

util-vserver (libvserver)
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1 Module Index

1.1 Modules

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2 Data Structure Index

2.1 Data Structures

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3 File Index

3.1 File List

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

internal.h (Declarations which are used by util-vserver internally)	14
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4 Module Documentation

4.1 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.
- [vc_vci_t 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, struct [vc_ctx_flags](#) *flags)
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.

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, struct vc_ctx_flags *flags)`

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_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

4.1.2.3 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.

4.1.2.4 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)
```

4.1.2.5 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.

4.1.2.6 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

4.1.2.7 vc_vci_t vc_get_vci ()

Returns the kernel configuration bits.

Returns:

The kernel configuration bits

4.1.2.8 int vc_get_version ()

Returns the version of the current kernel API.

Returns:

The versionnumber of the kernel API

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

4.1.2.10 `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

4.1.2.11 `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.

4.1.2.12 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.

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

Sets the ipv4root information.

Precondition:

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

4.1.2.14 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.

4.1.2.15 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

4.1.2.16 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.

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.
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:.*

4.2.1 Detailed Description

Functions which are doing general helper tasks like parameter parsing.

4.2.2 Function Documentation

4.2.2.1 `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 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

4.2.2.2 `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

4.2.2.3 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

4.2.2.4 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

5 Data Structure Documentation

5.1 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.

5.1.1 Detailed Description

Capabilities of process-contexts.

Definition at line 493 of file `vserver.h`.

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

- [vserver.h](#)

5.2 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.

5.2.1 Detailed Description

Flags of process-contexts.

Definition at line 415 of file `vserver.h`.

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

- [vserver.h](#)

5.3 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

5.3.1 Detailed Description

Statistics about a context.

Definition at line 446 of file `vserver.h`.

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

- [vserver.h](#)

5.4 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.

5.4.1 Detailed Description

Information about parsing errors.

Definition at line 844 of file `vserver.h`.

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

- [vserver.h](#)

5.5 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

5.5.1 Detailed Description

The limits of a resources.

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

Definition at line 559 of file vserver.h.

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

- [vserver.h](#)

5.6 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

5.6.1 Detailed Description

Masks describing the supported limits.

Definition at line 546 of file `vserver.h`.

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

- [vserver.h](#)

5.7 `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

5.7.1 Detailed Description

Statistics for a resource limit.

Definition at line 587 of file `vserver.h`.

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

- [vserver.h](#)

5.8 `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]

5.8.1 Detailed Description

Contains further statistics about a context.

Definition at line 461 of file vserver.h.

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

- [vserver.h](#)

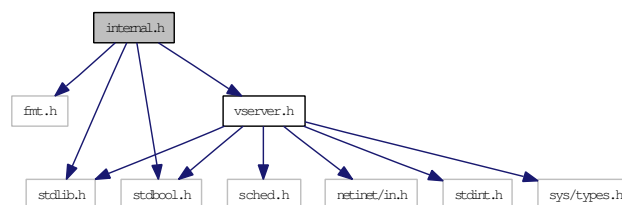
6 File Documentation

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
- ssize_t **utilvserver_text2value_uint32** (uint_least32_t *val, struct Mapping_uint32 const *map, size_t map_len) NONNULL((1
- ssize_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.

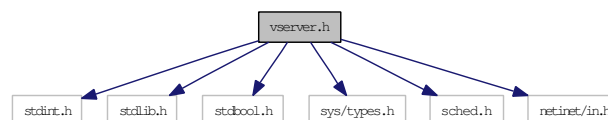
Definition in file [internal.h](#).

6.2 vserver.h File Reference

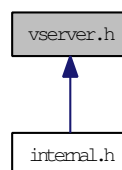
The public interface of the the libvserver library.

