaphore and SYS_A↩
RCH_PROTECT, while mem_free will only use SYS_ARCH_PROTECT. mem_malloc SYS_ARCH_UNPROTECTs with each loop so that mem_free can run.

ATTENTION: As you can see from the above description, this leads to dis-/ enabling interrupts often, which can be slow! Also, on low memory, mem_malloc can need longer.

If you don't want that, at least for NO_SYS=0, you can still use the following functions to enqueue a deallocation call which then runs in the tcpip_thread context:

- pbuf_free_callback(p);
- mem_free_callback(m);

Definition at line 212 of file opt.h.

5.72.2.59 #define LWIP_ARP 1

LWIP_ARP==1: Enable ARP functionality.

Definition at line 426 of file opt.h.

5.72.2.60 #define LWIP_AUTOIP 0

LWIP_AUTOIP==1: Enable AUTOIP module.

Definition at line 701 of file opt.h.

5.72.2.61 #define LWIP_BROADCAST_PING 0

LWIP_BROADCAST_PING==1: respond to broadcast pings (default is unicast only)

Definition at line 644 of file opt.h.

5.72.2.62 #define LWIP_CALLBACK_API 1

Definition at line 1080 of file opt.h.

5.72.2.63 #define LWIP_CHECKSUM_ON_COPY 0

LWIP_CHECKSUM_ON_COPY==1: Calculate checksum when copying data from application buffers to pbufs.

Definition at line 1841 of file opt.h.

5.72.2.64 #define LWIP_COMPAT_SOCKETS 1

LWIP_COMPAT_SOCKETS==1: Enable BSD-style sockets functions names. (only used if you use sockets.c)

Definition at line 1434 of file opt.h.

5.72.2.65 #define LWIP_DBG_MIN_LEVEL LWIP_DBG_LEVEL_ALL

LWIP_HOOK_IP4_INPUT(pbuf, input_netif):

- called from ip_input() (IPv4)
- pbuf: received struct pbuf passed to ip_input()
- input_netif: struct netif on which the packet has been received Return values:
- 0: Hook has not consumed the packet, packet is processed as normal
- != 0: Hook has consumed the packet. If the hook consumed the packet, 'pbuf' is in the responsibility of the hook (i.e. free it when done). LWIP_HOOK_IP4_ROUTE(dest):

- called from ip_route() (IPv4)
- dest: destination IPv4 address Returns the destination netif or NULL if no destination netif is found. In that case, ip_route() continues as normal. LWIP_DBG_MIN_LEVEL: After masking, the value of the debug is compared against this value. If it is smaller, then debugging messages are written.

Definition at line 1883 of file opt.h.

5.72.2.66 #define LWIP_DBG_TYPES_ON LWIP_DBG_ON

LWIP_DBG_TYPES_ON: A mask that can be used to globally enable/disable debug messages of certain types.

Definition at line 1891 of file opt.h.

5.72.2.67 #define LWIP_DHCP 0

LWIP_DHCP==1: Enable DHCP module.

Definition at line 682 of file opt.h.

5.72.2.68 #define LWIP_DHCP_AUTOIP_COOP 0

LWIP_DHCP_AUTOIP_COOP==1: Allow DHCP and AUTOIP to be both enabled on the same interface at the same time.

Definition at line 709 of file opt.h.

5.72.2.69 #define LWIP_DHCP_AUTOIP_COOP_TRIES 9

LWIP_DHCP_AUTOIP_COOP_TRIES: Set to the number of DHCP DISCOVER probes that should be sent before falling back on AUTOIP. This can be set as low as 1 to get an AutoIP address very quickly, but you should be prepared to handle a changing IP address when DHCP overrides AutoIP.

Definition at line 720 of file opt.h.

5.72.2.70 #define LWIP_DNS 0

LWIP_DNS==1: Turn on DNS module. UDP must be available for DNS transport.

Definition at line 818 of file opt.h.

5.72.2.71 #define LWIP_ETHERNET (LWIP_ARP || PPPOE_SUPPORT)

LWIP_ETHERNET==1: enable ethernet support for PPPoE even though ARP might be disabled

Definition at line 477 of file opt.h.

5.72.2.72 #define LWIP_EVENT_API 0

LWIP_EVENT_API and LWIP_CALLBACK_API: Only one of these should be set to 1. LWIP_EVENT_API==1: The user defines lwip_tcp_event() to receive all events (accept, sent, etc) that happen in the system. LWIP_CALLBA↩
CK_API==1: The PCB callback function is called directly for the event. This is the default.

Definition at line 1079 of file opt.h.

5.72.2.73 #define LWIP_HAVE_LOOPIF 0

LWIP_HAVE_LOOPIF==1: Support loop interface (127.0.0.1) and loopif.c

Definition at line 1217 of file opt.h.

5.72.2.74 #define LWIP_HAVE_SLIPIF 0

LWIP_HAVE_SLIPIF==1: Support slip interface and slipif.c

Definition at line 1229 of file opt.h.

5.72.2.75 #define LWIP_ICMP 1

LWIP_ICMP==1: Enable ICMP module inside the IP stack. Be careful, disable that make your product non-compliant to RFC1122

Definition at line 630 of file opt.h.

5.72.2.76 #define LWIP_IGMP 0

LWIP_IGMP==1: Turn on IGMP module.

Definition at line 805 of file opt.h.

5.72.2.77 #define LWIP_LOOPBACK_MAX_PBUFS 0

LWIP_LOOPBACK_MAX_PBUFS: Maximum number of pbufs on queue for loopback sending for each netif (0 = disabled)

Definition at line 1175 of file opt.h.

5.72.2.78 #define LWIP_MULTICAST_PING 0

LWIP_MULTICAST_PING==1: respond to multicast pings (default is unicast only)

Definition at line 651 of file opt.h.

5.72.2.79 #define LWIP_NETBUF_RECVINFO 0

LWIP_NETBUF_RECVINFO==1: append destination addr and port to every netbuf.

Definition at line 896 of file opt.h.

5.72.2.80 #define LWIP_NETCONN 1

LWIP_NETCONN==1: Enable Netconn API (require to use api_lib.c)

Definition at line 1407 of file opt.h.

5.72.2.81 #define LWIP_NETIF_API 0

LWIP_NETIF_API==1: Support netif api (in netifapi.c)

Definition at line 1124 of file opt.h.

5.72.2.82 #define LWIP_NETIF_HOSTNAME 0

LWIP_NETIF_HOSTNAME==1: use DHCP_OPTION_HOSTNAME with netif's hostname field.

Definition at line 1117 of file opt.h.

5.72.2.83 #define LWIP_NETIF_HWADDRHINT 0

LWIP_NETIF_HWADDRHINT==1: Cache link-layer-address hints (e.g. table indices) in struct netif. TCP and UDP can make use of this to prevent scanning the ARP table for every sent packet. While this is faster for big ARP tables or many concurrent connections, it might be counterproductive if you have a tiny ARP table or if there never are concurrent connections.

Definition at line 1159 of file opt.h.

5.72.2.84 #define LWIP_NETIF_LINK_CALLBACK 0

LWIP_NETIF_LINK_CALLBACK==1: Support a callback function from an interface whenever the link changes (i.e., link down)

Definition at line 1140 of file opt.h.

5.72.2.85 #define LWIP_NETIF_LOOPBACK 0

LWIP_NETIF_LOOPBACK==1: Support sending packets with a destination IP address equal to the netif IP address, looping them back up the stack.

Definition at line 1167 of file opt.h.

5.72.2.86 #define LWIP_NETIF_LOOPBACK_MULTITHREADING (!NO_SYS)

LWIP_NETIF_LOOPBACK_MULTITHREADING: Indicates whether threading is enabled in the system, as netifs must change how they behave depending on this setting for the LWIP_NETIF_LOOPBACK option to work. Setting this is needed to avoid reentering non-reentrant functions like tcp_input(). LWIP_NETIF_LOOPBACK_MULTITH↵ READING==1: Indicates that the user is using a multithreaded environment like tcpip.c. In this case, netif->input() is called directly. LWIP_NETIF_LOOPBACK_MULTITHREADING==0: Indicates a polling (or NO_SYS) setup. The packets are put on a list and netif_poll() must be called in the main application loop.

Definition at line 1192 of file opt.h.

5.72.2.87 #define LWIP_NETIF_REMOVE_CALLBACK 0

LWIP_NETIF_REMOVE_CALLBACK==1: Support a callback function that is called when a netif has been removed

Definition at line 1148 of file opt.h.

5.72.2.88 #define LWIP_NETIF_STATUS_CALLBACK 0

LWIP_NETIF_STATUS_CALLBACK==1: Support a callback function whenever an interface changes its up/down status (i.e., due to DHCP IP acquistion)

Definition at line 1132 of file opt.h.

5.72.2.89 #define LWIP_NETIF_TX_SINGLE_PBUF 0

LWIP_NETIF_TX_SINGLE_PBUF: if this is set to 1, lwIP tries to put all data to be sent into one single pbuf. This is for compatibility with DMA-enabled MACs that do not support scatter-gather. Beware that this might involve

CPU-memcpy before transmitting that would not be needed without this flag! Use this only if you need to!

Todo : TCP and IP-frag do not work with this, yet:

Definition at line 1205 of file opt.h.

5.72.2.90 #define LWIP_POSIX_SOCKETS_IO_NAMES 1

LWIP_POSIX_SOCKETS_IO_NAMES==1: Enable POSIX-style sockets functions names. Disable this option if you use a POSIX operating system that uses the same names (read, write & close). (only used if you use sockets.c)

Definition at line 1443 of file opt.h.

5.72.2.91 #define LWIP_RANDOMIZE_INITIAL_LOCAL_PORTS 0

LWIP_RANDOMIZE_INITIAL_LOCAL_PORTS==1: randomize the local port for the first local TCP/UDP pcb (default==0). This can prevent creating predictable port numbers after booting a device.

Definition at line 617 of file opt.h.

5.72.2.92 #define LWIP_RAW 1

LWIP_RAW==1: Enable application layer to hook into the IP layer itself.

Definition at line 663 of file opt.h.

5.72.2.93 #define LWIP_SNMP 0

LWIP_SNMP==1: Turn on SNMP module. UDP must be available for SNMP transport.

Definition at line 733 of file opt.h.

5.72.2.94 #define LWIP_SO_RCVBUF 0

LWIP_SO_RCVBUF==1: Enable SO_RCVBUF processing.

Definition at line 1475 of file opt.h.

5.72.2.95 #define LWIP_SO_RCVTIMEO 0

LWIP_SO_RCVTIMEO==1: Enable receive timeout for sockets/netconns and SO_RCVTIMEO processing.

Definition at line 1468 of file opt.h.

5.72.2.96 #define LWIP_SO_SNDTIMEO 0

LWIP_SO_SNDTIMEO==1: Enable send timeout for sockets/netconns and SO_SNDTIMEO processing.

Definition at line 1460 of file opt.h.

5.72.2.97 #define LWIP_SOCKET 1

LWIP_SOCKET==1: Enable Socket API (require to use sockets.c)

Definition at line 1426 of file opt.h.

5.72.2.98 #define LWIP_STATS 1

LWIP_STATS==1: Enable statistics collection in lwip_stats.

Definition at line 1510 of file opt.h.

5.72.2.99 #define LWIP_STATS_DISPLAY 0

LWIP_STATS_DISPLAY==1: Compile in the statistics output functions.

Definition at line 1519 of file opt.h.

5.72.2.100 #define LWIP_TCP 1

LWIP_TCP==1: Turn on TCP.

Definition at line 908 of file opt.h.

5.72.2.101 #define LWIP_TCP_KEEPALIVE 0

LWIP_TCP_KEEPALIVE==1: Enable TCP_KEEPIDLE, TCP_KEEPINTVL and TCP_KEEPCNT options processing. Note that TCP_KEEPIDLE and TCP_KEEPINTVL have to be set in seconds. (does not require sockets.c, and will affect tcp.c)

Definition at line 1452 of file opt.h.

5.72.2.102 #define LWIP_TCP_TIMESTAMPS 0

LWIP_TCP_TIMESTAMPS==1: support the TCP timestamp option.

Definition at line 1060 of file opt.h.

5.72.2.103 #define LWIP_TCPIP_CORE_LOCKING 0

LWIP_TCPIP_CORE_LOCKING: (EXPERIMENTAL!) Don't use it if you're not an active lwIP project member

Definition at line 1392 of file opt.h.

5.72.2.104 #define LWIP_TCPIP_CORE_LOCKING_INPUT 0

LWIP_TCPIP_CORE_LOCKING_INPUT: (EXPERIMENTAL!) Don't use it if you're not an active lwIP project member

Definition at line 1400 of file opt.h.

5.72.2.105 #define LWIP_TCPIP_TIMEOUT 1

LWIP_TCPIP_TIMEOUT==1: Enable tcpip_timeout/tcpip_untimeout tod create timers running in tcpip_thread from another thread.

Definition at line 1414 of file opt.h.

5.72.2.106 #define LWIP_UDP 1

LWIP_UDP==1: Turn on UDP.

Definition at line 875 of file opt.h.

5.72.2.107 #define LWIP_UDPLITE 0

LWIP_UDPLITE==1: Turn on UDP-Lite. (Requires LWIP_UDP)

Definition at line 882 of file opt.h.

5.72.2.108 #define MEM_ALIGNMENT 1

MEM_ALIGNMENT: should be set to the alignment of the CPU 4 byte alignment -> #define MEM_ALIGNMENT 4 2 byte alignment -> #define MEM_ALIGNMENT 2

Definition at line 124 of file opt.h.

5.72.2.109 #define MEM_DEBUG LWIP_DBG_OFF

MEM_DEBUG: Enable debugging in mem.c.

Definition at line 1982 of file opt.h.

5.72.2.110 #define MEM_LIBC_MALLOC 0

MEM_LIBC_MALLOC==1: Use malloc/free/realloc provided by your C-library instead of the lwip internal allocator. Can save code size if you already use it.

Definition at line 106 of file opt.h.

5.72.2.111 #define MEM_SIZE 1600

MEM_SIZE: the size of the heap memory. If the application will send a lot of data that needs to be copied, this should be set high.

Definition at line 132 of file opt.h.

5.72.2.112 #define MEM_STATS ((MEM_LIBC_MALLOC == 0) && (MEM_USE_POOLS == 0))

MEM_STATS==1: Enable mem.c stats.

Definition at line 1585 of file opt.h.

5.72.2.113 #define MEM_USE_POOLS 0

MEM_USE_POOLS==1: Use an alternative to malloc() by allocating from a set of memory pools of various sizes. When mem_malloc is called, an element of the smallest pool that can provide the length needed is returned. To use this, MEMP_USE_CUSTOM_POOLS also has to be enabled.

Definition at line 172 of file opt.h.

5.72.2.114 #define MEM_USE_POOLS_TRY_BIGGER_POOL 0

MEM_USE_POOLS_TRY_BIGGER_POOL==1: if one malloc-pool is empty, try the next bigger pool - WARNING: THIS MIGHT WASTE MEMORY but it can make a system more reliable.

Definition at line 180 of file opt.h.

5.72.2.115 #define MEMCPY(*dst, src, len*) memcpy(dst,src,len)

MEMCPY: override this if you have a faster implementation at hand than the one included in your C library

Definition at line 84 of file opt.h.

5.72.2.116 #define MEMP_DEBUG LWIP_DBG_OFF

MEMP_DEBUG: Enable debugging in memp.c.

Definition at line 1989 of file opt.h.

5.72.2.117 #define MEMP_MEM_MALLOC 0

MEMP_MEM_MALLOC==1: Use mem_malloc/mem_free instead of the lwip pool allocator. Especially useful with MEM_LIBC_MALLOC but handle with care regarding execution speed and usage from interrupts!

Definition at line 115 of file opt.h.

5.72.2.118 #define MEMP_NUM_ARP_QUEUE 30

MEMP_NUM_ARP_QUEUE: the number of simulateously queued outgoing packets (pbufs) that are waiting for an ARP request (to resolve their destination address) to finish. (requires the ARP_QUEUEING option)

Definition at line 296 of file opt.h.

5.72.2.119 #define MEMP_NUM_FRAG_PBUF 15

MEMP_NUM_FRAG_PBUF: the number of IP fragments simultaneously sent (fragments, not whole packets!). This is only used with IP_FRAG_USES_STATIC_BUF==0 and LWIP_NETIF_TX_SINGLE_PBUF==0 and only has to be $>$ 1 with DMA-enabled MACs where the packet is not yet sent when netif->output returns.

Definition at line 286 of file opt.h.

5.72.2.120 #define MEMP_NUM_IGMP_GROUP 8

MEMP_NUM_IGMP_GROUP: The number of multicast groups whose network interfaces can be members et the same time (one per netif - allsystems group -, plus one per netif membership). (requires the LWIP_IGMP option)

Definition at line 306 of file opt.h.

5.72.2.121 #define MEMP_NUM_LOCALHOSTLIST 1

MEMP_NUM_LOCALHOSTLIST: the number of host entries in the local host list if DNS_LOCAL_HOSTLIST_IS↩_DYNAMIC==1.

Definition at line 399 of file opt.h.

5.72.2.122 #define MEMP_NUM_NETBUF 2

MEMP_NUM_NETBUF: the number of struct netbufs. (only needed if you use the sequential API, like api_lib.c)

Definition at line 324 of file opt.h.

5.72.2.123 #define MEMP_NUM_NETCONN 4

MEMP_NUM_NETCONN: the number of struct netconns. (only needed if you use the sequential API, like api_lib.c)

Definition at line 332 of file opt.h.

5.72.2.124 #define MEMP_NUM_NETDB 1

MEMP_NUM_NETDB: the number of concurrently running lwip_addrinfo() calls (before freeing the corresponding memory using lwip_freeaddrinfo()).

Definition at line 391 of file opt.h.

5.72.2.125 #define MEMP_NUM_PBUF 16

MEMP_NUM_PBUF: the number of memp struct pbufs (used for PBUF_ROM and PBUF_REF). If the application sends a lot of data out of ROM (or other static memory), this should be set high.

Definition at line 226 of file opt.h.

5.72.2.126 #define MEMP_NUM_PPPOE_INTERFACES 1

MEMP_NUM_PPPOE_INTERFACES: the number of concurrently active PPPoE interfaces (only used with PPP↩
OE_SUPPORT==1)

Definition at line 407 of file opt.h.

5.72.2.127 #define MEMP_NUM_RAW_PCB 4

MEMP_NUM_RAW_PCB: Number of raw connection PCBs (requires the LWIP_RAW option)

Definition at line 234 of file opt.h.

5.72.2.128 #define MEMP_NUM_REASSDATA 5

MEMP_NUM_REASSDATA: the number of IP packets simultaneously queued for reassembly (whole packets, not fragments!)

Definition at line 275 of file opt.h.

5.72.2.129 #define MEMP_NUM_SNMP_NODE 50

MEMP_NUM_SNMP_NODE: the number of leafs in the SNMP tree.

Definition at line 357 of file opt.h.

5.72.2.130 #define MEMP_NUM_SNMP_ROOTNODE 30

MEMP_NUM_SNMP_ROOTNODE: the number of branches in the SNMP tree. Every branch has one leaf (MEM↩
P_NUM_SNMP_NODE) at least!

Definition at line 365 of file opt.h.

5.72.2.131 #define MEMP_NUM_SNMP_VALUE 3

MEMP_NUM_SNMP_VALUE: the number of OID or values concurrently used (does not have to be changed normally) - 3 of these are used per request (1 for the value read and 2 for OIDs - input and output)

Definition at line 383 of file opt.h.

5.72.2.132 #define MEMP_NUM_SNMP_VARBIND 2

MEMP_NUM_SNMP_VARBIND: the number of concurrent requests (does not have to be changed normally) - 2 of these are used per request (1 for input, 1 for output)

Definition at line 374 of file opt.h.

5.72.2.133 #define MEMP_NUM_SYS_TIMEOUT (LWIP_TCP + IP_REASSEMBLY + LWIP_ARP + (2∗LWIP_DHCP) + LWIP_AUTOIP + LWIP_IGMP + LWIP_DNS + PPP_SUPPORT)

MEMP_NUM_SYS_TIMEOUT: the number of simulateously active timeouts. (requires NO_SYS==0) The default number of timeouts is calculated here for all enabled modules. The formula expects settings to be either '0' or '1'.

Definition at line 316 of file opt.h.

5.72.2.134 #define MEMP_NUM_TCP_PCB 5

MEMP_NUM_TCP_PCB: the number of simulatenously active TCP connections. (requires the LWIP_TCP option)

Definition at line 251 of file opt.h.

5.72.2.135 #define MEMP_NUM_TCP_PCB_LISTEN 8

MEMP_NUM_TCP_PCB_LISTEN: the number of listening TCP connections. (requires the LWIP_TCP option)

Definition at line 259 of file opt.h.

5.72.2.136 #define MEMP_NUM_TCP_SEG 16

MEMP_NUM_TCP_SEG: the number of simultaneously queued TCP segments. (requires the LWIP_TCP option)

Definition at line 267 of file opt.h.

5.72.2.137 #define MEMP_NUM_TCPIP_MSG_API 8

MEMP_NUM_TCPIP_MSG_API: the number of struct tcpip_msg, which are used for callback/timeout API communication. (only needed if you use tcpip.c)

Definition at line 341 of file opt.h.

5.72.2.138 #define MEMP_NUM_TCPIP_MSG_INPKT 8

MEMP_NUM_TCPIP_MSG_INPKT: the number of struct tcpip_msg, which are used for incoming packets. (only needed if you use tcpip.c)

Definition at line 350 of file opt.h.

5.72.2.139 #define MEMP_NUM_UDP_PCB 4

MEMP_NUM_UDP_PCB: the number of UDP protocol control blocks. One per active UDP "connection". (requires the LWIP_UDP option)

Definition at line 243 of file opt.h.

5.72.2.140 #define MEMP_OVERFLOW_CHECK 0

MEMP_OVERFLOW_CHECK: memp overflow protection reserves a configurable amount of bytes before and after each memp element in every pool and fills it with a prominent default value. MEMP_OVERFLOW_CHECK == 0 no checking MEMP_OVERFLOW_CHECK == 1 checks each element when it is freed MEMP_OVERFLOW_CHECK >= 2 checks each element in every pool every time memp_malloc() or memp_free() is called (useful but slow!)

Definition at line 154 of file opt.h.

5.72.2.141 #define MEMP_SANITY_CHECK 0

MEMP_SANITY_CHECK==1: run a sanity check after each memp_free() to make sure that there are no cycles in the linked lists.

Definition at line 162 of file opt.h.

5.72.2.142 #define MEMP_SEPARATE_POOLS 0

MEMP_SEPARATE_POOLS: if defined to 1, each pool is placed in its own array. This can be used to individually change the location of each pool. Default is one big array for all pools

Definition at line 141 of file opt.h.

5.72.2.143 #define MEMP_STATS (MEMP_MEM_MALLOC == 0)

MEMP_STATS==1: Enable memp.c pool stats.

Definition at line 1592 of file opt.h.

5.72.2.144 #define MEMP_USE_CUSTOM_POOLS 0

MEMP_USE_CUSTOM_POOLS==1: whether to include a user file lwippools.h that defines additional pools beyond the "standard" ones required by lwIP. If you set this to 1, you must have lwippools.h in your inlude path somewhere.

Definition at line 190 of file opt.h.

5.72.2.145 #define NETIF_DEBUG LWIP_DBG_OFF

NETIF_DEBUG: Enable debugging in netif.c.

Definition at line 1905 of file opt.h.

5.72.2.146 #define NO_SYS 0

NO_SYS==1: Provides VERY minimal functionality. Otherwise, use lwIP facilities.

Definition at line 68 of file opt.h.

5.72.2.147 #define NO_SYS_NO_TIMERS 0

NO_SYS_NO_TIMERS==1: Drop support for sys_timeout when NO_SYS==1 Mainly for compatibility to old versions.

Definition at line 76 of file opt.h.

5.72.2.148 #define PBUF_DEBUG LWIP_DBG_OFF

PBUF_DEBUG: Enable debugging in pbuf.c.

Definition at line 1912 of file opt.h.

5.72.2.149 #define PBUF_LINK_HLEN (14 + ETH_PAD_SIZE)

PBUF_LINK_HLEN: the number of bytes that should be allocated for a link level header. The default is 14, the standard value for Ethernet.

Definition at line 1095 of file opt.h.

5.72.2.150 #define PBUF_POOL_BUFSIZE LWIP_MEM_ALIGN_SIZE(TCP_MSS+40+PBUF_LINK_HLEN)

PBUF_POOL_BUFSIZE: the size of each pbuf in the pbuf pool. The default is designed to accomodate single full size TCP frame in one pbuf, including TCP_MSS, IP header, and link header.

Definition at line 1104 of file opt.h.

5.72.2.151 #define PBUF_POOL_SIZE 16

PBUF_POOL_SIZE: the number of buffers in the pbuf pool.

Definition at line 414 of file opt.h.

5.72.2.152 #define PPP_DEBUG LWIP_DBG_OFF

PPP_DEBUG: Enable debugging for PPP.

Definition at line 2088 of file opt.h.

