util-vserver (libvserver) Reference Manual

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5 util-vserver (libvserver) Module Documentation

5.1 Syscall wrappers

Functions

- int vc_syscall (uint32_t cmd, xid_t xid, void ∗data)

  The generic vserver syscall
  This function executes the generic vserver syscall. It uses the correct syscallnumber (which may differ between the different architectures).

- int vc_get_version ()

  Returns the version of the current kernel API.

- int vc_get_vci ()

  Returns the kernel configuration bits.

- xid_t vc_new_s_context (xid_t ctx, unsigned int remove_cap, unsigned int flags)

  Moves current process into a context
  Puts current process into context ctx*, removes the capabilities given in* remove_cap *and sets* flags.

- int vc_set_ipv4root (uint32_t bcast, size_t nb, struct vc_ip_mask_pair const ∗ips)

  Sets the ipv4root information.

- xid_t vc_ctx_create (xid_t xid)

  Creates a context without starting it.
  This functions initializes a new context. When already in a freshly created context, this old context will be discarded.

- int vc_ctx_migrate (xid_t xid, uint_least64_t flags)

  Moves the current process into the specified context.

- int vc_ctx_stat (xid_t xid, struct vc_ctx_stat ∗stat)

  Get some statistics about a context.

- int vc_virt_stat (xid_t xid, struct vc_virt_stat ∗stat)

  Get more statistics about a context.

- int vc_ctx_kill (xid_t ctx, pid_t pid, int sig)

  Sends a signal to a context/pid
  Special values for pid *are:*
  - *-1 which means every process in ctx except the init-process*
  - *0 which means every process in ctx inclusive the init-process.*

- xid_t vc_get_task_xid (pid_t pid)

  Returns the context of the given process.

- int vc_wait_exit (xid_t xid)

  Waits for the end of a context.

- int vc_get_rlimit (xid_t xid, int resource, struct vc_rlimit ∗lim)

  Returns the limits of resource.

- int vc_set_rlimit (xid_t xid, int resource, struct vc_rlimit const ∗lim)

  Sets the limits of resource.

- int vc_rlimit_stat (xid_t xid, int resource, struct vc_rlimit_stat ∗stat)

  Returns the current stats of resource.

- int vc_reset_minmax (xid_t xid)

  Resets the minimum and maximum observed values of all resources.

- int vc_get_iattr (char const ∗filename, xid_t ∗xid, uint_least32_t ∗flags, uint_least32_t ∗mask)

  Returns information about attributes and assigned context of a file.
  This function returns the VC_IATTR_XXX flags and about the assigned context of a file. To request an information, the appropriate bit in `mask` *must be set and the corresponding parameter (*xid *or* flags*) must not be NULL.*

- xid_t vc_getfilecontext (char const ∗filename)

  Returns the context of `filename`
  This function calls vc_get_iattr() with appropriate arguments to determine the context of `filename`*. In error-case or when no context is assigned,* `VC_NOCTX` *will be returned. To differ between both cases,* `errno` *must be examined.*

5.1.1 Detailed Description

Functions which are calling the vserver syscall directly.

5.1.2 Function Documentation

5.1.2.1 xid_t vc_ctx_create (xid_t *xid*)

Creates a context without starting it.

This functions initializes a new context. When already in a freshly created context, this old context will be discarded.

Parameters:

xid The new context; special values are:

- VC_DYNAMIC_XID which means to create a dynamic context

Returns:

the xid of the created context, or VC_NOCTX on errors. `errno` will be set appropriately.

5.1.2.2 int vc_ctx_migrate (xid_t *xid*, uint_least64_t *flags*)

Moves the current process into the specified context.

Parameters:

xid The new context

flags The flags, see VC_VXM_∗

Returns:

0 on success, -1 on errors

5.1.2.3 int vc_ctx_stat (xid_t *xid*, struct vc_ctx_stat ∗ *stat*)

Get some statistics about a context.

Parameters:

xid The context to get stats about

stat Where to store the result

Returns:

0 on success, -1 on errors.

5.1.2.4 int vc_get_iattr (char const ∗ *filename*, xid_t ∗ *xid*, uint_least32_t ∗ *flags*, uint_least32_t ∗ *mask*)

Returns information about attributes and assigned context of a file.

This function returns the VC_IATTR_XXX flags and about the assigned context of a file. To request an information, the appropriate bit in `mask` must be set and the corresponding parameter (*xid* or *flags*) must not be NULL.

E.g. to receive the assigned context, the `VC_IATTR_XID` bit must be set in *mask*, and *xid* must point to valid memory.

Possible flags are `VC_IATTR_ADMIN`, `VC_IATTR_WATCH` , `VC_IATTR_HIDE`, `VC_IATTR_BARRIER`, `VC_IATTR_IUNLINK` and `VC_IATTR_IMMUTABLE`.

Parameters:

filename The name of the file whose attributes shall be determined.

xid When non-zero and the VC_IATTR_XID bit is set in *mask*, the assigned context of *filename* will be stored there.

flags When non-zero, a bitmask of current attributes will be stored there. These attributes must be requested explicitly by setting the appropriate bit in *mask*

mask Points to a bitmask which tells which attributes shall be determined. On return, it will masquerade the attributes which were determined.

Precondition:

mask!=0 && !((∗mask&VC_IATTR_XID) && xid==0) && !((∗mask&∼VC_IATTR_XID) && flags==0)

5.1.2.5 int vc_get_rlimit (xid_t *xid*, int *resource*, struct vc_rlimit ∗ *lim*)

Returns the limits of *resource*.

Parameters:

xid The id of the context

resource The resource which will be queried

lim The result which will be filled with the limits

Returns:

0 on success, and -1 on errors.

5.1.2.6 xid_t vc_get_task_xid (pid_t *pid*)

Returns the context of the given process.

Parameters:

pid the process-id whose xid shall be determined; pid==0 means the current process.

Returns:

the xid of process `pid` or -1 on errors

5.1.2.7 int vc_get_vci ()

Returns the kernel configuration bits.

Returns:

The kernel configuration bits

5.1.2.8 int vc_get_version ()

Returns the version of the current kernel API.

