

CLD

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Chapter 1

Data Structure Index

1.1 Data Structures

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Chapter 2

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Chapter 3

Data Structure Documentation

3.1 `chunk_check_status` Struct Reference

```
#include <chunk_msg.h>
```

Data Fields

- `uint8_t` [state](#)
- `uint8_t` [pad](#) [3]
- `uint32_t` [count](#)
- `uint64_t` [lastdone](#)

3.1.1 Field Documentation

3.1.1.1 `uint32_t chunk_check_status::count`

3.1.1.2 `uint64_t chunk_check_status::lastdone`

3.1.1.3 `uint8_t chunk_check_status::pad[3]`

3.1.1.4 `uint8_t chunk_check_status::state`

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

- `include/`[chunk_msg.h](#)

3.2 chunksrv_req Struct Reference

```
#include <chunk_msg.h>
```

Data Fields

- uint8_t [magic](#) [CHD_MAGIC_SZ]
- uint8_t [op](#)
- uint8_t [flags](#)
- uint16_t [key_len](#)
- uint32_t [nonce](#)
- uint64_t [data_len](#)
- char [sig](#) [CHD_SIG_SZ]

3.2.1 Field Documentation

3.2.1.1 `uint64_t chunksrv_req::data_len`

3.2.1.2 `uint8_t chunksrv_req::flags`

3.2.1.3 `uint16_t chunksrv_req::key_len`

3.2.1.4 `uint8_t chunksrv_req::magic[CHD_MAGIC_SZ]`

3.2.1.5 `uint32_t chunksrv_req::nonce`

3.2.1.6 `uint8_t chunksrv_req::op`

3.2.1.7 `char chunksrv_req::sig[CHD_SIG_SZ]`

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

- [include/chunk_msg.h](#)

3.3 chunksrv_resp Struct Reference

```
#include <chunk_msg.h>
```

Data Fields

- uint8_t [magic](#) [CHD_MAGIC_SZ]
- uint8_t [resp_code](#)
- uint8_t [rsv1](#) [3]
- uint32_t [nonce](#)
- uint64_t [data_len](#)
- unsigned char [hash](#) [CHD_CSUM_SZ]

3.3.1 Field Documentation

3.3.1.1 uint64_t chunksrv_resp::data_len

3.3.1.2 unsigned char chunksrv_resp::hash[CHD_CSUM_SZ]

3.3.1.3 uint8_t chunksrv_resp::magic[CHD_MAGIC_SZ]

3.3.1.4 uint32_t chunksrv_resp::nonce

3.3.1.5 uint8_t chunksrv_resp::resp_code

3.3.1.6 uint8_t chunksrv_resp::rsv1[3]

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

- include/[chunk_msg.h](#)

3.4 chunksrv_resp_chkstat Struct Reference

```
#include <chunk_msg.h>
```

Data Fields

- struct [chunksrv_resp](#) resp
- struct [chunk_check_status](#) chkstat

3.4.1 Field Documentation

3.4.1.1 struct [chunk_check_status](#) chunksrv_resp_chkstat::chkstat [read]

3.4.1.2 struct [chunksrv_resp](#) chunksrv_resp_chkstat::resp [read]

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

- include/[chunk_msg.h](#)

3.5 chunksrv_resp_get Struct Reference

```
#include <chunk_msg.h>
```

Data Fields

- struct [chunksrv_resp](#) `resp`
- uint64_t `mtime`

3.5.1 Field Documentation

3.5.1.1 uint64_t chunksrv_resp_get::mtime

3.5.1.2 struct chunksrv_resp chunksrv_resp_get::resp [read]

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

- include/[chunk_msg.h](#)

3.6 cld_dirent_cur Struct Reference

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

Data Fields

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

3.6.1 Field Documentation

3.6.1.1 `const void*` `cld_dirent_cur::p`

3.6.1.2 `size_t` `cld_dirent_cur::tmp_len`

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

- `include/cldc.h`

3.7 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]

3.7.1 Field Documentation

3.7.1.1 void(* [cld_timer::cb](#))(struct [cld_timer](#) *)

3.7.1.2 time_t [cld_timer::expires](#)

3.7.1.3 bool [cld_timer::fired](#)

3.7.1.4 char [cld_timer::name](#)[32]

3.7.1.5 bool [cld_timer::on_list](#)

3.7.1.6 void* [cld_timer::userdata](#)

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

- include/[cld_common.h](#)

3.8 cld_timer_list Struct Reference

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

Data Fields

- `GList *` [list](#)
- `time_t` [runmark](#)

3.8.1 Field Documentation

3.8.1.1 `GList* cld_timer_list::list`

3.8.1.2 `time_t cld_timer_list::runmark`

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

- `include/cld_common.h`

3.9 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`

3.9.1 Detailed Description

per-operation application options

3.9.2 Field Documentation

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

3.9.2.2 `void* cldc_call_opts::private`

3.9.2.3 `struct cld_msg_get_resp cldc_call_opts::resp` [`read`]

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

- `include/cldc.h`

3.10 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](#)

3.10.1 Detailed Description

an open file handle associated with a session

3.10.2 Field Documentation

3.10.2.1 `uint64_t cldc_fh::fh`

3.10.2.2 `struct cldc_session* cldc_fh::sess` [`read`]

3.10.2.3 `bool cldc_fh::valid`

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

- `include/cldc.h`

3.11 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](#)

3.11.1 Detailed Description

Information for a single CLD server host.

3.11.2 Field Documentation

3.11.2.1 char* cldc_host::host

3.11.2.2 unsigned short cldc_host::port

3.11.2.3 unsigned int cldc_host::prio

3.11.2.4 unsigned int cldc_host::weight

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

- include/[cldc.h](#)

3.12 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]

3.12.1 Detailed Description

an outgoing message, from client to server

3.12.2 Field Documentation

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

3.12.2.2 `void* cldc_msg::cb_private`

3.12.2.3 `struct cldc_call_opts cldc_msg::copts` [`read`]

3.12.2.4 `bool cldc_msg::done`

3.12.2.5 `time_t cldc_msg::expire_time`

3.12.2.6 `int cldc_msg::n_pkts`

3.12.2.7 `enum cld_msg_op cldc_msg::op`

3.12.2.8 `struct cldc_pkt_info* cldc_msg::pkt_info[0]` [`read`]

3.12.2.9 `struct cldc_session* cldc_msg::sess` [`read`]

3.12.2.10 `uint64_t cldc_msg::xid`

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

- `include/cldc.h`

3.13 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](#)