5.72.2.153 #define PPP_SUPPORT 0

PPP_SUPPORT==1: Enable PPP.

Definition at line 1627 of file opt.h.

5.72.2.154 #define PPP_THREAD_NAME "pppInputThread"

PPP_THREAD_NAME: The name assigned to the pppInputThread.

Definition at line 1300 of file opt.h.

5.72.2.155 #define PPP_THREAD_PRIO 1

PPP_THREAD_PRIO: The priority assigned to the pppInputThread. The priority value itself is platform-dependent, but is passed to sys_thread_new() when the thread is created.

Definition at line 1318 of file opt.h.

5.72.2.156 #define PPP_THREAD_STACKSIZE 0

PPP_THREAD_STACKSIZE: The stack size used by the pppInputThread. The stack size value itself is platform-dependent, but is passed to sys_thread_new() when the thread is created.

Definition at line 1309 of file opt.h.

5.72.2.157 #define PPPOE_SUPPORT 0

PPPOE_SUPPORT==1: Enable PPP Over Ethernet

Definition at line 1634 of file opt.h.

5.72.2.158 #define PPPOS_SUPPORT PPP_SUPPORT

PPPOS_SUPPORT==1: Enable PPP Over Serial

Definition at line 1641 of file opt.h.

5.72.2.159 #define RAW_DEBUG LWIP_DBG_OFF

RAW_DEBUG: Enable debugging in raw.c.

Definition at line 1975 of file opt.h.

5.72.2.160 #define RAW_TTL (IP_DEFAULT_TTL)

LWIP_RAW==1: Enable application layer to hook into the IP layer itself.

Definition at line 670 of file opt.h.

5.72.2.161 #define RECV_BUFSIZE_DEFAULT INT_MAX

If LWIP_SO_RCVBUF is used, this is the default value for recv_bufsize.

Definition at line 1482 of file opt.h.

5.72.2.162 #define SLIP_DEBUG LWIP_DBG_OFF

SLIP_DEBUG: Enable debugging in slipif.c.

Definition at line 2095 of file opt.h.

5.72.2.163 #define SLIPIF_THREAD_NAME "slipif_loop"

SLIPIF_THREAD_NAME: The name assigned to the slipif_loop thread.

Definition at line 1275 of file opt.h.

5.72.2.164 #define SLIPIF_THREAD_PRIO 1

SLIPIF_THREAD_PRIO: The priority assigned to the slipif_loop thread. The priority value itself is platform-dependent, but is passed to sys_thread_new() when the thread is created.

Definition at line 1293 of file opt.h.

5.72.2.165 #define SLIPIF_THREAD_STACKSIZE 0

SLIP_THREAD_STACKSIZE: The stack size used by the slipif_loop thread. The stack size value itself is platform-dependent, but is passed to sys_thread_new() when the thread is created.

Definition at line 1284 of file opt.h.

5.72.2.166 #define SMEMCPY(*dst,* *src,* *len*) memcpy(dst,src,len)

SMEMCPY: override this with care! Some compilers (e.g. gcc) can inline a call to memcpy() if the length is known at compile time and is small.

Definition at line 92 of file opt.h.

5.72.2.167 #define SNMP_CONCURRENT_REQUESTS 1

SNMP_CONCURRENT_REQUESTS: Number of concurrent requests the module will allow. At least one request buffer is required. Does not have to be changed unless external MIBs answer request asynchronously

Definition at line 742 of file opt.h.

5.72.2.168 #define SNMP_MAX_OCTET_STRING_LEN 127

The maximum length of strings used. This affects the size of MEMP_SNMP_VALUE elements.

Definition at line 776 of file opt.h.

5.72.2.169 #define SNMP_MAX_TREE_DEPTH 15

The maximum depth of the SNMP tree. With private MIBs enabled, this depends on your MIB! This affects the size of MEMP_SNMP_VALUE elements.

Definition at line 785 of file opt.h.

5.72.2.170 #define SNMP_MAX_VALUE_SIZE LWIP_MAX((SNMP_MAX_OCTET_STRING_LEN)+1, sizeof(s32_t)∗(SNMP_MAX_TREE_DEPTH))

The size of the MEMP_SNMP_VALUE elements, normally calculated from SNMP_MAX_OCTET_STRING_LEN and SNMP_MAX_TREE_DEPTH.

Definition at line 793 of file opt.h.

5.72.2.171 #define SNMP_MIB_DEBUG LWIP_DBG_OFF

SNMP_MIB_DEBUG: Enable debugging for SNMP MIBs.

Definition at line 2123 of file opt.h.

5.72.2.172 #define SNMP_MSG_DEBUG LWIP_DBG_OFF

SNMP_MSG_DEBUG: Enable debugging for SNMP messages.

Definition at line 2116 of file opt.h.

5.72.2.173 #define SNMP_PRIVATE_MIB 0

SNMP_PRIVATE_MIB: When using a private MIB, you have to create a file 'private_mib.h' that contains a 'struct mib_array_node mib_private' which contains your MIB.

Definition at line 759 of file opt.h.

5.72.2.174 #define SNMP_SAFE_REQUESTS 1

Only allow SNMP write actions that are 'safe' (e.g. disabeling netifs is not a safe action and disabled when SNM↩ P_SAFE_REQUESTS = 1). Unsafe requests are disabled by default!

Definition at line 768 of file opt.h.

5.72.2.175 #define SNMP_TRAP_DESTINATIONS 1

SNMP_TRAP_DESTINATIONS: Number of trap destinations. At least one trap destination is required

Definition at line 750 of file opt.h.

5.72.2.176 #define SO_REUSE 0

SO_REUSE==1: Enable SO_REUSEADDR option.

Definition at line 1489 of file opt.h.

5.72.2.177 #define SO_REUSE_RXTOALL 0

SO_REUSE_RXTOALL==1: Pass a copy of incoming broadcast/multicast packets to all local matches if SO_RE↩ USEADDR is turned on. WARNING: Adds a memcpy for every packet if passing to more than one pcb!

Definition at line 1498 of file opt.h.

5.72.2.178 #define SOCKETS_DEBUG LWIP_DBG_OFF

SOCKETS_DEBUG: Enable debugging in sockets.c.

Definition at line 1933 of file opt.h.

5.72.2.179 #define SYS_DEBUG LWIP_DBG_OFF

SYS_DEBUG: Enable debugging in sys.c.

Definition at line 1996 of file opt.h.

5.72.2.180 #define SYS_LIGHTWEIGHT_PROT 0

SYS_LIGHTWEIGHT_PROT==1: if you want inter-task protection for certain critical regions during buffer allocation, deallocation and memory allocation and deallocation.

Definition at line 60 of file opt.h.

5.72.2.181 #define SYS_STATS (NO_SYS == 0)

SYS_STATS==1: Enable system stats (sem and mbox counts, etc).

Definition at line 1599 of file opt.h.

5.72.2.182 #define TCP_CALCULATE_EFF_SEND_MSS 1

TCP_CALCULATE_EFF_SEND_MSS: "The maximum size of a segment that TCP really sends, the 'effective send MSS,' MUST be the smaller of the send MSS (which reflects the available reassembly buffer size at the remote host) and the largest size permitted by the IP layer" (RFC 1122) Setting this to 1 enables code that checks TCP_MSS against the MTU of the netif used for a connection and limits the MSS if it would be too big otherwise.

Definition at line 968 of file opt.h.

5.72.2.183 #define TCP_CWND_DEBUG LWIP_DBG_OFF

TCP_CWND_DEBUG: Enable debugging for TCP congestion window.

Definition at line 2039 of file opt.h.

5.72.2.184 #define TCP_DEBUG LWIP_DBG_OFF

TCP_DEBUG: Enable debugging for TCP.

Definition at line 2010 of file opt.h.

5.72.2.185 #define TCP_DEFAULT_LISTEN_BACKLOG 0xff

The maximum allowed backlog for TCP listen netconns. This backlog is used unless another is explicitly specified. 0xff is the maximum (u8_t).

Definition at line 1035 of file opt.h.

5.72.2.186 #define TCP_FR_DEBUG LWIP_DBG_OFF

TCP_FR_DEBUG: Enable debugging in tcp_in.c for fast retransmit.

Definition at line 2024 of file opt.h.

5.72.2.187 #define TCP_INPUT_DEBUG LWIP_DBG_OFF

TCP_INPUT_DEBUG: Enable debugging in tcp_in.c for incoming debug.

Definition at line 2017 of file opt.h.

5.72.2.188 #define TCP_LISTEN_BACKLOG 0

TCP_LISTEN_BACKLOG: Enable the backlog option for tcp listen pcb.

Definition at line 1026 of file opt.h.

5.72.2.189 #define TCP_MAXRTX 12

TCP_MAXRTX: Maximum number of retransmissions of data segments.

Definition at line 930 of file opt.h.

5.72.2.190 #define TCP_MSS 536

TCP_MSS: TCP Maximum segment size. (default is 536, a conservative default, you might want to increase this.) For the receive side, this MSS is advertised to the remote side when opening a connection. For the transmit size, this MSS sets an upper limit on the MSS advertised by the remote host.

Definition at line 956 of file opt.h.

5.72.2.191 #define TCP_OOSEQ_MAX_BYTES 0

TCP_OOSEQ_MAX_BYTES: The maximum number of bytes queued on ooseq per pcb. Default is 0 (no limit). Only valid for TCP_QUEUE_OOSEQ==0.

Definition at line 1011 of file opt.h.

5.72.2.192 #define TCP_OOSEQ_MAX_PBUFS 0

TCP_OOSEQ_MAX_PBUFS: The maximum number of pbufs queued on ooseq per pcb. Default is 0 (no limit). Only valid for TCP_QUEUE_OOSEQ==0.

Definition at line 1019 of file opt.h.

5.72.2.193 #define TCP_OUTPUT_DEBUG LWIP_DBG_OFF

TCP_OUTPUT_DEBUG: Enable debugging in tcp_out.c output functions.

Definition at line 2053 of file opt.h.

5.72.2.194 #define TCP_OVERSIZE TCP_MSS

TCP_OVERSIZE: The maximum number of bytes that tcp_write may allocate ahead of time in an attempt to create shorter pbuf chains for transmission. The meaningful range is 0 to TCP_MSS. Some suggested values are:

0: Disable oversized allocation. Each tcp_write() allocates a new pbuf (old behaviour). 1: Allocate size-aligned pbufs with minimal excess. Use this if your scatter-gather DMA requires aligned fragments. 128: Limit the pbuf/memory overhead to 20%. TCP_MSS: Try to create unfragmented TCP packets. TCP_MSS/4: Try to create 4 fragments or less per TCP packet.

Definition at line 1053 of file opt.h.

5.72.2.195 #define TCP_QLEN_DEBUG LWIP_DBG_OFF

TCP_QLEN_DEBUG: Enable debugging for TCP queue lengths.

Definition at line 2067 of file opt.h.

5.72.2.196 #define TCP_QUEUE_OOSEQ (LWIP_TCP)

TCP_QUEUE_OOSEQ==1: TCP will queue segments that arrive out of order. Define to 0 if your device is low on memory.

Definition at line 945 of file opt.h.

5.72.2.197 #define TCP_RST_DEBUG LWIP_DBG_OFF

TCP_RST_DEBUG: Enable debugging for TCP with the RST message.

Definition at line 2060 of file opt.h.

5.72.2.198 #define TCP_RTO_DEBUG LWIP_DBG_OFF

TCP_RTO_DEBUG: Enable debugging in TCP for retransmit timeout.

Definition at line 2032 of file opt.h.

5.72.2.199 #define TCP_SND_BUF (2 ∗ TCP_MSS)

TCP_SND_BUF: TCP sender buffer space (bytes). To achieve good performance, this should be at least 2 ∗ TC←֓
P_MSS.

Definition at line 977 of file opt.h.

5.72.2.200 #define TCP_SND_QUEUELEN ((4 ∗ (TCP_SND_BUF) + (TCP_MSS - 1))/(TCP_MSS))

TCP_SND_QUEUELEN: TCP sender buffer space (pbufs). This must be at least as much as (2 ∗ TCP_SND_B←֓
UF/TCP_MSS) for things to work.

Definition at line 985 of file opt.h.

5.72.2.201 #define TCP_SNDLOWAT LWIP_MIN(LWIP_MAX(((TCP_SND_BUF)/2), (2 ∗ TCP_MSS) + 1), (TCP_SND_BUF) - 1)

TCP_SNDLOWAT: TCP writable space (bytes). This must be less than TCP_SND_BUF. It is the amount of space which must be available in the TCP snd_buf for select to return writable (combined with TCP_SNDQUEUELOWAT).

Definition at line 994 of file opt.h.

5.72.2.202 #define TCP_SNDQUEUELOWAT LWIP_MAX(((TCP_SND_QUEUELEN)/2), 5)

TCP_SNDQUEUELOWAT: TCP writable bufs (pbuf count). This must be less than TCP_SND_QUEUELEN. If the number of pbufs queued on a pcb drops below this number, select returns writable (combined with TCP_SNDLO←֓
WAT).

Definition at line 1003 of file opt.h.

5.72.2.203 #define TCP_STATS (LWIP_TCP)

TCP_STATS==1: Enable TCP stats. Default is on if TCP enabled, otherwise off.

Definition at line 1578 of file opt.h.

5.72.2.204 #define TCP_SYNMAXRTX 6

TCP_SYNMAXRTX: Maximum number of retransmissions of SYN segments.

Definition at line 937 of file opt.h.

5.72.2.205 #define TCP_TTL (IP_DEFAULT_TTL)

TCP_TTL: Default Time-To-Live value.

Definition at line 915 of file opt.h.

5.72.2.206 #define TCP_WND (4 ∗ TCP_MSS)

TCP_WND: The size of a TCP window. This must be at least (2 ∗ TCP_MSS) for things to work well

Definition at line 923 of file opt.h.

5.72.2.207 #define TCP_WND_DEBUG LWIP_DBG_OFF

TCP_WND_DEBUG: Enable debugging in tcp_in.c for window updating.

Definition at line 2046 of file opt.h.

5.72.2.208 #define TCP_WND_UPDATE_THRESHOLD (TCP_WND / 4)

TCP_WND_UPDATE_THRESHOLD: difference in window to trigger an explicit window update

Definition at line 1068 of file opt.h.

5.72.2.209 #define TCPIP_DEBUG LWIP_DBG_OFF

TCPIP_DEBUG: Enable debugging in tcpip.c.

Definition at line 2081 of file opt.h.

5.72.2.210 #define TCPIP_MBOX_SIZE 0

TCPIP_MBOX_SIZE: The mailbox size for the tcpip thread messages The queue size value itself is platform-dependent, but is passed to sys_mbox_new() when tcpip_init is called.

Definition at line 1268 of file opt.h.

5.72.2.211 #define TCPIP_THREAD_NAME "tcpip_thread"

TCPIP_THREAD_NAME: The name assigned to the main tcpip thread.

Definition at line 1241 of file opt.h.

5.72.2.212 #define TCPIP_THREAD_PRIO 1

TCPIP_THREAD_PRIO: The priority assigned to the main tcpip thread. The priority value itself is platform-dependent, but is passed to sys_thread_new() when the thread is created.

Definition at line 1259 of file opt.h.

5.72.2.213 #define TCPIP_THREAD_STACKSIZE 0

TCPIP_THREAD_STACKSIZE: The stack size used by the main tcpip thread. The stack size value itself is platform-dependent, but is passed to sys_thread_new() when the thread is created.

Definition at line 1250 of file opt.h.

5.72.2.214 #define TIMERS_DEBUG LWIP_DBG_OFF

TIMERS_DEBUG: Enable debugging in timers.c.

Definition at line 2003 of file opt.h.

5.72.2.215 #define UDP_DEBUG LWIP_DBG_OFF

UDP_DEBUG: Enable debugging in UDP.

Definition at line 2074 of file opt.h.

5.72.2.216 #define UDP_STATS (LWIP_UDP)

UDP_STATS==1: Enable UDP stats. Default is on if UDP enabled, otherwise off.

Definition at line 1570 of file opt.h.

5.72.2.217 #define UDP_TTL (IP_DEFAULT_TTL)

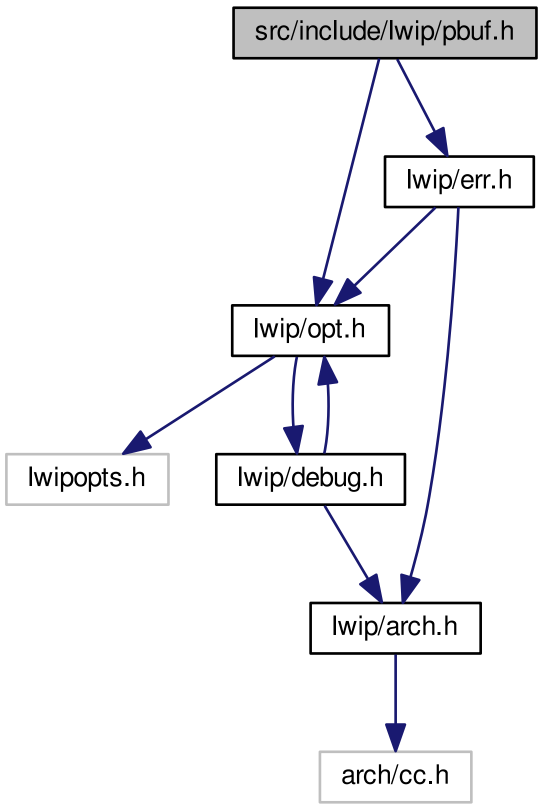
UDP_TTL: Default Time-To-Live value.

Definition at line 889 of file opt.h.

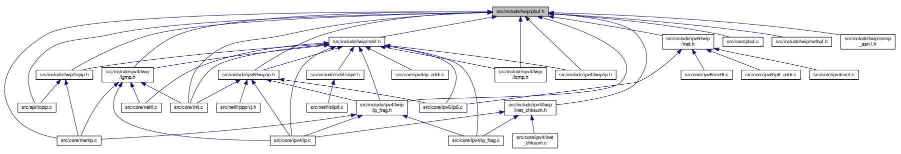
5.73 src/include/lwip/pbuf.h File Reference

```
#include "lwip/opt.h"
#include "lwip/err.h"
```

Include dependency graph for pbuf.h:



This graph shows which files directly or indirectly include this file:



Data Structures

- struct pbuf

Macros

- #define LWIP_SUPPORT_CUSTOM_PBUF (IP_FRAG && !IP_FRAG_USES_STATIC_BUF && !LWIP_N↩ ETIF_TX_SINGLE_PBUF)
- #define PBUF_TRANSPORT_HLEN 20
- #define PBUF_IP_HLEN 20
- #define PBUF_FLAG_PUSH 0x01U
- #define PBUF_FLAG_IS_CUSTOM 0x02U
- #define PBUF_FLAG_MCASTLOOP 0x04U
- #define PBUF_FLAG_LLBCAST 0x08U
- #define PBUF_FLAG_LLMCAST 0x10U
- #define PBUF_FLAG_TCP_FIN 0x20U
- #define pbuf_init()

Enumerations

- enum pbuf_layer { PBUF_TRANSPORT, PBUF_IP, PBUF_LINK, PBUF_RAW }
- enum pbuf_type { PBUF_RAM, PBUF_ROM, PBUF_REF, PBUF_POOL }

Functions

- struct pbuf ∗ pbuf_alloc (pbuf_layer l, u16_t length, pbuf_type type)
- void pbuf_realloc (struct pbuf ∗p, u16_t size)
- u8_t pbuf_header (struct pbuf ∗p, s16_t header_size)
- void pbuf_ref (struct pbuf ∗p)
- u8_t pbuf_free (struct pbuf ∗p)
- u8_t pbuf_clen (struct pbuf ∗p)
- void pbuf_cat (struct pbuf ∗head, struct pbuf ∗tail)
- void pbuf_chain (struct pbuf ∗head, struct pbuf ∗tail)
- struct pbuf ∗ pbuf_dechain (struct pbuf ∗p)
- err_t pbuf_copy (struct pbuf ∗p_to, struct pbuf ∗p_from)
- u16_t pbuf_copy_partial (struct pbuf ∗p, void ∗dataptr, u16_t len, u16_t offset)
- err_t pbuf_take (struct pbuf ∗buf, const void ∗dataptr, u16_t len)
- struct pbuf ∗ pbuf_coalesce (struct pbuf ∗p, pbuf_layer layer)
- u8_t pbuf_get_at (struct pbuf ∗p, u16_t offset)
- u16_t pbuf_memcmp (struct pbuf ∗p, u16_t offset, const void ∗s2, u16_t n)
- u16_t pbuf_memfind (struct pbuf ∗p, const void ∗mem, u16_t mem_len, u16_t start_offset)
- u16_t pbuf_strstr (struct pbuf ∗p, const char ∗substr)

5.73.1 Macro Definition Documentation

5.73.1.1 #define LWIP_SUPPORT_CUSTOM_PBUF (IP_FRAG && !IP_FRAG_USES_STATIC_BUF && !LWIP_NETIF_TX_SINGLE_PBUF)

Currently, the pbuf_custom code is only needed for one specific configuration of IP_FRAG

Definition at line 45 of file pbuf.h.

5.73.1.2 #define PBUF_FLAG_IS_CUSTOM 0x02U

indicates this is a custom pbuf: pbuf_free and pbuf_header handle such a a pbuf differently

Definition at line 69 of file pbuf.h.

5.73.1.3 #define PBUF_FLAG_LLBCAST 0x08U

indicates this pbuf was received as link-level broadcast

Definition at line 73 of file pbuf.h.

5.73.1.4 #define PBUF_FLAG_LLMCAST 0x10U

indicates this pbuf was received as link-level multicast

Definition at line 75 of file pbuf.h.

5.73.1.5 #define PBUF_FLAG_MCASTLOOP 0x04U

indicates this pbuf is UDP multicast to be looped back

Definition at line 71 of file pbuf.h.

5.73.1.6 #define PBUF_FLAG_PUSH 0x01U

indicates this packet's data should be immediately passed to the application

Definition at line 66 of file pbuf.h.

5.73.1.7 #define PBUF_FLAG_TCP_FIN 0x20U

indicates this pbuf includes a TCP FIN flag

Definition at line 77 of file pbuf.h.

5.73.1.8 #define pbuf_init( )

Definition at line 144 of file pbuf.h.

5.73.1.9 #define PBUF_IP_HLEN 20

Definition at line 48 of file pbuf.h.

5.73.1.10 #define PBUF_TRANSPORT_HLEN 20

Definition at line 47 of file pbuf.h.

5.73.2 Enumeration Type Documentation

5.73.2.1 enum pbuf_layer

Enumerator

PBUF_TRANSPORT

PBUF_IP

PBUF_LINK

PBUF_RAW

Definition at line 50 of file pbuf.h.

5.73.2.2 enum pbuf_type

Enumerator

PBUF_RAM

PBUF_ROM

PBUF_REF

PBUF_POOL

Definition at line 57 of file pbuf.h.

5.73.3 Function Documentation

5.73.3.1 struct pbuf* pbuf_alloc (pbuf_layer *layer,* u16_t *length,* pbuf_type *type*)

Allocates a pbuf of the given type (possibly a chain for PBUF_POOL type).

The actual memory allocated for the pbuf is determined by the layer at which the pbuf is allocated and the requested size (from the size parameter).

Parameters

layer	flag to define header size
length	size of the pbuf's payload
type	this parameter decides how and where the pbuf should be allocated as follows:

- PBUF_RAM: buffer memory for pbuf is allocated as one large chunk. This includes protocol headers as well.
- PBUF_ROM: no buffer memory is allocated for the pbuf, even for protocol headers. Additional headers must be prepended by allocating another pbuf and chain in to the front of the ROM pbuf. It is assumed that the memory used is really similar to ROM in that it is immutable and will not be changed. Memory which is dynamic should generally not be attached to PBUF_ROM pbufs. Use PBUF_REF instead.
- PBUF_REF: no buffer memory is allocated for the pbuf, even for protocol headers. It is assumed that the pbuf is only being used in a single thread. If the pbuf gets queued, then pbuf_take should be called to copy the buffer.
- PBUF_POOL: the pbuf is allocated as a pbuf chain, with pbufs from the pbuf pool that is allocated during pbuf_init().

Returns

the allocated pbuf. If multiple pbufs where allocated, this is the first pbuf of a pbuf chain.

Definition at line 207 of file pbuf.c.

5.73.3.2 void pbuf_cat (struct pbuf ∗ *h*, struct pbuf ∗ *t*)

Concatenate two pbufs (each may be a pbuf chain) and take over the caller's reference of the tail pbuf.

Note

The caller MAY NOT reference the tail pbuf afterwards. Use pbuf_chain() for that purpose.

See also

pbuf_chain()

Definition at line 745 of file pbuf.c.

5.73.3.3 void pbuf_chain (struct pbuf ∗ *h*, struct pbuf ∗ *t*)

Chain two pbufs (or pbuf chains) together.

The caller MUST call pbuf_free(t) once it has stopped using it. Use pbuf_cat() instead if you no longer use t.

Parameters

h	head pbuf (chain)
t	tail pbuf (chain)

Note

The pbufs MUST belong to the same packet.
MAY NOT be called on a packet queue.

