DEC VAX/VMS Station 4.02 Documentation Update

SN–0364

Cray Research, Inc.

Due to space restrictions, the following abbreviations are used in place of the specific system names:

CX/1	Includes all models of the CRAY X-MP and CRAY-1 computer systems
CEA	Includes all models of the Extended Architecture (EA) series, including the CRAY Y-MP and CRAY X-MP EA computer systems
CRAY-2	Includes all models of the CRAY-2 computer system
CX/CEA	Includes all models of the CRAY X-MP computer systems plus all models of the CRAY Y-MP and CRAY X-MP EA computer systems. It does not include the CRAY-1 computer systems.

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Preface

This publication is intended for users and administrators who run the DEC VAX/VMS 4.02 release of the station software. It describes the additions and changes that constitute release 4.02. Along with the *VAX/VMS Station 4.02 Release Notice*, it is the only documentation for the release.

The Cray Research, Inc. manuals affected by this document are as follows:

- *DEC VAX/VMS Station Reference Manual*, publication SV–0020
- *DEC VAX/VMS Station Installation Manual*, publication SV–0100
- *DEC VAX/VMS Station Primer for COS*, publication SV–0360
- *DEC VAX/VMS Station Guide to Common Access Facilities*, publication SN–0362
- *DEC VAX/VMS Station Administrator's Manual*, publication SV–0363

This publication is intended to be used in conjunction with the full manual set listed above.

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Introduction

This publication was written for users and administrators who run the 4.02 release of the DEC VAX/VMS station software. It describes the additions and changes that constitute release 4.02, and is to be used with the full documentation set. Along with the *VAX/VMS Station 4.02 Release Notice*, it is the only documentation for the release.

This document updates the existing DEC VAX/VMS manual set with the following:

- Description of the new features of release 4.02 and instructions for their use
- Additional text to further clarify existing documentation
- Corrections to the existing manual set and documentation to support software fixes

How this publication is organized

This document is organized in sections that correspond to existing manuals. You may want to remove the pages from this manual and insert them in the appropriate manual. Some of the DEC VAX/VMS document set will be updated at the 4.03 release; many of the changes documented here will be incorporated into that release.

Changes to the *DEC VAX/VMS Station Reference Manual*, publication SV–0020, consist of the following:

- Directions for using CINT with UNICOS
- Priority field in UNICOS system status entry
- Correction to the job field length with STATUS
- Additional DISPOSE record formats for use with UNICOS
- Restrictions for file qualifiers with UNICOS data
- A correction to the /NOUNLOAD qualifier with $TAPE
- A change to the /PRINTER qualifier with $SUBMIT
- File formats supported by this release of the station software
- The addition of the SHOW FILENAMES command

Using CINT with UNICOS

The description of CINT in publication SV–0020 (page 100) implies that the station must prompt you for your user number or job name when CINT is initiated. Although this is true under COS, UNICOS does this automatically through the shells; it is unnecessary and not recommended to have this option turned on in the station configuration.

Note

The user number and job name prompting are affected by the CRAYCP *parameter* IJNUSOPT *in the* LSCD *record of both the attached and remote stations.*

BYE/ABORT *and* BYE/SAVE *with CINT*

BYE terminates an interactive session. Depending on the command qualifiers, the Cray interactive job may also be terminated.

/ABORT

Terminates interactive session and the interactive job. QUIT is an alternative way of specifying BYE/ABORT.

/SAVE

Terminates interactive session. The associated interactive job remains active. If the job reaches a system threshold for output messages or requires input, the job is suspended. The interactive session can be reactivated by using the CINT station command with the appropriate job and user name.

Job field length with STATUS

In the documentation for the STATUS command, the description of the field length erroneously stated that the length is specified as a decimal count of 512-word blocks (page 200). It actually consists of 1,000 Cray word blocks.

Priority field in UNICOS system status entry

The PRIORITY field in a system status entry, previously displayed as a real number, is now displayed as an integer in the range 0-255 for UNICOS.

Additional DISPOSE record formats for use with UNICOS

With release 4.02, the $DISK file qualifier /RFM has been extended to incorporate the STMCR and STMLF stream formats for disposing files generated by UNICOS (SV-0020, page 36). The complete list, including qualifiers with /ORG, is as follows:

Qualifier	Description
/ORG=BLK SEQ REL	Target file organization is as follows:
	BLK File is written in block I/O mode. This can be used for files of unknown organization; default for dataset format TR.
	REL Records are written sequentially to an RMS relative-record file (starting at relative record number 1).
	SEQ Records are written sequentially to an RMS sequential-access file; default for dataset formats CB and BB.
/RFM=FIX VAR STMCR STMLF	Specifies type of format within the record file. This field is ignored if /ORG=BLK is specified.
	FIX Fixed-length record format. If the record received from the Cray system is less than the maximum record size (MRS) for the file and the format is fixed, the VMS record is padded with blanks. Exists in ANSI F type format.
	VAR Variable-length record format; this is the default. Exists in ANSI D type format.
	STMCR Determines byte used to terminate each record written to the file; in this case, decimal 13 or <RETURN>.
	STMLF Determines byte used to terminate each record written to the file; in this case, decimal 10 or <LINE FEED>.
/MRS = < max_rec_size >	Maximum record size for the file is as follows:

- For fixed-length records, /MRS specifies the actual size of each record in the file. If /RFM=FIX, this field must be specified.
- For variable length /ORG=SEQ records, the value represents the size of the largest record that can be written to the file. If MRS is not specified, there is no user limit on record size.
- For relative files, this value determines the size of the record cell. If /ORG=REL is specified, this is a required parameter.

Restrictions for file qualifiers with UNICOS data (UD)

The following restrictions apply when using file qualifiers with UNICOS data (UD):

- The /MRS file qualifier is ignored for UD disposes
- The /RMS=REC file qualifier is not allowed for UD FETCH or DISPOSE. Instead, the VAX/VMS station manager should set the RMSBLK field in the LSCD to ON.
- The /RFM and /ORG file qualifiers are meaningless with UD (stream LF) format file transfers.

$TAPE with DISPOSE

Page 41 of SV–0020 erroneously states /NOUNLOAD to be an optional qualifier to $TAPE in the DISPOSE TEXT field. However, the /NOUNLOAD parameter is not supported. See also the UNLOAD field in the LSCD configuration record in the DEC VAX/VMS Reference Manual, publication SV–0020.

/PRINTER with $SUBMIT

With the 4.02 release, the /PRINTER and /NOPRINTER qualifiers with $SUBMIT are no longer supported.

File formats

The DF parameter in the ACQUIRE, FETCH, and DISPOSE statements and the -f option in the acquire, fetch, and dispose commands define the Cray file formats. The VAX/VMS station supports character blocked (CB), binary blocked (BB), transparent blocked (TB), and transparent (TR) file formats. In addition for UNICOS, the station supports UNICOS data (UD).

The file organization and the VMS record format define VMS file formats. The VAX/VMS station supports sequential, relative, and block file organizations, and it supports variable record formats. Table 1 shows the relationship between the various file/dataset formats.

Table 1. Cray file organization to VMS file mapping

File format	Sequence fixed	Sequence variable	Relative fixed	Relative variable	Block tape	Block disk
CB (TC)	+	*	+	+	+	o
BB (TB)	+	*	+	+	+	o
TR	x	x	x	x	*	*
UD	o	+	o	o	o	o

\+ Allowed
o Not allowed
* Default
x Allowed, but extremely inefficient for transferring transparent data

SHOW FILENAMES

With the 4.02 release, the SHOW FILENAMES command has been reimplemented. The description of this command is formatted separately on the following page to allow you to insert it easily in the appropriate place in the "Command Reference" section of your manual.

SHOW FILENAMES — Displays the names of files currently in station staging

Restrictions

SHOW FILENAMES is an OPER only command that can be issued from the attached station when logged on to either COS or UNICOS. It is available at the DCL level.

Format

```
SHOW FILENAMES
```

Qualifiers

/[NO]CYCLE

Specifies whether all information (/CYCLE) or only one page of information (/NOCYCLE) should be displayed when in refresh style. If /CYCLE is specified and there is more than one page of information, the page number is automatically controlled, making it unnecessary to enter the + (page forward) and – (page backward) commands. /NOCYCLE is the default, indicating that only one page of the refresh-style display is shown until entry of the + or – commands.

Description

SHOW FILENAMES calls a display that reports the file names of datasets currently in transit to and from COS or UNICOS and the VAX/VMS station. The information is comprised of

- The stream number
- The transmission direction relative to the attached VAX/VMS station
- The VAX/VMS file specification of the dataset in transit

The stream number can be used as a command parameter to the CANCEL, POSTPONE, and HOLD commands.

This section describes changes to the *DEC VAX/VMS Station Installation Manual*, publication SV–0100. Depending on the specific requirements of your installation, you will need to use this publication along with SV–0100 to complete the installation of the DEC VAX/VMS 4.02 station software.

Note

All the examples in the most recent version of SV–0100 label the directories as CRAY401A or CRAY401R. With this release, these should be referred to as CRAY402A or CRAY402R.

Before you install the 4.02 software

Before you begin your installation procedure, read the section in the *DEC VAX/VMS Station Installation Manual*, SV–0100, "Preparing for the Installation," beginning on page 15.

For all installations

There are significant changes to SV–0100. Before installing a station of any type, refer to page 11 of this publication, beginning with "Additional requirements for the CRAYSTN account," through page 20, "An insert for page 43."

In addition, refer to the appropriate subsections introduced below.

Installing an attached station

To install an attached station, refer to the appropriate section in the *DEC VAX/VMS Station Installation Manual*, publication SV–0100.

Installing mixed version VMS

With this release, it is now easier to install remote stations that run a different version of VMS than the attached station. For instructions to set up the proper environment, refer to "Mixed VMS version installations," beginning on page 22 of this publication. Then proceed to the appropriate section in the *DEC VAX/VMS Station Installation Manual,* publication SV-0100.

Installing a remote station

To install a remote station, refer to the "Remote Station Command Procedures," pages 50-51 of SV-0100. Then install the remote station by using the instructions beginning on page 26 of this publication.

Installing additional attached stations

To install additional attached stations, refer to page 59 of this publication, which describes the command lines necessary to rebuild the interactive listener. Then refer to the appropriate section in the *DEC VAX/VMS Station Installation Manual,* publication SV-0100.

Installing additional remote stations

To install an additional remote station, refer to the instructions in the *DEC VAX/VMS Station Installation Manual,* publication SV-0100, beginning on page 80. In addition, note the change in the DCL command, page 60 of this publication.

Additional requirements for the CRAYSTN account

The subsection entitled "Step 1: Restoring the station software," (page 21 of SV–0100) describes the privileges required for the CRAYSTN account. In addition to these privileges, the PRMGBL privilege is required for removing the station global section VCSA.

The CRAYSTN account also requires write access to the SYS$MESSAGE directory so that the station message file can be copied to it.

For security reasons, the station account in AUTHORIZE must not be in the system group. Otherwise, users from other sources, such as other stations or telnet sessions on the Cray system, may be able to access files through the system (or system group) protection. In addition, the station should run under a UIC in its own, unique group. The UIC is configured in the LSCD DEFUIC field, which must match the UIC of the CRAYSTN account in AUTHORIZE.