3.13.1 Field Documentation

3.13.1.1 int cldc_node_metadata::flags

3.13.1.2 const char* cldc_node_metadata::inode_name

3.13.1.3 quad_t cldc_node_metadata::inum

3.13.1.4 quad_t cldc_node_metadata::time_create

3.13.1.5 quad_t cldc_node_metadata::time_modify

3.13.1.6 quad_t cldc_node_metadata::vers

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

- include/[cldc.h](#)

3.14 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)`

3.14.1 Detailed Description

application-supplied facilities

3.14.2 Field Documentation

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

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

3.14.2.3 `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`

3.15 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]

3.15.1 Field Documentation

3.15.1.1 char `cldc_pkt_info::data[0]`

3.15.1.2 int `cldc_pkt_info::hdr_len`

3.15.1.3 int `cldc_pkt_info::pkt_len`

3.15.1.4 int `cldc_pkt_info::retries`

3.15.1.5 char `cldc_pkt_info::user[CLD_MAX_USERNAME]`

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

- `include/cldc.h`

3.16 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](#)
- GList * [cfh](#)
- 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]

3.16.1 Detailed Description

a single CLD client session

3.16.2 Field Documentation

- 3.16.2.1 `uint8_t cldc_session::addr[64]`
- 3.16.2.2 `size_t cldc_session::addr_len`
- 3.16.2.3 `GList* cldc_session::cfh`
- 3.16.2.4 `bool cldc_session::confirmed`
- 3.16.2.5 `time_t cldc_session::expire_time`
- 3.16.2.6 `bool cldc_session::expired`
- 3.16.2.7 `char cldc_session::inode_name_temp[CLD_INODE_NAME_MAX]`
- 3.16.2.8 `struct hail_log cldc_session::log` [read]
- 3.16.2.9 `char cldc_session::msg_buf[CLD_MAX_MSG_SZ]`
- 3.16.2.10 `unsigned int cldc_session::msg_buf_len`
- 3.16.2.11 `enum cld_msg_op cldc_session::msg_buf_op`
- 3.16.2.12 `time_t cldc_session::msg_scan_time`
- 3.16.2.13 `uint64_t cldc_session::next_seqid_in`
- 3.16.2.14 `uint64_t cldc_session::next_seqid_in_tr`
- 3.16.2.15 `uint64_t cldc_session::next_seqid_out`
- 3.16.2.16 `struct cldc_ops* cldc_session::ops` [read]
- 3.16.2.17 `GList* cldc_session::out_msg`
- 3.16.2.18 `char cldc_session::payload[CLD_MAX_PAYLOAD_SZ]`
- 3.16.2.19 `void* cldc_session::private`
- 3.16.2.20 `char cldc_session::secret_key[CLD_MAX_SECRET_KEY]`
- 3.16.2.21 `uint8_t cldc_session::sid[CLD_SID_SZ]`
- 3.16.2.22 `char cldc_session::user[CLD_MAX_USERNAME]`

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

- `include/cldc.h`

3.17 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](#)

3.17.1 Detailed Description

A UDP implementation of the CLD client protocol.

3.17.2 Field Documentation

3.17.2.1 `uint8_t cldc_udp::addr[64]`

3.17.2.2 `size_t cldc_udp::addr_len`

3.17.2.3 `int(* cldc_udp::cb)(struct cldc_session *, void *)`

3.17.2.4 `void* cldc_udp::cb_private`

3.17.2.5 `int cldc_udp::fd`

3.17.2.6 `struct cldc_session* cldc_udp::sess` [`read`]

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

- `include/cldc.h`

3.18 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](#)

3.18.1 Field Documentation

3.18.1.1 void(*) boo [hail_log::debug](#))

3.18.1.2 void(* [hail_log::func](#))(int prio, const char *fmt,...) ATTR_PRINTF(2

3.18.1.3 bool [hail_log::verbose](#)

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

- include/[hail_log.h](#)

3.19 hstor_blist Struct Reference

```
#include <hstor.h>
```

Data Fields

- char * [own_id](#)
- char * [own_name](#)
- GList * [list](#)

3.19.1 Field Documentation

3.19.1.1 GList* hstor_blist::list

3.19.1.2 char* hstor_blist::own_id

3.19.1.3 char* hstor_blist::own_name

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

- [include/hstor.h](#)

3.20 hstor_bucket Struct Reference

```
#include <hstor.h>
```

Data Fields

- char * [name](#)
- char * [time_create](#)

3.20.1 Field Documentation

3.20.1.1 char* hstor_bucket::name

3.20.1.2 char* hstor_bucket::time_create

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

- [include/hstor.h](#)

3.21 hstor_client Struct Reference

```
#include <hstor.h>
```

Data Fields

- CURL * [curl](#)
- char * [acc](#)
- char * [host](#)
- char * [user](#)
- char * [key](#)
- bool [verbose](#)

3.21.1 Field Documentation

3.21.1.1 char* hstor_client::acc

3.21.1.2 CURL* hstor_client::curl

3.21.1.3 char* hstor_client::host

3.21.1.4 char* hstor_client::key

3.21.1.5 char* hstor_client::user

3.21.1.6 bool hstor_client::verbose

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

- [include/hstor.h](#)

3.22 hstor_keylist Struct Reference

```
#include <hstor.h>
```

Data Fields

- char * [name](#)
- char * [prefix](#)
- char * [marker](#)
- char * [delim](#)
- unsigned int [max_keys](#)
- bool [trunc](#)
- GList * [contents](#)
- GList * [common_pfx](#)

3.22.1 Field Documentation

3.22.1.1 GList* [hstor_keylist::common_pfx](#)

3.22.1.2 GList* [hstor_keylist::contents](#)

3.22.1.3 char* [hstor_keylist::delim](#)

3.22.1.4 char* [hstor_keylist::marker](#)

3.22.1.5 unsigned int [hstor_keylist::max_keys](#)

3.22.1.6 char* [hstor_keylist::name](#)

3.22.1.7 char* [hstor_keylist::prefix](#)

3.22.1.8 bool [hstor_keylist::trunc](#)

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

- include/[hstor.h](#)

3.23 hstor_object Struct Reference

```
#include <hstor.h>
```

Data Fields

- char * [key](#)
- char * [time_mod](#)
- char * [etag](#)
- uint64_t [size](#)
- char * [storage](#)
- char * [own_id](#)
- char * [own_name](#)

3.23.1 Field Documentation

3.23.1.1 char* hstor_object::etag

3.23.1.2 char* hstor_object::key

3.23.1.3 char* hstor_object::own_id

3.23.1.4 char* hstor_object::own_name

3.23.1.5 uint64_t hstor_object::size

3.23.1.6 char* hstor_object::storage

3.23.1.7 char* hstor_object::time_mod

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

- [include/hstor.h](#)