The ->tot_len fields of all pbufs of the head chain are adjusted. The ->next field of the last pbuf of the head chain is adjusted. The ->ref field of the first pbuf of the tail chain is adjusted.

Definition at line 786 of file pbuf.c.

5.73.3.4 u8_t pbuf_clen (struct pbuf ∗ *p*)

Count number of pbufs in a chain

Parameters

p	first pbuf of chain

Returns

the number of pbufs in a chain

Definition at line 704 of file pbuf.c.

5.73.3.5 struct pbuf* pbuf_coalesce (struct pbuf * *p,* pbuf_layer *layer*)

Creates a single pbuf out of a queue of pbufs.

Remarks

: Either the source pbuf 'p' is freed by this function or the original pbuf 'p' is returned, therefore the caller has to check the result!

Parameters

p	the source pbuf
layer	pbuf_layer of the new pbuf

Returns

a new, single pbuf (p->next is NULL) or the old pbuf if allocation fails

Definition at line 1010 of file pbuf.c.

5.73.3.6 err_t pbuf_copy (struct pbuf * *p_to,* struct pbuf * *p_from*)

Create PBUF_RAM copies of pbufs.

Used to queue packets on behalf of the lwIP stack, such as ARP based queueing.

Note

You MUST explicitly use p = pbuf_take(p);
Only one packet is copied, no packet queue!

Parameters

p_to	pbuf destination of the copy
p_from	pbuf source of the copy

Returns

ERR_OK if pbuf was copied ERR_ARG if one of the pbufs is NULL or p_to is not big enough to hold p_from

Definition at line 852 of file pbuf.c.

5.73.3.7 u16_t pbuf_copy_partial (struct pbuf * *buf,* void * *dataptr,* u16_t *len,* u16_t *offset*)

Copy (part of) the contents of a packet buffer to an application supplied buffer.

Parameters

buf	the pbuf from which to copy data
dataptr	the application supplied buffer
len	length of data to copy (dataptr must be big enough). No more than buf->tot_len will be copied, irrespective of len
offset	offset into the packet buffer from where to begin copying len bytes

Returns

the number of bytes copied, or 0 on failure

Definition at line 918 of file pbuf.c.

5.73.3.8 struct pbuf∗ pbuf_dechain (struct pbuf ∗ *p*)

Dechains the first pbuf from its succeeding pbufs in the chain.

Makes p->tot_len field equal to p->len.

Parameters

p	pbuf to dechain

Returns

remainder of the pbuf chain, or NULL if it was de-allocated.

Note

May not be called on a packet queue.

Definition at line 803 of file pbuf.c.

5.73.3.9 u8_t pbuf_free (struct pbuf ∗ *p*)

Dereference a pbuf chain or queue and deallocate any no-longer-used pbufs at the head of this chain or queue.

Decrements the pbuf reference count. If it reaches zero, the pbuf is deallocated.

For a pbuf chain, this is repeated for each pbuf in the chain, up to the first pbuf which has a non-zero reference count after decrementing. So, when all reference counts are one, the whole chain is free'd.

Parameters

p	The pbuf (chain) to be dereferenced.

Returns

the number of pbufs that were de-allocated from the head of the chain.

Note

MUST NOT be called on a packet queue (Not verified to work yet).
the reference counter of a pbuf equals the number of pointers that refer to the pbuf (or into the pbuf).

Definition at line 618 of file pbuf.c.

5.73.3.10 u8_t pbuf_get_at (struct pbuf ∗ *p*, u16_t *offset*)

Get one byte from the specified position in a pbuf WARNING: returns zero for offset >= p->tot_len

Parameters

p	pbuf to parse
offset	offset into p of the byte to return

Returns

byte at an offset into p OR ZERO IF 'offset' >= p->tot_len

Definition at line 1077 of file pbuf.c.

5.73.3.11 u8_t pbuf_header (struct pbuf ∗ *p*, s16_t *header_size_increment*)

Adjusts the payload pointer to hide or reveal headers in the payload.

Adjusts the ->payload pointer so that space for a header (dis)appears in the pbuf payload.

The ->payload, ->tot_len and ->len fields are adjusted.

Parameters

p	pbuf to change the header size.
header_size_↩ increment	Number of bytes to increment header size which increases the size of the pbuf. New space is on the front. (Using a negative value decreases the header size.) If hdr_size_inc is 0, this function does nothing and returns succesful.

PBUF_ROM and PBUF_REF type buffers cannot have their sizes increased, so the call will fail. A check is made that the increase in header size does not move the payload pointer in front of the start of the buffer.

Returns

non-zero on failure, zero on success.

Definition at line 511 of file pbuf.c.

5.73.3.12 u16_t pbuf_memcmp (struct pbuf ∗ *p*, u16_t *offset*, const void ∗ *s2*, u16_t *n*)

Compare pbuf contents at specified offset with memory s2, both of length n

Parameters

p	pbuf to compare
offset	offset into p at wich to start comparing
s2	buffer to compare
n	length of buffer to compare

Returns

zero if equal, nonzero otherwise (0xffff if p is too short, diffoffset+1 otherwise)

Definition at line 1104 of file pbuf.c.

5.73.3.13 u16_t pbuf_memfind (struct pbuf ∗ *p*, const void ∗ *mem*, u16_t *mem_len*, u16_t *start_offset*)

Find occurrence of mem (with length mem_len) in pbuf p, starting at offset start_offset.

Parameters

p	pbuf to search, maximum length is 0xFFFE since 0xFFFF is used as return value 'not found'
mem	search for the contents of this buffer
mem_len	length of 'mem'
start_offset	offset into p at which to start searching

Returns

0xFFFF if substr was not found in p or the index where it was found

Definition at line 1140 of file pbuf.c.

5.73.3.14 void pbuf_realloc (struct pbuf ∗ *p*, u16_t *new_len*)

Shrink a pbuf chain to a desired length.

Parameters

p	pbuf to shrink.
new_len	desired new length of pbuf chain

Depending on the desired length, the first few pbufs in a chain might be skipped and left unchanged. The new last pbuf in the chain will be resized, and any remaining pbufs will be freed.

Note

If the pbuf is ROM/REF, only the ->tot_len and ->len fields are adjusted.
May not be called on a packet queue.
Despite its name, pbuf_realloc cannot grow the size of a pbuf (chain).

Definition at line 430 of file pbuf.c.

5.73.3.15 void pbuf_ref (struct pbuf ∗ *p*)

Increment the reference count of the pbuf.

Parameters

p	pbuf to increase reference counter of

Definition at line 723 of file pbuf.c.

5.73.3.16 u16_t pbuf_strstr (struct pbuf ∗ *p*, const char ∗ *substr*)

Find occurrence of substr with length substr_len in pbuf p, start at offset start_offset WARNING: in contrast to strstr(), this one does not stop at the first \0 in the pbuf/source string!

Parameters

p	pbuf to search, maximum length is 0xFFFE since 0xFFFF is used as return value 'not found'
substr	string to search for in p, maximum length is 0xFFFE

Returns

0xFFFF if substr was not found in p or the index where it was found

Definition at line 1168 of file pbuf.c.

5.73.3.17 err_t pbuf_take (struct pbuf ∗ *buf*, const void ∗ *dataptr*, u16_t *len*)

Copy application supplied data into a pbuf. This function can only be used to copy the equivalent of buf->tot_len data.

Parameters

buf	pbuf to fill with data
dataptr	application supplied data buffer
len	length of the application supplied data buffer

Returns

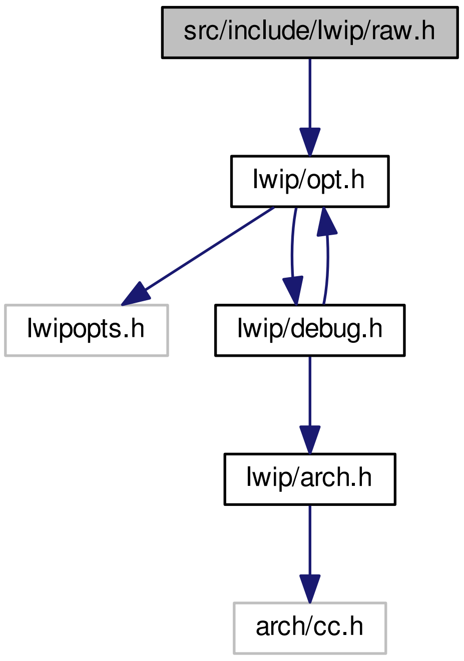
ERR_OK if successful, ERR_MEM if the pbuf is not big enough

Definition at line 966 of file pbuf.c.

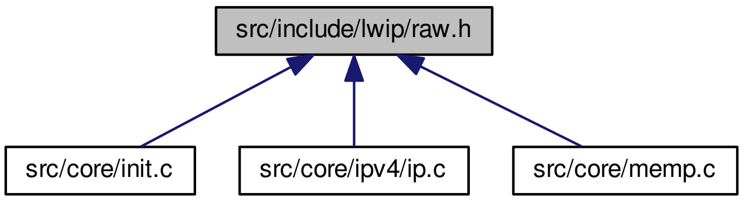
5.74 src/include/lwip/raw.h File Reference

```
#include "lwip/opt.h"
```

Include dependency graph for raw.h:



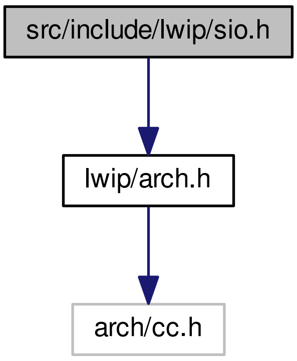
This graph shows which files directly or indirectly include this file:



5.75 src/include/lwip/sio.h File Reference

```
#include "lwip/arch.h"
```

Include dependency graph for sio.h:



Typedefs

- typedef void ∗ sio_fd_t

Functions

- sio_fd_t sio_open (u8_t devnum)
- void sio_send (u8_t c, sio_fd_t fd)
- u8_t sio_recv (sio_fd_t fd)
- u32_t sio_read (sio_fd_t fd, u8_t ∗data, u32_t len)
- u32_t sio_tryread (sio_fd_t fd, u8_t ∗data, u32_t len)
- u32_t sio_write (sio_fd_t fd, u8_t ∗data, u32_t len)
- void sio_read_abort (sio_fd_t fd)

5.75.1 Typedef Documentation

5.75.1.1 typedef void∗ **sio_fd_t**

Definition at line 47 of file sio.h.

5.75.2 Function Documentation

5.75.2.1 **sio_fd_t** sio_open (u8_t *devnum*)

Opens a serial device for communication.

Parameters

devnum	device number

Returns

handle to serial device if successful, NULL otherwise

5.75.2.2 u32_t sio_read (sio_fd_t *fd*, u8_t ∗ *data*, u32_t *len*)

Reads from the serial device.

Parameters

fd	serial device handle
data	pointer to data buffer for receiving
len	maximum length (in bytes) of data to receive

Returns

number of bytes actually received - may be 0 if aborted by sio_read_abort

Note

This function will block until data can be received. The blocking can be cancelled by calling sio_read_abort().

5.75.2.3 void sio_read_abort (sio_fd_t *fd*)

Aborts a blocking sio_read() call.

Parameters

fd	serial device handle

5.75.2.4 u8_t sio_recv (sio_fd_t *fd*)

Receives a single character from the serial device.

Parameters

fd	serial device handle

Note

This function will block until a character is received.

5.75.2.5 void sio_send (u8_t *c*, sio_fd_t *fd*)

Sends a single character to the serial device.

Parameters

c	character to send
fd	serial device handle

Note

This function will block until the character can be sent.

5.75.2.6 u32_t sio_tryread (sio_fd_t *fd*, u8_t ∗ *data*, u32_t *len*)

Tries to read from the serial device. Same as sio_read but returns immediately if no data is available and never blocks.

Parameters

fd	serial device handle
data	pointer to data buffer for receiving
len	maximum length (in bytes) of data to receive

Returns

number of bytes actually received

5.75.2.7 u32_t sio_write (sio_fd_t *fd,* u8_t ∗ *data,* u32_t *len*)

Writes to the serial device.

Parameters

fd	serial device handle
data	pointer to data to send
len	length (in bytes) of data to send

Returns

number of bytes actually sent

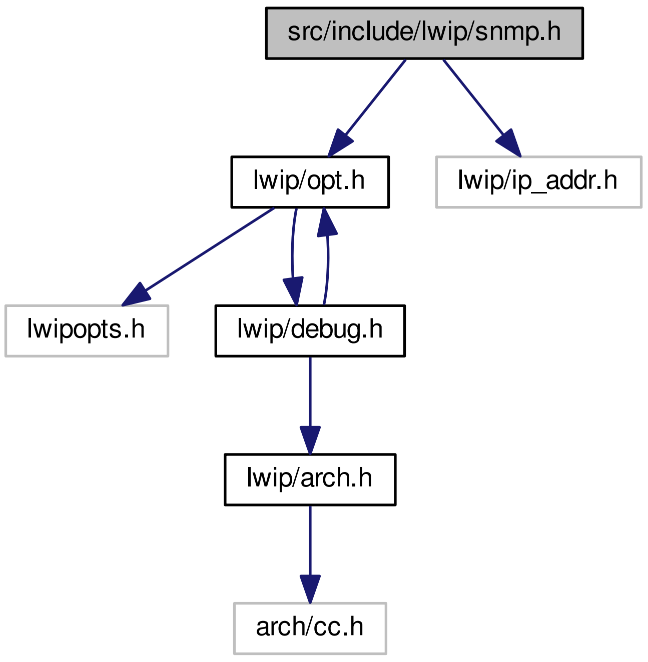
Note

This function will block until all data can be sent.

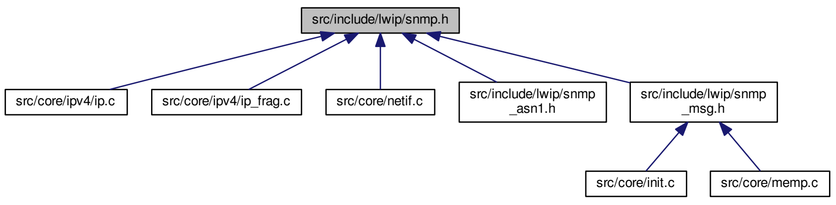
5.76 src/include/lwip/snmp.h File Reference

```
#include "lwip/opt.h"
#include "lwip/ip_addr.h"
```

Include dependency graph for snmp.h:



This graph shows which files directly or indirectly include this file:



Macros

- #define snmp_set_sysdesr(str, len)
- #define snmp_set_sysobjid(oid) ;
- #define snmp_get_sysobjid_ptr(oid)
- #define snmp_inc_sysuptime()
- #define snmp_add_sysuptime(value)
- #define snmp_get_sysuptime(value)
- #define snmp_set_syscontact(ocstr, ocstrlen) ;
- #define snmp_set_sysname(ocstr, ocstrlen) ;
- #define snmp_set_syslocation(ocstr, ocstrlen) ;
- #define snmp_add_ifinoctets(ni, value)

- #define snmp_inc_ifinucastpkts(ni)
- #define snmp_inc_ifinnucastpkts(ni)
- #define snmp_inc_ifindiscards(ni)
- #define snmp_add_ifoutoctets(ni, value)
- #define snmp_inc_ifoutucastpkts(ni)
- #define snmp_inc_ifoutnucastpkts(ni)
- #define snmp_inc_ifoutdiscards(ni)
- #define snmp_inc_iflist()
- #define snmp_dec_iflist()
- #define snmp_insert_arpidx_tree(ni, ip)
- #define snmp_delete_arpidx_tree(ni, ip)
- #define snmp_inc_ipinreceives()
- #define snmp_inc_ipinhdrerrors()
- #define snmp_inc_ipinaddrerrors()
- #define snmp_inc_ipforwdatagrams()
- #define snmp_inc_ipinunknownprotos()
- #define snmp_inc_ipindiscards()
- #define snmp_inc_ipindelivers()
- #define snmp_inc_ipoutrequests()
- #define snmp_inc_ipoutdiscards()
- #define snmp_inc_ipoutnoroutes()
- #define snmp_inc_ipreasmreqds()
- #define snmp_inc_ipreasmoks()
- #define snmp_inc_ipreasmfails()
- #define snmp_inc_ipfragoks()
- #define snmp_inc_ipfragfails()
- #define snmp_inc_ipfragcreates()
- #define snmp_inc_iproutingdiscards()
- #define snmp_insert_ipaddridx_tree(ni)
- #define snmp_delete_ipaddridx_tree(ni)
- #define snmp_insert_iprteidx_tree(dflt, ni)
- #define snmp_delete_iprteidx_tree(dflt, ni)
- #define snmp_inc_icmpinmsgs()
- #define snmp_inc_icmpinerrors()
- #define snmp_inc_icmpindestunreachs()
- #define snmp_inc_icmpintimeexcds()
- #define snmp_inc_icmpinparmprobs()
- #define snmp_inc_icmpinsrcquenchs()
- #define snmp_inc_icmpinredirects()
- #define snmp_inc_icmpinechos()
- #define snmp_inc_icmpinechoreps()
- #define snmp_inc_icmpintimestamps()
- #define snmp_inc_icmpintimestampreps()
- #define snmp_inc_icmpinaddrmasks()
- #define snmp_inc_icmpinaddrmaskreps()
- #define snmp_inc_icmpoutmsgs()
- #define snmp_inc_icmpouterrors()
- #define snmp_inc_icmpoutdestunreachs()
- #define snmp_inc_icmpouttimeexcds()
- #define snmp_inc_icmpoutparmprobs()
- #define snmp_inc_icmpoutsrcquenchs()
- #define snmp_inc_icmpoutredirects()
- #define snmp_inc_icmpoutechos()
- #define snmp_inc_icmpoutechoreps()
- #define snmp_inc_icmpouttimestamps()

- #define snmp_inc_icmpouttimestampreps()
- #define snmp_inc_icmpoutaddrmasks()
- #define snmp_inc_icmpoutaddrmaskreps()
- #define snmp_inc_tcpactiveopens()
- #define snmp_inc_tcppassiveopens()
- #define snmp_inc_tcpattemptfails()
- #define snmp_inc_tcpestabresets()
- #define snmp_inc_tcpinsegs()
- #define snmp_inc_tcpoutsegs()
- #define snmp_inc_tcpretranssegs()
- #define snmp_inc_tcpinerrs()
- #define snmp_inc_tcpoutrsts()
- #define snmp_inc_udpindatagrams()
- #define snmp_inc_udpnoports()
- #define snmp_inc_udpinerrors()
- #define snmp_inc_udpoutdatagrams()
- #define snmp_insert_udpidx_tree(pcb)
- #define snmp_delete_udpidx_tree(pcb)
- #define snmp_inc_snmpinpkts()
- #define snmp_inc_snmpoutpkts()
- #define snmp_inc_snmpinbadversions()
- #define snmp_inc_snmpinbadcommunitynames()
- #define snmp_inc_snmpinbadcommunityuses()
- #define snmp_inc_snmpinasnparseerrs()
- #define snmp_inc_snmpintoobigs()
- #define snmp_inc_snmpinnosuchnames()
- #define snmp_inc_snmpinbadvalues()
- #define snmp_inc_snmpinreadonlys()
- #define snmp_inc_snmpingenerrs()
- #define snmp_add_snmpintotalreqvars(value)
- #define snmp_add_snmpintotalsetvars(value)
- #define snmp_inc_snmpingetrequests()
- #define snmp_inc_snmpingetnexts()
- #define snmp_inc_snmpinsetrequests()
- #define snmp_inc_snmpingetresponses()
- #define snmp_inc_snmpintraps()
- #define snmp_inc_snmpouttoobigs()
- #define snmp_inc_snmpoutnosuchnames()
- #define snmp_inc_snmpoutbadvalues()
- #define snmp_inc_snmpoutgenerrs()
- #define snmp_inc_snmpoutgetrequests()
- #define snmp_inc_snmpoutgetnexts()
- #define snmp_inc_snmpoutsetrequests()
- #define snmp_inc_snmpoutgetresponses()
- #define snmp_inc_snmpouttraps()
- #define snmp_get_snmpgrpid_ptr(oid)
- #define snmp_set_snmpenableauthentraps(value)
- #define snmp_get_snmpenableauthentraps(value)

Enumerations

- enum snmp_ifType {
  snmp_ifType_other =1, snmp_ifType_regular1822, snmp_ifType_hdh1822, snmp_ifType_ddn_x25,
  snmp_ifType_rfc877_x25, snmp_ifType_ethernet_csmacd, snmp_ifType_iso88023_csmacd, snmp_ifType←
  _iso88024_tokenBus,
  snmp_ifType_iso88025_tokenRing, snmp_ifType_iso88026_man, snmp_ifType_starLan, snmp_ifType_←
  proteon_10Mbit,
  snmp_ifType_proteon_80Mbit, snmp_ifType_hyperchannel, snmp_ifType_fddi, snmp_ifType_lapb,
  snmp_ifType_sdlc, snmp_ifType_ds1, snmp_ifType_e1, snmp_ifType_basicISDN,
  snmp_ifType_primaryISDN, snmp_ifType_propPointToPointSerial, snmp_ifType_ppp, snmp_ifType_←
  softwareLoopback,
  snmp_ifType_eon, snmp_ifType_ethernet_3Mbit, snmp_ifType_nsip, snmp_ifType_slip,
  snmp_ifType_ultra, snmp_ifType_ds3, snmp_ifType_sip, snmp_ifType_frame_relay }

5.76.1 Macro Definition Documentation

5.76.1.1 #define snmp_add_ifinoctets(*ni*, *value*)

Definition at line 245 of file snmp.h.

5.76.1.2 #define snmp_add_ifoutoctets(*ni*, *value*)

Definition at line 249 of file snmp.h.

5.76.1.3 #define snmp_add_snmpintotalreqvars(*value*)

Definition at line 341 of file snmp.h.

5.76.1.4 #define snmp_add_snmpintotalsetvars(*value*)

Definition at line 342 of file snmp.h.

5.76.1.5 #define snmp_add_sysuptime(*value*)

Definition at line 238 of file snmp.h.

5.76.1.6 #define snmp_dec_iflist( )

Definition at line 254 of file snmp.h.

5.76.1.7 #define snmp_delete_arpidx_tree(*ni*, *ip*)

Definition at line 258 of file snmp.h.

5.76.1.8 #define snmp_delete_ipaddridx_tree(*ni*)

Definition at line 279 of file snmp.h.

5.76.1.9 #define snmp_delete_iprteidx_tree(*dflt*, *ni*)

Definition at line 281 of file snmp.h.

5.76.1.10 #define snmp_delete_udpidx_tree(*pcb*)

Definition at line 327 of file snmp.h.

5.76.1.11 #define snmp_get_snmpenableauthentraps(*value*)

Definition at line 359 of file snmp.h.

5.76.1.12 #define snmp_get_snmpgrpid_ptr(*oid*)

Definition at line 357 of file snmp.h.

5.76.1.13 #define snmp_get_sysobjid_ptr(*oid*)

Definition at line 236 of file snmp.h.

5.76.1.14 #define snmp_get_sysuptime(*value*)

Definition at line 239 of file snmp.h.

5.76.1.15 #define snmp_inc_icmpinaddrmaskreps( )

Definition at line 296 of file snmp.h.

5.76.1.16 #define snmp_inc_icmpinaddrmasks( )

Definition at line 295 of file snmp.h.

5.76.1.17 #define snmp_inc_icmpindestunreachs( )

Definition at line 286 of file snmp.h.

5.76.1.18 #define snmp_inc_icmpinechoreps( )

Definition at line 292 of file snmp.h.

5.76.1.19 #define snmp_inc_icmpinechos( )

Definition at line 291 of file snmp.h.

5.76.1.20 #define snmp_inc_icmpinerrors( )

Definition at line 285 of file snmp.h.

5.76.1.21 #define snmp_inc_icmpinmsgs( )

Definition at line 284 of file snmp.h.

5.76.1.22 #define snmp_inc_icmpinparmprobs( )

Definition at line 288 of file snmp.h.

5.76.1.23 #define snmp_inc_icmpinredirects( )

Definition at line 290 of file snmp.h.

5.76.1.24 #define snmp_inc_icmpinsrcquenchs( )

Definition at line 289 of file snmp.h.

5.76.1.25 #define snmp_inc_icmpintimeexcds( )

Definition at line 287 of file snmp.h.

5.76.1.26 #define snmp_inc_icmpintimestampreps( )

Definition at line 294 of file snmp.h.

5.76.1.27 #define snmp_inc_icmpintimestamps( )

Definition at line 293 of file snmp.h.

5.76.1.28 #define snmp_inc_icmpoutaddrmaskreps( )

Definition at line 309 of file snmp.h.

5.76.1.29 #define snmp_inc_icmpoutaddrmasks( )

Definition at line 308 of file snmp.h.

5.76.1.30 #define snmp_inc_icmpoutdestunreachs( )

Definition at line 299 of file snmp.h.

5.76.1.31 #define snmp_inc_icmpoutechoreps( )

Definition at line 305 of file snmp.h.

5.76.1.32 #define snmp_inc_icmpoutechos( )

Definition at line 304 of file snmp.h.

