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Specification of the Bastei OS Architecture

Norman Feske and Christian Helmuth

March 27, 2008

1 Bastei OS Architecture Namespace Documentation

1.1 Bastei Namespace Reference

CPU (processing time) manager session interface.

Classes

- class Allocator
- class Allocator_avl_base
- class Allocator_avl_tpl
- class Empty
- class Session
- class Child
- class Env
- class Heap
- class Sliced_heap
- class Ipc_error
- class Buffer
- class Ipc_marshaller
- class Ipc_unmarshaller
- class Ipc_ostream
- class Ipc_istream
- class Ipc_client
- class Ipc_server
- class Msgbuf
- class Lock
- class Lock_guard
- class Object_pool
- class Ram_dataspace
- class Semaphore
- class Server_object
- class Server_activation_base

- class Server_entrypoint
- class Server_activation
- class Client
- class Service
- class Local_service
- class Remote_service
- class Service_pool
- class Remote_service_pool
- class Session_control
- class Slab_block
- class Slab_entry
- class Slab
- class Task
- class Thread_base
- class Thread
- struct Thread_state
- class Tslab
- class Cap_session
- class Cpu_session
- class Dataspace
- class Io_mem_session
- class Io_port_session
- class Irq_session
- class Log_session
- class Parent
- class Ram_session
- class Rm_session
- class Rom_session
- class Root
- class Task_session

Typedefs

- typedef Allocator_avl_tpl< Empty > Allocator_avl
- typedef ::Fiasco::Capability Capability
- typedef ::Fiasco::l4_threadid_t Connection_state
- typedef ::Fiasco::Msgbuf_base Msgbuf_base
- typedef Service_pool< Local_service > Local_service_pool

Enumerations

- enum { ERR_INVALID_OBJECT = -1 }
- enum Ipc_ostream_send { IPC_SEND }
- enum Ipc_istream_wait { IPC_WAIT }
- enum Ipc_client_call { IPC_CALL }
- enum Ipc_server_reply_wait { IPC_REPLY_WAIT }

Functions

- template<typename T>
  void destroy (Allocator *alloc, T *obj)
- Env * env ()
- Capability parent_cap ()
- Capability session (const char *service_name, const char *format_args,...)
- void sleep_forever ()

1.1.1 Detailed Description

Task (program) manager session interface.

Author:

Christian Helmuth

Date:

2006-06-27

:Question:

Why are thread operations not methods of the thread but methods of the CPU session?

:Answer:

This enables the CPU session to impose policies on thread operations. These policies are based on the session construction arguments. If thread operations would be provided as thread methods, Thread would need to consult its container object (its CPU session) about the authorization of each operation and, thereby, would introduce a circular dependency between CPU session and Thread.

Author:

Christian Helmuth

Date:

2006-06-27

A task session represents the protection domain of a program.

1.1.2 Typedef Documentation

1.1.2.1 typedef Allocator_avl_tpl<Empty> Bastei::Allocator_avl

1.1.2.2 typedef ::Fiasco::Capability Bastei::Capability

1.1.2.3 typedef ::Fiasco::l4_threadid_t Bastei::Connection_state

1.1.2.4 typedef Service_pool<Local_service> Bastei::Local_service_pool

1.1.2.5 typedef ::Fiasco::Msgbuf_base Bastei::Msgbuf_base

1.1.3 Enumeration Type Documentation

1.1.3.1 anonymous enum

Enumerator:

ERR_INVALID_OBJECT

1.1.3.2 enum Bastei::Ipc_client_call

Enumerator:

IPC_CALL

1.1.3.3 enum Bastei::Ipc_istream_wait

Enumerator:

IPC_WAIT

1.1.3.4 enum Bastei::Ipc_ostream_send

Enumerator:

IPC_SEND

1.1.3.5 enum Bastei::Ipc_server_reply_wait

Enumerator:

IPC_REPLY_WAIT

1.1.4 Function Documentation

1.1.4.1 template<typename T> void Bastei::destroy (Allocator * *alloc*, T * *obj*) [inline]

1.1.4.2 Env* Bastei::env ()

1.1.4.3 Capability Bastei::parent_cap ()

Return parent capability

Platforms have to implement this function for environment initialization.

1.1.4.4 Capability Bastei::session (const char * *service_name*, const char * *format_args*, ...) [inline]

Shortcut for env()->parent()->session() function

1.1.4.5 void Bastei::sleep_forever () [inline]

1.2 Fiasco Namespace Reference

Classes

- class Capability
- class Msgbuf_base
- class Msgbuf

1.3 Framebuffer Namespace Reference

Classes

- class Session

1.4 Init Namespace Reference

Classes

- class Child
- class Child_config

1.5 Input Namespace Reference

Classes

- class Session

1.6 Nitpicker Namespace Reference

Classes

- class Session
- class View

1.7 Pci Namespace Reference

Classes

- class Device
- class Session

1.8 Timer Namespace Reference

Classes

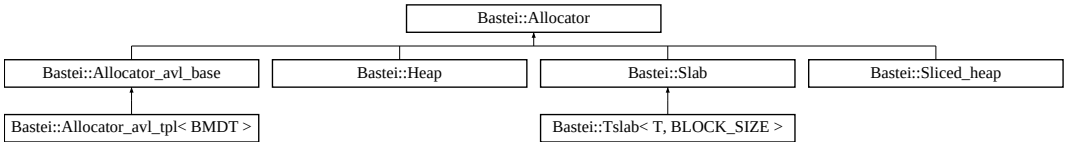
- class Session

2 Bastei OS Architecture Class Documentation

2.1 Bastei::Allocator Class Reference

`#include <allocator.h>`

Inheritance diagram for Bastei::Allocator::



Public Member Functions

- virtual ~Allocator ()
- virtual void * alloc (size_t size)=0
- virtual void free (void *addr, size_t size)=0
- virtual size_t consumed ()
- virtual size_t overhead ()=0

Classes

- class Out_of_memory

2.1.1 Constructor & Destructor Documentation

2.1.1.1 virtual Bastei::Allocator::~Allocator () `[inline, virtual]`

Destructor

2.1.2 Member Function Documentation

2.1.2.1 virtual void* Bastei::Allocator::alloc (size_t *size*) `[pure virtual]`

Allocate block

Implemented in Bastei::Allocator_avl_base, Bastei::Heap, Bastei::Sliced_heap, and Bastei::Slab.

2.1.2.2 virtual void Bastei::Allocator::free (void * *addr*, size_t *size*) [pure virtual]

Free block a previously allocated block

Implemented in Bastei::Allocator_avl_base, Bastei::Heap, Bastei::Sliced_heap, and Bastei::Slab.

2.1.2.3 virtual size_t Bastei::Allocator::consumed () [inline, virtual]

Return total amount of backingstore consumed by the allocator

Reimplemented in Bastei::Heap, Bastei::Sliced_heap, and Bastei::Slab.

2.1.2.4 virtual size_t Bastei::Allocator::overhead () [pure virtual]

Return metadata overhead per block

Implemented in Bastei::Allocator_avl_base, Bastei::Heap, Bastei::Sliced_heap, and Bastei::Slab.

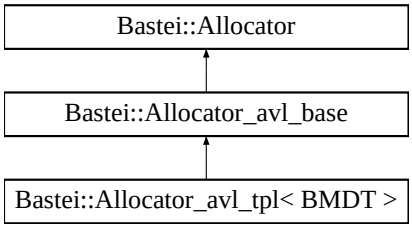
2.2 Bastei::Allocator::Out_of_memory Class Reference

`#include <allocator.h>`

2.3 Bastei::Allocator_avl_base Class Reference

`#include <allocator_avl.h>`

Inheritance diagram for Bastei::Allocator_avl_base::



Public Member Functions

- int add_area (addr_t base, size_t size)
- int remove_area (addr_t base, size_t size)
- void * alloc_aligned (size_t size, int align=0)
- bool alloc_addr (size_t size, addr_t addr)
- void free (void *addr)
- void dump_addr_tree (Block *addr_node=0)
- bool any_block_addr (addr_t *out_addr)
- void * alloc (size_t size)
- void free (void *addr, size_t)
- size_t overhead ()
- size_t avail ()

Protected Member Functions

- Block * _find_by_address (addr_t addr, size_t size=0, bool check_overlap=0) const
- Allocator_avl_base (Allocator *md_alloc, size_t md_entry_size)

Classes

- class Block

2.3.1 Constructor & Destructor Documentation

2.3.1.1 Bastei::Allocator_avl_base::Allocator_avl_base (Allocator * *md_alloc*, size_t *md_entry_size*) [inline, protected]

Constructor

This constructor can only be called from a derived class that provides an allocator for block metadata entries. This way, we can attach custom information to block metadata.

2.3.2 Member Function Documentation

2.3.2.1 Block* Bastei::Allocator_avl_base::_find_by_address (addr_t *addr*, size_t *size* = 0, bool *check_overlap* = 0) const [inline, protected]

Find block by specified address

2.3.2.2 int Bastei::Allocator_avl_base::add_area (addr_t *base*, size_t *size*)

Add free address area to allocator

Reimplemented in Bastei::Allocator_avl_tpl< BMDT >.

2.3.2.3 int Bastei::Allocator_avl_base::remove_area (addr_t *base*, size_t *size*)

Remove address area from allocator

2.3.2.4 void* Bastei::Allocator_avl_base::alloc_aligned (size_t *size*, int *align* = 0)

Allocate block

Parameters:

size size of new block

align alignment of new block specified as the power of two.

2.3.2.5 bool Bastei::Allocator_avl_base::alloc_addr (size_t *size*, addr_t *addr*)

Allocate block at address

Parameters:

size size of new block

addr desired address of block

Returns:

True if allocations succeeded, false otherwise

2.3.2.6 void Bastei::Allocator_avl_base::free (void * *addr*)

Free block a previously allocated block

2.3.2.7 void Bastei::Allocator_avl_base::dump_addr_tree (Block * *addr_node* = 0)

Debug hooks

2.3.2.8 bool Bastei::Allocator_avl_base::any_block_addr (addr_t * *out_addr*)

Return address of any block of the allocator

Parameters:

out_addr Result that constains address of block

Returns:

True if block was found or False if there is no block available

If no block was found, out_addr is set to zero.

2.3.2.9 void* Bastei::Allocator_avl_base::alloc (size_t *size*) [inline, virtual]

Allocate block

Implements Bastei::Allocator.

2.3.2.10 void Bastei::Allocator_avl_base::free (void * *addr*, size_t *size*) [inline, virtual]

Free block a previously allocated block

Implements Bastei::Allocator.

2.3.2.11 size_t Bastei::Allocator_avl_base::overhead () [inline, virtual]

The overhead is a rough estimation. If a block is somewhere in the middle of a free area, we could consider the metadata for the two free subareas when calculating the overhead.

The 4 represents the overhead of the metadata slab allocator.

Implements Bastei::Allocator.

2.3.2.12 size_t Bastei::Allocator_avl_base::avail ()

Return the sum of available memory

Note that the returned value is not neccessarily allocatable because the memory may be fragmented.

2.4 Bastei::Allocator_avl_base::Block Class Reference

`#include <allocator_avl.h>`

Public Types

- enum { FREE = false, USED = true }

Public Member Functions

- bool higher (Block *a)
- void recompute ()
- int id ()
- addr_t addr ()
- size_t avail ()
- size_t size ()
- bool used ()
- size_t max_avail ()
- void used (bool used)
- Block ()
- Block (addr_t addr, size_t size, bool used)
- Block * find_best_fit (size_t size, unsigned align=1)
- Block * find_by_address (addr_t addr, size_t size=0, bool check_overlap=0)
- size_t avail_in_subtree (void)
- void dump ()
- void dump_dot (int indent=0)

2.4.1 Member Enumeration Documentation

2.4.1.1 anonymous enum

Enumerator:

FREE

USED

2.4.2 Constructor & Destructor Documentation

2.4.2.1 Bastei::Allocator_avl_base::Block::Block () `[inline]`

Constructor

This constructor is called from metadata allocator during initialization of new metadata blocks.

2.4.2.2 Bastei::Allocator_avl_base::Block::Block (addr_t *addr*, size_t *size*, bool *used*) `[inline]`

Constructor

2.4.3 Member Function Documentation

2.4.3.1 bool Bastei::Allocator_avl_base::Block::higher (Block * *a*) [inline]

Avl_node interface: compare two nodes

2.4.3.2 void Bastei::Allocator_avl_base::Block::recompute ()

Avl_node interface: update metadata on node rearrangement

2.4.3.3 int Bastei::Allocator_avl_base::Block::id () [inline]

Accessor functions

2.4.3.4 addr_t Bastei::Allocator_avl_base::Block::addr () [inline]

2.4.3.5 size_t Bastei::Allocator_avl_base::Block::avail () [inline]

2.4.3.6 size_t Bastei::Allocator_avl_base::Block::size () [inline]

2.4.3.7 bool Bastei::Allocator_avl_base::Block::used () [inline]

2.4.3.8 size_t Bastei::Allocator_avl_base::Block::max_avail () [inline]

2.4.3.9 void Bastei::Allocator_avl_base::Block::used (bool *used*) [inline]

2.4.3.10 Block* Bastei::Allocator_avl_base::Block::find_best_fit (size_t *size*, unsigned *align* = 1)

Find best-fitting block

2.4.3.11 Block* Bastei::Allocator_avl_base::Block::find_by_address (addr_t *addr*, size_t *size* = 0, bool *check_overlap* = 0)

Find block that contains the specified address range

2.4.3.12 size_t Bastei::Allocator_avl_base::Block::avail_in_subtree (void)

Return sum of available memory in subtree

2.4.3.13 void Bastei::Allocator_avl_base::Block::dump ()

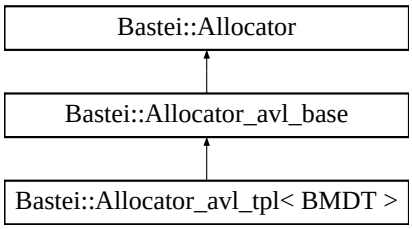
Debug hooks

2.4.3.14 void Bastei::Allocator_avl_base::Block::dump_dot (int *indent* = 0)

2.5 Bastei::Allocator_avl_tpl< BMDT > Class Template Reference

`#include <allocator_avl.h>`

Inheritance diagram for Bastei::Allocator_avl_tpl< BMDT >::



Public Member Functions

- Allocator_avl_tpl ()
- Allocator_avl_tpl (Allocator *metadata_chunk_alloc)
- void metadata (void *addr, BMDT bmd) const
- BMDT * metadata (void *addr) const
- int add_area (addr_t base, size_t size)

Classes

- class **Block**

2.5.1 Detailed Description

template<typename BMDT> class Bastei::Allocator_avl_tpl< BMDT >

AVL-based allocator with custom metadata attached to each block.

Parameters:

BMDT Block metadata type

2.5.2 Constructor & Destructor Documentation

2.5.2.1 template<typename BMDT> Bastei::Allocator_avl_tpl< BMDT >::Allocator_avl_tpl () `[inline]`

Constuctor

Use ourself for allocating our metadata blocks. This works only if the managed memory is completely accessible by the allocator. If the allocator is used to manage a non-accessible address range, for example the virtual address space of another task, the metadata allocator can be defined via the second constructor.

2.5.2.2 template<typename BMDT> Bastei::Allocator_avl_tpl< BMDT >::Allocator_avl_tpl (Allocator * *metadata_chunk_alloc*) `[inline, explicit]`

2.5.3 Member Function Documentation

2.5.3.1 template<typename BMDT> void Bastei::Allocator_avl_tpl< BMDT >::metadata (void * *addr*, BMDT *bmd*) const [inline]

Assign custom metadata to block at specified address

2.5.3.2 template<typename BMDT> BMDT* Bastei::Allocator_avl_tpl< BMDT >::metadata (void * *addr*) const [inline]

Return metadata that was attached to block at specified address

2.5.3.3 template<typename BMDT> int Bastei::Allocator_avl_tpl< BMDT >::add_area (addr_t *base*, size_t *size*) [inline]

Add free address area to allocator

Reimplemented from Bastei::Allocator_avl_base.

2.6 Bastei::Buffer Class Reference

`#include <ipc_generic.h>`

Public Member Functions

- Buffer (const char *addr, size_t size)
- Buffer (const char *str)
- Buffer ()
- const char * addr ()
- size_t size ()

2.6.1 Constructor & Destructor Documentation

2.6.1.1 Bastei::Buffer::Buffer (const char * *addr*, size_t *size*) [inline]

Construct buffer

2.6.1.2 Bastei::Buffer::Buffer (const char * *str*) [inline, explicit]

Construct buffer from null-terminated string

2.6.1.3 Bastei::Buffer::Buffer () [inline]

Construct an invalid buffer as default

2.6.2 Member Function Documentation

2.6.2.1 const char* Bastei::Buffer::addr () [inline]

2.6.2.2 size_t Bastei::Buffer::size () [inline]

2.7 Bastei::Cap_session Class Reference

`#include <cap_session.h>`

Public Member Functions

- virtual ~Cap_session ()
- virtual Capability alloc (Capability ep_cap)=0
- virtual void free (Capability cap)=0

Protected Types

- enum Opcode { ALLOC, FREE }

2.7.1 Member Enumeration Documentation

2.7.1.1 enum Bastei::Cap_session::Opcode [protected]

Enumerator:

ALLOC
FREE

2.7.2 Constructor & Destructor Documentation

2.7.2.1 virtual Bastei::Cap_session::~Cap_session () [inline, virtual]

2.7.3 Member Function Documentation

2.7.3.1 virtual Capability Bastei::Cap_session::alloc (Capability *ep_cap*) [pure virtual]

Allocate new unique userland capability

Parameters:

ep_cap entrypoint that will use this capability

Returns:

new userland capability

2.7.3.2 virtual void Bastei::Cap_session::free (Capability *cap*) [pure virtual]

Free userland capability

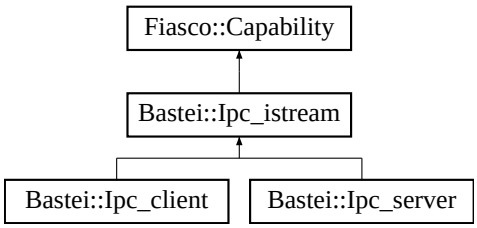
Parameters:

cap userland capability to free

2.8 Fiasco::Capability Class Reference

`#include <capability.h>`

Inheritance diagram for Fiasco::Capability::



Public Member Functions

- Capability ()
- long local_name () const
- bool valid () const
- Capability (l4_threadid_t tid, l4_umword_t local_name)
- l4_threadid_t tid () const

Protected Attributes

- l4_threadid_t _tid
- long _local_name

2.8.1 Constructor & Destructor Documentation

2.8.1.1 Fiasco::Capability::Capability () `[inline]`

Default constructor

2.8.1.2 Fiasco::Capability::Capability (l4_threadid_t *tid*, l4_umword_t *local_name*) `[inline]`

Constructor

This constructor can be called to create a Fiasco capability by hand. It must never be used from generic code!

2.8.2 Member Function Documentation

2.8.2.1 long Fiasco::Capability::local_name () const `[inline]`

2.8.2.2 bool Fiasco::Capability::valid () const `[inline]`

2.8.2.3 l4_threadid_t Fiasco::Capability::tid () const [inline]

Access raw capability data

2.8.3 Member Data Documentation

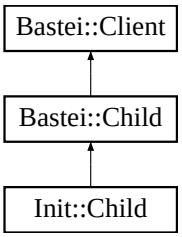
2.8.3.1 l4_threadid_t Fiasco::Capability::_tid [protected]

2.8.3.2 long Fiasco::Capability::_local_name [protected]

2.9 Bastei::Child Class Reference

`#include <child.h>`

Inheritance diagram for Bastei::Child::



Public Member Functions

- Child (const char *name, Capability elf_ds_cap, Capability ram_session_cap, Capability cpu_session_cap, Cap_session *cap_session, char *args[ ])
- ~Child ()
- Allocator * heap ()
- Capability ram_session_cap ()
- Capability cpu_session_cap ()
- void finalize_construction ()
- void prepare_destruction ()
- void revoke_server (Child *server)
- Server_entrypoint * parent_entrypoint ()
- int announce (const char *service_name, Capability service_root)
- Capability session (const char *service_name, const char *args)
- int transfer_quota (Capability to_session_cap, size_t amount)
- void close (Capability session_cap)
- void exit (int exit_value)

Protected Member Functions

- int _add_session (Session s)
- void _remove_session (Session *s)

Protected Attributes

- Capability _ram_session_cap
- Ram_session_client _ram_session_client

2.9.1 Constructor & Destructor Documentation

2.9.1.1 Bastei::Child::Child (const char * *name*, Capability *elf_ds_cap*, Capability *ram_session_cap*, Capability *cpu_session_cap*, Cap_session * *cap_session*, char * *args*[]) [inline]

Constructor

Parameters:

name Unique name of the child

elf_ds_cap Dataspace containing the binary

ram_session_cap RAM session with the child's quota

cpu_session_cap CPU session with the child's quota

cap_session Capability allocator

args ???

2.9.1.2 Bastei::Child::~Child () [inline]

Destructor

On destruction of a child, we close all sessions of the child to other services.

Reimplemented in Init::Child.

2.9.2 Member Function Documentation

2.9.2.1 int Bastei::Child::_add_session (Session *s*) [inline, protected]

2.9.2.2 void Bastei::Child::_remove_session (Session * *s*) [inline, protected]

2.9.2.3 Allocator* Bastei::Child::heap () [inline]

Return heap that uses the child's quota

2.9.2.4 Capability Bastei::Child::ram_session_cap () [inline]

2.9.2.5 Capability Bastei::Child::cpu_session_cap () [inline]

2.9.2.6 void Bastei::Child::finalize_construction () [inline]

Finalize construction of child

On construction of the child, we create a new task and a new parent server thread. The new child tasks starts immediately to speak with its parent server thread and performs session() RPC calls. Therefore, the dispatch function of the parent server may be called before the complete child object (including its final vtable entries) is constructed. Therefore, we delay the server activation of the parent server until all constructors are completed.

2.9.2.7 void Bastei::Child::prepare_destruction () [inline]

Prepare destruction of child

Similar to the construction case we must ensure that the server activation will not use half-destructed objects (vtable). Therefore we dissolve the server object (this child) from entrypoint before destruction starts.

2.9.2.8 void Bastei::Child::revoke_server (Child * *server*) [inline]

Discard all sessions to specified server

When this function is called, we assume the server task to be dead and all that all server quote was already transfered back to our own env()->ram_session() account. Note that the specified server object may not exist anymore. We do not de-reference the server argument in here!

2.9.2.9 Server_entrypoint* Bastei::Child::parent_entrypoint () [inline]

Request entrypoint used for the child's parent interface

This function allows for attaching additional server objects to the child-specific entrypoint, for example to provide child-specific services without the need to create separate entrypoints and activations. Note that all calls to this entrypoint get serialized. Therefore, a blocking server function defers calls to the parent interface.

2.9.2.10 int Bastei::Child::announce (const char * *service_name*, Capability *service_root*) [inline]

Reimplemented in Init::Child.

2.9.2.11 Capability Bastei::Child::session (const char * *service_name*, const char * *args*) [inline]

By default, we only check for the sessions that we created for the child on startup. A derived class may implement a proper service resolving policy.

Reimplemented in Init::Child.

2.9.2.12 int Bastei::Child::transfer_quota (Capability *to_session_cap*, size_t *amount*) [inline]

2.9.2.13 void Bastei::Child::close (Capability *session_cap*) [inline]

2.9.2.14 void Bastei::Child::exit (int *exit_value*) [inline]

2.9.3 Member Data Documentation

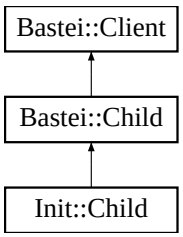
2.9.3.1 Capability Bastei::Child::_ram_session_cap [protected]

2.9.3.2 Ram_session_client Bastei::Child::_ram_session_client [protected]

2.10 Init::Child Class Reference

`#include <child.h>`

Inheritance diagram for Init::Child::



Public Member Functions

- Child (const char *name, Bastei::Capability elf_ds_cap, Bastei::Capability ram_session_cap, Bastei::Capability cpu_session_cap, Bastei::Cap_session *cap_session, Bastei::Remote_service_pool *remote_services, Bastei::Capability config_ds_cap)
- ~Child ()
- const char * name ()
- Bastei::Capability session (const char *service_name, const char *args)
- int announce (const char *service_name, Bastei::Capability service_root)

Protected Member Functions

- void _prepend_label (const char *args)
- virtual bool _delegate_to_parent (const char *service_name, const char *args)

Static Protected Member Functions

- static Bastei::size_t _ram_quota (const char *args)

Protected Attributes

- Bastei::Remote_service_pool * _remote_services
- char _argbuf [256]

Classes

- class **Config_rom_session_component**

2.10.1 Constructor & Destructor Documentation

2.10.1.1 Init::Child::Child (const char * *name*, Bastei::Capability *elf_ds_cap*, Bastei::Capability *ram_session_cap*, Bastei::Capability *cpu_session_cap*, Bastei::Cap_session * *cap_session*, Bastei::Remote_service_pool * *remote_services*, Bastei::Capability *config_ds_cap*) [inline]

Constructor

Parameters:

name Name of child (used for debugging)

elf_ds_cap ELF binary of program to run

ram_session_cap RAM session for child

cpu_session_cap CPU session for child

cap_session Capability session for child

remote_services Service pool for child

config_ds_cap Capability for configuration dataspace

See the description of Bastei::Child for the other arguments.

2.10.1.2 Init::Child::~Child () [inline]

Destructor

Reimplemented from Bastei::Child.

2.10.2 Member Function Documentation

2.10.2.1 static Bastei::size_t Init::Child::_ram_quota (const char * *args*) [inline, static, protected]

2.10.2.2 void Init::Child::_prepend_label (const char * *args*) [inline, protected]

2.10.2.3 virtual bool Init::Child::_delegate_to_parent (const char * *service_name*, const char * *args*) [inline, protected, virtual]

Decide if a session request should be delegated to our parent

We should do this only if we are confident that such a service exists at our parent. If the a service is not known to our parent, the parent may enqueue us into his wait-for-service queue and block the request.

2.10.2.4 const char* Init::Child::name () [inline, virtual]

Return name of client

This function is here for debugging purposes.

Reimplemented from Bastei::Client.

2.10.2.5 Bastei::Capability Init::Child::session (const char * *service_name*, const char * *args*) [inline]

By default, we only check for the sessions that we created for the child on startup. A derived class may implement a proper service resolving policy.

Reimplemented from Bastei::Child.

2.10.2.6 int Init::Child::announce (const char * *service_name*, Bastei::Capability *service_root*) [inline]

Reimplemented from Bastei::Child.

2.10.3 Member Data Documentation

2.10.3.1 Bastei::Remote_service_pool* Init::Child::_remote_services [protected]

2.10.3.2 char Init::Child::_argbuf[256] [protected]

2.11 Init::Child_config Class Reference

`#include <child_config.h>`

Public Member Functions

- Child_config (Bastei::Capability ram_session_cap, Bastei::Xml_node start_node)
- ~Child_config ()
- Bastei::Capability dataspace ()

2.11.1 Constructor & Destructor Documentation

2.11.1.1 Init::Child_config::Child_config (Bastei::Capability *ram_session_cap*, Bastei::Xml_node *start_node*) [inline]

Constructor

The provided RAM session is used to obtain a dataspace for holding the copy of the child's configuration data. Normally, the child's RAM session should be used to account the consumed RAM quota to the child.

2.11.1.2 Init::Child_config::~Child_config () [inline]

Destructor

2.11.2 Member Function Documentation

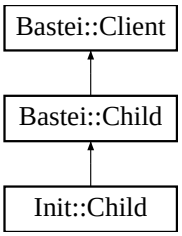
2.11.2.1 Bastei::Capability Init::Child_config::dataspace () [inline]

Request dataspace holding the start node's configuration data

2.12 Bastei::Client Class Reference

`#include <service.h>`

Inheritance diagram for Bastei::Client::



Public Member Functions

- Client ()
- virtual ~Client ()
- virtual const char * name ()
- void apply_for (const char *apply_for)
- const char * apply_for ()
- void sleep ()
- void wakeup ()

2.12.1 Detailed Description

A client is someone who applies for a service. If the service is not available yet, we enqueue the client into a wait queue and wake him up as soon as the requested service gets available.

2.12.2 Constructor & Destructor Documentation

2.12.2.1 Bastei::Client::Client () [inline]

Constructor

2.12.2.2 virtual Bastei::Client::~Client () [inline, virtual]

2.12.3 Member Function Documentation

2.12.3.1 virtual const char* Bastei::Client::name () [inline, virtual]

Return name of client

This function is here for debugging purposes.

Reimplemented in Init::Child.

2.12.3.2 void Bastei::Client::apply_for (const char * *apply_for*) [inline]

Set/Request service name that we are currently applying for

2.12.3.3 const char* Bastei::Client::apply_for () [inline]

2.12.3.4 void Bastei::Client::sleep () [inline]

Service wait queue support

2.12.3.5 void Bastei::Client::wakeup () [inline]

2.13 Bastei::Cpu_session Class Reference

`#include <cpu_session.h>`

Public Types

- enum { THREAD_NAME_LEN = 32 }

Public Member Functions

- virtual ~Cpu_session ()
- virtual int create_thread (const char *name, Capability *new_thread_cap)=0
- virtual void kill_thread (Capability thread_cap)=0
- virtual Capability first ()=0
- virtual Capability next (Capability curr)=0
- virtual int set_pager (Capability thread_cap, Capability pager_cap)=0
- virtual int start (Capability thread_cap, addr_t ip, addr_t sp)=0
- virtual int cancel_blocking (Capability thread_cap)=0
- virtual int name (Capability thread_cap, char *name_dst, size_t name_len)=0
- virtual int state (Capability thread_cap, Thread_state *state_dst)=0

Protected Types

- enum Opcode {
  CREATE_THREAD, KILL_THREAD, FIRST, NEXT,
  SET_PAGER, START, CANCEL_BLOCKING, NAME,
  STATE }

2.13.1 Member Enumeration Documentation

2.13.1.1 enum Bastei::Cpu_session::Opcode [protected]

Enumerator:

CREATE_THREAD

KILL_THREAD

FIRST

NEXT

SET_PAGER

START

CANCEL_BLOCKING

NAME

STATE

2.13.1.2 anonymous enum

Enumerator:

THREAD_NAME_LEN

2.13.2 Constructor & Destructor Documentation

2.13.2.1 virtual Bastei::Cpu_session::~Cpu_session () [inline, virtual]

2.13.3 Member Function Documentation

2.13.3.1 virtual int Bastei::Cpu_session::create_thread (const char * *name*, Capability * *new_thread_cap*) [pure virtual]

Create a new thread

Parameters:

name name for the thread

Return values:

new_thread_cap capability for the new thread

2.13.3.2 virtual void Bastei::Cpu_session::kill_thread (Capability *thread_cap*) [pure virtual]

Kill an existing thread

Parameters:

thread_cap capability of the thread to kill

2.13.3.3 virtual Capability Bastei::Cpu_session::first () [pure virtual]

Retrieve thread list of CPU session

The next() function returns an invalid capability if the specified thread does not exists or if it is the last one of the CPU session.

