

util-vserver (libvserver) Reference Manual

0.30.212

Generated by Doxygen 1.5.1

Sun Jan 7 20:47:44 2007

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1 util-vserver (libvserver) Module Index

1.1 util-vserver (libvserver) Modules

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2 util-vserver (libvserver) Data Structure Index

2.1 util-vserver (libvserver) Data Structures

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3 util-vserver (libvserver) File Index

3.1 util-vserver (libvserver) File List

Here is a list of all documented files with brief descriptions:

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4 util-vserver (libvserver) Module Documentation

4.1 Syscall wrappers

Functions

- [int vc_syscall](#) (uint32_t cmd, [xid_t](#) xid, void *data)
The generic vserver syscall.
- [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.
- [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.

- `int vc_ctx_migrate (xid_t xid)`
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_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 for all resources.
- `int vc_ctx_kill (xid_t ctx, pid_t pid, int sig)`
Sends a signal to a context/pid.
- `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.
- `xid_t vc_get_task_xid (pid_t pid)`
Returns the context of the given process.
- `xid_t vc_getfilecontext (char const *filename)`
Returns the context of filename.
- `int vc_wait_exit (xid_t xid)`
Waits for the end of a context.

4.1.1 Detailed Description

Functions which are calling the vserver syscall directly.

4.1.2 Function Documentation

4.1.2.1 `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.

4.1.2.2 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

4.1.2.3 int vc_ctx_migrate (xid_t xid)

Moves the current process into the specified context.

Parameters:

xid The new context

Returns:

0 on success, -1 on errors

4.1.2.4 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.

