DragonFlyBSD

DragonFlyBSD?

- The DragonFlyBSD operating system is a fork of the highly respected FreeBSD operating system

- Its goals are to maintain the stability, quality and performance of the FreeBSD 4 branch and further enhance and improve it using new concepts

- Brainchild of Matt Dillon, who started work on DragonFlyBSD in June 2003

Threading Model

- **M:1**   4BSD (FreeBSD <5)

- **1:1**   Linux, Solaris

- **M:N**   KSE (FreeBSD5), SA (NetBSD)

- **M:Ncpus** DragonFlyBSD

- MP support, a departure from the outdated SMP model

- Should scale very well

- Will achieve Single-System Image clustering

- Makes better use of the L1 and L2 cache of all CPUs

- Maintainable code

- Flexible code

DragonFlyBSD future

- Journaling filesystem

- Flexible package management

- SSI clustering

- VFS environments

- Next generation Jails similar to UML (User Mode Linux) in functionality but without the complex drivers needed to access the host hardware

- Ability to choose and switch between userland schedulers and multi-threaded libraries on the fly

Journaling Filesystem

- Will make security auditing easier

- Will make mirroring and local/offsite backups trivial

- Filesystem synchronization in a Clustered environment via cache coherency protocols

- Can revert the FS or part of it to a chosen state

- First stage will be decoupled from the system

- Second stage will provide feedback to journal-aware filesystems to allow them to use the system generic journal instead of rolling their own

- Also intended to provide data transport services in the cache coherency model as a third stage

Why not Softupdates & background fsck?

- Softdeps is very complex code

- Softdeps does not solve the problem of fast reboots after a crash

- Softdeps does not allow replaying changes for off-site synchronization

- Background fsck is still doing massive IO

- Background fsck doesn't scale well with today's increasing storage requirements

- Background fsck can not correct real disk corruption, manual user intervention is required

Packaging system

- Currently using the FreeBSD ports tree with an override mechanism and NetBSD's PKGSRC which supports DragonFly natively

- Will handle most of the base system to reduce bloat

- Will take advantage of varsyms and other DragonFly features to present a source build environment

- Will use a binary-install methodology

- Will allow multiple versions of anything to be installed

Most advanced networking stack

- Working SACK (RFC 2018)

- NewReno Modification to TCP's Fast Recovery Algorithm (RFC 2582)

- Larger congestion window sizes on connection startup (RFC 2414)

- Eifel detection for spurious retransmits (RFC 3522)

- Enhanced TCP loss recovery (RFC 3042)

- Early retransmit for TCP

- Parallel networking stack

- Cleaned up the BSD routing code. Check /usr/src/sys/net/route.c *rtalloc1() on FBSD* and *_rtlookup() on DFlyBSD*

Improvements

- BSD Installer (http://www.bsdinstaller.org)

- Checkpointing

- Variant Symlinks

- Kernel Trace Routines (KTR)

- Various userland enhancements (fstat etc.)

- Fine-grained nanosleep()

- Abstraction for supporting multiple compilers via CCVER environment variable; ie. % CCVER=gcc34 cc -v

- Currently GCC 2.95.4 and GCC 3.4.3 are in the base system

- PF+ALTQ in base

- OpenNTPD in base

- Device driver support is mostly in-sync with other BSDs

- Two additional distributions available, GoBSD (community) and Firefly BSD (commercial)

http://www.faqs.org/rfcs/rfc2018.html

http://www.faqs.org/rfcs/rfc2582.html

http://www.faqs.org/rfcs/rfc2414.html

http://www.faqs.org/rfcs/rfc3522.html

http://www.faqs.org/rfcs/rfc3042.html

http://www.icir.org/mallman/papers/draft-allman-tcp-early-rexmt-03.txt

http://ftp.cdut.edu.cn/pub/document/book/SunOS50MultithreadArchitecture.pdf

http://people.redhat.com/drepper/nptl-design.pdf

http://web.mit.edu/nathanw/www/usenix/freenix-sa/freenix-sa.html

http://www.asdf.dk/sjov/freebsd_kse.pdf

http://wwws.sun.com/software/whitepapers/solaris9/multithread.pdf

http://leaf.dragonflybsd.org/mailarchive/kernel/2003-10/msg00204.html

http://leaf.dragonflybsd.org/mailarchive/kernel/2003-11/msg00159.html

http://docs.freebsd.org/cgi/mid.cgi?20040527120819.B8434

http://wiki.dragonflybsd.org

http://www.shiningsilence.com/dbsdlog/

Thank You

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