

LANbeacon

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# Chapter 1

## Data Structure Index

### 1.1 Data Structures

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## Chapter 2

# File Index

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## Chapter 3

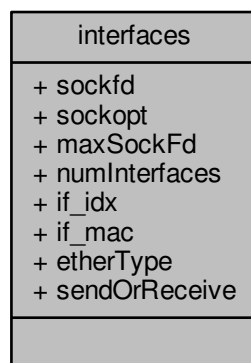
# Data Structure Documentation

### 3.1 interfaces Struct Reference

Contains all variables, that are needed to access sockets on interfaces.

```
#include <receiver.h>
```

Collaboration diagram for interfaces:



#### Data Fields

- int [sockfd](#) [20]
- int [sockopt](#) [20]
- int [maxSockFd](#)
- int [numInterfaces](#)
- struct ifreq [if\\_idx](#) [20]
- struct ifreq [if\\_mac](#) [20]
- unsigned short [etherType](#)
- unsigned short [sendOrReceive](#)

### 3.1.1 Detailed Description

Contains all variables, that are needed to access sockets on interfaces.

### 3.1.2 Field Documentation

#### 3.1.2.1 etherType

```
unsigned short interfaces::etherType
```

EtherType to send or receive on interface.

Referenced by `getInterfaces()`, and `sendRawSocket()`.

#### 3.1.2.2 if\_idx

```
struct ifreq interfaces::if_idx[20]
```

Interface IDs.

Referenced by `getInterfaces()`, and `sendRawSocket()`.

#### 3.1.2.3 if\_mac

```
struct ifreq interfaces::if_mac[20]
```

Interface MACs.

Referenced by `getInterfaces()`, and `sendRawSocket()`.

#### 3.1.2.4 maxSockFd

```
int interfaces::maxSockFd
```

Needed for select function.

Referenced by `getInterfaces()`, `lan_beacon_receiver()`, and `receiveChallenge()`.

#### 3.1.2.5 numInterfaces

```
int interfaces::numInterfaces
```

Number of used interfaces.

Referenced by `getInterfaces()`, `lan_beacon_receiver()`, `receiveChallenge()`, and `sendRawSocket()`.

#### 3.1.2.6 sendOrReceive

```
unsigned short interfaces::sendOrReceive
```

Switch for send or receive mode.

Referenced by `getInterfaces()`.

#### 3.1.2.7 sockfd

```
int interfaces::sockfd[20]
```

File descriptors of raw sockets.

Referenced by `getInterfaces()`, `lan_beacon_receiver()`, `receiveChallenge()`, and `sendRawSocket()`.

#### 3.1.2.8 sockopt

```
int interfaces::sockopt[20]
```

. Options for each raw socket.

Referenced by `getInterfaces()`.

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

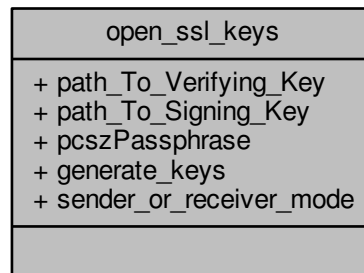
- [receiver.h](#)

## 3.2 open\_ssl\_keys Struct Reference

Key locations, password and further configurations.

```
#include <openssl_sign.h>
```

Collaboration diagram for open\_ssl\_keys:



### Data Fields

- char [path\\_To\\_Verifying\\_Key](#) [KEY\_PATHLENGTH\_MAX+1]
- char [path\\_To\\_Signing\\_Key](#) [KEY\_PATHLENGTH\_MAX+1]
- char [pcszPassphrase](#) [1024]
- int [generate\\_keys](#)
- int [sender\\_or\\_receiver\\_mode](#)

### 3.2.1 Detailed Description

Key locations, password and further configurations.

### 3.2.2 Field Documentation

#### 3.2.2.1 generate\_keys

```
int open_ssl_keys::generate_keys
```

Flag that determines, if keys should be generated.

Referenced by [lanbeacon\\_creator\(\)](#), and [signlanbeacon\(\)](#).



### 3.2.2.2 path\_To\_Signing\_Key

```
char open_ssl_keys::path_To_Signing_Key[KEY_PATHLENGTH_MAX+1]
```

Specified path of private key location.

Referenced by `lanbeacon_creator()`, `make_keys()`, and `read_keys()`.

### 3.2.2.3 path\_To\_Verifying\_Key

```
char open_ssl_keys::path_To_Verifying_Key[KEY_PATHLENGTH_MAX+1]
```

Specified path of public key location.

Referenced by `lanbeacon_creator()`, `make_keys()`, `read_keys()`, `receiver()`, `signlanbeacon()`, and `verifylanbeacon()`.

### 3.2.2.4 pcszPassphrase

```
char open_ssl_keys::pcszPassphrase[1024]
```

Specified password for private key.

Referenced by `lanbeacon_creator()`, `make_keys()`, and `read_keys()`.

### 3.2.2.5 sender\_or\_receiver\_mode

```
int open_ssl_keys::sender_or_receiver_mode
```

Flag for corresponding client mode.

Referenced by `read_keys()`, and `receiver()`.

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

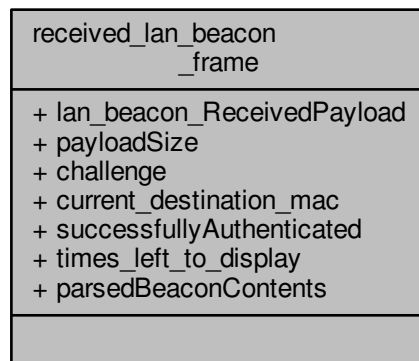
- [openssl\\_sign.h](#)

### 3.3 received\_lan\_beacon\_frame Struct Reference

Contains all the information related to one received frame.

```
#include <receiver.h>
```

Collaboration diagram for received\_lan\_beacon\_frame:



#### Data Fields

- unsigned char [lan\\_beacon\\_ReceivedPayload](#) [[LAN\\_BEACON\\_BUF\\_SIZ](#)]
- ssize\_t [payloadSize](#)
- unsigned long [challenge](#)
- unsigned char [current\\_destination\\_mac](#) [6]
- int [successfullyAuthenticated](#)
- int [times\\_left\\_to\\_display](#)
- char \*\* [parsedBeaconContents](#)

#### 3.3.1 Detailed Description

Contains all the information related to one received frame.

#### 3.3.2 Field Documentation

##### 3.3.2.1 challenge

```
unsigned long received_lan_beacon_frame::challenge
```

The challenge, that has been sent to the server.

Referenced by [evaluatelanbeacon\(\)](#), and [lan\\_beacon\\_receiver\(\)](#).

### 3.3.2.2 current\_destination\_mac

```
unsigned char received_lan_beacon_frame::current_destination_mac[6]
```

The MAC address of the server, which the frame was received from.

Referenced by `lan_beacon_receiver()`.

### 3.3.2.3 lan\_beacon\_ReceivedPayload

```
unsigned char received_lan_beacon_frame::lan_beacon_ReceivedPayload[LAN_BEACON_BUF_SIZ]
```

Contains the raw received payload from a LAN-Beacon frame.

Referenced by `evaluatelanbeacon()`, and `lan_beacon_receiver()`.

### 3.3.2.4 parsedBeaconContents

```
char** received_lan_beacon_frame::parsedBeaconContents
```

Contains the parsed contents, that will be used to print something to the display.

Referenced by `bananaPIprint()`, `lan_beacon_receiver()`, and `receiver()`.

### 3.3.2.5 payloadSize

```
ssize_t received_lan_beacon_frame::payloadSize
```

The size of the raw payload.

Referenced by `evaluatelanbeacon()`, and `lan_beacon_receiver()`.

### 3.3.2.6 successfullyAuthenticated

```
int received_lan_beacon_frame::successfullyAuthenticated
```

Has frame already been authenticated?

Referenced by `evaluatelanbeacon()`, and `lan_beacon_receiver()`.

### 3.3.2.7 times\_left\_to\_display

```
int received_lan_beacon_frame::times_left_to_display
```

Countdown, how many more times the frame will be displayed. Is updated, if frame with same content is received again.

Referenced by `bananaPlprint()`, and `lan_beacon_receiver()`.

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

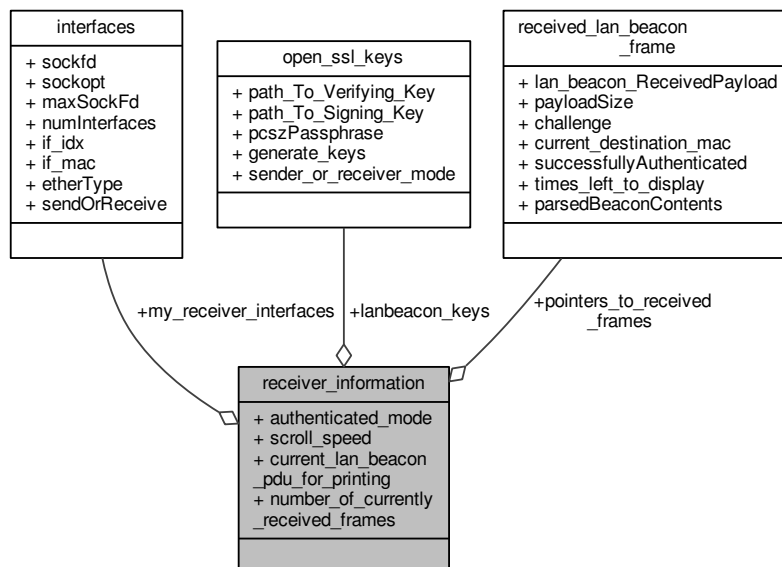
- [receiver.h](#)

## 3.4 receiver\_information Struct Reference

Receiver configurations.

```
#include <receiver.h>
```

Collaboration diagram for `receiver_information`:



### Data Fields

- int [authenticated\\_mode](#)
- int [scroll\\_speed](#)
- int [current\\_lan\\_beacon\\_pdu\\_for\\_printing](#)
- struct [received\\_lan\\_beacon\\_frame](#) \* [pointers\\_to\\_received\\_frames](#) [20]
- int [number\\_of\\_currently\\_received\\_frames](#)
- struct [open\\_ssl\\_keys](#) [lanbeacon\\_keys](#)
- struct [interfaces](#) [my\\_receiver\\_interfaces](#)

### 3.4.1 Detailed Description

Receiver configurations.

### 3.4.2 Field Documentation

#### 3.4.2.1 authenticated\_mode

```
int receiver_information::authenticated_mode
```

Has user specified using the authenticated mode?

Referenced by `lan_beacon_receiver()`, and `receiver()`.

#### 3.4.2.2 current\_lan\_beacon\_pdu\_for\_printing

```
int receiver_information::current_lan_beacon_pdu_for_printing
```

The currently printed PDU.

Referenced by `bananaPIprint()`, and `receiver()`.

#### 3.4.2.3 lanbeacon\_keys

```
struct open_ssl_keys receiver_information::lanbeacon_keys
```

The paths to the keys.

Referenced by `lan_beacon_receiver()`, and `receiver()`.

#### 3.4.2.4 my\_receiver\_interfaces

```
struct interfaces receiver_information::my_receiver_interfaces
```

Interfaces, that are used for LAN-Beacon reception.

Referenced by `lan_beacon_receiver()`, and `receiver()`.

#### 3.4.2.5 number\_of\_currently\_received\_frames

```
int receiver_information::number_of_currently_received_frames
```

How many frames are currently stored for displaying.

Referenced by `bananaPIprint()`, `lan_beacon_receiver()`, and `receiver()`.

#### 3.4.2.6 pointers\_to\_received\_frames

```
struct received\_lan\_beacon\_frame* receiver_information::pointers_to_received_frames[20]
```

Frames, that currently are stored for displaying.

Referenced by `bananaPIprint()`, `lan_beacon_receiver()`, and `receiver()`.

#### 3.4.2.7 scroll\_speed

```
int receiver_information::scroll_speed
```

How fast the display should switch to the next display page.

Referenced by `bananaPIprint()`, and `receiver()`.

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

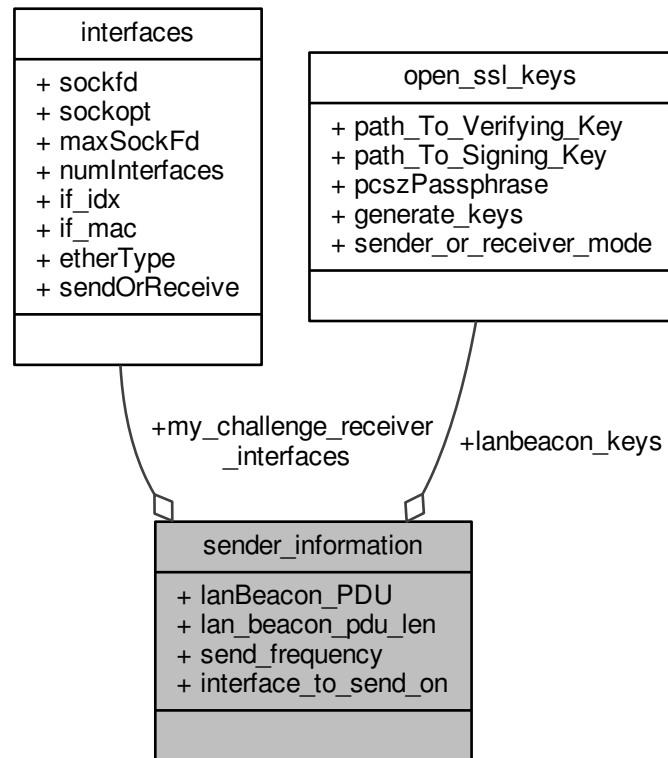
- [receiver.h](#)

### 3.5 sender\_information Struct Reference

Sender configurations.

```
#include <sender.h>
```

Collaboration diagram for sender\_information:



## Data Fields

- `char *` [lanBeacon\\_PDU](#)
- `int` [lan\\_beacon\\_pdu\\_len](#)
- `int` [send\\_frequency](#)
- `char *` [interface\\_to\\_send\\_on](#)
- `struct` [interfaces](#) [my\\_challenge\\_receiver\\_interfaces](#)
- `struct` [open\\_ssl\\_keys](#) [lanbeacon\\_keys](#)

### 3.5.1 Detailed Description

Sender configurations.

### 3.5.2 Field Documentation

### 3.5.2.1 interface\_to\_send\_on

```
char* sender_information::interface_to_send_on
```

If specified by start parameters, interface that is used for sending.

Referenced by `lanbeacon_creator()`, `sender()`, and `sendRawSocket()`.

### 3.5.2.2 lan\_beacon\_pdu\_len

```
int sender_information::lan_beacon_pdu_len
```

Length of the combined PDU.

Referenced by `lanbeacon_creator()`, and `send_lan_beacon_rawSock()`.

### 3.5.2.3 lanbeacon\_keys

```
struct open_ssl_keys sender_information::lanbeacon_keys
```

Keys configuration.

Referenced by `lanbeacon_creator()`, and `sendRawSocket()`.

### 3.5.2.4 lanBeacon\_PDU

```
char* sender_information::lanBeacon_PDU
```

The combined payload of a PDU, that is being sent.

Referenced by `send_lan_beacon_rawSock()`, and `sender()`.

### 3.5.2.5 my\_challenge\_receiver\_interfaces

```
struct interfaces sender_information::my_challenge_receiver_interfaces
```

Interfaces that are used for receiving challenges.

