

CLD

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Chapter 1

Data Structure Index

1.1 Data Structures

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Chapter 2

File Index

2.1 File List

Here is a list of all files with brief descriptions:

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Chapter 3

Data Structure Documentation

3.1 cld_dirent_cur Struct Reference

```
#include <cldc.h>
```

Data Fields

- const void * [p](#)
- size_t [tmp_len](#)

3.1.1 Field Documentation

3.1.1.1 const void* [cld_dirent_cur::p](#)

3.1.1.2 size_t [cld_dirent_cur::tmp_len](#)

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

- include/[cldc.h](#)

3.2 cld_timer Struct Reference

```
#include <cld_common.h>
```

Data Fields

- bool [fired](#)
- bool [on_list](#)
- void(* [cb](#))(struct [cld_timer](#) *)
- void * [userdata](#)
- time_t [expires](#)
- char [name](#) [32]

3.2.1 Field Documentation

3.2.1.1 `void(* cld_timer::cb)(struct cld_timer *)`

3.2.1.2 `time_t cld_timer::expires`

3.2.1.3 `bool cld_timer::fired`

3.2.1.4 `char cld_timer::name[32]`

3.2.1.5 `bool cld_timer::on_list`

3.2.1.6 `void* cld_timer::userdata`

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

- [include/cld_common.h](#)

3.3 cld_timer_list Struct Reference

```
#include <cld_common.h>
```

Data Fields

- `void * list`

3.3.1 Field Documentation

3.3.1.1 `void* cld_timer_list::list`

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

- [include/cld_common.h](#)

3.4 cldc_call_opts Struct Reference

per-operation application options

```
#include <cldc.h>
```

Data Fields

- `int(* cb)(struct cldc_call_opts *, enum cle_err_codes)`
- `void * private`
- `struct cld_msg_get_resp resp`

3.4.1 Detailed Description

per-operation application options

3.4.2 Field Documentation

3.4.2.1 `int(* cldc_call_opts::cb)(struct cldc_call_opts *, enum cle_err_codes)`

3.4.2.2 `void* cldc_call_opts::private`

3.4.2.3 `struct cld_msg_get_resp cldc_call_opts::resp`

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

- `include/cldc.h`

3.5 cldc_fh Struct Reference

an open file handle associated with a session

```
#include <cldc.h>
```

Data Fields

- `uint64_t fh`
- `struct cldc_session * sess`
- `bool valid`

3.5.1 Detailed Description

an open file handle associated with a session

3.5.2 Field Documentation

3.5.2.1 `uint64_t cldc_fh::fh`

3.5.2.2 `struct cldc_session* cldc_fh::sess`

3.5.2.3 `bool cldc_fh::valid`

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

- `include/cldc.h`

3.6 cldc_host Struct Reference

Information for a single CLD server host.

```
#include <cldc.h>
```

Data Fields

- unsigned int [prio](#)
- unsigned int [weight](#)
- char * [host](#)
- unsigned short [port](#)

3.6.1 Detailed Description

Information for a single CLD server host.

3.6.2 Field Documentation

3.6.2.1 char* cldc_host::host

3.6.2.2 unsigned short cldc_host::port

3.6.2.3 unsigned int cldc_host::prio

3.6.2.4 unsigned int cldc_host::weight

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

- [include/cldc.h](#)

3.7 cldc_msg Struct Reference

an outgoing message, from client to server

```
#include <cldc.h>
```

Data Fields

- uint64_t [xid](#)
- enum cld_msg_op [op](#)
- struct [cldc_session](#) * [sess](#)
- ssize_t(* [cb](#))(struct [cldc_msg](#) *, const void *, size_t, enum cle_err_codes)
- void * [cb_private](#)
- struct [cldc_call_opts](#) [copts](#)
- bool [done](#)
- time_t [expire_time](#)
- int [n_pkts](#)
- struct [cldc_pkt_info](#) * [pkt_info](#) [0]

3.7.1 Detailed Description

an outgoing message, from client to server

3.7.2 Field Documentation

3.7.2.1 `ssize_t(* cldc_msg::cb)(struct cldc_msg *, const void *, size_t, enum cle_err_codes)`