5.76.1.33 #define snmp_inc_icmpouterrors( )

Definition at line 298 of file snmp.h.

5.76.1.34 #define snmp_inc_icmpoutmsgs( )

Definition at line 297 of file snmp.h.

5.76.1.35 #define snmp_inc_icmpoutparmprobs( )

Definition at line 301 of file snmp.h.

5.76.1.36 #define snmp_inc_icmpoutredirects( )

Definition at line 303 of file snmp.h.

5.76.1.37 #define snmp_inc_icmpoutsrcquenchs( )

Definition at line 302 of file snmp.h.

5.76.1.38 #define snmp_inc_icmpouttimeexcds( )

Definition at line 300 of file snmp.h.

5.76.1.39 #define snmp_inc_icmpouttimestampreps( )

Definition at line 307 of file snmp.h.

5.76.1.40 #define snmp_inc_icmpouttimestamps( )

Definition at line 306 of file snmp.h.

5.76.1.41 #define snmp_inc_ifindiscards(*ni*)

Definition at line 248 of file snmp.h.

5.76.1.42 #define snmp_inc_ifinnucastpkts(*ni*)

Definition at line 247 of file snmp.h.

5.76.1.43 #define snmp_inc_ifinucastpkts(*ni*)

Definition at line 246 of file snmp.h.

5.76.1.44 #define snmp_inc_iflist( )

Definition at line 253 of file snmp.h.

5.76.1.45 #define snmp_inc_ifoutdiscards(*ni*)

Definition at line 252 of file snmp.h.

5.76.1.46 #define snmp_inc_ifoutnucastpkts(*ni*)

Definition at line 251 of file snmp.h.

5.76.1.47 #define snmp_inc_ifoutucastpkts(*ni*)

Definition at line 250 of file snmp.h.

5.76.1.48 #define snmp_inc_ipforwdatagrams( )

Definition at line 264 of file snmp.h.

5.76.1.49 #define snmp_inc_ipfragcreates( )

Definition at line 276 of file snmp.h.

5.76.1.50 #define snmp_inc_ipfragfails( )

Definition at line 275 of file snmp.h.

5.76.1.51 #define snmp_inc_ipfragoks( )

Definition at line 274 of file snmp.h.

5.76.1.52 #define snmp_inc_ipinaddrerrors( )

Definition at line 263 of file snmp.h.

5.76.1.53 #define snmp_inc_ipindelivers( )

Definition at line 267 of file snmp.h.

5.76.1.54 #define snmp_inc_ipindiscards( )

Definition at line 266 of file snmp.h.

5.76.1.55 #define snmp_inc_ipinhdrerrors( )

Definition at line 262 of file snmp.h.

5.76.1.56 #define snmp_inc_ipinreceives( )

Definition at line 261 of file snmp.h.

5.76.1.57 #define snmp_inc_ipinunknownprotos( )

Definition at line 265 of file snmp.h.

5.76.1.58 #define snmp_inc_ipoutdiscards( )

Definition at line 269 of file snmp.h.

5.76.1.59 #define snmp_inc_ipoutnoroutes( )

Definition at line 270 of file snmp.h.

5.76.1.60 #define snmp_inc_ipoutrequests( )

Definition at line 268 of file snmp.h.

5.76.1.61 #define snmp_inc_ipreasmfails( )

Definition at line 273 of file snmp.h.

5.76.1.62 #define snmp_inc_ipreasmoks( )

Definition at line 272 of file snmp.h.

5.76.1.63 #define snmp_inc_ipreasmreqds( )

Definition at line 271 of file snmp.h.

5.76.1.64 #define snmp_inc_iproutingdiscards( )

Definition at line 277 of file snmp.h.

5.76.1.65 #define snmp_inc_snmpinasnparseerrs( )

Definition at line 335 of file snmp.h.

5.76.1.66 #define snmp_inc_snmpinbadcommunitynames( )

Definition at line 333 of file snmp.h.

5.76.1.67 #define snmp_inc_snmpinbadcommunityuses( )

Definition at line 334 of file snmp.h.

5.76.1.68 #define snmp_inc_snmpinbadvalues( )

Definition at line 338 of file snmp.h.

5.76.1.69 #define snmp_inc_snmpinbadversions( )

Definition at line 332 of file snmp.h.

5.76.1.70 #define snmp_inc_snmpingenerrs( )

Definition at line 340 of file snmp.h.

5.76.1.71 #define snmp_inc_snmpingetnexts( )

Definition at line 344 of file snmp.h.

5.76.1.72 #define snmp_inc_snmpingetrequests( )

Definition at line 343 of file snmp.h.

5.76.1.73 #define snmp_inc_snmpingetresponses( )

Definition at line 346 of file snmp.h.

5.76.1.74 #define snmp_inc_snmpinnosuchnames( )

Definition at line 337 of file snmp.h.

5.76.1.75 #define snmp_inc_snmpinpkts( )

Definition at line 330 of file snmp.h.

5.76.1.76 #define snmp_inc_snmpinreadonlys( )

Definition at line 339 of file snmp.h.

5.76.1.77 #define snmp_inc_snmpinsetrequests( )

Definition at line 345 of file snmp.h.

5.76.1.78 #define snmp_inc_snmpintoobigs( )

Definition at line 336 of file snmp.h.

5.76.1.79 #define snmp_inc_snmpintraps( )

Definition at line 347 of file snmp.h.

5.76.1.80 #define snmp_inc_snmpoutbadvalues( )

Definition at line 350 of file snmp.h.

5.76.1.81 #define snmp_inc_snmpoutgenerrs( )

Definition at line 351 of file snmp.h.

5.76.1.82 #define snmp_inc_snmpoutgetnexts( )

Definition at line 353 of file snmp.h.

5.76.1.83 #define snmp_inc_snmpoutgetrequests( )

Definition at line 352 of file snmp.h.

5.76.1.84 #define snmp_inc_snmpoutgetresponses( )

Definition at line 355 of file snmp.h.

5.76.1.85 #define snmp_inc_snmpoutnosuchnames( )

Definition at line 349 of file snmp.h.

5.76.1.86 #define snmp_inc_snmpoutpkts( )

Definition at line 331 of file snmp.h.

5.76.1.87 #define snmp_inc_snmpoutsetrequests( )

Definition at line 354 of file snmp.h.

5.76.1.88 #define snmp_inc_snmpouttoobigs( )

Definition at line 348 of file snmp.h.

5.76.1.89 #define snmp_inc_snmpouttraps( )

Definition at line 356 of file snmp.h.

5.76.1.90 #define snmp_inc_sysuptime( )

Definition at line 237 of file snmp.h.

5.76.1.91 #define snmp_inc_tcpactiveopens( )

Definition at line 311 of file snmp.h.

5.76.1.92 #define snmp_inc_tcpattemptfails( )

Definition at line 313 of file snmp.h.

5.76.1.93 #define snmp_inc_tcpestabresets( )

Definition at line 314 of file snmp.h.

5.76.1.94 #define snmp_inc_tcpinerrs( )

Definition at line 318 of file snmp.h.

5.76.1.95 #define snmp_inc_tcpinsegs( )

Definition at line 315 of file snmp.h.

5.76.1.96 #define snmp_inc_tcpoutrsts( )

Definition at line 319 of file snmp.h.

5.76.1.97 #define snmp_inc_tcpoutsegs( )

Definition at line 316 of file snmp.h.

5.76.1.98 #define snmp_inc_tcppassiveopens( )

Definition at line 312 of file snmp.h.

5.76.1.99 #define snmp_inc_tcpretranssegs( )

Definition at line 317 of file snmp.h.

5.76.1.100 #define snmp_inc_udpindatagrams( )

Definition at line 322 of file snmp.h.

5.76.1.101 #define snmp_inc_udpinerrors( )

Definition at line 324 of file snmp.h.

5.76.1.102 #define snmp_inc_udpnoports( )

Definition at line 323 of file snmp.h.

5.76.1.103 #define snmp_inc_udpoutdatagrams( )

Definition at line 325 of file snmp.h.

5.76.1.104 #define snmp_insert_arpidx_tree(*ni*, *ip*)

Definition at line 257 of file snmp.h.

5.76.1.105 #define snmp_insert_ipaddridx_tree(*ni*)

Definition at line 278 of file snmp.h.

5.76.1.106 #define snmp_insert_iprteidx_tree(*dflt, ni*)

Definition at line 280 of file snmp.h.

5.76.1.107 #define snmp_insert_udpidx_tree(*pcb*)

Definition at line 326 of file snmp.h.

5.76.1.108 #define snmp_set_snmpenableauthentraps(*value*)

Definition at line 358 of file snmp.h.

5.76.1.109 #define snmp_set_syscontact(*ocstr, ocstrlen*) ;

Definition at line 240 of file snmp.h.

5.76.1.110 #define snmp_set_sysdesr(*str, len*)

Definition at line 234 of file snmp.h.

5.76.1.111 #define snmp_set_syslocation(*ocstr, ocstrlen*) ;

Definition at line 242 of file snmp.h.

5.76.1.112 #define snmp_set_sysname(*ocstr, ocstrlen*) ;

Definition at line 241 of file snmp.h.

5.76.1.113 #define snmp_set_sysobjid(*oid*) ;

Definition at line 235 of file snmp.h.

5.76.2 Enumeration Type Documentation

5.76.2.1 enum snmp_ifType

See also

RFC1213, "MIB-II, 6. Definitions"

Enumerator

snmp_ifType_other

snmp_ifType_regular1822

snmp_ifType_hdh1822

snmp_ifType_ddn_x25

snmp_ifType_rfc877_x25

snmp_ifType_ethernet_csmacd

snmp_ifType_iso88023_csmacd

snmp_ifType_iso88024_tokenBus

snmp_ifType_iso88025_tokenRing

snmp_ifType_iso88026_man

snmp_ifType_starLan

snmp_ifType_proteon_10Mbit

snmp_ifType_proteon_80Mbit

snmp_ifType_hyperchannel

snmp_ifType_fddi

snmp_ifType_lapb

snmp_ifType_sdlc

snmp_ifType_ds1

snmp_ifType_e1

snmp_ifType_basicISDN

snmp_ifType_primaryISDN

snmp_ifType_propPointToPointSerial

snmp_ifType_ppp

snmp_ifType_softwareLoopback

snmp_ifType_eon

snmp_ifType_ethernet_3Mbit

snmp_ifType_nsip

snmp_ifType_slip

snmp_ifType_ultra

snmp_ifType_ds3

snmp_ifType_sip

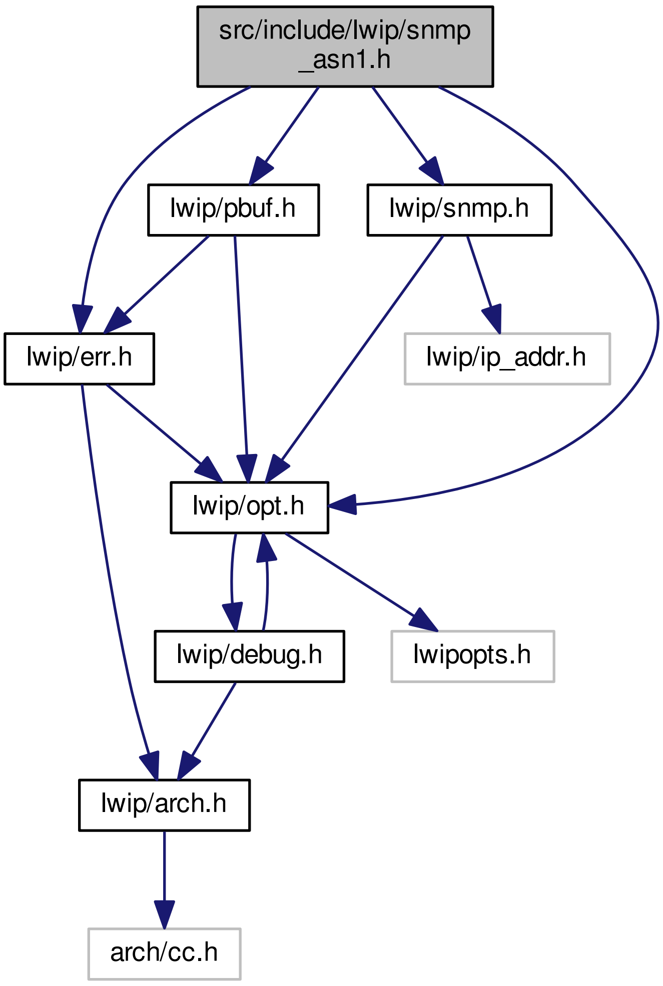
snmp_ifType_frame_relay

Definition at line 50 of file snmp.h.

5.77 src/include/lwip/snmp_asn1.h File Reference

```
#include "lwip/opt.h"
#include "lwip/err.h"
#include "lwip/pbuf.h"
#include "lwip/snmp.h"
```

Include dependency graph for snmp_asn1.h:



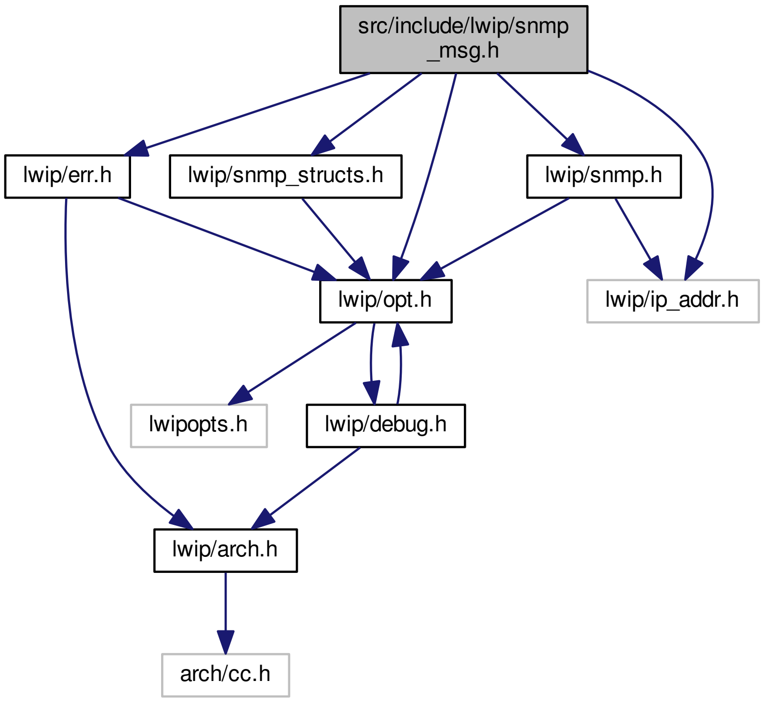
5.77.1 Detailed Description

Abstract Syntax Notation One (ISO 8824, 8825) codec.

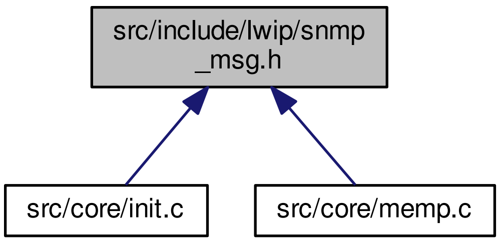
5.78 src/include/lwip/snmp_msg.h File Reference

```
#include "lwip/opt.h"
#include "lwip/snmp.h"
#include "lwip/snmp_structs.h"
#include "lwip/ip_addr.h"
#include "lwip/err.h"
```

Include dependency graph for snmp_msg.h:



This graph shows which files directly or indirectly include this file:



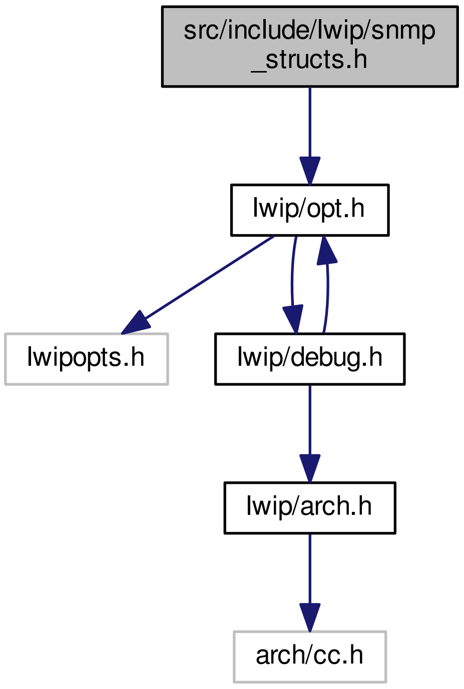
5.78.1 Detailed Description

SNMP Agent message handling structures.

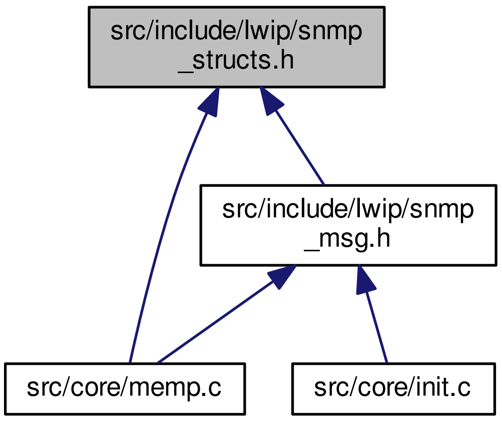
5.79 src/include/lwip/snmp_structs.h File Reference

```
#include "lwip/opt.h"
```

Include dependency graph for snmp_structs.h:



This graph shows which files directly or indirectly include this file:



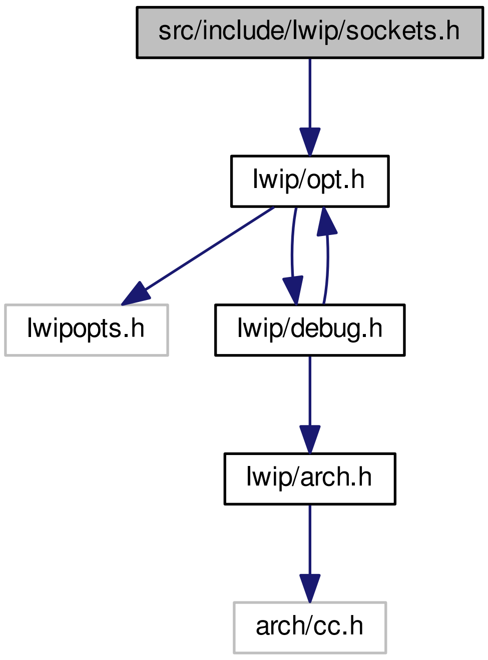
5.79.1 Detailed Description

Generic MIB tree structures.

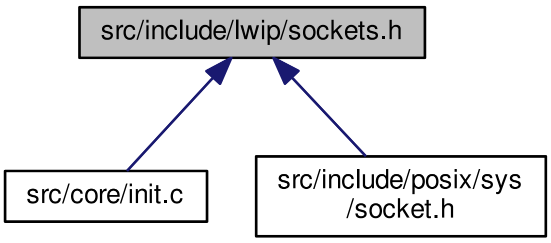
Todo namespace prefixes

5.80 src/include/lwip/sockets.h File Reference

`#include "lwip/opt.h"`
Include dependency graph for sockets.h:



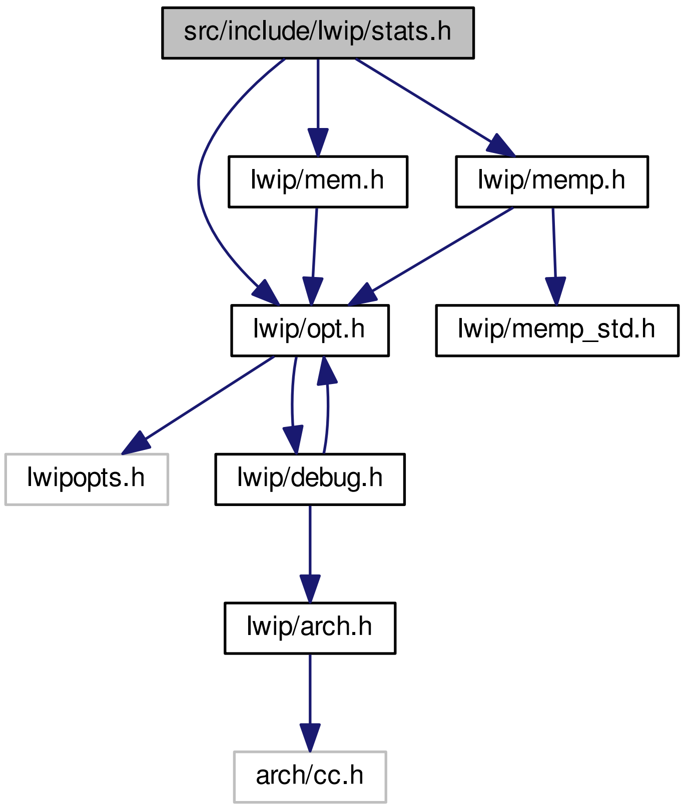
This graph shows which files directly or indirectly include this file:



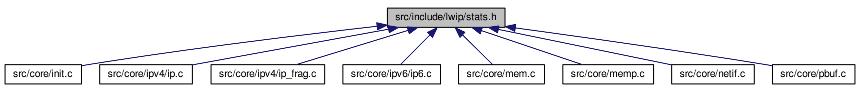
5.81 src/include/lwip/stats.h File Reference

```
#include "lwip/opt.h"
#include "lwip/mem.h"
#include "lwip/memp.h"
```

Include dependency graph for stats.h:



This graph shows which files directly or indirectly include this file:



Macros

- #define stats_init()
- #define STATS_INC(x)
- #define STATS_DEC(x)
- #define STATS_INC_USED(x)
- #define TCP_STATS_INC(x)

- #define TCP_STATS_DISPLAY()
- #define UDP_STATS_INC(x)
- #define UDP_STATS_DISPLAY()
- #define ICMP_STATS_INC(x)
- #define ICMP_STATS_DISPLAY()
- #define IGMP_STATS_INC(x)
- #define IGMP_STATS_DISPLAY()
- #define IP_STATS_INC(x)
- #define IP_STATS_DISPLAY()
- #define IPFRAG_STATS_INC(x)
- #define IPFRAG_STATS_DISPLAY()
- #define ETHARP_STATS_INC(x)
- #define ETHARP_STATS_DISPLAY()
- #define LINK_STATS_INC(x)
- #define LINK_STATS_DISPLAY()
- #define MEM_STATS_AVAIL(x, y)
- #define MEM_STATS_INC(x)
- #define MEM_STATS_INC_USED(x, y)
- #define MEM_STATS_DEC_USED(x, y)
- #define MEM_STATS_DISPLAY()
- #define MEMP_STATS_AVAIL(x, i, y)
- #define MEMP_STATS_INC(x, i)
- #define MEMP_STATS_DEC(x, i)
- #define MEMP_STATS_INC_USED(x, i)
- #define MEMP_STATS_DISPLAY(i)
- #define SYS_STATS_INC(x)
- #define SYS_STATS_DEC(x)
- #define SYS_STATS_INC_USED(x)
- #define SYS_STATS_DISPLAY()
- #define stats_display()
- #define stats_display_proto(proto, name)
- #define stats_display_igmp(igmp)
- #define stats_display_mem(mem, name)
- #define stats_display_memp(mem, index)
- #define stats_display_sys(sys)

5.81.1 Macro Definition Documentation

5.81.1.1 #define ETHARP_STATS_DISPLAY( )

Definition at line 220 of file stats.h.

5.81.1.2 #define ETHARP_STATS_INC(*x*)

Definition at line 219 of file stats.h.

5.81.1.3 #define ICMP_STATS_DISPLAY( )

Definition at line 188 of file stats.h.

5.81.1.4 #define ICMP_STATS_INC(*x*)

Definition at line 187 of file stats.h.

5.81.1.5 #define IGMP_STATS_DISPLAY( )

Definition at line 196 of file stats.h.

5.81.1.6 #define IGMP_STATS_INC(*x*)

Definition at line 195 of file stats.h.

5.81.1.7 #define IP_STATS_DISPLAY( )

Definition at line 204 of file stats.h.

5.81.1.8 #define IP_STATS_INC(*x*)

Definition at line 203 of file stats.h.

5.81.1.9 #define IPFRAG_STATS_DISPLAY( )

Definition at line 212 of file stats.h.

5.81.1.10 #define IPFRAG_STATS_INC(*x*)

Definition at line 211 of file stats.h.

5.81.1.11 #define LINK_STATS_DISPLAY( )

Definition at line 228 of file stats.h.

5.81.1.12 #define LINK_STATS_INC(*x*)

Definition at line 227 of file stats.h.

5.81.1.13 #define MEM_STATS_AVAIL(*x,* *y*)

Definition at line 238 of file stats.h.

5.81.1.14 #define MEM_STATS_DEC_USED(*x,* *y*)

Definition at line 241 of file stats.h.

5.81.1.15 #define MEM_STATS_DISPLAY( )

Definition at line 242 of file stats.h.

5.81.1.16 #define MEM_STATS_INC(*x*)

Definition at line 239 of file stats.h.

5.81.1.17 #define MEM_STATS_INC_USED(*x*, *y*)

Definition at line 240 of file stats.h.