Referenced by `sender()`, and `sendRawSocket()`.

### 3.5.2.6 send\_frequency

```
int sender_information::send_frequency
```

Number of seconds between each sent PDU.

Referenced by `lanbeacon_creator()`, `receiveChallenge()`, and `sendRawSocket()`.

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

- [sender.h](#)



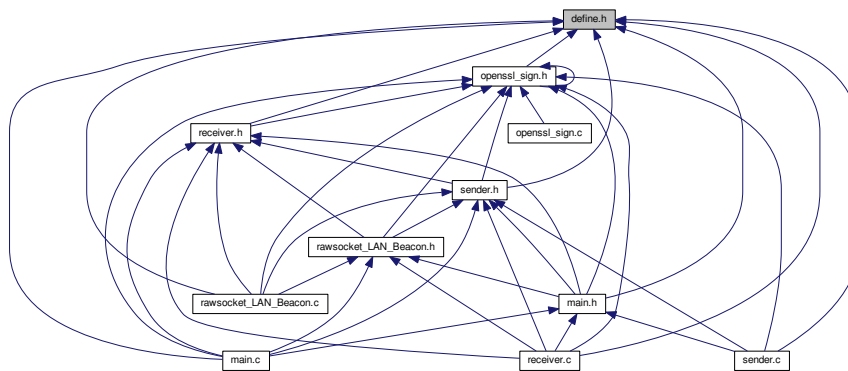
## Chapter 4

# File Documentation

### 4.1 define.h File Reference

Contains application-wide includes with information such as addresses and TLV types.

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



### Macros

#### Macro for gettext localization support

- `#define _(STRING) gettext(STRING)`

#### Protocol options such send frequency

- `#define LAN_BEACON_SEND_FREQUENCY 5`

#### LAN-Beacon Multicast addresses and EtherTypes

- `#define LAN_BEACON_DEST_MAC 0xff, 0xff, 0xff, 0xff, 0xff, 0xff`
- `#define LAN_BEACON_ETHER_TYPE 0x88B5`
- `#define CHALLENGE_ETHERTYPE 0x88B6`

### Buffer sizes

- #define `PARSED_TLV_MAX_NUMBER` 25
- #define `PARSED_TLV_MAX_LENGTH` 510
- #define `LAN_BEACON_BUF_SIZ` 2000
- #define `KEY_PATHLENGTH_MAX` 800

### Standard paths

- #define `PRIVATE_KEY_STANDARD_PATH` "private\_key.pem"
- #define `PUBLIC_KEY_STANDARD_PATH` "public\_key.pem"

### Display options

- #define `DEFAULT_SCROLLSPEED` 5
- #define `SHOW_FRAMES_X_TIMES` 2
- #define `DESCRIPTOR_WIDTH` 10

### Subtype numbers lanbeacon

- #define `SUBTYPE_VLAN_ID` 200
- #define `SUBTYPE_NAME` 201
- #define `SUBTYPE_CUSTOM` 202
- #define `SUBTYPE_IPV4` 203
- #define `SUBTYPE_IPV6` 204
- #define `SUBTYPE_EMAIL` 205
- #define `SUBTYPE_DHCP` 206
- #define `SUBTYPE_ROUTER` 207
- #define `SUBTYPE_SIGNATURE` 216
- #define `SUBTYPE_COMBINED_STRING` 217

### Descriptor strings lanbeacon

- #define `DESCRIPTOR_VLAN_ID` gettext("VLAN-ID:")
- #define `DESCRIPTOR_NAME` gettext("VLAN-Name:")
- #define `DESCRIPTOR_CUSTOM` gettext("Freetext:")
- #define `DESCRIPTOR_IPV4` gettext("IPv4:")
- #define `DESCRIPTOR_IPV6` gettext("IPv6:")
- #define `DESCRIPTOR_EMAIL` gettext("Email:")
- #define `DESCRIPTOR_DHCP` gettext("DHCP:")
- #define `DESCRIPTOR_ROUTER` gettext("Router:")
- #define `DESCRIPTOR_SIGNATURE` gettext("Authentication:")
- #define `DESCRIPTOR_COMBINED_STRING` gettext("Combined String:")

## 4.1.1 Detailed Description

Contains application-wide includes with information such as addresses and TLV types.

### Author

Dominik Bitzer

### Date

2017

## 4.1.2 Macro Definition Documentation

### 4.1.2.1 `_`

```
#define _(  
    STRING ) gettext(STRING)
```

Referenced by `bananaPIprint()`, `evaluatelanbeacon()`, `getInterfaces()`, `ipParser()`, `lan_beacon_receiver()`, `lanbeacon_creator()`, `make_keys()`, `printHelp()`, `read_keys()`, `receiveChallenge()`, `receiver()`, `sendRawSocket()`, `signlanbeacon()`, `transfer_to_pdu()`, `transfer_to_string()`, and `verifylanbeacon()`.

### 4.1.2.2 `CHALLENGE_ETHTYPE`

```
#define CHALLENGE_ETHTYPE 0x88B6
```

Referenced by `lan_beacon_receiver()`, `sender()`, and `sendRawSocket()`.

### 4.1.2.3 `DEFAULT_SCROLLSPEED`

```
#define DEFAULT_SCROLLSPEED 5
```

Referenced by `receiver()`.

### 4.1.2.4 `DESCRIPTOR_COMBINED_STRING`

```
#define DESCRIPTOR_COMBINED_STRING gettext("Combined String:")
```

Referenced by `evaluatelanbeacon()`.

### 4.1.2.5 `DESCRIPTOR_CUSTOM`

```
#define DESCRIPTOR_CUSTOM gettext("Freetext:")
```

Referenced by `evaluatelanbeacon()`, and `lanbeacon_creator()`.

#### 4.1.2.6 DESCRIPTOR\_DHCP

```
#define DESCRIPTOR_DHCP gettext("DHCP:")
```

Referenced by `evaluatelanbeacon()`, and `lanbeacon_creator()`.

#### 4.1.2.7 DESCRIPTOR\_EMAIL

```
#define DESCRIPTOR_EMAIL gettext("Email:")
```

Referenced by `evaluatelanbeacon()`, and `lanbeacon_creator()`.

#### 4.1.2.8 DESCRIPTOR\_IPV4

```
#define DESCRIPTOR_IPV4 gettext("IPv4:")
```

Referenced by `evaluatelanbeacon()`, and `ipParser()`.

#### 4.1.2.9 DESCRIPTOR\_IPV6

```
#define DESCRIPTOR_IPV6 gettext("IPv6:")
```

Referenced by `evaluatelanbeacon()`, and `ipParser()`.

#### 4.1.2.10 DESCRIPTOR\_NAME

```
#define DESCRIPTOR_NAME gettext("VLAN-Name:")
```

Referenced by `evaluatelanbeacon()`, and `lanbeacon_creator()`.

#### 4.1.2.11 DESCRIPTOR\_ROUTER

```
#define DESCRIPTOR_ROUTER gettext("Router:")
```

Referenced by `evaluatelanbeacon()`, and `lanbeacon_creator()`.

#### 4.1.2.12 DESCRIPTOR\_SIGNATURE

```
#define DESCRIPTOR_SIGNATURE gettext("Authentication:")
```

Referenced by `evaluatelanbeacon()`.

#### 4.1.2.13 DESCRIPTOR\_VLAN\_ID

```
#define DESCRIPTOR_VLAN_ID gettext("VLAN-ID:")
```

Referenced by `evaluatelanbeacon()`, and `lanbeacon_creator()`.

#### 4.1.2.14 DESCRIPTOR\_WIDTH

```
#define DESCRIPTOR_WIDTH 10
```

Referenced by `bananaPlprint()`.

#### 4.1.2.15 KEY\_PATHLENGTH\_MAX

```
#define KEY_PATHLENGTH_MAX 800
```

Referenced by `lanbeacon_creator()`, and `receiver()`.

#### 4.1.2.16 LAN\_BEACON\_BUF\_SIZ

```
#define LAN_BEACON_BUF_SIZ 2000
```

Referenced by `lan_beacon_receiver()`, and `sendRawSocket()`.

#### 4.1.2.17 LAN\_BEACON\_DEST\_MAC

```
#define LAN_BEACON_DEST_MAC 0xff, 0xff, 0xff, 0xff, 0xff, 0xff
```

Referenced by `lan_beacon_receiver()`, and `send_lan_beacon_rawSock()`.

#### 4.1.2.18 LAN\_BEACON\_ETHER\_TYPE

```
#define LAN_BEACON_ETHER_TYPE 0x88B5
```

Referenced by receiver(), send\_lan\_beacon\_rawSock(), and sendRawSocket().

#### 4.1.2.19 LAN\_BEACON\_SEND\_FREQUENCY

```
#define LAN_BEACON_SEND_FREQUENCY 5
```

Referenced by sender().

#### 4.1.2.20 PARSED\_TLV\_MAX\_LENGTH

```
#define PARSED_TLV_MAX_LENGTH 510
```

Referenced by evaluatelanbeacon().

#### 4.1.2.21 PARSED\_TLV\_MAX\_NUMBER

```
#define PARSED_TLV_MAX_NUMBER 25
```

Referenced by bananaPlprint(), evaluatelanbeacon(), and receiver().

#### 4.1.2.22 PRIVATE\_KEY\_STANDARD\_PATH

```
#define PRIVATE_KEY_STANDARD_PATH "private_key.pem"
```

Referenced by sender().

#### 4.1.2.23 PUBLIC\_KEY\_STANDARD\_PATH

```
#define PUBLIC_KEY_STANDARD_PATH "public_key.pem"
```

Referenced by receiver(), and sender().

#### 4.1.2.24 SHOW\_FRAMES\_X\_TIMES

```
#define SHOW_FRAMES_X_TIMES 2
```

Referenced by `lan_beacon_receiver()`.

#### 4.1.2.25 SUBTYPE\_COMBINED\_STRING

```
#define SUBTYPE_COMBINED_STRING 217
```

Referenced by `evaluatelanbeacon()`, and `lanbeacon_creator()`.

#### 4.1.2.26 SUBTYPE\_CUSTOM

```
#define SUBTYPE_CUSTOM 202
```

Referenced by `evaluatelanbeacon()`, and `lanbeacon_creator()`.

#### 4.1.2.27 SUBTYPE\_DHCP

```
#define SUBTYPE_DHCP 206
```

Referenced by `evaluatelanbeacon()`, and `lanbeacon_creator()`.

#### 4.1.2.28 SUBTYPE\_EMAIL

```
#define SUBTYPE_EMAIL 205
```

Referenced by `evaluatelanbeacon()`, and `lanbeacon_creator()`.

#### 4.1.2.29 SUBTYPE\_IPV4

```
#define SUBTYPE_IPV4 203
```

Referenced by `evaluatelanbeacon()`, and `ipParser()`.

#### 4.1.2.30 SUBTYPE\_IPV6

```
#define SUBTYPE_IPV6 204
```

Referenced by `evaluatelanbeacon()`, and `ipParser()`.

#### 4.1.2.31 SUBTYPE\_NAME

```
#define SUBTYPE_NAME 201
```

Referenced by `evaluatelanbeacon()`, and `lanbeacon_creator()`.

#### 4.1.2.32 SUBTYPE\_ROUTER

```
#define SUBTYPE_ROUTER 207
```

Referenced by `evaluatelanbeacon()`, and `lanbeacon_creator()`.

#### 4.1.2.33 SUBTYPE\_SIGNATURE

```
#define SUBTYPE_SIGNATURE 216
```

Referenced by `evaluatelanbeacon()`, and `sendRawSocket()`.

#### 4.1.2.34 SUBTYPE\_VLAN\_ID

```
#define SUBTYPE_VLAN_ID 200
```

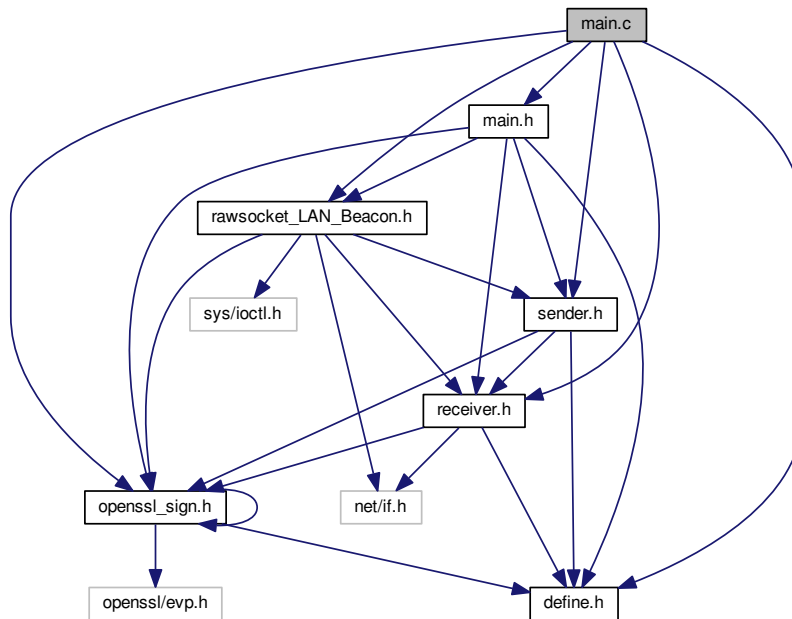
Referenced by `evaluatelanbeacon()`, and `lanbeacon_creator()`.



## 4.2 main.c File Reference

```
#include "openssl_sign.h"
#include "sender.h"
#include "rawsocket_LAN_Beacon.h"
#include "receiver.h"
#include "define.h"
#include "main.h"
```

Include dependency graph for main.c:



### Functions

- int [main](#) (int argc, char \*\*argv)  
*Separates receiver from sender mode and some setup.*
- void [printHelp](#) ()  
*Help function, executed if unknown parameters have been received or user specifically asks for help.*

### 4.2.1 Function Documentation

#### 4.2.1.1 main()

```
int main (
    int argc,
    char ** argv )
```

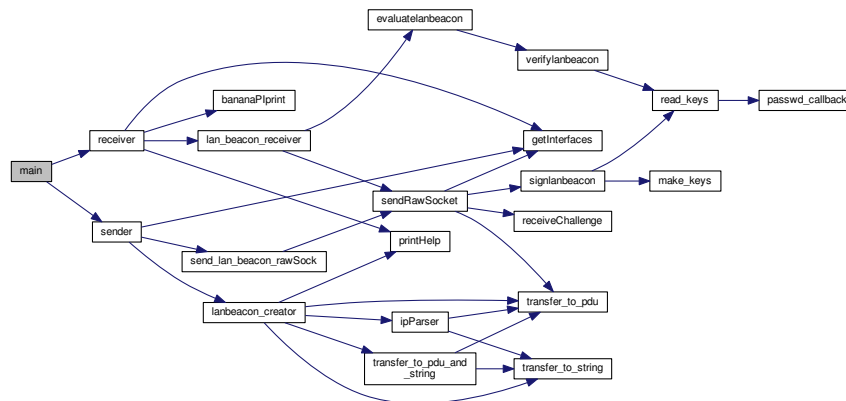
Separates receiver from sender mode and some setup.

**Returns**

Success or failure code.

References receiver(), and sender().