Returns:

The versionnumber of the kernel API

5.1.2.9 xid_t vc_getfilecontext (char const * *filename*)

Returns the context of `filename`

This function calls vc_get_iattr() with appropriate arguments to determine the context of `filename`. In error-case or when no context is assigned, `VC_NOCTX` will be returned. To differ between both cases, `errno` must be examined.

WARNING: this function can modify `errno` although no error happened.

Parameters:

filename The file to check

Returns:

The assigned context, or VC_NOCTX when an error occured or no such assignment exists. `errno` will be 0 in the latter case

5.1.2.10 xid_t vc_new_s_context (xid_t *ctx*, unsigned int *remove_cap*, unsigned int *flags*)

Moves current process into a context

Puts current process into context *ctx*, removes the capabilities given in *remove_cap* and sets *flags*.

Parameters:

ctx The new context; special values for are

- VC_SAMECTX which means the current context (just for changing caps and flags)
- VC_DYNAMIC_XID which means the next free context; this value can be used by ordinary users also

remove_cap The linux capabilities which will be **removed**.

flags Special flags which will be set.

Returns:

The new context-id, or VC_NOCTX on errors; `errno` will be set appropriately

See `http://vserver.13thfloor.at/Stuff/Logic.txt` for details

5.1.2.11 int vc_reset_minmax (xid_t *xid*)

Resets the minimum and maximum observed values of all resources.

Parameters:

xid The id of the context

Returns:

0 on success, and -1 on errors.

5.1.2.12 int vc_rlimit_stat (xid_t *xid*, int *resource*, struct vc_rlimit_stat * *stat*)

Returns the current stats of *resource*.

Parameters:

xid The id of the context

resource The resource which will be queried

stat The result which will be filled with the stats

Returns:

0 on success, and -1 on errors.

5.1.2.13 int vc_set_ipv4root (uint32_t *bcast*, size_t *nb*, struct vc_ip_mask_pair const $*$ *ips*)

Sets the ipv4root information.

Precondition:

nb < NB_IPV4ROOT && *ips* != 0

5.1.2.14 int vc_set_rlimit (xid_t *xid*, int *resource*, struct vc_rlimit const $*$ *lim*)

Sets the limits of *resource*.

Parameters:

xid The id of the context

resource The resource which will be queried

lim The new limits

Returns:

0 on success, and -1 on errors.

5.1.2.15 int vc_syscall (uint32_t *cmd*, xid_t *xid*, void $*$ *data*)

The generic vserver syscall

This function executes the generic vserver syscall. It uses the correct syscallnumber (which may differ between the different architectures).

Parameters:

cmd the command to be executed

xid the xid on which the cmd shall be applied

data additional arguments; depends on `cmd`

Returns:

depends on `cmd`; usually, -1 stands for an error

5.1.2.16 int vc_virt_stat (xid_t *xid*, struct vc_virt_stat $*$ *stat*)

Get more statistics about a context.

Parameters:

xid The context to get stats about

stat Where to store the result

Returns:

0 on success, -1 on errors.

5.2 Helper functions

Data Structures

- struct vc_err_listparser

  Information about parsing errors.

Functions

- size_t vc_get_nb_ipv4root () VC_ATTR_CONST

  Returns the value of NB_IPV4ROOT.
  This function returns the value of NB_IPV4ROOT which was used when the library was built, but **not** *the value which is used by the currently running kernel.*

- bool vc_parseLimit (char const ∗str, vc_limit_t ∗res)

  Parses a string describing a limit
  This function parses str *and interprets special words like* `"inf"` *or suffixes. Valid suffixes are*
  - `k` ... *1000*
  - `m` ... *1000000*
  - `K` ... *1024*
  - `M` ... *1048576.*

- uint_least64_t vc_text2bcap (char const ∗str, size_t len)

  Converts a single string into bcapability.

- char const ∗ vc_lobcap2text (uint_least64_t ∗val)

  Converts the lowest bit of a bcapability or the entire value (when possible) to a textual representation.

- int vc_list2bcap (char const ∗str, size_t len, struct vc_err_listparser ∗err, struct vc_ctx_caps ∗cap)

  Converts a string into a bcapability-bitmask
  Syntax of str:.

5.2.1 Detailed Description

Functions which are doing general helper tasks like parameter parsing.

5.2.2 Function Documentation

5.2.2.1 int vc_list2bcap (char const ∗ *str*, size_t *len*, struct vc_err_listparser ∗ *err*, struct vc_ctx_caps ∗ *cap*)

Converts a string into a bcapability-bitmask

Syntax of *str:*.

```
LIST   <- ELEM   | ELEM ',' LIST
ELEM   <- '~' ELEM | MASK | NAME
MASK   <- NUMBER | '^' NUMBER
NUMBER <- 0[0-7]* | [1-9][0-9]* | 0x[0-9,a-f]+
NAME   <- <literal name> | "all" | "any" | "none"
```

When the `'~'` prefix is used, the bits will be unset and a '~' after another '~' will cancel both ones. The `'^'` prefix specifies a bitnumber instead of a bitmask.

"literal name" is everything which will be accepted by the vc_text2bcap() function. The special values for `NAME` will be recognized case insensitively

Parameters:

str The string to be parsed

len The length of the string, or `0` for automatic detection

err Pointer to a structure for error-information, or `NULL`.

cap Pointer to a vc_ctx_caps structure holding the results; only the *bcaps* and *bmask* fields will be changed and already set values will not be honored. When an error occured, *cap* will have the value of all processed valid `BCAP` parts.

Returns:

0 on success, -1 on error. In error case, *err* will hold position and length of the first not understood BCAP part

Precondition:

str != 0 && *cap* != 0; *cap->bcaps* and *cap->bmask* must be initialized

5.2.2.2 char const* vc_lobcap2text (uint_least64_t * *val*)

Converts the lowest bit of a bcapability or the entire value (when possible) to a textual representation.

Parameters:

val The string to be converted; on success, the detected bit(s) will be unset, in errorcase only the lowest set bit

Returns:

A textual representation of *val* resp. of its lowest set bit; or `NULL` in errorcase.