Updating CRAYCP

The VAX/VMS station 4.02 software is shipped configured for UNICOS 4.0. There are several configuration differences between COS and UNICOS, as well as differences between the levels of UNICOS. Because of these differences, you must update the CRAYCP configuration files for the attached and remote with the default values of the Cray operating system you are using.

For COS operating systems

If you are connecting to a COS operating system, update your CRAYCP configuration file as follows:

```
$ DEFINE/TRANS=CONC CRAY_STATION disk:[CRAY402A.]
$ SET DEF CRAY_STATION:[VAXFES]
$ @CXCRAYCPDEFA
$ CRAYCP/INPUT=[.CF]DEFAULT_COS_ATTACHED.CRAYCP$CONFIG
$ CRAYCP/INPUT=[.CF]DEFAULT_COS_REMOTE.CRAYCP$CONFIG/CONF=VCSRPC.EXE
```

Now continue making site-specific changes to the CRAYCP configuration files (described beginning on page 38 of SV–0100).

For UNICOS 4.X operating systems

If you are connecting to a 4.*X* UNICOS operating system, update your CRAYCP configuration file as follows:

```
$ DEFINE/TRANS=CONC CRAY_STATION disk:[CRAY402A.]
$ SET DEF CRAY_STATION:[VAXFES]
$ @CRAYCPDEFA
$ CRAYCP/INPUT=[.CF]DEFAULT_UNICOS_4_ATTACHED.CRAYCP$CONFIG
$ CRAYCP/INPUT=[.CF]DEFAULT_UNICOS_4_REMOTE.CRAYCP$CONFIG/CONF=VCSRPC.EXE
```

Note

For UNICOS 5.0, the station uses the UNICOS 4.0 configuration file.

Now continue making site-specific changes to the CRAYCP configuration files (described beginning on page 38 of SV-100).

NSC BI 418/419 interface connections

This release includes the facilities for a NSC BI PI418/PI419 interface device. The released version of 4.02 does not support the PI418/PI419 interface device; mods to version 4.02 will be available in early 1990 to support this interface device.

Loading the interactive pseudo device driver

As of this release, the symbol `'interaction_option'` in `CXEQUATES.COM` controls the loading of the interactive pseudo device driver. If you want the interactive pseudo driver to be loaded whenever the `CXINSTALLA/R` station command files are executed, set the `'interaction_option'` to `INTYES` (this is the default). If this field is set to `INTNO`, the interactive pseudo driver will not be loaded.

Operating under secure UNICOS

If your station is connected to UNICOS running in secure mode, the following restrictions will apply:

- Users will not be able to kill their own jobs, even if they have operator privileges turned ON.
- Inter-station (for example, MVS-VMS) file transfers will not be possible because of TID mismatches.

DECnet security

The VAX station does not use login information when using DECnet task 0 to connect to the various station processes. This causes the partner system, either the attached or remote station, to detect a break-in whenever a connection is attempted between the station network processes. This problem occurs only if task 0 is disabled and network break-in alarms are enabled.

It is possible, however, to obtain system security without causing this problem.

First, create a special nonprivileged account for TASK with a unique UIC. For example, account TASK_ZERO as follows:

```
NCP> DEFINE OBJECT TASK NUMBER 0 USER TASK_ZERO PASSWORD EXAMPLE
```

Now, FAL does not have the privilege to copy files into the directory for TASK_ZERO. Therefore, users cannot use FAL to copy a command file on the system and then use TASK to invoke it.

To cause DECnet break-in messages to be displayed, disable object TASK when account information is not specified, as in the following:

```
NCP> DEFINE OBJECT TASK NUMBER 0 PASSWORD DISABLE
```

ASCD field DR_LINK_TIMEOUT

For releases 4.01, 4.01BF1, 4.01BF2, and 4.02, the station default value for the ASCD field DR_LINK_TIMEOUT is 5 seconds. However, if you are running attached VAXes using a direct connection, VSG (VAXBI32) or FEI-1 (DR70), in conjunction with UNICOS, this setting is inappropriate. Instead, set the default value up to a minimum of 30 seconds. This default will allow for proper synchronization between the attached VAX and a heavily loaded Cray system.

VAX 8800 machine support

If you are using a VAX Supercomputer Gateway Connection on an 8800 series machine to connect to the Cray system, you must build the station driver as follows:

```
$ DEFINE/TRANS=CONC CRAY_ROOT disk:[CRAY402A.]
$ SET DEF CRAY_ROOT:[VAXFES.C.SRC]
```

Next, edit the file VCPREBI.MAR and search for the symbol VC$MC_8800, which is shipped set to OFF. Set this symbol to ON.

```
VC$MC_8800    =  ON
```

To build the driver for 8800 VAX BI support, do the following:

```
$ SET DEF CRAY_ROOT:[VAXFES]
$ @[.C.BC.COM]VCBLD_BI
$ DEASSIGN/ALL
```

This station driver is now built for a VAX 8800.

PI13 burst mode support

The burst mode switch is turned off in the station driver prefix file for the PI13. If burst mode is set on your PI13 board, you must rebuild the driver as follows:

```
$ DEFINE/TRANS=CONC CRAY_ROOT disk:[CRAY402A.]
$ SET DEF CRAY_ROOT:[VAXFES.C.SRC]
```

Next, edit the file VCPREPI.MAR and search for the symbol VC$BURST. This file is shipped with this symbol commented out. To enable the burst mode feature, remove the semi-colon in column 1 as follows:

```
VC$BURST                = 0
```

Next, do the following:

```
$ SET DEF CRAY_ROOT:[VAXFES]
$ @[.C.PC.COM]VCBLD_PI
$ DEASSIGN/ALL
```

VMS 5.0 symmetric multiprocessing (SMP)

In release 4.02, the station fully supports symmetric multiprocessing (SMP). All station drivers and common services now build according to the VMS symbols contained in the CXEQUATES.COM file; no editing of the driver prefix files is required.

Release 4.02 is shipped for VMS 5.0 and SMP support by default; this causes no problems if the station is to run on a single-processor VAX running VMS 5.0. Any earlier versions of VMS software do not support SMP.

Note

The symbol VC$VMS_V5_SMP *in* CXEQUATES.COM *is now unnecessary and has been removed.*

Job unblocked facility

The job unblocked utility allows the attached station to perform the blocking of a job being sent to the Cray system rather than the blocking occurring on the remote. This facility allows local processing of job files that are on the attached station which would normally come under the control of the attached station administrator.

This is not a new feature, but is an extension to support UNICOS. The new installation exits can be used to implement a security system which is flexible and can be supported in a network environment.

The following installation exits facilitate this local checking if JOBUNB is ON in the node table.

PGIE_HSI_VALIDATE

The PGIE_HSI_VALIDATE exit is a new installation exit entry point required in the attached station acquire process. This exit validates the job request after VCA has picked up a remote job submission queue entry but before VCA requests that the remote acquire process sends the job file across.

Location

The location follows:

```
[VAXFES.IE.SRC]VIE_JOB_UNBLOCKED.MAR.
```

Calling sequence

The calling sequence follows:

```
ret_status=
PGIE_HSI_VALIDATE(UNP_address, DQA_request_entry_address)
```

UNP_address — Address of the UNP (unpack) data area as returned by PGUT_DTR_UNPACK_DSH

`DQA_request_entry address`
: Address of the dataset queue acquire (DQA) entry

`PGIE_JOB_AUTHENTICATE_1`

The `PGIE_JOB_AUTHENTICATE_1` exit is a new installation exit entry point in the remote VTA acquire process. This exit is used to investigate or manipulate the station slot for the job being submitted.

Location

The location follows:

```
[VAXFES.IE.SRC]VIE_JOB_UNBLOCKED.MAR.
```

Calling sequence

The calling sequence follows:

```
ret_status=
PGIE_JOB_AUTHENTICATE_1(station_slot_address)
```

`station_slot_address`
: Base address of the station slot in the dataset.

`PGIE_JOB_AUTHENTICATE_2`

The `PGIE_JOB_AUTHENTICATE_2` is a new installation exit entry point required in the remote acquire process. This exit is used to validate or manipulate the staging queue request.

Location

The location follows:

```
[VAXFES.IE.SRC]VIE_JOB_UNBLOCKED.MAR.
```

Calling sequence

The calling sequence follows:

```
ret_status=
PGIE_JOB_AUTHENTICATE_2(UNP_address,
DQA_request_entry_address)
```

`UNP_address` Address of the UNP (unpack) data area as returned by `PGUT_DTR_UNPACK_DSH`

`DQA_request_entry address`
Address of the dataset queue acquire (`DQA`) entry

Rebuilding the station for non-DECnet remote connections

With release 4.02, all protocol-specific components of the station are built with the following fields in `CXEQUATES.COM`:

```
network_tcp
network_netex
network_decnet
```

The release is shipped with DECnet built as the default. This allows remote VMS stations to connect to the attached with DECnet. If additional protocol support is required, set the appropriate flag to `YES` and build the particular station component according to the procedure on page 34 of SV-0100.

After setting the `network_xxx` flags in `CXEQUATES.COM`, build the attached station components as follows:

```
$ DEFINE/TRANS=CONCEALED CRAY_ROOT disk:[CRAY402A.]
$ SET DEF CRAY_ROOT:[VAXFES]
$ @[OM.COM]VOM_BLD
$ @[NL.COM]VNL_BLD
$ @[CA.COM]VCA_BLD
$ @[CD.COM]VCD_BLD
$ @[SD.COM]VSD_BLD
$ @[IL.COM]VIL_BLDA
```

After building the attached station, build the remote station components as follows:

```
$ @[OM.COM]VOM_LOG
$ @[OM.COM]VOM_LNKR
$ @[RA.COM]VRA_BLD
$ @[RD.COM]VRD_BLD
$ @[IL.COM]VIL_BLDR
```

Note

TCP/IP is not a supported protocol between attached and remote VMS stations.

The $USER exit for synchronous command procedure

Page 108 of SV-0100, subsection "User exit for Synchronous command procedures," discusses the user exit $USER, which allows users to execute a synchronous command procedure on the VAX from within a Cray job. The documentation does not state, however, that the procedure required to install this user exit at the remote station is not provided by the station.

Additionally, there is an error in the instructions for enabling this exit for your users. The correct instructions follow:

To enable this exit for users, you must rebuild the VCD image in the following manner, then remove and install the station.

```
$ DEF/PROC/TRANS=CONC disk:[CRAY402A.] CRAY_ROOT
$ SET DEF CRAY_ROOT:[VAXFES.CD.COM]
$ @VCD_LOG
$ @VCD_ASSEM VCD_US20
$ @VCD_US20LNK
```

Additional notes on building stations

Page 100 of SV-0100 contains a section entitled "Notes on Building Stations." This section contains items you should be aware of when building station components. To that list, add the following:

If you are going to rebuild the remote station using the CXBUILDR.COM command procedure, or you are linking the remote station with CXLINKR.COM, check that the following has occurred:

- The attached station has already been built
- The object and symbol table files are available

CRI recommends doing all station software builds before the remote stations are downloaded with CXADDNODE. Do not delete any object or symbol table files until the remote stations have been downloaded.

An insert for page 43

Page 43 of SV-0100 contains information on installing an attached station. This page contains several errors. The corrected page follows. You should insert this page in your manual.