Here is the call graph for this function:

**4.2.1.2 printHelp()**

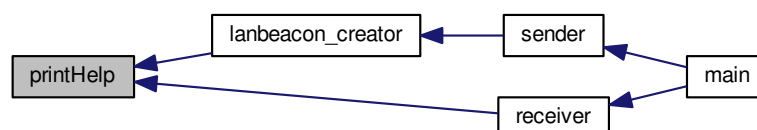
```
void printHelp ( )
```

Help function, executed if unknown parameters have been received or user specifically asks for help.

References \_.

Referenced by lanbeacon\_creator(), and receiver().

Here is the caller graph for this function:

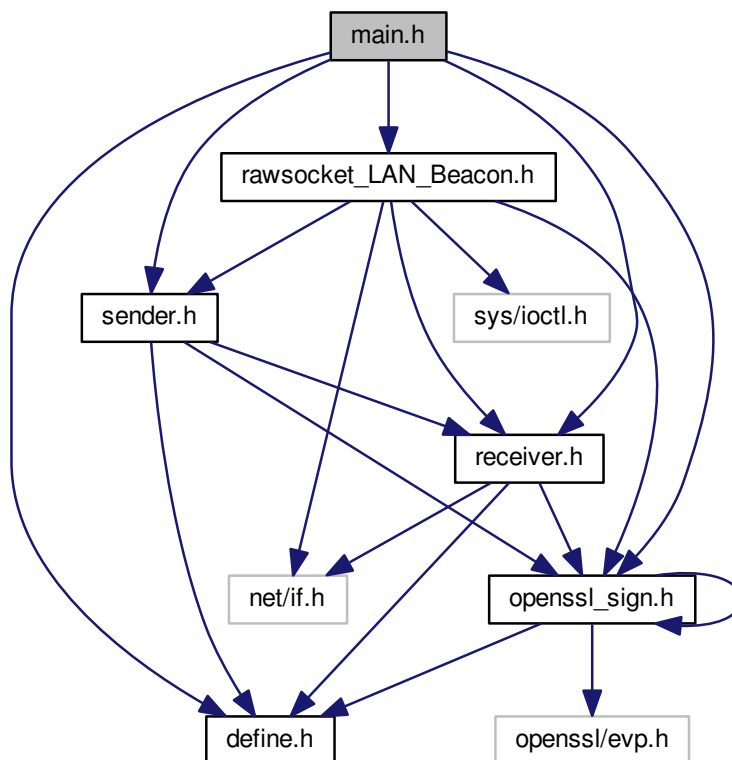


## 4.3 main.h File Reference

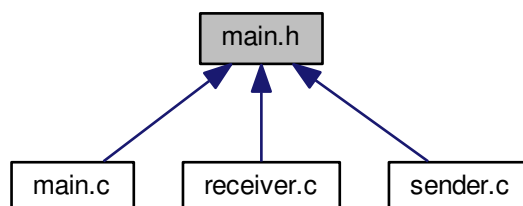
Main function and help function.

```
#include "openssl_sign.h"  
#include "sender.h"  
#include "rawsocket_LAN_Beacon.h"  
#include "receiver.h"  
#include "define.h"
```

Include dependency graph for main.h:



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



## Functions

- int `main` (int argc, char \*\*argv)  
*Separates receiver from sender mode and some setup.*
- void `printHelp` ()  
*Help function, executed if unknown parameters have been received or user specifically asks for help.*

### 4.3.1 Detailed Description

Main function and help function.

#### Author

Dominik Bitzer

#### Date

2017

### 4.3.2 Function Documentation

#### 4.3.2.1 main()

```
int main (
    int argc,
    char ** argv )
```

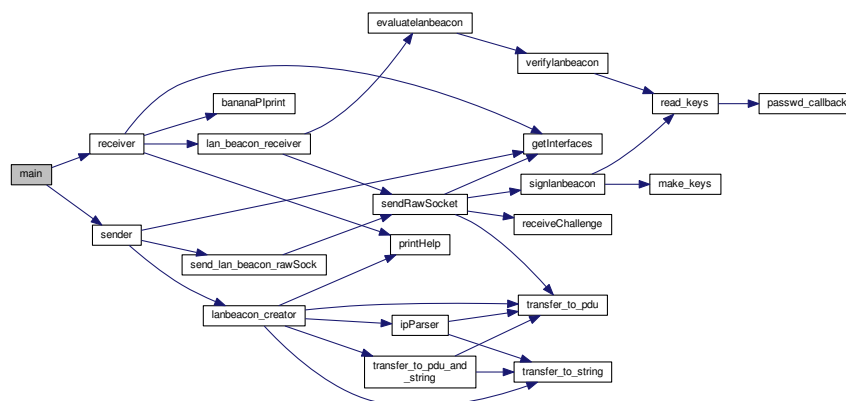
Separates receiver from sender mode and some setup.

#### Returns

Success or failure code.

References receiver(), and sender().

Here is the call graph for this function:



## 4.3.2.2 printHelp()

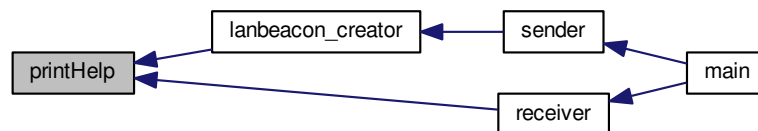
```
void printHelp ( )
```

Help function, executed if unknown parameters have been received or user specifically asks for help.

References [\\_](#).

Referenced by `lanbeacon_creator()`, and `receiver()`.

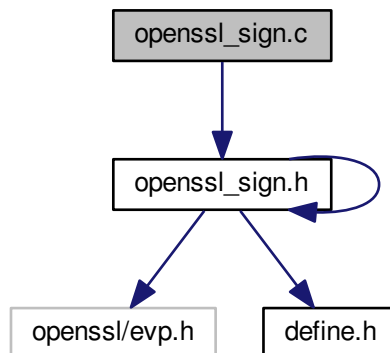
Here is the caller graph for this function:



## 4.4 openssl\_sign.c File Reference

```
#include "openssl_sign.h"
```

Include dependency graph for `openssl_sign.c`:



## Macros

- `#define KEY_READ_PROBLEM 0b1`
- `#define VERFIY_PROBLEM 0b01`
- `#define NO_PRIVATE_KEY 0b001`
- `#define NO_PUBLIC_KEY 0b0001`
- `#define PROBLEM_IN_SIGN_CALL 0b00001`
- `#define PROBLEM_IN_VERIFY_CALL 0b000001`
- `#define SIG_LEN 256`

## Functions

- int [verifylanbeacon](#) (const unsigned char \*msg, size\_t mlen, struct [open\\_ssl\\_keys](#) \*lanbeacon\_keys)  
*Verify the signature for LAN-Beacon PDUs.*
- int [signlanbeacon](#) (unsigned char \*\*sig, size\_t \*slen, const unsigned char \*msg, size\_t mlen, struct [open\\_ssl\\_keys](#) \*lanbeacon\_keys)  
*Create signature for LAN-Beacon PDU.*
- void [print\\_it](#) (const char \*label, const unsigned char \*buff, size\_t len)  
*Prints a buffer to stdout. Label is optional.*
- int [read\\_keys](#) (EVP\_PKEY \*\*skey, EVP\_PKEY \*\*vkey, struct [open\\_ssl\\_keys](#) \*lanbeacon\_keys)  
*Read stored pem files into memory.*
- int [make\\_keys](#) (EVP\_PKEY \*\*skey, EVP\_PKEY \*\*vkey, struct [open\\_ssl\\_keys](#) \*lanbeacon\_keys)  
*Generate and save keys to specified paths.*
- int [passwd\\_callback](#) (char \*pcszBuff, int size, int rwflag, void \*pPass)  
*Password callback function to retrieve password from configuration.*

## Variables

- const char [hn](#) [] = "SHA256"

### 4.4.1 Macro Definition Documentation

#### 4.4.1.1 KEY\_READ\_PROBLEM

```
#define KEY_READ_PROBLEM 0b1
```

#### 4.4.1.2 NO\_PRIVATE\_KEY

```
#define NO_PRIVATE_KEY 0b001
```

Referenced by [read\\_keys\(\)](#), and [signlanbeacon\(\)](#).

#### 4.4.1.3 NO\_PUBLIC\_KEY

```
#define NO_PUBLIC_KEY 0b0001
```

Referenced by [read\\_keys\(\)](#), and [verifylanbeacon\(\)](#).

#### 4.4.1.4 PROBLEM\_IN\_SIGN\_CALL

```
#define PROBLEM_IN_SIGN_CALL 0b00001
```

Referenced by `signlanbeacon()`.

#### 4.4.1.5 PROBLEM\_IN\_VERIFY\_CALL

```
#define PROBLEM_IN_VERIFY_CALL 0b000001
```

Referenced by `verifylanbeacon()`.

#### 4.4.1.6 SIG\_LEN

```
#define SIG_LEN 256
```

#### 4.4.1.7 VERFIY\_PROBLEM

```
#define VERFIY_PROBLEM 0b01
```

### 4.4.2 Function Documentation

#### 4.4.2.1 make\_keys()

```
int make_keys (  
    EVP_PKEY ** skey,  
    EVP_PKEY ** vkey,  
    struct open\_ssl\_keys * lanbeacon_keys )
```

Generate and save keys to specified paths.

##### Parameters

<i>skey</i>	pointer, where private key should be stored
<i>vkey</i>	pointer, where public key should be stored
<i>lanbeacon_keys</i>	configuration for file paths and password

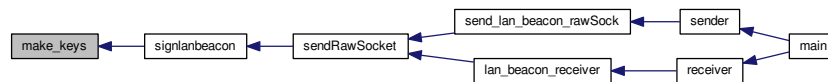
**Returns**

Returns 0 for success, non-0 otherwise

References `_`, `open_ssl_keys::path_To_Signing_Key`, `open_ssl_keys::path_To_Verifying_Key`, and `open_ssl_keys::pcszPassphrase`.

Referenced by `signlanbeacon()`.

Here is the caller graph for this function:

**4.4.2.2 passwd\_callback()**

```

int passwd_callback (
    char * pcszBuff,
    int size,
    int rwflag,
    void * pPass )
  
```

Password callback function to retrieve password from configuration.

**Parameters**

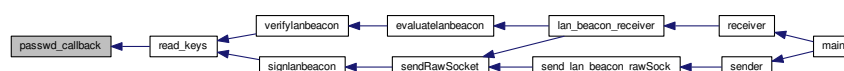
<i>pcszBuff</i>	Buffer for password
<i>size</i>	Size of buffer
<i>rwflag</i>	Read/write flag
<i>pPass</i>	Password

**Returns**

Success or error codes

Referenced by `read_keys()`.

Here is the caller graph for this function:





#### 4.4.2.3 print\_it()

```
void print_it (
    const char * label,
    const unsigned char * buff,
    size_t len )
```

Prints a buffer to stdout. Label is optional.

##### Parameters

<i>label</i>	Descriptor that will be put with contents
<i>buff</i>	Buffer for printing
<i>len</i>	Length of the buffer

#### 4.4.2.4 read\_keys()

```
int read_keys (
    EVP_PKEY ** skey,
    EVP_PKEY ** vkey,
    struct open_ssl_keys * lanbeacon_keys )
```

Read stored pem files into memory.

##### Parameters

<i>skey</i>	Memory address for the private key
<i>vkey</i>	Memory address for the public key
<i>lanbeacon_keys</i>	Configurations of the keys

##### Returns

Success or error codes

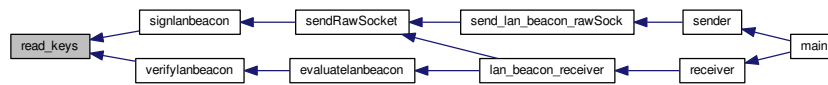
References `_`, `NO_PRIVATE_KEY`, `NO_PUBLIC_KEY`, `passwd_callback()`, `open_ssl_keys::path_To_Signing_Key`, `open_ssl_keys::path_To_Verifying_Key`, `open_ssl_keys::pcszPassphrase`, `RECEIVER_MODE`, `SENDER_MODE`, and `open_ssl_keys::sender_or_receiver_mode`.

Referenced by `signlanbeacon()`, and `verifylanbeacon()`.

Here is the call graph for this function:



Here is the caller graph for this function:



#### 4.4.2.5 signlanbeacon()

```

int signlanbeacon (
    unsigned char ** sig,
    size_t * slen,
    const unsigned char * msg,
    size_t qqlen,
    struct open_ssl_keys * lanbeacon_keys )

```

Create signature for LAN-Beacon PDU.

##### Parameters

<i>sig</i>	Memory pointer for signature
<i>slen</i>	Length of the created signature
<i>msg</i>	LAN-Beacon PDU that should be signed
<i>qqlen</i>	Size of the passed LAN-Beacon PDU
<i>lanbeacon_keys</i>	Configurations of the keys

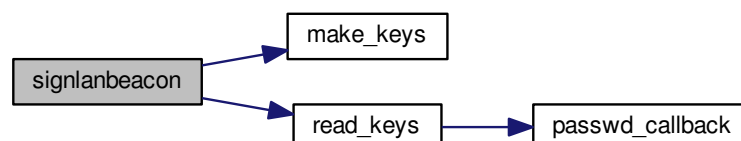
##### Returns

Success or error codes

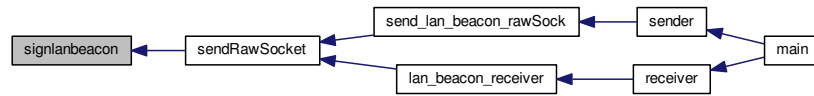
References `_`, `open_ssl_keys::generate_keys`, `hn`, `make_keys()`, `NO_PRIVATE_KEY`, `open_ssl_keys::path_To_↔`  
`Verifying_Key`, `PROBLEM_IN_SIGN_CALL`, and `read_keys()`.

Referenced by `sendRawSocket()`.

Here is the call graph for this function:



Here is the caller graph for this function:



#### 4.4.2.6 verifylanbeacon()

```

int verifylanbeacon (
    const unsigned char * msg,
    size_t mlen,
    struct open_ssl_keys * lanbeacon_keys )

```

Verify the signature for LAN-Beacon PDUs.

##### Parameters

<i>msg</i>	Message, that should be verified
<i>mlen</i>	Length of the message, that should be verified
<i>lanbeacon_keys</i>	Configurations of the keys

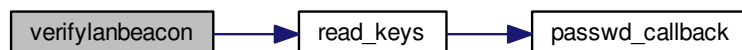
##### Returns

Success or error codes

References `_`, `hn`, `NO_PUBLIC_KEY`, `open_ssl_keys::path_To_Verifying_Key`, `PROBLEM_IN_VERIFY_CALL`, and `read_keys()`.

Referenced by `evaluatelanbeacon()`.

Here is the call graph for this function:



Here is the caller graph for this function:



### 4.4.3 Variable Documentation

#### 4.4.3.1 hn

```
const char hn[] = "SHA256"
```

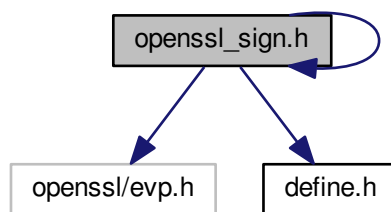
Referenced by `signlanbeacon()`, and `verifylanbeacon()`.

