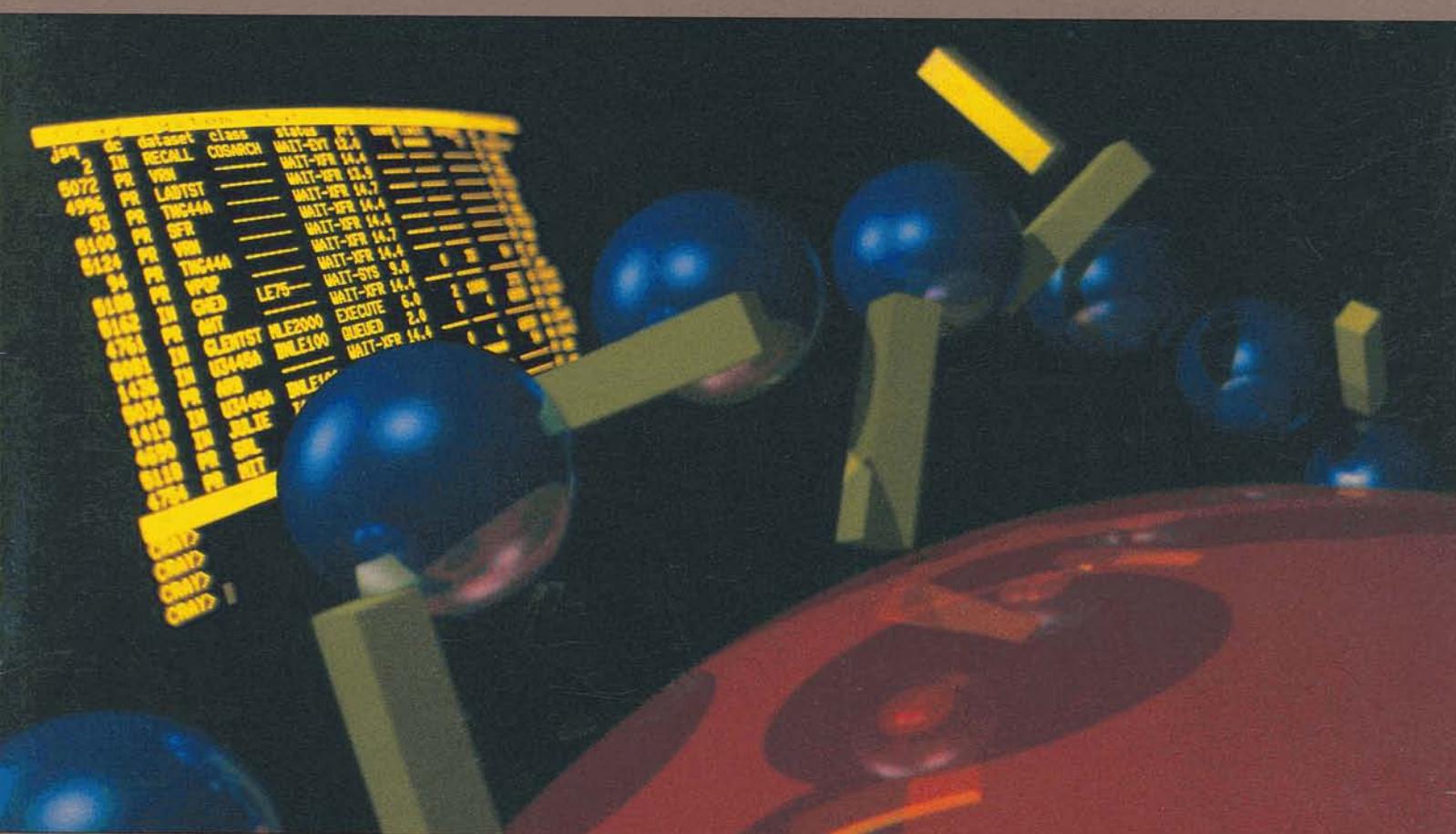


VAX/VMS Station

for Cray computer systems



CRAY

VAX/VMS Station

Since its inception, Cray Research has been committed to integrating fully the power and performance of its computer systems into customer environments. Now Cray Research offers enhanced communications capabilities between Cray computer systems and Digital Equipment Corporation VAX/VMS DECnet networks.