2.13.3.4 virtual Capability Bastei::Cpu_session::next (Capability *curr*) [pure virtual]

2.13.3.5 virtual int Bastei::Cpu_session::set_pager (Capability *thread_cap*, Capability *pager_cap*) [pure virtual]

Set paging capabilities for thread

Parameters:

thread_cap Thread to configure
pager_cap Capability used to propagate page faults

2.13.3.6 virtual int Bastei::Cpu_session::start (Capability *thread_cap*, addr_t *ip*, addr_t *sp*) [pure virtual]

Modify instruction and stack pointer of thread - start the thread

Parameters:

thread_cap Thread to start
ip Initial instruction pointer
sp Initial stack pointer

Returns:

0 on success

2.13.3.7 virtual int Bastei::Cpu_session::cancel_blocking (Capability *thread_cap*) [pure virtual]

Cancel a currently blocking operation

Parameters:

thread_cap Thread to unblock

Returns:

0 on success

2.13.3.8 virtual int Bastei::Cpu_session::name (Capability *thread_cap*, char * *name_dst*, size_t *name_len*) [pure virtual]

Return thread name

Parameters:

thread_cap Thread to query

name_dst Destination string buffer

name_len Length of destination string buffer

Returns:

0 on success

2.13.3.9 virtual int Bastei::Cpu_session::state (Capability *thread_cap*, Thread_state * *state_dst*) [pure virtual]

Return thread state

Parameters:

thread_cap Thread to spy on

state_dst Result

Returns:

0 on success

2.14 Bastei::Dataspace Class Reference

`#include <dataspace.h>`

Public Types

- enum Opcode { SIZE, PHYS_ADDR, NUM_GENERIC_OPCODES }

Public Member Functions

- virtual ~Dataspace ()
- virtual size_t size ()=0
- virtual addr_t phys_addr ()=0

2.14.1 Member Enumeration Documentation

2.14.1.1 enum Bastei::Dataspace::Opcode

Enumerator:

SIZE

PHYS_ADDR

NUM_GENERIC_OPCODES

2.14.2 Constructor & Destructor Documentation

2.14.2.1 virtual Bastei::Dataspace::~Dataspace () [inline, virtual]

2.14.3 Member Function Documentation

2.14.3.1 virtual size_t Bastei::Dataspace::size () [pure virtual]

Request size of dataspace

2.14.3.2 virtual addr_t Bastei::Dataspace::phys_addr () [pure virtual]

Request base address in physical address space

2.15 Pci::Device Class Reference

`#include <pci_device.h>`

Public Types

- enum { NUM_RESOURCES = 6 }

Public Member Functions

- virtual ~Device ()
- virtual unsigned short device_id ()=0
- virtual unsigned class_code ()=0
- virtual Resource resource (int resource_id)=0
- unsigned base_class ()
- unsigned sub_class ()

Protected Types

- enum Opcode { DEVICE_ID, CLASS_CODE, RESOURCE }

Classes

- class Resource

2.15.1 Member Enumeration Documentation

2.15.1.1 enum Pci::Device::Opcode [protected]

Enumerator:

DEVICE_ID

CLASS_CODE

RESOURCE

2.15.1.2 anonymous enum

Resource type, either port I/O resource or memory-mapped resource

Enumerator:

NUM_RESOURCES

2.15.2 Constructor & Destructor Documentation

2.15.2.1 virtual Pci::Device::~Device () [inline, virtual]

2.15.3 Member Function Documentation

2.15.3.1 virtual unsigned short Pci::Device::device_id () [pure virtual]

Return device ID obtained from the PCI config space

2.15.3.2 virtual unsigned Pci::Device::class_code () [pure virtual]

Return device class code from the PCI config space

2.15.3.3 virtual Resource Pci::Device::resource (int *resource_id*) [pure virtual]

Query PCI-resource information

Parameters:

resource_id Index of according PCI resource of the device

Returns:

Resource description. If the supplied resource ID is invalid, the type of the returned resource is INVALID.

2.15.3.4 unsigned Pci::Device::base_class () [inline]

2.15.3.5 unsigned Pci::Device::sub_class () [inline]

2.16 Pci::Device::Resource Class Reference

```
#include <pci_device.h>
```

Public Types

- enum Type { IO, MEMORY, INVALID }

Public Member Functions

- Resource ()
- Resource (unsigned bar, unsigned size)
- unsigned base ()
- unsigned size ()
- bool prefetchable ()
- Type type ()

2.16.1 Member Enumeration Documentation

2.16.1.1 enum Pci::Device::Resource::Type

Enumerator:

IO

MEMORY

INVALID

2.16.2 Constructor & Destructor Documentation

2.16.2.1 Pci::Device::Resource::Resource () [inline]

Default constructor

2.16.2.2 Pci::Device::Resource::Resource (unsigned *bar*, unsigned *size*) [inline]

Constructor

Parameters:

bar Content of base-address register

size Resource size

This constructor is only used by the PCI bus driver that implements the server-side of the the PCI session. If bar is set to zero, the constucted resource description represents an INVALID resource.

2.16.3 Member Function Documentation

2.16.3.1 unsigned Pci::Device::Resource::base () [inline]

Return base address of resource

2.16.3.2 unsigned Pci::Device::Resource::size () [inline]

Return resource size in bytes

2.16.3.3 bool Pci::Device::Resource::prefetchable () [inline]

Return true if resource is prefetchable memory

2.16.3.4 Type Pci::Device::Resource::type () [inline]

Return resource type

2.17 Bastei::Empty Class Reference

`#include <allocator_avl.h>`

2.17.1 Detailed Description

Define AVL-based allocator without any metadata attached to each block.

2.18 Bastei::Env Class Reference

`#include <env.h>`

Public Member Functions

- virtual ~Env ()
- virtual Parent * parent ()=0
- virtual Ram_session * ram_session ()=0
- virtual Capability ram_session_cap ()=0
- virtual Cpu_session * cpu_session ()=0
- virtual Rm_session * rm_session ()=0
- virtual Task_session * task_session ()=0
- virtual Allocator * heap ()=0

2.18.1 Constructor & Destructor Documentation

2.18.1.1 virtual Bastei::Env::~Env () [inline, virtual]

2.18.2 Member Function Documentation

2.18.2.1 virtual Parent* Bastei::Env::parent () [pure virtual]

Communication channel to our parent

2.18.2.2 virtual Ram_session* Bastei::Env::ram_session () [pure virtual]

RAM session for the program

The RAM Session represents a quota of memory that is available to the program. Quota can be used to allocate RAM-Dataspaces.

2.18.2.3 virtual Capability Bastei::Env::ram_session_cap () [pure virtual]

2.18.2.4 virtual Cpu_session* Bastei::Env::cpu_session () [pure virtual]

CPU session for the program

This session is used to create threads.

2.18.2.5 virtual Rm_session* Bastei::Env::rm_session () [pure virtual]

Region manager session of the program

2.18.2.6 virtual Task_session* Bastei::Env::task_session () [pure virtual]

Task session of the program

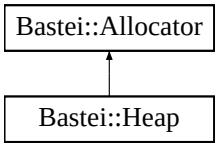
2.18.2.7 virtual Allocator* Bastei::Env::heap () [pure virtual]

Heap backed by the ram_session of the environment.

2.19 Bastei::Heap Class Reference

`#include <heap.h>`

Inheritance diagram for Bastei::Heap::



Public Types

- enum { UNLIMITED = ~0 }

Public Member Functions

- Heap (Ram_session *ram_session, Rm_session *rm_session, size_t quota_limit=UNLIMITED, void *static_addr=0, size_t static_size=0)
- int quota_limit (size_t new_quota_limit)
- void * alloc (size_t size)
- void free (void *addr, size_t size)
- size_t consumed ()
- size_t overhead ()

Classes

- class **Dataspace**
- class **Dataspace_pool**

2.19.1 Member Enumeration Documentation

2.19.1.1 anonymous enum

Enumerator:

UNLIMITED

2.19.2 Constructor & Destructor Documentation

2.19.2.1 Bastei::Heap::Heap (Ram_session * *ram_session*, Rm_session * *rm_session*, size_t *quota_limit* = UNLIMITED, void * *static_addr* = 0, size_t *static_size* = 0) [inline]

2.19.3 Member Function Documentation

2.19.3.1 int Bastei::Heap::quota_limit (size_t *new_quota_limit*)

Reconfigure quota limit

Returns:

negative error code if new quota limit is higher than currently used quota.

2.19.3.2 void* Bastei::Heap::alloc (size_t *size*) [virtual]

Allocate block

Implements Bastei::Allocator.

2.19.3.3 void Bastei::Heap::free (void * *addr*, size_t *size*) [virtual]

Free block a previously allocated block

Implements Bastei::Allocator.

2.19.3.4 size_t Bastei::Heap::consumed () [inline, virtual]

Return total amount of backingstore consumed by the allocator

Reimplemented from Bastei::Allocator.

2.19.3.5 size_t Bastei::Heap::overhead () [inline, virtual]

Return metadata overhead per block

Implements Bastei::Allocator.

2.20 Bastei::Io_mem_session Class Reference

```
#include <io_mem_session.h>
```

Public Member Functions

- virtual ~Io_mem_session ()
- virtual Capability dataspace ()=0

Protected Types

- enum Opcode { DATASPACE }

2.20.1 Member Enumeration Documentation

2.20.1.1 enum Bastei::Io_mem_session::Opcode [protected]

Enumerator:

DATASPACE

2.20.2 Constructor & Destructor Documentation

2.20.2.1 virtual Bastei::Io_mem_session::~Io_mem_session () [inline, virtual]

2.20.3 Member Function Documentation

2.20.3.1 virtual Capability Bastei::Io_mem_session::dataspace () [pure virtual]

Request dataspace containing the IO_MEM session data

Returns:

Capability to IO_MEM dataspace The capability may be invalid.

2.21 Bastei::Io_port_session Class Reference

`#include <io_port_session.h>`

Public Member Functions

- virtual ~Io_port_session ()
- virtual unsigned char inb (unsigned short address)=0
- virtual unsigned short inw (unsigned short address)=0
- virtual unsigned inl (unsigned short address)=0
- virtual void outb (unsigned short address, unsigned char value)=0
- virtual void outw (unsigned short address, unsigned short value)=0
- virtual void outl (unsigned short address, unsigned value)=0

Protected Types

- enum Opcode {
  INB, INW, INL, OUTB,
  OUTW, OUTL }

2.21.1 Member Enumeration Documentation

2.21.1.1 enum Bastei::Io_port_session::Opcode [protected]

Enumerator:

INB

INW

INL

OUTB

OUTW

OUTL

2.21.2 Constructor & Destructor Documentation

2.21.2.1 virtual Bastei::Io_port_session::~Io_port_session () [inline, virtual]

2.21.3 Member Function Documentation

2.21.3.1 virtual unsigned char Bastei::Io_port_session::inb (unsigned short *address*) [pure virtual]

Read byte (8 bit)

Parameters:

address Physical I/O port address

Returns:

Value read from port

2.21.3.2 virtual unsigned short Bastei::Io_port_session::inw (unsigned short *address*) [pure virtual]

Read word (16 bit)

Parameters:

address Physical I/O port address

Returns:

Value read from port

2.21.3.3 virtual unsigned Bastei::Io_port_session::inl (unsigned short *address*) [pure virtual]

Read double word (32 bit)

Parameters:

address Physical I/O port address

Returns:

Value read from port

2.21.3.4 virtual void Bastei::Io_port_session::outb (unsigned short *address*, unsigned char *value*) [pure virtual]

Write byte (8 bit)

Parameters:

address Physical I/O port address

value Value to write to port

2.21.3.5 virtual void Bastei::Io_port_session::outw (unsigned short *address*, unsigned short *value*) [pure virtual]

Write word (16 bit)

Parameters:

address Physical I/O port address

value Value to write to port

2.21.3.6 virtual void Bastei::Io_port_session::outl (unsigned short *address*, unsigned *value*) [pure virtual]

Write double word (32 bit)

Parameters:

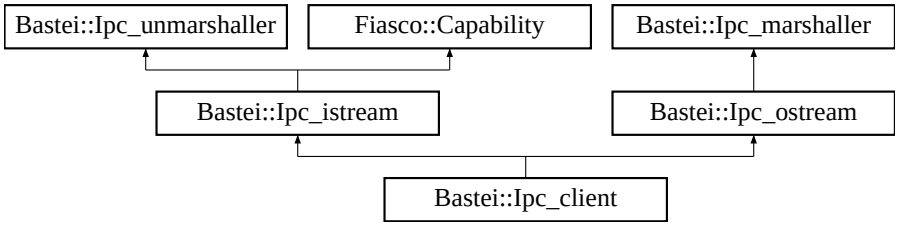
address Physical I/O port address

value Value to write to port

2.22 Bastei::Ipc_client Class Reference

`#include <ipc_generic.h>`

Inheritance diagram for Bastei::Ipc_client::



Public Member Functions

- Ipc_client (Capability &srv, Msgbuf_base *snd_msg, Msgbuf_base *rcv_msg)
- Ipc_client & operator<< (Ipc_client_call)
- template<typename T>
  Ipc_client & operator<< (T value)
- Ipc_client & operator<< (Buffer b)
- template<typename T>
  Ipc_client & operator>> (T &value)
- Ipc_client & operator>> (Buffer &b)
- operator int ()

Protected Member Functions

- void _prepare_next_call ()
- void _call ()

Protected Attributes

- int _result

2.22.1 Constructor & Destructor Documentation

2.22.1.1 Bastei::Ipc_client::Ipc_client (Capability & *srv*, Msgbuf_base * *snd_msg*, Msgbuf_base * *rcv_msg*)

Constructor

2.22.2 Member Function Documentation

2.22.2.1 void Bastei::Ipc_client::_prepare_next_call () [protected]

2.22.2.2 void Bastei::Ipc_client::_call () [protected]

Send RPC message and wait for result

2.22.2.3 Ipc_client& Bastei::Ipc_client::operator<< (Ipc_client_call) [inline]

Operator that issues an IPC call

2.22.2.4 template<typename T> Ipc_client& Bastei::Ipc_client::operator<< (T *value*) [inline]

Insert value into send buffer

Reimplemented from Bastei::Ipc_ostream.

2.22.2.5 Ipc_client& Bastei::Ipc_client::operator<< (Buffer *b*) [inline]

Insert byte buffer to send buffer

Reimplemented from Bastei::Ipc_ostream.

2.22.2.6 template<typename T> Ipc_client& Bastei::Ipc_client::operator>> (T & *value*) [inline]

Read values from receive buffer

Reimplemented from Bastei::Ipc_istream.

2.22.2.7 Ipc_client& Bastei::Ipc_client::operator>> (Buffer & *b*) [inline]

Read byte buffer from receive buffer

Reimplemented from Bastei::Ipc_istream.

2.22.2.8 Bastei::Ipc_client::operator int () [inline]

2.22.3 Member Data Documentation

2.22.3.1 int Bastei::Ipc_client::_result [protected]

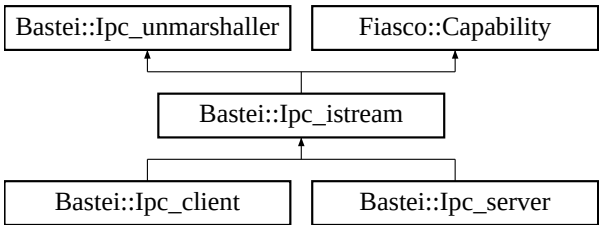
2.23 Bastei::Ipc_error Class Reference

`#include <ipc_generic.h>`

2.24 Bastei::Ipc_istream Class Reference

`#include <ipc_generic.h>`

Inheritance diagram for Bastei::Ipc_istream::



Public Member Functions

- Ipc_istream (Msgbuf_base *rcv_msg)
- ~Ipc_istream ()
- long badge ()
- Ipc_istream & operator>> (Ipc_istream_wait)
- template<typename T>
  Ipc_istream & operator>> (T &value)
- Ipc_istream & operator>> (Buffer &b)

Protected Member Functions

- void _prepare_next_receive ()
- void _wait ()

Protected Attributes

- Msgbuf_base * _rcv_msg
- Connection_state _rcv_cs

2.24.1 Detailed Description

Stream for receiving information

2.24.2 Constructor & Destructor Documentation

2.24.2.1 Bastei::Ipc_istream::Ipc_istream (Msgbuf_base * *rcv_msg*) [explicit]

2.24.2.2 Bastei::Ipc_istream::~Ipc_istream ()

2.24.3 Member Function Documentation

2.24.3.1 void Bastei::Ipc_istream::_prepare_next_receive () [protected]

Reset unmarshaller

2.24.3.2 void Bastei::Ipc_istream::_wait () [protected]

Wait for incoming message to be received in _rcv_msg

2.24.3.3 long Bastei::Ipc_istream::badge () [inline]

Read badge that was supplied with the message

2.24.3.4 Ipc_istream& Bastei::Ipc_istream::operator>> (Ipc_istream_wait) [inline]

Block for an incoming message filling the receive buffer

2.24.3.5 template<typename T> Ipc_istream& Bastei::Ipc_istream::operator>> (T & *value*) [inline]

Read values from receive buffer

Reimplemented in Bastei::Ipc_client, and Bastei::Ipc_server.

2.24.3.6 Ipc_istream& Bastei::Ipc_istream::operator>> (Buffer & *b*) [inline]

Read byte buffer from receive buffer

Reimplemented in Bastei::Ipc_client.