3.7.2.2 `void* cldc_msg::cb_private`

3.7.2.3 `struct cldc_call_opts cldc_msg::copts`

3.7.2.4 `bool cldc_msg::done`

3.7.2.5 `time_t cldc_msg::expire_time`

3.7.2.6 `int cldc_msg::n_pkts`

3.7.2.7 `enum cld_msg_op cldc_msg::op`

3.7.2.8 `struct cldc_pkt_info* cldc_msg::pkt_info[0]`

3.7.2.9 `struct cldc_session* cldc_msg::sess`

3.7.2.10 `uint64_t cldc_msg::xid`

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

- [include/cldc.h](#)

3.8 cldc_node_metadata Struct Reference

```
#include <cldc.h>
```

Data Fields

- `quad_t inum`
- `quad_t vers`
- `quad_t time_create`
- `quad_t time_modify`
- `int flags`
- `const char * inode_name`

3.8.1 Field Documentation

3.8.1.1 `int cldc_node_metadata::flags`

3.8.1.2 `const char* cldc_node_metadata::inode_name`

3.8.1.3 `quad_t cldc_node_metadata::inum`

3.8.1.4 `quad_t cldc_node_metadata::time_create`

3.8.1.5 `quad_t cldc_node_metadata::time_modify`

3.8.1.6 `quad_t cldc_node_metadata::vers`

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

- [include/cldc.h](#)

3.9 cldc_ops Struct Reference

application-supplied facilities

```
#include <cldc.h>
```

Data Fields

- `bool(* timer_ctl)(void *private, bool add, int(*cb)(struct cldc_session *, void *), void *cb_private, time_t secs)`
- `int(* pkt_send)(void *private, const void *addr, size_t addrlen, const void *buf, size_t buflen)`
- `void(* event)(void *private, struct cldc_session *, struct cldc_fh *, uint32_t)`

3.9.1 Detailed Description

application-supplied facilities

3.9.2 Field Documentation

3.9.2.1 `void(* cldc_ops::event)(void *private, struct cldc_session *, struct cldc_fh *, uint32_t)`

3.9.2.2 `int(* cldc_ops::pkt_send)(void *private, const void *addr, size_t addrlen, const void *buf, size_t buflen)`

3.9.2.3 `bool(* cldc_ops::timer_ctl)(void *private, bool add, int(*cb)(struct cldc_session *, void *), void *cb_private, time_t secs)`

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

- [include/cldc.h](#)

3.10 cldc_pkt_info Struct Reference

```
#include <cldc.h>
```

Data Fields

- int [pkt_len](#)
- int [hdr_len](#)
- int [retries](#)
- char [user](#) [CLD_MAX_USERNAME]
- char [data](#) [0]

3.10.1 Field Documentation

3.10.1.1 char [cldc_pkt_info::data](#)[0]

3.10.1.2 int [cldc_pkt_info::hdr_len](#)

3.10.1.3 int [cldc_pkt_info::pkt_len](#)

3.10.1.4 int [cldc_pkt_info::retries](#)

3.10.1.5 char [cldc_pkt_info::user](#)[CLD_MAX_USERNAME]

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

- include/[cldc.h](#)

3.11 cldc_session Struct Reference

a single CLD client session

```
#include <cldc.h>
```

Data Fields

- uint8_t [sid](#) [CLD_SID_SZ]
- struct [cldc_ops](#) * [ops](#)
- struct [hail_log](#) [log](#)
- void * [private](#)
- uint8_t [addr](#) [64]
- size_t [addr_len](#)
- GArray * [fh](#)
- GList * [out_msg](#)
- time_t [msg_scan_time](#)
- time_t [expire_time](#)
- bool [expired](#)
- uint64_t [next_seqid_in](#)