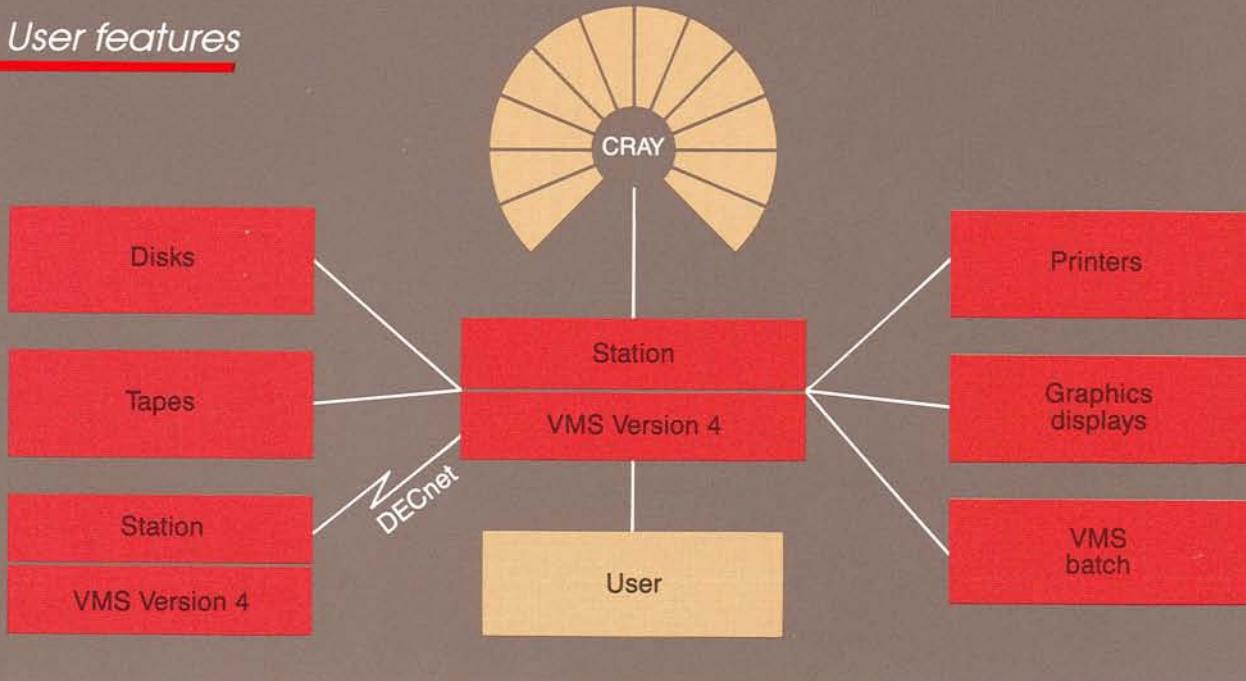
The VAX/VMS Station provides users at remote DECnet nodes with capabilities previously available only to stations attached directly to a Cray computer system. The VAX/VMS Station provides facilities for Cray job input and output, dataset movement between the VAX and Cray systems, Cray job monitoring and control, and a Cray interactive ability from attached stations.

The VAX/VMS Station offers many exciting possibilities for the sophisticated VAX user. Design input can be conducted interactively on the VAX and then transferred to the Cray computer system for analysis. Following analysis, the user can transfer the results back to the VAX system and explore them interactively to determine what, if any, design modifications should be made.

The Cray interactive facility provides an advanced program development environment, Cray interactive graphics, and an application interface to allow for distributed applications. A configuration management utility, which is included with the Station software, makes the VAX/VMS Station easy to install and modify.

The VAX/VMS Station supports the Cray operating system COS, version 1.13 or higher, and the Cray operating system UNICOS, release 2.0 or higher.

User features



The VAX/VMS Station provides a state-of-the-art interactive processing environment that optimizes user productivity and performance. Over 40 user commands provide facilities for Cray job input and output, data transfer between VMS and the Cray system, and a Cray interactive capability for stations attached directly to a Cray computer system. Users have access to Cray job status displays and on-line help information for VAX/VMS Station commands.

The VAX/VMS Station command SUBMIT enables users to submit job files to the Cray system for processing. The command provides parameter prompting and can be qualified to provide control of print output generated by the Cray job. The VMS file specification following the SUBMIT command identifies one or more standard VMS files that are concatenated to construct the Cray job.

The running Cray job can access or create files across the entire DECnet network with the

Cray ACQUIRE, FETCH, or DISPOSE control statements by a process known as dataset staging. ACQUIRE, FETCH, and DISPOSE provide a character string TEXT parameter that allows the user to identify uniquely the VMS files to be staged. With the exception of VMS magnetic tapes, the VMS file names will default to the user's directory. The TEXT parameter specifies a Station staging command and VMS file specification.