2.24.4 Member Data Documentation

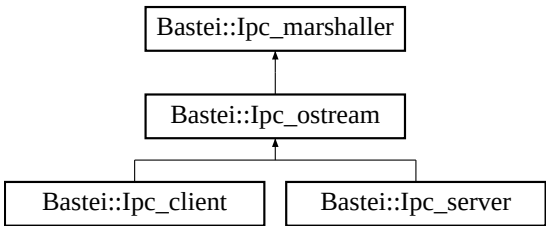
2.24.4.1 Msgbuf_base* Bastei::Ipc_istream::_rcv_msg [protected]

2.24.4.2 Connection_state Bastei::Ipc_istream::_rcv_cs [protected]

2.25 Bastei::Ipc_marshaller Class Reference

`#include <ipc_generic.h>`

Inheritance diagram for Bastei::Ipc_marshaller::



Public Member Functions

- Ipc_marshaller (char *sndbuf, size_t sndbuf_size)

Protected Member Functions

- template<typename T>
  void _write_to_buf (T &value)
- void _write_to_buf (const char *src_addr, unsigned num_bytes)
- void _write_buffer_to_buf (Buffer b)

Protected Attributes

- char * _sndbuf
- size_t _sndbuf_size

- unsigned _write_offset

2.25.1 Detailed Description

Marshal arguments into send message buffer

2.25.2 Constructor & Destructor Documentation

2.25.2.1 Bastei::Ipc_marshaller::Ipc_marshaller (char * *sndbuf*, size_t *sndbuf_size*) [inline]

2.25.3 Member Function Documentation

2.25.3.1 template<typename T> void Bastei::Ipc_marshaller::_write_to_buf (T & *value*) [inline, protected]

Write value to send buffer

2.25.3.2 void Bastei::Ipc_marshaller::_write_to_buf (const char * *src_addr*, unsigned *num_bytes*) [inline, protected]

Write bytes to send buffer

2.25.3.3 void Bastei::Ipc_marshaller::_write_buffer_to_buf (Buffer *b*) [inline, protected]

Write Buffer to send buffer

2.25.4 Member Data Documentation

2.25.4.1 char* Bastei::Ipc_marshaller::_sndbuf [protected]

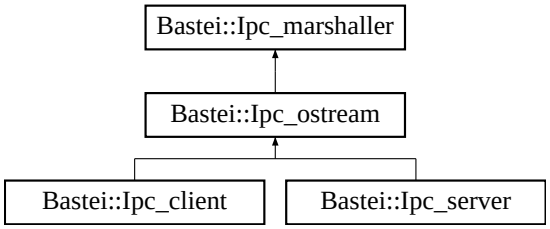
2.25.4.2 size_t Bastei::Ipc_marshaller::_sndbuf_size [protected]

2.25.4.3 unsigned Bastei::Ipc_marshaller::_write_offset [protected]

2.26 Bastei::Ipc_ostream Class Reference

`#include <ipc_generic.h>`

Inheritance diagram for Bastei::Ipc_ostream::



Public Member Functions

- Ipc_ostream (Capability dst, Msgbuf_base *snd_msg)
- bool ready_for_send ()
- template<typename T>
  Ipc_ostream & operator<< (T value)
- Ipc_ostream & operator<< (Buffer b)
- Ipc_ostream & operator<< (Ipc_ostream_send)

Protected Member Functions

- void _prepare_next_send ()
- void _send ()

Protected Attributes

- Msgbuf_base * _snd_msg
- Capability _dst

2.26.1 Detailed Description

Stream for sending information via a capability to an endpoint

2.26.2 Constructor & Destructor Documentation

2.26.2.1 Bastei::Ipc_ostream::Ipc_ostream (Capability *dst*, Msgbuf_base * *snd_msg*)

Constructor

2.26.3 Member Function Documentation

2.26.3.1 void Bastei::Ipc_ostream::_prepare_next_send () [protected]

Reset marshaller and write badge at the beginning of the message

2.26.3.2 void Bastei::Ipc_ostream::_send () [protected]

Send message in _snd_msg to _dst

2.26.3.3 bool Bastei::Ipc_ostream::ready_for_send () [inline]

Return true if Ipc_ostream is ready for send

2.26.3.4 template<typename T> Ipc_ostream& Bastei::Ipc_ostream::operator<< (T *value*) [inline]

Insert value into send buffer

Reimplemented in Bastei::Ipc_client, and Bastei::Ipc_server.

2.26.3.5 Ipc_ostream& Bastei::Ipc_ostream::operator<< (Buffer *b*) [inline]

Insert byte buffer to send buffer

Reimplemented in Bastei::Ipc_client.

2.26.3.6 Ipc_ostream& Bastei::Ipc_ostream::operator<< (Ipc_ostream_send) [inline]

Issue the sending of the message buffer

2.26.4 Member Data Documentation

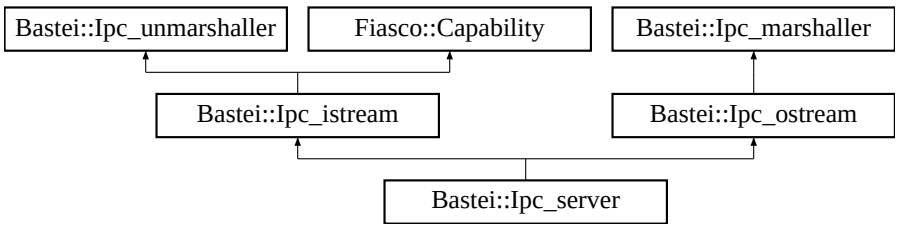
2.26.4.1 Msgbuf_base* Bastei::Ipc_ostream::_snd_msg [protected]

2.26.4.2 Capability Bastei::Ipc_ostream::_dst [protected]

2.27 Bastei::Ipc_server Class Reference

`#include <ipc_generic.h>`

Inheritance diagram for Bastei::Ipc_server::



Public Member Functions

- Ipc_server (Msgbuf_base *snd_msg, Msgbuf_base *rcv_msg)
- Ipc_server & operator>> (Ipc_server_reply_wait)
- void ret (int retval)
- template<typename T>
  Ipc_server & operator<< (T value)

- template<typename T>
  Ipc_server & operator>> (T &value)

Protected Member Functions

- void _prepare_next_reply_wait ()
- void _reply_wait ()

Protected Attributes

- bool _reply_needed

2.27.1 Constructor & Destructor Documentation

2.27.1.1 Bastei::Ipc_server::Ipc_server (Msgbuf_base * *snd_msg*, Msgbuf_base * *rcv_msg*)

Constructor

2.27.2 Member Function Documentation

2.27.2.1 void Bastei::Ipc_server::_prepare_next_reply_wait () [protected]

2.27.2.2 void Bastei::Ipc_server::_reply_wait () [protected]

Send result of previous RPC request and wait for new one

2.27.2.3 Ipc_server& Bastei::Ipc_server::operator>> (Ipc_server_reply_wait) [inline]

Reply current request and wait for a new one

2.27.2.4 void Bastei::Ipc_server::ret (int *retval*) [inline]

Set return value of server call

2.27.2.5 template<typename T> Ipc_server& Bastei::Ipc_server::operator<< (T *value*) [inline]

Insert value into send buffer

Reimplemented from Bastei::Ipc_ostream.

2.27.2.6 template<typename T> Ipc_server& Bastei::Ipc_server::operator>> (T & *value*) [inline]

Read values from receive buffer

Reimplemented from Bastei::Ipc_istream.

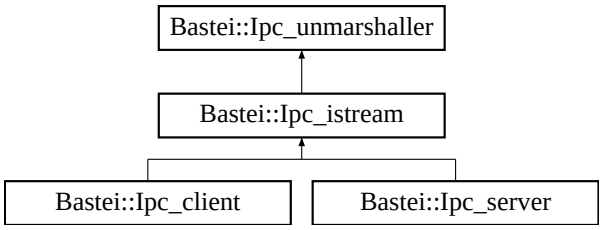
2.27.3 Member Data Documentation

2.27.3.1 bool Bastei::Ipc_server::_reply_needed [protected]

2.28 Bastei::Ipc_unmarshaller Class Reference

`#include <ipc_generic.h>`

Inheritance diagram for Bastei::Ipc_unmarshaller::



Public Member Functions

- Ipc_unmarshaller (char *rcvbuf, size_t rcvbuf_size)

Protected Member Functions

- template<typename T>
  void _read_from_buf (T &value)
- void _read_bytebuf_from_buf (Buffer &b)
- long _long_at_idx (int idx)

Protected Attributes

- char * _rcvbuf
- size_t _rcvbuf_size
- unsigned _read_offset

2.28.1 Detailed Description

Unmarshal arguments from receive buffer

2.28.2 Constructor & Destructor Documentation

2.28.2.1 Bastei::Ipc_unmarshaller::Ipc_unmarshaller (char * *rcvbuf*, size_t *rcvbuf_size*) [inline]

2.28.3 Member Function Documentation

2.28.3.1 template<typename T> void Bastei::Ipc_unmarshaller::_read_from_buf (T & *value*) [inline, protected]

Read value of type T from buffer

2.28.3.2 void Bastei::Ipc_unmarshaller::_read_bytebuf_from_buf (Buffer & *b*) [inline, protected]

Read Buffer from receive buffer

2.28.3.3 long Bastei::Ipc_unmarshaller::_long_at_idx (int *idx*) [inline, protected]

Read long value at specified byte index of receive buffer

2.28.4 Member Data Documentation

2.28.4.1 char* Bastei::Ipc_unmarshaller::_rcvbuf [protected]

2.28.4.2 size_t Bastei::Ipc_unmarshaller::_rcvbuf_size [protected]

2.28.4.3 unsigned Bastei::Ipc_unmarshaller::_read_offset [protected]

2.29 Bastei::Irq_session Class Reference

`#include <irq_session.h>`

Public Member Functions

- virtual ~Irq_session ()
- virtual void wait_for_irq ()=0

Protected Types

- enum Opcode { WAIT_FOR_IRQ }

2.29.1 Member Enumeration Documentation

2.29.1.1 enum Bastei::Irq_session::Opcode [protected]

Enumerator:

WAIT_FOR_IRQ

2.29.2 Constructor & Destructor Documentation

2.29.2.1 virtual Bastei::Irq_session::~Irq_session () [inline, virtual]

2.29.3 Member Function Documentation

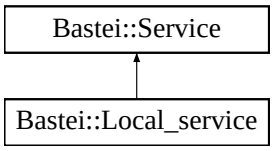
2.29.3.1 virtual void Bastei::Irq_session::wait_for_irq () [pure virtual]

Wait for interrupt occurence

2.30 Bastei::Local_service Class Reference

`#include <service.h>`

Inheritance diagram for Bastei::Local_service::



Public Member Functions

- Local_service (const char *name, Root *root)
- Root * root ()

2.30.1 Detailed Description

Representation of a service that is implemented locally

2.30.2 Constructor & Destructor Documentation

2.30.2.1 Bastei::Local_service::Local_service (const char * *name*, Root * *root*) [inline]

2.30.3 Member Function Documentation

2.30.3.1 Root* Bastei::Local_service::root () [inline, virtual]

Implements Bastei::Service.

2.31 Bastei::Lock Class Reference

`#include <lock.h>`

Public Types

- typedef Lock_guard< Lock > Guard

Public Member Functions

- Lock (State initial=UNLOCKED)
- void lock ()

2.31.1 Member Typedef Documentation

2.31.1.1 typedef Lock_guard<Lock> Bastei::Lock::Guard

Lock guard

2.31.2 Constructor & Destructor Documentation

2.31.2.1 Bastei::Lock::Lock (State *initial* = UNLOCKED) [inline, explicit]

Constructor

2.31.3 Member Function Documentation

2.31.3.1 void Bastei::Lock::lock () [inline]

2.32 Bastei::Lock_guard< LT > Class Template Reference

`#include <lock_guard.h>`

Public Member Functions

- Lock_guard (LT &lock)
- ~Lock_guard ()

2.32.1 Detailed Description

template<typename LT> class Bastei::Lock_guard< LT >

Lock guard template

Parameters:

LT Lock type

2.32.2 Constructor & Destructor Documentation

2.32.2.1 template<typename LT> Bastei::Lock_guard< LT >::Lock_guard (LT & *lock*) [inline, explicit]

2.32.2.2 template<typename LT> Bastei::Lock_guard< LT >::~Lock_guard () [inline]

2.33 Bastei::Log_session Class Reference

`#include <log_session.h>`

Public Member Functions

- virtual ~Log_session ()
- virtual size_t write (const char *string)=0

Protected Types

- enum Opcode { WRITE }

2.33.1 Member Enumeration Documentation

2.33.1.1 enum Bastei::Log_session::Opcode [protected]

Enumerator:

WRITE

2.33.2 Constructor & Destructor Documentation

2.33.2.1 virtual Bastei::Log_session::~Log_session () [inline, virtual]

2.33.3 Member Function Documentation

2.33.3.1 virtual size_t Bastei::Log_session::write (const char * *string*) [pure virtual]

Output null-terminated string

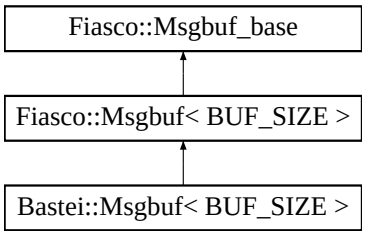
Returns:

Number of written characters

2.34 Fiasco::Msgbuf< BUF_SIZE > Class Template Reference

`#include <ipc_msgbuf.h>`

Inheritance diagram for Fiasco::Msgbuf< BUF_SIZE >::



Public Member Functions

- Msgbuf ()

Public Attributes

- char buf [BUF_SIZE]

2.34.1 Detailed Description

template<unsigned BUF_SIZE> class Fiasco::Msgbuf< BUF_SIZE >

Instance of IPC message buffer with specified buffer size

2.34.2 Constructor & Destructor Documentation

2.34.2.1 template<unsigned BUF_SIZE> Fiasco::Msgbuf< BUF_SIZE >::Msgbuf () [inline]

2.34.3 Member Data Documentation

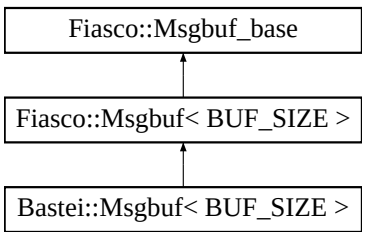
2.34.3.1 template<unsigned BUF_SIZE> char Fiasco::Msgbuf< BUF_SIZE >::buf[BUF_SIZE]

Reimplemented from Fiasco::Msgbuf_base.

2.35 Bastei::Msgbuf< BUF_SIZE > Class Template Reference

`#include <ipc_msgbuf.h>`

Inheritance diagram for Bastei::Msgbuf< BUF_SIZE >::

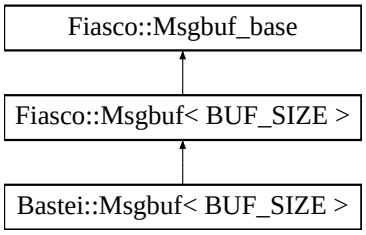


template<int BUF_SIZE> class Bastei::Msgbuf< BUF_SIZE >

2.36 Fiasco::Msgbuf_base Class Reference

`#include <ipc_msgbuf.h>`

Inheritance diagram for Fiasco::Msgbuf_base::



Public Member Functions

- Bastei::size_t size ()
- void * addr ()

Public Attributes

- l4_fpage_t rcv_fpage
- l4_msgdope_t size_dope
- l4_msgdope_t send_dope
- char buf [ ]

Protected Attributes

- Bastei::size_t _size
- char _msg_start [ ]

2.36.1 Detailed Description

IPC message buffer layout

2.36.2 Member Function Documentation

2.36.2.1 Bastei::size_t Fiasco::Msgbuf_base::size () `[inline]`

Return size of message buffer

2.36.2.2 void* Fiasco::Msgbuf_base::addr () `[inline]`

Return address of message buffer

2.36.3 Member Data Documentation

2.36.3.1 Bastei::size_t Fiasco::Msgbuf_base::_size [protected]

2.36.3.2 char Fiasco::Msgbuf_base::_msg_start[ ] [protected]

2.36.3.3 l4_fpage_t Fiasco::Msgbuf_base::rcv_fpage

2.36.3.4 l4_msgdope_t Fiasco::Msgbuf_base::size_dope

2.36.3.5 l4_msgdope_t Fiasco::Msgbuf_base::send_dope

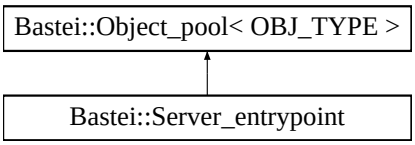
2.36.3.6 char Fiasco::Msgbuf_base::buf[ ]

Reimplemented in Fiasco::Msgbuf< BUF_SIZE >.