## 4.5 openssl\_sign.h File Reference

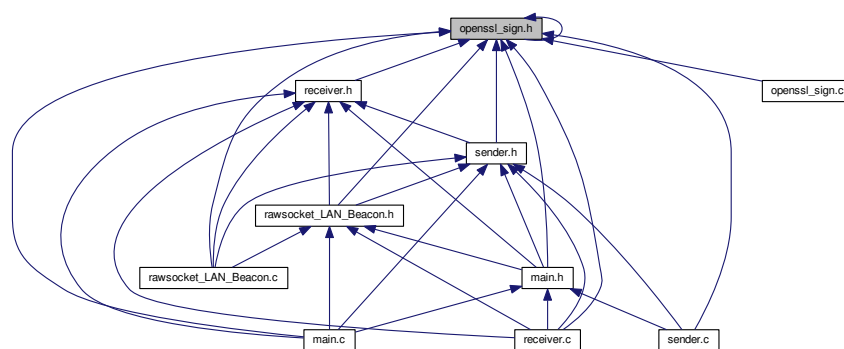
signing, verifying and key I/O

```
#include <openssl/evp.h>
#include "openssl_sign.h"
#include "define.h"
```

Include dependency graph for `openssl_sign.h`:



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



## Data Structures

- struct [open\\_ssl\\_keys](#)  
*Key locations, password and further configurations.*

## Macros

- #define [SENDER\\_MODE](#) 0
- #define [RECEIVER\\_MODE](#) 1

## Functions

- int [make\\_keys](#) (EVP\_PKEY \*\*skey, EVP\_PKEY \*\*vkey, struct [open\\_ssl\\_keys](#) \*lanbeacon\_keys)  
*Generate and save keys to specified paths.*
- void [print\\_it](#) (const char \*label, const unsigned char \*buff, size\_t len)  
*Prints a buffer to stdout. Label is optional.*
- int [passwd\\_callback](#) (char \*pcszBuff, int size, int rwflag, void \*pPass)  
*Password callback function to retrieve password from configuration.*
- int [signlanbeacon](#) (unsigned char \*\*sig, size\_t \*slen, const unsigned char \*msg, size\_t qlen, struct [open\\_ssl\\_keys](#) \*lanbeacon\_keys)  
*Create signature for LAN-Beacon PDU.*
- int [read\\_keys](#) (EVP\_PKEY \*\*skey, EVP\_PKEY \*\*vkey, struct [open\\_ssl\\_keys](#) \*lanbeacon\_keys)  
*Read stored pem files into memory.*
- int [verifylanbeacon](#) (const unsigned char \*msg, size\_t mlen, struct [open\\_ssl\\_keys](#) \*lanbeacon\_keys)  
*Verify the signature for LAN-Beacon PDUs.*

### 4.5.1 Detailed Description

signing, verifying and key I/O

#### Author

Dominik Bitzer

#### Date

2017

### 4.5.2 Macro Definition Documentation

#### 4.5.2.1 RECEIVER\_MODE

```
#define RECEIVER_MODE 1
```

Referenced by [read\\_keys\(\)](#), and [receiver\(\)](#).

#### 4.5.2.2 SENDER\_MODE

```
#define SENDER_MODE 0
```

Referenced by `read_keys()`, and `sender()`.

### 4.5.3 Function Documentation

#### 4.5.3.1 make\_keys()

```
int make_keys (
    EVP_PKEY ** skey,
    EVP_PKEY ** vkey,
    struct open_ssl_keys * lanbeacon_keys )
```

Generate and save keys to specified paths.

##### Parameters

<i>skey</i>	pointer, where private key should be stored
<i>vkey</i>	pointer, where public key should be stored
<i>lanbeacon_keys</i>	configuration for file paths and password

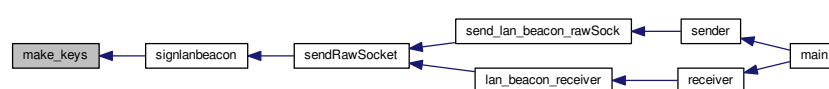
##### Returns

Returns 0 for success, non-0 otherwise

References `_`, `open_ssl_keys::path_To_Signing_Key`, `open_ssl_keys::path_To_Verifying_Key`, and `open_ssl_keys::pcszPassphrase`.

Referenced by `signlanbeacon()`.

Here is the caller graph for this function:



#### 4.5.3.2 passwd\_callback()

```
int passwd_callback (
    char * ppszBuff,
    int size,
    int rwflag,
    void * pPass )
```

Password callback function to retrieve password from configuration.

**Parameters**

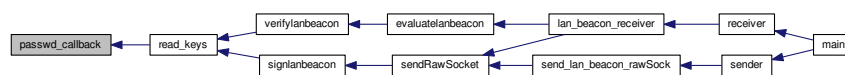
<i>pcszBuff</i>	Buffer for password
<i>size</i>	Size of buffer
<i>rwflag</i>	Read/write flag
<i>pPass</i>	Password

**Returns**

Success or error codes

Referenced by read\_keys().

Here is the caller graph for this function:

**4.5.3.3 print\_it()**

```

void print_it (
    const char * label,
    const unsigned char * buff,
    size_t len )

```

Prints a buffer to stdout. Label is optional.

**Parameters**

<i>label</i>	Descriptor that will be put with contents
<i>buff</i>	Buffer for printing
<i>len</i>	Length of the buffer

**4.5.3.4 read\_keys()**

```

int read_keys (
    EVP_PKEY ** skey,
    EVP_PKEY ** vkey,
    struct open_ssl_keys * lanbeacon_keys )

```

Read stored pem files into memory.



## Parameters

<i>skey</i>	Memory address for the private key
<i>vkey</i>	Memory address for the public key
<i>lanbeacon_keys</i>	Configurations of the keys

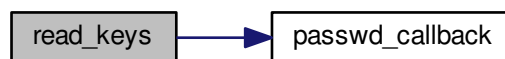
## Returns

Success or error codes

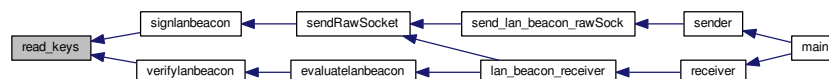
References `_`, `NO_PRIVATE_KEY`, `NO_PUBLIC_KEY`, `passwd_callback()`, `open_ssl_keys::path_To_Signing_Key`, `open_ssl_keys::path_To_Verifying_Key`, `open_ssl_keys::pcszPassphrase`, `RECEIVER_MODE`, `SENDER_MODE`, and `open_ssl_keys::sender_or_receiver_mode`.

Referenced by `signlanbeacon()`, and `verifylanbeacon()`.

Here is the call graph for this function:



Here is the caller graph for this function:



## 4.5.3.5 signlanbeacon()

```

int signlanbeacon (
    unsigned char ** sig,
    size_t * slen,
    const unsigned char * msg,
    size_t qlen,
    struct open_ssl_keys * lanbeacon_keys )
  
```

Create signature for LAN-Beacon PDU.

## Parameters

<i>sig</i>	Memory pointer for signature
<i>slen</i>	Length of the created signature
<i>msg</i>	LAN-Beacon PDU that should be signed
<i>qqlen</i>	Size of the passed LAN-Beacon PDU
<i>lanbeacon_keys</i>	Configurations of the keys

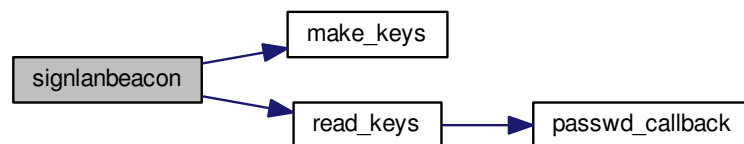
## Returns

Success or error codes

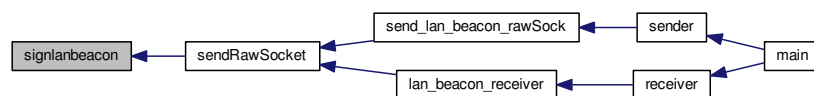
References `_`, `open_ssl_keys::generate_keys`, `hn`, `make_keys()`, `NO_PRIVATE_KEY`, `open_ssl_keys::path_To_`, `Verifying_Key`, `PROBLEM_IN_SIGN_CALL`, and `read_keys()`.

Referenced by `sendRawSocket()`.

Here is the call graph for this function:



Here is the caller graph for this function:

4.5.3.6 `verifylanbeacon()`

```

int verifylanbeacon (
    const unsigned char * msg,
    size_t mlen,
    struct open_ssl_keys * lanbeacon_keys )
  
```

Verify the signature for LAN-Beacon PDUs.

## Parameters

<i>msg</i>	Message, that should be verified
<i>mlen</i>	Length of the message, that should be verified
<i>lanbeacon_keys</i>	Configurations of the keys

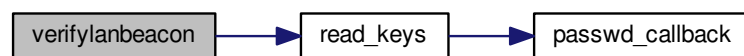
## Returns

Success or error codes

References `_`, `hn`, `NO_PUBLIC_KEY`, `open_ssl_keys::path_To_Verifying_Key`, `PROBLEM_IN_VERIFY_CALL`, and `read_keys()`.

Referenced by `evaluatelanbeacon()`.

Here is the call graph for this function:



Here is the caller graph for this function:

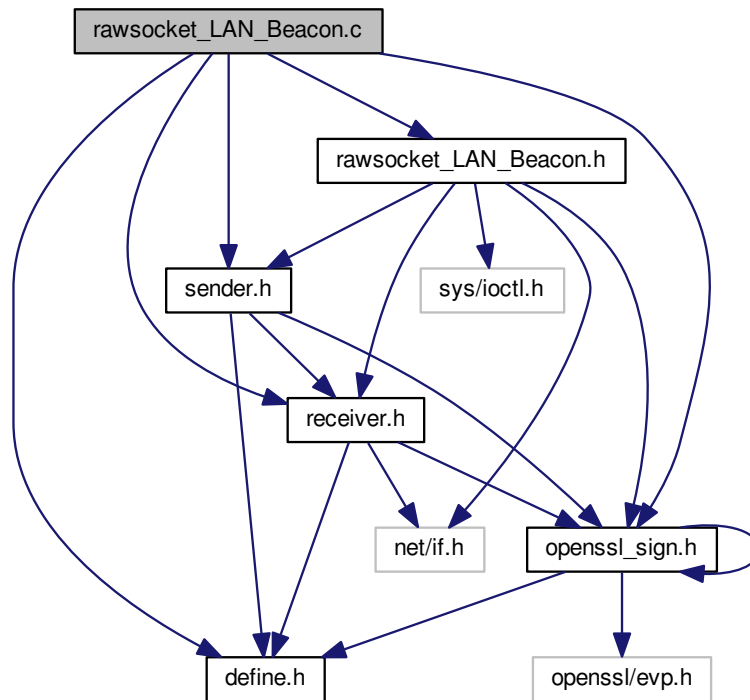


## 4.6 rawsocket\_LAN\_Beacon.c File Reference

```
#include "rawsocket_LAN_Beacon.h"
#include "receiver.h"
#include "openssl_sign.h"
#include "define.h"
```

```
#include "sender.h"
```

Include dependency graph for rawsocket\_LAN\_Beacon.c:



## Macros

- `#define GNU_SOURCE`

## Functions

- void [sendRawSocket](#) (unsigned char \*destination\_mac, void \*payload, int payloadLen, unsigned short etherType, struct [sender\\_information](#) \*my\_sender\_information)  
*Generic function to send on raw sockets, both handles sending of LAN-Beacon and challenges.*
- int [send\\_lan\\_beacon\\_rawSock](#) (struct [sender\\_information](#) \*my\_sender\_information)  
*Shortcut that can be used for sending LAN-Beacons, provides some configuration already.*
- void [lan\\_beacon\\_receiver](#) (struct [receiver\\_information](#) \*my\_receiver\_information)  
*Receives LAN-Beacons and adds them to the structure of received beacons.*
- unsigned long [receiveChallenge](#) (struct [interfaces](#) \*my\_challenge\_receiver\_interfaces, char \*challenge\_↔ dest\_mac, struct [sender\\_information](#) \*my\_sender\_information)  
*Listen for any and eventually receive challenges, that clients have sent in response to LAN-Beacon frames.*
- void [getInterfaces](#) (struct [interfaces](#) \*my\_interfaces\_struct, char \*interface\_to\_send\_on)  
*Get raw sockets for interfaces.*

### 4.6.1 Macro Definition Documentation

## 4.6.1.1 \_GNU\_SOURCE

```
#define _GNU_SOURCE
```

## 4.6.2 Function Documentation

## 4.6.2.1 getInterfaces()

```
void getInterfaces (
    struct interfaces * my_interfaces_struct,
    char * interface_to_send_on )
```

Get raw sockets for interfaces.

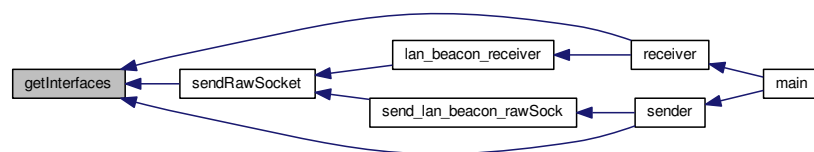
## Parameters

<i>my_interfaces_struct</i>	Struct that contains interfaces information and configuration
<i>interface_to_send_on</i>	Specified interfaces for sending

References `_`, `interfaces::etherType`, `interfaces::if_idx`, `interfaces::if_mac`, `interfaces::maxSockFd`, `interfaces::numInterfaces`, `REC_SOCKET`, `SEND_SOCKET`, `interfaces::sendOrReceive`, `interfaces::sockfd`, and `interfaces::sockopt`.

Referenced by `receiver()`, `sender()`, and `sendRawSocket()`.

Here is the caller graph for this function:



## 4.6.2.2 lan\_beacon\_receiver()

```
void lan_beacon_receiver (
    struct receiver_information * my_receiver_information )
```

Receives LAN-Beacons and adds them to the structure of received beacons.

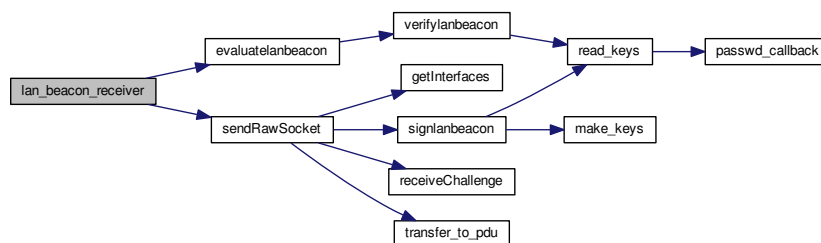
## Parameters

<code>my_receiver_information</code>	Receiver configuration and structs for storing the received beacons
--------------------------------------	---

References `_`, `receiver_information::authenticated_mode`, `received_lan_beacon_frame::challenge`, `CHALLENGE_ETHTYPE`, `received_lan_beacon_frame::current_destination_mac`, `evaluatelanbeacon()`, `LAN_BEACON_BUF_SIZ`, `LAN_BEACON_DEST_MAC`, `received_lan_beacon_frame::lan_beacon_ReceivedPayload`, `receiver_information::lanbeacon_keys`, `interfaces::maxSockFd`, `receiver_information::my_receiver_interfaces`, `receiver_information::number_of_currently_received_frames`, `interfaces::numInterfaces`, `received_lan_beacon_frame::parsedBeaconContents`, `received_lan_beacon_frame::payloadSize`, `receiver_information::pointers_to_received_frames`, `sendRawSocket()`, `SHOW_FRAMES_X_TIMES`, `interfaces::sockfd`, `received_lan_beacon_frame::successfullyAuthenticated`, and `received_lan_beacon_frame::times_left_to_display`.