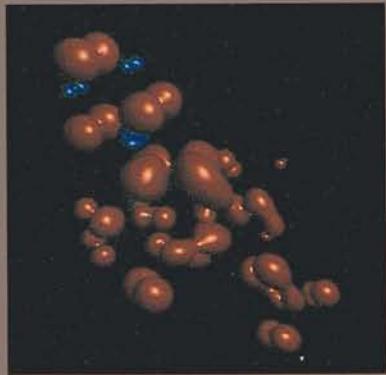
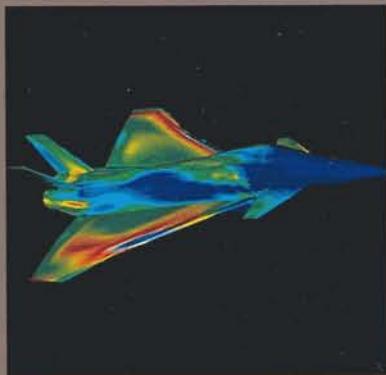
For datasets being staged from the Cray system to the VAX, the staging command can be either DISK, TAPE, PRINT, or SUBMIT. DISK and TAPE provide staging to VMS disks and magnetic tape. PRINT and SUBMIT generate VMS symbiont manager requests to print the staged file or submit it to a VMS batch queue. The Station provides a subset of qualifiers that can be used with the DCL PRINT and SUBMIT commands. For datasets being staged from the VAX to the Cray system, the staging commands are DISK and TAPE.

The Cray reference to a dataset to be transferred between the VAX and Cray systems may specify character, binary, or transparent mode. For character mode, the Station supports VMS sequential and relative file organizations; records within the organization can be fixed or variable. For transparent mode, the Station uses the VMS block I/O file access method.

A comprehensive set of user commands provides for displaying Cray status information and manipulating jobs as they pass between the VAX/VMS Station and the Cray computer system. The DATASET, ISTATUS, JOB, JSTAT, SHOW QUEUE, STATUS, TAPE, and TJOB commands allow users to display information on Cray datasets, batch and interactive jobs, entries in the dataset staging queue, and tape devices and jobs. Job manipulation commands allow users to drop, kill, or rerun Cray jobs and release datasets held on the Cray job queue.

VAX/VMS Station

Applications



(Credit: Ford Motor Company)

The interactive program development environment of the VAX/VMS Station makes it an ideal tool for use in mathematical modeling of complex physical structures and processes. Combined with the rapid processing and massive storage of Cray systems, the Station has provided government, education, and industry with accurate, detailed, and profitable results. The examples shown here illustrate only three of the many established applications.

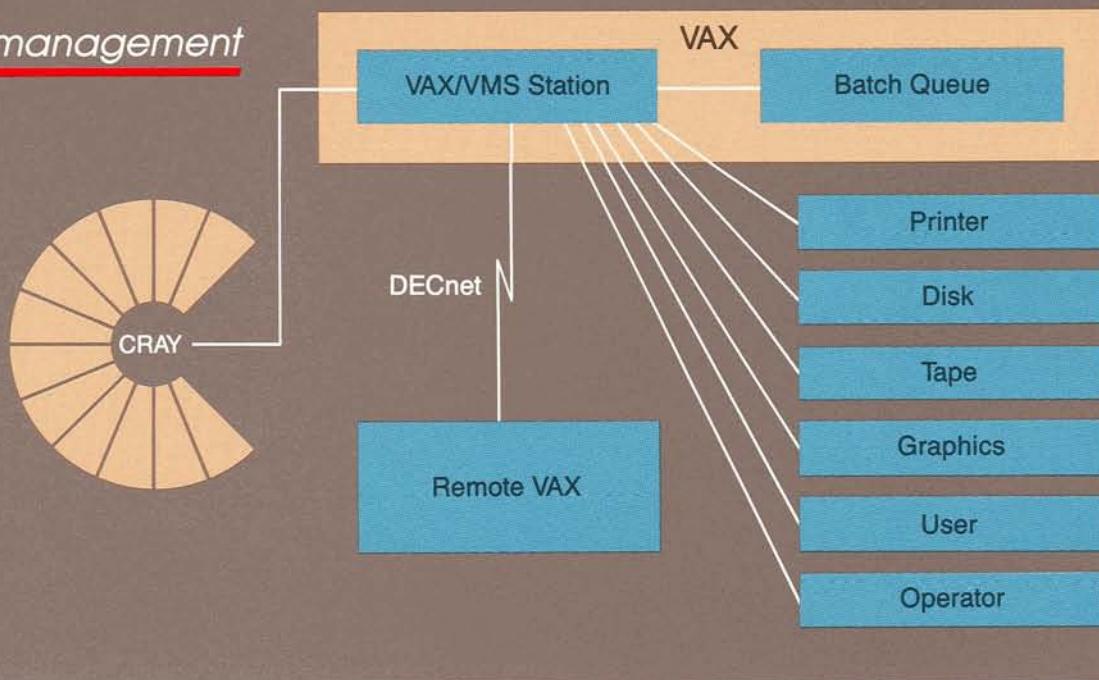
Aerodynamic simulation, such as that of the jet airplane pictured above (left), enables designers to bypass many cycles of wind tunnel testing. The VAX/VMS Station's interactive environment and high throughput allows designers to test and modify designs quickly while conserving resources needed for prototype testing.