Precondition:

val!=0

Postcondition:

$*val_{old} \; != 0 <-> *val_{old} > *val_{new}$
$*val_{old} == 0 --> result == 0$

5.2.2.3 bool vc_parseLimit (char const * *str*, vc_limit_t * *res*)

Parses a string describing a limit

This function parses *str* and interprets special words like `"inf"` or suffixes. Valid suffixes are

- `k` ... 1000
- `m` ... 1000000
- `K` ... 1024
- `M` ... 1048576.

Parameters:

str The string which shall be parsed

res Will be filled with the interpreted value; in errorcase, this value is undefined.

Returns:

true, iff the string *str* could be parsed. *res* will be filled with the interpreted value in this case.

Precondition:

str!=0 && *res!=0*

5.2.2.4 uint_least64_t vc_text2bcap (char const ∗ *str*, size_t *len*)

Converts a single string into bcapability.

Parameters:

str The string to be parsed; both "CAP_xxx" and "xxx" will be accepted

len The length of the string, or `0` for automatic detection

Returns:

0 on error; a bitmask on success

Precondition:

str != 0

6 util-vserver (libvserver) Data Structure Documentation

6.1 Mapping_uint32 Struct Reference

Data Fields

- char const ∗const id
- size_t len
- uint_least32_t val

6.1.1 Detailed Description

Definition at line 62 of file internal.h.

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

- internal.h

6.2 Mapping_uint64 Struct Reference

Data Fields

- char const ∗const id
- size_t len
- uint_least64_t val

6.2.1 Detailed Description

Definition at line 68 of file internal.h.

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

- internal.h

6.3 vc_ctx_caps Struct Reference

Capabilities of process-contexts.

```
#include <vserver.h>
```

Data Fields

- uint_least64_t bcaps

  Mask of set common system capabilities.

- uint_least64_t bmask

  Mask of set and unset common system capabilities when used by set operations, or the modifiable capabilities when used by get operations.

- uint_least64_t ccaps

  Mask of set process context capabilities.

- uint_least64_t cmask

  Mask of set and unset process context capabilities when used by set operations, or the modifiable capabilities when used by get operations.

6.3.1 Detailed Description

Capabilities of process-contexts.

Definition at line 454 of file vserver.h.

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

- vserver.h

6.4 vc_ctx_dlimit Struct Reference

Data Fields

- uint_least32_t space_used
- uint_least32_t space_total
- uint_least32_t inodes_used
- uint_least32_t inodes_total
- uint_least32_t reserved

6.4.1 Detailed Description

Definition at line 707 of file vserver.h.

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

- vserver.h

6.5 vc_ctx_flags Struct Reference

Flags of process-contexts.

```
#include <vserver.h>
```

Data Fields

- uint_least64_t flagword

  Mask of set context flags.

- uint_least64_t mask

  Mask of set and unset context flags when used by set operations, or modifiable flags when used by get operations.

6.5.1 Detailed Description

Flags of process-contexts.

Definition at line 376 of file vserver.h.

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

- vserver.h

6.6 vc_ctx_stat Struct Reference

Statistics about a context.

```
#include <vserver.h>
```

Data Fields

- uint_least32_t usecnt

  number of uses

- uint_least32_t tasks

  number of tasks

6.6.1 Detailed Description

Statistics about a context.

Definition at line 407 of file vserver.h.

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

- vserver.h

6.7 vc_err_listparser Struct Reference

Information about parsing errors.

```
#include <vserver.h>
```

Data Fields

- char const $*$ ptr

  Pointer to the first character of an erroneous string.

- size_t len

  Length of the erroneous string.

6.7.1 Detailed Description

Information about parsing errors.

Definition at line 768 of file vserver.h.

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

- vserver.h

6.8 vc_ip_mask_pair Struct Reference

Data Fields

- uint32_t ip
- uint32_t mask

6.8.1 Detailed Description

Definition at line 354 of file vserver.h.

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

- vserver.h

6.9 vc_net_caps Struct Reference

Data Fields

- uint_least64_t ncaps
- uint_least64_t cmask

6.9.1 Detailed Description

Definition at line 629 of file vserver.h.

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

- vserver.h

6.10 vc_net_flags Struct Reference

Data Fields

- uint_least64_t flagword
- uint_least64_t mask

6.10.1 Detailed Description

Definition at line 615 of file vserver.h.

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

- vserver.h

6.11 vc_net_nx Struct Reference

Data Fields

- vc_net_nx_type type
- size_t count
- uint32_t ip [4]
- uint32_t mask [4]

6.11.1 Detailed Description

Definition at line 608 of file vserver.h.

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

- vserver.h

6.12 vc_nx_info Struct Reference

Data Fields

- nid_t nid

6.12.1 Detailed Description

Definition at line 597 of file vserver.h.

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

- vserver.h

6.13 vc_rlimit Struct Reference

The limits of a resources.

```
#include <vserver.h>
```

Data Fields

- vc_limit_t min

  the guaranted minimum of a resources

- vc_limit_t soft

  the softlimit of a resource

- vc_limit_t hard

  the absolute hardlimit of a resource

6.13.1 Detailed Description

The limits of a resources.

This is a triple consisting of a minimum, soft and hardlimit.

Definition at line 520 of file vserver.h.

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

- vserver.h

6.14 vc_rlimit_mask Struct Reference

Masks describing the supported limits.

```
#include <vserver.h>
```

Data Fields

- uint_least32_t min

  masks the resources supporting a minimum limit

- uint_least32_t soft

  masks the resources supporting a soft limit

- uint_least32_t hard

  masks the resources supporting a hard limit

6.14.1 Detailed Description

Masks describing the supported limits.

Definition at line 507 of file vserver.h.

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

- vserver.h

6.15 vc_rlimit_stat Struct Reference

Statistics for a resource limit.

`#include <vserver.h>`

Data Fields

- uint_least32_t hits

  number of hits on the limit

- vc_limit_t value

  current value

- vc_limit_t minimum

  minimum value observed

- vc_limit_t maximum

  maximum value observed

6.15.1 Detailed Description

Statistics for a resource limit.

Definition at line 548 of file vserver.h.