```
#include <stdint.h>
#include <stdlib.h>
#include <stdbool.h>
#include <sys/types.h>
#include <sched.h>
#include <netinet/in.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_addr**
- 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_VXC_KTHREAD 0x01000000ull`
- `#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_LBACK_REMAP** 0x00000200ull
- **#define VC_NXF_LBACK_ALLOW** 0x00000400ull
- **#define VC_NXF_HIDE_NETIF** 0x02000000ull
- **#define VC_NXF_HIDE_LBACK** 0x04000000ull
- **#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_NXC_TUN_CREATE** 0x00000001ull
- **#define VC_NXC_RAW_ICMP** 0x00000100ull
- **#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_VCI_NETV2** (1 << 11)
- **#define VC_VCI_PPTAG** (1 << 28)
- **#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 VC_NXA_TYPE_IPV4** 0x0001
- **#define VC_NXA_TYPE_IPV6** 0x0002
- **#define VC_NXA_TYPE_NONE** 0x0000
- **#define VC_NXA_TYPE_ANY** 0x00FF
- **#define VC_NXA_TYPE_ADDR** 0x0010
- **#define VC_NXA_TYPE_MASK** 0x0020
- **#define VC_NXA_TYPE_RANGE** 0x0040
- **#define VC_NXA_MOD_BCAST** 0x0100
- **#define VC_NXA_MOD_LBACK** 0x0200
- **#define CLONE_NEWNS** 0x00020000
- **#define CLONE_NEWUTS** 0x04000000
- **#define CLONE_NEWIPC** 0x08000000
- **#define CLONE_NEWUSER** 0x10000000
- **#define CLONE_NEWPID** 0x20000000
- **#define CLONE_NEWNET** 0x40000000
- **#define VC_BAD_PERSONALITY** ((uint_least32_t)(-1))
- **#define vna_v4_ip** s.ip.v4
- **#define vna_v4_ip2** s.ip2.v4
- **#define vna_v4_mask** s.mask.v4

- `#define vna_v6_ip s.ip.v6`
- `#define vna_v6_ip2 s.ip2.v6`
- `#define vna_v6_mask s.mask.v6`
- `#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 an_unsigned_integer_type tag_t`
- `typedef uint64_t vc_vci_t`
- `typedef uint_least64_t vc_limit_t`
The type which is used for a single limit value.

Enumerations

- `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,`
`vcFEATURE_VINFO,`
`vcFEATURE_VHI, vcFEATURE_VSHELPER0, vcFEATURE_VSHELPER, vcFEATURE_-`
`VWAIT,`
`vcFEATURE_VNET, vcFEATURE_VSTAT, vcFEATURE_PPTAG }`
- `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 }`
- `enum vcCtxType { vcCTX_XID = 1, vcCTX_NID, vcCTX_TAG }`

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.

- `vc_vci_t 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, struct vc_ctx_flags *flags)`

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_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 *)`

- `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_addr const *info)`
- `int vc_net_remove(nid_t nid, struct vc_net_addr 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_fset_iattr(int fd, 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.
- `int vc_fget_iattr(int fd, xid_t *xid, uint_least32_t *flags, uint_least32_t *mask)`
- `int 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)
- [tag_t](#) **vc_get_task_tag** ([pid_t](#) pid)
- int **vc_tag_create** ([tag_t](#) tag)
- int **vc_tag_migrate** ([tag_t](#) tag)
- int **vc_set_sched** ([xid_t](#) xid, struct [vc_set_sched](#) const *)
- int **vc_get_sched** ([xid_t](#) xid, struct [vc_set_sched](#) *)
- 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)
- int **vc_unset_mapping** ([xid_t](#) xid, const char *device, const char *target, [uint32_t](#) flags)
- int **vc_get_badness** ([xid_t](#) xid, [int64_t](#) *badness)
- int **vc_set_badness** ([xid_t](#) xid, [int64_t](#) badness)
- [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`)
- `tag_t` `vc_tagopt2tag` (`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, `vcCtxType` type)
- `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 67 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 64 of file [vserver.h](#).

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

the value which means the current ctx

Definition at line 69 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 543 of file vserver.h.

6.2.3.2 an_unsigned_integer_type xid_t

The identifier of a context.

Definition at line 338 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 tag_t vc_get_task_tag (pid_t pid)

Get the filesystem tag for a process.

6.2.4.5 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.

6.2.4.6 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.

6.2.4.7 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.

6.2.4.8 xid_t vc_getVserverCtx (char const *id, vcCfgStyle style, bool honor_static, bool *is_running, vcCtxType type)

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.

6.2.4.9 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.

6.2.4.10 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.

6.2.4.11 bool vc_is_dynamic_xid (xid_t *xid*)

Returns true iff *xid* is a dynamic xid

6.2.4.12 nid_t vc_nidopt2nid (char const *, bool *honor_static*, char const ** *err_info*)

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

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

Remove a disk limit from a file system.

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

Set a disk limit.

6.2.4.15 int vc_tag_create (tag_t *tag*)

Create a new filesystem tag space.

6.2.4.16 int vc_tag_migrate (tag_t *tag*)

Migrate to an existing filesystem tag space.

6.2.4.17 tag_t vc_tagopt2tag (char const *, bool *honor_static*, char const ** *err_info*)

Maps a tag given at '-tag' options to a tag_t

6.2.4.18 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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