Referenced by `receiver()`.

Here is the call graph for this function:



Here is the caller graph for this function:



#### 4.6.2.3 receiveChallenge()

```

unsigned long receiveChallenge (
    struct interfaces * my_challenge_interfaces,
    char * challenge_dest_mac,
    struct sender_information * my_sender_information )

```

Listen for any and eventually receive challenges, that clients have sent in response to LAN-Beacon frames.

## Parameters

<i>my_challenge_interfaces</i>	Struct with the sockets for receiving challenges
<i>challenge_dest_mac</i>	States the destination to send the authenticated LAN-Beacon
<i>my_sender_information</i>	Sender configurations

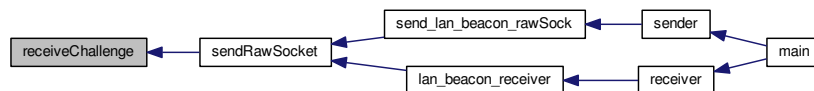
## Returns

Returns the value of the received challenge

References `_`, `interfaces::maxSockFd`, `interfaces::numInterfaces`, `sender_information::send_frequency`, and `interfaces::sockfd`.

Referenced by `sendRawSocket()`.

Here is the caller graph for this function:



## 4.6.2.4 send\_lan\_beacon\_rawSock()

```
int send_lan_beacon_rawSock (
    struct sender_information * my_sender_information )
```

Shortcut that can be used for sending LAN-Beacons, provides some configuration already.

## Parameters

<i>my_sender_information</i>	Struct that contains everything needed for sending
------------------------------	--

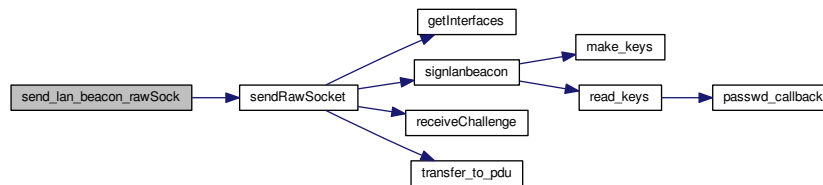
## Returns

Success or failure code, which is passed on from called function

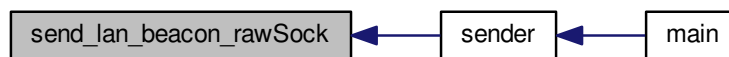
References `LAN_BEACON_DEST_MAC`, `LAN_BEACON_ETHER_TYPE`, `sender_information::lan_beacon_pdu_len`, `sender_information::lanBeacon_PDU`, and `sendRawSocket()`.

Referenced by `sender()`.

Here is the call graph for this function:



Here is the caller graph for this function:



#### 4.6.2.5 sendRawSocket()

```

void sendRawSocket (
    unsigned char * destination_mac,
    void * payload,
    int payloadLen,
    unsigned short etherType,
    struct sender_information * my_sender_information )
  
```

Generic function to send on raw sockets, both handles sending of LAN-Beacon and challenges.

##### Parameters

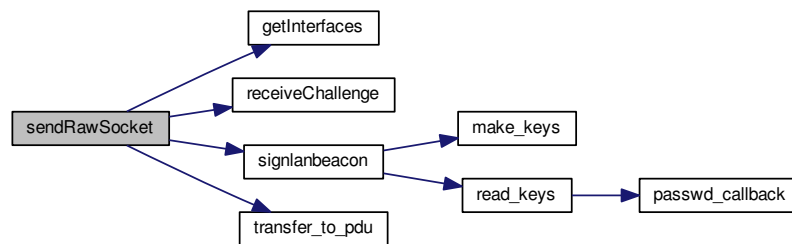
<i>destination_mac</i>	Destination MAC address
<i>payload</i>	Payload that should be sent
<i>payloadLen</i>	Length of payload
<i>etherType</i>	EtherType of payload
<i>my_sender_information</i>	Sender configurations

References `_`, `CHALLENGE_ETHTYPE`, `interfaces::etherType`, `getInterfaces()`, `interfaces::if_idx`, `interfaces::if_mac`, `sender_information::interface_to_send_on`, `LAN_BEACON_BUF_SIZ`, `LAN_BEACON_ETHER_TYPE`, `sender_information::lanbeacon_keys`, `sender_information::my_challenge_receiver_interfaces`, `interfaces::numInterfaces`, `receiveChallenge()`, `sender_information::send_frequency`, `SEND_SOCKET`, `signlanbeacon()`, `interfaces::sockfd`, `SUBTYPE_SIGNATURE`, and `transfer_to_pdu()`.

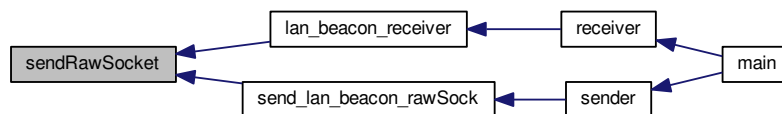
Referenced by `lan_beacon_receiver()`, and `send_lan_beacon_rawSock()`.



Here is the call graph for this function:



Here is the caller graph for this function:



## 4.7 rawsocket\_LAN\_Beacon.h File Reference

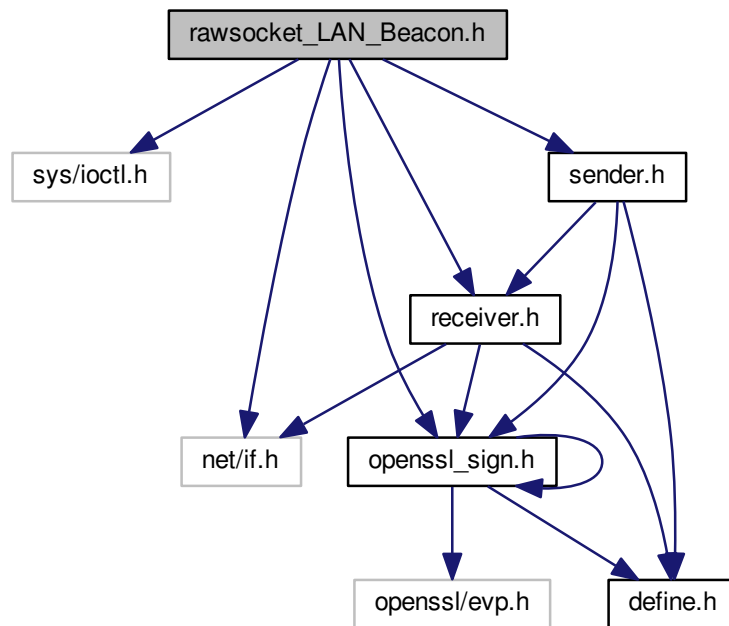
raw-socket sending and receiving

```

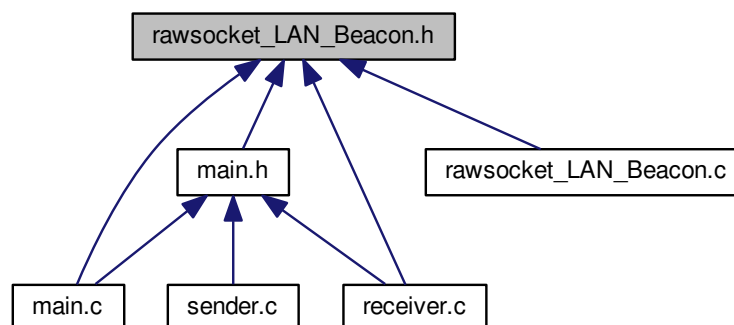
#include <sys/ioctl.h>
#include <net/if.h>
#include "openssl_sign.h"
#include "receiver.h"
#include "sender.h"

```

Include dependency graph for rawsocket\_LAN\_Beacon.h:



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



## Macros

- `#define SEND_SOCKET 0`
- `#define REC_SOCKET 1`

## Functions

- void `lan_beacon_receiver` (struct `receiver_information` \*my\_receiver\_information)  
*Receives LAN-Beacons and adds them to the structure of received beacons.*
- int `send_lan_beacon_rawSock` (struct `sender_information` \*my\_sender\_information)  
*Shortcut that can be used for sending LAN-Beacons, provides some configuration already.*
- unsigned long `receiveChallenge` (struct `interfaces` \*my\_challenge\_interfaces, char \*challenge\_dest\_mac, struct `sender_information` \*my\_sender\_information)  
*Listen for any and eventually receive challenges, that clients have sent in response to LAN-Beacon frames.*
- void `getInterfaces` (struct `interfaces` \*my\_interfaces\_struct, char \*interface\_to\_send\_on)  
*Get raw sockets for interfaces.*
- void `sendRawSocket` (unsigned char \*destination\_mac, void \*payload, int payloadLen, unsigned short etherType, struct `sender_information` \*my\_sender\_information)  
*Generic function to send on raw sockets, both handles sending of LAN-Beacon and challenges.*

### 4.7.1 Detailed Description

raw-socket sending and receiving

#### Author

Dominik Bitzer

#### Date

2017

### 4.7.2 Macro Definition Documentation

#### 4.7.2.1 REC\_SOCKET

```
#define REC_SOCKET 1
```

Referenced by `getInterfaces()`, `receiver()`, and `sender()`.

#### 4.7.2.2 SEND\_SOCKET

```
#define SEND_SOCKET 0
```

Referenced by `getInterfaces()`, and `sendRawSocket()`.

### 4.7.3 Function Documentation

#### 4.7.3.1 getInterfaces()

```
void getInterfaces (
    struct interfaces * my_interfaces_struct,
    char * interface_to_send_on )
```

Get raw sockets for interfaces.

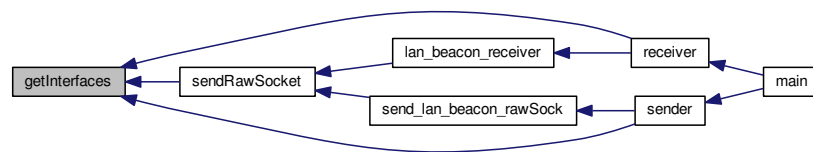
## Parameters

<i>my_interfaces_struct</i>	Struct that contains interfaces information and configuration
<i>interface_to_send_on</i>	Specified interfaces for sending

References `_`, `interfaces::etherType`, `interfaces::if_idx`, `interfaces::if_mac`, `interfaces::maxSockFd`, `interfaces::numInterfaces`, `REC_SOCKET`, `SEND_SOCKET`, `interfaces::sendOrReceive`, `interfaces::sockfd`, and `interfaces::sockopt`.

Referenced by `receiver()`, `sender()`, and `sendRawSocket()`.

Here is the caller graph for this function:



## 4.7.3.2 lan\_beacon\_receiver()

```
void lan_beacon_receiver (
    struct receiver_information * my_receiver_information )
```

Receives LAN-Beacons and adds them to the structure of received beacons.

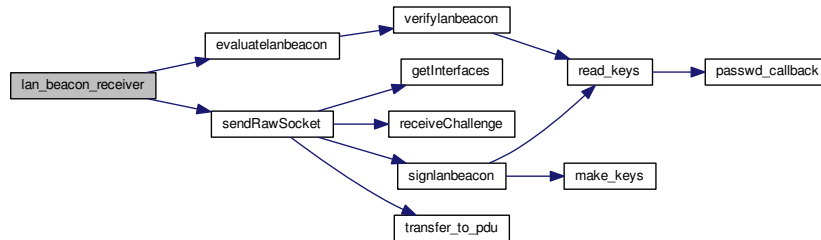
## Parameters

<i>my_receiver_information</i>	Receiver configuration and structs for storing the received beacons
--------------------------------	---

References `_`, `receiver_information::authenticated_mode`, `received_lan_beacon_frame::challenge`, `CHALLENGE_ETHTYPE`, `received_lan_beacon_frame::current_destination_mac`, `evaluateLanBeacon()`, `LAN_BEACON_BUFFER_SIZE`, `LAN_BEACON_DEST_MAC`, `received_lan_beacon_frame::lan_beacon_ReceivedPayload`, `receiver_information::lanbeacon_keys`, `interfaces::maxSockFd`, `receiver_information::my_receiver_interfaces`, `receiver_information::number_of_currently_received_frames`, `interfaces::numInterfaces`, `received_lan_beacon_frame::parsedBeaconContents`, `received_lan_beacon_frame::payloadSize`, `receiver_information::pointers_to_received_frames`, `sendRawSocket()`, `SHOW_FRAMES_X_TIMES`, `interfaces::sockfd`, `received_lan_beacon_frame::successfullyAuthenticated`, and `received_lan_beacon_frame::times_left_to_display`.

Referenced by `receiver()`.

Here is the call graph for this function:



Here is the caller graph for this function:



#### 4.7.3.3 receiveChallenge()

```

unsigned long receiveChallenge (
    struct interfaces * my_challenge_interfaces,
    char * challenge_dest_mac,
    struct sender_information * my_sender_information )

```

Listen for any and eventually receive challenges, that clients have sent in response to LAN-Beacon frames.

##### Parameters

<i>my_challenge_interfaces</i>	Struct with the sockets for receiving challenges
<i>challenge_dest_mac</i>	States the destination to send the authenticated LAN-Beacon
<i>my_sender_information</i>	Sender configurations

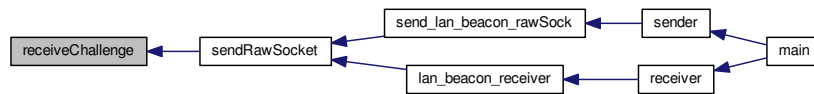
##### Returns

Returns the value of the received challenge

References `_`, `interfaces::maxSockFd`, `interfaces::numInterfaces`, `sender_information::send_frequency`, and `interfaces::sockfd`.

Referenced by `sendRawSocket()`.

Here is the caller graph for this function:



#### 4.7.3.4 send\_lan\_beacon\_rawSock()

```
int send_lan_beacon_rawSock (
    struct sender_information * my_sender_information )
```

Shortcut that can be used for sending LAN-Beacons, provides some configuration already.

##### Parameters

<i>my_sender_information</i>	Struct that contains everything needed for sending
------------------------------	--

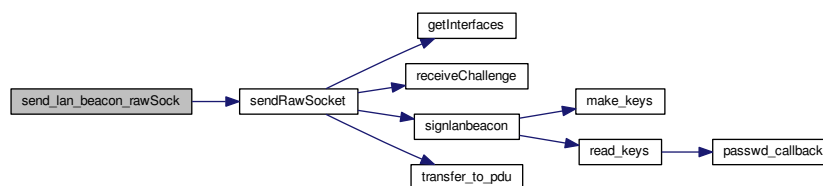
##### Returns

Success or failure code, which is passed on from called function

References LAN\_BEACON\_DEST\_MAC, LAN\_BEACON\_ETHER\_TYPE, sender\_information::lan\_beacon\_pdu↔\_len, sender\_information::lanBeacon\_PDU, and sendRawSocket().

Referenced by sender().

