Disk and Tape Volumes

Disk volumes can be organized into volume sets. Files of any organization type can span any number of volumes within a volume set. They can be allocated to the set as a whole (the default) or to specific volumes within the set. Volume sets can contain a mix of disk device types and can be extended by adding volumes. Optionally, specified portions of indexed files can be allocated to specified areas of a single disk volume or to specified volumes in a volume set.

Quotas can be placed on the amount of space individual users can allocate. Quota assignment is by UIC and may be controlled individually for each volume set in the system (or volume if the volume is not part of a set).

Structure information can be cached in memory to reduce the I/O overhead required for file management services. Although not required to do so, users can preallocate space and control automatic allocation. For example, when a file is extended, it can be extended by a given number of blocks, contiguously or noncontiguously for optional file system performance in specific cases.

The system applies software validity checks and check-sums to critical disk structure information. The critical information is duplicated. If a volume is improperly dismounted because of user error or system failure, its structure information is automatically rebuilt the next time it is mounted. The system detects bad blocks dynamically and prevents their reuse once the files to which the blocks were allocated are deleted.

The system provides eight levels of named directories and subdirectories, whose contents are alphabetically ordered. Device and file specifications follow standard conventions. Logical names can be used to abbreviate the specifications and to make application programs device and file-name independent. A logical name can be assigned to an entire specification, to a portion of a specification, or to another logical name.

VAX/VMS supports multivolume magnetic tape files with transparent volume switching. Access positioning is either by filename or by relative file position.

System utilities that aid in file maintenance include:

* **File transfer** - Transfers files from one volume to another, files can be in any of several formats.

* **Backup/restore** - Provides comprehensive, online and standalone full volume, and incremental file backup for file structured mounted volumes and volume sets. Files can be backed up to magnetic tape or another disk. Individual files, selected directory structures, or all files on a