BOOKreview by Matt Joras
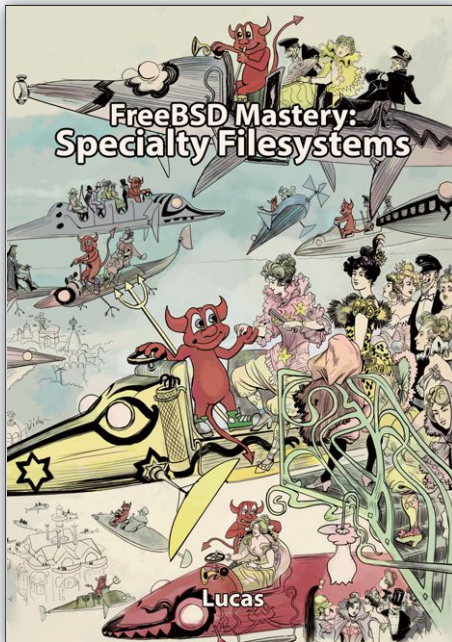
FreeBSD Mastery:
Specialty Filesystems
by Michael W Lucas

Publisher ....*Tilting Windmill Press (2016)*
Print List Price...$24.99
Digital List Price $9.99
ISBN..9780692610442
Pages 238

It is often difficult to find useful and practical examples for open-source software. Manual pages are all well and good, but they are often most useful once you understand the basics of the software. What's often missing from manual pages is the basic "here's an example of a problem this software solves and how to configure it to do so." Specialty Filesystems by Michael W Lucas fills this void for certain filesystems in FreeBSD.

The book serves as a basic reference, but it is best thought of as a book that showcases some lesser-known features of FreeBSD. It starts off with short, easily consumable examples of how to access various "foreign" media. This section is sprinkled with some interesting historical notes as well.

The next section focuses on devfs(8) and devd(8), both of which I was only vaguely familiar with. In addition to demystifying the purpose and function of devfs(8) and devd(8), Lucas offers useful advice and practical examples that a desktop user of FreeBSD will appreciate. There are additional mentions of procfs(5) and fdescfs(5); these, however, were less illuminating or useful than the sections on devfs(8) and devd(8).

The next set of filesystems covered are the POSIX message queue filesystem, union mounts, null mounts, and memory filesystems. The mqueuefs(5) is a feature I didn't even know was a part of POSIX. It seems that as an inter-process

communication method it has fallen out of (or maybe was never in) favor, perhaps without good reason. Its inclusion in the book makes for interesting reading, but such treatment of it may be better for a book focused on programming than systems administration. The union mounts and null mounts sections are useful for those who never thought a filesystem feature existed to solve certain classes of problems. The coverage of the two memory-backed filesystems md(4) and tmpfs(5) provides an overview for someone who needs to understand the differences between them.

The book goes on to give a broad overview of the venerable Network File System (NFS). System administrators who find the distinctions confusing should find this section helpful since the author does a better job at clarifying the situation than what you'll find when Google leads you to questions on Serverfault or Stackoverflow. The same can be said of the handling of Microsoft's CIFs.

There is an interesting and rather in-depth treatment of how to use iSCSI and the HAST feature to create a redundant storage network. This section could almost be used verbatim as a setup guide for someone looking to deploy a similar feature with FreeBSD. I learned a fair bit about the "built in" failover and redundancy features in FreeBSD. Despite its relative specificity compared to other sections of the book, I think it is still valuable as it leverages various "special" features.

The treatment of the FUSE was OK, but did not

add anything spectacularly useful compared to what is readily accessible on the Internet about fusefs. There are some specifics to FreeBSD's FUSE implementation that are legitimately useful, but I do think there are more caveats to the FreeBSD implementation that are not covered and probably should have been.

Personally, the section on automountd(8) was very informative. This is a feature I had seen mentioned here and there when I first started using FreeBSD as a desktop machine, but it was never entirely clear to me what it was doing. Frankly, I thought it was just a basic "see external media, mount it" sort of utility. The book does a great job of showcasing how it can do much more than that. It is definitely an underappreciated feature in FreeBSD that the book does more justice to than I've seen in official documentation and guides.

The section on NFSv4 ACLs did not contribute much overall to the book. It seems like a topic that is better suited to its own text rather than added on to an otherwise easy-to-read technical book.

Overall, the book was an easy and enjoyable read. As a software developer and hobbyist system administrator, I learned a fair bit about FreeBSD's filesystems and gained clarity on many I already knew about. I think the book is a good read for anyone looking to broaden their FreeBSD toolkit to include various filesystem bits.

MATT JORAS is a FreeBSD committer interested in kernel scalability, networking, and FreeBSD desktop/laptop usability. He currently works for Dell EMC developing for the Isilon product, which is based on FreeBSD. At home, he runs FreeBSD on his personal machines and is a hobbyist sysadmin using FreeBSD/ZFS to datahoard dozens of terabytes of personal data.