4.1.2.5 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)
```

4.1.2.6 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.

4.1.2.7 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

4.1.2.8 int vc_get_vci ()

Returns the kernel configuration bits.

Returns:

The kernel configuration bits

4.1.2.9 int vc_get_version ()

Returns the version of the current kernel API.

Returns:

The versionnumber of the kernel API

4.1.2.10 `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 occurred or no such assignment exists. `errno` will be 0 in the latter case

4.1.2.11 `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

4.1.2.12 `int vc_reset_minmax (xid_t xid)`

Resets the minimum and maximum observed values for all resources.

Parameters:

xid The id of the context

Returns:

0 on success, and -1 on errors.

4.1.2.13 `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.

4.1.2.14 `int vc_set_ipv4root (uint32_t bcast, size_t nb, struct vc_ip_mask_pair const * ips)`

Sets the ipv4root information.

Precondition:

$nb < \text{NB_IPV4ROOT}$ && $ips \neq 0$

4.1.2.15 `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.

4.1.2.16 `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

4.1.2.17 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.

4.2 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.
- `bool` `vc_parseLimit` (char const *str, `vc_limit_t` *res)
Parses a string describing a limit.
- `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.

4.2.1 Detailed Description

Functions which are doing general helper tasks like parameter parsing.

4.2.2 Function Documentation

4.2.2.1 `size_t` `vc_get_nb_ipv4root` ()

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.

4.2.2.2 `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*: list2xxx.syntax

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 occurred, *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

4.2.2.3 `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

4.2.2.4 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

4.2.2.5 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

5 util-vserver (libvserver) Data Structure Documentation

5.1 Mapping_uint32 Struct Reference

Data Fields

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

5.1.1 Detailed Description

Definition at line 62 of file internal.h.

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

- [internal.h](#)

5.2 Mapping_uint64 Struct Reference

Data Fields

- char const *const [id](#)
- size_t [len](#)
- uint_least64_t [val](#)

5.2.1 Detailed Description

Definition at line 68 of file internal.h.

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

- [internal.h](#)

5.3 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.

5.3.1 Detailed Description

Capabilities of process-contexts.

Definition at line 646 of file `vserver.h`.

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

- [vserver.h](#)

5.4 `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](#)

5.4.1 Detailed Description

Definition at line 823 of file `vserver.h`.

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

- [vserver.h](#)

5.5 `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.

5.5.1 Detailed Description

Flags of process-contexts.

Definition at line 636 of file `vserver.h`.

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

- [vserver.h](#)

5.6 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

5.6.1 Detailed Description

Statistics about a context.

Definition at line 381 of file `vserver.h`.

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

- [vserver.h](#)

5.7 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.

5.7.1 Detailed Description

Information about parsing errors.

Definition at line 664 of file `vserver.h`.

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

- [vserver.h](#)

5.8 `vc_ip_mask_pair` Struct Reference

Data Fields

- `uint32_t ip`
- `uint32_t mask`

5.8.1 Detailed Description

Definition at line 296 of file `vserver.h`.

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

- [vserver.h](#)

5.9 `vc_net_caps` Struct Reference

Data Fields

- `uint_least64_t ncaps`
- `uint_least64_t cmask`

5.9.1 Detailed Description

Definition at line 556 of file `vserver.h`.

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

- [vserver.h](#)

5.10 `vc_net_flags` Struct Reference

Data Fields

- `uint_least64_t flagword`
- `uint_least64_t mask`

5.10.1 Detailed Description

Definition at line 547 of file `vserver.h`.

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

- [vserver.h](#)

5.11 `vc_net_nx` Struct Reference

Data Fields

- `vc_net_nx_type type`

- [size_t count](#)
- [uint32_t ip](#) [4]
- [uint32_t mask](#) [4]

5.11.1 Detailed Description

Definition at line 534 of file `vserver.h`.

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

- [vserver.h](#)

5.12 `vc_nx_info` Struct Reference

Data Fields

- [nid_t nid](#)

5.12.1 Detailed Description

Definition at line 523 of file `vserver.h`.

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

- [vserver.h](#)

5.13 `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

5.13.1 Detailed Description

The limits of a resources.

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

Definition at line 432 of file `vserver.h`.

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

- [vserver.h](#)

5.14 `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

5.14.1 Detailed Description

Masks describing the supported limits.

Definition at line 439 of file `vserver.h`.

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

- [vserver.h](#)

5.15 `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
- `uint_least64_t` [value](#)
current value
- `uint_least64_t` [minimum](#)
minimum value observed
- `uint_least64_t` [maximum](#)
maximum value observed

5.15.1 Detailed Description

Statistics for a resource limit.

Definition at line 446 of file vserver.h.

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

- [vserver.h](#)

5.16 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](#)

5.16.1 Detailed Description

Definition at line 806 of file vserver.h.

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