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

- vserver.h

6.16 vc_sched_info Struct Reference

Data Fields

- int_least32_t cpu_id
- int_least32_t bucket_id

- uint_least64_t user_msec
- uint_least64_t sys_msec
- uint_least64_t hold_msec
- uint_least32_t token_usec
- int_least32_t vavavoom

6.16.1 Detailed Description

Definition at line 749 of file vserver.h.

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

- vserver.h

6.17 vc_set_sched Struct Reference

Data Fields

- uint_least32_t set_mask
- int_least32_t fill_rate
- int_least32_t interval
- int_least32_t fill_rate2
- int_least32_t interval2
- int_least32_t tokens
- int_least32_t tokens_min
- int_least32_t tokens_max
- int_least32_t priority_bias
- int_least32_t cpu_id
- int_least32_t bucket_id

6.17.1 Detailed Description

Definition at line 733 of file vserver.h.

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

- vserver.h

6.18 vc_virt_stat Struct Reference

Contains further statistics about a context.

```
#include <vserver.h>
```

Data Fields

- uint_least64_t offset
- uint_least64_t uptime
- uint_least32_t nr_threads
- uint_least32_t nr_running

- uint_least32_t nr_uninterruptible
- uint_least32_t nr_onhold
- uint_least32_t nr_forks
- uint_least32_t load [3]

6.18.1 Detailed Description

Contains further statistics about a context.

Definition at line 422 of file vserver.h.

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

- vserver.h

6.19 vc_vx_info Struct Reference

Data Fields

- xid_t xid
- pid_t initpid

6.19.1 Detailed Description

Definition at line 472 of file vserver.h.

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

- vserver.h

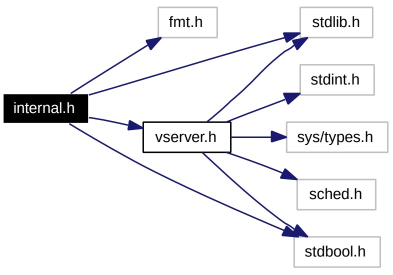
7 util-vserver (libvserver) File Documentation

7.1 internal.h File Reference

Declarations which are used by util-vserver internally.

```
#include "fmt.h"
#include "vserver.h"
#include <stdlib.h>
#include <stdbool.h>
```

Include dependency graph for internal.h:



Data Structures

- struct Mapping_uint32
- struct Mapping_uint64

Functions

- char ∗ **vc_getVserverByCtx_Internal** (xid_t ctx, vcCfgStyle ∗style, char const ∗revdir, bool validate_result)
- int **utilvserver_checkCompatVersion** ()
- uint_least32_t **utilvserver_checkCompatConfig** ()
- bool **utilvserver_isDirectory** (char const ∗path, bool follow_link)
- bool **utilvserver_isFile** (char const ∗path, bool follow_link)
- bool **utilvserver_isLink** (char const ∗path)
- int **utilvserver_listparser_uint32** (char const ∗str, size_t len, char const ∗∗err_ptr, size_t ∗err_len, uint_least32_t ∗flag, uint_least32_t ∗mask, uint_least32_t(∗func)(char const ∗, size_t, bool ∗)) NONNULL((1
- int int **utilvserver_listparser_uint64** (char const ∗str, size_t len, char const ∗∗err_ptr, size_t ∗err_len, uint_least64_t ∗flag, uint_least64_t ∗mask, uint_least64_t(∗func)(char const ∗, size_t, bool ∗)) NONNULL((1
- ssize_t **utilvserver_value2text_uint32** (char const ∗str, size_t len, struct Mapping_uint32 const ∗map, size_t map_len) NONNULL((1
- ssize_t ssize_t **utilvserver_value2text_uint64** (char const ∗str, size_t len, struct Mapping_uint64 const ∗map, size_t map_len) NONNULL((1
- ssize_t ssize_t ssize_t **utilvserver_text2value_uint32** (uint_least32_t ∗val, struct Mapping_uint32 const ∗map, size_t map_len) NONNULL((1
- ssize_t ssize_t ssize_t ssize_t **utilvserver_text2value_uint64** (uint_least64_t ∗val, struct Mapping_uint64 const ∗map, size_t map_len) NONNULL((1

7.1.1 Detailed Description

Declarations which are used by util-vserver internally.

Definition in file internal.h.

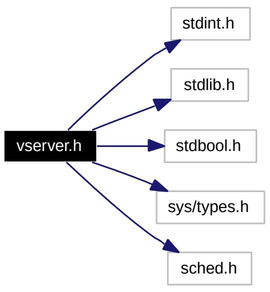
7.2 vserver.h File Reference

The public interface of the the libvserver library.

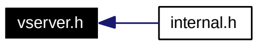
```
#include <stdint.h>
```

```
#include <stdlib.h>
#include <stdbool.h>
#include <sys/types.h>
#include <sched.h>
```

Include dependency graph for vserver.h:



This graph shows which files directly or indirectly include this file:



Data Structures

- struct vc_ip_mask_pair
- struct vc_ctx_flags

  Flags of process-contexts.
- struct vc_ctx_stat

  Statistics about a context.
- struct vc_virt_stat

  Contains further statistics about a context.
- struct vc_ctx_caps

  Capabilities of process-contexts.
- struct vc_vx_info
- struct vc_rlimit_mask

  Masks describing the supported limits.
- struct vc_rlimit

  The limits of a resources.
- struct vc_rlimit_stat

  Statistics for a resource limit.
- struct vc_nx_info

- struct vc_net_nx
- struct vc_net_flags
- struct vc_net_caps
- struct vc_ctx_dlimit
- struct vc_set_sched
- struct vc_sched_info
- struct vc_err_listparser

  Information about parsing errors.