Chemists use models produced on Cray systems to examine detailed molecular activity that would otherwise be impossible to observe. The image above (center), which depicts the electron distribution for a DPPH

molecule, was transferred to a graphics device attached to the Cray system by the VAX/VMS Station.

The automotive industry also enjoys the benefits of numerical modeling and graphics produced by Cray systems. The graphic simulation above (right), transferred to a graphical device through the Station, is sufficiently realistic to replace clay models in the early stages of design and evaluation.

System management



The VAX/VMS Station software is simple to install and adapts easily to meet site-specific requirements. VMS command procedures are provided to allow the system manager to generate the Station as follows:

- Assemble and link the appropriate device driver for the physical connection between the VAX and the Cray system
- Assemble and link the Station Images

With the CRAYCP utility, VAX system managers may alter configuration data that controls either attached or remote Station operations. Extensive validation ensures that the changes are valid within the defined Station environment. CRAYCP is a stand-alone utility acting on a disk-resident database; other VAX/VMS Station components need not be installed or active. With the SET command,

CRAYCP allows effective control of the attached and remote node Station environment. System managers can add a new node to the system by invoking a command procedure and answering a few questions that appear on the screen.

The VAX system manager is also provided with tools and utilities to change the configuration parameters that control day-to-day operation of the Station. Parameters that can be changed include:

- Number of logical data streams between the Cray system and the Station that may be active at any one time
- Station identity
- Size of data transmissions between the Cray system and the Station
- Virtual memory used for VMS input/output buffers
- Maximum number of magnetic tape dataset staging requests that may be active concurrently

- Maximum number of VAX/DECnet dataset staging requests that may be active concurrently
- Maximum number of Cray interactive users that may be connected to the Cray system via the Station

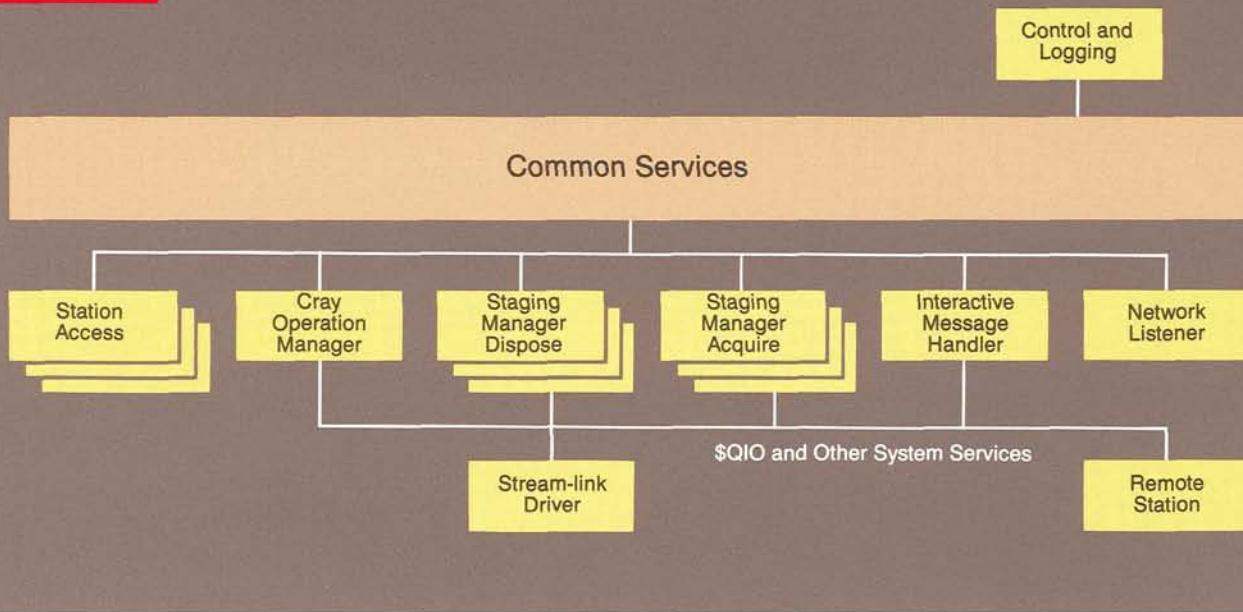
Installation exits

Further tailoring of the VAX/VMS Station to meet specific installation needs is simplified by the provision of installation exit calls in the Station code.

