rfid

1.2.1

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Chapter 4

Module Documentation

4.1 Application Interface

Data Structures

- struct nlrf_cardinfo

  RFID card information.

Files

- file nlrf.h

  RFID API.

Defines

- #define MAX_CARDNUM_LENGTH 8

  Maxinum card id length.

Enumerations

- enum RFIDResponse {
  NLRF_OK = 0,
  NLRF_ERR_NODEV = -1,
  NLRF_ERR_NOCARD = -2,
  NLRF_ERR_WRONGKEY = -3,
  NLRF_ERR_CARDORKEY = -4,

NLRF_ERR_IGNORE_ME = -5,
NLRF_ERR_INVALID = -6,
NLRF_ERR_SETTTY = -7,
NLRF_ERR_BACKUPTTY = -8,
NLRF_ERR_RESTORETTY = -9,
NLRF_ERR_UNKNOWN = -10 }

operation responses

- enum RFIDModelType {
  NLRF_MODEL_V1,
  NLRF_MODEL_V2,
  NLRF_MODEL_V3 }

  model types

- enum RFIDCardType {
  MIFARE_S50 = 0x01,
  MIFARE_ULTRALIGHT = 0x02,
  AT88RF020 = 0x04,
  ICODE_2 = 0x08 }

  card types

Functions

- int nlrf_open (const char ∗dev_name)

  Open RFID device.

- int nlrf_close (int fd)

  Close RFID device.

- int nlrf_querycardinfo (int fd, struct nlrf_cardinfo ∗info)

  Query card information.

- int nlrf_send_querycardinfo (int fd)

  Asynchronous query card information.

- int nlrf_fetch_querycardinfo (int fd, struct nlrf_cardinfo ∗info)

  Asynchronous fecth card information.

- int nlrf_chkkey (int fd, const unsigned char ∗key, int length)

  Set access key.

- int nlrf_setkey (int fd, int sector, const unsigned char ∗oldkey, const unsigned char ∗newkey, int length)

  Change access key for the specified sector.

- int nlrf_readblock (int fd, int sector, int block, unsigned char ∗data, int length)

  Read data.

- int nlrf_writeblock (int fd, int sector, int block, const unsigned char ∗data, int length)

  Write data.

- int nlrf_get_modeltype (int fd)

  Get current model type.

- int nlrf_set_cardtype (int fd, int cardtype)

  Set detectable card types.

4.1.1 Enumeration Type Documentation

4.1.1.1 enum RFIDCardType

card types

Enumerator:

MIFARE_S50 MIFARE S50. Spec:

- Protocol : ISO14443_TYPE_A
- Card ID length : 4
- Sectors : 16
- Blocks per sector : 3
- Bytes per block : 16
- Access key length : 12

MIFARE_ULTRALIGHT MIFARE Ultralight. Spec:

- Protocol : ISO14443_TYPE_A
- Card ID length : 4
- Sectors : 4
- Blocks per sector : 4
- Bytes per block : 4
- Access key length : not required

AT88RF020 AT88RF020. Spec:

- Protocol : ISO14443_TYPE_B
- Card ID length : 4
- Sectors : 1

- Blocks per sector : 32
- Bytes per block : 8
- Access key length : 8

ICODE_2 ICODE 2. Spec:

- Protocol : ISO15693
- Card ID length : 8
- Sectors : 1
- Blocks per sector : 28
- Bytes per block : 4
- Access key length : not required

Definition at line 92 of file nlrf.h.

4.1.1.2 enum RFIDModelType

model types

Enumerator:

NLRF_MODEL_V1 Model V1. Supported card types:

- MIFARE_S50

NLRF_MODEL_V2 Model V2. Supported card types:

- MIFARE_S50

NLRF_MODEL_V3 Model V3. Supported card types:

- MIFARE_S50
- MIFARE_ULTRALIGHT
- AT88RF020
- ICODE_2

Definition at line 55 of file nlrf.h.