Here is the call graph for this function:



Here is the caller graph for this function:



## 4.7.3.5 sendRawSocket()

```
void sendRawSocket (
    unsigned char * destination_mac,
    void * payload,
    int payloadLen,
    unsigned short etherType,
    struct sender_information * my_sender_information )
```

Generic function to send on raw sockets, both handles sending of LAN-Beacon and challenges.

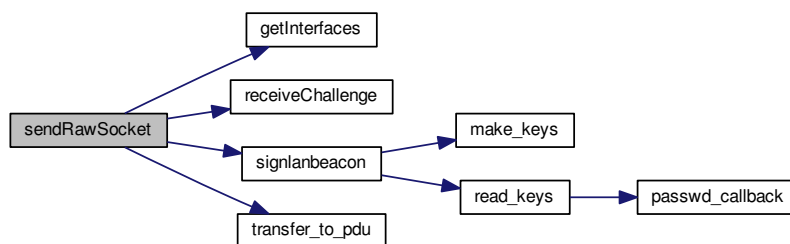
## Parameters

<i>destination_mac</i>	Destination MAC address
<i>payload</i>	Payload that should be sent
<i>payloadLen</i>	Length of payload
<i>etherType</i>	EtherType of payload
<i>my_sender_information</i>	Sender configurations

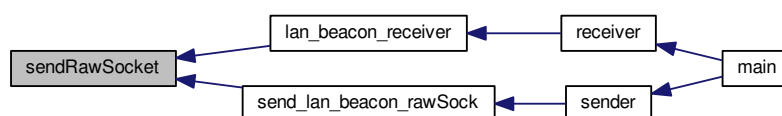
References `_`, `CHALLENGE_ETHTYPE`, `interfaces::etherType`, `getInterfaces()`, `interfaces::if_idx`, `interfaces::if_mac`, `sender_information::interface_to_send_on`, `LAN_BEACON_BUF_SIZ`, `LAN_BEACON_ETHER_TYPE`, `sender_information::lanbeacon_keys`, `sender_information::my_challenge_receiver_interfaces`, `interfaces::numInterfaces`, `receiveChallenge()`, `sender_information::send_frequency`, `SEND_SOCKET`, `signlanbeacon()`, `interfaces::sockfd`, `SUBTYPE_SIGNATURE`, and `transfer_to_pdu()`.

Referenced by `lan_beacon_receiver()`, and `send_lan_beacon_rawSock()`.

Here is the call graph for this function:



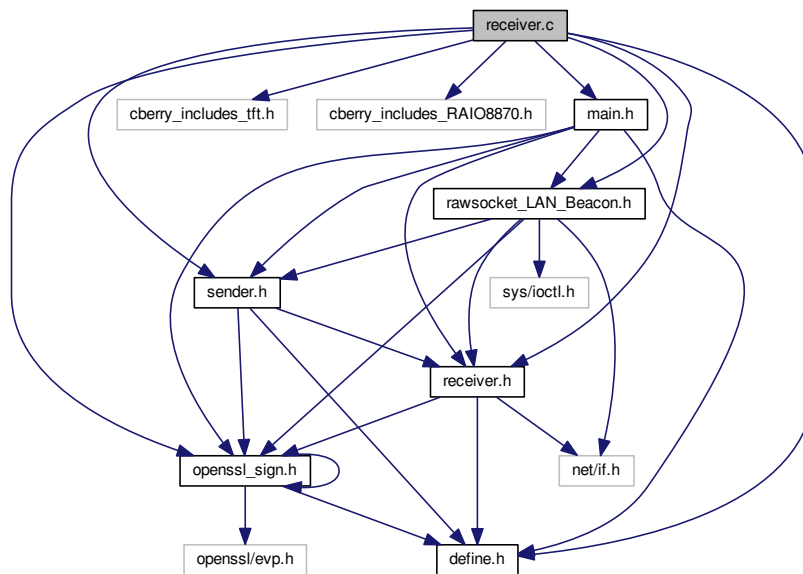
Here is the caller graph for this function:



## 4.8 receiver.c File Reference

```
#include "openssl_sign.h"
#include "cberry_includes_tft.h"
#include "cberry_includes_RAIO8870.h"
#include "rawsocket_LAN_Beacon.h"
#include "receiver.h"
#include "sender.h"
#include "define.h"
#include "main.h"
```

Include dependency graph for receiver.c:



### Macros

- `#define TLV_CUSTOM_COPY(descriptor, TLV_parsed_content, makro_currentTLVcontentSize)`
- `#define TLV_STRING_COPY(descriptor)`

### Functions

- `int receiver(int argc, char **argv)`  
*This function has the main receiver logic and starts all other receiver functions.*
- `char ** evaluatelanbeacon(struct received_lan_beacon_frame *my_received_lan_beacon_frame, struct open_ssl_keys *lanbeacon_keys)`  
*This function takes raw received LAN-Beacon frames and creates strings from them, that can be used for printing or further processing.*
- `void bananaP!print(struct receiver_information *my_receiver_information)`  
*This function prints the received content on the standard output and, if compiler flags are set, also on a C-Berry display.*



## 4.8.1 Macro Definition Documentation

### 4.8.1.1 TLV\_CUSTOM\_COPY

```
#define TLV_CUSTOM_COPY(  
    descriptor,  
    TLV_parsed_content,  
    makro_currentTLVcontentSize )
```

**Value:**

```
snprintf(parsedTLVs [numberParsedTLVs++], PARSED\_TLVs\_MAX\_LENGTH, "%-10s%.s", \  
    descriptor, (int) makro_currentTLVcontentSize, TLV_parsed_content); \  
    break;
```

Referenced by `evaluatelanbeacon()`.

### 4.8.1.2 TLV\_STRING\_COPY

```
#define TLV_STRING_COPY(  
    descriptor )
```

**Value:**

```
TLV\_CUSTOM\_COPY(descriptor, \  
    (char*) &my_received_lan_beacon_frame->lan_beacon_ReceivedPayload[currentPayloadByte+6], \  
    currentTLVsize-4);
```

Referenced by `evaluatelanbeacon()`.

## 4.8.2 Function Documentation

### 4.8.2.1 bananaPIprint()

```
void bananaPIprint (  
    struct receiver\_information * my_receiver_information )
```

This function prints the received content on the standard output and, if compiler flags are set, also on a C-Berry display.

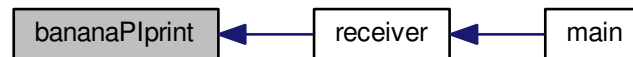
**Parameters**

<i>my_receiver_information</i>	receiver information struct, that contains display settings and contents that should be printed
--------------------------------	---

References `_`, `receiver_information::current_lan_beacon_pdu_for_printing`, `DESCRIPTOR_WIDTH`, `receiver_information::number_of_currently_received_frames`, `PARSED_TLV_MAX_NUMBER`, `received_lan_beacon_frame::parsedBeaconContents`, `receiver_information::pointers_to_received_frames`, `receiver_information::scroll_speed`, and `received_lan_beacon_frame::times_left_to_display`.

Referenced by `receiver()`.

Here is the caller graph for this function:

**4.8.2.2 evaluatelanbeacon()**

```

char** evaluatelanbeacon (
    struct received_lan_beacon_frame * my_received_lan_beacon_frame,
    struct open_ssl_keys * lanbeacon_keys )
  
```

This function takes raw received LAN-Beacon frames and creates strings from them, that can be used for printing or further processing.

**Parameters**

<i>my_received_lan_beacon_frame</i>	Pointer to one single received LAN-Beacon frame, that should be evaluated
<i>lanbeacon_keys</i>	Pointer to struct for keys, needed in order to verify authentication information

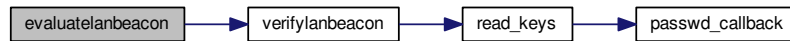
**Returns**

Returns parsed content as an array of TLV-descriptor and TLV-content pairs

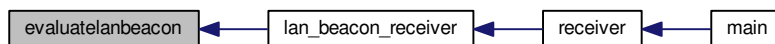
References `_`, `received_lan_beacon_frame::challenge`, `DESCRIPTOR_COMBINED_STRING`, `DESCRIPTOR_CUSTOM`, `DESCRIPTOR_DHCP`, `DESCRIPTOR_EMAIL`, `DESCRIPTOR_IPV4`, `DESCRIPTOR_IPV6`, `DESCRIPTOR_NAME`, `DESCRIPTOR_ROUTER`, `DESCRIPTOR_SIGNATURE`, `DESCRIPTOR_VLAN_ID`, `received_lan_beacon_frame::lan_beacon_ReceivedPayload`, `PARSED_TLV_MAX_LENGTH`, `PARSED_TLV_MAX_NUMBER`, `received_lan_beacon_frame::payloadSize`, `SUBTYPE_COMBINED_STRING`, `SUBTYPE_CUSTOM`, `SUBTYPE_DHCP`, `SUBTYPE_EMAIL`, `SUBTYPE_IPV4`, `SUBTYPE_IPV6`, `SUBTYPE_NAME`, `SUBTYPE_ROUTER`, `SUBTYPE_SIGNATURE`, `SUBTYPE_VLAN_ID`, `received_lan_beacon_frame::successfullyAuthenticated`, `TLV_CUSTOM_COPY`, `TLV_STRING_COPY`, and `verifylanbeacon()`.

Referenced by `lan_beacon_receiver()`.

Here is the call graph for this function:



Here is the caller graph for this function:



#### 4.8.2.3 receiver()

```

int receiver (
    int argc,
    char ** argv )
  
```

This function has the main receiver logic and starts all other receiver functions.

##### Parameters

<i>argc</i>	Number of command line arguments.
<i>argv</i>	Contents of command line arguments.

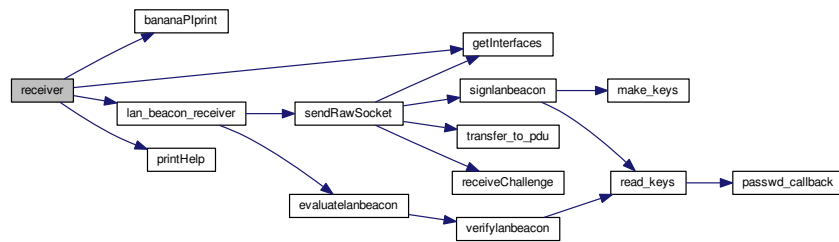
##### Returns

Error or failure code

References `_`, `receiver_information::authenticated_mode`, `bananaPIprint()`, `receiver_information::current_lan_beacon_pdu_for_printing`, `DEFAULT_SCROLLSPEED`, `getInterfaces()`, `KEY_PATHLENGTH_MAX`, `LAN_BEACON_ETHER_TYPE`, `lan_beacon_receiver()`, `receiver_information::lanbeacon_keys`, `receiver_information::my_receiver_interfaces`, `receiver_information::number_of_currently_received_frames`, `PARSED_TLV_MAX_NUMBER`, `received_lan_beacon_frame::parsedBeaconContents`, `open_ssl_keys::path_To_Verifying_Key`, `receiver_information::pointers_to_received_frames`, `printHelp()`, `PUBLIC_KEY_STANDARD_PATH`, `REC_SOCKET`, `RECEIVER_MODE`, `receiver_information::scroll_speed`, and `open_ssl_keys::sender_or_receiver_mode`.

Referenced by `main()`.

Here is the call graph for this function:



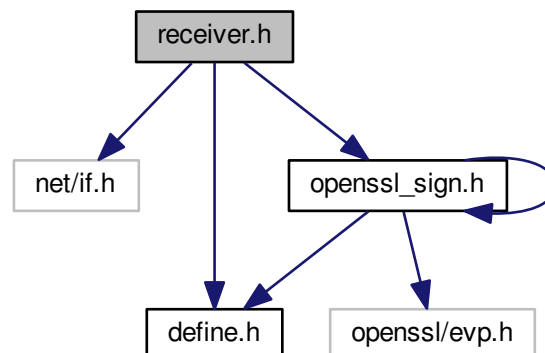
Here is the caller graph for this function:



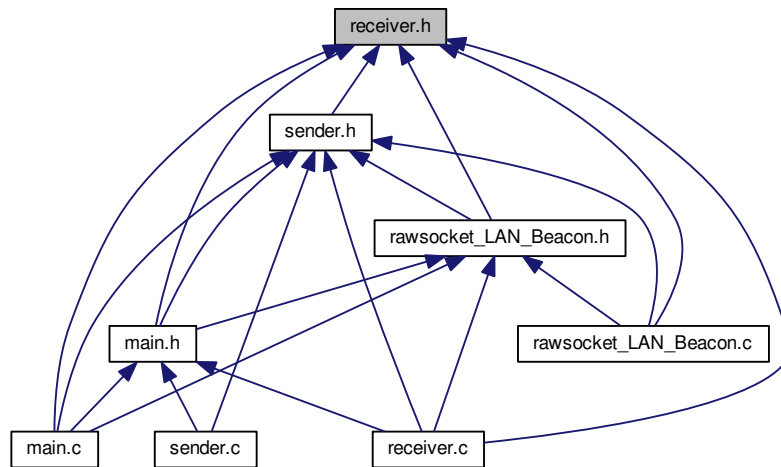
## 4.9 receiver.h File Reference

Receiver-specific functions and structures.

```
#include <net/if.h>
#include "define.h"
#include "openssl_sign.h"
Include dependency graph for receiver.h:
```



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



## Data Structures

- struct [received\\_lan\\_beacon\\_frame](#)  
*Contains all the information related to one received frame.*
- struct [interfaces](#)  
*Contains all variables, that are needed to access sockets on interfaces.*
- struct [receiver\\_information](#)  
*Receiver configurations.*

## Functions

- int [receiver](#) (int argc, char \*\*argv)  
*This function has the main receiver logic and starts all other receiver functions.*
- char \*\* [evaluatelanbeacon](#) (struct [received\\_lan\\_beacon\\_frame](#) \*my\_received\_lan\_beacon\_frame, struct [open\\_ssl\\_keys](#) \*lanbeacon\_keys)  
*This function takes raw received LAN-Beacon frames and creates strings from them, that can be used for printing or further processing.*
- void [bananaPIprint](#) (struct [receiver\\_information](#) \*my\_receiver\_information)  
*This function prints the received content on the standard output and, if compiler flags are set, also on a C-Berry display.*

### 4.9.1 Detailed Description

Receiver-specific functions and structures.

#### Author

Dominik Bitzer

#### Date

2017

## 4.9.2 Function Documentation

### 4.9.2.1 bananaPIprint()

```
void bananaPIprint (
    struct receiver_information * my_receiver_information )
```

This function prints the received content on the standard output and, if compiler flags are set, also on a C-Berry display.

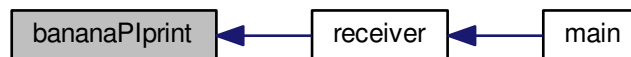
#### Parameters

<i>my_receiver_information</i>	receiver information struct, that contains display settings and contents that should be printed
--------------------------------	---

References `_`, `receiver_information::current_lan_beacon_pdu_for_printing`, `DESCRIPTOR_WIDTH`, `receiver_information::number_of_currently_received_frames`, `PARSED_TLV_MAX_NUMBER`, `received_lan_beacon_frame::parsedBeaconContents`, `receiver_information::pointers_to_received_frames`, `receiver_information::scroll_speed`, and `received_lan_beacon_frame::times_left_to_display`.

Referenced by `receiver()`.