5.81.1.18 #define MEMP_STATS_AVAIL(*x*, *i*, *y*)

Definition at line 252 of file stats.h.

5.81.1.19 #define MEMP_STATS_DEC(*x*, *i*)

Definition at line 254 of file stats.h.

5.81.1.20 #define MEMP_STATS_DISPLAY(*i*)

Definition at line 256 of file stats.h.

5.81.1.21 #define MEMP_STATS_INC(*x*, *i*)

Definition at line 253 of file stats.h.

5.81.1.22 #define MEMP_STATS_INC_USED(*x*, *i*)

Definition at line 255 of file stats.h.

5.81.1.23 #define STATS_DEC(*x*)

Definition at line 163 of file stats.h.

5.81.1.24 #define stats_display( )

Definition at line 280 of file stats.h.

5.81.1.25 #define stats_display_igmp(*igmp*)

Definition at line 282 of file stats.h.

5.81.1.26 #define stats_display_mem(mem, *name*)

Definition at line 283 of file stats.h.

5.81.1.27 #define stats_display_memp(mem, *index*)

Definition at line 284 of file stats.h.

5.81.1.28 #define stats_display_proto(*proto*, *name*)

Definition at line 281 of file stats.h.

5.81.1.29 #define stats_display_sys(*sys*)

Definition at line 285 of file stats.h.

5.81.1.30 #define STATS_INC(*x*)

Definition at line 162 of file stats.h.

5.81.1.31 #define STATS_INC_USED(*x*)

Definition at line 164 of file stats.h.

5.81.1.32 #define stats_init( )

Definition at line 161 of file stats.h.

5.81.1.33 #define SYS_STATS_DEC(*x*)

Definition at line 266 of file stats.h.

5.81.1.34 #define SYS_STATS_DISPLAY( )

Definition at line 268 of file stats.h.

5.81.1.35 #define SYS_STATS_INC(*x*)

Definition at line 265 of file stats.h.

5.81.1.36 #define SYS_STATS_INC_USED(*x*)

Definition at line 267 of file stats.h.

5.81.1.37 #define TCP_STATS_DISPLAY( )

Definition at line 172 of file stats.h.

5.81.1.38 #define TCP_STATS_INC(*x*)

Definition at line 171 of file stats.h.

5.81.1.39 #define UDP_STATS_DISPLAY( )

Definition at line 180 of file stats.h.

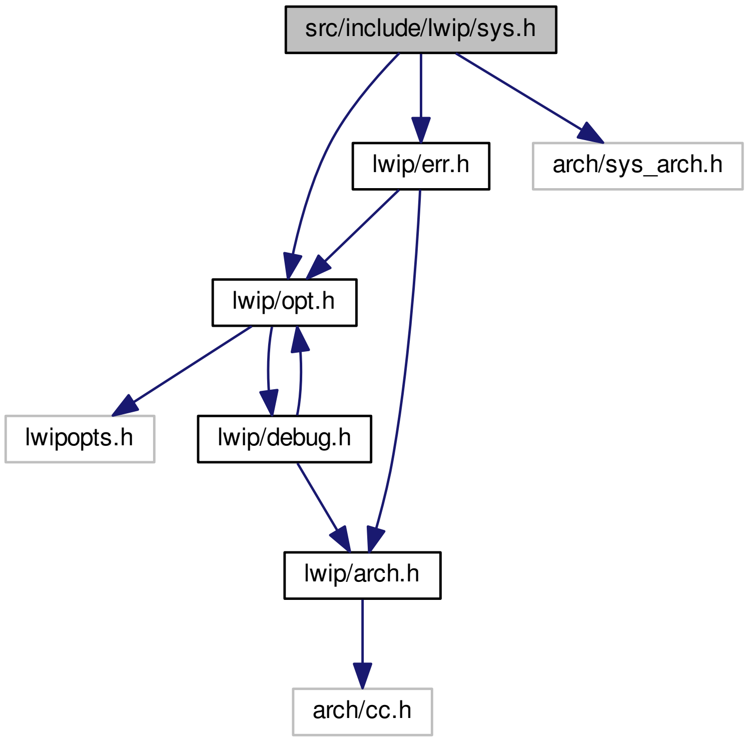
5.81.1.40 #define UDP_STATS_INC(*x*)

Definition at line 179 of file stats.h.

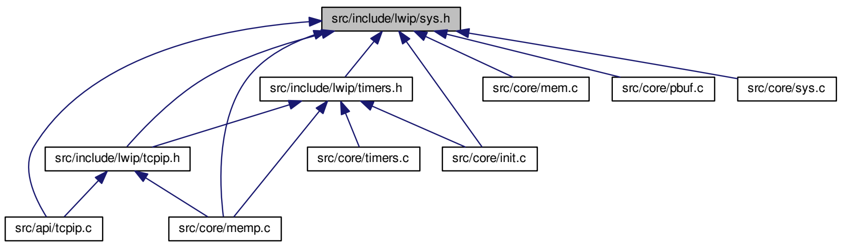
5.82 src/include/lwip/sys.h File Reference

```
#include "lwip/opt.h"
#include "lwip/err.h"
#include "arch/sys_arch.h"
```

Include dependency graph for sys.h:



This graph shows which files directly or indirectly include this file:



Macros

- #define SYS_ARCH_TIMEOUT 0xffffffffUL
- #define SYS_MBOX_EMPTY SYS_ARCH_TIMEOUT

- #define sys_sem_wait(sem) sys_arch_sem_wait(sem, 0)
- #define sys_mbox_tryfetch(mbox, msg) sys_arch_mbox_tryfetch(mbox, msg)
- #define sys_mbox_fetch(mbox, msg) sys_arch_mbox_fetch(mbox, msg, 0)
- #define SYS_ARCH_DECL_PROTECT(lev)
- #define SYS_ARCH_PROTECT(lev)
- #define SYS_ARCH_UNPROTECT(lev)
- #define SYS_ARCH_INC(var, val)
- #define SYS_ARCH_DEC(var, val)
- #define SYS_ARCH_GET(var, ret)
- #define SYS_ARCH_SET(var, val)

Typedefs

- typedef void(∗ lwip_thread_fn) (void ∗arg)

Functions

- err_t sys_mutex_new (sys_mutex_t ∗mutex)
- void sys_mutex_lock (sys_mutex_t ∗mutex)
- void sys_mutex_unlock (sys_mutex_t ∗mutex)
- void sys_mutex_free (sys_mutex_t ∗mutex)
- int sys_mutex_valid (sys_mutex_t ∗mutex)
- void sys_mutex_set_invalid (sys_mutex_t ∗mutex)
- err_t sys_sem_new (sys_sem_t ∗sem, u8_t count)
- void sys_sem_signal (sys_sem_t ∗sem)
- u32_t sys_arch_sem_wait (sys_sem_t ∗sem, u32_t timeout)
- void sys_sem_free (sys_sem_t ∗sem)
- int sys_sem_valid (sys_sem_t ∗sem)
- void sys_sem_set_invalid (sys_sem_t ∗sem)
- void sys_msleep (u32_t ms)
- err_t sys_mbox_new (sys_mbox_t ∗mbox, int size)
- void sys_mbox_post (sys_mbox_t ∗mbox, void ∗msg)
- err_t sys_mbox_trypost (sys_mbox_t ∗mbox, void ∗msg)
- u32_t sys_arch_mbox_fetch (sys_mbox_t ∗mbox, void ∗∗msg, u32_t timeout)
- u32_t sys_arch_mbox_tryfetch (sys_mbox_t ∗mbox, void ∗∗msg)
- void sys_mbox_free (sys_mbox_t ∗mbox)
- int sys_mbox_valid (sys_mbox_t ∗mbox)
- void sys_mbox_set_invalid (sys_mbox_t ∗mbox)
- sys_thread_t sys_thread_new (const char ∗name, lwip_thread_fn thread, void ∗arg, int stacksize, int prio)
- void sys_init (void)
- u32_t sys_jiffies (void)
- u32_t sys_now (void)

5.82.1 Macro Definition Documentation

5.82.1.1 #define SYS_ARCH_DEC(*var,* *val*)

Value:

```
do { \
                                SYS_ARCH_DECL_PROTECT(
      old_level); \
                                SYS_ARCH_PROTECT(old_level)
      ; \
                                var -= val; \
                                SYS_ARCH_UNPROTECT(
      old_level); \
                              } while(0)
```

Definition at line 306 of file sys.h.

5.82.1.2 #define SYS_ARCH_DECL_PROTECT(*lev*)

SYS_LIGHTWEIGHT_PROT define SYS_LIGHTWEIGHT_PROT in lwipopts.h if you want inter-task protection for certain critical regions during buffer allocation, deallocation and memory allocation and deallocation.

Definition at line 283 of file sys.h.

5.82.1.3 #define SYS_ARCH_GET(*var*, *ret*)

Value:

```
do { \
                                SYS_ARCH_DECL_PROTECT(
      old_level); \
                                SYS_ARCH_PROTECT(old_level)
      ; \
                                ret = var; \
                                SYS_ARCH_UNPROTECT(
      old_level); \
                              } while(0)
```

Definition at line 315 of file sys.h.

5.82.1.4 #define SYS_ARCH_INC(*var*, *val*)

Value:

```
do { \
                                SYS_ARCH_DECL_PROTECT(
      old_level); \
                                SYS_ARCH_PROTECT(old_level)
      ; \
                                var += val; \
                                SYS_ARCH_UNPROTECT(
      old_level); \
                              } while(0)
```

Definition at line 297 of file sys.h.

5.82.1.5 #define SYS_ARCH_PROTECT(*lev*)

Definition at line 284 of file sys.h.

5.82.1.6 #define SYS_ARCH_SET(*var*, *val*)

Value:

```
do { \
                                SYS_ARCH_DECL_PROTECT(
      old_level); \
                                SYS_ARCH_PROTECT(old_level)
      ; \
                                var = val; \
                                SYS_ARCH_UNPROTECT(
      old_level); \
                              } while(0)
```

Definition at line 324 of file sys.h.

5.82.1.7 #define SYS_ARCH_TIMEOUT 0xffffffffUL

Return code for timeouts from sys_arch_mbox_fetch and sys_arch_sem_wait

Definition at line 78 of file sys.h.

5.82.1.8 #define SYS_ARCH_UNPROTECT(*lev*)

Definition at line 285 of file sys.h.

5.82.1.9 #define SYS_MBOX_EMPTY SYS_ARCH_TIMEOUT

sys_mbox_tryfetch() returns SYS_MBOX_EMPTY if appropriate. For now we use the same magic value, but we allow this to change in future.

Definition at line 83 of file sys.h.

5.82.1.10 #define sys_mbox_fetch(*mbox,* *msg*) sys_arch_mbox_fetch(mbox, msg, 0)

Definition at line 207 of file sys.h.

5.82.1.11 #define sys_mbox_tryfetch(*mbox,* *msg*) sys_arch_mbox_tryfetch(mbox, msg)

For now, we map straight to sys_arch implementation.

Definition at line 203 of file sys.h.

5.82.1.12 #define sys_sem_wait(*sem*) sys_arch_sem_wait(sem, 0)

Wait for a semaphore - forever/no timeout

Definition at line 153 of file sys.h.

5.82.2 Typedef Documentation

5.82.2.1 typedef void(∗ lwip_thread_fn) (void ∗arg)

Function prototype for thread functions

Definition at line 89 of file sys.h.

5.82.3 Function Documentation

5.82.3.1 u32_t sys_arch_mbox_fetch (sys_mbox_t ∗ *mbox,* void ∗∗ *msg,* u32_t *timeout*)

Wait for a new message to arrive in the mbox

Parameters

mbox	mbox to get a message from
msg	pointer where the message is stored

timeout	maximum time (in milliseconds) to wait for a message

Returns

time (in milliseconds) waited for a message, may be 0 if not waited or SYS_ARCH_TIMEOUT on timeout The returned time has to be accurate to prevent timer jitter!

5.82.3.2 u32_t sys_arch_mbox_tryfetch (sys_mbox_t ∗ *mbox,* void ∗∗ *msg*)

Wait for a new message to arrive in the mbox

Parameters

mbox	mbox to get a message from
msg	pointer where the message is stored
timeout	maximum time (in milliseconds) to wait for a message

Returns

0 (milliseconds) if a message has been received or SYS_MBOX_EMPTY if the mailbox is empty

5.82.3.3 u32_t sys_arch_sem_wait (sys_sem_t ∗ *sem,* u32_t *timeout*)

Wait for a semaphore for the specified timeout

Parameters

sem	the semaphore to wait for
timeout	timeout in milliseconds to wait (0 = wait forever)

Returns

time (in milliseconds) waited for the semaphore or SYS_ARCH_TIMEOUT on timeout

5.82.3.4 void sys_init (void)

5.82.3.5 u32_t sys_jiffies (void)

Ticks/jiffies since power up.

5.82.3.6 void sys_mbox_free (sys_mbox_t ∗ *mbox*)

Delete an mbox

Parameters

mbox	mbox to delete

5.82.3.7 err_t sys_mbox_new (sys_mbox_t ∗ *mbox,* int *size*)

Create a new mbox of specified size

Parameters

mbox	pointer to the mbox to create
size	(miminum) number of messages in this mbox

Returns

ERR_OK if successful, another err_t otherwise

5.82.3.8 void sys_mbox_post (sys_mbox_t ∗ *mbox,* void ∗ *msg*)

Post a message to an mbox - may not fail -> blocks if full, only used from tasks not from ISR

Parameters

mbox	mbox to posts the message
msg	message to post (ATTENTION: can be NULL)

5.82.3.9 void sys_mbox_set_invalid (sys_mbox_t ∗ *mbox*)

Set an mbox invalid so that sys_mbox_valid returns 0

5.82.3.10 err_t sys_mbox_trypost (sys_mbox_t ∗ *mbox,* void ∗ *msg*)

Try to post a message to an mbox - may fail if full or ISR

Parameters

mbox	mbox to posts the message
msg	message to post (ATTENTION: can be NULL)

5.82.3.11 int sys_mbox_valid (sys_mbox_t ∗ *mbox*)

Check if an mbox is valid/allocated: return 1 for valid, 0 for invalid

5.82.3.12 void sys_msleep (u32_t *ms*)

Sleep for some ms. Timeouts are NOT processed while sleeping.

Parameters

ms	number of milliseconds to sleep

Definition at line 55 of file sys.c.

5.82.3.13 void sys_mutex_free (sys_mutex_t ∗ *mutex*)

Delete a semaphore

Parameters

mutex	the mutex to delete

5.82.3.14 void sys_mutex_lock (sys_mutex_t ∗ *mutex*)

Lock a mutex

Parameters

mutex	the mutex to lock

5.82.3.15 err_t sys_mutex_new (sys_mutex_t ∗ *mutex*)

Define LWIP_COMPAT_MUTEX if the port has no mutexes and binary semaphores should be used instead Create a new mutex

Parameters

mutex	pointer to the mutex to create

Returns

a new mutex

5.82.3.16 void sys_mutex_set_invalid (sys_mutex_t ∗ *mutex*)

Set a mutex invalid so that sys_mutex_valid returns 0

5.82.3.17 void sys_mutex_unlock (sys_mutex_t ∗ *mutex*)

Unlock a mutex

Parameters

mutex	the mutex to unlock

5.82.3.18 int sys_mutex_valid (sys_mutex_t ∗ *mutex*)

Check if a mutex is valid/allocated: return 1 for valid, 0 for invalid

5.82.3.19 u32_t sys_now (void)

Returns the current time in milliseconds, may be the same as sys_jiffies or at least based on it.

5.82.3.20 void sys_sem_free (sys_sem_t ∗ *sem*)

Delete a semaphore

Parameters

sem	semaphore to delete

5.82.3.21 err_t sys_sem_new (sys_sem_t ∗ *sem*, u8_t *count*)

Create a new semaphore

Parameters

sem	pointer to the semaphore to create
count	initial count of the semaphore

Returns

ERR_OK if successful, another err_t otherwise

5.82.3.22 void sys_sem_set_invalid (sys_sem_t ∗ *sem*)

Set a semaphore invalid so that sys_sem_valid returns 0

5.82.3.23 void sys_sem_signal (sys_sem_t ∗ *sem*)

Signals a semaphore

Parameters

sem	the semaphore to signal

5.82.3.24 int sys_sem_valid (sys_sem_t ∗ *sem*)

Check if a sempahore is valid/allocated: return 1 for valid, 0 for invalid

5.82.3.25 sys_thread_t sys_thread_new (const char ∗ *name*, lwip_thread_fn *thread*, void ∗ *arg*, int *stacksize*, int *prio*)

The only thread function: Creates a new thread

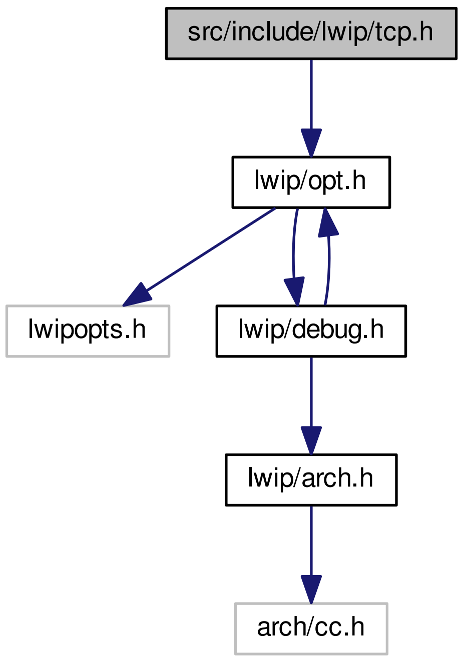
Parameters

name	human-readable name for the thread (used for debugging purposes)
thread	thread-function
arg	parameter passed to 'thread'
stacksize	stack size in bytes for the new thread (may be ignored by ports)
prio	priority of the new thread (may be ignored by ports)

5.83 src/include/lwip/tcp.h File Reference

```
#include "lwip/opt.h"
```

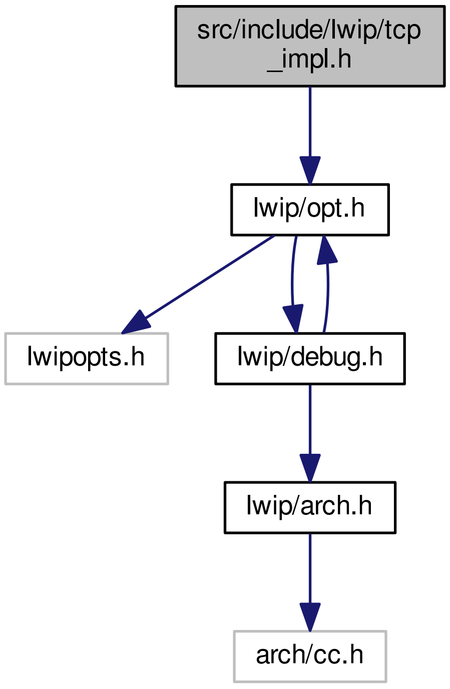
Include dependency graph for tcp.h:



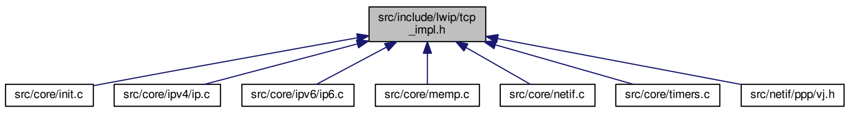
5.84 src/include/lwip/tcp_impl.h File Reference

```
#include "lwip/opt.h"
```

Include dependency graph for tcp_impl.h:



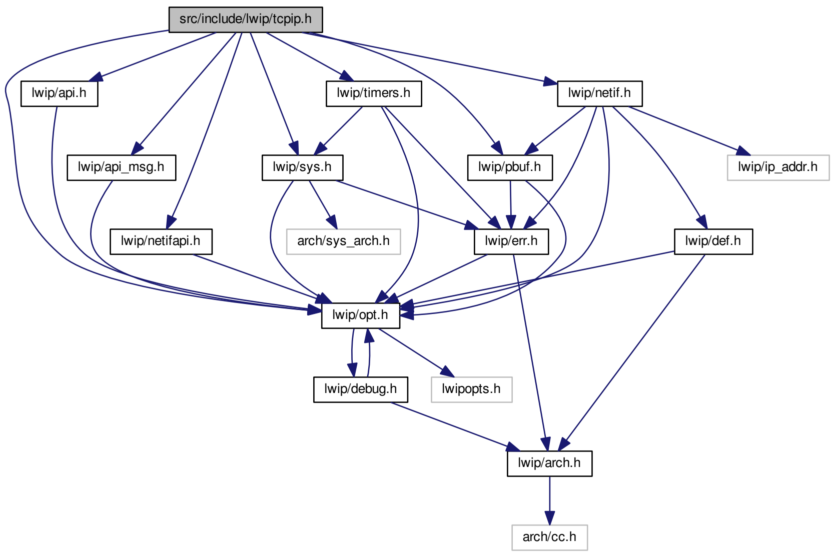
This graph shows which files directly or indirectly include this file:



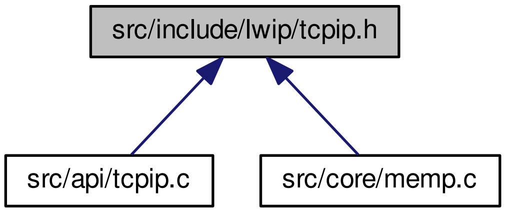
5.85 src/include/lwip/tcpip.h File Reference

```
#include "lwip/opt.h"
#include "lwip/api_msg.h"
#include "lwip/netifapi.h"
#include "lwip/pbuf.h"
#include "lwip/api.h"
#include "lwip/sys.h"
#include "lwip/timers.h"
#include "lwip/netif.h"
```

Include dependency graph for tcpip.h:



This graph shows which files directly or indirectly include this file:



Data Structures

- struct tcpip_msg

Macros

- #define LWIP_TCPIP_THREAD_ALIVE()
- #define LOCK_TCPIP_CORE()
- #define UNLOCK_TCPIP_CORE()
- #define TCPIP_APIMSG(m) tcpip_apimsg(m)
- #define TCPIP_APIMSG_ACK(m) sys_sem_signal(&m->conn->op_completed)
- #define TCPIP_NETIFAPI(m) tcpip_netifapi(m)
- #define TCPIP_NETIFAPI_ACK(m) sys_sem_signal(&m->sem)
- #define tcpip_callback(f, ctx) tcpip_callback_with_block(f, ctx, 1)

Typedefs

- typedef void(∗ tcpip_init_done_fn) (void ∗arg)
- typedef void(∗ tcpip_callback_fn) (void ∗ctx)

Enumerations

- enum tcpip_msg_type { TCPIP_MSG_INPKT, TCPIP_MSG_CALLBACK, TCPIP_MSG_CALLBACK_STA↩ TIC }

Functions

- void tcpip_init (tcpip_init_done_fn tcpip_init_done, void ∗arg)
- err_t tcpip_input (struct pbuf ∗p, struct netif ∗inp)
- err_t tcpip_callback_with_block (tcpip_callback_fn function, void ∗ctx, u8_t block)
- struct tcpip_callback_msg ∗ tcpip_callbackmsg_new (tcpip_callback_fn function, void ∗ctx)
- void tcpip_callbackmsg_delete (struct tcpip_callback_msg ∗msg)
- err_t tcpip_trycallback (struct tcpip_callback_msg ∗msg)
- err_t pbuf_free_callback (struct pbuf ∗p)
- err_t mem_free_callback (void ∗m)

5.85.1 Macro Definition Documentation

5.85.1.1 #define LOCK_TCPIP_CORE( )

Definition at line 67 of file tcpip.h.

5.85.1.2 #define LWIP_TCPIP_THREAD_ALIVE( )

Define this to something that triggers a watchdog. This is called from tcpip_thread after processing a message.

Definition at line 54 of file tcpip.h.

5.85.1.3 #define TCPIP_APIMSG(*m*) tcpip_apimsg(m)

Definition at line 69 of file tcpip.h.

5.85.1.4 #define TCPIP_APIMSG_ACK(*m*) sys_sem_signal(&m->conn->op_completed)

Definition at line 70 of file tcpip.h.

5.85.1.5 #define tcpip_callback(*f, ctx*) tcpip_callback_with_block(f, ctx, 1)

Definition at line 102 of file tcpip.h.

5.85.1.6 #define TCPIP_NETIFAPI(*m*) tcpip_netifapi(m)

Definition at line 71 of file tcpip.h.

5.85.1.7 #define TCPIP_NETIFAPI_ACK(*m*) sys_sem_signal(&m->sem)

Definition at line 72 of file tcpip.h.

5.85.1.8 #define UNLOCK_TCPIP_CORE( )

Definition at line 68 of file tcpip.h.

5.85.2 Typedef Documentation

5.85.2.1 typedef void(∗ tcpip_callback_fn) (void ∗ctx)

Function prototype for functions passed to tcpip_callback()

Definition at line 78 of file tcpip.h.

5.85.2.2 typedef void(∗ tcpip_init_done_fn) (void ∗arg)

Function prototype for the init_done function passed to tcpip_init

Definition at line 76 of file tcpip.h.