Installation procedures may be called during job submission and during dataset staging. The job processing exit allows for modification of COS job control language statements and for access control, if required. The dataset staging exit provides facilities to stage data to site-specific devices such as graphics terminals. The Station provides user-callable procedures to facilitate reformatting Cray data to VMS formats.

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Software



The components of the VAX/VMS Station are modular, enabling multiple users to access station functions. The Station consists of the main components described below.

Common Services maintains queues of requests from the user and operator as well as Station configuration information. These data areas are maintained as a VMS Global Section for efficient interprocess communication and for ease of recovery.

The Control and Logging Image creates and services the Station logfile and periodically updates the Station refresh status area.

The Station Access Image is activated by a DCL-level command issued by the user or operator. The operator commands control the operation of the Station and the communication with the Cray mainframe. User commands run in the user's logon process and

provide a DCL-style interface with prompting and HELP facilities for the terminal user.

The Cray Operation Manager Image processes and sends Cray operator requests to the Cray computer system and receives and distributes replies. The Cray Operation Manager Image also restarts the Station in the event of loss of communication between the Cray and VAX systems.

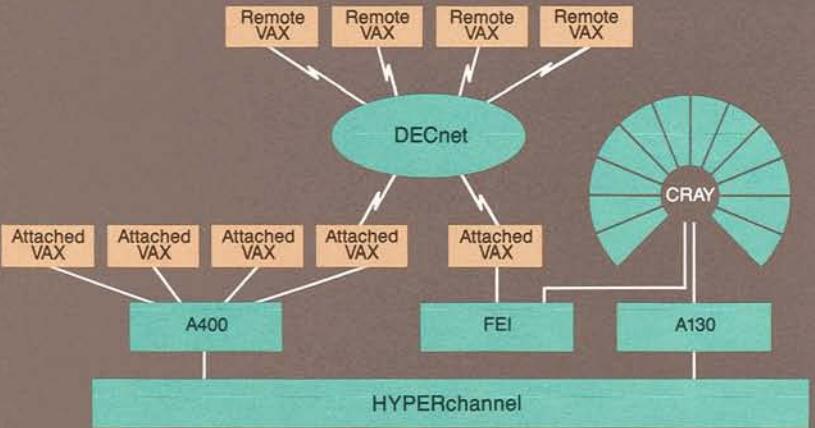
The Dataset Staging Manager Dispose Image receives data disposed by the Cray system to the VAX and transfers the data to an attached VAX device, a remote VAX, or a spooled device.

The Dataset Staging Acquire Image transfers files from an attached or remote VAX to the Cray system. The file transfers are of three types: Cray job submission files, acquire or fetch requests, and save requests initiated by the Station command CRAY SAVE.

The Interactive Message Handler collects individual interactive messages from users into one Cray message and distributes Cray interactive output to users. The interactive messages are passed between the interactive message handler and VMS terminal users via a VMS Global Section.

The Network Listener maintains communication between the attached station and remote stations. The Network Listener can manage up to 64 remote stations concurrently.

The Stream/Link Control portion of the Station is a VMS Device Driver that manages the physical link between the VAX and the Cray mainframe. It also controls the low-level parts of the Cray front-end protocol. Function Management Images request driver functions via the standard VMS QIO system service request.



Hardware

Several Cray/VAX hardware configurations are possible. A configuration chosen for a specific installation depends on user cost and performance considerations and the particular VAX model to be connected. The channel-to-channel Front-end Interface (FEI), manufactured by Cray Research, supports a single connection using a DEC DR70 Massbus. Multiple connections to the Cray computer system are possible using a Network Systems Corporation model A130 HYPERchannel adapter, which can service multiple A400s.

Documentation

The Station is supported by a comprehensive set of publications that address the specific needs of each user. The types of documentation provided include task-oriented, reference, quick reference, internals, and installation and maintenance. An extensive set of online help files is also available.



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