3.24 http_hdr Struct Reference

```
#include <hstor.h>
```

Data Fields

- char * [key](#)
- char * [val](#)

3.24.1 Field Documentation

3.24.1.1 char* http_hdr::key

3.24.1.2 char* http_hdr::val

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

- include/[hstor.h](#)

3.25 http_req Struct Reference

```
#include <hstor.h>
```

Data Fields

- char * [method](#)
- struct [http_uri](#) uri
- int [major](#)
- int [minor](#)
- char * [orig_path](#)
- unsigned int [n_hdr](#)
- struct [http_hdr](#) [hdr](#) [HREQ_MAX_HDR]

3.25.1 Field Documentation

3.25.1.1 struct [http_hdr](#) http_req::hdr[HREQ_MAX_HDR] [[read](#)]

3.25.1.2 int http_req::major

3.25.1.3 char* http_req::method

3.25.1.4 int http_req::minor

3.25.1.5 unsigned int http_req::n_hdr

3.25.1.6 char* http_req::orig_path

3.25.1.7 struct [http_uri](#) http_req::uri [[read](#)]

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

- [include/hstor.h](#)

3.26 http_uri Struct Reference

```
#include <hstor.h>
```

Data Fields

- char * [scheme](#)
- unsigned int [scheme_len](#)
- char * [userinfo](#)
- unsigned int [userinfo_len](#)
- char * [hostname](#)
- unsigned int [hostname_len](#)
- unsigned int [port](#)
- char * [path](#)
- unsigned int [path_len](#)
- char * [query](#)
- unsigned int [query_len](#)
- char * [fragment](#)
- unsigned int [fragment_len](#)

3.26.1 Field Documentation

3.26.1.1 char* [http_uri::fragment](#)

3.26.1.2 unsigned int [http_uri::fragment_len](#)

3.26.1.3 char* [http_uri::hostname](#)

3.26.1.4 unsigned int [http_uri::hostname_len](#)

3.26.1.5 char* [http_uri::path](#)

3.26.1.6 unsigned int [http_uri::path_len](#)

3.26.1.7 unsigned int [http_uri::port](#)

3.26.1.8 char* [http_uri::query](#)

3.26.1.9 unsigned int [http_uri::query_len](#)

3.26.1.10 char* [http_uri::scheme](#)

3.26.1.11 unsigned int [http_uri::scheme_len](#)

3.26.1.12 char* [http_uri::userinfo](#)

3.26.1.13 unsigned int [http_uri::userinfo_len](#)

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

- [include/hstor.h](#)

3.27 list_head Struct Reference

```
#include <elist.h>
```

Data Fields

- struct [list_head](#) * [next](#)
- struct [list_head](#) * [prev](#)

3.27.1 Field Documentation

3.27.1.1 struct list_head* list_head::next [read]

3.27.1.2 struct list_head * list_head::prev [read]

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

- include/[elist.h](#)

3.28 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](#)

3.28.1 Field Documentation

3.28.1.1 int ncld_fh::errc

3.28.1.2 void* ncld_fh::event_arg

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

3.28.1.4 unsigned int ncld_fh::event_mask

3.28.1.5 struct cldc_fh* ncld_fh::fh [read]

3.28.1.6 bool ncld_fh::is_open

3.28.1.7 int ncld_fh::nios

3.28.1.8 struct ncld_sess* ncld_fh::sess [read]

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

- include/[ncld.h](#)

3.29 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](#)

3.29.1 Field Documentation

3.29.1.1 int [nclد_read::errc](#)

3.29.1.2 struct [nclد_fh](#)* [nclد_read::fh](#) [[read](#)]

3.29.1.3 bool [nclد_read::is_done](#)

3.29.1.4 long [nclد_read::length](#)

3.29.1.5 struct [cldc_node_metadata](#) [nclد_read::meta](#) [[read](#)]

3.29.1.6 const void* [nclد_read::ptr](#)

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

- [include/nclد.h](#)

3.30 ncld_sess Struct Reference

```
#include <ncld.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](#)

3.30.1 Field Documentation

- 3.30.1.1 `GCond* ncld_sess::cond`
- 3.30.1.2 `int ncld_sess::errc`
- 3.30.1.3 `void(* ncld_sess::event)(void *, unsigned int)`
- 3.30.1.4 `void* ncld_sess::event_arg`
- 3.30.1.5 `GList* ncld_sess::handles`
- 3.30.1.6 `char* ncld_sess::host`
- 3.30.1.7 `bool ncld_sess::is_up`
- 3.30.1.8 `GMutex* ncld_sess::mutex`
- 3.30.1.9 `bool ncld_sess::open_done`
- 3.30.1.10 `unsigned short ncld_sess::port`
- 3.30.1.11 `GThread* ncld_sess::thread`
- 3.30.1.12 `struct cld_timer_list ncld_sess::tlist` `[read]`
- 3.30.1.13 `int ncld_sess::to_thread[2]`
- 3.30.1.14 `struct cldc_udp* ncld_sess::udp` `[read]`
- 3.30.1.15 `struct cld_timer ncld_sess::udp_timer` `[read]`

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

- `include/ncld.h`

3.31 objcache Struct Reference

```
#include <objcache.h>
```

Data Fields

- GMutex * [lock](#)
- GHashTable * [table](#)

3.31.1 Field Documentation

3.31.1.1 GMutex* objcache::lock

3.31.1.2 GHashTable* objcache::table

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

- [include/objcache.h](#)

3.32 objcache_entry Struct Reference

```
#include <objcache.h>
```

Data Fields

- unsigned int [hash](#)
- unsigned int [flags](#)
- int [ref](#)

3.32.1 Field Documentation

3.32.1.1 unsigned int objcache_entry::flags

3.32.1.2 unsigned int objcache_entry::hash

3.32.1.3 int objcache_entry::ref

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

- [include/objcache.h](#)

3.33 st_client Struct Reference

```
#include <chunkc.h>
```

Data Fields

- char * [host](#)
- char * [user](#)
- char * [key](#)
- bool [verbose](#)
- int [fd](#)
- SSL_CTX * [ssl_ctx](#)
- SSL * [ssl](#)
- char [req_buf](#) [sizeof(struct [chunksrv_req](#))+CHD_KEY_SZ]

3.33.1 Field Documentation

3.33.1.1 int [st_client::fd](#)

3.33.1.2 char* [st_client::host](#)

3.33.1.3 char* [st_client::key](#)

3.33.1.4 char [st_client::req_buf](#)[sizeof(struct [chunksrv_req](#))+CHD_KEY_SZ]

3.33.1.5 SSL* [st_client::ssl](#)

3.33.1.6 SSL_CTX* [st_client::ssl_ctx](#)

3.33.1.7 char* [st_client::user](#)

3.33.1.8 bool [st_client::verbose](#)

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

- include/[chunkc.h](#)

3.34 st_keylist Struct Reference

