

CLD

0.1git

Generated by Doxygen 1.8.3.1

Sun Feb 24 2013 01:32:29

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Chapter 1

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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 `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

3.4.1.2 struct [chunksrv_resp](#) chunksrv_resp.chkstat::resp

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

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`

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`

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`

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]`

3.12.2.9 `struct cldc_session* cldc_msg::sess`

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`
- 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`
- 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

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](#)
- bool [subdomain](#)

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 bool hstor_client::subdomain

3.21.1.6 char* hstor_client::user

3.21.1.7 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]

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

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](#)

3.27.1.2 struct [list_head](#) * [list_head::prev](#)

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`

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`

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

- `include/ncld.h`

3.29 ncld_read Struct Reference

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

Data Fields

- `const void * ptr`
- `long length`
- `struct cldc_node_metadata meta`
- `struct ncld_fh * fh`
- `bool is_done`
- `int errc`

3.29.1 Field Documentation

3.29.1.1 `int ncld_read::errc`

3.29.1.2 `struct ncld_fh* ncld_read::fh`

3.29.1.3 `bool ncld_read::is_done`

3.29.1.4 `long ncld_read::length`

3.29.1.5 `struct cldc_node_metadata ncld_read::meta`

3.29.1.6 `const void* ncld_read::ptr`

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

- `include/ncld.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](#)

3.30.1.13 int [ncld_sess::to_thread](#)[2]

3.30.1.14 struct [cldc_udp](#)* [ncld_sess::udp](#)

3.30.1.15 struct [cld_timer](#) [ncld_sess::udp_timer](#)

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>
```

Macros

- `#define MDB_TPATH_FMT "%s/%X"`
- `#define BAD_TPATH_FMT "%s/bad"`
- `#define PREFIX_LEN 3`

4.1.1 Macro Definition 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`

Macros

- `#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 Macro Definition 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 * pfd, 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 * pfd, 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](#)

Macros

- #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 Macro Definition 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 cld_err_codes ecode)`

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

<i>sess</i>	Session associated with received packet
<i>net_addr</i>	Opaque network address
<i>net_addrlen</i>	Size of opaque network address
<i>buf</i>	Pointer to data buffer containing packet
<i>buflen</i>	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](#)

Macros

- `#define LIST_HEAD_INIT(name) { &(amp;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 Macro Definition 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) { &(name), &(name) }

4.9 include/hail_log.h File Reference

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

Data Structures

- struct [hail_log](#)

Macros

- #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 Macro Definition 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>
```

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](#)

Macros

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

Enumerations

- enum [hstor_calling_format](#) { [HFMT_ORDINARY](#), [HFMT_SUBDOMAIN](#) }
- 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](#) (const 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_set_format](#) (struct [hstor_client](#) *hstor, enum [hstor_calling_format](#) f)
- 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, 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 Macro Definition 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 [hstor_calling_format](#)

Enumerator

HFMT_ORDINARY

HFMT_SUBDOMAIN

4.11.2.3 enum [ReqACLC](#)

Enumerator

ACLC_PRIV

ACLC_PUB_R

ACLC_PUB_RW

ACLC_AUTH_R

ACLCNUM

4.11.2.4 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 `bool hstor_set_format (struct hstor_client * hstor, enum hstor_calling_format f)`
- 4.11.3.24 `char* huri_field_escape (const char * signed_str, unsigned char mask)`

4.11.3.25 `int huri_field_unescape (char * s, int s_len)`

4.11.3.26 `struct http_uri* huri_parse (struct http_uri * uri_dest, char * uri_src_text)` [read]

4.11.3.27 `time_t hutil_str2time (const char * timestr)`

4.11.3.28 `char* hutil_time2str (char * buf, int len, time_t time)`

4.12 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](#) *)
- int [ncld_qlock](#) (struct [ncld_fh](#) *)
- int [ncld_unlock](#) (struct [ncld_fh](#) *)
- void [ncld_close](#) (struct [ncld_fh](#) *)
- void [ncld_sess_close](#) (struct [ncld_sess](#) *s)
- void [ncld_init](#) (void)

4.12.1 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 nclد_qlock (struct nclد_fh *)`

4.12.1.8 `void nclد_read_free (struct nclد_read * rp)`

4.12.1.9 `void nclد_sess_close (struct nclد_sess * s)`

4.12.1.10 `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]

4.12.1.11 `int nclد_trylock (struct nclد_fh *)`

4.12.1.12 `int nclد_unlock (struct nclد_fh *)`

4.12.1.13 `int nclد_write (struct nclد_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](#)

Macros

- #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 Macro Definition 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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