Defines

- #define VC_NOCTX ((xid_t)(-1))
- #define VC_NOXID ((xid_t)(-1))
- #define VC_DYNAMIC_XID ((xid_t)(-1))
- #define VC_SAMECTX ((xid_t)(-2))
- #define VC_NONID ((nid_t)(-1))
- #define VC_DYNAMIC_NID ((nid_t)(-1))
- #define VC_LIM_INFINITY (∼0ULL)
- #define VC_LIM_KEEP (∼1ULL)
- #define VC_CDLIM_UNSET (0U)
- #define VC_CDLIM_INFINITY (∼0U)
- #define VC_CDLIM_KEEP (∼1U)
- #define S_CTX_INFO_LOCK 1
- #define S_CTX_INFO_SCHED 2
- #define S_CTX_INFO_NPROC 4
- #define S_CTX_INFO_PRIVATE 8
- #define S_CTX_INFO_INIT 16
- #define S_CTX_INFO_HIDEINFO 32
- #define S_CTX_INFO_ULIMIT 64
- #define S_CTX_INFO_NAMESPACE 128
- #define VC_CAP_CHOWN 0
- #define VC_CAP_DAC_OVERRIDE 1
- #define VC_CAP_DAC_READ_SEARCH 2
- #define VC_CAP_FOWNER 3
- #define VC_CAP_FSETID 4
- #define VC_CAP_KILL 5
- #define VC_CAP_SETGID 6
- #define VC_CAP_SETUID 7
- #define VC_CAP_SETPCAP 8
- #define VC_CAP_LINUX_IMMUTABLE 9
- #define VC_CAP_NET_BIND_SERVICE 10
- #define VC_CAP_NET_BROADCAST 11
- #define VC_CAP_NET_ADMIN 12
- #define VC_CAP_NET_RAW 13
- #define VC_CAP_IPC_LOCK 14
- #define VC_CAP_IPC_OWNER 15
- #define VC_CAP_SYS_MODULE 16
- #define VC_CAP_SYS_RAWIO 17
- #define VC_CAP_SYS_CHROOT 18

- #define VC_CAP_SYS_PTRACE 19
- #define VC_CAP_SYS_PACCT 20
- #define VC_CAP_SYS_ADMIN 21
- #define VC_CAP_SYS_BOOT 22
- #define VC_CAP_SYS_NICE 23
- #define VC_CAP_SYS_RESOURCE 24
- #define VC_CAP_SYS_TIME 25
- #define VC_CAP_SYS_TTY_CONFIG 26
- #define VC_CAP_MKNOD 27
- #define VC_CAP_LEASE 28
- #define VC_CAP_AUDIT_WRITE 29
- #define VC_CAP_AUDIT_CONTROL 30
- #define VC_IMMUTABLE_FILE_FL 0x0000010lu
- #define VC_IMMUTABLE_LINK_FL 0x0008000lu
- #define VC_IMMUTABLE_ALL (VC_IMMUTABLE_LINK_FL|VC_IMMUTABLE_FILE_FL)
- #define VC_IATTR_XID 0x01000000u
- #define VC_IATTR_ADMIN 0x00000001u
- #define VC_IATTR_WATCH 0x00000002u
- #define VC_IATTR_HIDE 0x00000004u
- #define VC_IATTR_FLAGS 0x00000007u
- #define VC_IATTR_BARRIER 0x00010000u
- #define VC_IATTR_IUNLINK 0x00020000u
- #define VC_IATTR_IMMUTABLE 0x00040000u
- #define VC_VXF_INFO_LOCK 0x00000001ull
- #define VC_VXF_INFO_NPROC 0x00000004ull
- #define VC_VXF_INFO_PRIVATE 0x00000008ull
- #define VC_VXF_INFO_INIT 0x00000010ull
- #define VC_VXF_INFO_HIDEINFO 0x00000020ull
- #define VC_VXF_INFO_ULIMIT 0x00000040ull
- #define VC_VXF_INFO_NAMESPACE 0x00000080ull
- #define VC_VXF_SCHED_HARD 0x00000100ull
- #define VC_VXF_SCHED_PRIO 0x00000200ull
- #define VC_VXF_SCHED_PAUSE 0x00000400ull
- #define VC_VXF_VIRT_MEM 0x00010000ull
- #define VC_VXF_VIRT_UPTIME 0x00020000ull
- #define VC_VXF_VIRT_CPU 0x00040000ull
- #define VC_VXF_VIRT_LOAD 0x00080000ull
- #define VC_VXF_VIRT_TIME 0x00100000ull
- #define VC_VXF_HIDE_MOUNT 0x01000000ull
- #define VC_VXF_HIDE_NETIF 0x02000000ull
- #define VC_VXF_HIDE_VINFO 0x04000000ull
- #define VC_VXF_STATE_SETUP (1ULL<<32)
- #define VC_VXF_STATE_INIT (1ULL<<33)
- #define VC_VXF_STATE_ADMIN (1ULL<<34)
- #define VC_VXF_SC_HELPER (1ULL<<36)
- #define VC_VXF_REBOOT_KILL (1ULL<<37)
- #define VC_VXF_PERSISTENT (1ULL<<38)
- #define VC_VXF_FORK_RSS (1ULL<<48)
- #define VC_VXF_PROLIFIC (1ULL<<49)
- #define VC_VXF_IGNEG_NICE (1ULL<<52)