Here is the caller graph for this function:



### 4.9.2.2 evaluatelanbeacon()

```
char** evaluatelanbeacon (
    struct received_lan_beacon_frame * my_received_lan_beacon_frame,
    struct open_ssl_keys * lanbeacon_keys )
```

This function takes raw received LAN-Beacon frames and creates strings from them, that can be used for printing or further processing.

#### Parameters

<i>my_received_lan_beacon_frame</i>	Pointer to one single received LAN-Beacon frame, that should be evaluated
<i>lanbeacon_keys</i>	Pointer to struct for keys, needed in order to verify authentication information

**Returns**

Returns parsed content as an array of TLV-descriptor and TLV-content pairs

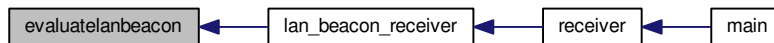
References `_`, `received_lan_beacon_frame::challenge`, `DESCRIPTOR_COMBINED_STRING`, `DESCRIPTOR_CUSTOM`, `DESCRIPTOR_DHCP`, `DESCRIPTOR_EMAIL`, `DESCRIPTOR_IPV4`, `DESCRIPTOR_IPV6`, `DESCRIPTOR_NAME`, `DESCRIPTOR_ROUTER`, `DESCRIPTOR_SIGNATURE`, `DESCRIPTOR_VLAN_ID`, `received_lan_beacon_frame::lan_beacon_ReceivedPayload`, `PARSED_TLVs_MAX_LENGTH`, `PARSED_TLVs_MAX_NUMBER`, `received_lan_beacon_frame::payloadSize`, `SUBTYPE_COMBINED_STRING`, `SUBTYPE_CUSTOM`, `SUBTYPE_DHCP`, `SUBTYPE_EMAIL`, `SUBTYPE_IPV4`, `SUBTYPE_IPV6`, `SUBTYPE_NAME`, `SUBTYPE_ROUTER`, `SUBTYPE_SIGNATURE`, `SUBTYPE_VLAN_ID`, `received_lan_beacon_frame::successfullyAuthenticated`, `TLV_CUSTOM_COPY`, `TLV_STRING_COPY`, and `verifylanbeacon()`.

Referenced by `lan_beacon_receiver()`.

Here is the call graph for this function:



Here is the caller graph for this function:

**4.9.2.3 receiver()**

```

int receiver (
    int argc,
    char ** argv )
  
```

This function has the main receiver logic and starts all other receiver functions.

**Parameters**

<i>argc</i>	Number of command line arguments.
<i>argv</i>	Contents of command line arguments.

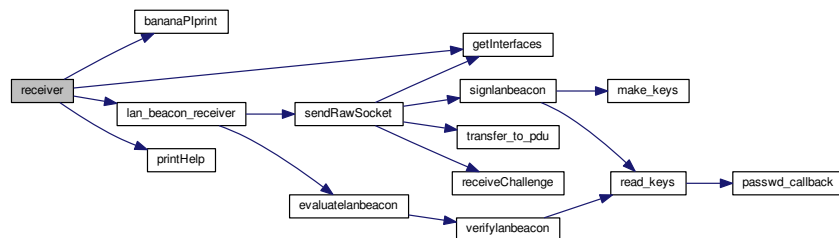
**Returns**

Error or failure code

References `_`, `receiver_information::authenticated_mode`, `bananaPIprint()`, `receiver_information::current_lan_beacon_pdu_for_printing`, `DEFAULT_SCROLLSPEED`, `getInterfaces()`, `KEY_PATHLENGTH_MAX`, `LAN_BEACON_ETHER_TYPE`, `lan_beacon_receiver()`, `receiver_information::lanbeacon_keys`, `receiver_information::my_receiver_interfaces`, `receiver_information::number_of_currently_received_frames`, `PARSED_TLV_MAX_NUMBER`, `received_lan_beacon_frame::parsedBeaconContents`, `open_ssl_keys::path_To_Verifying_Key`, `receiver_information::pointers_to_received_frames`, `printHelp()`, `PUBLIC_KEY_STANDARD_PATH`, `REC_SOCKET`, `RECEIVER_MODE`, `receiver_information::scroll_speed`, and `open_ssl_keys::sender_or_receiver_mode`.

Referenced by `main()`.

Here is the call graph for this function:



Here is the caller graph for this function:



## 4.10 sender.c File Reference

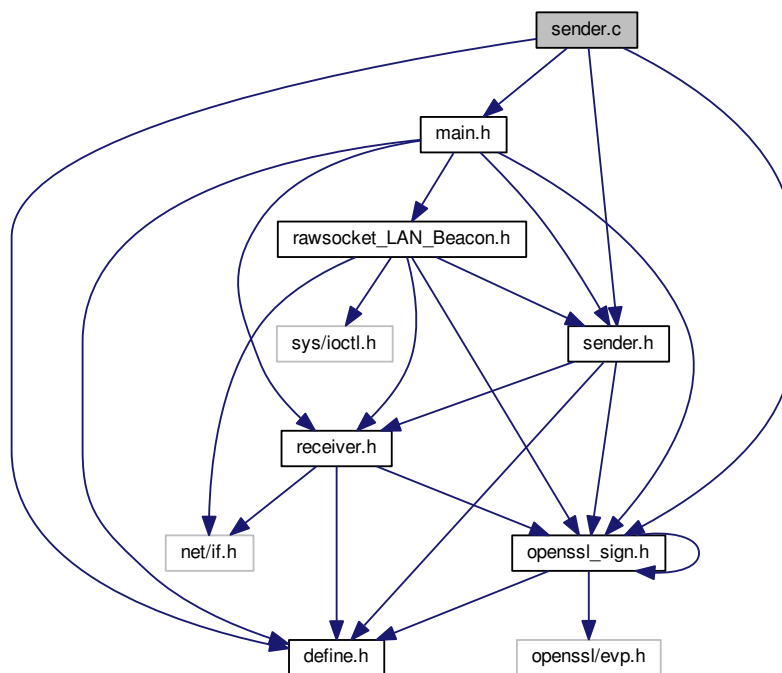
```

#include "openssl_sign.h"
#include "define.h"
#include "sender.h"
#include "main.h"

```



Include dependency graph for sender.c:



## Functions

- int [sender](#) (int argc, char \*\*argv)  
*This function has the main receiver logic and starts all other receiver functions.*
- char \* [lanbeacon\\_creator](#) (int argc, char \*\*argv, struct [sender\\_information](#) \*my\_sender\_information)  
*Creates a LAN-Beacon PDU from the command line arguments.*
- void [transfer\\_to\\_pdu\\_and\\_string](#) (unsigned char subtype, char \*TLVdescription, char \*\*combinedString, char \*source, char \*combinedBeacon, int \*currentByte)  
*Shortcut function for cases in which only a string is transferred, no binary format TLVs.*
- void [transfer\\_to\\_pdu](#) (unsigned char subtype, void \*source, char \*combinedBeacon, int \*currentByte, unsigned short int currentTLVlength)  
*Transferring the content of the field to the combined lanbeacon in binary format.*
- void [transfer\\_to\\_string](#) (char \*TLVdescription, char \*\*combinedString, char \*TLVcontents)  
*Transfer human-readable information to combined string.*
- void [ipParser](#) (int ip\_V4or6, char \*optarg, char \*\*combinedString, char \*combinedBeacon, int \*currentByte)  
*Parse IPv4 or IPv6 subnets to binary format.*

### 4.10.1 Function Documentation

#### 4.10.1.1 ipParser()

```
void ipParser (
    int ip_V4or6,
    char * optarg,
    char ** combinedString,
    char * combinedBeacon,
    int * currentByte )
```

Parse IPv4 or IPv6 subnets to binary format.

Using regex to get IP-addresses from string input, then convert them to binary representation for transport

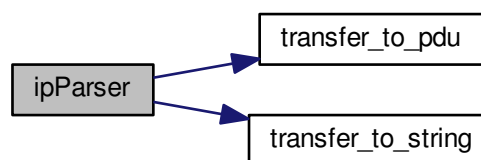
##### Parameters

<i>ip_V4or6</i>	Switch between IPv4 and IPv6 mode
<i>optarg</i>	String, which should be parsed
<i>combinedString</i>	Pointer to the string, that contains text representation of all contents
<i>combinedBeacon</i>	PDU of beacon, that TLVs should be added to
<i>currentByte</i>	current position in the Beacon-PDU

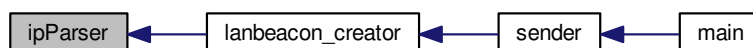
References `_`, `DESCRIPTOR_IPV4`, `DESCRIPTOR_IPV6`, `SUBTYPE_IPV4`, `SUBTYPE_IPV6`, `transfer_to_pdu()`, and `transfer_to_string()`.

Referenced by `lanbeacon_creator()`.

Here is the call graph for this function:



Here is the caller graph for this function:



## 4.10.1.2 lanbeacon\_creator()

```
char* lanbeacon_creator (
    int * argc,
    char ** argv,
    struct sender_information * my_sender_information )
```

Creates a LAN-Beacon PDU from the command line arguments.

Howto for adding new fields:

1. Add defines for desired new field in [define.h](#)
2. Add desired options in [lanbeacon\\_creator\(\)](#)

## Parameters

<i>argc</i>	Number of command line arguments.
<i>argv</i>	Contents of command line arguments.

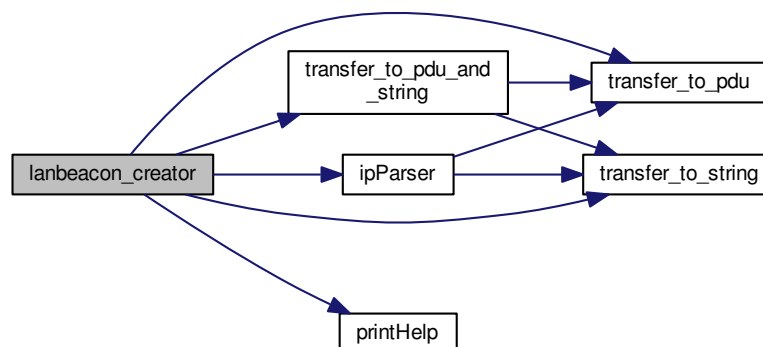
## Returns

Returns an array, that contains the payload of a lanBeacon\_PDU

References `_`, `DESCRIPTOR_CUSTOM`, `DESCRIPTOR_DHCP`, `DESCRIPTOR_EMAIL`, `DESCRIPTOR_NAME`, `DESCRIPTOR_ROUTER`, `DESCRIPTOR_VLAN_ID`, `open_ssl_keys::generate_keys`, `sender_information::interface_to_send_on`, `ipParser()`, `KEY_PATHLENGTH_MAX`, `sender_information::lan_beacon_pdu_len`, `sender_information::lanbeacon_keys`, `open_ssl_keys::path_To_Signing_Key`, `open_ssl_keys::path_To_Verifying_Key`, `open_ssl_keys::pcszPassphrase`, `printHelp()`, `sender_information::send_frequency`, `SUBTYPE_COMBINED_STRING`, `SUBTYPE_CUSTOM`, `SUBTYPE_DHCP`, `SUBTYPE_EMAIL`, `SUBTYPE_NAME`, `SUBTYPE_ROUTER`, `SUBTYPE_VLAN_ID`, `transfer_to_pdu()`, `transfer_to_pdu_and_string()`, and `transfer_to_string()`.

Referenced by `sender()`.

Here is the call graph for this function:



Here is the caller graph for this function:



#### 4.10.1.3 sender()

```

int sender (
    int argc,
    char ** argv )
  
```

This function has the main receiver logic and starts all other receiver functions.

##### Parameters

<i>argc</i>	Number of command line arguments.
<i>argv</i>	Contents of command line arguments.

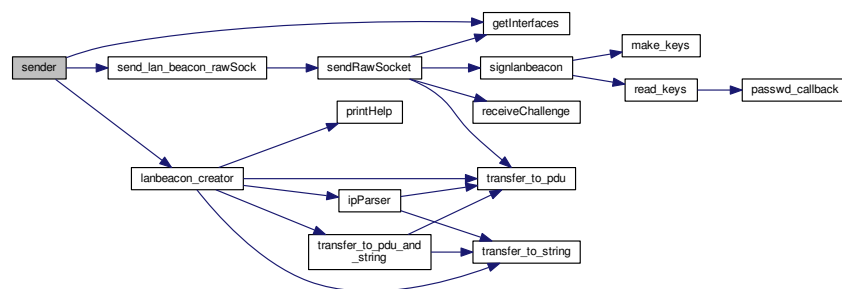
##### Returns

Error or failure code

References CHALLENGE\_ETHTYPE, getInterfaces(), sender\_information::interface\_to\_send\_on, LAN\_BEACON\_SEND\_FREQUENCY, lanbeacon\_creator(), sender\_information::lanBeacon\_PDU, sender\_information::my\_challenge\_receiver\_interfaces, PRIVATE\_KEY\_STANDARD\_PATH, PUBLIC\_KEY\_STANDARD\_PATH, RECEIVE\_SOCKET, send\_lan\_beacon\_rawSock(), and SENDER\_MODE.

Referenced by main().

Here is the call graph for this function:



Here is the caller graph for this function:



#### 4.10.1.4 transfer\_to\_pdu()

```

void transfer_to_pdu (
    unsigned char subtype,
    void * source,
    char * combinedBeacon,
    int * currentByte,
    unsigned short int currentTLVlength )
  
```

Transferring the content of the field to the combined lanbeacon in binary format.

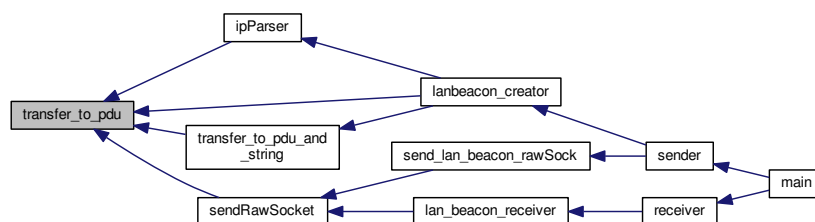
##### Parameters

<i>subtype</i>	Subtype of the TLV
<i>source</i>	String contents, that should be included to the PDU
<i>combinedBeacon</i>	PDU of beacon, that TLVs should be added to
<i>currentByte</i>	current position in the Beacon-PDU
<i>currentTLVlength</i>	Length of the passed TLV

##### References

Referenced by ipParser(), lanbeacon\_creator(), sendRawSocket(), and transfer\_to\_pdu\_and\_string().

Here is the caller graph for this function:



#### 4.10.1.5 transfer\_to\_pdu\_and\_string()

```
void transfer_to_pdu_and_string (
    unsigned char subtype,
    char * TLVdescription,
    char ** combinedString,
    char * source,
    char * combinedBeacon,
    int * currentByte )
```

Shortcut function for cases in which only a string is transferred, no binary format TLVs.

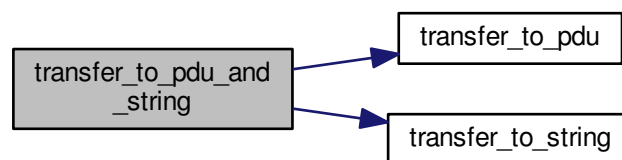
##### Parameters

<i>subtype</i>	Subtype of the TLV
<i>TLVdescription</i>	Descriptor string of the TLV
<i>combinedString</i>	Pointer to the string, that contains text representation of all contents
<i>source</i>	String contents, that should be included to the PDU
<i>combinedBeacon</i>	PDU of beacon, that TLVs should be added to
<i>currentByte</i>	current position in the Beacon-PDU

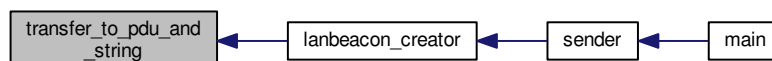
References transfer\_to\_pdu(), and transfer\_to\_string().