2.37 Bastei::Object_pool< OBJ_TYPE > Class Template Reference

`#include <object_pool.h>`

Inheritance diagram for Bastei::Object_pool< OBJ_TYPE >::



Public Member Functions

- void insert (OBJ_TYPE *obj)
- void remove (OBJ_TYPE *obj)
- OBJ_TYPE * obj_by_id (long obj_id)
- OBJ_TYPE * obj_by_cap (Capability cap)
- OBJ_TYPE * first ()

Classes

- class Entry

2.37.1 Detailed Description

template<typename OBJ_TYPE> class Bastei::Object_pool< OBJ_TYPE >

Map object ids to local objects

Parameters:

OBJ_TYPE Object type (must be inherited from Object_pool_entry)

The local names of a capabilities are used to differentiate multiple server objects managed by one and the same object pool.

2.37.2 Member Function Documentation

2.37.2.1 template<typename OBJ_TYPE> void Bastei::Object_pool< OBJ_TYPE >::insert (OBJ_TYPE * *obj*) [inline]

2.37.2.2 template<typename OBJ_TYPE> void Bastei::Object_pool< OBJ_TYPE >::remove (OBJ_TYPE * *obj*) [inline]

2.37.2.3 template<typename OBJ_TYPE> OBJ_TYPE* Bastei::Object_pool< OBJ_TYPE >::obj_by_id (long *obj_id*) [inline]

Lookup object

2.37.2.4 template<typename OBJ_TYPE> OBJ_TYPE* Bastei::Object_pool< OBJ_TYPE >::obj_by_cap (Capability *cap*) [inline]

2.37.2.5 template<typename OBJ_TYPE> OBJ_TYPE* Bastei::Object_pool< OBJ_TYPE >::first () [inline]

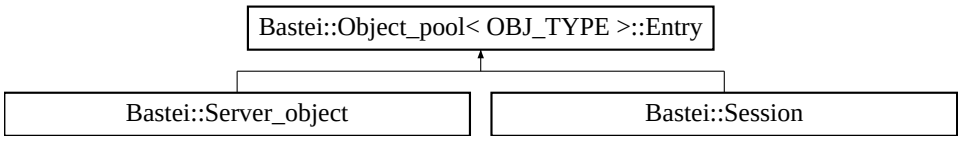
Return first element of tree

This function is used for removing tree elements step by step.

2.38 Bastei::Object_pool< OBJ_TYPE >::Entry Class Reference

`#include <object_pool.h>`

Inheritance diagram for Bastei::Object_pool< OBJ_TYPE >::Entry::



Public Types

- enum { OBJ_ID_INVALID = 0 }

Public Member Functions

- Entry ()
- Entry (Capability cap)
- bool higher (Entry *s)
- Entry * find_by_obj_id (long obj_id)
- void cap (Capability c)
- Capability cap ()

Friends

- class Object_pool
- class Avl_node< Entry >

template<typename OBJ_TYPE> class Bastei::Object_pool< OBJ_TYPE >::Entry

2.38.1 Member Enumeration Documentation

2.38.1.1 template<typename OBJ_TYPE> anonymous enum

Enumerator:

OBJ_ID_INVALID

2.38.2 Constructor & Destructor Documentation

2.38.2.1 template<typename OBJ_TYPE> Bastei::Object_pool< OBJ_TYPE >::Entry::Entry () [inline]

Constructors

2.38.2.2 template<typename OBJ_TYPE> Bastei::Object_pool< OBJ_TYPE >::Entry::Entry (Capability *cap*) [inline]

2.38.3 Member Function Documentation

2.38.3.1 template<typename OBJ_TYPE> bool Bastei::Object_pool< OBJ_TYPE >::Entry::higher (Entry * *s*) [inline]

Avl_node interface

2.38.3.2 template<typename OBJ_TYPE> Entry* Bastei::Object_pool< OBJ_TYPE >::Entry::find_by_obj_id (long *obj_id*) [inline]

Support for object pool

2.38.3.3 template<typename OBJ_TYPE> void Bastei::Object_pool< OBJ_TYPE >::Entry::cap (Capability *c*) [inline]

Assign capability to object pool entry

2.38.3.4 template<typename OBJ_TYPE> Capability Bastei::Object_pool< OBJ_TYPE >::Entry::cap () [inline]

2.38.4 Friends And Related Function Documentation

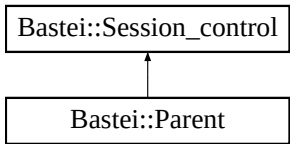
2.38.4.1 template<typename OBJ_TYPE> friend class Object_pool [friend]

2.38.4.2 template<typename OBJ_TYPE> friend class Avl_node< Entry > [friend]

2.39 Bastei::Parent Class Reference

`#include <parent.h>`

Inheritance diagram for Bastei::Parent::



Public Types

- enum { MSGBUF_SIZE = 256 }

Public Member Functions

- virtual ~Parent ()
- virtual void exit (int exit_value)=0
- virtual int announce (const char *service_name, Capability service_root)=0
- virtual Capability session (const char *service_name, const char *args)=0
- virtual int transfer_quota (Capability to_session_cap, size_t amount)=0

Protected Types

- enum Opcode {
  EXIT, ANNOUNCE, SESSION, TRANSFER_QUOTA,
  CLOSE }

2.39.1 Member Enumeration Documentation

2.39.1.1 anonymous enum

Enumerator:

MSGBUF_SIZE

2.39.1.2 enum Bastei::Parent::Opcode [protected]

Enumerator:

EXIT

ANNOUNCE

SESSION

TRANSFER_QUOTA

CLOSE

2.39.2 Constructor & Destructor Documentation

2.39.2.1 virtual Bastei::Parent::~Parent () [inline, virtual]

2.39.3 Member Function Documentation

2.39.3.1 virtual void Bastei::Parent::exit (int *exit_value*) [pure virtual]

Tell parent to exit the program

2.39.3.2 virtual int Bastei::Parent::announce (const char * *service_name*, Capability *service_root*) [pure virtual]

Announce service to the parent

2.39.3.3 virtual Capability Bastei::Parent::session (const char * *service_name*, const char * *args*) [pure virtual]

Create session to a service

Parameters:

service_name name of the requested interface

args session constructor arguments

Returns:

capability to session (may be invalid if an error occured)

The session id is used for referring the session at the parent. Direct communication with the session is performed via out_session_cap.

By convention, an argument value for 'ram_quota' must be specified in 'args'. The specified amount of RAM will be donated to the session-providing service.

2.39.3.4 virtual int Bastei::Parent::transfer_quota (Capability *to_session_cap*, size_t *amount*) [pure virtual]

Transfer our quota to the server that provides the specified session

Parameters:

to_session_cap Recipient session.

amount Quota (in bytes) to transfer.

Returns:

0 if quota could be transferred or -1 on error

The error case means that there is not enough unused quota on the source side.

2.40 Bastei::Ram_dataspace Class Reference

`#include <ram_dataspace.h>`

Public Member Functions

- Ram_dataspace (Ram_session *ram_session, size_t size)
- ~Ram_dataspace ()
- Capability cap ()
- template<typename T>
  T * local_addr ()

2.40.1 Constructor & Destructor Documentation

2.40.1.1 Bastei::Ram_dataspace::Ram_dataspace (Ram_session * *ram_session*, size_t *size*) [inline]

Constructor

Exceptions:

Ram_session::Alloc_failed

Rm_session::Attach_failed

2.40.1.2 Bastei::Ram_dataspace::~Ram_dataspace () [inline]

Destructor

2.40.2 Member Function Documentation

2.40.2.1 Capability Bastei::Ram_dataspace::cap () [inline]

Return capability of the used RAM dataspace

2.40.2.2 template<typename T> T* Bastei::Ram_dataspace::local_addr () [inline]

Request local address

This is a template to avoid inconvenient casts at the caller. A newly allocated RAM dataspace is untyped memory anyway.

2.41 Bastei::Ram_session Class Reference

`#include <ram_session.h>`

Public Member Functions

- virtual ~Ram_session ()
- virtual Capability alloc (size_t size)=0
- virtual void free (Capability ds_cap)=0
- virtual int ref_account (Capability ram_session)=0
- virtual int transfer_quota (Capability ram_session, size_t amount)=0
- virtual size_t quota ()=0
- virtual size_t used ()=0
- size_t avail ()

Protected Types

- enum Opcode {
  ALLOC, FREE, REF_ACCOUNT, TRANSFER_QUOTA,
  QUOTA, USED }

Classes

- class Alloc_failed
- class Quota_exceeded

2.41.1 Member Enumeration Documentation

2.41.1.1 enum Bastei::Ram_session::Opcode [protected]

Enumerator:

ALLOC

FREE

REF_ACCOUNT

TRANSFER_QUOTA

QUOTA

USED

2.41.2 Constructor & Destructor Documentation

2.41.2.1 virtual Bastei::Ram_session::~Ram_session () [inline, virtual]

Destructor

2.41.3 Member Function Documentation

2.41.3.1 virtual Capability Bastei::Ram_session::alloc (size_t *size*) [pure virtual]

Allocate RAM dataspace

Parameters:

size Size of RAM dataspace

Returns:

Capability to new RAM dataspace

Exceptions:

Quota_exceeded

2.41.3.2 virtual void Bastei::Ram_session::free (Capability *ds_cap*) [pure virtual]

Free RAM dataspace

Parameters:

ds_cap Dataspace capability as returned by alloc

2.41.3.3 virtual int Bastei::Ram_session::ref_account (Capability *ram_session*) [pure virtual]

Define reference account for the RAM session

Parameters:

ram_session Reference account

Returns:

0 on success

Each RAM session requires another RAM session as reference account to transfer quota to and from. The reference account can be defined only once.

2.41.3.4 virtual int Bastei::Ram_session::transfer_quota (Capability *ram_session*, size_t *amount*) [pure virtual]

Transfer quota the another ram session

Parameters:

ram_session Receiver of quota donation

amount Amount of quota to donate

Returns:

0 on success

Quota can only be transfered if the specified RAM session is either the reference account for this session or vice versa.

2.41.3.5 virtual size_t Bastei::Ram_session::quota () [pure virtual]

Return current quota limit

2.41.3.6 virtual size_t Bastei::Ram_session::used () [pure virtual]

Return used quota

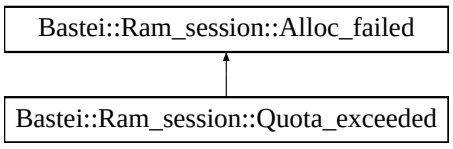
2.41.3.7 size_t Bastei::Ram_session::avail () [inline]

Return amount of available quota

2.42 Bastei::Ram_session::Alloc_failed Class Reference

`#include <ram_session.h>`

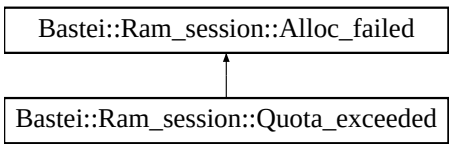
Inheritance diagram for Bastei::Ram_session::Alloc_failed::



2.43 Bastei::Ram_session::Quota_exceeded Class Reference

`#include <ram_session.h>`

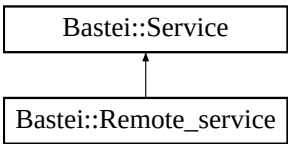
Inheritance diagram for Bastei::Ram_session::Quota_exceeded::



2.44 Bastei::Remote_service Class Reference

`#include <service.h>`

Inheritance diagram for Bastei::Remote_service::



Public Member Functions

- Remote_service (const char *name, Capability root_cap, Child *server)
- Root * root ()
- Child * server ()

2.44.1 Detailed Description

Representation of a service that is implemented in a child

2.44.2 Constructor & Destructor Documentation

2.44.2.1 Bastei::Remote_service::Remote_service (const char * *name*, Capability *root_cap*, Child * *server*) [inline]

Constructor

Parameters:

name Name of service

root_cap Capability to root interface

server Child that provides the service

2.44.3 Member Function Documentation

2.44.3.1 Root* Bastei::Remote_service::root () [inline, virtual]

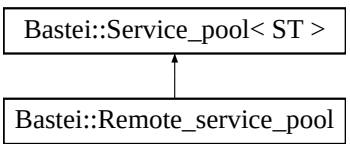
Implements Bastei::Service.

2.44.3.2 Child* Bastei::Remote_service::server () [inline]

2.45 Bastei::Remote_service_pool Class Reference

`#include <service.h>`

Inheritance diagram for Bastei::Remote_service_pool::



Public Member Functions

- Remote_service * find_by_server (Child *server)

2.45.1 Member Function Documentation

2.45.1.1 Remote_service* Bastei::Remote_service_pool::find_by_server (Child * *server*) [inline]

Return first service provided by specified server

2.46 Bastei::Rm_session Class Reference

`#include <rm_session.h>`

Public Member Functions

- virtual ~Rm_session ()
- virtual void * attach (Capability ds_cap, size_t size=0, off_t offset=0, addr_t local_addr=0)=0
- virtual void detach (void *local_addr)=0
- virtual int add_client (Capability thread_cap, Capability *pager_cap)=0

Protected Types

- enum Opcode { ATTACH, DETACH, ADD_CLIENT }

Classes

- class Attach_failed
- class Invalid_dataspace
- class Region_conflict

2.46.1 Member Enumeration Documentation

2.46.1.1 enum Bastei::Rm_session::Opcode [protected]

Enumerator:

ATTACH

DETACH

ADD_CLIENT

2.46.2 Constructor & Destructor Documentation

2.46.2.1 virtual Bastei::Rm_session::~Rm_session () [inline, virtual]

Destructor

2.46.3 Member Function Documentation

2.46.3.1 virtual void* Bastei::Rm_session::attach (Capability *ds_cap*, size_t *size* = 0, off_t *offset* = 0, addr_t *local_addr* = 0) [pure virtual]

Map dataspace into local address space

Parameters:

ds_cap Capability of dataspace to map

size Size of the locally mapped region default (0) is the whole dataspace

offset Start at offset in dataspace

local_addr Local destination address

Returns:

Local address of mapped dataspace

Exceptions:

Attach_failed if dataspace is invalid or on region conflict

2.46.3.2 virtual void Bastei::Rm_session::detach (void * *local_addr*) [pure virtual]

Remove region from local address space

2.46.3.3 virtual int Bastei::Rm_session::add_client (Capability *thread_cap*, Capability * *pager_cap*) [pure virtual]

Add client to pager

Parameters:

thread_cap Thread that will be paged

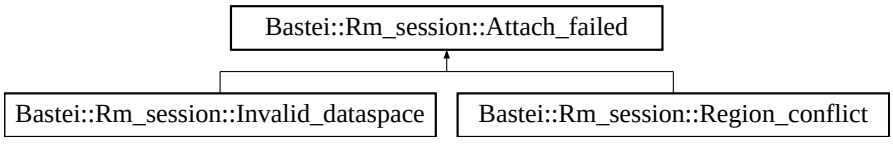
pager_cap Capability to be used for page faults

This method must be called at least once to establish a valid communication channel between the pager part of the region manager and the client thread.

2.47 Bastei::Rm_session::Attach_failed Class Reference

`#include <rm_session.h>`

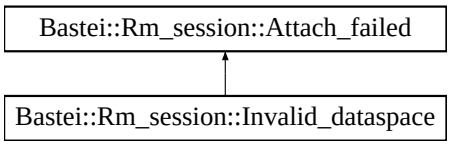
Inheritance diagram for Bastei::Rm_session::Attach_failed::



2.48 Bastei::Rm_session::Invalid_dataspace Class Reference

`#include <rm_session.h>`

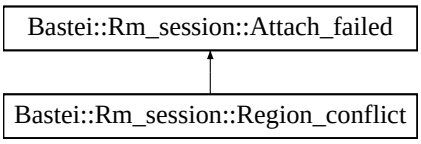
Inheritance diagram for Bastei::Rm_session::Invalid_dataspace::



2.49 Bastei::Rm_session::Region_conflict Class Reference

`#include <rm_session.h>`

Inheritance diagram for Bastei::Rm_session::Region_conflict::



2.50 Bastei::Rom_session Class Reference

`#include <rom_session.h>`

Public Member Functions

- virtual ~Rom_session ()
- virtual Capability dataspace ()=0

Protected Types

- enum Opcode { DATASPACE }

2.50.1 Member Enumeration Documentation

2.50.1.1 enum Bastei::Rom_session::Opcode `[protected]`

Enumerator:

DATASPACE

2.50.2 Constructor & Destructor Documentation

2.50.2.1 virtual Bastei::Rom_session::~Rom_session () `[inline, virtual]`

2.50.3 Member Function Documentation

2.50.3.1 virtual Capability Bastei::Rom_session::dataspace () [pure virtual]

Request dataspace containing the ROM session data

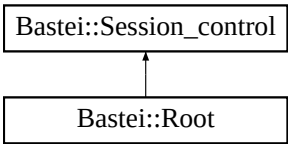
Returns:

Capability to ROM dataspace The capability may be invalid.