- #define VC_VXC_SET_UTSNAME 0x00000001ull
- #define VC_VXC_SET_RLIMIT 0x00000002ull
- #define VC_VXC_RAW_ICMP 0x00000100ull
- #define VC_VXC_SYSLOG 0x00001000ull
- #define VC_VXC_SECURE_MOUNT 0x00010000ull
- #define VC_VXC_SECURE_REMOUNT 0x00020000ull
- #define VC_VXC_BINARY_MOUNT 0x00040000ull
- #define VC_VXC_QUOTA_CTL 0x00100000ull
- #define VC_VXC_ADMIN_MAPPER 0x00200000ull
- #define VC_VXC_ADMIN_CLOOP 0x00400000ull
- #define VC_VXSM_FILL_RATE 0x0001
- #define VC_VXSM_INTERVAL 0x0002
- #define VC_VXSM_FILL_RATE2 0x0004
- #define VC_VXSM_INTERVAL2 0x0008
- #define VC_VXSM_TOKENS 0x0010
- #define VC_VXSM_TOKENS_MIN 0x0020
- #define VC_VXSM_TOKENS_MAX 0x0040
- #define VC_VXSM_PRIO_BIAS 0x0100
- #define VC_VXSM_CPU_ID 0x1000
- #define VC_VXSM_BUCKET_ID 0x2000
- #define VC_VXSM_IDLE_TIME 0x0200
- #define VC_VXSM_FORCE 0x0400
- #define VC_VXSM_MSEC 0x4000
- #define VC_VXSM_V3_MASK 0x0173
- #define VC_NXF_INFO_LOCK 0x00000001ull
- #define VC_NXF_INFO_PRIVATE 0x00000008ull
- #define VC_NXF_SINGLE_IP 0x00000100ull
- #define VC_NXF_HIDE_NETIF 0x02000000ull
- #define VC_NXF_STATE_SETUP (1ULL<<32)
- #define VC_NXF_STATE_ADMIN (1ULL<<34)
- #define VC_NXF_SC_HELPER (1ULL<<36)
- #define VC_NXF_PERSISTENT (1ULL<<38)
- #define VC_VLIMIT_NSOCK 16
- #define VC_VLIMIT_OPENFD 17
- #define VC_VLIMIT_ANON 18
- #define VC_VLIMIT_SHMEM 19
- #define VC_VLIMIT_SEMARY 20
- #define VC_VLIMIT_NSEMS 21
- #define VC_VLIMIT_DENTRY 22
- #define VC_VLIMIT_MAPPED 23
- #define VC_VCI_NO_DYNAMIC (1 << 0)
- #define VC_VCI_SPACES (1 << 10)
- #define VC_DATTR_CREATE 0x00000001
- #define VC_DATTR_OPEN 0x00000002
- #define VC_DATTR_REMAP 0x00000010
- #define VC_VXM_SET_INIT 0x00000001
- #define VC_VXM_SET_REAPER 0x00000002
- #define CLONE_NEWNS 0x00020000
- #define CLONE_NEWUTS 0x04000000
- #define CLONE_NEWIPC 0x08000000

- #define VC_BAD_PERSONALITY ((uint_least32_t)(-1))
- #define VC_LIMIT_VSERVER_NAME_LEN 1024
- #define vcSKEL_INTERFACES 1u
- #define vcSKEL_PKGMGMT 2u
- #define vcSKEL_FILESYSTEM 4u

Typedefs

- typedef an_unsigned_integer_type xid_t
- typedef an_unsigned_integer_type nid_t
- typedef uint_least64_t vc_limit_t

  The type which is used for a single limit value.

Enumerations

- enum vc_net_nx_type {

  vcNET_IPV4 = 1, **vcNET_IPV6** = 2, **vcNET_IPV4B** = 0x101, **vcNET_IPV6B** = 0x102,

  vcNET_ANY = ∼0 }
- enum vc_uts_type {

  vcVHI_CONTEXT, **vcVHI_SYSNAME**, **vcVHI_NODENAME**, **vcVHI_RELEASE**,

  vcVHI_VERSION, **vcVHI_MACHINE**, **vcVHI_DOMAINNAME** }
- enum vcFeatureSet {

  vcFEATURE_VKILL, **vcFEATURE_IATTR**, **vcFEATURE_RLIMIT**, **vcFEATURE_-COMPAT**,

  vcFEATURE_MIGRATE, **vcFEATURE_NAMESPACE**, **vcFEATURE_SCHED**, **vc-FEATURE_VINFO**,

  vcFEATURE_VHI, **vcFEATURE_VSHELPER0**, **vcFEATURE_VSHELPER**, **vcFEATURE_-VWAIT**,

  vcFEATURE_VNET, **vcFEATURE_VSTAT** }
- enum vcXidType {

  vcTYPE_INVALID, **vcTYPE_MAIN**, **vcTYPE_WATCH**, **vcTYPE_STATIC**,

  vcTYPE_DYNAMIC }
- enum vcCfgStyle {

  vcCFG_NONE, **vcCFG_AUTO**, **vcCFG_LEGACY**, **vcCFG_RECENT_SHORT**,

  vcCFG_RECENT_FULL }

Functions

- int vc_syscall (uint32_t cmd, xid_t xid, void ∗data)

  The generic vserver syscall
  This function executes the generic vserver syscall. It uses the correct syscallnumber (which may differ between the different architectures).

- int vc_get_version ()

  Returns the version of the current kernel API.

- int vc_get_vci ()

  Returns the kernel configuration bits.

- xid_t vc_new_s_context (xid_t ctx, unsigned int remove_cap, unsigned int flags)

  Moves current process into a context
  Puts current process into context ctx, *removes the capabilities given in* remove_cap *and sets* flags.

- int vc_set_ipv4root (uint32_t bcast, size_t nb, struct vc_ip_mask_pair const ∗ips)

  Sets the ipv4root information.

- size_t vc_get_nb_ipv4root () VC_ATTR_CONST

  Returns the value of NB_IPV4ROOT.
  This function returns the value of NB_IPV4ROOT which was used when the library was built, but **not** *the value which is used by the currently running kernel.*

- xid_t vc_ctx_create (xid_t xid)

  Creates a context without starting it.
  This functions initializes a new context. When already in a freshly created context, this old context will be discarded.

- int vc_ctx_migrate (xid_t xid, uint_least64_t flags)

  Moves the current process into the specified context.

- int vc_ctx_stat (xid_t xid, struct vc_ctx_stat ∗stat)

  Get some statistics about a context.

- int vc_virt_stat (xid_t xid, struct vc_virt_stat ∗stat)

  Get more statistics about a context.

- int vc_ctx_kill (xid_t ctx, pid_t pid, int sig)

  Sends a signal to a context/pid
  Special values for pid *are:*

  – *-1 which means every process in ctx except the init-process*
  – *0 which means every process in ctx inclusive the init-process.*

- int **vc_get_cflags** (xid_t xid, struct vc_ctx_flags ∗)
- int **vc_set_cflags** (xid_t xid, struct vc_ctx_flagsconst ∗)
- int **vc_get_ccaps** (xid_t xid, struct vc_ctx_caps ∗)
- int **vc_set_ccaps** (xid_t xid, struct vc_ctx_caps const ∗)
- int **vc_get_vx_info** (xid_t xid, struct vc_vx_info ∗info)
- xid_t vc_get_task_xid (pid_t pid)

  Returns the context of the given process.