- [vserver.h](#)

5.17 vc_virt_stat Struct Reference

Contains further statistics about a context.

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

Data Fields

- [uint_least64_t offset](#)
- [uint_least32_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]

5.17.1 Detailed Description

Contains further statistics about a context.

Definition at line 396 of file vserver.h.

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

- [vserver.h](#)

5.18 vc_vx_info Struct Reference

Data Fields

- [xid_t](#) xid
- [pid_t](#) initpid

5.18.1 Detailed Description

Definition at line 600 of file vserver.h.

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

- [vserver.h](#)

6 util-vserver (libvserver) File Documentation

6.1 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 **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 **utilvserver_value2text_uint64** (char const *str, size_t len, struct [Mapping_uint64](#) const *map, size_t map_len) NONNULL((1))
- size_t **utilvserver_text2value_uint32** (uint_least32_t *val, struct [Mapping_uint32](#) const *map, size_t map_len) NONNULL((1))
- size_t **utilvserver_text2value_uint64** (uint_least64_t *val, struct [Mapping_uint64](#) const *map, size_t map_len) NONNULL((1))

6.1.1 Detailed Description

Declarations which are used by util-vserver internally.

Definition in file [internal.h](#).

6.2 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_stat](#)
Statistics about a context.
- struct [vc_virt_stat](#)
Contains further statistics about a context.
- struct [vc_rlimit](#)
The limits of a resources.
- struct [vc_rlimit_mask](#)

Masks describing the supported limits.

- 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_vx_info](#)
- struct [vc_ctx_flags](#)

Flags of process-contexts.

- struct [vc_ctx_caps](#)

Capabilities of process-contexts.

- struct [vc_err_listparser](#)

Information about parsing errors.

- struct [vc_set_sched](#)
- struct [vc_ctx_dlimit](#)

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_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_NSOK 16`
- `#define VC_VLIMIT_OPENFD 17`
- `#define VC_VLIMIT_ANON 18`
- `#define VC_VLIMIT_SHMEM 19`
- `#define VC_VLIMIT_SEM 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 `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` }
- 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.
- `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.
- `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.
- `xid_t vc_ctx_create (xid_t xid)`
Creates a context without starting it.
- `int vc_ctx_migrate (xid_t xid)`
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_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_get_rlimit_mask (xid_t xid, struct vc_rlimit_mask *lim)`
- `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 for all resources.
- `bool vc_parseLimit (char const *str, vc_limit_t *res)`
Parses a string describing a limit.
- `int vc_ctx_kill (xid_t ctx, pid_t pid, int sig)`
Sends a signal to a context/pid.

- `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.

- `xid_t vc_get_task_xid` (`pid_t` pid)

Returns the context of the given process.

- `int vc_get_vx_info` (`xid_t` xid, struct `vc_vx_info` *info)
- `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)
- `bool vc_is_dynamic_xid` (`xid_t` xid)
- `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_get_cflags` (`xid_t` xid, struct `vc_ctx_flags` *)
- `int vc_set_cflags` (`xid_t` xid, struct `vc_ctx_flags` const *)
- `int vc_get_ccaps` (`xid_t` xid, struct `vc_ctx_caps` *)
- `int vc_set_ccaps` (`xid_t` xid, struct `vc_ctx_caps` const *)
- `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.

- `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)
- `xid_t vc_getfilecontext` (char const *filename)

Returns the context of filename.

- `int vc_set_sched` (xid_t xid, struct `vc_set_sched` const *)
- `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_wait_exit` (xid_t xid)

Waits for the end of a context.

- `bool vc_isSupported` (`vcFeatureSet` VC_ATTR_CONST)
- `bool vc_isSupportedString` (char const *)
- `vcXidType vc_getXIDType` (xid_t xid) VC_ATTR_CONST
- `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)

6.2.1 Detailed Description

The public interface of the the libvserver library.

Definition in file `vserver.h`.

6.2.2 Define Documentation

6.2.2.1 #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`.

6.2.2.2 #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.

6.2.2.3 #define VC_SAMECTX (([xid_t](#))(-2))

the value which means the current ctx

Definition at line 68 of file vserver.h.

6.2.3 Typedef Documentation

6.2.3.1 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 427 of file vserver.h.

6.2.3.2 an_unsigned_integer_type [xid_t](#)

The identifier of a context.

Definition at line 288 of file vserver.h.

6.2.4 Function Documentation

6.2.4.1 int [vc_add_dlimit](#) (char const * *filename*, [xid_t](#) *xid*, [uint_least32_t](#) *flags*)

Add a disk limit to a file system.

6.2.4.2 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).

6.2.4.3 int [vc_get_dlimit](#) (char const * *filename*, [xid_t](#) *xid*, [uint_least32_t](#) *flags*, struct [vc_ctx_dlimit](#) * *limits*)

Get a disk limit.

6.2.4.4 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.

6.2.4.5 `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.

6.2.4.6 `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.

6.2.4.7 `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.

6.2.4.8 `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.

6.2.4.9 `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.

6.2.4.10 `bool vc_is_dynamic_xid (xid_t xid)`

Returns true iff *xid* is a dynamic xid

6.2.4.11 `nid_t vc_nidopt2nid (char const *, bool honor_static, char const ** err_info)`

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

6.2.4.12 `int vc_rem_dlimit (char const * filename, xid_t xid, uint_least32_t flags)`

Remove a disk limit from a file system.

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

Set a disk limit.

6.2.4.14 `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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