- uint64_t `next_seqid_in_tr`
- uint64_t `next_seqid_out`
- char `user` [CLD_MAX_USERNAME]
- char `secret_key` [CLD_MAX_SECRET_KEY]
- bool `confirmed`
- enum `cld_msg_op` `msg_buf_op`
- unsigned int `msg_buf_len`
- char `msg_buf` [CLD_MAX_MSG_SZ]
- char `payload` [CLD_MAX_PAYLOAD_SZ]
- char `inode_name_temp` [CLD_INODE_NAME_MAX]

3.11.1 Detailed Description

a single CLD client session

3.11.2 Field Documentation

- 3.11.2.1 `uint8_t cldc_session::addr[64]`
- 3.11.2.2 `size_t cldc_session::addr_len`
- 3.11.2.3 `bool cldc_session::confirmed`
- 3.11.2.4 `time_t cldc_session::expire_time`
- 3.11.2.5 `bool cldc_session::expired`
- 3.11.2.6 `GArray* cldc_session::fh`
- 3.11.2.7 `char cldc_session::inode_name_temp[CLD_INODE_NAME_MAX]`
- 3.11.2.8 `struct hail_log cldc_session::log`
- 3.11.2.9 `char cldc_session::msg_buf[CLD_MAX_MSG_SZ]`
- 3.11.2.10 `unsigned int cldc_session::msg_buf_len`
- 3.11.2.11 `enum cld_msg_op cldc_session::msg_buf_op`
- 3.11.2.12 `time_t cldc_session::msg_scan_time`
- 3.11.2.13 `uint64_t cldc_session::next_seqid_in`
- 3.11.2.14 `uint64_t cldc_session::next_seqid_in_tr`
- 3.11.2.15 `uint64_t cldc_session::next_seqid_out`
- 3.11.2.16 `struct cldc_ops* cldc_session::ops`
- 3.11.2.17 `GList* cldc_session::out_msg`
- 3.11.2.18 `char cldc_session::payload[CLD_MAX_PAYLOAD_SZ]`
- 3.11.2.19 `void* cldc_session::private`
- 3.11.2.20 `char cldc_session::secret_key[CLD_MAX_SECRET_KEY]`
- 3.11.2.21 `uint8_t cldc_session::sid[CLD_SID_SZ]`
- 3.11.2.22 `char cldc_session::user[CLD_MAX_USERNAME]`

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

- [include/cldc.h](#)

3.12 cldc_udp Struct Reference

A UDP implementation of the CLD client protocol.

```
#include <cldc.h>
```

Data Fields

- uint8_t [addr](#) [64]
- size_t [addr_len](#)
- int [fd](#)
- struct [cldc_session](#) * [sess](#)
- int(* [cb](#))(struct [cldc_session](#) *, void *)
- void * [cb_private](#)

3.12.1 Detailed Description

A UDP implementation of the CLD client protocol.

3.12.2 Field Documentation

3.12.2.1 uint8_t [cldc_udp::addr](#)[64]

3.12.2.2 size_t [cldc_udp::addr_len](#)

3.12.2.3 int(* [cldc_udp::cb](#))(struct [cldc_session](#) *, void *)

3.12.2.4 void* [cldc_udp::cb_private](#)

3.12.2.5 int [cldc_udp::fd](#)

3.12.2.6 struct [cldc_session](#)* [cldc_udp::sess](#)

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

- [include/cldc.h](#)

3.13 hail_log Struct Reference

```
#include <hail_log.h>
```

Data Fields

- void(* [func](#))(int prio, const char *fmt,...) ATTR_PRINTF(2
- void(*) boo [debug](#))
- bool [verbose](#)

3.13.1 Field Documentation

3.13.1.1 void(*) boo hail_log::debug)

3.13.1.2 void(* hail_log::func)(int prio, const char *fmt,...) ATTR_PRINTF(2

3.13.1.3 bool hail_log::verbose

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

- include/hail_log.h

3.14 ncld_fh Struct Reference

```
#include <ncld.h>
```

Data Fields

- struct ncld_sess * sess
- struct cldc_fh * fh
- bool is_open
- int errc
- int nios
- unsigned int event_mask
- void(* event_func)(void *, unsigned int)
- void * event_arg