```
#include <chunkc.h>
```

Data Fields

- char * [name](#)
- GList * [contents](#)

3.34.1 Field Documentation

3.34.1.1 GList* st_keylist::contents

3.34.1.2 char* st_keylist::name

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

- include/[chunkc.h](#)

3.35 st_object Struct Reference

```
#include <chunkc.h>
```

Data Fields

- char * [name](#)
- char * [time_mod](#)
- char * [etag](#)
- uint64_t [size](#)
- char * [owner](#)

3.35.1 Field Documentation

3.35.1.1 char* st_object::etag

3.35.1.2 char* st_object::name

3.35.1.3 char* st_object::owner

3.35.1.4 uint64_t st_object::size

3.35.1.5 char* st_object::time_mod

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

- include/[chunkc.h](#)

Chapter 4

File Documentation

4.1 include/chunk-private.h File Reference

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

Defines

- #define [MDB_TPATH_FMT](#) "%s/%X"
- #define [BAD_TPATH_FMT](#) "%s/bad"
- #define [PREFIX_LEN](#) 3

4.1.1 Define Documentation

4.1.1.1 #define [BAD_TPATH_FMT](#) "%s/bad"

4.1.1.2 #define [MDB_TPATH_FMT](#) "%s/%X"

4.1.1.3 #define [PREFIX_LEN](#) 3

4.2 include/chunk_msg.h File Reference

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

Data Structures

- struct [chunksrv_req](#)
- struct [chunksrv_resp](#)
- struct [chunksrv_resp_get](#)
- struct [chunk_check_status](#)
- struct [chunksrv_resp_chkstat](#)

Defines

- #define [CHUNKD_MAGIC](#) "CHUNKDv1"

Enumerations

- enum {
 [CHD_MAGIC_SZ](#) = 8, [CHD_USER_SZ](#) = 64, [CHD_KEY_SZ](#) = 1024, [CHD_CSUM_SZ](#) = 20,
 [CHD_SIG_SZ](#) = 64 }
• enum [chunksrv_ops](#) {
 [CHO_NOP](#) = 0, [CHO_GET](#) = 1, [CHO_GET_META](#) = 2, [CHO_PUT](#) = 3,
 [CHO_DEL](#) = 4, [CHO_LIST](#) = 5, [CHO_LOGIN](#) = 6, [CHO_TABLE_OPEN](#) = 7,
 [CHO_CHECK_START](#) = 8, [CHO_CHECK_STATUS](#) = 9, [CHO_START_TLS](#) = 10, [CHO_CP](#) = 11
}
• enum [chunk_errcode](#) {
 [che_Success](#) = 0, [che_AccessDenied](#) = 1, [che_InternalError](#) = 2, [che_InvalidArgument](#) = 3,
 [che_InvalidURI](#) = 4, [che_NoSuchKey](#) = 5, [che_SignatureDoesNotMatch](#) = 6, [che_InvalidKey](#) = 7,
 [che_InvalidTable](#) = 8, [che_Busy](#) = 9, [che_KeyExists](#) = 10 }
• enum [chunk_flags](#) { [CHF_SYNC](#) = (1 << 0), [CHF_TBL_CREAT](#) = (1 << 1), [CHF_TBL_EXCL](#)
 = (1 << 2) }
• enum [chunk_check_state](#) { [chk_Off](#), [chk_Idle](#), [chk_Active](#) }

4.2.1 Define Documentation

4.2.1.1 #define [CHUNKD_MAGIC](#) "CHUNKDv1"

4.2.2 Enumeration Type Documentation

4.2.2.1 anonymous enum

Enumerator:

[CHD_MAGIC_SZ](#)

[CHD_USER_SZ](#)

[CHD_KEY_SZ](#)

CHD_CSUM_SZ

CHD_SIG_SZ

4.2.2.2 enum chunk_check_state

Enumerator:

chk_Off

chk_Idle

chk_Active

4.2.2.3 enum chunk_errcode

Enumerator:

che_Success

che_AccessDenied

che_InternalError

che_InvalidArgument

che_InvalidURI

che_NoSuchKey

che_SignatureDoesNotMatch

che_InvalidKey

che_InvalidTable

che_Busy

che_KeyExists

4.2.2.4 enum chunk_flags

Enumerator:

CHF_SYNC

CHF_TBL_CREAT

CHF_TBL_EXCL

4.2.2.5 enum chunksrv_ops

Enumerator:

CHO_NOP

CHO_GET

CHO_GET_META

CHO_PUT

CHO_DEL

CHO_LIST

CHO_LOGIN

CHO_TABLE_OPEN

CHO_CHECK_START

CHO_CHECK_STATUS

CHO_START_TLS

CHO_CP

4.3 include/chunkc.h File Reference