4.1.1.3 enum RFIDResponse

operation responses

Enumerator:

NLRF_OK operation success

NLRF_ERR_NODEV rfid device does not exist

NLRF_ERR_NOCARD no rfid card detected

NLRF_ERR_WRONGKEY invalid authen key

NLRF_ERR_CARDORKEY no card detected or invalid key

NLRF_ERR_IGNORE_ME just ignore this error

NLRF_ERR_INVALID	invalid input parameter
NLRF_ERR_SETTTY	error while setting tty
NLRF_ERR_BACKUPTTY	error while backuping tty
NLRF_ERR_RESTORETTY	error while restore tty
NLRF_ERR_UNKNOWN	unknown error occurred

Definition at line 36 of file nlrf.h.

4.1.2 Function Documentation

4.1.2.1 int nlrf_chkkey (int *fd*, const unsigned char * *key*, int *length*)

Set access key.

Parameters

in	*fd*	file descriptor
in	*key*	access key
in	*length*	access key length

Returns

operation result

Return values

NLRF_OK	
NLRF_ERR_NODEV	
NLRF_ERR_-INVALID	
NLRF_ERR_-NOCARD	
NLRF_ERR_-WRONGKEY	
NLRF_ERR_-CARDORKEY	

Attention

Call this function before nlrf_readblock and nlrf_writeblock

4.1.2.2 int nlrf_close (int *fd*)

Close RFID device.

Parameters

in	*fd*	file descriptor

Returns

operation result

Return values

NLRF_OK	
NLRF_ERR_-RESTORETTY	

4.1.2.3 int nlrf_fetch_querycardinfo (int *fd,* struct nlrf_cardinfo ∗ *info*)

Asynchronous fecth card information.

Parameters

`in`	*fd*	file descriptor
`out`	*info*	card information

Returns

operation result

Return values

NLRF_OK	
NLRF_ERR_NODEV	
NLRF_ERR_-INVALID	
NLRF_ERR_-IGNORE_ME	
NLRF_ERR_-NOCARD	

4.1.2.4 int nlrf_get_modeltype (int *fd*)

Get current model type.

Parameters

`in`	*fd*	file descriptor

Returns

Model Type

Return values

NLRF_MODEL_V1	
NLRF_MODEL_V2	
NLRF_MODEL_V3	

NLRF_ERR_NODEV	

4.1.2.5 int nlrf_open (const char * *dev_name*)

Open RFID device.

Parameters

`in`	*dev_name*	device file path

Returns

file descriptor for RFID device

Return values

fd	
NLRF_ERR_NODEV	
NLRF_ERR_-BACKUPTTY	
NLRF_ERR_-SETTTY	

4.1.2.6 int nlrf_querycardinfo (int *fd,* struct nlrf_cardinfo * *info*)

Query card information.

Parameters

`in`	*fd*	file descriptor
`out`	*info*	card information

Returns

operation result

Return values

NLRF_OK	
NLRF_ERR_NODEV	
NLRF_ERR_-NOCARD	

4.1.2.7 int nlrf_readblock (int *fd,* int *sector,* int *block,* unsigned char * *data,* int *length*)

Read data.

Parameters

in	*fd*	file descriptor
in	*sector*	sector id
in	*block*	block id
out	*data*	read data buffer
in	*length*	data length

Returns

operation result

Return values

NLRF_OK	
NLRF_ERR_NODEV	
NLRF_ERR_-INVALID	
NLRF_ERR_-NOCARD	
NLRF_ERR_-WRONGKEY	
NLRF_ERR_-CARDORKEY	

4.1.2.8 int nlrf_send_querycardinfo (int *fd*)

Asynchronous query card information.

Parameters

in	*fd*	file descriptor

Returns

operation result

Return values

NLRF_OK	
NLRF_ERR_NODEV	

4.1.2.9 int nlrf_set_cardtype (int *fd,* int *cardtype*)

Set detectable card types.

Parameters

in	*fd*	file descriptor
in	*cardtype*	detectable card types

Returns

operation result

Return values

NLRF_OK	
NLRF_ERR_-INVALID	

Attention

Only work on NLRF_MODEL_V3, using bitwise-or to set multiple card types, ex: MIFARE_S50 | AT88RF020. Default action is detecting all types of cards

4.1.2.10 int nlrf_setkey (int *fd,* int *sector,* const unsigned char ∗ *oldkey,* const unsigned char ∗ *newkey,* int *length*)

Change access key for the specified sector.