Referenced by lanbeacon\_creator().

Here is the call graph for this function:



Here is the caller graph for this function:



## 4.10.1.6 transfer\_to\_string()

```
void transfer_to_string (
    char * TLVdescription,
    char ** combinedString,
    char * source )
```

Transfer human-readable information to combined string.

Transferring the content of the field to the combined string in human-readable format. If one combined string exceeds 507 byte limit of TLV it is put to the next combined string TLV

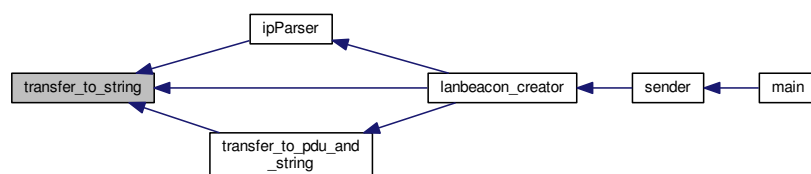
## Parameters

<i>TLVdescription</i>	Descriptor string of the TLV
<i>combinedString</i>	Pointer to the string, that contains text representation of all contents
<i>source</i>	String contents, that should be included to the PDU

References [\\_](#).

Referenced by `ipParser()`, `lanbeacon_creator()`, and `transfer_to_pdu_and_string()`.

Here is the caller graph for this function:

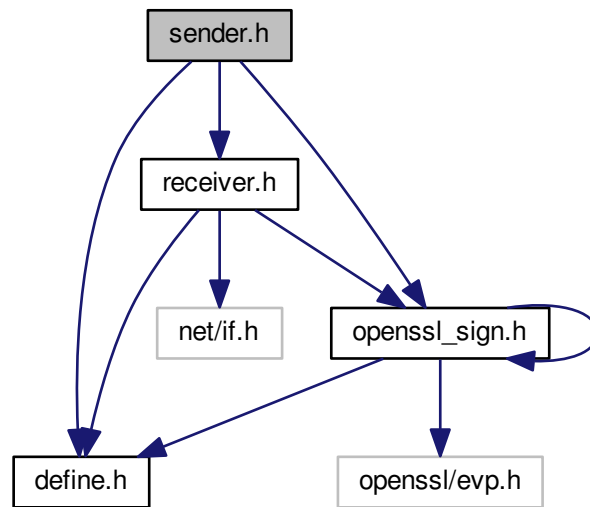


## 4.11 sender.h File Reference

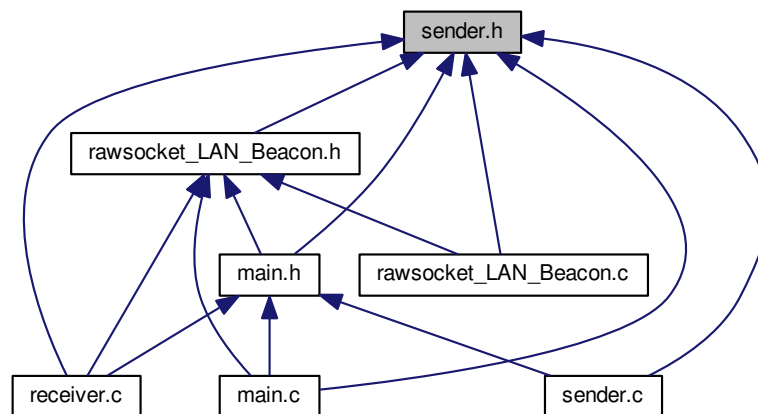
Sender-specific functions and structures.

```
#include "define.h"
#include "openssl_sign.h"
#include "receiver.h"
```

Include dependency graph for sender.h:



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



## Data Structures

- struct [sender\\_information](#)  
*Sender configurations.*



## Functions

- int [sender](#) (int argc, char \*\*argv)  
*This function has the main receiver logic and starts all other receiver functions.*
- char \* [lanbeacon\\_creator](#) (int \*argc, char \*\*argv, struct [sender\\_information](#) \*my\_sender\_information)  
*Creates a LAN-Beacon PDU from the command line arguments.*
- void [transfer\\_to\\_pdu\\_and\\_string](#) (unsigned char subtype, char \*TLVdescription, char \*\*combinedString, char \*source, char \*combinedBeacon, int \*currentByte)  
*Shortcut function for cases in which only a string is transferred, no binary format TLVs.*
- void [transfer\\_to\\_pdu](#) (unsigned char subtype, void \*source, char \*combinedBeacon, int \*currentByte, unsigned short int currentTLVlength)  
*Transferring the content of the field to the combined lanbeacon in binary format.*
- void [transfer\\_to\\_string](#) (char \*TLVdescription, char \*\*combinedString, char \*source)  
*Transfer human-readable information to combined string.*
- void [ipParser](#) (int ip\_V4or6, char \*optarg, char \*\*combinedString, char \*combinedBeacon, int \*currentByte)  
*Parse IPv4 or IPv6 subnets to binary format.*

### 4.11.1 Detailed Description

Sender-specific functions and structures.

#### Author

Dominik Bitzer

#### Date

2017

### 4.11.2 Function Documentation

#### 4.11.2.1 ipParser()

```
void ipParser (
    int ip_V4or6,
    char * optarg,
    char ** combinedString,
    char * combinedBeacon,
    int * currentByte )
```

Parse IPv4 or IPv6 subnets to binary format.

Using regex to get IP-addresses from string input, then convert them to binary representation for transport

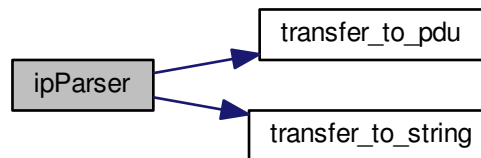
#### Parameters

<i>ip_V4or6</i>	Switch between IPv4 and IPv6 mode
<i>optarg</i>	String, which should be parsed
<i>combinedString</i>	Pointer to the string, that contains text representation of all contents
<i>combinedBeacon</i>	PDU of beacon, that TLVs should be added to
<i>currentByte</i>	current position in the Beacon-PDU

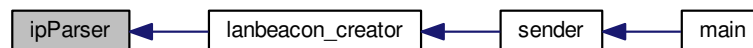
References `_`, `DESCRIPTOR_IPV4`, `DESCRIPTOR_IPV6`, `SUBTYPE_IPV4`, `SUBTYPE_IPV6`, `transfer_to_pdu()`, and `transfer_to_string()`.

Referenced by `lanbeacon_creator()`.

Here is the call graph for this function:



Here is the caller graph for this function:



#### 4.11.2.2 lanbeacon\_creator()

```

char* lanbeacon_creator (
    int * argc,
    char ** argv,
    struct sender_information * my_sender_information )
  
```

Creates a LAN-Beacon PDU from the command line arguments.

Howto for adding new fields:

1. Add defines for desired new field in [define.h](#)
2. Add desired options in [lanbeacon\\_creator\(\)](#)

#### Parameters

<code>argc</code>	Number of command line arguments.
<code>argv</code>	Contents of command line arguments.

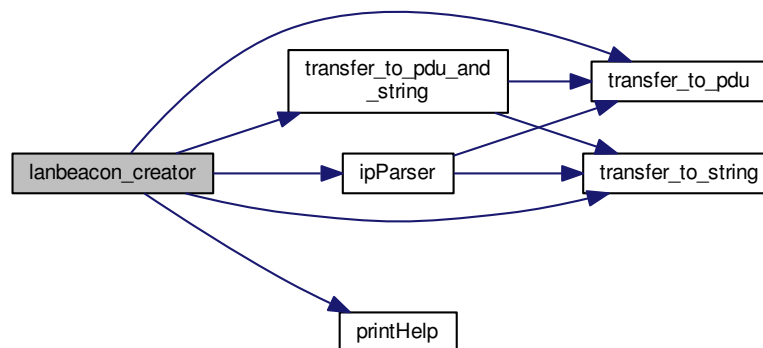
**Returns**

Returns an array, that contains the payload of a lanBeacon\_PDU

References `_`, `DESCRIPTOR_CUSTOM`, `DESCRIPTOR_DHCP`, `DESCRIPTOR_EMAIL`, `DESCRIPTOR_NAME`, `DESCRIPTOR_ROUTER`, `DESCRIPTOR_VLAN_ID`, `open_ssl_keys::generate_keys`, `sender_information::interface_to_send_on`, `ipParser()`, `KEY_PATHLENGTH_MAX`, `sender_information::lan_beacon_pdu_len`, `sender_information::lanbeacon_keys`, `open_ssl_keys::path_To_Signing_Key`, `open_ssl_keys::path_To_Verifying_Key`, `open_ssl_keys::pcszPassphrase`, `printHelp()`, `sender_information::send_frequency`, `SUBTYPE_COMBINED_STRING`, `SUBTYPE_CUSTOM`, `SUBTYPE_DHCP`, `SUBTYPE_EMAIL`, `SUBTYPE_NAME`, `SUBTYPE_ROUTER`, `SUBTYPE_VLAN_ID`, `transfer_to_pdu()`, `transfer_to_pdu_and_string()`, and `transfer_to_string()`.

Referenced by `sender()`.

Here is the call graph for this function:



Here is the caller graph for this function:

**4.11.2.3 sender()**

```

int sender (
    int argc,
    char ** argv )

```

This function has the main receiver logic and starts all other receiver functions.

## Parameters

<i>argc</i>	Number of command line arguments.
<i>argv</i>	Contents of command line arguments.

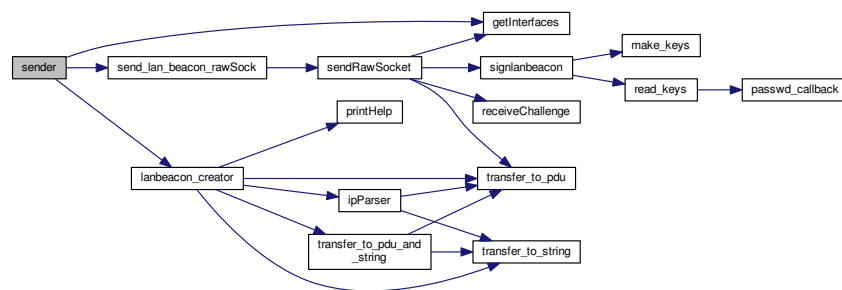
## Returns

Error or failure code

References CHALLENGE\_ETHTYPE, getInterfaces(), sender\_information::interface\_to\_send\_on, LAN\_BEACON\_SEND\_FREQUENCY, lanbeacon\_creator(), sender\_information::lanBeacon\_PDU, sender\_information::my\_challenge\_receiver\_interfaces, PRIVATE\_KEY\_STANDARD\_PATH, PUBLIC\_KEY\_STANDARD\_PATH, RECEIVE\_SOCKET, send\_lan\_beacon\_rawSock(), and SENDER\_MODE.

Referenced by main().

Here is the call graph for this function:



Here is the caller graph for this function:



## 4.11.2.4 transfer\_to\_pdu()

```

void transfer_to_pdu (
    unsigned char subtype,
    void * source,
    char * combinedBeacon,
    int * currentByte,
    unsigned short int currentTLVlength )
  
```

Transferring the content of the field to the combined lanbeacon in binary format.

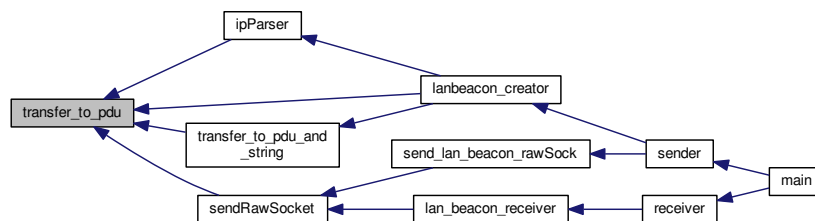
## Parameters

<i>subtype</i>	Subtype of the TLV
<i>source</i>	String contents, that should be included to the PDU
<i>combinedBeacon</i>	PDU of beacon, that TLVs should be added to
<i>currentByte</i>	current position in the Beacon-PDU
<i>currentTLVlength</i>	Length of the passed TLV

## References \_.

Referenced by ipParser(), lanbeacon\_creator(), sendRawSocket(), and transfer\_to\_pdu\_and\_string().

Here is the caller graph for this function:



## 4.11.2.5 transfer\_to\_pdu\_and\_string()

```

void transfer_to_pdu_and_string (
    unsigned char subtype,
    char * TLVdescription,
    char ** combinedString,
    char * source,
    char * combinedBeacon,
    int * currentByte )

```

Shortcut function for cases in which only a string is transferred, no binary format TLVs.

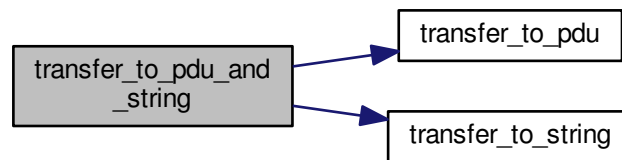
## Parameters

<i>subtype</i>	Subtype of the TLV
<i>TLVdescription</i>	Descriptor string of the TLV
<i>combinedString</i>	Pointer to the string, that contains text representation of all contents
<i>source</i>	String contents, that should be included to the PDU
<i>combinedBeacon</i>	PDU of beacon, that TLVs should be added to
<i>currentByte</i>	current position in the Beacon-PDU

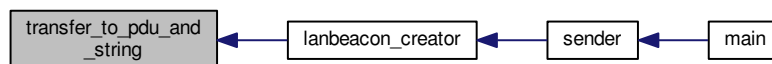
References transfer\_to\_pdu(), and transfer\_to\_string().

Referenced by `lanbeacon_creator()`.

Here is the call graph for this function:



Here is the caller graph for this function:



#### 4.11.2.6 `transfer_to_string()`

```

void transfer_to_string (
    char * TLVdescription,
    char ** combinedString,
    char * source )
  
```

Transfer human-readable information to combined string.

Transferring the content of the field to the combined string in human-readable format. If one combined string exceeds 507 byte limit of TLV it is put to the next combined string TLV

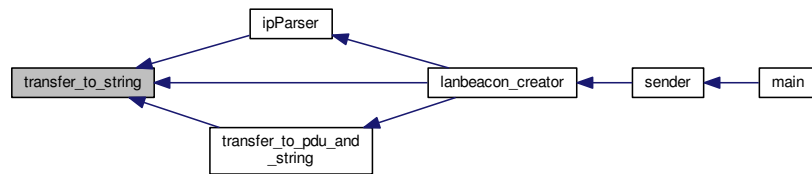
##### Parameters

<i>TLVdescription</i>	Descriptor string of the TLV
<i>combinedString</i>	Pointer to the string, that contains text representation of all contents
<i>source</i>	String contents, that should be included to the PDU

##### References

Referenced by `ipParser()`, `lanbeacon_creator()`, and `transfer_to_pdu_and_string()`.

Here is the caller graph for this function:







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