```
#include <sys/types.h>
#include <openssl/ssl.h>
#include <stdbool.h>
#include <stdint.h>
#include <string.h>
#include <glib.h>
#include <chunk_msg.h>
```

Data Structures

- struct [st_object](#)
- struct [st_keylist](#)
- struct [st_client](#)

Functions

- void [stc_free](#) (struct [st_client](#) *stc)
- void [stc_free_keylist](#) (struct [st_keylist](#) *keylist)
- void [stc_free_object](#) (struct [st_object](#) *obj)
- void [stc_init](#) (void)
- struct [st_client](#) * [stc_new](#) (const char *service_host, int port, const char *user, const char *secret_key, bool encrypt)
- bool [stc_table_open](#) (struct [st_client](#) *stc, const void *key, size_t key_len, uint32_t flags)
- bool [stc_get](#) (struct [st_client](#) *stc, const void *key, size_t key_len, size_t(*write_cb)(void *, size_t, size_t, void *), void *user_data)
- void * [stc_get_inline](#) (struct [st_client](#) *stc, const void *key, size_t key_len, size_t *len)
- bool [stc_get_start](#) (struct [st_client](#) *stc, const void *key, size_t key_len, int *pfd, uint64_t *len)
- size_t [stc_get_recv](#) (struct [st_client](#) *stc, void *data, size_t len)
- bool [stc_put](#) (struct [st_client](#) *stc, const void *key, size_t key_len, size_t(*read_cb)(void *, size_t, size_t, void *), uint64_t len, void *user_data, uint32_t flags)
- bool [stc_put_start](#) (struct [st_client](#) *stc, const void *key, size_t key_len, uint64_t cont_len, int *pfd, uint32_t flags)
- size_t [stc_put_send](#) (struct [st_client](#) *stc, void *data, size_t len)
- bool [stc_put_sync](#) (struct [st_client](#) *stc)
- bool [stc_put_inline](#) (struct [st_client](#) *stc, const void *key, size_t key_len, void *data, uint64_t len, uint32_t flags)
- bool [stc_cp](#) (struct [st_client](#) *stc, const void *dest_key, size_t dest_key_len, const void *src_key, size_t src_key_len)
- bool [stc_del](#) (struct [st_client](#) *stc, const void *key, size_t key_len)
- bool [stc_ping](#) (struct [st_client](#) *stc)
- bool [stc_check_start](#) (struct [st_client](#) *stc)
- bool [stc_check_status](#) (struct [st_client](#) *stc, struct [chunk_check_status](#) *out)
- struct [st_keylist](#) * [stc_keys](#) (struct [st_client](#) *stc)
- int [stc_readport](#) (const char *fname)

4.3.1 Function Documentation

- 4.3.1.1 `bool stc_check_start (struct st_client * stc)`
- 4.3.1.2 `bool stc_check_status (struct st_client * stc, struct chunk_check_status * out)`
- 4.3.1.3 `bool stc_cp (struct st_client * stc, const void * dest_key, size_t dest_key_len, const void * src_key, size_t src_key_len)`
- 4.3.1.4 `bool stc_del (struct st_client * stc, const void * key, size_t key_len)`
- 4.3.1.5 `void stc_free (struct st_client * stc)`
- 4.3.1.6 `void stc_free_keylist (struct st_keylist * keylist)`
- 4.3.1.7 `void stc_free_object (struct st_object * obj)`
- 4.3.1.8 `bool stc_get (struct st_client * stc, const void * key, size_t key_len, size_t(*) (void *, size_t, size_t, void *) write_cb, void * user_data)`
- 4.3.1.9 `void* stc_get_inline (struct st_client * stc, const void * key, size_t key_len, size_t * len)`
- 4.3.1.10 `size_t stc_get_recv (struct st_client * stc, void * data, size_t len)`
- 4.3.1.11 `bool stc_get_start (struct st_client * stc, const void * key, size_t key_len, int * pfid, uint64_t * len)`
- 4.3.1.12 `void stc_init (void)`
- 4.3.1.13 `struct st_keylist* stc_keys (struct st_client * stc)` [read]
- 4.3.1.14 `struct st_client* stc_new (const char * service_host, int port, const char * user, const char * secret_key, bool encrypt)` [read]
- 4.3.1.15 `bool stc_ping (struct st_client * stc)`
- 4.3.1.16 `bool stc_put (struct st_client * stc, const void * key, size_t key_len, size_t(*) (void *, size_t, size_t, void *) read_cb, uint64_t len, void * user_data, uint32_t flags)`
- 4.3.1.17 `bool stc_put_inline (struct st_client * stc, const void * key, size_t key_len, void * data, uint64_t len, uint32_t flags)`
- 4.3.1.18 `size_t stc_put_send (struct st_client * stc, void * data, size_t len)`
- 4.3.1.19 `bool stc_put_start (struct st_client * stc, const void * key, size_t key_len, uint64_t cont_len, int * pfid, uint32_t flags)`
- 4.3.1.20 `bool stc_put_sync (struct st_client * stc)`
- 4.3.1.21 `int stc_readport (const char * fname)`
- 4.3.1.22 `bool stc_table_open (struct st_client * stc, const void * key, size_t key_len, uint32_t flags)`

4.4 include/chunksrv.h File Reference