Step 5: Completing the attached station installation

The final phase of installing the attached station consists of making the software known to VMS and defining the commands for user access. These functions are performed by the CXINSTALLA and CXCRAYDEFA command procedures. The account you use needs CMKRNL, SYSGLB, SYSNAM, and OPER privileges. Follow these steps:

1. Remove any previous VAX/VMS station software (if any) running under your station logical name with the CXREMOVEA procedure:

```
$ @CRAY_STATION:[VAXFES]CXREMOVEA    ! Old station directory
```

2. If one exists, deassign your process logical name for the station:

```
$ DEASSIGN/PROCESS CRAY_STATION
```

3. Define the station logical name, CRAY_STATION, and install the station software with CXINSTALLA:

```
$ DEFINE/TRANS=CONC     CRAY_STATION disk:[CRAY402A.]
$ @CXINSTALLA
```

Mixed VMS version installations

With this release, it is now easier to install attached and remote stations when the systems are running different levels of VMS operating systems. This allows the remote station installation procedure, CXADDNODE, to use the correctly built VMS images while downloading the command procedures (which are VMS version independent) from the main CRAY_STATION:[VAXFES] directory.

For example, if you are running VMS 5.2 at the attached station and 5.1 at the remotes, the following procedures describe how to build the executable images and prepare for remote installations which use these images. If your remote systems are running the same version of VMS as your attached, skip to "Installing a remote with CXADDNODE," page 26 of this document, and continue.

How you build the executable images will depend on your access to a system running an alternate version of VMS. The following section describes how to build these images if you have access to an alternate VMS operating in the same cluster as the attached station. If this does not describe your situation, refer to the section "Building alternate VMS images without the VAXCluster access," page 24 of this publication.

Building alternate VMS images with VAXCluster access

In order to run in a mixed VMS operating system, you must create an alternative [.VAXFES] directory which will contain .EXE, .LIS, .OBJ and .MAP files. To create this directory, perform the following operations.

1. Create an empty directory structure with the following commands:

```
$ create/dir disk:[CRAY402A.ALTERNATE_VMS]
$ create/dir disk:[CRAY402A.ALTERNATE_VMS.VAXFES]
$ SET DEF disk:[CRAY402A.VAXFES]
$ BACKUP/LOG [...]*.DIR disk:[CRAY402A.ALTERNATE_VMS.VAXFES...]*
```

2. Log into the VAX system running the alternate version of VMS and define CRAY_ROOT as giving precedence to the alternate VMS [.VAXFES] in the search list:

```
$ set host <node>
Username:
Password:
$ DEFINE/TRANS=CONC     CRAY_ROOT disk:[CRAY402A.ALTERNATE_VMS.]
                                  disk:[CRAY402a.]
```

Once you have logged onto the VMS station running the alternate version of VMS, the attached and remote stations can be built using the following DCL commands and station build command files:

```
$ SET DEF CRAY_ROOT:[VAXFES]
$ @CXBUILDA                       !Build the attached station
$ @CXBUILDR                       !Build the remote station
```

After the attached and remote stations have been built using the alternate VMS system, you may log out of this system and continue setting up your environment to perform the attached or remote installation. Refer to page 25, beginning with the section "Installing an Alternate VMS Attached Station."

Note

Because the remote station shares code with the attached station, the attached station must be built first. CRI recommends you do not perform partial builds in this environment because a consistent level of VMS is required throughout the build.

Building alternate VMS images without VAXCluster access

To build alternate VMS images without VAXCluster access, you must first create a directory which will later hold the remote station images as built the alternate VMS operating system. To do this, issue the following commands from your site's master of the 4.02 release.

```
$ create/dir disk:[CRAY402A.ALTERNATE_VMS]
$ create/dir disk:[CRAY402A.ALTERNATE_VMS.VAXFES]
```

Now, find a system running the necessary version of VMS and read in the entire station release tape to that system. Then, when you have logged on to that system, completely build the attached and remote stations. (See SV–0100 beginng with page 34 for attached stations.) After the attached station has been built, execute the following commands to build the remote:

```
$ DEFINE/TRANS=CONCEALED CRAY_ROOT disk:[CRAY402A.]
$ SET DEF CRAY_ROOT:[VAXFES]
$ @CXBUILDR
```

Once these images are built (confirmed when you receive a DCL prompt) you must copy these images to the original 4.02 station directory. These images can be moved by using either DECnet or tape. From the alternate system, copy the files from `CRAY_ROOT:[VAXFES]*.EXE` to the master system's directory *disk*`:[CRAY402A.ALTERNATE_VMS.VAXFES]`.

shows a possible station structure for stations running mixed versions of VMS:

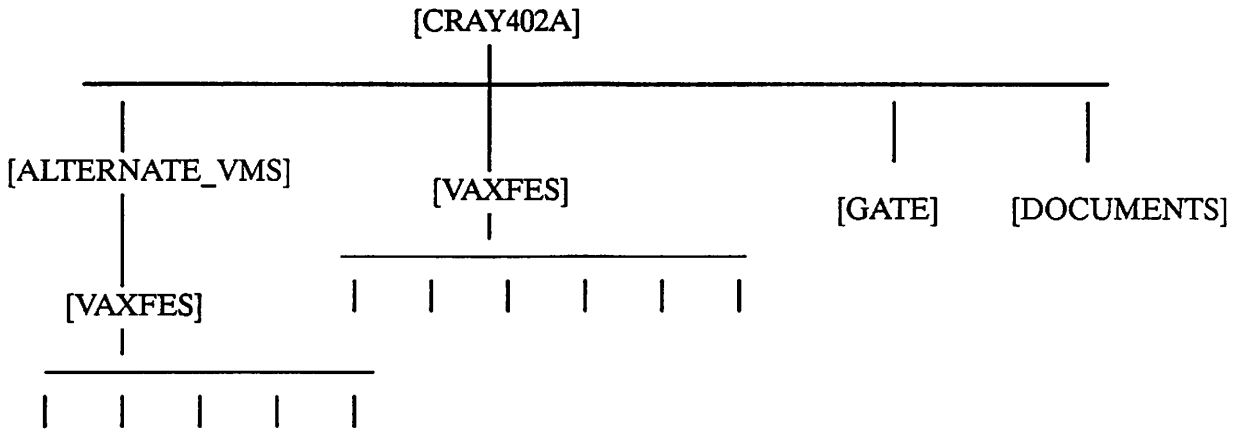

Figure 1. Station structure for mixed version VMS

Installing an alternate VMS attached station

To install an attached station using these new station images found in the [ALTERNATE_VMS.VAXFES] directory, define the process level logical name CRAY_STATION as a search list. Do this before running @CXINSTALLA as described in SV-0100 on page 43.

```
$ DEFINE/TRANS=CONC    CRAY_STATION disk:[CRAY402A.ALTERNATE_VMS.],
                                    disk:[CRAY402a.]
```

The above procedure allows the alternate VMS executables to be selected from the alternate [VAXFES] directory and all command files to be selected from the normal [VAXFES] directory.

Installing a remote station for an alternate VMS operating system

To install a remote station for the alternate VMS operating system, define the logical name CRAY_STATION as follows and use CXADDNODE to copy and configure the remote station. These operations should be done from the attached station.

```
$ DEFINE/TRANS=CONC          CRAY_STATION disk: [CRAY402A.ALTERNATE_VMS.],
                                          disk: [CRAY402a]
```

If you are installing a version of VMS on the remote which is unavailable on the attached, refer to the subsection "Examples of downloading the station modules," page 15.

Warning

When any station logical name CRAY_STATION *or* CRAY_ROOT *is defined as a search list, it is possible to remove files from the existing station directory as well as the alternate VMS station directory structure by using the DCL commands* PURGE *and* DELETE.

Installing a remote with CXADDNODE

The CXADDNODE command procedure allows you to add a new remote to an attached station. This new remote can be any remote that supports CRSP.

If the remote being added is a VAX/VMS machine, this is a two step process. First, CXADDNODE updates the configuration file of the attached station through CRAYCP. Secondly, CXADDNODE copies the files to the remote station.

If the remote being added is not a VAX/VMS machine, CXADDNODE updates the configuration file of the attached station and exits. To install this remote station, you would then use the installation procedures for that type of station, most likely from tape.

The CXADDNODE command procedure prompts you for information which will allow it to configure the attached station to recognize the type of remote being configured. For example, if you were adding a remote connected with DECnet, CXADDNODE would

prompt you for its DECnet node name and would not prompt you for useless information, such as identifying a TCP/IP address.

During the copying procedure, CXADDNODE will prompt you for information to facilitate this process. Depending on the type of remote station and connection, for example, it might ask you for information regarding the sharing of disks, the cluster organization, or instructions for file storage.

You may also use CXADDNODE to copy the remote station modules without updating configuration files. If your remote station is on the same cluster as the attached station, only a small subset of files is downloaded; most files are shared with the attached station.

If at any stage CXADDNODE encounters an error, or if the user aborts with <CONTROL-Y> all modifications already made will be "backed out" of, as if the process had not been started.

Creating the new node table entry

The node table entry you create with CXADDNODE is initialized with information from the default node table entry 61. To identify your default node, use the CRAYCP NODE/LIST command.

To make global changes, such as enabling all nodes to see all the system status entries, edit the attached station's configuration input file for the default node table entry. Then, run CRAYCP using this file as input. (See pages 38-42 of SV-0100). These changes are now permanent to the default node table entry and will be passed on to all other node table entries you create.

During the process of creating new node table entries, CXADDNODE creates small files to be used as input to CRAYCP. After these files are used, the CXADDNODE procedure asks you whether you want to save these input files. Cray Research, Inc. recommends saving the input files (properly file-protected) and keeping them updated with any changes. If you save the CRAYCP input file created by CXADDNODE, keep the other files that CXADDNODE uses in the [.CF] subdirectory. Saving this file enables easier upgrades to future releases.

Restrictions for using CXADDNODE

Before using CXADDNODE, you must log on to the station account on the attached station. Additionally, the following criteria must be met before you call CXADDNODE to add a new remote station.

- The logical name, CRAY_STATION, must be defined as follows:

```
$ DEF/PROCESS/TRANS=CONCEALED CRAY_STATION disk:[CRAY402A.]
```

For an alternate VMS built station, the name must be defined as follows:

```
$ DEF/PROCESS/TRANS=CONCEALED CRAY_STATION disk:[CRAY402A.ALTERNATE_VMS.],
disk:[CRAY402A]
```

For installing alternate VMS built stations, refer to "Mixed VMS version installations," page 22 of this publication.

- If the remote node is a VAX, it must be running VMS version 5.0 or later. There is no restriction on processor type. There are, however, restrictions on attached to remote station version levels. The remote station must be version 4.0*X*. You cannot run a version 3.0 remote to a 4.0*X* attached station due to interstation data protocol changes. If the remote node and attached nodes are installed with mixed versions of VMS, the remote station images will have to be relinked under the version of VMS that the remote is running. Station images linked on one version of VMS will not run on systems running lower versions of VMS.
- The DECnet link to the remote node must be operational if files are to be downloaded using DECnet.
- An account must be created (or specified) on the remote node to facilitate communications between the attached and remote stations. This account does not require any privileges other than TMPMBX and NETMBX, but it must be the station account which owns the station files and directories. You might also consider giving this account OPER privilege to allow it to perform normal station operations.