5.85.3 Enumeration Type Documentation

5.85.3.1 enum tcpip_msg_type

Enumerator

TCPIP_MSG_INPKT

TCPIP_MSG_CALLBACK

TCPIP_MSG_CALLBACK_STATIC

Definition at line 117 of file tcpip.h.

5.85.4 Function Documentation

5.85.4.1 err_t mem_free_callback (void ∗ *m*)

A simple wrapper function that allows you to free heap memory from interrupt context.

Parameters

m	the heap memory to free

Returns

ERR_OK if callback could be enqueued, an err_t if not

Definition at line 506 of file tcpip.c.

5.85.4.2 err_t pbuf_free_callback (struct pbuf ∗ *p*)

A simple wrapper function that allows you to free a pbuf from interrupt context.

Parameters

p	The pbuf (chain) to be dereferenced.

Returns

ERR_OK if callback could be enqueued, an err_t if not

Definition at line 493 of file tcpip.c.

5.85.4.3 err_t tcpip_callback_with_block (tcpip_callback_fn *function,* void ∗ *ctx,* u8_t *block*)

Call a specific function in the thread context of tcpip_thread for easy access synchronization. A function called in that way may access lwIP core code without fearing concurrent access.

Parameters

f	the function to call
ctx	parameter passed to f
block	1 to block until the request is posted, 0 to non-blocking mode

Returns

ERR_OK if the function was called, another err_t if not

Definition at line 211 of file tcpip.c.

5.85.4.4 void tcpip_callbackmsg_delete (struct tcpip_callback_msg ∗ *msg*)

Free a callback message allocated by tcpip_callbackmsg_new().

Parameters

msg	the message to free

Definition at line 425 of file tcpip.c.

5.85.4.5 struct tcpip_callback_msg∗ tcpip_callbackmsg_new (tcpip_callback_fn *function,* void ∗ *ctx*)

Allocate a structure for a static callback message and initialize it. This is intended to be used to send "static" messages from interrupt context.

Parameters

function	the function to call
ctx	parameter passed to function

Returns

a struct pointer to pass to tcpip_trycallback().

Definition at line 408 of file tcpip.c.

5.85.4.6 void tcpip_init (tcpip_init_done_fn *initfunc,* void ∗ *arg*)

Initialize this module:

- initialize all sub modules
- start the tcpip_thread

Parameters

initfunc	a function to call when tcpip_thread is running and finished initializing
arg	argument to pass to initfunc

Definition at line 455 of file tcpip.c.

5.85.4.7 err_t tcpip_input (struct pbuf ∗ *p*, struct netif ∗ *inp*)

Pass a received packet to tcpip_thread for input processing

Parameters

p	the received packet, p->payload pointing to the Ethernet header or to an IP header (if inp doesn't have NETIF_FLAG_ETHARP or NETIF_FLAG_ETHERNET flags)
inp	the network interface on which the packet was received

Definition at line 161 of file tcpip.c.

5.85.4.8 err_t tcpip_trycallback (struct tcpip_callback_msg ∗ *msg*)

Try to post a callback-message to the tcpip_thread mbox This is intended to be used to send "static" messages from interrupt context.

Parameters

msg	pointer to the message to post

Returns

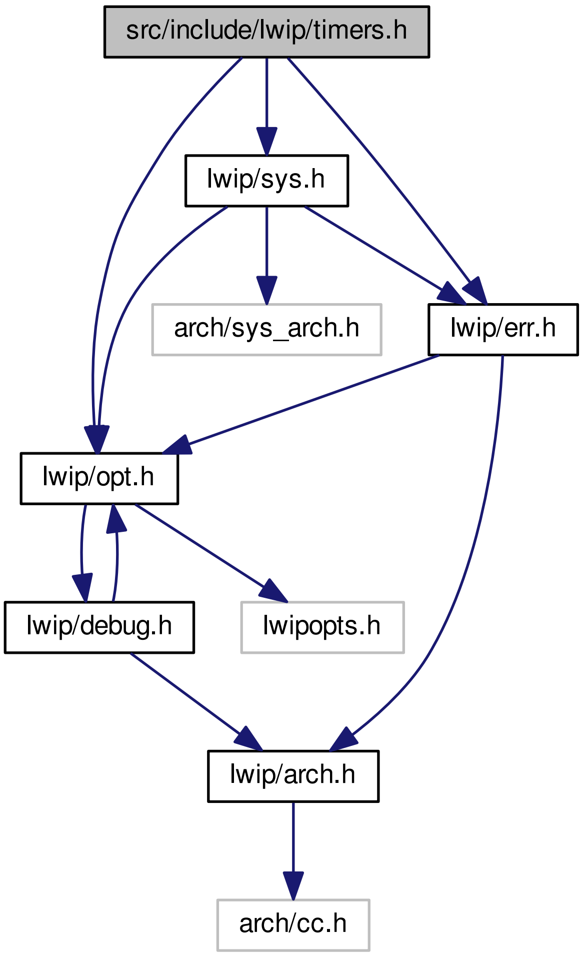
sys_mbox_trypost() return code

Definition at line 438 of file tcpip.c.

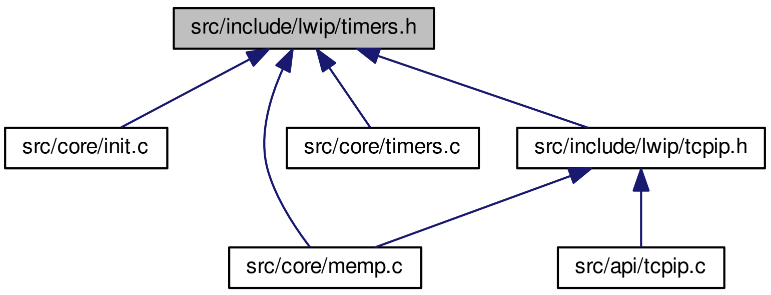
5.86 src/include/lwip/timers.h File Reference

```
#include "lwip/opt.h"
#include "lwip/err.h"
#include "lwip/sys.h"
```

Include dependency graph for timers.h:



This graph shows which files directly or indirectly include this file:



Data Structures

- struct sys_timeo

Macros

- #define LWIP_TIMERS (!NO_SYS || (NO_SYS && !NO_SYS_NO_TIMERS))
- #define LWIP_DEBUG_TIMERNAMES 0

Typedefs

- typedef void(∗ sys_timeout_handler) (void ∗arg)

Functions

- void sys_timeouts_init (void)
- void sys_timeout (u32_t msecs, sys_timeout_handler handler, void ∗arg)
- void sys_untimeout (sys_timeout_handler handler, void ∗arg)
- void sys_timeouts_mbox_fetch (sys_mbox_t ∗mbox, void ∗∗msg)

5.86.1 Macro Definition Documentation

5.86.1.1 #define LWIP_DEBUG_TIMERNAMES 0

Definition at line 56 of file timers.h.

5.86.1.2 #define LWIP_TIMERS (!NO_SYS || (NO_SYS && !NO_SYS_NO_TIMERS))

Definition at line 39 of file timers.h.

5.86.2 Typedef Documentation

5.86.2.1 typedef void(∗ sys_timeout_handler) (void ∗arg)

Function prototype for a timeout callback function. Register such a function using sys_timeout().

Parameters

arg	Additional argument to pass to the function - set up by sys_timeout()

Definition at line 65 of file timers.h.

5.86.3 Function Documentation

5.86.3.1 void sys_timeout (u32_t *msecs*, sys_timeout_handler *handler*, void ∗ *arg*)

5.86.3.2 void sys_timeouts_init (void)

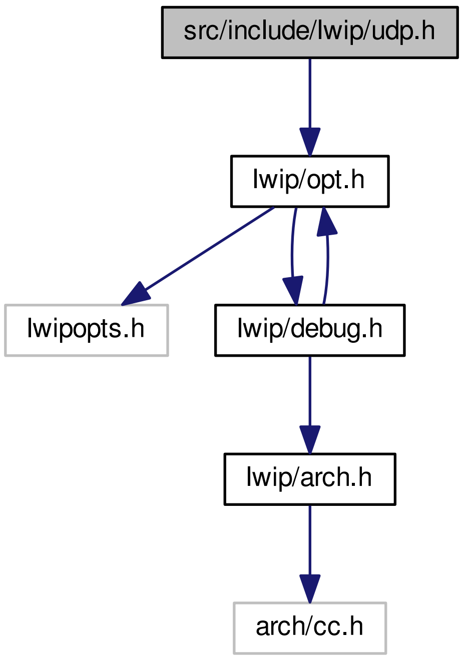
5.86.3.3 void sys_timeouts_mbox_fetch (sys_mbox_t ∗ *mbox*, void ∗∗ *msg*)

5.86.3.4 void sys_untimeout (sys_timeout_handler *handler*, void ∗ *arg*)

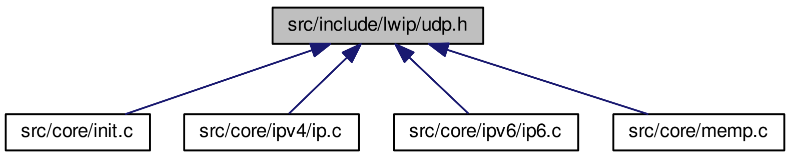
5.87 src/include/lwip/udp.h File Reference

`#include "lwip/opt.h"`

Include dependency graph for udp.h:



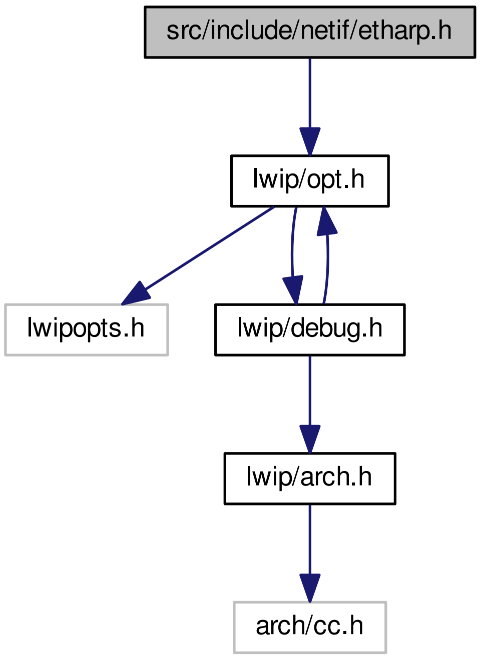
This graph shows which files directly or indirectly include this file:



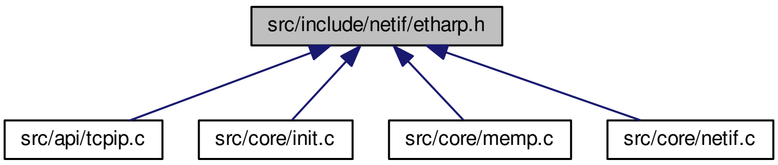
5.88 src/include/netif/etharp.h File Reference

`#include "lwip/opt.h"`

Include dependency graph for etharp.h:



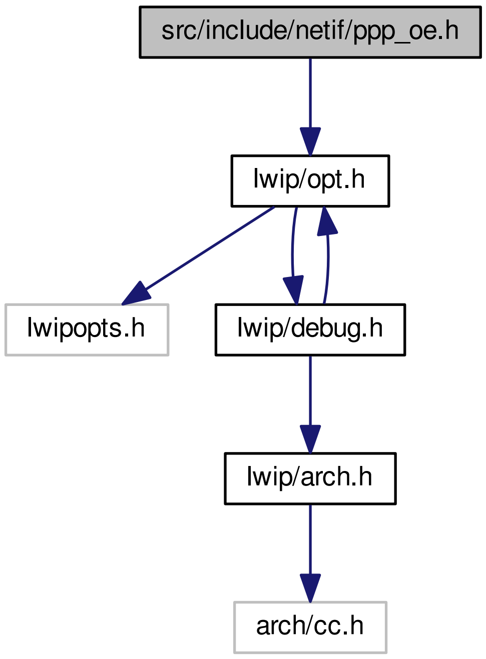
This graph shows which files directly or indirectly include this file:



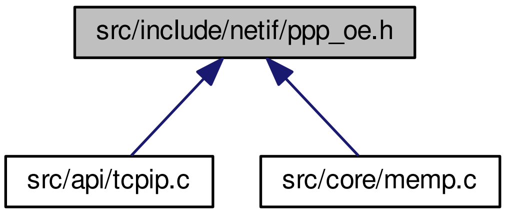
5.89 src/include/netif/ppp_oe.h File Reference

```
#include "lwip/opt.h"
```

Include dependency graph for ppp_oe.h:



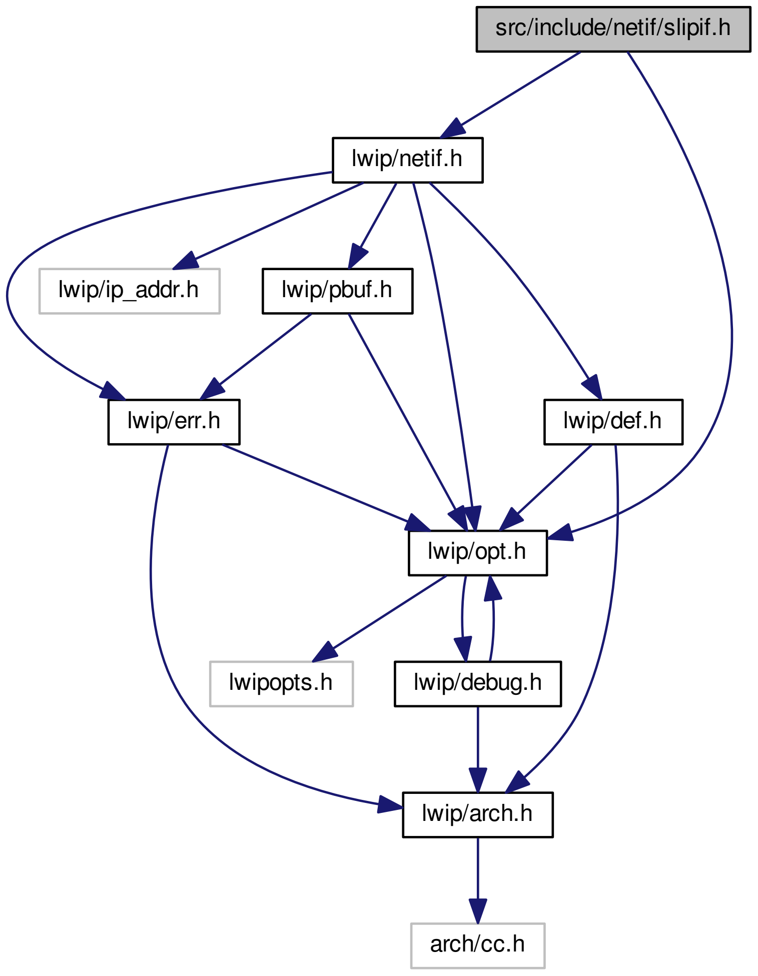
This graph shows which files directly or indirectly include this file:



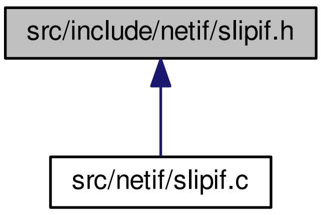
5.90 src/include/netif/slipif.h File Reference

```
#include "lwip/opt.h"
#include "lwip/netif.h"
```

Include dependency graph for slipif.h:



This graph shows which files directly or indirectly include this file:



Macros

- #define SLIP_USE_RX_THREAD !NO_SYS
- #define SLIP_RX_FROM_ISR 0
- #define SLIP_RX_QUEUE SLIP_RX_FROM_ISR

Functions

- err_t slipif_init (struct netif ∗netif)
- void slipif_poll (struct netif ∗netif)

5.90.1 Macro Definition Documentation

5.90.1.1 #define SLIP_RX_FROM_ISR 0

Set this to 1 to enable functions to pass in RX bytes from ISR context. If enabled, slipif_received_byte[s]() process incoming bytes and put assembled packets on a queue, which is fed into lwIP from slipif_poll(). If disabled, slipif_poll() polls the serila line (using sio_tryread()).

Definition at line 53 of file slipif.h.

5.90.1.2 #define SLIP_RX_QUEUE SLIP_RX_FROM_ISR

Set this to 1 (default for SLIP_RX_FROM_ISR) to queue incoming packets received by slipif_received_byte[s]() as long as PBUF_POOL pbufs are available. If disabled, packets will be dropped if more than one packet is received.

Definition at line 61 of file slipif.h.

5.90.1.3 #define SLIP_USE_RX_THREAD !NO_SYS

Set this to 1 to start a thread that blocks reading on the serial line (using sio_read()).

Definition at line 44 of file slipif.h.

5.90.2 Function Documentation

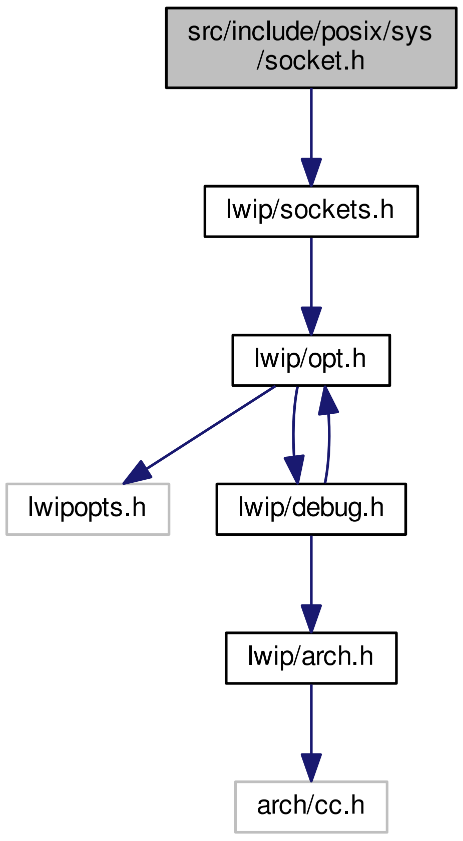
5.90.2.1 err_t slipif_init (struct netif ∗ *netif*)

5.90.2.2 void slipif_poll (struct netif ∗ *netif*)

5.91 src/include/posix/sys/socket.h File Reference

```
#include "lwip/sockets.h"
```

Include dependency graph for socket.h:



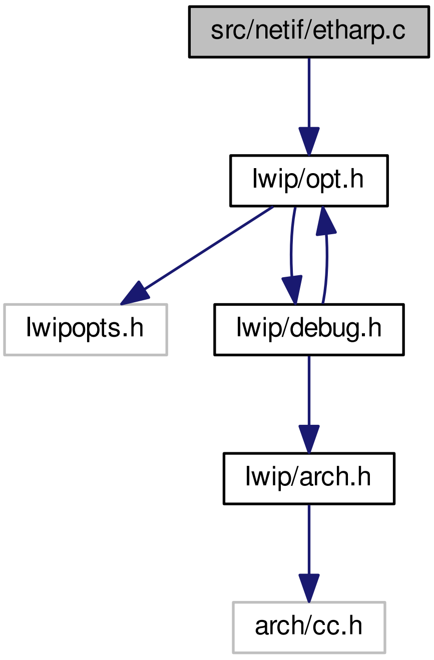
5.91.1 Detailed Description

This file is a posix wrapper for lwip/sockets.h.

5.92 src/netif/etharp.c File Reference

`#include "lwip/opt.h"`

Include dependency graph for etharp.c:



5.92.1 Detailed Description

Address Resolution Protocol module for IP over Ethernet

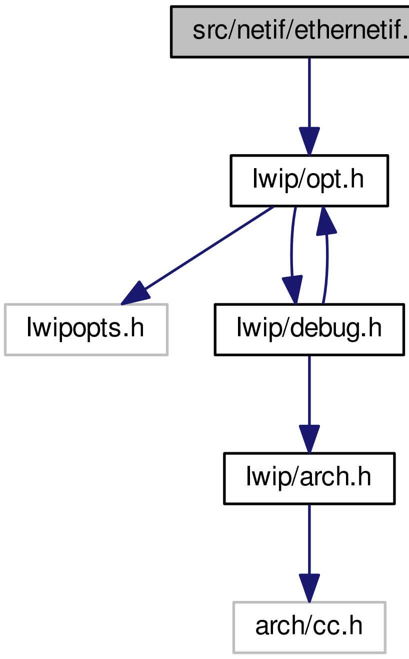
Functionally, ARP is divided into two parts. The first maps an IP address to a physical address when sending a packet, and the second part answers requests from other machines for our physical address.

This implementation complies with RFC 826 (Ethernet ARP). It supports Gratuitious ARP from RFC3220 (IP Mobility Support for IPv4) section 4.6 if an interface calls etharp_gratuitous(our_netif) upon address change.

5.93 src/netif/ethernetif.c File Reference

`#include "lwip/opt.h"`

Include dependency graph for ethernetif.c:



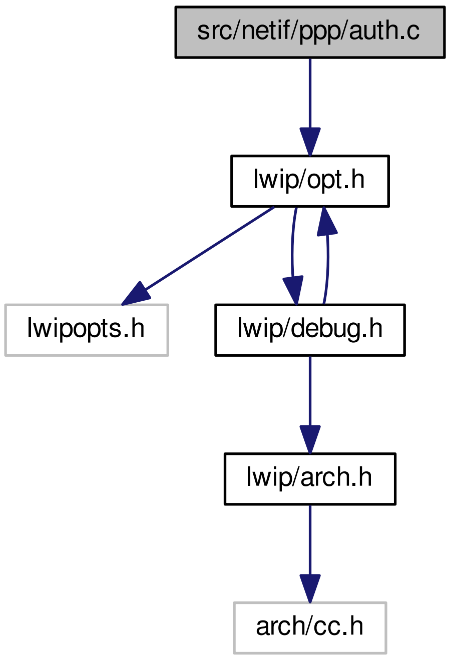
5.93.1 Detailed Description

Ethernet Interface Skeleton

5.94 src/netif/ppp/auth.c File Reference

```
#include "lwip/opt.h"
```

Include dependency graph for auth.c:



5.95 src/netif/ppp/auth.h File Reference

Functions

- void link_required (int)
- void link_terminated (int)
- void link_down (int)
- void link_established (int)
- void np_up (int, u16_t)
- void np_down (int, u16_t)
- void np_finished (int, u16_t)
- void auth_peer_fail (int, u16_t)
- void auth_peer_success (int, u16_t, char ∗, int)
- void auth_withpeer_fail (int, u16_t)
- void auth_withpeer_success (int, u16_t)
- void auth_check_options (void)
- void auth_reset (int)
- u_char check_passwd (int, char ∗, int, char ∗, int, char ∗∗, int ∗)
- int get_secret (int, char ∗, char ∗, char ∗, int ∗, int)
- int auth_ip_addr (int, u32_t)
- int bad_ip_adrs (u32_t)

5.95.1 Function Documentation

5.95.1.1 void auth_check_options (void)

5.95.1.2 int auth_ip_addr (int , u32_t)

5.95.1.3 void auth_peer_fail (int , u16_t)

5.95.1.4 void auth_peer_success (int , u16_t , char * , int)

5.95.1.5 void auth_reset (int)

5.95.1.6 void auth_withpeer_fail (int , u16_t)

5.95.1.7 void auth_withpeer_success (int , u16_t)

5.95.1.8 int bad_ip_adrs (u32_t)

5.95.1.9 u_char check_passwd (int , char * , int , char * , int , char ** , int *)

5.95.1.10 int get_secret (int , char * , char * , char * , int * , int)

5.95.1.11 void link_down (int)

5.95.1.12 void link_established (int)

5.95.1.13 void link_required (int)

5.95.1.14 void link_terminated (int)

5.95.1.15 void np_down (int , u16_t)

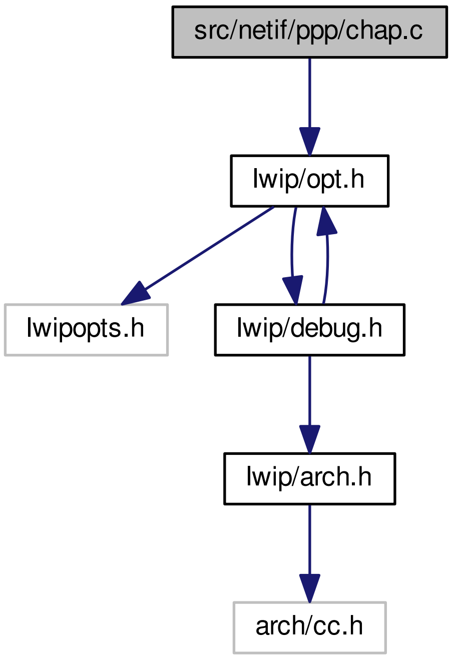
5.95.1.16 void np_finished (int , u16_t)

5.95.1.17 void np_up (int , u16_t)

5.96 src/netif/ppp/chap.c File Reference

```
#include "lwip/opt.h"
```

Include dependency graph for chap.c:



5.97 src/netif/ppp/chap.h File Reference

Data Structures

- struct chap_state

Macros

- #define CHAP_HEADERLEN 4
- #define CHAP_DIGEST_MD5 5 /∗ use MD5 algorithm ∗/
- #define MD5_SIGNATURE_SIZE 16 /∗ 16 bytes in a MD5 message digest ∗/
- #define CHAP_MICROSOFT 0x80 /∗ use Microsoft-compatible alg. ∗/
- #define MS_CHAP_RESPONSE_LEN 49 /∗ Response length for MS-CHAP ∗/
- #define CHAP_CHALLENGE 1
- #define CHAP_RESPONSE 2
- #define CHAP_SUCCESS 3
- #define CHAP_FAILURE 4
- #define MIN_CHALLENGE_LENGTH 32
- #define MAX_CHALLENGE_LENGTH 64
- #define MAX_RESPONSE_LENGTH 64 /∗ sufficient for MD5 or MS-CHAP ∗/
- #define CHAPCS_INITIAL 0 /∗ Lower layer down, not opened ∗/
- #define CHAPCS_CLOSED 1 /∗ Lower layer up, not opened ∗/
- #define CHAPCS_PENDING 2 /∗ Auth us to peer when lower up ∗/
- #define CHAPCS_LISTEN 3 /∗ Listening for a challenge ∗/

- #define CHAPCS_RESPONSE 4 /∗ Sent response, waiting for status ∗/
- #define CHAPCS_OPEN 5 /∗ We've received Success ∗/
- #define CHAPSS_INITIAL 0 /∗ Lower layer down, not opened ∗/
- #define CHAPSS_CLOSED 1 /∗ Lower layer up, not opened ∗/
- #define CHAPSS_PENDING 2 /∗ Auth peer when lower up ∗/
- #define CHAPSS_INITIAL_CHAL 3 /∗ We've sent the first challenge ∗/
- #define CHAPSS_OPEN 4 /∗ We've sent a Success msg ∗/
- #define CHAPSS_RECHALLENGE 5 /∗ We've sent another challenge ∗/
- #define CHAPSS_BADAUTH 6 /∗ We've sent a Failure msg ∗/

Typedefs

- typedef struct chap_state chap_state

Functions

- void ChapAuthWithPeer (int, char ∗, u_char)
- void ChapAuthPeer (int, char ∗, u_char)

Variables

- chap_state chap [ ]
- struct protent chap_protent

5.97.1 Macro Definition Documentation

5.97.1.1 #define CHAP_CHALLENGE 1

Definition at line 83 of file chap.h.

