Software Product Description

PRODUCT NAME: VAX DEC/CMS, Version 3.4 **SPD 25.52.15**

DESCRIPTION

VAX DEC/CMS (Code Management System) is a library system that facilitates the development and maintenance of software systems. Software systems are divided into different functional components that are, in turn, organized into sets of one or more files. During development, one or more programmers continually make changes to these files. VAX DEC/CMS helps manage the files during development (and later during maintenance) by storing the files in a project library, tracking changes, and monitoring access to the library.

VAX DEC/CMS also supplies a means of manipulating different combinations of files within a library. The ability to formalize these combinations provides a focus for system design and a means of organizing the files within a library.

VAX DEC/CMS supports the DECwindows software environment, and provides either a DECwindows or command line user interface.

VAX DEC/CMS is included in the VAXset (SPD 27.07.xx) Software Development Tools Package. This package provides simplified ordering and maintenance of various tools. See the appropriate Software Product Description for more information on VAXset.

Features

- Provides a DECwindows interface in addition to its command-line interface
- Store ASCII and non-ASCII (e.g., .EXE, .OBJ, and ISAM) files in a project library
- Support for multiple project libraries
- Retrieve previous file generations
- Delete, purge, or collapse generations
- Obtain a report of file modifications, including when, why, and by whom the modification was made
- Determine the origin of each line of a file, either as an annotated listing or as comments in the file
- Manage concurrent modifications
- Merge separately-developed modifications
- Combine related files together as a "group"
- Relate the generation of one element to the corresponding generations of other elements for purposes of freezing baselines or releases and for organizing ongoing development
- Interface via callable routines as well as DCL commands or DECwindows functions
- Through the use of CMS access control lists, fine tune VMS security mechanisms applied to CMS Libraries and provide a means of notification about Library events

Each CMS command may be invoked from VMS's command level to perform a specific function, such as reserving a file for modification or obtaining a report of development status. The command then returns to VMS's command level, where the user may edit, compile, and test in the usual manner.

Since VAX DEC/CMS allows the user to work with sequential ASCII files (among others), all of the standard editors and compilers can still be used.

All text files for the project can be stored in a single or multiple project library which the user identifies at the beginning of each session by means of the CMS SET LIBRARY command. In the case of multiple project libraries, the user provides a search list of directory specifications for the desired project libraries. ASCII and non-ASCII files can be stored in the project library, including source programs, command files, documentation, and test data.

A project library is a collection of elements. Elements can be created from ASCII and non-ASCII files and combined into "groups". A user can specify an element for review prior to acceptance. Commands operate on elements or groups, or they can operate on wild card specifications as in VMS.

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For each element, the library stores successive generations or historical instances of the element's files. Once an element generation exists in the library, it never changes. A modification to a generation is stored as a new generation. Successive generations, each a modification of the previous, form a line of descent. Typically, each element generation will have one successor, which is the main line of descent. VAX DEC/CMS allows two or more successors to a generation, forming variant lines of descent.

Generation expressions allow the user to retrieve a particular generation or the latest in a particular line of descent. A generation or line of descent can be identified by a generation number, or by a user-defined class name. A class can denote a base level, a release, the current stable version, a debugging version, or any other characteristic agreed upon by the users for their project.

Historical generations of source and other files are retained efficiently by storing only their differences. VAX DEC/CMS determines the differences, and this information enables it to report the generation of origin for each line of a file, i.e., the generation in which the line was most recently inserted or modified. This origin information can be optionally inserted as "history" comments on each line of the file itself.

A history is kept of all file movements into and out of the project library. In addition, a list of reservations is kept for all modifications that are in progress at any time. A user who wishes to reserve, for modification, an element that is previously reserved by someone else, is informed and asked permission to continue. If the user chooses to proceed, the occurrence is recorded as an unusual event. The other users involved will similarly be informed and queried, when they attempt to put their modifications back into the library. Users in general, can be notified through MAIL when any event occurs in the project libraries. This notification is achieved by processing the entries in the access control list (ACL).

Concurrent modifications are not lost; they are stored in the library on different lines of descent. Modifications on different lines of descent can be merged, and the result can be edited to resolve any conflicting modifications.

Principal VAX DEC/CMS Subcommands

- REVIEW commands - ACCEPT GENERATION, REJECT GENERATION, MARK GENERATION, REVIEW GENERATION, CANCEL REVIEW, and the /REVIEW qualifier on CREATE and MODIFY ELEMENT commands. These allow a user to specify that a generation of an element must be reviewed before becoming a "normal" part of the CMS library, to monitor the review process, and to approve the generation (or mark it as disapproved).
- RESERVE - Places a copy of a generation in the user's working directory and notes that the user is working on a modification for it. The entire element may be reserved against concurrent modification by another user. A user can have several elements reserved at the same time. Multiple generations of an element can be saved or the same generation of an element can be saved multiple times. A remark can optionally be inserted into each line to show the origin of the line (see ANNOTATE). A qualifier allows another generation of the same element to be merged into the copy supplied to the user.
- FETCH - Similar to RESERVE, except that the element is not reserved for modification. The copy placed in the working directory cannot be used to create a new generation of the same element.
- REPLACE - Creates a new generation of an element that the user has reserved. The files of the new generation are moved to the project library from the user's working directory.
- UNRESERVE - Cancels an existing reservation of an element.
- ANNOTATE - Produces an annotated listing of any element in the library. The annotations describe the element and its ancestors, and indicate the origin of each line of the element (i.e., the generation in which each line was inserted or most recently modified).
- SHOW - Displays information about any objects in the library: elements, element generations, groups, classes. For any generation, the command can give the author, creation data, creating command, and author's remark. This information can also be obtained for a generation's ancestors or descendants. The command can also list all elements of the library, all that are reserved, or all that have a generation in a given class. All or a portion of the project history can be displayed by object name, user name, or command.
- CREATE - Creates a new element, class, or group
- INSERT - Puts an element into a group or an element generation into a class
- SET LIBRARY - Identifies the user's project library or multiple project libraries at the start of a session
- SET ACL - Allows modification of the access control list on various objects in the DEC/CMS library. Access control lists can be used to control access to individual DEC/CMS commands.

- VERIFY - Performs consistency checks on the library, and recovers from a malfunction by voiding a partially-completed transaction.

Performance Considerations

Response time performance might appear to be less than expected because of the checking and processing done, for certain operations, ensuring the safety and accuracy of the user's file. It is not appropriate to compare these CMS commands to the VMS COPY command.

HARDWARE REQUIREMENTS

VAX, MicroVAX, VAXstation or VAXserver configuration as specified in the System Support Addendum (SSA 25.52.15-x).

SOFTWARE REQUIREMENTS*

For systems using terminals (no DECwindows interface):

- VMS Operating System

For workstations running VWS (no DECwindows interface):

- VMS Operating System
- VMS Workstation Software

For workstations running DECwindows:

- VMS Operating System (and necessary components of VMS DECwindows)

* Refer to the System Support Addendum (SSA 25.52.15-x) for availability and required versions of prerequisite/optional software and for information regarding components of VMS DECwindows.

ORDERING INFORMATION

Software Licenses: QL-007A*-**
Software Media: QA-007A*-**
Software Documentation: QA-007AA-GZ
Software Product Services: QT-007A*-**

* Denotes variant fields. For additional information on available licenses, services and media, refer to the appropriate price book.

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