```
#include <chunk_msg.h>
```

Functions

- `size_t req_len` (const struct `chunksrv_req` *req)
- `void chreq_sign` (struct `chunksrv_req` *req, const char *key, char *b64hmac_out)

4.4.1 Function Documentation

4.4.1.1 `void chreq_sign` (struct `chunksrv_req` * *req*, const char * *key*, char * *b64hmac_out*)

4.4.1.2 `size_t req_len` (const struct `chunksrv_req` * *req*)

4.5 include/cld-private.h File Reference

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

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

4.6 include/cld_common.h File Reference

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

Data Structures

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

Defines

- #define [CLD_ALIGN8](#)(n) ((8 - ((n) & 7)) & 7)
- #define [SIDFMT](#) "%016lX"
- #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.

4.6.1 Define Documentation

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

4.6.1.2 `#define CLD_PKT_FTR_LEN sizeof(struct cld_pkt_ftr)`

Length of the packet footer. This size is fixed

4.6.1.3 `#define PKT_HDR_TO_STR_SCRATCH_LEN 128`

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

4.6.1.5 `#define SIDFMT "%016llx"`

4.6.2 Function Documentation

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

Footer that appears at the end of each packet.

< packet sequence ID

< packet signature

4.6.2.2 `void __cld_dump_buf (const void * buf, size_t len)`

4.6.2.3 `int cld_authcheck (struct hail_log * log, const char * key, const void * buf, size_t buf_len, const void * sha)`

4.6.2.4 `int cld_authsign (struct hail_log * log, const char * key, const void * buf, size_t buf_len, void * sha)`

4.6.2.5 `const char* cld_errstr (enum cle_err_codes ecodes)`

4.6.2.6 `const char* cld_opstr (enum cld_msg_op)`

4.6.2.7 `const char* cld_pkt_hdr_to_str (char * scratch, const char * pkt_hdr, size_t pkt_len)`

4.6.2.8 `void cld_rand64 (void * p)`

4.6.2.9 `int cld_readport (const char * fname)`

4.6.2.10 `unsigned long long cld_sid2llu (const uint8_t * sid)`

4.6.2.11 `void cld_timer_add (struct cld_timer_list * tlist, struct cld_timer * timer, time_t expires)`

4.6.2.12 `void cld_timer_del (struct cld_timer_list * tlist, struct cld_timer * timer)`

4.6.2.13 `time_t cld_timers_run (struct cld_timer_list * tlist)`

4.7 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_copts_get_data` (const struct `cldc_call_opts` *copts, char **data, size_t *data_len)
- `void cldc_copts_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)

4.7.1 Function Documentation

- 4.7.1.1 `int cldc_close (struct cldc_fh *fh, const struct cldc_call_opts *copts)`
- 4.7.1.2 `void cldc_copts_get_data (const struct cldc_call_opts *copts, char **data, size_t *data_len)`
- 4.7.1.3 `void cldc_copts_get_metadata (const struct cldc_call_opts *copts, struct cldc_node_metadata *md)`
- 4.7.1.4 `int cldc_del (struct cldc_session *sess, const struct cldc_call_opts *copts, const char *pathname)`
- 4.7.1.5 `int cldc_dirent_count (const void *data, size_t data_len)`
- 4.7.1.6 `void cldc_dirent_cur_fini (struct cld_dirent_cur *dc)`
- 4.7.1.7 `void cldc_dirent_cur_init (struct cld_dirent_cur *dc, const void *buf, size_t buflen)`
- 4.7.1.8 `int cldc_dirent_first (struct cld_dirent_cur *dc)`
- 4.7.1.9 `char* cldc_dirent_name (struct cld_dirent_cur *dc)`
- 4.7.1.10 `int cldc_dirent_next (struct cld_dirent_cur *dc)`
- 4.7.1.11 `int cldc_end_sess (struct cldc_session *sess, const struct cldc_call_opts *copts)`
- 4.7.1.12 `int cldc_get (struct cldc_fh *fh, const struct cldc_call_opts *copts, bool metadata_only)`
- 4.7.1.13 `int cldc_getaddr (GList **host_list, const char *thishost, struct hail_log *log)`
- 4.7.1.14 `void cldc_init (void)`
- 4.7.1.15 `void cldc_kill_sess (struct cldc_session *sess)`
- 4.7.1.16 `int cldc_lock (struct cldc_fh *fh, const struct cldc_call_opts *copts, uint32_t lock_flags, bool wait_for_lock)`
- 4.7.1.17 `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)`
- 4.7.1.18 `int cldc_nop (struct cldc_session *sess, const struct cldc_call_opts *copts)`
- 4.7.1.19 `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)`
- 4.7.1.20 `int cldc_put (struct cldc_fh *fh, const struct cldc_call_opts *copts, const void *data, size_t data_len)`
- 4.7.1.21 `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. 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

4.7.1.22 `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)`

4.7.1.23 `void cldc_udp_free (struct cldc_udp * udp)`

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

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

4.7.1.26 `int cldc_udp_receive_pkt (struct cldc_udp * udp)`

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

4.8 include/elist.h File Reference

Data Structures

- struct [list_head](#)

Defines

- #define [LIST_HEAD_INIT](#)(name) { &(name), &(name) }
- #define [LIST_HEAD](#)(name) struct [list_head](#) name = LIST_HEAD_INIT(name)
- #define [INIT_LIST_HEAD](#)(ptr)
- #define [list_entry](#)(ptr, type, member) ((type *)((char *)(ptr)-(unsigned long)&((type *)0)->member))
list_entry - get the struct for this entry : the &struct [list_head](#) pointer.
- #define [list_for_each](#)(pos, head)
list_for_each - iterate over a list : the &struct [list_head](#) to use as a loop counter.
- #define [list_for_each_prev](#)(pos, head)
list_for_each_prev - iterate over a list backwards : the &struct [list_head](#) to use as a loop counter.
- #define [list_for_each_safe](#)(pos, n, head)
list_for_each_safe - iterate over a list safe against removal of list entry : the &struct [list_head](#) to use as a loop counter.
- #define [list_for_each_entry](#)(pos, head, member)
list_for_each_entry - iterate over list of given type : the type * to use as a loop counter.
- #define [list_for_each_entry_safe](#)(pos, n, head, member)
list_for_each_entry_safe - iterate over list of given type safe against removal of list entry : the type * to use as a loop counter.
- #define [list_for_each_entry_continue](#)(pos, head, member)
list_for_each_entry_continue - iterate over list of given type continuing after existing point : the type * to use as a loop counter.

4.8.1 Define Documentation

4.8.1.1 #define INIT_LIST_HEAD(ptr)

Value:

```
do { \
    (ptr)->next = (ptr); (ptr)->prev = (ptr); \
} while (0)
```

4.8.1.2 #define list_entry(ptr, type, member) ((type *)((char *)(ptr)-(unsigned long)(&((type *)0)->member)))

list_entry - get the struct for this entry : the &struct [list_head](#) pointer. : the type of the struct this is embedded in. : the name of the list_struct within the struct.

4.8.1.3 #define list_for_each(pos, head)

Value:

```
for (pos = (head)->next; pos != (head); \
     pos = pos->next)
```

list_for_each - iterate over a list : the &struct [list_head](#) to use as a loop counter. : the head for your list.

4.8.1.4 #define list_for_each_entry(pos, head, member)

Value:

```
for (pos = list_entry((head)->next, typeof(*pos), member); \
     &pos->member != (head); \
     pos = list_entry(pos->member.next, typeof(*pos), member))
```

list_for_each_entry - iterate over list of given type : the type * to use as a loop counter. : the head for your list. : the name of the list_struct within the struct.

4.8.1.5 #define list_for_each_entry_continue(pos, head, member)

Value:

```
for (pos = list_entry(pos->member.next, typeof(*pos), member), \
     prefetch(pos->member.next); \
     &pos->member != (head); \
     pos = list_entry(pos->member.next, typeof(*pos), member), \
     prefetch(pos->member.next))
```

list_for_each_entry_continue - iterate over list of given type continuing after existing point : the type * to use as a loop counter. : the head for your list. : the name of the list_struct within the struct.

4.8.1.6 #define list_for_each_entry_safe(pos, n, head, member)

Value:

```
for (pos = list_entry((head)->next, typeof(*pos), member), \
     n = list_entry(pos->member.next, typeof(*pos), member); \
     &pos->member != (head); \
     pos = n, n = list_entry(n->member.next, typeof(*n), member))
```

list_for_each_entry_safe - iterate over list of given type safe against removal of list entry : the type * to use as a loop counter.

: another type * to use as temporary storage : the head for your list. : the name of the list_struct within the struct.

4.8.1.7 #define list_for_each_prev(pos, head)**Value:**

```
for (pos = (head)->prev; pos != (head); \
     pos = pos->prev)
```

list_for_each_prev - iterate over a list backwards : the &struct [list_head](#) to use as a loop counter. : the head for your list.

4.8.1.8 #define list_for_each_safe(pos, n, head)**Value:**

```
for (pos = (head)->next, n = pos->next; pos != (head); \
     pos = n, n = pos->next)
```

list_for_each_safe - iterate over a list safe against removal of list entry : the &struct [list_head](#) to use as a loop counter.

: another &struct [list_head](#) to use as temporary storage : the head for your list.

4.8.1.9 #define LIST_HEAD(name) struct list_head name = LIST_HEAD_INIT(name)**4.8.1.10 #define LIST_HEAD_INIT(name) { &(amp;name), &(name) }**

4.9 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.

4.9.1 Define Documentation

4.9.1.1 #define ATTR_PRINTF(x, y)

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

Print out a critical warning message.

4.9.1.3 #define HAIL_DEBUG(log, ...)

Value:

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

Print out an application debug message if enabled.

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

Print out an error message.

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

Print out an informational log message.

4.9.1.6 #define HAIL_VERBOSE(log, ...)

Value:

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

Print out a CLD session debug message if enabled.

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

Print out a warning message.

4.10 include/hail_private.h File Reference