2.51 Bastei::Root Class Reference

`#include <root.h>`

Inheritance diagram for Bastei::Root::



Public Member Functions

- virtual ~Root ()
- virtual Capability session (const char *args)=0

Protected Types

- enum Opcode { SESSION, CLOSE }

2.51.1 Member Enumeration Documentation

2.51.1.1 enum Bastei::Root::Opcode [protected]

Enumerator:

SESSION

CLOSE

2.51.2 Constructor & Destructor Documentation

2.51.2.1 virtual Bastei::Root::~Root () [inline, virtual]

2.51.3 Member Function Documentation

2.51.3.1 virtual Capability Bastei::Root::session (const char * *args*) [pure virtual]

Create session

Returns:

Capability to new session (may be invalid)

2.52 Bastei::Semaphore Class Reference

`#include <semaphore.h>`

Public Member Functions

- Semaphore ()
- void up ()
- void down ()

2.52.1 Constructor & Destructor Documentation

2.52.1.1 Bastei::Semaphore::Semaphore () [inline]

2.52.2 Member Function Documentation

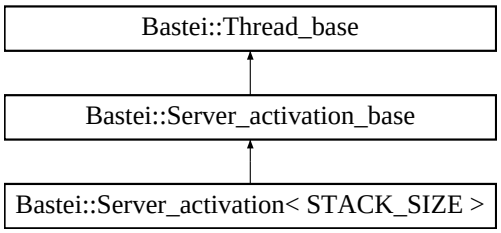
2.52.2.1 void Bastei::Semaphore::up () [inline]

2.52.2.2 void Bastei::Semaphore::down () [inline]

2.53 Bastei::Server_activation< STACK_SIZE > Class Template Reference

`#include <server.h>`

Inheritance diagram for Bastei::Server_activation< STACK_SIZE >::



Public Member Functions

- void start ()
- Server_activation (Msgbuf_base *snd_msg, Msgbuf_base *rcv_msg, bool start_on_construction=true, const char *name="activation")

template<int STACK_SIZE> class Bastei::Server_activation< STACK_SIZE >

2.53.1 Constructor & Destructor Documentation

2.53.1.1 template<int STACK_SIZE> Bastei::Server_activation< STACK_SIZE >::Server_activation (Msgbuf_base * *snd_msg*, Msgbuf_base * *rcv_msg*, bool *start_on_construction* = `true`, const char * *name* = `"activation"`) `[inline]`

Constructor

Parameters:

snd_msg Message buffer for send part of IPC

rcv_msg Message buffer for receive part of IPC

start_on_construction Specifies whether the activation thread should be started immediately (default) or explicitely via the start() function.

name Name of server activation thread (used for debugging)

The server activation thread will initialize its capability and but will not immediately enable the processing of requests. This way, the activation- using server can ensure that it gets initialized completely before the first capability invokations come in. Once the server is ready, it must enable the server activation explicitely by calling the start() function. The 'start_on_construction' argument is a shortcut for the common case where the server's capability is handed over to other parties _after_ the server is completely initialized.

2.53.2 Member Function Documentation

2.53.2.1 template<int STACK_SIZE> void Bastei::Server_activation< STACK_SIZE >::start () `[inline]`

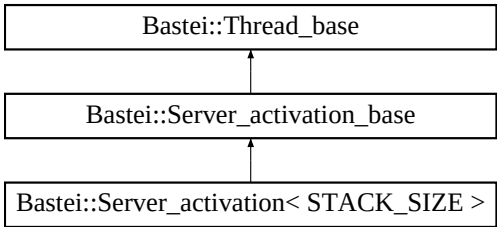
Unlock server activation if it is ready to serve requests

This function must be called before using the activation, for example, by supplying the activation to an entrypoint.

2.54 Bastei::Server_activation_base Class Reference

`#include <server.h>`

Inheritance diagram for Bastei::Server_activation_base::



Public Member Functions

- void ep (Server_entrypoint *ep)
- void entry ()
- Capability cap ()
- void leave_server_object (Server_object *obj)

Protected Member Functions

- Server_activation_base (Msgbuf_base *snd_msg, Msgbuf_base *rcv_msg)

Protected Attributes

- Server_object * _curr_obj
- Lock _curr_obj_lock
- Lock _cap_valid
- Lock _delay_start

2.54.1 Constructor & Destructor Documentation

2.54.1.1 Bastei::Server_activation_base::Server_activation_base (Msgbuf_base * *snd_msg*, Msgbuf_base * *rcv_msg*) [inline, protected]

2.54.2 Member Function Documentation

2.54.2.1 void Bastei::Server_activation_base::ep (Server_entrypoint * *ep*) [inline]

Set entrypoint which the activation serves

This function must by called by an Entrypoint on add_activation() only.

2.54.2.2 void Bastei::Server_activation_base::entry () [virtual]

Thread interface

Implements Bastei::Thread_base.

2.54.2.3 Capability Bastei::Server_activation_base::cap () [inline]

Return capability to this activation

This function should only be called from Server_entrypoint

2.54.2.4 void Bastei::Server_activation_base::leave_server_object (Server_object * *obj*)

Force activation to cancel dispatching the specified server object

2.54.3 Member Data Documentation

2.54.3.1 Server_object* Bastei::Server_activation_base::_curr_obj [protected]

2.54.3.2 Lock Bastei::Server_activation_base::_curr_obj_lock [protected]

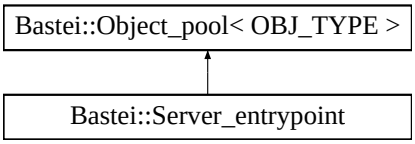
2.54.3.3 Lock Bastei::Server_activation_base::_cap_valid [protected]

2.54.3.4 Lock Bastei::Server_activation_base::_delay_start [protected]

2.55 Bastei::Server_entrypoint Class Reference

`#include <server.h>`

Inheritance diagram for Bastei::Server_entrypoint::



Public Member Functions

- Server_entrypoint (Cap_session *cap_session, Server_activation_base *a=0)
- int add_activation (Server_activation_base *t)
- Capability manage (Server_object *obj)
- void dissolve (Server_object *obj)

2.55.1 Detailed Description

Entrypoint into a server

For L4v2 and Linux, a Server_entrypoint can hold only one activation and thus, allow only serial access to the Server_objects managed by this endpoint. For a multithreaded server, multiple entrypoints (one per thread) have to be created.

2.55.2 Constructor & Destructor Documentation

2.55.2.1 Bastei::Server_entrypoint::Server_entrypoint (Cap_session * *cap_session*, Server_activation_base * *a* = 0)

Constructor

Parameters:

cap_session Cap_session for creating capabilities for the server objects managed by this entrypoint.

a Initial activation

2.55.3 Member Function Documentation

2.55.3.1 int Bastei::Server_entrypoint::add_activation (Server_activation_base * *t*)

Add activation to activation pool of this entrypoint

2.55.3.2 Capability Bastei::Server_entrypoint::manage (Server_object * *obj*)

Associate Server_object with the entrypoint

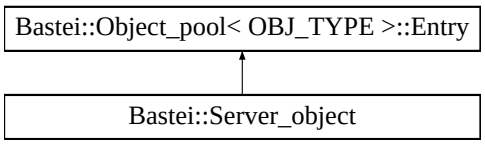
2.55.3.3 void Bastei::Server_entrypoint::dissolve (Server_object * *obj*)

Dissolve Server_object from entrypoint

2.56 Bastei::Server_object Class Reference

`#include <server.h>`

Inheritance diagram for Bastei::Server_object::



Public Member Functions

- virtual ~Server_object ()
- void lock ()
- void unlock ()
- virtual int dispatch (int op, Ipc_istream &is, Ipc_ostream &os)=0

2.56.1 Detailed Description

A Server_object is a locally implemented object that can be referenced from the outer world using a capability. The capability gets created when attaching a Server_object to an Server_entrypoint.

2.56.2 Constructor & Destructor Documentation

2.56.2.1 virtual Bastei::Server_object::~Server_object () `[inline, virtual]`

2.56.3 Member Function Documentation

2.56.3.1 void Bastei::Server_object::lock () `[inline]`

2.56.3.2 void Bastei::Server_object::unlock () [inline]

2.56.3.3 virtual int Bastei::Server_object::dispatch (int *op*, Ipc_istream & *is*, Ipc_ostream & *os*) [pure virtual]

Interface to be implemented by a derived class

Parameters:

op opcode of invoked method

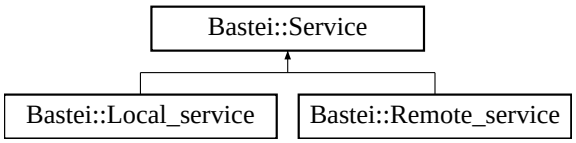
is Ipc_input stream with method arguments

os Ipc_output stream for storing method results

2.57 Bastei::Service Class Reference

`#include <service.h>`

Inheritance diagram for Bastei::Service::



Public Member Functions

- virtual ~Service ()
- Service (const char *name)
- virtual Root * root ()=0
- const char * name ()

2.57.1 Constructor & Destructor Documentation

2.57.1.1 virtual Bastei::Service::~Service () [inline, virtual]

2.57.1.2 Bastei::Service::Service (const char * *name*) [inline]

2.57.2 Member Function Documentation

2.57.2.1 virtual Root* Bastei::Service::root () [pure virtual]

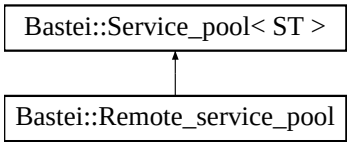
Implemented in Bastei::Local_service, and Bastei::Remote_service.

2.57.2.2 const char* Bastei::Service::name () [inline]

2.58 Bastei::Service_pool< ST > Class Template Reference

`#include <service.h>`

Inheritance diagram for Bastei::Service_pool< ST >::



Public Member Functions

- ST * find (const char *name)
- void dump_service_wait_queue ()
- ST * wait_for_service (const char *name, Client *client)
- void insert (ST *service)
- void remove (ST *service)

Protected Attributes

- Lock _service_wait_queue_lock
- List< Client > _service_wait_queue
- List< ST > _services

2.58.1 Detailed Description

template<typename ST> class Bastei::Service_pool< ST >

Container for holding service representations

2.58.2 Member Function Documentation

2.58.2.1 template<typename ST> ST* Bastei::Service_pool< ST >::find (const char * *name*) [inline]

Probe service with specified name

2.58.2.2 template<typename ST> void Bastei::Service_pool< ST >::dump_service_wait_queue () [inline]

2.58.2.3 template<typename ST> ST* Bastei::Service_pool< ST >::wait_for_service (const char * *name*, Client * *client*) [inline]

Wait for service

This function is called by the clients's thread when requesting a session creation. It blocks if the requested service is not available.

Returns:

Service structure that matches the request or 0 if the waiting was canceled.

2.58.2.4 template<typename ST> void Bastei::Service_pool< ST >::insert (ST * *service*) [inline]

Register service

This function is called by the server's thread.

2.58.2.5 template<typename ST> void Bastei::Service_pool< ST >::remove (ST * *service*) [inline]

Unregister service

2.58.3 Member Data Documentation

2.58.3.1 template<typename ST> Lock Bastei::Service_pool< ST >::_service_wait_queue_lock [protected]

2.58.3.2 template<typename ST> List<Client> Bastei::Service_pool< ST >::_service_wait_queue [protected]

2.58.3.3 template<typename ST> List<ST> Bastei::Service_pool< ST >::_services [protected]

2.59 Nitpicker::Session Class Reference

`#include <nitpicker_session.h>`

Public Member Functions

- virtual ~Session ()
- virtual Bastei::Capability framebuffer_session ()=0
- virtual Bastei::Capability input_session ()=0
- virtual Bastei::Capability create_view ()=0
- virtual void destroy_view (Bastei::Capability view_cap)=0
- virtual int background (Bastei::Capability view_cap)=0

Protected Types

- enum Opcode {
  FRAMEBUFFER_SESSION, INPUT_SESSION, CREATE_VIEW, DESTROY_VIEW,
  BACKGROUND }

2.59.1 Member Enumeration Documentation

2.59.1.1 enum Nitpicker::Session::Opcode [protected]

Enumerator:

FRAMEBUFFER_SESSION

INPUT_SESSION

CREATE_VIEW

DESTROY_VIEW

BACKGROUND

2.59.2 Constructor & Destructor Documentation

2.59.2.1 virtual Nitpicker::Session::~Session () [inline, virtual]

2.59.3 Member Function Documentation

2.59.3.1 virtual Bastei::Capability Nitpicker::Session::framebuffer_session () [pure virtual]

Request framebuffer sub-session

2.59.3.2 virtual Bastei::Capability Nitpicker::Session::input_session () [pure virtual]

Request input sub-session

2.59.3.3 virtual Bastei::Capability Nitpicker::Session::create_view () [pure virtual]

Create a new view at the buffer

Returns:

Capability to a new view.

2.59.3.4 virtual void Nitpicker::Session::destroy_view (Bastei::Capability *view_cap*) [pure virtual]

Destroy view

2.59.3.5 virtual int Nitpicker::Session::background (Bastei::Capability *view_cap*) [pure virtual]

Define view that is used as desktop background

2.60 Pci::Session Class Reference

`#include <pci_session.h>`

Public Member Functions

- virtual ~Session ()
- virtual Bastei::Capability find_device_by_vendor (unsigned short vendor_id, Bastei::Capability prev_device)=0
- virtual void release_device (Bastei::Capability device_cap)=0

Protected Types

- enum Opcode { FIND_DEVICE_BY_VENDOR, RELEASE_DEVICE }

2.60.1 Member Enumeration Documentation

2.60.1.1 enum Pci::Session::Opcode [protected]

Enumerator:

FIND_DEVICE_BY_VENDOR

RELEASE_DEVICE

2.60.2 Constructor & Destructor Documentation

2.60.2.1 virtual Pci::Session::~Session () [inline, virtual]

2.60.3 Member Function Documentation

2.60.3.1 virtual Bastei::Capability Pci::Session::find_device_by_vendor (unsigned short *vendor_id*, Bastei::Capability *prev_device*) [pure virtual]

Find device by the specified vendor ID

Parameters:

vendor_id Vendor ID matching the device

prev_device Previous device

The 'prev_device' argument can be used to iterate through the list of devices of the same vendor. For finding the first device, an invalid capability must be specified.

2.60.3.2 virtual void Pci::Session::release_device (Bastei::Capability *device_cap*) [pure virtual]

Free server-internal data structures representing the device

Use this function to relax the heap partition of your PCI session.