- int vc_wait_exit (xid_t xid)

  Waits for the end of a context.

- int vc_get_rlimit_mask (xid_t xid, struct vc_rlimit_mask ∗lim)

  Returns the limits supported by the kernel.

- int vc_get_rlimit (xid_t xid, int resource, struct vc_rlimit ∗lim)

Returns the limits of resource.

- int vc_set_rlimit (xid_t xid, int resource, struct vc_rlimit const ∗lim)

  Sets the limits of resource.

- int vc_rlimit_stat (xid_t xid, int resource, struct vc_rlimit_stat ∗stat)

  Returns the current stats of resource.

- int vc_reset_minmax (xid_t xid)

  Resets the minimum and maximum observed values of all resources.

- bool vc_parseLimit (char const ∗str, vc_limit_t ∗res)

  Parses a string describing a limit
  This function parses str *and interprets special words like* `"inf"` *or suffixes. Valid suffixes are*
  - `k` ... *1000*
  - `m` ... *1000000*
  - `K` ... *1024*
  - `M` ... *1048576.*

- nid_t **vc_get_task_nid** (pid_t pid)
- int **vc_get_nx_info** (nid_t nid, struct vc_nx_info ∗)
- nid_t **vc_net_create** (nid_t nid)
- int **vc_net_migrate** (nid_t nid)
- int **vc_net_add** (nid_t nid, struct vc_net_nx const ∗info)
- int **vc_net_remove** (nid_t nid, struct vc_net_nx const ∗info)
- int **vc_get_nflags** (nid_t, struct vc_net_flags ∗)
- int **vc_set_nflags** (nid_t, struct vc_net_flags const ∗)
- int **vc_get_ncaps** (nid_t, struct vc_net_caps ∗)
- int **vc_set_ncaps** (nid_t, struct vc_net_caps const ∗)
- int **vc_set_iattr** (char const ∗filename, xid_t xid, uint_least32_t flags, uint_least32_t mask)
- int vc_get_iattr (char const ∗filename, xid_t ∗xid, uint_least32_t ∗flags, uint_least32_t ∗mask)

  Returns information about attributes and assigned context of a file.
  This function returns the VC_IATTR_XXX flags and about the assigned context of a file. To request an information, the appropriate bit in `mask` *must be set and the corresponding parameter (*xid *or* flags*) must not be NULL.*

- xid_t vc_getfilecontext (char const ∗filename)

  Returns the context of `filename`
  This function calls vc_get_iattr() with appropriate arguments to determine the context of `filename`*. In error-case or when no context is assigned,* `VC_NOCTX` *will be returned. To differ between both cases,* `errno` *must be examined.*

- int **vc_set_vhi_name** (xid_t xid, vc_uts_type type, char const ∗val, size_t len)
- int **vc_get_vhi_name** (xid_t xid, vc_uts_type type, char ∗val, size_t len)
- int **vc_enter_namespace** (xid_t xid, uint_least64_t mask)
- int **vc_set_namespace** (xid_t xid, uint_least64_t mask)
- int **vc_cleanup_namespace** ()
- uint_least64_t **vc_get_space_mask** ()
- int vc_add_dlimit (char const ∗filename, xid_t xid, uint_least32_t flags)
- int vc_rem_dlimit (char const ∗filename, xid_t xid, uint_least32_t flags)

- int vc_set_dlimit (char const ∗filename, xid_t xid, uint_least32_t flags, struct vc_ctx_dlimit const ∗limits)
- int vc_get_dlimit (char const ∗filename, xid_t xid, uint_least32_t flags, struct vc_ctx_dlimit ∗limits)
- int **vc_set_sched** (xid_t xid, struct vc_set_sched const ∗)
- int **vc_sched_info** (xid_t xid, struct vc_sched_info ∗info)
- int **vc_set_mapping** (xid_t xid, const char ∗device, const char ∗target, uint32_t flags)
- uint_least64_t vc_text2bcap (char const ∗str, size_t len)

  Converts a single string into bcapability.

- char const ∗ vc_lobcap2text (uint_least64_t ∗val)

  Converts the lowest bit of a bcapability or the entire value (when possible) to a textual representation.

- int vc_list2bcap (char const ∗str, size_t len, struct vc_err_listparser ∗err, struct vc_ctx_caps ∗cap)

  Converts a string into a bcapability-bitmask
  Syntax of str:.

- uint_least64_t **vc_text2ccap** (char const ∗, size_t len)
- char const ∗ **vc_loccap2text** (uint_least64_t ∗)
- int **vc_list2ccap** (char const ∗, size_t len, struct vc_err_listparser ∗err, struct vc_ctx_caps ∗)
- int **vc_list2cflag** (char const ∗, size_t len, struct vc_err_listparser ∗err, struct vc_ctx_flags ∗flags)
- uint_least64_t **vc_text2cflag** (char const ∗, size_t len)
- char const ∗ **vc_locflag2text** (uint_least64_t ∗)
- uint_least32_t **vc_list2cflag_compat** (char const ∗, size_t len, struct vc_err_listparser ∗err)
- uint_least32_t **vc_text2cflag_compat** (char const ∗, size_t len)
- char const ∗ **vc_hicflag2text_compat** (uint_least32_t)
- int **vc_text2cap** (char const ∗)
- char const ∗ **vc_cap2text** (unsigned int)
- int **vc_list2nflag** (char const ∗, size_t len, struct vc_err_listparser ∗err, struct vc_net_flags ∗flags)
- uint_least64_t **vc_text2nflag** (char const ∗, size_t len)
- char const ∗ **vc_lonflag2text** (uint_least64_t ∗)
- uint_least64_t **vc_text2ncap** (char const ∗, size_t len)
- char const ∗ **vc_loncap2text** (uint_least64_t ∗)
- int **vc_list2ncap** (char const ∗, size_t len, struct vc_err_listparser ∗err, struct vc_net_caps ∗)
- uint_least64_t **vc_get_insecurebcaps** () VC_ATTR_CONST
- uint_least32_t **vc_text2personalityflag** (char const ∗str, size_t len)
- char const ∗ **vc_lopersonality2text** (uint_least32_t ∗)
- int **vc_list2personalityflag** (char const ∗, size_t len, uint_least32_t ∗personality, struct vc_err_-listparser ∗err)
- uint_least32_t **vc_str2personalitytype** (char const ∗, size_t len)
- bool **vc_isSupported** (vcFeatureSet) VC_ATTR_CONST
- bool **vc_isSupportedString** (char const ∗)
- vcXidType **vc_getXIDType** (xid_t xid) VC_ATTR_CONST
- bool vc_is_dynamic_xid (xid_t xid)
- xid_t vc_xidopt2xid (char const ∗, bool honor_static, char const ∗∗err_info)
- nid_t vc_nidopt2nid (char const ∗, bool honor_static, char const ∗∗err_info)
- vcCfgStyle **vc_getVserverCfgStyle** (char const ∗id)
- char ∗ vc_getVserverName (char const ∗id, vcCfgStyle style)
- char ∗ vc_getVserverCfgDir (char const ∗id, vcCfgStyle style)
- char ∗ vc_getVserverAppDir (char const ∗id, vcCfgStyle style, char const ∗app)
- char ∗ vc_getVserverVdir (char const ∗id, vcCfgStyle style, bool physical)

