#### **NAME**

dev\_refthread, devvn\_refthread, dev\_relthread - safely access device methods

#### **SYNOPSIS**

```
#include <sys/param.h>
#include <sys/conf.h>

struct cdevsw *
dev_refthread(struct cdev *dev, int *ref);

struct cdevsw *
devvn_refthread(struct vnode *vp, struct cdev **devp, int *ref);

void
dev_relthread(struct cdev *dev, int ref);
```

### DESCRIPTION

The **dev\_refthread**() (or **devvn\_refthread**()) and **dev\_relthread**() routines provide a safe way to access devfs(5) devices that may be concurrently destroyed by **destroy\_dev**() (e.g., removable media).

If successful, **dev\_refthread**() and **devvn\_refthread**() acquire a "thread reference" to the associated *struct cdev* and return a non-NULL pointer to the cdev's *struct cdevsw* method table. For the duration of that reference, the cdev's associated private data and method table object are valid. Destruction of the cdev sleeps until the thread reference is released.

A reference cannot prevent media removal. It is an implementation detail of individual drivers how method calls from callers with **dev\_refthread()** references are handled when the device is pending destruction. A common behavior for disk devices is to return the ENXIO status, but that is not required by this KPI.

The **devvn\_refthread**() variant of **dev\_refthread**() extracts the *struct cdev* pointer out of the VCHR vnode(9) automatically before performing the same actions as **dev\_refthread**(). Additionally, a pointer to the *struct cdev* is returned to the caller via \*devp. **devvn\_refthread**() correctly handles possible parallel reclamation of the vnode.

**dev\_relthread**() is used to release a reference to a *struct cdev*. **dev\_relthread**() **must** only be invoked when the associated invocation of **dev\_refthread**() or **devvn\_refthread**() returned a non-NULL *struct cdevsw* \*.

### **CONTEXT**

struct cdev objects have two reference counts, si\_refcount and si\_threadcount. The dev\_refthread(), devvn\_refthread(), and dev\_relthread() functions manipulate the si\_threadcount. The si\_threadcount reference guarantees the liveness of the struct cdev object. The other si\_refcount reference provides only the weaker guarantee that the memory backing the struct cdev has not been freed.

# **RETURN VALUES**

If dev\_refthread() or devvn\_refthread() are unsuccessful, they return NULL. If these routines are unsuccessful, they do not increment the struct cdev si\_threadcount and do not initialize the value pointed to by the \*ref parameter in any way.

### **SEE ALSO**

devfs(5), destroy\_dev(9)

# **CAVEATS**

Do not invoke **dev\_relthread**() unless the matching refthread routine succeeded!