2.61 Input::Session Class Reference

`#include <input_session.h>`

Public Member Functions

- virtual ~Session ()
- virtual Bastei::Capability dataspace ()=0
- virtual bool is_pending ()=0
- virtual int flush ()=0

Protected Types

- enum Opcode { DATASPACE, IS_PENDING, FLUSH }

2.61.1 Member Enumeration Documentation

2.61.1.1 enum Input::Session::Opcode [protected]

Enumerator:

DATASPACE

IS_PENDING

FLUSH

2.61.2 Constructor & Destructor Documentation

2.61.2.1 virtual Input::Session::~Session () [inline, virtual]

2.61.3 Member Function Documentation

2.61.3.1 virtual Bastei::Capability Input::Session::dataspace () [pure virtual]

Return capability to event buffer dataspace

2.61.3.2 virtual bool Input::Session::is_pending () [pure virtual]

Request input state

Returns:

True if new events are available

2.61.3.3 virtual int Input::Session::flush () [pure virtual]

Flush pending events to event buffer

Returns:

Number of flushed events

2.62 Framebuffer::Session Class Reference

`#include <framebuffer_session.h>`

Public Types

- enum Mode { INVALID, RGB565 }

Public Member Functions

- virtual ~Session ()
- virtual Bastei::Capability dataspace ()=0
- virtual void info (int *out_w, int *out_h, Mode *out_mode)=0
- virtual void refresh (int x, int y, int w, int h)=0

Protected Types

- enum Opcode { DATASPACE, INFO, REFRESH }

2.62.1 Member Enumeration Documentation

2.62.1.1 enum Framebuffer::Session::Opcode [protected]

Enumerator:

DATASPACE

INFO

REFRESH

2.62.1.2 enum Framebuffer::Session::Mode

Pixel formats

Enumerator:

INVALID

RGB565

2.62.2 Constructor & Destructor Documentation

2.62.2.1 virtual Framebuffer::Session::~Session () [inline, virtual]

2.62.3 Member Function Documentation

2.62.3.1 virtual Bastei::Capability Framebuffer::Session::dataspace () [pure virtual]

Request dataspace representing the logical frame buffer

2.62.3.2 virtual void Framebuffer::Session::info (int * *out_w*, int * *out_h*, Mode * *out_mode*) [pure virtual]

Request current screen mode properties

Parameters:

out_w Width of frame buffer

out_h Height of frame buffer

out_mode Pixel format

2.62.3.3 virtual void Framebuffer::Session::refresh (int *x*, int *y*, int *w*, int *h*) [pure virtual]

Flush specified pixel region

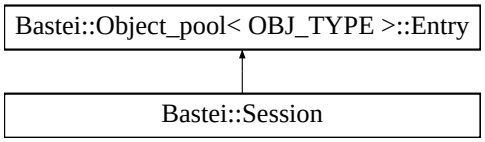
Parameters:

x,y,w,h Region to be updated on physical frame buffer

2.63 Bastei::Session Class Reference

`#include <child.h>`

Inheritance diagram for Bastei::Session::



Public Member Functions

- Session (Capability session_cap, Session_control *sc, size_t ram_quota, Child *server=0, const char *ident="<noname>")
- Session ()
- Capability session_cap ()
- Session_control * session_control ()
- size_t donated_ram_quota ()
- bool valid ()
- Child * server ()
- const char * ident ()

2.63.1 Constructor & Destructor Documentation

2.63.1.1 Bastei::Session::Session (Capability *session_cap*, Session_control * *sc*, size_t *ram_quota*, Child * *server* = 0, const char * *ident* = "<noname>") [inline]

Constructors

2.63.1.2 Bastei::Session::Session () [inline]

Default constructor creates invalid session

2.63.2 Member Function Documentation

2.63.2.1 Capability Bastei::Session::session_cap () [inline]

Accessors

2.63.2.2 Session_control* Bastei::Session::session_control () [inline]

2.63.2.3 size_t Bastei::Session::donated_ram_quota () [inline]

2.63.2.4 bool Bastei::Session::valid () [inline]

2.63.2.5 Child* Bastei::Session::server () [inline]

2.63.2.6 const char* Bastei::Session::ident () [inline]

2.64 Timer::Session Class Reference

`#include <timer_session.h>`

Public Member Functions

- virtual ~Session ()
- virtual void msleep (unsigned ms)=0

Protected Types

- enum Opcode { MSLEEP }

2.64.1 Member Enumeration Documentation

2.64.1.1 enum Timer::Session::Opcode [protected]

Enumerator:

MSLEEP

2.64.2 Constructor & Destructor Documentation

2.64.2.1 virtual Timer::Session::~Session () [inline, virtual]

2.64.3 Member Function Documentation

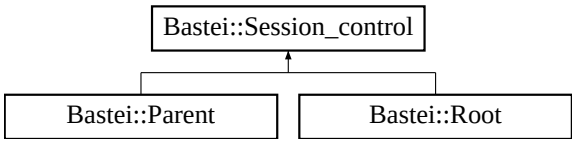
2.64.3.1 virtual void Timer::Session::msleep (unsigned *ms*) [pure virtual]

Sleep number of milliseconds

2.65 Bastei::Session_control Class Reference

`#include <session_control.h>`

Inheritance diagram for Bastei::Session_control::



Public Member Functions

- virtual ~Session_control ()
- virtual void close (Capability session_cap)=0

2.65.1 Constructor & Destructor Documentation

2.65.1.1 virtual Bastei::Session_control::~Session_control () [inline, virtual]

2.65.2 Member Function Documentation

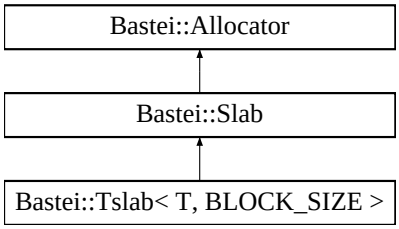
2.65.2.1 virtual void Bastei::Session_control::close (Capability *session_cap*) [pure virtual]

Close session

2.66 Bastei::Slab Class Reference

`#include <slab.h>`

Inheritance diagram for Bastei::Slab::



Public Member Functions

- size_t slab_size ()
- size_t block_size ()
- size_t num_elem ()
- size_t entry_size ()
- Slab (size_t slab_size, size_t block_size, Slab_block *initial_sb, Allocator *backingstore=0)
- ~Slab ()
- void dump_sb_list ()
- void remove_sb (Slab_block *sb)
- void insert_sb (Slab_block *sb, Slab_block *at=0)
- void * alloc ()
- void * first_used_elem ()
- bool num_free_entries_higher_than (int n)
- void backingstore (Allocator *bs)
- Allocator * backingstore ()
- void * alloc (size_t)
- void free (void *addr, size_t)
- size_t consumed ()
- size_t overhead ()

Static Public Member Functions

- static void free (void *addr)

2.66.1 Detailed Description

Slab allocator

2.66.2 Constructor & Destructor Documentation

2.66.2.1 Bastei::Slab::Slab (size_t *slab_size*, size_t *block_size*, Slab_block * *initial_sb*, Allocator * *backingstore* = 0)

Constructor

At construction time, there exists one initial slab block that is used for the first couple of allocations, especially for the allocation of the second slab block.

2.66.2.2 Bastei::Slab::~Slab ()

Destructor

2.66.3 Member Function Documentation

2.66.3.1 size_t Bastei::Slab::slab_size () [inline]

2.66.3.2 size_t Bastei::Slab::block_size () [inline]

2.66.3.3 size_t Bastei::Slab::num_elem () [inline]

2.66.3.4 size_t Bastei::Slab::entry_size () [inline]

2.66.3.5 void Bastei::Slab::dump_sb_list ()

Debug function for dumping the current slab block list

2.66.3.6 void Bastei::Slab::remove_sb (Slab_block * *sb*)

Remove block from slab block list

2.66.3.7 void Bastei::Slab::insert_sb (Slab_block * *sb*, Slab_block * *at* = 0)

Insert block into slab block list

2.66.3.8 void* Bastei::Slab::alloc ()

Allocate slab entry

2.66.3.9 static void Bastei::Slab::free (void * *addr*) [static]

Free slab entry

2.66.3.10 void* Bastei::Slab::first_used_elem ()

Return a used slab element

2.66.3.11 bool Bastei::Slab::num_free_entries_higher_than (int *n*)

Return true if number of free slab entries is higher than n

2.66.3.12 void Bastei::Slab::backingstore (Allocator * *bs*) [inline]

Define/request backingstore allocator

2.66.3.13 Allocator* Bastei::Slab::backingstore () [inline]

2.66.3.14 void* Bastei::Slab::alloc (size_t) [inline, virtual]

Allocator interface

Implements Bastei::Allocator.

2.66.3.15 void Bastei::Slab::free (void * *addr*, size_t *size*) [inline, virtual]

Free block a previously allocated block

Implements Bastei::Allocator.

2.66.3.16 size_t Bastei::Slab::consumed () [virtual]

Return total amount of backingstore consumed by the allocator

Reimplemented from Bastei::Allocator.

2.66.3.17 size_t Bastei::Slab::overhead () [inline, virtual]

Return metadata overhead per block

Implements Bastei::Allocator.

2.67 Bastei::Slab_block Class Reference

`#include <slab.h>`

Public Member Functions

- Slab_block (Slab *s=0)
- void slab (Slab *slab)
- unsigned avail ()
- void * alloc ()
- Slab_entry * first_used_entry ()
- void inc_avail (Slab_entry *e)
- void dec_avail ()
- void dump ()
- int check_bounds ()

Public Attributes

- Slab_block * next
- Slab_block * prev

2.67.1 Detailed Description

A slab block holds an array of slab entries.

2.67.2 Constructor & Destructor Documentation

2.67.2.1 Bastei::Slab_block::Slab_block (Slab * *s* = 0) [inline, explicit]

Constructor

Normally, Slab_blocks are constructed by a Slab allocator that specifies itself as constructor argument.

2.67.3 Member Function Documentation

2.67.3.1 void Bastei::Slab_block::slab (Slab * *slab*)

Configure block to be managed by the specified slab allocator

2.67.3.2 unsigned Bastei::Slab_block::avail () [inline]

Request number of available entries in block

2.67.3.3 void* Bastei::Slab_block::alloc ()

Allocate slab entry from block

2.67.3.4 Slab_entry* Bastei::Slab_block::first_used_entry ()

Return a used slab block entry

2.67.3.5 void Bastei::Slab_block::inc_avail (Slab_entry * *e*)

These functions are called by Slab_entry.

2.67.3.6 void Bastei::Slab_block::dec_avail ()

2.67.3.7 void Bastei::Slab_block::dump ()

Debug and test hooks

2.67.3.8 int Bastei::Slab_block::check_bounds ()

2.67.4 Member Data Documentation

2.67.4.1 Slab_block* Bastei::Slab_block::next

2.67.4.2 Slab_block* Bastei::Slab_block::prev

2.68 Bastei::Slab_entry Class Reference

`#include <slab.h>`

Public Member Functions

- void init ()
- void occupy (Slab_block *sb)
- void free ()
- void * addr ()

Static Public Member Functions

- static Slab_entry * slab_entry (void *addr)

2.68.1 Member Function Documentation

2.68.1.1 void Bastei::Slab_entry::init () [inline]

2.68.1.2 void Bastei::Slab_entry::occupy (Slab_block * *sb*) [inline]

2.68.1.3 void Bastei::Slab_entry::free () [inline]

2.68.1.4 void* Bastei::Slab_entry::addr () [inline]

2.68.1.5 static Slab_entry* Bastei::Slab_entry::slab_entry (void * *addr*) [inline, static]

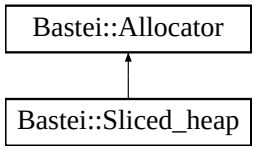
Lookup Slab_entry by given address

The specified address is supposed to point to _data[0].

2.69 Bastei::Sliced_heap Class Reference

`#include <heap.h>`

Inheritance diagram for Bastei::Sliced_heap::



Public Member Functions

- Sliced_heap (Ram_session *ram_session, Rm_session *rm_session)
- ~Sliced_heap ()
- void * alloc (size_t size)
- void free (void *addr, size_t size)
- size_t consumed ()
- size_t overhead ()

2.69.1 Detailed Description

Heap that allocates each block at a separate dataspace

2.69.2 Constructor & Destructor Documentation

2.69.2.1 Bastei::Sliced_heap::Sliced_heap (Ram_session * *ram_session*, Rm_session * *rm_session*)

Constructor

2.69.2.2 Bastei::Sliced_heap::~Sliced_heap ()

Destructor

2.69.3 Member Function Documentation

2.69.3.1 void* Bastei::Sliced_heap::alloc (size_t *size*) [virtual]

Allocate block

Implements Bastei::Allocator.

2.69.3.2 void Bastei::Sliced_heap::free (void * *addr*, size_t *size*) [virtual]

Free block a previously allocated block

Implements Bastei::Allocator.

2.69.3.3 size_t Bastei::Sliced_heap::consumed () [inline, virtual]

Return total amount of backingstore consumed by the allocator

Reimplemented from Bastei::Allocator.

2.69.3.4 size_t Bastei::Sliced_heap::overhead () [virtual]

Return metadata overhead per block

Implements Bastei::Allocator.

2.70 Bastei::Task Class Reference

`#include <task.h>`

Public Member Functions

- Task (Capability elf_data_ds_cap, Capability ram_session_cap, Capability cpu_session_cap, Capability parent_cap, const char *name, char *const argv[])
- ~Task ()
- Capability rm_session_cap () const
- Capability task_session_cap () const

2.70.1 Constructor & Destructor Documentation

2.70.1.1 Bastei::Task::Task (Capability *elf_data_ds_cap*, Capability *ram_session_cap*, Capability *cpu_session_cap*, Capability *parent_cap*, const char * *name*, char *const *argv*[])

Constructor - start task

On construction of a task, the execution of the new task is started immediately.

Parameters:

elf_data_ds_cap Dataspace that contains the elf binary. This dataspace can be read-only.

ram_session_cap RAM session providing the BSS for the new task.

cpu_session_cap CPU session for the new task.

parent_cap Parent of the new task

name Name of task (can be used in debugging)

argv ???

2.70.1.2 Bastei::Task::~Task ()

Destructor - kill task

2.70.2 Member Function Documentation

2.70.2.1 Capability Bastei::Task::rm_session_cap () const [inline]

2.70.2.2 Capability Bastei::Task::task_session_cap () const [inline]

2.71 Bastei::Task_session Class Reference

`#include <task_session.h>`

Public Member Functions

- virtual ~Task_session ()
- virtual int bind_thread (Capability thread)=0

Protected Types

- enum Opcode { BIND_THREAD }

2.71.1 Member Enumeration Documentation

2.71.1.1 enum Bastei::Task_session::Opcode [protected]

Enumerator:

BIND_THREAD

2.71.2 Constructor & Destructor Documentation

2.71.2.1 virtual Bastei::Task_session::~Task_session () [inline, virtual]

2.71.3 Member Function Documentation

2.71.3.1 virtual int Bastei::Task_session::bind_thread (Capability *thread*) [pure virtual]

Bind thread to task

Parameters:

thread capability of thread to bind

Returns:

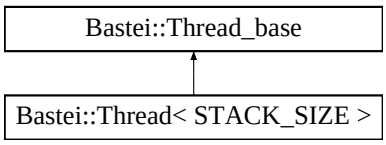
zero on success or negative error code

After successful bind the thread will run inside this task when started.

2.72 Bastei::Thread< STACK_SIZE > Class Template Reference

`#include <thread.h>`

Inheritance diagram for Bastei::Thread< STACK_SIZE >::



Public Member Functions

- Thread (const char *name="<noname>")
- void start ()

template<int STACK_SIZE> class Bastei::Thread< STACK_SIZE >

2.72.1 Constructor & Destructor Documentation

2.72.1.1 template<int STACK_SIZE> Bastei::Thread< STACK_SIZE >::Thread (const char * *name* = "<noname>") [inline, explicit]

Constructor

Parameters:

name Thread name (for debugging)

2.72.2 Member Function Documentation

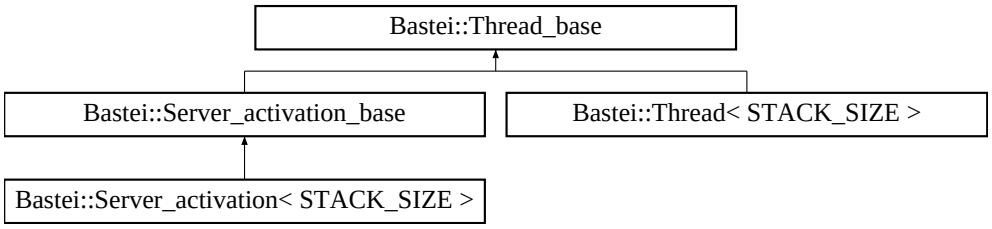
2.72.2.1 template<int STACK_SIZE> void Bastei::Thread< STACK_SIZE >::start () [inline]

Start execution of the thread

2.73 Bastei::Thread_base Class Reference

`#include <thread.h>`

Inheritance diagram for Bastei::Thread_base::



Public Member Functions

- virtual ~Thread_base ()
- virtual void entry ()=0

- void cancel_blocking ()
- Fiasco::l4_threadid_t tid ()

Protected Member Functions

- void _start (void *sp, const char *name="<noname>")

Static Protected Member Functions

- static void _thread_start (void *arg)

Protected Attributes

- Bastei::Capability _thread_cap
- Fiasco::l4_threadid_t _tid

Static Protected Attributes

- static Lock _startup_arg_lock
- static Thread_base * _startup_arg

2.73.1 Detailed Description

Thread_base provides the functionality to start the execution of an activity.

2.73.2 Constructor & Destructor Documentation

2.73.2.1 virtual Bastei::Thread_base::~Thread_base () [virtual]

2.73.3 Member Function Documentation

2.73.3.1 void Bastei::Thread_base::_start (void * *sp*, const char * *name* = "<noname>") [protected]

Start execution of thread at entry function

This function should be called from the constructor of the derived class.