5.97.1.2 #define CHAP_DIGEST_MD5 5 /∗ use MD5 algorithm ∗/

Definition at line 78 of file chap.h.

5.97.1.3 #define CHAP_FAILURE 4

Definition at line 86 of file chap.h.

5.97.1.4 #define CHAP_HEADERLEN 4

Definition at line 72 of file chap.h.

5.97.1.5 #define CHAP_MICROSOFT 0x80 /∗ use Microsoft-compatible alg. ∗/

Definition at line 80 of file chap.h.

5.97.1.6 #define CHAP_RESPONSE 2

Definition at line 84 of file chap.h.

5.97.1.7 #define CHAP_SUCCESS 3

Definition at line 85 of file chap.h.

5.97.1.8 #define CHAPCS_CLOSED 1 /∗ Lower layer up, not opened ∗/

Definition at line 126 of file chap.h.

5.97.1.9 #define CHAPCS_INITIAL 0 /∗ Lower layer down, not opened ∗/

Definition at line 125 of file chap.h.

5.97.1.10 #define CHAPCS_LISTEN 3 /∗ Listening for a challenge ∗/

Definition at line 128 of file chap.h.

5.97.1.11 #define CHAPCS_OPEN 5 /∗ We've received Success ∗/

Definition at line 130 of file chap.h.

5.97.1.12 #define CHAPCS_PENDING 2 /∗ Auth us to peer when lower up ∗/

Definition at line 127 of file chap.h.

5.97.1.13 #define CHAPCS_RESPONSE 4 /∗ Sent response, waiting for status ∗/

Definition at line 129 of file chap.h.

5.97.1.14 #define CHAPSS_BADAUTH 6 /∗ We've sent a Failure msg ∗/

Definition at line 141 of file chap.h.

5.97.1.15 #define CHAPSS_CLOSED 1 /∗ Lower layer up, not opened ∗/

Definition at line 136 of file chap.h.

5.97.1.16 #define CHAPSS_INITIAL 0 /∗ Lower layer down, not opened ∗/

Definition at line 135 of file chap.h.

5.97.1.17 #define CHAPSS_INITIAL_CHAL 3 /∗ We've sent the first challenge ∗/

Definition at line 138 of file chap.h.

5.97.1.18 #define CHAPSS_OPEN 4 /∗ We've sent a Success msg ∗/

Definition at line 139 of file chap.h.

5.97.1.19 #define CHAPSS_PENDING 2 /* Auth peer when lower up */

Definition at line 137 of file chap.h.

5.97.1.20 #define CHAPSS_RECHALLENGE 5 /* We've sent another challenge */

Definition at line 140 of file chap.h.

5.97.1.21 #define MAX_CHALLENGE_LENGTH 64

Definition at line 92 of file chap.h.

5.97.1.22 #define MAX_RESPONSE_LENGTH 64 /* sufficient for MD5 or MS-CHAP */

Definition at line 93 of file chap.h.

5.97.1.23 #define MD5_SIGNATURE_SIZE 16 /* 16 bytes in a MD5 message digest */

Definition at line 79 of file chap.h.

5.97.1.24 #define MIN_CHALLENGE_LENGTH 32

Definition at line 91 of file chap.h.

5.97.1.25 #define MS_CHAP_RESPONSE_LEN 49 /* Response length for MS-CHAP */

Definition at line 81 of file chap.h.

5.97.2 Typedef Documentation

5.97.2.1 typedef struct chap_state chap_state

5.97.3 Function Documentation

5.97.3.1 void ChapAuthPeer (int , char * , u_char)

5.97.3.2 void ChapAuthWithPeer (int , char * , u_char)

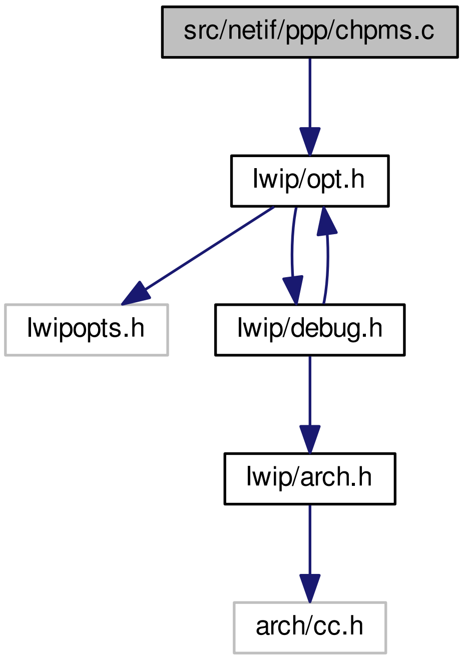
5.97.4 Variable Documentation

5.97.4.1 chap_state chap[ ]

5.97.4.2 struct protent chap_protent

5.98 src/netif/ppp/chpms.c File Reference

`#include "lwip/opt.h"`
Include dependency graph for chpms.c:



Macros

- #define USE_CRYPT

5.98.1 Macro Definition Documentation

5.98.1.1 #define USE_CRYPT

Definition at line 70 of file chpms.c.

5.99 src/netif/ppp/chpms.h File Reference

Macros

- #define MAX_NT_PASSWORD 256 /∗ Maximum number of (Unicode) chars in an NT password ∗/

Functions

- void ChapMS (chap_state ∗, char ∗, int, char ∗, int)

5.99.1 Macro Definition Documentation

5.99.1.1 #define MAX_NT_PASSWORD 256 /∗ Maximum number of (Unicode) chars in an NT password ∗/

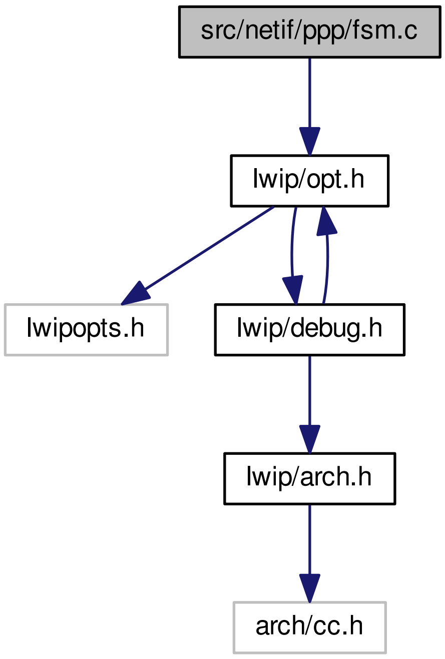
Definition at line 60 of file chpms.h.

5.99.2 Function Documentation

5.99.2.1 void ChapMS (chap_state ∗ , char ∗ , int , char ∗ , int)

5.100 src/netif/ppp/fsm.c File Reference

`#include "lwip/opt.h"`
Include dependency graph for fsm.c:



5.101 src/netif/ppp/fsm.h File Reference

Data Structures

- struct fsm
- struct fsm_callbacks

Macros

- #define HEADERLEN (sizeof (u_char) + sizeof (u_char) + sizeof (u_short))

- #define CONFREQ 1 /∗ Configuration Request ∗/
- #define CONFACK 2 /∗ Configuration Ack ∗/
- #define CONFNAK 3 /∗ Configuration Nak ∗/
- #define CONFREJ 4 /∗ Configuration Reject ∗/
- #define TERMREQ 5 /∗ Termination Request ∗/
- #define TERMACK 6 /∗ Termination Ack ∗/
- #define CODEREJ 7 /∗ Code Reject ∗/
- #define LS_INITIAL 0 /∗ Down, hasn't been opened ∗/
- #define LS_STARTING 1 /∗ Down, been opened ∗/
- #define LS_CLOSED 2 /∗ Up, hasn't been opened ∗/
- #define LS_STOPPED 3 /∗ Open, waiting for down event ∗/
- #define LS_CLOSING 4 /∗ Terminating the connection, not open ∗/
- #define LS_STOPPING 5 /∗ Terminating, but open ∗/
- #define LS_REQSENT 6 /∗ We've sent a Config Request ∗/
- #define LS_ACKRCVD 7 /∗ We've received a Config Ack ∗/
- #define LS_ACKSENT 8 /∗ We've sent a Config Ack ∗/
- #define LS_OPENED 9 /∗ Connection available ∗/
- #define OPT_PASSIVE 1 /∗ Don't die if we don't get a response ∗/
- #define OPT_RESTART 2 /∗ Treat 2nd OPEN as DOWN, UP ∗/
- #define OPT_SILENT 4 /∗ Wait for peer to speak first ∗/

Typedefs

- typedef struct fsm fsm
- typedef struct fsm_callbacks fsm_callbacks

Functions

- void fsm_init (fsm ∗)
- void fsm_lowerup (fsm ∗)
- void fsm_lowerdown (fsm ∗)
- void fsm_open (fsm ∗)
- void fsm_close (fsm ∗, char ∗)
- void fsm_input (fsm ∗, u_char ∗, int)
- void fsm_protreject (fsm ∗)
- void fsm_sdata (fsm ∗, u_char, u_char, u_char ∗, int)

Variables

- int peer_mru [ ]

5.101.1 Macro Definition Documentation

5.101.1.1 #define CODEREJ 7 /∗ Code Reject ∗/

Definition at line 72 of file fsm.h.

5.101.1.2 #define CONFACK 2 /∗ Configuration Ack ∗/

Definition at line 67 of file fsm.h.

5.101.1.3 #define CONFNAK 3 /∗ Configuration Nak ∗/

Definition at line 68 of file fsm.h.

5.101.1.4 #define CONFREJ 4 /∗ Configuration Reject ∗/

Definition at line 69 of file fsm.h.

5.101.1.5 #define CONFREQ 1 /∗ Configuration Request ∗/

Definition at line 66 of file fsm.h.

5.101.1.6 #define HEADERLEN (sizeof (u_char) + sizeof (u_char) + sizeof (u_short))

Definition at line 60 of file fsm.h.

5.101.1.7 #define LS_ACKRCVD 7 /∗ We've received a Config Ack ∗/

Definition at line 127 of file fsm.h.

5.101.1.8 #define LS_ACKSENT 8 /∗ We've sent a Config Ack ∗/

Definition at line 128 of file fsm.h.

5.101.1.9 #define LS_CLOSED 2 /∗ Up, hasn't been opened ∗/

Definition at line 122 of file fsm.h.

5.101.1.10 #define LS_CLOSING 4 /∗ Terminating the connection, not open ∗/

Definition at line 124 of file fsm.h.

5.101.1.11 #define LS_INITIAL 0 /∗ Down, hasn't been opened ∗/

Definition at line 120 of file fsm.h.

5.101.1.12 #define LS_OPENED 9 /∗ Connection available ∗/

Definition at line 129 of file fsm.h.

5.101.1.13 #define LS_REQSENT 6 /∗ We've sent a Config Request ∗/

Definition at line 126 of file fsm.h.

5.101.1.14 #define LS_STARTING 1 /∗ Down, been opened ∗/

Definition at line 121 of file fsm.h.

5.101.1.15 #define LS_STOPPED 3 /∗ Open, waiting for down event ∗/

Definition at line 123 of file fsm.h.

5.101.1.16 #define LS_STOPPING 5 /∗ Terminating, but open ∗/

Definition at line 125 of file fsm.h.

5.101.1.17 #define OPT_PASSIVE 1 /∗ Don't die if we don't get a response ∗/

Definition at line 134 of file fsm.h.

5.101.1.18 #define OPT_RESTART 2 /∗ Treat 2nd OPEN as DOWN, UP ∗/

Definition at line 135 of file fsm.h.

5.101.1.19 #define OPT_SILENT 4 /∗ Wait for peer to speak first ∗/

Definition at line 136 of file fsm.h.

5.101.1.20 #define TERMACK 6 /∗ Termination Ack ∗/

Definition at line 71 of file fsm.h.

5.101.1.21 #define TERMREQ 5 /∗ Termination Request ∗/

Definition at line 70 of file fsm.h.

5.101.2 Typedef Documentation

5.101.2.1 typedef struct fsm fsm

5.101.2.2 typedef struct fsm_callbacks fsm_callbacks

5.101.3 Function Documentation

5.101.3.1 void fsm_close (fsm ∗ , char ∗)

5.101.3.2 void fsm_init (fsm ∗)

5.101.3.3 void fsm_input (fsm ∗ , u_char ∗ , int)

5.101.3.4 void fsm_lowerdown (fsm ∗)

5.101.3.5 void fsm_lowerup (fsm ∗)

5.101.3.6 void fsm_open (fsm ∗)

5.101.3.7 void fsm_protreject (fsm ∗)

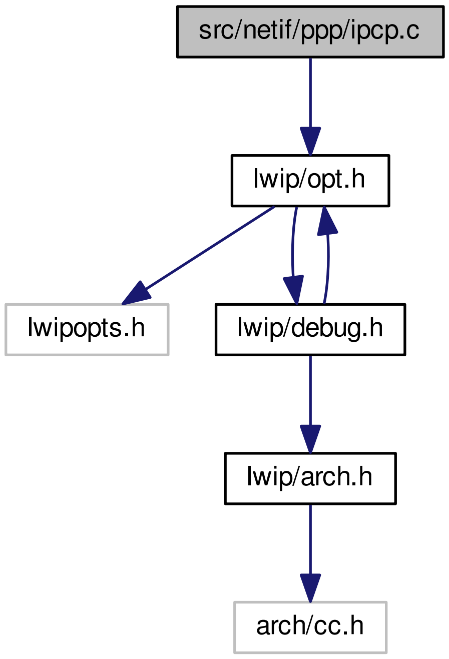
5.101.3.8 void fsm_sdata (fsm ∗ , u_char , u_char , u_char ∗ , int)

5.101.4 Variable Documentation

5.101.4.1 int peer_mru[ ]

5.102 src/netif/ppp/ipcp.c File Reference

`#include "lwip/opt.h"`
Include dependency graph for ipcp.c:



5.103 src/netif/ppp/ipcp.h File Reference

Data Structures

- struct ipcp_options

Macros

- #define CI_ADDRS 1 /∗ IP Addresses ∗/
- #define CI_COMPRESSTYPE 2 /∗ Compression Type ∗/
- #define CI_ADDR 3
- #define CI_MS_DNS1 129 /∗ Primary DNS value ∗/
- #define CI_MS_WINS1 128 /∗ Primary WINS value ∗/
- #define CI_MS_DNS2 131 /∗ Secondary DNS value ∗/
- #define CI_MS_WINS2 130 /∗ Secondary WINS value ∗/
- #define IPCP_VJMODE_OLD 1 /∗ "old" mode (option # = 0x0037) ∗/

- #define IPCP_VJMODE_RFC1172 2 /∗ "old-rfc"mode (option # = 0x002d) ∗/
- #define IPCP_VJMODE_RFC1332 3 /∗ "new-rfc"mode (option # = 0x002d, ∗/
- #define IPCP_VJ_COMP 0x002d /∗ current value for VJ compression option ∗/
- #define IPCP_VJ_COMP_OLD 0x0037 /∗ "old" (i.e, broken) value for VJ ∗/

Typedefs

- typedef struct ipcp_options ipcp_options

Variables

- fsm ipcp_fsm [ ]
- ipcp_options ipcp_wantoptions [ ]
- ipcp_options ipcp_gotoptions [ ]
- ipcp_options ipcp_allowoptions [ ]
- ipcp_options ipcp_hisoptions [ ]
- struct protent ipcp_protent

5.103.1 Macro Definition Documentation

5.103.1.1 #define CI_ADDR 3

Definition at line 62 of file ipcp.h.

5.103.1.2 #define CI_ADDRS 1 /∗ IP Addresses ∗/

Definition at line 60 of file ipcp.h.

5.103.1.3 #define CI_COMPRESSTYPE 2 /∗ Compression Type ∗/

Definition at line 61 of file ipcp.h.

5.103.1.4 #define CI_MS_DNS1 129 /∗ Primary DNS value ∗/

Definition at line 64 of file ipcp.h.

5.103.1.5 #define CI_MS_DNS2 131 /∗ Secondary DNS value ∗/

Definition at line 66 of file ipcp.h.

5.103.1.6 #define CI_MS_WINS1 128 /∗ Primary WINS value ∗/

Definition at line 65 of file ipcp.h.

5.103.1.7 #define CI_MS_WINS2 130 /∗ Secondary WINS value ∗/

Definition at line 67 of file ipcp.h.

5.103.1.8 #define IPCP_VJ_COMP 0x002d /∗ current value for VJ compression option ∗/

Definition at line 74 of file ipcp.h.

5.103.1.9 #define IPCP_VJ_COMP_OLD 0x0037 /∗ "old" (i.e, broken) value for VJ ∗/

Definition at line 75 of file ipcp.h.

5.103.1.10 #define IPCP_VJMODE_OLD 1 /∗ "old" mode (option # = 0x0037) ∗/

Definition at line 69 of file ipcp.h.

5.103.1.11 #define IPCP_VJMODE_RFC1172 2 /∗ "old-rfc"mode (option # = 0x002d) ∗/

Definition at line 70 of file ipcp.h.

5.103.1.12 #define IPCP_VJMODE_RFC1332 3 /∗ "new-rfc"mode (option # = 0x002d, ∗/

Definition at line 71 of file ipcp.h.

5.103.2 Typedef Documentation

5.103.2.1 typedef struct ipcp_options ipcp_options

5.103.3 Variable Documentation

5.103.3.1 ipcp_options ipcp_allowoptions[ ]

5.103.3.2 fsm ipcp_fsm[ ]

5.103.3.3 ipcp_options ipcp_gotoptions[ ]

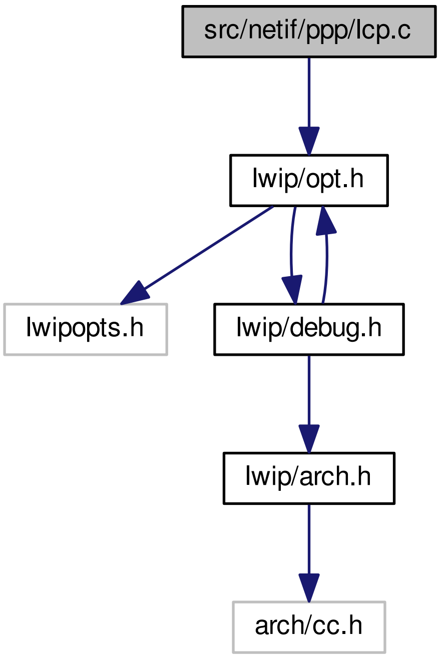
5.103.3.4 ipcp_options ipcp_hisoptions[ ]

5.103.3.5 struct protent ipcp_protent

5.103.3.6 ipcp_options ipcp_wantoptions[ ]

5.104 src/netif/ppp/lcp.c File Reference

`#include "lwip/opt.h"`
Include dependency graph for lcp.c:



5.105 src/netif/ppp/lcp.h File Reference

Data Structures

- struct lcp_options

Macros

- #define CI_MRU 1 /∗ Maximum Receive Unit ∗/
- #define CI_ASYNCMAP 2 /∗ Async Control Character Map ∗/
- #define CI_AUTHTYPE 3 /∗ Authentication Type ∗/
- #define CI_QUALITY 4 /∗ Quality Protocol ∗/
- #define CI_MAGICNUMBER 5 /∗ Magic Number ∗/
- #define CI_PCOMPRESSION 7 /∗ Protocol Field Compression ∗/
- #define CI_ACCOMPRESSION 8 /∗ Address/Control Field Compression ∗/
- #define CI_CALLBACK 13 /∗ callback ∗/
- #define CI_MRRU 17 /∗ max reconstructed receive unit; multilink ∗/
- #define CI_SSNHF 18 /∗ short sequence numbers for multilink ∗/
- #define CI_EPDISC 19 /∗ endpoint discriminator ∗/
- #define PROTREJ 8 /∗ Protocol Reject ∗/

- #define ECHOREQ 9 /∗ Echo Request ∗/
- #define ECHOREP 10 /∗ Echo Reply ∗/
- #define DISCREQ 11 /∗ Discard Request ∗/
- #define CBCP_OPT 6 /∗ Use callback control protocol ∗/
- #define DEFLOOPBACKFAIL 10

Typedefs

- typedef struct lcp_options lcp_options

Enumerations

- enum LinkPhase {
  PHASE_DEAD = 0, PHASE_INITIALIZE, PHASE_ESTABLISH, PHASE_AUTHENTICATE,
  PHASE_CALLBACK, PHASE_NETWORK, PHASE_TERMINATE }

Functions

- void lcp_init (int)
- void lcp_open (int)
- void lcp_close (int, char ∗)
- void lcp_lowerup (int)
- void lcp_lowerdown (int)
- void lcp_sprotrej (int, u_char ∗, int)

Variables

- LinkPhase lcp_phase [NUM_PPP]
- lcp_options lcp_wantoptions [ ]
- lcp_options lcp_gotoptions [ ]
- lcp_options lcp_allowoptions [ ]
- lcp_options lcp_hisoptions [ ]
- ext_accm xmit_accm [ ]
- struct protent lcp_protent

5.105.1 Macro Definition Documentation

5.105.1.1 #define CBCP_OPT 6 /∗ Use callback control protocol ∗/

Definition at line 78 of file lcp.h.

5.105.1.2 #define CI_ACCOMPRESSION 8 /∗ Address/Control Field Compression ∗/

Definition at line 65 of file lcp.h.

5.105.1.3 #define CI_ASYNCMAP 2 /∗ Async Control Character Map ∗/

Definition at line 60 of file lcp.h.

5.105.1.4 #define CI_AUTHTYPE 3 /∗ Authentication Type ∗/

Definition at line 61 of file lcp.h.

5.105.1.5 #define CI_CALLBACK 13 /∗ callback ∗/

Definition at line 66 of file lcp.h.

5.105.1.6 #define CI_EPDISC 19 /∗ endpoint discriminator ∗/

Definition at line 69 of file lcp.h.

5.105.1.7 #define CI_MAGICNUMBER 5 /∗ Magic Number ∗/

Definition at line 63 of file lcp.h.

5.105.1.8 #define CI_MRRU 17 /∗ max reconstructed receive unit; multilink ∗/

Definition at line 67 of file lcp.h.

5.105.1.9 #define CI_MRU 1 /∗ Maximum Receive Unit ∗/

Definition at line 59 of file lcp.h.

5.105.1.10 #define CI_PCOMPRESSION 7 /∗ Protocol Field Compression ∗/

Definition at line 64 of file lcp.h.

5.105.1.11 #define CI_QUALITY 4 /∗ Quality Protocol ∗/

Definition at line 62 of file lcp.h.

5.105.1.12 #define CI_SSNHF 18 /∗ short sequence numbers for multilink ∗/

Definition at line 68 of file lcp.h.

5.105.1.13 #define DEFLOOPBACKFAIL 10

Definition at line 149 of file lcp.h.

5.105.1.14 #define DISCREQ 11 /∗ Discard Request ∗/

Definition at line 77 of file lcp.h.