3.14.1 Field Documentation

3.14.1.1 int ncld_fh::errc

3.14.1.2 void* ncld_fh::event_arg

3.14.1.3 void(* ncld_fh::event_func)(void *, unsigned int)

3.14.1.4 unsigned int ncld_fh::event_mask

3.14.1.5 struct cldc_fh* ncld_fh::fh

3.14.1.6 bool ncld_fh::is_open

3.14.1.7 int ncld_fh::nios

3.14.1.8 struct ncld_sess* ncld_fh::sess

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

- include/ncld.h

3.15 nclد_read Struct Reference

```
#include <nclد.h>
```

Data Fields

- const void * [ptr](#)
- long [length](#)
- struct [cldc_node_metadata](#) [meta](#)
- struct [nclد_fh](#) * [fh](#)
- bool [is_done](#)
- int [errc](#)

3.15.1 Field Documentation

3.15.1.1 int nclد_read::errc

3.15.1.2 struct nclد_fh* nclد_read::fh

3.15.1.3 bool nclد_read::is_done

3.15.1.4 long nclد_read::length

3.15.1.5 struct cldc_node_metadata nclد_read::meta

3.15.1.6 const void* nclد_read::ptr

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

- include/[nclد.h](#)

3.16 nclد_sess Struct Reference

```
#include <nclد.h>
```

Data Fields

- char * [host](#)
- unsigned short [port](#)
- GMutex * [mutex](#)
- GCond * [cond](#)
- GThread * [thread](#)
- bool [is_up](#)
- bool [open_done](#)
- int [errc](#)
- GList * [handles](#)
- int [to_thread](#) [2]
- struct [cldc_udp](#) * [udp](#)

- struct [cld_timer](#) [udp_timer](#)
- struct [cld_timer_list](#) [tlist](#)
- void(* [event](#))(void *, unsigned int)
- void * [event_arg](#)

3.16.1 Field Documentation

3.16.1.1 `GCond* ncld_sess::cond`

3.16.1.2 `int ncld_sess::errc`

3.16.1.3 `void(* ncld_sess::event)(void *, unsigned int)`

3.16.1.4 `void* ncld_sess::event_arg`

3.16.1.5 `GList* ncld_sess::handles`

3.16.1.6 `char* ncld_sess::host`

3.16.1.7 `bool ncld_sess::is_up`

3.16.1.8 `GMutex* ncld_sess::mutex`

3.16.1.9 `bool ncld_sess::open_done`

3.16.1.10 `unsigned short ncld_sess::port`

3.16.1.11 `GThread* ncld_sess::thread`

3.16.1.12 `struct cld_timer_list ncld_sess::tlist`

3.16.1.13 `int ncld_sess::to_thread[2]`

3.16.1.14 `struct clde_udp* ncld_sess::udp`

3.16.1.15 `struct cld_timer ncld_sess::udp_timer`

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

- [include/ncld.h](#)

Chapter 4

File Documentation

4.1 include/cld-private.h File Reference

```
#include <stdint.h>
#include <glib.h>
```

4.2 include/cld_common.h File Reference

```
#include <stdint.h>
#include <stdbool.h>
#include <string.h>
#include <time.h>
#include <openssl/sha.h>
#include <cld_msg_rpc.h>
```

Data Structures

- struct [cld_timer_list](#)
- struct [cld_timer](#)

Defines

- #define [CLD_ALIGN8](#)(n) ((8 - ((n) & 7)) & 7)
- #define [SIDFMT](#) "%016llx"
- #define [SIDARG](#)(sid) cld_sid2llu(sid)
- #define [CLD_PKT_FTR_LEN](#) sizeof(struct cld_pkt_ftr)
Length of the packet footer.
- #define [PKT_HDR_TO_STR_SCRATCH_LEN](#) 128

Functions

- void `cld_timer_add` (struct `cld_timer_list` *tlist, struct `cld_timer` *timer, time_t expires)
- void `cld_timer_del` (struct `cld_timer_list` *tlist, struct `cld_timer` *timer)
- time_t `cld_timers_run` (struct `cld_timer_list` *tlist)
- unsigned long long `cld_sid2llu` (const uint8_t *sid)
- void `__cld_rand64` (void *p)
- const char * `cld_errstr` (enum `cle_err_codes` ecode)
- int `cld_readport` (const char *fname)
- int `__cld_authcheck` (struct `hail_log` *log, const char *key, const void *buf, size_t buf_len, const void *sha)
- int `__cld_authsign` (struct `hail_log` *log, const char *key, const void *buf, size_t buf_len, void *sha)
- const char * `__cld_opstr` (enum `cld_msg_op`)
- const char * `__cld_pkt_hdr_to_str` (char *scratch, const char *pkt_hdr, size_t pkt_len)
- void `__cld_dump_buf` (const void *buf, size_t len)
- struct `__attribute__((packed)) cld_pkt_ftr`

Footer that appears at the end of each packet.

4.2.1 Define Documentation

4.2.1.1 `#define CLD_ALIGN8(n) ((8 - ((n) & 7)) & 7)`

4.2.1.2 `#define CLD_PKT_FTR_LEN sizeof(struct cld_pkt_ftr)`

Length of the packet footer.

This size is fixed

4.2.1.3 `#define PKT_HDR_TO_STR_SCRATCH_LEN 128`

4.2.1.4 `#define SIDARG(sid) cld_sid2llu(sid)`

4.2.1.5 `#define SIDFMT "%016llx"`

4.2.2 Function Documentation

4.2.2.1 `struct __attribute__((packed)) [read]`

Footer that appears at the end of each packet.

< packet sequence ID

< packet signature

- 4.2.2.2 `int __cld_authcheck (struct hail_log * log, const char * key, const void * buf, size_t buf_len, const void * sha)`
- 4.2.2.3 `int __cld_authsign (struct hail_log * log, const char * key, const void * buf, size_t buf_len, void * sha)`
- 4.2.2.4 `void __cld_dump_buf (const void * buf, size_t len)`
- 4.2.2.5 `const char* __cld_opstr (enum cld_msg_op)`
- 4.2.2.6 `const char* __cld_pkt_hdr_to_str (char * scratch, const char * pkt_hdr, size_t pkt_len)`
- 4.2.2.7 `void __cld_rand64 (void * p)`
- 4.2.2.8 `const char* cld_errstr (enum cle_err_codes ecode)`
- 4.2.2.9 `int cld_readport (const char * fname)`
- 4.2.2.10 `unsigned long long cld_sid2llu (const uint8_t * sid)`
- 4.2.2.11 `void cld_timer_add (struct cld_timer_list * tlist, struct cld_timer * timer, time_t expires)`
- 4.2.2.12 `void cld_timer_del (struct cld_timer_list * tlist, struct cld_timer * timer)`
- 4.2.2.13 `time_t cld_timers_run (struct cld_timer_list * tlist)`

4.3 include/cldc.h File Reference

```
#include <sys/types.h>
#include <stdbool.h>
#include <glib.h>
#include <cld_msg_rpc.h>
#include <cld_common.h>
#include <hail_log.h>
```

Data Structures

- struct [cldc_call_opts](#)
per-operation application options
- struct [cldc_node_metadata](#)
- struct [cldc_pkt_info](#)
- struct [cldc_msg](#)
an outgoing message, from client to server
- struct [cldc_fh](#)
an open file handle associated with a session

- struct [cldc_ops](#)
application-supplied facilities
- struct [cldc_session](#)
a single CLD client session
- struct [cldc_host](#)
Information for a single CLD server host.
- struct [cldc_udp](#)
A UDP implementation of the CLD client protocol.
- struct [cld_dirent_cur](#)

Functions

- int [cldc_receive_pkt](#) (struct [cldc_session](#) *sess, const void *net_addr, size_t net_addrlen, const void *buf, size_t buflen)
Packet received from remote host.
- void [cldc_init](#) (void)
- int [cldc_new_sess](#) (const struct [cldc_ops](#) *ops, const struct [cldc_call_opts](#) *copts, const void *addr, size_t addr_len, const char *user, const char *secret_key, void *private, struct [cldc_session](#) **sess_out)
- void [cldc_kill_sess](#) (struct [cldc_session](#) *sess)
- int [cldc_end_sess](#) (struct [cldc_session](#) *sess, const struct [cldc_call_opts](#) *copts)
- int [cldc_nop](#) (struct [cldc_session](#) *sess, const struct [cldc_call_opts](#) *copts)
- int [cldc_del](#) (struct [cldc_session](#) *sess, const struct [cldc_call_opts](#) *copts, const char *pathname)
- int [cldc_open](#) (struct [cldc_session](#) *sess, const struct [cldc_call_opts](#) *copts, const char *pathname, uint32_t open_mode, uint32_t events, struct [cldc_fh](#) **fh_out)
- int [cldc_close](#) (struct [cldc_fh](#) *fh, const struct [cldc_call_opts](#) *copts)
- int [cldc_unlock](#) (struct [cldc_fh](#) *fh, const struct [cldc_call_opts](#) *copts)
- int [cldc_lock](#) (struct [cldc_fh](#) *fh, const struct [cldc_call_opts](#) *copts, uint32_t lock_flags, bool wait_for_lock)
- int [cldc_put](#) (struct [cldc_fh](#) *fh, const struct [cldc_call_opts](#) *copts, const void *data, size_t data_len)
- int [cldc_get](#) (struct [cldc_fh](#) *fh, const struct [cldc_call_opts](#) *copts, bool metadata_only)
- int [cldc_dirent_count](#) (const void *data, size_t data_len)
- int [cldc_dirent_first](#) (struct [cld_dirent_cur](#) *dc)
- int [cldc_dirent_next](#) (struct [cld_dirent_cur](#) *dc)
- void [cldc_dirent_cur_init](#) (struct [cld_dirent_cur](#) *dc, const void *buf, size_t buflen)
- void [cldc_dirent_cur_fini](#) (struct [cld_dirent_cur](#) *dc)
- char * [cldc_dirent_name](#) (struct [cld_dirent_cur](#) *dc)
- void [cldc_coops_get_data](#) (const struct [cldc_call_opts](#) *copts, char **data, size_t *data_len)
- void [cldc_coops_get_metadata](#) (const struct [cldc_call_opts](#) *copts, struct [cldc_node_metadata](#) *md)
- void [cldc_udp_free](#) (struct [cldc_udp](#) *udp)
- int [cldc_udp_new](#) (const char *hostname, int port, struct [cldc_udp](#) **udp_out)
- int [cldc_udp_receive_pkt](#) (struct [cldc_udp](#) *udp)
- int [cldc_udp_pkt_send](#) (void *private, const void *addr, size_t addrlen, const void *buf, size_t buflen)
- int [cldc_getaddr](#) (GList **host_list, const char *thishost, struct [hail_log](#) *log)
- int [cldc_saveaddr](#) (struct [cldc_host](#) *hp, unsigned int priority, unsigned int weight, unsigned int port, unsigned int nlen, const char *name, struct [hail_log](#) *log)