Parameters:

sp Initial stack pointer

name Name of thread (used for debugging)

2.73.3.2 static void Bastei::Thread_base::_thread_start (void * *arg*) [static, protected]

Thread startup wrapper

2.73.3.3 virtual void Bastei::Thread_base::entry () [pure virtual]

Entry function of the thread

Implemented in Bastei::Server_activation_base.

2.73.3.4 void Bastei::Thread_base::cancel_blocking ()

Cancel currently blocking operation

2.73.3.5 Fiasco::l4_threadid_t Bastei::Thread_base::tid () [inline]

Only to be called from Fiasco specific code

2.73.4 Member Data Documentation

2.73.4.1 Bastei::Capability Bastei::Thread_base::_thread_cap [protected]

Capability for this thread (set by _start())

2.73.4.2 Fiasco::l4_threadid_t Bastei::Thread_base::_tid [protected]

Fiasco thread ID that will be used to create capabilities to endpoints managed by the thread.

2.73.4.3 Lock Bastei::Thread_base::_startup_arg_lock [static, protected]

Thread startup argument frame

2.73.4.4 Thread_base* Bastei::Thread_base::_startup_arg [static, protected]

2.74 Bastei::Thread_state Struct Reference

`#include <thread_state.h>`

Public Member Functions

- Thread_state ()

Public Attributes

- addr_t ip
- addr_t sp

2.74.1 Constructor & Destructor Documentation

2.74.1.1 Bastei::Thread_state::Thread_state () [inline]

Constructor

2.74.2 Member Data Documentation

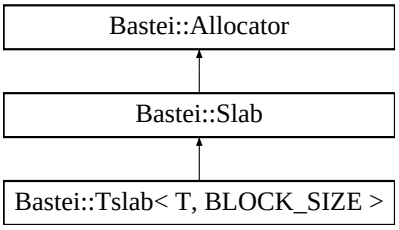
2.74.2.1 addr_t Bastei::Thread_state::ip

2.74.2.2 addr_t Bastei::Thread_state::sp

2.75 Bastei::Tslab< T, BLOCK_SIZE > Class Template Reference

`#include <tslab.h>`

Inheritance diagram for Bastei::Tslab< T, BLOCK_SIZE >::



Public Member Functions

- Tslab (Allocator *backingstore, Slab_block *initial_sb=0)
- T * first_object ()

template<typename T, size_t BLOCK_SIZE> class Bastei::Tslab< T, BLOCK_SIZE >

2.75.1 Constructor & Destructor Documentation

2.75.1.1 template<typename T, size_t BLOCK_SIZE> Bastei::Tslab< T, BLOCK_SIZE >::Tslab (Allocator * *backingstore*, Slab_block * *initial_sb* = `0`) `[inline]`

2.75.2 Member Function Documentation

2.75.2.1 template<typename T, size_t BLOCK_SIZE> T* Bastei::Tslab< T, BLOCK_SIZE >::first_object () `[inline]`

2.76 Nitpicker::View Class Reference

`#include <nitpicker_view.h>`

Public Member Functions

- virtual ~View ()
- virtual int viewport (int x, int y, int w, int h, int buf_x, int buf_y, bool redraw=true)=0

- virtual int stack (Bastei::Capability neighbor=Bastei::Capability(), bool behind=true, bool redraw=true)=0
- virtual int title (const char *title)=0

Protected Types

- enum Opcode { VIEWPORT, STACK, TITLE }

2.76.1 Member Enumeration Documentation

2.76.1.1 enum Nitpicker::View::Opcode [protected]

Enumerator:

VIEWPORT

STACK

TITLE

2.76.2 Constructor & Destructor Documentation

2.76.2.1 virtual Nitpicker::View::~View () [inline, virtual]

2.76.3 Member Function Documentation

2.76.3.1 virtual int Nitpicker::View::viewport (int *x*, int *y*, int *w*, int *h*, int *buf_x*, int *buf_y*, bool *redraw* = true) [pure virtual]

Define position and viewport

Both attributes are handled in one function to enable atomic updates of position and viewport. This is the common case for moving an overlay window.

2.76.3.2 virtual int Nitpicker::View::stack (Bastei::Capability *neighbor* = Bastei::Capability(), bool *behind* = true, bool *redraw* = true) [pure virtual]

Reposition view in view stack

Parameters:

neighbor Neighbor view

behind Insert view in front (true) or behind (false) the specified neightbor

redraw Redraw affected screen region

To insert a view at the top of the view stack, specify neighbor = invalid and behind = true. To insert a view at the bottom of the view stack, specify neighbor = invalid and behind = false.

2.76.3.3 virtual int Nitpicker::View::title (const char * *title*) [pure virtual]

Assign new view title

3 Bastei OS Architecture File Documentation

3.1 base/allocator.h File Reference

```
#include <base/stdint.h>
#include <base/exception.h>
```

Namespaces

- namespace Bastei

Classes

- class Bastei::Allocator
- class Bastei::Allocator::Out_of_memory

Functions

- template<typename T>
  void Bastei::destroy (Allocator *alloc, T *obj)
- void * operator new (Bastei::size_t size, Bastei::Allocator *allocator)

3.1.1 Function Documentation

3.1.1.1 void* operator new (Bastei::size_t *size*, Bastei::Allocator * *allocator*)

3.2 base/allocator_avl.h File Reference

```
#include <base/allocator.h>
#include <base/tslab.h>
#include <util/avl_tree.h>
#include <util/misc_math.h>
```

Namespaces

- namespace Bastei

Classes

- class Bastei::Allocator_avl_base
- class Bastei::Allocator_avl_base::Block
- class Bastei::Allocator_avl_tpl< BMDT >
- class **Bastei::Allocator_avl_tpl< BMDT >::Block**
- class Bastei::Empty

Typedefs

- typedef Allocator_avl_tpl< Empty > Bastei::Allocator_avl

3.3 base/capability.h File Reference

```
#include <l4/sys/types.h>
```

Namespaces

- namespace Fiasco
- namespace Bastei

Classes

- class Fiasco::Capability

Typedefs

- typedef ::Fiasco::Capability Bastei::Capability
- typedef ::Fiasco::l4_threadid_t Bastei::Connection_state

3.4 base/child.h File Reference

```
#include <parent/server.h>
#include <ram_session/client.h>
#include <util/arg_string.h>
#include <base/env.h>
#include <base/server.h>
#include <base/heap.h>
#include <base/task.h>
#include <base/service.h>
#include <base/lock.h>
```

Namespaces

- namespace Bastei

Classes

- class Bastei::Session
- class Bastei::Child

3.5 init/child.h File Reference

```
#include <base/env.h>
#include <base/child.h>
#include <base/service.h>
#include <cap_session/cap_session.h>
#include <rom_session/server.h>
#include <base/snprintf.h>
```

Namespaces

- namespace Init

Classes

- class Init::Child
- class **Init::Child::Config_rom_session_component**

3.6 base/env.h File Reference

```
#include <base/capability.h>
#include <parent/parent.h>
#include <rm_session/rm_session.h>
#include <ram_session/ram_session.h>
#include <cpu_session/cpu_session.h>
#include <task_session/task_session.h>
#include <base/allocator.h>
#include <base/snprintf.h>
#include <base/lock.h>
```

Namespaces

- namespace Bastei

Classes

- class Bastei::Env

Functions

- Env * Bastei::env ()

- Capability Bastei::parent_cap ()
- Capability Bastei::session (const char *service_name, const char *format_args,...)

3.7 base/errno.h File Reference

Namespaces

- namespace Bastei

Enumerations

- enum { Bastei::ERR_INVALID_OBJECT = -1 }

3.8 base/heap.h File Reference

```
#include <util/list.h>
#include <ram_session/ram_session.h>
#include <rm_session/rm_session.h>
#include <base/allocator_avl.h>
#include <base/lock.h>
```

Namespaces

- namespace Bastei

Classes

- class Bastei::Heap
- class **Bastei::Heap::Dataspace**
- class **Bastei::Heap::Dataspace_pool**
- class Bastei::Sliced_heap

3.9 base/ipc.h File Reference

```
#include <base/ipc_generic.h>
```

3.10 base/ipc_generic.h File Reference

```
#include <util/misc_math.h>
#include <util/string.h>
#include <base/exception.h>
#include <base/capability.h>
#include <base/ipc_msgbuf.h>
```

Namespaces

- namespace Bastei

Classes

- class Bastei::Ipc_error
- class Bastei::Buffer
- class Bastei::Ipc_marshaller
- class Bastei::Ipc_unmarshaller
- class Bastei::Ipc_ostream
- class Bastei::Ipc_istream
- class Bastei::Ipc_client
- class Bastei::Ipc_server

Enumerations

- enum Bastei::Ipc_ostream_send { Bastei::IPC_SEND }
- enum Bastei::Ipc_istream_wait { Bastei::IPC_WAIT }
- enum Bastei::Ipc_client_call { Bastei::IPC_CALL }
- enum Bastei::Ipc_server_reply_wait { Bastei::IPC_REPLY_WAIT }

3.11 base/ipc_msgbuf.h File Reference

Namespaces

- namespace Fiasco
- namespace Bastei

Classes

- class Fiasco::Msgbuf_base
- class Fiasco::Msgbuf< BUF_SIZE >
- class Bastei::Msgbuf< BUF_SIZE >

Typedefs

- typedef ::Fiasco::Msgbuf_base Bastei::Msgbuf_base

3.12 base/lock.h File Reference

```
#include <base/cancelable_lock.h>
```

Namespaces

- namespace Bastei

Classes

- class Bastei::Lock

3.13 base/lock_guard.h File Reference

Namespaces

- namespace Bastei

Classes

- class Bastei::Lock_guard< LT >

3.14 base/object_pool.h File Reference

```
#include <util/avl_tree.h>
#include <base/lock.h>
```

Namespaces

- namespace Bastei

Classes

- class Bastei::Object_pool< OBJ_TYPE >
- class Bastei::Object_pool< OBJ_TYPE >::Entry

3.15 base/ram_dataspace.h File Reference

```
#include <ram_session/ram_session.h>
#include <base/env.h>
```

Namespaces

- namespace Bastei

Classes

- class Bastei::Ram_dataspace

3.16 base/semaphore.h File Reference

```
#include <base/lock.h>
```

Namespaces

- namespace Bastei

Classes

- class Bastei::Semaphore

3.17 base/server.h File Reference

```
#include <base/thread.h>
#include <base/errno.h>
#include <base/ipc.h>
#include <base/object_pool.h>
#include <base/lock.h>
#include <cap_session/cap_session.h>
```

Namespaces

- namespace Bastei

Classes

- class Bastei::Server_object
- class Bastei::Server_activation_base
- class Bastei::Server_entrypoint
- class Bastei::Server_activation< STACK_SIZE >

3.18 base/service.h File Reference

```
#include <root/client.h>
#include <base/lock.h>
#include <base/printf.h>
#include <util/list.h>
```

Namespaces

- namespace Bastei

Classes

- class Bastei::Client
- class Bastei::Service
- class Bastei::Local_service
- class Bastei::Remote_service
- class Bastei::Service_pool< ST >
- class Bastei::Remote_service_pool

Typedefs

- typedef Service_pool< Local_service > Bastei::Local_service_pool

3.19 base/session_control.h File Reference

```
#include <base/capability.h>
```

Namespaces

- namespace Bastei

Classes

- class Bastei::Session_control

3.20 base/slab.h File Reference

```
#include <base/allocator.h>
#include <base/stdint.h>
```

Namespaces

- namespace Bastei

Classes

- class Bastei::Slab_block
- class Bastei::Slab_entry
- class Bastei::Slab

3.21 base/sleep.h File Reference

```
#include <base/ipc.h>
```

Namespaces

- namespace Bastei

Functions

- void Bastei::sleep_forever ()

3.22 base/task.h File Reference

```
#include <base/capability.h>
#include <rm_session/client.h>
#include <task_session/client.h>
#include <cpu_session/client.h>
```

Namespaces

- namespace Bastei

Classes

- class Bastei::Task

3.23 base/thread.h File Reference

```
#include <base/capability.h>
#include <base/lock.h>
#include <l4/sys/types.h>
```

Namespaces

- namespace Fiasco
- namespace Bastei

Classes

- class Bastei::Thread_base
- class Bastei::Thread< STACK_SIZE >

3.24 base/thread_state.h File Reference

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

Namespaces

- namespace Bastei

Classes

- struct Bastei::Thread_state

3.25 base/tslab.h File Reference

```
#include <base/slab.h>
```

Namespaces

- namespace Bastei

Classes

- class Bastei::Tslab< T, BLOCK_SIZE >

3.26 cap_session/cap_session.h File Reference

```
#include <base/capability.h>
```

Namespaces

- namespace Bastei

Classes

- class Bastei::Cap_session

3.27 cpu_session/cpu_session.h File Reference

```
#include <base/stdint.h>
#include <base/capability.h>
#include <base/thread_state.h>
```

Namespaces

- namespace Bastei

Classes

- class Bastei::Cpu_session

3.28 dataspace/dataspace.h File Reference

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

Namespaces

- namespace Bastei

Classes

- class Bastei::Dataspace

3.29 framebuffer_session/framebuffer_session.h File Reference

```
#include <base/capability.h>
```

Namespaces

- namespace Framebuffer

Classes

- class Framebuffer::Session

3.30 init/child_config.h File Reference

```
#include <base/env.h>
#include <base/printf.h>
#include <util/xml_node.h>
#include <rom_session/client.h>
#include <ram_session/client.h>
```

Namespaces

- namespace Init

Classes

- class Init::Child_config

3.31 input_session/input_session.h File Reference

```
#include <base/capability.h>
```

Namespaces

- namespace Input

Classes

- class Input::Session

3.32 io_mem_session/io_mem_session.h File Reference

```
#include <base/capability.h>
```

Namespaces

- namespace Bastei

Classes

- class Bastei::Io_mem_session

3.33 io_port_session/io_port_session.h File Reference

```
#include <base/capability.h>
```

Namespaces

- namespace Bastei

Classes

- class Bastei::Io_port_session

3.34 irq_session/irq_session.h File Reference

```
#include <base/capability.h>
```

Namespaces

- namespace Bastei

Classes

- class Bastei::Irq_session

3.35 log_session/log_session.h File Reference

```
#include <base/capability.h>
```

Namespaces

- namespace Bastei

Classes

- class Bastei::Log_session

3.36 nitpicker_session/nitpicker_session.h File Reference

```
#include <base/capability.h>
```

Namespaces

- namespace Nitpicker

Classes

- class Nitpicker::Session

3.37 nitpicker_view/nitpicker_view.h File Reference

```
#include <base/capability.h>
```

Namespaces

- namespace Nitpicker

Classes

- class Nitpicker::View

3.38 parent/parent.h File Reference

```
#include <base/ipc.h>
#include <base/session_control.h>
```

Namespaces

- namespace Bastei

Classes

- class Bastei::Parent

3.39 pci_device/pci_device.h File Reference

Namespaces

- namespace Pci

Classes

- class Pci::Device
- class Pci::Device::Resource

3.40 pci_session/pci_session.h File Reference

Namespaces

- namespace Pci

Classes

- class Pci::Session

3.41 ram_session/ram_session.h File Reference

```
#include <base/stdint.h>
#include <base/capability.h>
#include <base/exception.h>
```

Namespaces

- namespace Bastei

Classes

- class Bastei::Ram_session
- class Bastei::Ram_session::Alloc_failed
- class Bastei::Ram_session::Quota_exceeded

3.42 rm_session/rm_session.h File Reference

```
#include <base/exception.h>
#include <base/stdint.h>
#include <base/capability.h>
```

Namespaces

- namespace Bastei

Classes

- class Bastei::Rm_session
- class Bastei::Rm_session::Attach_failed
- class Bastei::Rm_session::Invalid_dataspace
- class Bastei::Rm_session::Region_conflict

3.43 rom_session/rom_session.h File Reference

```
#include <base/capability.h>
```

Namespaces

- namespace Bastei

Classes

- class Bastei::Rom_session

3.44 root/root.h File Reference

```
#include <base/ipc.h>
#include <base/session_control.h>
```

Namespaces

- namespace Bastei

Classes

- class Bastei::Root

3.45 task_session/task_session.h File Reference

```
#include <base/stdint.h>
#include <base/capability.h>
```

Namespaces

- namespace Bastei

Classes

- class Bastei::Task_session

3.46 timer_session/timer_session.h File Reference

Namespaces

- namespace Timer

Classes

- class Timer::Session

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