```
#include "hail-config.h"
#include <rpc/xdr.h>
```

Functions

- u_long [xdr_sizeof](#) (xdrproc_t, void *)

4.10.1 Function Documentation

4.10.1.1 u_long xdr_sizeof (xdrproc_t, void *)

4.11 include/hstor.h File Reference

```
#include <stdbool.h>
#include <stdint.h>
#include <curl/curl.h>
#include <glib.h>
```

Data Structures

- struct [hstor_client](#)
- struct [hstor_bucket](#)
- struct [hstor_blist](#)
- struct [hstor_object](#)
- struct [hstor_keylist](#)
- struct [http_uri](#)
- struct [http_hdr](#)
- struct [http_req](#)

Defines

- #define [ARRAY_SIZE](#)(arr) (sizeof(arr) / sizeof((arr)[0]))
- #define [PATH_ESCAPE_MASK](#) 0x02
- #define [QUERY_ESCAPE_MASK](#) 0x04

Enumerations

- enum { [HREQ_MAX_HDR](#) = 128 }
- enum [ReqQ](#) {
 [URIQ_ACL](#), [URIQ_LOCATION](#), [URIQ_LOGGING](#), [URIQ_TORRENT](#),
 [URIQNUM](#) }
- enum [ReqACLC](#) {
 [ACLC_PRIV](#), [ACLC_PUB_R](#), [ACLC_PUB_RW](#), [ACLC_AUTH_R](#),
 [ACLCNUM](#) }

Functions

- char * [hutil_time2str](#) (char *buf, int len, time_t time)
- time_t [hutil_str2time](#) (const char *timestr)
- int [hreq_hdr_push](#) (struct [http_req](#) *req, char *key, char *val)
- char * [hreq_hdr](#) (struct [http_req](#) *req, const char *key)
- void [hreq_sign](#) (struct [http_req](#) *req, const char *bucket, const char *key, char *b64hmac_out)
- GHashTable * [hreq_query](#) (struct [http_req](#) *req)
- int [hreq_is_query](#) (struct [http_req](#) *req)
- void [hreq_free](#) (struct [http_req](#) *req)
- int [hreq_acl_canned](#) (struct [http_req](#) *req)
- struct [http_uri](#) * [huri_parse](#) (struct [http_uri](#) *uri_dest, char *uri_src_text)

- int [huri_field_unescape](#) (char *s, int s_len)
- char * [huri_field_escape](#) (char *signed_str, unsigned char mask)
- void [hstor_free](#) (struct [hstor_client](#) *hstor)
- void [hstor_free_blist](#) (struct [hstor_blist](#) *blist)
- void [hstor_free_bucket](#) (struct [hstor_bucket](#) *buck)
- void [hstor_free_object](#) (struct [hstor_object](#) *obj)
- void [hstor_free_keylist](#) (struct [hstor_keylist](#) *keylist)
- struct [hstor_client](#) * [hstor_new](#) (const char *service_acc, const char *service_host, const char *user, const char *secret_key)
- bool [hstor_add_bucket](#) (struct [hstor_client](#) *hstor, const char *name)
- bool [hstor_del_bucket](#) (struct [hstor_client](#) *hstor, const char *name)
- struct [hstor_blist](#) * [hstor_list_buckets](#) (struct [hstor_client](#) *hstor)
- bool [hstor_get](#) (struct [hstor_client](#) *hstor, const char *bucket, const char *key, size_t(*write_cb)(void *, size_t, size_t, void *), void *user_data, bool want_headers)
- void * [hstor_get_inline](#) (struct [hstor_client](#) *hstor, const char *bucket, const char *key, bool want_headers, size_t *len)
- bool [hstor_put](#) (struct [hstor_client](#) *hstor, const char *bucket, const char *key, size_t(*read_cb)(void *, size_t, size_t, void *), uint64_t len, void *user_data, char **user_hdrs)
- bool [hstor_put_inline](#) (struct [hstor_client](#) *hstor, const char *bucket, const char *key, void *data, uint64_t len, char **user_hdrs)
- bool [hstor_del](#) (struct [hstor_client](#) *hstor, const char *bucket, const char *key)
- struct [hstor_keylist](#) * [hstor_keys](#) (struct [hstor_client](#) *hstor, const char *bucket, const char *prefix, const char *marker, const char *delim, unsigned int max_keys)

4.11.1 Define Documentation

4.11.1.1 **#define** `ARRAY_SIZE(arr)` `(sizeof(arr) / sizeof((arr)[0]))`

4.11.1.2 **#define** `PATH_ESCAPE_MASK` `0x02`

4.11.1.3 **#define** `QUERY_ESCAPE_MASK` `0x04`

4.11.2 Enumeration Type Documentation

4.11.2.1 anonymous enum

Enumerator:

HREQ_MAX_HDR

4.11.2.2 enum `ReqACLC`

Enumerator:

ACLC_PRIV

ACLC_PUB_R

ACLC_PUB_RW

ACLC_AUTH_R

ACLCNUM

4.11.2.3 enum ReqQ

Enumerator:

URIQ_ACL

URIQ_LOCATION

URIQ_LOGGING

URIQ_TORRENT

URIQNUM

4.11.3 Function Documentation

- 4.11.3.1 `int hreq_acl_canned (struct http_req * req)`
- 4.11.3.2 `void hreq_free (struct http_req * req)`
- 4.11.3.3 `char* hreq_hdr (struct http_req * req, const char * key)`
- 4.11.3.4 `int hreq_hdr_push (struct http_req * req, char * key, char * val)`
- 4.11.3.5 `int hreq_is_query (struct http_req * req)`
- 4.11.3.6 `GHashTable* hreq_query (struct http_req * req)`
- 4.11.3.7 `void hreq_sign (struct http_req * req, const char * bucket, const char * key, char * b64hmac_out)`
- 4.11.3.8 `bool hstor_add_bucket (struct hstor_client * hstor, const char * name)`
- 4.11.3.9 `bool hstor_del (struct hstor_client * hstor, const char * bucket, const char * key)`
- 4.11.3.10 `bool hstor_del_bucket (struct hstor_client * hstor, const char * name)`
- 4.11.3.11 `void hstor_free (struct hstor_client * hstor)`
- 4.11.3.12 `void hstor_free_blist (struct hstor_blist * blist)`
- 4.11.3.13 `void hstor_free_bucket (struct hstor_bucket * buck)`
- 4.11.3.14 `void hstor_free_keylist (struct hstor_keylist * keylist)`
- 4.11.3.15 `void hstor_free_object (struct hstor_object * obj)`
- 4.11.3.16 `bool hstor_get (struct hstor_client * hstor, const char * bucket, const char * key, size_t*(void *, size_t, size_t, void *) write_cb, void * user_data, bool want_headers)`
