

Silicon Graphics, Inc.

XFS Overview & Internals

03 - Build

November 2006

Building XFS

- This tutorial describes how to
 - obtain the latest XFS source code
 - how to build and install the commands and kernel components
- The following prerequisite RPMs should be installed
 - xfsprogs-devel
 - dmapi-devel
- These headers and installed can be built from source, but these RPMs will normally suffice

XFS Source Code

- Latest XFS is available via CVS from oss.sgi.com:

```
> export CVSROOT=':pserver:cv@oss.sgi.com:/cvs'  
> cvs login  
Logging in to :pserver:cv@oss.sgi.com:2401/cvs  
CVS password: <password is "cvs">  
> cvs checkout linux-2.6-xfs  
cvs checkout: Updating linux-2.6-xfs  
U linux-2.6-xfs/.gitignore  
U linux-2.6-xfs/COPYING  
U linux-2.6-xfs/CREDITS  
...  
> cvs checkout xfs-cmds
```

Building xfs-cmds

- Building the XFS commands

```
> cd xfs-cmds
> make
...
```

- RPM packages will be placed in RPMS/<arch>

```
> cd RPMS/x86_64
> sudo rpm -i xfsprogs-2.8.15-1.x86_64.rpm
> sudo rpm -i xfsdump-2.2.43-1.x86_64.rpm
```

- Source RPM packages will be placed in SRPMS/

Packaging

- XFS uses autoconf/configure
- Includes internationalization support

- User space packages
 - acl
 - libacl
 - attr
 - libattr (incl. IRIX compatibility API for xfsdump/restore/...)
 - xfsprogs
 - libhandle, libxfs, libxlog, libdisk
 - dmapi
 - libdm
 - xfsdump
 - dependency on attr packages
 - librmt

Kernel Configuration Options

- ***CONFIG_XFS_FS***
 - XFS can be built as a module or statically linked into the kernel
- ***CONFIG_XFS_QUOTA***
 - support for quota disk limits.
- ***CONFIG_XFS_DMAPI***
 - support for the data management API (requires generic kernel DMAPI support)
- ***CONFIG_XFS_SECURITY***
 - support for alternate access control models (ie SELinux).
- ***CONFIG_XFS_POSIX_ACL***
 - support for Access Control Lists.
- ***CONFIG_XFS_REALTIME***
 - support for the realtime allocator that provides deterministic data rates.
- ***CONFIG_XFS_DEBUG***
 - include debugging features in the build (ie ASSERTs, sanity checking code, etc).
- ***CONFIG_XFS_TRACING***
 - include support for activity tracing of inodes, buffers, locks, the log, I/O path, etc.

Build Kernel Components

- Configure and build kernel and modules

```
> cd linux-2.6-xfs
> make xconfig
> make bzImage
> make modules
> sudo make modules_install
```

- If XFS wasn't built as a module

```
# cp arch/<arch>/boot/bzImage /boot/vmlinuz
# cp System.map /boot/System.map
# lilo
# reboot
```

Load XFS Modules

- Load the XFS modules

```
# modprobe xfs
# modprobe xfs_dmap_i
# modprobe xfs_quota
```

```
# lsmod
```

Module	Size	Used by
xfs_dmap_i	32852	0
xfs_quota	85120	0
xfs	848864	2 xfs_dmap_i,xfs_quota

- Can now mount XFS filesystems...

Other products that know XFS

- Quota (sourceforge.net)
 - generic quota commands know about XFS
 - do not understand project quotas
 - seen as too intrusive, XFS only
- mount (kernel.org)
 - from *util-linux* package
 - knows where the primary XFS SB is
 - knows how to extract the label and UUID
 - for UUID= and LABEL= mounts
- Samba (samba.org)
 - has some XFS specific code in its handling of quotas
 - uses XFS `quotactl(2)` calls

sgi®