4.3.1 Function Documentation

- 4.3.1.1 `int cldc_close (struct cldc_fh * fh, const struct cldc_call_opts * copts)`
- 4.3.1.2 `void cldc_copts_get_data (const struct cldc_call_opts * copts, char ** data, size_t * data_len)`
- 4.3.1.3 `void cldc_copts_get_metadata (const struct cldc_call_opts * copts, struct cldc_node_metadata * md)`
- 4.3.1.4 `int cldc_del (struct cldc_session * sess, const struct cldc_call_opts * copts, const char * pathname)`
- 4.3.1.5 `int cldc_dirent_count (const void * data, size_t data_len)`
- 4.3.1.6 `void cldc_dirent_cur_fini (struct cld_dirent_cur * dc)`
- 4.3.1.7 `void cldc_dirent_cur_init (struct cld_dirent_cur * dc, const void * buf, size_t buflen)`
- 4.3.1.8 `int cldc_dirent_first (struct cld_dirent_cur * dc)`
- 4.3.1.9 `char* cldc_dirent_name (struct cld_dirent_cur * dc)`
- 4.3.1.10 `int cldc_dirent_next (struct cld_dirent_cur * dc)`
- 4.3.1.11 `int cldc_end_sess (struct cldc_session * sess, const struct cldc_call_opts * copts)`
- 4.3.1.12 `int cldc_get (struct cldc_fh * fh, const struct cldc_call_opts * copts, bool metadata_only)`
- 4.3.1.13 `int cldc_getaddr (GList ** host_list, const char * thishost, struct hail_log * log)`
- 4.3.1.14 `void cldc_init (void)`
- 4.3.1.15 `void cldc_kill_sess (struct cldc_session * sess)`
- 4.3.1.16 `int cldc_lock (struct cldc_fh * fh, const struct cldc_call_opts * copts, uint32_t lock_flags, bool wait_for_lock)`
- 4.3.1.17 `int cldc_new_sess (const struct cldc_ops * ops, const struct cldc_call_opts * copts, const void * addr, size_t addr_len, const char * user, const char * secret_key, void * private, struct cldc_session ** sess_out)`
- 4.3.1.18 `int cldc_nop (struct cldc_session * sess, const struct cldc_call_opts * copts)`
- 4.3.1.19 `int cldc_open (struct cldc_session * sess, const struct cldc_call_opts * copts, const char * pathname, uint32_t open_mode, uint32_t events, struct cldc_fh ** fh_out)`
- 4.3.1.20 `int cldc_put (struct cldc_fh * fh, const struct cldc_call_opts * copts, const void * data, size_t data_len)`
- 4.3.1.21 `int cldc_receive_pkt (struct cldc_session * sess, const void * net_addr, size_t net_addrlen, const void * buf, size_t buflen)`

Called by app when a packet is received from a remote host over the network.

Parameters

sess Session associated with received packet
net_addr Opaque network address
net_addrlen Size of opaque network address
buf Pointer to data buffer containing packet
buflen Length of received packet

Returns

Zero for success, non-zero on error

4.3.1.22 `int cldc_saveaddr (struct cldc_host * hp, unsigned int priority, unsigned int weight, unsigned int port, unsigned int nlen, const char * name, struct hail_log * log)`

4.3.1.23 `void cldc_udp_free (struct cldc_udp * udp)`

4.3.1.24 `int cldc_udp_new (const char * hostname, int port, struct cldc_udp ** udp_out)`

4.3.1.25 `int cldc_udp_pkt_send (void * private, const void * addr, size_t addrlen, const void * buf, size_t buflen)`

4.3.1.26 `int cldc_udp_receive_pkt (struct cldc_udp * udp)`

4.3.1.27 `int cldc_unlock (struct cldc_fh * fh, const struct cldc_call_opts * copts)`

4.4 include/hail_log.h File Reference

```
#include <stdbool.h>
```

Data Structures

- struct [hail_log](#)

Defines

- #define [ATTR_PRINTF](#)(x, y)
- #define [HAIL_VERBOSE](#)(log,...)
Print out a CLD session debug message if enabled.
- #define [HAIL_DEBUG](#)(log,...)
Print out an application debug message if enabled.
- #define [HAIL_INFO](#)(log,...) (log)->func(LOG_INFO, __VA_ARGS__)
Print out an informational log message.

- **#define HAIL_WARN(log,...)** (log)->func(LOG_WARNING, __VA_ARGS__)
Print out a warning message.
- **#define HAIL_ERR(log,...)** (log)->func(LOG_ERR, __VA_ARGS__)
Print out an error message.
- **#define HAIL_CRIT(log,...)** (log)->func(LOG_CRIT, __VA_ARGS__)
Print out a critical warning message.

4.4.1 Define Documentation

4.4.1.1 #define ATTR_PRINTF(x, y)

4.4.1.2 #define HAIL_CRIT(log, ...) (log)->func(LOG_CRIT, __VA_ARGS__)

Print out a critical warning message.