- The directory [CRAY402R], with its subdirectories [GATE] and [VAXFES], must be created on the remote node and must be owned by the station account that was created on this remote node. The subdirectory [GATE] should be protected against world access (W:), but must have system write access. The subdirectory [VAXFES] must have a protection of (W:RE). It is not necessary that the name CRAY402R be used as the top-level account; CXADDNODE prompts you for that name.
- Access to an account with VMS privileges of CMKRNL, OPER, SYSGBL, and SYSNAM on the remote node is required for the installation of the remote station software. This account must have access to the station files and directories.
- If you are installing NETEX remote stations, both the attached and remote VAXes must be properly licensed for NSC NETEX. If you are installing remote stations that are connecting through TCP/IP (CLS-UX), the attached VAX must be properly licensed for Wollongong TCP/IP.

The format of the command you use to invoke CXADDNODE is as follows:

```
$ SET DEF CRAY_STATION:[VAXFES]
$ @CXADDNODE !CXADDNODE.COM should only be executed at the attached station.
```

CXADDNODE.COM prompts you for all information required both to update configuration files and to download modules to the target node.

Examples of downloading the station modules

The following examples illustrate the use of CXADDNODE to create a new VMS remote station. The first example demonstrates how to add a DECnet protocol remote station. The second example demonstrates how to add a station that uses CLS-UX. CXADDNODE defaults dynamically, so that you only see the correct set of prompts for the type of software you are installing.

Once the criteria listed in the previous subsection have been satisfied, execute the CXADDNODE procedure at the attached station to create a new remote station.

```
$ SET DEF CRAY_STATION:[VAXFES] !At the attached station
$ @CXADDNODE                    !Invoke CXADDNODE DECnet remote
```

If the attached configuration subdirectory [VAXFES.CF] is not created, CXADDNODE will issue the following warning and prompt before continuing:

```
% CXADDNODE-W-CFDIR, CF directory does not exist
  Do you want to continue - CXADDNODE will create the subdirectory [.CF]? [Y]:
```

If the answer is YES or <RETURN>, the new subdirectory will be created. If the answer is NO, CXADDNODE will exit.

If the attached configuration subdirectory [VAXFES.CF] does not contain a configuration database file *station_log_name*:[VAXFES.CF]REMOTE.DATABASE1, CXADDNODE will issue the following warning and prompt before continuing:

```
%CXADDNODE-W-CFDBSE, CF database does not exist
 Do you want to continue - CXADDNODE will create the database? [Y]:
```

If the answer is NO, CXADDNODE will exit.

If the answer is YES or <RETURN>, CXADDNODE will create the CF subdirectory and respond with this introductory description:

```
CXADDNODE will update the VAX/VMS attached and remote station configuration
files with the minimum information needed to establish a new VMS remote
station, and then download the necessary files to that machine if DECnet is
available.

For CLS-UNIX systems, CXADDNODE will configure the attached configuration
file.  Configuration and loading of the remote software must be done on the
remote machine.

Please refer to the VAX/VMS Station or CLS-UX Installation Guide before
starting this download operation, as there may be additional configuration
fields which need to be coordinated between the attached and remote.
```

The interactive dialogue follows. Defaults are given in brackets after the prompt. You can terminate CXADDNODE at any prompt by pressing <CTRL/Z>, or at any time by using <CTRL/Y>.

```
Enter target operating system [VMS]:
```

For VMS remote stations, type VMS or press <RETURN>.

```
Enter REMOTE or CLS-UX [REMOTE]:
```

For VMS remote stations, type REMOTE or press <RETURN>.

```
Are the necessary directories created? [Y]:
```

Note

If you are going to create a TAPE SAVE_SET, *respond with* Y *to the previous question.*

If the directories have not been created, CXADDNODE will exit. If the necessary directories are created and the criteria given above are met, type YES or press <RETURN>.

```
Do you wish to install from an alternate VMS directory? [ALTERNATE_VMS]:
```

If you want to install a remote station running a version of VMS other than the station default, answer Y and press <RETURN>. See page 26, "Installing a remote station for an alternate VMS operating system," for detailed instructions.

Note

The default value will change to [N] *if the attached station is installed from the station default.*

```
Enter alternate directory (CRAY402A.ALTERNATE_VMS):
```

This prompt is bypassed if you are installing from the default VMS version. However, for alternate VMS remote station installations, you must comply fully with the instructions described within the section "Mixed VMS version installations," page 22 of this publication.

```
UPDATE configuration files or just COPY files? [UPDATE]:
```

If you wish to use CXADDNODE to completely configure and download a remote station, press <RETURN>. If you enter COPY, CXADDNODE will not update any configuration files, and will not ship certain node-specific files to the remote. Specifically, the following processing is modified:

- The node is not added to the attached configuration file
- The following files are not copied to the remote:
  VCSRPC.EXE
  CXEQUATES.COM
  VRA.COM
  VRD.COM

```
Enter transport service of DECnet,TCP, or NETEX [DECNET]:
```

Respond with the appropriate service.

```
     You will next be asked to supply a comment and connect nodename.
     The connect nodename is used by the attached station software to
     start communication with remote station nodes when using DECnet
     or NETEX protocols.  When using TCP/IP node names are not used,
     but rather internet number addresses and port numbers, and thus
     connect nodename is not prompted for when using TCP/IP.  Comment
     nodename is how the station knows the remote, and although not
     used to establish network connections, should agree with what is
     configured on CLS or VMS remote software.

     For more details refer to SV100.

Enter the connect nodename
CRAYCP field name is STATION_HOST:
```

Enter the node name of the remote computer as it is known by the attached VAX on the appropriate network protocol. This value corresponds to the CRAYCP NODE field STATION_HOST.

```
Enter the comment nodename - this
is the name by which your node is
known in station displays.
CRAYCP field name is STATION_NAME:
```

Enter the station identifier of the remote station. This value corresponds to the CRAYCP NODE field STATION_NAME.

```
Do you want interactive enabled at this REMOTE [Y]:
```

This action disables the interactive pseudo device driver on this remote.

```
     If the VMS remote you are adding is on this cluster, and you plan
     to have the remote share files from this directory, you can elect
     to enable the file sharing option and only copy a subset of files
     to the remote station's specific directory.  Please refer to SV100
     for additional information on file sharing.

Will the VMS remote share files from this directory? [N]
```

If this remote is in this cluster, only three files are downloaded: CXEQUATES.COM, VCSRPC.EXE, and VCSR.EXE. All of the remaining station files are shared with the attached station's [VAXFES] directory.

This prompt is bypassed if you are installing from an alternate VMS version.

```
Enter the username to use on the remote node:
```

This user name will be used for communications between the attached and remote nodes including CXADDNODE NETWORK copies.

```
Enter the account associated with this username:
```

Respond with the appropriate account.

```
Enter the UIC for this account (as [grp,mem]):
```

Enter a numeric UIC as specified.

```
      The station release was built under VMS 5.  If the remote node is
      running any version of VMS other than this, you may need to relink
      the remote station images (see CXLINKR.COM procedure in the VAXFES
      directory) or download objects and have the remote manager relink.
      If you are running a higher minor level of VMS, you shouldn't have
      to relink, and if you are running a higher major level of VMS, you
      may have to relink under a higher version.  The following examples
      illustrate these guidelines:

        Assume Attached Station Built Under VMS 5

        ==> If remote has VMS 5, no relinking may be necessary
        ==> If remote has VMS <ALT_VMS>*, no relinking may be necessary,
            but install remote from <ALTERNATE_VMS> directory
        ==> If remote has a higher level than VMS 5,
            relinking may be necessary
       * <ALT_VMS> any attached station built under an alternate version of VMS.

       Note: For further information on VMS versions mismatch consult your VMS
             systems manager.

Do you want to proceed with downloading the station 5 or <ALTERNATE_VMS> linked
images? [Y]:
```

If you answer N to the question regarding VMS version 5, CXADDNODE exits.

If the target remote node is running a non-DECnet protocol and you have rebuilt the station on the attached node, ensure that the operating system level on the remote is at or above the version of VMS running on the attached and that you have included support for non-DECnet protocols. You will then have to ship object modules downline and relink at the remote node.

```
Enter NETWORK, VMS pathname, VMS tape device, or NONE
for file copies [NETWORK]:
```

Choosing NETWORK copies the files to the target node using the appropriate transport service. Choosing a VMS path name copies files to the specified path directory. Choose this option when the installing remote is to share files with the attached VAXFES directory. Here the PATHNAME should be specified as <HSC-disk>:[CRAY402R.VAXFES].

If the device is a tape, you are prompted for the tape device and label. Unlabeled tapes are not supported. You are prompted for the label later. If you select tape, a file *node*_COPYFILE.COM is created in the CRAY_STATION:[VAXFES] directory; this file contains the necessary commands to restore the created tape on the target node.

```
Download via DECnet, TCP, or NETEX [DECNET]:
```

The only download option implemented in the version 4.02 station is DECnet. If no DECnet link is available, files must be copied to a directory and manually downloaded via NETEX. Specify this directory specification as a VMS path name to the previous prompt.

```
Enter the disk on node nodename to copy files to (as in DDCU:):
```

Enter the physical or logical disk name on the remote node. CXADDNODE needs this to download the files on [NETWORK] copies.

```
Will remote station use logical name CRAY_STATION [Y]:
```

If you are not installing this remote station on a node that already has an attached or remote station, press <RETURN>. If you are, answer N and enter your remote station's logical name. If your remote station does not use the logical name CRAY_STATION, enter N. CRAYCP and CXEQUATES are updated with the logical name you supply.

```
Enter target directory on diskname (default CRAY402R):
```

If you have created the default directory [CRAY402R], press <RETURN>. If not, specify the top-level directory name without brackets. CRAYCP and CXEQUATES are updated with the name you supply.

```
Do you want object files also?  [NO]
```

If the remote system's VMS level is such that it will not run with either of the two object libraries shipped, and you must relink images on the remote, you must ship object files as well. This should not normally be necessary, and you should consult your Cray analyst before selecting this option.

If you select the object files option, a VMS BACKUP save set, called *node*_OBJSAVSET.BCK, is created and copied to the [VAXFES] directory on the attached node. A file called *node*_OBJSAVSET.COM

is also created and copied. This file can be invoked to restore the copied save set to the remote system's files.

This prompt is bypassed if you choose the CLUSTER FILES SHARED option. See page 34 of this publication for more information on this option.

```
Do you wish to retry failed DECnet file transfers on download? [Y]:
```

If you wish to have CXADDNODE repeat failed DECnet copies until they succeed, press <RETURN>. Note that all errors, even SYSTEM-F-NOSUCHNODE, are retried, because DCL does not have access to these secondary error codes.

```
Save CRAYCP input files? [Y]:
```

If you answer Y (the default), CRAYCP input files are created as part of the procedure. These files contain the CRAYCP directives necessary to update the attached and remote configuration files for this node, and should be added to your local CRAYCP$CONFIG file.

This completes the prompting from CXADDNODE. You should now see the following message indicating that CXADDNODE is using CRAYCP to update the attached configuration database to reflect the new node:

```
%CXADDNODE-I-ATTCONF, Updating VMS Station CRAYCP attached configuration file
                      ----various CRAYCP messages----
```

If you answered Y to the prompt about saving CRAYCP input files, the following message also appears:

```
%CXADDNODE-I-ATTSAVE, Attached CRAYCP input file saved as:
                      nodename_ATTACHED.CRAYCP$CONFIG
```

CXADDNODE now updates the remote configuration file with the prompted information. You see this message:

```
%CXADDNODE-I-REMCONF, Updating remote configuration file
          ----various CRAYCP messages----
```

If you answered Y to the prompt about saving CRAYCP input files, the following message also appears:

```
%CXADDNODE-I-REMSAVE, Remote CRAYCP input file saved as:
                      nodename_REMOTE.CRAYCP$CONFIG
```

At this point, CXADDNODE asks if you want to edit CXEQUATES.COM:

```
Edit CXEQUATES to be prepared for nodename? [N]:
```

Even if you do not choose to edit CXEQUATES yourself, it is automatically changed to reflect the correct disk and directory names, as follows:

```
13    $ station_log_name        :== CRAY_STATION          ! Station logical name
34    $ station_specific_disk   :== $4$DUA5:              ! Specific station disk.
30    $ station_common_disk     :== $4$DUA5:              ! Common station disk.
49    $ station_specific_name   :== HELAPITAGE.402_REM    ! Top level specific dir
44    $ station_common_name     :== HELAPITAGE.402_REM    ! Top level common dir
56    $ default_remdir          :== HELAPITAGE.402_REM    ! Used by CXADDNODE on att
DEVO_STATION:[VAXFES]CXADDNODE_CXEQUATES.COM;2 177 lines
[EOB]
```

For most remote installations, this automatic edit is sufficient. A manual edit is required only if you are installing this remote station on a node that already has a station (attached or remote).

If you choose the manual edit by answering Y, EDT is invoked on a copy of CXEQUATES.COM. Use the editor to verify the values of the fields associated with remote stations (see "Step 2: Editing the attached station command procedures," page 24 of SV-0100). Those fields are as follows:

Symbol	Description
station_remcs_name	Remote Common Services name. The default, VCSR, is used to install the shareable image VCSR.EXE. Change this name only if you will be running multiple remote stations. (See "Installing multiple stations," page 80 of SV-0100.

Symbol	Description
station_log_name	Station logical name used by command files and users to find this station on VMS disk. This must always be CRAY_STATION unless a second remote station is being installed on the same VAX. See "Installing an additional remote station," page 80 of SV-0100, for information about installing additional remote stations on the same VAX.
station_common_disk	Disk device on which your station executables reside. May be either a physical or logical device name. On a nonclustered remote, set this symbol to the same value as *station_specific_disk*. On a remote station for which you want to share images with the attached station, set this value to the proper attached station disk. This field always requires editing, because the default depends on the disk on which the station was last built at CRI facilities.
station_specific_disk	Disk device on which your station-specific files reside. May be either a physical or logical device name. On a nonclustered remote or a single attached station, set this symbol to the same value as *station_specific_disk*. On a remote station for which you want to share images with the attached station, set this value to the proper remote station disk. This field always requires editing, because the default depends on the disk on which the station was last built at CRI facilities.

Symbol	Description
station_common_name	High-level directory name in which your station executables reside on *station_common_disk*. The default is CRAY402A. On a nonclustered remote, set this symbol to the same value as *station_specific_name*. On a remote station for which you want to share images with the attached station, set this value to the proper attached station directory.
station_specific_name	High-level directory name in which your station-specific files reside. The default is CRAY402A. On a nonclustered remote, set this symbol to the same value as *station_common_name*. On a remote station for which you want to share images with the attached station, set this value to the proper remote station directory.
station_control	Determines whether the CXREMOVER procedure will remove the station message file. The message file, which is installed by CXINSTALLR, resides in SYS$MESSAGE and is shared by multiple stations (either attached or remote) installed on the same VAX. If the value of this symbol is PRIMARY, CXREMOVER removes the message file from the known file list. A setting of SECONDARY indicates a secondary station, and prevents CXREMOVER from removing the message file when that particular station is removed.

Symbol	Description
interactive_device_name	Device name used by the station interactive pseudo device driver. The default is VIA0:. You will need to change this name if you are installing multiple stations with interactive capability.
default_remdir	Default high-level directory name to which CXADDNODE copies modules in *station_specific_disk* on the target remote node. You can override this default when CXADDNODE prompts for input. The default is CRAY402R.

When you exit EDT, this revised copy of CXEQUATES.COM is used to create CXEQUATES.COM at the remote node.

Once the remote configuration files are updated and all automatic edits are complete, CXADDNODE copies the necessary files to the remote node, indicating the type of media used:

```
%CXADDNODE-I-COPY, Copying remote station files to NETWORK
Enter the password for this username:  (password is not echoed)
Verification:  (enter the password exactly as before)
```

These prompts are displayed only if you have chosen DECnet as the transport service used to copy the software.

Note

Secondary passwords are not supported.

A log of each copy operation is sent to the terminal:

```
%CXADDNODE-I-DECNETCOPY, Starting copy number 1 to node nodename
%COPY-S-COPIED, CRAY_STATION:[VAXFES]VRL.EXE;2 copied to
  nodename "CRAY_STATION password"::DUAO:[CRAY401R.VAXFES]VRL.EXE;4 (28 blocks)
```

If this remote is clustered, you will only see messages for downloading the appropriate three files. If the remote is not clustered, the messages indicating the copy operations will be much more extensive.

When the copying has completed, as shown by the following message, CXADDNODE is finished:

```
%CXADDNODE-S-DONE, CXADDNODE procedure completed
```

These messages also appear if you chose to save the CRAYCP input files:

```
%CXADDNODE-I-ATTUPD, Add file nodename_ATTACHED.CRAYCP$CONFIG to your attached
                     CRAYCP input file
%CXADDNODE-I-REMUPD, Save file nodename_REMOTE.CRAYCP$CONFIG for later updates to
                     node nodename
%CXADDNODE-I-CAUTION, The attached input file contains password information and
                      should be protected
```

If CXADDNODE detects an error, as shown by the following messages, the attached configuration database is restored to its original state:

```
%CXADDNODE-F-ERROR, CXADDNODE procedure detected an error
%CXADDNODE-W-DELNODE, Deleting node table entry from attached node

          ----various CRAYCP messages----

%CXADDNODE-I-ERRTERM, CXADDNODE procedure terminated because of error
```

If this occurs, determine the cause of the error, correct it, and repeat CXADDNODE.

If you plan to add or update more than one remote node, you may wish to use CRAYCP to modify the remote configuration file VCSRPC. Because CXADDNODE modifies file VCSRPC.EXE (based on your input to prompts) and then ships it to the remote node, any changes you make to fields other than those modified by CXADDNODE are shipped to each node.

Although you can use CRAYCP to look at the node table entry record in VCSRPC, each remote node receives a copy of its node table entry record from the attached station when a connection is established. The remote node's node table entry data is then updated. In general, node table entry changes for each node should be done to the attached configuration file VCSAPC, and not to the remote configuration file VCSRPC. See the *DEC VAX/VMS Station Administrator's Manual* for more information.

The following example illustrates how to add a non-VMS remote station. Only a subset of the questions are prompted for if the remote is a non-VMS node. Only the attached configuration input file is saved, because the remote configuration file is created and maintained by the non-VAX/VMS station software.

```
@CXADDNODE

  CXADDNODE will update the VAX/VMS attached and remote station configuration
  files with the minimum information needed to establish a new VMS remote
  station, and then download the necessary files to that machine if DECnet is
  available.

  For CLS-UNIX systems, CXADDNODE will configure the attached configuration
  file.  Configuration and loading of the remote software must be done on the
  remote machine.

  Please refer to the VAX/VMS Station or CLS-UNIX Installation Guide before
  starting this download operation, as there may be additional configuration
  fields which need to be coordinated between the attached and remote.

  Enter target operating system [VMS]: UNIX
```

The target operating system must be one of the following: VMS, UNIX, AEGIS, MVS, Ultrix, or Other. The default is VMS. If the answer is not VMS, CXADDNODE assumes that you are adding a CLS-UX remote, and you can respond to most of the prompts with <RETURN>.

```
Enter REMOTE or CLS [CLS]: CLS-UX
```

Press <RETURN> for CLS-UX remotes.

```
Enter transport service of DECnet,
TCP, or NETEX [TCP]:
```

Enter the transport service your remote will use.

```
      You will next be asked to supply a comment and connect nodename.
      The connect nodename is used by the attached station software to
      start communication with remote station nodes when using DECnet
      or NETEX protocols.  When using TCP/IP node names are not used,
      but rather internet number addresses and port numbers, and thus
      connect nodename is not prompted for when using TCP/IP.  Comment
      nodename is how the station knows the remote, and although not
      used to establish network connections, should agree with what is
      configured on CLS or VMS remote software.

      For more details refer to SV100.

Enter the comment nodename - this
is the name by which your node is
known in station displays.
CRAYCP field name is STATION_NAME:
```

Enter the station identifier of the remote station. This value must correspond to the CRAYCP NODE field STATION_NAME.

```
Do you want interactive enabled to this CLS [Y]?:
```

It is possible to disable the interactive pseudo device driver for this CLS-UX remote at this time.

```
Enter internet address as 192.9.0.64:
```

This prompt only occurs if you specified TCP as the transport service.

Enter the internet address of this CLS-UX remote. This information makes the attached station aware of your CLS-UX machine.

```
Enter CLS fetch staging TCP port ID:
```

This prompt only occurs if you specified TCP as the transport service.

This number provides the specific number of the fetch process at the CLS-UX remote. This number can be obtained from the CLS-UX system administrator.

```
Enter CLS dispose staging TCP port ID:
```

This prompt only occurs if you specified TCP as the transport service.

This number provides the specific number of the dispose process at the CLS-UX remote. This number can be obtained from the CLS-UX system administrator.

```
Save CRAYCP input files? [Y]:
```

If you answer Y (the default), CRAYCP input files are created as part of the procedure. These files contain the CRAYCP directives necessary to update the attached and remote configuration files for this node, and should be added to your local CRAYCP$CONFIG file.

This completes the prompting from CXADDNODE. You should now see the following message indicating that CXADDNODE is using CRAYCP to update the attached configuration database to reflect the new node:

```
Save CRAYCP input files? [Y]:
```

```
%CXADDNODE-I-ATTCONF, Updating VMS Station CRAYCP attached configuration file
                    ----various CRAYCP messages----
```

If you answered Y to the prompt about saving CRAYCP input files, the following message also appears:

```
%CXADDNODE-I-ATTSAVE, Attached CRAYCP input file saved as:
                        nodename_ATTACHED.CRAYCP$CONFIG
```

When the copying has completed, as shown by the following message, CXADDNODE is finished:

```
%CXADDNODE-S-DONE, CXADDNODE procedure completed
```

This message also appears if you chose to save the CRAYCP input files:

```
%CXADDNODE-I-ATTUPD, Add file [VAXFES.CF]nodename_ATTACHED.CRAYCP$CONFIG to your
                     attached CRAYCP input file
```

If this is the first CLS-UX remote you have configured, you must define two CRAYCP fields on the attached station. These fields define the TCP/IP port addresses for the VMS station's network listener and interactive listener. When CLS-UX remotes connect, these numbers must be given to the CLS-UX system administrator. The following commands can be used to define the two fields:

```
$ CRAYCP
CRAYCP> CONTEXT ASCD
CRAYCP> DEFINE ILTCPPORT xxxxxxx
CRAYCP> CONTEXT NODE
CRAYCP> DEFINE LISTTCPPORT1 xxxxxxx
CRAYCP> WRITE
CRAYCP> EXIT
$
```

Defining site-specific configuration parameters

CXADDNODE has completed all the necessary configuration changes on the attached station database to accommodate the new remote station. It has also made the minimum configuration changes on the remote station database necessary to install the remote station component; however, some changes to the remote station configuration database may be required. CXADDNODE issues the following CRAYCP commands to alter the attached and remote station configuration databases.

Attached station configuration database:

CRAYCP command	Description
NODE/CREATE	Create a new node table entry
DEFINE STATION_NAME *rem_node*	Remote node name
DEFINE PROTOCOL *protocol*	DECnet, NETEX, or TCP protocol
DEFINE REMTCPINET(0-3)	4-part TCP address
DEFINE REMTCPAPORT	Remote TCP acquire port number
DEFINE REMTCPDPORT	Remote TCP dispose port number
DEFINE STATION_NAME	Machine node name
DEFINE STATION_HOST	Station identifier
WRITE	Write attached station changes

Remote station configuration database:

CRAYCP command	Description
`DEFINE LOCALNODE` *rem_node*	Remote node name
`DEFINE NODENAME` *att_node*	Attached node name
`DEFINE DEFACC` *account*	Account name of remote station
`DEFINE DEFUIC` *uic*	UIC of remote station
`DEFINE DEFUSER` *username*	User name of remote station
`CONTEXT NODE`	Change context to node table
`DEFINE NODE` *rem_node*	Remote node name
`DEFINE PROTOCOL` *protocol*	Protocol type
`DEFINE STATION_NAME`	Machine node name
`DEFINE STATION_HOST`	Station identifier
`WRITE`	Write remote station changes

If the attached node name is different as seen from the remote node than as seen from the attached node, you must change the remote configuration parameter `LSCD NODENAME` to reflect the node name as known on the remote node. You can make additional changes to the remote configuration database by using the CRAYCP utility on the remote node. See the *DEC VAX/VMS Station Administrator's Manual* for a discussion of the remote configuration parameter options.

A number of VMS station CRAYCP fields have corresponding fields in the CLS-UX remote. When you configure a CLS-UX remote on the VAX side, these parameters are set up for you automatically. You will not have to worry about these parameters unless you wish to change them. By default, these parameters are set up on both the VMS station and the CLS-UX remote to be equivalent. If you change one of the parameters, you should change the corresponding parameter on the CLS-UX remote. The change is not mandatory, but keeping these parameters consistent is highly recommended.

In Table 2, the VMS station CRAYCP parameters are all in the NODE record for the particular CLS-UX connection. In the CLS-UX column, the fields are on the ATTNET, REMOTE, or LOCAL page, shown in Table 2 as a prefix to the field. The default values for all fields are in parentheses after the name.

Table 2. Corresponding VMS CRAYCP fields and CLS-UX fields

VMS station	CLS-UX server	CLS-UX remote
NODE.REMACQTASK (VRA)	ATTNET.ACQUIRENAME (VRA)	ATTNET.ACQUIRENAME (VRA)
NODE.REMDISTASK (VRD)	ATTNET.DISPOSENAME (VRD)	ATTNET.DISPOSENAME (VRD)
NODE.SEGSIZ (4096)	LOCAL.MAXSEG (4096)	
NODE.MAXOUT_CUR (2)	REMOTE.ACQMAX (2)	ATTNET.MAXACQUIRE (2)
NODE.MAXINT_CUR (2)	REMOTE.DSPMAX (2)	ATTNET.MAXDISPOSE (2)
NODE.MAXTOT_CUR (4)	REMOTE.TOTAL (4)	

Table 3 depicts the relationship among the VMS station CRAYCP NODE, CMD*xxx* fields and the CLS-UX CRAYCP FILTER page. These fields describe which CLS-UX user and operator commands are allowed or disallowed. The default values for COS connections for all fields are in parentheses after the name.

Table 3. Corresponding VMS CRAYCP fields and CLS-UX FILTER pages

VMS station	Default	Command	CLS-UX server and remote FILTER pages
NODE.CMDDATA	(ON)	DATA	(ON)
NODE.CMDDDROP	(ON)	DROP	(ON)
NODE.CMDENTER	(OFF)	ENTER	(ON) (user commands CLASS, PRIORITY, MAINFRAME, SWITCH, and TIMELIMIT)
NODE.CMDJOB	(ON)	JOB	(ON)
NODE.CMDJSTAT	(ON)	JSTAT	(ON)
NODE.CMDKILL	(ON)	KILL	(ON)
NODE.CMDLINK	(ON)	LINK	(ON)
NODE.CMDQUEUE	(ON)	QUEUE	(ON)
NODE.CMDRELEASE	(ON)	RELEASE	(ON)
NODE.CMDRERUN	(ON)	RERUN	(ON)
NODE.CMSUBMIT	(ON)	SUBMIT	(ON)
NODE.CMDSTATC	(ON)	STATC	(ON)
NODE.CMDSTATUS	(ON)	STATUS	(ON)
NODE.CMDTAPE	(ON)	TAPE	(ON)
NODE.CMDTJOB	(ON)	TJOB	(ON)
NODE.FORWARD	(OFF)	OFF	(OFF)
		ON	(OFF)

Completing the installation for all remote station types

To complete the installation of any remote station, restart the attached station and start station networking by issuing the OFF STATION, ON STATION, and ON NETWORK commands as follows:

```
$ CRAY OFF STATION
$ CRAY ON STATION
$ CRAY ON NETWORK
```

These commands bring in a copy of the updated configuration file modified by the CXADDNODE procedure. Because the OFF STATION command logs off all remote stations and logs the station off UNICOS or COS, you may need to delay issuing it; however, your remote station will not communicate with your attached station until you do.

The updates to the attached station for remote installation are complete at this point. If you are installing a VMS remote station, proceed to the next subsection for information on completing your remote station installation. If you are installing any other type of remote station, you now must coordinate with the remote station administrator to complete the installation of that software.

Completing the installation for VMS remotes

The final phase of the remote station installation consists of making the software known to VMS and defining the commands for user access. The CXINSTALLR and CXCRAYDEFR command procedures perform these functions at the remote node. To complete the installation of a VMS remote station, follow these steps:

1. Log on to the remote node in an account with CMKRNL, OPER, SYSNAM, SYSGBL, and SYSPRV privileges. This account must have access to the station files. Set the default directory to the [VAXFES] subdirectory of the remote station, where *disk* names the disk on which the remote station software resides:

```
$ SET DEFAULT disk:[CRAY402R.VAXFES]
```

2. Remove any previous VMS station software running under your station logical name with the CXREMOVER procedure:

```
$ @CRAY_STATION:[VAXFES]CXREMOVER    ! Old station directory
```

3. If your remote station shares files with the attached station's [VAXFES] directory, (you answered [Y] to the CXADDNODE prompt "Will the VMS remote share files from this directory?" page 34) you must execute two DCL commands before installing with CXINSTALLR. If you do not share files with the attached station's VAXFES directory, go on to step 4.

   Issue the following DEFINE and SET commands before running CXINSTALLR:

```
$ DEF/PROCESS/TRANS=CONCEALED CRAY_STATION disk:[CRAY402R.],
                                          disk:[CRAY402A.]
$ SET DEF CRAY_STATION:[VAXFES]
```

4. Install the station software using CXINSTALLR:

```
$ @CXINSTALLR
```

You receive the following messages:

```
__Driver____Start___End___Dev___DDB_____CRB_____IDB____Unit__UCB___
VIDRIVER    801CACB0 801CB4F0

            80318C40 803098E0 8031D260

           0 801CB7A0

%SYSTEM-W-NOSUCHSEC, No such global section (If first install after a reboot)
%CX-I-NON_OP, The station is not operational - commands limited
%CX-I-LOGTRN, Installing from: disk:[CRAY402A.VAXFES]
%CXINSTALLA-S-INS, Cray VMS station software successfully installed
```

The first four lines are output from the VMS SYSGEN utility, indicating that the interactive pseudo device driver was successfully loaded. (The driver addresses may be different for your configuration.) If the driver has already been loaded by a previous CXINSTALLA, no reload is performed and these messages do not appear.

The first message (%SYSTEM-W-NOSUCHSEC) results when the station has not been previously installed with the configuration you are loading. The next message (%CX-I-NON_OP) results when CXINSTALLR invokes the Cray context utility in order to perform an ON STATION command. The third message (%CX_I_LOGTRN) indicates the disk and directory you are using to install the station. The final message (%CXINSTALLR-S-INS) indicates that the station was successfully installed.

If CXINSTALLR detects an error, it automatically removes the station for you by calling CXREMOVER. If this happens, you will see the following two messages:

```
%CXREMOVER-S-REM, Cray VMS station software successfully removed
%CXINSTALLR-F-NOTINS, Cray VMS station software not installed
```

Normally, messages are output before the station is removed to let you know why the installation failed. Correct the relevant fault and repeat this step.

5. Define the CRAY command for your process as follows:

```
$ @CXCRAYDEFR
```

This defines both the global symbol CRAY for your process and a logical name for accessing the station help file.

6. Start the remote station connection with the attached station. If the LSCD ONAUTO feature is enabled, a connection has been attempted during execution of the ON STATION command issued from CXINSTALLR, and this step is not necessary.

```
$ CRAY ON NETWORK
```

This same command must have been issued before on the attached station in order for the connection to complete. The ASCD NETON parameter can enable an ON NETWORK command to execute automatically during the ON CRAYLINK command on the attached station.

7. Add the call to CXINSTALLR in the system startup command procedure (SYS$MANAGER:SYSTARTUP.COM) on the remote node to install the station software automatically after a VMS reboot:

```
$ @disk:[CRAY402R.VAXFES]CXINSTALLR      ! In SYSTARTUP.COM
```

If this is not the only remote station on this VAX, you must also perform a CXCHOOSE before you call CXINSTALLR. Therefore, you must ensure that the correct configuration file is accessed. See "Installing an additional remote station," page 80 of SV–0100, and "The CXCHOOSE command procedure," page 94 of SV–0100, if this applies to you.

8. Add the call to CXCRAYDEFR in the system global login command procedure (SYS$MANAGER:SYLOGIN.COM) on the remote node to define the CRAY command for each VMS user. Since CXINSTALLA defines the logical name CRAY_STATION, you can refer to it in the SYLOGIN.COM file. Using this logical name reduces the number of edits required with future upgrades.

```
$ @CRAY_STATION:[VAXFES]CXCRAYDEFR      ! In SYLOGIN.COM
```

In addition, it is important that the following line be placed at the beginning of the station login command procedure and the beginning of each station user's LOGIN.COM file:

```
$ IF F$MODE() .EQS. "NETWORK" THEN EXIT
```

This ensures that DECnet transfers do not execute the station's login command procedure. You should also verify that the CXCRAYDEFR.COM file is accessible to all users (the protection should be W:RE) and that all users have read access to CXEQUATES.COM (the protection should be W:R).

If this is not the only remote station on this VAX, you should equate the symbol CRAY in SYLOGIN to execute CXCHOOSE (see "The CXCHOOSE command procedure," page 90 of SV-0100). Users then get the CXCHOOSE prompt the first time they issue the CRAY command at DCL level. The CRAY symbol is subsequently redefined by CXCHOOSE to point to the station chosen by each user.

9. Add a call to CXREMOVER in the system shutdown command procedure (SYS$MANAGER:SYSHUTDOWN.COM) on the remote node to automatically remove the station software upon VMS system shutdown:

```
$ @CRAY_STATION:[VAXFES]CXREMOVER   ! In SYSHUTDOWN.COM
```

You can use the CXREMOVER command procedure whenever it is necessary to remove the station from the VMS known file list on the remote node. It is recommended that the station remain installed and that you perform an OFF STATION command when it is necessary to terminate all of the station processes.

10. Check with your CRI VAX/VMS station regional support analyst to see if any fixes have been issued in conjunction with this release of the product.

The remote station software is completely installed at this point. Repeat the instructions in this section for each remote station that is communicating through the attached station.

Installing an additional attached station

The subsection entitled "Installing an additional attached station," shows you how to change the station driver and common services names (pages 88-9 of SV–0100). However, the command lines required for the rebuilding of the interactive listener were omitted. The following DCL commands are required for the rebuilding of the interactive listener VIL.

```
$ DEFINE/TRANS=CONCEALED CRAY_ROOT disk:[directory.]
$ SET DEF CRAY_ROOT:[VAXFES]
$ @[.IL.COM]VIL_BLDDRIVER
$ @[.IL.COM]VIL_BLDA
```

For a remote station, build the driver as follows:

```
$ DEFINE/TRANS=CONCEALED CRAY_ROOT disk:[directory.]
$ SET DEF CRAY_ROOT:[VAXFES]
$ @[.IL.COM]VIL_BLDDRIVER
$ @[.IL.COM]VIL_BLDR
```

Installing an additional remote station

The subsection entitled "Installing an additional remote station," shows you how to define the station logical name CRAY_ROOT (page 81 of SV-0100). The DCL command should be replaced with the following DCL command:

```
$ DEFINE/TRANS=CONCEALED CRAY_ROOT disk:[CRAY402R.]
```

Page

The change to the *DEC VAX/VMS Station Primer for COS*, publication SV–0360, is as follows:

- A correction to a parameter with DISPOSE

The DEFER parameter with DISPOSE

On page 70, the following command line is suggested as an "easy way to dispose your log file":

```
DISPOSE,DN=$OUT,TEXT=`alternate-location´,WAIT.
```

This command should be replaced with the following:

```
DISPOSE,DN=$OUT,TEXT=`alternate-location´,DEFER.
```

The DN=$OUT parameter names the dataset to be disposed. The DEFER option is not required but strongly recommended. Without it, your COS job is likely to finish before the DISPOSE statement executes, and the job log file will not reveal whether problems occurred in transfer. Using DEFER ensures that all error messages will be included in the log file.

Note

In all the DISPOSE *statements on pages 70 to 72 in SV-0360, the substitution of the* DEFER *parameter for the* WAIT *parameter is essential.*

Changes to the *DEC VAX/VMS Station Guide to Common Access Facilities*, publication SN–0362, are as follows:

- Additional instructions for attaching the interactive listener
- Minor changes in applications
- A change in the station's logical name

Attaching the interactive listener

As of release 4.01, you must attach to the interactive listener device by means of $ASSIGN VMS system service before calling the C_OPEN routine (SN–0362, pages 1-3). The system manager can find the name of your station's interactive device by looking at the IPDEVNAM field in the LSCD record of the configuration file using CRAYCP. (The default device name is VIA0:.)

Before proceeding with calls to the Common Access routines, issue a QIO SENSEMODE call to the interactive listener to determine whether the station is logged on to the Cray system.

Applications changes

Applications no longer need to include a call to $IODEF in their source code because this is done by the Common Access INCLUDE files.

The BYTLM quota may need to be increased in the SYSUAF file for users running Common Access applications. The suggested value for the BYTLM parameter is 16000. This is larger than the default value of the segment size with which the station is shipped, but the extra value allows for the handling of multiple operations.

Logical name change

At release 4.01 the Common Access interface was built with the station logical CRAY_STATION. This did not conform with the other station components which use CRAY_ROOT. At release 4.02, Common Access now uses CRAY_ROOT as its station logical name when building the interface.

Note

Examples of all the preceding changes and directions for their use can be found in the example program in the [.VAXFES.UI.SRC] *directory* CAMAIN.FOR.

Changes to the *DEC VAX/VMS Station Administrator's Manual*, publication SV–0363, include the following:

- A correction for the run command with LPBACKUTIL
- Directions for converting the PAF.DAT file to support the increase in the PAUTH node name length
- A description of configuration parameters involved in proxy transfers
- Additions and corrections to CRAYCP
- A note regarding the CRAYMSG utility
- A correction to the formula that determines optimum working set size
- A correction and addition to the Problem Analysis section of SV–0363
- Additional explanation regarding remote fields overlayed by the attached fields at ON NETWORK

Correction to LPBACKUTIL

On page 125 of SV–0363, directions in the first screen are incorrect. That screen should read:

```
$ CRAY SET DRIVER_PROTOCOL TRANSPARENT
$ SET DEF CRAY_STATION:[VAXFES.DT.EXE]
$ RUN LPBACKUTIL
```

This correction only affects users with FOL-3 (fiber-optic) VAX FEIs.

Changes to the PAUTH utility

To allow for additional flexibility in node names, the PAUTH node name length has been extended to 16 characters. To support this change, convert the existing PAF.DAT file by performing the following steps:

1. Set the default directory to CRAY_STATION:[GATE].
2. Generate a FDL file (PAF.FDL) using the DCL syntax ANAL/RMS/FDL PAF.DAT.
3. Make the following changes to the FDL file PAF.FDL.

Delete the line containing the IDENT field:

```
IDENT "19-APR-1989 10:55:59 VAX/VMS ANALYZE/RMS_FILE Utility"
```

Delete the line in the FILE section containing the NAME field:

```
NAME                    "CRAY_STATION:[GATE]PAF.DAT;1"
```

Delete all records belonging to the ANALYSIS_OF_* section:

```
ANALYSIS_OF_AREA 0
      RECLAIMED_SPACE              0

ANALYSIS_OF_AREA 1
      RECLAIMED_SPACE              0

ANALYSIS_OF_AREA 2
      RECLAIMED_SPACE              0

ANALYSIS_OF_KEY 0
 ! This index is uninitialized; there are no records.

ANALYSIS_OF_KEY 1
 ! This index is uninitialized; there are no records.
```

You must delete all lines following ANALYSIS_OF, including comments.

4. Change the SEG0_LENGTH for KEY 0 from 6 to 16:

```
KEY 0
      SEG0_LENGTH              6        ! Old line
      SEG0_LENGTH              16       ! New line
```

5. Issue the following DCL command, which converts the existing PAF.DAT file, using the PAF.FDL file you have just edited:

```
$ CONVERT/FDL=PAF.FDL PAF.DAT *
```

6. Delete all PAF.FDL files from the [GATE] directory.
7. Save the original copy of PAF.DAT for reference.

Required steps for proxy transfers

The VAX/VMS station software allows the users of one VAX station to access files from a different VAX station anywhere on the network. Users can submit jobs from the station they normally use (the originating station) that contain FETCH/ACQUIRE and DISPOSE statements accessing files from a different VAX/VMS station (the destination node). Any remote or attached VAX station that is properly authorized may be either the originator or destination node. The following is additional information regarding configuration parameters to enable proxy transfers.

Step one: CRAYCP parameter changes

The first step required to allow users to use the proxy staging feature of the VAX/VMS station network is to modify a number of CRAYCP parameters. The following CRAYCP parameters must be set to ON in the attached VAX/VMS station CRAYCP configuration database:

Record	Field	Description
ASCD	PROXYREDIR	Set to ON to enable proxy transfers for the entire station network.
NODE (destination)	PAF	Enables proxy for destination station.
NODE (destination)	PAF_DEFAULT	Determines if proxy is used by default.

In order for users on the destination node to use the PAUTH utility, the CRAYCP parameter must be set in the destination station as follows:

Record	Field	Description
LSCD	PAUTH	Set to ALLOW to enable users on one node to authorize users from other nodes for proxy transfers.

Step two: Authorizing users on the destination node

Once the attached and destination nodes' CRAYCP fields have been configured properly to allow proxy transfers, the user on the originating node must properly authorize her account on the destination node to access the desired files.

With SET HOST, the user on the originating node must log in to the destination node using the account (username/password) of

the owner of the files the originator wants to access. After logging on to the destination node, the user can run the VMS station PAUTH utility (by entering PAUTH at the VMS $ prompt) to authorize access to the desired files. At the PAUTH> prompt, the ADD command authorizes the originator to use the files as if the originator were the owner. (See "Proxy Staging and the PAUTH Utility," pages 95-100 in SV–0363.) Once the user has given herself proper authorization on the destination node with the ADD command of the PAUTH utility, she can log off and return to the origination node. An example of this session follows:

```
$ SET HOST destination_nodename
  USERNAME: username
  PASSWORD: password
$ !User is now on destination node
$ PAUTH
PAUTH> ADD originating_node::originating_node_username
PAUTH> EXIT
$ LOGOUT
```

Step three: Coding `TEXT` ***fields in*** `FETCH/ACQUIRE` ***or*** `DISPOSE` ***statements***

The originator can now build a job containing `FETCH/ACQUIRE` or `DISPOSE` commands accessing the files on the destination node. The `TEXT` field of these dataset staging commands contains a file specification with the destination node name and the file to access on the destination node. An example of this file specification follows:

```
destination_node::disk[directory]filename.type;version
```

Note that the user name and password are omitted from the file specification.

Considerations when configuring proxy transfers

There are several things to consider when configuring the VMS station network for proxy transfers. This subsection gives additional information on these special considerations. Information about unique VMS station configuration as well as processing performed depending on the settings of the various CRAYCP parameters are also included.

Any station in the VMS station network, the attached, any remote, and even CLS-UX stations, can be considered to be either the originating or the destination node. This feature allows users to submit jobs from any station in the network (the originating node) and access any datasets known only to a specific station in the network (the destination node). This implies the following:

- If the attached station is the destination node for dataset access, then the PAF and PAF_DEFAULT CRAYCP fields must be set to ON in Node Table Entry 0 (NTE 0).

  If the PAF_DEFAULT CRAYCP fields are set to OFF in Node Table Entry 0, you can still gain access to the destination node by using the /PAF qualifier to the $DISK staging command.

- If any remote station is the destination node for dataset access, then the PAF and PAF_DEFAULT CRAYCP fields must be set to ON in the Node Table Entry for the specific remote.

Processing a proxy transfer request

Once the station is configured to accept proxy transfer requests, users can submit jobs from the originating node and access datasets on the destination node. When the Cray operating system informs the attached station to handle a dataset transfer request, the attached VMS station receives the request and inspects the TEXT field of the request. If it finds the syntax of *node*:: in the TEXT field, it performs a number of checks to determine if the destination node (specified by *node*::) can process the request. These checks include the following:

1. If the CRAYCP field ASCD.PROXYREDIR flag is ON, the next check (described in point 2 following) is performed. If this flag is OFF, the originating node is sent the transfer request.

The following section, "What if proxy checks fail?" describes what the originating node does once it receives the dataset transfer request because one of the proxy transfer checks failed.

2. The attached station then determines if the destination station (specified as *node*::) can accept the request. If the CRAYCP field NODE*(destination-node)*.PAF flag is ON, the next check is performed. If the flag is OFF, the originating node is sent the transfer request.

3. The attached station then checks the CRAYCP field NODE*(destination-node)*.PAF_DEFAULT. If this field is ON, the dataset transfer request is then sent to the destination station. The section below entitled "Proxy transfers at destination node" describes what the destination node does with the proxy transfer request.

   If this field is OFF, the attached station then checks to see if the /PAF command qualifier is specified on the dataset staging command in the TEXT field ($DISK/PAF, for example). If this qualifier is specified, the attached station sends the request to the destination node. If this option is not specified, the originating node is sent the dataset transfer request.

What if proxy checks fail?

If one of the proxy staging checks fails at the attached station, the originating node is sent the dataset transfer request. The originating node will then attempt to stage the file (fetch or dispose) as specified in the TEXT field, including the *node*:: information. Therefore, this file syntax must be valid for the system performing the transfer. The user on the originating node must have DECnet proxy access to the file on the destination node.

Proxy transfers at destination node

Once the attached station sends the dataset transfer request to the destination node, that node must perform various checks on its own before staging the file.

The station then checks the Proxy Authorization File (PAF) for an entry describing the originating node and user name (in the format *originating_node::user_name*). If this format is found, information is extracted from the PAF (a station slot, basically). The station then uses this information to perform the dataset transfer in the context of the local user in the PAF.

If no match is found, then the transfer request is cancelled.

CRAYCP

This subsection contains the following:

- A new feature allowing control of the remote station's use of master operator commands
- A correction to the CONTEXT documentation
- Additional instructions for configuring the JOBUND parameter and the LISNUMBER field in the note table entry
- A description of new fields added to CRAYCP
- LSCD and NODE field dependencies
- Additional description of fields overlayed by the attached station when it connects through CRAYCP's ON NETWORK

Controlling the remote station's use of operator commands

With release 4.02 of the station, the scope of operator commands on a remote station can be limited through the CRAYCP configuration parameter CMDOPER.

If you set the CMDOPER field to DISALLOW in the remote station's configuration file, the remote station can no longer issue the following operator commands that will affect other attached or remote stations: DROP, JOB, JSTAT, KILL, MESSAGE, RELEASE, RERUN, SWITCH.

If you set CMDOPER to ALLOW, the remote station can issue operator commands that affect other attached or remote stations.

CMDOPER fields in the attached and remote stations must match. For a complete list of CMDOPER commands, see OPER under the online CRAY HELP.

VMS OPER privilege is required to issue any operator commands.

Note

The function of CMDOPER *is different in the attached station's configuration files, where it is used for controlling the use of Cray Master Operator commands. Master Operator commands can originate only from the attached station.*

Correction to* CONTEXT *documentation

Page 39 of SV-0363 erroneously added the qualifiers NAME=*DEFAULT to the CONTEXT command. These qualifiers are not applicable. To set the node context to node table 61, use the following CRAYCP command:

```
CRAYCP> CONTEXT/NTE=61
```

Configuring the node table entry (NODE)

The following gives additional instructions for configuring the node table entry with the JOBUNB field and the LISNUMBER field.

JOBUNB

JOBUNB enables or disables the blocking of Cray job input datasets at the attached node. This field must be set to ON or OFF for every node table entry at the attached station. These settings must match the node table for each remote station. Mixed settings for this field across a station network are not supported.

LISNUMBER

LISNUMBER indicates the maximum number of network listener processes that the station will activate when the ON NETWORK command is issued. With release 4.02, the value of this field must be 1. Multiple network listeners are no longer supported. However, the fields will remain in the configuration for use by CRI support staff. This field is only valid for the attached station's node table entry, NTE=0.

New* CMDxxx *fields for CRAYCP

The following fields have been added to CRAYCP in conjunction with the new UNICOS-only commands that may be supported at a future release. The modification of these fields has no effect on the station.

CMDUNIFILESTAT - UNICOS FILE STATUS
CMDUNIDISPLAY - UNICOS DISPLAY
CMDUNIDIRLIST - UNICOS DIRECTORY LIST

The following field has now been added to CRAYCP to allow or disallow the SHOW FILENAMES command:

CMDNAMES - CRAY SHOW FILENAMES

This command displays the names of the files currently in station staging.

The following three new text fields for the CRAYCP node table have been added to allow the attached VMS station manager to share information about the individual remote node that the attached station is serving.

Field Name	Value
AAANOTE1	Location: <Location of remote node>
AAANOTE2	Contact: <Person in charge of remote node>
AAANOTE3	Phone: <Phone number of contact person>

A possible use for these fields follows:

```
Chelmsford, UK
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```

STX_*xxx* *fields in the* NODE *table*

The following text provides additional information to the existing documentation in publication SV-0363 (page 88), but does not reflect a change in the software.

STX_*xxx* Field	Description
STXOPT_EXTRACT	For users without OPER privileges, determines the location from which Cray STATUS display information is retrieved. Must be ON or OFF. [STS_EXTRACT] If ON, STATUS information is retrieved from the local node's system status area. This area is maintained by the attached or remote station for that node. If OFF, STATUS information is retrieved directly from the Cray system at every refresh cycle. Note: If the user of the CRAY STATUS commands has OPER privilege, STATUS information is retrieved directly from the Cray system at every refresh cycle.
STXSEC_*xxx*	The following three fields control status filtering to this node's station (this node table entry). The fields are checked in the following order STXSEC_NODE, STXSEC_ATT, STXSEC_FREE. The station uses the first field set to ON and ignores the others. For example, to send back all status information available at the attached station to a remote station, STXSEC_NODE and STXSEC_ATT must be set to OFF to allow the STXSEC_FREE filter (if set to ON) to choose all information and pass it to the remote.

STX_xxx Field	Description
STXSEC_ATT	If ON, the attached station sends STATUS entries to this remote node containing entries for only those jobs that were submitted through this node's attached station network; that is, that were submitted by any remote node that is connected to the same attached station, or by the attached station itself. Must be ON or OFF. [LISMASK/STS_ATT]
STXSEC_FREE	If ON, the attached station sends back to this remote node any STATUS entries available to the attached station. Must be ON or OFF. [LISMASK/STS_FREE]
STXSEC_NODE	If ON, the attached station sends STATUS to this node containing entries for only those jobs originating from this node. Must be ON or OFF. [LISMASK/STS_NODE]

LSCD record field dependencies

For UNICOS 4.0 or later the RMSBLK field should always be set to ON to retain file structure.

Node table field dependencies

Version 4.02 of the software does not check for segment size equality. However, the following must be set correctly or failures may occur:

- For the attached station, SEGSIZ and SSGSIZ must be equal; if not, the station will not log on.
- The product of SEGSIZ and SBSEGS must be the same for all node table entries at both the attached and remote stations; if not, some file transfers will fail.

CRAYMSG.OBJ

The CRAYMSG utility is shipped already built because it is written in Fortran. If space is a concern and the .OBJ files are being considered for deletion, the object [.VAXFES.CM.OBJ]CRAYMSG.OBJ should not be deleted. If it is deleted, it must be regenerated by means of a Fortran compiler, or it must be retrieved from the backup tape.

Optimum working set size

In the "Performance Tuning" section of publication SV-0363, the formula for determining the optimum working set size for either VCA or VCD was erroneous (page 113). The correct formula is as follows:

```
Working set size - 156 + ( (SEGSIZ*SBSEG*MBCOUNT)/512)
```

Note

The interactive listener is now shipped with a default priority of 4. This restricts the amount of VMS resources VIL can use.

Problem analysis

The problem analysis section should include the following two additions: one should be added on page 159 in the subsection "Device driver error messages and codes." The other should be added to page 166 to the subsection "Monitoring and tracing the station."

Device driver error messages and codes

The station device driver generates some messages which are only reported on the operator's console. In this release, an extra message has been added to notify station operators about potential NSC HYPERchannel problems. The message is as follows:

```
**POSSIBLE ADAPTER CONTENTION OR HARDWARE PROBLEMS - PLEASE CHECK IF THIS
OCCURS REPEATEDLY
```

This message is displayed when the station driver is unable to reserve the local or remote adapter. If the adapters are reserved, this condition is usually temporary. If the message is continually displayed, however, one of two conditions exist: another user on the HYPERchannel has not unreserved one of the adapters; or there is a hardware problem. In either case, this problem should be investigated immediately.

Monitoring and tracing the station

The problem analysis subsection entitled "Monitoring and tracing the station" (page 166) describes the use of procedures DRIVER_TRACE.MONITOR and CRLNK_MONITOR. These names are misleading. The subsection should read as follows:

The command procedure DRIVER_TRACE.MONITOR monitors the station for logoffs. It runs as a background job in the VMS batch queue and checks once every 60 seconds to see whether the station is still logged on. If the station is not logged on, the monitor initiates a driver trace, dumps the trace results into a file with a unique name so that it will not be overwritten, and attempts to log the station back on to the Cray system.

Before you run the link monitor, do the following:

1. Build the driver trace (See "Enabling and disabling trace routines," page 178).
2. Set the CRAYCP LSCD RESTART field to OFF.
3. Check to ensure that the activating process has SYSNAM privilege by typing in SHOW PROCESS/PRIVILEGES.
4. Invoke the link monitor as follows:

```
$@CRAY_STATION:[VAXFES.TS.UTILS.CRLNK_MONITOR]CRLNK_MONITOR.START
```

The monitor initializes by defining the system logical name TRACE$CONTINUE. It polls the station for logoffs until you deassign TRACE$CONTINUE by issuing the VMS DEASSIGN command as follows:

```
$ DEASSIGN/SYSTEM TRACE$CONTINUE
```

Remote fields overlayed by the attached fields

Page 28 of SV–0363 explains "The remote station uses its own entry very briefly, until it connects with the attached station (ON NETWORK). After the connection is established, the attached station downloads its copy of the remote station's NODE record to the remote station, thereby overwriting the remote station's copy."

The above paragraph needs further clarification with the following description.

If the remote station logs onto the attached station at ON NETWORK, several of the remote's fields are overwritten by the attached station's configuration files. These fields are as follows:

CMD*ccc*
MAXINT_CUR
MAXINT_MAX
MAXMTT_CUR
MAXMTT_MAX
MAXOUT_CUR
MAXOUT_MAX
MAXTOT_CUR
MAXTOT_MAX
OSLEVEL
SEGSIZ

Once the remote is logged on to the attached at ON NETWORK, the downloaded values of MAX*xxx* take effect, and the number of VRA and VRD processes on the remote will be the number configured on the attached station for that remote node. However, if the remote station does not log on to the attached station at ON NETWORK, the number of staging streams is determined by the number set in the remote node's configuration file.

Once the remote station is logged on to the attached at ON NETWORK, a bit mask is sent to the remote node indicating which commands it is allowed to use. However, if the remote station does not log on to the attached station at ON NETWORK, the remote station uses the commands allowable in its own configuration file.

For example, if the remote node's configuration files allow the SUBMIT command, but the attached station disallows the SUBMIT command for the same remote node, the remote node must SUBMIT the job to be queued before the remote node is logged on to the attached. If the remote node tries to submit a job after it is logged on to the attached, the job will be disallowed by the attached.

With UNICOS 5.0 and greater, you must make sure the OSLEVEL is set correctly at the remote node to enable the transfer of character-blocked UNIX data. CRI recommends setting the attached and remote node table entries to identical values. If the OSLEVEL is set incorrectly in the remote node's configuration file, and the job is sent to the Cray system before the remote node is logged on to the attached station, then the job may not be successfully read by the Cray system.

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