5.105.1.15 #define ECHOREP 10 /∗ Echo Reply ∗/

Definition at line 76 of file lcp.h.

5.105.1.16 #define ECHOREQ 9 /∗ Echo Request ∗/

Definition at line 75 of file lcp.h.

5.105.1.17 #define PROTREJ 8 /∗ Protocol Reject ∗/

Definition at line 74 of file lcp.h.

5.105.2 Typedef Documentation

5.105.2.1 typedef struct lcp_options lcp_options

5.105.3 Enumeration Type Documentation

5.105.3.1 enum LinkPhase

Enumerator

PHASE_DEAD
PHASE_INITIALIZE
PHASE_ESTABLISH
PHASE_AUTHENTICATE
PHASE_CALLBACK
PHASE_NETWORK
PHASE_TERMINATE

Definition at line 118 of file lcp.h.

5.105.4 Function Documentation

5.105.4.1 void lcp_close (int , char ∗)

5.105.4.2 void lcp_init (int)

5.105.4.3 void lcp_lowerdown (int)

5.105.4.4 void lcp_lowerup (int)

5.105.4.5 void lcp_open (int)

5.105.4.6 void lcp_sprotrej (int , u_char ∗ , int)

5.105.5 Variable Documentation

5.105.5.1 lcp_options lcp_allowoptions[ ]

5.105.5.2 lcp_options lcp_gotoptions[ ]

5.105.5.3 lcp_options lcp_hisoptions[ ]

5.105.5.4 LinkPhase lcp_phase[NUM_PPP]

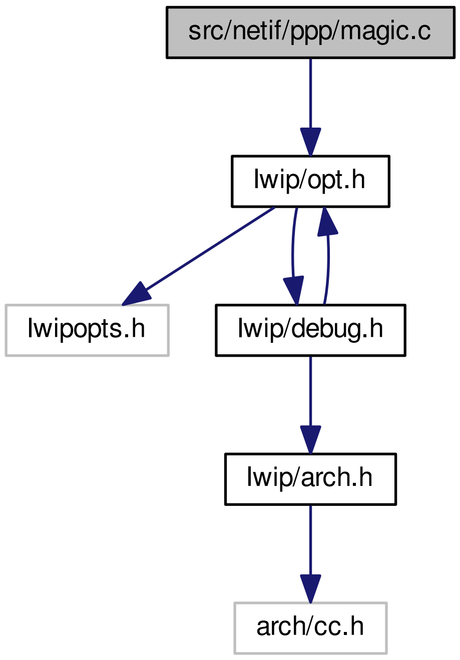
5.105.5.5 struct protent lcp_protent

5.105.5.6 lcp_options lcp_wantoptions[ ]

5.105.5.7 ext_accm xmit_accm[ ]

5.106 src/netif/ppp/magic.c File Reference

```
#include "lwip/opt.h"
```
Include dependency graph for magic.c:



5.107 src/netif/ppp/magic.h File Reference

Functions

- void magicInit (void)
- u32_t magic (void)

5.107.1 Function Documentation

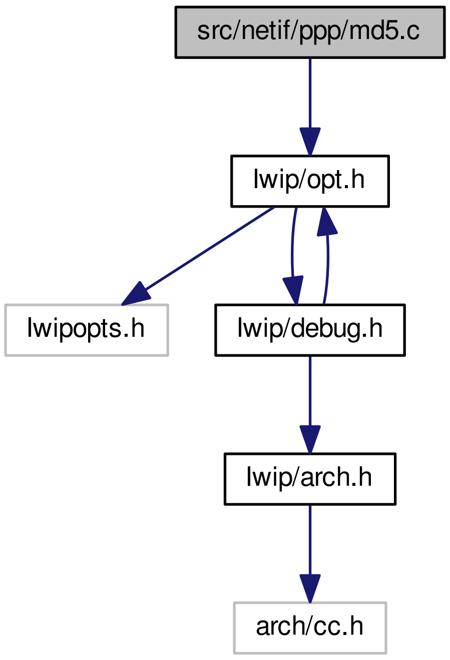
5.107.1.1 u32_t magic (void)

5.107.1.2 void magicInit (void)

5.108 src/netif/ppp/md5.c File Reference

```
#include "lwip/opt.h"
```

Include dependency graph for md5.c:



5.109 src/netif/ppp/md5.h File Reference

Data Structures

- struct MD5_CTX

Functions

- void MD5Init (MD5_CTX ∗mdContext)
- void MD5Update (MD5_CTX ∗mdContext, unsigned char ∗inBuf, unsigned int inLen)
- void MD5Final (unsigned char hash[ ], MD5_CTX ∗mdContext)

5.109.1 Function Documentation

5.109.1.1 void MD5Final (unsigned char *hash[ ]*, MD5_CTX ∗ *mdContext*)

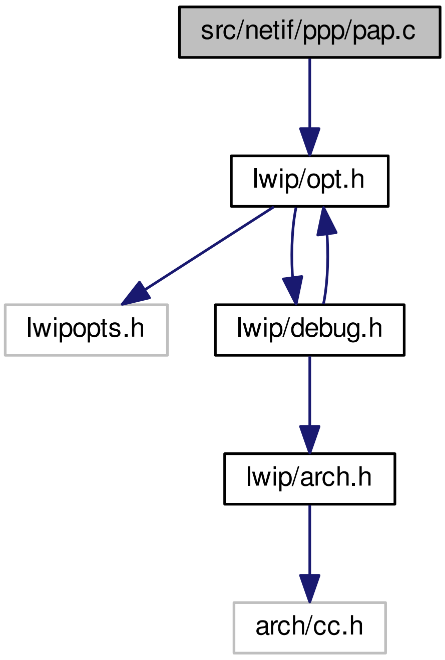
5.109.1.2 void MD5Init (MD5_CTX ∗ *mdContext*)

5.109.1.3 void MD5Update (MD5_CTX ∗ *mdContext*, unsigned char ∗ *inBuf*, unsigned int *inLen*)

5.110 src/netif/ppp/pap.c File Reference

```
#include "lwip/opt.h"
```

Include dependency graph for pap.c:

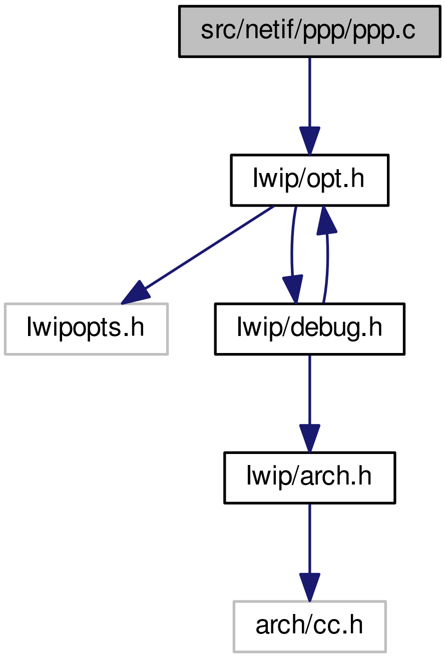


5.111 src/netif/ppp/pap.h File Reference

5.112 src/netif/ppp/ppp.c File Reference

```
#include "lwip/opt.h"
```

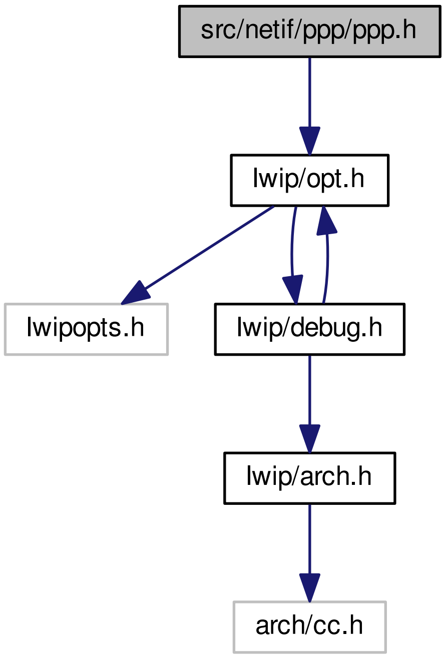
Include dependency graph for ppp.c:



5.113 src/netif/ppp/ppp.h File Reference

```
#include "lwip/opt.h"
```

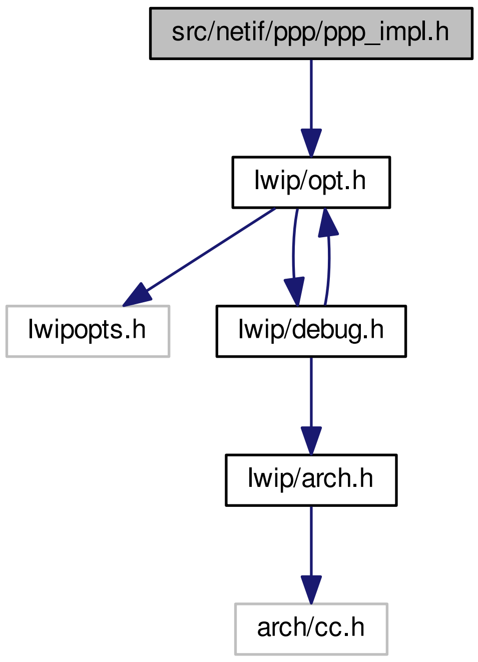
Include dependency graph for ppp.h:



5.114 src/netif/ppp/ppp_impl.h File Reference

```
#include "lwip/opt.h"
```

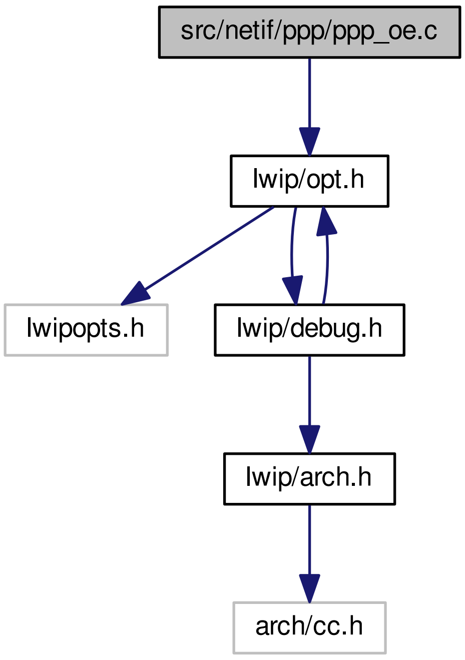
Include dependency graph for ppp_impl.h:



5.115 src/netif/ppp/ppp_oe.c File Reference

```
#include "lwip/opt.h"
```

Include dependency graph for ppp_oe.c:



5.116 src/netif/ppp/pppdebug.h File Reference

Macros

- #define LOG_CRITICAL (PPP_DEBUG | LWIP_DBG_LEVEL_SEVERE)
- #define LOG_ERR (PPP_DEBUG | LWIP_DBG_LEVEL_SEVERE)
- #define LOG_NOTICE (PPP_DEBUG | LWIP_DBG_LEVEL_WARNING)
- #define LOG_WARNING (PPP_DEBUG | LWIP_DBG_LEVEL_WARNING)
- #define LOG_INFO (PPP_DEBUG)
- #define LOG_DETAIL (PPP_DEBUG)
- #define LOG_DEBUG (PPP_DEBUG)
- #define TRACELCP PPP_DEBUG
- #define AUTHDEBUG(a, b)
- #define IPCPDEBUG(a, b)
- #define UPAPDEBUG(a, b)
- #define LCPDEBUG(a, b)
- #define FSMDEBUG(a, b)
- #define CHAPDEBUG(a, b)
- #define PPPDEBUG(a, b)

5.116.1 Macro Definition Documentation

5.116.1.1 #define AUTHDEBUG(*a, b*)

Definition at line 63 of file pppdebug.h.

5.116.1.2 #define CHAPDEBUG(*a*, *b*)

Definition at line 68 of file pppdebug.h.

5.116.1.3 #define FSMDEBUG(*a*, *b*)

Definition at line 67 of file pppdebug.h.

5.116.1.4 #define IPCPDEBUG(*a*, *b*)

Definition at line 64 of file pppdebug.h.

5.116.1.5 #define LCPDEBUG(*a*, *b*)

Definition at line 66 of file pppdebug.h.

5.116.1.6 #define LOG_CRITICAL (PPP_DEBUG | LWIP_DBG_LEVEL_SEVERE)

Definition at line 40 of file pppdebug.h.

5.116.1.7 #define LOG_DEBUG (PPP_DEBUG)

Definition at line 46 of file pppdebug.h.

5.116.1.8 #define LOG_DETAIL (PPP_DEBUG)

Definition at line 45 of file pppdebug.h.

5.116.1.9 #define LOG_ERR (PPP_DEBUG | LWIP_DBG_LEVEL_SEVERE)

Definition at line 41 of file pppdebug.h.

5.116.1.10 #define LOG_INFO (PPP_DEBUG)

Definition at line 44 of file pppdebug.h.

5.116.1.11 #define LOG_NOTICE (PPP_DEBUG | LWIP_DBG_LEVEL_WARNING)

Definition at line 42 of file pppdebug.h.

5.116.1.12 #define LOG_WARNING (PPP_DEBUG | LWIP_DBG_LEVEL_WARNING)

Definition at line 43 of file pppdebug.h.

5.116.1.13 #define PPPDEBUG(*a*, *b*)

Definition at line 69 of file pppdebug.h.

5.116.1.14 #define TRACELCP PPP_DEBUG

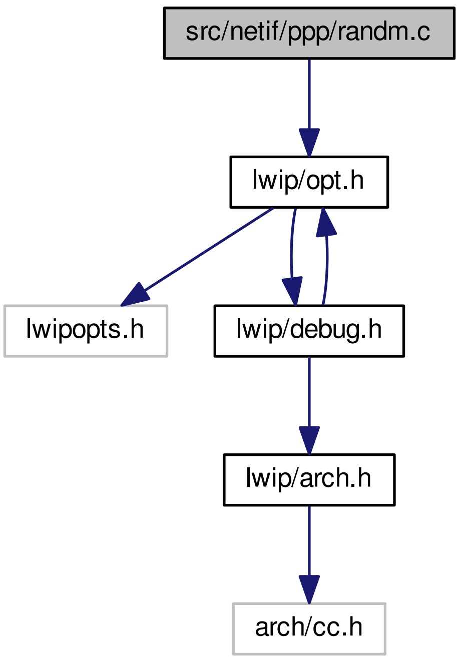
Definition at line 49 of file pppdebug.h.

5.116.1.15 #define UPAPDEBUG(*a*, *b*)

Definition at line 65 of file pppdebug.h.

5.117 src/netif/ppp/randm.c File Reference

`#include "lwip/opt.h"`
Include dependency graph for randm.c:



5.118 src/netif/ppp/randm.h File Reference

Functions

- void avRandomInit (void)
- void avChurnRand (char ∗randData, u32_t randLen)
- void avRandomize (void)
- void avGenRand (char ∗buf, u32_t bufLen)
- u32_t avRandom (void)

5.118.1 Function Documentation

5.118.1.1 void avChurnRand (char ∗ *randData*, u32_t *randLen*)

5.118.1.2 void avGenRand (char ∗ *buf*, u32_t *bufLen*)

5.118.1.3 u32_t avRandom (void)

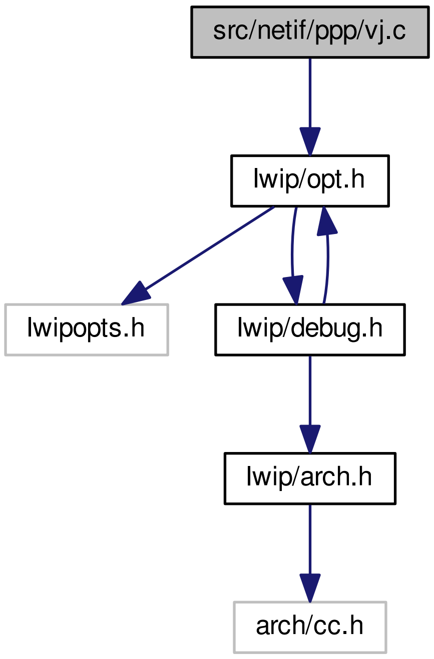
5.118.1.4 void avRandomInit (void)

5.118.1.5 void avRandomize (void)

5.119 src/netif/ppp/vj.c File Reference

```
#include "lwip/opt.h"
```

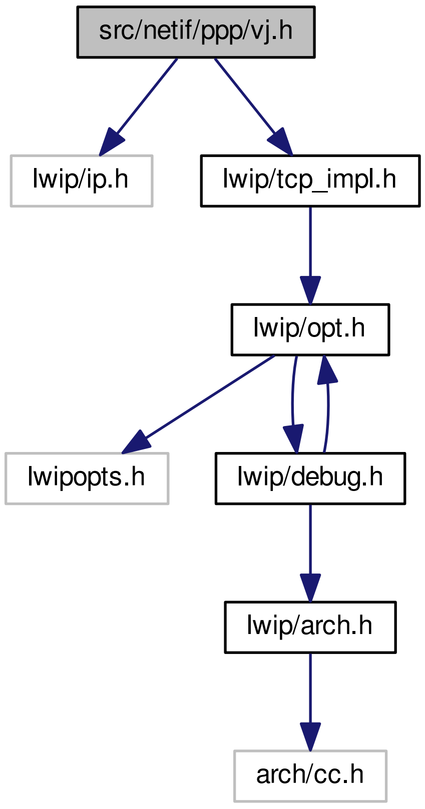
Include dependency graph for vj.c:



5.120 src/netif/ppp/vj.h File Reference

```
#include "lwip/ip.h"
#include "lwip/tcp_impl.h"
```

Include dependency graph for vj.h:



Data Structures

- struct cstate
- struct vjstat
- struct vjcompress

Macros

- #define MAX_SLOTS 16 /∗ must be $>$ 2 and $<$ 256 ∗/
- #define MAX_HDR 128
- #define TYPE_IP 0x40
- #define TYPE_UNCOMPRESSED_TCP 0x70
- #define TYPE_COMPRESSED_TCP 0x80
- #define TYPE_ERROR 0x00
- #define NEW_C 0x40 /∗ flag bits for what changed in a packet ∗/
- #define NEW_I 0x20
- #define NEW_S 0x08
- #define NEW_A 0x04
- #define NEW_W 0x02
- #define NEW_U 0x01

- #define SPECIAL_I (NEW_S|NEW_W|NEW_U) /∗ echoed interactive traffic ∗/
- #define SPECIAL_D (NEW_S|NEW_A|NEW_W|NEW_U) /∗ unidirectional data ∗/
- #define SPECIALS_MASK (NEW_S|NEW_A|NEW_W|NEW_U)
- #define TCP_PUSH_BIT 0x10
- #define cs_ip vjcs_u.csu_ip
- #define cs_hdr vjcs_u.csu_hdr
- #define VJF_TOSS 1U /∗ tossing rcvd frames because of input err ∗/

Functions

- void vj_compress_init (struct vjcompress ∗comp)
- u_int vj_compress_tcp (struct vjcompress ∗comp, struct pbuf ∗pb)
- void vj_uncompress_err (struct vjcompress ∗comp)
- int vj_uncompress_uncomp (struct pbuf ∗nb, struct vjcompress ∗comp)
- int vj_uncompress_tcp (struct pbuf ∗∗nb, struct vjcompress ∗comp)

5.120.1 Macro Definition Documentation

5.120.1.1 #define cs_hdr vjcs_u.csu_hdr

Definition at line 116 of file vj.h.

5.120.1.2 #define cs_ip vjcs_u.csu_ip

Definition at line 115 of file vj.h.

5.120.1.3 #define MAX_HDR 128

Definition at line 32 of file vj.h.

5.120.1.4 #define MAX_SLOTS 16 /∗ must be > 2 and < 256 ∗/

Definition at line 31 of file vj.h.

5.120.1.5 #define NEW_A 0x04

Definition at line 87 of file vj.h.

5.120.1.6 #define NEW_C 0x40 /∗ flag bits for what changed in a packet ∗/

Definition at line 84 of file vj.h.

5.120.1.7 #define NEW_I 0x20

Definition at line 85 of file vj.h.

5.120.1.8 #define NEW_S 0x08

Definition at line 86 of file vj.h.

5.120.1.9 #define NEW_U 0x01

Definition at line 89 of file vj.h.

5.120.1.10 #define NEW_W 0x02

Definition at line 88 of file vj.h.

5.120.1.11 #define SPECIAL_D (NEW_S|NEW_A|NEW_W|NEW_U) /∗ unidirectional data ∗/

Definition at line 93 of file vj.h.

5.120.1.12 #define SPECIAL_I (NEW_S|NEW_W|NEW_U) /∗ echoed interactive traffic ∗/

Definition at line 92 of file vj.h.

5.120.1.13 #define SPECIALS_MASK (NEW_S|NEW_A|NEW_W|NEW_U)

Definition at line 94 of file vj.h.

5.120.1.14 #define TCP_PUSH_BIT 0x10

Definition at line 96 of file vj.h.

5.120.1.15 #define TYPE_COMPRESSED_TCP 0x80

Definition at line 80 of file vj.h.

5.120.1.16 #define TYPE_ERROR 0x00

Definition at line 81 of file vj.h.

5.120.1.17 #define TYPE_IP 0x40

Definition at line 78 of file vj.h.

5.120.1.18 #define TYPE_UNCOMPRESSED_TCP 0x70

Definition at line 79 of file vj.h.

5.120.1.19 #define VJF_TOSS 1U /∗ tossing rcvd frames because of input err ∗/

Definition at line 148 of file vj.h.

5.120.2 Function Documentation

5.120.2.1 void vj_compress_init (struct vjcompress ∗ *comp*)

5.120.2.2 u_int vj_compress_tcp (struct vjcompress ∗ *comp,* struct pbuf ∗ *pb*)

5.120.2.3 void vj_uncompress_err (struct **vjcompress** ∗ *comp*)

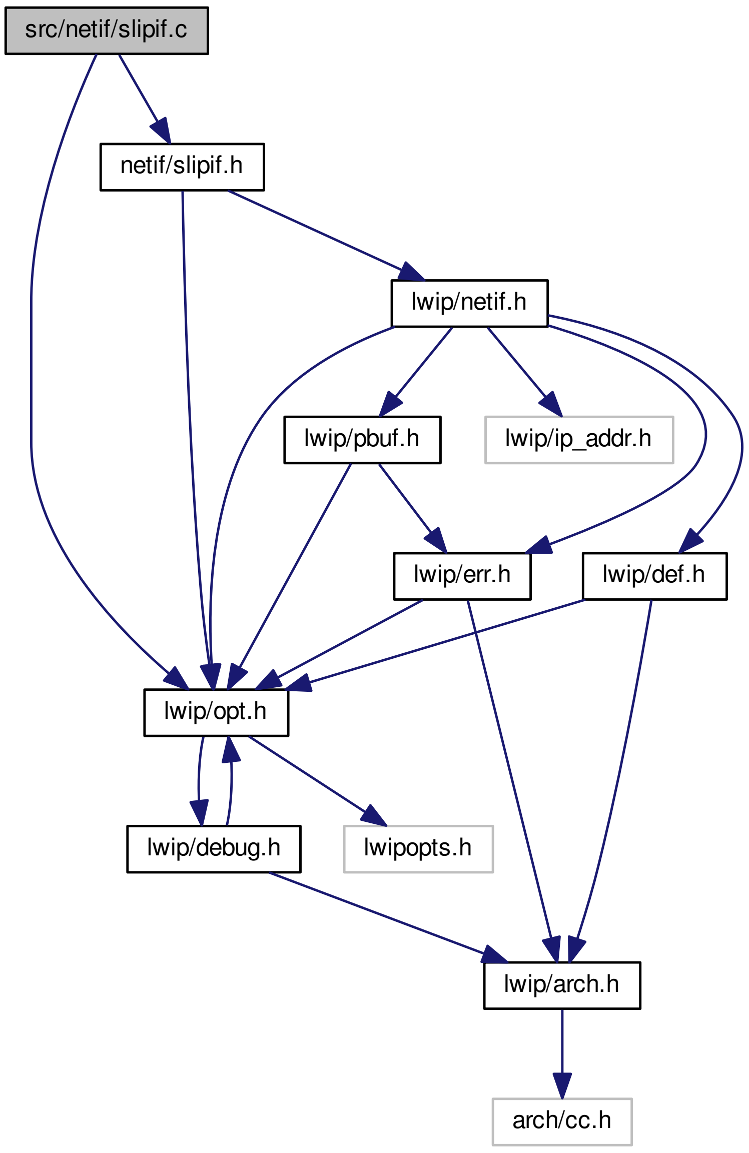
5.120.2.4 int vj_uncompress_tcp (struct **pbuf** ∗∗ *nb,* struct **vjcompress** ∗ *comp*)

5.120.2.5 int vj_uncompress_uncomp (struct **pbuf** ∗ *nb,* struct **vjcompress** ∗ *comp*)

5.121 src/netif/slipif.c File Reference

```
#include "netif/slipif.h"
#include "lwip/opt.h"
```

Include dependency graph for slipif.c:



5.121.1 Detailed Description

SLIP Interface

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