- xid_t vc_getVserverCtx (char const ∗id, vcCfgStyle style, bool honor_static, bool ∗is_running)
- char ∗ vc_getVserverByCtx (xid_t ctx, vcCfgStyle ∗style, char const ∗revdir)
- int **vc_compareVserverById** (char const ∗lhs, vcCfgStyle lhs_style, char const ∗rhs, vcCfgStyle rhs_style)
- int vc_createSkeleton (char const ∗id, vcCfgStyle style, int flags)

7.2.1 Detailed Description

The public interface of the the libvserver library.

Definition in file vserver.h.

7.2.2 Define Documentation

7.2.2.1 #define VC_DYNAMIC_XID ((xid_t)(-1))

the value which means a random (the next free) ctx

Definition at line 66 of file vserver.h.

7.2.2.2 #define VC_NOCTX ((xid_t)(-1))

the value which is returned in error-case (no ctx found)

Definition at line 63 of file vserver.h.

7.2.2.3 #define VC_SAMECTX ((xid_t)(-2))

the value which means the current ctx

Definition at line 68 of file vserver.h.

7.2.3 Typedef Documentation

7.2.3.1 typedef uint_least64_t vc_limit_t

The type which is used for a single limit value.

Special values are

- VC_LIM_INFINITY ... which is the infinite value
- VC_LIM_KEEP ... which is used to mark values which shall not be modified by the vc_set_rlimit() operation.

Else, the interpretation of the value depends on the corresponding resource; it might be bytes, pages, seconds or litres of beer.

Definition at line 504 of file vserver.h.

7.2.3.2 an_unsigned_integer_type xid_t

The identifier of a context.

Definition at line 301 of file vserver.h.

7.2.4 Function Documentation

7.2.4.1 int vc_add_dlimit (char const ∗ *filename*, xid_t *xid*, uint_least32_t *flags*)

Add a disk limit to a file system.

7.2.4.2 int vc_createSkeleton (char const ∗ *id*, vcCfgStyle *style*, int *flags*)

Create a basic configuration skeleton for a vserver plus toplevel directories for pkgmanagemt and filesystem (when requested).

7.2.4.3 int vc_get_dlimit (char const ∗ *filename*, xid_t *xid*, uint_least32_t *flags*, struct vc_ctx_dlimit ∗ *limits*)

Get a disk limit.

7.2.4.4 char∗ vc_getVserverAppDir (char const ∗ *id*, vcCfgStyle *style*, char const ∗ *app*)

Returns the path of the configuration directory for the given application. The result will be allocated and must be freed by the caller.

7.2.4.5 char∗ vc_getVserverByCtx (xid_t *ctx*, vcCfgStyle ∗ *style*, char const ∗ *revdir*)

Resolves the cfg-path of the vserver owning the given ctx. 'revdir' will be used as the directory holding the mapping-links; when NULL, the default value will be assumed. The result will be allocated and must be freed by the caller.

7.2.4.6 char∗ vc_getVserverCfgDir (char const ∗ *id*, vcCfgStyle *style*)

Returns the path of the vserver configuration directory. When the given vserver does not exist, or when it does not have such a directory, NULL will be returned. Else, the result will be allocated and must be freed by the caller.

7.2.4.7 xid_t vc_getVserverCtx (char const ∗ *id*, vcCfgStyle *style*, bool *honor_static*, bool ∗ *is_-running*)

Returns the ctx of the given vserver. When vserver is not running and 'honor_static' is false, VC_NOCTX will be returned. Else, when 'honor_static' is true and a static assignment exists, those value will be returned. Else, the result will be VC_NOCTX.

When 'is_running' is not null, the status of the vserver will be assigned to this variable.

7.2.4.8 char∗ vc_getVserverName (char const ∗ *id*, vcCfgStyle *style*)

Resolves the name of the vserver. The result will be allocated and must be freed by the caller.

7.2.4.9 char∗ vc_getVserverVdir (char const ∗ *id*, vcCfgStyle *style*, bool *physical*)

Returns the path to the vserver root-directory. The result will be allocated and must be freed by the caller.

7.2.4.10 bool vc_is_dynamic_xid (xid_t *xid*)

Returns true iff *xid* is a dynamic xid

7.2.4.11 nid_t vc_nidopt2nid (char const ∗, bool *honor_static*, char const ∗∗ *err_info*)

Maps a nid given at '–nid' options to a nid_t

7.2.4.12 int vc_rem_dlimit (char const ∗ *filename*, xid_t *xid*, uint_least32_t *flags*)

Remove a disk limit from a file system.

7.2.4.13 int vc_set_dlimit (char const ∗ *filename*, xid_t *xid*, uint_least32_t *flags*, struct vc_ctx_dlimit const ∗ *limits*)

Set a disk limit.

7.2.4.14 xid_t vc_xidopt2xid (char const ∗, bool *honor_static*, char const ∗∗ *err_info*)

Maps an xid given at '–xid' options to an xid_t

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