- 4.11.3.17 `void* hstor_get_inline (struct hstor_client * hstor, const char * bucket, const char * key, bool want_headers, size_t * len)`
- 4.11.3.18 `struct hstor_keylist* hstor_keys (struct hstor_client * hstor, const char * bucket, const char * prefix, const char * marker, const char * delim, unsigned int max_keys) [read]`
- 4.11.3.19 `struct hstor_blist* hstor_list_buckets (struct hstor_client * hstor) [read]`
- 4.11.3.20 `struct hstor_client* hstor_new (const char * service_acc, const char * service_host, const char * user, const char * secret_key) [read]`
- 4.11.3.21 `bool hstor_put (struct hstor_client * hstor, const char * bucket, const char * key, size_t*(void *, size_t, size_t, void *) read_cb, uint64_t len, void * user_data, char ** user_hdrs)`
- 4.11.3.22 `bool hstor_put_inline (struct hstor_client * hstor, const char * bucket, const char * key, void * data, uint64_t len, char ** user_hdrs)`
- 4.11.3.23 `char* huri_field_escape (char * signed_str, unsigned char mask)`
- 4.11.3.24 `int huri_field_unescape (char * s, int s_len)`
- 4.11.3.25 `struct http_uri* huri_parse (struct http_uri * uri_dest, char * uri_src_text) [read]`
- 4.11.3.26 `time_t hutil_str2time (const char * timestr)`

4.12 include/nclld.h File Reference

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

Data Structures

- struct [nclld_sess](#)
- struct [nclld_fh](#)
- struct [nclld_read](#)

Functions

- struct [nclld_sess](#) * [nclld_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 [nclld_fh](#) * [nclld_open](#) (struct [nclld_sess](#) *s, const char *fname, unsigned int mode, int *error, unsigned int events, void(*event)(void *, unsigned int), void *ev_arg)
- int [nclld_del](#) (struct [nclld_sess](#) *nsess, const char *fname)
- struct [nclld_read](#) * [nclld_get](#) (struct [nclld_fh](#) *fh, int *error)
- struct [nclld_read](#) * [nclld_get_meta](#) (struct [nclld_fh](#) *fh, int *error)
- void [nclld_read_free](#) (struct [nclld_read](#) *rp)
- int [nclld_write](#) (struct [nclld_fh](#) *, const void *data, long len)
- int [nclld_trylock](#) (struct [nclld_fh](#) *)
- int [nclld_qlock](#) (struct [nclld_fh](#) *)
- int [nclld_unlock](#) (struct [nclld_fh](#) *)
- void [nclld_close](#) (struct [nclld_fh](#) *)
- void [nclld_sess_close](#) (struct [nclld_sess](#) *s)
- void [nclld_init](#) (void)

4.12.1 Function Documentation

4.12.1.1 void `ncld_close` (struct `ncld_fh` *)

4.12.1.2 int `ncld_del` (struct `ncld_sess` * *nsess*, const char * *fname*)

4.12.1.3 struct `ncld_read`* `ncld_get` (struct `ncld_fh` * *fh*, int * *error*) [`read`]

4.12.1.4 struct `ncld_read`* `ncld_get_meta` (struct `ncld_fh` * *fh*, int * *error*) [`read`]

4.12.1.5 void `ncld_init` (void)

4.12.1.6 struct `ncld_fh`* `ncld_open` (struct `ncld_sess` * *s*, const char * *fname*, unsigned int *mode*, int * *error*, unsigned int *events*, void(*) (void *, unsigned int) *event*, void * *ev_arg*) [`read`]

4.12.1.7 int `ncld_qlock` (struct `ncld_fh` *)

4.12.1.8 void `ncld_read_free` (struct `ncld_read` * *rp*)

4.12.1.9 void `ncld_sess_close` (struct `ncld_sess` * *s*)

4.12.1.10 struct `ncld_sess`* `ncld_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`]

4.12.1.11 int `ncld_trylock` (struct `ncld_fh` *)

4.12.1.12 int `ncld_unlock` (struct `ncld_fh` *)

4.12.1.13 int `ncld_write` (struct `ncld_fh` *, const void * *data*, long *len*)

4.13 include/objcache.h File Reference

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

Data Structures

- struct [objcache](#)
- struct [objcache_entry](#)

Defines

- #define [OC_F_DIRTY](#) 0x1
- #define [objcache_get](#)(c, k, l) __objcache_get(c, k, l, 0)
- #define [objcache_get_dirty](#)(c, k, l) __objcache_get(c, k, l, OC_F_DIRTY)

Functions

- struct [objcache_entry](#) * [__objcache_get](#) (struct [objcache](#) *cache, const char *key, int klen, unsigned int flag)
- bool [objcache_test_dirty](#) (struct [objcache](#) *cache, struct [objcache_entry](#) *entry)
- void [objcache_put](#) (struct [objcache](#) *cache, struct [objcache_entry](#) *entry)
- int [objcache_count](#) (struct [objcache](#) *cache)
- int [objcache_init](#) (struct [objcache](#) *cache)
- void [objcache_fini](#) (struct [objcache](#) *cache)

4.13.1 Define Documentation

4.13.1.1 #define [objcache_get](#)(c, k, l) __objcache_get(c, k, l, 0)

4.13.1.2 #define [objcache_get_dirty](#)(c, k, l) __objcache_get(c, k, l, OC_F_DIRTY)

4.13.1.3 #define [OC_F_DIRTY](#) 0x1

4.13.2 Function Documentation

4.13.2.1 struct [objcache_entry](#)* [__objcache_get](#) (struct [objcache](#) * *cache*, const char * *key*, int *klen*, unsigned int *flag*) [read]

4.13.2.2 int [objcache_count](#) (struct [objcache](#) * *cache*)

4.13.2.3 void [objcache_fini](#) (struct [objcache](#) * *cache*)

4.13.2.4 int [objcache_init](#) (struct [objcache](#) * *cache*)

4.13.2.5 void [objcache_put](#) (struct [objcache](#) * *cache*, struct [objcache_entry](#) * *entry*)

4.13.2.6 bool [objcache_test_dirty](#) (struct [objcache](#) * *cache*, struct [objcache_entry](#) * *entry*)

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