4.4.1.3 #define HAIL_DEBUG(log, ...)

Value:

```
if ((log)->debug) { \
    (log)->func (LOG_DEBUG, __VA_ARGS__); \
}
```

Print out an application debug message if enabled.

4.4.1.4 #define HAIL_ERR(log, ...) (log)->func(LOG_ERR, __VA_ARGS__)

Print out an error message.

4.4.1.5 #define HAIL_INFO(log, ...) (log)->func(LOG_INFO, __VA_ARGS__)

Print out an informational log message.

4.4.1.6 #define HAIL_VERBOSE(log, ...)

Value:

```
if ((log)->verbose) { \
    (log)->func (LOG_DEBUG, __VA_ARGS__); \
}
```

Print out a CLD session debug message if enabled.

4.4.1.7 #define HAIL_WARN(log, ...) (log)->func(LOG_WARNING, __VA_ARGS__)

Print out a warning message.

4.5 include/ncld.h File Reference

```
#include <stdbool.h>
#include <glib.h>
#include <cldc.h>
```

Data Structures

- struct [ncld_sess](#)
- struct [ncld_fh](#)
- struct [ncld_read](#)

Functions

- struct [ncld_sess](#) * [ncld_sess_open](#) (const char *host, int port, int *error, void(*event)(void *, unsigned int), void *ev_arg, const char *cld_user, const char *cld_key, struct [hail_log](#) *log)
- struct [ncld_fh](#) * [ncld_open](#) (struct [ncld_sess](#) *s, const char *fname, unsigned int mode, int *error, unsigned int events, void(*event)(void *, unsigned int), void *ev_arg)
- int [ncld_del](#) (struct [ncld_sess](#) *nsess, const char *fname)
- struct [ncld_read](#) * [ncld_get](#) (struct [ncld_fh](#) *fh, int *error)
- struct [ncld_read](#) * [ncld_get_meta](#) (struct [ncld_fh](#) *fh, int *error)
- void [ncld_read_free](#) (struct [ncld_read](#) *rp)
- int [ncld_write](#) (struct [ncld_fh](#) *, const void *data, long len)
- int [ncld_trylock](#) (struct [ncld_fh](#) *)
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- int [ncld_unlock](#) (struct [ncld_fh](#) *)
- void [ncld_close](#) (struct [ncld_fh](#) *)
- void [ncld_sess_close](#) (struct [ncld_sess](#) *s)
- void [ncld_init](#) (void)

4.5.1 Function Documentation

4.5.1.1 void `nclد_close` (struct `nclد_fh` *)

4.5.1.2 int `nclد_del` (struct `nclد_sess` * *nsess*, const char * *fname*)

4.5.1.3 struct `nclد_read`* `nclد_get` (struct `nclد_fh` * *fh*, int * *error*) [read]

4.5.1.4 struct `nclد_read`* `nclد_get_meta` (struct `nclد_fh` * *fh*, int * *error*) [read]

4.5.1.5 void `nclد_init` (void)

4.5.1.6 struct `nclد_fh`* `nclد_open` (struct `nclد_sess` * *s*, const char * *fname*, unsigned int *mode*, int * *error*, unsigned int *events*, void(*) (void *, unsigned int) *event*, void * *ev_arg*) [read]

4.5.1.7 int `nclد_qlock` (struct `nclد_fh` *)

4.5.1.8 void `nclد_read_free` (struct `nclد_read` * *rp*)

4.5.1.9 void `nclد_sess_close` (struct `nclد_sess` * *s*)

4.5.1.10 struct `nclد_sess`* `nclد_sess_open` (const char * *host*, int *port*, int * *error*, void(*) (void *, unsigned int) *event*, void * *ev_arg*, const char * *cld_user*, const char * *cld_key*, struct `hail_log` * *log*) [read]

4.5.1.11 int `nclد_trylock` (struct `nclد_fh` *)

4.5.1.12 int `nclد_unlock` (struct `nclد_fh` *)

4.5.1.13 int `nclد_write` (struct `nclد_fh` * , const void * *data*, long *len*)

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