Parameters

in	*fd*	file descriptor
in	*sector*	sector id
in	*oldkey*	old access key
in	*newkey*	new access key
in	*length*	access key length

Returns

operation result

Return values

NLRF_OK	
NLRF_ERR_NODEV	
NLRF_ERR_-INVALID	
NLRF_ERR_-NOCARD	
NLRF_ERR_-WRONGKEY	
NLRF_ERR_-CARDORKEY	

Attention

Each sector requires its own access key

4.1.2.11 int nlrf_writeblock (int *fd,* int *sector,* int *block,* const unsigned char * *data,* int *length*)

Write data.

Parameters

in	*fd*	file descriptor
in	*sector*	sector id
in	*block*	block id
in	*data*	write data buffer
in	*length*	data length

Returns

operation result

Return values

NLRF_OK	
NLRF_ERR_NODEV	
NLRF_ERR_-INVALID	
NLRF_ERR_-NOCARD	
NLRF_ERR_-WRONGKEY	
NLRF_ERR_-CARDORKEY	

Chapter 5

Data Structure Documentation

5.1 nlrf_cardinfo Struct Reference

RFID card information.

```
#include <nlrf.h>
```

Data Fields

- int cardtype

    card type

- int nsector

    total sectors

- int nblock

    blocks per sector

- int blocksize

    bytes per block

- int keysize

    access key length

- int idlen

    card id length

- unsigned char cardnum [MAX_CARDNUM_LENGTH]

    card id

5.1.1 Detailed Description

RFID card information.

Definition at line 155 of file nlrf.h.

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

- nlrf.h

Chapter 6

File Documentation

6.1 main.c File Reference

Demo.

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
#include <fcntl.h>
#include <unistd.h>
#include "nlrf.h"
```

Functions

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

6.1.1 Detailed Description

Demo. This demo program will work on all models

Author

Lin Yuning (lyn), `linyn@newlandcomputer.com`

Definition in file main.c.

6.2 nlrf.h File Reference

RFID API.

Data Structures

- struct nlrf_cardinfo

  RFID card information.

Defines

- #define MAX_CARDNUM_LENGTH 8

  Maxinum card id length.

Enumerations

- enum RFIDResponse {
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  NLRF_ERR_NODEV = -1,
  NLRF_ERR_NOCARD = -2,
  NLRF_ERR_WRONGKEY = -3,
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  operation responses

- enum RFIDModelType {
  NLRF_MODEL_V1,
  NLRF_MODEL_V2,
  NLRF_MODEL_V3 }

  model types

- enum RFIDCardType {
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  MIFARE_ULTRALIGHT = 0x02,
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  card types

Functions

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  Close RFID device.

- int nlrf_querycardinfo (int fd, struct nlrf_cardinfo ∗info)

  Query card information.

- int nlrf_send_querycardinfo (int fd)

  Asynchronous query card information.

- int nlrf_fetch_querycardinfo (int fd, struct nlrf_cardinfo ∗info)

  Asynchronous fecth card information.

- int nlrf_chkkey (int fd, const unsigned char ∗key, int length)

  Set access key.

- int nlrf_setkey (int fd, int sector, const unsigned char ∗oldkey, const unsigned char ∗newkey, int length)

  Change access key for the specified sector.

- int nlrf_readblock (int fd, int sector, int block, unsigned char ∗data, int length)

  Read data.

- int nlrf_writeblock (int fd, int sector, int block, const unsigned char ∗data, int length)

  Write data.

- int nlrf_get_modeltype (int fd)

  Get current model type.

- int nlrf_set_cardtype (int fd, int cardtype)

  Set detectable card types.

6.2.1 Detailed Description

RFID API. API for RFID reader

Author

Lin Yuning (lyn), linyn@newlandcomputer.com

Definition in file nlrf.h.