

A D M I N I S T R A T I O N

ADVANCED SYSTEM ADMINISTRATION

UNIX[®] SVR4.2



Edited by Kathy O'Leary & Matthew Wood

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Published by Prentice-Hall, Inc.
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Englewood Cliffs, New Jersey 07632

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10 9 8 7 6 5 4 3 2 1

ISBN 0-13-042565-6

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A D M I N I S T R A T I O N

When you're the one who has to get it going, fix it, or shut it down, you need UNIX[®] system administration guides you can depend on.

The System Administration Series was developed and extensively tested at UNIX System Laboratories – the home of the UNIX system. The three books in the series tell how to use shell commands to administer your system: whether or not you have a graphical or character-based user-interface available on your system, shell commands are always a reliable alternative.

■ *Basic System Administration* covers frequently needed information. The first part explains setting up the system, managing user accounts, installing add-on software, security, and booting and system states. The second part explains system services: backup, restore, mail, and printers. The third part gives troubleshooting tips.

■ *Advanced System Administration* covers on-line resources and performance. The first part explains setting up and maintaining file systems of various types, storage devices – such as hard disks and cartridge tapes – and local and remote ports. The second part describes tools to monitor system resources, track performance, and improve response time.

■ *Network Administration* covers basic network connectivity, setting up and maintaining TCP/IP, and using it with multiple network devices (interface cards). Other topics include setting up, maintaining, and using the Distributed File System, Remote File Sharing and Network File System. Remote Procedure Call administration and Network Information Service administration are also explained.



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The ufs File System Type

The `ufs` FS type is considerably more complex in its design than the `ms5` FS type. In addition to the four categories of addressable blocks found in `ms5`, there are several additional information management disk areas. There is also a radically different method of allocating and managing these blocks. Of primary interest is the fact that multiple super-blocks are made during the `mkfs` procedure. One of the replicas is stored in each cylinder group, offset by a certain amount. For multi-platter disk drives, the offsets are calculated so that a super-block appears on each platter of the drive. So if the first platter is lost, an alternate super-block can be retrieved. For platters other than the top one in a pack, the leading blocks created by the offsets are reclaimed for data storage.

Kept with the super-block is a summary information block. This block is not replicated, but is grouped together with the first super-block, normally in cylinder group 0. This summary block is used to record changes that take place as the file system is used, and lists the number of inodes, directories, fragments, and blocks within the file system.

Another feature of `ufs` is the "cylinder group map." This is a block of data found in each cylinder group that records the block usage within the cylinder. This information is kept directly following the super-block copy for that cylinder group.

To give an idea of the appearance of a typical `ufs` file system, the following diagram shows a series of cylinder groups in a generic `ufs` file system: