

NQE Installation

SG-5236 3.3

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New Features

NQE Installation

SG-5236 3.3

The NQE 3.3 release has the following features that affect installation and upgrade of NQE:

- Support was added for the following operating system levels: UNICOS/mk 2.0, UNICOS 10.0, HP-UX 10.10 (initially supported in the NQE 3.2.2 release), and IRIX 6.5. For a complete list of operating systems and release levels supported with the NQE 3.3 release, see Table 1, page 1.
- The `qstart(8)` and `qstop(8)` commands now allow an administrator to execute programs immediately before and after the NQS daemon starts (`NQE_ETC/q start.pre` and `NQE_ETC/qstart.pst`, where `NQE_ETC` is defined in the `nqeinfo` file) and immediately before and after the NQS daemon is shut down (`NQE_ETC/qstop.pre` and `NQE_ETC/qstop.pst`, where `NQE_ETC` is defined in the `nqeinfo` file). The administrator must create the files, and they must be executable.
- All `nqeinfo` file variables are now documented on the new `nqeinfo(5)` man page; this man page is also accessible through the Help facility of the NQE configuration (`nqeconfig`) utility.
- This release replaces the `NQE_TYPE` variable in the `nqeinfo(5)` file with a new `NQE_DEFAULT_COMPLIST` variable, which defines the list of NQE components to be started or stopped. The NQE 3.3 release is shipped with the `NQE_DEFAULT_COMPLIST` variable set to the following components: `NQS`, `COLLECTOR`, and `NLB`.

For a complete list of new features for the NQE 3.3 release, see the *NQE Release Overview*, publication RO-5237 3.3.

Record of Revision

<i>Version</i>	<i>Description</i>
1.0	December 1993. Original Printing. This publication describes how to install the Cray Network Queuing Environment (NQE) 1.0 release.
1.1	June 1994. Incorporates information for NQE release 1.1.
2.0	May 1995. Incorporates information for NQE release 2.0. Information in this document also supports Network Queuing EXtensions (NQX) synchronous with the UNICOS operating system 9.0 release; however, NQE on UNICOS systems does not use the installation tool discussed in this document.
3.0	April 1996. Incorporates information for the NQE 3.0 release. NQE on UNICOS systems does not use the installation tool discussed in this document.
3.2	February 1997. Incorporates information for the NQE 3.2 release. Installation and upgrade procedures are included in this document for all systems that are supported by this NQE release.
3.3	March 1998. Incorporates information for the NQE 3.3 release. Installation and upgrade procedures are included in this document for all systems that are supported by this NQE release.

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Installation Overview [1]

The NQE 3.3 release is an independent installation. For all supported platforms, including the NQE subset (NQS and FTA) running on UNICOS, you should use the NQE installation and upgrade procedures in this document to install the NQE 3.3 release.

If you have received a new UNICOS or UNICOS/mk system that has NQE 3.3 preinstalled, Chapter 4, page 7, describes how to customize the NQE installation on your system.

NQE 3.3 supports the operating systems listed in the following table; the table also indicates whether or not NQE supports DCE on each platform:

Table 1. NQE 3.3 Supported Operating Systems

Operating system supported	NQE support of DCE on operating system
AIX 4.2	Yes
Digital UNIX 4.0	Yes
HP-UX 10.10	Yes
IRIX 6.2, 6.3, 6.4, and 6.5	Yes
Solaris 2.5	Yes
UNICOS 9.0.x	Yes
UNICOS 10.0	Yes
UNICOS/mk 2.0	No

Note: General product information about NQE is available at this URL:

<http://www.cray.com/products/software/nqe/>

Information about obtaining new releases is available at this URL:

<http://www.cray.com/products/software/nqe/download.html>

Summary of Installation Steps [2]

To install the NQE software, you will complete the following steps:

1. Read Chapter 3, page 5, which describes the NQE directory structure.

Note: The directory structure changed for the NQE 3.1 release.

2. If you received a new UNICOS or UNICOS/mk system that has NQE preinstalled, follow the procedures in Chapter 4, page 7, to complete the NQE installation for your system.
3. If you are upgrading directly from the NQE 3.2 release to the NQE 3.3 release, follow the upgrade procedures described in Chapter 5, page 9.
4. If you are upgrading from an NQE release prior to NQE 3.2, you will first install NQE 3.3, and then follow the upgrade procedures described in Chapter 12, page 43.
5. If you plan to change your configuration from the default provided **or** if you are upgrading and plan to change your configuration from your previous NQE release, you must plan your configuration and determine NQE servers, clients, and port numbers as described in Chapter 7, page 15.
6. For UNICOS and UNICOS/mk systems, if you choose to install the `modules` package, install the package **before** you install NQE 3.3. For the `modules` package installation procedures, see Chapter 16, page 73.
7. Install NQE by following the appropriate set of procedures for your installation:
 - Installing NQE on systems other than UNICOS and UNICOS/mk, which is described in Chapter 8, page 21. This installation procedure uses the NQE `INSTALL` utility. For IRIX systems, NQE may also be installed by using `inst` utility, which is described in Chapter 9, page 27.
 - Installing NQE on IRIX systems by using the `inst` utility, which is described in Chapter 9, page 27.
 - Installing NQE UNICOS/mk systems, which is described in Chapter 10, page 29.
 - Installing NQE on UNICOS 9.0.x systems, which is described in Chapter 11, page 37. Cray PVP customers running UNICOS and running only

the NQE subset (NQS and FTA) should also use these NQE installation procedures.

8. Use the NQE version maintenance utility (`nqemaint(8)` command) to set NQE 3.3 to be the default version of NQE; `nqemaint` is described in Chapter 13, page 57.
9. Read Chapter 14, page 61, which includes important information you need to know **before** you start NQE.
10. If you are upgrading to NQE 3.3 on a Cray PVP system that is running a version of UNICOS before UNICOS 9.2, you should remove previous versions of NQX, NQS, and/or FTA that were bundled with UNICOS, as described in Chapter 15, page 69.

Appendixes in this installation guide provide information about preparing a node to run NQE, using the NQE configuration utility (`nqeconfig(8)` command), and mounting and unmounting CD-ROMs.

NQE Directory Structure [3]

Throughout this documentation, the path */nqebase* is used in place of the default NQE path name, which is */opt/craysoft/nqe* on UNICOS, UNICOS/mk, and Solaris systems and is */usr/craysoft/nqe* on all other supported platforms.

NQE 3.3 is installed into */nqebase*.

Figure 1, page 6, shows the NQE directory structure; the installed components are put into the directories shown in the figure. The symbolic links to the */nqebase/\$NQE_VERSION* directories are built when you run the `nqemaint(8)` command and click on the `Make Default` button.

The `dependencies` file includes a list of the supported operating systems and release levels. It also includes dependencies that you should be aware of **before** you start NQE. This information is also included in this NQE installation guide.

The `news` file contains descriptions of the new features and user-level compatibilities and differences. This information is also included in the *NQE Release Overview*, publication RO-5237 3.3, which is included with each NQE 3.3 release package.

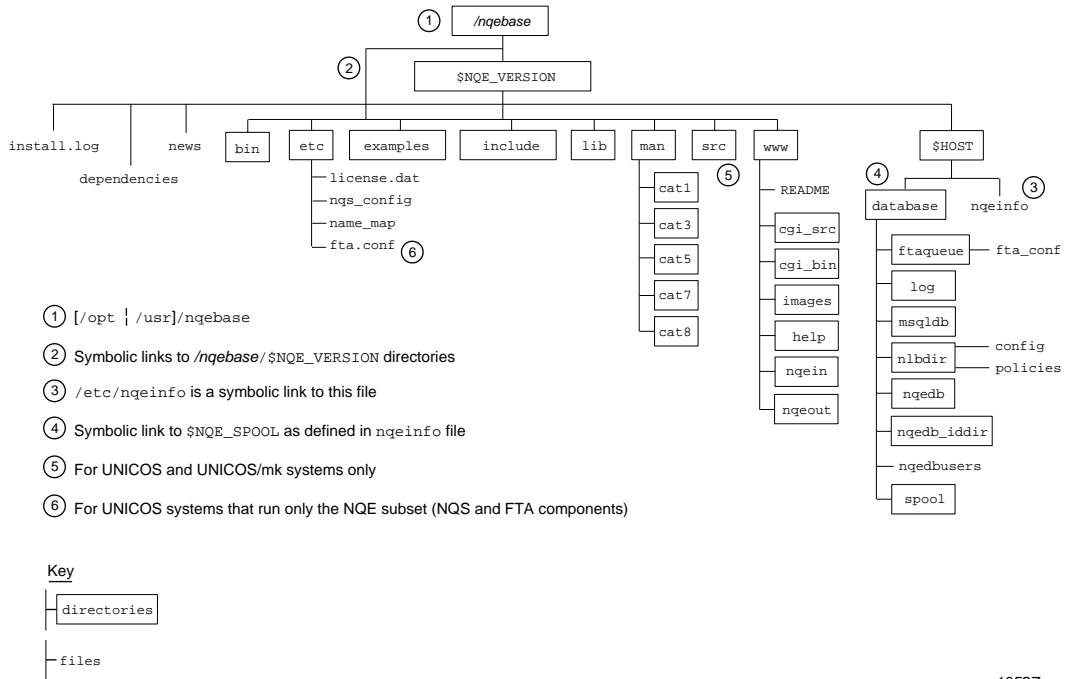


Figure 1. NQE Directory Structure

Each version of NQE is a complete copy in its own directory. Therefore, you can have any number of versions of NQE loaded. The link, /nqebase/bin, points to the default version of NQE. You can change this link by using the NQE version maintenance utility, which is invoked by the nqemaint(8) command. For information about using the nqemaint(8) command, see Chapter 13, page 57.

Customizing Preinstalled NQE [4]

If you have received a new UNICOS or UNICOS/mk system that was delivered with NQE preinstalled, you need to customize the NQE installation for your site. Complete the steps in this chapter if you have either the full NQE configuration or only the NQE subset (NQS and FTA) configuration.

Note: All steps in this chapter should be completed **before** starting NQE.



Caution: Ensure that you have installed your FLEXlm license file for this release. The FLEXlm license included with your NQE 3.3 release may be only a temporary license. If it is only a temporary license, you must order and install your permanent NQE license and then restart NQE 3.3.

Cray PVP UNICOS systems that run only the NQE subset (NQS and FTA) do not require a FLEXlm license file.

For information about FLEXlm licensing requirements, see Chapter 6, page 11.

The `modules` package should already have been installed on your system. To verify that the `modules` package is installed, enter the following command:

```
ls /opt/modules
2.2 modules
```

For information about installing `modules` with NQE, see Chapter 16, page 73.

For information about planning your configuration, see Chapter 7, page 15.

Note: To complete the following steps, you must have `root` permission.

To customize NQE software that has been preinstalled on your system, perform the following steps:

1. Attach your system to the network, and define the host name and IP address of the machine.
2. During the NQE preinstallation process, the symbolic link `/etc/nqeinfo` may have been created. Ensure that this symbolic link is removed by executing the following command:

```
rm -f /etc/nqeinfo
```

3. Create a host-specific configuration directory without a domain name extension, as follows:

```
cd /nqebase/version
mkdir `hostname | cut -d. -f1`
cd `hostname | cut -d. -f1`
```

For example, if you were installing NQE 3.3 on a system named `thunder.cray.com`, you should now be in the `/nqebase/3.3/thunder` directory.

4. Generate a new `nqeinfo` file by invoking the NQE configuration utility (`nqeconfig(8)`), as follows:

```
../bin/nqeconfig -a -o ./nqeinfo
```

For information about using the NQE configuration utility, see Appendix B, page 81.

A new `nqeinfo` file should now exist in the current directory; this file contains information specific to the host name of your system.

5. Create symbolic links by using the NQE maintenance utility (`nqemaint(8)`). First, invoke `nqemaint(8)` as follows:

```
export DISPLAY=myhost:0
../bin/nqemaint
```

After invoking the `nqemaint(8)` utility, click on the `Make Default` button to create all of the necessary symbolic links. After the process is complete, exit `nqemaint(8)`. For information about running `nqemaint(8)`, see Chapter 13, page 57.

6. Read Chapter 14, page 61, for important information you should know about **before** you start NQE 3.3.

To prepare a node to run NQE and to start NQE, see Appendix A, page 77.

For information about how to start and stop NQE, see the `nqeinit(8)` and `nqestop(8)` man pages. On UNICOS systems that run only the NQE subset (NQS and FTA components), for information about how to start and stop NQS, see the `qstart(8)` and `qstop(8)` man pages.

Upgrading Directly from NQE 3.2 to NQE 3.3 [5]

If you are upgrading to NQE 3.3 directly from the NQE 3.2 release, follow the steps listed in this chapter.



Warning: If you have jobs that are running or suspended, they can be preserved across an upgrade only on UNICOS and UNICOS/mk systems. If possible, jobs that are running or suspended should be allowed to finish before you upgrade NQE on UNICOS and UNICOS/mk systems, and these jobs must be allowed to finish before upgrading on all other platforms. Jobs that are queued are preserved across an upgrade on all platforms.

Note: This release adds a new *project_id* field to accounting records in the NQS accounting file (IRIX systems only). In order for this new `Project ID` column header to be written to the NQS accounting file (`nqsacct`), you must shut down NQE, rename the existing `nqsacct` file, and then restart NQE. NQS will then create a new `nqsacct` file with the new `Project ID` column header. For more information on the *project_id* field in accounting records, see the “Accounting records” subsection in the *NQE Administration*, publication SG-2150.

To upgrade to NQE 3.3 directly from the NQE 3.2 release, complete the following steps:

Note: To upgrade NQE, you must have `root` permission.

1. Shut down NQE.
2. Install NQE 3.3 according to the appropriate installation procedure in this document.
3. In the directory `/nqebase/3.3.x.x/bin`, use the NQE version maintenance utility (`nqemaint(8)`) to set NQE 3.3 to be the default version. For information about how to use `nqemaint(8)`, see Chapter 13, page 57.
4. Read Chapter 14, page 61, for important information that you should know about **before** you start NQE 3.3.
5. Because new NQE configuration variables were added in the NQE 3.3 release, use the default `nqeinfo` file that is provided with the NQE 3.3 release. Compare your NQE 3.2 `nqeinfo` file with the default NQE 3.3 `nqeinfo` file, and modify the NQE 3.3 `nqeinfo` file as needed by using

the NQE configuration utility (`nqeconfig(8)`). Do not use your NQE 3.2 `nqeinfo` file as direct input into NQE 3.3. (For information about how to use the NQE configuration utility, see Appendix B, page 81.)



Warning: It is strongly recommended that you do not modify the `NQE_NQS_SPOOL nqeinfo` file variable. If you choose to modify this variable, you must also ensure that the NQS log file path is correctly set by using the `qmgr(8)` command. Failure to do so may result in NQS log messages not being logged.

6. Start NQE. To prepare a node to run NQE, see Appendix A, page 77. For information about how to start and stop NQE, see the `nqeinit(8)` and `nqestop(8)` man pages.

FLEXIm License Requirements [6]

The software licensing used by NQE is based on the FLEXIm product from GLOBEtrotter Software, Inc. For all supported platforms, a FLEXIm license is required to use NQE.

Note: A FLEXIm license is not required for Cray PVP systems running UNICOS that will run only the NQE subset (NQS and FTA components).

For all systems except UNICOS and UNICOS/mk systems, NQE includes a temporary license so that you may install and use NQE on a temporary basis; you must get a permanent NQE license and restart NQE 3.3 once you have that license.

Note: If you have a new UNICOS or UNICOS/mk system that was delivered with NQE preinstalled, the FLEXIm license included with your NQE 3.3 release may be a temporary license. If it is only a temporary license, you must order and install your permanent NQE license and then restart NQE 3.3.

This chapter describes the following:

- NQE licensing type used
- Where to place your NQE `license.dat` file
- A sample `license.dat` file
- How to order your permanent NQE license for this release

For more information on FLEXIm, access the World Wide Web page for GLOBEtrotter Software, Inc., at the following URL:

<http://www.globetrotter.com>

Also, you may order the *Flexible License Manager End User Manual* from GLOBEtrotter Software, Inc., or from the Cray Research Distribution Center.

6.1 NQE Licensing Type

NQE 3.3 uses only server licenses. A *server license* regulates the number of NQS server nodes allowed to run requests. The server license specifies 0 (unlimited) users, but it is issued to a specific TCP/IP host name or hardware serial number. You must have a server license for each NQS server node in your system.

6.2 Where to Place Your NQE license.dat File

You should place your NQE `license.dat` file in the `/nqebase/etc` directory on all NQS server nodes. You do not need to place this file on systems that have only NQE clients.

You will need to know the TCP/IP host name and the host ID of each server. To display the host ID, execute the following command on each server:

```
# /nqebase/bin/lmutil lmhostid
```

Note: You can combine your NQE `license.dat` file with FLEXlm license files from other vendors. If you merge the NQE `license.dat` file into another `license.dat` file, or if you change the location of it, you must manually edit the `nqeinfo` file and change the `NQE_FLEXLM_LIC_FILE` variable to point to the new location. The `NQE_FLEXLM_LIC_FILE` variable cannot be changed using the NQE configuration utility (`nqeconfig(8)`).

If you have questions about your NQE `license.dat` file, contact your NQE customer service representative (see the *NQE Release Overview*, publication RO-5237, or the `cs_support(7)` man page).

6.3 license.dat File Example

The `license.dat` file in the following example lets NQE users run requests on one NQE server. Note the following in the example: `x.xxx` is the NQE version, `690ab753` is the `lmhostid` of the NQE server for which the license is intended; some of the lines in the example file are longer than 80 characters and may wrap on your screen; and lines that start with a `#` are comments.

```
# ++++ Start of the license file >>>>
#>
FEATURE nqe_fl craylmd x.xxx dd-mm-yy 50 3CA29267F7F7CF06DF66 "nqe_connections" ANY
FEATURE nqe_nl craylmd x.xxx dd-mm-yy 0 FC42125756DC8961AAB2 "nqe_server" 690ab753
FEATURE fta_nl craylmd x.xxx dd-mm-yy 0 2CC2724776DF7672B760 "fta_client" 690ab753
```

6.4 Ordering Your Permanent NQE FLEXlm License

Note: If you have a new UNICOS or UNICOS/mk system that was delivered with NQE preinstalled, the FLEXlm license included with your NQE 3.3 release may be a temporary license. If it is only a temporary license, you must order and install your permanent NQE license and then restart NQE 3.3. All other customers running NQE on a UNICOS or UNICOS/mk system do not need to order a permanent NQE FLEXlm license key.

You can get a permanent key through the World Wide Web (WWW) by going to this URL:

`http://www.cray.com/cgi-bin/keys/key_request`

You can also get a permanent key by faxing the following information to the Minnesota Distribution Center (MDC) Order Desk at (612) 452-0141 or by e-mailing the following information to the MDC Order Desk at `orderdsk@cray.com`:

Contact Name:

Company Name:

Address:

City:

State/Province:

Zip/Postal Code:

Country:

Main Phone:

Fax:

Company URL:

E-mail address:

Hardware type:

Entitlement ID:

lmhostid (comma separated list):

Note: Your Entitlement ID is a randomly generated number that was sent with your NQE software package. Your Entitlement ID allows you to get a permanent license.

Customers with valid NQE 3.2 FLEXlm licenses do not need new licenses for the NQE 3.3 release.

The information provided in the following sections will help you complete the electronic *SGI/Cray permanent FLEXlm key request form* on the WWW.

6.4.1 NQE Nodes

You will need to provide the NQE node machine host name(s) (`uname -n` command) and host ID(s) (`/nqebase/bin/lmutil lmhostid` command) for each NQE node.

Also, provide your machine type (for example, Sun SS1000) and operating system level (for example, Solaris 2.5) for each host name/host ID specified.

6.4.2 Registering Your Software

After you have requested a license key either through the WWW, Fax, or E-mail, you will receive a response within 24 hours, excluding weekends and holidays. Your 30-day warranty period will start the day you obtain the license file. For further information, contact your local support or sales representative.

Planning Your Configuration [7]

Read this chapter if one of the following statements is applicable:

- This is the first installation of NQE at your site.
- You are upgrading and plan to change your NQE configuration.

Otherwise, skip to the appropriate set of installation procedures.

The following sections describe configuration decisions you must make before you start the installation process, including the following:

- Planning server type(s) and clients
- Planning server configuration
- Planning an NQE cluster configuration
- Setting port numbers

7.1 Planning Server Type(s) and Clients

An NQE cluster can contain the following components defined by the `NQE_DEFAULT_COMPLIST` variable in the `nqeinfo(5)` file:

NQS	Network Queuing System
NLB	Network Load Balancer
COLLECTOR	NLB collector
NQEEDB	NQE database
MONITOR	NQE database monitor
SCHEDULER	NQS scheduler
LWS	Lightweight server

Beginning with the NQE 3.3 release, the default component list consists of the following components: NQS, NLB, and COLLECTOR.

NQE *clients* contain software that allows users to submit, monitor, and control requests by using either the NQE graphical user interface (GUI) or the command-line interface. From clients, users may also monitor request status, delete or signal requests, monitor machine load, and receive request output.

NQE clients also contain the NQE Web example, which provides a sample World Wide Web (WWW) interface to selected NQE functions. After it is installed, you can access the WWW interface through Web clients such as Mosaic or Netscape. This means that IBM PCs, Macintosh systems, workstations, and superservers can use NQE services. Through the WWW interface, you can submit a batch request (from a file or entered interactively), obtain status on your requests, delete your requests, and signal your requests. You also can view and save output files produced. Hypertext-based online help is provided.

If you are not sure where you want to run NQE components and clients, you should read *NQE Administration*, publication SG-2150, which provides detailed descriptions of NQE components and contains an appendix that introduces the concepts of simple networks, load-balanced networks, and the default NQE configuration.

7.2 Planning Server Configuration

After you have determined where in your NQE cluster you will run NQE components, clients, license servers, and other installation options, you must gather information about the hosts on which they will run. This information is used when you contact your NQE customer support representative to obtain your permanent NQE 3.3 license and during installation of NQE.

Note: If you will run the NQE database, you must select only one NQE database node (MSQL_SERVER) to run the NQE database, scheduler, and monitor. This is done by including NQEDB, SCHEDULER, and MONITOR in the list of configured NQE components specified for the NQE_DEFAULT_COMPLIST nqeinfo variable.

Also, you must configure the MSQL_SERVER host and the MSQL_TCP_PORT TCP/IP port for the NQE database mSQL server. These two settings must be the same on every machine (node) in the NQE cluster.

You must have information about host names, directories, and port numbers for the servers and clients you install. Table 2, page 17, describes the necessary directories and host names, lists disk space requirements, and identifies the defaults that the configuration procedure uses.

Table 2. NQE Configuration Information

Item	Description	Default value
<i>target_root</i> file system	The NQE version maintenance utility, <i>nqemaint(8)</i> , creates a directory tree under this directory. The NQE directory is installed in a subdirectory of the target root file system called <i>/craysoft</i> . Do not use a <i>tmpfs</i> (memory-based) file system.	<i>/opt</i> on Solaris, UNICOS, and UNICOS/mk systems and normally <i>/usr</i> on all other platforms. On UNICOS and UNICOS/mk systems, to install NQE, the <i>target_root</i> file system must be <i>/opt</i> .
	Systems other than UNICOS and UNICOS/mk need the following approximate amount of disk space, depending upon the system. NQE components and clients: approximately 22.7 Mbytes to 33.1 Mbytes of disk space. Client: approximately 9.25 Mbytes to 14.2 Mbytes of disk space.	
<i>/tmp</i> file system	UNICOS and UNICOS/mk systems need approximately 95 Mbytes of disk space. All UNICOS and UNICOS/mk systems require 95 Mbytes of disk space.	
NQE spool directory	All servers must specify the directory in which NQE working files (such as request files, output files, and the NLB database) are placed. For an initial installation, you need approximately .5 Mbytes of disk space, although the amount of required disk space will vary depending upon the type of logging you do and the number of jobs running.	<i>/usr/spool/nqe</i>
NLB server host name	All NQE nodes must specify the host name of the NQE nodes on which the NLB server runs. To ensure greater availability of the NLB server in the network, you can run redundant servers.	Local host

Item	Description	Default value
NQE database server host name (mSQL server host)	If you will use the NQE scheduler and NQE database, all nodes and clients must specify the host name of the NQE node on which the database server runs. Only one NQE node in the NQE cluster can run the database server, even if you install multiple NQE nodes.	Local host
NQS_SERVER	All clients must have a default NQS server host to process their requests. This value must be the host name of an NQS server.	Installation host for NQS servers; no default if installing on client

7.3 Planning a Cluster Configuration

When planning a cluster configuration, you will need to add mids (machine IDs) for all servers in the cluster to the NQS configuration on each server. Also, any NQS batch queues and pipe queues in addition to the default configuration should be added at installation time. This may be done by adding all mids and queues on the first server you install and then creating a snap file as follows:

```
% qmgr
qmgr: snap file = /tmp/snapfile
```



Caution: When you copy the snap file into `${NQE_ETC}/nqs_config` on other servers, ensure the `NQE_ROOT` has the correct value for the system. For example, a snap file written on an IRIX system, where the value of `NQE_ROOT` is `/usr`, will have the wrong path names if it is read without modification on a UNICOS system, where the value of `NQE_ROOT` is `/opt`.

Modify the snap file as needed so that paths match `NQE_ROOT`. In the case of pipe queues, the absolute path is not needed. For example, the default `nqenlb` load-balancing queue could be changed from the following:

```
create pipe_queue nqenlb priority=63 \
    server=(/nqbase/bin/pipeclient CRI_DS)
```

to the following:

```
create pipe_queue nqenlb priority=63 server=(pipeclient CRI_DS)
```

Servers with multiple network interfaces must have all interfaces named for the same mid, or a machine ID conflict is likely. If you are letting NQE calculate the mid, after NQE has calculated all the mids on one server, use those mid numbers when adding mids on all other servers. Using the above snap file

method to update the configuration on every other server will accomplish this for you. For example:

```
stone% netstat -i
Name  Mtu  Network  Address      Ipkts  Ierrs  Opkts  Oerrs
np1   16432 hyp/24   stone        45433  0      8303   38
fd0   4352  fddi/2  stone-fddi  1571299  1    836739  0
lo0   65535 loopback localhost     4905  0      4905   0

stone% qmgr
Qmgr: add mid stone stone-fddi
Qmgr: add mid clay clay-hyp
Qmgr: show mid
      MID          PRINCIPAL NAME  AGENTS  ALIASES
-----
10638371  stone          nqs     stone-fddi
10640917  clay           nqs     clay-hyp

clay% qmgr
Qmgr: add mid 10638371 stone stone-hyp
Qmgr: add mid 10640917 clay clay-hyp
```

If a machine ID conflict occurs, the following error message would appear in the NQS log on the server:

```
02/06/97 14:30:30:6777: prenetserver: 15097: 10485: netdaemon.c: 960:
nqs-617: WARNING: pre_server(): Conflicting mids for client :
cmid <10638371>, lmid <10638362>.
```

In this case, the mid for stone on stone (the client) is 10638371, but the server has 10638362 as the mid for stone and does not recognize stone.

If the server does not have a mid for stone, the following error message appears in the NQS log:

```
02/06/97 17:21:14:7567: prenetserver: 15097: 7047: netdaemon.c: 936:
nqs-614: WARNING: pre_server(): Client host name unknown to
local host.
```

7.4 Setting Port Numbers

The TCP/IP port numbers for NLB, FTA, the NQE database (mSQL), and NQS have default values, as shown in Table 3. These numbers must be the same for all nodes in the NQE cluster.

You must ensure that no other applications are listening on these ports. To display the ports that are in use, use the `netstat -a` command.

To determine the port numbers that are configured for the local system, examine the `/etc/services` file. If you are running NIS or NIS+, use the `yycat` command to search the `services` file for port numbers. For example, to determine if the TCP/IP port number configured for NQS is port 607, use the following command:

```
% yycat services | grep 607
nqs          607/tcp    # Network Queuing System
```

Note: For UNICOS and UNICOS/mk systems, the FTA port changed from 21 to 605 as of the NQE 3.1 release.

Table 3. NQE Default Port Numbers

Item	Description	Default value
mSQL port	TCP/IP port number for the NQE database (mSQL) server	603
NLB port	TCP/IP port number for NLB	604
FTA port	TCP/IP port number for file transfer	605
NQS port	TCP/IP port number for batch request transfers	607

Installing on Systems Other than UNICOS or UNICOS/mk [8]

This chapter provides NQE 3.3 installation procedures for AIX, Digital UNIX, HP-UX, Solaris, and IRIX systems.

Note: The IRIX `inst` installation utility is also supported for installing NQE 3.3. To use the `inst` utility, see Chapter 9, page 27.

For a list of the supported operating system levels, see Table 1, page 1.



Caution: Ensure that you have installed your FLEXlm license file for this release. The FLEXlm license included with your NQE 3.3 release is temporary; when you order your permanent NQE license, you must restart NQE 3.3. Customers with valid NQE 3.2 FLEXlm licenses do not need new licenses for the NQE 3.3 release.

For information about FLEXlm licensing requirements, see Chapter 6, page 11.

Note: To install NQE 3.3, you are required to have root permission.

The installation tool checks the version level of the product you are loading. If the same version level as the one you are trying to load already exists, you are prompted to defer or continue loading. If you choose to continue loading, the existing version is overwritten.

To install NQE on an AIX, Digital UNIX, HP-UX, Solaris, or IRIX system, complete the following procedure:

1. Verify that you have sufficient disk space and that your port numbers are correct for this release; see Table 2, page 17, and Table 3, page 20.
2. Ensure that the X Window System display environment variable `DISPLAY` points to your local X Window System server (that is, the workstation you are using to run the installation procedure). The installation tool uses the X Window System display determined by the `DISPLAY` environment variable.

For example, your local X Window System server is named `ice`, and you are installing NQE on a server named `snow`. If you use `sh` or `ksh`, the following command sets the environment variable:

```
export DISPLAY=ice:0
```

If you use `csch`, the following command sets the environment variable:

```
setenv DISPLAY ice:0
```

You must add the host on which you are installing NQE (which is `snow` in this example) to the client list on your X Window System server by using the `xhost` command. For example:

```
xhost snow
```

3. Mount the CD-ROM.

Place the CD-ROM into the caddy and insert it into the drive. To mount the CD-ROM, use the `mount(1M or 8)` command.

For system-specific reference material, see the `mount` and `showmount` man pages on your system. Also, Appendix C, page 89, includes examples of mounting the CD-ROM on supported NQE platforms.

Note: For Solaris systems. On Solaris systems, the Volume Management daemon automatically mounts the CD-ROM when you insert it at the mount point, `/cdrom/network_queuing_environment_33`. It also creates a symbolic link, `/cdrom/cdrom0`, which points to the `/cdrom/network_queuing_environment_33` directory. Mount commands are not necessary.

Note: NQE 3.3 may be installed from a remote CD-ROM drive mounted via NFS to the local system; however, there is one potential problem. If the NFS server and the NFS client are both capable of using the NFS version 3 protocol, files on the CD-ROM might not be accessible. Two known cases affecting the NQE 3.3 CD-ROM are Digital UNIX 4.0 and Solaris. For these cases, the NFS server (where the CD-ROM drive existed) was an IRIX 6.2 machine called pendulum.

The workaround is to force the mount command (on Digital UNIX 4.0 or Solaris) to use the NFS version 2 protocol. This may also be necessary on other operating systems. Sample mount commands on Digital UNIX 4.0 and Solaris follow, assuming that the CD-ROM drive is on a machine called pendulum and that the CD-ROM is mounted on pendulum as /CDROM.

```
Digital UNIX 4.0# mount -t nfs -o ro,nfsv2,soft,intr pendulum:/CDROM
/tmp/cdrom
Digital UNIX 4.0# cd /tmp/cdrom/INSTALL
Digital UNIX 4.0# ls
AIX      INSTALL  OSF1     SunOS5   common   DIST
HP-UX    IRIX5    IRIX6    IRIX64   SunOS4   client

Solaris# mount -F nfs -o ro,vers=2,soft,intr pendulum:/CDROM
/tmp/cdrom
Solaris# ls /tmp/cdrom/INSTALL
AIX      INSTALL  OSF1     SunOS5   common   DIST
HP-UX    IRIX5    IRIX6    IRIX64   SunOS4   client
```

4. Execute the following command:

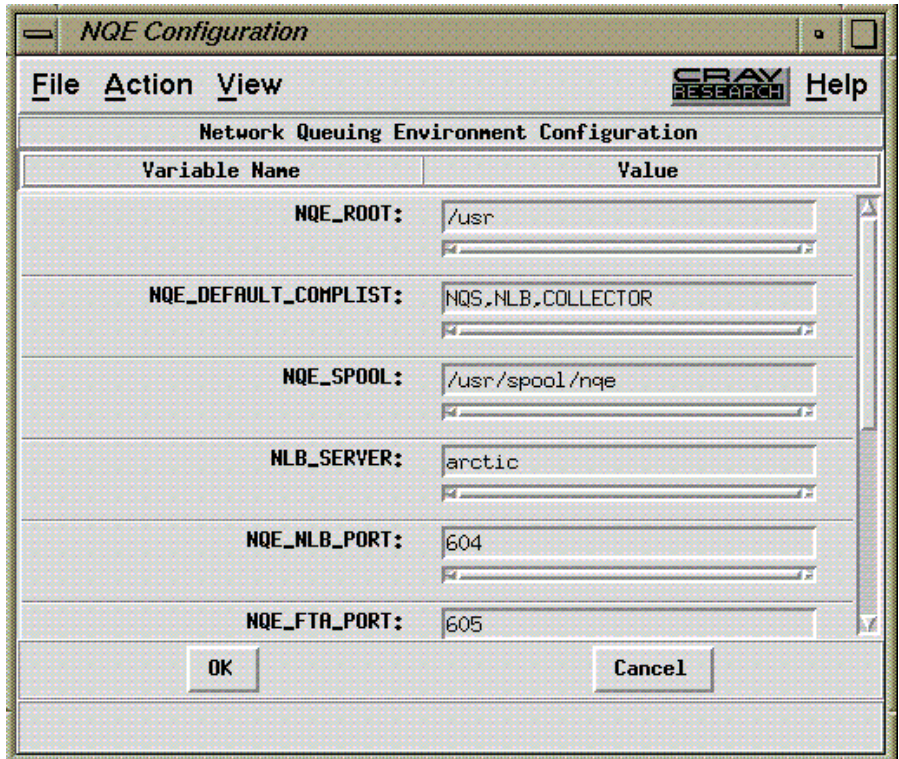
```
./INSTALL
```

A confirmation message will appear on the screen, as follows:

```
NOTE
installing NQE version on system
Operating system name = OS name
Operating system level = OS level
```

5. Enter **yes** at the prompt.

The following display will appear:



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Figure 2. NQE Configuration Install Display

6. If an NQE configuration file (nqeinfo file) already exists, the following screen will appear before you can continue:

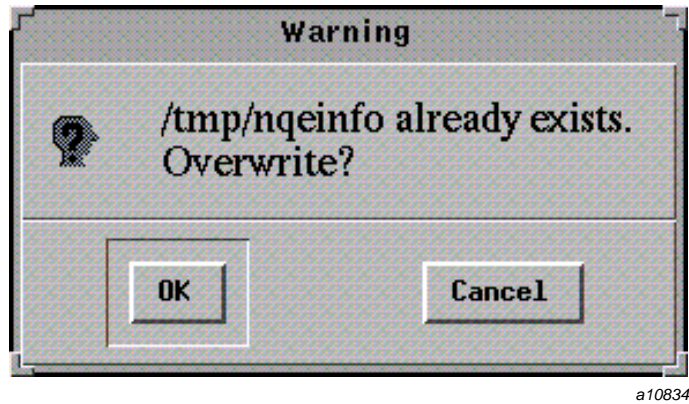


Figure 3. nqeinfo File Warning Screen

Click on OK and overwrite the existing file.

7. The following information appears on the NQE configuration Install display:
 - The host name; the NQE configuration utility defaults to the local host name returned by the `uname -n` command.
 - NQE component list (NQE_DEFAULT_COMPLIST). This is the list of NQE components which will be started or stopped by default when the `nqeinit` and `nqestop` scripts are used. The valid NQE components are as follows: NQS, NLB, COLLECTOR, NQEDB, MONITOR, SCHEDULER, and LWS. For more information on valid NQE components, see Section 7.1, page 15.

Note: For NQE client-only installation, this component is blank. If one or more components are specified, all NQE components are installed.
 - Port numbers; the default port numbers are provided.
 - The NQE_ROOT is the base location for the installation; it usually is `/opt` or `/usr`.

After you have entered the correct information for your installation, click on OK.

8. The procedure verifies that there is sufficient disk space available to load NQE. The installation will stop if not enough disk space is available. If less

than 10% of the space on the disk would remain available after the installation, you are asked if you want to continue the installation. The following is an example of the disk space verification messages:

```
Checking for space...available: 117342 1k bytes...needed
for nqe: 25807 1k bytes.
available after the load: 91535 1k bytes or 6% of disk.
Do you wish to continue with the load? [n/y] y
```

9. Once available disk space is confirmed, the installation process continues, and you will see the following messages:

```
Done checking for disk space.
Installing NQS into /nqebase/nqeversion.
installing MAN pages
MAN pages complete

INSTALLATION COMPLETE
```

10. Eject the CD-ROM.
11. If you are upgrading to NQE 3.3 directly from NQE 3.2, return to Chapter 5, page 9, and complete the upgrade steps.
12. If you are upgrading to NQE 3.3 from a release prior to NQE 3.2, skip to Chapter 12, page 43, and complete the appropriate upgrade procedure.
13. Otherwise, use the NQE version maintenance utility (`nqemaint(8)`) to make NQE 3.3 the default version. For information about how to use the NQE version maintenance utility, see Chapter 13, page 57.
14. Read Chapter 14, page 61, for important information you should know about **before** you start NQE 3.3.

For information about how to prepare a node to run NQE see Appendix A, page 77.

For information about how to start and stop NQE, see the `nqeminit(8)` and `nqestop(8)` man pages.

Installing on IRIX Systems Using the `inst` Utility [9]

This chapter describes how to use the IRIX `inst` utility to install NQE 3.3 on IRIX systems. For a list of the supported operating system levels, see Table 1, page 1.



Caution: Ensure that you have installed your FLEXlm license file for this release. The FLEXlm license included with your NQE 3.3 release is temporary; when you order your permanent NQE license, you must restart NQE 3.3. Customers with valid NQE 3.2 FLEXlm licenses do not need new licenses for the NQE 3.3 release.

For information about FLEXlm licensing requirements, see Chapter 6, page 11.

Note: To install NQE 3.3, you are required to have root permission.

To install NQE on an IRIX system, complete the following procedure:

1. Place the CD-ROM into the drive.
2. Using the left mouse button, select `System->Software Manager` on the pulldown menu.
3. On the `Available Software` list, select `/CDROM/dist`. The `dist` directory contains four directories as follows: `6.2`, `6.3`, `6.4`, and `6.5`.
4. Click on the desired type of installation (`Default Installation`, `Customize Installation`, or `Manage Installed Software...`).
5. Click on the desired IRIX system level and type of installation (`master` or `client`).
6. Click on the `Start` button. The `Log` screen will display the following message when the NQE installation is complete:

```
Installations and removals were successful.
```
7. Eject the CD-ROM.
8. If you are upgrading to NQE 3.3 directly from NQE 3.2, return to Chapter 5, page 9, and complete the upgrade steps.

9. If you are upgrading to NQE 3.3 from a release before NQE 3.2, skip to Chapter 12, page 43, and complete the appropriate upgrade procedure.
10. Otherwise, use the NQE version maintenance utility (`ngemaint(8)`) to make NQE 3.3 the default version. For information about how to use `ngemaint(8)`, see Chapter 13, page 57.
11. Read Chapter 14, page 61, for important information you should know about **before** you start NQE 3.3.

For information about how to prepare a node to run NQE, see Appendix A, page 77.

For information about how to start and stop NQE, see the `ngemaint(8)` and `ngestop(8)` man pages.

Installing on UNICOS/mk or UNICOS 10.0 Systems [10]

This chapter provides the NQE 3.3 installation procedures for UNICOS/mk and UNICOS 10.0 systems. The common installation tool (CIT) is used to install the NQE 3.3 software on these systems. For a complete list of the supported operating system levels, see Table 1, page 1.

If you have received a new system that has NQE 3.3 preinstalled, do not use the procedures in this chapter. Instead, follow the procedures provided in Chapter 4, page 7.

10.1 Before You Install NQE

This section describes activities you need to perform before you install NQE.

Note: To install NQE 3.3, you must have `root` permission.

10.1.1 FLEXlm License File

Ensure that you have installed your FLEXlm license file for this release. Customers with valid NQE 3.2 FLEXlm licenses do not need new licenses for the NQE 3.3 release. For information about FLEXlm licensing requirements, see Chapter 6, page 11.

10.1.2 modules Package

The `modules` package is included on the NQE release medium. If you do not already have this version of the `modules` package loaded on your system, it is highly recommended that you install it and make it available to the users of the NQE components. For installation instructions and information about using `modules` with NQE 3.3, see Chapter 16, page 73. If you choose not to install or use the `modules` package, you will get a warning message (as described in Chapter 16, page 73) during the installation of NQE 3.3; you may ignore this warning message.

10.1.3 Verify Disk Space and Port Numbers

Verify that you have sufficient disk space and that your port numbers are correct for this release; see Table 2, page 17, and Table 3, page 20.

Note: For UNICOS/mk systems, the FTA port changed from 21 to 605 as of the NQE 3.1 release.

10.1.4 Ensure Your `.rhosts` Files Are Configured Correctly

To use CIT, you must ensure that your `.rhosts` files are configured correctly by performing the following steps:

1. On the Cray Research system, log in as `root` and edit the `/.rhosts` file so that it includes your workstation name and your login name on the workstation, as shown in the following example:

```
crayname% cat /.rhosts
wrkstat01                workstation_login_id
wrkstat01.cray.com       workstation_login_id
```

2. On the local workstation, edit your `.rhosts` file to ensure that all paths to the Cray Research system are included. The list of paths is in file `/etc/hosts` on the Cray Research system. The associated login name must be `root`, as shown in the following example:

```
srkstat01% cat ~user_id/.rhosts
crayname                root
crayname-hyp            root
crayname-fddi           root
crayname.cray.com       root
crayname-hyp.cray.com   root
crayname-fddi.cray.com  root
```

3. Ensure that both connections work by issuing the following command:

```
wrkstat01% rsh crayname -l root "remsh wrkstat01 -l user_id uname -a"
SunOS wrkstat01 5.4 Generic_101945-38 sun4m sparc
```

10.2 Installing NQE

The installation tool checks the version level of the product you are loading. If the same version level as the one you are trying to load already exists, you are

prompted to defer or continue loading. If you choose to continue loading, the existing version is overwritten.

Note: To install NQE 3.3, you must have `root` permission.

To install NQE 3.3, perform the following steps:

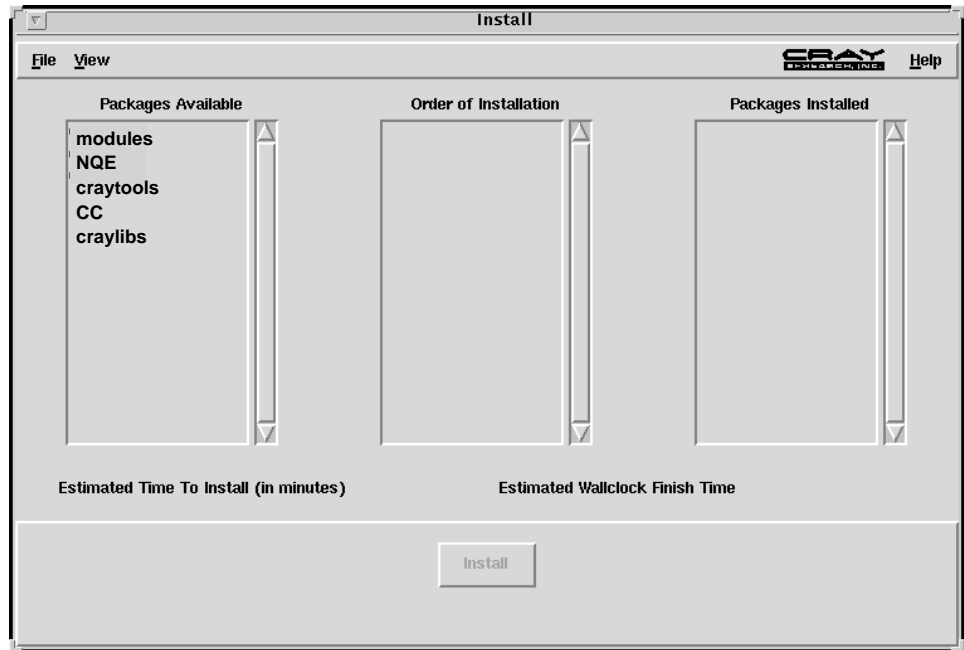
1. A copy of CIT is included on the CD-ROM with the software. To use that copy, change directories as follows.

```
wrkstat01% cd /cdrom/cdrom0
```

2. The routine `setup` determines the type of front-end system (Solaris or SunOS) and passes the parameters to CIT. In the current directory, execute the following command to install the software:

```
wrkstat01% setup -c crayname -l root .
```

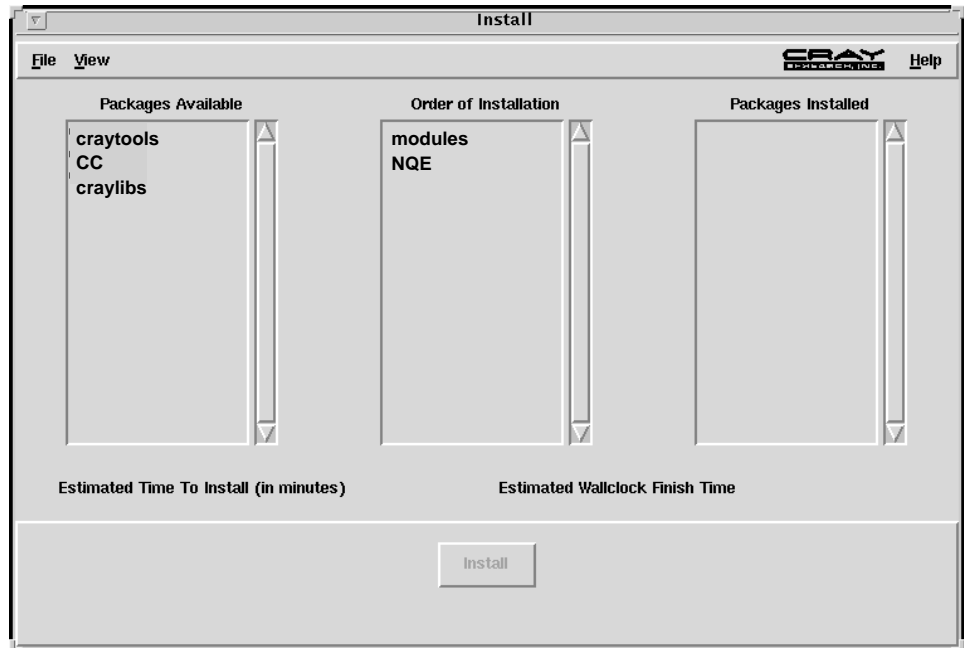
The *crayname* argument is the name of the Cray Research machine on which you are installing the software. If you are installing from CD-ROM, the path is `/cdrom/cdrom0`. The following main menu appears:



a10721

Figure 4. CIT Main Menu

3. Select the packages to be installed by using the left mouse button and double-clicking on the products listed in the leftmost window. The products will be installed in the order in which you select them. Selected items will move from the leftmost window to the middle window. In the following example, `modules` and `NQE` were selected.



a10722

Figure 5. Product Selection in CIT

4. To initiate the installation, click on the `Install` button.
5. Before the installation actually begins, you must answer the questions on the `NQE Pre-install queries` menu. A separate menu appears for each product you are installing.

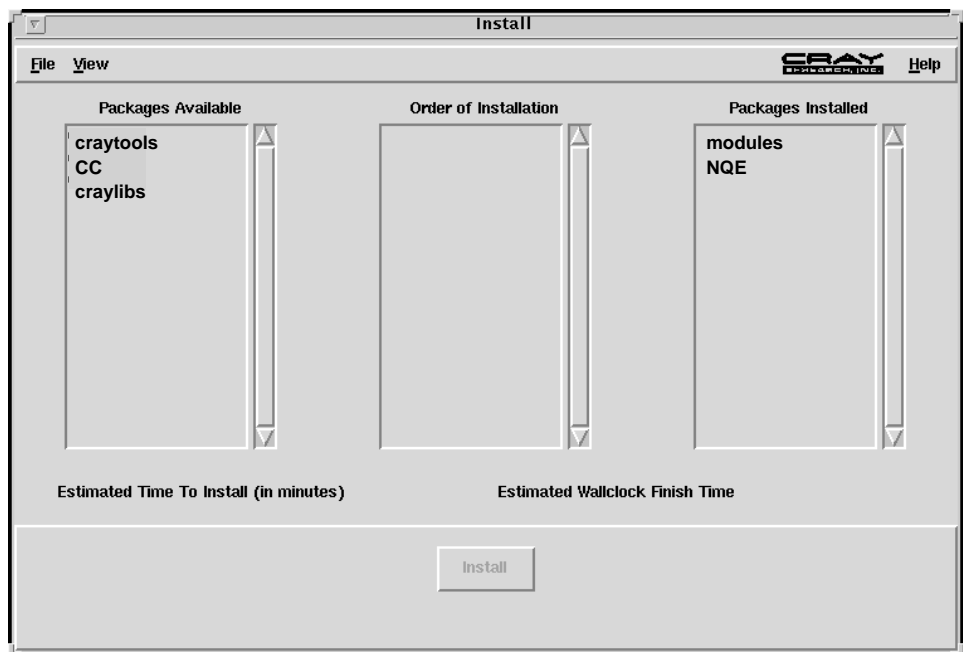


Caution: You must select no for the `Make this vers default?` question when installing `NQE`.

When you have answered the questions, click on the `Done` button.

6. During installation, a speedometer screen (called the `Product speedometer window`) and a log screen appear for each product being installed. To interrupt the installation, press the `Stop` button. This activates the following buttons:
 - `Resume`, which can restart the installation from the last checkpointed task associated with the product

- Restart, which restarts the installation from the beginning
 - Cancel, which returns control to the main menu
7. When the installation is complete, the products that have been installed move from the middle window to the rightmost window in the main menu, as in the following example:



a10725

Figure 6. CIT Packages Installed Display

8. If you are upgrading to NQE 3.3 directly from NQE 3.2, return to Chapter 5, page 9, and complete the upgrade steps.
9. If you are upgrading to NQE 3.3 from a release before NQE 3.2, skip to Chapter 12, page 43, and complete the appropriate upgrade procedure.
10. Otherwise, use the NQE version maintenance utility (`nqemaint(8)`) to make NQE 3.3 the default version. For information about how to use `nqemaint(8)`, see Chapter 13, page 57.

11. Read Chapter 14, page 61, for important information you should know about **before** you start NQE 3.3.

For information about how to prepare a node to run NQE, see Appendix A, page 77.

For information about how to start and stop NQE, see the `nqeinit(8)` and `nqestop(8)` man pages.

Installing on UNICOS 9.0.x Systems [11]

This chapter provides the NQE 3.3 installation procedures for UNICOS 9.0.x systems. UNICOS customers running only the NQE subset (NQS and FTA) should also use these NQE installation procedures.



Caution: Ensure that you have installed your FLEXlm license file for this release. Customers with valid NQE 3.1 FLEXlm licenses do not need new licenses for the NQE 3.3 release.

UNICOS customers running only the NQE subset (NQS and FTA) do not need to install and configure a FLEXlm license file for this release.

For information about FLEXlm licensing requirements, see Chapter 6, page 11.

The `modules` package is included on the NQE release medium. If you do not already have this version of the `modules` package loaded on your system, it is highly recommended that you install it and make it available to the users of the NQE components. For installation instructions and information about using `modules` with NQE 3.3, see Chapter 16, page 73. If you choose not to install or use the `modules` package, you will get a warning message (as described in Chapter 16, page 73) during the installation of NQE 3.3; you may ignore this warning message.

The installation tool checks the version level of the product you are loading. If the same version level as the one you are trying to load already exists, you are prompted to defer or continue loading. If you choose to continue loading, the existing version is overwritten.

Note: The procedural steps described in this chapter must be performed in the order specified. Doing so will install all parts of the NQE product.

The NQE 3.3 distribution package contains one `cpio` file with all of the NQE files and the installation script. For information about setting parameters and device names appropriate for your system and media type, see your UNICOS installation guide or the *UNICOS System Configuration Using ICMS*, publication SG-2412.

Note: To install NQE 3.3, you are required to have root permission.

To install NQE 3.3, perform the following steps:

1. Verify that you have sufficient disk space and that your port numbers are correct for this release; see Table 2, page 17, and Table 3, page 20.

Note: For UNICOS and UNICOS/mk systems, the FTA port changed from 21 to 605 as of the NQE 3.1 release.

2. Invoke the installation tool as follows:

```
cd /etc/install
./install
```

3. From the UNICOS Installation/Configuration Menu System menu, select Release Media Management.
4. Select Define Load Device and set parameters appropriate to your load device. Also set Miscellaneous Load Options to **-A**.
5. Return to the UNICOS Release Media Management menu by pressing **e** twice.
6. In the UNICOS Release Media Management menu, position the menu prompt next to the Load asynchronous product selection, as shown in the following screen, and press RETURN.

```

                Release Media Management
          Define load device ==>
                .
                .
                .
          A-> Load asynchronous product ...
    
```

7. Depending on the selected method of loading or the load medium, a message such as the following appears on the screen:

```

Load Manager: Loading Async from Tape
Device (Root - / )
Mount ASYNC0 tape on the local J90_EL style
tape drive, then press return:
    
```

Verify that the release medium is mounted on the chosen device and press RETURN.

8. If the package you loaded contains multiple products, the following screen appears:

```
Distribution Package

M-> Distribution Package Contents ==>
    Load selected products...
```

9. To view a list of individual products in a package, position the M-> menu prompt at the Distribution Package Contents menu item and press RETURN.

A form menu describing the package contents is displayed as shown in the following example:

```
Distribution Package Contents

Load ? [Description] [Vol] [Pos] [Directory]
-----
E-> YES Package 1      0    0    pkgdir0
    YES Package 2      0    1    pkgdir1
    YES Package 3      0    2    pkgdir2
    .
    .
    YES Package N      0    n    pkgdir(n)

Keys: ^? Commands H Help Q Quit V ViewDoc W WhereAmI
```

By default, all packages are loaded when you select the Load selected products action item of the Distribution Package menu.

Note: If your screen is not wide enough to display the full form menu, an > or < symbol appears in the direction of the undisplayed information. Use the > and the < keys to scroll the screen from side to side.

The NQE installation is now complete.

10. Make the following changes to the installation tool settings so that future use of the tool does not corrupt your NQE 3.3 nqeinfo file.



Caution: Remove the entries from the Utilities menus before making configuration changes.

- a. Remove all NQS, NQE, and FTA entries from the following tables:
 - UNICOS Installation/Configuration Menu
System->Utilities->Conversion Utility->Conversion Table
 - UNICOS Installation/Configuration Menu
System->Utilities->Import Utility->Import Table
 - UNICOS Installation/Configuration Menu
System->Utilities->Activation Utility->Activation Table
 - b. In the UNICOS Installation/Configuration Menu
System->Configure System->Startup (/etc/rc)
Configuration list, change the NQS log file path to be the NQE default path (as shown below) or the path where you want the NQS log file to be located:

NQS logfile (blank = /usr/spool/nqs/log)/usr/spool/nqe/log
 - c. In the UNICOS Installation/Configuration Menu
System->Configure System->System Daemons
Configuration->System Daemons Table, change the NQS daemon setting to NO (not required).
 - d. In the UNICOS Installation/Configuration Menu
System->Configure System->Major Software Configuration
list, change the FTA and NQS settings to OFF.
 - e. In the UNICOS Installation/Configuration Menu
System->Configure System->Configurator Automation
Options list, change the FTA, NQS, and NQE configuration settings to NO.
11. If you are using USCP, as of the NQE 3.1 release, the locations of the NQS user commands moved from /usr/bin to /nqebase/bin. USCP must be configured with the correct location for the NQS user commands. There is a USCP run-time configuration parameter that can be set to override the default location of /usr/bin. To make this change, you must modify the value of the USCP configuration parameter NQSDIR to be /nqebase/bin.

If you are using the installation tool, the menu path is as follows: UNICOS Installation/Configuration Menu System->Configure System->Network Configuration->USCP Configuration->General Parameter Overrides (uscp.rc).

Otherwise, you can edit the USCP run-time configuration file in `/etc/config/uscp.rc` and add the following line:

```
NQSDIR /nqbase/bin
```

Once the run-time configuration file is changed, you need to stop and then start USCP for the change to take effect.

12. If you are upgrading to NQE 3.3 directly from NQE 3.2, return to Chapter 5, page 9, and complete the upgrade steps.
13. If you are upgrading to NQE 3.3 from a release before NQE 3.2, proceed to Chapter 12, page 43, and complete the appropriate upgrade procedure.
14. Otherwise, use the NQE version maintenance utility (`nqemaint(8)`) to make NQE 3.3 the default version. For information about how to use the NQE version maintenance utility, see Chapter 13, page 57.
15. Read Chapter 14, page 61, for important information you should know about **before** you start NQE 3.3.

For information about how to prepare a node to run NQE see Appendix A, page 77.

For information about how to start and stop NQE, see the `nqeinit(8)` and `nqestop(8)` man pages. For UNICOS systems that run only the NQE subset (NQS and FTA components), for information about how to start and stop NQS, see the `qstart(8)` and `qstop(8)` man pages.

Upgrading from a Release Prior to NQE 3.1 [12]

Note: If you are upgrading from a UNICOS 9.0 system that has NQS and FTA software bundled in your operating system and are upgrading to the NQE 3.1 release, follow the steps in this section.

If you are upgrading to NQE 3.3 from a release prior to the NQE 3.1 release, follow the procedures in this chapter **after** you have installed NQE.

If you are upgrading to NQE 3.3 directly from the NQE 3.1 release, follow the steps listed in Chapter 5, page 9.



Warning: If you have jobs that are running or suspended, they can be preserved only across an upgrade on UNICOS systems. If possible, jobs that are running or suspended should be allowed to finish before you upgrade NQE on UNICOS systems, and these jobs must be allowed to finish before upgrading on all other platforms. Jobs that are queued are preserved across an upgrade on all platforms.



Warning: It is strongly recommended that you do not modify the `NQE_NQS_SPOOL nqeinfo` file variable. If you choose to modify this variable, you must also ensure that the NQS log file path is correctly set by using the `qmgr(8)` command. Failure to do so may result in NQS log messages not being logged.

Note: To upgrade NQE, you must have `root` permission.

Note: For UNICOS systems, as of the NQE 3.1 release, the user and administrative commands for NQE, NQS, and FTA are now in `/nqebase/bin` and `/nqebase/etc`.

The steps in the rest of this chapter should be performed after NQE 3.3 is installed, but **before** you set NQE 3.3 to be the default version (by using the `nqemaint(8)` command), or use the NQE configuration utility (`nqeconfig(8)` command), or start NQE.

Also, you should read Chapter 14, page 61, for important information that you should know about **before** you start NQE 3.3.

12.1 Upgrading from NQE 3.0

Because new NQE configuration variables were added in the NQE 3.3 release, use the default `nqeinfo` file that is provided with the NQE 3.3 release. Compare your NQE 3.0 `nqeinfo` file with the default NQE 3.3 `nqeinfo` file, and modify the NQE 3.3 `nqeinfo` file as needed by using the NQE configuration utility (`nqeconfig(8)`). Do not use your NQE 3.0 `nqeinfo` file as direct input into NQE 3.3. (For information about how to use the NQE configuration utility, see Appendix B, page 81.)

No upgrade steps are required to upgrade from NQE 3.0 to NQE 3.3. To set NQE 3.3 to be the default NQE version, to prepare a node to run NQE 3.3, and to configure NQE variables, see the following:

- Chapter 13, page 57, NQE Version Maintenance Utility
- Appendix A, page 77, Preparing a Node to Run NQE
- Appendix B, page 81, Configuring NQE Variables

For information about how to start and stop NQE, see the `nqeinit(8)` and `nqestop(8)` man pages.

12.2 Upgrading from NQE 2.0

The procedures described in this section are required to upgrade NQE 2.0 NQE server nodes and clients:

For clients and NQE server nodes, see the following:

- Chapter 13, page 57, NQE Version Maintenance Utility
- Appendix A, page 77, Preparing a Node to Run NQE
- Appendix B, page 81, Configuring NQE Variables

For information about how to start and stop NQE, see the `nqeinit(8)` and `nqestop(8)` man pages.

Note: Steps 1 and 2 should be performed before you have stopped NQE 2.0.

1. Create a directory to hold files related to the current NQE 2.0 system by entering the following command:

```
mkdir backup_directory
```


2. Save the NQE 2.0 NLB configuration by using the following commands; these commands save the NQE 2.0 name map, the NQE 2.0 ACLs, and the NQE 2.0 FTA configuration:

```

/nqebase/bin/nlbconfig -mdump -f backup_directory/old_name_map
/nqebase/bin/nlbconfig -adump -f backup_directory/old_acl
/nqebase/bin/nlbconfig -odump -t FTA_CONFIG \
-f backup_directory/old_fta_config
/nqebase/bin/nlbconfig -odump -t FTA_DOMAIN \
-f backup_directory/old_fta_domain

```

These files will be used in steps 8, 9, and 10 if local modifications were made to your NQE 2.0 NLB name map, the `acl` file, or the FTA configuration.

3. Stop NQE 2.0 by executing the following command:

```
/nqebase/etc/nqestop
```

4. Move the NQE 2.0 NLB configuration from the NQE spool directory, by using the following command:

```
mv NLB_SERVER_DIR backup_directory
```

The `NLB_SERVER_DIR` setting is provided in your `/etc/nqeinfo` file.

Moving this directory forces the creation of a new `NLB_SERVER_DIR` that has the default NQE 3.3 NLB configuration when NQE 3.3 is first initialized.

5. Because new NQE configuration variables were added in the NQE 3.3 release, use the default `nqeinfo` file that is provided with the NQE 3.3 release. Compare your NQE 2.0 `nqeinfo` file with the default NQE 3.3 `nqeinfo` file, and modify the NQE 3.3 `nqeinfo` file as needed by using the NQE configuration utility (`nqeconfig(8)`). Do not use your NQE 2.0 `nqeinfo` file as direct input into NQE 3.3. (For information about how to use the NQE configuration utility, see Appendix B, page 81.)
6. Configure NQE as documented in the following:
 - Chapter 13, page 57, NQE Version Maintenance Utility
 - Appendix A, page 77, Preparing a Node to Run NQE
 - Appendix B, page 81, Configuring NQE Variables

7. NQE 3.3 is now your default version. Start NQE 3.3 by entering the following command:

```
/nqebase/etc/nqeinit
```

This step loads the new `NLB_SERVER_DIR`, which has the NQE 3.3 NLB default configuration.

8. If you have changed the ACL permissions in NQE 2.0, you must make the changes again for NQE 3.3. To determine whether you will need to make changes to the master ACL and default ACL, compare the file `config` in the NQE 3.3 `NLB_SERVER_DIR` with the copy of the NQE 2.0 file `config` in your backup copy of the NQE 2.0 `NLB_SERVER_DIR` that you made in step 4 above.

To determine whether you need to make changes to other ACLs, use the following command to obtain the default NQE 3.3 ACL configuration:

```
/nqebase/bin/nlbconfig -adump -f backup_directory/acl
```

Compare the content of this file with the content of the `old_acl` file created by step 2 above.

For more information about changing ACLs, see *Overview of NLB configuration* and *Configuring name maps, objects and ACLs in NQE Administration*, publication SG-2150.

9. If you have changed the FTA configuration in your NQE 2.0 system, you must make the changes again for NQE 3.3.

You can use the following commands to obtain the default NQE 3.3 FTA configuration:

```
/nqebase/bin/nlbconfig -odump -t FTA_CONFIG \  
-f backup_directory/fta_config  
/nqebase/bin/nlbconfig -odump -t FTA_DOMAIN \  
-f backup_directory/fta_domain
```

Compare the content of these files with the content of the files `old_fta_config` and `old_fta_domain` that were created in step 2 above to determine what changes you must make. For additional information on configuring FTA, see *FTA Administration in NQE Administration*, publication SG-2150.

10. If you have made changes to your NLB name map for NQE 2.0, you must make the changes again for NQE 3.3.

Because significant changes were made to the NLB name map in the NQE 3.0 release, it will not be useful to compare your modified NQE 2.0 name map to the NQE 3.3 name map. In your NQE 2.0 directories, you can find the default NQE name map in `/nqebase/2.0/etc/name_map`. Compare this NQE 2.0 default file with the NQE 2.0 file `old_name_map` that was created in step 2 above to determine what changes you must make. For additional information on configuring the name map, see *Configuring name maps, objects and ACLs in NQE Administration*, publication SG-2150.

11. If you have changed the NLB policies in NQE 2.0, you must reload your `policies` file. The current policy file is kept in `NLB_SERVER_DIR/policies`. In step 4 above, you moved the NQE 2.0 `NLB_SERVER_DIR` to `backup_directory`. You can compare your NQE 2.0 `policies` file from the backup location and use it to help you determine whether you need to change the NQE 3.3 default `policies` file in `NLB_SERVER_DIR`.

After you have modified the policies file, issue the following command to request that the NLB server reread the policies file:

```
/nqebase/bin/nlbconfig -pol
```

For further information on NLB policies, see *NLB Administration and Implementing NLB policies in NQE Administration*, publication SG-2150.

12. When you are finished with the conversion from the NQE 2.0 NLB configuration, you may remove the `backup_directory`.

12.3 Upgrading to NQE 3.3 If Running UNICOS 9.0 version of NQE, UNICOS 9.0 NQS/FTA (No NQX License)

The following steps apply to upgrades for full NQE 3.3 functionality and for the NQE 3.3 UNICOS subset (NQS and FTA components only).

1. Create a directory to hold files related to the current UNICOS system:

```
mkdir backup_directory
```

2. If your site uses NQS user exits, see Section 5.25.1, "NQS user exits for UNICOS and UNICOS/mk systems," in *NQE Administration*, publication SG-2150. Your current directory must be `/nqebase/${NQE_VERSION}` when you rebuild NQS.

- For NLB server nodes, if local modifications were made to the NLB name map or ACLs, save the current NLB configuration by using the following commands:

```
/usr/bin/nlbconfig -mdump -f backup_directory/old_name_map
/usr/bin/nlbconfig -adump -f backup_directory/old_acl
```

- Save the current NQS configuration by using the following commands, starting the current NQS if it is not running.

Note: If you want to save the original NQE 3.3 nqs_config file, you must rename it.

```
/usr/bin/qstart -i /dev/null
/usr/bin/qmgr
> snap file = /nqbase/${NQE_VERSION}/etc/nqs_config
> exit
```

- Edit the snap file to make the following changes, or use the ksh script in `/nqbase/${NQE_VERSION}/examples/remabspath`.

- Change all `pipe_queue` server path names from absolute path names to `pipeclient`:

```
create pipe_queue nqenlb priority=63 server=(pipeclient CRI_DS)
create pipe_queue gate priority=63 server=(pipeclient)
```

- Change all absolute path name references for `netdaemon`, `netserver`, and `netclient`:

```
set network client=(netclient)
set network daemon=(netdaemon)
set network server=(netserver)
```

Note: Do not change the checkpoint directory path name if there are restart files within the directory.

- If you want to preserve existing NQS requests and FTA queued transfers, see Section 12.4, page 50.
- If you have not yet shut down NQE/NQS, do so by using the following commands:

```
/etc/nqestop (if you have an NQE (NQX) license)
/etc/qstop (if you are running the NQS/FTA subset only)
```

8. Because new NQE configuration variables were added in the NQE 3.3 release, use the default `nqeinfo` file that is provided with the NQE 3.3 release. Compare your NQE `nqeinfo` file with the default NQE 3.3 `nqeinfo` file, and modify the NQE 3.3 `nqeinfo` file as needed by using the NQE configuration utility (`nqeconfig(8)`). Do not use your previous NQE `nqeinfo` file as direct input into NQE 3.3. (For information about how to use the NQE configuration utility, see Appendix B, page 81.)
9. Use the NQE maintenance utility (`nqemaint(8)`) to set the NQE 3.3 release to be the default NQE version.
10. Configure NQE as documented in the following:
 - Appendix A, page 77, Preparing a Node to Run NQE
 - Appendix B, page 81, Configuring NQE Variables



Warning: You currently have two sets of commands and databases for both NQS and FTA. It is very easy to mix and mismatch these commands and databases; however, mixing of these sets is not supported. Be sure that `/nqebase/bin:/nqebase/etc` precedes `/etc:/usr/bin` in your path, or use the full path name for NQE commands, as shown in this chapter. Ensure that your `NQEINFOFILE` environment variable is either not set or is pointing to `/etc/nqeinfo`.

11. If you have saved your NQS and/or FTA database files, go to Section 12.5.2, page 53, and follow the directions in that section. Otherwise, continue the procedure by starting NQE 3.3 with one of the following commands:


```
/nqebase/etc/nqeinit (if you have an NQE 3.3 license)
/nqebase/etc/qstart (if you are running the NQS/FTA subset only)
```
12. If you have routed NQS requests to another NQS server, route them back as described in Section 12.5.1, page 53.
13. If your site has local modifications to the NLB configuration, the files created in step 3 can be used as examples to recreate these modifications within the NQE 3.3 NLB configuration. These files, however, cannot be used directly as input to the `/nqebase/bin/nlbconfig` command.

For more information on configuring the NLB, see the following information in *NQE Administration*, publication SG-2150:

- Configuring name maps, objects, and ACLs
- Changing ACL permissions

- Example of writing a load-balancing policy
14. If you have jobs that are checkpointed, let these jobs restart. When they have all been restarted, you should change the checkpoint directory by entering the following commands:

```
# /nqebase/bin/qmgr
Qmgr: SET CHeckpoint_directory /usr/spool/nqe/spool/
      private/root/chkpnt
Qmgr: quit
#
```

15. If you start or stop NQS or NQE in the `/etc/config/daemons` file, change the entries to the following:

```
/nqebase/etc/nqeinit (if you have an NQE 3.3 license)
/nqebase/etc/nqestop (if you have an NQE 3.3 license)

/nqebase/etc/qstart (if you are running the NQS/FTA subset only)
/nqebase/etc/qstop (if you are running the NQS/FTA subset only)
```

16. If you are running full NQE, in order to use the `sdaemon(8)` command to start or stop NQE, you must comment out the NQS line in the `/etc/config/daemons` file, and add a line for NQE.
17. If applicable, remove the conversion files from the backup directory by using the following commands:

```
cd backup_directory
rm qstat-a qstat-f nqs_cpio fta_cpio
```

12.4 Migrating NQS/FTA Requests

The information in this section provides a way to migrate NQS queued job requests and FTA queued file transfers to the new NQE 3.3 spool area. If the NQS jobs have a restart file, the jobs will be restarted under NQE 3.3.

The following are some suggested methods of preserving NQS batch requests across an NQE 3.3 upgrade:

- Let all queues empty and all jobs run to completion (see Section 12.4.1)
- Route the queued jobs to another NQS server (see Section 12.4.2), upgrade to NQE 3.3, and then route the queued jobs back (see Section 12.5.1)

- Save the NQS and FTA database files (see Section 12.4.3) and restore them in the upgraded NQE 3.3 NQE spool area (see Section 12.5.2)

The following sections describe these methods.

12.4.1 Empty NQS Queues

To empty the NQS queues, use the following procedure:

1. To stop new requests from entering the queues, disable all the NQS queues.
2. Let the requests that are currently in the queues complete execution.
3. When there are no requests remaining in the queues, shut down NQS.
4. When all queues are empty, complete the upgrade to NQE 3.3 by going back to step 7 of Section 12.3.

12.4.2 Route NQS Jobs to Another NQS Server

You can route the queued batch requests to another NQS server so that they can be preserved during the NQE upgrade.

Note: This method does **not** work for batch requests that are submitted from stations through USCP.

The user and group IDs must be the same on both hosts. The users must have the appropriate `.nqshosts` or `.rhosts` file set up on both hosts, or the jobs will be deleted.

Use the following procedure to route the queued batch requests to another NQS server:

1. Set up a pipe queue on the upgrading UNICOS system. The pipe queue should have an enabled, stopped pipe queue as its destination at the host storing the requests.
2. Move all queued batch requests on the upgrading UNICOS system to the pipe queue.
3. Running requests cannot be moved to a pipe queue. To move a request that is currently running, stop the corresponding batch queue and rerun the request by using the `qmgr rerun` command. This action returns the request to a queued state, from which it can be moved to a pipe queue. Some batch requests may be specified as nonrerunnable, and you must let them complete.

4. When all the requests have been moved to the storing machine and the NQS queues are empty, complete the upgrade to NQE 3.3 by going back to step 7 of Section 12.3.

12.4.3 Save the NQS/FTA Database Files

Because each site has its own requirements, it is not possible to describe all the conditions that a site may encounter (such as local mods and file system setup). If the solutions described in either Section 12.4.1 or Section 12.4.2 meet your site's needs, you are encouraged to use them instead of the following procedure because they are easier to use and are less dependent on local configurations.

The following steps should be performed before you use the `nqemaint(8)` or `nqeconfig(8)` command. You should perform all actions with `root` permission.

1. Create a directory to hold files related to the current versions of NQS and FTA that are running under NQE 1.1, UNICOS 9.0 by entering the following command:

```
mkdir backup_directory
```

2. Shut down NQE/NQS by using one of the following commands:

```
/nqebase/etc/nqestop (if you have an NQE 3.3 license)  
/nqebase/etc/qstop (if you are running the NQS/FTA subset only)
```

3. Save a copy of the current status of the NQS queues and requests as follows:

```
/usr/bin/qstat -f > backup_directory/qstat-f  
/usr/bin/qstat -a > backup_directory/qstat-a
```

4. Preserve the current NQS requests for migration to the new NQE 3.3 spool. Use the following command to save the required NQS database files from the current NQS spool:

```
/nqebase/${NQE_VERSION}/etc/qdump backup_directory/nqs_cpio
```

5. Preserve the current FTA queued file transfers by using the following commands (NQE_FTA_QUEUE is defined in `/etc/nqeinfo`):

```
cd NQE_FTA_QUEUE  
ls qf* | cpio -om > backup_directory/fta_cpio
```


12.5 Restoring NQS/FTA Requests



Warning: You currently have two sets of commands and databases for both NQS and FTA. Ensure that your `NQEINFOFILE` environment variable is either not set or is pointing to `/etc/nqeinfo`. Also, ensure that `/nqebase/bin:/nqebase/etc` precedes `/etc:/usr/bin` in your path, or use the full path name for NQE commands, as shown.

This section describes how you can restore the NQS and FTA requests that you saved when you followed the method described in Section 12.4.2 or in Section 12.4.3.

12.5.1 Routing Back NQS Jobs That Were Stored on Another NQS Server

If you routed jobs to another NQS server, route the requests at the remote host back to the upgraded host once NQE 3.3 is running and configured. You can do this by creating a pipe queue on the remote host with a destination queue on the upgraded server. Then, move the requests to this queue.

If you restored NQS following this method, complete the upgrade procedure by going back to step 13 of Section 12.3; otherwise, see Section 12.5.2.

12.5.2 Restoring NQS/FTA Database Files

If you saved the NQS and FTA database files as described in Section 12.4.3, you can use the following steps to restore them.

1. Start NQE 3.3 to create the 3.3 spool directories and recreate the NQS queues from the modified snap file you placed in `/nqebase/${NQE_VERSION}/etc/nqs_config` by using one of the following commands:

```
/nqebase/etc/nqeinit (if you have an NQE 3.3 license)
/nqebase/etc/qstart (if you are running the NQS/FTA subset only)
```

2. List the NQE 3.3 NQS queues with the following command. Compare this list with the list of queues from UNICOS 9.0 in the `backup_directory/qstat-f` file.

```
/nqebase/bin/qstat -f
```



Warning: The NQE 3.3 NQS queue configuration must be identical to your previous UNICOS 9.0 NQS configuration.

NQS checks several dependencies when it rebuilds queues. If there are errors or inconsistencies found in a request, NQS deletes it. When NQS scans requests to rebuild its queues, there must be a control file and a data file. The request must reference an existing queue name, and a valid transaction entry that describes the state of the job must be present in the `transact` file.

3. Shut down NQE 3.3 before you reload the NQS and FTA requests by using one of the following commands:

```
/nqbase/etc/nqestop (if you have an NQE 3.3 license)  
/nqbase/etc/qstop (if you are running the NQS/FTA subset only)
```

4. Restore the NQS database files, which were saved from the previous `qdump` operation, by using the following command:

```
/nqbase/etc/qload backup_directory/nqs_cpio
```

5. Restore the FTA queued file transfers by entering the following commands:

```
cd NQE_FTA_QUEUE  
cpio -imu < backup_directory/fta_cpio
```

6. Restart NQE 3.3 by entering the following command:

```
/nqbase/etc/nqeinit -i /dev/null  
(if you have an NQE 3.3 license)  
/nqbase/etc/qstart -i /dev/null  
(if you are running the NQS/FTA subset only)
```

7. List the NQE 3.3 queued NQS requests as follows. Compare this with the list of requests from UNICOS 9.0 stored in the `backup_directory/qstat-a` file, to ensure that all requests have been reloaded.

```
/nqbase/bin/qstat -a
```

If these procedures are successful, your batch requests will now be in the new spool area. If you have no jobs that are checkpointed, you can delete the old spool area, which is `/usr/spool/nqs` by default. If you have checkpointed jobs, you should wait for these checkpointed jobs to restart before you delete the old spool area.

8. Start all queues by using the following commands:

```
/nqebase/bin/qmgr  
Qmgr: start all_queues
```

If you restored NQS following this method, complete the upgrade procedure by going back to step 13 of Section 12.3; otherwise, see Section 12.5.1.

NQE Version Maintenance Utility [13]

After you have installed the NQE 3.3 release, set this NQE release to be the default version of NQE by using the NQE version maintenance utility (`nqemaint(8)`). This utility handles the setup of all symbolic links that NQE requires to operate normally. Therefore, NQE must not be running when you use the `nqemaint(8)` utility.

Also, you can use the `nqemaint(8)` utility to view NQE release-specific news and to view information related to dependencies that you should be aware of before you start this version of NQE.

You can also use the `nqemaint(8)` utility to switch between versions of NQE.

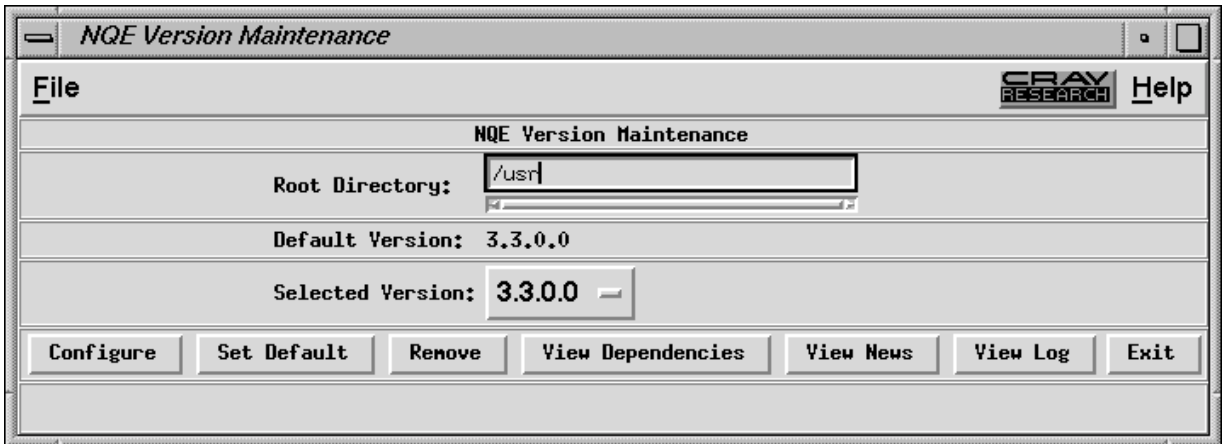


Caution: For sites upgrading from any previous version of NQE: As described in the upgrade procedures, because new NQE configuration variables were added in the NQE 3.3 release, use the default `nqeinfo` file that is provided with the NQE 3.3 release. Compare your previous NQE `nqeinfo` file with the default NQE 3.3 `nqeinfo` file, and modify the NQE 3.3 `nqeinfo` file as needed by using the NQE configuration utility (`nqeconfig(8)`). Do not use your previous NQE `nqeinfo` file as direct input into NQE 3.3. (For information about how to use the NQE configuration utility, see Appendix B, page 81.)

In the directory `/nqebase/3.3.x.x/bin`, use the `nqemaint(8)` utility to set NQE 3.3 to be the default version. In order to use the `nqemaint(8)` utility, ensure that your `DISPLAY` environment variable is set up, and then enter the following command:

```
nqemaint &
```

The screen shown in Figure 7 is then displayed:

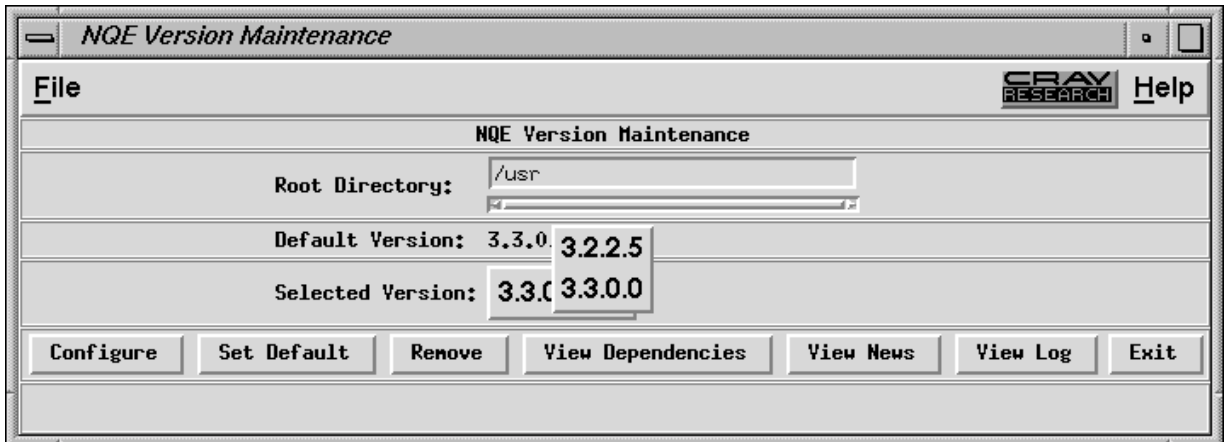


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Figure 7. NQE Version Maintenance Display

The fields and buttons of the NQE Version Maintenance display are described as follows:

<u>Field/Button</u>	<u>Description</u>
Root Directory	This field allows you to set the root directory to be scanned for installed versions of NQE. The Select Root option on the File pulldown menu can also be used to specify this value, and, if you use this option, the selected root directory is entered into the Root Directory field. The default value is /opt.
Default Version	This field displays the default installed version of NQE. If there is no default NQE configured yet, NONE is displayed.
Selected Version	This field allows you to select a specifically installed version of NQE with which to work. You must select a version of NQE before using the Configure, Make Default, Remove, Dependencies, News, or Log buttons. Figure 8 shows a sample pulldown menu from which to select an installed NQE version.



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Figure 8. NQE Version Selection Menu

Configure	This button allows you to use the <code>nqeconfig(8)</code> utility to customize the <code>nqeinfo</code> file for the selected version of NQE. For more information, see Appendix B, page 81, or the <code>nqeconfig(8)</code> man page.
Set Default	This button allows you to make the selected version of NQE the default NQE. When this is done, symbolic links are set up in <code>/nqebase</code> for <code>bin</code> , <code>doc</code> , <code>etc</code> , <code>include</code> , <code>lib</code> , and <code>man</code> . These symbolic links point to matching subdirectories for the selected version. On Cray PVP platforms, a symbolic link for the <code>src</code> subdirectory is also created. A symbolic link, <code>/etc/nqeinfo</code> , is created to point to the <code>nqeinfo</code> file for the selected version. Also, a symbolic link pointing to <code>NQE_SPOOL</code> , (<code>/nqebase/nqeversion/hostname/database</code>) is created. <code>NQE_SPOOL</code> is configured in the <code>nqeinfo</code> file and defaults to the <code>/usr/spool/nqe</code> directory. On all Cray Research platforms, a symbolic link is also created from <code>/etc/privdb/nqs.db</code> to the <code>nqs.db</code> file for the selected version.

Remove	This button allows you to remove the selected version of NQE. When this is done, a confirmation dialog is used to ensure that this action is really desired. If positive confirmation is given, all NQE files and directories for the selected version are removed. If the selected version was also the default version, the default symbolic links are also removed, and the default version will be NONE.
View Dependencies	This button allows you to view the <code>dependencies</code> file for the selected version. This file contains information on any dependencies that exist for a specific version of NQE, such as operating system levels supported, and so on.
View News	This button allows you to view the <code>news</code> file for the selected version. This file contains information about new NQE features, changes in the product, and future plans.
View Log	This button allows you to view the installation log file for the selected version. This file contains information from the installation, configuration, and maintenance of a specific version of NQE.
Exit	This button allows you to exit from the NQE version maintenance utility.
Help	This button allows viewing of the <code>nqemaint(8)</code> man page.

Remember to read Chapter 14, page 61, for important information you should know about **before** you start NQE 3.3.

Read This Before You Start NQE [14]

This chapter includes important information that you should be aware of **before** you start NQE.

For information about compatibility issues and differences that your users may experience after upgrading to NQE 3.3, see the *NQE Release Overview*, publication RO-5237 3.3.

14.1 Checkpointing Function on IRIX Systems

The checkpointing function is supported on IRIX 64-bit systems; NQE 3.3 requires IRIX release 6.4.1 or later for the checkpointing function to work.

Note: The new environment variable `NQE_SHEPHERD_PID` was added so that the `qchkpnt(1)` command will work on 64-bit IRIX systems. `NQE_SHEPHERD_PID` is added to the initiated job's environment only on 64-bit IRIX systems. The value of `NQE_SHEPHERD_PID` is the shepherd PID for the job.

14.2 Checkpoint and Restart Operations on IRIX Systems

Checkpoint and restart operations work by default on IRIX 6.4.1 or later systems for jobs that have the following two characteristics:

- The job was submitted using the default two-shell invocation (see section 5.3 in the *NQE User's Guide*, publication SG-2148)
- Direct job output was requested when the job was submitted (if the command-line interface was used, this means the `-ro` option was used with either the `qsub(1)` or `cqsub(1)` command)

Jobs that do not have these characteristics cannot be restarted when using NQE as installed by default. In order for these jobs to be restartable, you must change the permissions on the `$NQEBASE/spool/private` directory from 700 to 711. The permission change must be made manually after the system has been installed and configured.



Caution: Changing these permissions may open a security hole and allow any user access to the internal NQE directories. If a user inadvertently or maliciously alters the files located there, running jobs may fail and NQE operations may be corrupted. Sites that are willing to accept the security risk in order to provide checkpoint and restart operations to all jobs should make the permission modification.

This problem will be corrected in a future release of NQE and the IRIX checkpoint and restart software, allowing all jobs to be checkpointed while still maintaining proper security.

14.3 `-rf` Option Supported on `cqsub(1)` Command

The `-rf` option is now supported on the `cqsub(1)` command. The `-rf` option forces the request to be restarted from a checkpoint image. This option is supported only on UNICOS systems.

14.4 Possible Need to Modify the `ilbrc` File

The `ilbrc` file in the `nqebase/etc` directory may need to be modified, depending on your system configuration. This configuration file controls how `ilb` behaves when logging in to a remote machine. Currently, `ilbrc` contains references to `/usr/bin/telnet` and `/usr/bin/rlogin`. The administrator should ensure that these paths are correct on each of the machines on which NQE is installed.

14.5 Cray DynaWeb Server

Note: This was also a dependency for accessing the NQE 3.1 and 3.2 online documentation using the Cray DynaWeb server application that is provided with the NQE release package.

A Cray DynaWeb server is required to access the following NQE 3.3 online documentation:

- *NQE Release Overview*, publication RO-5237 3.3
- *NQE Installation*, publication SG-5236 3.3
- *Introducing NQE*, publication IN-2153 3.3

- *NQE User's Guide*, publication SG-2148 3.3
- *NQE Administration*, publication SG-2150 3.3

For additional information, see the Cray DynaWeb documentation that is included with your NQE 3.3 release package.

14.6 Hewlett-Packard Patch Required before You Start NQE

Note: This was also a dependency for the NQE 3.1 and 3.2 releases.

NQE 3.3 requires the following patch from Hewlett-Packard for HP-UX 9.x: PHCO_5341 Patch.

This patch fixes the following problem:

```
s700_800 9.x mkdir -p will not cross a read-only NFS mount.
```

The patch can be accessed through the Hewlett-Packard Support Line Services World Wide Web page at the following URL:

<http://us.external.hp.com>

14.7 Hewlett-Packard Systems Requirement for `what is` File

Note: This was also a dependency for the NQE 3.1 and 3.2 releases.

After you have installed NQE 3.3 on Hewlett-Packard systems, but before you run the `man -k` command, you must merge the `what is` file from NQE with the `what is` file in `/usr/lib` if you want `what is` or `man -k` operations to pick up NQE entries. The easiest way to do this is to use `cat(1)` to concatenate the `/usr/lib/what is` file and the NQE `what is` file, pipe the concatenated file through `sort`, and then replace `/usr/lib/what is` with the result.

14.8 Problem with Shutdown/restart of NQE Database

Note: This was also a dependency for the NQE 3.1 and 3.2 releases.

Following the shutdown of the NQE database (mSQL database), it may not be possible to restart the NQE database daemon, `msqld`, unless you wait for 3 or 4 minutes. A `bind` system call failure (port in use) will show up in the `msqld_log` file if you try to restart `msqld` too soon. The problem is caused by the way in which TCP/IP handles the closing of connections. A

TIME_WAIT_TCP connection state is used to allow for the proper reuse of port numbers.

To work around the problem, do not attempt to restart `msqld` until the `MSQL_TCP_PORT` (603) has been released by TCP/IP. Use the following command to verify that the port is available.

```
# netstat -a | grep 603
```

You should not see any entries of the following forms, which indicate that the `MSQL_TCP_PORT` 603 is still in use:

```
latte.603      latte.974      8192  0 8192  0 TIME_WAIT
localhost.603 localhost.974  8192  0 8192  0 LAST_ACK
```

Note: If the `mSQL` port number is defined in `/etc/services`, the previous command may not show the active port because the name of the port appears as the service name. In this case, you should use the `netstat -a | grep msql` command.

14.9 QSUB_WORKDIR Value for Requests Submitted through the NQE Database

Note: This was also a dependency for the NQE 3.1 and 3.2 releases.

When you submit a request, the `QSUB_WORKDIR` environment variable is set to be the current directory when the request was submitted. However, for requests that are submitted through the NQE database, the value of the `QSUB_WORKDIR` environment variable is set to be the job owner's `$HOME` directory on the NQE database LWS or the `NQE_BIN` directory for job owners whose `$HOME` directory is within the Distributed File System (DFS).

14.10 NLB Differences for UNICOS/mk Systems

Note: This was also a dependency for the NQE 3.1 and 3.2 releases.

The Network Load Balancer (NLB) database information is supplied by the `ccollect(8)` program. On UNICOS/mk systems, `ccollect(8)` relies on the `sar(1)` command to retrieve system performance data. Currently, the `sar` command on UNICOS/mk systems does not provide system performance data for memory or swapping usage statistics. As a result, the NQE GUI Load window for memory demand displays a fixed value of 96% when reporting on UNICOS/mk systems.

In addition, the following NLB attributes are not meaningful for UNICOS/mk systems:

```
NLB_A_SWAPPING
NLB_SWAPPING
NLB_SWAPSIZE
NLB_SWAPFREE
NLB_FREEMEM
NLB_A_FREEMEM
```

14.11 UNICOS Sites Using ftp Interface or USCP Interface

Note: This was also a dependency for the NQE 3.1 and 3.2 releases.

This section describes additional installation changes needed for sites using the UNICOS ftp(1) interface or the USCP interface to NQS. The NQS commands qsub(1), qstat(1), and qdel(1) have been moved from /usr/bin to /nqebase/bin; for USCP, the qmsg(1) command has also been moved from /usr/bin to /nqebase/bin.

These commands and absolute path names are used in the ftp interface and in the USCP interface to NQS. Sites that want to use the ftp or USCP interface to NQS must create symbolic links from /nqebase/bin to /usr/bin. This can be done after NQE is installed.

For the ftp interface, to create symbolic links from /nqebase/bin to /usr/bin, enter the following to delete the old commands and create links to the version available in NQE 3.3:

```
rm /usr/bin/qsub
rm /usr/bin/qstat
rm /usr/bin/qdel

ln -s /nqebase/bin/qsub /usr/bin/qsub
ln -s /nqebase/bin/qdel /usr/bin/qdel
ln -s /nqebase/bin/qstat /usr/bin/qstat
```

For the USCP interface, to create symbolic links from */nqebase/bin* to */usr/bin*, enter the following to delete the old commands and create links to the version available in NQE 3.3:

```
rm /usr/bin/qsub
rm /usr/bin/qstat
rm /usr/bin/qdel
rm /usr/bin/qmsg

ln -s /nqebase/bin/qsub /usr/bin/qsub
ln -s /nqebase/bin/qdel /usr/bin/qdel
ln -s /nqebase/bin/qstat /usr/bin/qstat
ln -s /nqebase/bin/qmsg /usr/bin/qmsg
```

14.12 Command Paths Changed for UNICOS Systems

Note: This was also a dependency for the NQE 3.1 and 3.2 releases.

Previous releases of NQS and NQX on Cray Research systems were bundled with UNICOS and installed in */etc*, */usr/bin*, */usr/lib*, */usr/include*, and */usr/man*. NQE 3.3 on UNICOS and UNICOS/mk platforms is released as an asynchronous product and is installed in the */nqebase* directory (that is, */nqebase* on UNICOS, UNICOS/mk, and Solaris systems or */usr/craysoft/nqe* on all other supported platforms). For a description of the NQE directory structure, see Chapter 3, page 5.

This path change affects both administrators and end users of NQS, FTA, and NQX. Users must be notified of the new command location so their user environments can be changed to access the commands from */nqebase/bin*. For example, this command path change will affect user cron jobs, job submission scripts, and any user programs that reference NQS, FTA, or NQX commands.

The system files that set up user environments can be modified to add */nqebase/bin* to the default path. The *modules* package can be used to set up the appropriate path to the NQE commands. See Chapter 16, page 73, for more information about the *modules* package.

14.13 UNICOS/mk Changes to */etc/rc* and */etc/config/rcoptions*

Note: This was also a dependency for the NQE 3.1 and 3.2 releases.

For UNICOS/mk systems, the `RC_NQSLOGFILE` variable has been removed from the `/etc/config/rcoptions` file. The `/etc/config/rcoptions` file is created by the UNICOS/mk installation tool. In addition, the code in the `/etc/rc` script that references the `RC_NQSLOGFILE` variable has been removed. The `RC_NQSLOGFILE` variable was used to provide a way to move the current NQS log file to `logfile.date` during system startup.

The NQS `qmgr(8)` command provides log file segmentation at NQS startup and periodically as desired. For further information, see the `qmgr(8)` man page.

14.14 NQS Customized Variables Now May Be Defined in the `nqeinfo` File

Note: This was also a dependency for the NQE 3.1 and 3.2 releases.

NQS customized variables may be defined in the `nqeinfo` file by using the `nqeconfig(8)` command. These customized variables were made available in the NQE 3.0 release for workstation platforms by manually editing the `nqeinfo` file. Prior to the NQE 3.1 release, these customized variables were available on UNICOS systems within the `/usr/src/net/nqe/src/nqs/include/config.h` file. For a list of each `config.h` file variable and its equivalent `nqeinfo` file entry, see *NQE Administration*, publication SG-2150. For further information about the `nqeconfig(8)` command, see Appendix B, page 81, or the `nqeconfig(8)` man page.

14.15 DCE Considerations

Note: This was also a dependency for the NQE 3.1 and 3.2 releases.

If you plan to use DCE with NQE, please note the following considerations:

- NQE support of DCE/DFS does not include support for an installation running DFS-only file space. The NQE spool and binary trees, among other components, must reside in UNIX file space.

Note: On UNICOS systems, this release of NQE supports only DCE/DFS version 1.1.

- UNICOS and IRIX systems must have the DCE integrated login feature enabled in order for DCE credentials to be passed through NQE. For further information, see Section 14, “Configuring DCE/DFS” in *NQE Administration*, publication SG-2150 *Cray DCE Client Services/Cray DCE DFS Server Release Overview*, publication RO-5225.

- For IBM AIX 4.2 systems to run NQE 3.3 with DCE/DFS, you must install the IBM APAR ix59568 patch; otherwise, system crashes may occur, unless DCE/DFS is disabled. AIX customers may obtain the patch by calling 1-800-CALLAIX and requesting the fix for APAR ix59568.

Note: This patch is not needed when running NQE 3.3 without DCE/DFS on IBM AIX 4.2 systems.

- On HP-UX systems, NQE is configured to provide DCE authentication by adding the `NQE_AUTHENTICATION` variable, set to `dce`, in the `nqeinfo` file. If this is done on an HP-UX system that does not have DCE installed, NQE jobs initiated on this HP-UX system abort. The following mail message is sent to the job owner:

```
Request aborted via a signal.  
Request deleted.
```

```
Aborting signal was: 6
```

The following message is written into the NQS log file:

```
/lib/dld.sl: Can't find path for shared library: libc_r.sl
```

If this occurs, stop NQE on the HP-UX system and remove the `NQE_AUTHENTICATION` variable from the `nqeinfo` file on the HP-UX system. After you restart NQE, NQE jobs on this non-DCE HP-UX system will be run without this error.

14.16 FLEXIm Documentation

As of the NQE 3.0 release, the PostScript file containing the *Flexible License Manager End User Manual* is no longer provided with NQE. For more information on FLEXIm, access the GLOBEtrotter Software, Inc., World Wide Web page at the following URL:

<http://www.globetrotter.com>

Also, you can order the *Flexible License Manager End User Manual* from GLOBEtrotter Software, Inc., or from the Cray Research Distribution Center.

Removing Previous NQX/NQS/FTA Versions [15]

If you are upgrading to NQE 3.3 on a Cray PVP system that is running a version of UNICOS before UNICOS 9.2, you can reduce disk storage requirements and clarify commands that will be used by removing previous versions of NQX, NQS, and/or FTA that were bundled with UNICOS.

You can remove the following files **after** NQE 3.3 is installed, configured, and running:

<u>Directory</u>	<u>File</u>
/etc	addnode
	csuspend
	njs_qstat.awk
	nqeinit
	nqestop
	NQS.shutdown
	NQS.startup
	nqs_config
	qdump
	qload
	qstart
	qstop
/etc/config	NQS.shutdown
	NQS.startup
	nqs_config
/etc/privdb	nqs.db

/usr/bin	ccol604
	ccollect
	cevent
	cload
	cqdel
	cqstat
	cqstatl
	cqsub
	ftua
	nlbconfig
	nlbpolicy
	qalter
	qchkpnt
	qconfigchk
	qdel
	qlimit
	qmgr
	qmgr.hlp
	qmsg
	qping
	qstat
	qsub
/usr/include	nqsaudit.h
/usr/lib	fta
	libfta.a
	libnqe.a
/usr/lib/nqs	logdaemon
	netclient
	netdaemon

netserver
nqsdaemon
nqsfts
pipeclient
shlexefai

Using modules with NQE [16]

This chapter applies only to UNICOS and UNICOS/mk systems. It includes installation procedures and provides information about using modules with NQE.

If you plan to install the Cray Research modules package, it must be installed before you install NQE 3.3.

If you choose not to use or install the Cray Research modules package, the following warning message, which you can ignore, is produced during the installation of NQE 3.3:

```
The /opt/modules/modules/modulesfiles directory does not exist!  
The nqe modulefiles were not installed into  
/opt/modules/modules/modulesfiles. The complete modules package  
must be installed into /opt before the nqe modulefiles  
can be installed into /opt/modules/modules/modulesfiles.
```

16.1 Loading the modules Package

If you plan to install the Cray Research modules package, it must be installed before you install NQE 3.3.

If you already have the modules package loaded on the system, you do not need to reload it. To verify that the modules package is available, enter the following command:

```
ls /opt/modules  
2.2 modules
```

If the /opt/modules directory exists, modules is already installed on the system, and you can now install NQE 3.3.

The NQE 3.3 release package includes the modules 2.2 package. If the version of modules shipped with NQE 3.3 is more current than the version loaded on your system, you should load the more current version; however, it does not matter if NQE 3.3 is loaded before or after the updated modules package.

If you do not have the modules package loaded on the system, install it as follows:

1. If you are using the common installation tool (CIT), install the `modules` package by double-clicking on `modules` first, which installs this package first.
2. If you are using the UNICOS Installation and Configuration Menu System interface, you are not able to select the order in which products are loaded from the distribution tape. Therefore, to ensure that the `modules` package is loaded first, you must deselect all products except `Modules` by setting the `Load Subpackage ?` option in the `Distribution Package Contents` menu to `no`. After the `modules` package is loaded, set all products to `yes`, except `Modules`, and complete the installation. This requirement will be eliminated with future (post 2.2) `modules` releases. For more information about using the UNICOS Installation and Configuration Menu System, see Chapter 11, page 37.

16.2 Using the NQE Modules File

The use of `modules` files is described in the following online files:

- `/opt/modules/modules/doc/Modules-Paper.ps`
- `/opt/modules/modules/man/man1/module.1`
- `/opt/modules/modules/man/man4/modulefile.4`

The NQE `modules` file is installed in the following location:

```
/opt/modules/modules/modulefiles
```

Note: You must tell your user community if you are using the `modules` interface and give them the information that is included in Section 16.3, page 74.

16.3 Setting up Your User Environment

If you use NQE frequently, you must add the appropriate statements to your `.cshrc` or `.profile` files to set up your user environment. If you already have the `modules` package loaded on your system, simply add `nqe` to the list of `modules` loaded. If the `modules` package has not been previously loaded, the statements to be added must follow all other path-setting code.

If you are a C shell user, add the following statements to your `.cshrc` file:

```
if (-f /opt/modules/modules/init/csh) then

    #Initialize modules

    source /opt/modules/modules/init/csh
    module load modules nqe
endif
```

If you are an `sh` or `ksh` shell user, add the following statements to your `.profile` file:

```
if [ -f /opt/modules/modules/init/ksh ] ; then

    #Initialize modules

    . /opt/modules/modules/init/ksh
    module load modules nqe
fi
```

Note: If you use NQE only occasionally, include the following line in your `.cshrc` or `.profile` file:

```
source /opt/modules/modules/init/csh
```

Then, before you use NQE, enter the following command from the command line:

```
module load modules nqe
```


Preparing a Node to Run NQE [A]

This appendix describes the steps necessary to prepare a node to run NQE.

Note: Before you start NQE, you must perform the steps necessary to configure licensing, as described in this appendix. On each server, complete all the steps. On each client, complete only steps 1 through 3; if NPPA authentication is required, also complete step 6.

To set up NQE, complete the following steps:

Note: You must complete steps 1, 2, and 3 on each NQE client. Also, step 6 is required in order for NPPA authentication to work. If NPPA is not required, connections to a client through FTA may be handled by the client's `ftpd`.

1. If this is the first time NQE is being set up at your site, place the following entries in the `/etc/services` file:

```
fta      605/tcp      #NQE fta services
msql     603/tcp      #NQE msql service
nlb      604/tcp      #NQE nlb service
nqs      607/tcp      #NQE nqs service
```

2. Add the NQE binary directory to your search path. This lets you issue commands without specifying their full path names.

For `sh` or `ksh`, use the following command:

```
export PATH=/nqebase/nqeversion/bin:$PATH
```

For `csh`, use the following command:

```
setenv PATH /nqebase/nqeversion/bin:$PATH
```

3. Copy the license file to the `/nqebase/nqeversion/etc` directory and name it `license.dat`.
4. Verify the integrity of the license file you received from Cray Research by using the following command.

Note: The instructions for configuring the FLEXlm license manager assume that you have no other applications using FLEXlm licenses. If you do have other applications using FLEXlm licenses, consult FLEXlm documentation about combining licenses from multiple vendors.

```
lmcksum -c /nqebase/nqeverion/etc/license.dat
```

You will receive output about your `license.dat` file. The last line should give you a checksum number, as in the following example:

```
lmcksum - Copyright (C) 1990 by Globetrotter Software, Inc.  
lmcksum: using license file "/nqebase/nqeverion/etc/license.dat" ...  
52: (overall file checksum)
```

This checksum (52: (overall file checksum)) should match the checksum line in your `license.dat` file. To see whether the checksums match, view the file. If the checksums do not match, contact your NQE customer service representative.

5. Set the file access permissions on `license.dat` as follows:

```
chown root /nqebase/nqeverion/etc/license.dat  
chgrp other /nqebase/nqeverion/etc/license.dat  
chmod 644 /nqebase/nqeverion/etc/license.dat
```

6. Ensure that the `/etc/inetd.conf` file has the following entry.

Note: For UNICOS and UNICOS/mk systems, include the `-N` option after `ftad` to enable NPPA.

```
fta stream tcp nowait root /nqebase/nqeverion/bin/ftad ftad
```

The link to the `/nqebase/bin/ftad` path name is created after you start NQE.

7. If you edit `/etc/inetd.conf`, send a hang-up signal (SIGHUP or `kill -1`) to the `inetd` process. This signals `inetd` to read `/etc/inetd.conf`. For example, if `inetd` has the process ID (pid) 634, use the following command:

```
kill -1 634
```

Note: On AIX systems, if you manually edit the `inetd.conf` file, you must synchronize the `inetd.conf` file and the object data manager (ODM) database by using the `inetimp` command.

8. By default, an NQS machine identifier (`mid`) is generated for your local host. If you want to change the `mid` for the local host or add `mids` for other local hosts, edit the `/nqbase/nqeversion/etc/nqs_config` file. For additional information, see *NQE Administration*, publication SG-2150, Chapter 7, or the `qmgr(8)` man page.
9. If you are running the MLS feature on UNICOS systems or if you are running the ML-Safe feature on UNICOS/mk systems and want to change your MLS or ML-Safe configuration, see *NQE Administration*, publication SG-2150, Section 7.21.4; also, to install PALs, see *NQE Administration*, publication SG-2150, Section 7.21.2.

To set this NQE release to be the default NQE version, see Chapter 13, page 57.

Configuring NQE Variables [B]

The NQE configuration utility (`nqeconfig(8)`) assists administrators in creating and maintaining the NQE configuration file (`nqeinfo` file). The NQE configuration file contains the NQE configuration variables and is created by the NQE installation procedure. NQE nodes and clients must each have a unique NQE configuration file.

When you use the NQE configuration utility, each NQE configuration variable is displayed along with its value. Most variables are configurable. However, some variables are derived from the values of other variables and may not be changed. This helps to ensure that changes are propagated throughout the file and reduces the risk of misconfiguration due to conflicting values of related variables.

Note: The NQE configuration utility contains a subset of the NQE configuration variables. For a description of the complete set of NQE configuration variables, see the `nqeinfo(5)` man page.

Note: Some variables may be set in the user's environment to indicate individual preferences. The NQE configuration file variables are used only if an individual has not indicated a preference.

This appendix describes how to start and use the NQE configuration utility. For a complete list of all NQE configuration variables, see the `nqeinfo(5)` man page or the NQE configuration utility `Help` facility.

Note: For UNICOS 9.0.x upgrading to this NQE release, *NQE Administration*, publication SG-2150, includes a list of NQE configuration file (`nqeinfo` file) names that were previously included in the `config.h` file.

B.1 Starting the NQE Configuration Utility

To start the NQE configuration utility, use the `nqeconfig(8)` command. The `nqeconfig(8)` command has the following syntax:

```
nqeconfig [-a] [-f filename][-o filename]
          [-D variable=value[ ,variable=value , ... ]]
```

The `nqeconfig(8)` command accepts the following options:

<u>Option</u>	<u>Description</u>
-a	Instructs <code>nqeconfig(8)</code> to run in <i>autopilot mode</i> . No prompting occurs when this command is run in this mode. The configuration file is generated using the values from the file indicated by the <code>NQEINFOFILE</code> environment variable (or from the <code>nqeinfo</code> file if the <code>NQEINFOFILE</code> variable is not set), from the values in the input file specified on the command line with the <code>-f</code> option, and from other values specified with the <code>-D</code> option.
<code>-f filename</code>	Indicates the input file used to specify additional configuration variables and new values for existing variables. The format of this file is the same as that of the <code>nqeinfo</code> file.
<code>-o filename</code>	Specifies the file location for the new configuration file. This location may be overridden in the <code>File</code> menu of the <code>nqeconfig(8)</code> display.
<code>-D variable=value</code> <code>[,variable=value,...]</code>	Allows you to specify, on the command line, additional configuration variables and new values for existing variables. The argument to this variable is a comma-separated list of <i>variable=value</i> pairs. Multiple <code>-D</code> options may be specified.

B.2 Editing the NQE Configuration Variables

By default, after you execute the `nqeconfig(8)` command, the following NQE Configuration display appears, as shown in Figure 9:

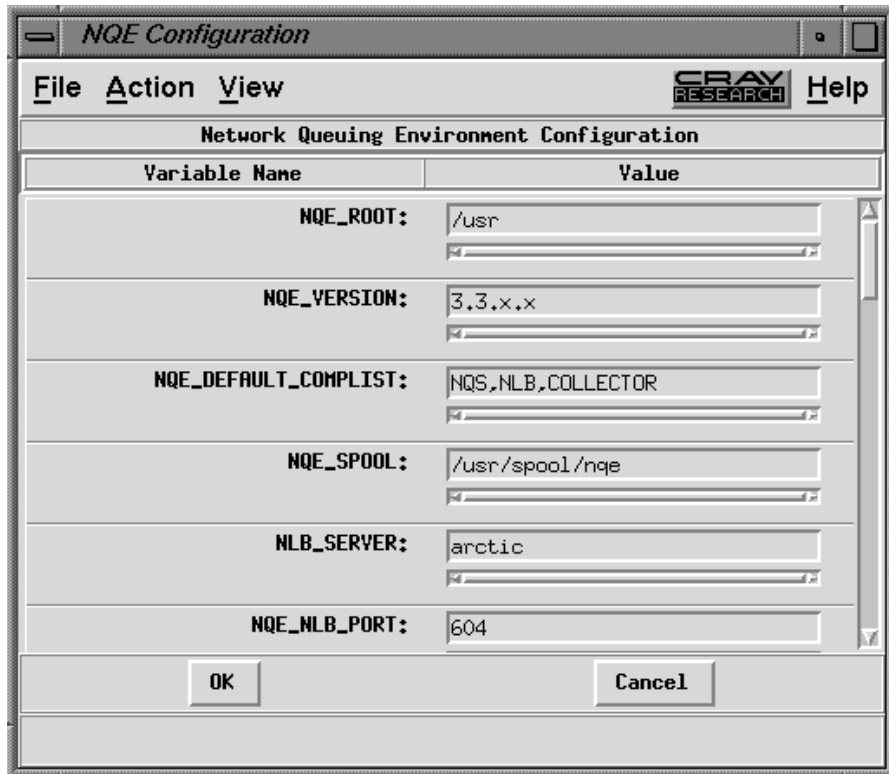


Figure 9. NQE Configuration Display, Condensed View



Caution: Always stop NQE before making changes to the NQE configuration. Each NQE command and server program reads the configuration file once during command or server initialization. Changes made to the configuration file while NQE is running can result in NQE commands and servers using different configuration file values, which will result in unpredictable problems.

The NQE Configuration display presents the NQE configuration variables and their associated values. Values with a dark background are derived from the values of other variables and may not be edited. Other values may be

edited either by entering the appropriate text or by choosing a value from a set of options. The scrollbar allows you to scroll through the list.

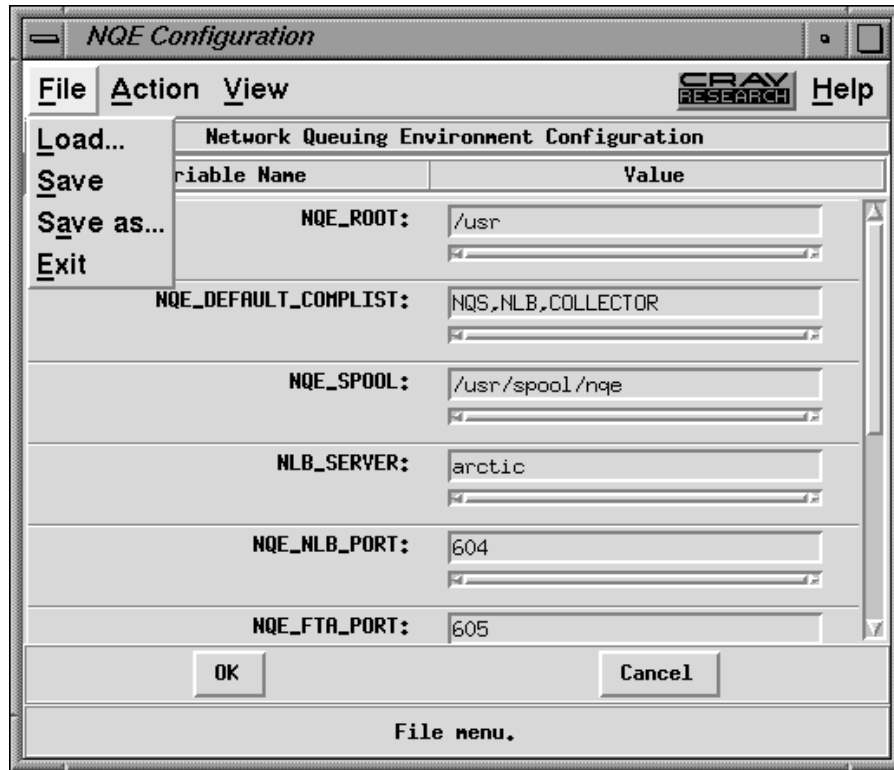
When you have finished making configuration changes, write the configuration changes to the new configuration file by clicking on the OK button, or you can cancel the changes by clicking on the Cancel button.

Context-sensitive help is available at the bottom of the display.

B.3 NQE Configuration Display Menus

The following menus provide additional functionality:

<u>Menu</u>	<u>Description</u>
File menu	Contains options that allow you to save your changes to the default file location, to the location specified with the <code>-o</code> option on the command line, to specify another file and save the changes, or to exit the utility without saving changes. The File menu is as follows:

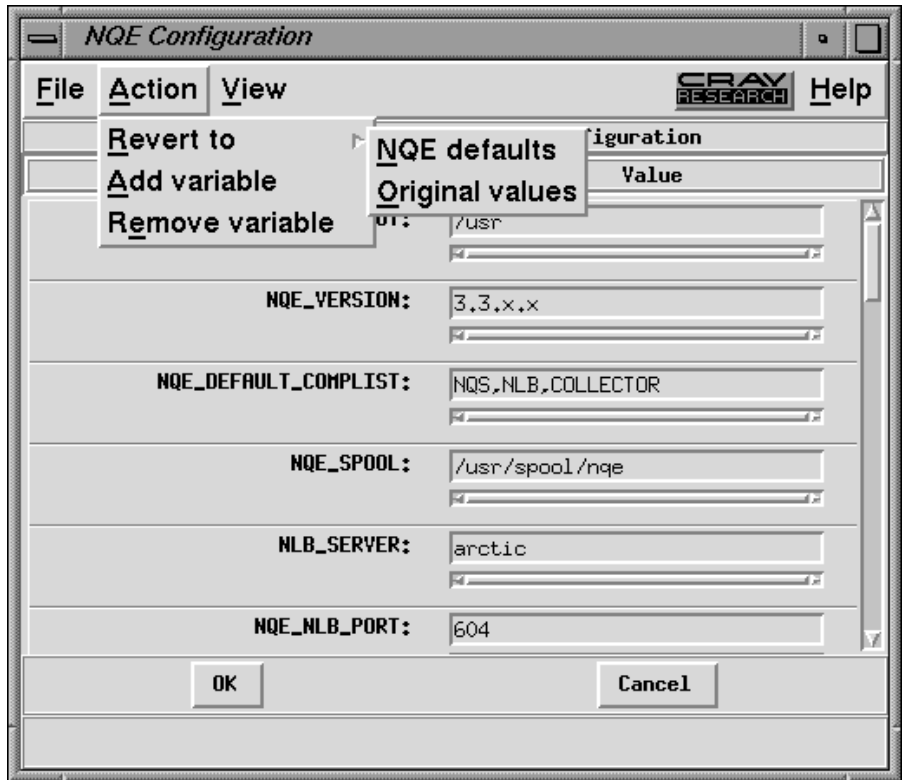


a11556

Figure 10. NQE Configuration Display, File Menu

Action menu

Allows you to revert to the NQE default configuration values, to revert to the values in use when the utility started, or to add variables to the configuration. The Action menu is as follows:

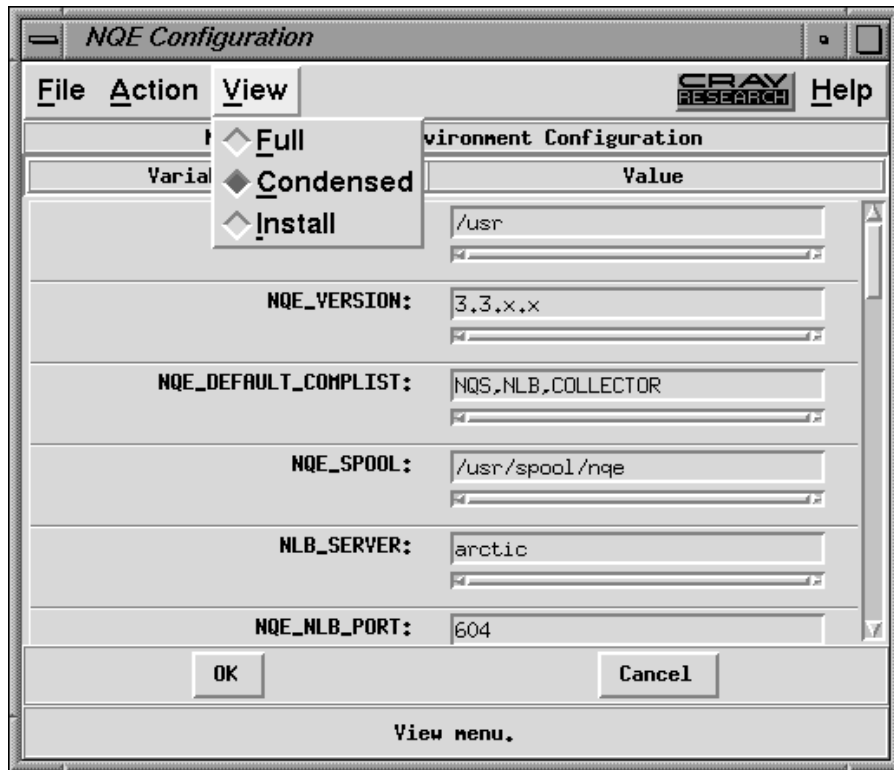


a11557

Figure 11. NQE Configuration Display, Action Menu

View menu

Allows you to select one of three views: Condensed, Full, or Install. The View menu is as follows:

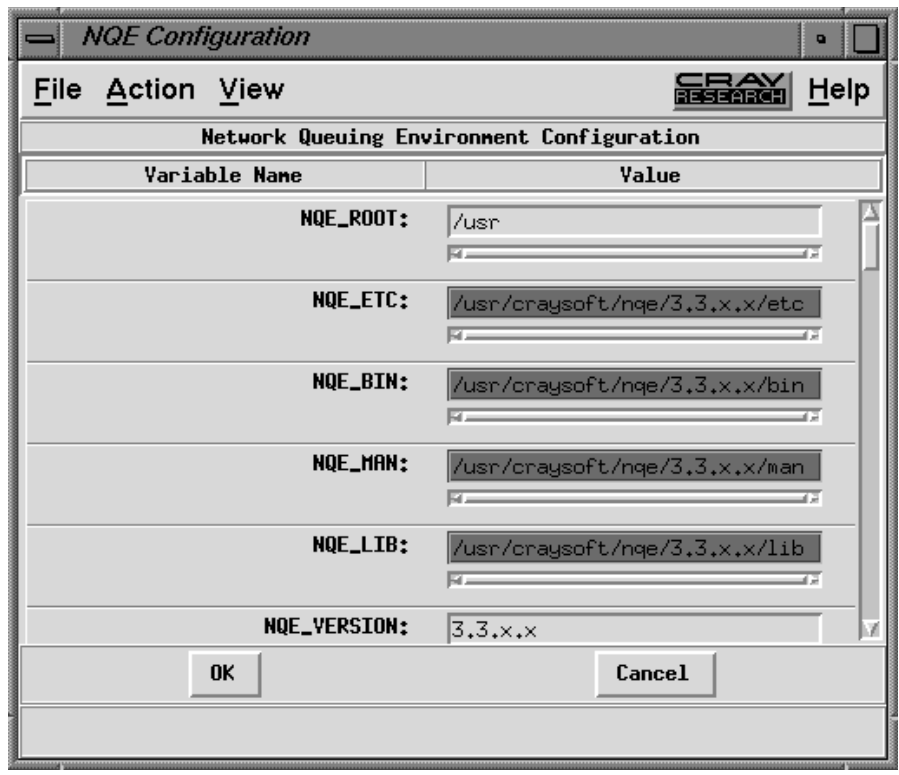


a11558

Figure 12. NQE Configuration Display, View Menu

The Condensed view displays only the variables that you may modify. This is the default view when you execute the `nqeconfig(8)` command. The Condensed view is shown in Figure 9, page 83.

The Full view, as shown below, displays all variables that will be placed in the output file:



a11559

Figure 13. NQE Configuration Display, Full View

The Install view is functional only during the NQE installation process for systems that use the NQE installation script to install NQE (see Chapter 8, page 21).

Mounting/Unmounting CD-ROMs [C]

This appendix provides system-specific information on mounting and unmounting CD-ROMs. Examples of the following are provided:

- Mounting CD-ROMs in the drive
- Unmounting (ejecting) CD-ROMs
- Exporting and mounting CD-ROM file systems over NFS

C.1 Mounting Local CD-ROMs

The following sections provide examples of how to mount CD-ROMs on the specified platforms.

C.1.1 AIX Systems

On AIX systems, the following steps mount a CD-ROM from `/dev/cd0` onto mount point `/usr/cdrom`:

1. Create the mount point if it does not exist:

```
mkdir /usr/cdrom
```

2. Use the `mount` command to mount the device:

```
mount -v cdrfs -o ro /dev/cd0 /usr/cdrom
```

To simplify the `mount` command, add the relevant information to the `/etc/filesystems` file. In this example, you would add the following:

```
/usr/cdrom:  
dev      = /dev/cd0  
vfs      = cdrfs  
mount    = false  
options  = ro  
account  = false
```

If you add this information to the file, the following command mounts the CD-ROM:

```
mount /usr/cdrom
```

C.1.2 HP-UX Systems

On HP-UX systems, the following steps mount a CD-ROM drive connected as device 2 on SCSI controller 0 (device `/dev/dsk/c201d2s0`) onto mount point `/usr/cdrom`.

1. Create the mount point if it does not exist:

```
mkdir /usr/cdrom
```

2. Use the `mount(1M)` command to mount the device:

```
mount -t cdfs -o ro /dev/dsk/c201d2s0 /usr/cdrom
```

This example is taken from a series 700 workstation with a CD-ROM drive configured at SCSI target 2. Other HP-UX systems may require different device entries.

To simplify the `mount` command, add the relevant information to the `/etc/checklist` file. In this example, you would add the following:

```
/dev/dsk/c201d2s0 /usr/cdrom cdfs ro 0 0 0
```

If you add this information to the file, the following command mounts the CD-ROM:

```
mount /usr/cdrom
```

C.1.3 IRIX Systems

The IRIX system provides the `mediad(1M)` daemon, which monitors the removable media devices on a system. For information about configuring the daemon to monitor CD-ROM devices and mount the medium automatically, see the `mediad(1M)` man page.

Note: When mounting a CD-ROM on a Silicon Graphics system, you must specify the `notranslate` option on the `mount(1M)` command. If you omit this option, directory names will be translated into lowercase, and the NQE software will not load properly.

By default, `mediad` runs and mounts CD-ROM medium on the `/CDROM` file system; if `mediad` has been disabled, the following steps manually mount a CD-ROM drive connected as device 4 on SCSI controller 0.

1. Create the mount point if it does not exist:

```
mkdir /usr/cdrom
```

2. Use the `mount(1M)` command to mount the device:

```
mount -t iso9660 -o notranslate,ro /dev/scsi/sc0d410 /usr/cdromeoe2.sw.cdrom
```

`oe2.sw.cdrom` must be installed in order to use the `iso9660` file system type.

To simplify the `mount` command, add the relevant information to the `/etc/fstab` file. In this example, you would add the following:

```
/dev/scsi/sc0d410 /usr/cdrom iso9660 notranslate,ro 0 0
```

If you add this information to the file, the following command mounts the CD-ROM:

```
mount /usr/cdrom
```

C.1.4 Digital UNIX Systems

On Digital UNIX systems, the following steps mount a CD-ROM from device `/dev/rz4c` onto mount point `/usr/cdrom`.

1. Create the mount point if it does not exist:

```
mkdir /usr/cdrom
```

2. Use the `mount(1M)` command to mount the device:

```
mount -t cdfs -o ro,nodefperm /dev/rz4c /usr/cdrom
```

To simplify the `mount` command, add the relevant information to the `/etc/fstab` file. In this example, you would add the following:

```
/dev/rz4c /usr/cdrom cdfs ro,nodefperm 0 0
```

If you add this information to the file, the following command mounts the CD-ROM:

```
mount /usr/cdrom
```

C.1.5 Solaris Systems

On Solaris systems, the Volume Management daemon, `vold(1M)`, automatically mounts the CD-ROM when it is inserted at mount point `/cdrom/cdrom0`. Mount commands are not necessary. After you insert the CD-ROM, you can access it by using the `/cdrom/cdrom0` mount point.

By default, `vold(1M)` is running; if it has been disabled, the following steps mount a CD-ROM drive connected as device 6 on SCSI controller 0.

1. Create the mount point if it does not exist:

```
mkdir /usr/cdrom
```

2. Use the `mount(1M)` command to mount the device:

```
mount -F hfs -o ro /dev/dsk/c0t6d0s0 /usr/cdrom
```

If `vold(1M)` is not running on your system, consult the `hfs(7)` and `mount(1M)` man pages for further information on mounting the CD-ROM.

To simplify the `mount` command, add the relevant information to the `/etc/vfstab` file. In this example, you would add the following:

```
/dev/dsk/c0t6d0s0 /dev/rdisk/c0t6d0s0 /usr/cdrom hfs - no ro
```

If you add this information to the file, the following command mounts the CD-ROM:

```
mount /usr/cdrom
```

C.2 Unmounting (Ejecting) Local CD-ROMs

The following sections provide examples of how to unmount CD-ROMs on the specified platforms.

C.2.1 AIX Systems

To eject the CD-ROM medium, use the `umount(1M)` command to unmount it, as follows:

```
umount /usr/cdrom
```

After you have issued the command, press the eject button on the drive. The CD-ROM will not eject until you unmount the medium.

C.2.2 HP-UX Systems

To eject the CD-ROM medium, use the `umount(1M)` command to unmount it, as follows:

```
umount /usr/cdrom
```


After you have issued the command, press the eject button on the drive. The CD-ROM will not eject until you unmount the medium.

C.2.3 IRIX Systems

To eject a CD-ROM, floppy disk, or tape, use the `eject(1)` command. If the floppy disk or CD-ROM is mounted, `eject(1)` will try to unmount it before it ejects the medium.

You also can eject the medium manually by pressing the eject button on the drive after you unmount it.

C.2.4 Digital UNIX Systems

To eject the CD-ROM medium, use the `umount(1M)` command to unmount it, as follows:

```
umount /usr/cdrom
```

After you have issued the command, press the eject button on the drive. The CD-ROM will not eject until you unmount the medium.

C.2.5 Solaris Systems

To eject a CD-ROM, floppy disk, or tape, use the `eject(1)` command. If the floppy disk or CD-ROM is mounted, `eject(1)` will try to unmount it before it ejects the medium.

You also can eject the medium manually by pressing the eject button on the drive after you unmount it.

C.3 Exporting and Mounting CD-ROMs over NFS

Sometimes it may be desirable to install the NQE software on a system that does not have a CD-ROM drive. To do this, you can mount the CD-ROM on a system that has a CD-ROM drive and use NFS to export the CD-ROM file system to the system without the CD-ROM drive. Reusing the CD-ROM medium involves the following:

- NFS exporting and mounting of the CD-ROM file system
- Installing NQE as described in this publication.

You must mount the file system to allow set UID (`suid`) execution. This is done on the origin host (the NFS client), either in the `mount` command or in the automounter map files if you are using `automount`.

C.3.1 Exporting File Systems

To make a mounted CD-ROM file system available to other workstations, you first must verify that at least one `nfsd` (1M or 8) daemon is running on the NFS server. The `nfsd` daemon runs on a server machine to service NFS requests from client machines. The NFS load on your NFS server will dictate the number of `nfsd` daemons required on that host, but at least one `nfsd` daemon must be running to export file systems over NFS.

Different systems have different procedures for exporting file systems. The following sections describe how it is accomplished on supported NQE platforms.

C.3.1.1 Exporting on AIX, HP-UX, and IRIX,

On AIX, HP-UX, and IRIX platforms, file systems are exported by editing the `/etc/exports` file and then executing the `exportfs` command. Consult the man pages for the following systems:

<u>Platform</u>	<u>Man pages</u>
AIX, HP-UX, and IRIX	<code>exports(4)</code> , <code>exportfs(1M)</code> , and <code>showmount(1M)</code>

The following procedure demonstrates how to export the local file system `/usr/cdrom` from host `hosta` to hosts `hostb` and `hostc`.

1. Edit `/etc/exports`. Its content in this example would include the following line:

```
/usr/cdrom hostb:hostc
```

2. Export the new file system, as follows:

```
# exportfs /usr/cdrom
```

3. Verify that the file system is exported by examining the `/etc/xtab` file. The `showmount` command displays only the name of the exported file

system, not the options with which it was exported, as shown in the following example:

```
# cat /etc/xtab
/usr/cdrom hostb:hostc
# showmount -e hosta
/usr/cdrom
```

C.3.1.2 Exporting on Digital UNIX

On Digital UNIX platforms, file systems are exported by editing the `/etc/exports` file and then executing the `mountd(8)` command. Man pages for `exports(4)` and `mountd(8)` are available.

The following procedure demonstrates how to export the local file system `/usr/cdrom` from host `hostd` to hosts `hostb` and `hostc`.

1. Edit `/etc/exports`. Its content in this example would include the following line:

```
/usr/cdrom hostb hostc
```

The list of host names is separated by white space, not with commas or colons.

2. Export the new file system, as follows:

```
# exportfs /usr/cdrom
```

3. Verify that the file system is exported. Because no `/etc/xtab` file exists, use the `showmount(8)` command as follows (the options are not visible):

```
# showmount -e hostd
Exports list on hostd:
usr/cdrom          hostb,hostc
```

C.3.1.3 Exporting on Solaris

On Solaris platforms, file systems are exported by editing the `/etc/dfs/dfstab` file and then executing the `share` or `shareall(1M)` command. Man pages for `share(1M)`, `shareall(1M)`, `showmount(1M)`, and

dfstab(4) are available. The `dfstab` file contains `share(1M)` commands for automatic execution when the system boots and goes into multiuser mode.

The following procedure demonstrates how to export local file system `/usr/cdrom` from host `hostc` to hosts `hostb` and `hosta`.

1. Edit `/etc/dfs/dfstab`. Its content in this example would include the following line:

```
share -F nfs -o hostb:hosta /usr/cdrom
```

2. Export the new file system by executing either the `share` or `shareall` command:

```
# shareall
```

3. Verify that the file system is exported either by examining the `/etc/dfs/sharetab` file or by executing the `showmount(1M)` command.

C.3.2 Mounting File Systems

All of the supported NQE workstation platforms allow set UID (`suid`) execution upon NFS-mounted file systems by default, which lets you set the user ID upon execution of set UID executable files. If a file system is mounted `nosuid`, it will not allow execution of set UID programs by way of that mount.

The following procedure demonstrates how to mount the remote file system `/usr/cdrom` from host `hosta` on host `hostb` at `/tmp/cdrom` with set UID execution allowed.

1. Create the local mount point, as follows:

```
# mkdir -p /tmp/cdrom
```

2. Execute the mount command.

Options must precede the remote file system name and the local mount point name, as follows:

```
# mount -o suid hosta:/usr/cdrom /tmp/cdrom
```

The `-o suid` option is not required, because this is the default on all supported workstation platforms.

On AIX platforms, you must specify the target host, the local directory, and the target directory, as follows:

```
# mount -ntarget_host /usr/craysoft /tmp/craysoft
```

The default information for file systems (both local and remote) resides in different places on different systems, as shown in Table 4, page 97. For more information on configuring the appropriate files, see the system-specific man pages and documentation.

Table 4. File System Information

Platform	File	Man page
AIX	<code>/etc/filesystems</code>	<code>filesystems(4)</code>
HP-UX	<code>/etc/checklist</code>	<code>checklist(4)</code>
IRIX	<code>/etc/fstab</code>	<code>fstab(4)</code>
Digital UNIX	<code>/etc/fstab</code>	<code>fstab(4)</code>
Solaris	<code>/etc/vfstab</code>	<code>vfstab(4)</code>

After you have exported and mounted the CD-ROM file system, install the software on the target host as described in this publication.

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